HEARINGS EXAMINER MEETING AGENDA
Thursday, August 16, 2018, 4:00 PM
City Hall, 616 NE 4th Avenue

I. CALL TO ORDER

II. INTRODUCTION AND INSTRUCTIONS

III. HEARING ITEM

A. Public Hearing for Hubbard Dock
Details: The applicant, Brant Hubbard, requests approval of a Shoreline Substantial Development Permit and Shoreline Variance (SHOR18-01) to construct a private dock. The proposed dock will be located at 1180 SE Polk Street, on the Columbia River. The project will require a variance due to the need for 12-inch pilings, and for the length of the gangway. A staff report provides the applicable approval criteria. The Shoreline Management Review Committee referred the decision to the city's hearings examiner.
Presenter: Sarah Fox, Senior Planner
Recommended Action: Staff recommends that the Hearings Examiner review the permit application, conduct a public hearing, deliberate, and render a decision. The local decision will be forwarded to the Department of Ecology for final permit approval.

Staff Report

1_Application Materials and Biological Report

2_Critical Areas Report for Dock

3_Ecology Comment

4_Carol Buck Comment

5_Andreas and April Juretzka Comment

6_Carol Buck Comment on June 3 2018

7_Hubbbard Dock Drawing

8_Minutes from Public Meeting

B. Public Hearing for 43rd Avenue Subdivision
Details: The 43rd Avenue Subdivision was submitted by PBS Engineering on March 12, 2018. The applicant requests approval of a 12-lot subdivision. The proposed project is located at 2223 NW 43rd Avenue, on 3.48 acres [Tax Parcel: 177887-000]. The project area is zoned Single-family Residential 7,500 (R-7.5).
Presenter: Sarah Fox, Senior Planner
Recommended Action: Staff recommends that the Hearings Examiner review the permit application, conduct a public hearing, deliberate, and render a decision.

Staff Report for 43rd Ave

01-Geotech_Engineering_Report

02-Title_Report

03-Application_Form_and_Fees

04-Preliminary_Storm_TIR

05-Pre-Application_Meeting_Notes

06-Sight_Distance_Certification

07-Project_Narrative

08-Wetland_Report_

09-43rd_Critical_Areas_Report

10-Preliminary-Plans_2018-03-07

11-Revised_Prelim_Stormwater

12-Sign Posting and Email Correspondence

13-Arborist_Report

14-Existing_Tree_Priority_Exhibit

15-Revised_Plan_Set

16-Revised_Critical_Areas_Rpt

17-Response_Letter

18-Revised_Narrative

IV. ADJOURNMENT

V. LAND USE DECISION

NOTE: The City of Camas welcomes and encourages the participation of all of its citizens in the public meeting process. A special effort will be made to ensure that persons with special needs have opportunities to participate. For more information, please call the City Clerk's Office at 360.817.1591.

STAFF REPORT
HUBBARD DOCK
SHORELINE SUBSTANTIAL DEVELOPMENT PERMIT AND VARIANCE

File No. SHOR18-01

REPORT DATE: JULY 9, 2018
PUBLIC HEARING: AUGUST 16, 2018

To:	Hearings Examiner Joseph Turner	**Applicant**: Brant Hubbard 1180 SE Polk Street, Camas, WA 98607
From:	Sarah Fox, Senior Planner, on behalf of the Shoreline Management Review Committee	
Location:	1180 SE Polk Street, Camas, WA. Also described as the NW ¼ section, Sec. 13, Township 1N, R3E, W. M.	
Public Notice:	The city mailed application notices to properties within 300-feet of the subject site on May 4, 2018. The city issued a SEPA Determination of Non-significance (file #SEPA18-07) on May 17, 2018, and the comment period ended on May 31, 2018.	

CONTENTS

APPLICABLE LAW

The applicable codes are those codes that were in effect on the date of application, to include the Camas Shoreline Master Program (Limited Amendment Ord. 15-007) consolidated with Critical Area Review within Appendix C (SMP); and the Shoreline Management Act (RCW90-58)(WAC 173-27). **Note**: ***Camas Shoreline Master Program (SMP) citations are in italics throughout this report.***

CAMAS SHORELINE MASTER PROGRAM (SMP) PERMITS

Shoreline Substantial Development Permits must be consistent with approved Shoreline Master Program (SMP) element goals, objectives and general policies of the designated environment; policy statements for shoreline use activities; and with use activity regulations. Critical area review and permitting are consolidated with the SMP.

Shoreline Variance: The applicant must demonstrate that the variance is the minimum necessary to afford relief and that it will not cause adverse effects to the environment. SMP Variances require final approval or disapproval from the Department of Ecology after final local action has been taken.

SUMMARY

The proposed dock will be located within the Columbia River. The Camas Shoreline Master Program (SMP) classifies the shoreline management areas as "Medium Intensity" and "Aquatic". In both environments, a private dock is an allowed shoreline use.

The Shoreline Management Review Committee held a public meeting on June 7, 2018 to review the application and submitted comments. After deliberation, the committee determined that the project involved "public concern" and referred the application to the city's Hearings Examiner for a public hearing, pursuant to SMP, Appendix B Section IV (C).

MASTER PROGRAM GOALS AND POLICIES (CHAPTER 3)

General Goals, Section 3.2

Within the City of Camas, the Columbia River is designated as a shorelines of statewide significance (SSWS). Shorelines of statewide significance are of value to the entire state. In accordance with RCW 90.58.020, SSWS will be managed as follows:

> *1. Preference shall be given to the uses that are consistent with the statewide interest in such shorelines.*
>
> *2. Uses that are not consistent with these policies should not be permitted on SSWS.*
>
> *3. Those limited shorelines containing unique, scarce and/or sensitive resources should be protected.*
>
> *4. Development should be focused in already developed shoreline areas to reduce adverse environmental impacts and to preserve undeveloped shoreline areas. In general, SSWS should be preserved for future generations by 1) restricting or prohibiting development that would irretrievably damage shoreline resources, and 2) evaluating the short-term economic gain or convenience of developments relative to the long-term and potentially costly impairments to the natural shoreline.*

FINDING: Staff finds that the general goals and policies of Chapter 3 are met as this project will not affect public use of shorelines, and is in an area that is already developed with single family residences.

AQUATIC ENVIRONMENT (CHAPTER 4)

The management policies of the Aquatic Shoreline Designation at SMP Section 4.3.1.4 are as follows:

1) *New over-water structures should be allowed only for water-dependent uses or ecological restoration.*

FINDING: The development is a dock that is solely for water-dependent uses.

2) *Shoreline uses and modifications should be designed and managed to prevent degradation of water quality and natural hydrographic conditions.*

FINDING: The applicant has prepared specifications in regard to the in-water work and their efforts to protect the environment.

1) *In-water uses should be allowed where impacts can be mitigated to ensure no net loss of ecological functions. Permitted in-water uses must be managed to avoid impacts to shoreline functions. Unavoidable impacts must be minimized and mitigated.*

FINDING: The applicant has proposed to minimize impacts.

2) *On navigable waters or their beds, all uses and developments should be located and designed to: (a) minimize interference with surface navigation; (b) consider impacts to public views; and (c) allow for the safe, unobstructed passage of fish and wildlife, particularly species dependent on migration.*

FINDING: Dock design will minimize interference with navigation and fish migration, and will not impact public views.

3) *Multiple or shared use of over-water and water access facilities should be encouraged to reduce the impacts of shoreline development and increase effective use of water resources.*

FINDING: Development is for a private dock.

4) *Structures and activities permitted should be related in size, form, design, and intensity of use to those permitted in the immediately adjacent upland area. The size of new over-water structures should be limited to the minimum necessary to support the structure's intended use.*

FINDING: Applicant proposes the minimum necessary dimensions for structure.

5) *Natural light should be allowed to penetrate to the extent necessary to discourage salmonid predation and to support nearshore habitat unless other illumination is required by state or federal agencies.*

FINDING: The gangway will allow light penetration.

6) *Aquaculture practices should be encouraged in those waters and beds most suitable for such use. Aquaculture should be discouraged where it would adversely affect the strength or viability of native stocks or unreasonably interfere with navigation.*

FINDING: No aquaculture activities are proposed.

7) *Given that the aquatic designation is waterward of the OHWM, then when the proposed use, development, activity or modification requires use of adjacent upland property, then it must also be allowed within the upland shoreline designation.*

FINDING: The upland environment is included in this analysis and staff report.

MEDIUM INTENSITY ENVIRONMENT (CHAPTER 4)

The management policies of the Medium Shoreline Designation at SMP Section 4.3.4.4 are as follows:

1) The scale and density of new uses and development should be compatible with sustaining shoreline ecological functions and processes, and the existing residential character of the area.

FINDING: The SMP allows a dock for each residential lot, and therefore meets this criterion.

2) Public access and joint use (rather than individual) of recreational facilities should be promoted.

FINDING: The development is not for joint use.

3) Access, utilities, and public services to serve proposed development within shorelines should be constructed outside shorelines to the extent feasible, and be the minimum necessary to adequately serve existing needs and planned future development.

FINDING: The applicant proposes a foot path from yard to gangway.

4) Public or private outdoor recreation facilities should be provided with proposals for subdivision development and encouraged with all shoreline development if compatible with the character of the area. Priority should be given first to water-dependent and then to water-enjoyment recreation facilities.

FINDING: Not a subdivision.

5) Commercial development should be limited to water-oriented uses. Non-water-oriented commercial uses should only be allowed as part of mixed-use developments where the primary use is residential and where there is a substantial public benefit with respect to the goals and policies of this Program such as providing public access or restoring degraded shorelines.

FINDING: Not a commercial development.

GENERAL SHORELINE USE AND DEVELOPMENT REGULATIONS (CHAPTER 5)

The SMP includes general regulations that apply to all development in the shorelines. The following analysis and findings respond to the criteria at **Section 5.1** General Shoreline Use & Development.

1. Shoreline uses and developments that are water-dependent shall be given priority.

FINDING: The development is water-dependent.

2. Shoreline uses and developments shall not cause impacts that require remedial action or loss of shoreline functions on other properties.

FINDING: The proposed work will not affect shoreline functions on other properties.

3. Shoreline uses and developments shall be located and designed in a manner such that shoreline stabilization is not necessary at the time of development and will not be necessary in the future for the subject property or other nearby shoreline properties unless it can be demonstrated that stabilization is the only alternative to protecting public safety and existing primary structures.

FINDING: The development will require a concrete bulkhead at start of gangway, and is not for the purposes of protecting property. It does not appear that it will that any further measures will be necessary in the future.

4. Land shall not be cleared, graded, filled, excavated or otherwise altered prior to issuance of the necessary permits and approvals for a proposed shoreline use or development to determine if environmental impacts have been avoided, minimized and mitigated to result in no net loss of ecological functions.

FINDING: The applicant will need to excavate three (3) cubic yards for bulkhead. The applicant has also requested to build a stone pathway from backyard to gangway.

5. Single family residential development shall be allowed on all shorelines except the Aquatic and Natural shoreline designation, and shall be located, designed and used in accordance with applicable policies and regulations of this Program.

FINDING: This criterion is not applicable as the residence is existing.

6. Unless otherwise stated, no development shall be constructed, located, extended, modified, converted, or altered or land divided without full compliance with CMC Title 17 Land Development and CMC Title 18 Zoning.

FINDING: The project will not require development permits as found within CMC Titles 17 or 18.

7. On navigable waters or their beds, all uses and developments should be located and designed to: (a) minimize interference with surface navigation; (b) consider impacts to public views; and (c) allow for the safe, unobstructed passage of fish and wildlife, particularly species dependent on migration.

FINDING: The development is within the aquatic environment. The development will not impact public views and the biological evaluation did not find any negative impacts to fish and wildlife.

8. Hazardous materials shall be disposed of and other steps be taken to protect the ecological integrity of the shoreline area in accordance with the other policies and regulations of this Program as amended and all other applicable federal, state, and local statutes, codes, and ordinances.

FINDING: No hazardous materials are expected as part of this development.

9. In-water work shall be scheduled to protect biological productivity (including but not limited to fish runs, spawning, and benthic productivity). In-water work shall not occur in areas used for commercial fishing during a fishing season unless specifically addressed and mitigated for in the permit.

FINDING: The work will occur when authorized through WA Dept. of Fish & Wildlife, and other state agencies.

10. The applicant shall demonstrate all reasonable efforts have been taken to avoid, and where unavoidable, minimize and mitigate impacts such that no net loss of critical area and shoreline function is achieved. Applicants must comply with the provisions of Appendix C with a particular focus on mitigation sequencing per Appendix C, Section 16.51.160 Mitigation Sequencing. Mitigation Plans must comply with the requirements of Appendix C, Section 16.51.170 Mitigation Plan Requirements, to achieve no net loss of ecological functions.

FINDING: The application includes a Biological Evaluation in which a discussion on minimizing impacts was included.

11. The effect of proposed in-stream structures on bank margin habitat, channel migration, and floodplain processes should be evaluated during permit review.

FINDING: The application includes a biological evaluation and critical area reports. Impacts will be mitigated with installation of large woody debris.

12. Within urban growth areas, Ecology may grant relief from use and development regulations in accordance with RCW 90.58.580, and requested with a shoreline permit application.

FINDING: The development is within the city jurisdictions.

SPECIFIC SHORELINE USE REGULATIONS (CHAPTER 6) – BOATING USES (6.3.3)

The SMP contains 28 regulations for mooring facilities and docks. Not all of the regulations are applicable to this proposal. The applicant addressed several of the applicable regulations and requests variances to both the piling size and the length of the gangway.

Section 6.3.3.4 Moorage Facilities: Docks, Piers, and Mooring Buoys	Findings
1. Moorage facilities shall be located so as to minimize interference with the use of navigable waters.	Dock has been located to minimize interference with navigable waters.
2. Mooring buoys shall be used instead of docks and piers whenever feasible.	Dock is being proposed.
3. Mooring buoys shall be placed as specified by WDFW, DNR, and the U.S. Coast Guard to balance the goals of protecting nearshore habitat and minimizing obstruction to navigation. Anchors and other design features shall meet WDFW standards.	Buoys are not proposed.
4. Mooring buoys shall be discernible from a distance of at least one hundred (100) yards, and shall be equipped with reflectors for nighttime visibility. Only one mooring buoy for each waterfront lot shall be permitted unless greater need is demonstrated by the applicant, for example: if there is a community park with recreational users or a residential development with lot owners both on and away from the shoreline needing moorage.	Buoys are not proposed.
5. Mooring buoys for residential use on a river shall be securely anchored to pilings to allow for changes in river level, and shall be designed to withstand the one- hundred (100) year flood or be seasonably removable.	Buoys are not proposed.
6. Moorage facilities should not be located in areas with important bank margin habitat for aquatic species or where wave action caused by boating use would increase bank erosion rates.	Wave action will not increase bank erosion.
7. Piles or other in-water portions of the moorage structure shall not be treated with pentachlorophenol, creosote, CCA or comparably toxic compounds. If ACZA piling are proposed, the applicant will meet all of the Best Management Practices, including a post-treatment procedure, as outlined in the amended Best Management Practices of the Western Wood Preservers. Any paint, stain, or preservative applied to the overwater structure shall be completely dried or cured prior to installation.	Gangway and dock will not utilize toxic materials. Pilings and gangway grating will be metal.
8. In-water work shall be scheduled to protect biological productivity (including but not limited to fish runs, spawning, and benthic productivity). In-water work shall not occur in areas used for commercial fishing during a fishing season unless specifically addressed and mitigated for in the permit.	Applicant will comply with state guidelines for in-water construction.
9. Covered moorage shall be prohibited.	None proposed
10. Moorage facilities in waters providing a public drinking water supply shall be constructed of untreated materials, such as untreated wood, approved plastic composites, concrete, or steel.	Steel construction proposed.

11. Existing residential moorage facilities shall be allowed as follows: **a. Existing, legally-established, private recreational docks and floats for individual lots in existing subdivisions and for existing individual single-family developments are considered conforming uses and structures.** **b. If an existing dock or float is abandoned, becomes hazardous, or is removed for any reason, then a new dock or float must meet the requirements of this section, which may include provisions for use of mooring buoys or to share the new dock (e.g. Locate along property lines for future expansion), and are consistent with other policies and regulations of this Program.**	Not applicable
12. New recreational moorage facilities are allowed as follows: **a. For individual residential lots, the applicant shall demonstrate that existing facilities such as marinas and shared moorage are not adequate or not available for use within one-quarter (1/4) mile.**	Marina is 0.7 miles from site, which is more than ¼ mile.
b. No more than one private, non-commercial dock or mooring buoy or boat launch facility is permitted for each shoreline lot, or parcel, or contiguous group of lots or parcels in a single ownership that existed on the effective date of this Program, if shared moorage is unavailable within one-quarter (1/4) mile of proposed facility (e.g.: one facility or the other, not a combination).	Only one dock proposed for this lot.
c. Only a single, joint-use moorage facility may be permitted in association with hotels, motels, land divisions, and multi-family residences. The application shall demonstrate a need and public benefit for moorage.	Not applicable
13. Provisions for waste discharge shall be made in all proposals for public moorage facilities, and shall include oil containment barriers when required by the U.S. Coast Guard under provisions of the Federal Water Pollution Control Act.	Private facility
14. All moorage facilities shall be constructed and maintained in a safe and sound condition. Those that are abandoned or unsafe shall be removed or repaired promptly by the moorage owner or lessee.	Dock will be constructed by licensed contractor
15. Overwater structures shall be located in water sufficiently deep to prevent the structure from grounding out at the lowest low water or stoppers should be installed to prevent grounding out on state-owned aquatic lands.	Proposal includes stops to avoid grounding out at low water.
16. Docks and piers are prohibited along braided or meandering river channels, or where the river channel is subject to change in direction or alignment (e.g. Washougal River).	Not applicable
17. Docks and piers shall be located to avoid fish spawning locations to the extent practicable.	Application includes analysis of effects on fish.
18. Fixed-piers shall not be permitted for residential use on rivers. Floating docks shall be required in rivers and streams unless it can be demonstrated that fixed docks will result in substantially less impact on geo-hydraulic processes and flood hazards can be minimized or mitigated.	Gangway and dock will be secured to pilings, not piers.
19. Docks for residential use on a river shall be securely anchored to pilings to allow for changes in river level, and shall be designed to withstand the one-hundred (100) year flood or be seasonably removable	Applicant has proposed a variance to piling dimensions to meet this provision.
20. All docks shall include stops that serve to keep the floats off the lake or river beds at low water levels. If a bulkhead-like base is proposed for a fixed pier or dock where there is net positive littoral drift, the base shall be built landward of the OHWM or protective berms…	Proposal includes stops at the OHWM level.
21. New subdivisions (more than two lots) with shoreline frontage shall provide joint-use moorage facilities if any are proposed. Proposed moorage facility shall include no more than	Not a subdivision

one mooring space for each lot with shoreline frontage. Moorage to serve upland lots without water frontage shall be regulated as a marina.	
22. Applicants for joint-use docks and piers shall demonstrate and document that adequate maintenance of the structure, activities, and associated landward area will be provided by identified responsible parties.	Not a joint-use application
23. The maximum dimensions of a dock or pier shall be no greater than necessary, but may be adjusted to protect sensitive shoreline resources.	Applicant requests a variance to avoid wetlands and achieve required depths.
a. A dock or pier (gangway and floating structure combined) shall be long enough to obtain a depth as required by WDFW at its landward edge. Maximum length is sixty (60) feet unless a depth of eight (8) feet cannot be obtained. In such circumstances the dock may be extended until the water depth reaches a point of eight (8) feet in depth at ordinary low water (OLWM), or to a maximum of one-hundred (100) feet whichever is reached first.	The gangway will exceed 60 feet. A variance to allow the gangway to be 220 feet is necessary to achieve depth.
b. To prevent damage to shallow water habitat, piers and/or ramps shall extend at least twenty (20) feet perpendicular from the OHWM.	The length of 220 feet will meet this standard.
c. Piers and ramps shall be no more than four feet (4) in width.	Ramp is 4 feet wide.
d. The bottom of the fascia boards on the pier or bottom of the landward edge of the ramp shall be elevated at least two (2) feet above the horizontal plane of the OHWM	Meets this standard.
e. Grating or clear translucent material shall cover the entire surface area of the pier and ramp. The open area of grating shall have a minimum of sixty percent (60%) open. Clear translucent material shall have greater than ninety percent (90%) light transmittance as rated by the manufacturer.	Meets this standard.
f. Docks and piers shall be set back a minimum of ten (10) feet from side property lines, except that joint-use facilities may be located closer to or upon a side property line when agreed to by contract or covenant with the owners of the affected properties. This agreement shall be recorded with the County Auditor and a copy filed with the shoreline permit application.	Meets this standard.
g. The Administrator may adjust the dimension in this section by equal to or less than ten (10) percent on a case-by-case basis if there are factors such as safety, ADA accessibility, or potential environmental damage. If the proposal requires more than a ten (10) percent deviation, than a Shoreline Variance permit will be required.	Variance requested exceeds 10% administrative approval.
24. Docks used for motor boats should be located where the water will be deeper than seven (7) feet at the lowest low water to avoid prop scour.	Meets this standard.
25. Recreational floats shall be allowed only when located as close to the shore as possible, and no farther waterward than any existing floats and established swimming areas. Floats shall be unattached to other structures and be constructed as follows: **a. That the deck surface is not higher than one (1) foot above the water surface. Reflectors for nighttime visibility shall be incorporated into their design.** **b. Floats shall not exceed dimensions of one-hundred-sixty (160) square feet. For private-use structures a maximum of one float shall be installed. A maximum of two floats shall be installed for joint-use structures.** **c. Freeboard height on floats shall be at least ten (10) inches.** **d. Grating or clear translucent material shall cover at least fifty-percent (50%) of the surface area of floats.**	The applicant has proposed two floating elements – a dock and a landing. The dock is 144 square feet and the landing is 96 square feet. The proposal exceeds this standard by 80 square feet and has more than one floating element. A condition to remedy this deficiency is included.
26. Pilings shall be constructed as follows: **a. Piling diameter shall be minimized to meet the structural requirements of expected loads. Generally, piling shall not exceed four (4) inches in diameter. If a piling is encased in a sleeve, the piling plus sleeve diameter shall not exceed five (5) inches.**	Applicant has requested a variance based on conditions of the Columbia River.

b. Pile spacing shall be the maximum feasible to minimize shading and avoid a "wall" effect that would block or baffle wave patterns, currents, littoral drift, or movement of aquatic life forms, or result in structure damage from driftwood impact or entrapment. Minimum pile spacing is eighteen (18) feet on the same side of any component of the overwater structure.	Pilings are spaced from 77' to 80' apart. Pilings at the floating dock are 13' apart. A condition to increase spacing to 18' will be included.
27. Bulk storage (non-portable storage in fixed tanks) for gasoline, oil and other petroleum products for any use or purpose is prohibited on docks and piers.	Not proposed.
28. Overhead wiring or plumbing shall not be permitted on docks or piers	Not proposed.

SHORELINE VARIANCE

The applicant requested a variance to the length of the gangway and to the size of the in-water pilings. A request for a variance to a development may be authorized when the applicant can demonstrate all of the following:

1. That if the applicant complies with the provisions of the Program then they cannot make any reasonable use of the property. The fact that there is the possibility that the property might make a greater profit by using the property in a manner contrary to the intent of the Program is not a sufficient reason for a variance;

FINDING: The variance is not for financial reasons.

2. That the hardship is specifically related to unique conditions of the property (e.g. irregular lot shape, size or natural features) and not, for example, from deed restrictions or the applicant's own actions;

FINDING: The variance is necessary due to specific conditions of the Columbia River.

3. That the variance requested is the minimum necessary to afford relief;

FINDING: The applicant asks for the minimum relief due to the specific conditions.

4. That the variance will not constitute a grant of special privilege not enjoyed by other properties in the area;

FINDING: The construction of other docks on the Columbia River have requested larger pilings than the 4" limitation due to the minimum engineering requirements. The length of gangways of other docks have also required the longer length due to the water depths. No special privilege is requested.

5. That the design of the project will be in harmony with the other authorized uses in the area, and the intent of the Program; and

FINDING: The development is consistent with residential uses on the shoreline and a preference for water-dependent activities.

6. That the public welfare and interest will be preserved; if more harm will be done to the area by granting the variance than would be done to the applicant by denying it, the variance will be denied.

FINDING: The development will not impact any public shoreline or river use.

7. If proposed waterward of the OHWM, then the public rights of navigation and use will not be adversely affected.

FINDING: The development will minimize any navigation impacts.

CRITICAL AREAS

Critical Area regulations are located within the SMP, Appendix C.

FISH AND WILDLIFE CONSERVATION AREAS- SMP APPENDIX C, CHAPTER 16.61

The application contained a Critical Area Report (May 2018) and a Biological Evaluation (1/24/18). The report included an evaluation that no endangered and threatened species will be affected by the project. The application proposed to provide mitigation for the loss of habitat. A large wood debris pile will be installed waterward of the ordinary high water mark. A condition in regard to the timing of mitigation will be included.

After local approval is granted, the activity is also subject to permitting from the Department of Fish and Wildlife, the Army Corps of Engineers and the Department of Ecology.

FINDING: The applicant demonstrated that impacts to threatened and endangered species can be minimized or avoided.

CONCLUSIONS

- Based upon the submitted plans and reports, Staff finds that the project is consistent with the general goals and policies of the SMP pursuant to SMP Chapter 3 Goals and Policies, and Chapter 5 General Use & Development Regulations.
- As proposed, the project is consistent with the SMP Chapter 6 Specific Shoreline Use Regulations, for docks.
- The development can comply with the critical area regulations of the SMP.

RECOMMENDATION

Staff recommends **APPROVAL** of the Hubbard Dock (File #SHOR18-01) with the following conditions:

Proposed Conditions:

1. The applicant indicates that there is only a 13 foot spacing at the landing and dock (floats). The applicant must modify piling spacing to obtain a minimum of 18 feet spacing on the same side of any component of the overwater structures.
2. The floating landing and dock exceed the dimensional limitations and the number of floats. The applicant will modify the proposal to limit the floating element of the proposal to one, and not exceed a size of 160 square feet.
3. The applicant shall install the wood debris structure within three (3) months of dock construction. Proof of compliance will be provided to the city, to include photos and inspection report by biologist of record.

Shoreline Substantial Development Submittal
for: Hubbard Dock
1180 SE Polk Cir.
Camas, WA 98607

submitted by: Jack Loranger , 360-837-3760
162 Krogstad Rd.
Washougal WA, 98671
Authorized Agent for Brant Hubbard

Contents:

2 pages – City of Camas General Application Form
13 pages – SEPA Checklist
1 page – Contour/Soils Map
1 page – Quarter Section Map

4 pages – Plan Set
1 page – Zoning
1 page – Recorded Deed
2 pages – Narrative
14 pages – JARPA
2 pages – JARPA Attachment E
17 pages – Biological Evaluation
12 pages – Mitigation Plan

300' radius map
300' radius labels
300' Certified labels list

Community Development Department | Planning
616 NE Fourth Avenue | Camas, WA 98607
(360) 817-1568 | www.cityofcamas.us

General Application Form **Case Number:**

Applicant Information

Applicant/Contact:: Jack Loranger, Agent for Brant Hubbard Phone: (360) 837-3760

Address: 162 Krogstad Rd jack@shorelinepermits.com
Street Address *E-mail Address*

Washougal WA 98671
City *State* *ZIP Code*

Property Information

Property Address: 1180 SE Polk Cir. 87350005
Street Address *County Assessor # / Parcel #*

Camas WA 98607
City *State* *ZIP Code*

Zoning District R-15 Site Size 12,632 sq. ft. .29 acres

Description of Project

Brief description: To construct a private recreational floating dock and landing in the Columbia River with an elevated gangway from the landing to a concrete bulkhead located on the upland area of the property. Steel pilings will be driven for dock and gangway support .

Are you requesting a consolidated review per CMC 18.55.020(B)? YES ☐ NO ☒

Permits Requested: ☐ Type I ☐ Type II ☐ Type III ☐ Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: HUBBARD BRANT Phone: (503) 804-2620
Last *First*

Address: 1180 SE Polk St. Camas
Street Address *Apartment/Unit #*

E mail Address: b_hubbard@comcast.net WA 98607
City *State* *Zip*

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: **Date:**

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: Pre-Application Date:

Staff: Related Cases #

Validation of Fees

Revised: 01/14/13

Application Checklist and Fees [April 25, 2017]

◊	Annexation	$264 - 10% petition; $1,320 - 60% petition	001-00-345-890-00		$
◊	Appeal Fee		001-00-345-810-00	$355.00	$
◊	Archaeological Review		001-00-345-810-00	$122.00	$
◊	Binding Site Plan	$1,675 + $21 per unit	001-00-345-810-00		$
◊	Boundary Line Adjustment		001-00-345-810-00	$91.00	$
◊	Comprehensive Plan Amendment		001-00-345-810-00	$1,756.00	$
◊	Conditional Use Permit				
	Residential	$3,045 + $96 per unit	001-00-345-810-00		$
	Non-Residential		001-00-345-810-00	$3,857.00	$
◊	Continuance of Public Hearing		001-00-345-810-00	$305.00	$
◊	Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$690.00	$
	(wetlands, steep slopes or potentially unstable soils, streams and watercourses, vegetation removal, wildlife habitat)				
◊	Design Review				
	Minor		001-00-345-810-00	$386.00	$
	Committee		001-00-345-810-00	$1,776.00	$
◊	Development Agreement	$782 first hearing; $305 ea. add'l hearing	001-00-345-810-00		$
◊	Engineering Department Review				
	Review Fee	3% of estimated construction costs	001.00.345.830.20		$
	Modification to Approved Construction Plans		001.00.345.810.00	$370.00	$
◊	Fire Department Review				
	Short Plat or other Development Review		115-09-345-830-10	$127.00	$
	Short Plat or other Development Inspection		115-09-345-830-10	$127.00	$
	Subdivision or PRD Review		115-09-345-830-10	$157.00	$
	Subdivision or PRD Inspection		115-09-345-830-10	$157.00	$
	Site Plan Review		115-09-345-830-10	$188.00	$
	Site Plan Inspection		115-09-345-830-10	$188.00	$
◊	Home Occupation				
	Minor - Notification (No fee)			$0.00	
	Major		001-00-321-900-00	$61.00	$
◊	LI/BP Development	$3857 + $36.50 per 1000 sf of GFA	001-00-345-810-00		$
◊	Minor Modifications to approved development		001-00-345-810-00	$178.00	$
◊	Planned Residential Development	$30 per unit + subdivision fees	001-00-345-810-00		$
◊	Plat, Preliminary				
	Short Plat	4 lots or less: $1725.00 per lot	001-00-345-810-00		$
	Short Plat	5 lots or more: $6,400 + $225 per lot	001-00-345-810-00		$
	Subdivision	$6,400 + $225 per lot	001-00-345-810-00		$
◊	Plat, Final:				
	Short Plat		001-00-345-810-00	$178.00	$
	Subdivision		001-00-345-810-00	$1,066.00	$
◊	Plat Modification/Alteration		001-00-345-810-00	$548.00	$
◊	Pre-Application (Type III or IV Permits)				
	No fee for Type I or II				
	General		001-00-345-810-00	$315.00	$
	Subdivision		001-00-345-810-00	$812.00	$
◊	SEPA		001-00-345-890-00	$721.00	$
◊	Shoreline Permit		001-00-345-890-00	$782.00	$
◊	Sign Permit				
	General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$36.00	$
	Master Sign Permit		001.00.322.400.00	$112.00	$
◊	Site Plan Review				
	Residential	$1,025 + $30 per unit	001-00-345-830-10		$
	Non-Residential	$2,562 + $61 per 1000 sf of GFA	001-00-345-830-10		$
	Mixed Residential/Non Residential	$3,613 + $30 per res unit + $61 per 1000 sf of GFA	001-00-345-830-10		$
◊	Temporary Use Permit		001-00-321-990-00	$71.00	$
◊	Variance (Minor or Major)		001-00-345-810-00	$620.00	$
◊	Zone Change (single tract)		001-00-345-810-00	$1,746.00	$

Adopted by RES 1023 Aug 2005; Revised by RES 1113 Sept 2007; Revised by RES 1163 Oct 2009; Revised by RES 1204 Nov 2010
Revised by RES 15-001 Jan 2015; Revised by RES 15-007 May 2015; Revised by RES 15-018 Dec 2015; Revised by RES 16-019 Nov 2016

For office use only

Total Fees Due: $

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

SEPA ENVIRONMENTAL CHECKLIST

UPDATED 2016

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

***Instructions for applicants*:**

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals: [help]

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [help]

1. Name of proposed project, if applicable: [help]
   Hubbard Dock
2. Name of applicant: [help]
   Brant Hubbard

3. Address and phone number of applicant and contact person: [help]
Brant Hubbard 1180 SE Polk St. Camas , WA 98607 503-804-2620
CONTACT: Jack Loranger 162 Krogstad Rd. Washougal, WA 98671 360-837-3760

4. Date checklist prepared: [help]
1/11/2018

5. Agency requesting checklist: [help]
City of Camas - Planning

6. Proposed timing or schedule (including phasing, if applicable): [help]
10/1/2018 or sooner if a work window opens

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]
No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]
A Biological Evaluation, a compensetory mitigation plan and a Critical Areas Report will be prepared.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]
No

10. List any government approvals or permits that will be needed for your proposal, if known. [help] Camas Shoreline Permit, DNR approval, USACOE Section 10 Permit, DFW HPA Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help] To construct a private recreational 6'x24' floating dock and 6'x16' floating landing in the Columbia River with an elevated gangway 4' wide and 220' long from the landing to a 7'x6' concrete bulkhead located on the upland area of the property. 7 steel pilings 12" diameter will be driven for dock and gangway support .

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]
1180 SE Polk Cir. Camas, Clark County WA 98607 - NW 1/4,S13,T1N,R3E South side of house top of bank west of stairway

B. ENVIRONMENTAL ELEMENTS [help]

1. Earth [help]

a. General description of the site: [help]
Flat upland with residence and yard steep slope on bank to gental slope at the tidelands.
(circle one): Flat, rolling, hilly, steep slopes, mountainous, other flat area and slopes

b. What is the steepest slope on the site (approximate percent slope)? [help]
~ 30%

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. [help]

Sand, silt and boulders.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. [help]

No

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. [help]

N/A

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. [help]

N/A

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? [help]

~ 16%

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: [help]

None

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. [help]

Limited exhaust emissions from the barge while driving pilings and setting the gangways.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. [help]

No

c. Proposed measures to reduce or control emissions or other impacts to air, if any: [help]

None

3. **Water** [help]

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. [help]

Columbia River

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans. [help]

Yes. The project is a floating dock that is located in the Columbia River with an elevated gangway spaning to the upland property.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material. [help]

None

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. [help]

No

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. [help]

Yes. It is in the river.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. [help]

No

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. [help]

No

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. [help]

N/A

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe. [help]

N/A

2) Could waste materials enter ground or surface waters? If so, generally describe. [help]

No

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. [help]

No

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: [help]

None

4. **Plants** [help]

a. Check the types of vegetation found on the site: [help]

_X_ deciduous tree: alder, maple, aspen, other
_X_ evergreen tree: fir, cedar, pine, other
_X_ shrubs
_X_ grass
____ pasture
____ crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____ water plants: water lily, eelgrass, milfoil, other
____ other types of vegetation

b. What kind and amount of vegetation will be removed or altered? [help]

None

c. List threatened and endangered species known to be on or near the site. [help]

DFW lists as threatened, may be affected : Golden Paintbrush
Not observed on site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: [help]

None

e. List all noxious weeds and invasive species known to be on or near the site. [help]

Amorpha fruticosa near site

5. **Animals** [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. [help]

Examples include:

birds: hawk, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site. [help]

DFW lists as threatened, may be affected and outside critical habitat: Streaked Horned Owl, Bull Trout, Yellow-billed Cuckoo

c. Is the site part of a migration route? If so, explain. [help]

No

d. Proposed measures to preserve or enhance wildlife, if any: [help]

Compensetory mitigation in the form of a Large Woody Sturcture on site.

e. List any invasive animal species known to be on or near the site. [help]

None

6. **Energy and Natural Resources** [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. [help]

None

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. [help]

No

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: [help]

None

7. **Environmental Health** [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. [help]

No

1) Describe any known or possible contamination at the site from present or past uses.

[help]

None

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity. [help]

None

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project. [help]

None

4) Describe special emergency services that might be required. [help]

None

5) Proposed measures to reduce or control environmental health hazards, if any: [help]

None

b. Noise [help]

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? [help]

None

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site. [help]

Pile driving during construction approximately 6 hours.

3) Proposed measures to reduce or control noise impacts, if any: [help]

If impact driver is required a wood block and bubble curtain will be used.

8. **Land and Shoreline Use** [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. [help]

Single Family Residential - No

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? [help]

No

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how: [help]

No

c. Describe any structures on the site. [help]

Single Family Residence with Attached Garage. Wooden stairway on bank

d. Will any structures be demolished? If so, what? [help]

No

e. What is the current zoning classification of the site? [help]

R-15

f. What is the current comprehensive plan designation of the site? [help]

SFL

g. If applicable, what is the current shoreline master program designation of the site? [help]

Aquatic
Medium Intensity

h. Has any part of the site been classified as a critical area by the city or county? If so, specify. [help]

Riparian Habitat Conservation Area

i. Approximately how many people would reside or work in the completed project? [help]

None

j. Approximately how many people would the completed project displace? [help]

None

k. Proposed measures to avoid or reduce displacement impacts, if any: [help]

None

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: [help]

None

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: [help]

None

9. **Housing** [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing. [help]

None

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing. [help]

None

c. Proposed measures to reduce or control housing impacts, if any: [help]

None

10. **Aesthetics** [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? [help]

The tops of the pilings will be at approximately 35' NGVD.

b. What views in the immediate vicinity would be altered or obstructed? [help]

None

b. Proposed measures to reduce or control aesthetic impacts, if any: [help]

None

11. **Light and Glare** [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur? [help]

None

b. Could light or glare from the finished project be a safety hazard or interfere with views? [help]

No

c. What existing off-site sources of light or glare may affect your proposal? [help]

None

d. Proposed measures to reduce or control light and glare impacts, if any: [help]

None

12. **Recreation** [help]

a. What designated and informal recreational opportunities are in the immediate vicinity? [help]

Water related activities

b. Would the proposed project displace any existing recreational uses? If so, describe. [help]

No

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any: [help]

The private floating dock will be used for water related recreation.

13. **Historic and cultural preservation** [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe. [help]

No

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources. [help]

None Known. City listed Archaeological Probability High

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc. [help]

An Archaeological Predetermination will be performed. The tribes will receive a copy for comment.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required. [help]

The project will be designed to avoid any areas determined by the Archaeological Report

14. **Transportation** [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. [help]

SE Polk Cir. a cul-de-sac serving single family residences.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? [help]

No 1.6 miles to C-Tran stop in Camas

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? [help]

None

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). [help]

No

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. [help]

River traffic in the vicinity. The main channel is approximately 800' from the project site.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? [help]

N/A

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. [help]

No

h. Proposed measures to reduce or control transportation impacts, if any: [help]

None

15. **Public Services** [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. [help]

No

b. Proposed measures to reduce or control direct impacts on public services, if any. [help]

None

16. **Utilities** [help]

a. Circle utilities currently available at the site: [help]

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed. [help] None

C. Signature [help]

Under the penalty of perjury, the above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee _____

Position and Agency/Organization _____

Date Submitted: _____

Community Development
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http://www.cityofcamas.us

D. supplemental sheet for nonproject actions [help]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

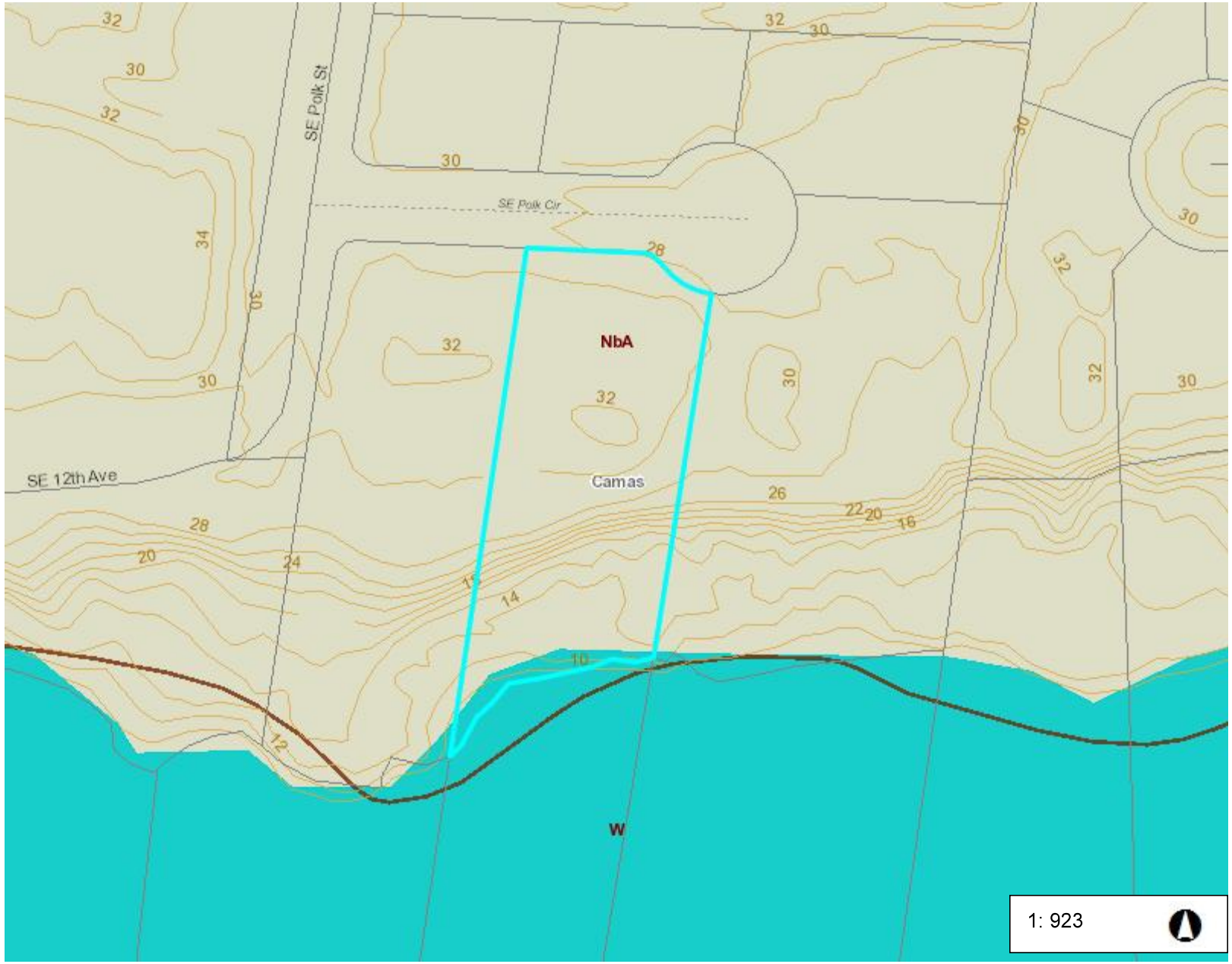
Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

Hubbard Dock Contours/Soils



Legend

- Taxlots
- Contour Lines - 2 ft
- Soil Type
- Cities Boundaries
- Urban Growth Boundaries

Notes:

153.8 0 76.90 153.8 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

Printed: September 22, 2016
Scale - 1:3600
1" = 300'

Information shown on this map was collected from several sources. Clark County accepts no responsibility for any inaccuracies that may be present.

Clark County
Geographic Information System

NW Qtr of Section 13 T1N R3E WM

HUBBARD DOCK VICINITY MAP

REFERENCE#_____

APPLICANT: BRANT HUBBARD

ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

LOCATION:
1180 SE POLK CIR. CAMAS, WA 98607

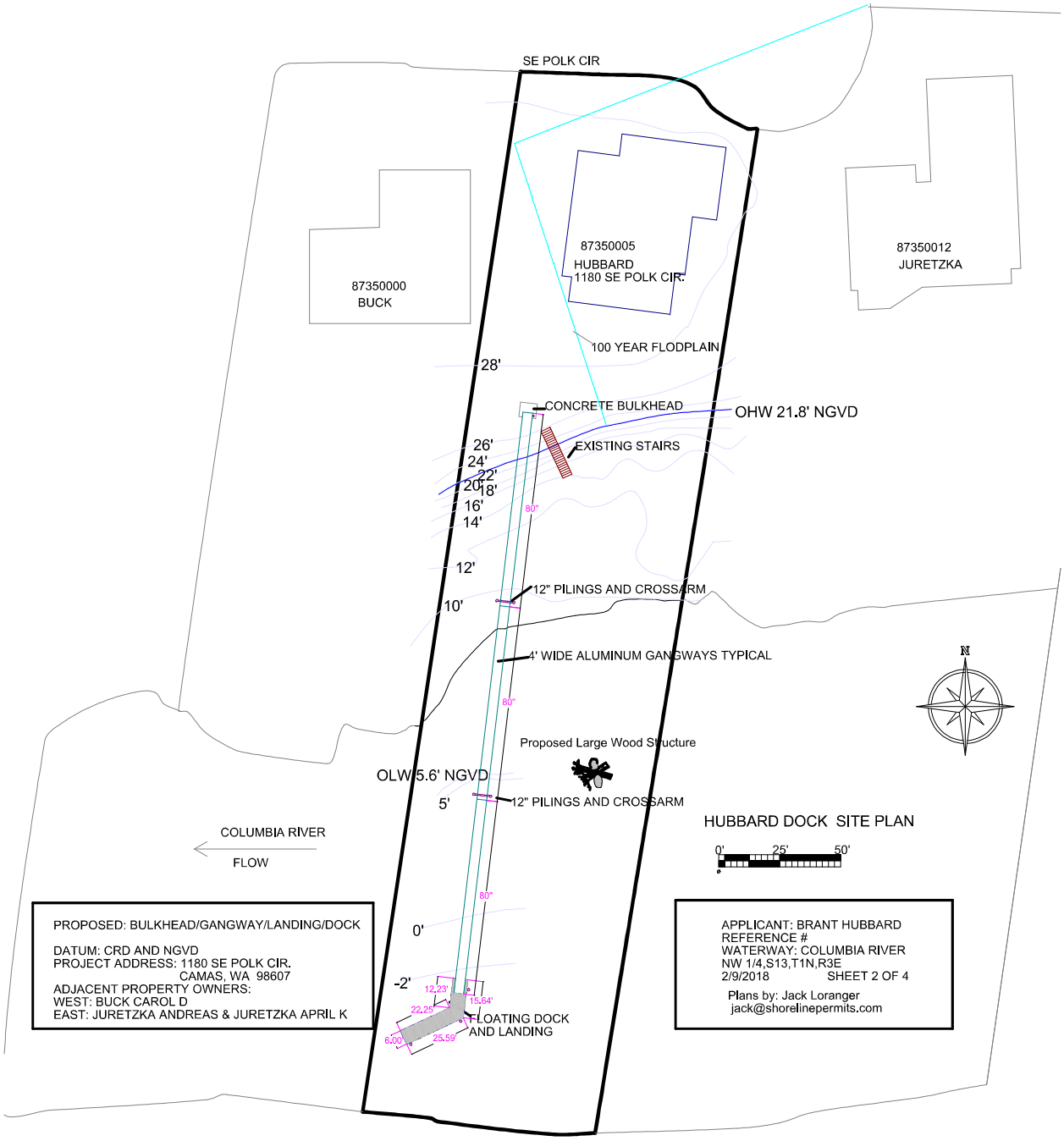
45.57852331 N lat. / -122.39632320 W long

PAGE 1 OF 4 2/9/2018

PROPOSED PROJECT:
BULKHEAD/GANGWAY/LANDING/DOCK

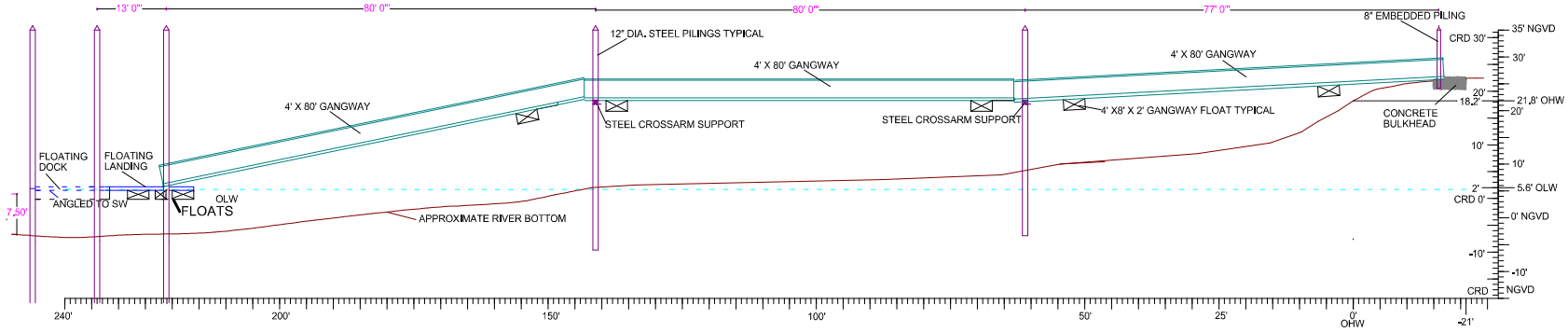
IN: COLUMBIA RIVER
NEAR: CAMAS, WA
COUNTY: CLARK
STATE: WA

plans by:Jack Loranger jack@shorelinepermits.com


SE POLK CIR
87350000
BUCK
87350005
HUBBARD
1180 SE POLK CIR.
87350012
JURETZKA
100 YEAR FLODPLAIN
28'
CONCRETE BULKHEAD
OHW 21.8' NGVD
EXISTING STAIRS
26'
24'
22'
20'
18'
16'
14'
12'
10'
80'
12" PILINGS AND CROSSARM
4' WIDE ALUMINUM GANGWAYS TYPICAL
N
Proposed Large Wood Structure
OLW 5.6' NGVD
5'
12" PILINGS AND CROSSARM
COLUMBIA RIVER
FLOW
0'
-2'
12.23'
15.64'
22.25'
6.00'
25.59'
FLOATING DOCK
AND LANDING
HUBBARD DOCK SITE PLAN
0'
25'
50'
PROPOSED: BULKHEAD/GANGWAY/LANDING/DOCK
DATUM: CRD AND NGVD
PROJECT ADDRESS: 1180 SE POLK CIR.
CAMAS, WA 98607
ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K
APPLICANT: BRANT HUBBARD
REFERENCE #
WATERWAY: COLUMBIA RIVER
NW 1/4,S13,T1N,R3E
2/9/2018
SHEET 2 OF 4
Plans by: Jack Loranger
jack@shorelinepermits.com

PROPOSED STRUCTURES

1 - 6'X7'X27" DEEP CONCRETE BULKHEAD
WITH EMBEDDED 8" STEEL PILING
7 - 12" STEEL PILINGS
2 - 6"X8" STEEL SUPPORT CROSSARMS
3 - 4' WIDE 80' LONG ALUMINUM GANGWAYS
1 - 6' WIDE FLOATING LANDING AVERAGE 14' LONG QUADRILATERAL
1 - 6' WIDE FLOATING DOCK AVERAGE 24' LONG QUADRILATERAL
5 - 4'X8'X2' DEEP FLOATS FOR GANGWAYS
2 - 4'X6'X20" DEEP FLOATS FOR LANDING
7 - 2'X6'X20" DEEP FLOATS FOR LANDING AND DOCK



EAST ELEVATION PROPOSED HUBBARD DOCK

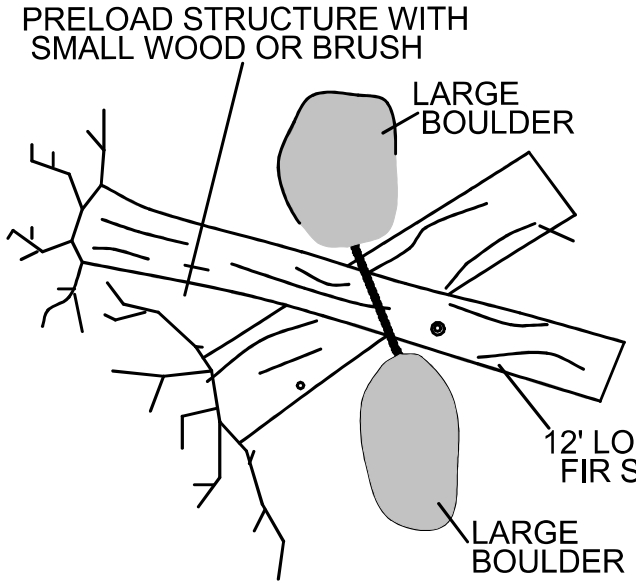
PROPOSED: BULKHEAD/GANGWAY/LANDING/DOCK

DATUM: CRD AND NGVD
PROJECT ADDRESS: 1180 SE POLK CIR.
CAMAS, WA 98607
ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

APPLICANT: BRANT HUBBARD
REFERENCE #
WATERWAY: COLUMBIA RIVER
NW 1/4,S13,T1N,R3E
2/09/2018 SHEET 3 OF 4

Plans by: Jack Loranger jack@shorelinepermits.com

Large Wood Structure



1/2" X 8" EYE BOLTS EPOXIED INTO BOULDERS
1/2" CHAIN WRAPPED AROUND LOGS AND
COUPLED TO THE EYE BOLTS

FLOW ←

PROPOSED: DOCK/LANDING/RAMP/BULKHEAD

Datum: NGVD

Project Address: 1180 SE Polk Cir.
Camas, Clark, WA 98607

Adjacent Property Owners:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

Applicant: Brant Hubbard

Reference # NWS-

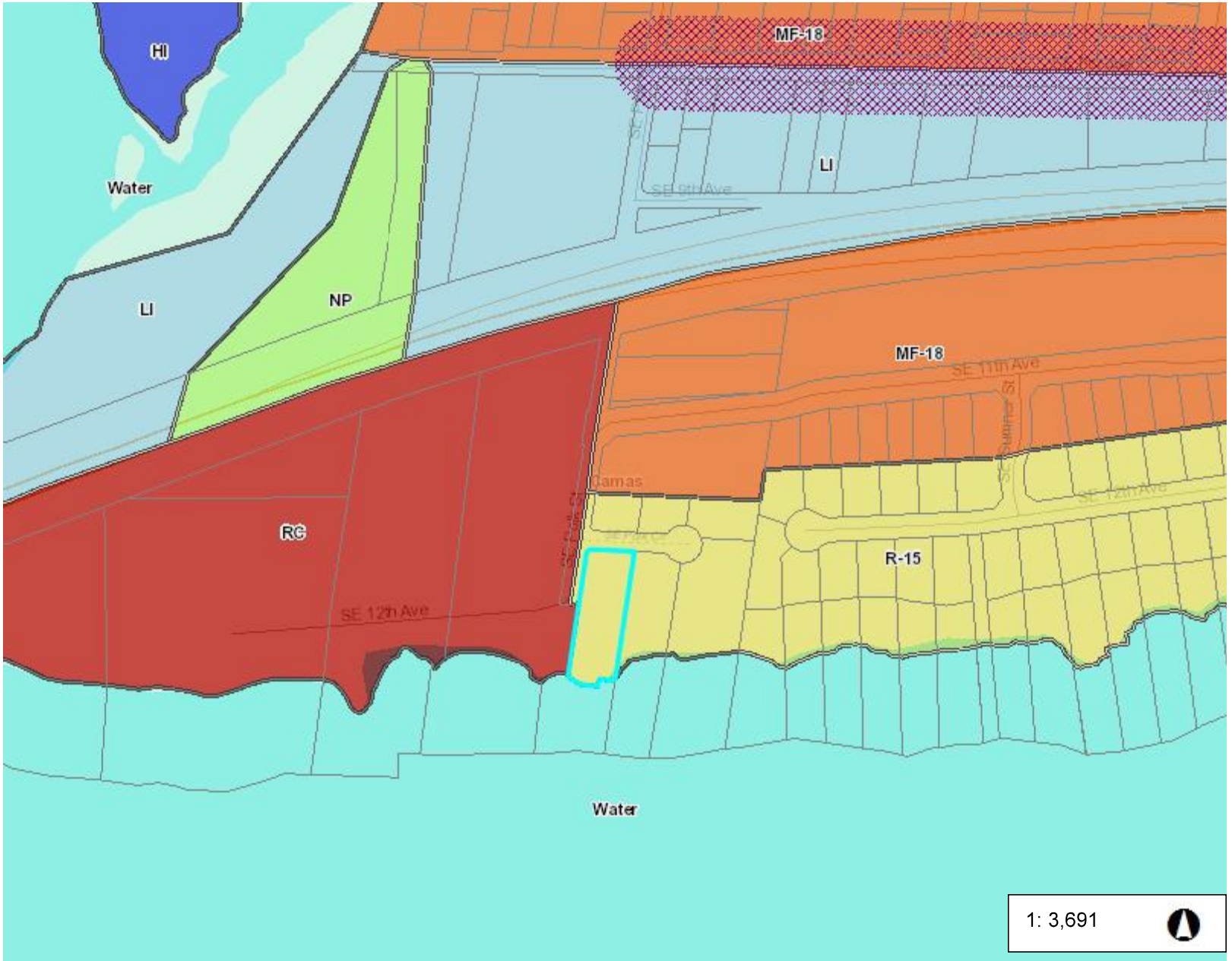
Waterway: Columbia River

1/4 of Sec.18 T1N R4E

2/9/2018

NTS

Hubbard Dock Zoning



1: 3,691

615.2 0 307.60 615.2 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Clark County, WA. GIS - http://gis.clark.wa.gov

This map was generated by Clark County's "MapsOnline" website. Clark County does not warrant the accuracy, reliability or timeliness of any information on this map, and shall not be held liable for losses caused by using this information.

Legend

- Taxlots

Zoning Overlay

- Urban Reserve - 10 (UR-10)
- Urban Reserve - 20 (UR-20)
- Railroad Industrial Urban Reserve
- Rural Industrial Land Bank Overlay
- Railroad Industrial Overlay District
- Urban Holding - 10 (UH-10)
- Urban Holding - 20 (UH-20)
- Airport Environs Overlay
- Surface Mining Overlay District
- Rural Center Mixed Use (RC-MX)
- Existing Historic Resort
- Mill Creek Overlay District
- Highway 99 Overlay District
- Activity Center Overlay
- Transitional Area Overlay
- Single Family Residential Area Ove
- Mixed Residential Area Overlay
- Multifamily Residential Area Overla
- 78th Street Property
- Columbia River Gorge Scenic Area
- Vancouver - Multiple Overlays
- Sewer Capacity Overlay

Notes:

6

5164967 D
RecFee - $72.00 Pages: 1 - COLUMBIA TITLE AGENCY
Clark County, WA 04/20/2015 03:43

WHEN RECORDED RETURN TO:

BRANT SUMMERS HUBBARD
1180 SE Polk Street
Camas, WA 98607

Real Estate Excise Tax
Ch. 11 Rev. Laws 1951
$ 1486 has been paid
Recp.# 724943 Date 4/21/15
Sec. 61, see Affd. No.
Doug Lasher
Clark County Treasurer
By Deputy

Escrow Number: 41192
Filed for Record at Request of: ***Columbia Title Agency***

STATUTORY WARRANTY DEED

THE GRANTOR(S), SARAH T. MAI and THOMAS P. TRIEU, wife and husband for and in consideration of Ten Dollars and other valuable consideration in hand paid, conveys, and warrants to BRANT ~~SUMMERS~~ HUBBARD, a single man the following described real estate, situated in the County of Clark, State of Washington:

Lot 2, of SHORT PLATS, recorded in Book 2 of Short Plats, Page 264, records of Clark County, Washington.

TOGETHER WITH any land lying between the Southerly extensions of the Easterly and Westerly lines of said Lot 2 and the Southerly of the river bank, including any tidelands of the Second Class, as conveyed by instruments recorded in Volume 51, Page 214, records of Clark County, Washington, lying between the Southerly extensions of the Easterly and Westerly lines of said Lot 2 that are appurtenant to the above described upland Tract

Subject to:
Covenants, conditions, restrictions and easements of record.
Abbreviated Legal: (Required if full legal not inserted above.)

Tax Parcel Number(s): 87350005 and 500909001

Dated: April 06, 2015

SARAH T. MAI

THOMAS P. TRIEU

State of Washington

ss.

County of Clark

I certify that I know or have satisfactory evidence that SARAH T. MAI and THOMAS P. TRIEU are the persons who appeared before me, and said persons acknowledged that they signed this instrument and acknowledged it to be their free and voluntary act for the uses and purposes mentioned in this instrument.

Dated: 4/17/15

JACOB A. MENSINGER
NOTARY PUBLIC
STATE OF WASHINGTON
COMMISSION EXPIRES
JUNE 29, 2017

Notary name printed or typed: Jacob A. Mensinger
Notary Public in and for the State of WA
Residing at Vancouver
My appointment expires: June 29, 2017

Compliance Narrative
Prepared for Brant Hubbard

Prepared by: Jack Loranger, Permit Acquisition Agent/Consultant

Introduction:

As the agent for Brant Hubbard, Jack Loranger is submitting an application for a Shoreline Substantial Development Permit and Variance to construct a private recreational dock. The construction will be within the Shoreline Management area of the City of Camas. The site is located at 1180 SE Polk St. Camas, WA Latitude and Longitude : 45.57852331 N lat. / -122.39632320 W long., described as ¼ Section NW Section 13 Township 1N Range 3E. The subject property is owned by Brant Hubbard.

Designation:

The proposed project is located on property zoned R- 15 by the City of Camas. This area of Shoreline Management jurisdiction is designated as " Medium Intensity ".

Project Description:

To construct a private recreational 6'x24' floating dock and 6'x16' floating landing in the Columbia River with an elevated gangway 4' wide and 220' long from the landing to a 7'x6' concrete bulkhead located on the upland area of the property. 7 steel pilings 12" diameter will be driven for dock and gangway support .The length of the dock will require a variance from the 100' maximum. The length of the dock is the shortest possible while still complying with the minimum depth of water the dock needs to be in at low water. The length will not interfere with navigation on the river since there are docks on both sides of the proposed project that protrude further into the river. 12" steel pilings will be used to secure the floating dock, walkway and gangway. A variance will be required for the dimension of the pilings. The SMP allows for maximum 5" diameter for a cased piling. A 12" piling is standard typical use on the Columbia River and has the strength required for the length of the pilings and the flow of the river. The gangway will be supported by cross-arms to prevent grounding during low water.

Camas Shoreline Master Program :

Archaeological, Historic, and Cultural Resources:

The project is in a high probability area, the applicant will provide for a site inspection and evaluation by a professional archaeologist in the form of an Archaeological Pre-determination.

Conservation:

The only disturbance on the wetlands will be driving two 12" diameter piling. A large woody debris structure will be constructed in the aquatic habitat area as mitigation for this project.

Public Access and Recreation:

The proposed project will not adversely affect public access, aesthetics, or recreation.

Restoration:

Clearing and grading are not anticipated. However, inadvertently disturbed sites remaining after construction will be promptly replanted with native vegetation.

Shoreline Use and Development:

The Proposed project uses are water-dependent, water-related, and water-enjoyment. It will retain the quality of the shoreline function while respecting the rights of others. The proposed project will not create risk or harm to neighboring or downstream properties; and will preserve the shoreline's natural features and functions.

Water Quality and Quantity:

The dock has been designed to be constructed out of the water and then floated/craned into place. Equipment for driving piling, handling and placing the docks will be maintained in a safe and leakproof condition.

Effective erosion control methods will be utilized, as needed, during project construction and operation.

There is a strip of inventoried wetlands that runs along the shoreline in the project area. The proposed gangway is designed to span over this area and the floating dock is designed so it will not ground out. There should be no net loss of wetland area or function due to the proposed project.

The NMFS will be consulted, and they will draft a Biological Opinion to ensure that priority species/habitats will not be negatively impacted.

Medium Intensity Shoreline Designation:

The purpose of the "Medium Intensity" shoreline designation is to accommodate primarily residential development and appurtenant structures, but to also allow other types of development that are consistent with this chapter. An additional purpose is to provide appropriate public access and recreational uses.

The proposed private recreational dock as an appurtenant structure, will provide for recreational water activity uses of the Hubbard residence. Careful design and agency review will allow this project to provide water dependent recreational opportunities while sustaining the integrity of the shoreline and its resources and preserving its character.

Medium Intensity Managment Policies:

The scale and density of the proposed project is designed to be compatible with sustaining shoreline ecological functions and processes and retain the existing residential character of the area.

While this is a private recreational dock, it will also be used for recreational water dependent activities by friends and family that visit.

GENERAL SHORELINE USE AND DEVELOPMENT REGULATIONS:

General Shoreline Use and Development Regulations:

The proposed project is a water-dependent use that has been designed so it will not cause impacts that require remedial action or loss of shoreline function on other properties and will not require shoreline stabilization.

The proposed project has been located and designed to: (a) minimize interference with surface navigation; (b) consider impacts to public views; and (c) allow for the safe, unobstructed passage of fish and wildlife, particularly species dependent on migration.

In-water work will be scheduled to protect biological productivity (including but not limited to fish runs, spawning, and benthic productivity). In-water work shall not occur in areas used for commercial fishing during a fishing season unless specifically addressed and mitigated for in the permit. Work windows provided by the Army Corps of Engineers and Washington State Fish and Wildlife will be used for in-water work.

The proposed gangway is elevated to span over the critical area terminating on a floating landing attached to to the proposed floating dock. The gangway be supported by pilings and a cross arm so there will be no grounding of the dock or gangway. The entire gangway surface will be grating with at least 60% open space to reduce shading. The elevated gangway will afford unique viewing opportunities. The proposed project should have no adverse affects on the critical area with no net loss or function.

Critical Areas Protection:

The proposed project has been located and designed to protect the ecological processes and functions of critical areas. Care will be taken not to disturb critical areas. Any area that has been inadvertently disturbed or degraded by this proposed project will be restored with native plant material similar to that which originally occurred on the site.

Flood Prevention and Flood Damage Minimization:

The proposed gangway, walkway and dock are all designed to float during flood waters and remain attached to their pilings.

Site Planning and Development:

General:

The proposed project is designed so cut or fill will not be necessary.
The proposed project will create no impervious surfaces. The gangway is elevated to span across the sensitive areas.

Clearing, Grading, Fill and Excavation:

Approximately 3 c/y will be excavated landward of OHWM for the proposed concrete bulkhead.
Ground work waterward of OHWM is not anticipated for the proposed project.

Building Design:

The proposed structure has been designed to conform to natural contours an minimize disturbance to soils and vegetation. The proposed dock design is compatible with the adjacent properties and the scope has been reduced to the smallest footprint and still provide usability. Surfaces materials will be chosen to minimize reflective light.

Vegetation Conservation:

Vegetation removal is not anticipated for the proposed project.

Use-specific Development Regulations:

Boating Uses:

General Requirements:

The proposed project is designed to protect the rights of navigation.

Moorage Facilities:Docks, and Mooring Buoys:

The Proposed dock has been located so as to minimize the interference with the use of navigable waters. Treated wood will not be used in the proposed project. The in-water work window will be prescribed by the Army Corps of Engineers and WDFW. There is no marina or shared moorage available within ¼ mile of the proposed project. The Port's launch and fueling facilities will be used. The proposed dock has been designed to prevent grounding with the use of cross arm supports for the gangways. The proposed dock has been designed to the minimum dimensions necessary and designed to protect sensitive areas by being elevated and spanning over them and positioning the dock where it will have 7.5' of water beneath it even in low water. To get to the proper depth, the gangway will be 220' in length 4' wide, the floating landing will be 16' in length 6' wide. A variance will be required for the length dimension. The gangway is

elevated to and will float above when river stage is over OHWM. The entire surface will be a protruded grating with 60% open space.

Variances necessary for the proposed dock.

6.3.3.4 Moorage Facilities:Docks, Piers, and Mooring Buoys
23. ***The maximum dimensions of a dock or pier shall be no greater than necessary, but may be adjusted to protect sensitive shoreline resources.***
a. A dock or pier (gangway and floating structure combined) shall be long enough to obtain a depth as required by WDFW at its landward edge. Maximum length is sixty (60) feet unless a depth of eight (8) feet cannot be obtained. In such circumstances the dock may be extended until the water depth reaches a point of eight (8) feet in depth at ordinary low water (OLWM), or to a maximum of one-hundred (100) feet whichever is reached first.

The proposed dock and gangway is a total of 236' and exceeds the maximum length of 100 feet. The original design length is the minimum necessary to reach a point of 7.5' below OLWM and also span over critical areas and shoreline resources. The gangway has been designed so most of the length will be supported above the water most of the time. It will utilize open grating on 100% of the surface to minimize shading. The other private recreational docks/gangways in the area are approximately the same length. Large woody Debris mitigation has been offered to balance the impact.

6.3.3.4 Moorage Facilities:Docks, Piers, and Mooring Buoys
26. Pilings shall be constructed as follows:
a. Piling diameter shall be minimized to meet the structural requirements of expected loads. Generally, piling shall not exceed four (4) inches in diameter. If a piling is encased in a sleeve, the piling plus sleeve diameter shall not exceed five (5) inches.

The pilings for the proposed dock are 12” diameter and will exceed the 5” maximum to allow for safety, security and protection of resources. The dock has been designed to use a minimum number of piling to minimize the impact on the shoreline resources and fish habitat. Twelve inch diameter steel piling is the standard used on docks, gangways and piers in this area of the Columbia river in order to secure the structures. Using the 12” diameter pilings allows the gangway to span over the critical areas without disturbing them. Pile spacing has been designed to be the maximum feasible to minimize shading and avoid a "wall" effect that would block or baffle wave patterns, currents, littoral drift, or movement of aquatic life forms, or result in structure damage from driftwood impact or entrapment.(6.3.3.4 26(b)) Five inch diameter is not adequate to withstand the forces of the river at OHW. The dock builder for this project has been constructing docks on the Columbia for 30 years and refuses to use less than 12” diameter piling for safety and liability reasons.

IX. Variances
The SMRC or the hearings examiner may send a decision to Ecology for final approval regarding substantial development permits which are at variance with specific bulk, dimensional or performance criteria where, owing to special conditions pertaining to a specific piece of property, the literal

interpretation and strict application of the criteria would cause undue and unnecessary hardship. Variances shall not be granted from the use regulations of this Program.

A.
A request for a variance to a development may be authorized when the applicant can demonstrate all of the following:
1.
That if the applicant complies with the provisions of the Program then they cannot make any reasonable use of the property. The fact that there is the possibility that the property might make a greater profit by using the property in a manner contrary to the intent of the Program is not a sufficient reason for a variance;

The applicant owns the tidelands which consist of the protected Critical Area and a portion of the riverbed. The applicant wishes to protect and preserve the Critical Area while still enjoying water related activities. Literal interpretation and strict application of the criteria would cause an undue and unnecessary hardship and not allow the reasonable use of their property that other property owners in the same area enjoy.

2.
That the hardship is specifically related to unique conditions of the property (e.g. irregular lot shape, size or natural features) and not, for example, from deed restrictions or the applicant's own actions;

The hardship is specifically related to the unique conditions of this piece of property and not the applicant's own actions. The extended shallow water and the critical area and shoreline resources dictate the length and design of the project.

3.
That the variance requested is the minimum necessary to afford relief;

The project has been designed to meet the criteria that protects both the river bed and the critical area resources. The variances of dimensional criteria requested is the minimum necessary to afford relief.

4.
That the variance will not constitute a grant of special privilege not enjoyed by other properties in the area;

Other property owners along this stretch of the Columbia already enjoy private recreational docks similar to this proposed dock. The variances requested will not constitute a special privilege.

5.
That the design of the project will be in harmony with the other authorized uses in the area, and the intent of the Program; and

There is a Community dock just East of the proposed project and commercial docks to the West. The aesthetics and use project has been designed to harmonize with the community dock.

6.
That the public welfare and interest will be preserved; if more harm will be done to the area by granting the variance than would be done to the applicant by denying it, the variance will be denied.

The applicants have offered mitigation in the form of Large Woody Debris structure to insure that the project will have no net negative effect on the public welfare and interests. The project will allow access to and enjoyment of the river while protecting and preserving the critical area resources.

7.
If proposed waterward of the OHWM, then the public rights of navigation and use will not be adversely affected.

The proposed project is well outside public navigational routes and has docks on both sides that protrude further into the river. Public rights of navigation and use will not be effected.

Compliance with other agencies:

Washington Department of Fish and Wildlife:

The Washington Department of Fish and Wildlife recommends that all docks and walkways greater than 4' in width allow 60% light penetration for 60% of the surface area. The proposed dock will comply with this recommendation.

Washington Department of Ecology:

The Washington Department of Ecology Water Quality division requires:

1. *Erosion control measures must be in place prior to any clearing, grading, or construction. These control measures must be effective to prevent soil from being carried into surface water by stormwater runoff.*
2. *During construction, all releases of oils, hydraulic fluids, fuels, other petroleum products, paints, solvents, and other deleterious materials must be contained and removed in a manner that will prevent their discharge to the waters and soils of the state. The cleanup of spills should take precedence over all other work on the site.*
3. *Proper disposal of construction debris must be on land in such a manner that debris cannot enter the Columbia River or cause water quality degradation of the state waters.*
4. *All trenches, depressions, or holes created in the intertidal area shall be backfilled prior to inundation by tidal waters.*
5. *All concrete shall be poured in the dry and allowed to cure a minimum of seven days before contact with the water.*
6. *The applicant should consider alternatives to treated wood or other chemically treated wood for in water construction of wooden structures.*

The proposed dock will adhere to the recommendations of The Washington Department of Ecology.

Washington Department of Natural Resources:

The Washington Department of Natural Resources requires a lease for the use of state-owned aquatic land on the shore of the Columbia River. The proposed project is located on privately owned uplands and tidelands.

US Army Corps of Engineers:

The US Army Corps of Engineers requires the applicant to obtain a Section 10 permit and provide a Biological Evaluation.

The attached JARPA and Biological Evaluation serves as the application for this permit.

Conclusion:

The proposed private recreational dock complies with local, state and federal regulations and will be subject to agency recommendations.

WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) Form[1,2] [help]

US Army Corps of Engineers
Seattle District

USE BLACK OR BLUE INK TO ENTER ANSWERS IN THE WHITE SPACES BELOW.

AGENCY USE ONLY

Date received:

Agency reference #: _____

Tax Parcel #(s): _____

Part 1–Project Identification

1. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [help]
Hubbard Dock

Part 2–Applicant

The person and/or organization responsible for the project. [help]

2a. Name (Last, First, Middle)			
Hubbard, Brant			
2b. Organization (If applicable)			
2c. Mailing Address (Street or PO Box)			
1180 SE Polk St.			
2d. City, State, Zip			
Camas, WA 98607			
2e. Phone (1)	**2f.** Phone (2)	**2g.** Fax	**2h.** E-mail
503-804-2620			b_hubbard@comcast.net

[1]Additional forms may be required for the following permits:
- If your project may qualify for Department of the Army authorization through a Regional General Permit (RGP), contact the U.S. Army Corps of Engineers for application information (206) 764-3495.
- If your project might affect species listed under the Endangered Species Act, you will need to fill out a Specific Project Information Form (SPIF) or prepare a Biological Evaluation. Forms can be found at http://www.nws.usace.army.mil/Missions/CivilWorks/Regulatory/PermitGuidebook/EndangeredSpecies.aspx.
- Not all cities and counties accept the JARPA for their local Shoreline permits. If you need a Shoreline permit, contact the appropriate city or county government to make sure they accept the JARPA.

[2]To access an online JARPA form with [help] screens, go to http://www.epermitting.wa.gov/site/alias__resourcecenter/jarpa_jarpa_form/9984/jarpa_form.aspx.

For other help, contact the Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.

Part 3–Authorized Agent or Contact

Person authorized to represent the applicant about the project. (Note: Authorized agent(s) must sign 11b of this application.) [help]

3a. Name (Last, First, Middle)			
Loranger, Jack			
3b. Organization (If applicable)			
Authorized Agent			
3c. Mailing Address (Street or PO Box)			
162 Krogstad Rd.			
3d. City, State, Zip			
Washougal, WA 98671			
3e. Phone (1)	**3f.** Phone (2)	**3g.** Fax	**3h.** E-mail
360-837-3760	503-908-5408		jack@shorelinepermits.com

Part 4–Property Owner(s)

Contact information for people or organizations owning the property(ies) where the project will occur. Consider both **upland and aquatic** ownership because the upland owners may not own the adjacent aquatic land. [help]

☑ Same as applicant. (Skip to Part 5.)

☐ Repair or maintenance activities on existing rights-of-way or easements. (Skip to Part 5.)

☐ There are multiple upland property owners. Complete the section below and fill out JARPA Attachment A for each additional property owner.

☐ Your project is on Department of Natural Resources (DNR)-managed aquatic lands. If you don't know, contact the DNR at (360) 902-1100 to determine aquatic land ownership. If yes, complete JARPA Attachment E to apply for the Aquatic Use Authorization.

4a. Name (Last, First, Middle)			
4b. Organization (If applicable)			
4c. Mailing Address (Street or PO Box)			
4d. City, State, Zip			
4e. Phone (1)	**4f.** Phone (2)	**4g.** Fax	**4h.** E-mail

Part 5–Project Location(s)

Identifying information about the property or properties where the project will occur. [help]

☐ There are multiple project locations (e.g. linear projects). Complete the section below and use JARPA Attachment B for each additional project location.

5a. Indicate the type of ownership of the property. (Check all that apply.) [help]

☑ Private
☐ Federal
☐ Publicly owned (state, county, city, special districts like schools, ports, etc.)
☐ Tribal
☐ Department of Natural Resources (DNR) – managed aquatic lands (Complete JARPA Attachment E)

5b. Street Address (Cannot be a PO Box. If there is no address, provide other location information in 5p.) [help]

1180 SE Polk Cir.

5c. City, State, Zip (If the project is not in a city or town, provide the name of the nearest city or town.) [help]

Camas, WA 98607

5d. County [help]

CLARK

5e. Provide the section, township, and range for the project location. [help]

¼ Section	Section	Township	Range
NW	13	1N	3E

5f. Provide the latitude and longitude of the project location. [help]

- Example: 47.03922 N lat. / -122.89142 W long. (Use decimal degrees - NAD 83)

45.57852331 N lat. / -122.39632320 W long.

5g. List the tax parcel number(s) for the project location. [help]

- The local county assessor's office can provide this information.

87350005

5h. Contact information for all adjoining property owners. (If you need more space, use JARPA Attachment C.) [help]

Name	Mailing Address	Tax Parcel # (if known)
BUCK CAROL D	1202 SE POLK ST CAMAS WA, 98607	87350000
JURETZKA ANDREAS & JURETZKA APRIL K	1339 FOREST BAY DR WATERFORD MI, 48328	87350012

5i. List all wetlands on or adjacent to the project location. [help]

Wetlands presence at tidal area

5j. List all waterbodies (other than wetlands) on or adjacent to the project location. [help]

Columbia River

5k. Is any part of the project area within a 100-year floodplain? [help]

☒ Yes ☐ No ☐ Don't know

5l. Briefly describe the vegetation and habitat conditions on the property. [help]

There are trees, shrubs and lawn grass on the upland portion of the property. The bank is steep and populated with ivy and the shorelands are grass and small herbaceous plants.

5m. Describe how the property is currently used. [help]

Single family residence

5n. Describe how the adjacent properties are currently used. [help]

Single family residences

5o. Describe the structures (above and below ground) on the property, including their purpose(s) and current condition. [help]

Single family home with attached garage and exterior deck. Wood stairway from upland to shorelands.

5p. Provide driving directions from the closest highway to the project location, and attach a map. [help]

WA-14 E to SE Union St. Take exit 14 and keep to the right at the round-about taking the first exit SE 11th Ave. Follow SE 11th Ave until it bends to the South and becomes SE Polk St. take a left at SE Polk Cir. 1180 SE Polk Cir will be the second driveway on the right.

Part 6–Project Description

6a. Briefly summarize the overall project. You can provide more detail in 6b. [help]

To construct a private recreational 6'x24' floating dock and 6'x16' floating landing in the Columbia River with an elevated gangway 4' wide and 220' long from the landing to a 7'x6' concrete bulkhead located on the upland area of the property. 7 steel pilings 12" diameter will be driven for dock and gangway support .

6b. Describe the purpose of the project and why you want or need to perform it. [help]

To provide the property owners a safe water dependent recreational access to the river and a place to dock their private recreational boat.

6c. Indicate the project category. (Check all that apply) [help]

☐ Commercial ☒ Residential ☐ Institutional ☐ Transportation ☒ Recreational

☐ Maintenance ☐ Environmental Enhancement

6d. Indicate the major elements of your project. (Check all that apply) [help]

☐ Aquaculture	☐ Culvert	☐ Float	☐ Retaining Wall (upland)
☐ Bank Stabilization	☐ Dam / Weir	☐ Floating Home	☐ Road
☐ Boat House	☐ Dike / Levee / Jetty	☐ Geotechnical Survey	☐ Scientific Measurement Device
☐ Boat Launch	☐ Ditch	☐ Land Clearing	☐ Stairs
☐ Boat Lift	☒ Dock / Pier	☐ Marina / Moorage	☐ Stormwater facility
☐ Bridge	☐ Dredging	☐ Mining	☐ Swimming Pool
☒ Bulkhead	☐ Fence	☐ Outfall Structure	☐ Utility Line
☐ Buoy	☐ Ferry Terminal	☒ Piling/Dolphin	
☐ Channel Modification	☐ Fishway	☐ Raft	

☐ Other:

6e. Describe how you plan to construct each project element checked in 6d. Include specific construction methods and equipment to be used. [help]

- Identify where each element will occur in relation to the nearest waterbody.
- Indicate which activities are within the 100-year floodplain.

Concrete bulkhead, located above OHWM, will be formed and poured concrete.
River pilings will be driven from a floating barge.
Aluminum gangways will be constructed off site, barged to the site and craned into place
Aluminum and steel floating landing and dock will be constructed off site, barged to the site and craned into place

6f. What are the anticipated start and end dates for project construction? (Month/Year) [help]

- If the project will be constructed in phases or stages, use JARPA Attachment D to list the start and end dates of each phase or stage.

Start Date: 6/1/2018 End Date: 6/1/2023 ☐ See JARPA Attachment D

6g. Fair market value of the project, including materials, labor, machine rentals, etc. [help]

~ $100,000

6h. Will any portion of the project receive federal funding? [help]

- **If yes**, list each agency providing funds.

☐ Yes ☒ No ☐ Don't know

Part 7–Wetlands: Impacts and Mitigation

☒ Check here if there are wetlands or wetland buffers on or adjacent to the project area.
(If there are none, skip to Part 8.) [help]

7a. Describe how the project has been designed to avoid and minimize adverse impacts to wetlands. [help]

☐ Not applicable

The elevated gangway is designed to span over the wetland area.

7b. Will the project impact wetlands? [help]

☐ Yes ☒ No ☐ Don't know

7c. Will the project impact wetland buffers? [help]

☐ Yes ☒ No ☐ Don't know

7d. Has a wetland delineation report been prepared? [help]

- **If Yes**, submit the report, including data sheets, with the JARPA package.

☐ Yes ☒ No

7e. Have the wetlands been rated using the Western Washington or Eastern Washington Wetland Rating System? [help]

- **If Yes**, submit the wetland rating forms and figures with the JARPA package.

☐ Yes ☐ No ☒ Don't know

7f. Have you prepared a mitigation plan to compensate for any adverse impacts to wetlands? [help]

- **If Yes**, submit the plan with the JARPA package and answer 7g.
- **If No, or Not applicable**, explain below why a mitigation plan should not be required.

☐ Yes ☒ No ☐ Don't know

No adverse impacts to the wetlands

7g. Summarize what the mitigation plan is meant to accomplish, and describe how a watershed approach was used to design the plan. [help]

N/A

7h. Use the table below to list the type and rating of each wetland impacted, the extent and duration of the impact, and the type and amount of mitigation proposed. Or if you are submitting a mitigation plan with a similar table, you can state (below) where we can find this information in the plan. [help]

Activity (fill, drain, excavate, flood, etc.)	Wetland Name[1]	Wetland type and rating category[2]	Impact area (sq. ft. or Acres)	Duration of impact[3]	Proposed mitigation type[4]	Wetland mitigation area (sq. ft. or acres)

[1] If no official name for the wetland exists, create a unique name (such as "Wetland 1"). The name should be consistent with other project documents, such as a wetland delineation report.
[2] Ecology wetland category based on current Western Washington or Eastern Washington Wetland Rating System. Provide the wetland rating forms with the JARPA package.
[3] Indicate the days, months or years the wetland will be measurably impacted by the activity. Enter "permanent" if applicable.
[4] Creation (C), Re-establishment/Rehabilitation (R), Enhancement (E), Preservation (P), Mitigation Bank/In-lieu fee (B)

Page number(s) for similar information in the mitigation plan, if available: _____

7i. For all filling activities identified in 7h, describe the source and nature of the fill material, the amount in cubic yards that will be used, and how and where it will be placed into the wetland. [help]
N/A
7j. For all excavating activities identified in 7h, describe the excavation method, type and amount of material in cubic yards you will remove, and where the material will be disposed. [help]
N/A

Part 8–Waterbodies (other than wetlands): Impacts and Mitigation

In Part 8, "waterbodies" refers to non-wetland waterbodies. (See Part 7 for information related to wetlands.) [help]

☒ Check here if there are waterbodies on or adjacent to the project area. (If there are none, skip to Part 9.)

8a. Describe how the project is designed to avoid and minimize adverse impacts to the aquatic environment. [help]
☐ Not applicable
The dock may cast shadows into the river which will be mitigated by providing 60% or more light penetration for 100% of the gangway and dock surface area. Most of the gangway will be elevated above OHWM to reduce shading.
8b. Will your project impact a waterbody or the area around a waterbody? [help]
☒ Yes ☐ No

8c. Have you prepared a mitigation plan to compensate for the project's adverse impacts to non-wetland waterbodies? [help]

- **If Yes**, submit the plan with the JARPA package and answer 8d.
- **If No, or Not applicable,** explain below why a mitigation plan should not be required.

☐ Yes ☒ No ☐ Don't know

Mitigation Plan being prepared

8d. Summarize what the mitigation plan is meant to accomplish. Describe how a watershed approach was used to design the plan.

- If you already completed 7g you do not need to restate your answer here. [help]

Direct effects include interaction with fish migrating through the action area during in-water work, effect to local habitat structure, and effects to benthic forage. Specifically, shading, vegetation, and noise will affect the ESA-listed salmon, steelhead, sturgeon, and smelt.

The applicant proposes to construct one large woody debris (LWD) structure to compensate for impacts through enhancing the aquatic habitat by providing refuge and food source for rearing salmonids

8e. Summarize impact(s) to each waterbody in the table below. [help]

Activity (clear, dredge, fill, pile drive, etc.)	Waterbody name[1]	Impact location[2]	Duration of impact[3]	Amount of material (cubic yards) to be placed in or removed from waterbody	Area (sq. ft. or linear ft.) of waterbody directly affected
Pile Driving	Columbia River	In-water	2- Days	7 - 12" dia. Piles	7 s/f

[1] If no official name for the waterbody exists, create a unique name (such as "Stream 1") The name should be consistent with other documents provided.
[2] Indicate whether the impact will occur in or adjacent to the waterbody. If adjacent, provide the distance between the impact and the waterbody and indicate whether the impact will occur within the 100-year flood plain.
[3] Indicate the days, months or years the waterbody will be measurably impacted by the work. Enter "permanent" if applicable.

8f. For all activities identified in 8e, describe the source and nature of the fill material, amount (in cubic yards) you will use, and how and where it will be placed into the waterbody. [help]

N/A

8g. For all excavating or dredging activities identified in 8e, describe the method for excavating or dredging, type and amount of material you will remove, and where the material will be disposed. [help]

N/A

Part 9–Additional Information

Any additional information you can provide helps the reviewer(s) understand your project. Complete as much of this section as you can. It is ok if you cannot answer a question.

9a. If you have already worked with any government agencies on this project, list them below. [help]

Agency Name	Contact Name	Phone	Most Recent Date of Contact
City of Camas	Sarah Fox	360-817-1568	10/3/2017

9b. Are any of the wetlands or waterbodies identified in Part 7 or Part 8 of this JARPA on the Washington Department of Ecology's 303(d) List? [help]

- **If Yes,** list the parameter(s) below.
- If you don't know, use Washington Department of Ecology's Water Quality Assessment tools at: http://www.ecy.wa.gov/programs/wq/303d/.

☒ Yes ☐ No

6294 Temerature
7879 Total Dissolved Gas

9c. What U.S. Geological Survey Hydrological Unit Code (HUC) is the project in? [help]

- Go to http://cfpub.epa.gov/surf/locate/index.cfm to help identify the HUC.

Lower Columbia-Sandy Watershed -- 17080001

9d. What Water Resource Inventory Area Number (WRIA #) is the project in? [help]

- Go to http://www.ecy.wa.gov/water/wria/index.html to find the WRIA #.

WRIA 28 Salmon-Washougal

9e. Will the in-water construction work comply with the State of Washington water quality standards for turbidity? [help]

- Go to http://www.ecy.wa.gov/programs/wq/swqs/criteria.html for the standards.

☒ Yes ☐ No ☐ Not applicable

9f. If the project is within the jurisdiction of the Shoreline Management Act, what is the local shoreline environment designation? [help]

- If you don't know, contact the local planning department.
- For more information, go to: http://www.ecy.wa.gov/programs/sea/sma/laws_rules/173-26/211_designations.html.

☐ Urban ☐ Natural ☒ Aquatic ☐ Conservancy ☒ Other: Medium Intesity

9g. What is the Washington Department of Natural Resources Water Type? [help]

- Go to http://www.dnr.wa.gov/forest-practices-water-typing for the Forest Practices Water Typing System.

☒ Shoreline ☒ Fish ☐ Non-Fish Perennial ☐ Non-Fish Seasonal

9h. Will this project be designed to meet the Washington Department of Ecology's most current stormwater manual? [help]

- **If No**, provide the name of the manual your project is designed to meet.

☒ Yes ☐ No

Name of manual: _____

9i. Does the project site have known contaminated sediment? [help]

- **If Yes**, please describe below.

☐ Yes ☒ No

9j. If you know what the property was used for in the past, describe below. [help]

Single family residence

9k. Has a cultural resource (archaeological) survey been performed on the project area? [help]

- **If Yes**, attach it to your JARPA package.

☐ Yes ☒ No

9l. Name each species listed under the federal Endangered Species Act that occurs in the vicinity of the project area or might be affected by the proposed work. [help]

Bald Eagle, Clark's Grebe, Golden Eagle, Lesser Yellowlegs, Marbled Godwit, Olive Sided Fly-catcher, Red-Throated Loon, Rufous Hummingbird, Semipalmated Sandpiper, Short-billed Dowitcher, Whimbrel

9m. Name each species or habitat on the Washington Department of Fish and Wildlife's Priority Habitats and Species List that might be affected by the proposed work. [help]

LCR Chinook salmon (Oncorhynchus tschawtscha), LCR coho salmon (O. kisutch), LCR steelhead (O. mykiss), UCR spring-run Chinook salmon, UCR steelhead, SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, SR sockeye salmon (Oncorhynchus nerka), SRB steelhead, Columbia River chum salmon (O. keta), and MCR steelhead, North American Green Sturgeon (Acipenser medirostris) Bull trout (Salvelinus confluentus) and Smelt (Eulachon)

Part 10–SEPA Compliance and Permits

Use the resources and checklist below to identify the permits you are applying for.

- Online Project Questionnaire at http://apps.oria.wa.gov/opas/.
- Governor's Office for Regulatory Innovation and Assistance at (800) 917-0043 or help@oria.wa.gov.
- For a list of addresses to send your JARPA to, click on agency addresses for completed JARPA.

10a. Compliance with the State Environmental Policy Act (SEPA). (Check all that apply.) [help]

- For more information about SEPA, go to www.ecy.wa.gov/programs/sea/sepa/e-review.html.

☐ A copy of the SEPA determination or letter of exemption is included with this application.

☐ A SEPA determination is pending with City of Camas (lead agency). The expected decision date is Jan 31 2017.

☐ I am applying for a Fish Habitat Enhancement Exemption. (Check the box below in 10b.) [help]

☐ This project is exempt (choose type of exemption below).

☐ Categorical Exemption. Under what section of the SEPA administrative code (WAC) is it exempt? _____

☐ Other: _____

☐ SEPA is pre-empted by federal law.

10b. Indicate the permits you are applying for. (Check all that apply.) [help]

LOCAL GOVERNMENT

Local Government Shoreline permits:

☒ Substantial Development ☐ Conditional Use ☒ Variance

☐ Shoreline Exemption Type (explain): _____

Other City/County permits:

☐ Floodplain Development Permit ☒ Critical Areas Ordinance

STATE GOVERNMENT

Washington Department of Fish and Wildlife:

☒ Hydraulic Project Approval (HPA) ☐ Fish Habitat Enhancement Exemption – Attach Exemption Form

Washington Department of Natural Resources:

☒ Aquatic Use Authorization

Complete JARPA Attachment E and submit a check for $25 payable to the Washington Department of Natural Resources. **Do not send cash.**

Washington Department of Ecology:

☐ Section 401 Water Quality Certification

FEDERAL GOVERNMENT

United States Department of the Army permits (U.S. Army Corps of Engineers):

☐ Section 404 (discharges into waters of the U.S.) ☒ Section 10 (work in navigable waters)

United States Coast Guard permits:

☐ General Bridge Act Permit ☐ Private Aids to Navigation (for non-bridge projects)

Part 11–Authorizing Signatures

Signatures are required before submitting the JARPA package. The JARPA package includes the JARPA form, project plans, photos, etc. [help]

11a. Applicant Signature (required) [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities, and I agree to start work only after I have received all necessary permits.

I hereby authorize the agent named in Part 3 of this application to act on my behalf in matters related to this application. _____ (initial)

By initialing here, I state that I have the authority to grant access to the property. I also give my consent to the permitting agencies entering the property where the project is located to inspect the project site or any work related to the project. _____ (initial)

Applicant Printed Name	Brant Hubbard Applicant Signature	Date

11b. Authorized Agent Signature [help]

I certify that to the best of my knowledge and belief, the information provided in this application is true, complete, and accurate. I also certify that I have the authority to carry out the proposed activities and I agree to start work only after all necessary permits have been issued.

Authorized Agent Printed Name	Jack Loranger Authorized Agent Signature	Date

11c. Property Owner Signature (if not applicant) [help]

Not required if project is on existing rights-of-way or easements (provide copy of easement with JARPA).

I consent to the permitting agencies entering the property where the project is located to inspect the project site or any work. These inspections shall occur at reasonable times and, if practical, with prior notice to the landowner.

Property Owner Printed Name	Property Owner Signature	Date

18 U.S.C §1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly falsifies, conceals, or covers up by any trick, scheme, or device a material fact or makes any false, fictitious, or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious, or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years or both.

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA publication number: ORIA-16-011 rev. 07/2017

WASHINGTON STATE
Joint Aquatic Resources Permit Application (JARPA) [help]

US Army Corps of Engineers ®
Seattle District

AGENCY USE ONLY
Date received:_____; ☐ **Town**
☐ **Application Fee Received;** ☐ **Fee N/A**
☐ **New Application;** ☐ **Renewal Application**
Type/Prefix #:_____; **NaturE Use Code:**_____
LM Initials & BP#:_____
RE Assets Finance BP#:_____
New Application Number:_____
Trust(s):_____; **County:**_____
AQR Plate #(s):_____
Gov Lot #(s):_____
Tax Parcel #(s):_____

Attachment E:
Aquatic Use Authorization on Department of Natural Resources (DNR)-managed aquatic lands [help]

Complete this attachment and submit it with the completed JARPA form only if you are applying for an Aquatic Use Authorization with DNR. Call (360) 902-1100 or visit http://www.dnr.wa.gov/programs-and-services/aquatics/leasing-and-land-transactions for more information.

- DNR recommends you discuss your proposal with a DNR land manager before applying for regulatory permits. Contact your regional land manager for more information on potential permit and survey requirements. You can find your regional land manager by calling (360) 902-1100 or going to http://www.dnr.wa.gov/programs-and-services/aquatics/aquatic-districts-and-land-managers-map. [help]
- The applicant may not begin work on DNR-managed aquatic lands until DNR grants an Aquatic Use Authorization.
- Include a $25 non-refundable application processing fee, payable to the "Washington Department of Natural Resources." (Contact your Land Manager to determine if and when you are required to pay this fee.) [help]

DNR may reject the application at any time prior to issuing the applicant an Aquatic Use Authorization. [help]

Use black or blue ink to enter answers in white spaces below.

1. Applicant Name (Last, First, Middle)

Hubbard , Brant

2. Project Name (A name for your project that you create. Examples: Smith's Dock or Seabrook Lane Development) [help]

Hubbard Dock

3. Phone Number and Email

503-804-2620 b_hubbard@comcast.net

4. Which of the following applies to Applicant? Check one and, if applicable, attach the written authority – bylaws, power of attorney, etc. [help]

☐ Corporation	☒ Individual
☐ Limited Partnership	☐ Marital Community (Identify spouse):
☐ General Partnership	
☐ Limited Liability Company	☐ Government Agency
Home State of Registration:	☐ Other (Please Explain):

5. Washington UBI (Unified Business Identifier) number, if applicable: [help]

6. Are you aware of any existing or previously expired Aquatic Use Authorizations at the project location?

☐ Yes ☒ No ☐ Don't know

If Yes, Authorization number(s): _____

7. Do you intend to sublease the property to someone else?

☐ Yes ☒ No

If Yes, contact your Land Manager to discuss subleasing.

8. If fill material was used previously on DNR-managed aquatic lands, describe below the type of fill material and the purpose for using it. [help]

N/A

To be completed by DNR and a copy returned to the applicant.

Signature for projects on DNR-managed aquatic lands:

Applicant must obtain the signature of DNR Aquatics District Manager OR Assistant Division Manager if the project is located on DNR-managed aquatic lands.

I, a designated representative of the Dept. of Natural Resources, am aware that the project is being proposed on Dept. of Natural Resources-managed aquatic lands and agree that the applicant or his/her representative may pursue the necessary regulatory permits. My signature does not authorize the use of DNR-managed aquatic lands for this project.

Printed Name	**Signature**	**Date**
Dept. of Natural Resources District Manager or Assistant Division Manager	Dept. of Natural Resources District Manager or Assistant Division Manager	

If you require this document in another format, contact the Governor's Office for Regulatory Innovation and Assistance (ORIA) at (800) 917-0043. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call (877) 833-6341. ORIA Publication ORIA-16-016 rev. 10/2016

BIOLOGICAL EVALUATION
HUBBARD DOCK
1180 SE Polk St. , Camas, WA

Prepared for:
Army Corps of Engineers
U.S. Army Corps of Engineers,
Seattle District
Regulatory Branch
Post Office Box 3755
Seattle, WA 98124-2255
Telephone (206) 764-3495
FAX (206) 764-6602

Prepared by:
Jack Loranger,
Permit Acquisition Agent/Consultant
1/24/2018

1.0 BACKGROUND/HISTORY

The purpose of this Biological Evaluation is to address the effect of the Hubbard Dock Project on ESA-listed species, listed as endangered or threatened under the Endangered Species Act (ESA), or their designated critical habitat.

The project involves construction a floating dock in Camas, WA. Since work will occur in the Columbia River, it has the potential to impact the following ESA-listed marine species that occur in the area: Lower Columbia River (LCR)Chinook salmon (Oncorhynchus tschawtscha), LCR coho salmon (O. kisutch), LCR steelhead (O. mykiss), Upper Columbia River (UCR) spring-run Chinook salmon, UCR steelhead, Snake River (SR) spring/summer run Chinook salmon, SR fall-run Chinook salmon, SR sockeye salmon (Oncorhynchus nerka), Snake River Basin (SRB) steelhead, Columbia River chumsalmon (O. keta), and Middle Columbia River (MCR) steelhead, North American Green Sturgeon (Acipenser medirostris), Bull trout (Salvelinus confluentus) and Smelt (Southern Eulachon).

This BE, prepared by the consultant, addresses the proposed action in compliance with Section 7(c) of the ESA of 1973, as amended. Section 7 of the ESA assures that, through consultation (or conferencing for proposed species) with the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (USFWS), federal actions do not jeopardize the continued existence of any threatened, endangered or proposed species, or result in the destruction or adverse modification of critical habitat.

Purpose and Need:
The purpose of the proposed action is to construct a private recreational dock for the Hubbard family. The proposed project will satisfy the Hubbard's need for safe recreational access to the river.

2.0 DESCRIPTION OF THE ACTION & ACTION AREA

The proposed action includes:

Pilings
7 hollow steel river pilings, 12' diameter, will be installed to secure the floating dock and elevated gangways. The pilings will be installed from a barge with a vibratory hammer. If an impact hammer is required to reach proper depth the noise will be dampened with a wooden block or bubble curtain. Steel crossbeams will be will be welded across the first two sets of river pilings to elevate the gangway and prevent grounding.

Dock Installation
The docks and gangways will be constructed on land, craned into the water and floated/craned into place. They will be constructed of welded steel and/or aluminum frames with floats made of EPS foam completely encapsulated in virgin grade polyethylene with UV inhibitors. The decking will be grating that allows light to penetrate. The dock design will allow at lease 60% light penetration for the entire surface area. There is 220 l/f of 4' wide gangway, 16 l/f of 6' floating landing attached to a ~24' by 6' floating dock. River depth at the waterward end of the dock is approximately -2' NGVD. The dock extends a total of 245' from the OHWM.

Action Area
The action area includes the Immediate Area plus .5 mile upstream and .5 mile downstream of the project area. The Immediate Area is located on the north shore of the Columbia River about 0.5 miles east of the confluence of the Washougal River and the Camas Slough. There are a couple of residential lots, the sewage treatment facility, and Mark Marine's docks in the Action Area west of the proposed project. The Action area to the east consists of residential properties, some with private docks, and the Port of Camas/Washougal which is approximately .5 miles east of the Immediate Area. The Immediate Area is a roughly rectangular tract that is approximately 425 feet (ft) north to south and 80 ft east to west. It is bordered to the north by SE Polk St. , to the east and west by single family residential properties, and to the south by the Columbia River. A single family residence is located on the northern part of the property with a landscaped, grassy yard area around it and paved driveway. The upland grassy yard on the south side of the residence has a steep slope that falls to the shoreline grassy area and then a gentle slope to the river changing to a sand and stone beach in the tidal zone. There is a wetlands presence in the active tidal.
The project is located in an area that has already been impacted by development of marina facilities at the Port of Camas/Washougal and private docks to the East and a Marine Service facility, sewage treatment facility and private docks to the West.

3.0 LISTED SPECIES & CRITICAL HABITAT IN THE ACTION AREA

Information on status of the species in this section relies heavily on information gathered by NMFS' biological review team (BRT), which issued its findings in Good et al. (2005)
The following ESA-listed marine species occur within the action area, or may be affected by the proposed action:

LCR Chinook salmon. Historical records of Chinook salmon abundance are sparse, but cannery records suggest a peak run of 4.6 million fish in 1883. Although fall-run Chinook salmon are still present

throughout much of their historical range, they face the challenges of large-scale hatchery production, relatively high harvest rates, and extensive habitat degradation. Abundances largely declined from 1998 to 2000, and trend indicators for most populations are negative, especially if hatchery fish are assumed to have a reproductive success equivalent to that of natural-origin fish (Good et al. 2005). However, 2001 and 2002 abundance estimates increased for most LCR Chinook populations. The BRT gave ratings of moderately high risk for all four VSP variables for this species (Good et al. 2005). The Willamette/Lower Columbia River Technical Review Team (WLCTRT) estimated that 8-10 historical populations have been extirpated, most of them spring-run populations, due to dams that block access to higher-elevation habitat. Near loss of that important life history type remained an important BRT concern (Good et al. 2005). Although some natural production currently occurs in 20 or so populations, only one exceeds 1000 spawners. High hatchery production continues to pose genetic and ecological risks to natural populations and to mask their performance. Most LCR Chinook salmon populations have not seen as pronounced increases in recent years as occurred in many other geographic areas (Good et al. 2005). The NMFS identified reduced access to spawning/rearing habitat in tributaries, hatchery impacts, loss of habitat diversity and channel stability in tributaries, excessive sediment in spawning gravels, elevated water temperature in tributaries, and harvest impacts as the major factors limiting recovery of this species (NMFS 2007).

UCR spring-run Chinook salmon. Based on redd count data series, spawning escapements for the three populations identified by (Ford et al. 2001) for this species (Wenatchee, Entiat, and Methow rivers) have declined an average of 5.6%, 4.8%, and 6.3% per year, respectively, since 1958. Adult returns increased substantially in 2000 and 2001 compared to lows in 1996 to 1999, but the short-term trends analyzed by the BRT for 1996-2001 remained negative (Good et al. 2005). Based on 1980-2000 returns, the average annual growth rate for this species is estimated as 0.85 (a growth rate of less than 1.0 is non-viable) (Good et al. 2005). Assuming that population growth rates were to continue at 1980-2000 levels, UCR spring-run Chinook salmon populations are likely to have very high probabilities of decline within 50 years (87 to 100%) (Good et al. 2005), and the species is likely to go extinct. Current abundances for populations in the UCR Chinook species are well below the minimum thresholds defined in the draft viability criteria of the Interior Columbia River Basin Technical Recovery Team (ICTRT). Actually achieving abundance and productivity criteria will require a sustained and significant response by the populations (ICTRT 2006). The risk estimates reflect strong ongoing concerns regarding abundance and growth rate/productivity (high to very high risk) and somewhat less (but still significant) concerns for spatial structure (moderate risk) and diversity (moderately high risk). The NMFS identified mortality in the Columbia River hydropower system, tributary riparian degradation and loss of in-river wood, altered tributary floodplain and channel morphology, reduced tributary stream flow and impaired passage, and harvest impacts as the major factors limiting recovery of this species (NMFS 2007).

SR spring/summer run Chinook salmon. The CTRT identified 32 populations in 5 major population groups (MPGs) (Upper Salmon River, South Fork Salmon River, Middle Fork Salmon River, Grande Ronde/Imnaha, Lower Snake Mainstem Tributaries) for this species. Historical populations above Hells Canyon Dam are extinct (ICTRT 2003). Although direct estimates of historical annual SR spring/summer run Chinook salmon returns are not available, returns may have declined by as much as 97% between the late 1800s and 2000. According to Matthews and Waples (1991) total annual SR spring/summer run Chinook salmon production may have exceeded 1.5 million adult fish in the late 1800s. Total (natural plus hatchery origin) returns fell to roughly 100,000 spawners by the late 1960s (Fulton 1968) and were below 10,000 by 1980. Between 1981 and 2000, total returns fluctuated

between extremes of 1,800 and 44,000 fish. The 2001 and 2002 total returns increased to over 185,000 and 97,184 adults, respectively. However, over 80% of the 2001 return and over 60% of the 2002 return originated in hatcheries. Despite the recent increases in total returns of SR spring/summer run Chinook salmon, current abundances for populations in the Snake River Chinook species are well below the minimum thresholds defined in the ICTRT viability criteria. Actually achieving abundance and productivity criteria will require a sustained and significant response by the populations (ICTRT 2006). The NMFS identified mortality from the mainstem lower Snake River and Columbia River hydropower systems, reduced tributary stream flows, altered tributary channel morphology, excessive sediment in tributaries, degraded tributary water quality, and harvest- and hatchery related adverse effects as the major factors limiting recovery of this species (NMFS 2007).

SR fall-run Chinook salmon. The BRT found moderate risk to the species for productivity and moderately high risks for abundance, spatial structure, and diversity (Good et al. 2005). The paragraphs below summarize information from BRT, the ICTRT, and other sources on the status of SR fall-run Chinook salmon in terms of those four viability components. The estimated annual return for the period 1938 to 1949 was 72,000 fish, and by the 1950s, numbers had declined to an annual average of 29,000 fish. Numbers of SR fall-run Chinook salmon continued to decline during the 1960s and 1970s as approximately 80% of their historical habitat was eliminated or severely degraded by the construction of the Hells Canyon hydropower complex (1958 to 1967) and the lower Snake River dams (1961 to 1975). Counts of natural origin adult SR fall-run Chinook salmon at Lower Granite Dam were 1000 fish in 1975, and ranged from 78 to 905 fish (with an average of 489 fish) over the ensuing 25-year period through 2000 (Good et al. 2005). Numbers of natural-origin SR fall-run Chinook salmon have increased over the last few years, with estimates at Lower Granite dam of 2,652 fish in 2001 (Good et al. 2005), 2,095 fish in 2002, and 3,895 fish in 2003. Despite the recent increases in total returns of SR fall Chinook salmon, current abundances for populations in the Snake River Chinook species are well below the minimum thresholds defined in the ICTRT viability criteria (ICTRT 2006). The NMFS identified mortality in the mainstem lower Snake River and Columbia River hydropower systems, degraded water quality, reduced spawning/rearing habitat due to the lower Snake River hydropower system, and harvest as the major factors limiting recovery of this species (NMFS 2007).

CR chum salmon. Information contained in previous Lower Columbia River status reviews, and preliminary analyses by the WLCTRT suggest that 14 of the 16 historical populations (88%) are extinct or nearly so. The two extant populations (Grays River, and Lower Columbia Gorge) have been at low abundance for the last 50 years in the range where stochastic processes could lead to extinction. The Lower Columbia Gorge population includes a number of subpopulations immediately below Bonneville Dam. In addition there are new (or newly discovered) Washougal River spawning groups, and a small number of fish (less than 100 per year) passing Bonneville Dam annually likely are remnants of an Upper Columbia Gorge population (Good et al. 2005).

The BRT had substantial concerns about every viable salmonid population (VSP) element. The populations that remain are small with poor diversity and connectivity, and overall abundance for the species is low. This species has shown low productivity for many decades, even though the remaining populations are at low abundance and density-dependent compensation might be expected. The BRT was encouraged that preliminary return reports for 2002 suggested a large increase in abundance in some (perhaps many) locations. Whether this large increase was due to any recent management actions or simply reflects unusually good conditions in the marine environment is not known. The NMFS identified altered channel form and stability in tributaries, excessive sediment in tributary spawning gravels, altered stream flow in tributaries and the Columbia River, loss of some tributary habitat types,

and harassment of spawners in tributaries and the Columbia River as the major factors limiting recovery of this species (Good et al. 2005).

LCR coho salmon. The BRT (Good et al. 2005) had major concerns for this species in all VSP risk categories (risk estimates ranged from high risk for spatial structure/connectivity and growth rate/productivity to very high for diversity). The most serious overall concern was the scarcity of naturally-produced spawners, with attendant risks associated with small population, loss of diversity, and fragmentation and isolation of the remaining naturally produced fish. In the only two populations with significant natural production (Sandy and Clackamas), short and long-term trends are negative and productivity (as gauged by pre-harvest recruits) is down sharply from recent (1980s) levels. Adult returns in 2000 and 2001 were up noticeably in some areas, and evidence for limited natural production has been found in some areas outside the Sandy and Clackamas Rivers (Good et al. 2005).

SR sockeye salmon. Five lakes in Idaho's Stanley Basin historically contained sockeye salmon: Alturas, Pettit, Redfish, Stanley and Yellowbelly (Bjornn et al. 1968). Today, they only occur in Redfish Lake. Sockeye counts at the Redfish Lake weir in 1985, 1986, and 1987 were 11, 29, and 16, respectively (Good et al. 2005). Recent annual abundances of natural origin sockeye salmon to the Stanley Basin have been extremely low. No natural origin, anadromous adults have returned since 1998, and the abundance of residual sockeye salmon in Redfish Lake is unknown. This species is entirely supported by adults produced through the captive propagation program. The first adult returns from the captive brood stock program returned to the Stanley Basin in 1999. From 1999 through 2005, 345 captive brood program adults that had migrated to the ocean returned to the Stanley Basin. Current smolt-to-adult survival of sockeye originating from the Stanley Basin lakes is rarely greater than 0.3%. The current average productivity likely is substantially less than the productivity required for any population to be at low (1 to 5%) extinction risk at the minimum abundance threshold. The BRT determined that the SR sockeye salmon remains in danger of extinction (Good et al. 2005). The NMFS identified reduced tributary stream flow, impaired tributary passage and blocks to migration, and mortality from the Columbia River hydropower system as the major factors limiting recovery of this species (NMFS 2007).

LCR steelhead. Two distinct races of steelhead, summer and winter runs, historically and currently are found in the LCR. The life histories of summer and winter steelhead overlap as both rear in freshwater for 1-4 years prior to smolting, select similar habitat for freshwater rearing, and spend 1-4 years in the ocean. Differences include adult freshwater entry and timing, the degree of sexual maturity upon entry, spawning time, and the frequency of repeat spawning. On average, there is a 2-month difference in peak spawning time between winter and summer steelhead, with spawning in distinct areas within the same watershed (Myers et al. 2006). The BRT (Good et al. 2005) found moderate risks in all the VSP categories, with mean risk matrix scores ranging from moderately low for spatial structure to moderately high for both abundance and growth rate/productivity. Most populations are at relatively low abundance, and those with adequate data for modeling probably have a relatively high extinction probability. Some populations, particularly summer runs, showed increases in 1999-2001 (Good et al. 2005). The NMFS identified degraded floodplain and stream channel structure and function, reduced access to spawning and rearing habitat, altered stream flow in tributaries, excessive sediment and elevated water temperatures in tributaries, and hatchery impacts as the major factors limiting recovery of this species (NMFS 2007).

MCR steelhead. The MCR steelhead do not include resident forms of O. mykiss (rainbow trout) co-

occurring with these steelhead. The ICTRT (2003) identified 15 populations in four MPGs (Cascades Eastern Slopes Tributaries, John Day River, the Walla Walla and Umatilla Rivers, and the Yakima River) and one unaffiliated independent population (Rock Creek) in this species. There are two extinct populations in the Cascades Eastern Slope Major Population Grouping (MPG); the Deschutes River above Pelton Dam, and the White Salmon River. Natural returns to the Yakima River, once a major historical production center for the species, continue to be less than 20% of the interim recovery abundance target for the subbasin (Good et al. 2005). The presence of substantial numbers of out-of-basin (and largely out-of-species) natural spawners in the Deschutes River raised substantial concern within NMFS, BRT regarding the genetic integrity and productivity of the native Deschutes River population (Good et al. 2005). The 5-year average return (geometric mean) of natural MCR steelhead for 1997 to 2001 was up from previous years' basin estimates (Good et al. 2005). Despite recent increases in MCR steelhead returns, the BRT believed that the species remains at moderate risk for all four VSP parameters (Good et al. 2005). The NMFS identified mortality in the Columbia River hydropower system, reduced stream flow in tributaries, altered tributary channel morphology, excessive sediment in tributaries, degraded tributary water quality, and harvest and hatchery related adverse effects as the major factors limiting recovery of this species (NMFS 2007).

UCR steelhead. This species is currently limited to four extant populations in one MPG. The MPG historically included a fourth population in the Crab Creek drainage, which probably is functionally extinct. Two additional MPGs likely existed, but access to the tributaries that supported them is now cut off by Grand Coulee and Chief Joseph Dams (ICTRT 2006). While total abundance within this species has been relatively stable or increasing, it appears to be occurring only because of major hatchery supplementation programs. The major concern for this species is the replacement failure of natural stocks. The BRT members were also strongly concerned about the problems of genetic homogenization due to hatchery supplementation, apparent high harvest rates on steelhead smolts in rainbow trout fisheries, and the degradation of freshwater habitats within the region, especially the effects of grazing, irrigation diversions and hydroelectric dams (Good et al. 2005). The most serious risk identified by NMFS (2007) was growth rate/productivity, estimated to be high to very high. Other VSP factors were also relatively high, ranging from moderate for spatial structure to moderately high for diversity. In 1999-2001 the number of naturally produced fish increased. However, the recent mean abundance in the major basins is still only a fraction of interim recovery targets. Furthermore, overall adult returns are still dominated by hatchery fish, and detailed information is lacking regarding productivity of natural populations. The ratio of naturally-produced adults to the number of parental spawners (including hatchery fish) remains low for UCR steelhead. The BRT did not find data to suggest that the extremely low replacement rate of naturally-spawning fish (estimated adult:adult ratio was only 0.25-0.3 at the time of the last status review update) has improved substantially (Good et al. 2005) . The UCR steelhead species continues to have problems including genetic homogenization from hatchery supplementation, high harvest rates on steelhead smolts in rainbow trout fisheries, and degradation of freshwater habitats (Good et al. 2005). The NMFS identified mortality from the mainstem Columbia River hydropower system, reduced tributary stream flows, tributary riparian degradation and loss of in-river wood, altered tributary floodplain and channel morphology, excessive sediment, and degraded tributary water quality as the major factors limiting recovery of this species (NMFS 2007).

SRB steelhead. The SRB steelhead species does not include resident forms of O. mykiss (rainbow trout) co-occurring with these steelhead. The ICTRT (2003) identified 23 populations in six MPGs in this species. Annual return estimates are limited to counts of the aggregate return over Lower Granite

Dam, and spawner estimates for the Tucannon, Grande Ronde, and Imnaha Rivers. The 2001 return over Lower Granite Dam was substantially higher relative to the low levels seen in the 1990s, but the recent 5-year mean abundance was approximately 29% of the interim recovery target level. Abundances in surveyed sections of the Grande Ronde, Imnaha and Tucannon Rivers improved in 2001. However, recent 5-year abundance and productivity trends (through 2001) were mixed. Five of the nine available data series exhibit positive long- and short-term trends in abundance. The majority of long-term population growth rate estimates for the nine available series were below replacement. The majority of short-term population growth rates (through 2001) were marginally above replacement or well below replacement, depending upon the assumption made regarding the effectiveness of hatchery fish in contributing to natural production (Good et al. 2005). In spite of the recent increases in SRB steelhead returns, the BRT believed that the species remains at moderate risk for abundance, productivity, and diversity. The BRT was also concerned about the predominance of hatchery-origin fish in this species, the inferred displacement of naturally-produced fish by hatchery-origin fish, and potential impacts on species diversity (Good et al. 2005). Cooney (2004) reported continuing high returns of natural-origin SRB steelhead (both A- and Brun fish) during 2002 and 2003, compared to those observed during much of the 1990s. In their preliminary report, Fisher and Hinrichsen (2004) estimated that the geometric mean of the natural-origin run was 37,784 fish during 2001 to 2003, a 253% increase over the 1996 to 2000 period (10,694 fish). The slope of the population trend increased 9.3% (from 1.00 to 1.10) when the counts for 2001 to 2003 were added to the 1990 to 2000 data series. These data indicate that, at least in the short term, the natural-origin run has been increasing. The NMFS identified mortality from the mainstem Columbia River hydropower system, reduced tributary stream flows, altered tributary channel morphology, excessive sediment in tributaries, degraded tributary water quality, and harvest and hatchery related adverse effects as the major factors limiting recovery of this species (NMFS 2007).

Bull Trout . This project may affect Bull trout critical habitat through the impacts described above. Bull trout are members of the char subgroup of the salmon family (salmonids), which also includes the Dolly Varden, lake trout and Arctic char. Historically bull trout occurred throughout the Columbia River Basin; east to western Montana; south to the Jarbidge River in northern Nevada, the Klamath Basin in Oregon, and the McCloud River in California; and north to Alberta, British Columbia, and possibly southeastern Alaska. Today bull trout are found primarily in upper tributary streams and several lake and reservoir systems; they have been eliminated from or their numbers reduced in the mainstems of most large rivers. The main populations remaining in the lower 48 states are in Montana, Idaho, Oregon, and Washington with a small population in northern Nevada. Bull trout no longer occur in northern California. Small bull trout eat terrestrial and aquatic insects but shift to preying on other fish as they grow larger. Large bull trout primarily prey on fish such as whitefish, sculpins and other trout. Bull trout spawn in the fall after water temperatures drop below 48° Fahrenheit, in streams with cold, unpolluted water, clean gravel and cobble substrate, and gentle stream slopes. Many spawning areas are associated with cold water springs or areas where stream flow is influenced by groundwater. Bull trout eggs require a long incubation period compared to other salmon and trout (4 to 5 months), hatching in late winter or early spring. Fry remain in the stream bed for up to 3 weeks before emerging. Juvenile fish retain their fondness for the stream bottom and are often found at or near there. Some bull trout (resident fish) spend their entire lives near areas where they were hatched. Others migrate from streams to lakes (adfluvial) or rivers (fluvial) or, in the case of coastal populations, salt water, to forage. Because migratory bull trout have more extensive ranges and, consequently, access to more resources, they tend to be larger than resident individuals. Bull trout are vulnerable to many of the same threats that have reduced salmon populations in the Pacific Northwest. They are more sensitive to increased

water temperatures, poor water quality, and low flow conditions than many other salmonids. Past and continuing land management activities such as timber harvest and livestock grazing have degraded stream habitat, especially along larger river systems and stream areas located in valley bottoms, to the point that bull trout can no longer survive or reproduce successfully. In many watersheds, remaining bull trout are small, resident fish isolated in headwater streams. (USFW 2003 http://library.fws.gov/Pubs/bulltrt03.pdf)

North American Green Sturgeon. This project may affect North American Green Sturgeon critical habitat through the impacts described above. This species is found along the west coast of Mexico, the United States, and Canada. Green sturgeon are believed to spend the majority of their lives in nearshore oceanic waters, bays, and estuaries. Early life-history stages reside in fresh water, with adults returning to freshwater to spawn when they are more than 15 years of age and more than 4 feet (1.3 m) in size. Spawning is believed to occur every 2-5 years (Moyle, 2002). Adults typically migrate into fresh water beginning in late February; spawning occurs from March-July, with peak activity from April-June (Moyle et al., 1995). Females produce 60,000-140,000 eggs (Moyle et al., 1992). Juvenile green sturgeon spend 1-4 years in fresh and estuarine waters before dispersal to saltwater (Beamsesderfer and Webb, 2002). They disperse widely in the ocean after their out-migration from freshwater (Moyle et al., 1992). The only feeding data we have on adult green sturgeon shows that they are eating "benthic" invertebrates including shrimp, mollusks, amphipods, and even small fish (Moyle et al., 1992). Green sturgeon utilize both freshwater and saltwater habitat. Green sturgeon spawn in deep pools or "holes" in large, turbulent, freshwater river mainstems (Moyle et al., 1992). Specific spawning habitat preferences are unclear, but eggs likely are broadcast over large cobble substrates, but range from clean sand to bedrock substrates as well (Moyle et al., 1995). It is likely that cold, clean water is important for proper embryonic development. Adults live in oceanic waters, bays, and estuaries when not spawning. Green sturgeon are known to forage in estuaries and bays ranging from San Francisco Bay to British Columbia. Green sturgeon are the most broadly distributed, wide-ranging, and most marine-oriented species of the sturgeon family. The green sturgeon ranges from Mexico to at least Alaska in marine waters, and is observed in bays and estuaries up and down the west coast of North America (Moyle et al., 1995). The actual historical and current distribution of where this species spawns is unclear as green sturgeon make non-spawning movements into coastal lagoons and bays in the late summer to fall, and because their original spawning distribution may have been reduced due to harvest and other anthropogenic effects (Adams et al., in press). Today green sturgeon are believed to spawn in the Rogue River, Klamath River Basin, and the Sacramento River. Spawning appears to rarely occur in the Umpqua River. Green sturgeon in the South Fork of the Trinity River were thought extirpated (Moyle, 2002), but juveniles are captured at Willow Creek on the Trinity River (Scheiff et al., 2001), and it is suspected that the fish could be coming from either the South Fork or the Trinity River (Adams et al., in press). Green sturgeon appear to occasionally occupy the Eel River. No good data on current population sizes exists and data on population trends is lacking. A principal factor in the decline of the Southern DPS is the reduction of the spawning area to a limited section of the Sacramento River. This remains a threat due to increased risk of extirpation due to catastrophic events. Insufficient freshwater flow rates in spawning areas, contaminants (e.g., pesticides), bycatch of green sturgeon in fisheries, potential poaching (e.g., for caviar), entrainment by water projects, influence of exotic species, small population size, impassable barriers, and elevated water temperatures likely pose a threat to this species. Fishing regulations and conservation measures represent a reduction in risk to green sturgeon. California, Oregon, Washington (United States) and British Columbia (Canada) have restricted commercial and sport fisheries where green sturgeon occur. Recent implementation of sturgeon fishing restrictions in Oregon and Washington and protective efforts put in place on the Klamath, Trinity, and

Eel Rivers in the 1970s, 1980s, and 1990s may offer protection to the Southern DPS. The recent closure of the California recreational fishery may also provide beneficial to this species. The most important conservation currently occurring is the change in operations of Red Bluff Diversion dam (open from mid September to mid May) allowing access to spawning areas above the dam. Originally, the dam was closed year around. (http://www.nmfs.noaa.gov/pr/species/fish/greensturgeon.htm)

Eulachon (commonly called smelt, candlefish, or hooligan) are a small, anadromous fish from the eastern Pacific Ocean. They are distinguished by large canine teeth on the bone in the roof of the mouth ("vomer") and 18 to 23 rays in their anal fin. Like Pacific salmon they have an "adipose fin"; it is sickle-shaped. The paired fins are longer in males than in females. All fins have well-developed breeding tubercles (raised tissue "bumps") in ripe males, but these are poorly developed or absent in females. As adults, they are brown to blue on their backs and on top of their heads, lighter to silvery white on the sides, and white on the ventral surface. Their backs may have fine, sparse speckling. They feed on plankton but only while at sea.

Eulachon typically spend 3 to 5 years in saltwater before returning to freshwater to spawn from late winter through mid spring. During spawning, males have a distinctly raised ridge along the middle of their bodies. Eggs are fertilized in the water column. After fertilization, the eggs sink and adhere to the river bottom, typically in areas of gravel and coarse sand. Most eulachon adults die after spawning. Eulachon eggs hatch in 20 to 40 days. The larvae are then carried downstream and are dispersed by estuarine and ocean currents shortly after hatching. Juvenile eulachon move from shallow nearshore areas to mid-depth areas. Within the Columbia River Basin, the major and most consistent spawning runs occur in the mainstem of the Columbia River as far upstream as the Bonneville Dam, and in the Cowlitz River.

Habitat
Eulachon occur in nearshore ocean waters and to 1,000 feet (300 m) in depth, except for the brief spawning runs into their natal (birth) streams. Spawning grounds are typically in the lower reaches of larger snowmelt-fed rivers with water temperatures ranging from 39 to 50°F (4 to 10°C). Spawning occurs over sand or coarse gravel substrates.

Critical Habitat
In October 2011, NMFS designated critical habitat for the threatened southern DPS (76 FR 65323). The proposed critical habitat (76 FR 515) was published in January 2011.

Distribution
Eulachon are endemic to the eastern Pacific Ocean, ranging from northern California to southwest Alaska and into the southeastern Bering Sea. In the continental United States, most eulachon originate in the Columbia River Basin. Other areas in the United States where eulachon have been documented include the Sacramento River, Russian River, Humboldt Bay and several nearby smaller coastal rivers (e.g., Mad River), and the Klamath River in California; the Rogue River and Umpqua Rivers in Oregon; and infrequently in coastal rivers and tributaries to Puget Sound, Washington.

Population Trends
Eulachon abundance exhibits considerable year-to-year variability. However, nearly all spawning runs from California to southeastern Alaska have declined in the past 20 years, especially since the mid 1990s. From 1938 to 1992, the median commercial catch of eulachon in the Columbia River was approximately 2 million pounds (900,000 kg) but from 1993 to 2006, the median catch had declined to approximately 43,000 pounds (19,500 kg), representing a nearly 98% reduction in catch from the prior

period. Eulachon returns in the Fraser River and other British Columbia rivers similarly suffered severe declines in the mid-1990s and, despite increased returns during 2001 to 2003, presently remain at very low levels. The populations in the Klamath River, Mad River, Redwood Creek, and Sacramento River are likely "extirpated", or nearly so.

Threats

- •Habitat loss and degradation, particularly in the Columbia River basin
  --Hydroelectric dams block access to historical eulachon spawning grounds and affect the quality of spawning substrates through flow management, altered delivery of coarse sediments, and siltation. The release of fine sediments from behind a U.S. Army Corps of Engineers sediment retention structure on the Toutle River has been negatively correlated with Cowlitz River eulachon returns 3 to 4 years later and is thus implicated in harming eulachon in this river system, though the exact cause of the effect is undetermined. Dredging activities in the Cowlitz and Columbia rivers during spawning runs may entrain and kill fish or otherwise result in decreased spawning success.

- •Global climate change may threaten eulachon, particularly in the southern portion of its range where ocean warming trends may be the most pronounced and may alter prey, spawning, and rearing success.

Eulachon have been shown to carry high levels of chemical pollutants, and although it has not been demonstrated that high contaminant loads in eulachon result in increased mortality or reduced reproductive success, such effects have been shown in other fish species.

Eulachon harvest has been curtailed significantly in response to population declines. However, existing regulatory mechanisms may be inadequate to recover eulachon stocks.

Conservation Efforts
Conservation efforts include fishing restrictions and habitat improvements targeted to improve the status of eulachon, salmon, and other native species in Pacific Northwest streams.

Regulatory Overview
In 1999, NOAA Fisheries was petitioned to list Columbia River eulachon under the ESA. In November 1999, NMFS issued a finding that the petition did not present substantial scientific information indicating the petitioned action may be warranted (64 FR 66601; November 29, 1999).

On November 8, 2007, NMFS received another petition to list southern eulachon under the ESA. The petition sought delineation of a southern eulachon "Distinct Population Segment" (DPS) extending from the U.S.-Canada border south to include populations in Washington, Oregon, and California. In March 2008, NMFS determined that the petition presented substantial scientific and commercial information indicating the petitioned action may be warranted, and initiated a status review.

In March 2010, NMFS listed the Southern DPS of eulachon as threatened under the ESA.

(http://www.nmfs.noaa.gov/pr/species/fish/pacificeulachon.htm) updated March 25th 2014

4.0 SURVEY RESULTS:

The Washington Department of Fish and Wildlife Priority Habitats and Species Map web site at http://apps.wdfw.wa.gov/phsontheweb/ was searched. The resulting map and report identified caves or cave rich areas within ¼ mile of the project area.

5.0 AFFECTED ENVIRONMENT:

The proposed private recreational dock is located within the city limits of Camas. The project area is a residential area occupied by single family residences, each with ownership of the adjacent tidelands. There are single family residences, marina facilities at the Port of Camas/Washougal and private docks to the East and single family residences, Marine Service facility, sewage treatment plant to the West.

Direct Effects

The proposed action will affect the ESA-listed salmon, steelhead and sturgeon by causing physical and biological changes to the environmental baseline, and through direct effects to ESA-listed fish. These effects include interaction with fish migrating through the action area during in-water work, effect to local habitat structure, and effects to benthic forage. The perceived categories of direct effects are summarized below.

Shading Effects: Approximately 24 lineal feet of 6' wide dock would be oriented on an east-west axis. 16 lineal feet of 6'wide floating landing and 220 lineal feet of 4' wide elevated gangway would be oriented on a north-south axis. Minimum depth to bottom beneath the dock at low water would be approximately 7' 6". The new dock and landing would float on approximately 231 s/f of open water, effectively shading the same amount of area. It is commonly known that shading provided by the docks also provides shading for predatory fish, which depredate smelts and juvenile stage fish including ESA listed fish. This direct effect would be permanent, and would occur through migratory and non-migratory periods for the above mentioned fish. A boat tied to the proposed dock for long periods of time would have a similar effect as the docks, providing shade for predatory fish. The dock will be constructed with materials that will allow at least 60% light penetration for the entire surface area to reduce the impact of shading.

Vegetation Effects: Shading impacts from the proposed docks would also potentially impact vegetation occurring near the shore; aquatic vegetation would be shaded out by the near-shore portion of the docks, resulting in loss of cover for ESA-listed fish species. This direct effect would be permanent, and would occur through migratory and non-migratory periods for the above mentioned fish.

Noise Effects: Impacts caused by noise (pile driving) would be minimized. Piles would be installed using a vibratory hammer during Washington Department of Fish and Wildlife's recommended in-water work period. This would be a temporary effect of the proposed action.

Increased noise would potentially occur due to the additional capacity for small watercraft to utilize the dock.

Indirect Effects

Indirect effects resulting from the project would include some reduction in safe migratory passage of juvenile fish due to advantages increased dock shading would provide to predatory fish.

Cumulative Effects

For the purposes of the Endangered Species Act, cumulative impacts are defined as all future state, local, or private activities that are reasonably certain to occur within the action area of the project under consultation. The analysis does not include future federal activities unrelated to the proposed action, as those impacts will be subject to separate consultation.

The applicant is not aware of any specific future federal or non-Federal activities within the action area that would cause greater effects to a listed species or a designated critical habitat than presently occurs.

6.0 CONCLUSIONS

In conclusion, based on information I have collected, I have determined that the proposed action may affect, but is not likely to adversely affect LCR Chinook salmon (Oncorhynchus tschawtscha), LCR coho salmon (O. kisutch), LCR steelhead (O. mykiss), UCR spring-run Chinook salmon, UCR steelhead, SR spring/summer run Chinook salmon, SR fall-run Chinook salmon, SR sockeye salmon (Oncorhynchus nerka), SRB steelhead, Columbia River chum salmon (O. keta), and MCR steelhead, North American Green Sturgeon (Acipenser medirostris) Bull trout (Salvelinus confluentus), Smelt (Eulachon) and their habitats.

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http://www.nmfs.noaa.gov/pr/species/fish/pacificeulachon.htm

Addendum 1

ASSESSMENT OF IMPACTS TO CRITICAL HABITAT FOR

ESUs of Pacific Salmon and Steelhead in Washington

Designated December 28, 1993 and September 2, 2005

Salmon and Steelhead Critical Habitat - Primary Constituent Elements
From 50 CFR Part 226 70 FR 52664-5

Select all critical habitat ESUs in the action area:

- ☐ Puget Sound Chinook
- x Lower Columbia River (LCR) Chinook
- ☐ Upper Willamette River (UWR) Chinook
- x Upper Columbia River (UCR) spring Chinook
- x Snake River (SR) fall Chinook
- x SR spring-summer Chinook
- ☐ Hood Canal summer chum
- x Columbia River chum
- ☐ Ozette Lake sockeye
- ☐ SR sockeye
- x UCR steelhead
- x Mid Columbia River (MCR) steelhead
- x LCR steelhead
- ☐ UWR steelhead
- x SR steelhead

The primary constituent elements determined essential to the conservation of Pacific salmon and steelhead are:

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation, and larval development.

Existing Conditions:
The existing substrate consists of sand, rock and silt.

Effects to PCE:
Water quality – Construction will slightly increase TSS and turbidity in the action area for a period of 1 week. Increased turbidity from the proposed action is not likely to be measurable for more than 24 hours after construction is completed, and no long-term effect on water quality will occur. There will be increased potential for toxic contamination (*i.e.,* fuel, oil, lubricants) of the aquatic and substrate environments from increased boating activity and recreational use for the life of the boat dock.

Substrate – The existing substrate is not conducive to spawning, incubation and larval development. There will be no effect from the proposed action.

(2) Freshwater rearing sites with water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; water quality and forage supporting juvenile development; and natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.

(3)

Existing Conditions:

At OHWM, the heavily vegetative bank slopes down to gentle sloped mixed grass area. The tidal zone gradually slopes to the riverbed where the substrate consists sand and silt.

Effects to PCE:.
Water Quality- Same as above

Floodplain Connectivity- Current connectivity conditions will not be altered.

Forage – Macroinvertebrate communities will be slightly and temporarily (1-2 weeks) negatively affected due to increases in TSS and through disturbance of the channel substrate. However, these effects are likely to be minor and insignificant at the watershed scale (5th field).

Natural cover – The proposed mitigation , a Large Woody Debris structure, is designed to enhance the natural cover in the action area.
(3) Freshwater migration corridors free of obstruction with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Existing Conditions:
Same as above

Effects to PCE:
Water Quality- Same as above

Free passage – The proposed boat dock is likely to slightly and locally obstruct passage for both adult and juvenile Pacific salmon and steelhead for the life of the project. In addition, increased boat traffic in the area may startle migrating fish. Effects on free passage are not likely to be significant due to the pile spacing and location.

Natural cover – Same as above

(4) Estuarine areas free of obstruction with water quality, water quantity and salinity conditions supporting juvenile and adult physiological transitions between fresh-and saltwater; natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels, and juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Existing Conditions:
Same as above
Effects to PCE:
Water Quality- Same as above

Free passage – Same as above

Natural cover – The proposed mitigation, a Large Woody Debris structure, is designed to provide natural cover with both submerged and overhanging large wood

(5) Nearshore marine areas free of obstruction with water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.

Existing Conditions:
Same as above
Effects to PCE:
Water Quality- Same as above

Free passage – Same as above

Natural cover – Same as above

(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Existing Conditions:
Same as above
Effects to PCE:
Water Quality- Same as above

Determination of Effect: If critical habitat for the ESU does not occur in the action area, no determination of effect is required for that ESU.

	NE[1]	NLAA[2]	LAA[3]
Puget Sound Chinook:	☐	☐	☐
LCR Chinook	☐	x	☐
UWR Chinook	☐	☐	☐
UCR spring Chinook	☐	x	☐
SR fall Chinook	☐	x	☐
SR spring-summer Chinook	☐	x	☐
Hood Canal summer chum	☐	☐	☐
Columbia River chum	☐	x	☐
Ozette Lake sockeye	☐	☐	☐
SR sockeye	☐	x	☐
UCR steelhead	☐	x	☐
MCR steelhead	☐	x	☐
UWR steelhead	☐	☐	☐
SR steelhead	☐	x	☐

Conservation Measures:
The applicants propose to create and maintain a large woody debris structure.

[1] NE is no effect.
[2] NLAA is may affect, not likely to adversely affect.
[3] LAA is may affect, likely to adversely affect.

	
Action Area - View is to the North *The gangway will be located to the left of the stairs.*	*Action Area – View is to the South* *The gangway will be located to the right of the boat.*
	
Shoreline and Mark Marine - View is to the West of Action Area	*Mitigation area in the immediate foreground and community dock in background - View is to the East of the Action Area.*

Photos were taken when river level was at approximately 2' CRD.

Mitigation Plan for Hubbard Dock

Prepared by: Jack Loranger , 360-837-3760 jack@shorelinepermits.com 2/2/2018
For applicant: Brant Hubbard

PROPOSED DEVELOPMENT PROJECT

PROJECT PURPOSE AND NEED

The purpose of the proposed action is to construct a private recreational floating dock with associated gangway and bulkhead. The proposed project will provide safe access to water dependent activities in the river and safe mooring for the property owner.

PROJECT LOCATION AND SETTING

The project is located in the City of Camas, Clark County, Washington , Latitude and Longitude : 45.57852331 N lat. / -122.39632320 W long., described as ¼ Section NW Section 13 Township 1N Range 3E. The property is at River Mile
(RM) 121 of the Columbia River. It is also within the 17080001 Hydraulic Unit Code and in Water Resources Inventory Area 28 (Lower Columbia-Sandy watershed).
The project site is tidally influenced and is located in freshwater. Project plans are attached to this plan. The project site is located on the property at 1180 SE Polk St. Camas, WA (Plan Set Page 1).
There are no wetlands or other critical areas located on site other than the Columbia River. Surrounding property use is single-family residential. The shoreline designation on the property is Medium Intensity and is zoned R-15.

PROJECT DESCRIPTION

To construct a private recreational 6'x24' floating dock and 6'x16' floating landing in the Columbia River with an elevated gangway 4' wide and 220' long from the landing to a 7'x6' concrete bulkhead located on the upland area of the property. 7 steel pilings 12" diameter will be driven for dock and gangway support .The length of the dock will require a variance from the 100' maximum. The length of the dock is the shortest possible while still complying with the minimum depth of water the dock needs to be in at low water. The length will not interfere with navigation on the river since there are docks on both sides of the proposed project that protrude further into the river. 12” steel pilings will be used to secure the floating dock, walkway and gangway. A variance will be required for the dimension of the pilings. The SMP allows for maximum 5” diameter for a cased piling. A 12” piling is standard typical use on the Columbia River and has the strength required for the length of the pilings and the flow of the river. The gangway will be supported by cross-arms to prevent grounding during low water.

Existing Conditions

Terrestrial Habitat

The Immediate Area is a roughly rectangular tract that is approximately 425 feet (ft) north to south and 80 ft east to west. It is bordered to the north by SE Polk St. , to the east and west by single family residential properties, and to the south by the Columbia River. A single family residence is located on the northern part of the property with a landscaped, grassy yard area around it and paved driveway. The upland grassy yard on the south side of the residence has a steep slope that falls to the shoreline grassy area and then a gentle slope to the river changing to a sand and stone beach in the tidal zone. There is a wetlands presence in the active tidal.

The project is located in an area that has already been impacted by development of marina facilities at the Port of Camas/Washougal and private docks to the East and a Marine Service facility, sewage treatment facility and private docks to the West.

Aquatic Habitat

In general, aquatic habitat in the lower Columbia River has been degraded since western civilization arrived. Dam construction changed many of the baseline conditions, including habitat-forming processes, habitat types, primary productivity, the food web, access to habitats, and predation. Diking, dredging, and channelization of the Columbia River, an extensive drainage system of sloughs, and extensive fill placement have separated the river from its former floodplain area, causing the loss of shallow-water and wetland habitats used for salmonid rearing. In some areas of the lower Columbia River, industrialization and urbanization have also created impacts related to chemical contamination of water and sediments that become incorporated into the food web.

The river is approximately 3700' wide in the project vicinity. The bank along the project site is relatively steep. The project area is approximately at RM 121, which is outside of the influence of salt water from the ocean, but it is influenced by tides. The existing substrate consists of boulders, rock, mud and silt.

Water Quality and Sediment Quality

At the OHWM, the bank slopes down to mixed grass.

The tidal zone gradually slopes to the riverbed where the substrate consists of boulders, rock, mud and silt. The 2012 *Washington State Water Quality Atlas* 303(d) list shows listing 6294 as a Temperature water-quality impairment and listing 7879 as Total Dissolve Gas within the Columbia River in the project area.

FEDERALLY LISTED SPECIES AND CRITICAL HABITATS PRESENT

Federally listed species in the following table may be affected by this project.

Table 1. Listed, Proposed, and Candidate Species and Critical Habitat Addressed in this Document.

Species, ESU or DPS	Federal Status	Critical Habitat in Action Area?
NMFS Jurisdiction		
Chinook Salmon *(Onchorhynchus tshawytscha)*		
Lower Columbia River Chinook ESU	Threatened	Presence
Upper Willamette River Chinook ESU	Threatened	Presence
Upper Columbia River Spring-run Chinook ESU	Endangered	Presence
Snake River Spring/Summer-run Chinook ESU	Threatened	Presence
Snake River Fall-run Chinook ESU	Threatened	Presence
Chum Salmon (*Onchorhynchus keta*)		
Columbia River Chum Salmon ESU	Threatened	Presence
Coho Salmon (*Onchorhynchus kisutch*)		
Lower Columbia River Coho Salmon ESU	Threatened	Presence
Sockeye Salmon (*Onchorhynchus nerka*)		
Snake River Sockeye ESU	Endangered	Presence
Steelhead (*Onchorhynchus mykiss*)		
Lower Columbia River Steelhead DPS	Threatened	Presence
Middle Columbia River Steelhead DPS	Threatened	Presence
Upper Columbia River Steelhead DPS	Threatened	Presence
Snake River Basin Steelhead DPS	Endangered	Presence
North American Green Sturgeon Southern DPS *(Acipenser medirostris)*	Threatened	Presence
Columbia River Smelt (Eulachon) Southern DPS *(Thaleichthys pacificus)*	Threatened	Presence
USFWS Jurisdiction		
Bull Trout – Columbia River DPS *(Salvelinus confluentus)*	Threatened	Presence

DPS = Distinct Population Segment ESU = Evolutionarily Significant Unit

IMPACT ASSESSMENT

PROJECT SITE

Direct effects include interaction with fish migrating through the action area during in-water work, effect to local habitat structure, and effects to benthic forage. Specifically, shading, vegetation, and noise will affect the ESA-listed salmon, steelhead, sturgeon, and smelt. In-air noise will temporarily exceed background noise levels in the surrounding environment and in this area of the river. Underwater noise from pile driving will be temporary but it will be minimized as a vibratory hammer will be used to install these piles. The proposed dock will permanently increase shading for aquatic vegetation and for fish species; however, shading will be minimized as the dock will be constructed with materials allowing 60 percent light penetration.

MITIGATION SITE

Interrelated activities typically include those impacts from mitigation activities. The mitigation site is located onsite. It was selected because of the proximity to the project site. The mitigation is proposed to compensate for impacts through construction and maintenance of a Large Woody Debris structure.

EFFECT DETERMINATIONS - FEDERALLYLISTED SPECIES

The project has been designed to avoid and minimize the impacts to species and habitats within the project and action areas. This section summarizes the primary project effects to each species and critical habitat in the area. For a full discussion of potential effects, see the section in the biological evaluation document (BE).

DIRECT EFFECTS

Direct effects include interaction with fish migrating through the action area during in-water work, effect to local habitat structure, and effects to benthic forage. Specifically, shading, vegetation, and noise will affect the ESA-listed salmon, steelhead, sturgeon, and smelt. Avoidance and minimization measures for construction equipment leaks will be implemented. Because leaks are unlikely to occur, effects are considered discountable.

The dimensions of the proposed dock are 24 lineal feet of 6-foot wide oriented on an east/west axis and 16 lineal feet of 6-foot wide landing on a north/south axis. Approximately 231 square feet of open water will be shaded from the proposed dock walkway and landing. The 220 lineal feet of 4' wide elevated gangway will be cause some shading. The dock and elevated gangway will be constructed with materials that will allow at least 60 percent light penetration for the entire surface area to reduce the impact of shading. The direct effect would be permanent and would occur through migratory and non-migratory periods for the above mentioned fish. Boats tied to the proposed dock for long periods of time would have a similar effect as the docks, providing shade. Impacts caused by noise (pile driving) would be minimized. Piles would be installed using a vibratory hammer during Washington Department of Fish Wildlife (WDFW) recommended in-water work period. This would be a temporary effect of the proposed action. Increased noise would potentially occur due to the additional capacity for small watercraft to utilize the dock. If an impact hammer is necessary to obtain sufficient depth for the pilings sound pressure levels will be monitored during impact hammer pile driving actions. If sound pressure levels exceed 180 decibels within 18 meters of the pile driving activity, then additional sound attenuation measures will be employed including the use of a wood block or an additional bubble curtain.

INDIRECT EFFECTS

Indirect effects resulting from the project would include some reduction in safe migratory passage of juvenile fish due to increased dock shading for predatory fish.

EFFECT DETERMINATIONS

For the reasons discussed above, the project may affect and will not likely adversely affect ESUs/DPSs of salmon and steelhead, North American green sturgeon, bull trout, and smelt.

EFFECTS TO CRITICAL HABITAT

Project effects described above for the species also affect primary constituent elements (PCEs) of salmon and steelhead, bull trout, and smelt that are described in the BE. Construction will slightly increase total suspended solids (TSS) and turbidity in the action area for a period of 1 week. Increased turbidity from the proposed action is not likely to be measurable for more than 24 hours after construction is completed, and no long-term effect on water quality will occur. There will be increased potential for toxic contamination (i.e. fuel, oil, lubricants) of the aquatic and substrate environments from increased boating activity and recreational use for the life of the boat dock. Macroinvertebrate communities will be slightly and temporarily (1-2 weeks) negatively affected due to increases in TSS and through disturbance of the channel substrate. However, these effects are likely to be minor and insignificant at the watershed scale (5th field). The proposed dock is likely to slightly and locally obstruct passage for both adult and juvenile Pacific salmon and steelhead for the life of the project. In addition, increased boat traffic in the area may startle migrating fish. Direct effects to the migration PCEs, water-quality PCEs and the food-resources PCEs will be insignificant for the following reasons:

- Effects to the food chain from increases in suspended solids and from benthic disturbance will be temporary and spatially limited compared to the size of the Columbia River.
- The Columbia River is a large waterbody, so there are other opportunities for foraging and migration, and the small amount of suspended solids that may occur during the project during brief periods will dissipate quickly.
- Effects on free passage are not likely to be significant due to the pile spacing and location.

There will be no indirect effects to any of the PCEs after construction activities. For these reasons, the project may affect, and will not likely adversely affect designated critical habitat for ESUs/DPSs of salmon and steelhead, bull trout, and smelt.

MITIGATION APPROACH

MITIGATION SEQUENCING

IMPACT AVOIDANCE AND MINIMIZATION MEASURES

The project has been designed to avoid and minimize impacts to habitats and species that may potentially occur in the vicinity of the project area. This will be accomplished by using the following measures:

1. The barge will not "ground out" at any time.
2. The barge will have a containment boom on board to use if there are fluid leaks.
3. No debris will be allowed to enter the river from the barge. The contractor will be required to retrieve any floating debris generated during construction using a skiff and a net. Debris will be disposed of upland.
4. Anti-perching devices will be placed on the top of dock pilings to discourage use of structure by predatory birds.
5. Alteration or disturbance of the bank and bank vegetation will not be necessary to construct the project.
6. An abbreviated in-water work window recommended by WDFW will be observed.
7. The in-water work window will avoid eulachon run timing and there will be no entrainment of eulachon eggs or larvae.
8. Equipment will be checked daily, prior to starting work, for leaks, and any necessary repairs will be completed prior to commencing work activities.
9. A vibratory pile driver will be used to the extent allowed by geological conditions. A confined bubble curtain system will be used if impact pile driving is used.
10. Sound pressure levels will be monitored during impact hammer pile driving actions. If sound pressure levels exceed 180 decibels within 18 meters o the pile driving activity, then additional sound attenuation measures will be employed including use of a wood block or an additional bubble curtain.
11. The contractor will follow the Washington Department of Ecology's *Source Control BMPs for Spills of Oil and Hazardous Substances to Prevent and Contain Petroleum Spills from Construction Equipment*.
12. A temporary erosion sediment control (TESC) plan will be implemented. The best management practices include minimizing vegetation removal and maintaining a vegetative buffer where possible.
15. Docking structures are designed to use grating that allows at least 60% light transmission on the entire dock surface.

MITIGATION GOAL

The mitigation goal is to compensate for temporary and permanent project impacts to aquatic habitat and species near the impact site by enhancing the aquatic habitat by constructing and maintaining a Large Woody Debris (LWD) structure.

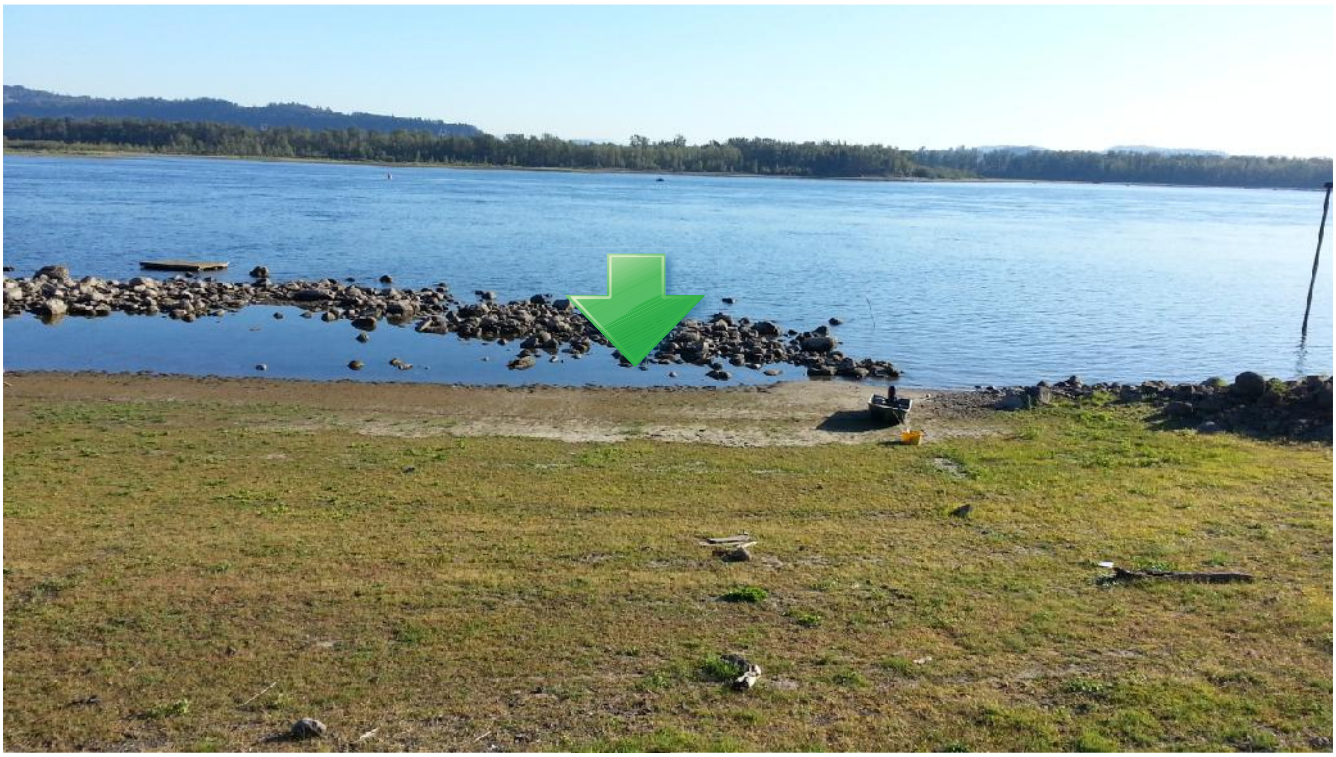
MITIGATION STRATEGY

This mitigation location was selected because it is close to the impact site and can be easily monitored. There are also large boulders available on site for securing the LWD structure.

PROPOSEDMITIGATION SITE

EXISTINGCONDITIONS AT THEMITIGATION SITE

The proposed mitigation area is located in the tidelands of the project area at approximately LWM or 2' CRD. The soil is a sandy loam and silt with scattered boulders of varying sizes.



Mitigation Area looking South

LWD MITIGATION DESIGN AND CONSTRUCTION

The proposed LWD structure is designed to enhance aquatic habitat by providing refuge and food source for rearing salmonids. One large woody debris (LWD) structure will be constructed using 2 untreated Douglas fir root wads minimum 12' long and 16" diameter stem. These logs are available from wind falls near the project site. The logs will cross each other with a 3/8" chain wrapping the cross section of the logs. The chain will be secured to large boulders by drilling and epoxying 8" long 1/2" diameter eye bolts into the boulders. The log structure will be installed from the shore using an excavator during low water in the provided in-water-work window. Two large boulders may need to be re-positioned.

LWD MITIGATION GOAL, OBJECTIVES, AND PERFORMANCE STANDARDS

The mitigation goal is to compensate for project impacts to aquatic habitat and species near the impact site by creating instream cover.

Objective 1: **Provide natural refuge for rearing salmonids.**

Performance Standard 1a. Install LWD structure near the low water mark during the in-water work window. Logs will be Douglas fir.

This performance standard will be met when the as-built report is submitted to the Washington Department of Fish and Wildlife, and the U.S. Army Corps of Engineers within 2 months of project completion.

Objective 2: **Protect the mitigation-structure functions**.

Performance Standard 2a: *Annually inspect the structures for 5 years to ensure they continue to function as refuge and food source for rearing salmonids*.
This performance standard will be met when the annual monitoring report is submitted to the Washington Department of Fish and Wildlife, and the U.S. Army Corps of Engineers by December 31 of each monitoring year.

MONITORING PLAN

Monitoring for this project will be conducted each year, after the completion of the project, for a total of 5 years. Annual monitoring will occur at water levels that allow for visual inspection and so photographs can be taken of the Mitigation Area.
Results of the visual inspection will include an assessment of whether the original structures are still in place and if they are likely still functioning as refuge for rearing salmonids.
Photographs will also be taken, which will be included in the annual monitoring report. The report will be submitted to the Washington Department of Fish and Wildlife,and the U.S. Army Corps of Engineers by December 31 of each monitoring year.

Monitoring Report Contents

Reports will discuss how performance standards are being met. The following items will be included in the report:

- Location map (including photo-point locations).
- Historic description of project, including date of installation, current year of monitoring, and restatement of mitigation goal, objectives, and performance standards for that monitoring year.
- Description of the condition of the mitigation area.
- Photographs of the mitigation area.
- Summary of maintenance and contingency measures completed for the past year and proposed for the next year.

MAINTENANCE PLAN

The LWD structure requires no routine maintenance. If a structure is not functioning to provide equivalent instream habitat as installed, one or more components of the structure will be repaired or replaced, and these actions will be discussed in the annual report.

CONTINGENCY PLAN

If the LWD structure is no longer present within a 5-year period and aquatic conditions change substantially such that replacement structure would not be advised, the following procedure will be implemented:
Identify the cause(s) of the failure or potential failure.
1. Identify the extent of the failure or potential failure.
2. Document the activities and include this data in the monitoring reports.
3. In the event that a routine corrective action will not correct the problem, consult with the appropriate agencies.
4. Evaluate recommendations from resource agency staff and implement recommendations in a timely manner.

Funding for corrective actions will be the responsibility of the landowner.

IMPLEMENTATION SCHEDULE

The construction of the LWD structure will be completed within 1 year of the dock installation. An as built report will be submitted to the above-named agencies within 2 months of completion.
Annual monitoring will begin during the summer or fall of the year following the submittal of the as built report and will be submitted to those same agencies by December 31 of the monitored year.

HUBBARD DOCK VACINITY MAP

REFERENCE#_____

APPLICANT: BRANT HUBBARD

ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

LOCATION:
1180 SE POLK CIR. CAMAS, WA 98607

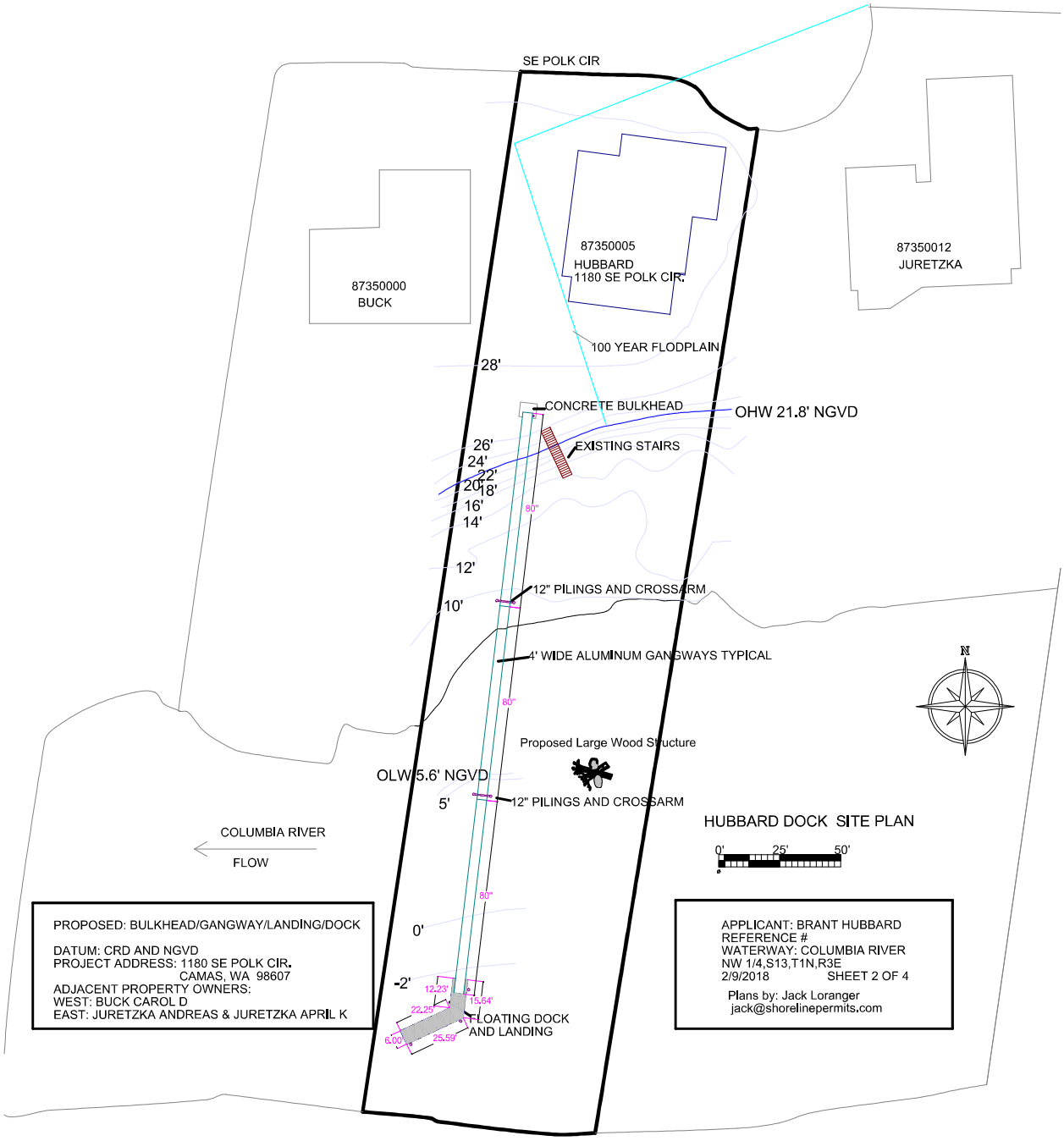
45.57852331 N lat. / -122.39632320 W long

 2/9/2018

PROPOSED PROJECT:
BULKHEAD/GANGWAY/LANDING/DOCK

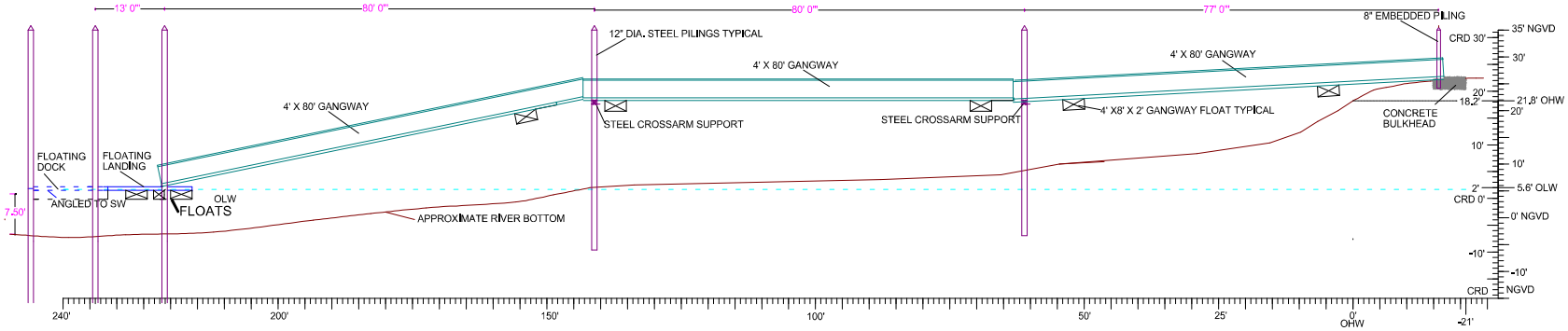
IN: COLUMBIA RIVER
NEAR: CAMAS, WA
COUNTY: CLARK
STATE: WA

plans by:Jack Loranger jack@shorelinepermits.com


SE POLK CIR
87350000
BUCK
87350005
HUBBARD
1180 SE POLK CIR.
87350012
JURETZKA
100 YEAR FLODPLAIN
28'
CONCRETE BULKHEAD
OHW 21.8' NGVD
EXISTING STAIRS
26'
24'
22'
20'
18'
16'
14'
12'
10'
80'
12" PILINGS AND CROSSARM
4' WIDE ALUMINUM GANGWAYS TYPICAL
Proposed Large Wood Structure
OLW 5.6' NGVD
5'
12" PILINGS AND CROSSARM
N
COLUMBIA RIVER
FLOW
HUBBARD DOCK SITE PLAN
0'
25'
50'
0'
-2'
12.23'
15.64'
22.25'
6.00'
25.59'
FLOATING DOCK
AND LANDING
PROPOSED: BULKHEAD/GANGWAY/LANDING/DOCK
DATUM: CRD AND NGVD
PROJECT ADDRESS: 1180 SE POLK CIR.
CAMAS, WA 98607
ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K
APPLICANT: BRANT HUBBARD
REFERENCE #
WATERWAY: COLUMBIA RIVER
NW 1/4,S13,T1N,R3E
2/9/2018 SHEET 2 OF 4
Plans by: Jack Loranger
jack@shorelinepermits.com

PROPOSED STRUCTURES

1 - 6'X7'X27" DEEP CONCRETE BULKHEAD
WITH EMBEDDED 8" STEEL PILING
7 - 12" STEEL PILINGS
2 - 6"X8" STEEL SUPPORT CROSSARMS
3 - 4' WIDE 80' LONG ALUMINUM GANGWAYS
1 - 6' WIDE FLOATING LANDING AVERAGE 14' LONG QUADRILATERAL
1 - 6' WIDE FLOATING DOCK AVERAGE 24' LONG QUADRILATERAL
5 - 4'X8'X2' DEEP FLOATS FOR GANGWAYS
2 - 4'X6'X20" DEEP FLOATS FOR LANDING
7 - 2'X6'X20" DEEP FLOATS FOR LANDING AND DOCK



EAST ELEVATION PROPOSED HUBBARD DOCK

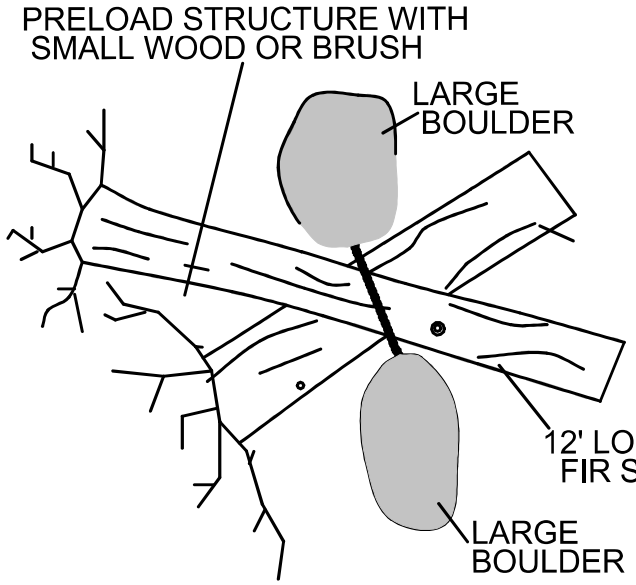
PROPOSED: BULKHEAD/GANGWAY/LANDING/DOCK

DATUM: CRD AND NGVD
PROJECT ADDRESS: 1180 SE POLK CIR.
CAMAS, WA 98607
ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

APPLICANT: BRANT HUBBARD
REFERENCE #
WATERWAY: COLUMBIA RIVER
NW 1/4,S13,T1N,R3E
2/09/2018 SHEET 3 OF 4

Plans by: Jack Loranger jack@shorelinepermits.com

Large Wood Structure



1/2" X 8" EYE BOLTS EPOXIED INTO BOULDERS
1/2" CHAIN WRAPPED AROUND LOGS AND
COUPLED TO THE EYE BOLTS

FLOW ←

PROPOSED: DOCK/LANDING/RAMP/BULKHEAD

Datum: NGVD

Project Address: 1180 SE Polk Cir.
Camas, Clark, WA 98607

Adjacent Property Owners:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

Applicant: Brant Hubbard

Reference # NWS-

Waterway: Columbia River

1/4 of Sec.18 T1N R4E

2/9/2018

NTS

CRITICAL AREAS REPORT

May 2018

Hubbard Dock

City of Camas, Washington

Prepared for

Brant Hubbard
1180 SE Polk Circle
Camas, Washington 98607
(503) 804-2620

Prepared by

Ecological Land Services, Inc.

1157 3rd Avenue South, Suite 220A • Longview, WA 98632

(360) 578-1371 • Project Number 2697.01

SIGNATURES

The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.

Sarah Fitzpatrick
Biologist

Coli Huffman
Biologist

Michele McGraw
Senior Wildlife Biologist/Principal

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Figures and Photoplates:

INTRODUCTION

Ecological Land Services, Inc. (ELS) was contracted by Brant Hubbard to conduct a critical areas determination for tax parcel 87350005, located off of SE Polk Circle in Camas, Washington (Figure 1). The site is approximately 0.30 acres and is located within Section 1 and Section 13, Township 1 North, Range 3 East of the Willamette Meridian. ELS conducted a critical areas determination to determine the presence and extent of critical areas onsite; this report summarizes ELS findings according to the *Camas Shoreline Master Program (SMP 2015), Appendix C.*

METHODOLOGY

ELS conducted a site visit on March 26, 2018 to make determinations about the presence or absence of critical areas onsite and offsite. The Washington Department of Ecology flagged the Ordinary High Water Mark (OHWM) of the Columbia River using florescent flagging. The OHWM corresponded with scour marks and dead vegetation. The OHWM was recorded by ELS using a GPS unit with sub-meter accuracy (Figure 2).

SITE DESCRIPTION

The site lies south of SE Polk Circle and is a residential property with a single family home. The majority of the property consists of the property, which faces the Columbia River on its southern side, and maintained lawn and landscaping. The surrounding properties are part of a residential subdivision. The house and lawn are elevated approximately 12 feet above the Columbia River, with large, ivy-covered boulders filling the slope between the two elevations. There is also an existing wooden staircase that provides access from the lawn to the river. The majority of the shoreline consists of bare ground with small piles of driftwood scattered throughout. There is a small amount of herbaceous cover along the shoreline, but no shrubs or trees present. Scour marks and a line of dead ivy along the boulders correspond with the OHWM line (Figure 2 and Photoplate 1).

STREAM INVENTORY

The Washington Department of Natural Resources (DNR) Stream Mapping maps the Columbia River as a shoreline of the state (Figure 3). ELS findings were consistent with DNR mapping (DNR 2017).

PRIORITY HABITAT AND SPECIES

The Washington Department of Fish and Wildlife (WDFW) Priority Habitat and Species map indicates no priority habitats or species onsite or in the vicinity of the site (Figure 4).

CONCLUSIONS

The Columbia River is a Type S (shoreline of the state) waterbody, requiring a 150-foot fish and wildlife habitat conservation area buffer according to *CSMP Appendix C, Chapter 16.61*. However, *Chapter 5.3* provides exceptions for lots fronting on SE 12th Avenue and SE 11th Avenue between SE Polk Street and SE Front Street, allowing reduction of the buffer to 20% of

the lot depth measured from the OHWM. As lot depth varies within the parcel, three lot depth measurements were taken and averaged; twenty percent of this average resulted in a 46-foot fish and wildlife habitat conservation buffer. No side channels, river-associated wetlands, or other critical areas were observed on aerials or during the site visit. Critical areas are summarized in Table 1.

Table 1. Summary of Critical Areas onsite

Critical Area	Waterbody Classification[1]	Buffer Width (feet)[2]
Columbia River	Type S	46

[1]According to DNR Stream Type Mapping
[2]According to *CSMP, Appendix C, Chapter 5.3*. As lot depth varies within the parcel, three lot depth measurements were taken and averaged; twenty percent of this average is detailed in Table 1.

LIMITATIONS

The services described in this report were performed consistent with generally accepted professional consulting principles and practices. There are no other warranties, express or implied. The services preformed were consistent with our agreement with our client. This report is prepared solely for the use of our client and may not be used or relied upon by a third party for any purpose. Any such use or reliance will be at such party's risk.

The opinions and recommendations contained in this report apply to conditions existing when services were performed. ELS is not responsible for the impacts of any changes in environmental standards, practices, or regulations after the date of this report. ELS does not warrant the accuracy of supplemental information incorporated in this report that was supplied by others.

REFERENCES

City of Camas. 2012. *Camas Shoreline Master Program* (*CSMP*), *Chapter 5.3, Critical Areas Protection and Appendix C: Chapter 16.61 Fish and wildlife habitat conservation areas.*

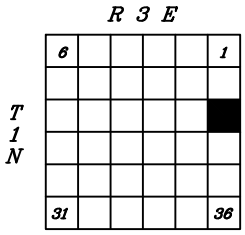
Washington Department of Fish and Wildlife (WDFW). 2015. *PHS on the Web.* http://apps.wdfw.wa.gov/phsontheweb/. Accessed February 2018.

Washington State Department of Natural Resources (DNR). 2017. *Forest Practices Mapping Application.* https://fortress.wa.gov/dnr/protectiongis/fpamt/. Accessed March 2018.

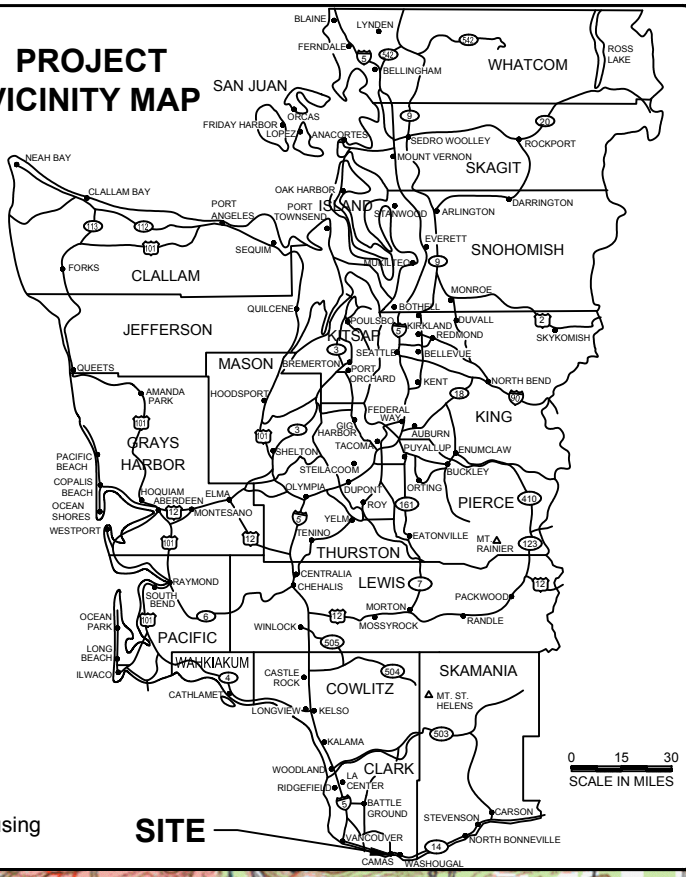
FIGURES AND PHOTOPLATES

Latitude:45.5778°
Longitude:-122.3914°

LOCATION MAP



PROJECT VICINITY MAP



NOTE:
USGS topographic quadrangle map reproduced using MAPTECH Inc., Terrain Navigator Pro software.

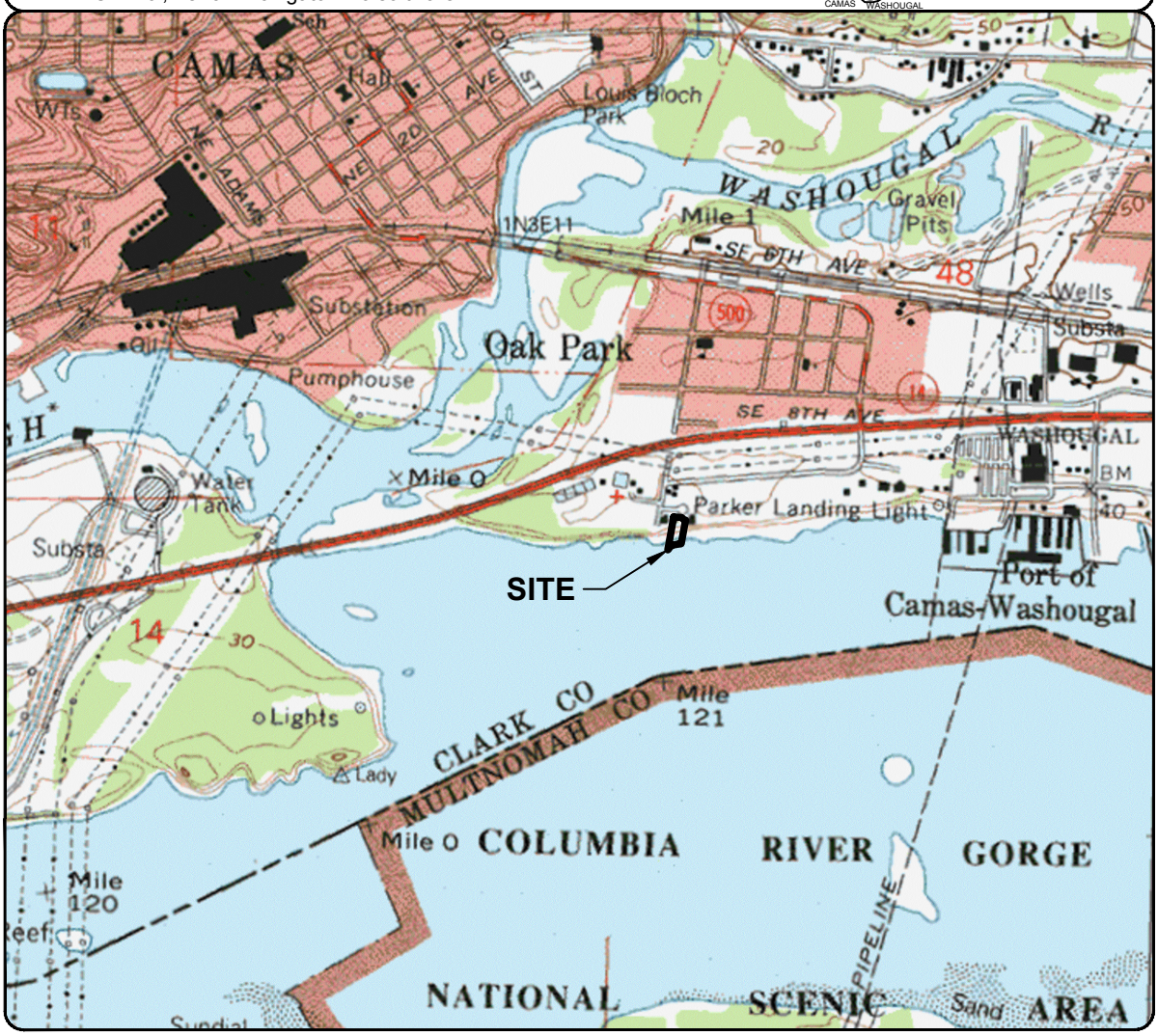


Figure 1
VICINITY MAP
Hubbard Dock
Brant Hubbard
City of Camas, Clark County, Washington
Section 13, Township 1N, Range 3E, W.M.

DATE: 4/30/18
DWN: CDP
REQ. BY: SF
PRJ. MGR: SF
CHK: MLM
PROJECT NO: 2697.01

1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371
Fax: (360) 414-9305
www.eco-land.com

Ecological Land Services

0 1500 3000
SCALE IN FEET

N W E S

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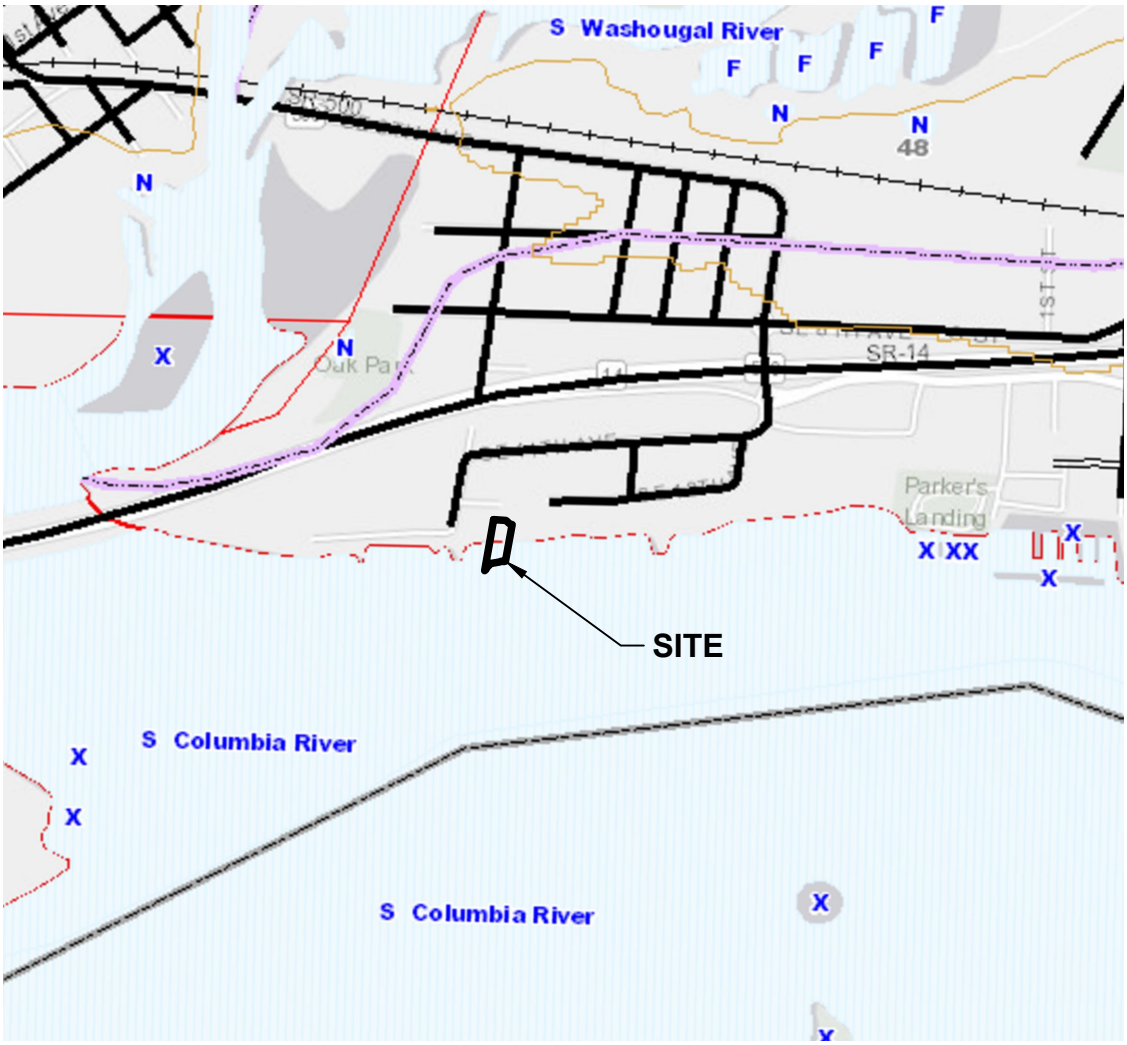
Figure 2
SITE MAP
Hubbard Dock
Brant Hubbard
City of Camas, Clark County, Washington
Section 13, Township 1N, Range 3E, W.M.



Streams indicated onsite by the Washington State Department of Natural Resources (DNR).

Streams

Streams

- Type S
- Type F
- Type N, Np, Ns
- U, unknown
- X, non-typed per WAC 222-16

NOTE: Map provided online by Washington State Department of Natural Resources at web address: *https://fortress.wa.gov/dnr/protectiongis/fpamt/index.html*

Figure 3
DNR WATER TYPE MAP
Hubbard Dock
Brant Hubbard
City of Camas, Clark County, Washington
Section 13, Township 1N, Range 3E, W.M.

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0 1000 2000
SCALE IN FEET

N
W E
S

Priority Habitat & Species indicated by the Washington Department of Fish & Wildlife (WDFW).

LEGEND:

- Site Boundary
- Parcel Boundaries
- Fish & Wildlife Priority Habitat & Species Area

NOTE: Map provided online by Washington Department of Fish and Wildlife at web address: *http://apps.wdfw.wa.gov/phsontheweb/*

Figure 4
WDFW PRIORITY HABITAT & SPECIES MAP
Hubbard Dock
Brant Hubbard
City of Camas, Clark County, Washington
Section 13, Township 1N, Range 3E, W.M.

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0 800 1600
SCALE IN FEET

N W E S

Photoplate 1

The approximate location of the OHWM (flagged by Ecology). The OHWM corresponds with scour marks and dead vegetation along the boulders.

Photo 1. This photo was taken facing west. This photo documents the existing stairs and where the dock is planned to be built. The line of dead ivy and scour marks along the boulders align with the OHWM.

Photo 2. This photo was taken facing southwest. This photo documents the southern portion of the site and the water level of the Columbia River onsite during the site visit.

Ecological Land Services

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Phone: (360) 578-1371
Fax: (360) 414-9305

DATE: 4/13/2018
DWN: SF
PRJ. MGR: SF
PROJ.#: 2697.01

Site Photos
Photoplate 1
Hubbard Dock
Brant Hubbard
Camas, Washington

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

May 31, 2018

Robert Maul, Planning Manager
City of Camas
Community Development Department
616 Northeast Fourth Avenue
Camas, WA 98607

Dear Mr. Maul:

Thank you for the opportunity to comment on the determination of nonsignificance for the Hubbard Dock Project (SEPA18-07 & SHOR18-01) located at 1180 Southeast Polk Street as proposed by Brant Hubbard. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

SHORELANDS & ENVIRONMENTAL ASSISTANCE:
Rebecca Rothwell (360) 407-7273

Per section 6.3.3.4.12.b. of the Camas Shoreline Master Program, a private dock is permitted...if shared moorage is unavailable within 1/4 mile. Shared moorage may be available at the Port of Camas-Washougal. The applicant will need to demonstrate whether moorage is available at the port.

Section 6.3.3.4.23 of the SMP specifies maximum dimensions and extent of docks and piers into the waterway. If the proposal will exceed these dimensions, and the applicant will be requesting a shoreline variance, the burden of proof is on the applicant to demonstrate that all variance criteria will be met.

The proposal includes a 6' x 24' floating dock and a 6' x 16' floating landing at the end of the gangway. Section 6.3.3.4.25 states the following:

> Recreational floats shall be allowed only when located as close to the shore as possible, and no farther waterward than any existing floats and established swimming areas. Floats shall be unattached to other structures and be constructed as follows:
>
> a. That the deck surface is not higher than one (1) foot above the water surface. Reflectors for nighttime visibility shall be incorporated into their design.

b. Floats shall not exceed dimensions of one-hundred-sixty (160) square feet. For private-use structures a maximum of one float shall be installed. A maximum of two floats shall be installed for joint-use structures.

c. Freeboard height on floats shall be at least ten (10) inches.

d. Grating or clear translucent material shall cover at least fifty-percent (50%) of the surface area of floats.

It does not appear that the project as currently proposed will meet these specifications for the following reasons:

- Two floats are proposed; the residential limit is one.
- The total square footage of the two floats would be 240 square feet, exceeding the limit of 160 square feet.
- The floats would be placed at the waterward end of the gangway; the SMP requires that they be located as close to the shore as possible.

Ensure that the OHWM is labeled on all site plans and is consistent with the location determined by Ecology at the site on March 16, 2018.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(MLD:201802615)

cc: Rebecca Rothwell, SEA
Brant Hubbard (Applicant)
Jack Loranger (Contact)

Sarah Fox

From: CAROL BUCK <mimibuck@comcast.net>
Sent: Thursday, May 31, 2018 4:39 PM
To: Sarah Fox
Subject: Comments/concerns REF: SEPA18-07 HUBBARD DOCK

Applicant: Brant Hubbard

1180 SE Polk Circle

Camas, WA. 98607

Regarding: Constructing of private, recreational floating dock and gangway on Columbia River

From: Carol Buck

1202 SE Polk Circle

Camas, WA. 98607

360-834-7579

I currently live to the west of Mr. Hubbard on the Columbia River. After reviewing the SEPA Environmental Checklist I have concerns and questions regarding the following items listed in the checklist provided to me today (5/31/2018)

A. Background

#4..Mr. Hubbard lists the description of his private recreational floating dock, floating landing and ***elevated gangway 4'x 220' long from water landing to a 7'x6' concrete bulkhead located what appears to be the edge of his backyard. Also listed is 7 steel pilings 12" diameter will be driven for dock and gangway support.***

The only visual frame of reference I have are the docks and gangway east of my home known as Camas River Edge or Rivers Edge located on SE 12th at the south end of Sumner Ave. Looking at their gangway and Mr. Hubbard's proposed gangway of 220' extending out into the Columbia River would directly obstruct my views from my living room, bath room and bedroom. Also anyone accessing the gangway at this elevation would be looking directly into my windows 220' out into the river. I did not see any height listed for the guardrails that I would think would have to be on a 220' gangway. The gangway at Camas River Edge measures 5' 'wide and the guardrails are appox. 4' in height.

I also question why Mr. Hubbard's placement of this project is directly as near as one can get to my property line. Is this so his view is not obstructed by his own project?

I'm also concern about the driving of pilings. All three homes on Polk Circle facing the Columbia River has had their banks compromised in the flood of 1996. The Juretzka's and Hubbard's banks were washed completely away and had to be rebuilt. I allowed access from my property to assist them in the rebuilding of their banks and because of that my bank was also compromised. I just recently spent $5000 to level my backyard from the settling of the bank. I'm concerned the pile driving could cause further settlement and movement of boulders and if there is who pays for repairs?

There are covenants and restrictions attached to Juretzka's and Hubbard's properties restricting anything in their yards being over 33' sea level. I'm not sure if anything is listed in Hubbard's yard regarding this dock other than the bulkhead and there is no mention of it's height.

It appears also that the list of birds and other animals observed are not complete.

I'm respectfully submitting these concerns and apologize for the delay. I requested and received Hubbard's complete application today and got a better understanding of what is being built.

Thank you

Carol Buck

Exhibit 5
SHOR18-01

From:	andreas.juretzka@daimler.com
To:	Community Development Email
Cc:	akjuretzka1@gmail.com
Subject:	SEPA/ Sarah Fox Comments for REF: SEPA18-07 HUBBARD DOCK
Date:	Monday, June 04, 2018 1:23:12 AM
Attachments:	image007.png

To whom it may concern,

response to the construction of a private, recreational floating dock and gangway on the Columbia River

Applicant: Brant Hubbard

1180 SE Polk Circle

Camas, WA. 98607

Regarding: Constructing of private, recreational floating dock and gangway on Columbia River

From: Andreas & April Juretzka

Homeowner Address Primary Address

1160 SE Polk Cir 902 NE 224th. CIR

Camas, WA. 98706 Ridgefield, WA. 98642

Tel. No: 971 344 0891

Our property is located east of Mr. Hubbard on the Columbia River. We own our property (1160 SE Polk Circle) since 2010.

We understand that our response is late. We just received the notification letter Friday 06/01. We just moved back to Washington from Michigan and the letter was mail forwarded between residences. Please consider our comments and concerns on the SEPA rules. We have been reviewing the application checklist from Mr. Hubbard and would like to add some additional information.

B. Environmental Elements

- 1d) After the flood in 1996 the banks of our properties were washed away and needed to be rebuild. The last years we have seen strong movements and boulders are still falling down the bank. In 2017 a large boulder fell down our bank and almost destroyed our new rebuild staircase down to the waterfront. A cost of $8000 for the replacement of that boulder has been estimated.

- 1f) Yes

- 5a) Bolt Eagles and Sea Lions

- 5c) Salmon

- 10a) The pilings would be too high (35feet) and exceed the building restrictions of the neighborhood. (See attachment). Also the railings are not specified and might have the same issue.

- 10b) In 2012/2013 the neighbor's home association, known as Camas River Edge or Rivers Edge located on SE 12th. at the south end of Sumner Ave, were building a marina type gangway for their community. This would be a reference point. Understanding that Hubbard's "mega" construction for the benefit of only one household will have 250 feet into the river this will have "of course" a tremendous impact on the aesthetics of the neighborhoods view and feel. The gateway to the George becomes a gateway to the marina. This has an impact on the property value and the feel of privacy.

Please put these points under consideration.

<u>Additional facts and considerations referencing shoreline management rules:</u>

A private single residence peer for the sole use of the property owner should not be considered an outright use on Camas Columbia shorelines. A peer may be allowed when the applicant has demonstrated a need for a moorage and the following alternatives have been investigated and are not available or feasible:

- Commercial or marina moorage

- Floating moorage buoys

- Joint use moorage

Mr. Hubbard has never contacted us directly and failed to discuss his construction proposal. We were unaware until we saw the proposed project billboard mounted outside his property.

The proposed dock won't to be compatible with the surrounding environment, land and water use. With a buildout of a new dock in the neighborhood it will change the intensity of the use of the waterfront. Next to the aesthetics of the giant bridge there is additional safety and privacy concerns due to accessibility from the dock.

Also, it needs be put under consideration what the minimum waterfront footage is to allow a peer in the neighborhood? For that reason for a private deck the total surface area of peers, moorages, floats and/or lounging facilities or any combination thereof should not exceed certain square foot limits. This new waterfront construction will dictate the adjacent neighbors (us) to possibly build-out into their water frontage in the future.

Lastly, a peer, moorage float or overwater structure or device should NOT be located close to the site property line, except that such structures may abut property lines for the common use of adjacent property owners when mutually agreed to by the property owners in a contact recorded with the records and licensing services division.

For those reasons and the over proportional size of the construction for a recreational one person request we would like to vote against this dock proposal.

Thanks for the opportunity to provide feedback.

Andreas and April Juretzka

Mit freundlichen Gruessen, 宜しくお願い致します, best regards

Dr.-Ing. Andreas Juretzka | Electric Mobility Group Lead | **Daimler Trucks North America** | TN/EMG | Portland, OR | cell: 971-344-0891

Commencing at a point on the West line of Lot 1 of [illegible] PLATS, recorded in Book 2 of Short Plats, page 264, records of Clark County, Washington, which point lies 6 feet North of the South boundary of vacated S.E. 12th Street as located on the aforedescribed Short Plat; thence proceeding North 88°42'49" East parallel to the South boundary of S.E. 12th Street as vacated a distance of 101.34; thence North 9°50'19" East along the East boundary of said Lot 1 a distance of 4 feet; thence North 88°42'49" East parallel to the South boundary of S.E. 12th Street as vacated a distance of 243.1 feet more or less to the East boundary of Lot 3 of Short Plats recorded in Book 2 of Short Plats, page 264, records of Clark County, Washington.

Section 2. **BUILDING RESTRICTIONS:** Except as hereinafter specifically provided, there shall be no structures, buildings, fences, hedges or other improvements exceeding thirty-three (33) feet above sea level in height erected, constructed, installed or maintained in the aforedescribed restrictive zone.

Section 3. **EXCEPTIONS TO BUILDING RESTRICTIONS:** The building restrictions set forth in Section 2 hereof shall not apply to deck railings, benches and planters which are installed, constructed, erected or maintained in that portion of the aforedescribed restrictive zone lying north of the south line of vacated S.E. 12th Avenue, provided however, such deck railings, benches and planters shall not exceed a height of thirty-six (36) feet above sea level.

Section 4. **EFFECT OF COVENANTS:** The restrictive covenants set forth herein shall be binding upon the parties, their heirs, successors and assigns, and shall be deemed covenants running with the land. 5

DATED this 12th day of ~~November~~ December, 1988.

Steven E Buck
Steven E. Buck

Richard G. Gettmann

Carol D. Buck
Carol D. Buck

Linda J. Gettmann
Linda J. Gettmann

Exhibit 6
SHOR18-01

Received 6/3/18
Planning Div. - SJF

To: City of Camas
616 NE 4th Ave.
Camas, WA. 98607
Attention: Sarah Fox
Senior Planner

NOTICE OF APPLICATION FOR SHORELINE PERMIT
Construction of private, recreational floating docks and gangway on the Columbia River at 1180 SE Polk Circle, Camas, WA.
(File #SHORE18-01)

Applicant: Brant Hubbard
1180 SE Polk Circle
Camas, WA 98607

From: Carol Buck
1202 SE Polk Circle
Camas, WA. 98607
360-834-7579

I reside at 1202 SE Polk Circle, Camas, WA., and the only home to the west of the proposed private gangway/docks by Mr. Hubbard. The only other home involved, owned by the Juretzka's, is to the east of Mr. Hubbard. After reviewing the paper work submitted to the City of Camas for this project I do have several concerns and a few comments.

I did note in the paper work received the proposed aluminum gangway to the docks has been described in the SEPA application as 220' but in drawing given me it shows 3 sections 80' long, which would be 240' feet. The gangway is described as 4' wide but does not give the height of guardrails. I think anything this long suspended over a steep river bank, river and rocks, out to docks 240' away would have guardrails. And for security reasons is there a proposed locked gate at the entrance to the gangway. The gangway described would be an attraction for kids. (see attached drawing that shows the gangway at 240' & SEPA app at 220')

The only frame of reference I have to the size of Mr. Hubbard's proposed gangway is the gangway and docks located east of me at Rivers Edge. This small marina is located on SE 12th at the south end of Sumner St. Their gangway measures 250' long, 5'wide with approx. 4' guardrails. This gangway and docks serves 26 homes in their HOA and has a locked gate at the entrance. (See 4 attached photo's of Rivers Edge).

Given the density and closeness of the three homes affected by this project, and the location of the suspended gangway by Mr. Hubbard over the bank extending 240' out to the docks below is invasive to the privacy of my home and Juretzka's (who are addressing this also). I'm sure this project will also have a negative impact on the value of the properties to the east and west given the lack of privacy imposed. The gangway and bulkhead, from what I can see, is to be located on the far west side of Mr. Hubbard's lot right next to my property line. The start of the gangway and placement of the bulkhead is in his backyard at the edge of the bank. Once the placement of the "bulk head" is in this will raise the height of the gangway in his yard. Anyone using this gangway would be looking directly into my covered deck, living/dining room, bathroom and bedroom as well as the Juretzka's home. This gangway would directly be obstructing my view of the river from each of the rooms described. Mr. Hubbard's placement of this project looks to be as near as it can be to my property line. I question if this is to avoid his view from being compromised. (See attached 7 photo's of property)

The driving of the pilings are a concern as well as the integrity of all three banks. I noted in the SEPA application under "B. ENVIROMENTAL ELEMENTS, #1, question d, Are there surface indications or ***history*** of unstable soils in the immediate vicinity?" The answer was "no". I've lived on the river 30 years and it's always eroding. And for the past several years during this time of year the water runs very high, close to flood stages at times. And there is ***history*** here. All three homes on Polk Circle facing the river (Juretzka's/Hubbard's/Buck) has had their banks compromised in the flood of 1996. The Juretzka's and Hubbard's banks washed away and had to be rebuilt. Please note Juretzka and Hubbard did not own the property at that time, it was owned by Wendt's and Gettemen's. I allowed access through my property to assist them in the rebuilding of their banks. Because of that rebuilding my bank was compromised. This project amounted to $20,000 for all three homes. Two years ago I paid $5000 to level my backyard from the settling of the rebuilding of the bank in1996. I'm concerned the pile driving could cause further settlement and movement of boulders, especially since the river has been running so high near the tops of the banks over the past couple of years. I have the applications and documentation for that project in1996 if needed.

There is a Restrictive Covenant Agreement #8812160003 (recorded in Clark Co.) attached to Hubbard's property, and the other two homes as well, restricting any **permanent** structure exceeding 33' above sea level. Our foundations are at 33' sea level. I question the end result height of the bulkhead and aluminum gangway being placed adjacent to my property and in Hubbard's back yard. Copies of the Restrictive Covenant Agreement are available.

Mr. Hubbard briefly approach me a year ago asking if I wanted to build a dock with him. I was told by Mr. Juretzka he was never asked. However Mr. Hubbard did not consult with Mr. Juretzka or about his decision to build a private dock. I declined Mr. Hubbard's offer since I had owned docks from 1988 to 1996 then lost them in the flood. Its expensive to build them, maintain them and when lost to remove what is left. My docks did not obstruct anyone's views since they had to rise and lower with the river at that time and was not attached to our backyard with a pier/ gangway. I have noted there are now 5 docks between my home and the Port of Camas/Washougal, looking like one giant marina. 3 have gangways, two do not, and one of the two is in bad repair which I realize it does not make for an attractive shoreline with so many pilings. I currently look at approximately 27 pilings, Rivers Edge has 24, I have 2 and not sure who the other one belongs to. And it should be noted we do have a beautiful community marina available for use and Mr. Hubbard's father owns one of the large gangway docks just east of our homes.

I was surprised to see a very limited list of wild life listed on Hubbard's SEPA application, unless I misunderstood it. The Columbia River has an amazing full habitat of fish, fowl, four legged animals etc. and they should always be considered.

In the SEPA application #11 Light and Glare, it asks what type of light or "glare" will the proposal produce. The answer was "none". I see glare off the 250' gangway to the east of me at Rivers Edge all the time. I know one homeowner at Rivers Edge, closer to the 250' gangway, installed interior window coverings to reduce the "glare" from the gangway. Because of the way the shoreline runs and the elevations that differs from Rivers Edge to ours (their homes sit higher/gangway is further away from their homes) Mr. Hubbard's gangway would be intrusive if not blinding in our homes if the sun hits it. I have aluminum boats going by all day and get instant flashes of glare into my home all the time.(see 1 attached photo of glare on River's Edge gangway taken 6/5/2018)

I respectfully submit these concerns and comments and thank you for reviewing this.

Carol Buck

Carol Buck

Community Development
616 NE Fourth Avenue • Camas, WA 98607
(360) 817-1568
http://www.cityofcamas.us

3. Address and phone number of applicant and contact person: [help]
Brant Hubbard 1180 SE Polk St. Camas , WA 98607 503-804-2620
CONTACT: Jack Loranger 162 Krogstad Rd. Washougal, WA 98671 360-837-3760

4. Date checklist prepared: [help]
1/11/2018

5. Agency requesting checklist: [help]
City of Camas - Planning

6. Proposed timing or schedule (including phasing, if applicable): [help]
10/1/2018 or sooner if a work window opens

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. [help]
No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal. [help]
A Biological Evaluation, a compensetory mitigation plan and a Critical Areas Report will be prepared.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. [help]
No

10. List any government approvals or permits that will be needed for your proposal, if known. [help] Camas Shoreline Permit, DNR approval, USACOE Section 10 Permit, DFW HPA Permit

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) [help] To construct a private recreational 6'x24' floating dock and 6'x16' floating landing in the Columbia River with an elevated gangway 4' wide and 220' long from the landing to a 7'x6' concrete bulkhead located on the upland area of the property. 7 steel pilings 12" diameter will be driven for dock and gangway support .

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist. [help]

1180 SE Polk Cir. Camas, Clark County WA 98607 - NW 1/4,S13,T1N,R3E South side of house top of bank west of stairway

B. ENVIRONMENTAL ELEMENTS [help]

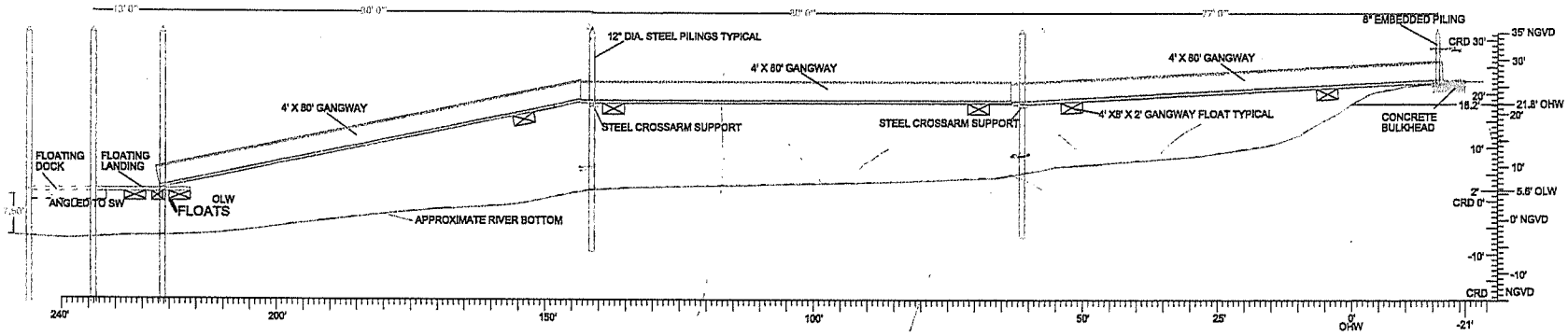
1. Earth [help]

a. General description of the site: [help]
Flat upland with residence and yard steep slope on bank to gental slope at the tidelands.
(circle one): Flat, rolling, hilly, steep slopes, mountainous, other flat area and slopes

b. What is the steepest slope on the site (approximate percent slope)? [help]
~ 30%

PROPOSED STRUCTURES

1 - 6'X7'X27" DEEP CONCRETE BULKHEAD
WITH EMBEDDED 8" STEEL PILING
7 - 12" STEEL PILINGS
2 - 6"X8" STEEL SUPPORT CROSSARMS
3 - 4' WIDE 80' LONG ALUMINUM GANGWAYS
1 - 6' WIDE FLOATING LANDING AVERAGE 14' LONG QUADRILATERAL
1 - 6' WIDE FLOATING DOCK AVERAGE 24' LONG QUADRILATERAL
5 - 4'X8'X2' DEEP FLOATS FOR GANGWAYS
2 - 4'X6'X20" DEEP FLOATS FOR LANDING
7 - 2'X6'X20" DEEP FLOATS FOR LANDING AND DOCK



EAST ELEVATION PROPOSED HUBBARD DOCK

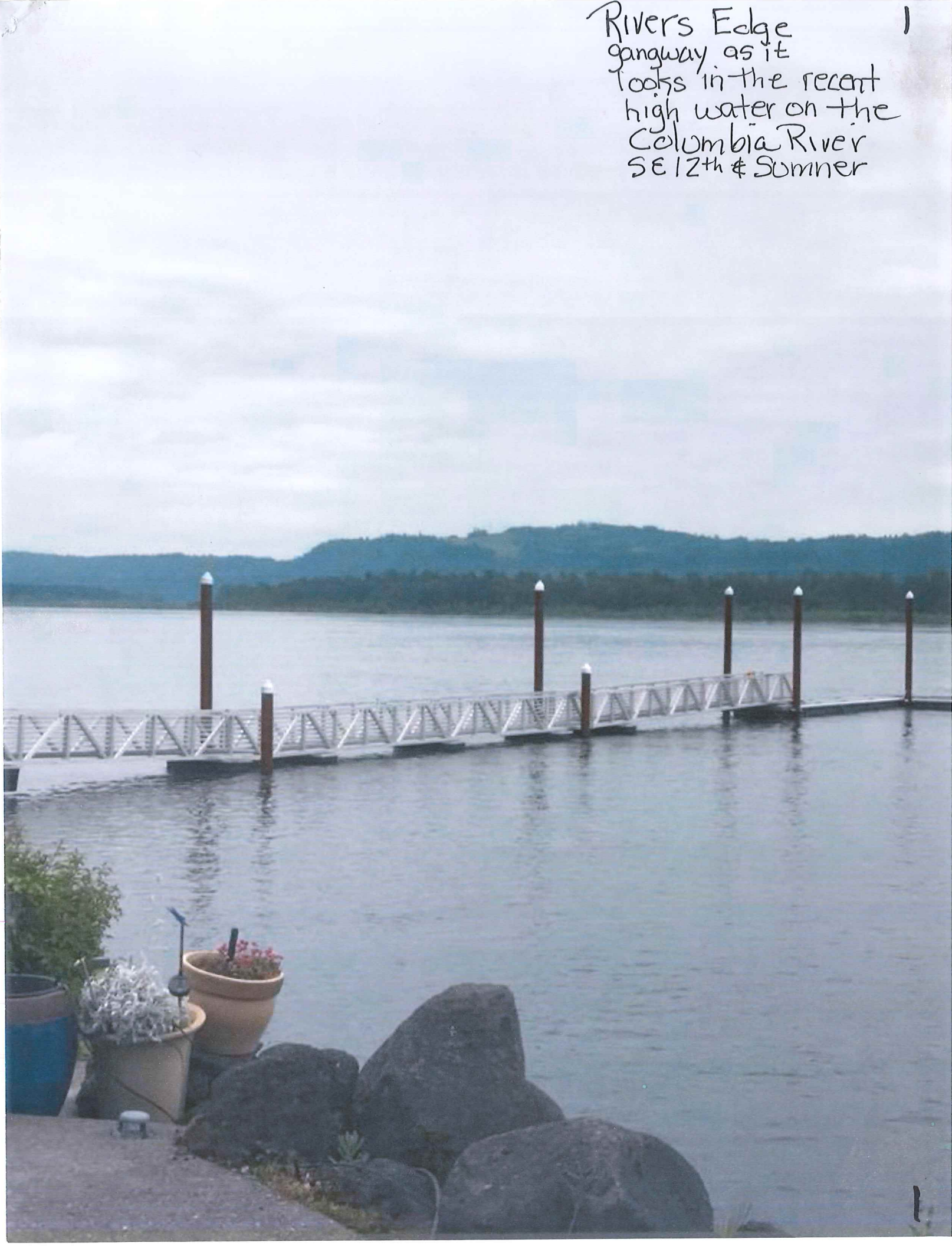
PROPOSED: BULKHEAD/GANGWAY/LANDING/DOCK

DATUM: CRD AND NGVD
PROJECT ADDRESS: 1180 SE POLK CIR.
CAMAS, WA 98607
ADJACENT PROPERTY OWNERS:
WEST: BUCK CAROL D
EAST: JURETZKA ANDREAS & JURETZKA APRIL K

APPLICANT: BRANT HUBBARD
REFERENCE #
WATERWAY: COLUMBIA RIVER
NW 1/4,S13,T1N,R3E
2/09/2018 SHEET 3 OF 4

Plans by: Jack Loranger jack@shorelinepermits.com

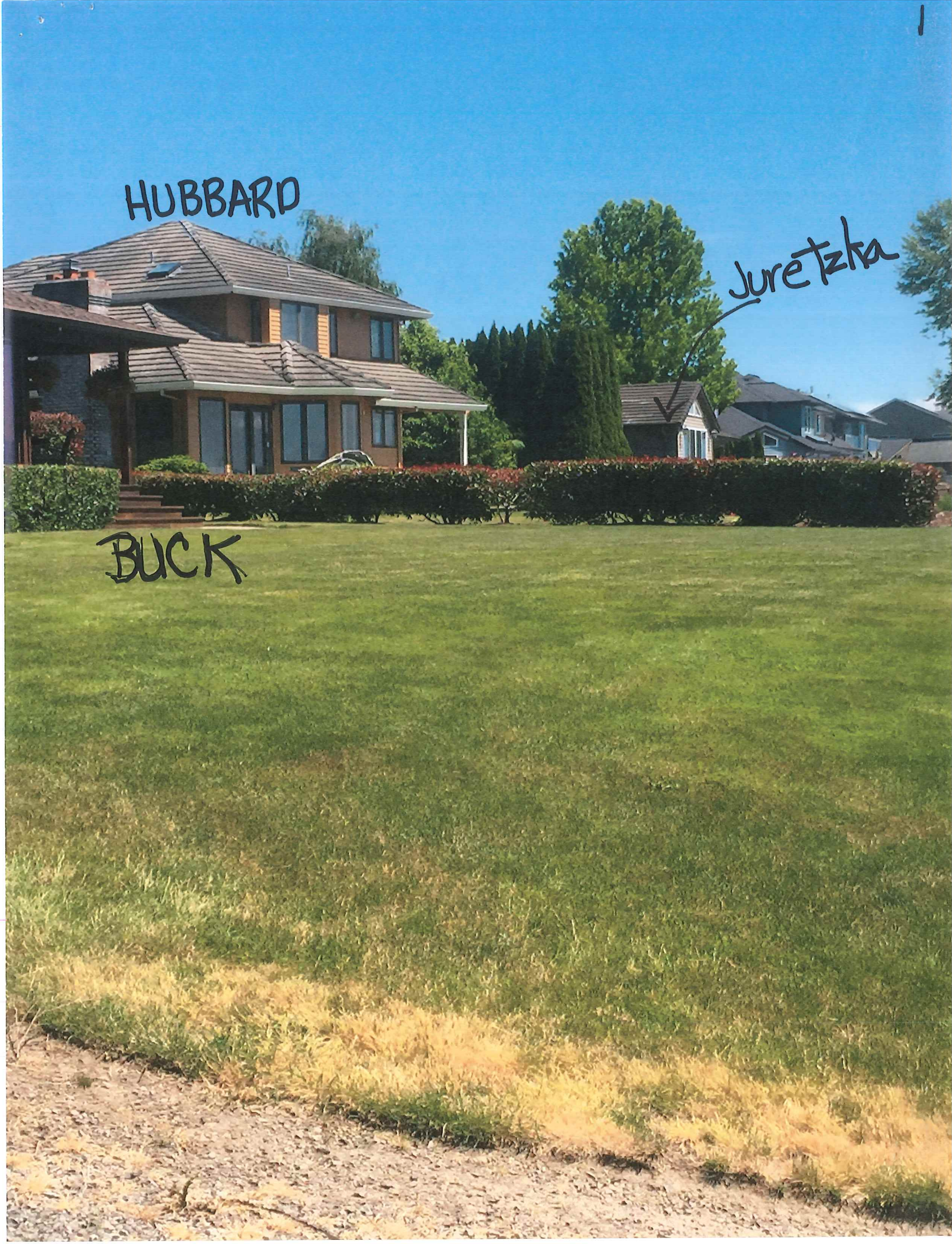
Rivers Edge
gangway as it
looks in the recent
high water on the
Columbia River
SE 12th & Sumner

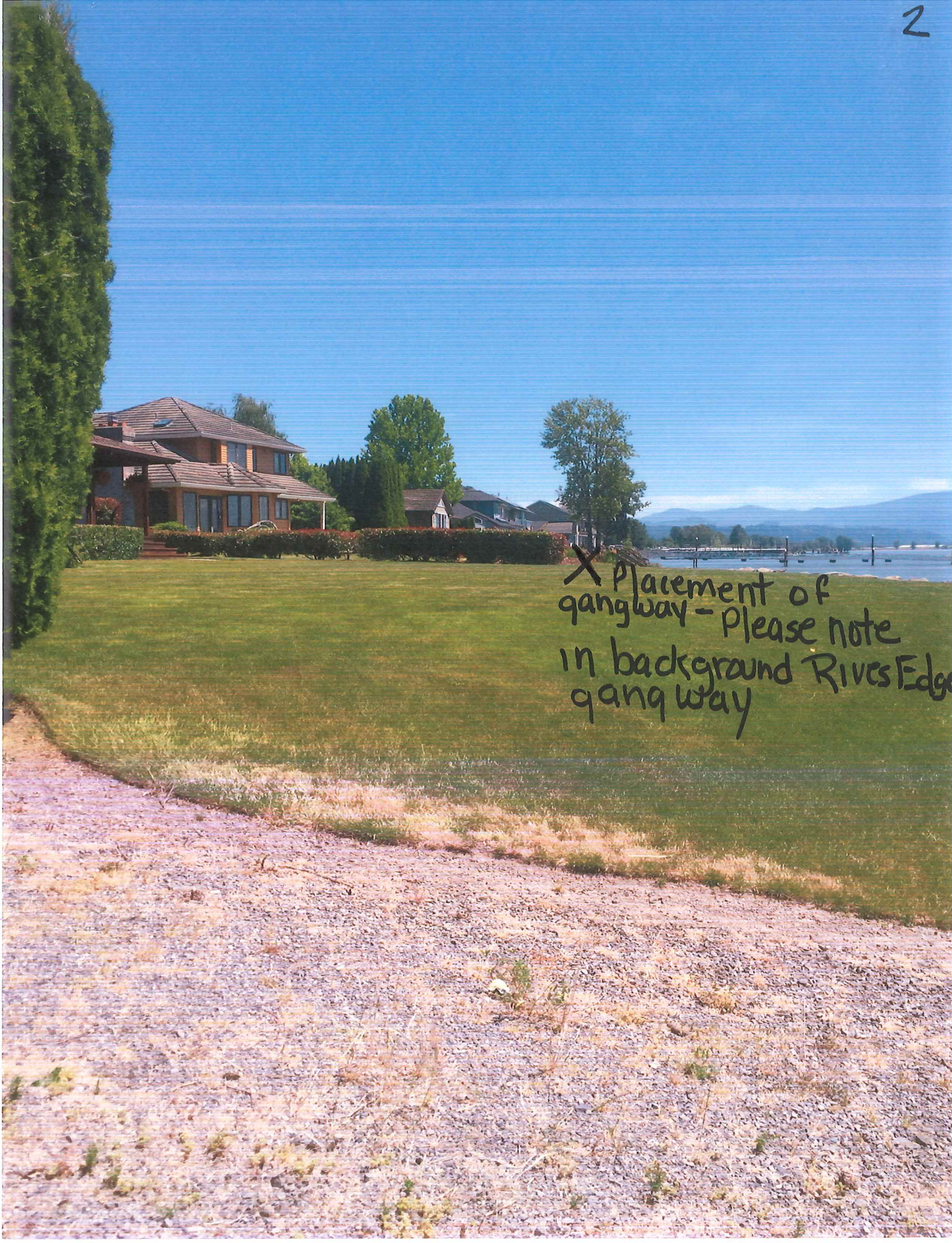


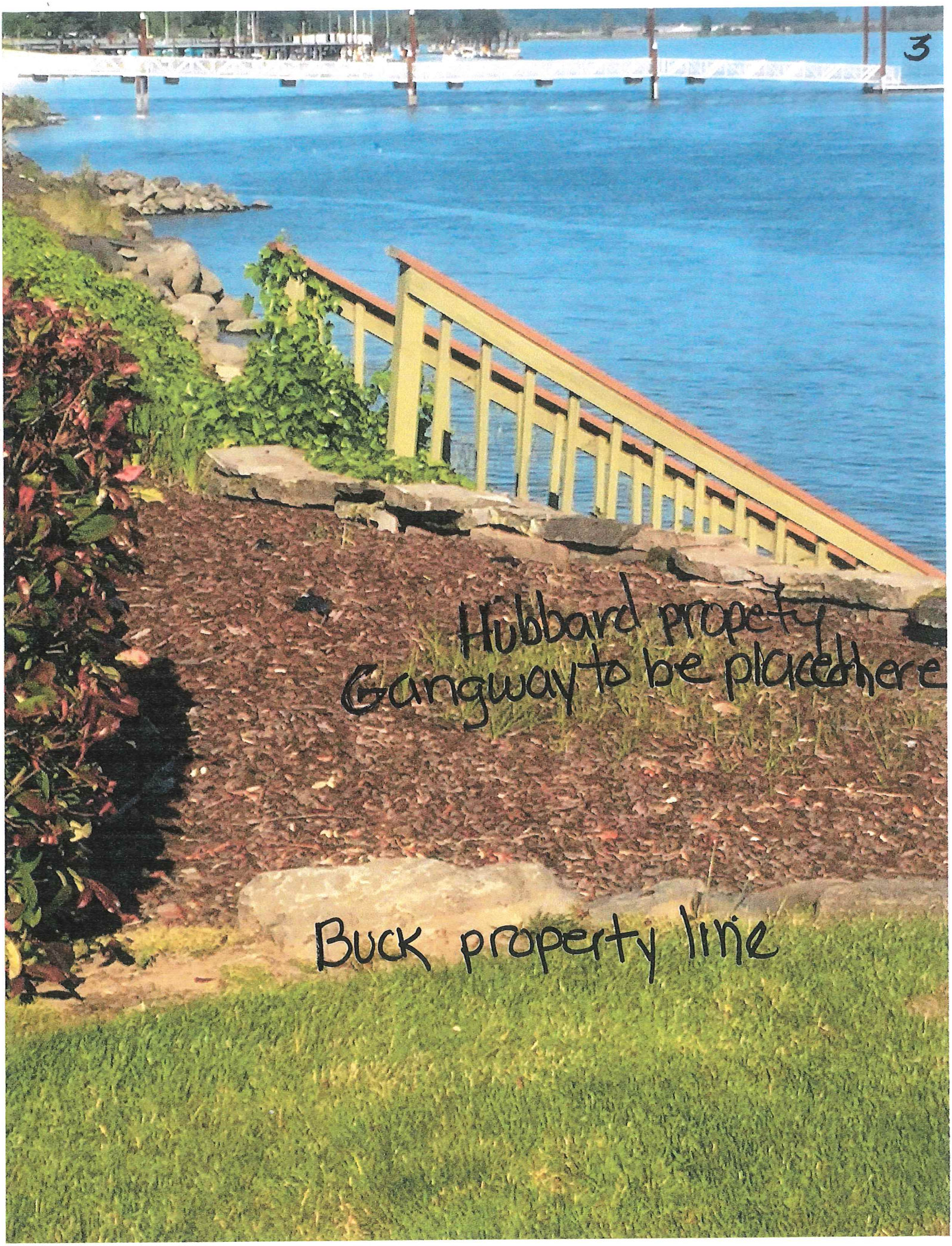

Rivers Edge gangway 2
how it usually sits

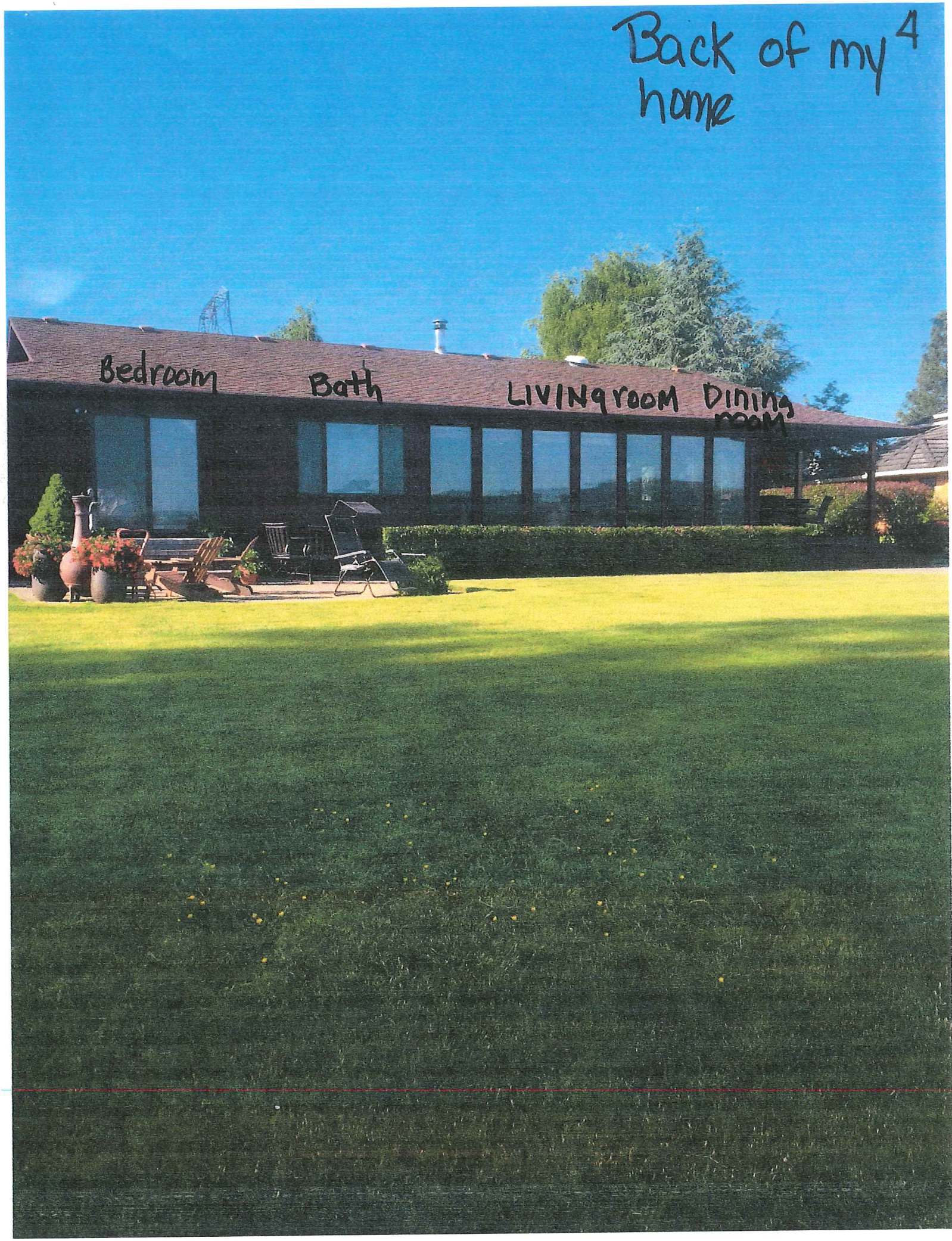
Rivers Edge gangway
SE 12th + Sumner


Rivers Edge
gangway/docks
during high water 4
taken 6/1/2018-

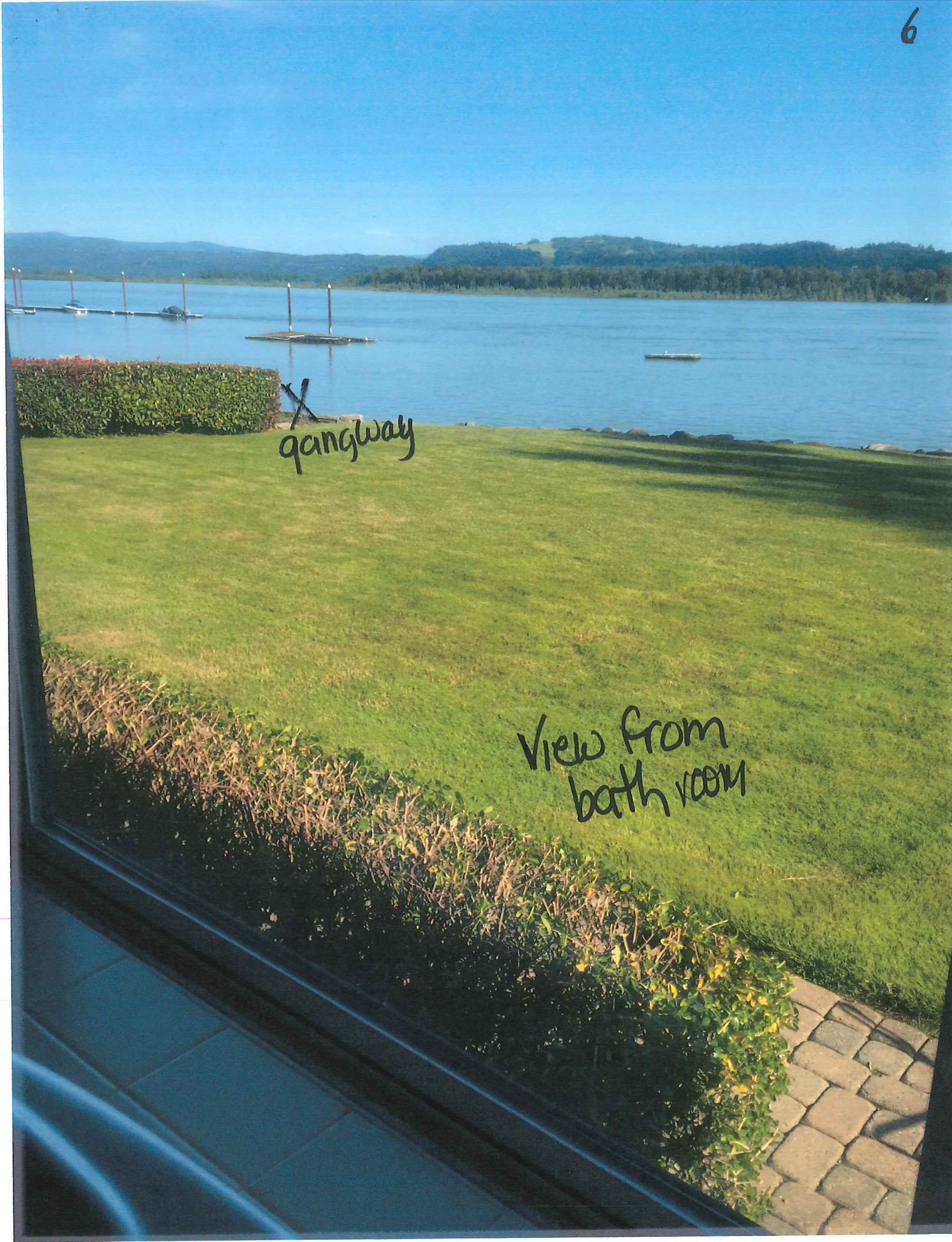

HUBBARD
Juretzka
BUCK

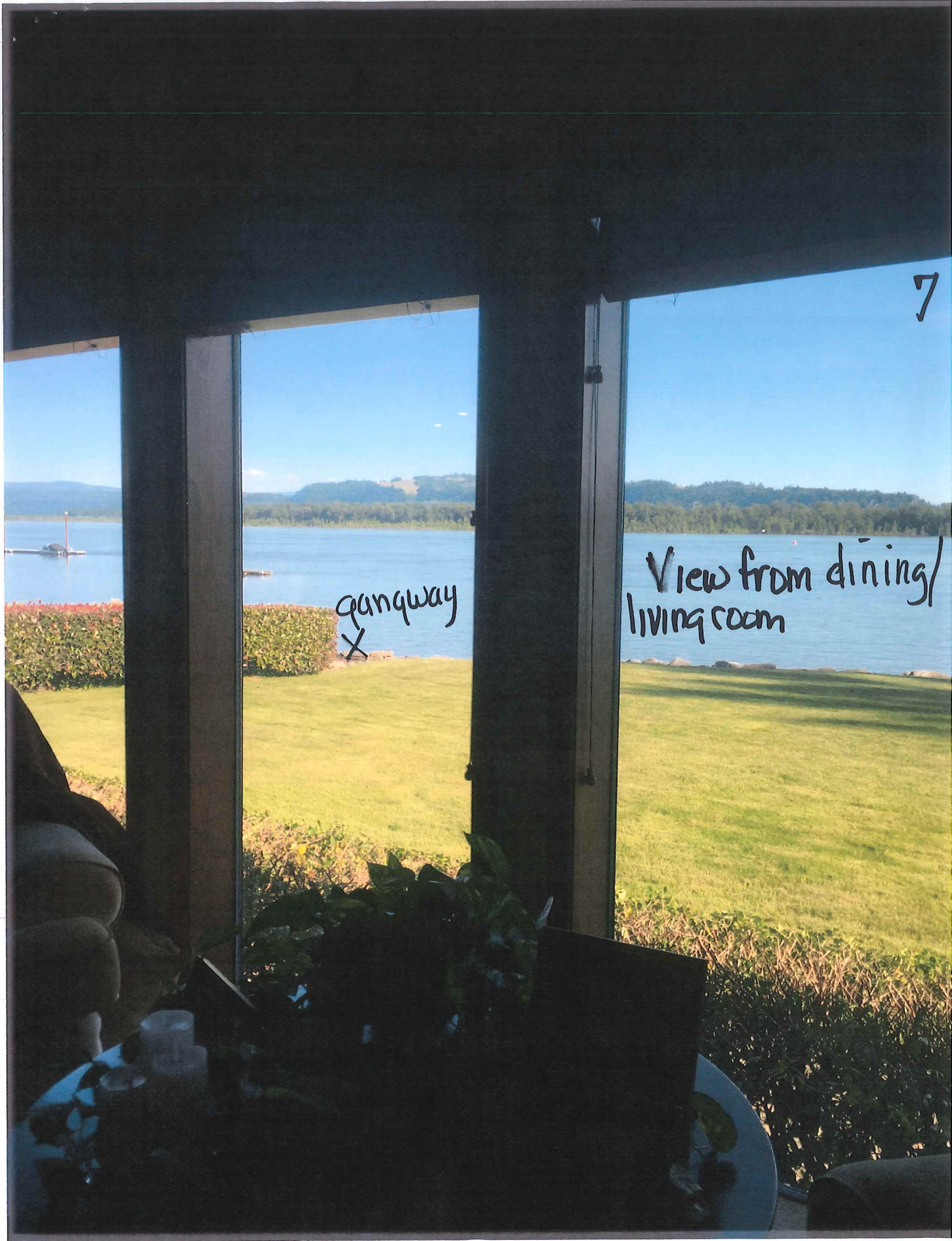

X Placement of gangway - Please note in background Rivers Edge gangway


Hubbard property
Gangway to be placed here
Buck property line


Back of my home 4
Bedroom
Bath
LIVINGroom
Dining room

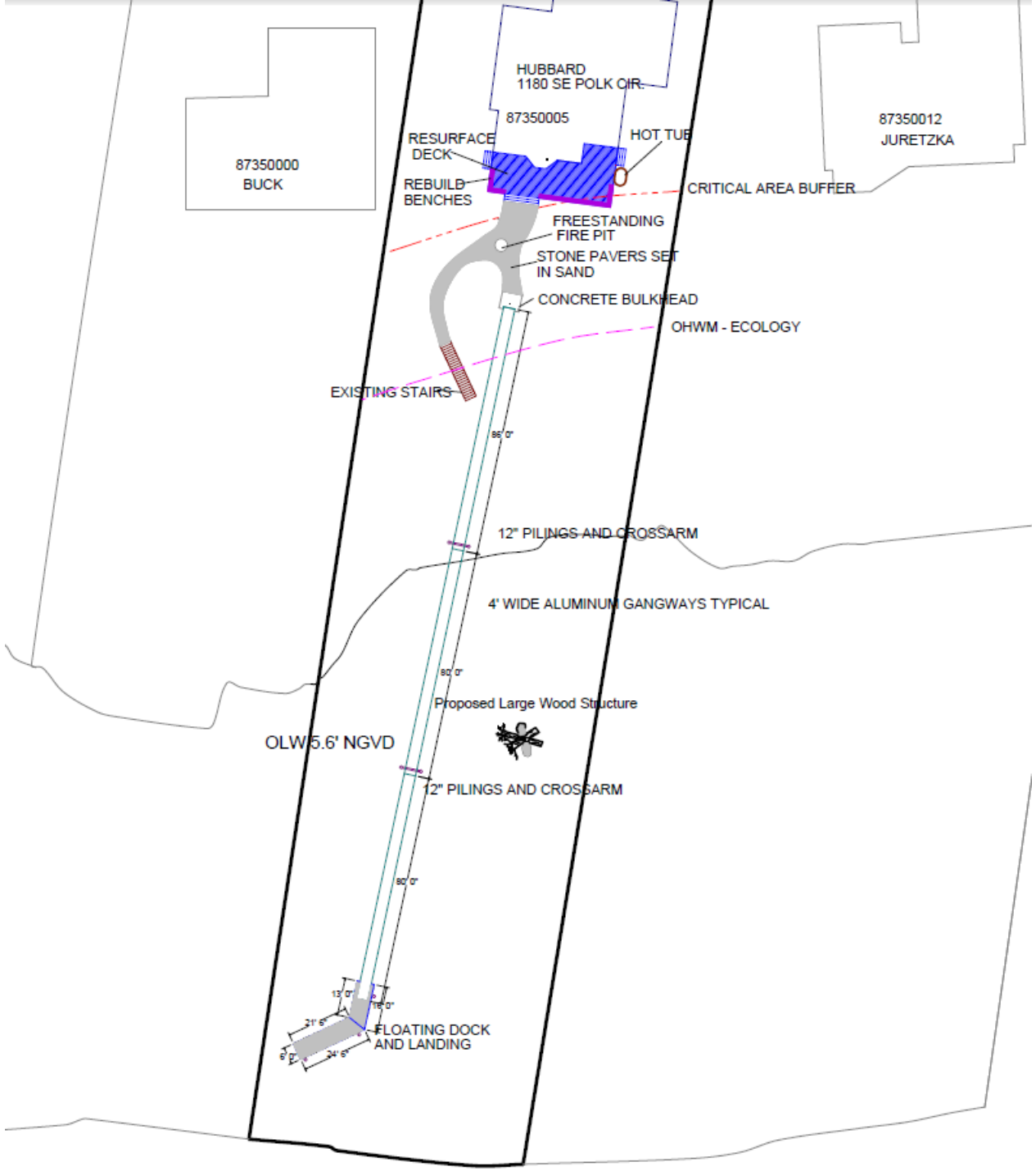

View from bedroom
gangway


gangway
View from
bathroom


7
gangway
X
View from dining/
living room


Glare off
Rivers Edge
gangway Taken
6/5/18

HUBBARD DOCK



SHORELINE MANAGEMENT REVIEW COMMITTEE
MEETING MINUTES - FINAL
Thursday, June 7, 2018, 4:00 PM
City Hall, 616 NE 4th Avenue

I. CALL TO ORDER

Sarah Fox called the meeting to order at 4:00 p.m.

II. INTRODUCTIONS / ROLL CALL

Present: Don Chaney and Randy Curtis

Excused: Bryan Beel

Staff Present: Jerry Acheson, Jan Coppola, Sarah Fox and Robert Maul

Sarah Fox gave a brief presentation and outlined the public meeting process.

A. Overview of the Shoreline Management Review Committee

Presentation given by Staff

III. MEETING ITEMS

A. Shoreline Substantial Development and Shoreline Variance Permit for Lacamas North Shore Trail Project
Details: The city proposes to construct a new section of trail to extend the existing trail system at the south end of Lacamas Lake, which will require approval of a Shoreline Substantial Development and Shoreline Variance Permit (SHOR18-02). The new trail segment would be located on City property on the northeast side of Lacamas Lake, from an existing trail on the east side of NE Everett Street to a natural area on the lakeshore. Public comments are attached to the record. Comments are generally opposed to the public's use of the park that is adjacent to their properties. A staff report provides the applicable approval criteria.
Presenter: Sarah Fox, Senior Planner

Lacamas North Shore Trail Staff Report (SHOR18-02)

1_Lacamas North Shore Trail - Materials

2_Lacamas North Shore Trail JARPA

3_Lacamas North Shore Trail - Upland Data Plots

4_Comments from Ecology

5_Comments from Nicholas & Paula Stanley

6_ Coment fromKelli Burton

7_Comment from Chad Burton

8_Comments from Lori and Dan Maginnis

9_ Comment from Brian Sullivan

10_Comment from Rick Jones

11_Comment from Brad Clifton

12_Comments from Lacamas Lake Residents

13_Comment from Marcy Watson

14_Comments from Chris & Patti Brown

15_North Shore Trail Photo

16_North Shore Trail Presentation given by Staff

Sarah Fox provided an overview of the Lacamas North Shore Trail project.

Jerry Acheson and Kent Synder, Consultant responded to inquires from the Committee Members.

It was moved and seconded to forward a recommendation of approval for the Lacamas North Shore Trail Substantial Development and Shoreline Variance Permits (SHOR18-02) as conditioned. The motion carried.

B. Shoreline Substantial Development and Shoreline Variance Permit for Hubbard Dock

Details: The applicant, Brant Hubbard, requests approval of a Shoreline Substantial Development Permit and Shoreline Variance (SHOR18-01) to construct a private dock. The proposed dock will be located at 1180 SE Polk Street, on the Columbia River. The project will require a variance due to the need for 12-inch pilings, and for the length of the gangway. A staff report provides the applicable approval criteria.

Presenter: Sarah Fox, Senior Planner

Hubbard Dock Staff Report (SHOR18-01)

1_Application Materials and Biological Report

2_Critical Areas Report for Dock

3_Ecology Comment

4_Carol Buck Comment

5_Andreas and April Juretzka Comment

6_Carol Buck Comment on June 3 2018

7_Hubbbard Dock Drawing

Sarah Fox provided an overview of the Hubbard Dock proposal.

Jack Loranger, Representing the Applicant responded to inquires from the Committee Members.

It was moved and seconded to refer the Hubbard Dock Substantial Development and Shoreline Variance Permits (SHOR18-01) to a public hearing before the Camas Hearings Examiner. The motion carried.

C. Shoreline Substantial Development Permit for the Georgia-Pacific Fire System Improvement Project
Details: Georgia-Pacific requests approval of a Shoreline Substantial Development Permit (SHOR18-03) for a Fire System Improvement Project. The proposed project includes replacing a diesel powered pump with an electric pump and back-up generator. The project is located at the terminus of NE 3rd Avenue, along the Camas Slough of the Columbia River, within the "High Intensity" shoreline designation. A staff report provides the applicable approval criteria.
Presenter: Sarah Fox, Senior Planner

Georgia-Pacific Staff Report (SHOR18-03)

1_Diesel Fire Pump Application Narrative

2_Diesel Fire Pump Replacement JARPA

3_Ecology Comments

4_Public Comment from Roberts

5_Fire Pump Replacement Drawing

Sarah Fox provided an overview of Georgia-Pacific's Fire System Improvement Project.

Jeff Dambrun and Samantha Hutcheson, Georgia-Pacific's Representatives responded to inquires from the Committee Members.

It was moved and seconded to forward a recommendation of approval for the Georgia-Pacific Fire System Improvement Project Substantial Development Permit (SHOR18-03) as proposed. The motion carried.

IV. ADJOURNMENT

The meeting adjourned at 5:35 p.m.

NOTE: The City of Camas welcomes and encourages the participation of all of its citizens in the public meeting process. A special effort will be made to ensure that persons with special needs have opportunities to participate. For more information, please call the City Clerk's Office at 360.817.1591.

STAFF REPORT

43RD AVENUE SUBDIVISION

FILE NO. SUB18-01

Report Date: July 28, 2018

TO:	Hearings Examiner	HEARING DATE: August 16, 2018
PROPOSAL:	To divide a 3.48 acre property into 12 single-family lots	
LOCATION:	The site is located at 2223 NW 43rd Avenue, Camas, WA 98607. Tax Parcel #177887-000.	
APPLICANT:	PBS Engineering and Environmental, 415 W 6th ST, Vancouver, WA (360) 695-2116	
OWNER:	Brett Simpson, Waverly Homes 3205 NE 78th ST, Suite 10, Vancouver, WA (360) 314-6877	
STATE ENVIRONMENTAL POLICY ACT (SEPA):		The City issued a SEPA Determination of Non-significance (DNS) on August 2, 2018, with a comment period that ends on August 16, 2018.
PUBLIC NOTICE:	Public hearing notices were mailed to property owners on July 25, 2018, and published in the Post Record on August 2, 2018. Legal publication #611779. Site sign was updated with public hearing information on July 28, 2018.	

APPLICABLE LAW: The application was submitted on March 12, 2018, and the applicable codes are those vested and in effect through Ordinance #18-006. Camas Municipal Code Chapters (CMC): Title 16 Environment, Title 17 Land Development; and Title 18 Zoning; Specifically (not limited to): Chapter 16.53 Wetlands; Chapter 16.61 Fish & Wildlife Habitat Conservation Areas; Chapter 17.11 Subdivisions, Chapter 17.19 Design & Improvement Standards; Chapter 18.07 Use Authorization, Chapter 18.09 Density and Development, Chapter 18.55 Administrative Provisions, and Chapter 3.88 (Impact Fees).

SUMMARY:

Zoning: R-7.5	**Total site area: 3.27 acres**
Proposed Lots: 12 Single family lots	**Open Spaces: Tract D is 2,865 sq. ft. (0.06 acres)**
Maximum Density (per net acre): 15 units1	**Critical areas: Tract B set aside of 0.51 acres. Type IV wetland is 0.63 acres with 50-foot buffer.**
Average lot size: 6,580 sq. ft.	

The development proposes to divide the property into 12 single family lots. The private road will be named NW 44th Avenue (not Waverly Place). The site has an existing single family dwelling and a shed. There is landscaping, mature trees, and a wetland area that extends to the north and east of the property. The site contours are gentle and are lower than the grade of NW 43rd Avenue which is to the south of the property.

To the east is a 2.72 acre parcel with a single family home that could be divided in the future. To the west is the Sierra Meadows Subdivision. To the north of the property are existing lots within the Lake Pointe Subdivision, which is zoned R-12. To the west and east, the properties are zoned the same as the subject parcel.

This staff report consolidates review of the following permit applications: Preliminary plat, Critical areas, and Sensitive Areas and Open Space. [*Note: Citations from Camas Municipal Code (CMC) are indicated with italicized and underlined type.]*

The following report includes the applicable approval criteria, staff analysis, findings of compliance or non-compliance, and a recommendation to the City's Hearings Examiner.

II. PRELIMINARY PLAT CRITERIA OF APPROVAL (CMC17.11.030)

Criteria for Preliminary Plat Approval. The hearings examiner decision on an application for preliminary plat approval shall be based on the following criteria, numbered 1 to 10.

1. The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;

Land Use/Housing: The Comprehensive Plan has a citywide housing goal (H-1), which states, *"Maintain the strength, vitality, and stability of all neighborhoods and promote the development of a variety of housing choices that meet the needs of all members of the community."* There are seven policies that are intended to support that goal. The development is consistent with policies 1.1 and 1.6 as it will be providing additional housing options on an under-utilized residential parcel.

The comprehensive plan also states a requirement for a percentage of newly created lots to include a restriction on the face of the plat for the following unit types (1.4): Single-story dwellings; Barrier-free dwellings (consistent with Americans with Disabilities Act [ADA] guidelines);

[1] Calculation [(3.27 acres) – (0.63 acres)] x 5.8 units

or ADUs, to be constructed concurrent with primary dwellings. This provision has not been codified to date, and the applicant has not proposed this provision.

The development proposes a grading plan that appears to focus on flat lots and storm drainage, however it does not balance requirements for tree preservation or with landscaping design along NW 43rd Avenue. The proposal for a 10-foot landscape tract along NW 43rd Avenue will be approximately 2-4 feet below the back of the curb. Comprehensive plan policy H-1.2 states (in part), "*Support residential development that* ***minimizes both impervious areas and minimizes site grading to retain the natural contours of the land****." (Emphasis added).* A condition in regard to grading is included with this report.

Parks and Open Space Comprehensive Plan: Although this project is in the vicinity of the T-7 local trail connector, the east-west section of this local trail was installed on the south side of NW 43rd Avenue from NW Sierra Street, west to NW Astor Street as part of the improvements associated with the Hidden Terrace subdivision completed in the summer of 2014. Staff finds that as proposed the applicant can or will comply with the requirements of the Parks, Recreation and Open Space Comprehensive Plan.

Neighborhood Traffic Management Plan (NTM): This plan identifies the need for installation of acceptable traffic calming features when a proposed development will create 700 Average Daily Trips (ADT) or more. This project is expected to generate approximately 120 ADT and therefore is traffic calming features are not required. The neighborhood traffic management plan requires connectivity, which is provided by this project. There will also be pedestrian connection provided at the end of the dead end street, to access NW 43rd Ave. Staff finds that this project is not subject to the requirements for traffic calming as noted in the City's Neighborhood Traffic Management (NTM) plan.

Findings: The development can or will comply with comprehensive plan goals and policies in regard to housing, parks, neighborhood traffic management as conditioned.

2. Provisions have been made for water, storm drainage, erosion control and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;

Water: There is an existing 18" diameter water main located in NW 43rd Avenue. The applicant is proposing to connect to this water line and extend an 8" diameter water line into the site to serve the proposed lots. The Applicant shall be required to verify that an 8-inch line provides sufficient fire flows to the development. A condition of approval to this effect is warranted.

Staff would recommend that the Applicant be required to provide adequate access and utility maintenance easements over the private road Tract to the City of Camas for the maintenance of the proposed water system. A condition of approval to this effect is warranted.

Water meters located outside of the private road Tract, are to have a 5-foot water meter easement granted to the City of Camas for access, inspection, and maintenance. A note to this effect is warranted on the face of the final plat and is included with this report.

Existing wells, septic tanks and septic drain fields: Staff checked on the billing status, with Camas Finance Dept., and confirmed that the existing home located at 2223 NW 43rd Avenue, has been billed for water since it was connected to City water in 2008. The Applicant shall provide

documentation that the existing well was decommissioned in accordance with State and County health regulations. A condition of approval to this effect is warranted.

Additionally, the Finance Dept. confirmed that the existing home was not connected to City sewer and are not billed for service. Staff believes that the home continues to be on a septic system and septic drain field.

CMC 17.19.020 (A 3) requires decommissioning of existing septic tanks and septic drain fields. The Applicant shall be required to properly decommission the septic tanks and septic drain fields in accordance with State and County guidelines prior to final plat approval. A condition of approval to this effect is warranted.

Findings: Staff finds that as conditioned the applicant can and will provide water system and sewer system improvements consistent with the City's standards.

Storm Drainage: The Applicant has submitted a preliminary stormwater Technical Information Report (TIR), dated April 24, 2018, which addresses the stormwater collection system, water quality treatment and stormwater detention for the proposed project. The site is located in the Lacamas watershed above the dam at the south end of the Round Lake. As such, phosphorus treatment is required.

The Applicant is including phosphorus treatment along with basic treatment as required in the Camas Stormwater Design Standards Manual in Section 5.04.

As the existing stormwater runoff flows to western edge of the property, the proposed location for the stormwater facility is on the western most edge of the development and is located a minimum of 30-feet from the roadway. The Applicant is proposing to treat the stormwater runoff via an underground treatment vault that will discharge to an above ground detention pond. The detention facility will be constructed with a series of French drains and an impermeable liner to prevent groundwater from seeping into the detention pond.

The stormwater facility must be owned and maintained by the homeowners association (HOA), or where an HOA has not been established, maintenance responsibility is with the homeowners/property owners within the platted subdivision. *A condition of approval to this effect is warranted and included with this report.*

The stormwater facility has been designed to discharge stormwater runoff onto the adjacent property to the west. The basis for the location of the outfall, is that existing stormwater runoff from the proposed development site generally drains towards the adjacent property to the west and the existing culvert. However, the design does not appear to adequately address the discharge onto the adjacent property. The Applicant shall adequately address stormwater discharge from the storm facility onto the adjacent property, prior to approval of construction plans. *A condition of approval to this effect is warranted and included with this report.*

Staff recommends that the Applicant be required to provide right-of-entry for the purpose of inspection of the stormwater facilities located in Tract 'C'. *A condition of approval to this effect is warranted and included with this report.*

Findings: Staff finds that as conditioned the applicant can and will make adequate provisions for stormwater control and drainage.

Erosion Control: Adequate erosion control measures will be provided during the site improvements for this subdivision in accordance with adopted City standards. The Erosion Sediment Control plans will ultimately be submitted to the City for review and approval prior to any land-disturbing activities.

Per Camas Municipal Code (CMC) 14.06.200 and 17.21.030 the Applicant is required to submit an Erosion Control Bond for land-disturbing activities of one acre or more, in the amount of two hundred percent (200%) of the engineer's estimated cost for erosion prevention/sediment control measures.

Additionally, the Applicant will be required to submit to a copy of their NPDES General Construction Stormwater Permit and their Stormwater Pollution Prevention Plan (SWPPP) that is required through the Washington State Department of Ecology for land-disturbing activities one acre or more.

Sanitary Sewage Disposal: The applicant is proposing the installation of a Septic Tank Effluent Pump (STEP) pressurized sewer system. The system will consist of an individual underground 1,250 or 1,500 gallon HDPE tank installed at the time of home construction on each lot. The tank will retain the solids and a small pump will pump the effluent into the pressure sewer system that will be designed to serve this development. The City will maintain the individual STEP tanks and liquid level alarm once home construction is completed. The individual lot owners will be responsible for the cost and installation of the individual systems. A right-of-entry shall be granted to the City for maintenance and repair of said STEP tanks. *A note to this effect is warranted on the face of the final plat.*

Findings: Staff finds that adequate provisions can or will be made for water, storm drainage, erosion control and sanitary sewage disposal which are consistent with the current standards and plans of the Camas Design Standard Manual.

3. Provisions have been made for road, utilities, street lighting, street trees and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;

Collector / NW 43rd Avenue: The site is bordered on the south by NW 43rd Avenue, which is identified as an existing 2 or 3 lane collector, per the 2016 Comprehensive Plan. As such, the minimum access spacing standard is 330-feet with a maximum spacing of 600-feet. The proposed access location is approximately 610-feet west of NW Sierra Dr. and 700-feet east of NW Astor Street. The access is located as far to the east as the width of the parcel frontage allows providing for an offset intersection alignment with NW Utah Street.

The location of the proposed access is supported by the City Engineer since the left turns from either direction on NW 43rd Avenue will not be in conflict.

A Traffic Study for Sight Distance report, dated March 5, 2018, was provided by PBS. Analysis (of said report): "Based on this analysis, there is sufficient intersection sight distance at the Rondeau's proposed access location." Staff concurs with the Analysis as stated in the Traffic Study for Sight Distance report.

NW 43rd Avenue has unimproved frontage along the proposed development. The Applicant should be required to dedicate additional right-of-way that varies between 30-feet to 32-feet from the centerline of the road in order to construct full half-street improvements, per CMC 17.19.040.B.1, which includes utility easements, pedestrian pathway, stormwater drainage, street lighting and signage to the centerline of the right-of-way. A condition of approval to this effect is warranted.

As a marginal access route the Applicant is to provide the double frontage lots with suitable depth, appropriate fencing with landscaping or masonry walls contained in a non-access tract with a minimum ten-foot width along the real property line, or such other treatment as may be

necessary for adequate protection of residential properties and separation from traffic. The applicant should be required to include a fencing and landscaping plan for the required fencing and landscaping along NW 43rd Avenue. A condition of approval to this effect is warranted.

Interior Roads: CMC 17.19.040.10 states that the "street layout shall provide for the most advantageous development of the land development, adjoining area, and the entire neighborhood."

The Applicant is proposing a private road that will be located within a 41-foot wide tract and will include 28-feet of pavement, one detached 6-foot wide sidewalk, and one attached 5-foot sidewalk. This private street is not consistent with the Private Street Standard 'D' on Table 17.19.040-1. The proposed road and right-of-way configuration would need a deviation from the Private Street Standard 'D' as shown on Table 17.19.040-1.

Per CMC 17.19.040.10.f 'when, on the basis of topography, projected traffic usage or other relevant facts, it is unfeasible to comply with the foregoing right-of-way, tract and street width standards, the approval authority, upon recommendation from the City Engineer, may permit a deviation from the standards of Table 17.19.040-1 and Table 17.19.040-2.

The right-of-way width on the proposed private street is constrained due to the wetland and associated wetland buffer that is located on the north side of the development. A deviation from the right-of-way standard enables the Applicant to increase the lot depths between the wetland buffer and the roadway. Support for the deviation, due to the wetland buffer constraints, is recommended by the City Engineer.

Fire Sprinklers: In accordance with the provisions of CMC 17.19.040 (A7) homes accessed from a private street require automatic fire sprinklers installed per NFPA 13D or 13R. The city has also adopted a regulation that requires that all new residential homes have fire sprinklers installed (CMC§15.17.050 - Automatic fire sprinkler system required). A condition of approval to this effect is warranted.

Parking: The proposed private street will not be wide enough to allow for parking on both sides. In accordance with the provisions of CMC 17.19.040 (A9) the Applicant will need to provide for adequate parking enforcement in the CC&R's at the time of final platting. A condition of approval to this effect is warranted.

Utilities, Street Lighting, Street Trees, and Other Improvements: The applicant can or will make adequate provisions for utilities as shown on the Preliminary Development Plans.

LED Street lighting will be installed along all street frontages within and adjacent to the proposed development. Street lighting, and maintenance of said street lights, on the interior street will be metered separately and will be the responsibility of the HOA. A condition of approval to this effect is warranted.

CMC 17.19.030 (F 1) requires the Applicant to install one 2-inch diameter tree in the front yard of each lot. The location of these trees should be shown on the final site improvement plans along with the enhanced landscaping to screen the stormwater facility. The Applicant will also be required to provide acceptable fencing and landscaping along NW 43rd Avenue in accordance with CMC 17.19.040 (B 11c). The proposed fencing, landscaping, and street tree plantings shall be included with the final engineering plan submittal for the site improvements. A condition of approval to this effect is warranted.

Findings: Staff finds that the applicant can or will make adequate provisions for roads, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans.

4. Provisions have been made for dedications, easements and reservations;

The Applicant is proposing an internal roadway that is to be put into a Tract and identified as a 'private road' on the preliminary plat. Public water and sewer mainlines will also be located within this private roadway. For these reasons, the Applicant shall provide an ingress and egress utility easement, over and under this roadway, for ownership, maintenance, and improvements of the public water and sewer mainlines to the City of Camas at the time of final platting. A note to this effect is warranted on the face of the final plat.

The Applicant must be required to provide a right-of-entry to the City for inspection and maintenance of the individual STEP systems. A note to this effect is warranted on the face of the final plat.

Water meters located outside of the private road Tract, are to have a 5-foot water meter easement granted to the City of Camas for access, inspection, and maintenance. A note to this effect is warranted on the face of the final plat.

The Applicant shall be required to provide a public pedestrian access easement over the 5-foot wide sidewalk easement, located on the north side of the private roadway. A note to this effect is warranted on the face of the final plat.

The Applicant shall be required to provide right-of-entry to the City of Camas for purposes of inspection of the stormwater facilities located in Tract 'C'. A note to this effect is warranted on the face of the final plat.

The Applicant shall be required to provide a 6-foot private utility easement (PUE) for the purpose of installing, constructing, renewing, operating, and maintaining electric, telephone, TV, cable, and other utilities as noted. A note to this effect is warranted on the face of the final plat.

Findings: Staff finds that the development can provide easements for access, inspection and public use in conformance with CMC and the comprehensive plan goals and policies.

5. The design, shape and orientation of the proposed lots are appropriate to the proposed use:

The land use is designated for single family, and the proposal includes twelve lots. The maximum density allowed is 15 lots, and single family zones do not require a minimum unit density. The design and orientation of the lots must balance many factors to include avoidance of wetland impacts, preservation of significant trees, access, safety, and other infrastructure standards. Staff is concerned with the proposed grading of the site as it is not in balance with the other design factors.

Double frontage lots: The lots that are adjacent to NW 43rd Avenue, Lots 8 to 12, are considered to be "double-frontage" lots as the have street frontage on opposite lot lines. When this design cannot be avoided, per CMC§17.19.030(D)(6), then certain design standards are required to include creation of a landscape tract, fencing and building façade design. The preliminary design includes a 10-foot tract, fencing and setbacks along NW 43rd consistent with this standard.

The application has not included details on the architectural design of the building facades that would be visible to NW 43rd Avenue. CMC§17.19.030(D)(6)(c) Architectural Design, requires articulation of building facades and avoidance of "large blank walls". The sides of buildings that are visible to NW 43rd Avenue must be articulated to include the level of detail, materials and colors consistent with a front façade. *A condition in regard to design review of building plans for Lots 8 to 12 is appropriate and will be recommended.*

Smaller or Fewer Lots: The applicant proposed to utilize the density transfer standards of CMC§18.09.040 Table 1 (B) Density Transfer Lots. This standard requires that critical areas be set aside in a tract. Tract B is 0.51 acres and contains wetlands to satisfy that criterion. Staff supports lots sizes as small as 4,950 sq. ft. and reduced setbacks to protect critical areas.

Subsection "D" of CMC§18.09.060 allows additional flexibility in "lot sizes, lot width, depth or setback standards" if the set aside tract is larger than a ½ acre, which also has been met with this application. For these reasons, proposed lots 1 to 5 are smaller than the standards of Table 1, and the setbacks are reduced. Discussion under the critical area permit section of this report discusses that the impacts to the wetland area could be further avoided. Staff provided options for avoidance of wetland and buffer impacts with the applicant in person and in writing. A few of the options discussed include:

(1) Reduce impacts to wetland and buffer, by reducing the number of lots. The development could add another lot at the NW corner of the site, where there are currently two lots, by extending Tract B along the entire northern boundary of the site, which would separate new lots from the existing development to the north and provide more onsite area for wetland mitigation. This would also eliminate the need to create larger lots in this area to meet the code requirement for matching adjacent lower density zoning standards, per CMC§18.09.080(B). Refer to example at Attachment "A".

(2) If the development reduced direct wetland impacts by not creating lots north of the interior road or avoiding impacts beyond what can be mitigated on-site, then the total lot count would be below nine lots. The development would then be considered a Short Subdivision (refer to CMC Chapter 17.09). This would change the permit type from a Type III to a Type II, which is an administrative decision.

Findings: Staff finds that there are double-frontage lots along NW 43rd Avenue and that the application can be conditioned to meet the standards for those lots. The applicant has also proposed lots to utilize density transfer provisions that allows for flexibility in lot size, setbacks and dimensions. Staff supports lots sizes as small as 4,950 sq. ft. and reduced setbacks.

6. The subdivision complies with the relevant requirements of the Camas land development and zoning codes, and all other relevant local regulations;

Discussion: The application included a tree survey as required per CMC§18.31.030 and 080, prepared by Davey Resource Group. The report dated May 2018, identified trees that are in good health and candidates for retention. The arborist report indicated that 37 trees could be retained, and twelve of those were "excellent candidates" for retention, which ranged in size from 9" dbh[2] to 38" dbh. The majority of the priority trees are located along the southern property line.

Notwithstanding the recommendations of the arborist, it appears as if only three (3) trees will be retained (Refer to Sheet SP-102). Two of the trees are located within the wetland buffer, and one is along the northern property line. The grading plan conflicts with their tree preservation plan as it is shown at the location of all three trees. The city does not require that lots be graded to the extent proposed.

The development must retain significant trees "To the extent practical" per CMC§18.31.080(B). The application materials did not demonstrate that any alternate designs were considered to retain healthy, significant trees. It appears as if the arborist report, which was submitted in May

[2] "Dbh" is an acronym for "diameter at breast height".

had no effect on the initial March submittal, given that it did not incorporate the recommendations of their arborist for additional tree retention.

The city prefers that existing trees be set aside in a tract versus being located on individual lots, per CMC§18.31.110. The applicant proposes to plant 25 trees within Tract B as mitigation for the removed trees. The city is supportive of mitigation for tree removal impacts. The city also requires that double frontage lots (Lots 8-12) include a landscape buffer tract of 10-feet and a fence or wall along the property line, per CMC§17.19.030(D)(6) Double Frontage Lots. In combination with the fact that many of the healthy, priority trees were located in this southern area of the site where there will be a tract, it is reasonable to believe that tree retention in this area is "practical", possible, and would be consistent with CMC. A condition in regard to tree retention and a revised grading plan is warranted and is included.

The applicant's arborist also provided detailed recommendations for protecting trees that are identified for preservation. Those recommendations are included with the conditions at the end of this report.

Findings: The applicant has not proposed to retain healthy significant trees as advised in their arborist report, nor demonstrated an effort to retain significant healthy trees per CMC§18.31.080. Staff is supportive of plans to mitigate tree removal.

Parking Discussion: The city requires additional off-street parking requirements of CMC 17.19.040(B)(10)(e). The applicant does not propose any off-street parking, although it is required at a ratio of one off-street parking space per five lots, when the average lot size of the development is under 7,400 square feet. The average lot size of this development is 6,580 square feet. The number of off-street parking spaces required is two spaces. A condition in regard to additional off-street parking shall be provided.

Findings: Staff finds that the proposed subdivision does or can be meet off-street parking requirement.

Sales Office Discussion: Typically the developer of a new subdivision requests that a sales office be located on site for sale of lots. The zoning regulations of CMC limit sales offices to a six-month temporary use permit, unless approved with a Type III application (Refer to CMC§18.07.040-Table 2, Note 4). Given that this is a Type III application, a condition in regard to a longer time frame is allowed and offered as a condition.

Finding: Staff included a condition to allow for a longer time frame for a sales office, if proposed.

7. Appropriate provisions are made to address all impacts identified by the transportation impact study:

The Applicant was notified by staff at the pre-application meeting that a Traffic Study for Sight Distance would be required based on the location of the access and the limited width of the parcel. The sight distance analysis was required at the proposed intersection on NW 43rd Avenue.

A Traffic Study for Sight Distance report, dated March 5, 2018, was provided by PBS. The report concluded that, "Based on this analysis, there is sufficient intersection sight distance at the Rondeau's proposed access location." **Staff concurs with the analysis as stated in the Traffic Study for Sight Distance report.**

Findings: Staff finds that the development complies with this criterion.

8. Appropriate provisions for maintenance of commonly owned private facilities have been made;

The Applicant did not provide draft provisions with the initial submittal. Prior to final plat approval, the applicant must submit CC&R's to the City of review and approval that clearly state the provisions for the maintenance of private facilities. *A condition of approval to this effect is warranted.*

Findings: Staff finds that the Applicant must submit CC&R's to the City for review and approval that clearly state the provisions for maintenance of private facilities.

9. Appropriate provisions, in accordance with RCW 58.17.110, are made for:

a. The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at schools bus shelter/stops, and for students who walk to and from school, and

b. The public use and interest will be served by the platting of such subdivision and dedication;

The grading as proposed does not appear to meet the city's design standards for sidewalks. The Applicant is required to ensure that all pedestrian access routes, including sidewalks on interior and exterior roads, meet Americans with Disabilities Act (ADA) Standards, per CMC 17.19.040.B.10.b.ii. A condition of approval to this effect is warranted.

Findings: Staff finds that the applicant must ensure that all pedestrian access routes, including sidewalks on interior and exterior roads, meet Americans with Disabilities Act (ADA) standards, per CMC 17.19.040.B.10.b.ii.

10. The application and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.

Findings: Refer to Section III of this report in regard to environmental review.

III. CRITICAL AREA REVIEW

The property contains 0.63 acres encumbered by wetland and associated buffer areas. The city requires a demonstration and discussion of efforts to avoid and minimize impacts. The revised application includes a demonstration and discussion of efforts to minimize and avoid impacts to the wetland. However, staff is still concerned with the direct wetland impacts proposed by the project for individual lots and the location of mitigation. The criteria for preliminary approval of a Wetland permit is provided at CMC§16.53.050(H)(1-4).

1. Decision Maker. A wetland permit application which has been consolidated with another permit or approval request which requires a public hearing (e.g., preliminary plat) shall be heard and decided in accordance with the procedures applicable to such other request. Any other wetland permit application shall be acted on by the responsible official within the timeline specified in Appendix B [of the Shoreline Master Plan] or CMC Chapter 18.55 for the required permit type.

Finding: **The wetland permit has been consolidated with the preliminary plat permit.**

2. Findings. A decision preliminarily approving or denying a wetland permit shall be supported by findings of fact relating to the standards and requirements of this chapter.

Finding: **Wetland standards are provided at CMC§16.53.050(D) and included below (shading).**

D. Standards—Wetland Activities. The following additional standards apply to the approval of all activities permitted within wetlands under this section:

1. Sequencing. Applicants shall demonstrate that a range of project alternatives have been given substantive consideration with the intent to avoid or minimize impacts to wetlands. Documentation must demonstrate that the following hierarchy of avoidance and minimization has been pursued:

a. Avoid impacts to wetlands unless the responsible official finds that:

i. For Categories I and II wetlands, avoiding all impact is not in the public interest or will deny all reasonable economic use of the site;

ii. For Categories III and IV wetlands, avoiding all impact will result in a project that is either:

(A) Inconsistent with the city of Camas comprehensive plan;
(B) Inconsistent with critical area conservation goals; or
(C) Not feasible to construct.

b. Minimize impacts to wetlands if complete avoidance is infeasible. The responsible official must find that the applicant has limited the degree or magnitude of impact to wetlands by using appropriate technology and by taking affirmative steps to reduce impact through efforts such as:

i. Seeking easements or agreements with adjacent land owners or project proponents where appropriate;

ii. Seeking reasonable relief that may be provided through application of other city zoning and design standards;

iii. Site design; and

iv. Construction techniques and timing.

c. Compensate for wetland impacts that will occur, after efforts to minimize have been exhausted. The responsible official must find that:

i. The affected wetlands are restored to the conditions existing at the time of the initiation of the project;
ii. Unavoidable impacts are mitigated in accordance with this subsection; and
iii. The required mitigation is monitored and remedial action is taken when necessary to ensure the success of mitigation activities.

Discussion: Per criterion 1, the applicant's revised critical areas report (dated May 4, 2018) provides a sequencing description of alternative designs that would have created more impacts than the current site design. The report summarized that the development avoided 0.21 acres of wetland impacts, and impacted .20 acres directly and 0.56 acres of buffer.

The current design has utilized some of the options/tools that were discussed at meetings with the applicant and through written review comments. Some of those measures include: (1) road narrowing; (2) placing the sidewalk in an easement versus the right-of-way or tract; and (3) reducing several lot sizes by utilizing density transfer lot standards, and (4) reducing the buffer width. The applicant could further reduce the size of Lot 1 and/or remove lots 2, 3 or 4, which have the bulk of the wetland area. Lots 3 and 4 are at the low point of the wetland where the water flows and collects. The applicant has proposed to collect water between Lots 3 and 4 and divert it to the stormwater facility (Sheet C-201). The applicant is utilizing a buffer reduction provision per CMC 16.53.050.C.1.b. which allows the buffer widths to be reduced up to 25 percent if the buffer is restored or enhanced, but did not include an illustration of the effect of this provision.

As noted above at Subsection D, "*The responsible official must find that the applicant has limited the degree or magnitude of impact to wetlands by using appropriate technology and by taking affirmative steps to reduce impacts*" such as site design if complete avoidance is "infeasible".

Complete avoidance could include the elimination of Lots 1-5. Utilizing the reduction of the buffer width from 50-feet to 25-feet would also likely result in no indirect impacts. CMC does not provide a definition of "infeasible". Per CMC§18.03.010, "Terms not defined shall hold their common and generally accepted meaning, unless otherwise specifically defined in this code." Merriam-Webster defines "infeasible" as "impracticable". Impracticable means "incapable of being performed or accomplished by the means employed or at command". Staff cannot find that avoidance is infeasible as there have been several options discussed in this report to further reduce impacts or to completely avoid impacts.

Findings: Staff finds that it is not infeasible for the development to avoid wetland impacts and/or further reduce impacts.

2. Location of Wetland Mitigation. Wetland mitigation for unavoidable impacts shall be located using the following prioritization:

a. On-Site. Locate mitigation according to the following priority:

i. Within or adjacent to the same wetland as the impact;

ii. Within or adjacent to a different wetland on the same site;

b. Off-Site. Locate mitigation within the same watershed or use an established wetland mitigation bank; the service area determined by the mitigation bank review team and identified in the executed mitigation bank instrument;

c. In-Kind. Locate or create wetlands with similar landscape position and the same hydro-geomorphic (HGM) classification based on a reference to a naturally occurring wetland system; and

d. Out-of-Kind. Mitigate in a different landscape position and/or HGM classification based on a reference to a naturally occurring wetland system.

Discussion: The city's first priority for the location of mitigation is on-site. The report indicates that 0.2 acres of direct wetland impacts and 0.57 acres of buffer impacts will be compensated off-site at the Terrace Mitigation Bank. The report acknowledges that it is inconsistent with the city's order of preference (page 7). The report does not consider onsite mitigation options. Depending on the type of mitigation proposed (Creation to Enhancement) the mitigation area could range in size from 0.3 acres to 1.2 acres for 0.2 acres of direct impacts currently proposed.

Some options to consider, which were discussed with the applicant, include extending Tract B to the west to provide more area for on-site mitigation, and would better preserve the significant tree in that area. This option would also allow Lots 6 and 7 to be smaller as CMC§18.09.080 would not be applicable (as previously discussed).

Findings: The applicant <u>did not</u> consider options for on-site mitigation as the first priority of the city's CAO. Impacts could be reduced further to provide for on-site mitigation.

3. Types of Wetland Mitigation. The various types of wetland mitigation allowed are listed below in the general order of preference.

a. Restoration. The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:

i. Re-Establishment... [3]
ii. Rehabilitation. …

b. Creation (Establishment)…

c. Enhancement. …

d. Protection/Maintenance (Preservation)… Preservation does not result in a gain of wetland acres, but may result in improved wetland functions.

Discussion: The applicant proposes to reduce the buffer per CMC 16.53.050.C.1.b. which states buffer widths may be reduced up to 25 percent if the buffer is restored or enhanced from a pre-project condition that is disturbed (e.g., dominated by invasive species), so that functions of the post-project wetland and buffer are equal or greater. The report did not include an exhibit to

[3] Staff did not include full text citation of the CMC for purposes of brevity. When CMC is abbreviated it is indicated with **"…"**

illustrate the difference of impacts between the 50-foot buffer and the reduced buffer. The report proposes to install enhancement plantings within Tract B that is required per the CAO in order to be eligible for buffer reduction. The planting plan is included on the landscape plan (L-102).

The report also includes measures to protect the remaining wetland within Tract B (starting at page 5), which is consistent with the city's CAO to include recording a covenant on the tract and installation of fencing and signage. The application drawings (Sheet SP-103) indicates that the fencing will be split rail fencing and the wetland report states that it will be vinyl-coated chain link. Either fencing is acceptable to the city.

Finding: Wetland enhancement and proposed protective measures are consistent with the CAO. The wetland tract can be protected with a split rail or chain-link fence.

3. Conditions. A decision preliminarily approving a wetland permit shall incorporate at least the following as conditions:

a. The approved preliminary mitigation plan;

b. Applicable conditions provided for in subsection (E)(3) of this section;

c. Posting of a performance assurance pursuant to subsection J of this section; and

d. Posting of a maintenance assurance pursuant to subsection J of this section.

Finding: **The preliminary mitigation plan, per subsection "a" must be modified to consider on-site mitigation as the first option. Per subsections "b" to "d", this report includes conditions in regard to the applicant providing financial assurances for performance and maintenance.**

4. Duration. Wetland permit preliminary approval shall be valid for a period of three years from the date of issuance or termination of administrative appeals or court challenges, whichever occurs later, unless:

a. A longer period is specified in the permit; or

b. The applicant demonstrates good cause to the responsible official's satisfaction for an extension not to exceed an additional one year.

Finding: The preliminary wetland permit is consolidated with other development permits, and should be valid for the same duration as preliminary plat approval. A condition to this effect is included.

CONCLUSIONS OF LAW

The following conclusions of law are based on the findings of facts as discussed throughout this report and decision.

- As conditioned, SUB18-01 can be consistent with the comprehensive plan.
- As conditioned, SUB18-01 can comply with land development standards of CMC Chapters 17.11 Subdivisions and 17.19 Design and Improvement Standards.
- As conditioned, SUB18-01 can comply with critical area regulations of Title 16 Environment.

- As conditioned, SUB18-01 can comply with zoning standards of CMC Chapter 18.09 Density and Dimensions.
- As conditioned, SUB18-01 can comply with standards of CMC Chapter 18.31 Sensitive Areas and Open Space.
- As submitted, SUB18-01 complies with CMC Chapter 18.55 Administration and Procedures.

RECOMMENDATION

Staff recommends approval of the consolidated application for 43rd Avenue Subdivision (SUB18-01) based on the applicant's narrative, drawings, and supporting technical reports as revised, except as otherwise clarified or modified through the following conditions of approval.

Further, unless otherwise waived in writing in this decision, the development must comply with the minimum requirements of Camas Municipal Code.

Standard Conditions:

1. All construction plans shall be prepared in accordance with City of Camas standards. The plans will be prepared by a licensed civil engineer in Washington State and submitted to the City for review and approval.
2. A 3% construction plan review and inspection fee shall be required for this development. The fee will be based on an engineer's estimate or construction bid. The specific estimate will be submitted to the City for review and approval. The fee will be paid prior to the construction plans being signed and released to the applicant. Under no circumstances will the applicant be allowed to begin construction prior to approval of the construction plans.
3. Telecommunication facilities shall be located per CMC 5.45.365.
4. Existing septic tanks and septic drain fields shall be abandoned in accordance with state and county guide lines per CMC 17.19.020 (A3).
5. Any entrance structures or signs proposed or required for this project will be reviewed and approved by the City. All designs will be in accordance with applicable City codes. The maintenance of the entrance structure will be the responsibility of the homeowners.
6. The applicant will be responsible for ensuring that private utilities; underground power, telephone, gas, CATV, street lights, and associated appurtenances are installed.
7. A 6-foot private utility easement (PUE) shall be located outside of the right-of-way on public streets and outside of the tracts on private streets.
8. A draft street lighting plan shall be submitted for review prior to final plan submittal to Clark Public Utility.
9. The applicant will be required to purchase and install all permanent traffic control signs, street name signs, street lighting, and traffic control markings and barriers for the improved subdivision.
10. A homeowner's association (HOA) will be required for this development. The applicant will be required to furnish a copy of the CC&R's for the development to the City for review.

Specifically, the applicant will need to make provisions in the CC&R's for maintenance of the stormwater detention and treatment facilities, any storm drainage system, fencing, landscaping, private roads, retaining walls, Tracts, or easements outside the City's right of way (if applicable).

11. Building permits shall not be issued until this subdivision has been granted Final Acceptance and the final plat is recorded and approved by the Planning, Engineering, Finance, Building, and Fire Departments.
12. The applicant shall remove all temporary erosion prevention and sediment control measures from the site at the end of the two-year warranty period, unless otherwise directed by the Public Works Director.
13. Final plat and final as-built construction drawing submittals shall meet the requirements of the CMC 17.11.060, CMC 17.01.050 and the Camas Design Standards Manual for engineering as-built submittals.

Engineering Division:

14. The Applicant shall be required to verify that an 8-inch line provides sufficient fire flows to the development.
15. The Applicant shall grant an access and utility maintenance easement to the City of Camas for access, inspection, and maintenance of the water system over and under the private road Tract.
16. The Applicant shall be required to provide documentation that the existing well was decommissioned in accordance with State and County health regulations.
17. Existing septic tank and septic drain field shall be properly decommissioned in accordance with State and County guidelines prior to final plat approval.
18. The stormwater facility shall be owned and maintained by the homeowners association (HOA), or where an HOA has not been established, maintenance responsibility is with the homeowners/property owners within the platted subdivision.
19. The Applicant shall adequately address stormwater discharge, from the storm facility onto the adjacent property, prior to approval of construction plans.
20. The Applicant shall grant a right-of-entry to the City for the purpose of inspection of the stormwater facilities located in Tract 'C'.
21. The Applicant shall be required to dedicate additional right-of-way that varies between 30-feet to 32-feet from the centerline of the road in order to construct full half-street improvements, per CMC 17.19.040.B.1, which includes utility easements, pedestrian pathway, stormwater drainage, street lighting and signage to the centerline of the right-of-way.
22. The Applicant shall include a fencing and landscaping plan that depicts the fencing style, materials and associated details necessary for the fence construction along with the proposed landscaping plan that includes plant numbers, varieties, spacing, installation and staking details along NW 43rd Avenue.
23. Automatic fire sprinklers installed per NFPA 13D or 13R shall be required in all new residential structures.
24. Provisions for parking enforcement acceptable to the Fire Marshal shall be included in the CC&R's at the time of final platting.
25. Street lighting, and maintenance of said street lights, on the interior street shall be metered separately and shall be the responsibility of the HOA.

26. Prior to final engineering plan approval the Applicant shall include a landscaping plan that details the location, number, proposed plant species, planting notes, fencing notes and associated details for the fencing and landscaping work associated with the stormwater detention pond and the landscaping and fencing along NW 43rd Avenue.
27. The Applicant shall be required to submit CC&R's to the City for review and approval that clearly state the provisions for maintenance of private facilities.
28. The Applicant shall be required to ensure that all pedestrian access routes, including sidewalks on interior and exterior roads, meet Americans with Disabilities Act (ADA) standards, per CMC 17.19.040.B.10.b.ii.

Planning Division:

29. The applicant shall provide a minimum of two off-street parking spaces located in a common tract maintained by the HOA at locations acceptable to the city.
30. Minor Design Review shall be required at time of building plan submittal for lots adjacent to NW 43rd Avenue (current lots 8-12). The sides of buildings that are visible to NW 43rd Avenue will be articulated to include the level of detail, materials and colors consistent with a front façade. Blank walls are not acceptable. A note to this effect shall be added to the final plat.
31. The applicant must revise the landscaping plan along NW 43rd Avenue and shall provide it to the Planning Division prior to engineering plan submittal. A final landscaping plan for the tract that separates the lots from NW 43rd Avenue shall include retaining exiting healthy significant trees, and also include new trees and shrubs consistent with CMC§17.19.030(D)(6).
32. An irrigation system shall be installed to ensure successful establishment of landscaping within the required 10-foot tract along NW 43rd Avenue.
33. Construction plans for fencing or walls along NW 43rd Avenue must be submitted for approval and include columns or physical indentations every fifty feet per CMC§17.19.030(D)(6)(b)(ii).
34. Tract improvements along NW 43rd Avenue shall be installed prior to final plat approval.
35. The preliminary wetland permit is valid until a final wetland permit is approved, but not beyond the expiration of the preliminary plat.
36. The development will reduce impacts to wetlands to a level that will allow for mitigation to occur on-site.
37. The applicant shall provide a final wetland mitigation report for approval by the Planning Division prior to final engineering plan approval.
    a) The final mitigation report will be consistent with CMC§16.53.050 (3) to include written specifications of the proposed construction sequence, grading and excavation details, water and nutrient requirements for planting, specification of substrate stockpiling techniques, and planting instructions, as appropriate. These written specifications shall be accompanied by detailed site diagrams, scaled cross-sectional drawings, and topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or anticipated final outcome.
    b) The final plan must include access to the area that is a minimum of 12-feet wide.
    c) The plan must include a program for controlling the spread of invasive species and to ensure that the grasses do not pose a fire hazard during the summer months.
    d) The monitoring and maintenance program will be for a period of five years from date of initial installation.

e) A conservation covenant shall be recorded in a form approved by the city, which will give notice of the requirement to the future owners to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer.

f) The recorded covenant must be referenced on the face of the plat.

g) A watering system will be installed to ensure successful establishment and watering during dry months for an initial three years.

38. The applicant shall provide financial assurances for wetland mitigation and implementation in accordance with of CMC§16.51.180 and CMC§16.53.050(J). The financial guarantee must include monitoring and maintenance per CMC§16.51.180 (D, E, and F) shall be submitted for approval prior final engineering plan approval.

39. If approved, the applicant shall provide the city a copy of the final contract with the wetland bank for off-site mitigation, prior to final engineering approval.

40. Wetland and buffer shall have temporary protective fencing installed prior to earthwork occurring on site and remain in good condition until permanent fencing is installed.

41. Wetlands shall be fenced with permanent and continuous fencing at a minimum height of 4-feet if chain-link, or split rail fencing per CMC§16.53.040(C). Signs regarding wetland protection and permanent fencing shall be installed prior to final plat approval.

42. Tree retention shall be clearly marked on the final plat and grading shall be revised with the intent to retain additional trees as recommended by the arborist. Tree topping is not permitted to retained trees, nor removal of more than 20 percent of a tree's canopy. A note to this effect shall be added to the plat.

43. Consistent with the recommendations of the applicant's arborist, the following tree protection measures will be required.

a) Preconstruction tree maintenance by a certified arborist must occur prior to the installation of tree protection barriers. Tree maintenance for retained trees pruning to remove dead, structurally weak, and low-hanging branches to allow for safety and clearance, mulch, and fertilization.

b) Tree locations and fencing should be carefully measured on site at time of tree protection zone (TPZ) installation as determined by arborist.

c) Root protection must be installed by applying a four-inch layer of mulch inside and extending to 5 feet outside the TPZ.

d) Additional root protection with plywood over mulch should be used to allow for construction equipment access as needed.

e) Tree protection fencing and tree protection area signs are must be installed prior to construction and remain in place until final plat approval.

f) All excavation work within 5 feet of the TPZ must be done by hand or air spade.

g) A note on the plat shall be included to reference protected trees.

44. A single sales office in a model home or trailer for purposes of selling lots within the development may be established, and remain until 50% of lots are sold or two years after Certificate of Occupancy was issued, whichever is less. After such time, the sales office in the home must be removed. Hours of operation of sales office shall be established and approved with the Certificate of Occupancy.

Fire Department:

45. Onsite fire hydrants required contact fire department for locations. IFC Appendix C Sec. C105
46. Provide plan for adequate parking enforcement and towing on private roads, which will include at the minimum, signage installed. CMC§17.19.040(A)(9).

FINAL PLAT NOTES

(1) A homeowners association (HOA) will be required for this development. Copies of the C.C. & R's shall be submitted and on file with the City of Camas.

(2) No further short platting or subdividing will be permitted once the final plat has been recorded.

(3) Building permits will not be issued by the Building Department until all subdivision improvements are completed and Final Acceptance has been issued by the City.

(4) The lots in this subdivision are subject to traffic impact fees, school impact fees, fire impact fees and park/open space impact fees. Each new dwelling will be subject to the payment of appropriate impact fees at the time of building permit issuance.

(5) The maximum lot coverage shall be 40%, unless it is a single-story home, then the maximum building lot coverage may be up to forty-five percent. To qualify for increased lot coverage, a single-story home cannot include a basement or additional levels.

(6) Minor Design Review shall be required for lots adjacent to NW 43rd Avenue (Lots 8-12). The sides of buildings that are visible to NW 43rd Avenue will be articulated to include the level of detail, materials and colors consistent with a front façade. Blank walls are not acceptable.

(7) Trees identified on this plat for preservation shall not be topped. Removal of more than 20 percent of a tree's canopy is not permitted.

(8) Tract B contains is dedicated to the HOA as a critical area tract and shall remain in its natural state and maintained as recommended in the Final Wetland Mitigation Plan (dated xxxx). Any modifications to this tract must be approved by the City. Fencing and signage must be maintained in perpetuity.

(9) Provisions for parking enforcement must be posted on the street, and the development must maintain clearance for first responders. The city is not responsible for towing of vehicles on private streets.

(10) Automatic fire sprinkler systems designed and installed in accordance with NFPA 13D are required in all structures.

(11) All costs associated with the installation of individual STEP systems for each lot will be the responsibility of the lot owner.

(12) A right-of-entry shall be granted to the City of Camas for the maintenance and repair of the individual STEP systems located on the lots within this plat.

(13) Stormwater facilities shall be owned and maintained by the HOA and/or Homeowners per CMC 14.02. A right-of-entry shall be granted to the City of Camas for inspection of the stormwater facilities located in Tract 'C'.

(14) In the event that any item of archaeological interest is uncovered during the course of a permitted ground disturbing action or activity, all ground disturbing activities shall immediately cease and the applicant shall notify the Public Works Department and OAHP.

(15) An ingress and egress utility easement, over and under this roadway, is granted to the City of Camas for ownership, maintenance, and improvements of the public water and sewer mainlines located within the private roadway Tract.

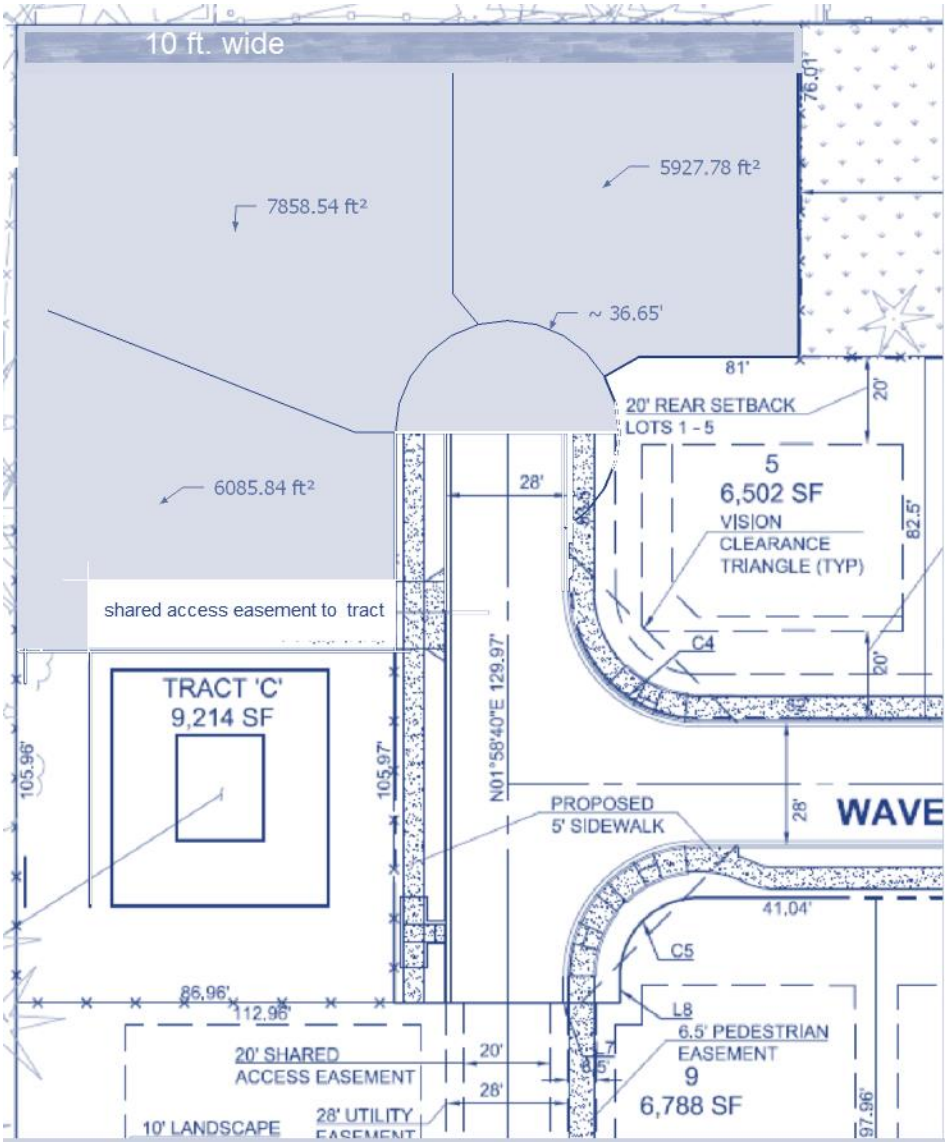
(16) A 5-foot access, inspection, and maintenance easement shall be granted to the City of Camas for all water meters located outside of the private road Tract.

(17) A public pedestrian access easement is granted over the 5-foot wide sidewalk easement, located on the north side of the private roadway.

(18) The exterior 6-feet of all Lots and Tracts lying parallel with and adjacent to public and/or private roads shall have a private utility easement (PUE) for the purpose of installing, constructing, renewing, operating, and maintaining electric, telephone, TV, cable, and other utilities as noted.

Attachment "A"

Example Lot Layout. Note that the buffer tract to the north would include trees along shared border every 30'feet and continuous fencing, as an extension of Tract B.



Geotechnical Engineering Report

Proposed Subdivision
2223 NW 43rd Avenue
Camas, Washington 98607

Prepared for:
Brett Simpson
Waverly Homes LLC
3205 NE 78th St Suite 10
Vancouver, Washington 98665

December 28, 2017
PBS Project No. 75345.000

PBS
4412 SW CORBETT AVENUE
PORTLAND, OR 97239
503.248.1939 MAIN
866.727.0140 FAX
PBSUSA.COM

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Prepared by:

Cory Van Fosson, EIT
Engineering Staff

Reviewed by:

Saiid Behboodi, PE, GE
Principal Geotechnical Engineer

Reviewed by:

12/28/2017

Ryan White, PE, GE (OR)
Geotechnical Discipline Lead

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1 INTRODUCTION

1.1 General

This report presents results of PBS Engineering and Environmental Inc. (PBS) geotechnical engineering services for the proposed 12 lot subdivision located at 2223 NW 43rd Avenue in Camas, WA (site). The general site location is shown on the Vicinity Map, Figure 1. The locations of PBS' explorations in relation to existing site features are shown on the Site Plan, Figure 2.

1.2 Purpose and Scope

The purpose of PBS' services was to develop geotechnical design and construction recommendations in support of the planned new subdivision. This was accomplished by performing the following scope of services.

1.2.1 Literature and Records Review

PBS reviewed various published geologic maps of the area for information regarding geologic conditions and hazards at or near the site. PBS also reviewed previously completed reports for nearby projects.

1.2.2 Subsurface Explorations

PBS excavated seven test pits within the proposed development area to depths of up to 11 feet below the existing ground surface (bgs). The test pits were logged and representative soil samples collected by a member of the PBS geotechnical engineering staff. Interpreted test pit logs are included as Figures A1 through A7 in Appendix A, Field Explorations.

1.2.3 Field Infiltration Testing

Cased-hole, falling-head field infiltration tests were completed in test pits TP-1 and TP-2 within the proposed development at a depth of 4 feet bgs. Infiltration testing was monitored by PBS geotechnical engineering staff.

1.2.4 Soils Testing

Soil samples were returned to our laboratory and classified in general accordance with the Unified Soil Classification System, Visual-Manual Procedure. Laboratory tests included natural moisture contents and grain-size analyses (P200). Laboratory test results are included in the exploration logs in Appendix A, Field Explorations; and in Appendix B, Laboratory Testing.

1.2.5 Geotechnical Engineering Analysis

Data collected during the subsurface exploration, literature research, and testing were used to develop site-specific geotechnical design parameters and construction recommendations.

1.2.6 Report Preparation

This Geotechnical Engineering Report summarizes the results of our explorations, testing, and analyses, including information relating to the following:

- Field exploration logs and site plan showing approximate exploration locations
- Laboratory test results
- Infiltration test results
- Groundwater considerations

- Earthwork and grading, cut, and fill recommendations:
  - Structural fill materials and preparation, and reuse of on-site soils
  - Wet weather considerations
  - Utility trench excavation and backfill requirements
  - Temporary and permanent slope inclinations
- Pavement subgrade preparation recommendations
- Asphalt concrete (AC) pavement sections suggestions

1.3 Project Understanding

PBS understands the site is relatively flat and bordered by NW 43rd Avenue to the south and residential developments on the north, east, and west, with wetland to the north. The site is currently occupied by a single residence and associated outbuildings and is covered with grass, shrubs, and trees. Conceptual plans indicate the approximate 3.5-acre site will be subdivided into 12 residential lots and includes asphalt concrete (AC) paved access roads and a stormwater infiltration facility.

2 SITE CONDITIONS

2.1 Surface Description

The proposed residential development area is roughly rectangular shaped with vegetation chiefly consisting of brush and grasses. Based on available topographical data, the site slopes generally downward to the north. Natural drainages have created small creeks on the north side of the site. Ground surface elevations range to a maximum of approximately 380 feet above mean sea level (amsl).

2.2 Geologic Map Review

Published geologic maps of the area (Evarts et al., 2008) show the site is mantled with Quaternary-Tertiary gravel deposits consisting of interbedded clay, silt, and sand deposited during catastrophic floods.

2.3 Subsurface Conditions

The site was explored by excavating test pits, designated TP-1 through TP-7, to depths of 4.0 to 11.0 feet bgs. Test pit excavation was performed by Dan J. Fischer Excavating, Inc., of Forest Grove, Oregon, using a John Deere 35C backhoe.

PBS has summarized the subsurface units as follows:

SURFACE MATERIALS:	Approximately 12 inches of topsoil/root zone was observed in test pits TP-4, TP-5, and TP-7. All of the test pits had clay with variable amounts of sand and gravel.
CLAY (CL):	Medium stiff clay was encountered throughout all seven test pits completed at the site, with variable amounts of silt, sand, and gravel to the maximum depth of the excavations. The clay had low plasticity, with moisture contents ranged from 23 to 47 percent and sand contents (P200) of 35 to 43 percent.

2.4 Groundwater

Groundwater seepage was encountered during our explorations at depths of 2.5 feet to 8 feet bgs. Based on a review of well logs available from the State of Washington Department of Ecology, we anticipate that static groundwater is present at a depth of about 5 feet bgs and shallower. Please note that groundwater levels can

fluctuate during the year depending on climate, irrigation season, extended periods of precipitation, drought, and other factors.

2.5 Infiltration Testing

PBS completed cased-hole falling head infiltration tests in TP-1 and TP-2 at a depth of 4 feet bgs. The infiltration tests were conducted within a 6-inch inside diameter pipe. The pipe was filled with water to achieve a minimum 1-foot-high column of water. After a period of saturation, the height of the water column in the pipe was then measured initially and at regular, timed intervals. Results of our field infiltration testing are presented in Table 1. The two field infiltration tests performed were determined to be impermeable.

Table 1. Infiltration Test Results

Test Location	Depth (feet bgs)	Field Measured Infiltration Rate (in/hr)	Soil Classification
TP-1	4	0	Clay
TP-2	4	0	Clay

3 CONCLUSIONS AND RECOMMENDATIONS

3.1 Geotechnical Design Considerations

The project site is underlain by clay with variable amounts of silt, sand, and gravel. Based on our observations and analyses, conventional foundation support on shallow spread footings is feasible for the proposed residential structures. Excavation with conventional equipment is feasible over the majority of the site. Fine-grained soils encountered in our explorations can be easily disturbed, particularly when wet; we recommend earthwork be completed during the drier summer months.

The grading and final development plans for the project had not been completed when this report was prepared. Once completed, PBS should be engaged to review the project plans and update our recommendations as necessary.

The following sections provide a more detailed discussion of our analysis and recommendations.

3.2 Shallow Foundations

Following removal of topsoil, shallow spread footings bearing on 4 inches of compacted crushed rock, structural fill founded on stiff native clay may be used to support loads associated with the proposed development. Topsoil should not be reused as structural fill. The on-site soils should be prepared in general accordance with section 4.3.1 of this report. The building foundation should be designed and constructed in accordance with the governing building code and City of Camas requirements.

3.3 Pavement Design

The asphalt concrete (AC) pavement was evaluated using a pavement design life of 20 years. Site traffic will consist primarily of cars, with occasional garbage, delivery, and/or fire trucks. We have estimated approximately 20,000 equivalent single-axle loads (ESALs) for a 20-year design life. The native subgrade under AC pavement areas should be prepared by removing the upper 12-inches of topsoil, scarifying, moisture conditioning, and recompacting a minimum of 12 inches below the bottom of the base course. Our AC pavement design recommendations are based on the following assumptions and design parameters:

- A resilient modulus of 4,500 pounds per square inch (psi) (equivalent to a California Bearing Ratio [CBR] value of 3) was used for subgrades that have been scarified and recompacted to a depth of 12 inches bgs

- A resilient modulus of 28,000 psi was assumed for the aggregate base rock
- Initial and terminal serviceability index of 4.2 and 2.5, respectively
- Reliability and standard deviation of 90 percent and 0.45, respectively
- Structural coefficient of 0.42 and 0.13 for the asphalt and aggregate base rock, respectively

Table 2. Minimum AC Pavement Sections

Traffic Loading	AC (inches)	Base Course (inches)	Subgrade*
Drive Lanes and Access Roads	3	9	Firm subgrade as verified by PBS personnel

* Subgrade must pass proofroll

Pavement subgrades should be evaluated and prepared in accordance with the Site Preparation and Wet/Freezing Weather and Wet Soil Conditions sections of this report. Construction during wet conditions may require thicker aggregate base course thicknesses in order support construction traffic and/or paving equipment.

The asphalt cement binder should be selected following WSDOT SS 9-02.1(4) – Performance Graded Asphalt Binder. The AC should consist of ½-inch hot mix asphalt (HMA) with a maximum lift thickness of 3.0 inches. The AC should conform to WSDOT SS 5-04.3(7)A – Mix Design, WSDOT SS 9-03.8(2) – HMA Test Requirements, and WSDOT SS 9-03.8(6) – HMA Proportions of Materials. The AC should be compacted to 91 percent of the maximum theoretical density (Rice value) of the mix, as determined in accordance with ASTM D2041, following the guidelines set in WSDOT SS 5-04.3(10) – Compaction.

If construction traffic is to be allowed on newly constructed road sections, an allowance for this additional traffic will need to be made in the design pavement section.

4 CONSTRUCTION RECOMMENDATIONS

4.1 Site Preparation

Construction of the proposed development will involve clearing and grubbing of the existing vegetation or demolition of possible existing structures. Topsoil and surface vegetation may be encountered as deep as 12 inches bgs and should be removed. Deeper removal of top soils may occur in some localized areas. Demolition should include removal of existing pavement, utilities, etc., throughout the proposed new development. Underground utility lines or other abandoned structural elements should also be removed. The voids resulting from removal of foundations or loose soil in utility lines should be backfilled with compacted structural fill. The base of these excavations should be excavated to firm, native subgrade before filling, with sides sloped at a minimum of 1H:1V to allow for uniform compaction. Materials generated during demolition should be transported off site or stockpiled in areas designated by the owner's representative.

4.1.1 Proofrolling/Subgrade Verification

Following site preparation and compaction of subgrade, and prior to placing aggregate base for the pavement section, the exposed subgrade should be evaluated either by proofrolling or another method of subgrade verification. The subgrade should be proofrolled with a fully loaded dump truck or similar heavy, rubber-tire construction equipment to identify unsuitable areas. If evaluation of the subgrades occurs during wet conditions, or if proofrolling the subgrades will result in disturbance, they should be evaluated by PBS using a steel foundation probe. We recommend that PBS be retained to observe the proofrolling and perform

the subgrade verifications. Unsuitable areas identified during the field evaluation should be compacted to a firm condition or be excavated and replaced with structural fill.

4.1.2 Wet/Freezing Weather and Wet Soil Conditions

Due to the presence of fine-grained clay in the near-surface materials at the site, construction equipment may have difficulty operating on the near-surface soils when the moisture content of the surface soil is more than a few percentage points above the optimum moisture required for compaction. Soils disturbed during site preparation activities, or unsuitable areas identified during proofrolling or probing, should be removed and replaced with compacted structural fill.

Site earthwork and subgrade preparation should not be completed during freezing conditions, except for mass excavation to the subgrade design elevations.

Protection of the subgrade is the responsibility of the contractor. Construction of granular haul roads to the project site entrance may help reduce further damage to the pavement and disturbance of site soils. The actual thickness of haul roads and staging areas should be based on the contractors' approach to site development, and the amount and type of construction traffic. The imported granular material should be placed in one lift over the prepared undisturbed subgrade and compacted using a smooth-drum, non-vibratory roller. A geotextile fabric should be used to separate the subgrade from the imported granular material in areas of repeated construction traffic. Depending on site conditions, the geotextile should meet Washington State Department of Transportation (WSDOT) SS 9-33.2 Geosynthetic Properties for soil separation or stabilization. The geotextile should be installed in conformance with WSDOT SS 2-12.3 Construction Geosynthetic (Construction Requirements) and, as applicable, WSDOT SS 2-12.3(2) Separation or WSDOT SS 2-12.3(3) Stabilization.

4.2 Excavation

The near-surface soils at the site can be excavated with conventional earthwork equipment. Sloughing and caving should be anticipated. All excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. The contractor is solely responsible for adherence to the OSHA requirements. Trench cuts should stand relatively vertical to a depth of approximately 4 feet bgs, provided no groundwater seepage is present in the trench walls. Open excavation techniques may be used provided the excavation is configured in accordance with the OSHA requirements, groundwater seepage is not present, and with the understanding that some sloughing may occur. Trenches/excavations should be flattened if sloughing occurs or seepage is present. Use of a trench shield or other approved temporary shoring is recommended if vertical walls are desired for cuts deeper than 4 feet bgs.

4.3 Structural Fill

The extent of site grading is currently unknown; however, PBS estimates that cuts and fills will be on the order of up to 5 feet within the proposed development. Structural fill should be placed over subgrade that has been prepared in conformance with the Site Preparation and Wet/Freezing Weather and Wet Soil Conditions sections of this report. Structural fill material should consist of relatively well-graded soil, or an approved rock product that is free of organic material and debris, and contains particles not greater than 3 inches nominal dimension.

The suitability of soil for use as compacted structural fill will depend on the gradation and moisture content of the soil when it is placed. As the amount of fines (material finer than the US Standard No. 200 Sieve) increases, soil becomes increasingly sensitive to small changes in moisture content and compaction becomes more difficult to achieve. Soils containing more than about 5 percent fines cannot consistently be compacted to a

dense, non-yielding condition when the water content is significantly greater (or significantly less) than optimum.

If fill and excavated material will be placed on slopes steeper than 5H:1V, these must be keyed/benched into the existing slopes and installed in horizontal lifts. Vertical steps between benches should be approximately 2 feet.

4.3.1 On-Site Soil

On-site soils encountered in our explorations may be suitable for placement as structural fill provided the soil is free of organics and is placed during moderate, dry weather when moisture content can be maintained by air drying and/or addition of water. The fine-grained fraction of the site soils are moisture sensitive, and during wet weather, will become unworkable because of excess moisture content. In order to reduce moisture content, some aerating and drying of fine-grained soils will be required. The material should be placed in lifts with a maximum uncompacted thickness of approximately 8 inches and compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557 (modified proctor).

4.3.2 Imported Granular Materials

Imported granular material used during periods of wet weather or for haul roads, building pad subgrades, staging areas, etc., should be pit or quarry run rock, crushed rock, or crushed gravel and sand, and should meet the specifications provided in WSDOT SS 9-03.14(2) – Select Borrow. In addition, the imported granular material should be fairly well graded between coarse and fine, and of the fraction passing the US Standard No. 4 Sieve, less than 5 percent by dry weight should pass the US Standard No. 200 Sieve.

Imported granular material should be placed in lifts with a maximum uncompacted thickness of 9 inches, and be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

During wet conditions, where imported granular material is placed over potentially soft-soil subgrades, we recommend a geotextile be placed between the subgrade and imported granular material. Depending on site conditions, the geotextile should meet WSDOT SS 9-33.2 – Geosynthetic Properties for soil separation or stabilization. The geotextile should be installed in conformance with WSDOT SS 2-12.3 – Construction Geosynthetic (Construction Requirements) and, as applicable, WSDOT SS 2-12.3(2) – Separation or WSDOT SS 2-12.3(3) – Stabilization.

4.3.3 Base Aggregate

Base aggregate for floor slabs and beneath pavements should be clean, crushed rock or crushed gravel. The base aggregate should contain no deleterious materials, meet specifications provided in WSDOT SS 9-03.9(3) – Crushed Surfacing Base Course, and have less than 5 percent (by dry weight) passing the US Standard No. 200 Sieve. The imported granular material should be placed in one lift and compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557.

4.3.4 Foundation Base Aggregate

Imported granular material placed at the base of excavations for spread footings, slabs-on-grade, and other below-grade structures should be clean, crushed rock or crushed gravel, and sand that is fairly well graded between coarse and fine. The granular materials should contain no deleterious materials, have a maximum particle size of 1½ inch, and meet WSDOT SS 9-03.12(1)A – Gravel Backfill for Foundations (Class A). The imported granular material should be placed in one lift and compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D1557.

4.3.5 Utility Trench Backfill

Trench backfill placed beneath, adjacent to, and for at least 2 feet above utility lines (i.e., the pipe zone) should consist of well-graded granular material with a maximum particle size of 1 inch and less than 10 percent by dry weight passing the US Standard No. 200 Sieve, and should meet the standards prescribed by WSDOT SS 9-03.12(3) – Gravel Backfill for Pipe Zone Bedding. The pipe zone backfill should be compacted to at least 90 percent of the maximum dry density as determined by ASTM D1557, or as required by the pipe manufacturer or local building department.

Within pavement areas or beneath building pads, the remainder of the trench backfill should consist of well-graded granular material with a maximum particle size of 1½ inches, less than 10 percent by dry weight passing the US Standard No. 200 Sieve, and should meet standards prescribed by WSDOT SS 9-03.19 – Bank Run Gravel for Trench Backfill. This material should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D1557, or as required by the pipe manufacturer or local building department. The upper 2 feet of the trench backfill should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D1557.

Outside of structural improvement areas (e.g., roadway alignments or building pads), trench backfill placed above the pipe zone should consist of excavated material free of wood waste, debris, clods, or rocks greater than 6 inches in diameter and meet WSDOT SS 9-03.14 – Borrow and WSDOT SS 9-03.15 – Native Material for Trench Backfill. This general trench backfill should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D1557, or as required by the pipe manufacturer or local building department.

5 ADDITIONAL SERVICES AND CONSTRUCTION OBSERVATIONS

In most cases, other services beyond completion of a final geotechnical engineering report are necessary or desirable to complete the project. Occasionally, conditions or circumstances arise that require additional work that was not anticipated when the geotechnical report was written. PBS offers a range of environmental, geological, geotechnical, and construction services to suit the varying needs of our clients.

PBS should be retained to review the plans and specifications for this project before they are finalized. Such a review allows us to verify that our recommendations and concerns have been adequately addressed in the design.

Satisfactory earthwork performance depends on the quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. We recommend that PBS be retained to observe general excavation, stripping, fill placement, footing subgrades, and/or pile installation. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

6 LIMITATIONS

This report has been prepared for the exclusive use of the addressee, and their architects and engineers, for aiding in the design and construction of the proposed development and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without express written consent of the client and PBS. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure correct implementation of the recommendations.

The opinions, comments, and conclusions presented in this report are based upon information derived from our literature review, field explorations, laboratory testing, and engineering analyses. It is possible that soil, rock, or groundwater conditions could vary between or beyond the points explored. If soil, rock, or groundwater conditions are encountered during construction that differ from those described herein, the client is responsible for ensuring that PBS is notified immediately so that we may reevaluate the recommendations of this report.

Unanticipated fill, soil and rock conditions, and seasonal soil moisture and groundwater variations are commonly encountered and cannot be fully determined by merely taking soil samples or completing explorations such as soil borings or test pits. Such variations may result in changes to our recommendations and may require additional funds for expenses to attain a properly constructed project; therefore, we recommend a contingency fund to accommodate such potential extra costs.

The scope of work for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

If there is a substantial lapse of time between the submission of this report and the start of work at the site, if conditions have changed due to natural causes or construction operations at or adjacent to the site, or if the basic project scheme is significantly modified from that assumed, this report should be reviewed to determine the applicability of the conclusions and recommendations presented herein. Land use, site conditions (both on and off site), or other factors may change over time and could materially affect our findings; therefore, this report should not be relied upon after three years from its issue, or in the event that the site conditions change.

7 REFERENCES

Evarts, R.C., et al. (2008). Geologic map of the Camas quadrangle, Clark County, Washington, and Multnomah County, Oregon: U.S. Geological Survey, Scientific Investigations Map SIM-3017, scale 1:24,000.

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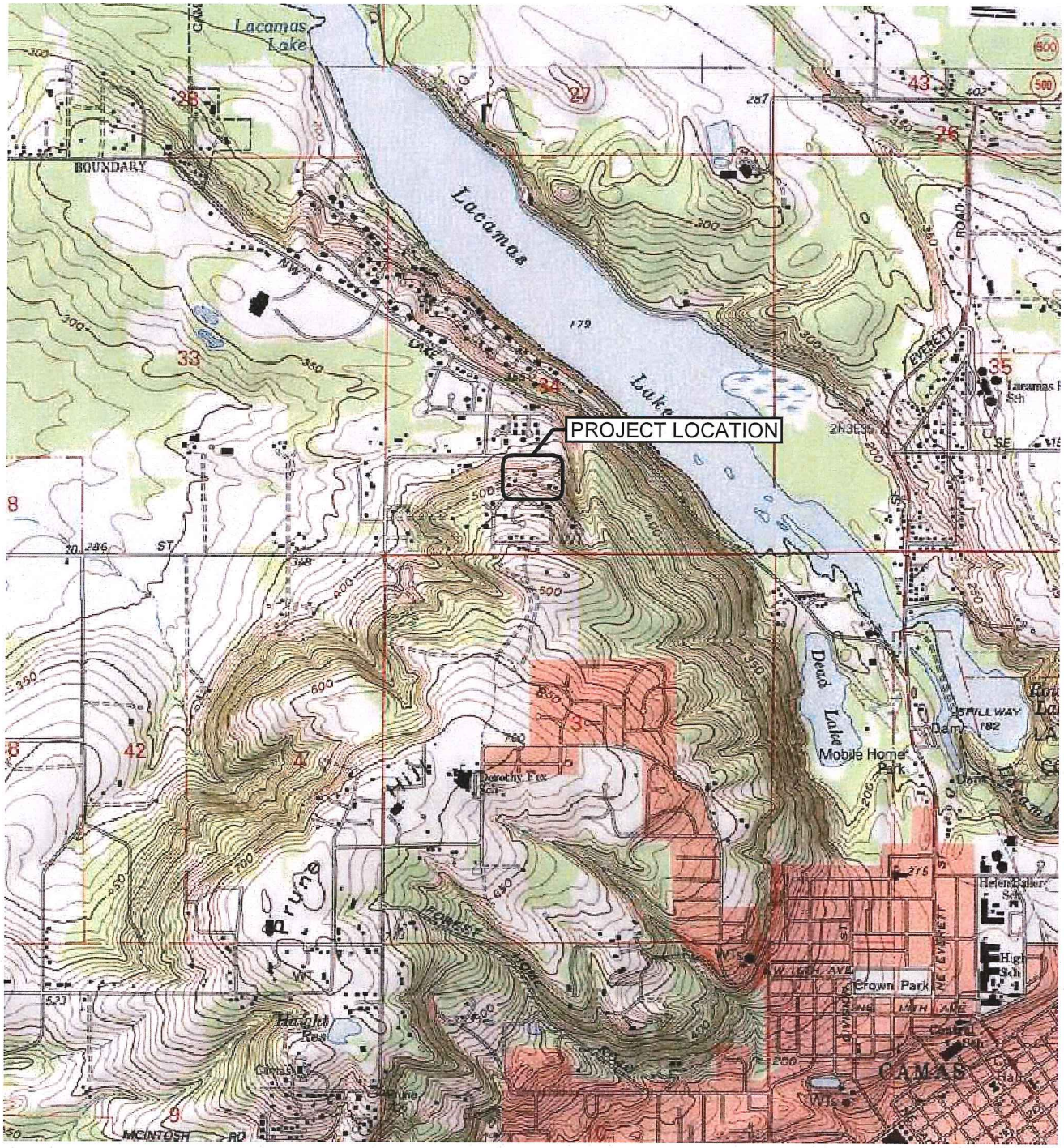
Washington State Department of Transportation (WSDOT SS). (2018). Standard Specifications for Road, Bridge, and Municipal Construction, M 41-10, Olympia, Washington.

FIGURES



SOURCE: USGS CAMAS, WA OR QUADRANGLE 1994.
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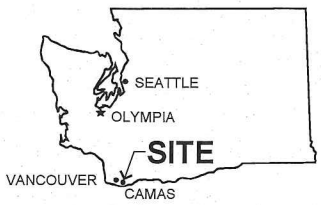


SCALE: 1" = 2,000'

0 1,000' 2,000' 4,000'

PREPARED FOR: WAVERLY HOMES

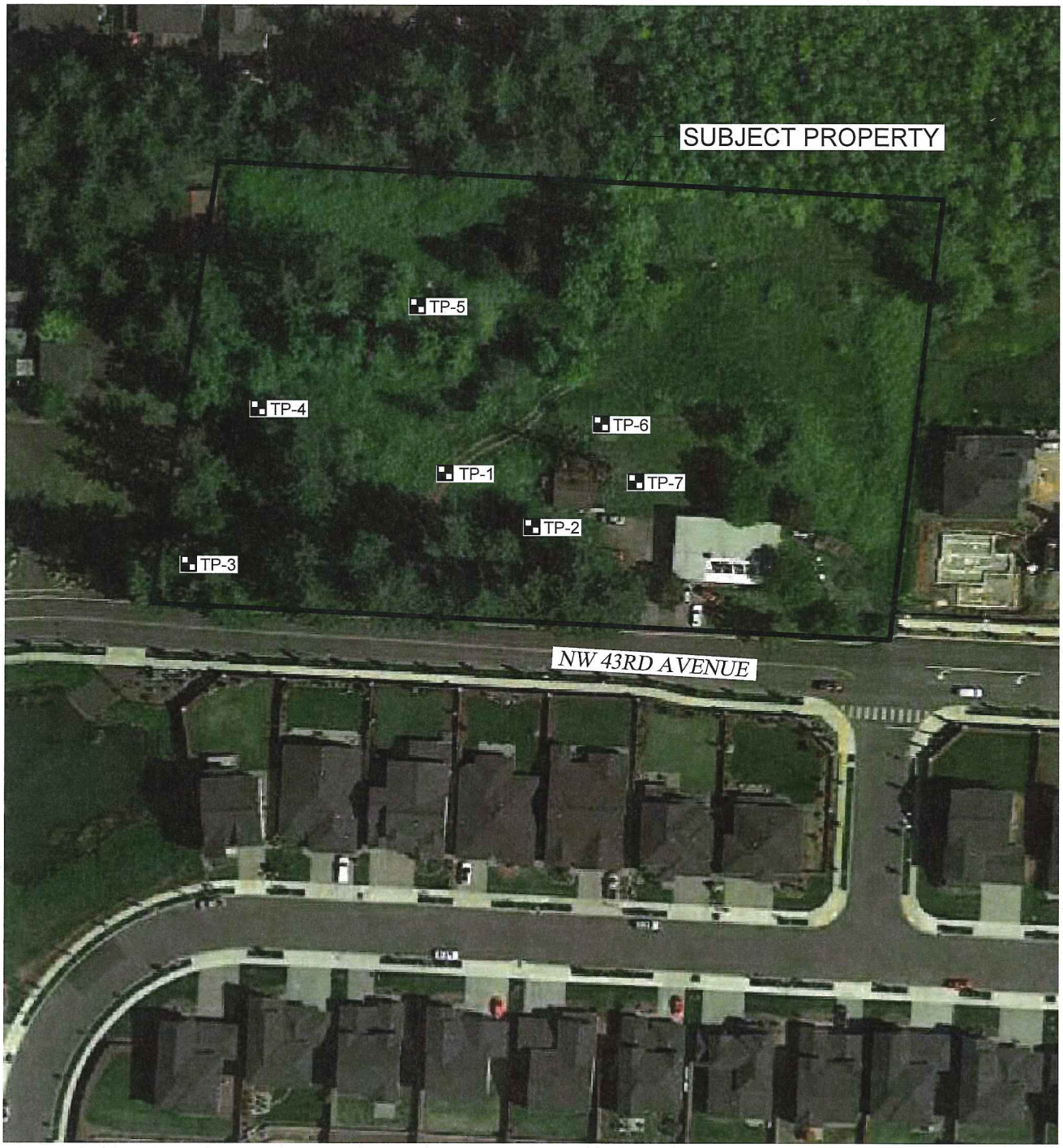
PBS

VICINITY MAP

2223 NW 43TH AVENUE
CAMAS, WASHINGTON

DEC 2017
75345.000

FIGURE
1



SOURCE: © 2017 GOOGLE EARTH PRO

LEGEND

TP-1 TEST PIT NUMBER AND APPROXIMATE LOCATION

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES

PBS

SITE PLAN

2223 NW 43TH AVENUE
CAMAS, WASHINGTON

DEC 2017
75345.000

FIGURE
2

APPENDIX A

Field Explorations

APPENDIX A: FIELD EXPLORATIONS

A1 GENERAL

PBS explored subsurface conditions at the project site by excavating seven test pits to depths of up to approximately 11 feet bgs on November 27, 2017. The approximate locations of the explorations are shown on Figure 2, Site Plan. The procedures used to advance the test pits, collect samples, and other field techniques are described in detail in the following paragraphs. Unless otherwise noted, all soil sampling and classification procedures followed engineering practices in general accordance with relevant ASTM procedures. "General accordance" means that certain local drilling/excavation and descriptive practices and methodologies have been followed.

A2 TEST PITS

A2.1 Excavation

The test pits were excavated by Dan J. Fischer Excavating, Inc., of Forest Grove, Oregon, using a John Deere 35C backhoe. The excavations were observed by a member of the PBS geotechnical staff who maintained a detailed log of the subsurface conditions and materials encountered during the course of the work.

A2.2 Sampling

Disturbed soil samples were collected in the test pit excavations at select depths and lithologic changes. The samples were obtained throughout the excavation from the 2-foot-wide excavation bucket. The disturbed soil samples were examined by the PBS geotechnical staff and then sealed in plastic bags for further examination and testing in our laboratory.

A2.4 Test Pit Logs

The test pit logs show the various types of materials that were encountered in the excavations and the depths where the materials and/or characteristics of these materials changed, although the changes may be gradual. Where material types and descriptions changed between samples, the contacts were interpreted. The types of samples taken during excavation, along with their sample identification number, are shown to the right of the classification of materials. The natural water (moisture) contents are shown further to the right. Measured seepage levels, if observed, are noted in the column to the right.

A3 MATERIAL DESCRIPTION

Initially, samples were classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. Afterward, the samples were reexamined in the PBS laboratory, various standard classification tests were conducted, and the field classifications were modified where necessary. The terminology used in the soil classifications and other modifiers are defined in Table A-1, Terminology Used to Describe Soil.

Table A-1
Terminology Used to Describe Soil

Soil Descriptions

Soils exist in mixtures with varying proportions of components. The predominant soil, i.e., greater than 50 percent based on total dry weight, is the primary soil type and is capitalized in our log descriptions (SAND, GRAVEL, SILT, or CLAY). Smaller percentages of other constituents in the soil mixture are indicated by use of modifier words in general accordance with the ASTM D2488-06 Visual-Manual Procedure. "General Accordance" means that certain local and common descriptive practices may have been followed. In accordance with ASTM D2488-06, group symbols (such as GP or CH) are applied on the portion of soil passing the 3-inch (75mm) sieve based on visual examination. The following describes the use of soil names and modifying terms used to describe fine- and coarse-grained soils.

Fine-Grained Soils (50% or greater fines passing 0.075 mm, No. 200 sieve)
The primary soil type, i.e., SILT or CLAY is designated through visual-manual procedures to evaluate soil toughness, dilatency, dry strength, and plasticity. The following outlines the terminology used to describe fine-grained soils, and varies from ASTM D2488 terminology in the use of some common terms.

Primary soil NAME, Symbols, and Adjectives			Plasticity Description	Plasticity Index (PI)
SILT (ML & MH)	**CLAY (CL & CH)**	**ORGANIC SOIL (OL & OH)**		
SILT		Organic SILT	Non-plastic	0 – 3
SILT		Organic SILT	Low plasticity	4 – 10
SILT/Elastic SILT	Lean CLAY	Organic SILT/ Organic CLAY	Medium Plasticity	10 – 20
Elastic SILT	Lean/Fat CLAY	Organic CLAY	High Plasticity	20 – 40
Elastic SILT	Fat CLAY	Organic CLAY	Very Plastic	>40

Modifying terms describing secondary constituents, estimated to 5 percent increments, are applied as follows:

Description	% Composition	
With Sand	% Sand ≥ % Gravel	15% to 25% plus No. 200
With Gravel	% Sand < % Gravel	
Sandy	% Sand ≥ % Gravel	≤30% to 50% plus No. 200
Gravelly	% Sand < % Gravel	

Borderline Symbols, for example CH/MH, are used when soils are not distinctly in one category or when variable soil units contain more than one soil type. **Dual Symbols,** for example CL-ML, are used when two symbols are required in accordance with ASTM D2488.

Soil Consistency terms are applied to fine-grained, plastic soils (i.e., PI ≥ 7). Descriptive terms are based on direct measure or correlation to the Standard Penetration Test N-value as determined by ASTM D1586-84, as follows. SILT soils with low to non-plastic behavior (i.e., PI < 7) may be classified using relative density.

Consistency Term	SPT N-value	Unconfined Compressive Strength	
		tsf	kPa
Very soft	Less than 2	Less than 0.25	Less than 24
Soft	2 – 4	0.25 – 0.5	24 – 48
Medium stiff	5 – 8	0.5 – 1.0	48 – 96
Stiff	9 – 15	1.0 – 2.0	96 – 192
Very stiff	16 – 30	2.0 – 4.0	192 – 383
Hard	Over 30	Over 4.0	Over 383

PBS

Table A-1
Terminology Used to Describe Soil

Soil Descriptions

Coarse - Grained Soils (less than 50% fines)

Coarse-grained soil descriptions, i.e., SAND or GRAVEL, are based on the portion of materials passing a 3-inch (75mm) sieve. Coarse-grained soil group symbols are applied in accordance with ASTM D2488-06 based on the degree of grading, or distribution of grain sizes of the soil. For example, well-graded sand containing a wide range of grain sizes is designated SW; poorly graded gravel, GP, contains high percentages of only certain grain sizes. Terms applied to grain sizes follow.

Material NAME	Particle Diameter	
	Inches	Millimeters
SAND (SW or SP)	0.003 – 0.19	0.075 – 4.8
GRAVEL (GW or GP)	0.19 – 3	4.8 – 75
Additional Constituents:		
Cobble	3 – 12	75 – 300
Boulder	12 – 120	300 – 3050

The primary soil type is capitalized, and the fines content in the soil are described as indicated by the following examples. Percentages are based on estimating amounts of fines, sand, and gravel to the nearest 5 percent. Other soil mixtures will have similar descriptive names.

Example: Coarse-Grained Soil Descriptions with Fines

>5% to < 15% fines (Dual Symbols)	≥15% to < 50% fines
Well graded GRAVEL with silt: GW-GM	Silty GRAVEL: GM
Poorly graded SAND with clay: SP-SC	Silty SAND: SM

Additional descriptive terminology applied to coarse-grained soils follow.

Example: Coarse-Grained Soil Descriptions with Other Coarse-Grained Constituents

Coarse-Grained Soil Containing Secondary Constituents	
With sand or with gravel	≥ 15% sand or gravel
With cobbles; with boulders	Any amount of cobbles or boulders.

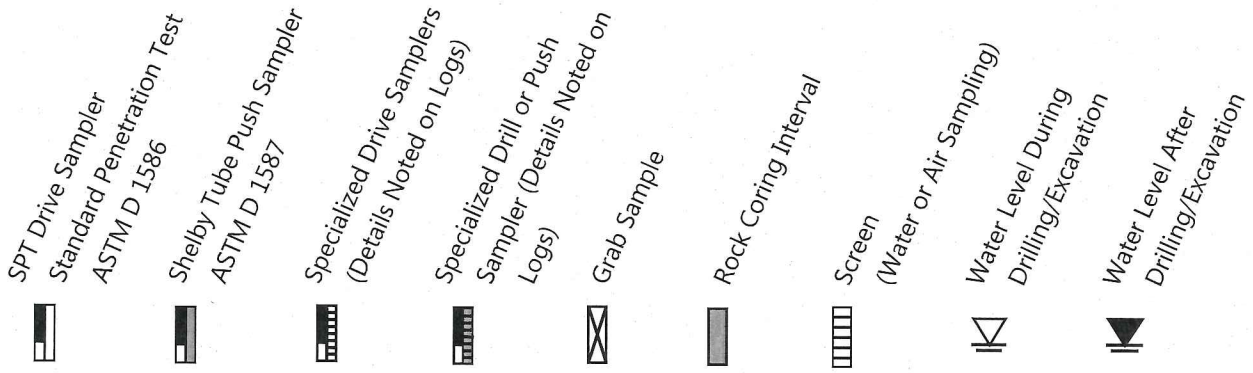
Cobble and boulder deposits may include a description of the matrix soils, as defined above.

Relative Density terms are applied to granular, non-plastic soils based on direct measure or correlation to the Standard Penetration Test N-value as determined by ASTM D1586-84.

Relative Density Term	SPT N-value
Very loose	0 – 4
Loose	5 – 10
Medium dense	11 – 30
Dense	31 – 50
Very dense	> 50

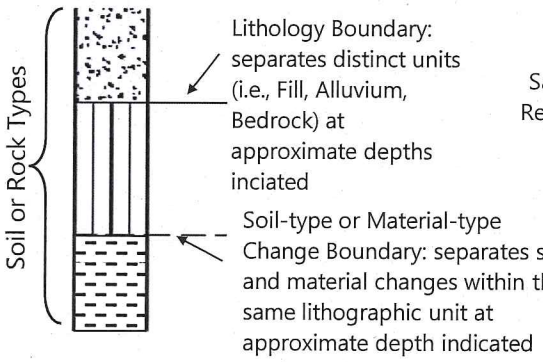
Table A-2
Key To Test Pit and Boring Log Symbols

SAMPLING DESCRIPTIONS

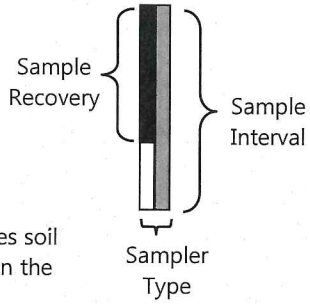


LOG GRAPHICS

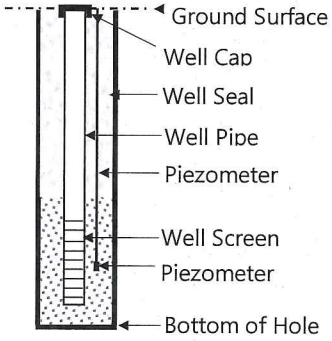
Soil and Rock



Sampling Symbols



Instrumentation Detail



Geotechnical Testing Acronym Explanations

PP	Pocket Penetrometer	HYD	Hydrometer Gradation
TOR	Torvane	SIEV	Sieve Gradation
DCP	Dynamic Cone Penetrometer	DS	Direct Shear
ATT	Atterberg Limits	DD	Dry Density
PL	Plasticity Limit	CBR	California Bearing Ratio
LL	Liquid Limit	RES	Resilient Modulus
PI	Plasticity Index	VS	Vane Shear
P200	Percent Passing US Standard No. 200 Sieve	bgs	Below ground surface
OC	Organic Content	MSL	Mean Sea Level
CON	Consolidation	HCL	Hydrochloric Acid
UC	Unconfined Compressive Strength		

Details of soil and rock classification systems are available on request.

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WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-1

APPROX. TEST PIT TP-1 LOCATION:
(See Site Plan)
Lat: 45.6108 Long: -122.4328

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0		Dark brown Lean CLAY (CL) with sand, gravel, and cobbles; medium plasticity; fine sand; fine to coarse, subangular gravel; moist	0.0		S-1		Surface Conditions: Blackberry Bushes
1.5		Brown Lean CLAY (CL) with sand; low to medium plasticity; fine sand; moist	1.5		S-2	●	
4.0		Final depth 4.0 feet bgs; test pit backfilled with excavated material to existing ground surface.	4.0		S-3		Seepage at 4 feet bgs
2.0, 6.0, 8.0, 10.0, 12.0, 14.0							

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A1
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TEST PIT LOG - 1 PER PAGE 75345.000 TP1-7 20171205.GPJ PBS DATATMPL GEO.GDT PRINT DATE: 12/22/17:RPG

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WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-2

APPROX. TEST PIT TP-2 LOCATION:
(See Site Plan)
Lat: 45.6103 Long: -122.4322

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.
0.0		Dark brown Lean CLAY (CL) with sand and gravel; medium plasticity; fine to coarse sand; fine to coarse, subangular gravel; moist
1.5		Brown Lean CLAY (CL) with sand; low plasticity; fine to medium sand; moist
2.0		becomes sandy; fine to coarse sand
6.0		rock encountered
8.0		Final depth 8.0 feet bgs; test pit backfilled with excavated material to existing ground surface.
10.0		
12.0		
14.0		

DEPTH | TESTING | SAMPLE TYPE SAMPLE ID | ◆ DYNAMIC CONE PENETROMETER ⊠ STATIC PENETROMETER ● MOISTURE CONTENT %

0.0 — S-1 — 1.5 — S-2 — S-3 — S-4 — 8.0

0 50 100

COMMENTS

Surface Conditions: Trees and Grass

Seepage and caving at 6 feet bgs

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A2
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WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-3

APPROX. TEST PIT TP-3 LOCATION:
(See Site Plan)
Lat: 45.6103 Long: -122.4326

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	COMMENTS
0.0		Brown Lean CLAY (CL) with sand; low plasticity; fine to coarse sand; moist	0.0		S-1	Surface Conditions: Grass
2.0		becomes sandy; fine sand			S-2	
4.0				P200	S-3	P200 = 65%
6.0						
8.0						Seepage at 8 feet bgs
10.0					S-4	
		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface.	11.0			
12.0						
14.0						

DYNAMIC CONE PENETROMETER
STATIC PENETROMETER
MOISTURE CONTENT %
0 50 100

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A3
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 75345.000 TP1-7 20171205.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 12/22/17 RPG

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CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-4

APPROX. TEST PIT TP-4 LOCATION:
(See Site Plan)
Lat: 45.6109 Long: -122.4333

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Dark brown Lean CLAY (CL) with sand, gravel, and rootlets; low plasticity; fine to coarse sand; fine, subrounded gravel; moist	0.0				Surface Conditions: Blackberry Bushes
		Dark brown Lean CLAY (CL) with sand; low plasticity; fine sand; moist	1.0		S-1		
2.0					S-2		
		becomes brown			S-3		
4.0		Final depth 4.0 feet bgs; test pit backfilled with excavated material to existing ground surface.	4.0				Seepage at 4 feet bgs
6.0							
8.0							
10.0							
12.0							
14.0							

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A4
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 75345.000 TP1-7 20171205.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 12/22/17 RPG

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WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-5

APPROX. TEST PIT TP-5 LOCATION:
(See Site Plan)

Lat: 45.6111 Long: -122.4329

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT %	COMMENTS
0.0		Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.				0 50 100	Surface Conditions: Blackberry Bushes
		Dark brown Lean CLAY (CL) with sand, gravel, and rootlets; low to medium plasticity; fine, rounded gravel; moist	0.0				
		Brown Lean CLAY (CL) with sand; medium plasticity; fine sand; moist	1.0		S-1 S-2		
2.0		becomes sandy; low plasticity					
		Brown Lean CLAY (CL); medium plasticity; moist	3.0		S-3		
4.0		Final depth 4.0 feet bgs; test pit backfilled with excavated material to existing ground surface.	4.0		S-4		Seepage at 4 feet bgs
6.0							
8.0							
10.0							
12.0							
14.0						0 50 100	

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A5
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 75345.000 TP1-7 20171205.GPJ PBS DATATMPL GEO.GDT PRINT DATE: 12/22/17:RPG

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WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-6

APPROX. TEST PIT TP-6 LOCATION:
(See Site Plan)

Lat: 45.6109 Long: -122.4324

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0		Brown Lean CLAY (CL) with sand; low plasticity; fine sand; moist	0.0		S-1		Surface Conditions: Grass
2.0		Dark brown sandy Lean CLAY (CL) with gravel; medium plasticity; fine to coarse sand; coarse, rounded gravel; moist	2.5		S-2		
4.0		becomes brown			S-3		Seepage 3.6 feet bgs
6.0		Final depth 6.0 feet bgs; test pit backfilled with excavated material to existing ground surface.	6.0				
8.0							
10.0							
12.0							
14.0							

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A6
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 75345.000 TP1-7 20171205.GPJ PBS DATATMPL GEO.GDT PRINT DATE: 12/22/17 RPG

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WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

TEST PIT TP-7

APPROX. TEST PIT TP-7 LOCATION:
(See Site Plan)
Lat: 45.6108 Long: -122.4323

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 – 50 – 100)	COMMENTS
0.0		Dark brown Lean CLAY (CL) with sand and rootlets; medium plasticity; fine sand; moist	0.0		S-1		Surface Conditions: Grass
2.0					S-2		Seepage and caving at 2.5 feet bgs
4.0		Brown sandy Lean CLAY (CL) with gravel; medium plasticity; fine to coarse sand; fine, subrounded gravel; moist	3.5	P200	S-3		P200 = 57%
6.0		Brown with orange and black mottles clayey SAND (SC) with gravel; medium plasticity; fine to coarse sand; fine, subrounded gravel; moist	6.0		S-4		
8.0		Final depth 6.75 feet bgs; test pit backfilled with excavated material to existing ground surface.	6.8				
10.0							
12.0							
14.0							

LOGGED BY: C. Van Fosson
COMPLETED: 11/27/17

EXCAVATED BY: Dan J. Fischer Excavating, Inc.
EXCAVATION METHOD: Deere 35C with Toothed Bucket

FIGURE A7
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 75345.000 TP1-7 20171205.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 12/22/17:RPG

APPENDIX B

Laboratory Testing

APPENDIX B: LABORATORY TESTING

B1 GENERAL

Samples obtained during the field explorations were examined in the PBS laboratory. The physical characteristics of the samples were noted and field classifications were modified where necessary. During the course of examination, representative samples were selected for further testing. The testing program for the soil samples included standard classification tests, which yield certain index properties of the soils important to an evaluation of soil behavior. The testing procedures are described in the following paragraphs. Unless noted otherwise, all test procedures are in general accordance with applicable ASTM standards. "General accordance" means that certain local and common descriptive practices and methodologies have been followed.

B2 CLASSIFICATION TESTS

B2.1 Visual Classification

The soils were classified in accordance with the Unified Soil Classification System with certain other terminology, such as the relative density or consistency of the soil deposits, in general accordance with engineering practice. In determining the soil type (that is, gravel, sand, silt, or clay) the term that best described the major portion of the sample is used. Modifying terminology to further describe the samples is defined in Table A-1, Terminology Used to Describe Soil, in Appendix A.

B2.2 Moisture (Water) Contents

Natural moisture content determinations were made on samples of the fine-grained soils (that is, silts, clays, and silty sands). The natural moisture content is defined as the ratio of the weight of water to dry weight of soil, expressed as a percentage. The results of the moisture content determinations are presented on the logs of the test pits in Appendix A and on Figure B1, Summary of Laboratory Data, in Appendix B.

B2.3 Grain-Size Analyses (P200 Wash)

No. 200 wash (P200) analyses were completed on samples to determine the portion of soil samples passing the No. 200 Sieve (i.e., silt and clay). The results of the P200 test results are presented on the exploration logs in Appendix A and on Figure B1, Summary of Laboratory Data, in Appendix B.

PBS

SUMMARY OF LABORATORY DATA

WAVERLY HOMES PROPOSED SUBDIVISION
CAMAS, WASHINGTON

PBS PROJECT NUMBER:
75345.000

SAMPLE INFORMATION				MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)	PLASTICITY INDEX (PERCENT)
TP-1	S-2	2	376.0	30.7							
TP-2	S-2	2	378.0	29.7							
TP-3	S-3	4.5	376.5	23.2				65			
TP-4	S-2	2	379.0	31.1							
TP-5	S-2	1.5	373.5	31.9							
TP-7	S-3	3.5	373.5	46.5				57			

FIGURE B1
Page 1 of 1

14. Title Report

First American Title Insurance Company

7710 NE Greenwood Drive, Suite 160
Vancouver, WA 98662

November 13, 2017

Brett Simpson
Waverly Homes, LLC
PMB 145 9208 NE Hwy 99, # 107
Vancouver, WA 98665

Phone: (360)524-2128
Fax: (360)314-6764

Title Officer:	Sherlyn Adair
Phone:	(360)553-3005
Fax No.:	(866)731-5624
E-Mail:	sadair@firstam.com
Order Number:	2970546

Escrow Number: 2970546

Buyer:

Owner:	Hidden Glen, LLC
Property:	2223 NW 43rd Avenue Camas, Washington 98607

Attached please find the following item(s):

Guarantee

Thank You for your confidence and support. We at First American Title Insurance Company maintain the fundamental principle:

Customer First!

First American

Guarantee

Subdivision Guarantee

ISSUED BY
First American Title Insurance Company

GUARANTEE NUMBER
5003353-2970546

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE LIMITS OF LIABILITY AND THE CONDITIONS AND STIPULATIONS OF THIS GUARANTEE,

FIRST AMERICAN TITLE INSURANCE COMPANY
a Nebraska corporation, herein called the Company

GUARANTEES

Waverly Homes, LLC

the Assured named in Schedule A against actual monetary loss or damage not exceeding the liability stated in Schedule A, which the Assured shall sustain by reason of any incorrectness in the assurances set forth in Schedule A.

First American Title Insurance Company

Dennis J. Gilmore
President

Jeffrey S. Robinson
Secretary

This jacket was created electronically and constitutes an original document

SCHEDULE OF EXCLUSIONS FROM COVERAGE OF THIS GUARANTEE

1. Except to the extent that specific assurances are provided in Schedule A of this Guarantee, the Company assumes no liability for loss or damage by reason of the following:
   (a) Defects, liens, encumbrances, adverse claims or other matters against the title, whether or not shown by the public records.
   (b) (1) Taxes or assessments of any taxing authority that levies taxes or assessments on real property; or, (2) Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not the matters excluded under (1) or (2) are shown by the records of the taxing authority or by the public records.
   (c) (1) Unpatented mining claims; (2) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (3) water rights, claims or title to water, whether or not the matters excluded under (1), (2) or (3) are shown by the public records.
2. Notwithstanding any specific assurances which are provided in Schedule A of this Guarantee, the Company assumes no liability for loss or damage by reason of the following:
   (a) Defects, liens, encumbrances, adverse claims or other matters affecting the title to any property beyond the lines of the land expressly described in the description set forth in Schedule (A), (C) or in Part 2 of this Guarantee, or title to streets, roads, avenues, lanes, ways or waterways to which such land abuts, or the right to maintain therein vaults, tunnels, ramps or any structure or improvements; or any rights or easements therein, unless such property, rights or easements are expressly and specifically set forth in said description.
   (b) Defects, liens, encumbrances, adverse claims or other matters, whether or not shown by the public records; (1) which are created, suffered, assumed or agreed to by one or more of the Assureds; (2) which result in no loss to the Assured; or (3) which do not result in the invalidity or potential invalidity of any judicial or non-judicial proceeding which is within the scope and purpose of the assurances provided.
   (c) The identity of any party shown or referred to in Schedule A.
   (d) The validity, legal effect or priority of any matter shown or referred to in this Guarantee.

GUARANTEE CONDITIONS AND STIPULATIONS

1. Definition of Terms.
The following terms when used in the Guarantee mean:
   (a) the "Assured": the party or parties named as the Assured in this Guarantee, or on a supplemental writing executed by the Company.
   (b) "land": the land described or referred to in Schedule (A)(C) or in Part 2, and improvements affixed thereto which by law constitute real property. The term "land" does not include any property beyond the lines of the area described or referred to in Schedule (A)(C) or in Part 2, nor any right, title, interest, estate or easement in abutting streets, roads, avenues, alleys, lanes, ways or waterways.
   (c) "mortgage": mortgage, deed of trust, trust deed, or other security instrument.
   (d) "public records": records established under state statutes at Date of Guarantee for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without knowledge.
   (e) "date": the effective date.

2. Notice of Claim to be Given by Assured Claimant.
An Assured shall notify the Company promptly in writing in case knowledge shall come to an Assured hereunder of any claim of title or interest which is adverse to the title to the estate or interest, as stated herein, and which might cause loss or damage for which the Company may be liable by virtue of this Guarantee. If prompt notice shall not be given to the Company, then all liability of the Company shall terminate with regard to the matter or matters for which prompt notice is required; provided, however, that failure to notify the Company shall in no case prejudice the rights of any Assured unless the Company shall be prejudiced by the failure and then only to the extent of the prejudice.

3. No Duty to Defend or Prosecute.
The Company shall have no duty to defend or prosecute any action or proceeding to which the Assured is a party, notwithstanding the nature of any allegation in such action or proceeding.

4. Company's Option to Defend or Prosecute Actions; Duty of Assured Claimant to Cooperate.
Even though the Company has no duty to defend or prosecute as set forth in Paragraph 3 above:
   (a) The Company shall have the right, at its sole option and cost, to institute and prosecute any action or proceeding, interpose a defense, as limited in (b), or to do any other act which in its opinion may be necessary or desirable to establish the title to the estate or interest as stated herein, or to establish the lien rights of the Assured, or to prevent or reduce loss or damage to the Assured. The Company may take any appropriate action under the terms of this Guarantee, whether or not it shall be liable hereunder, and shall not thereby concede liability or waive any provision of this Guarantee. If the Company shall exercise its rights under this paragraph, it shall do so diligently.
   (b) If the Company elects to exercise its options as stated in Paragraph 4(a) the Company shall have the right to select counsel of its choice (subject to the right of such Assured to object for reasonable cause) to represent the Assured and shall not be liable for and will not pay the fees of any other counsel, nor will the Company pay any fees, costs or expenses incurred by an Assured in the defense of those causes of action which allege matters not covered by this Guarantee.
   (c) Whenever the Company shall have brought an action or interposed a defense as permitted by the provisions of this Guarantee, the Company may pursue any litigation to final determination by a court of competent jurisdiction and expressly reserves the right, in its sole discretion, to appeal from an adverse judgment or order.
   (d) In all cases where this Guarantee permits the Company to prosecute or provide for the defense of any action or proceeding, an Assured shall secure to the Company the right to so prosecute or provide for the defense of any action or proceeding, and all appeals therein, and permit the Company to use, at its option, the name of such Assured for this purpose. Whenever requested by the Company, an Assured, at the Company's expense, shall give the Company all

reasonable aid in any action or proceeding, securing evidence, obtaining witnesses, prosecuting or defending the action or lawful act which in the opinion of the Company may be necessary or desirable to establish the title to the estate or interest as stated herein, or to establish the lien rights of the Assured. If the Company is prejudiced by the failure of the Assured to furnish the required cooperation, the Company's obligations to the Assured under the Guarantee shall terminate.

5. Proof of Loss or Damage.

In addition to and after the notices required under Section 2 of these Conditions and Stipulations have been provided to the Company, a proof of loss or damage signed and sworn to by the Assured shall be furnished to the Company within ninety (90) days after the Assured shall ascertain the facts giving rise to the loss or damage. The proof of loss or damage shall describe the matters covered by this Guarantee which constitute the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage. If the Company is prejudiced by the failure of the Assured to provide the required proof of loss or damage, the Company's obligation to such assured under the Guarantee shall terminate. In addition, the Assured may reasonably be required to submit to examination under oath by any authorized representative of the Company and shall produce for examination, inspection and copying, at such reasonable times and places as may be designated by any authorized representative of the Company, all records, books, ledgers, checks, correspondence and memoranda, whether bearing a date before or after Date of Guarantee, which reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Assured shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect and copy all records, books, ledgers, checks, correspondence and memoranda in the custody or control of a third party, which reasonably pertain to the loss or damage. All information designated as confidential by the Assured provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Assured to submit for examination under oath, produce other reasonably requested information or grant permission to secure reasonably necessary information from third parties as required in the above paragraph, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this Guarantee to the Assured for that claim.

6. Options to Pay or Otherwise Settle Claims: Termination of Liability.

In case of a claim under this Guarantee, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Liability or to Purchase the Indebtedness.

The Company shall have the option to pay or settle or compromise for or in the name of the Assured any claim which could result in loss to the Assured within the coverage of this Guarantee, or to pay the full amount of this Guarantee or, if this Guarantee is issued for the benefit of a holder of a mortgage or a lienholder, the Company shall have the option to purchase the indebtedness secured by said mortgage or said lien for the amount owing thereon, together with any costs, reasonable attorneys' fees and expenses incurred by the Assured claimant which were authorized by the Company up to the time of purchase.

Such purchase, payment or tender of payment of the full amount of the Guarantee shall terminate all liability of the Company hereunder. In the event after notice of claim has been given to the Company by the Assured the Company offers to purchase said indebtedness, the owner of such indebtedness shall transfer and assign said indebtedness, together with any collateral security, to the Company upon payment of the purchase price.

Upon the exercise by the Company of the option provided for in Paragraph (a) the Company's obligation to the Assured under this Guarantee for the claimed loss or damage, other than to make the payment required in that paragraph, shall terminate, including any obligation to continue the defense or prosecution of any litigation for which the Company has exercised its options under Paragraph 4, and the Guarantee shall be surrendered to the Company for cancellation.

(b) To Pay or Otherwise Settle With Parties Other Than the Assured or With the Assured Claimant.

To pay or otherwise settle with other parties for or in the name of an Assured claimant any claim assured against under this Guarantee, together with any costs, attorneys' fees and expenses incurred by the Assured claimant which were authorized by the Company up to the time of payment and which the Company is obligated to pay.

Upon the exercise by the Company of the option provided for in Paragraph (b) the Company's obligation to the Assured under this Guarantee for the claimed loss or damage, other than to make the payment required in that paragraph, shall terminate, including any obligation to continue the defense or prosection of any litigation for which the Company has exercised its options under Paragraph 4.

7. Determination and Extent of Liability.

This Guarantee is a contract of Indemnity against actual monetary loss or damage sustained or incurred by the Assured claimant who has suffered loss or damage by reason of reliance upon the assurances set forth in this Guarantee and only to the extent herein described, and subject to the Exclusions From Coverage of This Guarantee.

The liability of the Company under this Guarantee to the Assured shall not exceed the least of:

(a) the amount of liability stated in Schedule A or in Part 2;

(b) the amount of the unpaid principal indebtedness secured by the mortgage of an Assured mortgagee, as limited or provided under Section 6 of these Conditions and Stipulations or as reduced under Section 9 of these Conditions and Stipulations, at the time the loss or damage assured against by this Guarantee occurs, together with interest thereon; or

(c) the difference between the value of the estate or interest covered hereby as stated herein and the value of the estate or interest subject to any defect, lien or encumbrance assured against by this Guarantee.

8. Limitation of Liability.

(a) If the Company establishes the title, or removes the alleged defect, lien or encumbrance, or cures any other matter assured against by this Guarantee in a reasonably diligent manner by

any method, including litigation and the completion of any appeals therefrom, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused thereby.

(b) In the event of any litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals therefrom, adverse to the title, as stated herein.

(c) The Company shall not be liable for loss or damage to any Assured for liability voluntarily assumed by the Assured in settling any claim or suit without the prior written consent of the Company.

9. Reduction of Liability or Termination of Liability.

All payments under this Guarantee, except payments made for costs, attorneys' fees and expenses pursuant to Paragraph 4 shall reduce the amount of liability pro tanto.

10. Payment of Loss.

(a) No payment shall be made without producing this Guarantee for endorsement of the payment unless the Guarantee has been lost or destroyed, in which case proof of loss or destruction shall be furnished to the satisfaction of the Company.

(b) When liability and the extent of loss or damage has been definitely fixed in accordance with these Conditions and Stipulations, the loss or damage shall be payable within thirty (30) days thereafter.

11. Subrogation Upon Payment or Settlement.

Whenever the Company shall have settled and paid a claim under this Guarantee, all right of subrogation shall vest in the Company unaffected by any act of the Assured claimant.

The Company shall be subrogated to and be entitled to all rights and remedies which the Assured would have had against any person or property in respect to the claim had this Guarantee not been issued. If requested by the Company, the Assured shall transfer to the Company all rights and remedies against any person or property necessary in order to perfect this right of subrogation. The Assured shall permit the Company to sue, compromise or settle in the name of the Assured and to use the name of the Assured in any transaction or litigation involving these rights or remedies.

If a payment on account of a claim does not fully cover the loss of the Assured the Company shall be subrogated to all rights and remedies of the Assured after the Assured shall have recovered its principal, interest, and costs of collection.

12. Arbitration.

Unless prohibited by applicable law, either the Company or the Assured may demand arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Assured arising out of or relating to this Guarantee, any service of the Company in connection with its issuance or the breach of a Guarantee provision or other obligation. All arbitrable matters when the Amount of Liability is $2,000,000 or less shall be arbitrated at the option of either the Company or the Assured. All arbitrable matters when the amount of liability is in excess of $2,000,000 shall be arbitrated only when agreed to by both the Company and the Assured. The Rules in effect at Date of Guarantee shall be binding upon the parties. The award may include attorneys' fees only if the laws of the state in which the land is located permits a court to award attorneys' fees to a prevailing party. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof.

The law of the situs of the land shall apply to an arbitration under the Title Insurance Arbitration Rules.

A copy of the Rules may be obtained from the Company upon request.

13. Liability Limited to This Guarantee; Guarantee Entire Contract.

(a) This Guarantee together with all endorsements, if any, attached hereto by the Company is the entire Guarantee and contract between the Assured and the Company. In interpreting any provision of this Guarantee, this Guarantee shall be construed as a whole.

(b) Any claim of loss or damage, whether or not based on negligence, or any action asserting such claim, shall be restricted to this Guarantee.

(c) No amendment of or endorsement to this Guarantee can be made except by a writing endorsed hereon or attached hereto signed by either the President, a Vice President, the Secretary, an Assistant Secretary, or validating officer or authorized signatory of the Company.

14. Notices, Where Sent.

All notices required to be given the Company and any statement in writing required to be furnished the Company shall include the number of this Guarantee and shall be addressed to the Company at **First American Title Insurance Company, Attn: Claims National Intake Center, 1 First American Way, Santa Ana, California 92707 Claims.NIC@firstam.com Phone: 888-632-1642 Fax: 877-804-7606**

First American Title

First American

Schedule A

Subdivision Guarantee

ISSUED BY
First American Title Insurance Company

GUARANTEE NUMBER
2970546

Order No.: 2970546 | Liability: $2,000.00 | Fee: $350.00 Tax: $29.40

Name of Assured: Waverly Homes, LLC

Date of Guarantee: November 09, 2017

The assurances referred to on the face page hereof are:

1. Title is vested in:

   HIDDEN GLEN, LLC, A WASHINGTON LIMITED LIABILITY COMPANY

2. That, according to the public records relative to the land described in Schedule C attached hereto (including those records maintained and indexed by name), there are no other documents affecting title to said land or any portion thereof, other than those shown under Record Matters in Schedule B.

3. The following matters are excluded from the coverage of this Guarantee

A. Unpatented Mining Claims, reservations or exceptions in patents or in acts authorizing the issuance thereof.

B. Water rights, claims or title to water.

C. Tax Deeds to the State of Washington.

D. Documents pertaining to mineral estates.

4. No guarantee is given nor liability assumed with respect to the validity, legal effect or priority of any matter shown herein.

5. This Guarantee is restricted to the use of the Assured for the purpose of providing title evidence as may be required when subdividing land pursuant to the provisions of Chapter 58.17, R.C.W., and the local regulations and ordinances adopted pursuant to said statute. It is not to be used as a basis for closing any transaction affecting title to said property.

6. Any sketch attached hereto is done so as a courtesy only and is not part of any title commitment, guarantee or policy. It is furnished solely for the purpose of assisting in locating the premises and First American expressly disclaims any liability which may result from reliance made upon it.

RECORD MATTERS

1. Municipal assessments, if any, levied by the City of Camas.

2. Terms, covenants, conditions, restrictions, easements, boundary discrepancies and encroachments as contained in recorded Lot Line Adjustment (Boundary Line Revisions):
   Recorded: October 18, 2018
   Recording Information: 5219362

Informational Notes, if any

A. General taxes for the year 2017, which have been paid.

Tax Account No.:	177887-000	
Code Area:	117000	
Amount:	$	5,950.92
Assessed Land Value:	$	435,289.00
Assessed Improvement Value:	$	10,990.00

First American

Schedule C

Subdivision Guarantee

ISSUED BY
First American Title Insurance Company

GUARANTEE NUMBER
2970546

The land in the County of Clark, State of Washington, described as follows:

A PORTION OF THAT CERTAIN TRACT OF LAND CONVEYED TO JOHN R. ZAGUNIS BY STATUTORY WARRANTY DEED RECORDED UNDER AUDITOR'S FILE NO. 9305120205, RECORDS OF CLARK COUNTY, WASHINGTON, LOCATED IN A PORTION OF THE NORTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN, CITY OF CAMAS, CLARK COUNTY, WASHINGTON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF THE SOUTHWEST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 2 NORTH, RANGE 3 EAST OF THE WILLAMETTE MERIDIAN, CLARK COUNTY, WASHINGTON;
THENCE NORTH 01°58'23" EAST ALONG THE WEST LINE OF SAID SECTION 34, FOR A DISTANCE OF 20.00 FEET TO A POINT ON THE NORTH RIGHT OF WAY LINE OF NW 43RD AVENUE;
THENCE SOUTH 88°01'37" EAST ALONG SAID NORTH RIGHT OF WAY LINE FOR A DISTANCE OF 304.00 FEET TO THE TRUE POINT OF BEGINNING;
THENCE CONTINUING SOUTH 88°01'37" EAST ALONG SAID NORTH RIGHT OF WAY LINE, FOR A DISTANCE OF 452.41 FEET, MORE OR LESS, TO THE SOUTHEAST CORNER OF SAID ZAGUNIS TRACT;
THENCE NORTH 05°55'23" EAST ALONG THE EAST LINE OF SAID ZAGUNIS TRACT FOR A DISTANCE OF 308.54 FEET TO THE SOUTH LINE OF THE "LAKE POINT 1" SUBDIVISION, ACCORDING TO THE PLAT THEREOF, RECORDED IN BOOK H OF PLATS, OF PAGE 772, RECORDS OF CLARK COUNTY, WASHINGTON;
THENCE NORTH 88°07'13" WEST ALONG THE SOUTH LINE OF "LAKE POINT 1" SUBDIVISION AND THE SOUTH LINE OF THE "LAKE POINT 2" SUBDIVISION (H/915) AND THE SOUTH LINE OF THE "LAKE POINT 4" SUBDIVISION (H/998), FOR A DISTANCE OF 473.67 FEET;
THENCE SOUTH 01°58'23" WEST, PARALLEL WITH SAID SECTION LINE FOR A DISTANCE OF 307.04 FEET TO THE TRUE POINT OF BEGINNING.

SITUATED IN CLARK COUNTY, STATE OF WASHINGTON.

2. Application Form and Fees

Community Development Department | Planning
616 NE Fourth Avenue | Camas, WA 98607
(360) 817-1568
communitydevelopment@cityofcamas.us

General Application Form **Case Number:**

Applicant Information

Applicant/Contact: PBS Engineering and Environmental – Andy Nuttbrock, RLA Phone: (360) 695-2116

Address: 415 W 6th Street, Suite 601 (*Street Address*) andy.nuttbrock@pbsusa.com (*E-mail Address*)

Vancouver (*City*) WA (*State*) 98660 (*ZIP Code*)

Property Information

Property Address: 2223 NW 43rd Avenue (*Street Address*) 177887000 (*County Assessor # / Parcel #*)

Camas (*City*) WA (*State*) 98607 (*ZIP Code*)

Zoning District R-7.5 Site Size 3.48 Acres (151,589 SF)

Description of Project

Brief description: The applicant requests approval to subdivide the property into 12 single-family residential lots.

Are you requesting a consolidated review per CMC 18.55.020(B)? YES [XX] NO [ ]

Permits Requested: [ ] Type I [ ] Type II [XX] Type III [ ] Type IV, BOA, Other

Property Owner or Contract Purchaser

Owner's Name: Simpson (*Last*) Brett (*First*) Phone: (360) 314-6877

Address: 3205 NE 78th Street, Suite 10 (*Street Address*) (*Apartment/Unit #*)

E mail Address: Vancouver (*City*) WA (*State*) 98665 (*Zip*)

Signature

I authorize the applicant to make this application. Further, I grant permission for city staff to conduct site inspections of the property.

Signature: Date: 2/26/18

Note: If multiple property owners are party to the application, an additional application form must be signed by each owner. If it is impractical to obtain a property owner signature, then a letter of authorization from the owner is required.

Date Submitted: Pre-Application Date:	
Staff: Related Cases # [ ] **Electronic Copy Submitted**	**Validation of Fees**

Revised: 11/30/17

Application Checklist and Fees [January 1, 2018]

◊	Annexation	$274 - 10% petition; $1,372 - 60% petition	001-00-345-890-00		$
◊	Appeal Fee		001-00-345-810-00	$369.00	$
◊	Archaeological Review		001-00-345-810-00	$127.00	$127.00
◊	Binding Site Plan	$1,742 + $22 per unit	001-00-345-810-00		$
◊	Boundary Line Adjustment		001-00-345-810-00	$95.00	$
◊	Comprehensive Plan Amendment		001-00-345-810-00	$1,826.00	$
◊	Conditional Use Permit				
	Residential	$3,167 + $99 per unit	001-00-345-810-00		$
	Non-Residential		001-00-345-810-00	$4,011.00	$
◊	Continuance of Public Hearing		001-00-345-810-00	$317.00	$
◊	Critical or Sensitive Areas (fee per type)		001-00-345-810-00	$718.00	$1,436.00
	(**wetlands**, steep slopes or potentially unstable soils, streams and watercourses, **vegetation removal**, wildlife habitat)				
◊	Design Review				
	Minor		001-00-345-810-00	$401.00	$
	Committee		001-00-345-810-00	$1,847.00	$
◊	Development Agreement	$2,000 first hearing; $500 ea. add'l hearing/continuance	001-00-345-810-00		$
◊	Engineering Department Review				
	Review Fee	3% of estimated construction costs $500,000	001.00.345.830.20		$15,000.00
	Modification to Approved Construction Plans		001.00.345.810.00	$391.00	$
◊	Fire Department Review				
	Short Plat or other Development Review		115-09-345-830-10	$132.00	$
	Short Plat or other Development Inspection		115-09-345-830-10	$132.00	$
	Subdivision or PRD Review		115-09-345-830-10	$164.00	$164.00
	Subdivision or PRD Inspection		115-09-345-830-10	$164.00	$
	Site Plan Review (commercial)		115-09-345-830-10	$195.00	$
	Site Plan Inspection (commercial)		115-09-345-830-10	$195.00	$
◊	Home Occupation				
	Minor - Notification (No fee)			$0.00	
	Major		001-00-321-900-00	$64.00	$
◊	LI/BP Development	$4,011 + $38.00 per 1000 sf of GFA	001-00-345-810-00		$
◊	Minor Modifications to approved development		001-00-345-810-00	$185.00	$
◊	Planned Residential Development	$32 per unit + subdivision fees	001-00-345-810-00		$
◊	Plat, Preliminary				
	Short Plat	4 lots or less: $1795.00 per lot	001-00-345-810-00		$
	Short Plat	5 lots or more: $6,650 + $234 per lot	001-00-345-810-00		$
	Subdivision	$6,650 + $234 per lot	001-00-345-810-00		$9,458.00
◊	Plat, Final:				
	Short Plat		001-00-345-810-00	$185.00	$
	Subdivision		001-00-345-810-00	$1,108.00	$
◊	Plat Modification/Alteration		001-00-345-810-00	$570.00	$
◊	Pre-Application (Type III or IV Permits)				
	No fee for Type I or II				
	General		001-00-345-810-00	$327.00	$
	Subdivision		001-00-345-810-00	$844.00	$
◊	SEPA		001-00-345-890-00	$749.00	$749.00
◊	Shoreline Permit		001-00-345-890-00	$813.00	$
◊	Sign Permit				
	General Sign Permit	(Exempt if building permit is required)	001.00.322.400.00	$37.00	$
	Master Sign Permit		001.00.322.400.00	$116.00	$
◊	Site Plan Review				
	Residential	$1,066 + $31 per unit	001-00-345-830-10		$
	Non-Residential	$2,665 + $63 per 1000 sf of GFA	001-00-345-830-10		$
	Mixed Residential/Non Residential	$3,758 + $31 per res unit + $63 per 1000 sf of GFA	001-00-345-830-10		$
◊	Temporary Use Permit		001-00-321-990-00	$74.00	$
◊	Variance (Minor or Major)		001-00-345-810-00	$644.00	$
◊	Zone Change (single tract)		001-00-345-810-00	$1,815.00	$

Adopted by RES 1023 Aug 2005; Revised by RES 1113 Sept 2007; Revised by RES 1163 Oct 2009; Revised by RES 1204 Nov 2010; Revised by RES 15-001 Jan 2015; Revised by RES 15-007 May 2015; Revised by RES 15-018 Dec 2015; Revised by RES 16-019 Nov 2016; Revised by RES 17-015 Nov 2017

For office use only

Total Fees Due: $ 26,934.00

9. Preliminary Stormwater Technical Information Report

43rd Avenue Subdivision
2223 NW 43rd Avenue
Camas, Washington

PRELIMINARY TECHNICAL INFORMATION REPORT

March 6, 2018

Prepared for:
Waverly Homes, LLC
Brad Sheets
3205 NE 78th Street, Suite 10
Vancouver, WA 98665
(360) 216-6462

Prepared by:
PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
(360) 695-3488

TABLE OF CONTENTS

TABLES

APPENDICES

CERTIFICATE OF ENGINEER

43rd Avenue Subdivision

Preliminary Technical Information Report

The technical information and data contained in this report were prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

This document was:

Prepared by: _____

Daniel Skolrud, Design Technician IV

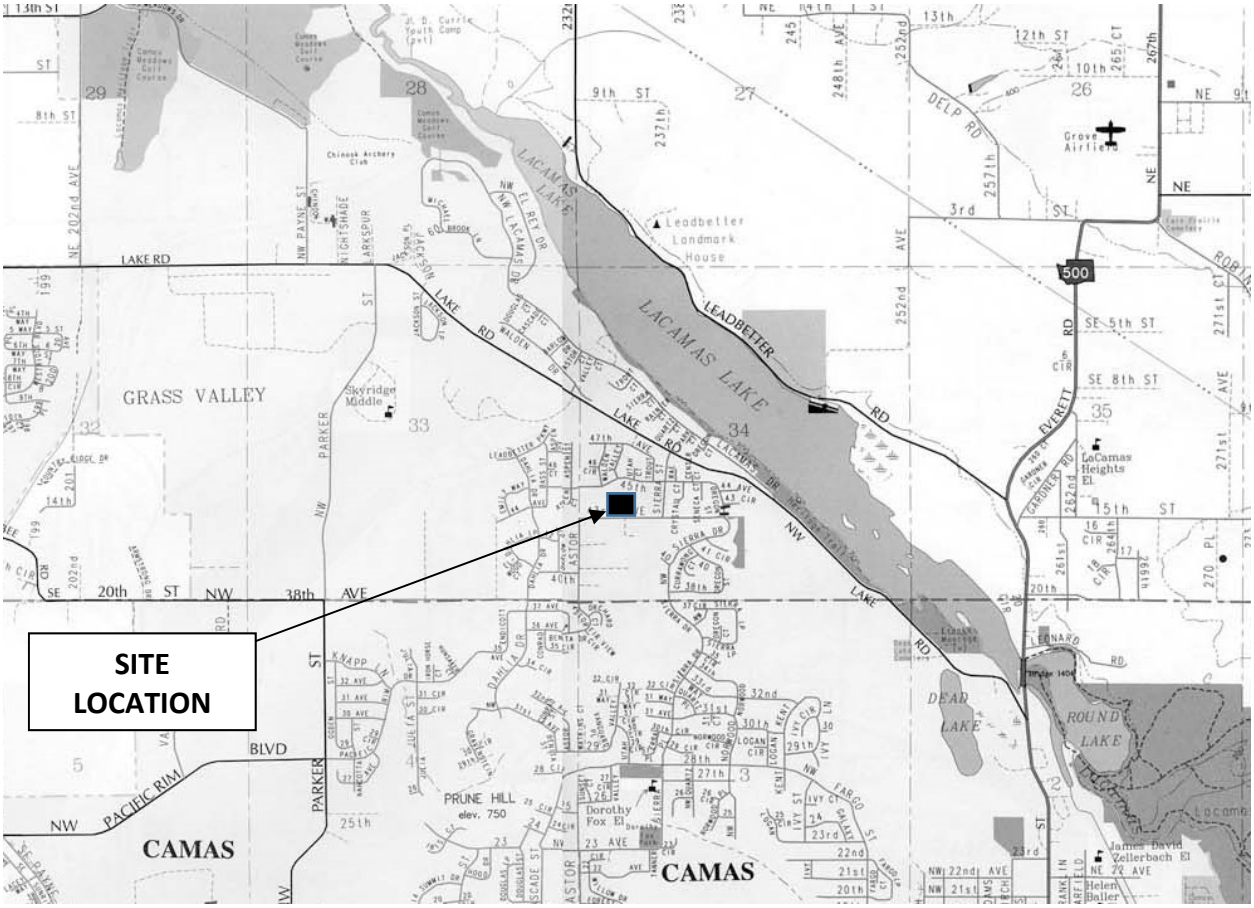
Approved by: _____

Richard E. Darland, P.E.

SITE MAPS

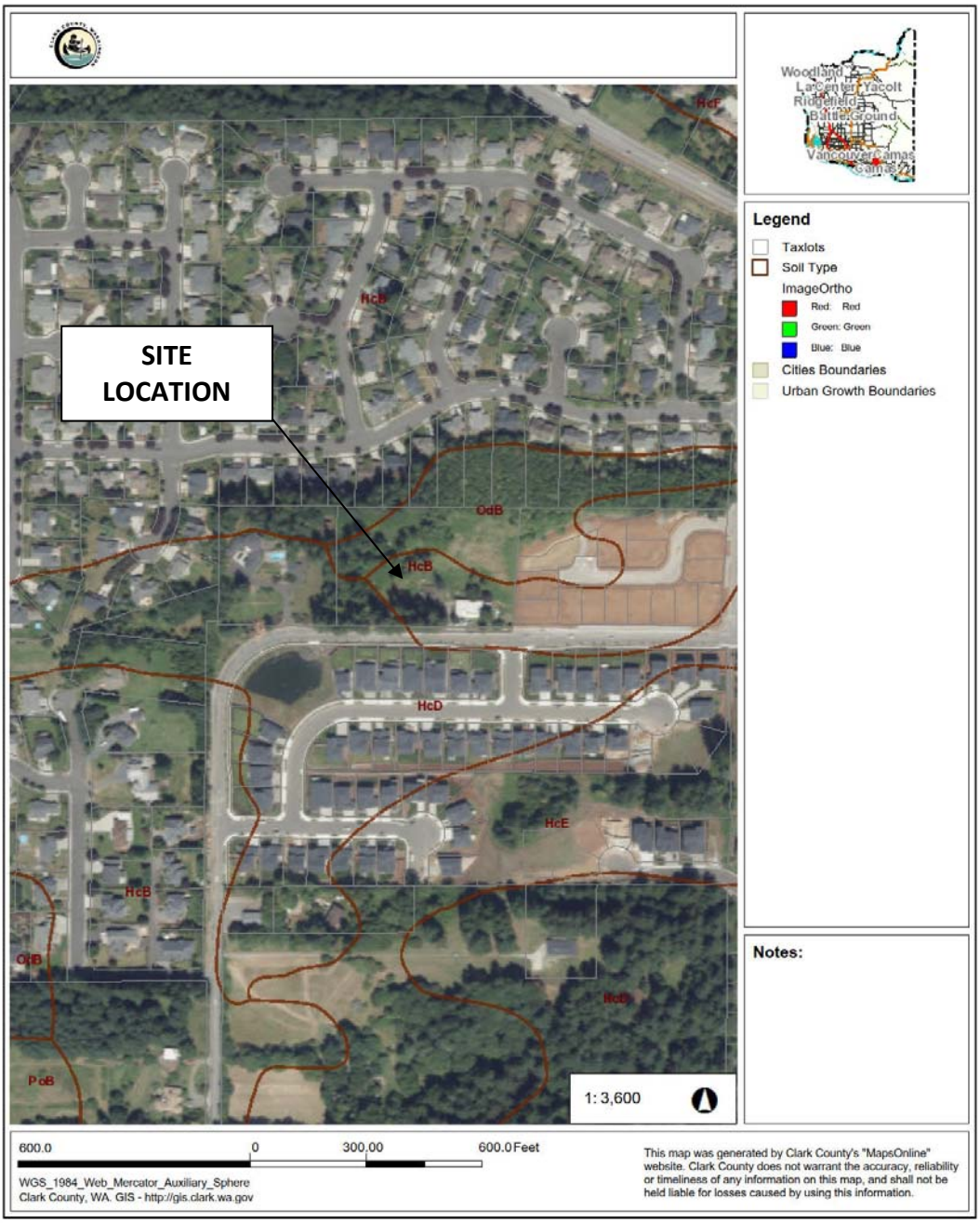
Site Location Map

Source: Clark County Road Atlas
North is to top of the page
SW ¼ Section 34 T2N, R3E



Soils Map

Soils Map (Clark County GIS)
Site Soils Include: Hesson Clay Loam (HcB), Hesson Clay Loam (HcD), Odne Silt Loam (OdB)



SECTION A – PROJECT OVERVIEW

The 43rd Avenue Subdivision proposes to divide 3.27 acres into 12 single family lots. The property identification number is 177887-000 and is located SW ¼ of Section 34, T2N, R3E, W.M. The project is located to the north of NW 43rd Avenue and west of NW Sierra Street. The address for the site is 2223 NW 43rd Avenue, Camas, Washington.

The site is bordered by NW 43rd Avenue to the south and residential developments on the north, east and west, with a wetland in the northeast corner of the site. The property is roughly rectangular. The site is currently occupied by a single residence and associated outbuildings and is covered with grass, shrubs and trees. Based on topographical data, the site slopes generally downward to the north. Natural drainages have created a wetland on the north side of the site.

This project proposes to develop the parcel into a residential subdivision with 12 residential lots, stormwater treatment and a detention facility. The project will also construct the roadways within the subdivision as well as the widening of NW 43rd Avenue along the frontage of the project site. Sanitary sewer, storm sewer, water and dry utilities will be installed and extended to each individual lot. Nearly all existing vegetation will be removed except for the wetland and wetland buffer areas.

There are no known agricultural drain tiles or areas of potential slope instability. All wells and septic tanks will be abandoned with the construction of the development.

The existing stormwater runoff from the site generally drains toward the western property line to an existing culvert.

The site's development plan proposes to grade the site to collect the site runoff and convey it to the proposed stormwater system which will treat and detain the stormwater through the use of FloGard Perk Filters™ and a detention pond.

The FloGard Perk Filters™ and detention pond will be constructed to provide stormwater treatment and detention per the Camas Stormwater Design Standards Manual.

SECTION B – MINIMUM REQUIREMENTS

The existing impervious surface on the site is less than 35% and the project will add more than 5,000 square feet of new impervious surface, therefore minimum requirements 1-9 will apply to this project.

Table 1 – Surface Totals

Description	Area (Acres)
Existing Impervious Surface	0.311
New Impervious Surface	1.438
Replaced Impervious Surface	0.152
Native Vegetation Converted to Lawn or Landscaping	1.632
Native Vegetation Converted to Pasture	0.000
Land Disturbing Activity	3.055

SECTION C – SOILS EVALUATION

The Natural Resources Conservation Service (NRCS) soils map indicates the onsite soils to be Hesson Clay Loam (HcB), Hesson Clay Loam (HcD) and Odne Silt Loam (OdB). These soils do not generally drain adequately for infiltration of stormwater runoff to be used as a BMP. The Hesson soils are considered hydrologic soils group C and the Odne soils are hydrologic soil group D.

A Geotechnical Engineering Report was prepared for the project by PBS Engineering and Environmental, Inc. dated 12/28/2017 and has been included in this report under Appendix C. Groundwater seepage was encountered on the site between 2.5 feet to 8 feet below ground surface (bgs). Test pit 4 (TP-4), which is near the stormwater facility encountered groundwater seepage at a depth of 4 feet below ground surface.

Infiltration testing was performed by PBS at TP-1 and TP-2 using the cased-hole falling head infiltration test. The infiltration tests were conducted within a 6 inch inside diameter pipe that was filled with water to achieve a minimum 1 foot high column of water. After a period of saturation, the height of the water column in the pipe was then measured initially and at regular, timed intervals. The two infiltration tests performed resulted with an infiltration rate of 0 inches per hour.

French drains and an impermeable liner will be installed at the stormwater facility to prevent groundwater from seeping into the detention pond.

SECTION D – SOURCE CONTROL

As a single family residential development, this project does not necessitate any special source control measures due to the low risks associated with the project. Source control for this site will become the responsibility of the future homeowners.

SECTION E – ONSITE STORMWATER MANAGEMENT BMPs

The stormwater runoff from the site will be collected and conveyed to the detention pond located along the western edge of the project. The volume of the detention pond was determined by the Western Washington Hydrology Model. Stormwater runoff from the site will be collected and treated in a Perk Filter™ Treatment Vault located next to the detention pond. After the stormwater runoff is treated in the Perk Filter Treatment Vault, it will be discharged into the detention pond. The Perk Filter™ treatment system has a General Use Level Designation (GULD) for basic and phosphorus treatment.

SECTION F – RUNOFF TREATMENT ANALYSIS AND DESIGN

As mentioned in Section E above, the runoff from the site will be treated by the Perk Filter Treatment Vault that has been approved for basic and phosphorus treatment.

A geotechnical report has been prepared for the site and was mentioned in Section C above and a copy of the report will be included in Appendix C.

The treatment of stormwater runoff for the development will utilize Kristar/Oldcastle Precast, Inc. FloGard Perk Filter™ (using ZPC Filter Media). The GULD for the Perk Filter™ allows basic and phosphorus treatment using a zeolite-perlite-carbon (ZPC) filter media sized for a hydraulic loading rate of no more than 1.5 gpm/ft^2 of media surface area. The design flow rate per cartridge is shown in the Table 2 below.

Table 2 - Design Flowrate per Cartridge

Effective Cartridge Height (inches)	12	18
Cartridge Flowrate (gpm/cartridge)	6.8	10.2

The water quality flow for proposed site in 0.3114 cubic feet per second (cfs). The treatment vault has been sized to treat the stormwater runoff with a 9'x16' vault with 21 cartridges. The effective cartridge height will be 12" and a cartridge flow rate of 6.8 gpm/cartridge or 0.15 cfs per cartridge.

Table 3 lists the areas of pollution-generating pervious surfaces (PGPS) and pollution-generating impervious surfaces (PGIS) for the proposed development. Drainage basin maps for the pre-development and post-development basins are in Appendix A.

Table 3 - Pollution Generating Surfaces

	Basin Area (Acres)	Impervious Area (Acres)	Pervious Area (Acres)
Basin 1	3.055	1.327	1.728

SECTION G – FLOW CONTROL ANALYSIS AND DESIGN

The site has one threshold drainage area (TDA). The flow control for the TDA will utilize a detention pond with a control riser to meet the minimum flow requirements. Calculations are provided in Appendix B.

The geotechnical report noted that infiltration tests were performed onsite and determined the rate to be 0 inches per hour.

The detention pond is located on the western boundary of proposed development. The dimensions at the bottom of the detention pond will be 20'x24' with 3:1 side slopes. The access road to the facility will be on northern portion of Tract 'C' as well as the control manhole and emergency overflow for the detention pond.

SECTION H – WETLANDS PROTECTION

The northeast corner of the site has a Category IV wetland. The water from the wetland will flow to a ditch inlet to the northern end of Tract 'E'. The water will be conveyed through pipes and be discharged to the existing 15" pipe located near the stormwater facility. The wetland conveyance pipe will discharge the water at the point the water left the property prior to the development of the site.

Silt fence will be installed along the proposed wetland buffer to protect the area from sediment from the construction area.

APPENDICES

Appendix A
Basin Delineation Maps

LAKE POINTE SUBDIVISION

EXISTING FLOW (TYP)

THRESHOLD DISCHARGE AREA (TYP)

HcB
HESSON CLAY LOAM

OdB
ODNE SILT LOAM

EXISTING CONTOUR (TYP)

SOIL DELINEATION (TYP)

EXISTING WETLAND DELINEATION

SIERRA MEADOWS SUBDIVISION

EXISTING 15" SD

EXISTING OUTBUILDING

EXISTING WETLAND BUFFER

EXISTING HOUSE

177894000

HcD
HESSON CLAY LOAM

HcB
HESSON CLAY LOAM

EXTG 24" SD

NE 43RD AVE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Filename: L:\Projects\71000_FromOtherOffices\75000\75300-75399\75345\75345-000\Civil\CAD\Working\Sheets\75345-000_BSN-01.dwg Layout Tab: BSN-01 User: Dan Skolrud CAD Plot DateTime: 3/6/2018 10:24:43 AM

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
360.695.3488
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PBS

PRE-DEVELOPED DRAINAGE BASIN MAP FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

DESIGNED: DPS

CHECKED: RED

MAR 2018
75345.000

SHEET ID
BSN-01

SHEET 1 OF 2

LAKE POINTE SUBDIVISION

PROPOSED WETLAND BOUNDARY (TYP)

THRESHOLD DISCHARGE AREA (TYP)

TRACT 'A'

PROPOSED WETLAND BUFFER (TYP)

DITCH INLET (TYP)

EXTG CONTOUR (TYP)

EMERGENCY OVERFLOW

WETLAND CONVEYANCE PIPE (TYP)

TRACT 'E'

CONTROL MANHOLE
W/18" DIAM x 4' HIGH RISER ASSEMBLY
ORIFICE 1 DIAMETER 2.90"
RECTANGULAR NOTCH
WIDTH AND HEIGHT 0.05'x0.80'

177894000

15' WIDE ACCESS ROAD

TRACT 'C'

PERK FILTER TREATMENT VAULT
W/21 CARTRIDGES (42" HIGH)

SIERRA MEADOWS SUBDIVISION

PROPOSED FLOW (TYP)

TRACT 'A'

WAVERLY PLACE

STORM MANHOLE (TYP)

BASIN 1

PROPOSED CONTOUR (TYP)

28' WIDE UTILITY EASEMENT

STORM PIPE (TYP)

EXTG 24" SD

NE 43RD AVE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

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PBS

POST-DEVELOPED DRAINAGE BASIN MAP FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

DESIGNED:	DPS
CHECKED:	RED
MAR 2018	75345.000
SHEET ID	BSN-02
SHEET	2 OF 2

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Appendix B
WWHM2012 Project Report

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	75345ccsg-WO-Wetland_WQ_Vault
Site Name:	43rd Ave Subdivision
Site Address:	
City:	Camas, WA
Report Date:	1/22/2018
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.30
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Flat	1.047
SG4, Forest, Mod	2.008
Pervious Total	3.055
Impervious Land Use	acre
Impervious Total	0
Basin Total	3.055

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Field, Mod	1.728
Pervious Total	1.728

Impervious Land Use	acre
ROADS FLAT	0.748
ROOF TOPS FLAT	0.579
Impervious Total	1.327
Basin Total	3.055

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length: 20.00 ft.
Bottom Width: 24.00 ft.
Depth: 5 ft.
Volume at riser head: 0.1129 acre-feet.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 4 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.050 ft.
Notch Height: 0.800 ft.
Orifice 1 Diameter: 2.9 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Pond Hydraulic Table

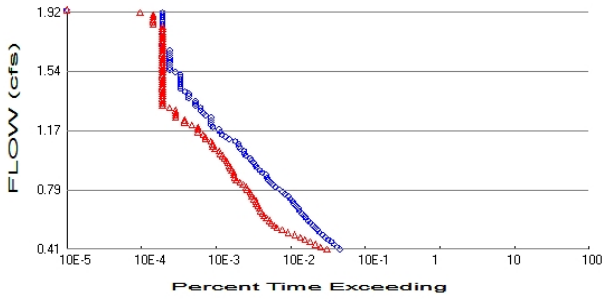
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.011	0.000	0.000	0.000
0.0556	0.011	0.000	0.053	0.000
0.1111	0.011	0.001	0.076	0.000
0.1667	0.012	0.001	0.093	0.000
0.2222	0.012	0.002	0.107	0.000
0.2778	0.012	0.003	0.120	0.000
0.3333	0.013	0.004	0.131	0.000
0.3889	0.013	0.004	0.142	0.000
0.4444	0.013	0.005	0.152	0.000
0.5000	0.014	0.006	0.161	0.000
0.5556	0.014	0.007	0.170	0.000
0.6111	0.015	0.007	0.178	0.000
0.6667	0.015	0.008	0.186	0.000
0.7222	0.015	0.009	0.194	0.000
0.7778	0.016	0.010	0.201	0.000
0.8333	0.016	0.011	0.208	0.000
0.8889	0.017	0.012	0.215	0.000
0.9444	0.017	0.013	0.221	0.000
1.0000	0.017	0.014	0.228	0.000
1.0556	0.018	0.015	0.234	0.000
1.1111	0.018	0.016	0.240	0.000
1.1667	0.019	0.017	0.246	0.000
1.2222	0.019	0.018	0.252	0.000
1.2778	0.020	0.019	0.258	0.000
1.3333	0.020	0.020	0.263	0.000
1.3889	0.021	0.021	0.269	0.000
1.4444	0.021	0.023	0.274	0.000
1.5000	0.022	0.024	0.279	0.000
1.5556	0.022	0.025	0.284	0.000
1.6111	0.022	0.026	0.289	0.000
1.6667	0.023	0.028	0.294	0.000
1.7222	0.023	0.029	0.299	0.000

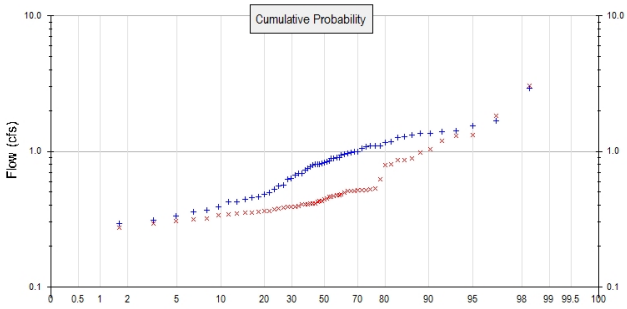
1.7778	0.024	0.030	0.304	0.000
1.8333	0.024	0.032	0.309	0.000
1.8889	0.025	0.033	0.313	0.000
1.9444	0.025	0.034	0.318	0.000
2.0000	0.026	0.036	0.322	0.000
2.0556	0.027	0.037	0.327	0.000
2.1111	0.027	0.039	0.331	0.000
2.1667	0.028	0.040	0.335	0.000
2.2222	0.028	0.042	0.340	0.000
2.2778	0.029	0.044	0.344	0.000
2.3333	0.029	0.045	0.348	0.000
2.3889	0.030	0.047	0.352	0.000
2.4444	0.030	0.049	0.356	0.000
2.5000	0.031	0.050	0.360	0.000
2.5556	0.031	0.052	0.364	0.000
2.6111	0.032	0.054	0.368	0.000
2.6667	0.033	0.056	0.372	0.000
2.7222	0.033	0.058	0.376	0.000
2.7778	0.034	0.059	0.380	0.000
2.8333	0.034	0.061	0.384	0.000
2.8889	0.035	0.063	0.387	0.000
2.9444	0.036	0.065	0.391	0.000
3.0000	0.036	0.067	0.395	0.000
3.0556	0.037	0.069	0.398	0.000
3.1111	0.037	0.071	0.402	0.000
3.1667	0.038	0.074	0.406	0.000
3.2222	0.039	0.076	0.410	0.000
3.2778	0.039	0.078	0.416	0.000
3.3333	0.040	0.080	0.424	0.000
3.3889	0.041	0.082	0.433	0.000
3.4444	0.041	0.085	0.442	0.000
3.5000	0.042	0.087	0.452	0.000
3.5556	0.043	0.089	0.463	0.000
3.6111	0.043	0.092	0.474	0.000
3.6667	0.044	0.094	0.485	0.000
3.7222	0.045	0.097	0.496	0.000
3.7778	0.045	0.099	0.508	0.000
3.8333	0.046	0.102	0.520	0.000
3.8889	0.047	0.104	0.532	0.000
3.9444	0.047	0.107	0.544	0.000
4.0000	0.048	0.110	0.556	0.000
4.0556	0.049	0.112	0.767	0.000
4.1111	0.049	0.115	1.150	0.000
4.1667	0.050	0.118	1.640	0.000
4.2222	0.051	0.121	2.206	0.000
4.2778	0.052	0.124	2.820	0.000
4.3333	0.052	0.127	3.457	0.000
4.3889	0.053	0.130	4.088	0.000
4.4444	0.054	0.133	4.684	0.000
4.5000	0.055	0.136	5.223	0.000
4.5556	0.055	0.139	5.684	0.000
4.6111	0.056	0.142	6.058	0.000
4.6667	0.057	0.145	6.347	0.000
4.7222	0.058	0.148	6.570	0.000
4.7778	0.058	0.151	6.848	0.000
4.8333	0.059	0.155	7.071	0.000
4.8889	0.060	0.158	7.286	0.000
4.9444	0.061	0.161	7.494	0.000

5.0000	0.062	0.165	7.697	0.000
5.0556	0.062	0.168	7.894	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 3.055
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.728
Total Impervious Area: 1.327

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.825404
5 year	1.277192
10 year	1.521791
25 year	1.770251
50 year	1.917721
100 year	2.038879

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.471505
5 year	0.730375
10 year	0.953996
25 year	1.307454
50 year	1.63034
100 year	2.011768

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.622	0.430
1950	0.817	0.465
1951	1.098	0.390
1952	0.631	0.510
1953	0.888	0.390
1954	1.321	0.415
1955	0.684	0.361
1956	1.264	1.297
1957	1.082	0.508
1958	0.790	0.975

1959	0.480	0.313
1960	0.440	0.336
1961	1.166	0.476
1962	0.804	0.460
1963	0.898	0.409
1964	0.841	0.411
1965	0.732	0.483
1966	0.993	0.513
1967	0.888	0.384
1968	1.093	0.397
1969	0.995	0.518
1970	2.900	3.064
1971	0.459	0.349
1972	0.753	0.408
1973	0.772	0.515
1974	1.184	1.322
1975	0.664	0.404
1976	0.986	0.497
1977	0.028	0.253
1978	1.426	0.857
1979	0.941	0.866
1980	0.555	0.381
1981	1.281	0.805
1982	0.855	0.790
1983	1.537	1.038
1984	0.498	0.359
1985	0.366	0.363
1986	0.453	0.351
1987	0.797	0.413
1988	0.357	0.318
1989	0.387	0.350
1990	0.335	0.307
1991	0.905	0.422
1992	0.954	0.391
1993	1.098	0.880
1994	0.830	0.524
1995	0.687	0.476
1996	1.401	1.830
1997	1.681	1.202
1998	1.359	0.445
1999	0.968	0.535
2000	0.525	0.292
2001	0.294	0.273
2002	1.360	0.519
2003	1.047	0.620
2004	0.309	0.344
2005	0.427	0.371
2006	0.804	0.466
2007	0.425	0.427
2008	0.560	0.451

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.9001	3.0639
2	1.6810	1.8296
3	1.5367	1.3223
4	1.4264	1.2973

5	1.4010	1.2023
6	1.3602	1.0382
7	1.3585	0.9746
8	1.3205	0.8803
9	1.2813	0.8662
10	1.2636	0.8568
11	1.1838	0.8050
12	1.1660	0.7902
13	1.0985	0.6204
14	1.0976	0.5347
15	1.0931	0.5242
16	1.0821	0.5189
17	1.0467	0.5179
18	0.9954	0.5150
19	0.9932	0.5132
20	0.9861	0.5098
21	0.9680	0.5080
22	0.9542	0.4973
23	0.9414	0.4826
24	0.9048	0.4765
25	0.8982	0.4763
26	0.8882	0.4659
27	0.8882	0.4649
28	0.8551	0.4599
29	0.8410	0.4512
30	0.8304	0.4454
31	0.8166	0.4300
32	0.8044	0.4271
33	0.8038	0.4219
34	0.7974	0.4151
35	0.7899	0.4132
36	0.7717	0.4112
37	0.7527	0.4089
38	0.7319	0.4084
39	0.6868	0.4041
40	0.6842	0.3972
41	0.6636	0.3910
42	0.6310	0.3903
43	0.6219	0.3899
44	0.5600	0.3838
45	0.5550	0.3807
46	0.5245	0.3707
47	0.4976	0.3631
48	0.4800	0.3606
49	0.4589	0.3591
50	0.4534	0.3514
51	0.4395	0.3504
52	0.4269	0.3492
53	0.4254	0.3435
54	0.3868	0.3358
55	0.3664	0.3180
56	0.3572	0.3127
57	0.3354	0.3065
58	0.3088	0.2923
59	0.2944	0.2731
60	0.0284	0.2527

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.4127	953	642	67	Pass
0.4279	878	531	60	Pass
0.4431	811	452	55	Pass
0.4583	739	385	52	Pass
0.4735	669	326	48	Pass
0.4887	608	284	46	Pass
0.5039	561	238	42	Pass
0.5191	514	194	37	Pass
0.5343	477	162	33	Pass
0.5495	451	137	30	Pass
0.5647	416	125	30	Pass
0.5799	386	116	30	Pass
0.5951	358	109	30	Pass
0.6103	335	99	29	Pass
0.6255	316	92	29	Pass
0.6407	296	88	29	Pass
0.6559	278	83	29	Pass
0.6711	266	80	30	Pass
0.6863	248	76	30	Pass
0.7015	232	72	31	Pass
0.7167	222	72	32	Pass
0.7319	210	68	32	Pass
0.7472	195	63	32	Pass
0.7624	178	62	34	Pass
0.7776	163	60	36	Pass
0.7928	148	55	37	Pass
0.8080	131	53	40	Pass
0.8232	121	48	39	Pass
0.8384	112	44	39	Pass
0.8536	105	39	37	Pass
0.8688	102	37	36	Pass
0.8840	98	36	36	Pass
0.8992	87	36	41	Pass
0.9144	81	34	41	Pass
0.9296	75	33	44	Pass
0.9448	71	31	43	Pass
0.9600	67	30	44	Pass
0.9752	62	29	46	Pass
0.9904	60	27	45	Pass
1.0056	53	26	49	Pass
1.0208	51	24	47	Pass
1.0360	50	23	46	Pass
1.0512	44	20	45	Pass
1.0664	43	19	44	Pass
1.0816	42	19	45	Pass
1.0968	38	18	47	Pass
1.1120	31	15	48	Pass
1.1272	28	15	53	Pass
1.1424	25	14	56	Pass
1.1576	24	12	50	Pass
1.1728	23	12	52	Pass
1.1880	19	12	63	Pass
1.2032	18	10	55	Pass

1.2184	18	8	44	Pass
1.2336	18	8	44	Pass
1.2488	18	6	33	Pass
1.2640	15	6	40	Pass
1.2792	14	6	42	Pass
1.2944	13	6	46	Pass
1.3096	13	5	38	Pass
1.3248	11	4	36	Pass
1.3400	11	4	36	Pass
1.3552	11	4	36	Pass
1.3704	9	4	44	Pass
1.3856	9	4	44	Pass
1.4008	9	4	44	Pass
1.4160	8	4	50	Pass
1.4313	7	4	57	Pass
1.4465	7	4	57	Pass
1.4617	7	4	57	Pass
1.4769	7	4	57	Pass
1.4921	7	4	57	Pass
1.5073	7	4	57	Pass
1.5225	7	4	57	Pass
1.5377	6	4	66	Pass
1.5529	5	4	80	Pass
1.5681	5	4	80	Pass
1.5833	5	4	80	Pass
1.5985	5	4	80	Pass
1.6137	5	4	80	Pass
1.6289	5	4	80	Pass
1.6441	5	4	80	Pass
1.6593	5	4	80	Pass
1.6745	5	4	80	Pass
1.6897	4	4	100	Pass
1.7049	4	4	100	Pass
1.7201	4	4	100	Pass
1.7353	4	4	100	Pass
1.7505	4	4	100	Pass
1.7657	4	4	100	Pass
1.7809	4	4	100	Pass
1.7961	4	4	100	Pass
1.8113	4	4	100	Pass
1.8265	4	4	100	Pass
1.8417	4	3	75	Pass
1.8569	4	3	75	Pass
1.8721	4	3	75	Pass
1.8873	4	3	75	Pass
1.9025	4	3	75	Pass
1.9177	4	2	50	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.288 acre-feet
On-line facility target flow:	0.3114 cfs.
Adjusted for 15 min:	0.3114 cfs.
Off-line facility target flow:	0.1822 cfs.
Adjusted for 15 min:	0.1822 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	275.31			☐	0.00			
Total Volume Infiltrated		275.31	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 3

POC #3 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 4

POC #4 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 5

POC #5 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic

Mitigated Schematic

Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   75345ccsg-WO-Wetland_WQ_Vault.wdm
MESSU       25   Pre75345ccsg-WO-Wetland_WQ_Vault.MES
            27   Pre75345ccsg-WO-Wetland_WQ_Vault.L61
            28   Pre75345ccsg-WO-Wetland_WQ_Vault.L62
            30   POC75345ccsg-WO-Wetland_WQ_Vault1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      28
      PERLND      29
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                        in  out           ***
   28     SG4, Forest, Flat       1    1    1    1   27    0
   29     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   28         0    0    1    0    0    0    0    0    0    0    0    0
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
   28         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   28         0    0    0    0    0    0    0    0    0    0    0
   29         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   28              0         6      0.04       400      0.05         0      0.96
   29              0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   28              0         0         3         2         0         0         0
   29              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   28            0.2       0.4      0.35         2       0.4       0.7
   29            0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   28              0         0         0         0       2.5         1         0
   29              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                 in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
```

```
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  28                       1.047     COPY   501     12
PERLND  28                       1.047     COPY   501     13
PERLND  29                       2.008     COPY   501     12
PERLND  29                       2.008     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   75345ccsg-WO-Wetland_WQ_Vault.wdm
MESSU       25   Mit75345ccsg-WO-Wetland_WQ_Vault.MES
            27   Mit75345ccsg-WO-Wetland_WQ_Vault.L61
            28   Mit75345ccsg-WO-Wetland_WQ_Vault.L62
            30   POC75345ccsg-WO-Wetland_WQ_Vault1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      32
      IMPLND       1
      IMPLND       4
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   32     SG4, Field, Mod         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   32         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   32         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   32         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   32              0         6      0.03       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   32              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   32           0.15       0.4       0.3         2       0.4       0.4
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   32              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
```

```
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  32                      1.728     RCHRES   1      2
IMPLND   1                      0.748     RCHRES   1      5
IMPLND   4                      0.579     RCHRES   1      5

******Routing******
PERLND  32                      1.728     COPY     1     12
IMPLND   1                      0.748     COPY     1     15
IMPLND   4                      0.579     COPY     1     15
RCHRES   1                          1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Trapezoidal Pond-005    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
```

```
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.011019  0.000000  0.000000
  0.055556  0.011359  0.000622  0.053792
  0.111111  0.011703  0.001262  0.076074
  0.166667  0.012052  0.001922  0.093171
  0.222222  0.012407  0.002601  0.107584
  0.277778  0.012767  0.003301  0.120283
  0.333333  0.013131  0.004020  0.131763
  0.388889  0.013501  0.004760  0.142321
  0.444444  0.013876  0.005520  0.152147
  0.500000  0.014256  0.006302  0.161376
  0.555556  0.014641  0.007105  0.170106
  0.611111  0.015032  0.007929  0.178408
  0.666667  0.015427  0.008775  0.186341
  0.722222  0.015827  0.009643  0.193950
  0.777778  0.016233  0.010534  0.201272
  0.833333  0.016644  0.011447  0.208336
  0.888889  0.017059  0.012383  0.215168
  0.944444  0.017480  0.013343  0.221790
  1.000000  0.017906  0.014325  0.228221
  1.055556  0.018337  0.015332  0.234474
  1.111111  0.018774  0.016363  0.240566
  1.166667  0.019215  0.017418  0.246506
  1.222222  0.019661  0.018498  0.252307
  1.277778  0.020113  0.019603  0.257978
  1.333333  0.020569  0.020733  0.263526
  1.388889  0.021031  0.021889  0.268960
  1.444444  0.021498  0.023070  0.274287
  1.500000  0.021970  0.024277  0.279512
  1.555556  0.022447  0.025511  0.284641
  1.611111  0.022929  0.026772  0.289679
  1.666667  0.023416  0.028059  0.294631
  1.722222  0.023908  0.029374  0.299502
  1.777778  0.024406  0.030716  0.304294
  1.833333  0.024908  0.032086  0.309012
  1.888889  0.025416  0.033483  0.313659
  1.944444  0.025928  0.034910  0.318238
  2.000000  0.026446  0.036364  0.322753
  2.055556  0.026969  0.037848  0.327205
  2.111111  0.027497  0.039361  0.331597
  2.166667  0.028030  0.040904  0.335932
  2.222222  0.028569  0.042476  0.340211
  2.277778  0.029112  0.044078  0.344437
  2.333333  0.029660  0.045711  0.348613
  2.388889  0.030214  0.047374  0.352738
```

```
  2.444444  0.030772  0.049068  0.356816
  2.500000  0.031336  0.050793  0.360848
  2.555556  0.031905  0.052550  0.364836
  2.611111  0.032479  0.054338  0.368780
  2.666667  0.033058  0.056159  0.372683
  2.722222  0.033642  0.058011  0.376545
  2.777778  0.034231  0.059897  0.380368
  2.833333  0.034826  0.061815  0.384152
  2.888889  0.035425  0.063766  0.387900
  2.944444  0.036029  0.065751  0.391612
  3.000000  0.036639  0.067770  0.395290
  3.055556  0.037254  0.069822  0.398933
  3.111111  0.037874  0.071909  0.402543
  3.166667  0.038499  0.074031  0.406121
  3.222222  0.039129  0.076187  0.410218
  3.277778  0.039764  0.078379  0.416740
  3.333333  0.040404  0.080605  0.424562
  3.388889  0.041049  0.082868  0.433282
  3.444444  0.041700  0.085167  0.442698
  3.500000  0.042355  0.087501  0.452679
  3.555556  0.043016  0.089873  0.463127
  3.611111  0.043682  0.092281  0.473966
  3.666667  0.044353  0.094727  0.485134
  3.722222  0.045029  0.097209  0.496579
  3.777778  0.045710  0.099730  0.508254
  3.833333  0.046396  0.102288  0.520120
  3.888889  0.047087  0.104885  0.532141
  3.944444  0.047783  0.107520  0.544283
  4.000000  0.048485  0.110195  0.556517
  4.055556  0.049191  0.112908  0.767947
  4.111111  0.049903  0.115660  1.150618
  4.166667  0.050620  0.118453  1.640198
  4.222222  0.051342  0.121285  2.205969
  4.277778  0.052069  0.124157  2.820936
  4.333333  0.052801  0.127071  3.457674
  4.388889  0.053538  0.130024  4.088111
  4.444444  0.054280  0.133019  4.684840
  4.500000  0.055028  0.136056  5.223296
  4.555556  0.055780  0.139134  5.684537
  4.611111  0.056538  0.142254  6.058487
  4.666667  0.057300  0.145416  6.347583
  4.722222  0.058068  0.148620  6.570774
  4.777778  0.058841  0.151868  6.848776
  4.833333  0.059619  0.155158  7.071028
  4.888889  0.060402  0.158492  7.286065
  4.944444  0.061190  0.161870  7.494552
  5.000000  0.061983  0.165291  7.697060
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP
WDM      2 PREC     ENGL    1.3            RCHRES   1     EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            RCHRES   1     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS
```

```
MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK         2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     2

  MASS-LINK         5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     5

  MASS-LINK        12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    12

  MASS-LINK        15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    15

  MASS-LINK        16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK    16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

Disclaimer

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Clear Creek Solutions, Inc.
6200 Capitol Blvd. Ste F
Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Appendix C
Geotechnical Report

6. Pre-Application Meeting Notes

Pre-Application Meeting Notes
Rondeau Preliminary Plat
File PA17-31

Thursday, September 21, 2017
1:30pm, Public Works
616 NE Fourth Avenue, Camas, WA 98607

Applicant/ Contact:	**Project Description:**
Brad Sheets Robert Rondeau 4920 SW 5th Ave Camas, WA 98607 brad@mywaverlyhomes.com	Applicant proposes to divide property into 13 single family lots

Representing City of Camas:
Sarah Fox, Sr. Planner
Norm Wurzer, Engineer
Bob Cunningham, Building Official
Ron Schumacher, Fire Marshal

Location:	**2223 NW 43rd Avenue**
Tax Account:	177887-000
Zoning:	**R-7.5**

NOTICE: Notwithstanding any representation by City staff at a pre-application conference, staff is not authorized to waive any requirement of the City Code. Any omission or failure by staff to recite to an applicant all relevant applicable code requirements shall not constitute a waiver by the City of any standard or requirement. [CMC 18.55.060 (C)] This pre-application conference shall be valid for a period of 180 days from the date it is held. If no application is filed within 180 days of the conference or meeting, the applicant must schedule and attend another conference before the City will accept a permit application. [CMC 18.55.060 (D)] Any changes to the code or other applicable laws, which take effect between the pre-application conference and submittal of an application, shall be applicable. [CMC 18.55.060 (D)]. A link to the Camas Municipal Code (CMC) can be found on the City of Camas website, http://www.cityofcamas.us/ on the main page under "Business and Development".

Development fees will be based on the adopted fees at the time of application submittal. The applicable fees include:

Preliminary Plat	$6400 + $225/lot
Archaeological Review	$122
Critical Areas	$690
SEPA	$721
Engineering Review	3% of estimated infrastructure construction costs
Building Permit and Plan Review	Based on the valuation of the project

PLANNING DIVISION **Sarah Fox (360) 817-7269**

An application for a preliminary plat is considered a Type III permit. Applicable codes for development include Title 16 Environment, Title 17 Land Development and Title 18 Zoning of the Camas Municipal Code ("CMC"), which can be found on the city website. Please note it remains the applicant's responsibility to review the CMC and address all applicable provisions.

Submittal Items. In addition to two paper copies application materials please submit all application materials, including drawings and reports**, electronically on a CD or flashdrive**.

The application must include items the following items within CMC§18.55.110 Application.

- ☐ A copy of a completed city application form [the application must be signed by all property owners] and required fee(s);
- ☐ A current (within thirty days prior to application) mailing list and mailing labels of owners of real property within three hundred feet of the subject parcel, certified as based on the records of Clark County assessor;
- ☐ A summary narrative that describes the proposed development, existing site conditions, existing buildings, public roads and services, and other natural features. The narrative shall address any information indicated by staff at the pre-application conference as being required;
- ☐ SEPA Checklist – is required if landfills or excavation exceeds 500 cubic yards.
- ☐ Installation of a development sign on the property that is 4'x 8' and visible to the public street. CMC Section 18.55.110.H (1-5
- ☐ Specific Submittal items for Subdivisions, per CMC§17.11.030. The following is an excerpt from the requirements (see code section for full text):
  1. A vicinity map showing location of the site; and
  2. Site and development plans which provide the information outlined in CMC Section 17.11.030.B.
  3. Preliminary grading plan;
  4. Preliminary stormwater plan and report;
  5. A narrative addressing ownership and maintenance of open spaces, stormwater facilities, public trails and critical areas, and the applicable approval criteria (CMC Section 17.11.030.D) and standards of the Camas Municipal Code.

Notes on lot layout: The average size of the lots in the development must be 7,500 square feet. Refer to dimensional standards at CMC Section 18.09.040 Table 2. The range of lot sizes must be in a range between 5,250 to 9,000 square feet (if density transfer is applicable).

The city also discourages a design wherein lots are considered to be "double-frontage". If unavoidable, then refer to code section: CMC17.19.030(D.6).

- ☐ **Archeological Report**. The site is located in an area of moderate-high probability for the presence of archaeological objects. As such, an archaeological predetermination is required as per CMC Section 16.31.070.
- ☐ **Critical Areas Review.** The subject property contains wetlands, which are designated as critical areas per CMC Section 16.51.070. Per CMC Section 16.51.130, a critical areas report is required if a proposed development is within or adjacent to a critical area. The general requirements for a critical areas

> 6. Double Frontage Lots. Residential lots which have street frontage along two opposite lot lines shall be avoided, except for double frontage lots adjacent to an arterial or collector, which must comply with the following design standards:
>
> a. Landscaping. A ten-foot landscaped tract is provided along the real property line to visually buffer the rear yards from public view and prevent vehicular access. The ten-foot landscaped tract shall include a minimum two-inch caliper trees every thirty feet on center, three-foot tall shrubs that form a continuous screen, groundcover plants that fully cover the remainder of the landscaped area, and maintained in perpetuity by the homeowners association;
>
> i. If the front of the structure faces a collector or arterial street, the ten-foot landscape tract is not required; and
>
> ii. The lot must provide pedestrian access to the arterial or collector, and include a rear-loaded garage;
>
> b. Fencing and Walls. A sight-obscuring fence or masonry wall shall be located at the line that separates the lot from the ten-foot landscape tract (see Figure 17.19-1). The design must include:
>
> i. The height of the fence or wall shall be a minimum four feet tall along a collector and six feet tall along an arterial;
>
> ii. The fence or wall shall include columns or physical indentations in the fence or wall at least every fifty lineal feet to reduce the massing effect of the fencing material;
>
> c. Architectural Design. Side and rear building facades visible from an arterial or collector shall maintain the architectural design, horizontal and vertical articulation, level of detail, and materials and colors consistent with the front building facade. Avoid large blank walls on side and rear building facades;
>
> d. Setbacks. Minimum of twenty-foot setback will be provided from the property line separating the lot from the tract that is adjacent to the arterial or collector;

report is found in CMC Section 16.51.140. The City's code contains additional requirements for each type of critical area. Wetlands are addressed in CMC Section 16.53.030.

- ☐ **SEPA.** Your proposal is not categorically exempt from the requirements of the State Environmental Policy Act (SEPA) per CMC Section 16.07.025 as the proposed property for development contains environmentally sensitive areas. Therefore, a SEPA environmental checklist is required.
- ☐ **Tree retention.** Per CMC Section 18.31.080, a tree survey is required for development; not for lands to be retained as undeveloped open space. CMC 18.31.080(B) requires preservation of significant trees and integrate them into the land use design per CMC§17.19.030(A)(2). Significant trees are defined per CMC 18.03.050. "Evergreen trees 8 inches dbh, and deciduous trees, other than red alder or cottonwood, 12 inches dbh."

ENGINEERING DIVISION Norm Wurzer (360) 817-7237

Streets:

1) Construction plans shall be prepared by a licensed Washington State engineer in accordance with City of Camas standards.
   - A 3% plan review and inspection fee will be required. The fee will be based on an engineer's estimate or construction bid.
   - A demolition permit will need to be obtained from the building department for demolition of the existing houses.
   - Construction activities within the Right-of-Way shall be performed by licensed and bonded in the State of Washington contractor and will require an encroachment permit.
   - Access to NW 43rd will be allowed near the easterly or westerly end of the property provided there is adequate sight distance. Based on the location and limited width of the property the City Engineer supports a deviation from the 330' intersection spacing for Collector Streets.
2) Private streets shall meet the design requirements of CMC 17.19.040B. (Table 17.19.040-1)
3) NW 43 adjacent to the subject parcel is designated as a Collector Street. Improvements to NW 43rd Street shall meet the requirements of City of Camas's Design Standard for a three lane collector as shown on the design standard print ST5. This will required Right-of-Way dedication (up to 37' R of W from Centerline at the left turn lane, less elsewhere).
4) The applicant will be responsible for all traffic control signs, street name signs, pavement markings and street lighting per CMC 17.19.030 (I) (J). As of October, 2014 LED street lighting is a requirement for all street lighting.
5) Directional ADA ramps will be required on each side of NW 43rd at the applicant's intersection. This will include the installation of a receiving ramp on the south side of NW 43rd.
6) ADA compliant pedestrian ramps and ADA compliant street crossings are required (NW 43rd). To provide ADA compliant pedestrian ramps and street crossings careful evaluation of street profile grades and intersection site grading will be required. The applicant is requested to submit a crosswalk design for each location for review and approval.
   - A left turn lane pocket will be required.
   - Restriping of NW 43rd will be required based on approved road design (e.g. bike lanes, left turn lane, and Centerline realignment).
   - Internal street radiuses will be a minimum of 70'.
   - A traffic study for sight distance will be required at the applicant's intersection.

Storm-water:

- Per CMC 14.02 stormwater treatment and runoff control, if triggered (5,000 SF of new or replaced impervious surface), shall be designed in accordance with the latest edition of the Storm-water Management Manual for Western Washington and the City of Camas Stormwater Design Standards Manual.
- Maintenance of the storm water facilities will be the responsibility of the Homeowners or their association.

Utilities:

- Joint utility trench coordination will be required with the franchise utility purveyor(s) and the applicant's engineer during the site design process. Final engineering approval will not be issued until completion of the franchise utility extension design for all projects that require extensions of city and franchise utilities to the site.

- The applicant will be responsible for the design and submittal of the utility plan showing the locations for underground power, telephone, gas, CATV, street lights and associated appurtenances.

Water:

- An 18" DIP water mainline is adjacent to the site on NW 43. Proposed Lot(s) to have one common connection to the 18" mainline.

Sanitary:

- A 3" STEP sanitary mainline is adjacent to the site near the SE Corner on NW 43rd. Proposed Lots to have one common connection to the 3" pressurized sanitary mainline.
- The 3" STEP sanitary mainline will need to be extended to the west end of the applicant's property line on NW 43rd. The design on approval may include passing through the proposed development and back onto NW 43rd.

Additional:

- It is recommended that the applicant resolve placement of the community mailboxes with the Postmaster and the City of Camas prior to design submittal.
- Solid waste and recycle pick-up shall be located on NW 43rd.

Impact Fees and System Development Charges (SDCs)

All fees and charges are subject to change and are paid at time of building permit issuance.
For each single family detached residential structure the 2017 SDC will be as follows:

- TIF $ 3,112.00 (South)
- School Impact Fee $ 5,371.00 (Camas)
- ¾" Water System SDC $ 4,778.00 (South)
- Water Meter install Fee $ 365.00
- Sewer SDC $ 2,493.00 (South)
- Park/O.S. Impact Fee $ 2,290.00
- Fire Impact Fee $ 0.20/SF

BUILDING DIVISION **Bob Cunningham (360) 817-1568**

1. Existing structures need an asbestos survey and demolition permit.
2. Decommissioning of septic tanks and drain fields through Clark County Department of Health
3. The structures will be reviewed under the most current building codes as adopted by The State of Washington.
4. The structural drawings and calculations shall be prepared and stamped by a Professional Engineer licensed by the State of Washington.
5. The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal shall conform to Sections R403.1.7.1 through R403.1.7.4. A geotechnical reports may be required
6. The required fire distance between buildings and property line shall be in accordance with the International Building Codes.
7. The required fire suppression system shall be in accordance with IBC and other applicable codes standards and shall be reviewed by the Camas Fire Marshal's office.
8. Storm sewer disposal and connections shall identified on the approved plans.
9. All lots shall be provided a storm drain lateral at the lowest practical location.
10. Storm water from neighboring dwellings in existing developments should be taken into consideration.
11. System Development Charges and Impact fees shall be assessed prior to permits
12. An approved monument sign for posting addresses shall be provided at all Flag lots, the monument sign, location and design a shall be noted on the Plat.
13. Any development located within a special flood hazard area shall be in accordance with CMC 16.57
14. The top of any exterior building foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device a minimum of 12" plus 2% slope. Building may be located with a lower

elevation provided drainage from of all portions of the lot and the building is connected to an approved low point drain installed at the low point of the property.

FIRE DEPARTMENT **Randy Miller 360-834-6191 FMO@cityofcamas.us**

1) Low Flow Life Safety Residential Fire Sprinklers are required in all new dwellings.
2) The distance from a required fire hydrant may be doubled when Low Flow Life Safety Residential Fire Sprinklers are installed throughout a fully sprinklered subdivision. CMC 17.19.040.C.4.a.
3) Establishing Hydrant Flow Tests per NFPA 24 (National Fire Protection Association) utilizing a Washington State Licensed Fire Sprinkler Contractor may be waived when Low Flow Life Safety Residential Fire Sprinklers are installed throughout a fully sprinklered subdivision. 17.15.030.D.C
4) An approved address sign, in accordance with the Camas Municipal Code, must be posted for each residence where the flag lot leaves the public road or access tract. CMC 17.19.030.D.5.d
5) Underground oil tank removal requires a permit with the fire marshal's office following IFC (International Fire Code) 3404.2.14
6) Any existing structures that are scheduled to be torn down may be considered for fire department training.
7) Any blasting that may be needed for this location is required to follow the CMC Blasting Code and requires a permit with the fire marshal's office. CMC 15.40
8) Any gates serving two or more homes is required to follow the gate code CMC 12.36
9) Gated access to two or more homes is required to have Low Flow Life Safety Residential Fire Sprinklers installed CMC 12.36.040.J
10) Private Streets require a plan for access obstruction per CMC, 17.19.040.A.9
11) Private hydrants shall be ordered in the color of Red. Public Hydrants are yellow.
12) Confirm with your fire sprinkler contractor the water supply line size needed from the meter into the residential structure prior to installation. Generally a 1 ¼ or 1 ½ inch line has sufficed however in some rare cases a 2 inch line has been needed.

10. Sight Distance Certification

MEMORANDUM

DATE:	March 5, 2018
TO:	City of Camas (Norm Wurzer)
FROM:	Cory Kratovil, PE
PROJECT:	Rondeau Preliminary Plat
Subject:	Traffic Study for Sight Distance

The Rondeau development, consists of 12 Single-family residential lots for detached housing and related frontage improvements, was submitted for a Pre-Application Conference, which was held on September 21, 2017. The Pre-Application Meeting Notes were published on October 12, 2017. Two comments from the Engineering Department pertain to the development's proposed access location related to Intersection Sight Distance.

- Comment 1), Bullet 4 states "Access to NW 43rd will be allowed near the easterly or westerly end of the property provided there is adequate sight distance. Based on the location and limited width of the property the City Engineer Supports a Deviation from the 330' Intersection Spacing for Collector Streets."
- Comment 6), Bullet 4 states "A traffic study for sight distance will be required at the applicant's intersection."

The following analysis addresses these comments:

Sight Distance Criteria

- NE 43rd Ave is posted at 30 MPH
- Per City of Camas Design Manual, Intersection Sight Distance should meet AASHTO standards
  - Per AASHTO, Minimum Intersection Sight Distance is 335' for a posted speed of 30 MPH
  - Driver eye height is 3.5-ft
  - Object height is 4.35-ft
  - Measured 15-ft back from the edge of traveled way for the major road.

Field Test

- A cone was placed on existing grade roughly 15-ft north of the NE 43rd Travel Lane at the proposed access location, approximately 3.5 feet above the proposed grade.
- A 4.35-ft cone was placed on the southern fog line 335-ft east of the proposed intersection (measured with a measuring wheel)
  - Sight distance was deemed adequate, as this portion of the road is on a gradual uphill slope.
- A 4.35-ft cone was placed on the northern fog line 335-ft west of the proposed intersection (measured with a measuring wheel)
  - Sight distance was deemed adequate. The existing crest curve, roughly 200-ft west of the proposed intersection location, should not obstruct the sight line.

Analysis

Based on this analysis, there is sufficient Intersection Sight Distance at the Rondeau's proposed access location.

4. Project Narrative

Preliminary Plat Subdivision Review

43rd Avenue Subdivision
City of Camas, Washington

Applicant:
Waverly Homes LLC
3205 NE 78th Street, Suite 10
Vancouver, Washington 98665

March 9, 2018
PBS Project No. 75345.000

PBS
415 W 6TH STREET, SUITE 601
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

TABLE OF CONTENTS

INTRODUCTION & SUMMARY

This narrative is for the Type III Preliminary Plat Approval Application for Waverly Homes LLC (Applicant) to develop a 12-lot residential subdivision on a site containing an existing single-family dwelling. The application will be submitted to the City of Camas (City) pursuant to the City of Camas's Municipal Code (CMC) Chapter 18.55 and will include residential lots, a wetland tract, a landscape buffer tract, an open space tract, a new public street, and a storm water tract. The final plat will be recorded prior to application for building permits for the new houses.

This narrative addresses the following substantive areas of the CMC:

- CMC Title 16: Environment
  - CMC 16.51: General Provisions for Critical Areas
  - CMC 16.53: Wetlands
- CMC Title 17: Land Development
  - CMC 17.11: Subdivisions
  - CCC 17.19: Design and Improvement Standards
- CMC Title 18: Zoning
  - CMC 18.05: Zoning Map and Districts
  - CMC 18.09: Density and Dimensions
  - CMC 18.11: Parking
  - CMC 18.13: Landscaping
  - CMC 18.17: Supplemental Development Standards
  - CMC 18.31: Sensitive Areas and Open Space
  - CMC 18.55: Administration and Procedures

The following table lists the project team and contact information. Inquiries should be directed to Brett Simpson as the primary point of contact.

Table 1: Project Team and Contact Information

Applicant: WAVERLY HOMES	**Brett Simpson** **Waverly Homes LLC** 3205 NE 78th Street, Suite 10 Vancouver, WA 98665 (360) 314-6877 brett@mywaverlyhomes.com

Planner/Landscape Architecture/Civil Engineer/Surveying/Traffic Engineering: 	**PBS Engineering and Environmental** 415 W. 6th Street, Suite 601 Vancouver WA 98660 (360) 695-3488 **Andy Nuttbrock, RLA** andy.nuttbrock@pbsusa.com **Rich Darland, P.E.** rich.darland@pbsusa.com **Terry Goodman, PLS** terry.goodman@pbsusa.com

PROJECT LOCATION

The project parcel is comprised of one tax lot, identified as property account number 177887000, and is located within the SW 1/4 of Section 34, Township 2N, Range 3E, of the Willamette Meridian. Specifically, the tax lot is known as #11 SEC 34 T2N R3EWM 3.48A and has a property situs address of 2223 NW 43rd Avenue, Camas, Washington 98607. The project site is located on the north side of NW 43rd Avenue, to the west of the NW 43rd Avenue/NW Utah Street intersection.

PROPERTY BACKGROUND

The subject parcel currently has two structures on the site: a single-family dwelling with an attached garage and finished basement built in 1965, and a detached shed built in 1973. The site also contains a residential driveway and accompanying residential landscaping. Clark County GIS information has Hidden Glen LLC at 9208 NE Highway 99 PMB 145, Suite 107, Vancouver, Washington 98665, listed as the current property owner.

PROJECT NEEDS AND GOALS

This project is needed to provide housing for families in the area. The proposed project will provide 12 single-family dwellings in similarity to those in residential subdivisions surrounding the site.

SITE DESCRIPTION

The following subsections describe the existing conditions associated with the site.

Zoning

The project site is zoned Residential 7,500 (R-7.5) with a Comprehensive Plan designation of Single-Family Medium (SFM). The subject property is not located within any overlay zones.

Existing Conditions/Structures

The existing site is a single parcel consisting of 142,382 square feet, or 3.27 acres, in area. The site has an existing single-family residential structure with a finished basement and an attached garage with a residential driveway. The site also contains a detached general-purpose shed. Existing structures, driveways, and residential landscaping will be demolished as part of this project.

The subject site slopes generally from the south to the north. There is an existing wetland in the northeast corner of the subject property. The site contains trees, shrubs, and residential landscaping in front of the existing house. The site is in the Lacamas Creek watershed and the Dwyer Creek sub-watershed. The water

resource inventory area for the site is the Burnt Bridge sub-basin. The site is outside the flood hazard area and does not have a shoreline designation. The site is not within a critical aquifer recharge area. There aren't any mapped steep slopes or geological hazards on the site. Liquefaction is noted as being very low. The site does not contain any designated fish and wildlife habitat area. The site has a high to moderate-high to moderate archaeological probability, with no mapping indicators that the property is a historic site.

Single-family residential subdivisions are located along the adjoining north and east property lines. To the south is NW 43rd Avenue, and south of that is another single-family residential subdivision. The property to the west contains one single-family dwelling. Further west is a single-family residential subdivision. Zoning designations of adjacent properties are R-7.5 to the south, east, and west and R-12 to the north, all with the comprehensive plan designation of SUM.

PROJECT DESCRIPTION

Construction Schedule

Infrastructure installation and site development is anticipated to begin once the approvals are given. Submittal of building permit applications will take place upon recording of the final plat.

Proposed Lots and Tracts

Table 2: Lot and Tract Breakdown

Lot/Tract	Area
Lot 1	7,426 square feet
Lot 2	5,427 square feet
Lot 3	5,250 square feet
Lot 4	5,250 square feet
Lot 5	6,055 square feet
Lot 6	9,000 square feet
Lot 7	9,000 square feet
Lot 8	8,359 square feet
Lot 9	6,788 square feet
Lot 10	5,718 square feet
Lot 11	5,670 square feet
Lot 12	5,933 square feet
Tract A	501 square feet
Tract B	17,073 square feet
Tract C	9,214 square feet
Tract D	2,865 square feet
Tract E	1,312 square feet
ROW Frontage	4,819 square feet
ROW Internal	26,722 square feet
Total	**142,382 square feet**

Description of Uses

Single-family Detached Dwellings – Upon completion and recording of the final plat, the applicant will submit building permit applications for single-family detached dwellings with attached garages for a total of 12 new houses.

Access
The subject site fronts NW 43rd Avenue as its south boundary. A new public street, Waverly Place, will be constructed within the development intersecting with existing NW 43rd Avenue. A hammerhead turnaround will be provided at the end of Waverly Place. Each lot will have an individual driveway from Waverly Place to access houses. No lots will directly access NW 43rd Avenue.

Parking
Parking will be provided on each individual lot via the residential driveways and attached garages.

Solid Waste and Recycling
Residents will place their residential bins for solid waste and recycling at the curbside of NW 43rd Avenue for weekly pick-up and disposal.

Common Mailboxes
One grouping of common mailboxes for the development will be placed within the subdivision in the right-of-way.

TITLE 18 ZONING
CHAPTER 18.01 GENERAL PROVISIONS
18.01.030 Standards designated
This narrative and accompanying drawings, plans, reports, and attachments will demonstrate compliance with CMC Title 18, thus showing the project is in the interest of the public health, safety, and general welfare.

CHAPTER 18.05 ZONING MAP AND DISTRICTS
18.05.020 Districts designated
The proposed project is located within the R-7.5 zoning district.

18.05.040 Residential and multifamily zones
The R-7.5 zone is intended for single-family dwellings with densities of five to six dwellings per acre. The project site consists of 3.27 gross acres to be developed as 12 lots for construction of single-family dwellings on each lot.

18.05.060 Overlay zones/special planning areas
The subject site is not within any overlay zones or special planning areas.

18.05.070 Park zoning
The subject site is not within a park zoning district, nor is it held in public trust. As stated previously, the property is owned by Hidden Glen LLC.

CHAPTER 18.07 USE AUTHORIZATION
18.07.040 Residential and multifamily land uses
Table 2 in CMC Section 18.07.040 lists detached single-family dwellings as a permitted use in a residential zone. This development in the R-7.5 zone proposes construction of detached single-family dwellings on each of the 12 lots upon completion and approval of site development and final platting.

CHAPTER 18.09 DENSITY AND DIMENSIONS

18.09.040 Density and dimensions—Single-family residential zones

The tables below show the requirements for development within the R-7.5 zoning district and how each lot will meet the requirements. Sheet SP-103 of the submitted plan set illustrates the dimensions of and setbacks for each lot, noting that the south line of Lots 8 through 12 is along NW 43rd Avenue and is therefore a street side setback of 20 feet.

Table 3: Density and Dimensions for R-7.5 zoning district

Density Transfer Lots	**R-7.5 Required**	**Proposed**
Maximum density (dwelling units/net acre)	5.8 dwelling units/2.8 net acres = maximum 16 dwelling units	12 dwelling units
Minimum lot size (square feet)	5,250	5,250
Maximum lot size (square feet)[3]	9,000	9,000
Minimum lot width	60	60
Minimum lot depth	80	87.5
Maximum building lot coverage[5]	40%	Will be met; verify with building permit
Maximum building height (feet)[2]	35	Will be met; verify with building permit

1 For additional density and dimension provisions see CMC Sections 18.09.060 through 18.09.180.
2 Maximum building height: three stories and a basement, not to exceed height listed.
3 For parcels with an existing dwelling, a one-time exception may be allowed to partition from the parent parcel a lot that exceeds the maximum lot size permitted in the underlying zone. Any further partitioning of the parent parcel or the oversized lot must comply with the lot size requirements of the underlying zone.
4 Average lot area is based on the square footage of all lots within the development or plat. The average lot size may vary from the stated standard by no more than five hundred square feet.
5 The maximum building lot coverage for single-story homes may be up to forty-five percent in R-6 and R-7.5 zones, and forty percent in R-10 and R-12 zones. To qualify for increased lot coverage, a single-story home cannot include a basement or additional levels.

Table 4: Building Setbacks for R-7.5 zoning district[1]

Lot Area	**5,000 to 11,999 sf Required**	**Proposed**
Minimum front yard (feet)	20	20; verify with building permit
Minimum side yard and corner lot rear yard (feet)	5	5; verify with building permit
Minimum side yard flanking a street (feet)	20	20; verify with building permit
Minimum rear yard (feet)	25	25; verify with building permit
Minimum lot frontage on a cul-de-sac or curve (feet)	30	55.45

1 Setbacks may be reduced to be consistent with the lot sizes of the development in which it is located. Notwithstanding the setbacks requirements of this chapter, setbacks and/or building envelopes clearly established on an approved plat or development shall be applicable.

18.09.060 Density transfers

CMC Section 18.09.060(C) states that lots proposed within the development may utilize the density transfer standards listed in CMC Section 18.09.040 Table-2 when the project proposes to set aside a tract for the protection of a critical area. The subject site has a wetland area in the northeast corner. 17,073 square feet of the site's wetland (2,428 square feet) and wetland buffer (14,645 square feet) areas are being preserved in Tract B and will not be developed. The project, therefore, is eligible for density transfer, and is utilizing the density transfer lot standards as noted above in Table 3: Density and Dimensions for R-7.5.

18.09.080 Lot sizes

The proposed project is not a planned residential development, but it is adjacent to the R-12 zoning district to the north. When creating new lots via a subdivision that is adjacent to a different residential zone designation, the new lots along the common boundary shall be the maximum lot size allowed for the zone designation of the new development (if a lower density adjacent zone), as based on CMC 18.09.040 Table 2, Section A. The subject site is zoned R-7.5 and the adjacent development to the north is zoned R-12. The adjacent R-12 is a greater density than the subject site's R-7.5 zone. The minimum and maximum lot sizes allowed in the R-7.5 zone using density transfer standards are 5,250 and 9,000 square feet, respectively. Lots 6 and 7 abut the adjacent R-12 lots to the north and are 9,000 square feet in area, which is the maximum allowed in the R-7.5 zone using density transfer standards. Lot sizes are depicted on Sheet SP-103 of the submitted plan set.

18.09.090 Reduction prohibited

No reductions to lot area, yard, open space, or off-street parking area are proposed as part of this project.

18.09.100 Lot exception

Not applicable. The areas and dimensions of all proposed lots conform with the density provisions of the R-7.5 zoning district.

18.09.110 Height—Exception

Not applicable. To be addressed with the building permit phase.

18.09.120 Roof overhang permitted

Not applicable. To be addressed with the building permit phase.

18.09.130 Setback—Exception

Not applicable. To be addressed with the building permit phase.

18.09.140 Front yard—Exception
18.09.150 Side yard—Exception
18.09.160 Side yard—Flanking street
18.09.170 Rear yard—Exception

These exceptions apply only to commercial and industrial districts. As stated previously, the subject site is in a residential district.

18.09.180 Elevated decks

Not applicable. To be addressed with the building permit phase.

CHAPTER 18.11 PARKING
18.11.030 Location

CMC Section 18.11.030(A) requires off-street parking spaces for single-family dwellings to be provided on the same lots with the structures they are required to serve. The project proposes to install paved driveways on each lot for utilization of the residents of the house on that same lot. Houses will also contain attached garages.

18.11.100 Residential parking

CMC Section 18.11.100 requires the residential off-street parking spaces to consist of a parking strip, driveway, garage, or a combination therefore, and to be located on the lot they are intended to serve. The project

proposes to install paved driveways in front of the attached garages on each lot. Each lot, therefore, will be provided with adequate off-street parking in the form of both the driveway and the garage.

18.11.130 Standards

According to Table 18.11-1 in CMC Section 18.11.130, the required number of off-street parking spaces for a single-family dwelling is two spaces per dwelling unit. The proposed subdivision will construct one paved driveway in front of the attached garage for each house on each lot. The driveway and the garage, in combination, will satisfy the two-space off-street parking requirement.

CHAPTER 18.13 LANDSCAPING

18.13.020 Scope

CMC Section 18.13.020 states that landscaping standards shall apply to all new multifamily, commercial, industrial, governmental uses, and any development subject to design review. The proposed project is a single-family residential subdivision, not subject to design review; therefore, landscaping standards in CMC Chapter 18.13 are not applicable to this project.

CHAPTER 18.15 SIGNS

This application does not propose any signage.

CHAPTER 18.17 SUPPLEMENTAL DEVELOPMENT STANDARDS

18.17.030 Vision clearance area

Since the subject site is in the R-7.5 zoning district and since there is a new intersection of NW 43rd Avenue and Waverly Place, the vision clearance area requirements apply. The vision triangles at the new intersection and around the hammerhead are depicted throughout the plan set. Specifically, Sheet L-101, the Preliminary Landscape Plan, shows the vision triangle areas being clear of plantings.

18.17.040 Accessory structures

This application does not include a request for any accessory structures.

18.17.050 Fences and walls

This application does not propose construction of any walls. A new six-foot tall sight-obscuring wood fence will be installed along the south portion of the development, on the north line of the ten-foot wide landscape tract, identified as Tract D, bordering the rear of Lots 9 through 12. The fence will be extended across the south side of Lot 8 as part of a ten-foot wide landscape easement bordering said south side of Lot 8. The fence will be installed around the vision triangle area on the southeast corner of Lot 12. Since the fence is not proposed to be taller than six feet, a building permit is not required. No fencing is proposed in the front yards of any of the lots for this application.

18.17.060 Retaining walls

This project does not propose any retaining walls.

CHAPTER 18.18 SITE PLAN REVIEW

As already noted in the narrative, this project is a land division of the subject property into 12 lots. Per CMC Section 18.18.020(B)2, site plan review is not required for a land division.

CHAPTER 18.19 DESIGN REVIEW

Per CMC Section 18.19.025, design review only applies to parcels located within the downtown commercial zone. As previously stated, the subject site is in the R-7.5 zoning district; therefore, design review is not required.

CHAPTER 18.31 SENSITIVE AREAS AND OPEN

18.31.020 Scope

Land proposals below are subject to the criteria, guidelines, conditions, performance standards, and procedural requirements contained in this chapter:

F. Subdivision

The project is a 12-lot subdivision with wetland area in the northeast corner of the subject property; therefore, CMC Chapter 18.31 is applicable.

18.31.030 Administration

The notes from the pre-application meeting held on September 21, 2017 state a critical areas report is required per CMC Chapter 16.51. CMC Title 16 is addressed in detail through a combination of this narrative and the critical areas report included with the application submittal.

18.31.080 Tree retention

A. A tree survey, conducted by a qualified biologist, landscape architect, or arborist, shall be conducted for all lands proposed to be developed and listed under Section 18.31.020. A survey shall not be required for lands proposed to be retained as undeveloped open space.

The proposed project is a subdivision. Subdivisions are listed under CMC Section 18.31.020 as needing to comply with the requirements of CMC Chapter 18.31. Accordingly, Sheet SP-102 of the submitted plan set depicts the required tree survey of the subject site performed by the project's landscape architect, Andy Nuttbrock. The survey shows 79 trees on the site. The reason for removal of trees to be removed is noted in the "comments" column of the Existing Tree Table shown on Sheet SP-102.

B. To the extent practical, existing healthy significant trees shall be retained.

Three trees of the existing 79 trees on the site will be protected during construction. Sheet SP-102 shows tree numbers 47, 48, and 57 as the protected trees. Tree number 45 is identified as a tree near which no construction will occur.

18.31.090 – Vegetation removal

A. Exceptions

As depicted on Sheets SP-101 and SP-102 of the submitted plan set, there are existing trees and vegetation and on the site. Pursuant to CMC Section 18.31.090(A), the removal of the following items is exempt from the requirements of the vegetation removal permit: the vegetation outside of the designated wetland and wetland buffer area (identified as Tract B); removal of the trees four inches or less in diameter; removal of the dead, diseased or dying vegetation and trees; removal of the nonnative invasive plant species on the site (Himalayan blackberries and ivy); and, removal of the vegetation related to the construction and installation of the public utilities needed for the development.

B. Vegetation Removal Permit Required.

Healthy trees over four inches in diameter will be removed from the entire subject site, and healthy, noninvasive vegetation and trees will be removed from the wetland area on the subject site; therefore, a vegetation removal permit is required for this project.

C. *Preliminary Review*
A vegetation removal permit is required for this project as noted above.

D. *Vegetation Management Plan as Part of Vegetation Removal Permit*
A vegetation management plan will be required for this project since the vegetation removal permit is required.

E. *Vegetation Management Plan—Standards. Vegetation management plans shall meet the following standards:*

1. *Vegetation management plans shall be prepared by a qualified arborist or biologist;*
The submitted preliminary landscape plan (Sheet L-101) serves as the vegetation management plan prepared by Andy Nuttbrock, a licensed landscape architect.

2. *If the proposed vegetation removal impacts a steep slope or area with potentially unstable soils, the vegetation management plan shall contain a certification by a qualified geotechnical engineer that the removal of vegetation in accordance with the vegetation management plan will not cause erosion or increase the likelihood of a landslide;*
A geotechnical report, dated December 28, 2017, stamped by Ryan White at PBS, has been included with this application packet. As noted in the report, the site is relatively flat; therefore, the removal of vegetation does not need to be mitigated for erosion or landslides.

3. *Where possible, proposed vegetation removal activities adjacent to environmentally sensitive areas should be configured in a manner which avoids impacts;*
Trees and vegetation removed adjacent to and within Tract B, the designated wetland tract for the project, will be removed only as necessary and with the least impact as possible to the wetland.

4. *Where possible, limbing, pruning, or thinning should be utilized in lieu of removal of vegetation;*
Tree removal is necessary to perform required grading and construction of utilities, the stormwater facility, and the new street.

5. *Vegetation removal should normally be mitigated through vegetation enhancement in the form of additional plantings;*
Sheet L-101 of the submitted plan set shows proposed plantings to mitigate for vegetation removal. Proposed plantings on the entire site include multipurpose grass seed mix, bearberry cotoneaster, red sunset maple, and weeping white spruce. Trees to be planted specifically within the designated wetland buffer area are nine western red cedar and 15 red alder trees. There will also be a multipurpose grass seed mix planted in the wetland buffer area. The full planting list for the development is detailed on Sheet L-101.

6. *Vegetation management should be done in the manner that takes into consideration stormwater runoff, slope stability, view enhancement, and wildlife habitat;*
The subject site does not have any view corridors or wildlife habitat. Slope stability has not been indicated to be an issue by the geotechnical report or Clark County GIS mapping information. The 2,428-square feet of designated wetland area for the development will retain the seven existing trees. The wetland buffer area will retain two trees, plant 24 trees, and be seeded with multipurpose grass seed mix.

7. *The schedule for removal and planting should be done in such a manner as to optimize the survival of the modified vegetation and new plantings;*
   Removal of vegetation will take place as soon as appropriate approvals and permits have been received. As noted in Note Number 2 on Sheet L-101, landscape for each lot shall be installed at the time of house construction, and all tract landscape shall be installed at the time of road construction.

8. *Monitoring of vegetation survival may be required, and should normally include reports and photographs to the community development director or designee;*
   The applicant shall abide by any conditions of approval pertaining to monitoring of vegetation survival. Note number 6 on Sheet L-101 indicates monitoring of vegetation survival may be required.

9. *Vegetation removal for purposes of view enhancement shall be limited to view corridors, as opposed to removal of vegetation over a larger area;*
   None of the vegetation removal is for view enhancement. Vegetation removal is necessary for site grading, expansion of NW 43rd Avenue, new construction of Waverly Place, new construction of the proposed storm facility, and construction of the new houses.

10. *Vegetation management plans shall bear the certification of the qualified arborist and any other registered professional involved in its preparation or implementation;*
    Sheet L-101 bears the seal of Andy Nuttbrock, the project's licensed landscape architect.

11. *Vegetation management plans should contain a provision requiring thirty days' written notice to the city prior to any removal or replanting of vegetation.*
    Note number 5 on Sheet L-101 indicates the required written notice to the city prior to any removal or replanting of vegetation.

F. *Bonding*
   The applicant acknowledges the possibility of a bond requirement pursuant to CMC Section 18.31.090(F).

G. *Incorporation*
   The applicant will include the provisions of the approved vegetation management plan in the covenants, conditions, and restrictions of the proposed subdivision, as well as referencing them on the final plat.

H. *Process*
   The applicant acknowledges the required vegetation removal permit for removal of vegetation in the critical area of the subject site shall be processed as a Type I administrative review.

18.31.110 Mandatory preservation

A. *As a condition of development approval for any development application set forth in Section 18.31.020(A) of this chapter, the applicant shall sect aside and preserve all sensitive areas, except as otherwise permitted by this chapter. To ensure that such areas are adequately protected, the applicant shall cause a protective mechanism acceptable to the city to be put in place.*
   The wetland and wetland buffer areas have been designated as Tract B in the project and will be identified as non-developable on the final plat and in the conditions, covenants, and restrictions that accompany the finished development.

B. *For property zoned single-family residential or multifamily residential, the applicant shall receive a density transfer to the remainder of the parcel that is equal to the density lost due to the property set aside, except*

that the density transfer shall not exceed thirty percent of the allowable density for the entire development if it were not encumbered with sensitive lands.

The subject site is zoned R-7.5 and the proposed development is taking advantage of the density transfer allowed under CMC Section 18.31.110(B). Tract B, in the amount of 17,073 square feet or 0.39 acres, represents the wetland and wetland buffer areas being preserved as non-developable property. This results in a loss of two lots (0.39 acres multiplied by 5.8 dwelling units equals 2.3 or 2 lots). The net acreage of the development, if the site did not contain wetlands, would be 141,881 square feet (142,382 gross square feet less 501 square feet of open space as Tract A) or 3.26 acres which would yield a maximum density of 19 lots (3.26 acres multiplied by 5.8 dwelling units equals 18.9 or 19 lots), and 30 percent of 19 lots equals 5.7 or 6 lots. The two lots lost due to the wetland area do not exceed the six-lot 30-percent requirement.

18.31.120 Negotiated preservation

No negotiated preservation as described in CMC Section 18.31.120 is taking place as part of this application.

CHAPTER 18.32 PARK AND OPEN SPACE ZONING

The regulations of this chapter apply only to land held in public trust. As stated previously in this narrative, the subject site is owned by Hidden Glen LLC not a public trust; therefore, CMC Chapter 18.32 is not applicable to this application.

CHAPTER 18.55 ADMINISTRATION AND PROCEDURES

18.55.030 Summary of decision making processes

Table 1 in CMC Section 18.55.030 lists an archaeological permit as a type II or III process, a preliminary subdivision plat as a type III process, sensitive areas as a type II or III process, and the SEPA threshold determination as SEPA. This type III application includes a preliminary subdivision plat, archaeological review, SEPA review, and critical areas review, as well as a vegetation removal permit with accompanying vegetation management plan.

18.55.050 Initiation of action

Except as otherwise provided, Type I, II, III, or BOA applications may only be initiated by written consent of the owner(s) of record or contract purchaser(s).

The deed for the subject site lists Hidden Glen LLC as the property owner, who has signed the submitted application.

18.55.060 Preapplication conference meeting—Type II, Type III

The applicant attended a pre-application meeting with the City on September 21, 2017. City employees present were Sarah Fox, Senior Planner; Norm Wurzer, Engineer; Bob Cunningham, Building Official; and Ron Schumacher, Fire Marshal. The pre-application meeting is valid for 180 days or until March 20, 2018.

18.55.110 Application—Required information

Type II or Type III applications include all the materials listed in this subsection. The director may waive the submission of any of these materials if not deemed to be applicable to the specific review sought. Likewise, the director may require additional information beyond that listed in this subsection or elsewhere in the city code, such as a traffic study or other report prepared by an appropriate expert where needed to address relevant approval criteria. In any event, the applicant is responsible for the completeness and accuracy of the application and all of the supporting documentation. Unless specifically waived by the director, the following must be submitted at the time of application:

A. *A copy of a completed city application form(s) and required fee(s);*
The completed application forms and required fees have been included as part of this submittal package.

B. *A complete list of the permit approvals sought by the applicant;*
The applicant is seeking type III preliminary subdivision plat approval. Additionally, this application includes an archaeological predetermination report, a critical areas report addressing the sensitive areas, the vegetation removal permit and accompanying vegetation management plan, and the SEPA threshold determination. A wetlands delineation report and geotechnical engineering report are also included for review.

C. *A current (within thirty days prior to application) mailing list and mailing labels of owners of real property within three hundred feet of the subject parcel, certified as based on the records of Clark County assessor;*
The application package submitted to the City includes the required current mailing list and mailing labels.

D. *A complete and detailed narrative description that describes the proposed development, existing site conditions, existing buildings, public facilities and services, and other natural features.*
This document is the narrative detailing the required information and is part of the application.

E. *Necessary drawings in the quantity specified by the director;*
Complete plan sets consisting of the preliminary cover sheet, preliminary typical sections, existing conditions plan, existing tree survey, preliminary site plan, preliminary erosion control and grading plan, preliminary street and storm drainage plan, preliminary sanitary sewer and water plan, preliminary striping plan, and preliminary landscape plan are included with this application submittal.

F. *Copy of the preapplication meeting notes (Type II and Type III);*
A copy of the notes from the pre-application meeting held on September 21, 2017 is included with this application submittal.

G. *SEPA checklist, if required;*
The required SEPA checklist is included with this application submittal.

H. *Signage for Type III applications and short subdivisions*
The required sign for this type III application will be posted on the subject property along the NW 43rd Avenue street frontage prior to the application being deemed complete and prior to the public hearings. The required signage shall remain until the conclusion of the Type III process and shall be removed in the appropriate timeframe.

TITLE 17 LAND DEVELOPMENT
CHAPTER 17.11 SUBDIVISIONS
17.11.010 Scope
This application is for a 12-lot subdivision. Pursuant to CMC Section 17.11.010, any land being divided into ten or more lots for sale or gift shall conform to the procedures and requirements of CMC Chapter 17.11. Accordingly, this narrative addresses CMC Chapter 17.11 below.

17.11.020 Decision process
This subdivision application is being submitted for type III review as per CMC Chapter 18.55.

17.11.030 Preliminary subdivision plat approval

A. Preapplication.

The required pre-application meeting was held on September 21,2017. A copy of the pre-application meeting notes is included with this submittal.

B. Application.

1. *Completed general application form as prescribed by the community development director, with the applicable application fees;*
   The general application form for a type III preliminary plat review has been completed and included as part of the submittal package, along with the applicable fees.

2. *A complete and signed SEPA checklist. The SEPA submittal should also include a legal description of the parcel from deed;*
   The SEPA checklist has been completed, signed, and included as part of the submittal package.

3. *Complete applications for other required land use approvals applicable to the proposal;*
   This application is seeking approval for the type III preliminary plat application and the type I vegetation removal permit with accompanying vegetation management plan. The applicant also seeks approval of the SEPA threshold determination, critical areas report, and archaeological predetermination report. All documents and completed applications have been included with this submittal for review and approval.

4. *A vicinity map showing location of the site;*
   Sheet C-001 of the submitted plan set shows the required vicinity map in the upper right corner with the project site identified.

5. *A survey of existing significant trees as required under CMC Section 18.31.080;*
   Per CMC Section 18.31.080 a survey of existing trees has taken place and the results are depicted on Sheet SP-102 of the submitted plan set.

6. *All existing conditions shall be delineated. Site and development plans shall provide the following information:*
   Sheet SP-101 of the submitted plan set illustrates the delineation of all existing conditions of the subject site.

7. *For properties with slopes of ten percent or greater a preliminary grading plan will be required with the development application that shows:*
   Sheet C-201 of the submitted plan set is the required preliminary grading plan.

8. *Preliminary stormwater plan and report;*
   Sheet C-301 is the preliminary street and storm drainage plan for the proposed project. A stormwater report has also been completed and included as part of the submittal package.

9. *For properties with development proposed on slopes of ten percent or greater a preliminary geotechnical report will be consistent with CMC Chapter 16.59;*
   A geotechnical engineering report, dated December 28, 2017, and stamped by Ryan White, a professional engineer at PBS, has been included as part of the submittal package.

10. *Clark County assessor's maps which show the location of each property within three hundred feet of the subdivision;*
    The required Clark County assessor's maps have been submitted with the application.

11. *Applicant shall furnish one set of mailing labels for all property owners as provided in CMC Section 18.55.110;*
    The applicant has submitted one set of mailing labels, pursuant to CMC Section 18.55.110, as part of the application package.

12. *Complete and submit a transportation impact study to determine the adequacy of the transportation system to serve a proposed development and to mitigate impacts of the proposal on the surrounding transportation system; and*
    A sight distance certification for the intersection of Waverly Place and NW 43rd Avenue has been included as part of the application package.

13. *A narrative addressing ownership and maintenance of open spaces, stormwater facilities, public trails and critical areas, and the applicable approval criteria and standards of the Camas Municipal Code. It should also address any proposed building conditions or restrictions.*
    The proposed development does not contain any public trails. All the tracts will be owned and maintained by the homeowners' association through maintenance conditions contained in the covenants, conditions, and restrictions that will be recorded for this subdivision.

C. *Review Procedures*
The review process for this type III application will follow the guidelines of CMC Chapter 18.55.

D. *Criteria for Preliminary Plat. The hearings examiner decision on an application for preliminary plat approval shall be based on the following criteria:*
1. *The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;*
   Please see the entirety of this application for compliance with applicable sections of the CMC and applicable city-adopted plans.

2. *Provisions have been made for water, storm drainage, erosion control, and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;*
   Sheets C-201, C-301, and C-401 depict preliminary plans for erosion control, storm drainage, and sewer and water, respectively. Erosion control best management practices will be used to prevent sediment-laden flow from existing the site. Public water through the City is available via an existing mainline in NW 43rd Avenue. The development proposes to connect to this water main to serve the new lots. Sanitary sewer, also through the City, is available in NW 43rd Avenue, immediately to the east of the site. This sewer main line will be extended into the development to serve the lots, then out of the development and continued to the east for future connections.

   The site's development plan proposes to grade the site to collect the site stormwater runoff and convey it to the proposed detention pond located along the western edge of the project. The volume of the detention pond was determined by the Western Washington Hydrology Model. Stormwater runoff from the site will be collected and treated in a Perk Filter Treatment Vault located next to the detention pond. After the stormwater runoff is treated in the Perk Filter Treatment Vault, it will be

discharged into the detention pond. The Perk Filter treatment system has a General Use Level Designation (GULD) for basic and phosphorus treatment. The water from the wetland and wetland buffer areas in Tract B will flow to a ditch inlet in the north end of Tract E. The water will be conveyed through pipes and discharged to the existing 15-inch pipe located near the stormwater facility. The wetland conveyance pipe will discharge the water at the point the water left the property prior to the development of the site.

3. *Provisions have been made for road, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;*
   The subject site's NW 43rd Avenue frontage will be improved, and a new public street, Waverly Place, will be constructed for access to the development, all in accordance with the Camas Design Standard Manual. Street improvements are shown on Sheets C-002, C-201, C-301, and C-501. Water, storm drainage, and sanitary sewage disposal are being provided for each lot and for street improvements as depicted on Sheets C-201, C-301, and C-401 of the submitted plan set. Street lighting will be addressed as part of the final engineering phase. Proposed street tree plantings are shown on Sheet L-101 of the submitted plan set. The proposed street tree along Waverly Place is the red sunset maple in the amount of 17 trees, and the chanticleer flowering pear along NW 43rd Avenue in the amount of 13 trees.

4. *Provisions have been made for dedications, easements and reservations;*
   The project includes only one dedication to the public in the form of ten feet of right-of-way along the subject site's NW 43rd Avenue frontage. There is a proposed 28-foot wide utility easement between Lots 8 and 9 as depicted on Sheet C-301 of the submitted plan set. There is also a 20-foot wide by 40-foot deep shared access easement between Lots 8 and 9 for access for those two lots only from Waverly Place. Tract B is being preserved as non-developable and non-buildable wetland and wetland buffer to be owned and maintained by the homeowners' association.

5. *The design, shape and orientation of the proposed lots are appropriate to the proposed use;*
   The proposed lots are largely rectangular with side lines having right angles to Waverly Place. Lot size and dimension requirements of CMC Title 18 have been met as discussed under CMC Section 18.09. Sheet SP-103 shows the proposed lots and dimensions, along with setbacks, to demonstrate the proposed use of single-family detached dwellings will be achievable once the final plat is recorded.

6. *The subdivision complies with the relevant requirements of the Camas land development and zoning code, and all other relevant local regulations;*
   This application, narrative, and all accompanying documents, reports, exhibits, and attachments demonstrate compliance with the relevant requirements of the CMC and other applicable regulations.

7. *Appropriate provisions are made to address all impacts identified by the transportation impact study;*
   A transportation impact study is not required for this 12-lot subdivision. The only traffic-related item required is a sight distance certification for the new NW 43rd Avenue/Waverly Place intersection, which has been completed and included as part of this application submittal. Based upon the submitted analysis, there is sufficient intersection sight distance at the subdivision's proposed access location.

8. *Appropriate provisions for maintenance of commonly owned private facilities have been made;*
   All proposed tracts will be owned by the homeowners' association. Maintenance for all tracts will be the responsibility of the homeowners' association via covenants, conditions, and restrictions to be recorded as part of the final plat process.

9. *Appropriate provisions, in accordance with RCW 58.17.110, are made for:*
   a. The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at school bus shelter/stops, and for students who walk to and from school, and
   This application, narrative, and all accompanying documents, reports, exhibits, and attachments demonstrate that appropriate provisions have been included in the proposed project for the public health, safety, and general welfare.

   b. The public use and interest will be served by the platting of such subdivision and dedication;
   Approval of this subdivision and right-of-way dedication will serve the current and future citizens of the City by providing much-needed single-family detached dwellings.

10. *The applicant and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.*
    This application, narrative, and all accompanying documents, reports, exhibits, and attachments demonstrate consistency with applicable regulations and adopted standards.

17.11.040 Phasing

The proposed subdivision will be developed in one phase.

17.11.050 Limitations on further subdivision

Under the current zoning of R-7.5, none of the resulting lots will be large enough for further division.

17.11.060 Expiration

It is the applicant's intent to begin preparation of the final engineering drawings and final plat immediately upon receipt of the preliminary plat approval, with submittal for review taking place as soon as the drawings and final plat are prepared.

CHAPTER 17.19 DESIGN AND IMPROVEMENT STANDARDS

17.19.030 Tract, block and lot standards

A. Environmental Considerations

1. *Critical Areas. Land that contains a critical area or its buffer as defined in Title 16 of this code, or is subject to the flood hazard regulations, shall be platted to show the standards and requirements of the critical areas.*
   The subject property contains the critical area of wetlands and wetlands buffer in the northeast corner of the site. Tract B has been identified as the area to be preserved as non-developable wetland and wetland buffer areas.

2. *Vegetation. In addition to meeting the requirements of CMC Chapter 18.31, Tree Regulations, every reasonable effort shall be made to preserve existing significant trees and vegetation and integrate them into the land use design.*
   Two of the trees in the wetland buffer area will be preserved. Seven trees in the protected wetland area along the north boundary of Tract B will be retained and preserved.

3. *Density transfers may be applicable if developer preserves critical areas. See Chapter 18.09 of this code.*
   Density transfers are applicable to this project and are discussed in this narrative under Chapter 18.09.

B. *Blocks. Blocks shall be wide enough to allow two tiers of lots, except where abutting a major street or prevented by topographical conditions or size of the property, in which case the approval authority may approve a single tier.*
   Sheet SP-103 of the submitted plan set shows one row of lots on the north side of Waverly Place and one row of lots on the south side of Waverly Place. Due to the site's south boundary being NW 43rd Avenue (a collector), the existence of wetlands in the northeast portion of the site, and the small area (3.27 gross acres) of the parent parcel, it is not possible to include any additional lots on either side of the proposed rows.

C. *Compatibility with Existing Land Use and Plans*
   The subject site is in a residential zone with a residential comprehensive plan designation. It is surrounded by other residentially-zoned properties, all within the same residential comprehensive plan designation of SMU. There are single-family residential subdivisions to the north, south, east, and west of the site. The proposed development of single-family residential dwellings is like the surrounding existing development. None of the surrounding developments contain stub or dead-end streets that need to be extended or connected as part of this project.

D. *Lots*
   1. *Each lot must have frontage and access onto a public street.*
      Sheet SP-103 of the submitted plan set shows the lots have both frontage on and access to Waverly Place, the new public street constructed as part of this development.

   2. *Side Lot Lines. The side lines of lots shall run at right angles to the street upon which the lots face as far as practical, or on curved streets they shall be radial to the curve;*
      A review of Sheet SP-103 of the submitted plan set shows the proposed side lot lines run at right angles to Waverly Place.

   3. *Building Envelopes. No lot shall be created without a building envelope of a size and configuration suitable for the type of development anticipated. For single-family residential zones, a suitable size and configuration generally includes a building envelope capable of siting a forty-foot by forty-foot square dwelling within the building envelope.*
      Sheet SP-103 of the submitted plan set shows the lot dimensions, lot areas, and yard setbacks to demonstrate a 40-foot by 40-foot square dwelling can be placed on each lot within the minimum setback areas.

   4. *Where property is zoned and planned for commercial or industrial use*
      As stated previously in this narrative, the subject property is zoned for residential use.

5. *Flag lots, access tracts, and private roads may be permitted only when the community development director or designee finds the applicant meets the criteria listed hereinafter:*
   a. The pole of a flag lot must be a minimum of twenty feet wide with a minimum of twelve feet of pavement and shall serve no more than one lot;
   b. The structure(s) accessed by a flag lot, access tract, or private road will be required to furnish a minimum of two off-street parking spaces per residential unit. Under no circumstances will required parking be allowed along the flag pole lot;
   c. An approved address sign, in accordance with the Camas Municipal Code, must be posted for each residence where the flag lot leaves the public road or access tract; and
   c. To protect the character of the immediate neighborhood, the city may impose special conditions, where feasible, including access configuration and separation, setbacks, fencing and landscaping.
   The project does not propose any access tracts or private roads. Lot 7 is the only proposed flag lot for the development. Sheet SP-103 of the submitted plan set shows the width of the flag pole as 24 feet. The flag pole will only serve Lot 7 and will be a paved width of at least 12 feet. An approved address sign will be placed at the east end of the flag pole, which is where the pole meets Waverly Place.

6. *Double Frontage Lots. Residential lots which have street frontage along two opposite lot lines shall be avoided, except for double frontage lots adjacent to an arterial or collector, which must comply with the following design standards:*
   A review of Sheet SP-103 of the submitted plan set shows Lots 9 through 12 as having street frontage along two opposite lines with Waverly Place running along their north lot lines and NW 43rd Avenue running along their south lot lines. NW 43rd Avenue is a collector street, so the proposed double frontage lots are allowed, provided they meet the design standards discussed below.

   a. Landscaping. A ten-foot landscaped tract is provided along the rear property line to visually buffer the rear yards from public view and prevent vehicular access.
   Sheet SP-103 of the submitted plan set depicts the required ten-foot wide landscape tract, along the rear property line of Lots 9 through 12, which will serve to visually buffer these rear yards from public view of NW 43rd Avenue as well as prevent vehicular access to NW 43rd Avenue. All lots in the subdivision, including the double frontage lots, will access from Waverly Place. None of the lots will take direct access from NW 43rd Avenue. Although not required, the ten-foot width of landscaping along the south lot line of Lots 9 through 12 will be extended along the south lot line of Lot 8 to the west edge of the subdivision, as a ten-foot wide landscape easement, to provide aesthetic continuity for the frontage of the development.

   Sheet L-101 of the submitted plan set shows the proposed landscaping for the site, including the landscaping plan for the ten-foot wide landscape tract. This tract will contain trees (Princeton sentry ginkgo) every 30 feet on center, three-foot tall shrubs (including purple rock rose and dwarf yedda hawthorn) to form a continuous screen, and groundcover (bearberry cotoneaster) to fully cover the remainder of the tract. Sheet L-101 notes in the plant list the trees will be two-inch caliper trees at the time of planting.

   b. Fencing and Walls. A sight-obscuring fence or masonry wall shall be located at the line that separates the lot from the ten-foot landscape tract.
   Sheet L-101 of the submitted plan set shows a six-foot tall wood fence on the north side of the ten-foot wide landscape tract to separate Lots 9 through 12 from said tract. The proposed six-foot tall wood fence will contain stone columns every 50 lineal feet to reduce the massing effect of the wood fencing material.

c. Architectural Design.
House elevations and facades have not been prepared for this project, and this application does not include any building permit requests. When the houses for Lots 9 through 12 are designed, the facades visible from NW 43rd Avenue will be consistent with the front building façade along Waverly Place. Houses on Lots 9 through 12 will avoid large blank walls on facades visible to NW 43rd Avenue. These items will be reviewed for compliance as part of the building permit process.

d. Setbacks. Minimum of twenty-foot setback will be provided from the property line separating the lot from the tract that is adjacent to the arterial or collector;
The required ten-foot wide landscape tract is adjacent to NW 43rd Avenue, which is a collector street. Sheet SP-103 of the submitted plan set shows the required 20-foot setback from the north line of the landscape tract.

7. *Corner Lots. Corner lots may be required to be platted with additional width to allow for the additional side yard requirements.*
Sheet SP-103 of the submitted plan set shows Lot 12 as being the only corner lot in the project. Side yard setbacks are shown on the lot demonstrating the lot is capable of siting a house and meeting the yard requirements.

8. *Restricted Corner Lots. Corner lots restricted from access on side yard flanking street shall be treated as interior lots and conform to front, side and rear yard interior setbacks of CMC Chapter 18.09; and*
Sheet SP-103 of the submitted plan set shows Lot 12 as being the only corner lot in the project. Access will be restricted and only allowed from the north property line to Waverly Place. Access will not be allowed from the east property line. Front, side, and rear yard interior setbacks are depicted on Sheet SP-103.

9. *Redivision.*
Sheet SP-103 shows the largest lot in the proposed development is 9,000 square feet in area. This is not large enough for re-division in the R-7.5 zone as 7,500 square feet is the minimum standard lot size, and 5,250 square feet is the minimum density transfer lot size; therefore, re-division standards are not applicable to this application.

E. Tracts and Trails
The subject site is not located in an area of an officially designated trail and no trails are proposed as part of this development. Proposed tracts are shown on Sheet SP-103 of the submitted plan set. Tract A is an open space tract that will contain landscaping. Tract B is the proposed wetland and wetland buffer areas tract. Tract C is the storm facility. Tract D is the required landscape tract separating Lots 9 through 12 from NW 43rd Avenue. Tract E will contain stormwater pipe and a ditch inlet to convey water from Tract B to the development's stormwater system. All tracts will be owned and maintained by the homeowners' association. Maintenance standards will be outlined in the covenants, conditions, and restrictions to be recorded as part of the final development process.

F. Landscaping
1. Each dwelling unit with a new development shall be landscaped with at least one tree in the planting strip of the right-of-way, or similar location in the front yard of each dwelling unit, with the exception of flag lots and lots accessed by tracts.

CMC Section 17.19.030(F) requires every dwelling unit to have at least one tree in the planting strip or front yard, excepting flag lots. Sheet L-101 of the submitted plan set shows the location of the proposed tree required for each lot. As discussed previously, Lot 7 is a flag lot and thus does not show a tree as one is not required.

G. Non-City Utility Easements
No non-city utility easements are proposed.

H. Watercourse Easements
The subject site is not traversed by any watercourses, drainageway, channels, or streams requiring stormwater easements or drainage rights-of-way.

I. Street Signs
The applicant shall pay for the initial cost of required street name or number signs, or street markings, including installation thereof, as part of developing the proposed project.

J. Lighting
The applicant shall pay for the cost of the design and installation of the street lighting system, acknowledging street lighting shall conform to the Clark public utility standards and be approved by the city. Street lighting design will be addressed during final engineering.

K. All residential streets shall conform to the guidelines and standards of the city neighborhood traffic management plan.
The project proposes one new residential street, Waverly Place. Sheet C-002 of the submitted plan set shows the required typical section for Waverly Place as well as the hammerhead turnaround at the west end. Also shown is the typical section for the required NW 43rd Avenue street frontage improvements.

17.19.040 – Infrastructure standards

A. Private Street
The project does not propose any private streets. The new street will be public.

B. Streets

1. *Half Width Improvement.*
   The subject site has NW 43rd Avenue frontage as its south boundary. This frontage will be improved to meet standards in the Design Standard Manual. A typical section is shown on Sheet C-002 of the submitted plan set. Sheet C-501 of the submitted plan set provides a preliminary striping plan for NW 43rd Avenue and the new intersection of NW 43rd Avenue and Waverly Place.

2. *Streets abutting the perimeter of a development shall be provided in accordance with CMC 17.19.040(B)(1) above, and the Design Standard Manual.*
   No streets are adjacent to the perimeter of the development, except NW 43rd Avenue along the south boundary, because the subject site is abutting a fully-developed parcel to the west and developed subdivisions to the north and east. Due to the existing development, it is not possible to construct streets abutting the north, east, or west perimeter of the development.

3. *The city engineer may approve a delay of frontage street improvements for development proposals under any of the following conditions:*

No delays are anticipated or proposed for the frontage improvements.

4. *In the event the frontage improvement is delayed, the owner must provide an approved form or financial surety in lieu of said improvements.*
   The applicant intends to construct all frontage improvements upon approval and receipt of necessary permits. Should there be a delay, the applicant acknowledges financial surety must be provided in lieu of the improvements.

5. *Dedication of additional right-of-way may be required for a development when it is necessary to meet the minimum street width standards or when lack of such dedication would cause…*
   Waverly Place will be dedicated as a 52-foot wide public street. An additional ten feet of right-of-way will be dedicated along the subject site's NW 43rd Avenue frontage as part of this project.

6. *Extension. Proposed street systems shall extend existing streets at the same or greater width unless…*
   No street extensions are proposed as part of this project. There are no abutting streets adjacent to the site requiring extension through or connection to this development.

7. *Names. All street names, street numbers, and building numbers shall be assigned in accordance with CMC 12.24.*
   Addressing will take place in accordance with CMC 12.24 through another phase of the development.

8. *Right-of-way, tract and pavement widths for streets shall be based on Table 17.19.040-1 and Table 17.19.040-2.*
   Waverly Place is a new public street, shown throughout the submitted plan set with a 52-foot wide right-of-way and 28 feet of pavement width as per Table 17.19.040-2. Sheet C-002 shows the typical section for Waverly Place, including the required five-foot wide detached sidewalk on both sides and five-foot wide planter strip on both sides. Sheet C-002 shows the typical section for NW 43rd Avenue, with the ten-foot wide right-of-way dedication shown on Sheet SP-103.

9. *Intersection. Any intersection of streets that connect to a public street, whatever the classification, shall be at right angles as nearly as possible, shall not exceed fifteen degrees, and not be offset insofar as practical. All right-of-way lines at intersections with arterial streets shall have a corner radius of not less than twelve feet.*
   The proposed intersection of Waverly Place and NW 43rd Avenue is at right angles as depicted on Sheet SP-103 of the submitted plan set.

10. *Street Layout. Street layout shall provide for the most advantageous development of the land development, adjoining area, and the entire neighborhood. Evaluation of street layout shall take into consideration potential circulation solutions for vehicle, bicycle and pedestrian traffic, and, where feasible, street segments shall be interconnected.*
    The subject site is adjacent to fully-developed subdivisions to the north and east, neither of which have any streets stubbing or dead-ending at the site's north or east property lines. NW 43rd Avenue is the south property line of the development. The parcel to the west contains an established single-family dwelling.

11. *Access Management.*
    The site does not contain any marginal access streets. A new local street will be constructed off NW 43rd Avenue to provide all access to the 12 new lots. A sight distance certification stating there is

sufficient intersection sight distance at the project's proposed access location has been included with this submittal package.

12. *Street Design.*
Sheet C-002 of the submitted plan set shows the typical street sections. Sheet C-201 shows the preliminary street grading plan to illustrate preliminary compliance with the Camas Design Standard Manual, and, specifically, to show the grade of the proposed Waverly Place does not exceed the 12-percent maximum. Final engineering drawings will show specific street design details to meet requirements in the Camas Design Standard Manual.

13. *Sidewalks shall be constructed as specified in Camas Design Standard Manual.*
Sidewalks will be constructed on both sides of Waverly Place, both sides of the hammerhead, and along the subject site's NW 43rd Avenue frontage. The typical street sections shown on Sheet C-002 of the submitted plan set illustrate the width of the sidewalks. The proposed sidewalks are also shown on all applicable sheets of the submitted plan set. Final engineering drawings will contain sidewalk design specifics. Sidewalks shall be installed prior to final acceptance of the development.

14. *Cul-de-sacs.*
The project does not propose any cul-de-sacs.

15. *Turn-arounds.*
The project proposes a hammerhead turnaround at the west end of Waverly Place. The hammerhead typical section is shown on Sheet C-002 of the submitted plan set.

C. *Utilities*

1. *Generally. All utilities designed to serve the development shall be placed underground and, if located within a critical area, shall be designed to meet the standards of the critical areas ordinance.*
All utilizes for the new subdivision shall be placed underground as part of site development. No utilities are proposed within the wetland or wetland buffer areas.

2. *Sanitary sewers shall be provided to each lot at no cost to the city and designed in accordance with city standards.*
Sheet C-401 of the submitted plan set illustrates the proposed sewer extension from NW 43rd Avenue, through the development, and back down to NW 43rd Avenue, along with showing the typical STEP sewer services to each new lot. This sheet shows the existing three-inch STEP sanitary mainline in NW 43rd Avenue adjacent to the site's southeast corner and demonstrates how it is being extended through the development and back to NW 43rd Avenue. A STEP sanitary cleanout is provided at the north end of the proposed hammerhead as well as at the west edge of the development in NW 43rd Avenue.

3. *Storm Drainage. The storm drainage collection system shall meet the requirements of the city's officially adopted storm water standards.*
The site's development plan proposes to grade the site to collect the site stormwater runoff and convey it to the proposed detention pond located along the western edge of the project. The volume of the detention pond was determined by the Western Washington Hydrology Model. Stormwater runoff from the site will be collected and treated in a Perk Filter Treatment Vault located next to the detention pond. After the stormwater runoff is treated in the Perk Filter Treatment Vault, it will be

discharged into the detention pond. The Perk Filter treatment system has a General Use Level Designation (GULD) for basic and phosphorus treatment. The water from the wetland and wetland buffer areas in Tract B will flow to a ditch inlet in the north end of Tract E. The water will be conveyed through pipes and discharged to the existing 15-inch pipe located near the stormwater facility. The wetland conveyance pipe will discharge the water at the point the water left the property prior to the development of the site.

4. *Water System.*
   There is an existing 18-inch ductile iron pipe water mainline adjacent to the subject site in NW 43rd Avenue. Proposed lots will have one common connection to this existing 18-inch mainline via installation of an eight-inch water line that will connect to the existing mainline and run through Waverly Place, transitioning to a six-inch water line in the hammerhead portion of Waverly Place. One-inch water services are proposed on each lot from the newly-installed water line in Waverly Place. Sheet C-401 of the submitted plan set depicts the existing and proposed water lines and services. The required service for an irrigation meter in Tracts A and D is shown on Sheet L-101 of the submitted plan set.

   Installation of a new public fire hydrant will take place south of the common property corner of Lots 4 and 5 as shown on Sheet C-401 of the submitted plan set. It is noted that Low Flow Life Safety Residential Fire Sprinklers are required to be installed in all the new houses of the development.

TITLE 16 ENVIRONMENT
SEPA
A SEPA threshold determination has been included as part of this application submittal.

ARCHAEOLOGICAL
An archaeological report has been included as part of this application submittal. The report, dated October 6, 2017, was prepared by Archaeological Investigations Northwest, Inc. (AINW), specifically Sarah L. Dubois, a professional archaeologist as defined by RCW 27.53.030(8) and WAS 25-48-020(4). The report recommends an archaeological resource survey is not necessary and states the following findings and conclusions:

> "The project is located within an area indicated as having a moderate, moderate-high, to high probability for pre-contact sites under the Clark County Predictive Model. No pre-contact or historic-period archaeological material was identified during the pedestrian survey and shovel testing. No archaeological sites have been recorded nearby. AINW recommends no further archaeological work is needed for this work."

Regardless, if any cultural or historical resources are discovered during construction activity, construction shall cease until a qualified archaeologist assesses the find.

CRITICAL AREAS
CHAPTER 16.51 GENERAL PROVISIONS FOR CRITICAL AREAS
16.51.070 Critical areas—Regulated
CMC Section 16.51.070(A) states the critical areas regulated by CMC Chapter 16.52 are wetlands (CMC Chapter 16.53), critical aquifer recharge areas (CMC Chapter 16.55), frequently flooded areas (CMC Chapter 16.57), geologically hazardous areas (CMC Chapter 16.59), and fish and wildlife habitat conservation areas (CMC Chapter 16.61). CMC Section 16.51.070(B) states all areas within the City meeting the definition of one or more critical areas, platted natural open space area, and conservation covenant areas are designated critical

areas and are subject to these provisions. The subject property has identified wetlands in the northeast corner of the site; therefore, the development is subject to CMC Chapter 16.51 and CMC Chapter 16.53.

16.51.090 Applicability

CMC Section 16.51.090(H) lists a subdivision as an activity subject to the criteria, guidelines, report requirements, conditions, and performances standards in CMC Title 16.

16.51.125 Vegetation removal permit

A vegetation removal permit request and vegetation management plan have been included with this application submittal and were addressed earlier in this document under the heading of Chapter 18.31.

16.51.130 Review required

The required critical areas report has been submitted with this application.

16.51.140 Critical area reporting evaluation—Requirements

The completed critical areas report addressing the criteria listed in CMC Section 16.51.140 is included with this application submittal.

16.51.150 Critical area report—Modifications to requirements

This project does not propose any modifications to the requirements.

16.51.160 Mitigation requirements
16.51.170 Mitigation sequencing
16.51.180 Mitigation plan requirements
16.51.190 Innovative mitigation

The applicant proposes to offset the proposed wetland and buffer impacts by purchasing credits form the Terrace Mitigation Bank (TMB). The subject property is within the service area of TMB as required by CMC Chapter 16.53.050.D.2.b. and 16.53.050.D.5.a.iii. As further required under CMC Chapter 16.53.050.D.5.a.i., TMB is currently certified under state and federal rules, has palustrine, emergent and buffer (case-by-case) credits available, and the use of credits is consistent with the terms and conditions of the certified bank instruments. The replacement ratios are listed in Table 2. Credit-Debit Ratios in the Critical Areas Report included with this application submittal.

16.51.200 Unauthorized critical area alterations and enforcement

The applicant does not propose or anticipate any unauthorized critical area alterations to the subject site.

16.51.210 Critical area markers, signs and fencing

During construction, the outer perimeter of Tract B will be marked with temporary orange construction/silt fencing to prevent unauthorized intrusion. The temporary fencing will be maintained through the entire construction period. A permanent vinyl-coated chain link fence is proposed along the perimeter of the tract for long-term protection. As required by CMC Chapter 16.53.040.C.2.b., signs will be installed, worded substantially as follows:

"Wetland and Buffer Area – Retain in a natural state"

Tract B will be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be

recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

16.51.220 Notice on title

Tract B will be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

16.51.240 Critical area protective mechanism

The identified critical area, being the wetland and wetland buffer areas in the northeast portion of the proposed development, is being set aside as Tract B and will be preserved and non-developable. During construction, the outer perimeter of Tract B will be marked with temporary orange construction/silt fencing to prevent unauthorized intrusion. The temporary fencing will be maintained through the entire construction period. A permanent vinyl-coated chain link fence is proposed along the perimeter of the tract for long-term protection. As required by CMC Chapter 16.53.040.C.2.b., signs will be installed, worded substantially as follows:

"Wetland and Buffer Area – Retain in a natural state"

Tract B will be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

16.51.250 Bonds to ensure mitigation, maintenance, and monitoring

The applicant shall establish any required bonds to ensure mitigation, maintenance, and monitoring of proposed Tract B.

CHAPTER 16.53 WETLANDS

The subject site has wetland and wetland buffer areas, as identified in the wetland delineation report, dated October 8, 2017, and included as part of this submittal. The critical areas report included with this application gives a detailed discussion on the project's compliance with CMC Chapter 16.53.

CHAPTER 61.55 CRITICAL AQUIFER RECHARGE AREAS

As confirmed in the critical areas report, the subject site does not contain any critical aquifer recharge areas.

CHAPTER 61.57 FREQUENTLY FLOODED AREAS

As confirmed in the critical areas report, the subject site does not contain any frequently flooded areas.

CHAPTER 16.61 FISH AND WILDLIFE HABITAT CONSERVATION AREAS

As confirmed in the critical areas report, the subject site does not contain any fish and wildlife habitat conservation areas.

TITLE 15 BUILDING AND CONSTRUCTION

Compliance with the City's Building and Construction Code will be demonstrated with the submittal of individual building and construction permit requests. Fire protection will be provided through provisions for apparatus access and provisions of fire protection water supplies as required by the International Fire Code. Apparatus access will be provided from existing NW 43rd Avenue through the proposed Waverly Place, with a fire apparatus turnaround at the end of Waverly Place. Fire protection supplies will be accomplished through a public fire hydrant located south of the common property corner of Lots 4 and 5 as shown on Sheet C-401 of the submitted plan set. Low Flow Life Safety Residential Fire Sprinklers are required in all the new dwellings. Nothing in the proposed application will preclude compliance with CMC Title 15.

CONCLUSION

The applicant has provided a development to meet the needs of the existing and future residents of the City. The proposal complies with all applicable portions of the CMC and furthers the goals of the City's adopted Comprehensive Plan.

Exhibit 8

Wetland Delineation Report for Clark County Parcel 177887000

2223 NW 43rd Avenue
Camas, Washington

Waverly Homes
3205 NE 78th Street, Suite 10
Vancouver, Washington 98665

October 8, 2017
PBS Project No. 75345.000

PBS
314 WEST 15TH STREET
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

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1 INTRODUCTION

PBS Engineering and Environmental (PBS) was contracted by Waverly Homes to conduct a wetland delineation in preparation of a new residential subdivision. The study area is located at 2223 NW 43rd Avenue, north of the Camas city center, Clark County, Washington (Appendix A, Figure 1). The 3.59-acre study area consists of Clark County parcel ID 177887000 in Township 2 North, Range 3 East, Section 34 (Clark County 2017). The delineation fieldwork was completed on September 15, 2017 by Greg Swenson, Professional Wetland Scientist.

The wetland boundaries described in this report are PBS' best professional opinion based on the circumstances and site conditions encountered at the time of this study. The final determination of the wetland boundary, classification, and required buffer will be made by local, state, and federal jurisdictions.

2 METHODS

The method used for delineating wetland boundaries followed the routine approach of the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Supplement (Version 2.0)* (Supplement) (U.S. Army Corps of Engineers 2010). Soils, vegetation, and indicators of hydrology were recorded at four sample plot locations on standard wetland determination data forms (Appendix B). Wetland plant ratings were assigned based on the *2016 National Wetland Plant List* (Lichvar et. al. 2016). No modification of the standard methodologies was necessary during the delineation. Wetland boundaries, sample plot locations, and snapshot photograph locations (Appendix C) were recorded in the field using a Trimble GeoXT handheld GPS unit. The wetlands documented during the field study were rated using the *Washington State Wetland Rating System for Western Washington 2014 Update* (Hruby 2014). The Wetland Rating Form is included in Appendix D.

The following information was reviewed prior to the field study:

- U.S. Geological Survey 7.5-minute topographic quadrangle map for Camas, WA-OR (USGS 1993), included in Appendix A, Figure 1
- U.S. Fish and Wildlife Service National Wetlands Inventory (USFWS 2017)
- Clark County critical areas mapping (Clark County 2017), wetland polygon included in Appendix A, Figure 2
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017a) soils map of the study area, included in Appendix A, Figure 3
- Aerial photograph (ESRI 2017), included as the background to Figures 2, 3, and 4 (Appendix A)
- Washington Department of Fish and Wildlife Priority Habitats and Species on the Web (WDFW 2017)
- Washington Department of Natural Resources Forest Practices Interactive Water Typing Map (i.e., Forest Practices Application Review System [FPARS]) (WDNR 2017)

3 RESULTS AND DISCUSSION

3.1 Topography

The study area is located at the eastern edge of the Willamette Valley Level IV Ecoregion 3a: Portland / Vancouver Basin (USGS 2017). This ecoregion is characterized by undulating terraces and floodplains at lower elevations (USGS 2017). Local upland topography is somewhat rolling with a gentle to moderate northward slope. A broad swale runs roughly east to west along the north part of the study area. According to previous

wetland delineation work conducted in the area (TRC 2015), the swale occupies the lowest elevations in the vicinity, most of which is north of the study area.

3.2 Plant Communities

Most plant species documented within the study area are aggressive non-native invaders. The upland plant community is dominated by Spreading Bent (*Agrostis stolonifera*), Himalayan Blackberry (*Rubus armeniacus*), and Canadian Thistle (*Cirsium arvense*) with occasional Oregon Ash (*Fraxinus latifolia*) saplings. The wetland plant community was dominated by similar weeds but had a greater amount of Oregon Ash with Reed Canary Grass (*Phalaris arundinacea*) in the understory.

3.3 Soils

According to the NRCS (NRCS 2017a), three soil mapping units occur within the study area: *Hesson clay loam, 0 to 8 percent slopes* (mapping unit HcB), *Hesson clay loam, 8 to 20 percent slopes* (mapping unit HcD), and *Odne silt loam, 0 to 5 percent slopes* (mapping unit OdB).

Hesson clay loam, 0 to 8 percent slopes and *Hesson clay loam, 8 to 20 percent slopes* are mapped in the northwest, west, and south parts of the study area. The non-hydric *Hesson* soil consists of well drained soils formed in old alluvium on high terraces and terrace escarpments (NRCS 2017b). Plot 1 was established in the *Hesson* mapping unit and was generally within the NRCS-described range of characteristics for the mapping unit.

The *Odne silt loam, 0 to 5 percent slopes* mapping unit occurs in the north and central parts of the study area. The hydric *Odne* unit consists of poorly drained soils formed in alluvium in basins and drainageways on terraces (NRCS 2017b). Plots 2, 3, and 4 were established within the mapped boundaries of the *Odne* unit. Plots 2 and 4 had hydric soil indicators but were outside the NRCS-described range of characteristics for the *Odne* soil. Plot 3 lacked hydric soil indicators.

3.4 Hydrology

The closest WETS climate station with a similar elevation as the study area is the Vancouver 4 NNE station (NRCS 2017c). Historical (1971-2000 period) average annual rainfall is listed as 41.51 inches in Vancouver. Recent precipitation data were not available from the WETS Vancouver 4 NNE station, therefore the recent data were obtained from the Vancouver Pearson Field Airport station (National Weather Service 2017). Table 1 shows the monthly precipitation averages for the water year preceding the field study.

Table 1. Observed and Normal Monthly Precipitation for Vancouver, Washington

Month	Actual	Vancouver, WA 1971-2000			% of Average	Above or Below Normal
		30% chance will have		Average		
		Less than	More than			
October 2016	8.22	1.87	3.87	3.18	258	Above
November 2016	6.88	4.15	7.39	6.18	111	Normal
December 2016	4.76	4.44	7.54	6.35	75	Normal
January 2017	4.31	3.74	6.83	5.69	76	Normal
February 2017	10.38	3.44	5.72	4.83	215	Above
March 2017	7.05	3.32	4.85	4.21	167	Above
April 2017	4.25	2.23	3.62	3.07	138	Above
May 2017	1.79	1.69	3.18	2.64	68	Normal
June 2017	1.24	1.16	2.11	1.76	70	Normal
July 2017	Trace	0.34	0.93	0.80	0	Below
August 2017	0.10	0.41	1.25	1.06	9	Below
September 1-15, 2017	0.09	0.39 (Prorated)	1.03 (Prorated)	0.88 (prorated)	10	Below
Water Year Through September 15, 2017	**49.07**	**27.18**	**48.32**	**40.65**	**121**	**Above**

Rainfall recorded prior to the field study was below average and below the normal range. Due to the late summer timing of the field study, all wetland data plots lacked primary hydrology indicators. The determination of wetland hydrology was based on the presence of two secondary hydrology indicators.

Hydrology modifications in the form of excavated ditches were observed during the field study. The ditches appeared to be old and poorly maintained. Nonetheless, their function for draining runoff from the south to the north and, ultimately, offsite, appeared to be intact. Excavated Ditch 1 appeared to augment seasonal hydrology to the south part of Wetland A while Excavated Ditch 2 appeared to somewhat drain the north part of Wetland A.

3.5 Existing Wetland Mapping

The configuration and area of the wetlands documented during the field study roughly corresponds to those mapped on the Clark County *Wetland Presence* mapping (Clark County 2017). The National Wetland Inventory (NWI) (USFWS 2017) does not map wetlands within the study area.

3.6 Findings

Wetland A (0.52-ac.) is located in the northeast part of the study area. The Cowardin (Cowardin et. al. 1979) and hydrogeomorphic (HGM) (Hruby 2014) classifications of Wetland A are palustrine, emergent and slope, respectively. Soils within Wetland A exhibited hydric soil indicators and secondary indicators of wetland hydrology were present. The contrasting uplands lacked hydric soils and wetland hydrology indicators. Landscape position was the primary method for identifying the upland / wetland boundary.

4 CONCLUSIONS

The wetland area, wetland rating, and local buffering requirements (City of Camas 2017) are shown below in Table 2.

Table 2. Wetland Summary

Wetland	Area (acre)	Wetland Rating	Wetland Buffer Dimensions (feet)
Wetland A	0.53	IV	50[1]

[1]Based on high intensity use.

5 JURISDICTION

Wetland A likely falls under local, state, and federal jurisdictions. Any impacts to jurisdictional wetlands, waters, and/or buffers will require review by USACE, Washington Department of Ecology, and the City of Camas. Excavated Ditch 1 appears to have been entirely created in uplands for the explicit purpose of facilitating stormwater drainage. The ditch appears to be outside of local, state, and federal jurisdictions. Excavated Ditch 2 appears to have been created in existing wetlands and is likely jurisdictional.

6 DISCLAIMER

This report is based on observations of vegetation, soils, and hydrology at the time of the study. Changing environmental conditions or human activities may alter those parameters which may change the conclusions presented in this report. The conclusions in this report represent the investigator's interpretation of the specified technical manuals and best available science and may not correspond with observations or conclusions of others, including government agencies.

This report was prepared to meet current local, state, and federal regulations. PBS is not responsible for changes made to regulations and reporting requirements after the report has been completed. Final authority regarding jurisdiction and permitting requirements rests with the appropriate agencies.

This report is for the exclusive use of the Client for design of the development and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the expressed written consent of the Client and PBS.

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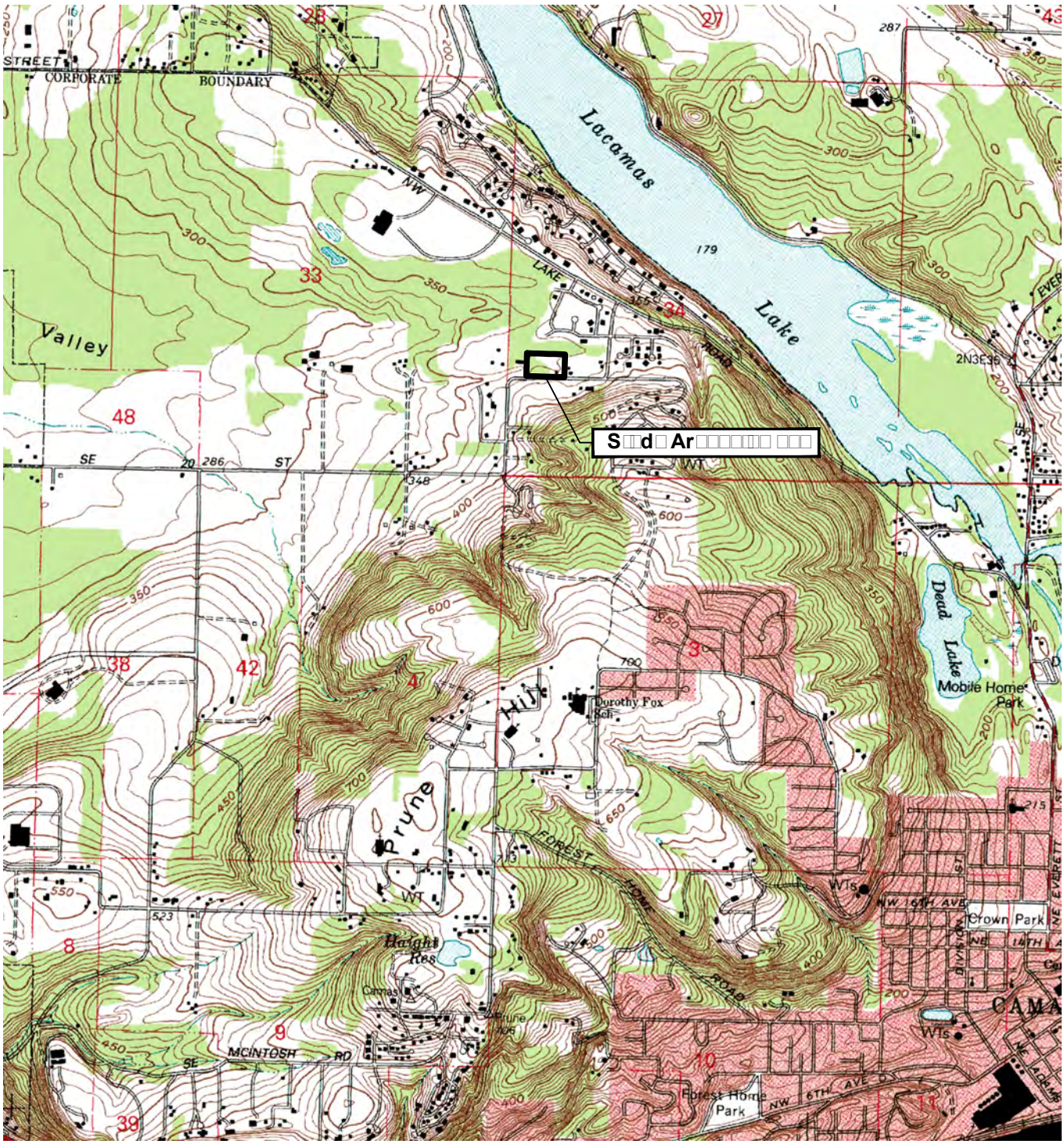
APPENDIX A

Figures



SOURCE: USGS CAMAS, WA-OR □UADRANGLE, 1993.

□ AS□INGTON

SCALE: 1" = 2,000'

0 1,000' 2,000' 4,000'

PREPARED FOR: WAVERLY HOMES.

PBS

VICINITY MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE

□

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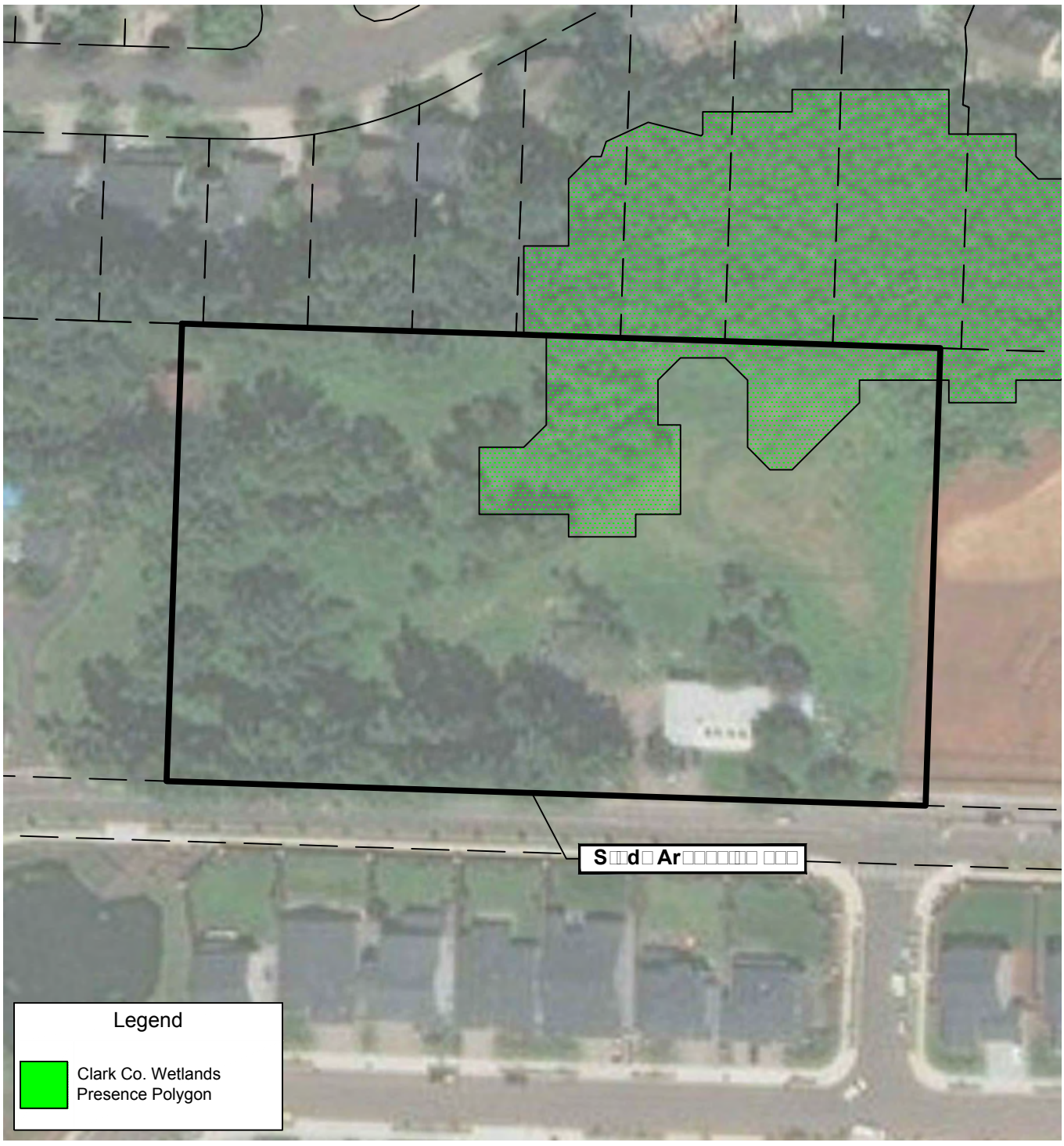

SOURCE: ESRI IMAGERY. CLARK CO. WETLAND PRESENCE POLYGON.

□ AS□INGTON

□□NO NWI WETLANDS MAPPED IN STUDY AREA□□

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

PBS

NATIONAL □LOCAL □ ETLAND INVENTORY MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE

□

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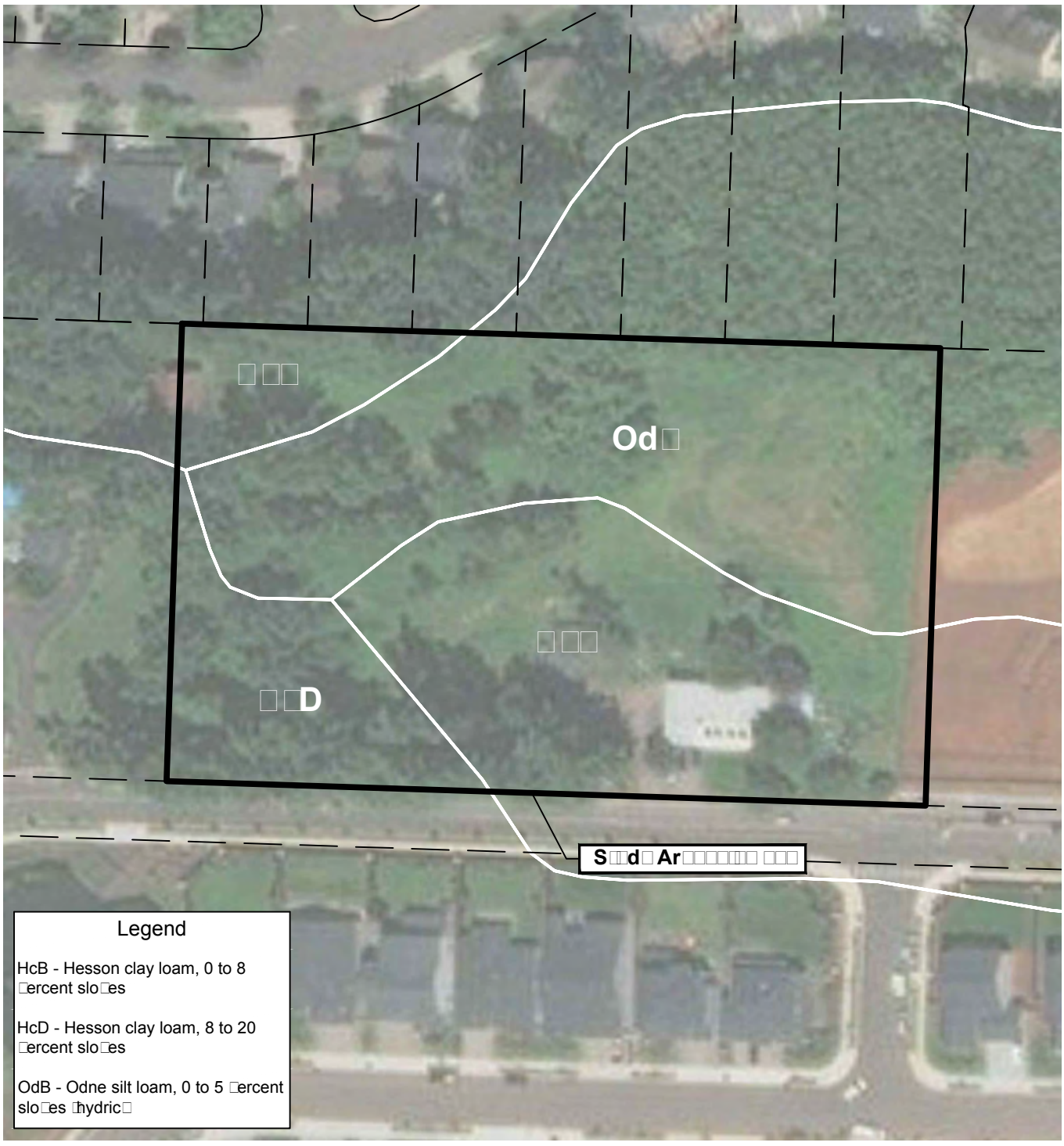

SOURCE: NRCS SOIL MAPPING POLYGONS. AERIAL PHOTOGRAPH FROM ESRI 2017

AS INGTON

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

PBS

SOIL MAPPING NITS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE

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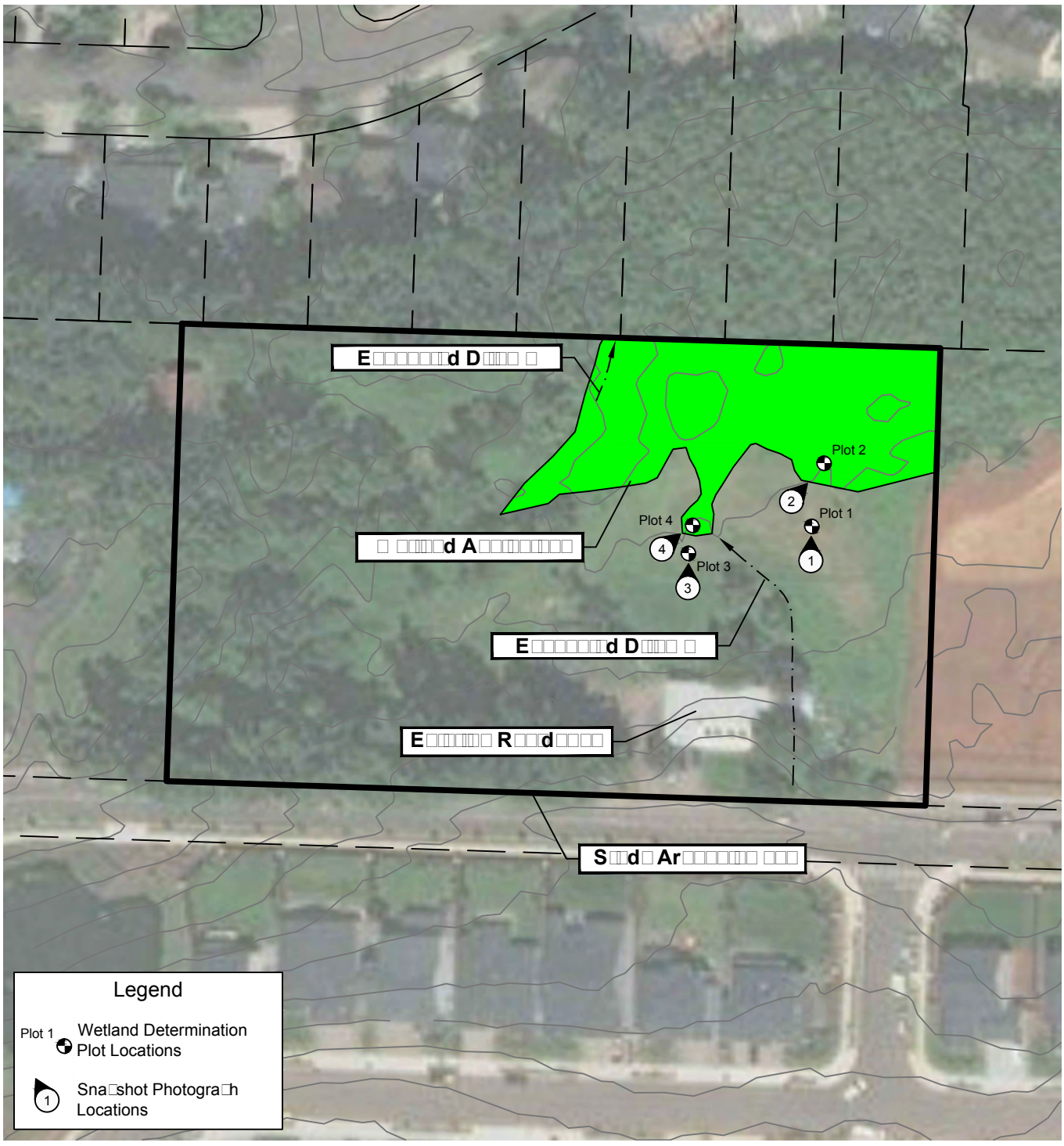


SOURCE: AERIAL PHOTOGRAPH FROM ESRI 2017

WASHINGTON

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

WETLAND DELINEATION MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:28:58 PM

APPENDIX B

Wetland Data Forms

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 1
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Toeslope Local relief: Convex Slope (%): 4
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611040 Long: -122.431847 Datum: WGS84
Soil Map Unit Name: Hesson clay loam, 0 to 8 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes		No	**X**
Wetland Hydrology Present?	Yes		No	**X**

Is the Sampled Area within a wetland? **Yes** ____ **No** **X**

Remarks: Northeast part of study area, 115 feet south of north study area boundary and 80 feet west of east study area boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Fraxinus latifolia*	5	Yes	FACW
2.			
3.			
4.			
5.			
Total Cover:	5		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis stolonifera*	85	Yes	FAC
2. *Cirsium arvense*	5	No	FAC
3. *Holcus lanatus*	5	No	FAC
4. *Schedonorus arundinaceus*	5	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	5 x 2 =	10
FAC species	100 x 3 =	300
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	105 (A)	310 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks:

SOIL

Sampling Point: 1

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

Depth	Matrix		Redox Features				Texture	Remarks
(in.)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-12	5YR 3/2	100					scl	dry
12-16	5YR 3/2	100					cl	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: 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]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present?

Yes ___ **No** X

Remarks:

Rock fragment refusal at 16".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ___ 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, and 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 (D4)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (in):	
Water Table Present?	Yes ___	No X	Depth (in):	>16
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (in):	>16

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 2
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Broad swale Local relief: Concave Slope (%): 2
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611156 Long: -122.431817 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes	**X**	No	
Wetland Hydrology Present?	Yes	**X**	No	

Is the Sampled Area within a wetland? **Yes X** **No**

Remarks: Northeast part of study area, 35 feet north of Plot 1 and 1 foot lower.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Fraxinus latifolia*	10	Yes	FACW
2. *Rubus armeniacus*	5	Yes	FAC
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95	Yes	FACW
2. *Cirsium arvense*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0 x 1 =	
FACW species	105 x 2 =	210
FAC species	10 x 3 =	30
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	115 (A)	240 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks:

SOIL

Sampling Point: 2

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

Depth (in.)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 2.5/2	95	7.5YR 3/4	5	C	M	cl	dry
12-20+	7.5YR 2.5/2	95	7.5YR 3/4	5	C	M	c	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10)
	Red Parent Material (TF2)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks:

12-20+" horizon has 1% rounded gravels and 10% 5YR 4/6 sandy parent material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**		Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
	High Water Table (A2)				
	Saturation (A3)		Salt Crust (B11)		Drainage Patterns (B10)
	Water Marks (B1)		Aquatic Invertebrates (B13)		Dry-Season Water Table (C2)
	Sediment Deposits (B2)		Hydrogen Sulfide Odor (C1)		Saturation Visible on Aerial Imagery (C9)
	Drift Deposits (B3)		Oxidized Rhizospheres along Living Roots (C3)	X	Geomorphic Position (D2)
	Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)		Shallow Aquitard (D3)
	Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils (C6)	X	FAC-Neutral Test (D5)
	Surface Soil Cracks (B6)		Stunted or Stressed Plants (D1) (**LRR A**)		Raised Ant Mounds (D6) (**LRR A**)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Frost-Heave Hummocks (D4)
	Sparsely Vegetated Concave Surface (B8)				

Field Observations:

Surface Water Present?	Yes		No X	Depth (in):	
Water Table Present?	Yes		No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes		No X	Depth (in):	>20

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 3
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Toeslope Local relief: Convex Slope (%): 4
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.610984 Long: -122.432168 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes		No	**X**
Wetland Hydrology Present?	Yes		No	**X**

Is the Sampled Area within a wetland? **Yes** **No** **X**

Remarks: Northeast part of study area, 140 feet south of north study area boundary and 165 west of east study area boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Rubus armeniacus*	15	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot size: 5' r)			
1. *Cirsium arvense*	50	Yes	FAC
2. *Agrostis stolonifera*	40	Yes	FAC
3. *Phalaris arundinacea*	10	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	10 x 2 =	20
FAC species	105 x 3 =	315
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	115 (A)	335 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No**

Remarks:

SOIL

Sampling Point: 3

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

Depth	Matrix		Redox Features				Texture	Remarks
(in.)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-15	7.5YR 2.5/2	100					c	dry
15-20+	7.5YR 3/2	100					sc	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: 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]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present?

Yes ___ **No** X

Remarks:

15-20+" horizon has 10% 5YR 4/6 sandy parent material inclusions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ___ 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, and 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 (D4)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (in):	
Water Table Present?	Yes ___	No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (in):	>20

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 4
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Broad swale Local relief: Concave Slope (%): 3
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611036 Long: -122.432160 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes X No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a wetland? Yes X No

Remarks: Northeast part of study area, 20 feet north of Plot 3 and 1 foot lower.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95	Yes	FACW
2. *Cirsium arvense*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	95 x 2 =	190
FAC species	5 x 3 =	15
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	100 (A)	205 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: 4

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

Depth (in.)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 3/2	95	7.5YR 4/4	5	C	M	cl	dry
14-16	7.5YR 4/4	95	2.5Y 2.5/1	5	C	M	scl	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10)
	Red Parent Material (TF2)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: Refusal at 16" due to rock fragment. 0-14" horizon has 5% bits of black charcoal. 14-16" horizon has 20% 7.5YR 5/8 sandy parent material throughout. 2.5Y 2.5/1 redox concentrations/concretions increase with depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
	High Water Table (A2)		
	Saturation (A3)		Salt Crust (B11)
	Water Marks (B1)		Aquatic Invertebrates (B13)
	Sediment Deposits (B2)		Hydrogen Sulfide Odor (C1)
	Drift Deposits (B3)		Oxidized Rhizospheres along Living Roots (C3)
	Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)
	Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils (C6)
	Surface Soil Cracks (B6)		Stunted or Stressed Plants (D1) (**LRR A**)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (2 or more required)

	Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
	Drainage Patterns (B10)
	Dry-Season Water Table (C2)
	Saturation Visible on Aerial Imagery (C9)
X	Geomorphic Position (D2)
	Shallow Aquitard (D3)
X	FAC-Neutral Test (D5)
	Raised Ant Mounds (D6) (**LRR A**)
	Frost-Heave Hummocks (D4)

Field Observations:

Surface Water Present?	Yes	No X	Depth (in):	
Water Table Present?	Yes	No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (in):	>20

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

APPENDIX C

Snapshot Photographs

Photo 1. Panoramic □hoto of the east-central □art of the study area □u□land□ View is to the north. Sam□le □lot 1 is visible just left of center. Photo taken Se□tember 15, 2017.

Photo 2. Panoramic □hoto of the northeast □art of the study area □Wetland A□ View is to the northeast. Sam□le □lot 2 is visible in the center. Photo taken Se□tember 15, 2017.

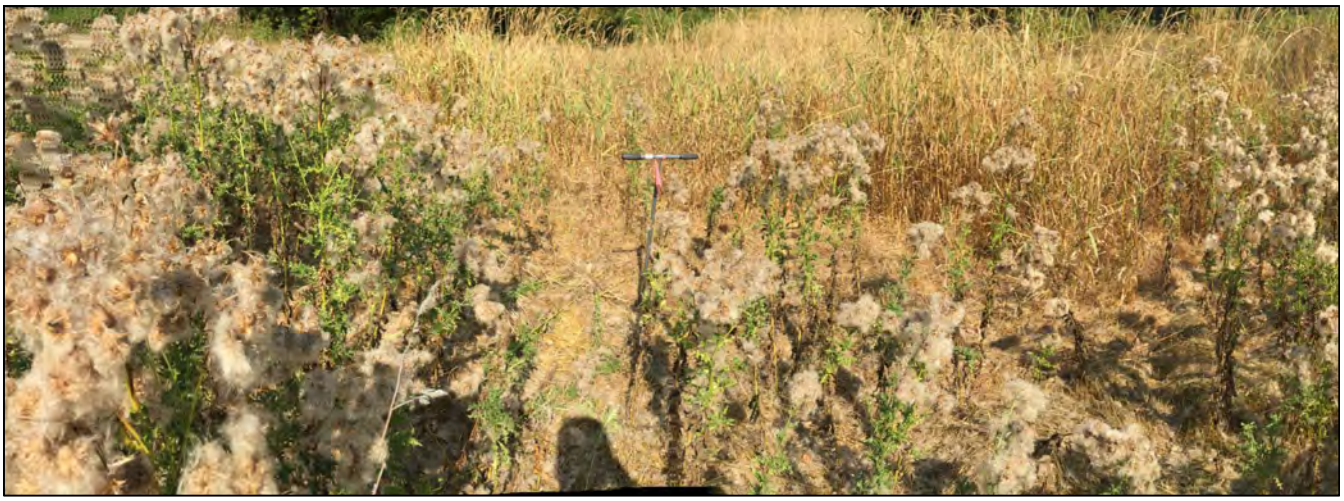


Photo 3. Panoramic □hoto of the central □art of the study area □u□land□ View is to the north. Sam□le □lot 3 is visible in the center. Photo taken Se□tember 15, 2017.

Photo 4. Panoramic □hoto Wetland A where Excavated Ditch 1 □not visible□discharges. View is to the northeast. Sam□le □lot 4 is visible in the center. Photo taken Se□tember 15, 2017.

APPENDIX D

Wetland Rating Form & Figures

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 9/15/17

Rated by Greg Swenson Trained by Ecology? Yes No Date of training 9/24-25/14

HGM Class used for rating Slope Wetland has multiple HGM classes? Y X N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map ESRI / ArcGIS

OVERALL WETLAND CATEGORY ____ (based on functions X or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

X **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		Circle the appropriate ratings		
Site Potential	H M (L)	H (M) L	H M (L)	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	(H) M L	H M (L)	H (M) L	**TOTAL**
Score Based on Ratings	6	5	4	15

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	X

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	A
Hydroperiods	H 1.2	A
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	A
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	A
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	A
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	B
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	C
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	D

Wetland name or number A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   (NO) – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   (NO) – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   X The wetland is on a slope (*slope can be very gradual*),
   X The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**.

   NO – go to 5 (YES) **–** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number A

(NO) – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

(NO) – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

(NO) – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% points = 1 Slope is greater than 5% points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	2
Total for S 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** X **0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	0
Total for S 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: X **1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the basin in which unit is found.* Yes = 2 No = 0	2
Total for S 3 Add the points in the boxes above	3

Rating of Value If score is: X **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	1

Rating of Site Potential If score is: X **1 = M** ___**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1

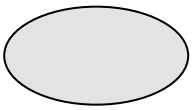
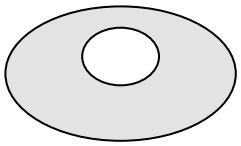
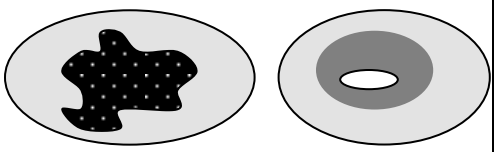
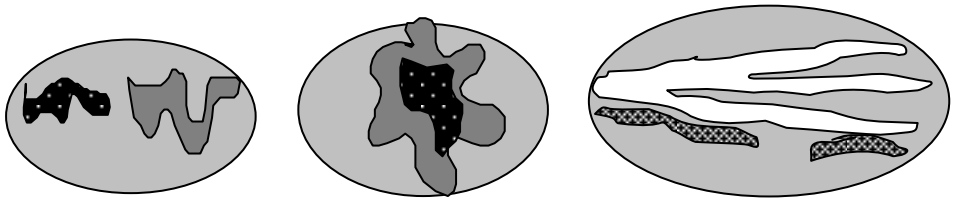
Rating of Landscape Potential If score is: X **1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	0

Rating of Value If score is: ___**2-4 = H** ___**1 = M** X **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _A__

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ____Aquatic bed — 4 structures or more: points = 4 __X__Emergent — 3 structures: points = 2 ____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 __X__Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____Permanently flooded or inundated — 4 or more types present: points = 3 __X__Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 ____Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland ____Seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	2

Wetland name or number A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	2
Total for H 1 Add the points in the boxes above	6

Rating of Site Potential If score is:___**15-18 = H** ___**7-14 = M** X **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 0 **+** [(% moderate and low intensity land uses)/2] 0.5 **=** 0.5 % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 17 **+** [(% moderate and low intensity land uses)/2] 6.5 **=** 23.5 % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** X **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

Rating of Value If score is:___**2 = H** X **1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

X **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

X **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

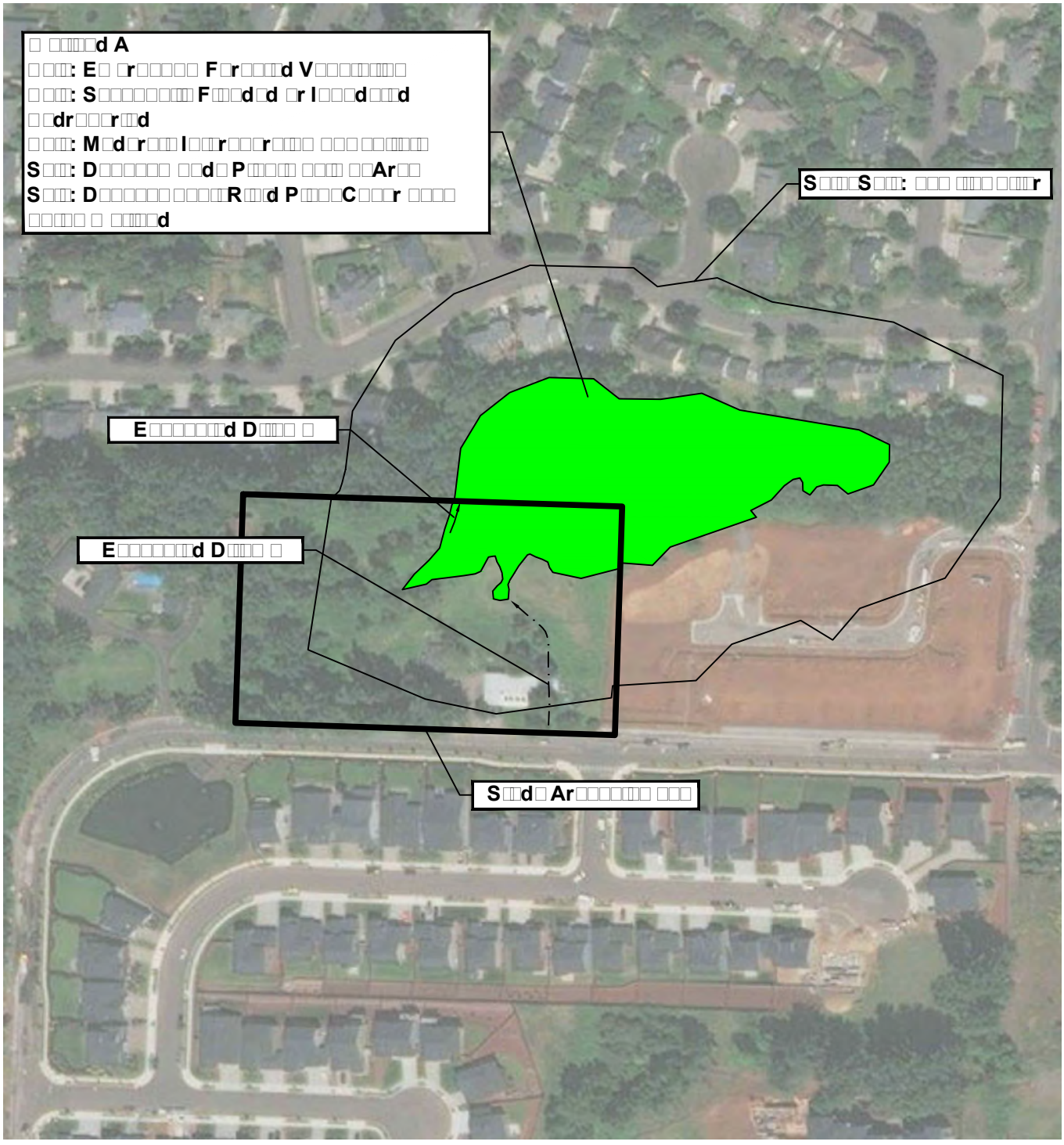
Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** (No) **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? (Yes) – Go to **SC 2.2** No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** (No) **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** (No) – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** (No) **= Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number A

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** (No) = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** (No) = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** (No) = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A



SOURCE: AERIAL PHOTOGRAPHY FROM ESRI (2017)

AS INGTON

SCALE: 1" = 200'

0 100' 200' 400'

PREPARED FOR: WAVERLY HOMES.

PBS

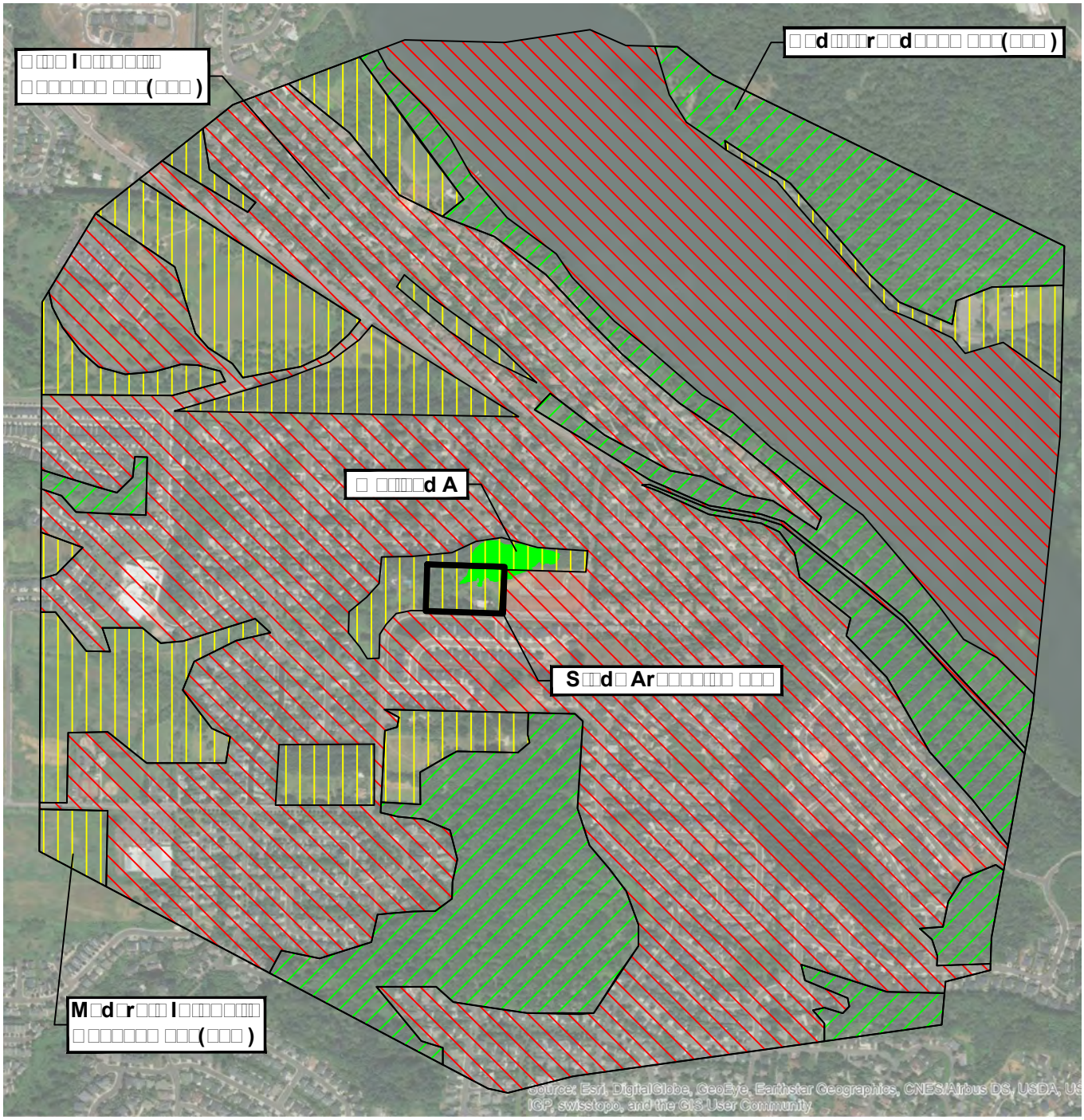
ETLAND RATINGS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
A

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:31:43 PM



SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017)

WASHINGTON

SCALE: 1" = 1,000'

0 500' 1,000' 2,000'

PREPARED FOR: WAVERLY HOMES.

PBS

WETLAND RATINGS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

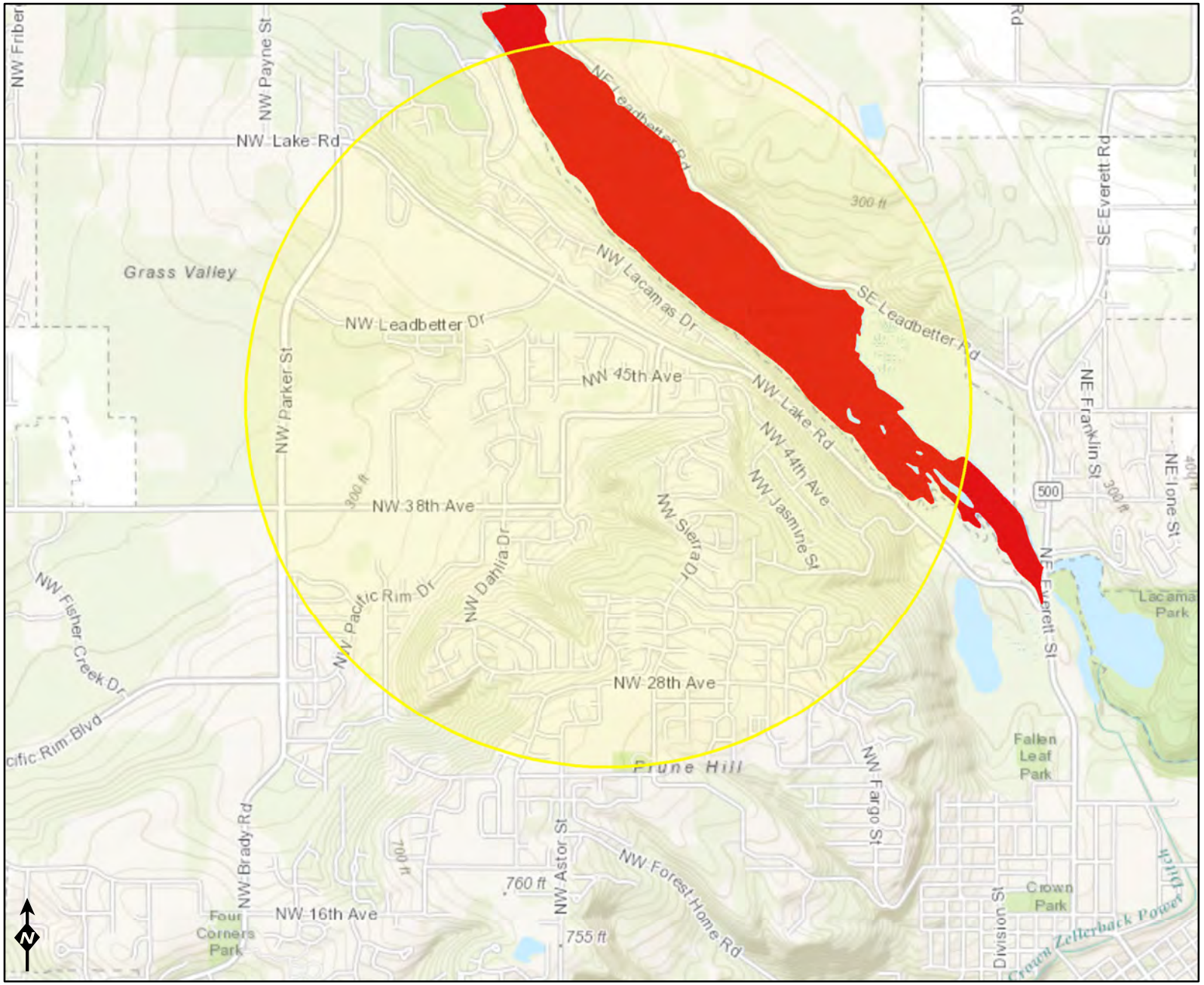
OCT 2017
75345.000

FIGURE

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:32:20 PM

October 7, 2017

Clark Co. Parcel 177887000 Wetland Rating Figure C



Assessed Waters/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Miles
0 0.25 0.5 1

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, ©

DEPARTMENT OF ECOLOGY
State of Washington

Clark Co. Parcel 177887000 Wetland Rating Figure D

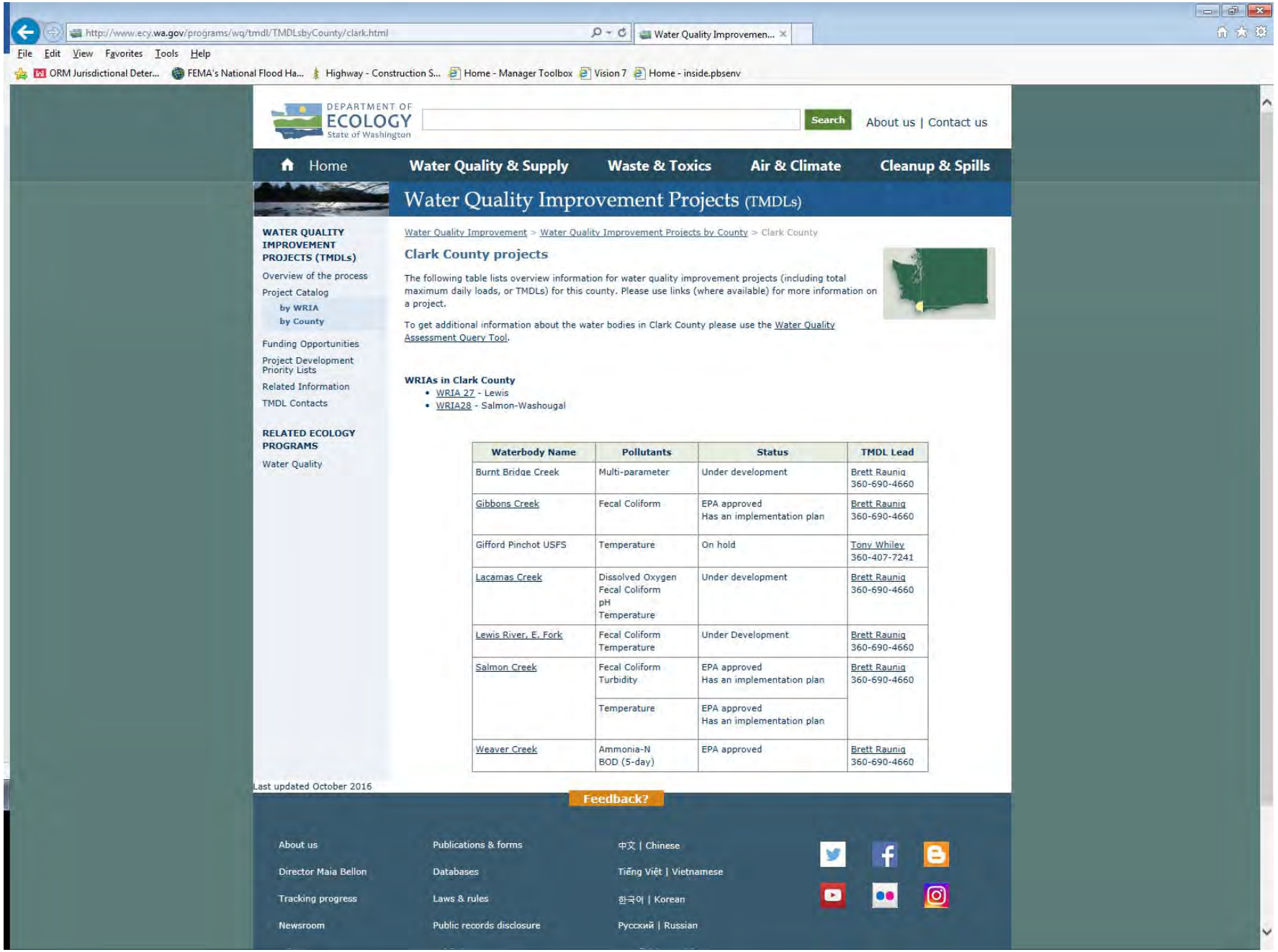


Exhibit 9

Critical Areas Report for NW 43rd Avenue Subdivision

2223 NW 43rd Avenue
Camas, Washington

Prepared for:
Waverly Homes, LLC
3205 NE 78th Street, Suite 10
Vancouver, WA 98665

March 9, 2018
PBS Project No. 75345.000

PBS
314 WEST 15TH STREET
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

TABLE OF CONTENTS

SUPPORTING DATA

TABLES

APPENDICES

1 PROJECT INFORMATION

Applicant
Brett Simpson, Manager
Waverly Homes, LLC
3205 NE 78th Street, Suite 10
Vancouver, WA 98665
brett@mywaverlyhomes.com
(360) 524-2128

Location

Current Address:	2223 NW 43rd Avenue in Camas, Washington (Figure 1)
Clark County Parcel ID:	177887000 in the southwest ¼ of Section 34, Township 2 North, Range 3 East
Elevation:	360 to 374 feet NGVD29(47) (PBS 2017a)

City of Camas Comprehensive Plan Designation: Single-Family Medium (SFM)

2 DESCRIPTION OF THE PROPOSAL

The applicant proposes to develop a new residential subdivision of 12 lots for single-family detached dwellings (Figure 2). Each lot would contain a dwelling with an attached garage, paved driveway, and yard area. The proposed project would include a new street (Waverly Place) extending north from NW 43rd Avenue, then bending west and terminating in a hammerhead configuration. Waverly Place would approximately bisect the site with seven lots and a natural area on the north side and five lots on the south side of the street. New utilities and stormwater drainage infrastructure is also proposed. PBS Engineering and Environmental (PBS) has identified the following critical areas within the subject property per Title 16 of the Camas Municipal Code (CMC) (City of Camas 2018).

- Wetlands. PBS completed a wetland delineation report in October 2017. 0.53-acre of Category IV wetlands were delineated in the northeast part of the subject property (Appendix A) (PBS 2017b). The wetland has a 50-foot buffer that totals 0.64-acre. The applicant proposes to fill 0.20-acre of the wetland and 0.57-acre of the buffer. The balance of the wetland and buffer acreage would be contained in a dedicated tract (Tract B shown on Figure 2). Twelve (12) trees located in the in the wetland and buffer are proposed to be removed during site grading. Twenty-four (24) replacement trees would be planted in Tract B pursuant to CMC Chapter 16.51.125.B. Permits requested: wetland permit and vegetation removal permit.

  As part of the wetland rating included with the wetland delineation report, wetlands within 300 feet of the subject property were mapped (Appendix A, Figure A). PBS' fieldwork and fieldwork conducted by other consultants on adjacent lands indicate the buffer for all wetlands is 50 feet. No shoreline areas, water features, floodplains, other critical areas or related buffers are known within 300 feet of the subject property.

- Critical Aquifer Recharge Areas (CARA). The City of Camas *CARA Map* (City of Camas 2012) does not indicate *Wells Serving Over 20 People* or *Wellhead Protection Areas* on or near the subject property. According to the Clark County GIS (Clark County 2018), the subject property is not within the *Critical Aquifer Recharge Area - Category 1* layer.

- Frequently Flooded Areas. PBS reviewed Flood Insurance Rate Map Number 53011C0531D (NFIP 2012) and the Clark County GIS (Clark County 2018). No frequently flooded areas occur within the subject property.

- Geologically Hazardous Areas. CMC Chapter 16.59.010 identifies four types of geologically hazardous areas: erosion hazard, landslide hazard, seismic hazard, or other geological events including, mass wasting, debris flows, rock falls, and differential settlement. The Clark County GIS (Clark County 2018) does not map the subject property in the *Severe Erosion Hazard* or *Landslide Hazard Areas* layers. The *Earthquake Hazard: NEHRP* layer designates *Site Class C* for ground shaking amplification potential, which is relatively low. The *Earthquake Hazard: Liquefaction* layer indicates *Low* liquefaction potential. The *Faults 24K* layer does not indicate any faults in the area. PBS completed a geotechnical engineering report for the subject property in December 2017 (Appendix B) (PBS 2017c). No geologically hazardous areas were identified.
- Fish and Wildlife Habitat Conservation Areas. CMC Chapter 16.61.010 identifies the following fish and wildlife habitat conservation areas:
    1. Areas with which state or federally designated endangered, threatened, and sensitive (TES) species have a primary association. No known TES species occur within the subject property.
    2. State Priority Habitats and areas associated with state priority species. The *Priority Habitats on the Web* mapper (WDFW 2018) does not indicate any Priority Habitats on or near the subject property.
    3. Habitats of local importance as identified by the city's parks and open space plan as natural open space. No Oregon White Oak or Camas Lily populations were observed during PBS' wetland field study.
    4. Naturally occurring ponds under 20 acres. No ponds occur on the subject property.
    5. Waters of the state. No non-wetland waters of the state occur on the subject property.
    6. Bodies of water planted with game fish by a governmental or tribal entity. No bodies of water occur on the subject property.
    7. State natural area preserves and natural resource conservation areas. No state natural area preserves or natural resource conservation areas occur within the subject property.

3 PREPARER

This Critical Areas Report was prepared by PBS' Professional Wetland Scientist Greg Swenson. Mr. Swenson has over 17 years of consulting experience in land and water resources assessment and permitting. Mr. Swenson conducted the fieldwork on September 15, 2017.

4 DESCRIPTION OF WETLANDS

PBS delineated Wetland A in the northeast part of the study area (Figure 2). The Cowardin (Cowardin et. Al. 1979) and hydrogeomorphic (HGM) (Hruby 2014) classifications of Wetland A are palustrine, emergent and slope, respectively. Dominant plant species consist of aggressive non-native invaders such as Himalayan Blackberry (*Rubus armeniacus*) and Reed Canary Grass (*Phalaris arundinacea*) with a few Oregon Ash (*Fraxinus latifolia*) trees with in the overstory (PBS 2017b). Soils within Wetland A are mapped as *Odne silt loam, 0 to 5 percent slopes* (NRCS 2018a). The hydric *Odne* mapping unit consists of poorly-drained soils formed in alluvium in basins and drainageways on terraces (NRCS 2018b). The fieldwork confirmed the presence of hydric soil indicators within the wetland boundary. Due to the late summer timing of the wetland delineation fieldwork, secondary hydrology indicators were documented to confirm the presence of wetland hydrology.

Wetland Rating & Buffer

PBS rated Wetland A as Category IV using the 2014 version of the *Washington State Wetland Rating System for Western Washington* (Hruby 2014). The proposed project has a density of more than one unit per acre, which

makes the project a high intensity land use. A Category IV wetland with a high intensity land use has a required buffer width of 50 feet, as per CMC Table 16.53.040-1, to protect water quality functions.

5 IMPACT MINIMIZATION

Due to the configuration of Wetland A, total avoidance of wetland and buffer impacts is not feasible and would be inconsistent with the City of Camas comprehensive plan. The applicant initially anticipated a 14-lot subdivision which would have resulted in filling 0.64-acre of wetland buffer and 0.43-acre of wetland (Figure 3). To minimize these impacts, the applicant removed two lots which reduced the impacts to the following:

Table 1. Proposed Impact Summary

Impact ID	Wetland Category	Cowardin Class	HGM Class	Proposed Impact
Wetland A	IV	Palustrine, emergent	Slope	0.20-ac. direct, permanent 0.27-ac. indirect, permanent
Wetland A Buffer	N/A	Upland	N/A	0.57-ac. direct, permanent

As proposed, the 0.39-acre Tract B would consist of 0.33-acre wetland buffer and 0.06-acre of avoided wetland.

6 MITIGATION

The applicant proposes to offset the proposed wetland and buffer impacts by purchasing credits from the Terrace Mitigation Bank (TMB). The subject property is within the service area of TMB as required by CMC Chapter 16.53.050.D.2.b. and 16.53.050.D.5.a.iii. As further required under CMC Chapter 16.53.050.D.5.a.i., TMB is currently certified under state and federal rules, has palustrine, emergent and buffer (case-by-case) credits available, and the use of credits is consistent with the terms and conditions of the certified bank instrument. As per CMC Chapter 16.53.050.D.5.a.ii. and the TMB certified instrument, the following replacement ratios apply:

Table 2. Credit-Debit Ratios

Resource Impact	Bank Credits: Impact Acreage	Proposed Credits
Wetland, Category I	Case-by-Case	N/A
Wetland, Category II	1.2:1	N/A
Wetland, Category III	1:1	N/A
Wetland, Category IV	0.85:1	0.85*0.20=0.17 credit
Critical Area Buffer	Case-by-Case	0.20*0.57=0.114 credit[1]

[1]TMB contains both wetland and enhanced uplands within the bank boundary. A common concept is that upland areas associated with wetlands generates 1 mitigation credit for every 5 acres. In other words, each mitigation credit contains approximately 20% upland which equates to a 0.20:1 ratio.

The applicant's proposal is consistent with the federal mitigation hierarchy which favors the use of mitigation bank credits over other forms of mitigation.

7 PROTECTION OF TRACT B

During construction, the outer perimeter of Tract B would be marked with temporary orange construction/silt fencing to prevent unauthorized intrusion. The temporary fencing would be maintained through the entire construction period. A permanent vinyl-coated chain link fence is proposed along the perimeter of the tract for long-term protection. As required at CMC Chapter 16.53.040.C.2.b., signs would be installed, worded substantially as follows:

"Wetland and Buffer Area -- Retain in a natural state."

Tract B would be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

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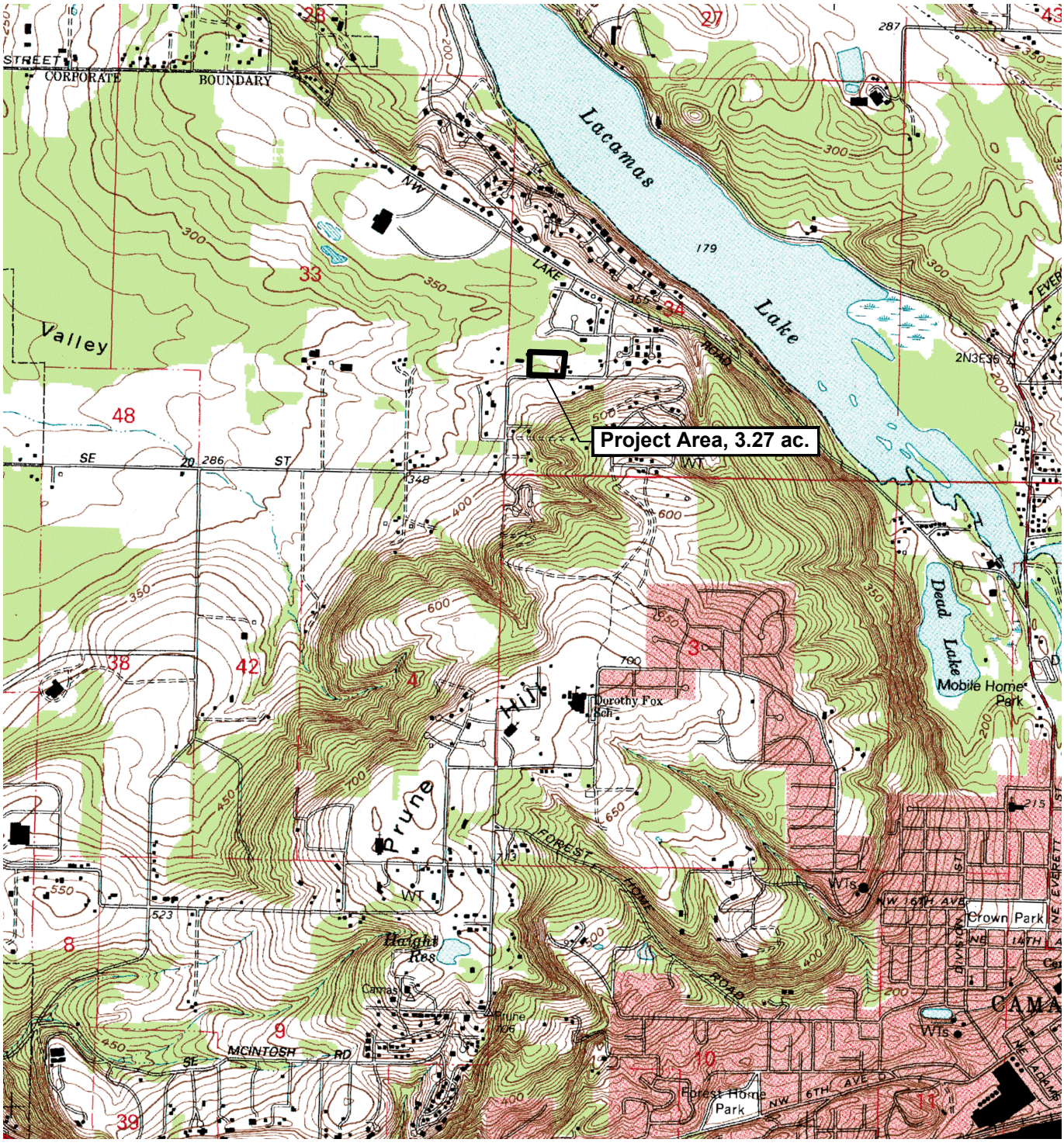

SOURCE: USGS CAMAS, WA-OR QUADRANGLE, 1993.

WASHINGTON

SCALE: 1" = 2,000'

0 1,000' 2,000' 4,000'

PREPARED FOR: WAVERLY HOMES.

VICINITY MAP

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAR 2018
75345.000

FIGURE
1

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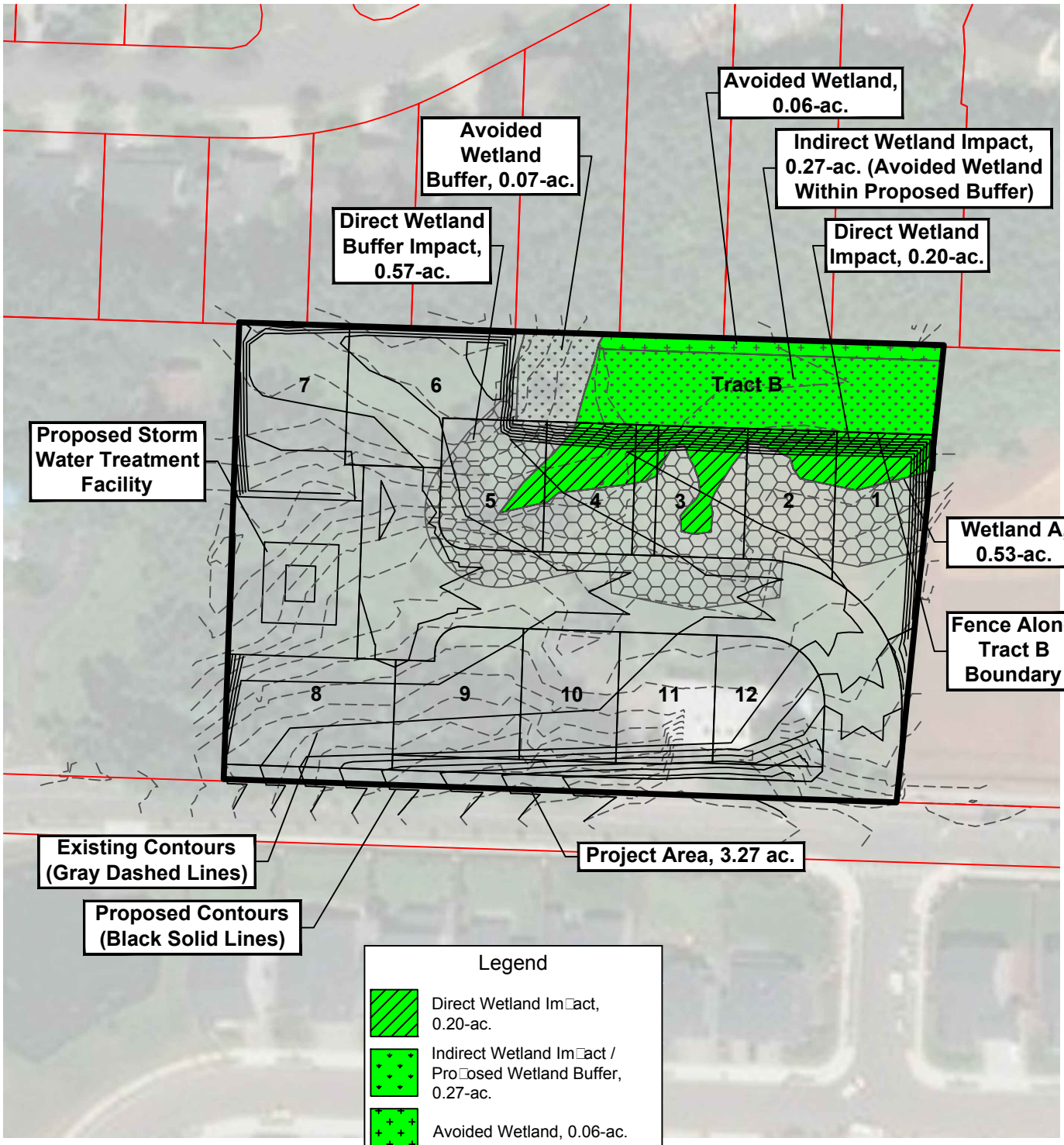

SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

PROPOSED DEVELOPEMENT - PLAN VIEW

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAR 2018
75345.000

FIGURE
2

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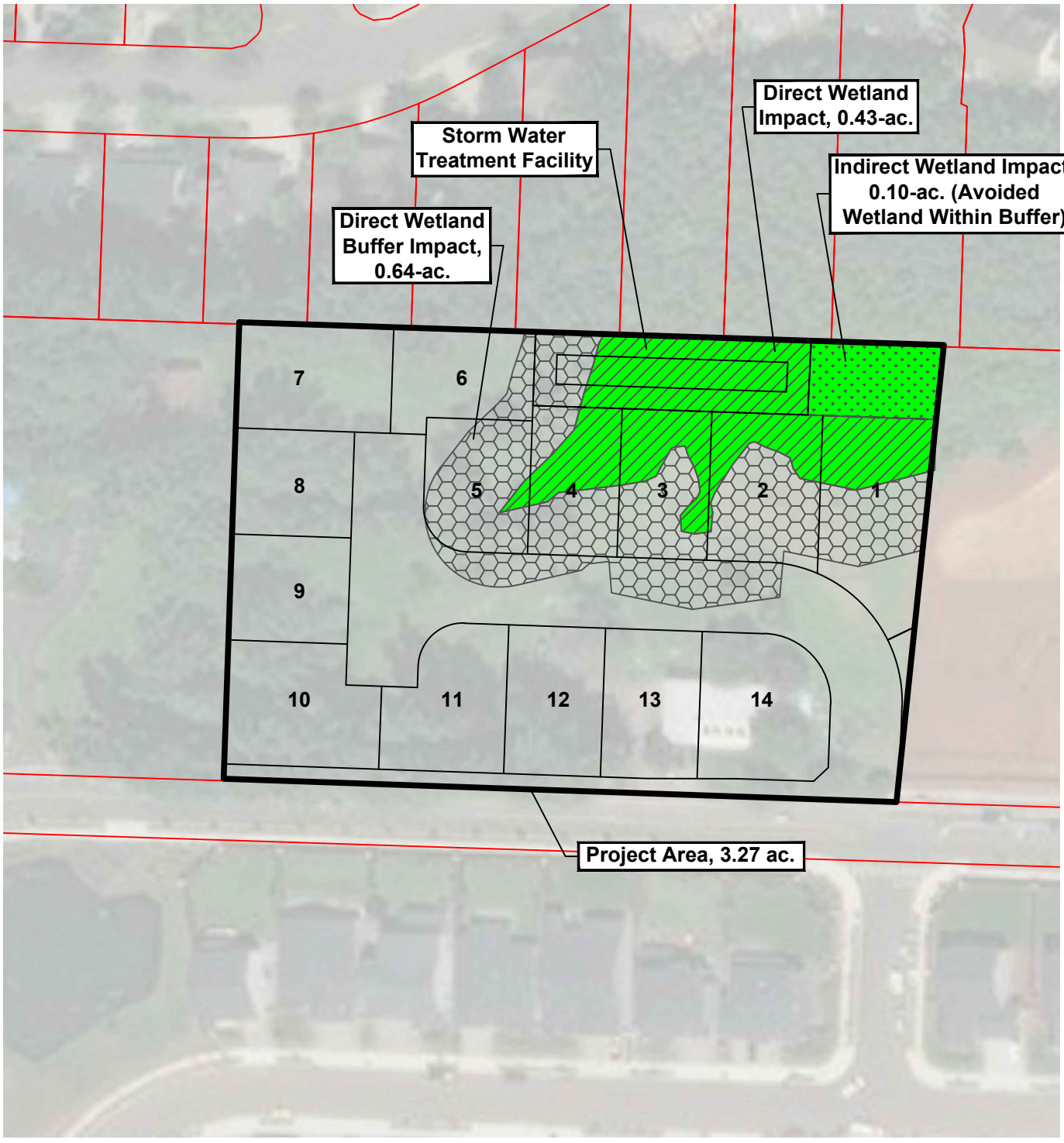
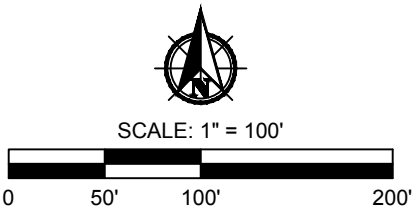


SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

Legend

- Direct Wetland Im□act, 0.43-ac.
- Indirect Wetland Im□act / Wetland Buffer, 0.10-ac.
- Direct Wetland Buffer Im□act, 0.64-ac.



PREPARED FOR: WAVERLY HOMES.

PBS

REJECTED ALTERNATIVE - PLAN VIEW

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAR 2018
75345.000

FIGURE
3

Filename: C:\Users\gregs\Deskto□\GIS\CAD\75345-000_C-201.dwg CAD Plot Date/Time: 3/8/2018 11:11:54 AM

APPENDIX A

Wetland Delineation Report for Clark County Parcel 177887000

Wetland Delineation Report for Clark County Parcel 177887000

2223 NW 43rd Avenue
Camas, Washington

Waverly Homes
3205 NE 78th Street, Suite 10
Vancouver, Washington 98665

October 8, 2017
PBS Project No. 75345.000

PBS
314 WEST 15TH STREET
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

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Wetland Rating Form & Figures

1 INTRODUCTION

PBS Engineering and Environmental (PBS) was contracted by Waverly Homes to conduct a wetland delineation in preparation of a new residential subdivision. The study area is located at 2223 NW 43rd Avenue, north of the Camas city center, Clark County, Washington (Appendix A, Figure 1). The 3.59-acre study area consists of Clark County parcel ID 177887000 in Township 2 North, Range 3 East, Section 34 (Clark County 2017). The delineation fieldwork was completed on September 15, 2017 by Greg Swenson, Professional Wetland Scientist.

The wetland boundaries described in this report are PBS' best professional opinion based on the circumstances and site conditions encountered at the time of this study. The final determination of the wetland boundary, classification, and required buffer will be made by local, state, and federal jurisdictions.

2 METHODS

The method used for delineating wetland boundaries followed the routine approach of the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Supplement (Version 2.0)* (Supplement) (U.S. Army Corps of Engineers 2010). Soils, vegetation, and indicators of hydrology were recorded at four sample plot locations on standard wetland determination data forms (Appendix B). Wetland plant ratings were assigned based on the *2016 National Wetland Plant List* (Lichvar et. al. 2016). No modification of the standard methodologies was necessary during the delineation. Wetland boundaries, sample plot locations, and snapshot photograph locations (Appendix C) were recorded in the field using a Trimble GeoXT handheld GPS unit. The wetlands documented during the field study were rated using the *Washington State Wetland Rating System for Western Washington 2014 Update* (Hruby 2014). The Wetland Rating Form is included in Appendix D.

The following information was reviewed prior to the field study:

- U.S. Geological Survey 7.5-minute topographic quadrangle map for Camas, WA-OR (USGS 1993), included in Appendix A, Figure 1
- U.S. Fish and Wildlife Service National Wetlands Inventory (USFWS 2017)
- Clark County critical areas mapping (Clark County 2017), wetland polygon included in Appendix A, Figure 2
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017a) soils map of the study area, included in Appendix A, Figure 3
- Aerial photograph (ESRI 2017), included as the background to Figures 2, 3, and 4 (Appendix A)
- Washington Department of Fish and Wildlife Priority Habitats and Species on the Web (WDFW 2017)
- Washington Department of Natural Resources Forest Practices Interactive Water Typing Map (i.e., Forest Practices Application Review System [FPARS]) (WDNR 2017)

3 RESULTS AND DISCUSSION

3.1 Topography

The study area is located at the eastern edge of the Willamette Valley Level IV Ecoregion 3a: Portland / Vancouver Basin (USGS 2017). This ecoregion is characterized by undulating terraces and floodplains at lower elevations (USGS 2017). Local upland topography is somewhat rolling with a gentle to moderate northward slope. A broad swale runs roughly east to west along the north part of the study area. According to previous

wetland delineation work conducted in the area (TRC 2015), the swale occupies the lowest elevations in the vicinity, most of which is north of the study area.

3.2 Plant Communities

Most plant species documented within the study area are aggressive non-native invaders. The upland plant community is dominated by Spreading Bent (*Agrostis stolonifera*), Himalayan Blackberry (*Rubus armeniacus*), and Canadian Thistle (*Cirsium arvense*) with occasional Oregon Ash (*Fraxinus latifolia*) saplings. The wetland plant community was dominated by similar weeds but had a greater amount of Oregon Ash with Reed Canary Grass (*Phalaris arundinacea*) in the understory.

3.3 Soils

According to the NRCS (NRCS 2017a), three soil mapping units occur within the study area: *Hesson clay loam, 0 to 8 percent slopes* (mapping unit HcB), *Hesson clay loam, 8 to 20 percent slopes* (mapping unit HcD), and *Odne silt loam, 0 to 5 percent slopes* (mapping unit OdB).

Hesson clay loam, 0 to 8 percent slopes and *Hesson clay loam, 8 to 20 percent slopes* are mapped in the northwest, west, and south parts of the study area. The non-hydric *Hesson* soil consists of well drained soils formed in old alluvium on high terraces and terrace escarpments (NRCS 2017b). Plot 1 was established in the *Hesson* mapping unit and was generally within the NRCS-described range of characteristics for the mapping unit.

The *Odne silt loam, 0 to 5 percent slopes* mapping unit occurs in the north and central parts of the study area. The hydric *Odne* unit consists of poorly drained soils formed in alluvium in basins and drainageways on terraces (NRCS 2017b). Plots 2, 3, and 4 were established within the mapped boundaries of the *Odne* unit. Plots 2 and 4 had hydric soil indicators but were outside the NRCS-described range of characteristics for the *Odne* soil. Plot 3 lacked hydric soil indicators.

3.4 Hydrology

The closest WETS climate station with a similar elevation as the study area is the Vancouver 4 NNE station (NRCS 2017c). Historical (1971-2000 period) average annual rainfall is listed as 41.51 inches in Vancouver. Recent precipitation data were not available from the WETS Vancouver 4 NNE station, therefore the recent data were obtained from the Vancouver Pearson Field Airport station (National Weather Service 2017). Table 1 shows the monthly precipitation averages for the water year preceding the field study.

Table 1. Observed and Normal Monthly Precipitation for Vancouver, Washington

Month	Actual	Vancouver, WA 1971-2000			% of Average	Above or Below Normal
		30% chance will have		Average		
		Less than	More than			
October 2016	8.22	1.87	3.87	3.18	258	Above
November 2016	6.88	4.15	7.39	6.18	111	Normal
December 2016	4.76	4.44	7.54	6.35	75	Normal
January 2017	4.31	3.74	6.83	5.69	76	Normal
February 2017	10.38	3.44	5.72	4.83	215	Above
March 2017	7.05	3.32	4.85	4.21	167	Above
April 2017	4.25	2.23	3.62	3.07	138	Above
May 2017	1.79	1.69	3.18	2.64	68	Normal
June 2017	1.24	1.16	2.11	1.76	70	Normal
July 2017	Trace	0.34	0.93	0.80	0	Below
August 2017	0.10	0.41	1.25	1.06	9	Below
September 1-15, 2017	0.09	0.39 (Prorated)	1.03 (Prorated)	0.88 (prorated)	10	Below
Water Year Through September 15, 2017	**49.07**	**27.18**	**48.32**	**40.65**	**121**	**Above**

Rainfall recorded prior to the field study was below average and below the normal range. Due to the late summer timing of the field study, all wetland data plots lacked primary hydrology indicators. The determination of wetland hydrology was based on the presence of two secondary hydrology indicators.

Hydrology modifications in the form of excavated ditches were observed during the field study. The ditches appeared to be old and poorly maintained. Nonetheless, their function for draining runoff from the south to the north and, ultimately, offsite, appeared to be intact. Excavated Ditch 1 appeared to augment seasonal hydrology to the south part of Wetland A while Excavated Ditch 2 appeared to somewhat drain the north part of Wetland A.

3.5 Existing Wetland Mapping

The configuration and area of the wetlands documented during the field study roughly corresponds to those mapped on the Clark County *Wetland Presence* mapping (Clark County 2017). The National Wetland Inventory (NWI) (USFWS 2017) does not map wetlands within the study area.

3.6 Findings

Wetland A (0.52-ac.) is located in the northeast part of the study area. The Cowardin (Cowardin et. al. 1979) and hydrogeomorphic (HGM) (Hruby 2014) classifications of Wetland A are palustrine, emergent and slope, respectively. Soils within Wetland A exhibited hydric soil indicators and secondary indicators of wetland hydrology were present. The contrasting uplands lacked hydric soils and wetland hydrology indicators. Landscape position was the primary method for identifying the upland / wetland boundary.

4 CONCLUSIONS

The wetland area, wetland rating, and local buffering requirements (City of Camas 2017) are shown below in Table 2.

Table 2. Wetland Summary

Wetland	Area (acre)	Wetland Rating	Wetland Buffer Dimensions (feet)
Wetland A	0.53	IV	50[1]

[1]Based on high intensity use.

5 JURISDICTION

Wetland A likely falls under local, state, and federal jurisdictions. Any impacts to jurisdictional wetlands, waters, and/or buffers will require review by USACE, Washington Department of Ecology, and the City of Camas. Excavated Ditch 1 appears to have been entirely created in uplands for the explicit purpose of facilitating stormwater drainage. The ditch appears to be outside of local, state, and federal jurisdictions. Excavated Ditch 2 appears to have been created in existing wetlands and is likely jurisdictional.

6 DISCLAIMER

This report is based on observations of vegetation, soils, and hydrology at the time of the study. Changing environmental conditions or human activities may alter those parameters which may change the conclusions presented in this report. The conclusions in this report represent the investigator's interpretation of the specified technical manuals and best available science and may not correspond with observations or conclusions of others, including government agencies.

This report was prepared to meet current local, state, and federal regulations. PBS is not responsible for changes made to regulations and reporting requirements after the report has been completed. Final authority regarding jurisdiction and permitting requirements rests with the appropriate agencies.

This report is for the exclusive use of the Client for design of the development and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the expressed written consent of the Client and PBS.

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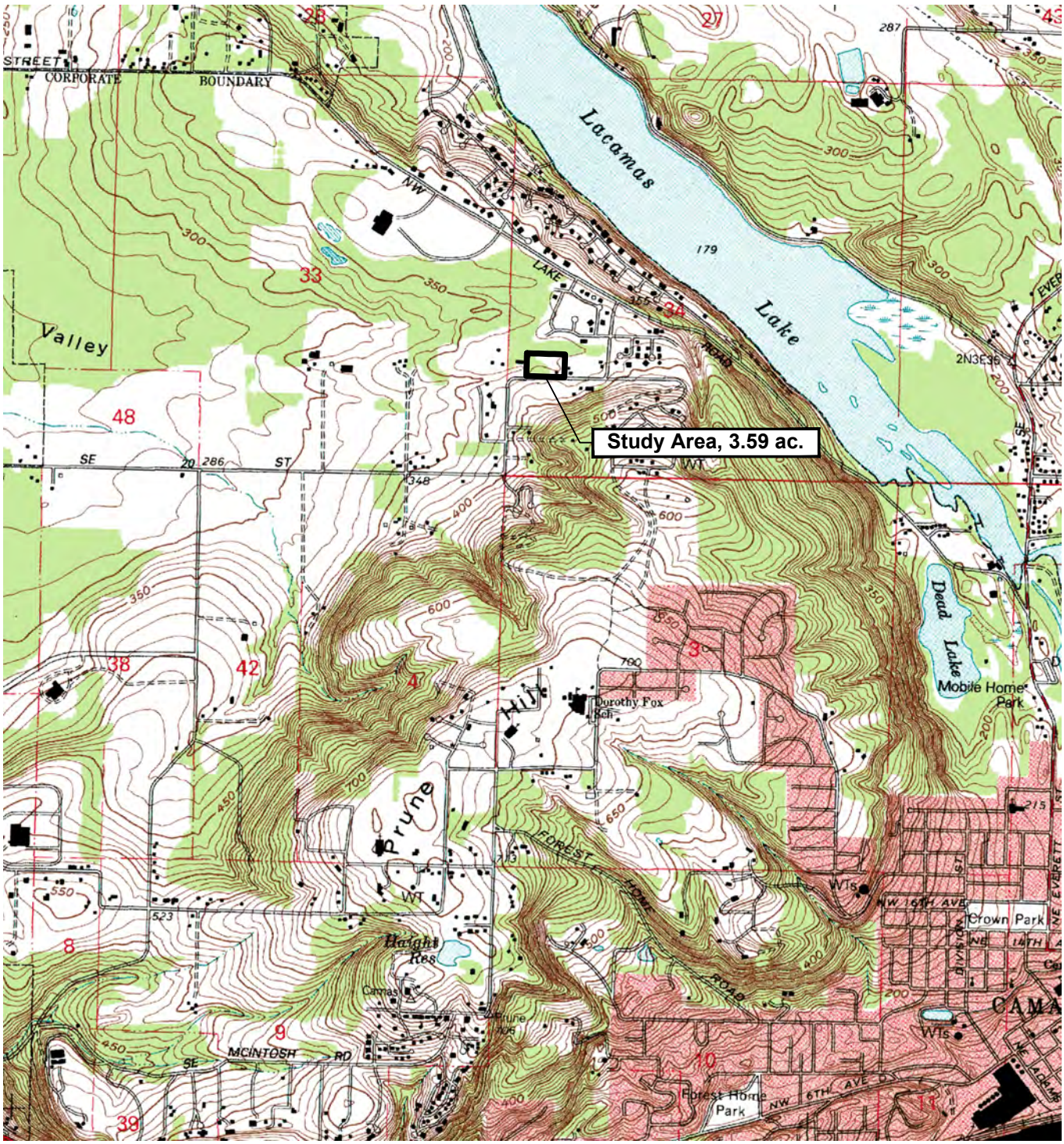
APPENDIX A

Figures



SOURCE: USGS CAMAS, WA-OR □UADRANGLE, 1993.

WASHINGTON

SCALE: 1" = 2,000'

0 1,000' 2,000' 4,000'

PREPARED FOR: WAVERLY HOMES.

VICINITY MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
1

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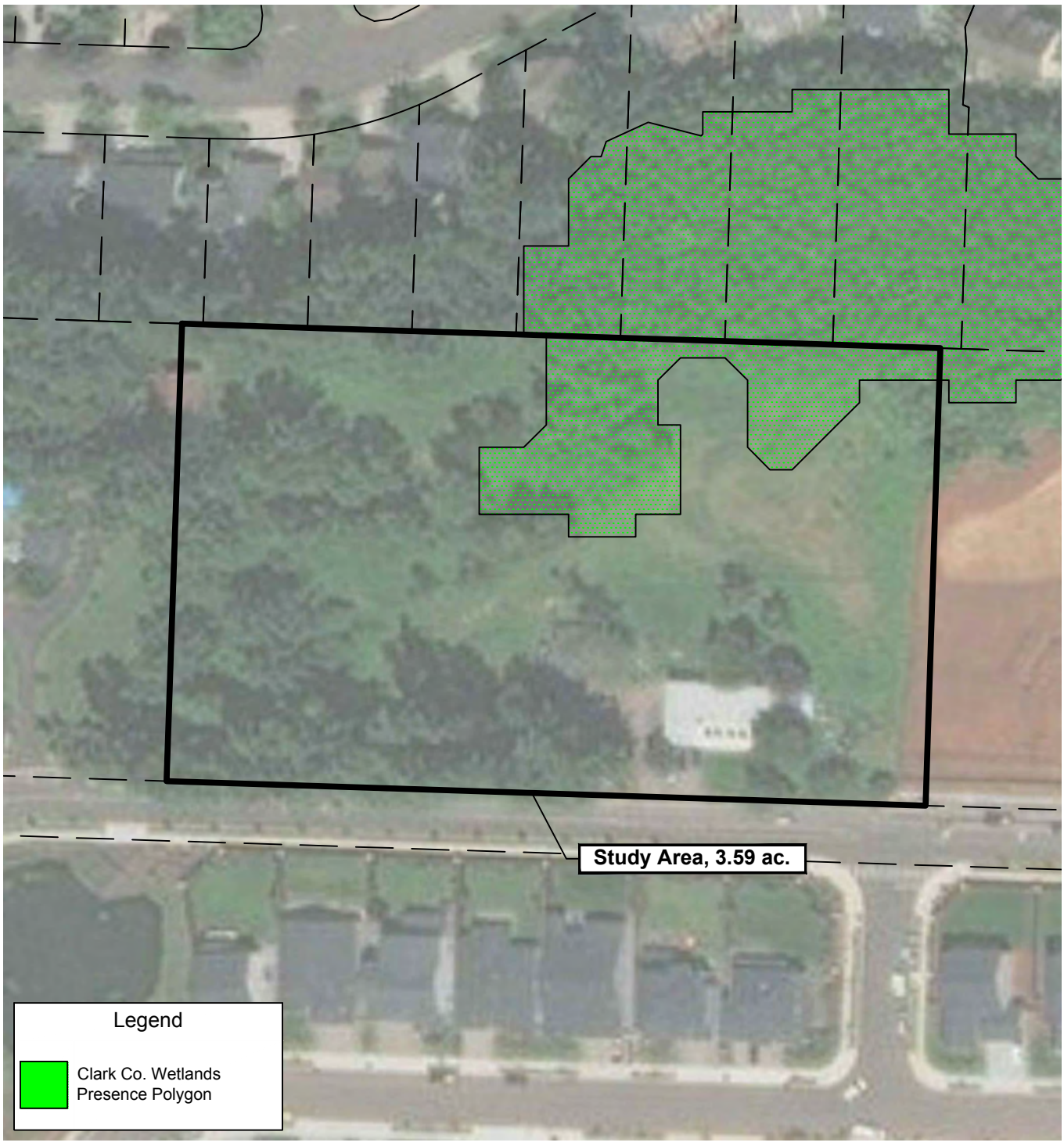

SOURCE: ESRI IMAGERY. CLARK CO. WETLAND PRESENCE POLYGON.

WASHINGTON

NO NWI WETLANDS MAPPED IN STUDY AREA

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

PBS

NATIONAL LOCAL WETLAND INVENTORY MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
2

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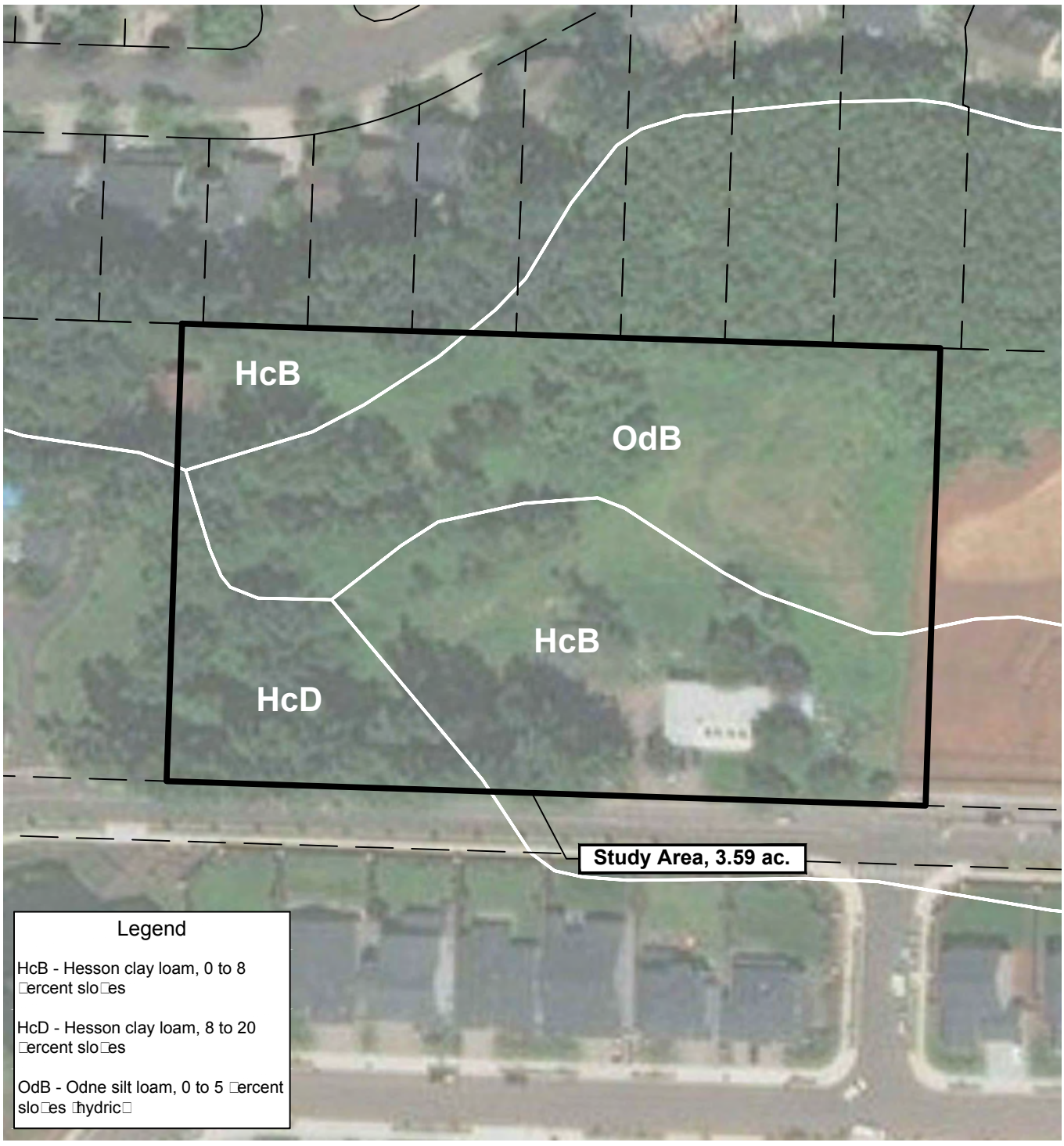

SOURCE: NRCS SOIL MAPPING POLYGONS. AERIAL PHOTOGRAPH FROM ESRI □2017□

WASHINGTON

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0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

SOIL MAPPING UNITS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
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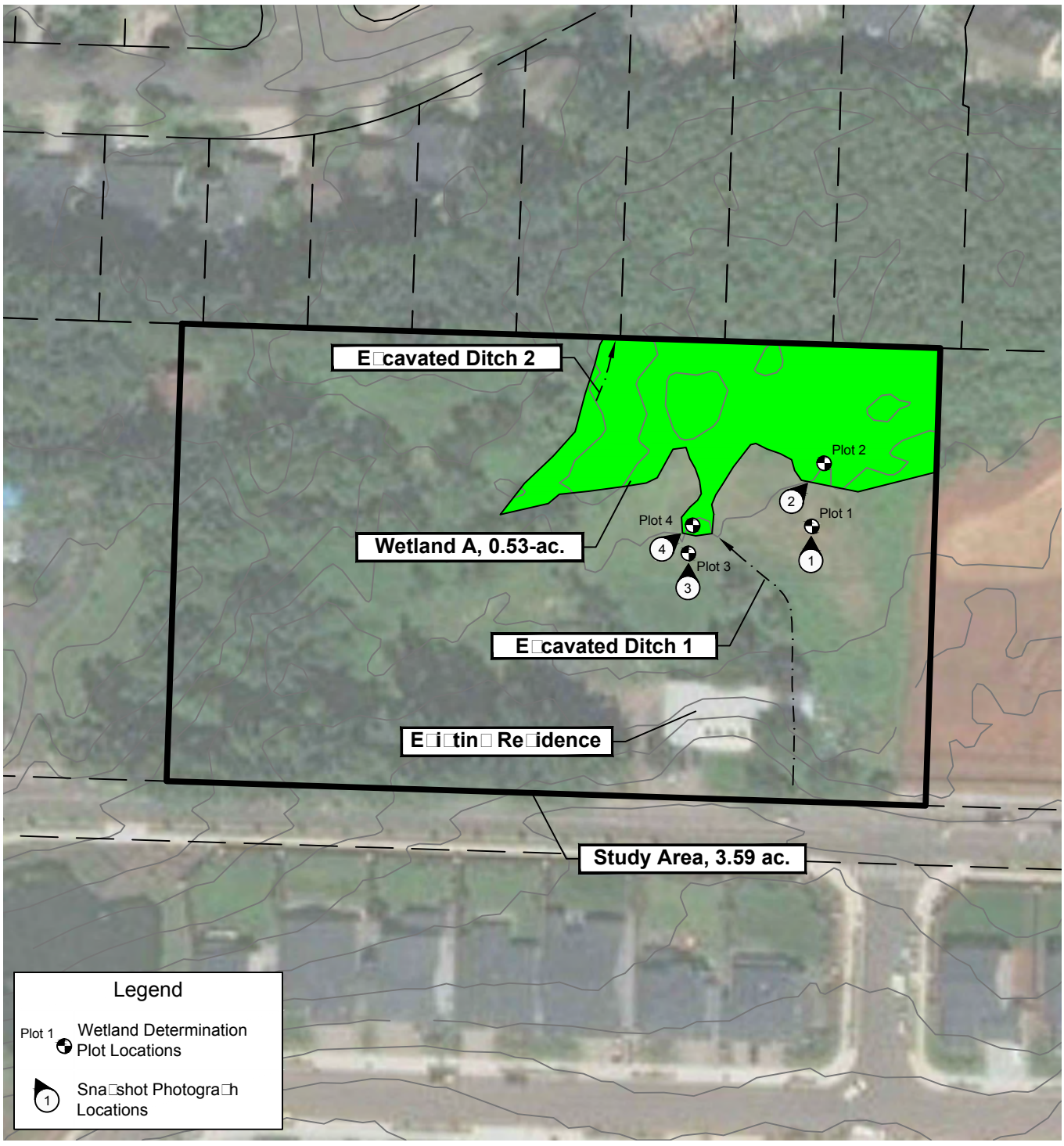

SOURCE: AERIAL PHOTOGRAPH FROM ESRI 2017

WASHINGTON

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

WETLAND DELINEATION MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
4

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APPENDIX B

Wetland Data Forms

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 1
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Toeslope Local relief: Convex Slope (%): 4
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611040 Long: -122.431847 Datum: WGS84
Soil Map Unit Name: Hesson clay loam, 0 to 8 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes		No	**X**
Wetland Hydrology Present?	Yes		No	**X**

Is the Sampled Area within a wetland? **Yes** ____ **No** **X**

Remarks: Northeast part of study area, 115 feet south of north study area boundary and 80 feet west of east study area boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Fraxinus latifolia*	5	Yes	FACW
2.			
3.			
4.			
5.			
Total Cover:	5		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis stolonifera*	85	Yes	FAC
2. *Cirsium arvense*	5	No	FAC
3. *Holcus lanatus*	5	No	FAC
4. *Schedonorus arundinaceus*	5	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	5 x 2 =	10
FAC species	100 x 3 =	300
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	105 (A)	310 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks:

SOIL

Sampling Point: 1

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

Depth	Matrix		Redox Features				Texture	Remarks
(in.)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-12	5YR 3/2	100					scl	dry
12-16	5YR 3/2	100					cl	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: 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]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present?

Yes ___ **No** X

Remarks:

Rock fragment refusal at 16".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ___ 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, and 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 (D4)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (in):	
Water Table Present?	Yes ___	No X	Depth (in):	>16
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (in):	>16

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 2
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Broad swale Local relief: Concave Slope (%): 2
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611156 Long: -122.431817 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes	**X**	No	
Wetland Hydrology Present?	Yes	**X**	No	

Is the Sampled Area within a wetland? **Yes X** **No**

Remarks: Northeast part of study area, 35 feet north of Plot 1 and 1 foot lower.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Fraxinus latifolia*	10	Yes	FACW
2. *Rubus armeniacus*	5	Yes	FAC
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95	Yes	FACW
2. *Cirsium arvense*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0 x 1 =	
FACW species	105 x 2 =	210
FAC species	10 x 3 =	30
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	115 (A)	240 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks:

SOIL

Sampling Point: 2

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

Depth (in.)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 2.5/2	95	7.5YR 3/4	5	C	M	cl	dry
12-20+	7.5YR 2.5/2	95	7.5YR 3/4	5	C	M	c	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10)
	Red Parent Material (TF2)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks:

12-20+" horizon has 1% rounded gravels and 10% 5YR 4/6 sandy parent material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**		Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
	High Water Table (A2)				
	Saturation (A3)		Salt Crust (B11)		Drainage Patterns (B10)
	Water Marks (B1)		Aquatic Invertebrates (B13)		Dry-Season Water Table (C2)
	Sediment Deposits (B2)		Hydrogen Sulfide Odor (C1)		Saturation Visible on Aerial Imagery (C9)
	Drift Deposits (B3)		Oxidized Rhizospheres along Living Roots (C3)	X	Geomorphic Position (D2)
	Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)		Shallow Aquitard (D3)
	Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils (C6)	X	FAC-Neutral Test (D5)
	Surface Soil Cracks (B6)		Stunted or Stressed Plants (D1) (**LRR A**)		Raised Ant Mounds (D6) (**LRR A**)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Frost-Heave Hummocks (D4)
	Sparsely Vegetated Concave Surface (B8)				

Field Observations:

Surface Water Present?	Yes		No X	Depth (in):	
Water Table Present?	Yes		No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes		No X	Depth (in):	>20

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 3
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Toeslope Local relief: Convex Slope (%): 4
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.610984 Long: -122.432168 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes		No	**X**
Wetland Hydrology Present?	Yes		No	**X**

Is the Sampled Area within a wetland? **Yes** **No** **X**

Remarks: Northeast part of study area, 140 feet south of north study area boundary and 165 west of east study area boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Rubus armeniacus*	15	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot size: 5' r)			
1. *Cirsium arvense*	50	Yes	FAC
2. *Agrostis stolonifera*	40	Yes	FAC
3. *Phalaris arundinacea*	10	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	10 x 2 =	20
FAC species	105 x 3 =	315
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	115 (A)	335 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No**

Remarks:

SOIL

Sampling Point: 3

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

Depth	Matrix		Redox Features				Texture	Remarks
(in.)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-15	7.5YR 2.5/2	100					c	dry
15-20+	7.5YR 3/2	100					sc	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: 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]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present?

Yes ___ **No** X

Remarks:

15-20+" horizon has 10% 5YR 4/6 sandy parent material inclusions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ___ 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, and 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 (D4)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (in):	
Water Table Present?	Yes ___	No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (in):	>20

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 4
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Broad swale Local relief: Concave Slope (%): 3
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611036 Long: -122.432160 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes X No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a wetland? Yes X No

Remarks: Northeast part of study area, 20 feet north of Plot 3 and 1 foot lower.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95	Yes	FACW
2. *Cirsium arvense*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	95 x 2 =	190
FAC species	5 x 3 =	15
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	100 (A)	205 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: 4

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

Depth (in.)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 3/2	95	7.5YR 4/4	5	C	M	cl	dry
14-16	7.5YR 4/4	95	2.5Y 2.5/1	5	C	M	scl	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10)
	Red Parent Material (TF2)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: Refusal at 16" due to rock fragment. 0-14" horizon has 5% bits of black charcoal. 14-16" horizon has 20% 7.5YR 5/8 sandy parent material throughout. 2.5Y 2.5/1 redox concentrations/concretions increase with depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
	High Water Table (A2)		
	Saturation (A3)		Salt Crust (B11)
	Water Marks (B1)		Aquatic Invertebrates (B13)
	Sediment Deposits (B2)		Hydrogen Sulfide Odor (C1)
	Drift Deposits (B3)		Oxidized Rhizospheres along Living Roots (C3)
	Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)
	Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils (C6)
	Surface Soil Cracks (B6)		Stunted or Stressed Plants (D1) (**LRR A**)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (2 or more required)

	Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
	Drainage Patterns (B10)
	Dry-Season Water Table (C2)
	Saturation Visible on Aerial Imagery (C9)
X	Geomorphic Position (D2)
	Shallow Aquitard (D3)
X	FAC-Neutral Test (D5)
	Raised Ant Mounds (D6) (**LRR A**)
	Frost-Heave Hummocks (D4)

Field Observations:

Surface Water Present?	Yes	No X	Depth (in):	
Water Table Present?	Yes	No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (in):	>20

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

APPENDIX C

Snapshot Photographs

Photo 1. Panoramic □hoto of the east-central □art of the study area □u□land□ View is to the north. Sam□le □lot 1 is visible just left of center. Photo taken Se□tember 15, 2017.

Photo 2. Panoramic □hoto of the northeast □art of the study area □Wetland A□ View is to the northeast. Sam□le □lot 2 is visible in the center. Photo taken Se□tember 15, 2017.

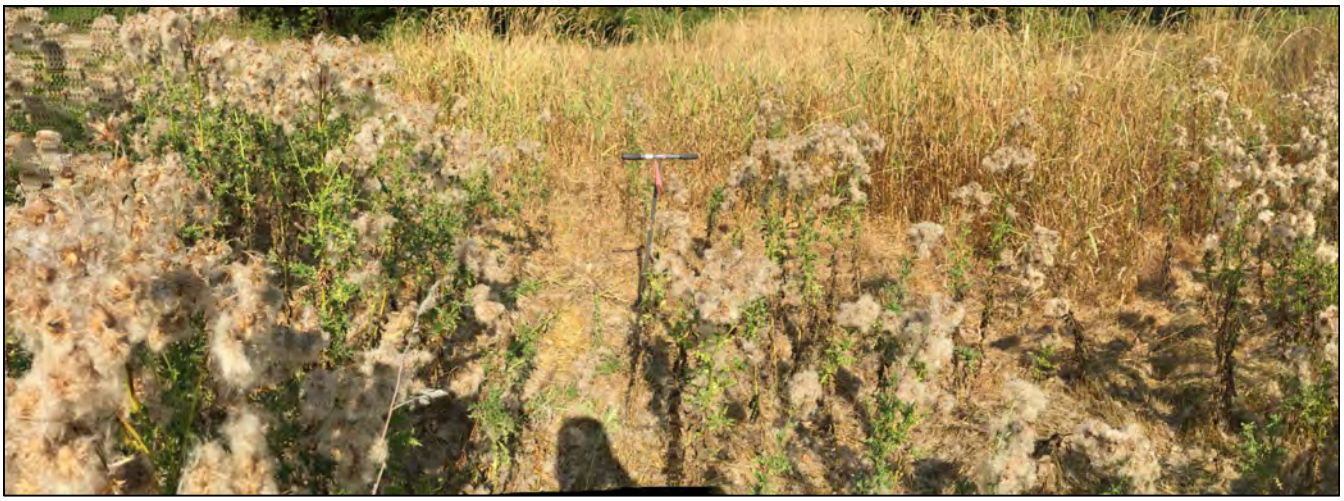


Photo 3. Panoramic □hoto of the central □art of the study area □u□land□ View is to the north. Sam□le □lot 3 is visible in the center. Photo taken Se□tember 15, 2017.

Photo 4. Panoramic □hoto Wetland A where Excavated Ditch 1 □not visible□discharges. View is to the northeast. Sam□le □lot 4 is visible in the center. Photo taken Se□tember 15, 2017.

APPENDIX D

Wetland Rating Form & Figures

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 9/15/17

Rated by Greg Swenson Trained by Ecology? Yes No Date of training 9/24-25/14

HGM Class used for rating Slope Wetland has multiple HGM classes? Y X N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map ESRI / ArcGIS

OVERALL WETLAND CATEGORY ____ (based on functions X or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

X **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		Circle the appropriate ratings		
Site Potential	H M (L)	H (M) L	H M (L)	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	(H) M L	H M (L)	H (M) L	**TOTAL**
Score Based on Ratings	6	5	4	15

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	X

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	A
Hydroperiods	H 1.2	A
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	A
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	A
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	A
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	B
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	C
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	D

Wetland name or number A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   (NO) – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   (NO) – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   X The wetland is on a slope (*slope can be very gradual*),
   X The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**.

   NO – go to 5 (YES) **–** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number A

(NO) – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

(NO) – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

(NO) – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% points = 1 Slope is greater than 5% points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	2
Total for S 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** X **0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	0
Total for S 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: X **1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the basin in which unit is found.* Yes = 2 No = 0	2
Total for S 3 Add the points in the boxes above	3

Rating of Value If score is: X **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	1

Rating of Site Potential If score is: X **1 = M** ___**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1

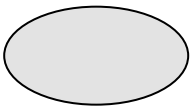
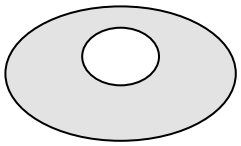
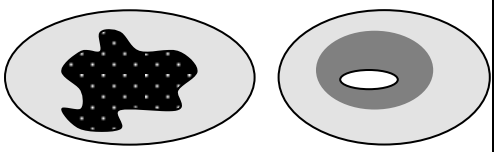
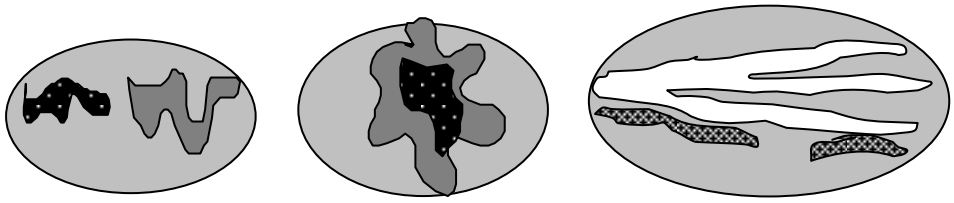
Rating of Landscape Potential If score is: X **1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	0

Rating of Value If score is: ___**2-4 = H** ___**1 = M** X **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _A__

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ____Aquatic bed — 4 structures or more: points = 4 __X__Emergent — 3 structures: points = 2 ____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 __X__Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____Permanently flooded or inundated — 4 or more types present: points = 3 __X__Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 ____Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland ____Seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	2

Wetland name or number A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	2
Total for H 1 Add the points in the boxes above	6

Rating of Site Potential If score is:___**15-18 = H** ___**7-14 = M** X **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 0 **+** [(% moderate and low intensity land uses)/2] 0.5 **=** 0.5 % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 17 **+** [(% moderate and low intensity land uses)/2] 6.5 **=** 23.5 % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** X **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

Rating of Value If score is:___**2 = H** X **1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

X **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

X **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

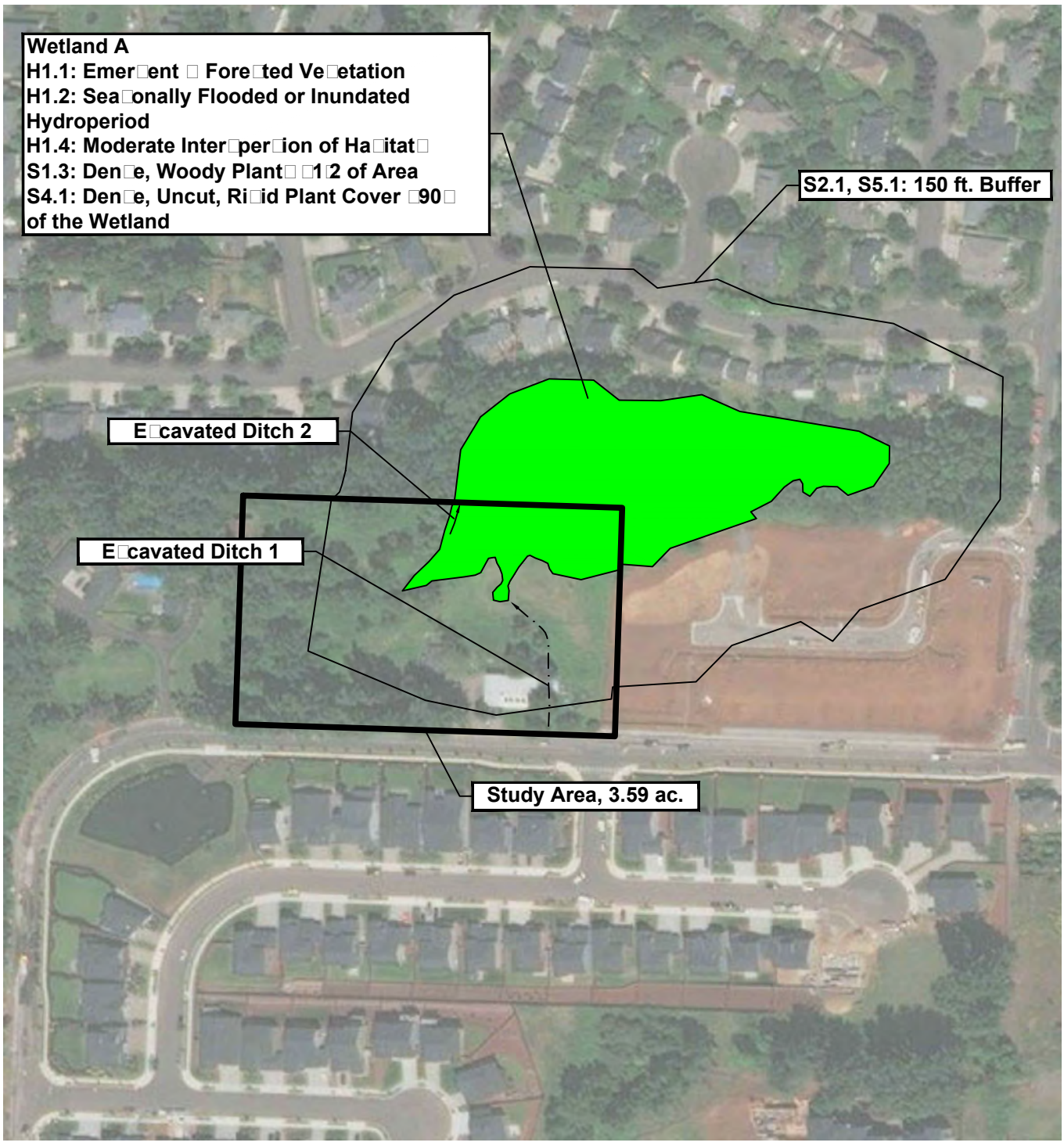
Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** (No) **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? (Yes) – Go to **SC 2.2** No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** (No) **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** (No) – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** (No) **= Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number A

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** (No) = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** (No) = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** (No) = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A



SOURCE: AERIAL PHOTOGRAPH FROM ESRI □2017□

WASHINGTON

SCALE: 1" = 200'

0 100' 200' 400'

PREPARED FOR: WAVERLY HOMES.

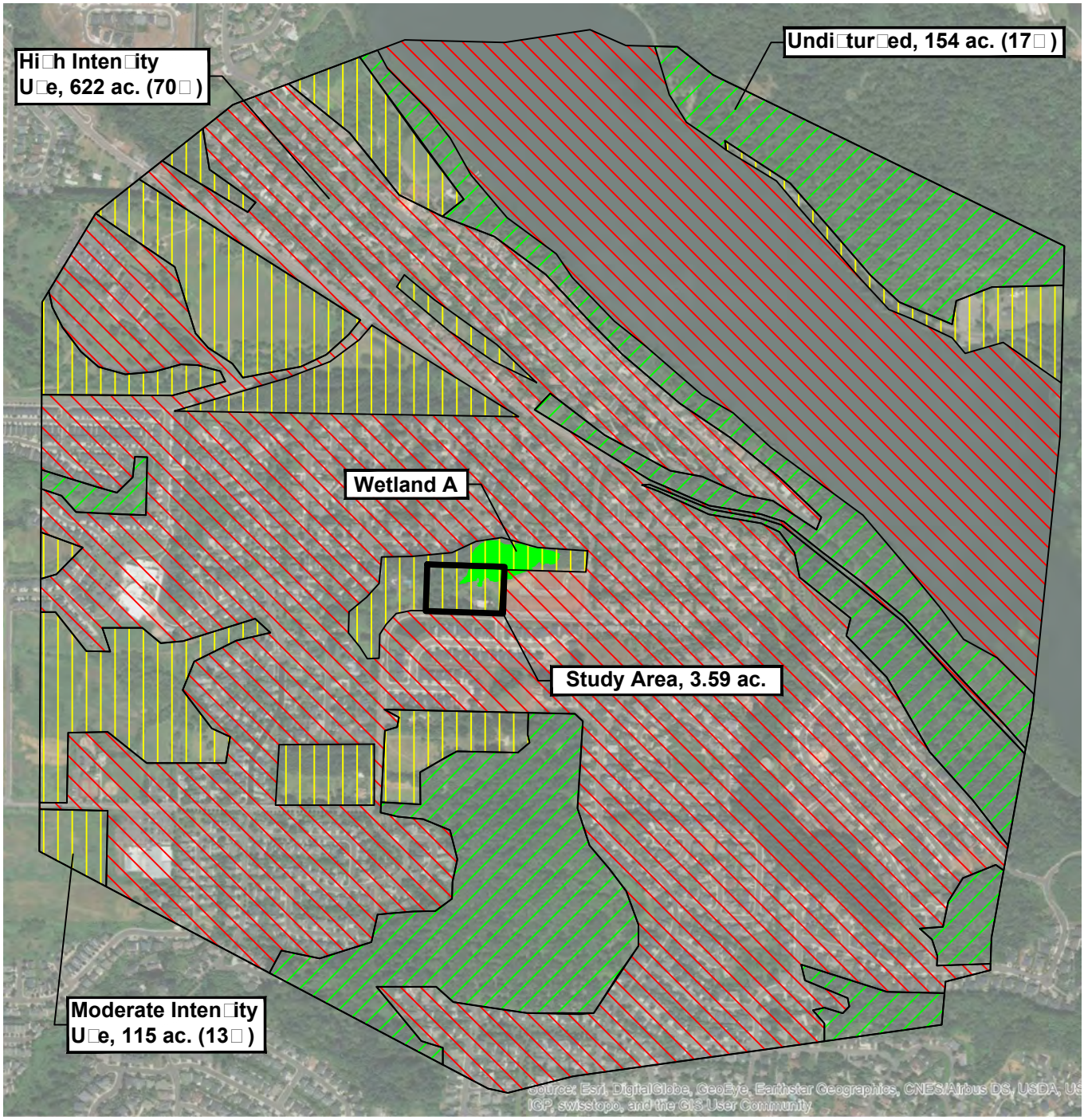
WETLAND RATINGS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
A

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:31:43 PM



SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017)

WASHINGTON

SCALE: 1" = 1,000'

0 500' 1,000' 2,000'

PREPARED FOR: WAVERLY HOMES.

WETLAND RATINGS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

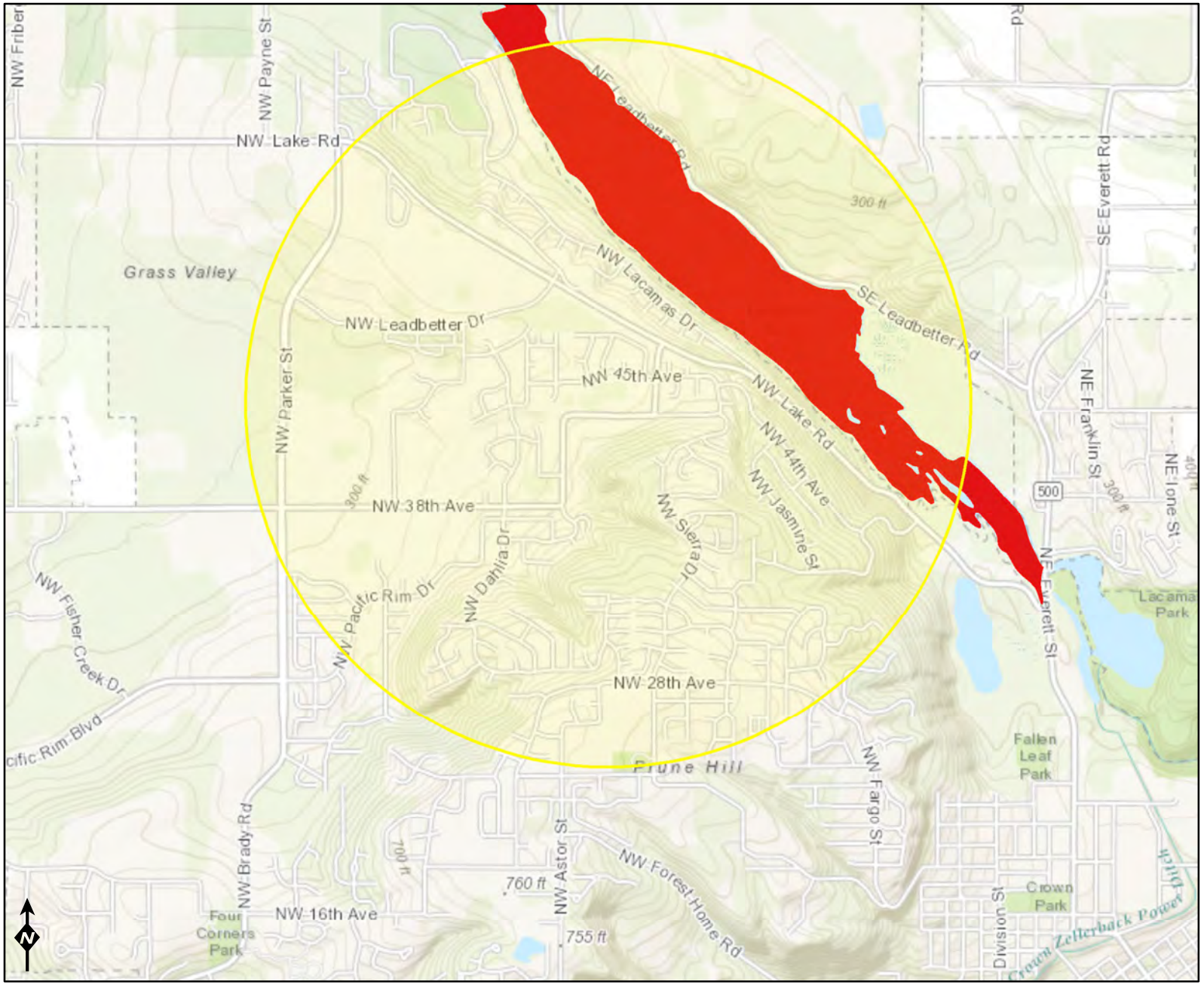
OCT 2017
75345.000

FIGURE
B

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:32:20 PM

October 7, 2017

Clark Co. Parcel 177887000 Wetland Rating Figure C



Assessed Waters/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

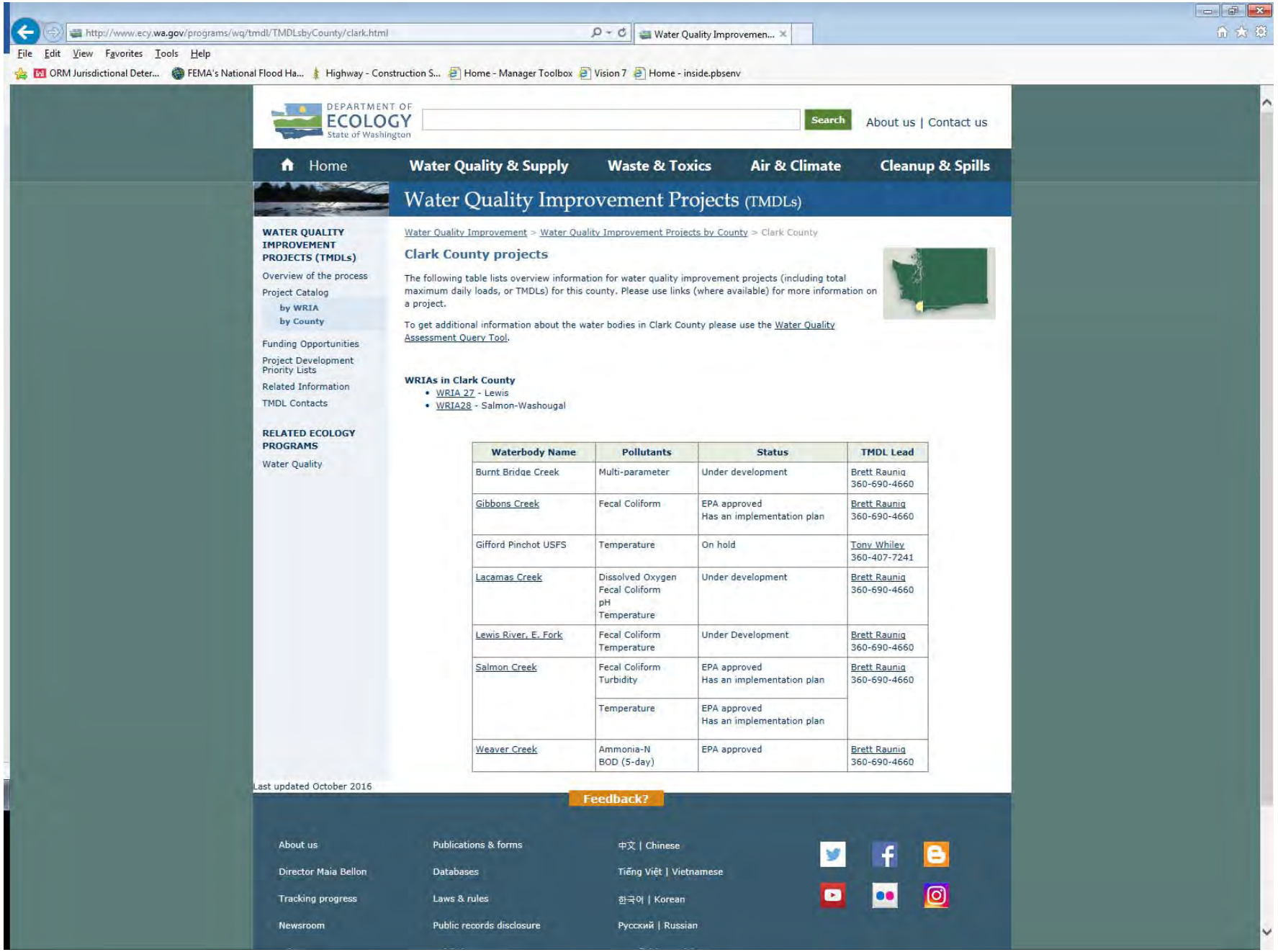
Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Miles
0 0.25 0.5 1

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, ©

DEPARTMENT OF ECOLOGY
State of Washington

Clark Co. Parcel 177887000 Wetland Rating Figure D

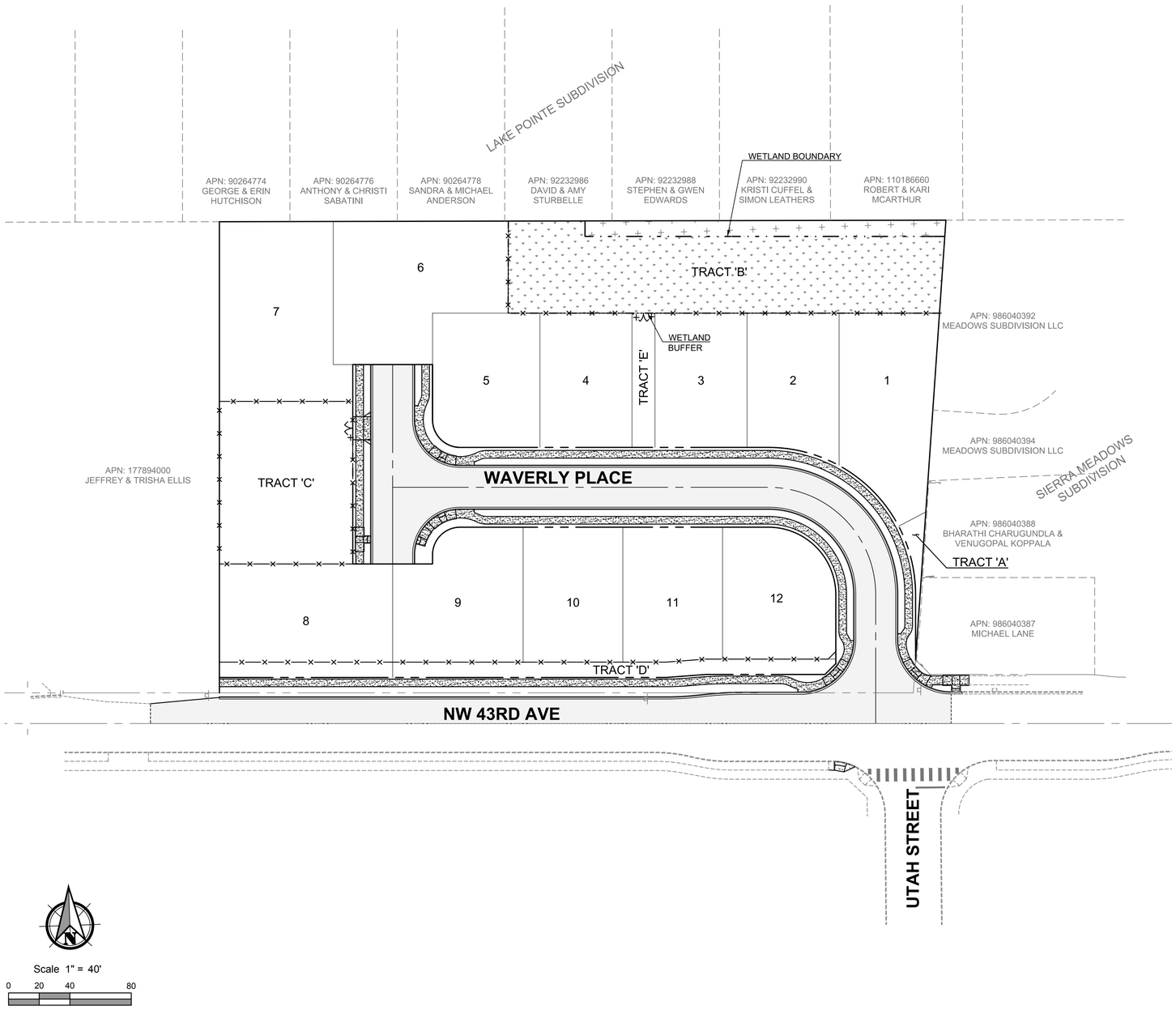


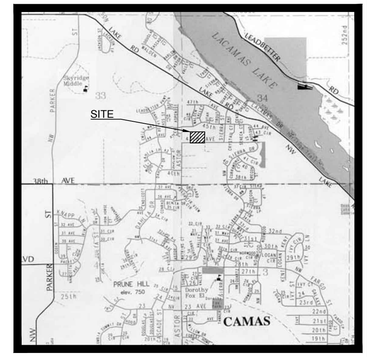
APPENDIX B

Geotechnical Engineering Report Proposed Subdivision 2223 NW 43rd Avenue
Camas, Washington 98607
(See Tab 8 of the Preliminary Land Use Application)

43RD AVENUE SUBDIVISION

SW 1/4 of Sec. 34, T. 2 N., R. 3 E., W.M.





VICINITY MAP
NOT TO SCALE

Sheet Index

Sheet No.	Sheet ID	Description
1	C-001	Preliminary Cover Sheet
2	C-002	Preliminary Typical Sections
3	SP-101	Existing Conditions Plan
4	SP-102	Existing Tree Survey
5	SP-103	Preliminary Site Plan
6	C-201	Preliminary Erosion Control & Grading Plan
7	C-301	Preliminary Street & Storm Drainage Plan
8	C-401	Preliminary Sanitary Sewer & Water Plan
9	C-501	Preliminary Striping Plan
10	L-101	Preliminary Landscape Plan

Contact Info:

Owner/Applicant:
Waverly Homes, LLC
3205 NE 78th Street, Suite 10
Vancouver, WA 98665
Brett Simpson
brett@mywaverlyhomes.com
(360) 524-2128

Contact/Planner:
PBS Engineering and Environmental
415 W 6th Street, Suite 601
Vancouver, WA 98660
Andy Nuttbrock; Project Planner
nuttbrocka@pbsusa.com
(360) 695-3488
(360) 695-8767, fax

Engineer:
PBS Engineering and Environmental
415 W 6th Street, Suite 601
Vancouver, WA 98660
Rich Darland; PE
rich.darland@pbsusa.com
(360) 695-3488
(360) 695-8767, fax

Surveyor:
PBS Engineering and Environmental
415 W 6th Street, Suite 601
Vancouver, WA 98660
Terry Goodman; PLS
terry.goodman@pbsusa.com
(360) 695-3488
(360) 695-8767, fax

LOT TABLE		
LOT 1	7,426 SF	0.17 AC
LOT 2	5,427 SF	0.12 AC
LOT 3	5,250 SF	0.12 AC
LOT 4	5,250 SF	0.12 AC
LOT 5	6,055 SF	0.14 AC
LOT 6	9,000 SF	0.21 AC
LOT 7	9,000 SF	0.21 AC
LOT 8	8,359 SF	0.19 AC
LOT 9	6,788 SF	0.16 AC
LOT 10	5,718 SF	0.13 AC
LOT 11	5,670 SF	0.13 AC
LOT 12	5,933 SF	0.14 AC
TRACT 'A'	501 SF	0.01 AC
TRACT 'B'	17,073 SF	0.39 AC
TRACT 'C'	9,214 SF	0.21 AC
TRACT 'D'	2,865 SF	0.07 AC
TRACT 'E'	1,312 SF	0.03
R/W DEDICATION	31,541 SF	0.72 AC
TOTAL	**142,382 SF**	**3.27 AC**
EXISTING	**142,382 SF**	**3.27 AC**

No.	Revision	Date	By	App'd
A	PRELIMINARY - ISSUED FOR REVIEW			

PRELIMINARY

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Vancouver, WA 98660
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PRELIMINARY COVER SHEET FOR:
43RD AVENUE SUBDIVISION
A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

RICHARD E. DARLAND
STATE OF WASHINGTON
33172
REGISTERED
PROFESSIONAL ENGINEER
PRELIMINARY

DESIGNED: DPS
CHECKED: RED
MAR 2018
75345.000
SHEET ID
C-001
SHEET 1 OF 10

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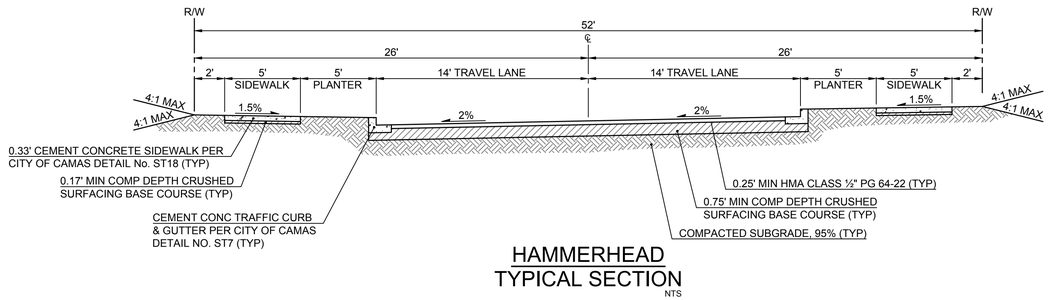
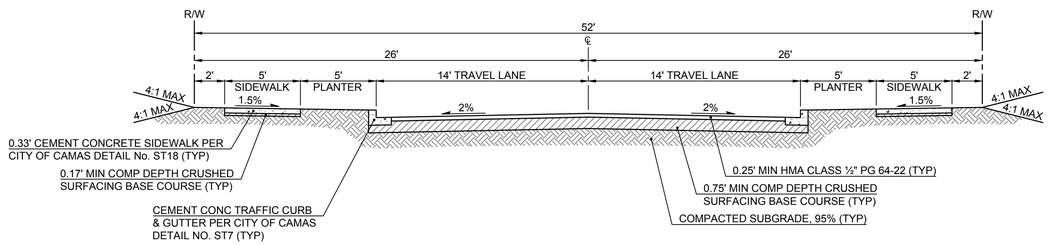
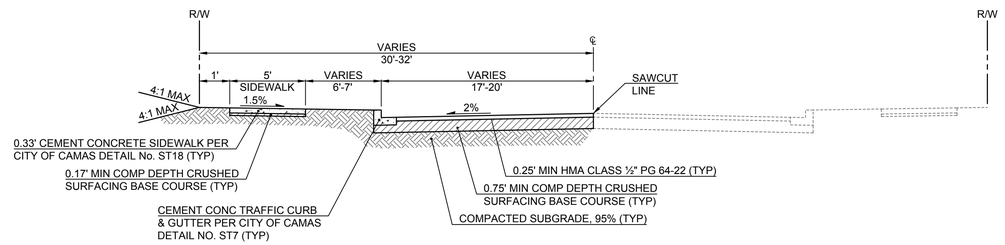


HAMMERHEAD
TYPICAL SECTION
NTS



WAVERLY PLACE
TYPICAL SECTION
NTS



NW 43rd AVENUE
TYPICAL SECTION
NTS

PRELIMINARY

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

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PRELIMINARY TYPICAL SECTIONS FOR:

43RD AVENUE SUBDIVISION

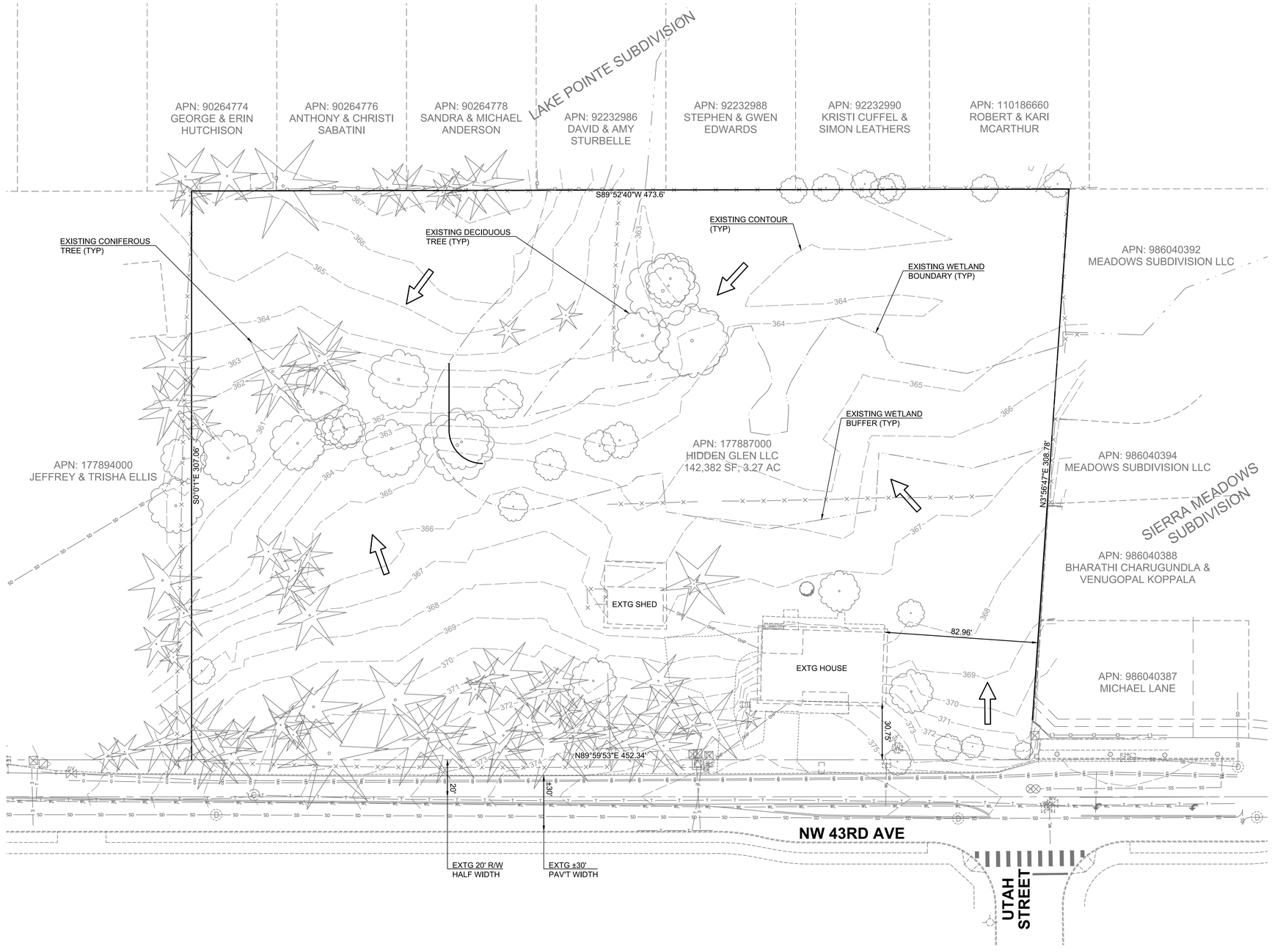
A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's **below.** **Call** before you dig.

RICHARD E. DARLAND
STATE OF WASHINGTON
33172
REGISTERED
PROFESSIONAL ENGINEER
PRELIMINARY

DESIGNED:	DPS
CHECKED:	RED
MAR 2018	75345.000
SHEET ID	C-002
SHEET	2 OF 10

PRELIMINARY



Scale 1" = 30'

0 15 30 60

Site Information:

Parcel Serial #s:	177887-000
Parcel Size:	142,382 SF; 3.27 AC
Site Improvements:	Developed with a two-story, single-family residence, out building and gravel parking area
Zoning:	Residential-7,500 (R-7.5)
Comp Plan Designation:	Single-Family Medium (SFM)
Neighborhood Assoc:	N/A
School District:	Camas
TIF Area:	Camas
PIF Area:	N/A
Sewer District:	Camas
Water District:	Camas
Building Moratorium Area:	None
Soil Type(s):	HcB, HcD, OdB
Hydric Soils:	Non-Hydric and Hydric soils on site
Slope(s);	0-5%; 5-10%; 10-15%; 15-20%
Landslide Hazards:	No Mapping Indicators
Slope Stability:	No Mapping Indicators
Flood Zone Designation:	Outside Flood Area
Cara:	No Mapping Indicators
Wildlands:	No Mapping Indicators
Priority Species:	No Mapping Indicators
Priority Habitat:	No Mapping Indicators
Archaeological Predictive:	Moderate; Moderate-High, High
Archaeological Site Buffers:	No Mapping Indicators

Plan Notes:

Boundary, topographic and environmental information were obtained from Clark County GIS and PBS survey.

Currently the site is identified as tax lot 177887000 (#11 SEC 34 T2N R3EWM 3.48 AC) and is addressed as 2223 NW 43rd Avenue, Camas, WA 98607. There is a two-story, single-family residence on site with associated gravel parking and out building.

Transportation and Utilities:

The project site is located on the north side of NW 43rd Avenue, to the west of the intersection with NW Utah Street. The property is bound to the north by R-12 zoned properties, with R-7.5 zoned properties to the east and west.

There is an existing water main running in NW 43rd Avenue, with City of Camas as the purveyor. Sanitary Sewer is available in NW 43rd Avenue, immediately to the east of the site, with City of Camas as the purveyor.

Stormwater:

There are no existing stormwater facilities on site. Currently stormwater either infiltrates on site or runs from the northwest and southeast towards the middle of the site, then to the west and offsite to an existing drainage.

Environmental:

Available GIS information indicates that the site contains no areas of potential landslide instability, severe erosion hazard areas, or habitat conservation areas. The site is identified as having a wetland, as well as some hydric soils on a portion of the site. The archaeological predictive for the site is High, Moderate-High, or Moderate for different potions of the site; the property is not within an archaeological site buffer.

Linetype Legend	
Existing Sanitary Sewer Pipe	SS SS SS
Existing Storm Sewer Pipe	SD SD SD
Existing Water Pipe	WL WL WL
Existing Electric Line	E E E E
Existing Gas Line	G G G G
Existing Telephone Line	T T T T
Existing Centerline	
Existing Curb	
Existing Lot Line	
Existing Gravel road	
Existing Paint Stripe	
Existing Right-of-way	
Existing Building	
Existing Wetland Perimeter	
Existing Wetland Buffer	
Existing Fence	X X X X X
Existing Wall	
Existing Contour	224

Symbol Legend	
Existing Water Valve	WV
Existing Gas Valve	GV
Existing Fire Hydrant	
Existing Well	W
Existing Power Pole	
Existing Water Meter	
Existing Electrical Pedestal	
Existing Electrical Transformer	
Existing Sanitary Cleanout	
Existing Storm Manhole	D
Existing Sign	
Existing Flow Arrow	

PRELIMINARY

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PBS

EXISTING CONDITIONS PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

DESIGNED: JAN

CHECKED: JAN

MAR 2018

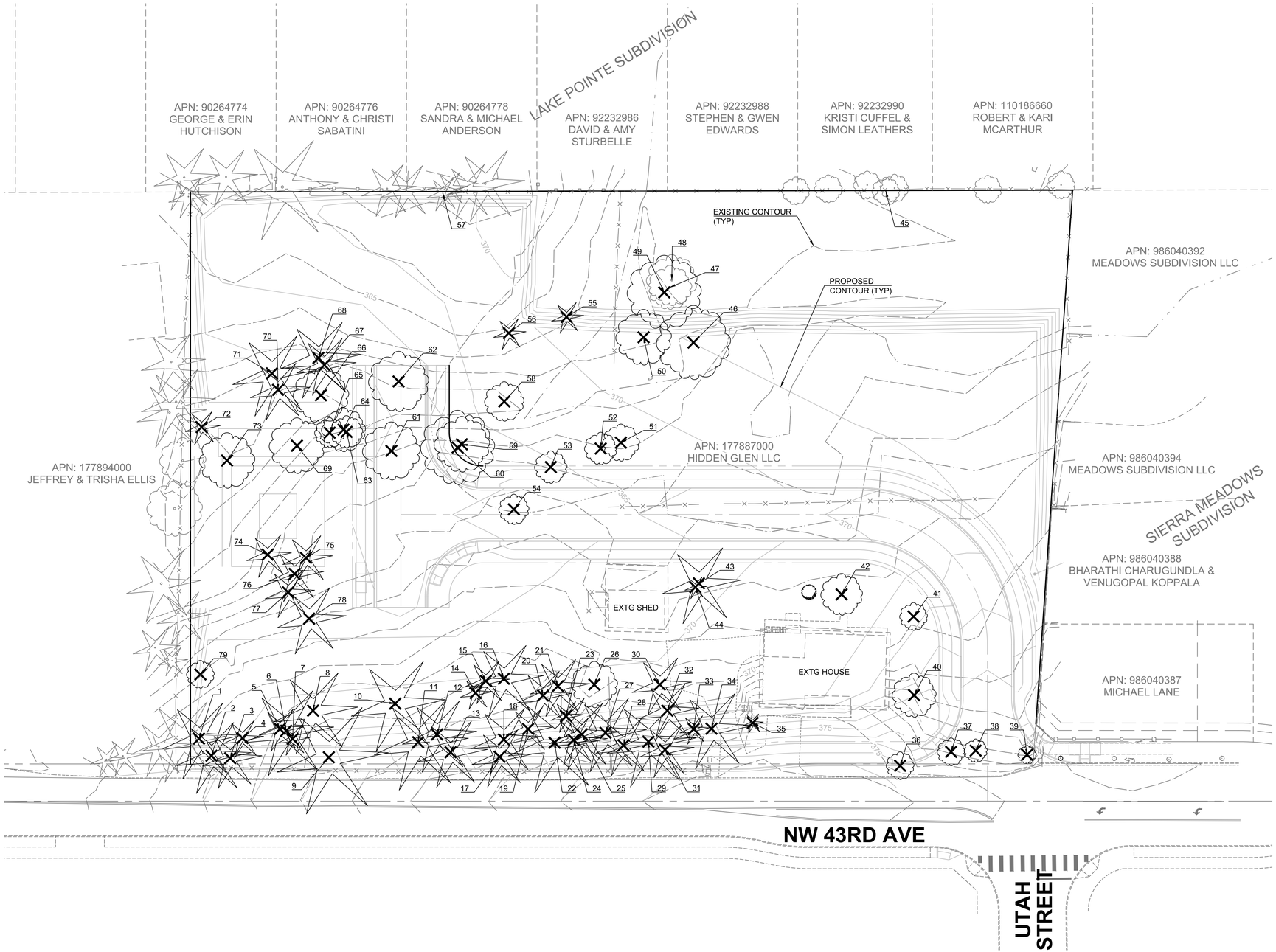
75345.000

SHEET ID

SP-101

SHEET 3 OF 10

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.



Scale 1" = 30'

0 15 30 60

PRELIMINARY

EXISTING TREE TABLE			
NO.	SIZE	TYPE	COMMENTS
1	32"	Evergreen	Tree to be removed, within site grading.
2	30"	Evergreen	Tree to be removed, within 43rd expansion.
3	24"	Evergreen	Tree to be removed, within 43rd expansion.
4	16"	Evergreen	Tree to be removed, within site grading.
5	18"	Evergreen	Tree to be removed, within site grading.
6	36"	Evergreen	Tree to be removed, within site grading.
7	13"	Evergreen	Tree to be removed, within site grading.
8	34"	Evergreen	Tree to be removed, within site grading.
9	45"	Evergreen	Tree to be removed, within 43rd expansion.
10	38"	Evergreen	Tree to be removed, within site grading.
11	38"	Evergreen	Tree to be removed, within site grading.
12	30"	Evergreen	Tree to be removed, within site grading.
13	28"	Evergreen	Tree to be removed, within 43rd expansion.
14	13"	Evergreen	Tree to be removed, within site grading.
15	18"	Evergreen	Tree to be removed, within site grading.
16	30"	Evergreen	Tree to be removed, within site grading.
17	24"	Evergreen	Tree to be removed, within 43rd expansion.
18	28"	Evergreen	Tree to be removed, within site grading.
19	19"	Evergreen	Tree to be removed, within site grading.
20	22"	Evergreen	Tree to be removed, within site grading.
21	24"	Evergreen	Tree to be removed, within site grading.
22	40"	Evergreen	Tree to be removed, within site grading.
23	13"	Evergreen	Tree to be removed, within site grading.
24	20"	Evergreen	Tree to be removed, within site grading.
25	28"	Evergreen	Tree to be removed, within site grading.
26	20"	Deciduous	Tree to be removed, within site grading.
27	31"	Evergreen	Tree to be removed, within site grading.
28	24"	Evergreen	Tree to be removed, within site grading.
29	36"	Evergreen	Tree to be removed, within site grading.
30	24"	Evergreen	Tree to be removed, within site grading.
31	22" (2)	Evergreen	Tree to be removed, within 43rd expansion.
32	24"	Evergreen	Tree to be removed, within site grading.
33	12"	Evergreen	Tree to be removed, within site grading.
34	32"	Evergreen	Tree to be removed, within site grading.
35	8" (3)	Evergreen	Tree to be removed, within site grading.
36	12"	Deciduous	Tree to be removed, within 43rd expansion.
37	12"	Deciduous	Tree to be removed, within new roadway.
38	10"	Deciduous	Tree to be removed, within new roadway.
39	8"	Deciduous	Tree to be removed, within new roadway.
40	19"	Deciduous	Tree to be removed, within site grading.
41	12"	Deciduous	Tree to be removed, within site grading.
42	18"	Deciduous	Tree to be removed, within site grading.
43	32"	Evergreen	Tree to be removed, within site grading.
44	9"	Evergreen	Tree to be removed, within site grading.
45	12"	Deciduous	No construction will occur near this tree.
46	32"	Deciduous	Tree to be removed, within site grading.
47	18"	Deciduous	Tree to be protected.
48	22"	Deciduous	Tree to be protected.
49	32"	Deciduous	Tree to be removed, within site grading.
50	24" (2)	Deciduous	Tree to be removed, within site grading.
51	16"	Deciduous	Tree to be removed, within site grading.
52	14"	Deciduous	Tree to be removed, within site grading.
53	14"	Deciduous	Tree to be removed, within site grading.
54	13"	Deciduous	Tree to be removed, within new roadway.
55	13"	Evergreen	Tree to be removed, within site grading.
56	13"	Evergreen	Tree to be removed, within site grading.
57	14"	Evergreen	Tree to be protected.
58	17"	Deciduous	Tree to be removed, within site grading.
59	24" (2)	Deciduous	Tree to be removed, within site grading.
60	32"	Deciduous	Tree to be removed, within site grading.
61	25"	Deciduous	Tree to be removed, within new roadway.
62	26"	Deciduous	Tree to be removed, within new roadway.
63	14"	Deciduous	Tree to be removed, with new storm facility.
64	19"	Deciduous	Tree to be removed, with new storm facility.
65	13"	Deciduous	Tree to be removed, with new storm facility.
66	24"	Deciduous	Tree to be removed, within site grading.
67	24"	Evergreen	Tree to be removed, within site grading.
68	32"	Evergreen	Tree to be removed, within site grading.
69	24"	Deciduous	Tree to be removed, with new storm facility.
70	24"	Evergreen	Tree to be removed, within site grading.
71	34"	Evergreen	Tree to be removed, within site grading.
72	14"	Evergreen	Tree to be removed, within site grading.
73	24"	Deciduous	Tree to be removed, with new storm facility.
74	18"	Evergreen	Tree to be removed, with new storm facility.
75	20"	Evergreen	Tree to be removed, with new storm facility.
76	22"	Evergreen	Tree to be removed, with new storm facility.
77	20"	Evergreen	Tree to be removed, within site grading.
78	28"	Evergreen	Tree to be removed, within site grading.
79	12"	Deciduous	Tree to be removed, within site grading.

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
360.695.3488
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PBS

EXISTING TREE SURVEY FOR: 43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

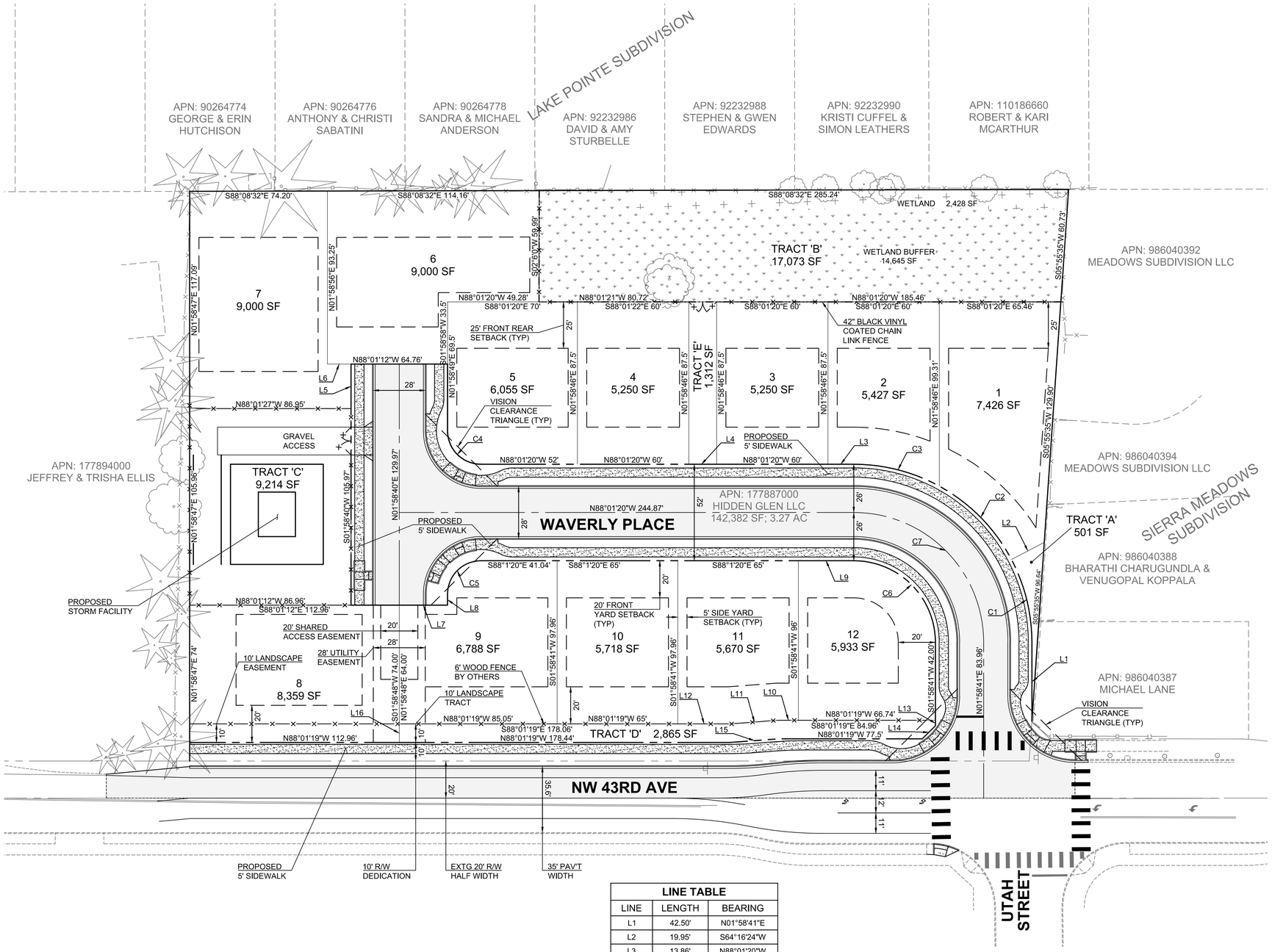
STATE OF WASHINGTON
JOHN A. NUTTBROCK
No. 983 EXP. 05/14/2018
LICENSED LANDSCAPE ARCHITECT

PRELIMINARY

DESIGNED: JAN
CHECKED: JAN
MAR 2018
75345.000

SHEET ID
SP-102

SHEET 4 OF 10



Plan Notes:

The proposal is to develop a 12-lot residential subdivision with wetland and storm tracts. The proposal includes all associated roadway and sidewalk improvements. The site currently has a single-family residence with associated parking area and out building.

Transportation and Utilities:
The project site is located on the north side of NW 43rd Avenue, to the west of the intersection with NW Utah Street. The property is bound TO the north by R-12 zoned properties, with R-7.5 zoned properties to the east and west.

The development proposes a new intersection on the east side of the proposed site, across from the existing Utah Street intersection. The new Waverly Place, will include full right-of-way build out with two travel lanes, planting strips, and sidewalks. The existing NW 43rd Avenue will be fully improved for the street half-width fronting the site. This includes 10' right-of-way dedication, widening of the roadway, installation of curb, planter strip, and sidewalk, and a left turn lane into the development.

There is an existing water main running in NW 43rd Avenue, with City of Camas as the purveyor. The development proposes to connect to this water main to serve the lots. Sanitary Sewer is available in NW 43rd Avenue, immediately to the east of the site, with City of Camas as the purveyor. This project proposes the extension of this sewer main into the development to serve the lots, then out of the development and continuing east for future connections.

Stormwater:
Stormwater runoff will be collected, detained, and treated on site, then released at mitigated rates to the existing drainage on the west side of the site. See preliminary TIR report submitted with this application.

Solid Waste & Recycling:
Solid waste and recycling will be collected at the curb side of NW 43rd Avenue.

Project Information:

Zone:	Residential-7,500 (R-7.5)
Comp Plan Designation:	Single-Family_Medium (SFM)

Dimensional Standards:	Required	Proposed
Maximum Density	5.8 d.u./AC	d.u./AC
Minimum Lot Size -	5,250 SF	5,250 SF
Maximum Lot Size -	9,000 SF	9,000 SF
Min Lot Width -	60 FT	60 FT
Min Lot Depth -	80 FT	87.5 FT
Front Setback -	20 FT	20 FT
Side Setback -	5 FT	5 FT
Street Side Setback -	20 FT	20 FT
Rear Setback (corner lot) -	5 FT	5 FT
Rear Setback -	25 FT	25 FT
Maximum Lot Coverage -	40%	Will Meet
Maximum Building Height -	35 FT	Will Meet

LOT TABLE		
LOT 1	7,426 SF	0.17 AC
LOT 2	5,427 SF	0.12 AC
LOT 3	5,250 SF	0.12 AC
LOT 4	5,250 SF	0.12 AC
LOT 5	6,055 SF	0.14 AC
LOT 6	9,000 SF	0.21 AC
LOT 7	9,000 SF	0.21 AC
LOT 8	8,359 SF	0.19 AC
LOT 9	6,788 SF	0.16 AC
LOT 10	5,718 SF	0.13 AC
LOT 11	5,670 SF	0.13 AC
LOT 12	5,933 SF	0.14 AC
TRACT 'A'	501 SF	0.01 AC
TRACT 'B'	17,073 SF	0.39 AC
TRACT 'C'	9,214 SF	0.21 AC
TRACT 'D'	2,865 SF	0.07 AC
TRACT 'E'	1,312 SF	0.03 AC
R/W DEDICATION	31,541 SF	0.72 AC
TOTAL	**142,382 SF**	**3.27 AC**
EXISTING	**142,382 SF**	**3.27 AC**

LINE TABLE		
LINE	LENGTH	BEARING
L1	42.50'	N01°58'41"E
L2	19.95'	S64°16'24"W
L3	13.86'	N88°01'20"W
L4	15.00'	N88°01'20"E
L5	24.00'	S01°58'40"W
L6	12.76'	S88°01'12"E
L7	26.00'	S88°01'12"E
L8	5.97'	N1°58'14"E
L9	29.82'	S88°01'20"E
L10	10.76'	N88°01'19"W
L11	25.92'	S87°37'53"W
L12	28.39'	N88°01'19"W
L13	2.93'	S01°58'41"W
L14	10.01	S47°02'31"W
L15	25.92'	S87°37'53"W
L16	10.00'	N01°58'48"E

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD DIRECTION	CHORD LENGTH
C1	46.42'	96.00'	27°42'17"	N11°52'28"W	45.97'
C2	56.25'	96.00'	33°34'22"	N42°30'47"W	55.45'
C3	48.13'	96.00'	28°43'22"	N73°39'39"W	47.62'
C4	28.27'	18.00'	90°00'00"	N43°1'20"W	25.46'
C5	28.28'	18.00'	90°00'25"	N46°58'27"E	25.46'
C6	69.12'	44.00'	90°00'00"	S43°1'19"E	62.23'
C7	109.96'	70.00	90°00'00"	N43°1'19"W	98.99'

Scale 1" = 30'
0 15 30 60

PRELIMINARY

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
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PRELIMINARY SITE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

DESIGNED: JAN
CHECKED: JAN
MAR 2018
75345.000

SHEET ID
SP-103
SHEET 5 OF 10

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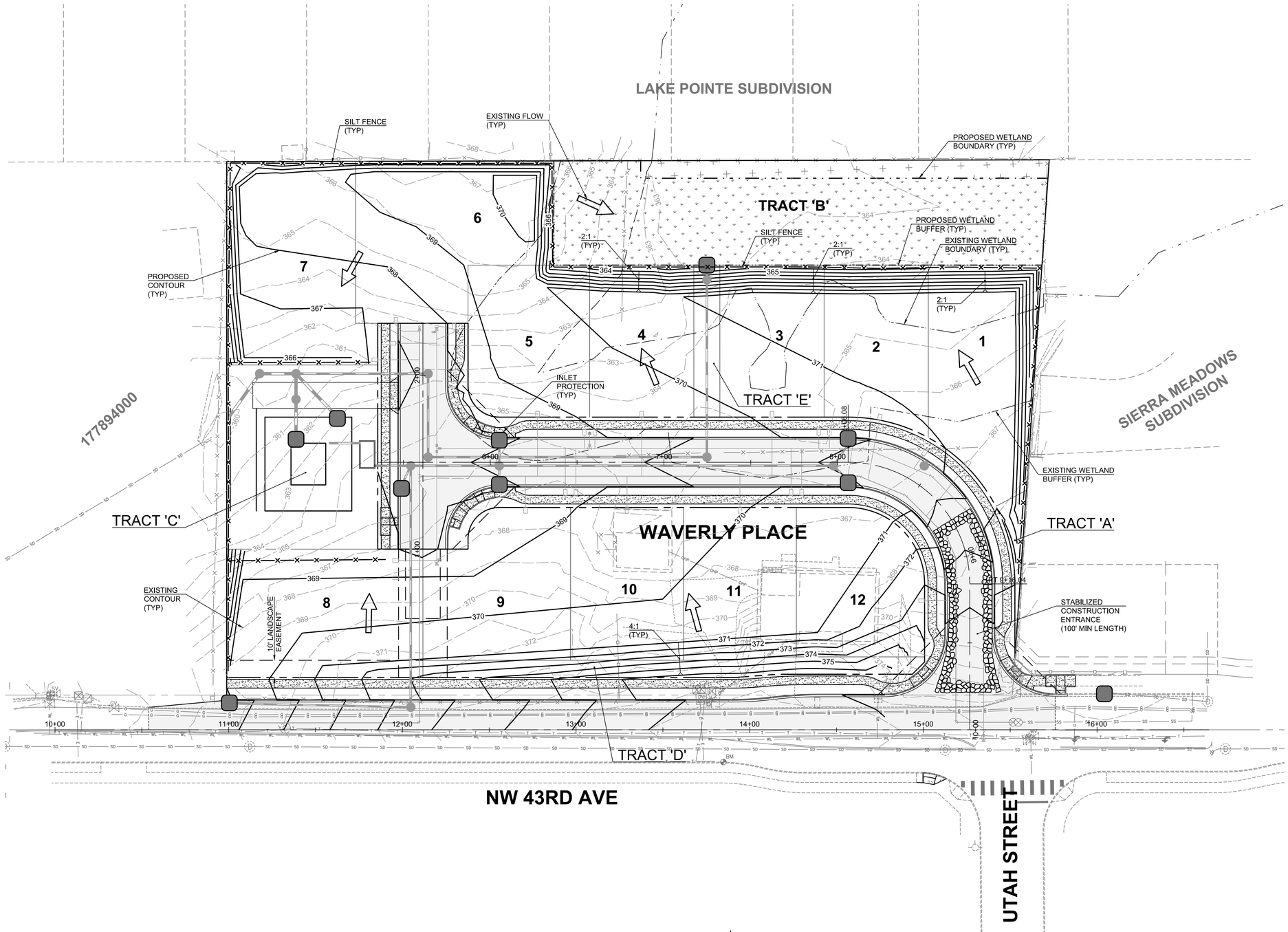

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PRELIMINARY EROSION CONTROL & GRADING PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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STATE OF WASHINGTON
13172
REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY

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SHEET ID	C-201
SHEET	6 OF 10

LAKE POINTE SUBDIVISION

PROPOSED WETLAND BOUNDARY (TYP)

TRACT 'B'

PROPOSED WETLAND BUFFER (TYP)

DITCH INLET (TYP)

TRACT 'E'

6

7

5

4

3

2

1

52' R/W

EMERGENCY OVERFLOW

5' S/W

5'

CONTROL MANHOLE
W/18" DIAM x 4' HIGH RISER ASSEMBLY
ORIFICE 1 DIAMETER 2.90"
RECTANGULAR NOTCH
WIDTH AND HEIGHT 0.05'x0.80'

177894000

WETLAND CONVEYANCE PIPE (TYP)

EXISTING WETLAND BOUNDARY (TYP)

CATCH BASIN (TYP)

SIERRA MEADOWS SUBDIVISION

EXISTING WETLAND BUFFER (TYP)

N 01° 58' 40" E

S 88° 01' 20" E

15' WIDE ACCESS ROAD

TRACT 'C'

TRACT 'A'

WAVERLY PLACE

PERK FILTER TREATMENT VAULT W/21 CARTRIDGES (12" HIGH)

5+61.21 WAVERLY PLACE=
1+50.00 HAMMERHEAD

R=70.00'
L=109.96'
=90°00'01"
T=70.00'

6' TALL BLACK VINYL COATED CHAIN LINE FENCE

28' WIDE UTILITY EASEMENT

8

9

10

11

12

STORM PIPE (TYP)

STORM MANHOLE (TYP)

CATCH BASIN (TYP)

TRACT 'D'

ADA RAMP

EXTG 3" STEP FM

EXTG 24" SD

EXTG 18" WATER

NW 43RD AVE

32' ½ WIDTH R/W

ADA RAMP

15+26.69 NW 43RD AVENUE=
10+00.00 WAVERLY PLACE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
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PRELIMINARY STREET & STORM DRAINAGE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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33172
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PROFESSIONAL ENGINEER
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DESIGNED:	DPS
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MAR 2018	75345.000
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SHEET	7 OF 10

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LAKE POINTE SUBDIVISION

SIERRA MEADOWS SUBDIVISION

177894000

TRACT 'B'

TRACT 'C'

TRACT 'D'

TRACT 'E'

TRACT 'A'

WAVERLY PLACE

NW 43RD AVE

UTAH STREET

6 7 8 9 10 11 12 5 4 3 2 1

2" STANDARD BLOWOFF (TYP)

STEP SANITARY CLEANOUT (TYP)

6" DI CL52 WATER (TYP)

STEP SEWER SERVICE (TYP)

FIRE HYDRANT (TYP)

1" WATER SERVICE (TYP)

8" DI CL52 WATER (TYP)

PIC 8+00.08

6+00 7+00 8+00

EXTG CONTOUR (TYP)

12' 10' 6'

3" STEP SAN FM

2" STANDARD BLOWOFF (TYP)

28' WIDE UTILITY EASEMENT

PT 9+16.04

8" DI CL52 WATER (TYP)

IRRIGATION METER

REMOVE EXTG CLEANOUT AND CONNECT TO EXTG SAN FM

EXTG 3" STEP FM

STEP SANITARY CLEANOUT (TYP)

10+00 11+00 12+00 13+00 14+00 15+00 16+00

EXTG 24" SD

EXTG 18" WATER

3" STEP SAN FM

CONNECT NEW 8" DI (W) TO EXTG 18" (W)

Scale 1" = 30'

0 15 30 60

PRELIMINARY

PRELIMINARY SANITARY SEWER & WATER PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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STATE OF WASHINGTON
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DESIGNED: DPS
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C-401
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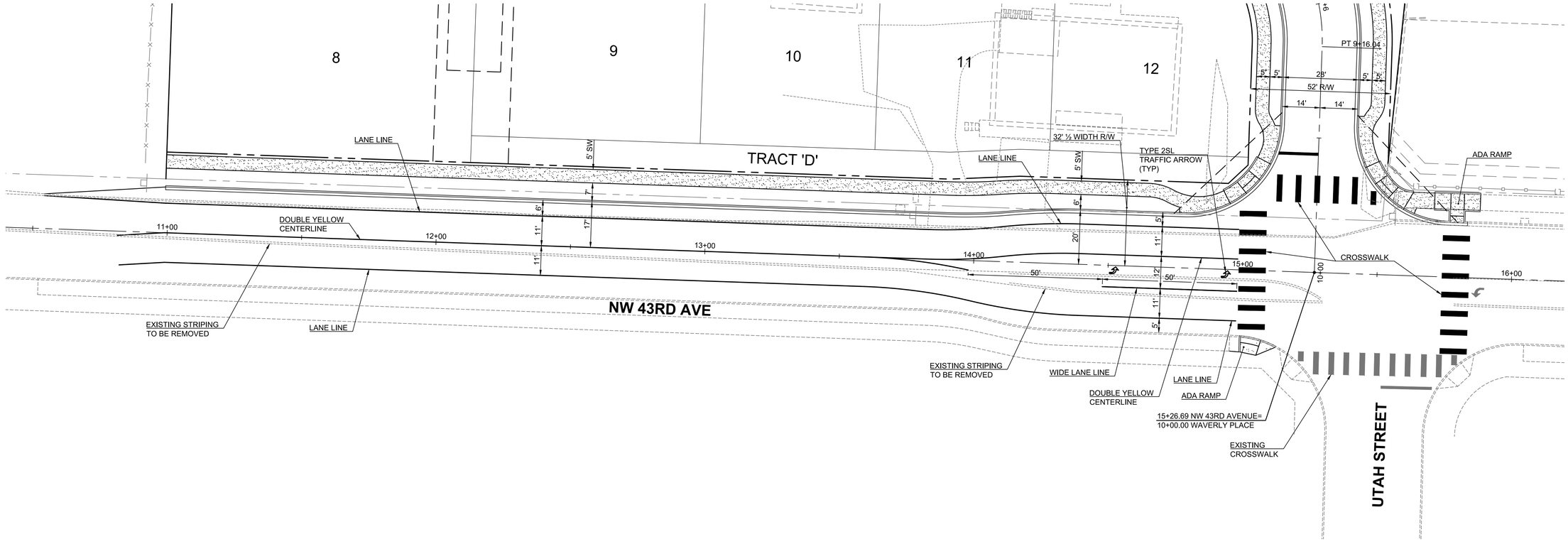

Scale 1" = 20'

0 10 20 40

PRELIMINARY

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PRELIMINARY STRIPING PLAN FOR: 43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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STATE OF WASHINGTON
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PROFESSIONAL ENGINEER
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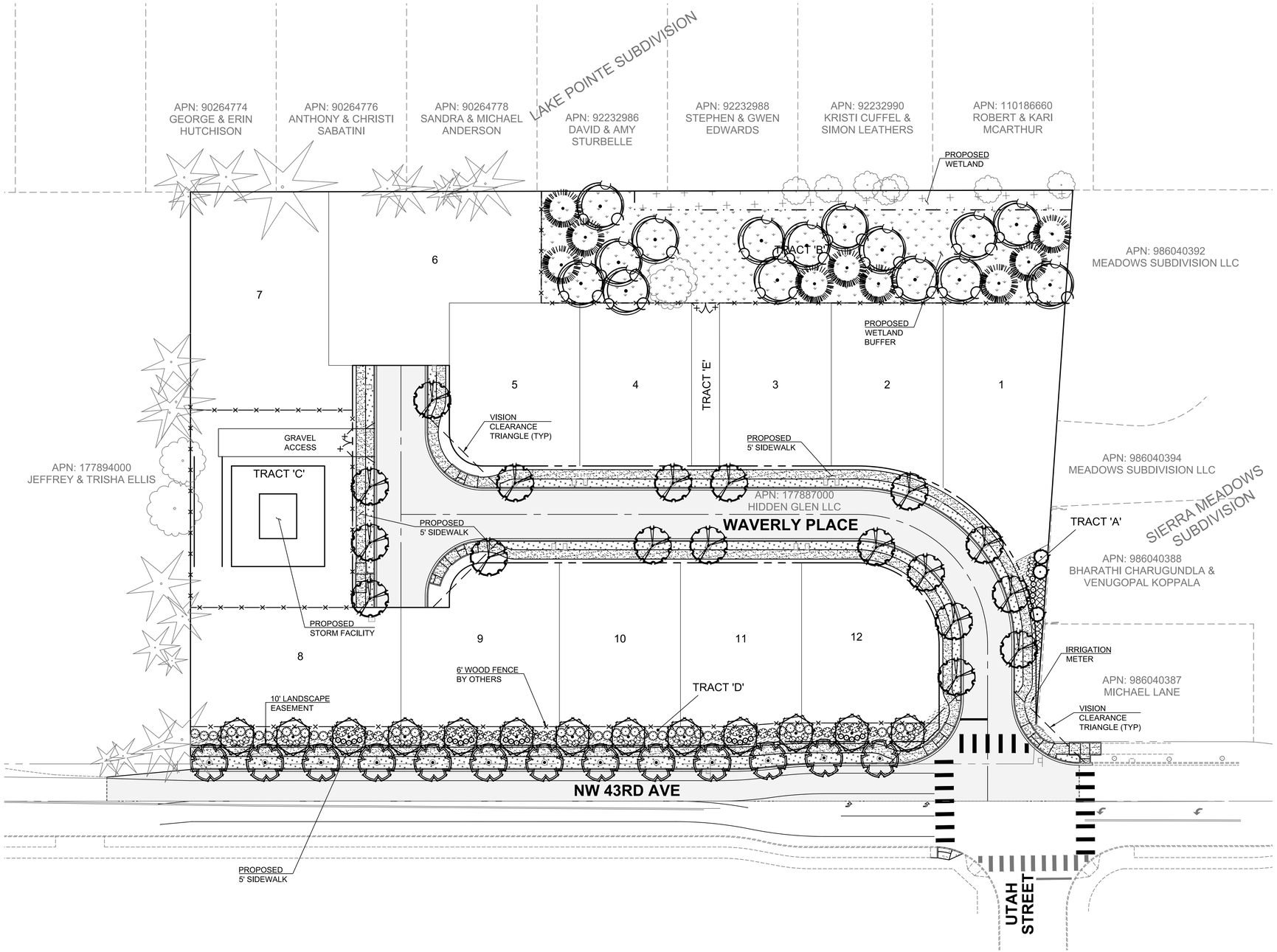
SHEET ID	C-501
SHEET	9 OF 10



Scale 1" = 30'

0 15 30 60

PRELIMINARY

PLANT LIST

SYM	QTY	NAME	SIZE	CONT.	SPACING
TREES					
	17	*Acer rubrum 'Franksred'* Red Sunset Maple	2" Cal	B&B	As Shown
	15	*Alnus rubra* Red Alder	2" Cal	B&B	As Shown
	13	*Ginkgo biloba 'Princeton Sentry'* Princeton Sentry Ginkgo	2" Cal.	B&B	As Shown
	3	*Picea glauca 'Pendula'* Weeping White Spruce	6' Height	B&B	As Shown
	13	*Pyrus calleryana 'Chanticleer'* Chanticleer Flowering Pear	2" Cal	B&B	As Shown
	9	*Thuja plicata* Western Red Cedar	6' Height	B&B	As Shown
SHRUBS					
	25	*Berberis thunbenii 'Crimson Pygmy'* Crimson Pygmy Barberry	12" Height Min	2 Gal	As Shown
	34	*Cistus x purpureus* Purple Rock Rose	30" Height Min	5 Gal	As Shown
	6	*Pieris japonica 'Mountain Fire'* Moutain Fire Lily of the Valley	30" Height Min	5 Gal	As Shown
	45	*Rhaphiolepis umbellata 'Minor'* Dwarf Yedda Hawthorn	30" Height Min	5 Gal	As Shown
	36	*Spiraea japonica 'Goldmound'* Golmound Spirea	12" Height Min	2 Gal	As Shown
	6	*Viburnum davidii* David Viburnum	12" Height Min	2 Gal	As Shown
GROUNDCOVERS					
	214	*Cotoneaster dammeri 'Lowfast'* Bearberry Cotoneaster	Fully Rooted	4" Pot	36" O.C.
SEED MIX					
	5,615 SF	'DOT Multipurpose' Mix *Lolium perenne var Blazer 4* *Lolium perenne var Allstar III* *Festuca rubra spp fallax var Windward* *Festuca rubra var Garnet*		SEE MIX	8 LBS / 1,000 SF

NOTES:

1. Street tree location is based on assumed driveway locations. Grass seed is shown in entire planter strip for reference, install seed after driveway installation for each lot.
2. Landscape for each lot shall be installed at the time of home construction. All Tract landscape shall be installed at time of road construction.
3. Irrigation will be design build by the landscape contractor. All irrigation for the lot frontages will be installed at the time of home construction and be operated and maintained by the home owner.
4. All Tract irrigation will be installed at the time of road construction. Tract irrigation will be operated and maintained by the home owners association.
5. City of Camas must receive written notice 30 days prior to any removal or replanting of vegetation.
6. Monitoring of vegetation survival may be required.

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
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PRELIMINARY LANDSCAPE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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STATE OF WASHINGTON
JOHN A. NUTTBROCK
No. 993 EXP. 05/14/2018
LICENSED LANDSCAPE ARCHITECT
PRELIMINARY

DESIGNED:	JAN
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MAR 2018	75345.000
SHEET ID	L-101
SHEET	10 OF 10

43rd Avenue Subdivision
2223 NW 43rd Avenue
Camas, Washington

PRELIMINARY TECHNICAL INFORMATION REPORT

April 24, 2018

Prepared for:
Waverly Homes, LLC
Brad Sheets
3205 NE 78th Street, Suite 10
Vancouver, WA 98665
(360) 216-6462

Prepared by:
PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
(360) 695-3488

TABLE OF CONTENTS

TABLES

APPENDICES

CERTIFICATE OF ENGINEER

43rd Avenue Subdivision

Preliminary Technical Information Report

The technical information and data contained in this report were prepared under the direction and supervision of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.

This document was:

Prepared by: _____

Daniel Skolrud, Design Technician IV

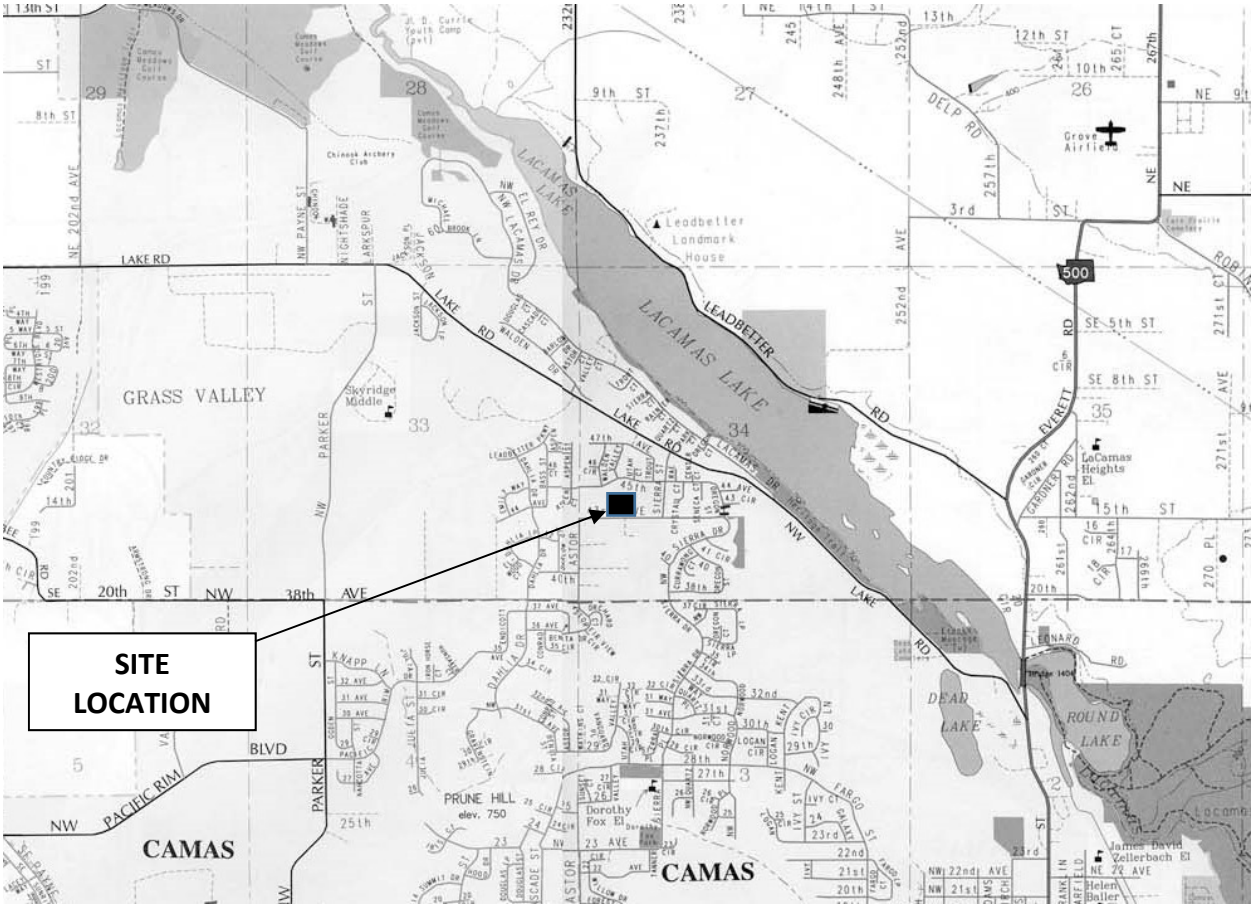
Approved by: _____

Richard E. Darland, P.E.

SITE MAPS

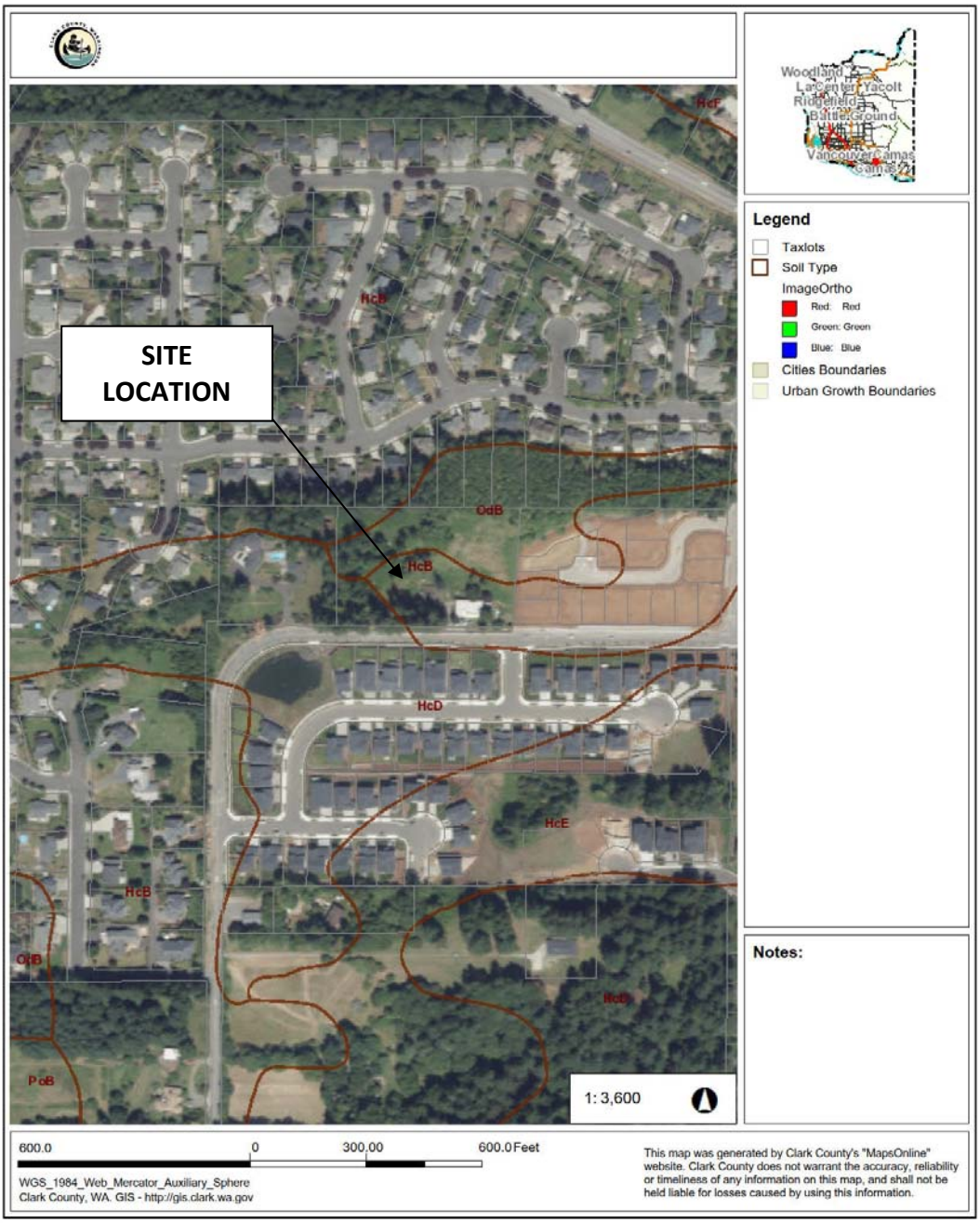
Site Location Map

Source: Clark County Road Atlas
North is to top of the page
SW ¼ Section 34 T2N, R3E



Soils Map

Soils Map (Clark County GIS)
Site Soils Include: Hesson Clay Loam (HcB), Hesson Clay Loam (HcD), Odne Silt Loam (OdB)



SECTION A – PROJECT OVERVIEW

The 43rd Avenue Subdivision proposes to divide 3.27 acres into 12 single family lots. The property identification number is 177887-000 and is located SW ¼ of Section 34, T2N, R3E, W.M. The project is located to the north of NW 43rd Avenue and west of NW Sierra Street. The address for the site is 2223 NW 43rd Avenue, Camas, Washington.

The site is bordered by NW 43rd Avenue to the south and residential developments on the north, east and west, with a wetland in the northeast corner of the site. The property is roughly rectangular. The site is currently occupied by a single residence and associated outbuildings and is covered with grass, shrubs and trees. Based on topographical data, the site slopes generally downward to the north. Natural drainages have created a wetland on the north side of the site.

This project proposes to develop the parcel into a residential subdivision with 12 residential lots, stormwater treatment and a detention facility. The project will also construct the roadways within the subdivision as well as the widening of NW 43rd Avenue along the frontage of the project site. Sanitary sewer, storm sewer, water and dry utilities will be installed and extended to each individual lot. Nearly all existing vegetation will be removed except for the wetland and wetland buffer areas.

There are no known agricultural drain tiles or areas of potential slope instability. All wells and septic tanks will be abandoned with the construction of the development.

The existing stormwater runoff from the site generally drains toward the western property line to an existing culvert.

The site's development plan proposes to grade the site to collect the site runoff and convey it to the proposed stormwater system which will treat and detain the stormwater through the use of FloGard Perk Filters™ and a detention pond.

The FloGard Perk Filters™ and detention pond will be constructed to provide stormwater treatment and detention per the Camas Stormwater Design Standards Manual.

SECTION B – MINIMUM REQUIREMENTS

The existing impervious surface on the site is less than 35% and the project will add more than 5,000 square feet of new impervious surface, therefore minimum requirements 1-9 will apply to this project.

Table 1 – Surface Totals

Description	Area (Acres)
Existing Impervious Surface	0.311
New Impervious Surface	1.438
Replaced Impervious Surface	0.152
Native Vegetation Converted to Lawn or Landscaping	1.632
Native Vegetation Converted to Pasture	0.000
Land Disturbing Activity	3.055

SECTION C – SOILS EVALUATION

The Natural Resources Conservation Service (NRCS) soils map indicates the onsite soils to be Hesson Clay Loam (HcB), Hesson Clay Loam (HcD) and Odne Silt Loam (OdB). These soils do not generally drain adequately for infiltration of stormwater runoff to be used as a BMP. The Hesson soils are considered hydrologic soils group C and the Odne soils are hydrologic soil group D.

A Geotechnical Engineering Report was prepared for the project by PBS Engineering and Environmental, Inc. dated 12/28/2017 and has been included in this report under Appendix C. Groundwater seepage was encountered on the site between 2.5 feet to 8 feet below ground surface (bgs). Test pit 4 (TP-4), which is near the stormwater facility encountered groundwater seepage at a depth of 4 feet below ground surface.

Infiltration testing was performed by PBS at TP-1 and TP-2 using the cased-hole falling head infiltration test. The infiltration tests were conducted within a 6 inch inside diameter pipe that was filled with water to achieve a minimum 1 foot high column of water. After a period of saturation, the height of the water column in the pipe was then measured initially and at regular, timed intervals. The two infiltration tests performed resulted with an infiltration rate of 0 inches per hour.

French drains and an impermeable liner will be installed at the stormwater facility to prevent groundwater from seeping into the detention pond.

SECTION D – SOURCE CONTROL

As a single family residential development, this project does not necessitate any special source control measures due to the low risks associated with the project. Source control for this site will become the responsibility of the future homeowners.

SECTION E – ONSITE STORMWATER MANAGEMENT BMPs

The stormwater runoff from the site will be collected and conveyed to the detention pond located along the western edge of the project. The volume of the detention pond was determined by the Western Washington Hydrology Model. Stormwater runoff from the site will be collected and treated in a Perk Filter™ Treatment Vault located next to the detention pond. After the stormwater runoff is treated in the Perk Filter Treatment Vault, it will be discharged into the detention pond. The Perk Filter™ treatment system has a General Use Level Designation (GULD) for basic and phosphorus treatment.

Minimum Requirement #5: On-site Stormwater Management.

Table 2.5.1 from the 2012 Stormwater Management Manual for Western Washington as amended in December 2014 (The 2014 SWMMWW) requires either Low Impact Development Performance Standand and BMP T5.13 or List #2. List #2 will be utilized for this development and is addressed below:

- Lawn and landscaped areas:
    1. BMP T5.13 (Post-Construction Soil Quality and Depth) requires the lawn and landscaped area to be entered in the model as pasture. These areas have been modeled as field since the pasture option is not present in the WWHM Clark2012SG.
- Roofs
    1. BMP T5.10A (Downspout Full Infiltration System) is not feasible. Two infiltration tests were performed on-site (see Section C of this report) resulting in an infiltration rate of 0 inches per hour and groundwater was encountered beginning at 2.5 feet below ground surface during the geotechnical explorations.
    2. Bioretention is not feasible for this development. Bioretention facilities can add phosphorus to stormwater and should not be used when water would be routed to a phosphorus sensitive receiving water (Lacamas Lake).
    3. BMP T5.10B (Downspout Dispersion System) is not feasible. The small lot sizes limit the available vegetated flow path after the splash block to less than 50.
    4. BMP T5.10C (Perforated Stub-out Connections) is not feasible. The project will be constructed on compacted fill and groundwater was encountered beginning at 2.5 feet below ground surface during the geotechnical explorations.
- Other Hard Surfaces
    1. BMP T5.30 (Full Dispersion) is not feasible. Two infiltration tests were performed on-site (see Section C of this report) resulting with an infiltration rate of 0 inches per hour and groundwater was encountered beginning at 2.5 feet below ground surface during the geotechnical explorations.

2. Permeable pavement is not feasible. Two infiltration tests were performed on-site (see Section C of this report) resulting with an infiltration rate of 0 inches per hour and groundwater was encountered beginning at 2.5 feet below ground surface during the geotechnical explorations.
3. Bioretention is not feasible for this development. Bioretention facilities can add phosphorus to stormwater and should not be used when water would be routed to a phosphorus sensitive receiving water (Lacamas Lake).
4. BMP T5.11 or BMP T5.12 (Sheet or Concentrated Flow Dispersion) is not feasible. The available vegetated flow path is less than 50 feet.

SECTION F – RUNOFF TREATMENT ANALYSIS AND DESIGN

As mentioned in Section E above, the runoff from the site will be treated by the Perk Filter Treatment Vault that has been approved for basic and phosphorus treatment.

A geotechnical report has been prepared for the site and was mentioned in Section C above and a copy of the report will be included in Appendix C.

The treatment of stormwater runoff for the development will utilize Kristar/Oldcastle Precast, Inc. FloGard Perk Filter™ (using ZPC Filter Media). The GULD for the Perk Filter™ allows basic and phosphorus treatment using a zeolite-perlite-carbon (ZPC) filter media sized for a hydraulic loading rate of no more than 1.5 gpm/ft^2 of media surface area. The design flow rate per cartridge is shown in the Table 2 below.

Table 2 - Design Flowrate per Cartridge

Effective Cartridge Height (inches)	12	18
Cartridge Flowrate (gpm/cartridge)	6.8	10.2

The water quality flow for proposed site in 0.3114 cubic feet per second (cfs). The treatment vault has been sized to treat the stormwater runoff with a 9'x16' vault with 21 cartridges. The effective cartridge height will be 12" and a cartridge flow rate of 6.8 gpm/cartridge or 0.15 cfs per cartridge.

Table 3 lists the areas of pollution-generating pervious surfaces (PGPS) and pollution-generating impervious surfaces (PGIS) for the proposed development. Drainage basin maps for the pre-development and post-development basins are in Appendix A.

Table 3 - Pollution Generating Surfaces

	Basin Area (Acres)	Impervious Area (Acres)	Pervious Area (Acres)
Basin 1	3.055	1.327	1.728

SECTION G – FLOW CONTROL ANALYSIS AND DESIGN

The site has one threshold drainage area (TDA). The flow control for the TDA will utilize a detention pond with a control riser to meet the minimum flow requirements. Calculations are provided in Appendix B.

The geotechnical report noted that infiltration tests were performed onsite and determined the rate to be 0 inches per hour.

The detention pond is located on the western boundary of proposed development. The dimensions at the bottom of the detention pond will be 20'x24' with 3:1 side slopes. The access road to the facility will be on northern portion of Tract 'C' as well as the control manhole and emergency overflow for the detention pond.

SECTION H – WETLANDS PROTECTION

The northeast corner of the site has a Category IV wetland. The water from the wetland will flow to a ditch inlet to the northern end of Tract 'E'. The water will be conveyed through pipes and be discharged to the existing 15" pipe located near the stormwater facility. The wetland conveyance pipe will discharge the water at the point the water left the property prior to the development of the site.

Silt fence will be installed along the proposed wetland buffer to protect the area from sediment from the construction area.

APPENDICES

Appendix A
Basin Delineation Maps

LAKE POINTE SUBDIVISION

EXISTING FLOW (TYP)

THRESHOLD DISCHARGE AREA (TYP)

HcB
HESSON CLAY LOAM

OdB
ODNE SILT LOAM

EXISTING CONTOUR (TYP)

SOIL DELINEATION (TYP)

EXISTING WETLAND DELINEATION

SIERRA MEADOWS SUBDIVISION

EXISTING 15" SD

EXISTING OUTBUILDING

EXISTING WETLAND BUFFER

EXISTING HOUSE

177894000

HcD
HESSON CLAY LOAM

HcB
HESSON CLAY LOAM

EXTG 24" SD

NE 43RD AVE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

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PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
360.695.3488
pbsusa.com

PBS

PRE-DEVELOPED DRAINAGE BASIN MAP FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

DESIGNED: DPS

CHECKED: RED

MAR 2018
75345.000

SHEET ID
BSN-01

SHEET 1 OF 2

LAKE POINTE SUBDIVISION

PROPOSED WETLAND BOUNDARY (TYP)

THRESHOLD DISCHARGE AREA (TYP)

TRACT 'A'

PROPOSED WETLAND BUFFER (TYP)

DITCH INLET (TYP)

EXTG CONTOUR (TYP)

EMERGENCY OVERFLOW

WETLAND CONVEYANCE PIPE (TYP)

TRACT 'E'

CONTROL MANHOLE
W/18" DIAM x 4' HIGH RISER ASSEMBLY
ORIFICE 1 DIAMETER 2.90"
RECTANGULAR NOTCH
WIDTH AND HEIGHT 0.05'x0.80'

177894000

15' WIDE ACCESS ROAD

TRACT 'C'

PERK FILTER TREATMENT VAULT
W/21 CARTRIDGES (42" HIGH)

SIERRA MEADOWS SUBDIVISION

PROPOSED FLOW (TYP)

TRACT 'A'

WAVERLY PLACE

STORM MANHOLE (TYP)

BASIN 1

PROPOSED CONTOUR (TYP)

28' WIDE UTILITY EASEMENT

STORM PIPE (TYP)

EXTG 24" SD

NE 43RD AVE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

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Vancouver, WA 98660
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pbsusa.com

PBS

POST-DEVELOPED DRAINAGE BASIN MAP FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

DESIGNED:	DPS
CHECKED:	RED
MAR 2018	75345.000
SHEET ID	BSN-02
SHEET	2 OF 2

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Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Appendix B
WWHM2012 Project Report

WWHM2012

PROJECT REPORT

General Model Information

Project Name:	75345ccsg-WO-Wetland_WQ_Vault
Site Name:	43rd Ave Subdivision
Site Address:	
City:	Camas, WA
Report Date:	1/22/2018
Gage:	Lacamas
Data Start:	1948/10/01
Data End:	2008/09/30
Timestep:	15 Minute
Precip Scale:	1.30
Version Date:	2016/02/25
Version:	4.2.12

POC Thresholds

Low Flow Threshold for POC1:	50 Percent of the 2 Year
High Flow Threshold for POC1:	50 Year

Landuse Basin Data

Predeveloped Land Use

Basin 1

Bypass:	No
GroundWater:	No
Pervious Land Use	acre
SG4, Forest, Flat	1.047
SG4, Forest, Mod	2.008
Pervious Total	3.055
Impervious Land Use	acre
Impervious Total	0
Basin Total	3.055

Element Flows To:

Surface	Interflow	Groundwater

Mitigated Land Use

Basin 1

Bypass:	No
GroundWater:	No

Pervious Land Use	acre
SG4, Field, Mod	1.728
Pervious Total	1.728

Impervious Land Use	acre
ROADS FLAT	0.748
ROOF TOPS FLAT	0.579
Impervious Total	1.327
Basin Total	3.055

Element Flows To:

Surface	Interflow	Groundwater
Trapezoidal Pond 1	Trapezoidal Pond 1	

Routing Elements
Predeveloped Routing

Mitigated Routing

Trapezoidal Pond 1

Bottom Length: 20.00 ft.
Bottom Width: 24.00 ft.
Depth: 5 ft.
Volume at riser head: 0.1129 acre-feet.
Side slope 1: 3 To 1
Side slope 2: 3 To 1
Side slope 3: 3 To 1
Side slope 4: 3 To 1
Discharge Structure
Riser Height: 4 ft.
Riser Diameter: 18 in.
Notch Type: Rectangular
Notch Width: 0.050 ft.
Notch Height: 0.800 ft.
Orifice 1 Diameter: 2.9 in. Elevation:0 ft.
Element Flows To:
Outlet 1 Outlet 2

Pond Hydraulic Table

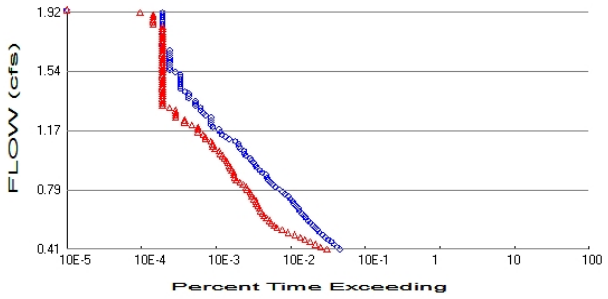
Stage(feet)	Area(ac.)	Volume(ac-ft.)	Discharge(cfs)	Infilt(cfs)
0.0000	0.011	0.000	0.000	0.000
0.0556	0.011	0.000	0.053	0.000
0.1111	0.011	0.001	0.076	0.000
0.1667	0.012	0.001	0.093	0.000
0.2222	0.012	0.002	0.107	0.000
0.2778	0.012	0.003	0.120	0.000
0.3333	0.013	0.004	0.131	0.000
0.3889	0.013	0.004	0.142	0.000
0.4444	0.013	0.005	0.152	0.000
0.5000	0.014	0.006	0.161	0.000
0.5556	0.014	0.007	0.170	0.000
0.6111	0.015	0.007	0.178	0.000
0.6667	0.015	0.008	0.186	0.000
0.7222	0.015	0.009	0.194	0.000
0.7778	0.016	0.010	0.201	0.000
0.8333	0.016	0.011	0.208	0.000
0.8889	0.017	0.012	0.215	0.000
0.9444	0.017	0.013	0.221	0.000
1.0000	0.017	0.014	0.228	0.000
1.0556	0.018	0.015	0.234	0.000
1.1111	0.018	0.016	0.240	0.000
1.1667	0.019	0.017	0.246	0.000
1.2222	0.019	0.018	0.252	0.000
1.2778	0.020	0.019	0.258	0.000
1.3333	0.020	0.020	0.263	0.000
1.3889	0.021	0.021	0.269	0.000
1.4444	0.021	0.023	0.274	0.000
1.5000	0.022	0.024	0.279	0.000
1.5556	0.022	0.025	0.284	0.000
1.6111	0.022	0.026	0.289	0.000
1.6667	0.023	0.028	0.294	0.000
1.7222	0.023	0.029	0.299	0.000

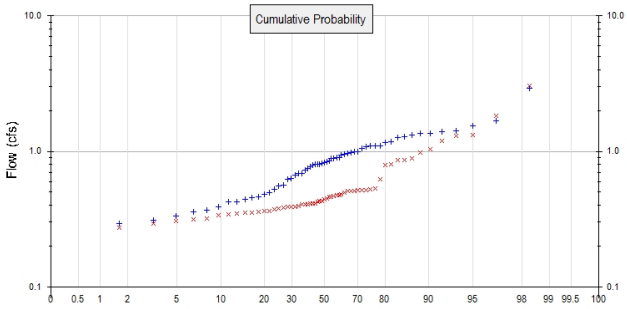
1.7778	0.024	0.030	0.304	0.000
1.8333	0.024	0.032	0.309	0.000
1.8889	0.025	0.033	0.313	0.000
1.9444	0.025	0.034	0.318	0.000
2.0000	0.026	0.036	0.322	0.000
2.0556	0.027	0.037	0.327	0.000
2.1111	0.027	0.039	0.331	0.000
2.1667	0.028	0.040	0.335	0.000
2.2222	0.028	0.042	0.340	0.000
2.2778	0.029	0.044	0.344	0.000
2.3333	0.029	0.045	0.348	0.000
2.3889	0.030	0.047	0.352	0.000
2.4444	0.030	0.049	0.356	0.000
2.5000	0.031	0.050	0.360	0.000
2.5556	0.031	0.052	0.364	0.000
2.6111	0.032	0.054	0.368	0.000
2.6667	0.033	0.056	0.372	0.000
2.7222	0.033	0.058	0.376	0.000
2.7778	0.034	0.059	0.380	0.000
2.8333	0.034	0.061	0.384	0.000
2.8889	0.035	0.063	0.387	0.000
2.9444	0.036	0.065	0.391	0.000
3.0000	0.036	0.067	0.395	0.000
3.0556	0.037	0.069	0.398	0.000
3.1111	0.037	0.071	0.402	0.000
3.1667	0.038	0.074	0.406	0.000
3.2222	0.039	0.076	0.410	0.000
3.2778	0.039	0.078	0.416	0.000
3.3333	0.040	0.080	0.424	0.000
3.3889	0.041	0.082	0.433	0.000
3.4444	0.041	0.085	0.442	0.000
3.5000	0.042	0.087	0.452	0.000
3.5556	0.043	0.089	0.463	0.000
3.6111	0.043	0.092	0.474	0.000
3.6667	0.044	0.094	0.485	0.000
3.7222	0.045	0.097	0.496	0.000
3.7778	0.045	0.099	0.508	0.000
3.8333	0.046	0.102	0.520	0.000
3.8889	0.047	0.104	0.532	0.000
3.9444	0.047	0.107	0.544	0.000
4.0000	0.048	0.110	0.556	0.000
4.0556	0.049	0.112	0.767	0.000
4.1111	0.049	0.115	1.150	0.000
4.1667	0.050	0.118	1.640	0.000
4.2222	0.051	0.121	2.206	0.000
4.2778	0.052	0.124	2.820	0.000
4.3333	0.052	0.127	3.457	0.000
4.3889	0.053	0.130	4.088	0.000
4.4444	0.054	0.133	4.684	0.000
4.5000	0.055	0.136	5.223	0.000
4.5556	0.055	0.139	5.684	0.000
4.6111	0.056	0.142	6.058	0.000
4.6667	0.057	0.145	6.347	0.000
4.7222	0.058	0.148	6.570	0.000
4.7778	0.058	0.151	6.848	0.000
4.8333	0.059	0.155	7.071	0.000
4.8889	0.060	0.158	7.286	0.000
4.9444	0.061	0.161	7.494	0.000

5.0000	0.062	0.165	7.697	0.000
5.0556	0.062	0.168	7.894	0.000

Analysis Results

POC 1





\+ Predeveloped x Mitigated

Predeveloped Landuse Totals for POC #1
Total Pervious Area: 3.055
Total Impervious Area: 0

Mitigated Landuse Totals for POC #1
Total Pervious Area: 1.728
Total Impervious Area: 1.327

Flow Frequency Method: Log Pearson Type III 17B

Flow Frequency Return Periods for Predeveloped. POC #1

Return Period	**Flow(cfs)**
2 year	0.825404
5 year	1.277192
10 year	1.521791
25 year	1.770251
50 year	1.917721
100 year	2.038879

Flow Frequency Return Periods for Mitigated. POC #1

Return Period	**Flow(cfs)**
2 year	0.471505
5 year	0.730375
10 year	0.953996
25 year	1.307454
50 year	1.63034
100 year	2.011768

Annual Peaks

Annual Peaks for Predeveloped and Mitigated. POC #1

Year	**Predeveloped**	**Mitigated**
1949	0.622	0.430
1950	0.817	0.465
1951	1.098	0.390
1952	0.631	0.510
1953	0.888	0.390
1954	1.321	0.415
1955	0.684	0.361
1956	1.264	1.297
1957	1.082	0.508
1958	0.790	0.975

1959	0.480	0.313
1960	0.440	0.336
1961	1.166	0.476
1962	0.804	0.460
1963	0.898	0.409
1964	0.841	0.411
1965	0.732	0.483
1966	0.993	0.513
1967	0.888	0.384
1968	1.093	0.397
1969	0.995	0.518
1970	2.900	3.064
1971	0.459	0.349
1972	0.753	0.408
1973	0.772	0.515
1974	1.184	1.322
1975	0.664	0.404
1976	0.986	0.497
1977	0.028	0.253
1978	1.426	0.857
1979	0.941	0.866
1980	0.555	0.381
1981	1.281	0.805
1982	0.855	0.790
1983	1.537	1.038
1984	0.498	0.359
1985	0.366	0.363
1986	0.453	0.351
1987	0.797	0.413
1988	0.357	0.318
1989	0.387	0.350
1990	0.335	0.307
1991	0.905	0.422
1992	0.954	0.391
1993	1.098	0.880
1994	0.830	0.524
1995	0.687	0.476
1996	1.401	1.830
1997	1.681	1.202
1998	1.359	0.445
1999	0.968	0.535
2000	0.525	0.292
2001	0.294	0.273
2002	1.360	0.519
2003	1.047	0.620
2004	0.309	0.344
2005	0.427	0.371
2006	0.804	0.466
2007	0.425	0.427
2008	0.560	0.451

Ranked Annual Peaks

Ranked Annual Peaks for Predeveloped and Mitigated. POC #1

Rank	Predeveloped	Mitigated
1	2.9001	3.0639
2	1.6810	1.8296
3	1.5367	1.3223
4	1.4264	1.2973

5	1.4010	1.2023
6	1.3602	1.0382
7	1.3585	0.9746
8	1.3205	0.8803
9	1.2813	0.8662
10	1.2636	0.8568
11	1.1838	0.8050
12	1.1660	0.7902
13	1.0985	0.6204
14	1.0976	0.5347
15	1.0931	0.5242
16	1.0821	0.5189
17	1.0467	0.5179
18	0.9954	0.5150
19	0.9932	0.5132
20	0.9861	0.5098
21	0.9680	0.5080
22	0.9542	0.4973
23	0.9414	0.4826
24	0.9048	0.4765
25	0.8982	0.4763
26	0.8882	0.4659
27	0.8882	0.4649
28	0.8551	0.4599
29	0.8410	0.4512
30	0.8304	0.4454
31	0.8166	0.4300
32	0.8044	0.4271
33	0.8038	0.4219
34	0.7974	0.4151
35	0.7899	0.4132
36	0.7717	0.4112
37	0.7527	0.4089
38	0.7319	0.4084
39	0.6868	0.4041
40	0.6842	0.3972
41	0.6636	0.3910
42	0.6310	0.3903
43	0.6219	0.3899
44	0.5600	0.3838
45	0.5550	0.3807
46	0.5245	0.3707
47	0.4976	0.3631
48	0.4800	0.3606
49	0.4589	0.3591
50	0.4534	0.3514
51	0.4395	0.3504
52	0.4269	0.3492
53	0.4254	0.3435
54	0.3868	0.3358
55	0.3664	0.3180
56	0.3572	0.3127
57	0.3354	0.3065
58	0.3088	0.2923
59	0.2944	0.2731
60	0.0284	0.2527

Duration Flows

The Facility PASSED

Flow(cfs)	Predev	Mit	Percentage	Pass/Fail
0.4127	953	642	67	Pass
0.4279	878	531	60	Pass
0.4431	811	452	55	Pass
0.4583	739	385	52	Pass
0.4735	669	326	48	Pass
0.4887	608	284	46	Pass
0.5039	561	238	42	Pass
0.5191	514	194	37	Pass
0.5343	477	162	33	Pass
0.5495	451	137	30	Pass
0.5647	416	125	30	Pass
0.5799	386	116	30	Pass
0.5951	358	109	30	Pass
0.6103	335	99	29	Pass
0.6255	316	92	29	Pass
0.6407	296	88	29	Pass
0.6559	278	83	29	Pass
0.6711	266	80	30	Pass
0.6863	248	76	30	Pass
0.7015	232	72	31	Pass
0.7167	222	72	32	Pass
0.7319	210	68	32	Pass
0.7472	195	63	32	Pass
0.7624	178	62	34	Pass
0.7776	163	60	36	Pass
0.7928	148	55	37	Pass
0.8080	131	53	40	Pass
0.8232	121	48	39	Pass
0.8384	112	44	39	Pass
0.8536	105	39	37	Pass
0.8688	102	37	36	Pass
0.8840	98	36	36	Pass
0.8992	87	36	41	Pass
0.9144	81	34	41	Pass
0.9296	75	33	44	Pass
0.9448	71	31	43	Pass
0.9600	67	30	44	Pass
0.9752	62	29	46	Pass
0.9904	60	27	45	Pass
1.0056	53	26	49	Pass
1.0208	51	24	47	Pass
1.0360	50	23	46	Pass
1.0512	44	20	45	Pass
1.0664	43	19	44	Pass
1.0816	42	19	45	Pass
1.0968	38	18	47	Pass
1.1120	31	15	48	Pass
1.1272	28	15	53	Pass
1.1424	25	14	56	Pass
1.1576	24	12	50	Pass
1.1728	23	12	52	Pass
1.1880	19	12	63	Pass
1.2032	18	10	55	Pass

1.2184	18	8	44	Pass
1.2336	18	8	44	Pass
1.2488	18	6	33	Pass
1.2640	15	6	40	Pass
1.2792	14	6	42	Pass
1.2944	13	6	46	Pass
1.3096	13	5	38	Pass
1.3248	11	4	36	Pass
1.3400	11	4	36	Pass
1.3552	11	4	36	Pass
1.3704	9	4	44	Pass
1.3856	9	4	44	Pass
1.4008	9	4	44	Pass
1.4160	8	4	50	Pass
1.4313	7	4	57	Pass
1.4465	7	4	57	Pass
1.4617	7	4	57	Pass
1.4769	7	4	57	Pass
1.4921	7	4	57	Pass
1.5073	7	4	57	Pass
1.5225	7	4	57	Pass
1.5377	6	4	66	Pass
1.5529	5	4	80	Pass
1.5681	5	4	80	Pass
1.5833	5	4	80	Pass
1.5985	5	4	80	Pass
1.6137	5	4	80	Pass
1.6289	5	4	80	Pass
1.6441	5	4	80	Pass
1.6593	5	4	80	Pass
1.6745	5	4	80	Pass
1.6897	4	4	100	Pass
1.7049	4	4	100	Pass
1.7201	4	4	100	Pass
1.7353	4	4	100	Pass
1.7505	4	4	100	Pass
1.7657	4	4	100	Pass
1.7809	4	4	100	Pass
1.7961	4	4	100	Pass
1.8113	4	4	100	Pass
1.8265	4	4	100	Pass
1.8417	4	3	75	Pass
1.8569	4	3	75	Pass
1.8721	4	3	75	Pass
1.8873	4	3	75	Pass
1.9025	4	3	75	Pass
1.9177	4	2	50	Pass

Water Quality

Water Quality BMP Flow and Volume for POC #1

On-line facility volume:	0.288 acre-feet
On-line facility target flow:	0.3114 cfs.
Adjusted for 15 min:	0.3114 cfs.
Off-line facility target flow:	0.1822 cfs.
Adjusted for 15 min:	0.1822 cfs.

LID Report

LID Technique	Used for Treatment ?	Total Volume Needs Treatment (ac-ft)	Volume Through Facility (ac-ft)	Infiltration Volume (ac-ft)	Cumulative Volume Infiltration Credit	Percent Volume Infiltrated	Water Quality	Percent Water Quality Treated	Comment
Trapezoidal Pond 1 POC	☐	275.31			☐	0.00			
Total Volume Infiltrated		275.31	0.00	0.00		0.00	0.00	0%	No Treat. Credit
Compliance with LID Standard 8% of 2-yr to 50% of 2-yr									Duration Analysis Result = Passed

POC 2

POC #2 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 3

POC #3 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 4

POC #4 was not reported because POC must exist in both scenarios and both scenarios must have been run.

POC 5

POC #5 was not reported because POC must exist in both scenarios and both scenarios must have been run.

Model Default Modifications

Total of 0 changes have been made.

PERLND Changes

No PERLND changes have been made.

IMPLND Changes

No IMPLND changes have been made.

Appendix
Predeveloped Schematic

Mitigated Schematic

Predeveloped UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                   UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   75345ccsg-WO-Wetland_WQ_Vault.wdm
MESSU       25   Pre75345ccsg-WO-Wetland_WQ_Vault.MES
            27   Pre75345ccsg-WO-Wetland_WQ_Vault.L61
            28   Pre75345ccsg-WO-Wetland_WQ_Vault.L62
            30   POC75345ccsg-WO-Wetland_WQ_Vault1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      28
      PERLND      29
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Basin  1                   MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                        in  out           ***
   28     SG4, Forest, Flat       1    1    1    1   27    0
   29     SG4, Forest, Mod        1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   28         0    0    1    0    0    0    0    0    0    0    0    0
   29         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
```

```
   28         0    0    4    0    0    0    0    0    0    0    0    0    1    9
   29         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   28         0    0    0    0    0    0    0    0    0    0    0
   29         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   28              0         6      0.04       400      0.05         0      0.96
   29              0         6      0.04       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   28              0         0         3         2         0         0         0
   29              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   28            0.2       0.4      0.35         2       0.4       0.7
   29            0.2       0.4      0.35         2       0.4       0.7
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
               ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   28              0         0         0         0       2.5         1         0
   29              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                 in  out           ***
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
  END IWAT-PARM2

  IWAT-PARM3
```

```
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                  <--Area-->     <-Target->   MBLK   ***
<Name>   #                  <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  28                       1.047     COPY   501     12
PERLND  28                       1.047     COPY   501     13
PERLND  29                       2.008     COPY   501     12
PERLND  29                       2.008     COPY   501     13

******Routing******
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************* Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ****************** PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                     ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
  END HYDR-INIT
END RCHRES
```

```
SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    501 FLOW     ENGL      REPL
END EXT TARGETS

MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>            <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK       12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   12

  MASS-LINK       13
PERLND     PWATER IFWO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK   13


END MASS-LINK

END RUN
```

Mitigated UCI File

```
RUN

GLOBAL
  WWHM4 model simulation
  START       1948 10 01        END    2008 09 30
  RUN INTERP OUTPUT LEVEL    3    0
  RESUME     0 RUN     1                    UNIT SYSTEM     1
END GLOBAL

FILES
<File>  <Un#>   <-----------File Name------------------------------>***
<-ID->                                                              ***
WDM         26   75345ccsg-WO-Wetland_WQ_Vault.wdm
MESSU       25   Mit75345ccsg-WO-Wetland_WQ_Vault.MES
            27   Mit75345ccsg-WO-Wetland_WQ_Vault.L61
            28   Mit75345ccsg-WO-Wetland_WQ_Vault.L62
            30   POC75345ccsg-WO-Wetland_WQ_Vault1.dat
END FILES

OPN SEQUENCE
    INGRP              INDELT 00:15
      PERLND      32
      IMPLND       1
      IMPLND       4
      RCHRES       1
      COPY         1
      COPY       501
      DISPLY       1
    END INGRP
END OPN SEQUENCE
DISPLY
  DISPLY-INFO1
    # -  #<----------Title----------->***TRAN PIVL DIG1 FIL1  PYR DIG2 FIL2 YRND
    1        Trapezoidal Pond  1         MAX                    1    2   30    9
  END DISPLY-INFO1
END DISPLY
COPY
  TIMESERIES
    # -  #  NPT  NMN ***
    1         1    1
  501         1    1
  END TIMESERIES
END COPY
GENER
  OPCODE
    #    # OPCD ***
  END OPCODE
  PARM
    #    #         K ***
  END PARM
END GENER
PERLND
  GEN-INFO
    <PLS ><-------Name------->NBLKS   Unit-systems   Printer ***
    # -  #                          User  t-series Engl Metr ***
                                          in  out           ***
   32     SG4, Field, Mod         1    1    1    1   27    0
  END GEN-INFO
  *** Section PWATER***

  ACTIVITY
    <PLS > ************ Active Sections ******************************
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC ***
   32         0    0    1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags **************************** PIVL  PYR
```

```
    # -  # ATMP SNOW PWAT  SED  PST  PWG PQAL MSTL PEST NITR PHOS TRAC  *********
   32         0    0    4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  PWAT-PARM1
    <PLS >  PWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP UZFG  VCS  VUZ  VNN VIFW VIRC  VLE INFC  HWT ***
   32         0    0    0    0    0    0    0    0    0    0    0
  END PWAT-PARM1

  PWAT-PARM2
    <PLS >      PWATER input info: Part 2         ***
    # -  # ***FOREST      LZSN    INFILT      LSUR     SLSUR     KVARY     AGWRC
   32              0         6      0.03       400       0.1         0      0.96
  END PWAT-PARM2

  PWAT-PARM3
    <PLS >      PWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN    INFEXP    INFILD    DEEPFR    BASETP    AGWETP
   32              0         0         3         2         0         0         0
  END PWAT-PARM3
  PWAT-PARM4
    <PLS >     PWATER input info: Part 4                              ***
    # -  #     CEPSC      UZSN      NSUR     INTFW       IRC     LZETP ***
   32           0.15       0.4       0.3         2       0.4       0.4
  END PWAT-PARM4

  PWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
             ran from 1990 to end of 1992 (pat 1-11-95) RUN 21 ***
    # -  # ***  CEPS      SURS       UZS      IFWS       LZS      AGWS      GWVS
   32              0         0         0         0       2.5         1         0
  END PWAT-STATE1

END PERLND

IMPLND
  GEN-INFO
    <PLS ><-------Name------->   Unit-systems   Printer ***
    # -  #                     User  t-series Engl Metr ***
                                     in  out           ***
    1      ROADS/FLAT             1    1    1   27    0
    4      ROOF TOPS/FLAT         1    1    1   27    0
  END GEN-INFO
  *** Section IWATER***

  ACTIVITY
    <PLS > ************* Active Sections ******************************
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL   ***
    1         0    0    1    0    0    0
    4         0    0    1    0    0    0
  END ACTIVITY

  PRINT-INFO
    <ILS > ******** Print-flags ******** PIVL  PYR
    # -  # ATMP SNOW IWAT  SLD  IWG IQAL    *********
    1         0    0    4    0    0    0    1    9
    4         0    0    4    0    0    0    1    9
  END PRINT-INFO

  IWAT-PARM1
    <PLS >  IWATER variable monthly parameter value flags  ***
    # -  # CSNO RTOP  VRS  VNN RTLI     ***
    1         0    0    0    0    0
    4         0    0    0    0    0
  END IWAT-PARM1

  IWAT-PARM2
    <PLS >      IWATER input info: Part 2         ***
    # -  # ***  LSUR     SLSUR      NSUR     RETSC
```

```
    1            400      0.01       0.1       0.1
    4            400      0.01       0.1       0.1
  END IWAT-PARM2

  IWAT-PARM3
    <PLS >      IWATER input info: Part 3         ***
    # -  # ***PETMAX    PETMIN
    1              0         0
    4              0         0
  END IWAT-PARM3

  IWAT-STATE1
    <PLS > *** Initial conditions at start of simulation
    # -  # ***  RETS      SURS
    1              0         0
    4              0         0
  END IWAT-STATE1

END IMPLND

SCHEMATIC
<-Source->                 <--Area-->     <-Target->   MBLK   ***
<Name>   #                 <-factor->     <Name>   #   Tbl#   ***
Basin  1***
PERLND  32                      1.728     RCHRES   1      2
IMPLND   1                      0.748     RCHRES   1      5
IMPLND   4                      0.579     RCHRES   1      5

******Routing******
PERLND  32                      1.728     COPY     1     12
IMPLND   1                      0.748     COPY     1     15
IMPLND   4                      0.579     COPY     1     15
RCHRES   1                          1     COPY   501     16
END SCHEMATIC

NETWORK
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
COPY   501 OUTPUT MEAN   1 1   48.4        DISPLY   1     INPUT  TIMSER 1



<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   #        <Name> # #<-factor->strg <Name>   #   #        <Name> # #  ***
END NETWORK

RCHRES
  GEN-INFO
    RCHRES       Name        Nexits   Unit Systems   Printer                ***
    # -  #<------------------><---> User T-series  Engl Metr LKFG           ***
                                       in  out                              ***
    1     Trapezoidal Pond-005    1    1    1    1   28    0    1
  END GEN-INFO
  *** Section RCHRES***

  ACTIVITY
    <PLS > ************ Active Sections ****************************
    # -  # HYFG ADFG CNFG HTFG SDFG GQFG OXFG NUFG PKFG PHFG ***
    1         1    0    0    0    0    0    0    0    0    0
  END ACTIVITY

  PRINT-INFO
    <PLS > ***************** Print-flags ******************* PIVL  PYR
    # -  # HYDR ADCA CONS HEAT  SED  GQL OXRX NUTR PLNK PHCB PIVL  PYR  *********
    1         4    0    0    0    0    0    0    0    0    0    1    9
  END PRINT-INFO

  HYDR-PARM1
    RCHRES  Flags for each HYDR Section                                  ***
    # -  #  VC A1 A2 A3  ODFVFG for each *** ODGTFG for each     FUNCT  for each
```

```
            FG FG FG FG  possible  exit  *** possible  exit      possible  exit
             *  *  *  *    *  *  *  *  *       *  *  *  *  *         ***
    1        0  1  0  0    4  0  0  0  0       0  0  0  0  0        2  2  2  2  2
  END HYDR-PARM1

  HYDR-PARM2
    # -  #    FTABNO       LEN     DELTH     STCOR        KS      DB50       ***
  <------><--------><--------><--------><--------><--------><-------->       ***
    1               1      0.01       0.0       0.0       0.5       0.0
  END HYDR-PARM2
  HYDR-INIT
    RCHRES  Initial conditions for each HYDR section                         ***
    # -  # ***   VOL     Initial  value  of COLIND     Initial  value  of OUTDGT
          *** ac-ft     for each possible exit        for each possible exit
  <------><-------->     <---><---><---><---><---> *** <---><---><---><---><--->
    1            0         4.0  0.0  0.0  0.0  0.0       0.0  0.0  0.0  0.0  0.0
  END HYDR-INIT
END RCHRES

SPEC-ACTIONS
END SPEC-ACTIONS
FTABLES
  FTABLE      1
   91    4
     Depth      Area    Volume  Outflow1 Velocity  Travel Time***
      (ft)   (acres) (acre-ft)   (cfs)   (ft/sec)    (Minutes)***
  0.000000  0.011019  0.000000  0.000000
  0.055556  0.011359  0.000622  0.053792
  0.111111  0.011703  0.001262  0.076074
  0.166667  0.012052  0.001922  0.093171
  0.222222  0.012407  0.002601  0.107584
  0.277778  0.012767  0.003301  0.120283
  0.333333  0.013131  0.004020  0.131763
  0.388889  0.013501  0.004760  0.142321
  0.444444  0.013876  0.005520  0.152147
  0.500000  0.014256  0.006302  0.161376
  0.555556  0.014641  0.007105  0.170106
  0.611111  0.015032  0.007929  0.178408
  0.666667  0.015427  0.008775  0.186341
  0.722222  0.015827  0.009643  0.193950
  0.777778  0.016233  0.010534  0.201272
  0.833333  0.016644  0.011447  0.208336
  0.888889  0.017059  0.012383  0.215168
  0.944444  0.017480  0.013343  0.221790
  1.000000  0.017906  0.014325  0.228221
  1.055556  0.018337  0.015332  0.234474
  1.111111  0.018774  0.016363  0.240566
  1.166667  0.019215  0.017418  0.246506
  1.222222  0.019661  0.018498  0.252307
  1.277778  0.020113  0.019603  0.257978
  1.333333  0.020569  0.020733  0.263526
  1.388889  0.021031  0.021889  0.268960
  1.444444  0.021498  0.023070  0.274287
  1.500000  0.021970  0.024277  0.279512
  1.555556  0.022447  0.025511  0.284641
  1.611111  0.022929  0.026772  0.289679
  1.666667  0.023416  0.028059  0.294631
  1.722222  0.023908  0.029374  0.299502
  1.777778  0.024406  0.030716  0.304294
  1.833333  0.024908  0.032086  0.309012
  1.888889  0.025416  0.033483  0.313659
  1.944444  0.025928  0.034910  0.318238
  2.000000  0.026446  0.036364  0.322753
  2.055556  0.026969  0.037848  0.327205
  2.111111  0.027497  0.039361  0.331597
  2.166667  0.028030  0.040904  0.335932
  2.222222  0.028569  0.042476  0.340211
  2.277778  0.029112  0.044078  0.344437
  2.333333  0.029660  0.045711  0.348613
  2.388889  0.030214  0.047374  0.352738
```

```
  2.444444  0.030772  0.049068  0.356816
  2.500000  0.031336  0.050793  0.360848
  2.555556  0.031905  0.052550  0.364836
  2.611111  0.032479  0.054338  0.368780
  2.666667  0.033058  0.056159  0.372683
  2.722222  0.033642  0.058011  0.376545
  2.777778  0.034231  0.059897  0.380368
  2.833333  0.034826  0.061815  0.384152
  2.888889  0.035425  0.063766  0.387900
  2.944444  0.036029  0.065751  0.391612
  3.000000  0.036639  0.067770  0.395290
  3.055556  0.037254  0.069822  0.398933
  3.111111  0.037874  0.071909  0.402543
  3.166667  0.038499  0.074031  0.406121
  3.222222  0.039129  0.076187  0.410218
  3.277778  0.039764  0.078379  0.416740
  3.333333  0.040404  0.080605  0.424562
  3.388889  0.041049  0.082868  0.433282
  3.444444  0.041700  0.085167  0.442698
  3.500000  0.042355  0.087501  0.452679
  3.555556  0.043016  0.089873  0.463127
  3.611111  0.043682  0.092281  0.473966
  3.666667  0.044353  0.094727  0.485134
  3.722222  0.045029  0.097209  0.496579
  3.777778  0.045710  0.099730  0.508254
  3.833333  0.046396  0.102288  0.520120
  3.888889  0.047087  0.104885  0.532141
  3.944444  0.047783  0.107520  0.544283
  4.000000  0.048485  0.110195  0.556517
  4.055556  0.049191  0.112908  0.767947
  4.111111  0.049903  0.115660  1.150618
  4.166667  0.050620  0.118453  1.640198
  4.222222  0.051342  0.121285  2.205969
  4.277778  0.052069  0.124157  2.820936
  4.333333  0.052801  0.127071  3.457674
  4.388889  0.053538  0.130024  4.088111
  4.444444  0.054280  0.133019  4.684840
  4.500000  0.055028  0.136056  5.223296
  4.555556  0.055780  0.139134  5.684537
  4.611111  0.056538  0.142254  6.058487
  4.666667  0.057300  0.145416  6.347583
  4.722222  0.058068  0.148620  6.570774
  4.777778  0.058841  0.151868  6.848776
  4.833333  0.059619  0.155158  7.071028
  4.888889  0.060402  0.158492  7.286065
  4.944444  0.061190  0.161870  7.494552
  5.000000  0.061983  0.165291  7.697060
  END FTABLE  1
END FTABLES

EXT SOURCES
<-Volume-> <Member> SsysSgap<--Mult-->Tran <-Target vols> <-Grp> <-Member->  ***
<Name>   # <Name> # tem strg<-factor->strg <Name>   #   #        <Name> # #  ***
WDM      2 PREC     ENGL    1.3            PERLND   1 999 EXTNL  PREC
WDM      2 PREC     ENGL    1.3            IMPLND   1 999 EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            PERLND   1 999 EXTNL  PETINP
WDM      1 EVAP     ENGL    0.8            IMPLND   1 999 EXTNL  PETINP
WDM      2 PREC     ENGL    1.3            RCHRES   1     EXTNL  PREC
WDM      1 EVAP     ENGL    0.8            RCHRES   1     EXTNL  POTEV

END EXT SOURCES

EXT TARGETS
<-Volume-> <-Grp> <-Member-><--Mult-->Tran <-Volume-> <Member> Tsys Tgap Amd ***
<Name>   #        <Name> # #<-factor->strg <Name>   # <Name>    tem strg strg***
RCHRES   1 HYDR   RO     1 1        1      WDM   1000 FLOW     ENGL      REPL
RCHRES   1 HYDR   STAGE  1 1        1      WDM   1001 STAG     ENGL      REPL
COPY     1 OUTPUT MEAN   1 1     48.4      WDM    701 FLOW     ENGL      REPL
COPY   501 OUTPUT MEAN   1 1     48.4      WDM    801 FLOW     ENGL      REPL
END EXT TARGETS
```

```
MASS-LINK
<Volume>   <-Grp> <-Member-><--Mult-->     <Target>       <-Grp> <-Member->***
<Name>             <Name> # #<-factor->     <Name>                <Name> # #***
  MASS-LINK         2
PERLND     PWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     2

  MASS-LINK         5
IMPLND     IWATER SURO       0.083333      RCHRES         INFLOW IVOL
  END MASS-LINK     5

  MASS-LINK        12
PERLND     PWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    12

  MASS-LINK        15
IMPLND     IWATER SURO       0.083333      COPY           INPUT  MEAN
  END MASS-LINK    15

  MASS-LINK        16
RCHRES     ROFLOW                          COPY           INPUT  MEAN
  END MASS-LINK    16


END MASS-LINK

END RUN
```

Predeveloped HSPF Message File

Mitigated HSPF Message File

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Olympia, WA. 98501
Toll Free 1(866)943-0304
Local (360)943-0304

www.clearcreeksolutions.com

Appendix C
Geotechnical Report

Anne Marie Skinner

From: Anne Marie Skinner
Sent: Monday, April 9, 2018 11:49 AM
To: 'Sarah Fox'
Subject: FW: NW 43rd. Ave - Land Use Notification sign SUB18-01
Attachments: NW 43rd Ave - Land Use Sign - Wide.jpg; NW 43rd Ave - Land Use Sign - Medium.jpg; NW 43rd Ave - Land Use Sign - Close.jpg

Hi Sarah,

I hope you had a delightful time away from work last week. Now it's back to the grindstone. ☹

Attached to this email are pictures confirming posting of the site for SUB18-01, the NW 43rd Avenue project. This should satisfy #1 on your letter dated March 27, 2018. Please confirm receipt and acknowledge #1 is complete.

Have a great week!

Thank you,
Anne Marie

Anne Marie Skinner | Senior Planner | PBS Portland | 503.417.7684 (direct) | 971.330.1129 (cell)

From: Andy Nuttbrock
Sent: Monday, April 9, 2018 11:03 AM
To: Anne Marie Skinner <AnneMarie.Skinner@pbsusa.com>
Subject: FW: NW 43rd. Ave - Land Use Notification sign

Andy Nuttbrock, RLA | Landscape Architect, Senior Planner | PBS Vancouver | 360.567.2116 (direct)

From: Brett Simpson <brett@mywaverlyhomes.com>
Sent: Tuesday, April 3, 2018 3:20 PM
To: Andy Nuttbrock <Andy.Nuttbrock@pbsusa.com>
Subject: Fwd: NW 43rd. Ave - Land Use Notification sign

See attached for signage pics.

I'm still looking for an arborist. The guy I've used before is certified, but doesnt have experience doing this sort of thing and didn't feel comfortable taking it on.

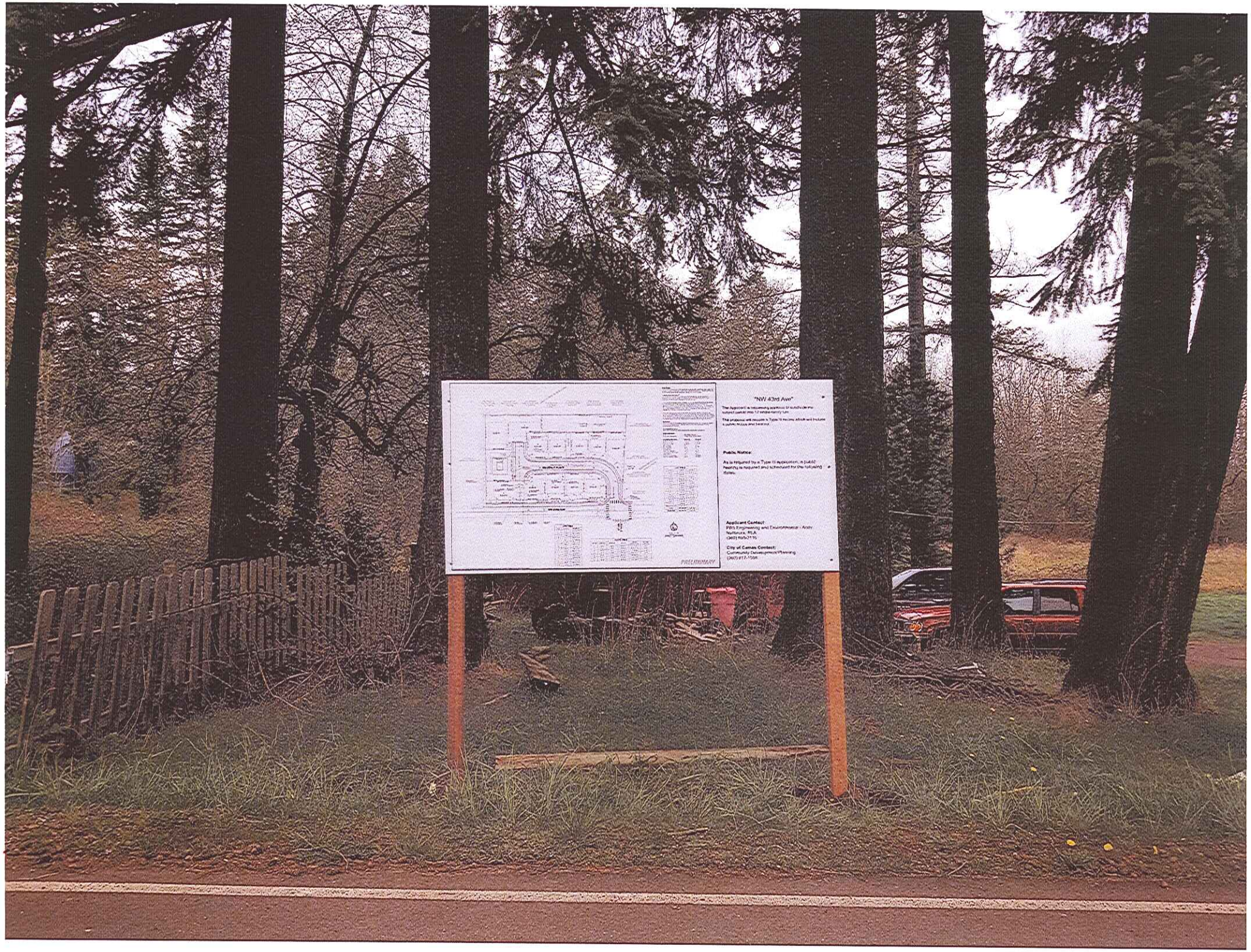
---------- Forwarded message ---------
From: Brad Sheets <brad@mywaverlyhomes.com>
Date: Tue, Apr 3, 2018, 11:39 AM
Subject: NW 43rd. Ave - Land Use Notification sign
To: Brett Simpson <brett@mywaverlyhomes.com>

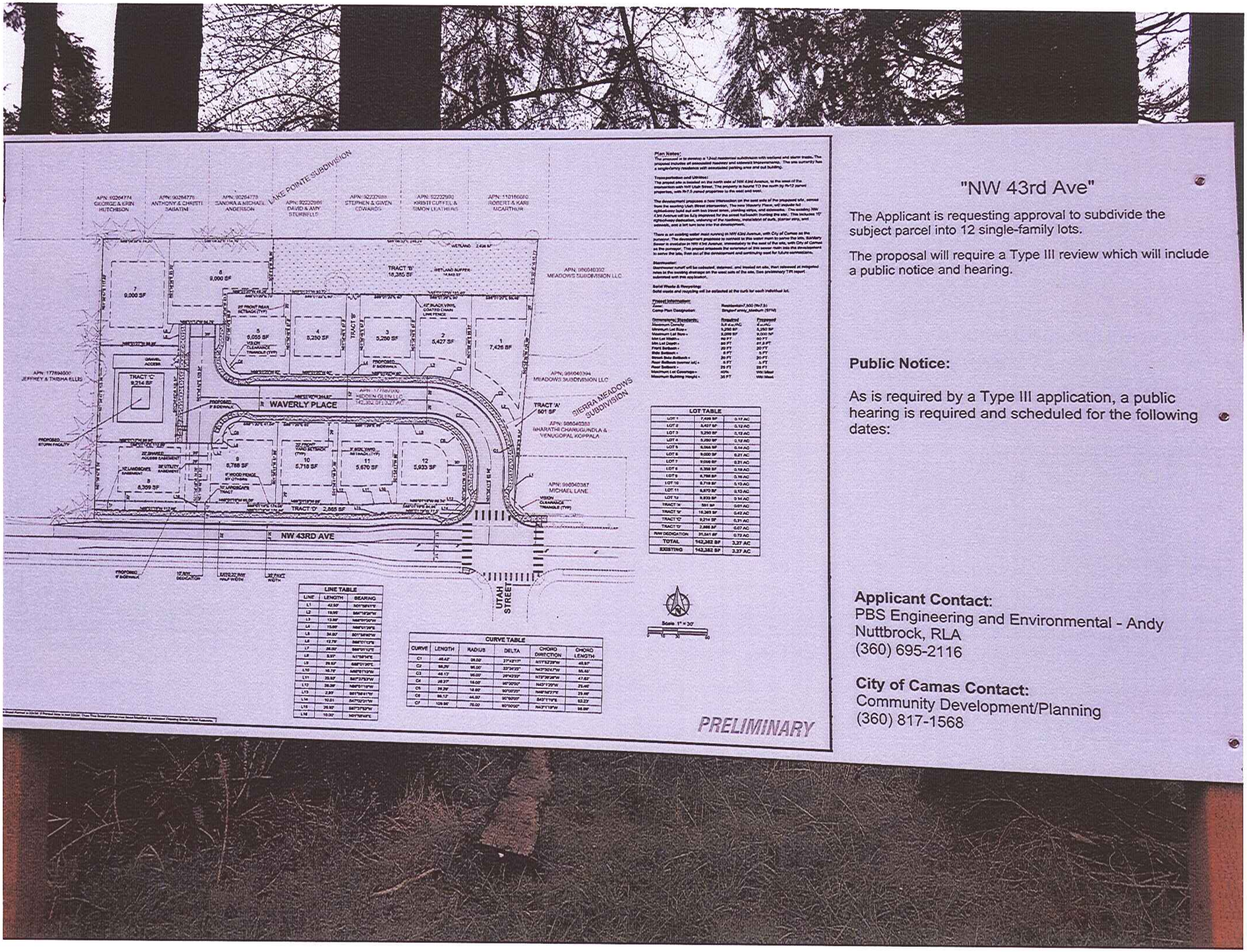
Hi Brett,

I pick-up the Land Use Notification sign for NW 43rd Ave. in Camas from Sign - N - More and hung it up on the property this afternoon. I've attached photos of the sign on the property.

Sincerely,
Brad

–
Bradford Sheets | Waverly Homes LLC | 3205 NE 78th Street, Suite 10| Vancouver, WA 98665
Office: 360-314-6877 | Mobile: 360-216-6462


"NW 43rd Ave"
Public Notice:
Applicant Contact:
City of Camas Contact:
PRELIMINARY



"NW 43rd Ave"
The Applicant is requesting approval to subdivide the subject parcel into 12 single-family lots.
The proposal will require a Type III review which will include a public notice and hearing.
Public Notice:
As is required by a Type III application, a public hearing is required and scheduled for the following dates:
Applicant Contact:
PBS Engineering and Environmental - Andy Nuttbrock, RLA
(360) 695-2116
City of Camas Contact:
Community Development/Planning
(360) 817-1568
LAKE POINTE SUBDIVISION
SIERRA MEADOWS SUBDIVISION
WAVERLY PLACE
NW 43RD AVE
UTAH STREET
TRACT 'A' 501 SF
TRACT 'B' 16,385 SF
TRACT 'C' 9,214 SF
TRACT 'D' 2,865 SF
LOT TABLE
LINE TABLE
CURVE TABLE
PRELIMINARY

Anne Marie Skinner

From: Anne Marie Skinner
Sent: Monday, April 9, 2018 3:47 PM
To: 'Sarah Fox'
Subject: FW: FW: Camas Archaeological Predetermination Report -- SUB18-01
Attachments: NW 43rd Avenue-Predetermination Rpt 3928.pdf

Please see the email string below as proof of emailing to the tribes. It appears to have been emails to DAHP and Tribes on October 10, 2017.

Please confirm receipt and let me know that #2 from your letter dated March 27, 2018 has been satisfied.

Thank you,
Anne Marie

Anne Marie Skinner | Senior Planner | PBS Portland | 503.417.7684 (direct) | 971.330.1129 (cell)

From: Andy Nuttbrock
Sent: Monday, April 9, 2018 3:41 PM
To: Anne Marie Skinner <AnneMarie.Skinner@pbsusa.com>
Subject: FW: FW: Camas Archaeological Predetermination Report -- Project at 2223 NW 43rd Avenue

Please see the email chain below for prove of submittal to DAHP.

Andy Nuttbrock, RLA | Landscape Architect, Senior Planner | PBS Vancouver | 360.567.2116 (direct)

From: Jo Reese <Jo@ainw.com>
Sent: Monday, April 9, 2018 3:38 PM
To: Brad Sheets <brad@mywaverlyhomes.com>
Cc: Brett Simpson <brett@mywaverlyhomes.com>; Andy Nuttbrock <Andy.Nuttbrock@pbsusa.com>
Subject: RE: FW: Camas Archaeological Predetermination Report -- Project at 2223 NW 43rd Avenue

Hi, Brad. As you can see in the email thread below, the report was emailed (and uploaded) to DAHP and to Tribes way back on October 10, 2017.

I am copying Andy, since he seems to need the information. Andy, I did not get an email from you. I am pretty good about replying, as you know. 8-)

FYI, I just arrived in Washington DC for a week-long series of meetings and a conference. Please let me know if something is up and you need something more from me. I have attached the report, for your information.

Let me know if there are some changes. I have plenty of staff at the office who can tackle what you may need. Thanks!

Jo
AINW

From: Brett Simpson [mailto:brett@mywaverlyhomes.com]
Sent: Thursday, January 18, 2018 3:07 PM

To: Jo Reese
Subject: Re: FW: Camas Archaeological Predetermination Report -- Project at 2223 NW 43rd Avenue

Thank you!

On Thu, Jan 18, 2018 at 1:56 PM, Jo Reese <Jo@ainw.com> wrote:

Here is the full PDF. Brad has it, but this will make it handy for you.

Jo

AINW

From: Jo Reese
Sent: Tuesday, October 10, 2017 1:25 PM
To: 'Kaehler, Gretchen (DAHP)'; 'jkanim25@gmail.com'; 'Nathan Reynolds'; 'permitreview@cowlitz.org'; 'Johnson Meninick (johnson@yakama.com)'; 'kate@yakama.com'; 'thpo@grandronde.org'; 'jessica.curteman@grandronde.org'; 'thpo@ctwsbnr.org'; 'edavis@shoalwaterbay-nsn.gov'; 'tearafarrow@ctuir.com'; 'HollySheaBarrick@ctuir.org'; 'keithb@nezperce.org'
Cc: 'Phil Bourquin'; 'sfox@cityofcamas.us'; Sarah Dubois; 'Brad Sheets'
Subject: Camas Archaeological Predetermination Report -- Project at 2223 NW 43rd Avenue

Good Afternoon, Gretchen and Tribal Representatives.

Attached is AINW's archaeological predetermination report for a relatively small (< 4 acres) development in Camas. I am emailing this to you, and copying the City's Community Development department, in fulfillment of the City's archaeological ordinance.

The project is on the lower slope of Prune Hill. No evidence of an archaeological site was found during the fieldwork, and none of the nearby archaeological studies have found evidence of an archaeological site. Our findings are consistent with previous archaeological studies on Prune Hill, in that resources on the hill are few, and those that have been found are typically a single or a few artifacts. Closer to Lacamas Lake and near the Columbia River and other streams, archaeological sites are much more common.

Please let me know if you have any questions about the study. If you have questions on the proposed development, please contact Brad Sheets, Waverly Homes, at his email address in the CC line.

Thank you for your time and interest.

Jo

AINW

Jo Reese, M.A., R.P.A. || VP/Senior Archaeologist
Archaeological Investigations Northwest, Inc. (AINW)

3510 NE 122nd Avenue, Portland, Oregon 97230

P 503-761-6605 || from Vancouver 696-7473 || F 503-761-6620

Cell 971-409-6979 || email: jo@ainw.com || www.ainw.com

--

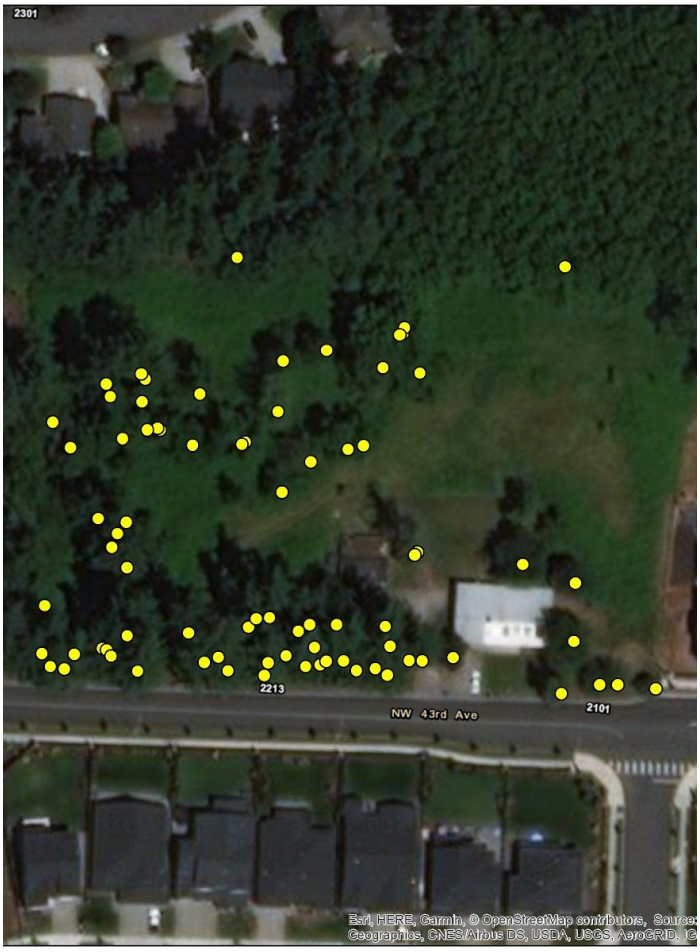
Please let me know you received this e-mail.

Brett Simpson
Manager
Waverly Homes LLC
(360) 524-2128
www.mywaverlyhomes.com

Arborist Report

2223 NW 43rd Avenue,Camas, WA

May 2018



Prepared For:

Brett Simpson
Waverly Homes LLC
9208 NE Hwy 99 #107
PMB 145
Vancouver, WA, 98665

Prepared By:

Davey Resource Group Inc.

18809 10th Ave NE
Shoreline, WA, 98155
Contact: Ian Scott
ian.scott@davey.com
Local Office: 206-714-3147
Corporate Office:
800-966-2021

DAVEY Resource Group

Notice of Disclaimer

Assessment data provided by Davey Resource Group is based on visual recording at the time of inspection. Visual records do not include testing or analysis and do not include aerial or subterranean inspection unless indicated. Davey Resource Group is not responsible for discovery or identification of hidden or otherwise non-observable risks. Records may not remain accurate after inspection due to variable deterioration of surveyed material. Risk ratings are based on observable defects and mitigation recommendations do not reduce potential liability to the owner. Davey Resource Group provides no warranty with respect to the fitness of the trees for any use or purpose whatsoever.

Table of Contents

Summary

In May 2018 an International Society of Arboriculture (ISA) Certified Arborist (NE-6913A) conducted a tree inventory on the property at 2223 NW 43rd Avenue, Camas, WA. This tree inventory forms part of a tree retention plan which will be submitted for approval prior to construction at the site. The trees were assessed by their location, size, current condition, overall health, species, and tree preservation priority. This data was used to determine Tree Protection Zones (TPZ) around each tree designated for retention which will help guide construction options and mitigate potential impacts.

The following is a summary of the inventory data.

- 79 trees were inventoried where Douglas fir (*Pseudotsuga menziesii)* was the most common species (44), followed by Oregon Ash (*Fraxinus latifolia*) with 18 specimens.
- 49 coniferous trees at the site are considered Significant Trees according to City of Camas municipal code.
- 28 deciduous trees at the site are considered Significant Trees according to City of Camas municipal code.
- Priority Retain/Remove
    - Priority 4: 31 trees should be removed due to poor condition and/or major defects.
    - Priority 3: 11 trees are not worth any special retention efforts.
    - Priority 2: 25 trees require minor maintenance and should be retained and protected.
    - Priority 1: 12 trees are excellent candidates for retention.
- Condition determined by observable defects and viability. Good condition trees may be recommended for removal to decrease resource competition which will increase the overall health and viability of the stand of trees.
    - Good: 38 trees
    - Fair: 9 trees
    - Poor: 32 trees

Introduction

Background

The property owners are planning a construction project at the site. In order to comply with Camas municipal code, a comprehensive tree inventory was conducted to establish the tree retention and removal priorities at the site. Davey Resource Group (DRG) developed this arborist report on the health, size, and location of the trees as well as identification of tree protection and retention measures for submittal and approval with the City.

Using a pen tablet computer, a DRG International Society of Arboriculture (ISA) Certified Arborist surveyed all the trees on the property. Each tree was visually assessed and the required tree data was collected within a GIS database. Following data collection, specific tree preservation plan elements were calculated that identified the measures required to help ensure survivability during planned development and trees that will need to be removed.The data collection and arborist report includes:

- Numbering of all existing trees on the subject property (with corresponding tags on trees)
- Tree type or species and DBH (Diameter at 4.5’ above soil level).
- A complete description of each tree’s health, condition and viability.
- Determination of significant trees as defined by municipal code.
- Proposed tree status (trees to be removed or retained) and an explanation of justification.
- Determination of Tree Protection Zone (TPZ) of all trees to be preserved and a description of the methods used to establish a Tree Protection Zone.
- A discussion of timing for installation of tree protection measures.
- Any special instructions for tree care when work may be required within the TPZ.
- Map illustrations of tree locations.

Limits of the Assignment

There are many factors that can limit specific and accurate data when performing evaluations of trees, their conditions, and values. The determinations and recommendations presented here are based on current data and conditions that existed at the time of the evaluation and cannot be a predictor of the ultimate outcomes for the trees. A visual inspection was used to develop the findings, conclusions, and recommendations found in this report. Values were assigned to grade the attributes of the trees, including structure and canopy health, and to obtain an overall condition rating. No physical inspection of the upper canopy, sounding, root crown excavation, and resistograph or other technologies were used in the evaluation of the trees.

Methodology

Data was collected on May 24, 2018 by an ISA Certified Arborist (NE-6913A). A visual inspection was used to develop the findings, conclusions, and recommendations found in this report. No physical inspection of the upper canopy, sounding, root crown excavation, resistograph or other technologies were used in the evaluation of the trees.

The following attributes were collected for each site:

Tree ID: Tree ID was created and a numbered aluminum tag affixed to the tree.

Stems: The number of stems was recorded.

Location and Unique ID: An X and Y coordinate was generated for each tree site.

Species: Trees were identified by genus and species, cultivar if evident, and by common name.

Diameter at Breast Height (DBH): Trunk diameter was recorded to the nearest inch at 4.5 feet (breast height) above grade except where noted. When limbs or deformities occurred at breast height, measurement was taken below 4.5 ft. The DBH of multi-trunk trees was determined by adding the dbh of the individual trunks.

Height: Tree Height estimated to the nearest <5ft.

Average Crown Radius: Dripline distance was measured for each tree.

Condition: The general condition of each tree was recorded in one of the following categories adapted from the rating system established by the International Society of Arboriculture:

Excellent	4
Good	3
Fair	2
Poor	1
Dead	0

Observable Defects: Including but not limited too deadwood, trunk cavity, excessive lean, insects or disease problems, girdling roots, serious decline, root decay or damage and/or included bark.

Tree Protection Priority: A retention priority was assigned to each inventoried tree using the following criteria:

Priority 1: Highest priority for protection (i.e. particularly good condition, unique tree and/or should be protected at all reasonable cost).

Priority 2: Good or high fair condition tree well worth protecting though not uniquely valuable.

Priority 3: Low fair condition tree or otherwise determined to be not worth retention that will not be missed if it were gone, not worth any special protection measures.

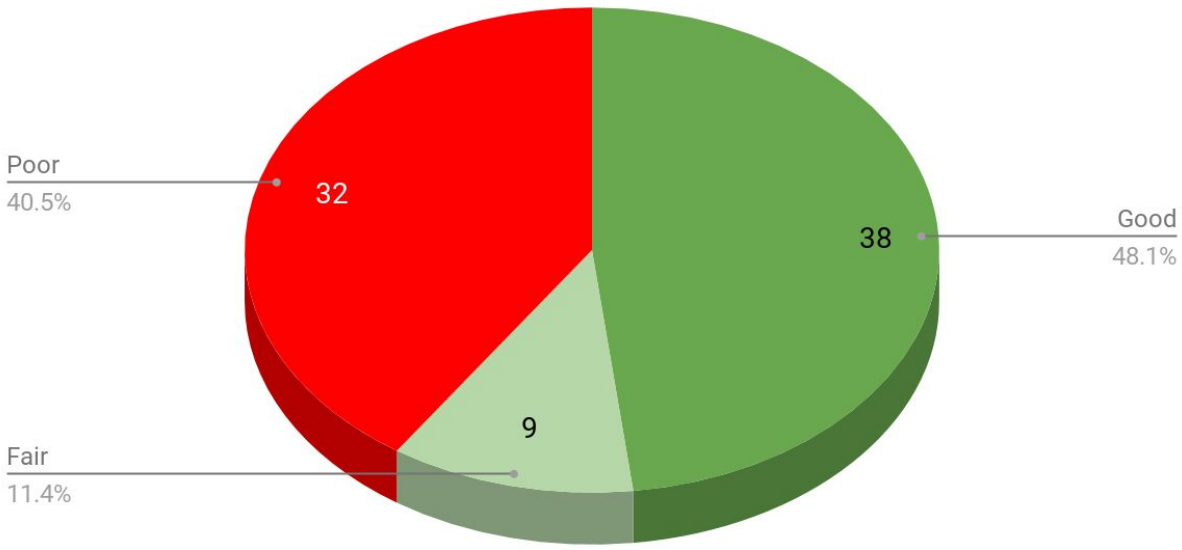
Priority 4: Tees that should be removed under most any circumstances (invasive/undesirable species, poor or dead trees, particularly high risk situations, etc).

Observations

Tree Condition

Tree condition is important to evaluate prior to construction because healthy trees can better withstand construction impacts and partial root loss. In addition it is not recommended to try to preserve trees in poor condition throughout construction when removal is a better option for the aesthetic value and health of the tree population as a whole.

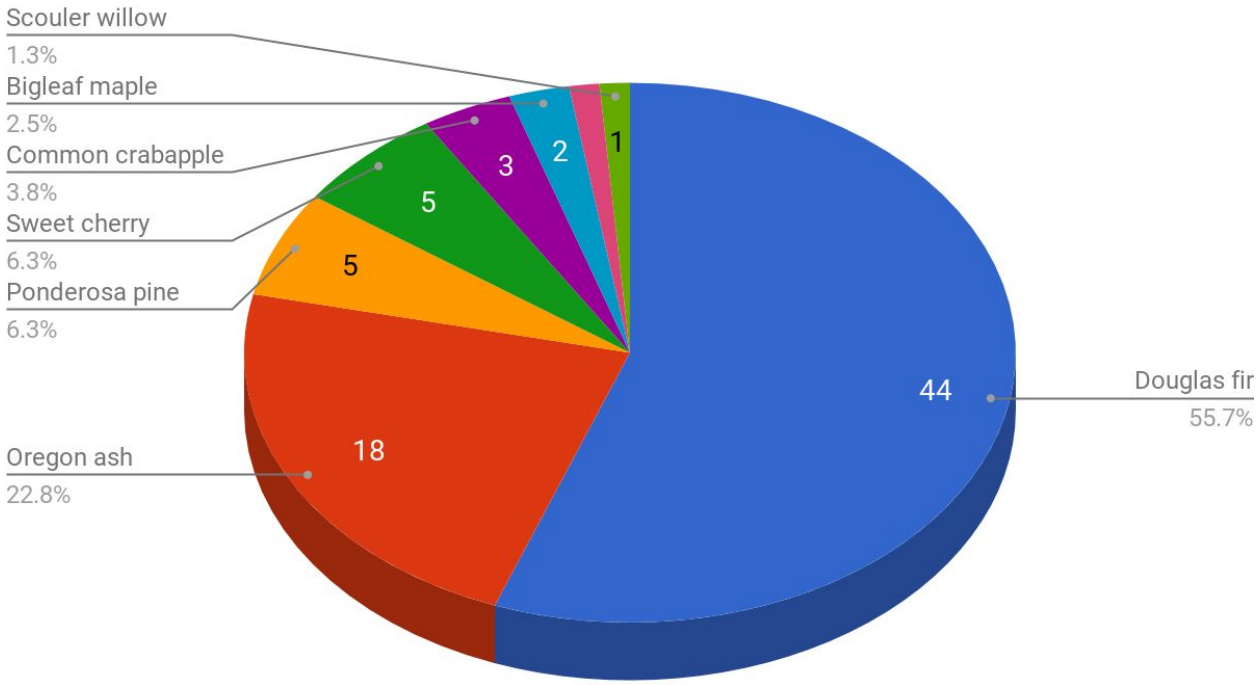
Figure 1. Tree Condition



Species Composition

Eight distinct species are found at the site. The most common species in order of occurrence are Douglas fir, Oregon ash, Ponderosa pine, sweet cherry, common crabapple, bigleaf maple, and Scouler willow. All species are native specimens.

Figure 2. Species Composition

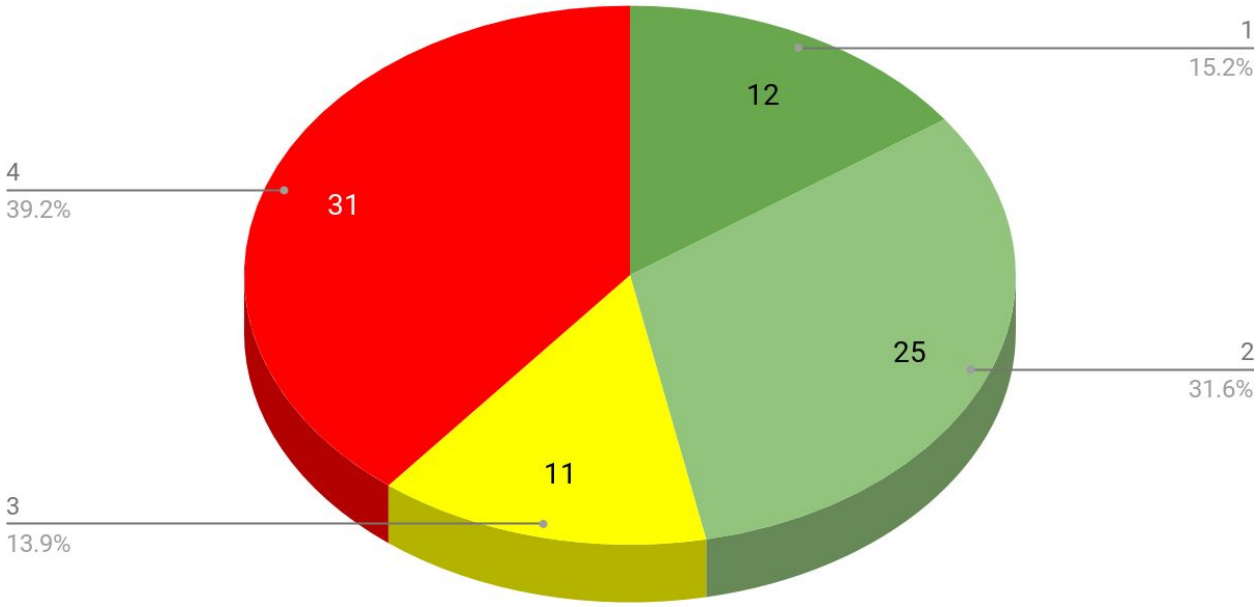


Analysis & Recommendations

Tree Preservation Priority

Tree preservation priority was assigned to each inventoried specimen based on health, condition, and any observable defects. Trees in poor condition are not good candidates for preservation due to their inability to tolerate construction impacts even with appropriate tree protection. Tree preservation at the site should include a Tree Protection Zone (TPZ) which is typically delineated by the dripline of the tree or calculated by using DBH (diameter at 4.5 feet from soil line) or Critical Root Zone (CRZ).

Figure 1: Tree Preservation Priority



Tree Removals

The following list represents those trees that should be removed if construction were to take place. Reasons for removal could include poor health, structural defects, and/or low construction impact tolerance.

Table 2: Recommended Removals

TREE TAG	DBH	COMMON NAME	CONDITION	PRIORITY	DEFECTS
6	36	Douglas fir	Poor	4	Trunk Decay, Broken Limbs, Included Bark, Weak Union
36	15	European white birch	Poor	4	Large Deadwood, Trunk Decay, Basal Decay, Branch Decay, Serious Decline
37	12	Common crabapple	Poor	4	Trunk Decay, Basal Decay, Branch Decay, Serious Decline
38	10	Sweet cherry	Poor	4	Large Deadwood, Trunk Decay, Basal Decay
39	8	Common crabapple	Poor	4	Trunk Decay, Basal Decay, Branch Decay
43	32	Douglas fir	Poor	4	Serious Decline
46	32	Oregon ash	Poor	4	Large Deadwood, Trunk Decay, Basal Decay, Serious Decline
50	24	Oregon ash	Poor	4	Large Deadwood, Trunk Decay, Included Bark, Weak Union
54	13	Oregon ash	Poor	4	Large Deadwood, Trunk Decay, Branch Decay, Broken Limbs, Serious Decline
58	17	Bigleaf maple	Poor	4	
59	24	Oregon ash	Poor	4	Trunk Decay, Basal Decay, Included Bark, Weak Union
60	32	Oregon ash	Poor	4	Trunk Decay, Serious Decline
61	25	Oregon ash	Poor	4	Large Deadwood, Vines, Mechanical Damage, Serious Decline
63	14	Oregon ash	Poor	4	Large Deadwood, Broken Limbs, Mechanical Damage, Serious Decline
64	19	Oregon ash	Poor	4	Broken Limbs, Mechanical Damage, Serious Decline
65	16	Oregon ash	Poor	4	Large Deadwood, Broken Limbs
66	24	Oregon ash	Poor	4	Broken Limbs, Mechanical Damage, Serious Decline
69	24	Oregon ash	Poor	4	Large Deadwood, Trunk Decay, Branch Decay, Serious Decline
70	24	Douglas fir	Poor	4	Large Deadwood, Excessive Lean
72	14	Douglas fir	Poor	4	Serious Decline, Excessive Lean
30	26	Douglas fir	Poor	4	Large Deadwood, Compacted Soil, Branch Decay, Serious Decline
35	8	Ponderosa pine	Poor	4	Compacted Soil, Root Damage
40	19	Sweet cherry	Poor	4	Trunk Decay, Basal Decay, Serious Decline
41	12	Common crabapple	Poor	4	Serious Decline
45	12	Bigleaf maple	Poor	4	Trunk Decay, Broken Limbs, Excessive Lean

TREE TAG	DBH	COMMON NAME	CONDITION	PRIORITY	DEFECTS
47	22	Oregon ash	Poor	4	Large Deadwood, Trunk Decay, Branch Decay, Included Bark, Weak Union, Excessive Lean
52	14	Oregon ash	Poor	4	Large Deadwood, Branch Decay, Broken Limbs, Included Bark, Weak Union
53	14	Scouler willow	Poor	4	Large Deadwood, Branch Decay, Broken Limbs, Included Bark, Weak Union, Serious Decline
62	26	Oregon ash	Poor	4	Large Deadwood, Included Bark, Weak Union
67	24	Douglas fir	Poor	4	Large Deadwood, Excessive Lean
73	28	Oregon ash	Poor	4	Large Deadwood, Included Bark, Weak Union, Excessive Lean

Tree Retention

The following are recommended for retention and protection during construction. These trees were determined to be in fair or good condition and no major defects were observable. The trees in fair condition may only need minor pruning or treatment to be considered in good condition.

Table 3. Recommended Trees for Retention/Protection

TREE TAG	DBH	COMMON NAME	CONDITION	PRIORITY	DEFECTS
8	34	Douglas fir	Good	1	
10	38	Douglas fir	Good	1	
16	30	Douglas fir	Good	1	
18	31	Douglas fir	Good	1	
19	19	Douglas fir	Good	1	
20	22	Douglas fir	Good	1	
21	24	Douglas fir	Good	1	
26	20	Sweet cherry	Fair	1	Broken Limbs
44	9	Ponderosa pine	Good	1	
55	13	Ponderosa pine	Good	1	
75	20	Douglas fir	Good	1	
78	28	Douglas fir	Good	1	Included Bark, Weak Union
1	32	Douglas fir	Good	2	
2	30	Douglas fir	Good	2	
3	32	Douglas fir	Good	2	

TREE TAG	DBH	COMMON NAME	CONDITION	PRIORITY	DEFECTS
4	16	Douglas fir	Good	2	
5	18	Douglas fir	Good	2	
9	45	Douglas fir	Good	2	
11	38	Douglas fir	Good	2	
12	30	Douglas fir	Good	2	
15	18	Douglas fir	Good	2	
22	40	Douglas fir	Good	2	Large Deadwood
25	28	Douglas fir	Good	2	Large Deadwood
27	31	Douglas fir	Good	2	
28	24	Douglas fir	Good	2	Large Deadwood, Broken Limbs
29	41	Douglas fir	Good	2	Large Deadwood, Broken Limbs
31	22	Douglas fir	Good	2	Large Deadwood, Weak Union, Excessive Lean
34	32	Douglas fir	Good	2	Large Deadwood, Compacted Soil, Broken Limbs
42	20	Sweet cherry	Good	2	
48	22	Oregon ash	Fair	2	Large Deadwood, Broken Limbs, Included Bark, Weak Union
56	13	Ponderosa pine	Fair	2	Included Bark, Weak Union
68	32	Douglas fir	Good	2	
71	34	Douglas fir	Good	2	Large Deadwood
74	18	Douglas fir	Good	2	Large Deadwood
76	24	Douglas fir	Good	2	Large Deadwood
77	20	Douglas fir	Good	2	Included Bark, Weak Union
79	12	Sweet cherry	Good	2	

Critical Root Zones

The trunk diameter (DBH) of the surveyed trees was used to determine the potential Critical Root Zone (CRZ) of each tree. The CRZ is considered the ideal preservation area of the root zone of a tree. It is equal to one (1) foot of radius for every inch of trunk diameter measured at 4.5 feet from grade. For example; a tree with a DBH of 27 inches has a calculated CRZ radius of 27 feet. Tree protection fencing is normally installed to protect the CRZ for trees to be preserved in construction.

Any work within the Critical Root Zone of a tree that will be preserved at the site will require special considerations.

- All excavation work within the CRZ of trees to be retained should be done by hand and/or an air spade by/or under the direct supervision of ISA Certified Arborist.
- All construction activities and land disturbance activities are prohibited within 5 feet of the CRZ unless otherwise permitted by an ISA Certified Arborist. This includes but is not limited to the storage of materials, parking of vehicles, contaminating soil by washing out equipment, (concrete, paint, etc.), or changing soil grade.
- The CRZ of all trees to remain at the site should be delineated and protected by a 2-4 inch layer of wood chips or undyed mulch where it falls outside the Tree Protection Zone (TPZ).

Tree Protection Zone & Timing

To ensure long-term viability of trees and stands identified for protection, construction activities shall comply with the following minimum required tree protection for those trees determined to remain on the site.

- Preconstruction tree maintenance is recommended prior to the installation of tree protection barriers, including mulch, fertilization, supplemental irrigation as necessary, and pruning to remove dead, structurally weak, and low-hanging branches.
- It is recommended that the Tree Protection Zone (TPZ) barriers be installed at the dripline of the tree or at the edge of the Critical Root Zone (CRZ) whichever is greater.
- The TPZ barrier shall be a minimum of 4 feet high, constructed of chain link or polyethylene laminar safety fencing or similar material subject to approval by an ISA Certified Arborist.
- “Tree Protection Area - Keep Out” or similar signs shall accompany the TPZ fencing at regular intervals.
- TPZs fencing shall be constructed in such a fashion as to not be easily moved or dismantled.
- All construction activities are prohibited within the TPZ where tree protection barriers shall be installed prior to any land disturbance. This includes but is not limited to the storage of materials, parking, contaminating soil by washing out equipment, (concrete, paint, etc.), changing soil grade, or damaging overhead branches.
- TPZs fencing shall remain in place for the entirety of the project and only removed, temporarily or otherwise, by an ISA Certified Arborist after submittal and approval of intent.

Table 4. CRZ and Dripline Measurements of Trees Recommended for Retention/Protection

TREE TAG	DBH	COMMON NAME	DRIPLINE DIAMETER (feet)	CRZ DIAMETER (feet)	CONDITION	PRIORITY
8	34	Douglas fir	50	68	Good	1
10	38	Douglas fir	40	76	Good	1
16	30	Douglas fir	40	60	Good	1
18	31	Douglas fir	40	62	Good	1
19	19	Douglas fir	30	38	Good	1
20	22	Douglas fir	40	44	Good	1
21	24	Douglas fir	30	48	Good	1
26	20	Sweet cherry	60	40	Fair	1
44	9	Ponderosa pine	80	18	Good	1
55	13	Ponderosa pine	80	26	Good	1
75	20	Douglas fir	120	40	Good	1
78	28	Douglas fir	160	56	Good	1
1	32	Douglas fir	40	64	Good	2
2	30	Douglas fir	40	60	Good	2
3	32	Douglas fir	40	64	Good	2
4	16	Douglas fir	40	32	Good	2
5	18	Douglas fir	40	36	Good	2
9	45	Douglas fir	40	90	Good	2
11	38	Douglas fir	40	76	Good	2
12	30	Douglas fir	30	60	Good	2
15	18	Douglas fir	30	36	Good	2
22	40	Douglas fir	40	80	Good	2
25	28	Douglas fir	40	56	Good	2
27	31	Douglas fir	40	62	Good	2
28	24	Douglas fir	40	48	Good	2
29	41	Douglas fir	80	82	Good	2
31	22	Douglas fir	80	44	Good	2
34	32	Douglas fir	80	64	Good	2
42	20	Sweet cherry	40	40	Good	2
48	22	Oregon ash	80	44	Fair	2
56	13	Ponderosa pine	80	26	Fair	2
68	32	Douglas fir	120	64	Good	2

TREE TAG	DBH	COMMON NAME	DRIPLINE DIAMETER (feet)	CRZ DIAMETER (feet)	CONDITION	PRIORITY
71	34	Douglas fir	120	68	Good	2
74	18	Douglas fir	160	36	Good	2
76	24	Douglas fir	160	48	Good	2
77	20	Douglas fir	120	40	Good	2
79	12	Sweet cherry	160	24	Good	2

Concluding Remarks

This report, along with the tree inventory, is the first step in preserving the forest aesthetic, health, function, and value on the site during and after development. Trees and green spaces provide benefits and add value to developments. Preserving trees has positive effects on the image and attractiveness of developments and enhances the developers' reputations and profits. Developers who understand these values realize it is their best interest to preserve trees and green spaces. Tree preservation starts with a basic understanding of the health and structure of the trees on the site. The importance of protecting trees that have been selected for preservation should be clearly communicated to contractors, equipment operators, and workers before any land disturbance.

The established trees are primarily in good and fair condition. Trees in a high-fair condition usually require routine maintenance or care to be considered in good condition. This will increase the overall condition of the population and will enable the trees to better withstand many development impacts throughout the project and increase safety on the site. It is also recommended to conduct a tree inspection during and immediately following completion of the construction project to identify and changes in tree health or risk that may occur on the retained trees. Multiple tree inspections may be required during the construction phase of the project depending on the length it will take to complete. Any inspections or tree maintenance should be completed under the supervision of an ISA Certified Arborist.

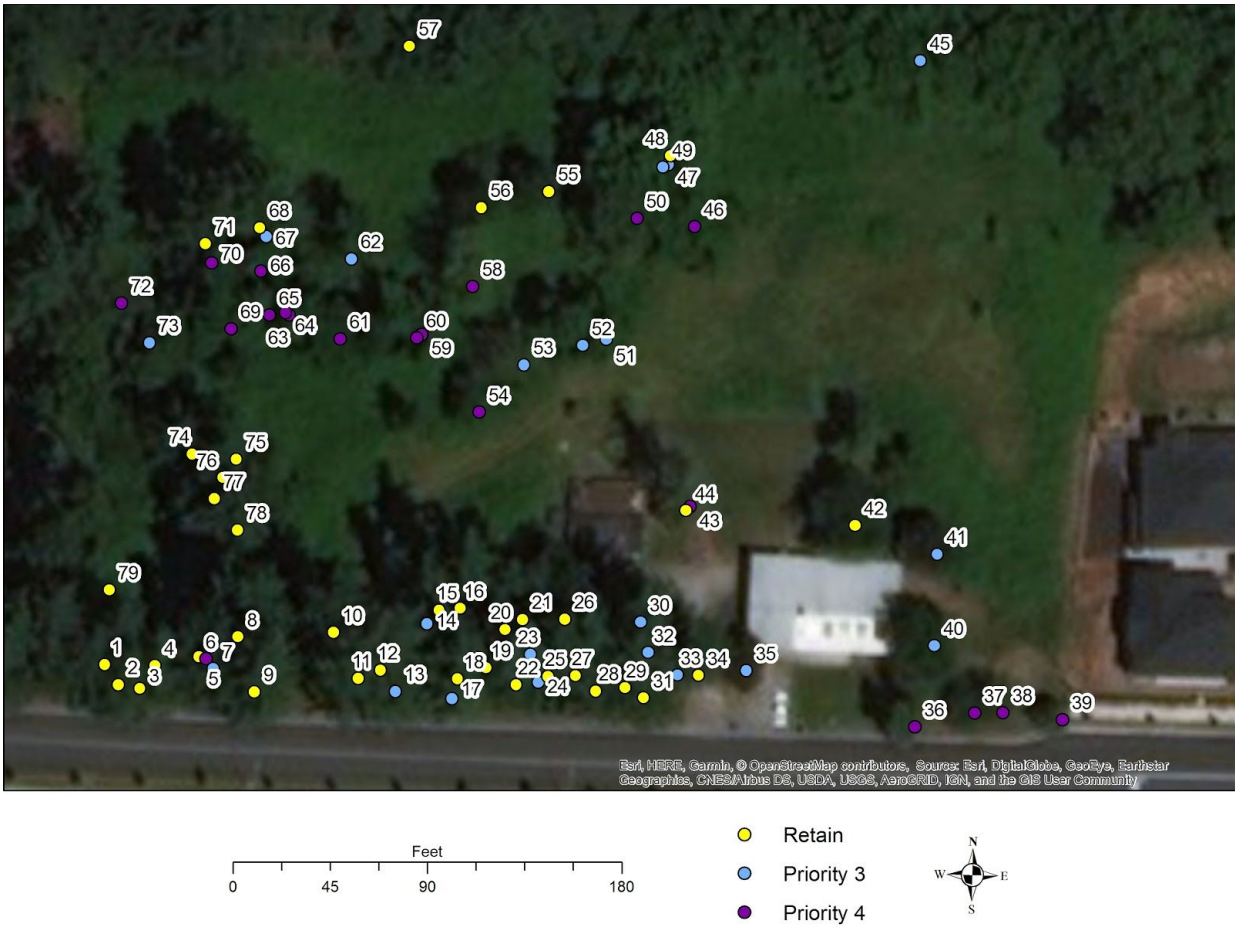
The following recommendations are provided in support of tree protection during development:

- Preconstruction tree maintenance is recommended prior to the installation of tree protection barriers, including mulch, fertilization, supplemental irrigation as necessary, and pruning to remove dead, structurally weak, and low-hanging branches to allow for safety and clearance.
- Tree locations and fencing should be carefully measured on site at time of TPZ installation.
- Root protection is recommended by using a four-inch layer of mulch inside and extending to 5 feet outside the TPZ.
- Additional root protection with plywood over mulch should be used to allow for construction equipment access as needed.
- Chain link tree protection fencing and tree protection area signs are recommended along the TPZ and should be installed prior to construction.
- Regular tree condition assessments and construction monitoring are recommended. All excavation work within 5 feet of the TPZ should be done by hand or air spade and supervised by a Certified Arborist.

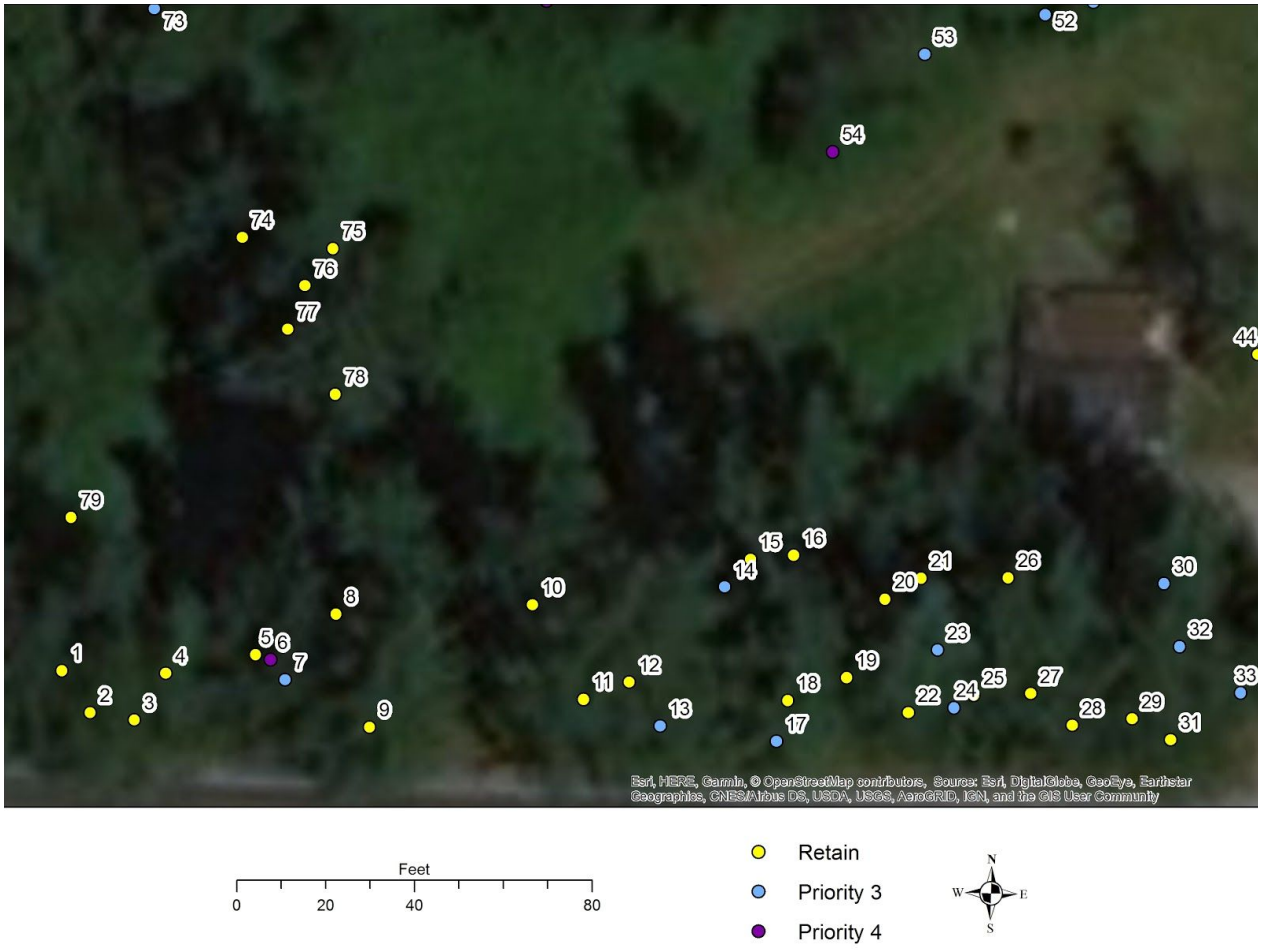
Appendix A: Maps

Map 1. Site Map Overview

Map 2. Site Overview Detailing Tree Tag Number

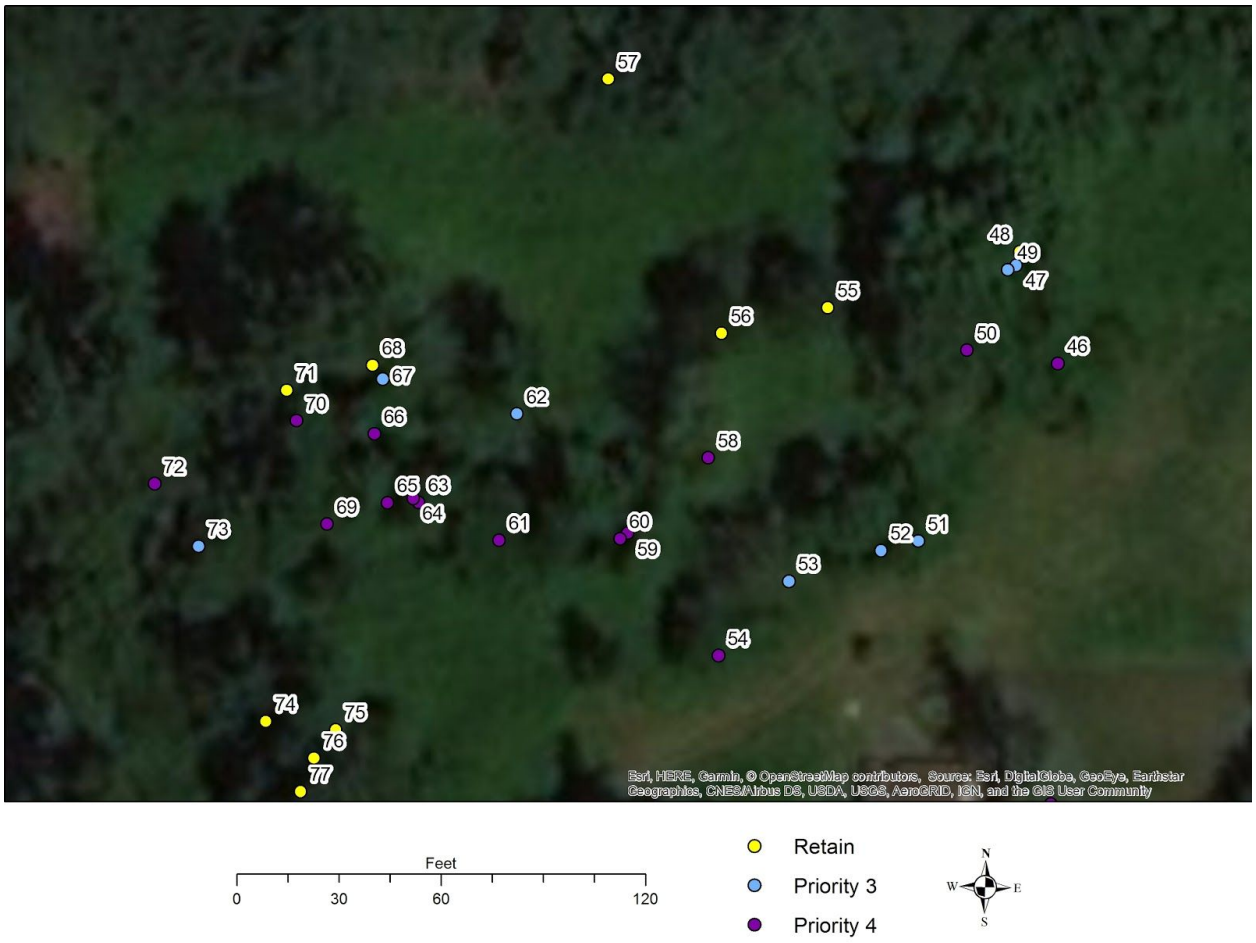


Map 3. Southeast Site Overview Detailing Tree Tag Number



Map 4. Southeast Site Overview Detailing Tree Tag Number

Map 5. North Site Overview Detailing Tree Tag Number



Appendix B: Inventory Tables

Table 5. Complete Tree Inventory Table

TREE TAG	DBH	COMMON NAME	BOTANICAL NAME	CONDITION	PRIORITY	AVG CANOPY RADIUS	HEIGHT	STEMS	DEFECTS
1	32	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
2	30	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
3	32	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
4	16	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
5	18	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
6	36	Douglas fir	Pseudotsuga menziesii	Poor	4	20	115	1	Trunk Decay, Broken Limbs, Included Bark, Weak Union
7	13	Douglas fir	Pseudotsuga menziesii	Fair	3	10	25	1	Included Bark, Weak Union
8	34	Douglas fir	Pseudotsuga menziesii	Good	1	25	115	1	
9	45	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
10	38	Douglas fir	Pseudotsuga menziesii	Good	1	20	115	1	
11	38	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
12	30	Douglas fir	Pseudotsuga menziesii	Good	2	15	100	1	
13	28	Douglas fir	Pseudotsuga menziesii	Good	3	15	70	1	
14	13	Douglas fir	Pseudotsuga menziesii	Fair	3	10	45	1	Broken Limbs
15	18	Douglas fir	Pseudotsuga menziesii	Good	2	15	100	1	
16	30	Douglas fir	Pseudotsuga menziesii	Good	1	20	115	1	

TREE TAG	DBH	COMMON NAME	BOTANICAL NAME	CONDITION	PRIORITY	AVG CANOPY RADIUS	HEIGHT	STEMS	DEFECTS
17	24	Douglas fir	Pseudotsuga menziesii	Good	3	10	55	1	Branch Decay, Broken Limbs
18	31	Douglas fir	Pseudotsuga menziesii	Good	1	20	115	1	
19	19	Douglas fir	Pseudotsuga menziesii	Good	1	15	55	1	
20	22	Douglas fir	Pseudotsuga menziesii	Good	1	20	115	1	
21	24	Douglas fir	Pseudotsuga menziesii	Good	1	15	105	1	
22	40	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	Large Deadwood
23	13	Douglas fir	Pseudotsuga menziesii	Fair	3	20	80	1	Trunk Decay, Broken Limbs, Excessive Lean
24	20	Douglas fir	Pseudotsuga menziesii	Good	3	15	80	1	
25	28	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	Large Deadwood
26	20	Sweet cherry	Prunus avium	Fair	1	30	60	1	Broken Limbs
27	31	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
28	24	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	Large Deadwood, Broken Limbs
29	41	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	Large Deadwood, Broken Limbs
30	26	Douglas fir	Pseudotsuga menziesii	Poor	4	10	60	1	Large Deadwood, Compacted Soil, Branch Decay, Serious Decline
31	22	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	2	Large Deadwood, Weak Union, Excessive Lean
32	24	Douglas fir	Pseudotsuga menziesii	Fair	3	20	115	1	Large Deadwood, Broken Limbs
33	12	Douglas fir	Pseudotsuga menziesii	Good	3	15	55	1	
34	32	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	Large Deadwood, Compacted Soil, Broken Limbs

TREE TAG	DBH	COMMON NAME	BOTANICAL NAME	CONDITION	PRIORITY	AVG CANOPY RADIUS	HEIGHT	STEMS	DEFECTS
35	8	Ponderosa pine	Pinus ponderosa	Poor	4	12	25	3	Compacted Soil, Root Damage
36	15	European white birch	Betula pendula	Poor	4	15	50	1	Large Deadwood, Trunk Decay, Basal Decay, Branch Decay, Serious Decline
37	12	Common crabapple	Malus sylvestris	Poor	4	10	35	1	Trunk Decay, Basal Decay, Branch Decay, Serious Decline
38	10	Sweet cherry	Prunus avium	Poor	4	12	35	1	Large Deadwood, Trunk Decay, Basal Decay
39	8	Common crabapple	Malus sylvestris	Poor	4	0	35	1	Trunk Decay, Basal Decay, Branch Decay
40	19	Sweet cherry	Prunus avium	Poor	4	25	45	1	Trunk Decay, Basal Decay, Serious Decline
41	12	Common crabapple	Malus sylvestris	Poor	4	20	45	1	Serious Decline
42	20	Sweet cherry	Prunus avium	Good	2	25	45	1	
43	32	Douglas fir	Pseudotsuga menziesii	Poor	4	20	100	1	Serious Decline
44	9	Ponderosa pine	Pinus ponderosa	Good	1	10	35	1	
45	12	Bigleaf maple	Acer macrophyllum	Poor	4	35	40	1	Trunk Decay, Broken Limbs, Excessive Lean
46	32	Oregon ash	Fraxinus latifolia	Poor	4	35	95	1	Large Deadwood, Trunk Decay, Basal Decay, Serious Decline
47	22	Oregon ash	Fraxinus latifolia	Poor	4	15	65	1	Large Deadwood, Trunk Decay, Branch Decay, Included Bark, Weak Union, Excessive Lean
48	22	Oregon ash	Fraxinus latifolia	Fair	2	25	65	1	Large Deadwood, Broken Limbs, Included Bark, Weak Union
49	32	Oregon ash	Fraxinus latifolia	Fair	3	25	65	1	Large Deadwood, Branch Decay, Included Bark, Weak Union
50	24	Oregon ash	Fraxinus latifolia	Poor	4	25	75	1	Large Deadwood, Trunk Decay, Included Bark, Weak Union

TREE TAG	DBH	COMMON NAME	BOTANICAL NAME	CONDITION	PRIORITY	AVG CANOPY RADIUS	HEIGHT	STEMS	DEFECTS
51	16	Oregon ash	Fraxinus latifolia	Fair	3	25	75	1	Large Deadwood, Branch Decay, Broken Limbs, Included Bark, Weak Union
52	14	Oregon ash	Fraxinus latifolia	Poor	4	25	75	1	Large Deadwood, Branch Decay, Broken Limbs, Included Bark, Weak Union
53	14	Scouler willow	Salix scouleriana	Poor	4	25	65	1	Large Deadwood, Branch Decay, Broken Limbs, Included Bark, Weak Union, Serious Decline
54	13	Oregon ash	Fraxinus latifolia	Poor	4	25	35	1	Large Deadwood, Trunk Decay, Branch Decay, Broken Limbs, Serious Decline
55	13	Ponderosa pine	Pinus ponderosa	Good	1	15	75	1	
56	13	Ponderosa pine	Pinus ponderosa	Fair	2	20	70	1	Included Bark, Weak Union
57	14	Ponderosa pine	Pinus ponderosa	Poor	3	20	50	1	Outside Construction Zone
58	17	Bigleaf maple	Acer macrophyllum	Poor	4	25	85	1	
59	24	Oregon ash	Fraxinus latifolia	Poor	4	30	90	2	Trunk Decay, Basal Decay, Included Bark, Weak Union
60	32	Oregon ash	Fraxinus latifolia	Poor	4	25	90	1	Trunk Decay, Serious Decline
61	25	Oregon ash	Fraxinus latifolia	Poor	4	20	85	1	Large Deadwood, Vines, Mechanical Damage, Serious Decline
62	26	Oregon ash	Fraxinus latifolia	Poor	4	25	90	1	Large Deadwood, Included Bark, Weak Union
63	14	Oregon ash	Fraxinus latifolia	Poor	4	15	90	1	Large Deadwood, Broken Limbs, Mechanical Damage, Serious Decline
64	19	Oregon ash	Fraxinus latifolia	Poor	4	5	65	1	Broken Limbs, Mechanical Damage, Serious Decline
65	16	Oregon ash	Fraxinus latifolia	Poor	4	15	90	1	Large Deadwood, Broken Limbs
66	24	Oregon ash	Fraxinus latifolia	Poor	4	10	65	1	Broken Limbs, Mechanical Damage, Serious Decline

67	24	Douglas fir	Pseudotsuga menziesii	Poor	4	15	100	1	Large Deadwood, Excessive Lean
TREE TAG	DBH	COMMON NAME	BOTANICAL NAME	CONDITION	PRIORITY	AVG CANOPY RADIUS	HEIGHT	STEMS	DEFECTS
68	32	Douglas fir	Pseudotsuga menziesii	Good	2	20	115	1	
69	24	Oregon ash	Fraxinus latifolia	Poor	4	25	90	1	Large Deadwood, Trunk Decay, Branch Decay, Serious Decline
70	24	Douglas fir	Pseudotsuga menziesii	Poor	4	20	100	1	Large Deadwood, Excessive Lean
71	34	Douglas fir	Pseudotsuga menziesii	Good	2	30	115	1	Large Deadwood
72	14	Douglas fir	Pseudotsuga menziesii	Poor	4	15	65	1	Serious Decline, Excessive Lean
73	28	Oregon ash	Fraxinus latifolia	Poor	4	25	90	1	Large Deadwood, Included Bark, Weak Union, Excessive Lean
74	18	Douglas fir	Pseudotsuga menziesii	Good	2	15	100	1	Large Deadwood
75	20	Douglas fir	Pseudotsuga menziesii	Good	1	15	90	1	
76	24	Douglas fir	Pseudotsuga menziesii	Good	2	20	100	1	Large Deadwood
77	20	Douglas fir	Pseudotsuga menziesii	Good	2	20	90	1	Included Bark, Weak Union
78	28	Douglas fir	Pseudotsuga menziesii	Good	1	25	115	1	Included Bark, Weak Union
79	12	Sweet cherry	Prunus avium	Good	2	10	65	1	

APN: 90264774
GEORGE & ERIN
HUTCHISON

APN: 90264776
ANTHONY & CHRISTI
SABATINI

APN: 90264778
SANDRA & MICHAEL
ANDERSON

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EDWARDS

APN: 92232990
KRISTI CUFFEL &
SIMON LEATHERS

APN: 110186660
ROBERT & KARI
MCARTHUR

APN: 986040392
MEADOWS SUBDIVISION LLC

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MEADOWS SUBDIVISION LLC

SIERRA MEADOWS
SUBDIVISION

APN: 986040388
BHARATHI CHARUGUNDLA &
VENUGOPAL KOPPALA

APN: 986040387
MICHAEL LANE

APN: 177894000
JEFFREY & TRISHA ELLIS

APN: 177887000
HIDDEN GLEN LLC
142,382 SF; 3.27 AC

EXISTING CONTOUR
(TYP)

PROPOSED
CONTOUR (TYP)

TRACT 'A'

TRACT 'B'

TRACT 'C'

TRACT 'D'

TRACT 'E'

WAVERLY PLACE

NW 43RD AVE

UTAH
STREET

Scale 1" = 30'

0 15 30 60

TREE PRIORITY TABLE	
CRITICAL ROOT ZONE (CRZ)	PRIORITY LEVEL FOR RETENTION
- - - - - - - -	ONE
————	TWO

PRELIMINARY

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EXISTING TREE PRIORITY EXHIBIT FOR:

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APR 2018
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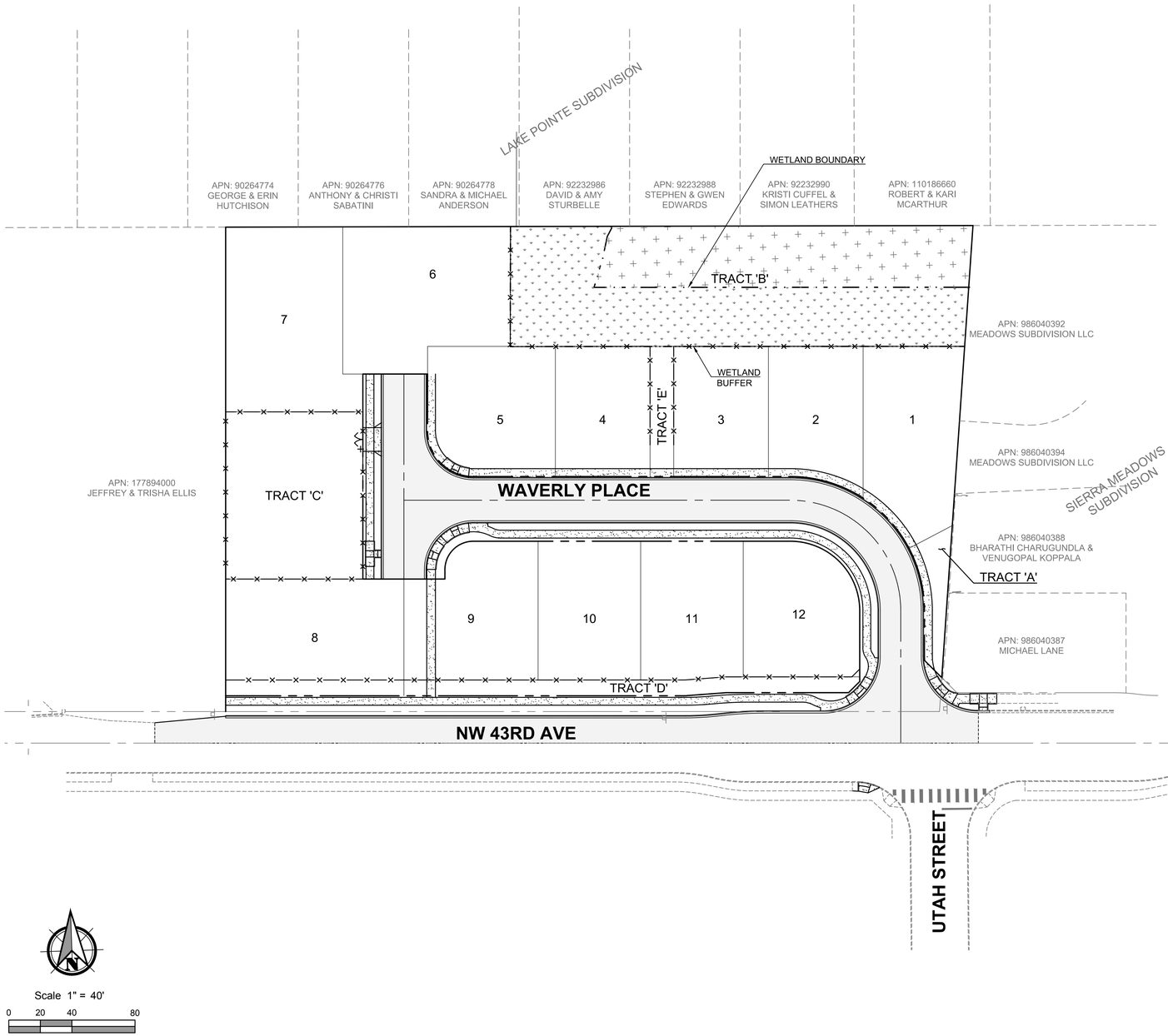
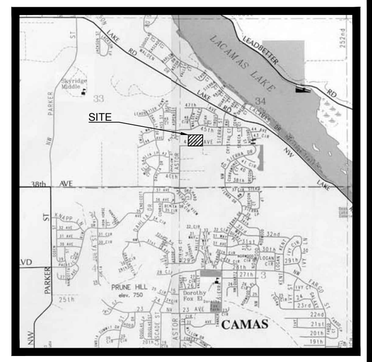
SP-103

SHEET 5 OF 12

43RD AVENUE SUBDIVISION

SW 1/4 of Sec. 34, T. 2 N., R. 3 E., W.M.





VICINITY MAP
NOT TO SCALE

Sheet Index

Sheet No.	Sheet ID	Description
1	C-001	Preliminary Cover Sheet
2	C-002	Preliminary Typical Sections
3	SP-101	Existing Conditions Plan
4	SP-102	Existing Tree Survey
5	SP-103	Preliminary Site Plan
6	C-201	Preliminary Erosion Control & Grading Plan
7	C-301	Preliminary Street & Storm Drainage Plan
8	C-401	Preliminary Sanitary Sewer & Water Plan
9	C-501	Preliminary Striping Plan
10	C601	Circulation Plan
11	L-101	Preliminary Landscape Plan
12	L-102	Preliminary Wetland Buffer Plan

Contact Info:

Owner/Applicant:
Waverly Homes, LLC
3205 NE 78th Street, Suite 10
Vancouver, WA 98665
Brett Simpson
brett@mywaverlyhomes.com
(360) 524-2128

Contact/Planner:
PBS Engineering and Environmental
415 W 6th Street, Suite 601
Vancouver, WA 98660
Andy Nuttbrock; Project Planner
nuttbrocka@pbsusa.com
(360) 695-3488
(360) 695-8767, fax

Engineer:
PBS Engineering and Environmental
415 W 6th Street, Suite 601
Vancouver, WA 98660
Rich Darland; PE
rich.darland@pbsusa.com
(360) 695-3488
(360) 695-8767, fax

Surveyor:
PBS Engineering and Environmental
415 W 6th Street, Suite 601
Vancouver, WA 98660
Terry Goodman; PLS
terry.goodman@pbsusa.com
(360) 695-3488
(360) 695-8767, fax

No.	Revision	Date	By	App'd
A	PRELIMINARY - ISSUED FOR REVIEW			

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SHEET ID
C-001
SHEET 1 OF 12

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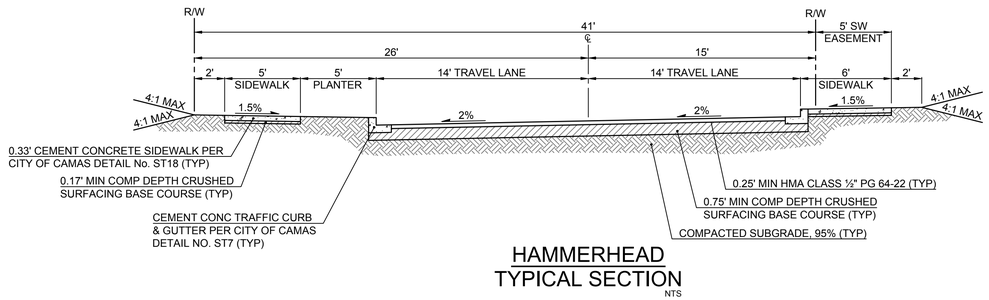

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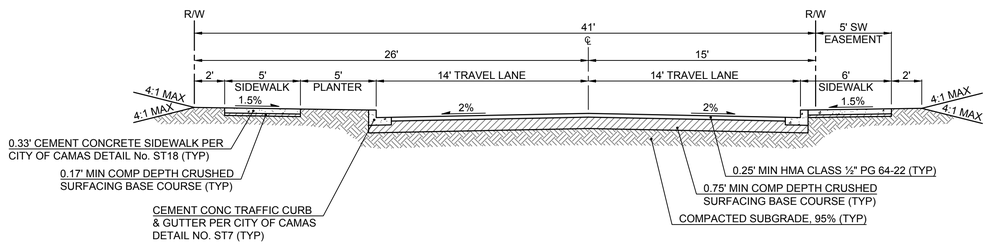
TYPICAL SECTION
NTS



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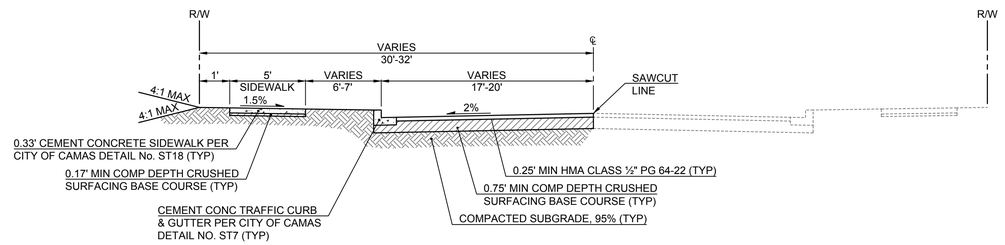
TYPICAL SECTION
NTS



NW 43rd AVENUE
TYPICAL SECTION
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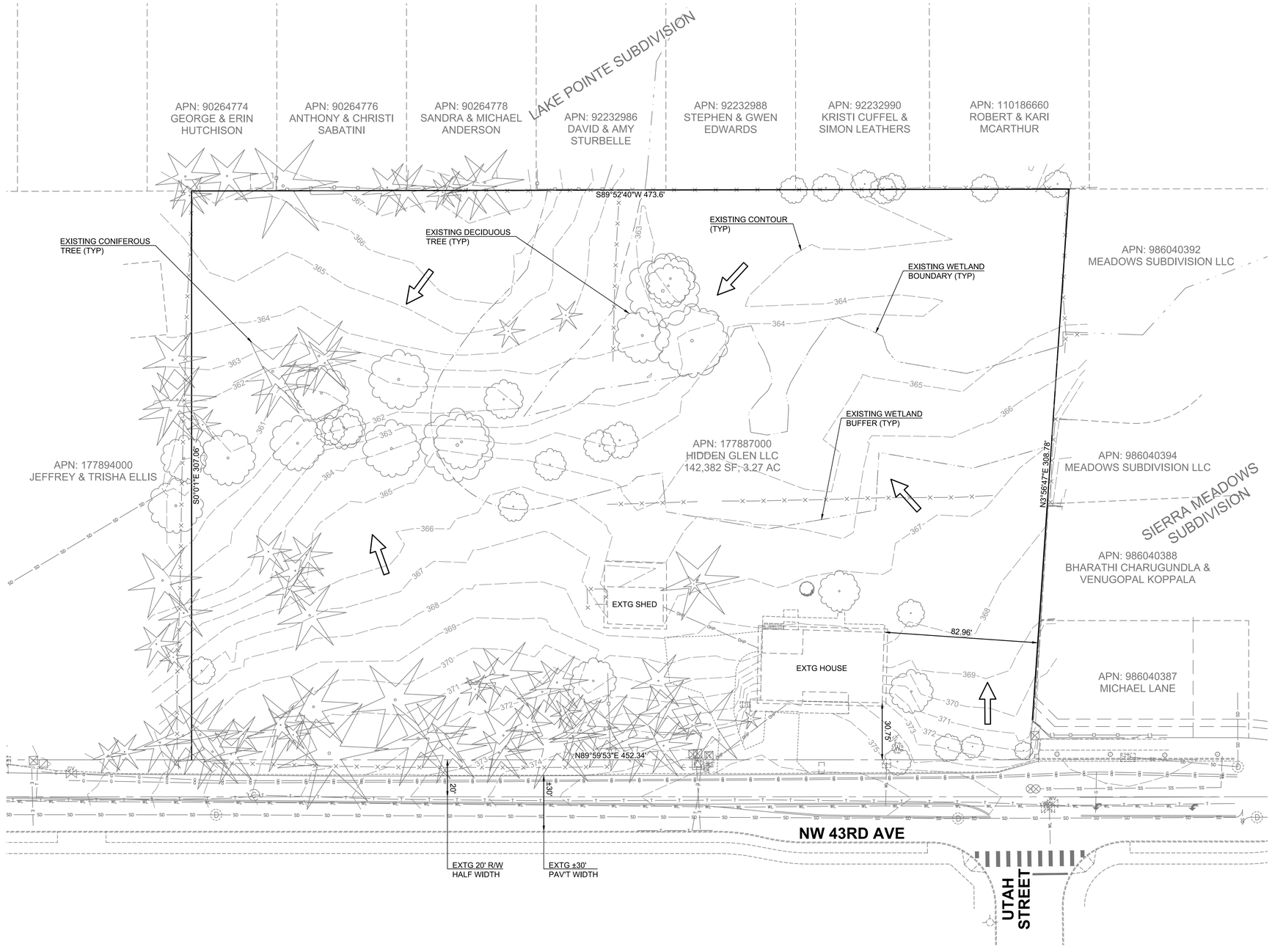
SHEET	2 OF 12



Scale 1" = 30'

0 15 30 60

Site Information:

Parcel Serial #s:	177887-000
Parcel Size:	142,382 SF; 3.27 AC
Site Improvements:	Developed with a two-story, single-family residence, out building and gravel parking area
Zoning:	Residential-7,500 (R-7.5)
Comp Plan Designation:	Single-Family Medium (SFM)
Neighborhood Assoc:	N/A
School District:	Camas
TIF Area:	Camas
PIF Area:	N/A
Sewer District:	Camas
Water District:	Camas
Building Moratorium Area:	None
Soil Type(s):	HcB, HcD, OdB
Hydric Soils:	Non-Hydric and Hydric soils on site
Slope(s);	0-5%; 5-10%; 10-15%; 15-20%
Landslide Hazards:	No Mapping Indicators
Slope Stability:	No Mapping Indicators
Flood Zone Designation:	Outside Flood Area
Cara:	No Mapping Indicators
Wildlands:	No Mapping Indicators
Priority Species:	No Mapping Indicators
Priority Habitat:	No Mapping Indicators
Archaeological Predictive:	Moderate; Moderate-High, High
Archaeological Site Buffers:	No Mapping Indicators

Plan Notes:

Boundary, topographic and environmental information were obtained from Clark County GIS and PBS survey.

Currently the site is identified as tax lot 177887000 (#11 SEC 34 T2N R3EWM 3.48 AC) and is addressed as 2223 NW 43rd Avenue, Camas, WA 98607. There is a two-story, single-family residence on site with associated gravel parking and out building.

Transportation and Utilities:

The project site is located on the north side of NW 43rd Avenue, to the west of the intersection with NW Utah Street. The property is bound to the north by R-12 zoned properties, with R-7.5 zoned properties to the east and west.

There is an existing water main running in NW 43rd Avenue, with City of Camas as the purveyor. Sanitary Sewer is available in NW 43rd Avenue, immediately to the east of the site, with City of Camas as the purveyor.

Stormwater:

There are no existing stormwater facilities on site. Currently stormwater either infiltrates on site or runs from the northwest and southeast towards the middle of the site, then to the west and offsite to an existing drainage.

Environmental:

Available GIS information indicates that the site contains no areas of potential landslide instability, severe erosion hazard areas, or habitat conservation areas. The site is identified as having a wetland, as well as some hydric soils on a portion of the site. The archaeological predictive for the site is High, Moderate-High, or Moderate for different potions of the site; the property is not within an archaeological site buffer.

Linetype Legend	
Existing Sanitary Sewer Pipe	SS
Existing Storm Sewer Pipe	SD
Existing Water Pipe	WL
Existing Electric Line	E
Existing Gas Line	G
Existing Telephone Line	T
Existing Centerline	
Existing Curb	
Existing Lot Line	
Existing Gravel road	
Existing Paint Stripe	
Existing Right-of-way	
Existing Building	
Existing Wetland Perimeter	
Existing Wetland Buffer	
Existing Fence	X
Existing Wall	
Existing Contour	224

Symbol Legend	
Existing Water Valve	WV
Existing Gas Valve	GV
Existing Fire Hydrant	
Existing Well	W
Existing Power Pole	
Existing Water Meter	
Existing Electrical Pedestal	
Existing Electrical Transformer	
Existing Sanitary Cleanout	
Existing Storm Manhole	D
Existing Sign	
Existing Flow Arrow	

PRELIMINARY

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EXISTING CONDITIONS PLAN FOR: 43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

DESIGNED: JAN
CHECKED: JAN
APR 2018
75345.000

SHEET ID
SP-101

SHEET 3 OF 12

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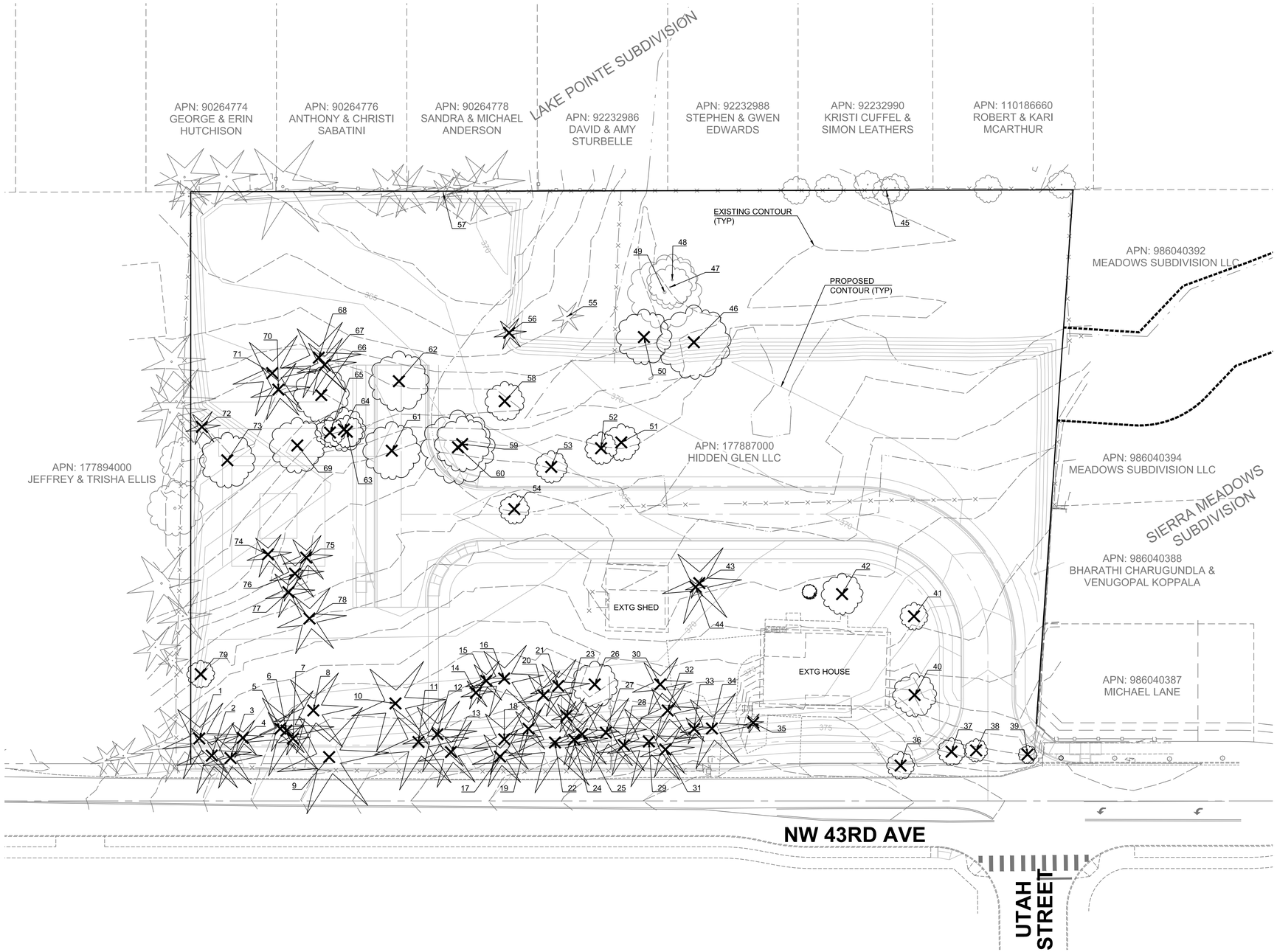

EXISTING TREE TABLE

NO.	SIZE	TYPE	COMMENTS
1	32"	Evergreen	Tree to be removed, within site grading.
2	30"	Evergreen	Tree to be removed, within 43rd expansion.
3	24"	Evergreen	Tree to be removed, within 43rd expansion.
4	16"	Evergreen	Tree to be removed, within site grading.
5	18"	Evergreen	Tree to be removed, within site grading.
6	36"	Evergreen	Tree to be removed, within site grading.
7	13"	Evergreen	Tree to be removed, within site grading.
8	34"	Evergreen	Tree to be removed, within site grading.
9	45"	Evergreen	Tree to be removed, within 43rd expansion.
10	38"	Evergreen	Tree to be removed, within site grading.
11	38"	Evergreen	Tree to be removed, within site grading.
12	30"	Evergreen	Tree to be removed, within site grading.
13	28"	Evergreen	Tree to be removed, within 43rd expansion.
14	13"	Evergreen	Tree to be removed, within site grading.
15	18"	Evergreen	Tree to be removed, within site grading.
16	30"	Evergreen	Tree to be removed, within site grading.
17	24"	Evergreen	Tree to be removed, within 43rd expansion.
18	28"	Evergreen	Tree to be removed, within site grading.
19	19"	Evergreen	Tree to be removed, within site grading.
20	22"	Evergreen	Tree to be removed, within site grading.
21	24"	Evergreen	Tree to be removed, within site grading.
22	40"	Evergreen	Tree to be removed, within site grading.
23	13"	Evergreen	Tree to be removed, within site grading.
24	20"	Evergreen	Tree to be removed, within site grading.
25	28"	Evergreen	Tree to be removed, within site grading.
26	20"	Deciduous	Tree to be removed, within site grading.
27	31"	Evergreen	Tree to be removed, within site grading.
28	24"	Evergreen	Tree to be removed, within site grading.
29	36"	Evergreen	Tree to be removed, within site grading.
30	24"	Evergreen	Tree to be removed, within site grading.
31	22" (2)	Evergreen	Tree to be removed, within 43rd expansion.
32	24"	Evergreen	Tree to be removed, within site grading.
33	12"	Evergreen	Tree to be removed, within site grading.
34	32"	Evergreen	Tree to be removed, within site grading.
35	8" (3)	Evergreen	Tree to be removed, within site grading.
36	12"	Deciduous	Tree to be removed, within 43rd expansion.
37	12"	Deciduous	Tree to be removed, within new roadway.
38	10"	Deciduous	Tree to be removed, within new roadway.
39	8"	Deciduous	Tree to be removed, within new roadway.
40	19"	Deciduous	Tree to be removed, within site grading.
41	12"	Deciduous	Tree to be removed, within site grading.
42	18"	Deciduous	Tree to be removed, within site grading.
43	32"	Evergreen	Tree to be removed, within site grading.
44	9"	Evergreen	Tree to be removed, within site grading.
45	12"	Deciduous	No construction will occur near this tree.
46	32"	Deciduous	Tree to be removed, within site grading.
47	18"	Deciduous	Tree to be protected.
48	22"	Deciduous	Tree to be protected.
49	32"	Deciduous	Tree to be protected.
50	24" (2)	Deciduous	Tree to be removed, within site grading.
51	16"	Deciduous	Tree to be removed, within site grading.
52	14"	Deciduous	Tree to be removed, within site grading.
53	14"	Deciduous	Tree to be removed, within site grading.
54	13"	Deciduous	Tree to be removed, within new roadway.
55	13"	Evergreen	Tree to be protected.
56	13"	Evergreen	Tree to be removed, within site grading.
57	14"	Evergreen	Tree to be protected.
58	17"	Deciduous	Tree to be removed, within site grading.
59	24" (2)	Deciduous	Tree to be removed, within site grading.
60	32"	Deciduous	Tree to be removed, within site grading.
61	25"	Deciduous	Tree to be removed, within new roadway.
62	26"	Deciduous	Tree to be removed, within new roadway.
63	14"	Deciduous	Tree to be removed, with new storm facility.
64	19"	Deciduous	Tree to be removed, with new storm facility.
65	13"	Deciduous	Tree to be removed, with new storm facility.
66	24"	Deciduous	Tree to be removed, within site grading.
67	24"	Evergreen	Tree to be removed, within site grading.
68	32"	Evergreen	Tree to be removed, within site grading.
69	24"	Deciduous	Tree to be removed, with new storm facility.
70	24"	Evergreen	Tree to be removed, within site grading.
71	34"	Evergreen	Tree to be removed, within site grading.
72	14"	Evergreen	Tree to be removed, within site grading.
73	24"	Deciduous	Tree to be removed, with new storm facility.
74	18"	Evergreen	Tree to be removed, with new storm facility.
75	20"	Evergreen	Tree to be removed, with new storm facility.
76	22"	Evergreen	Tree to be removed, with new storm facility.
77	20"	Evergreen	Tree to be removed, within site grading.
78	28"	Evergreen	Tree to be removed, within site grading.
79	12"	Deciduous	Tree to be removed, within site grading.

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EXISTING TREE SURVEY FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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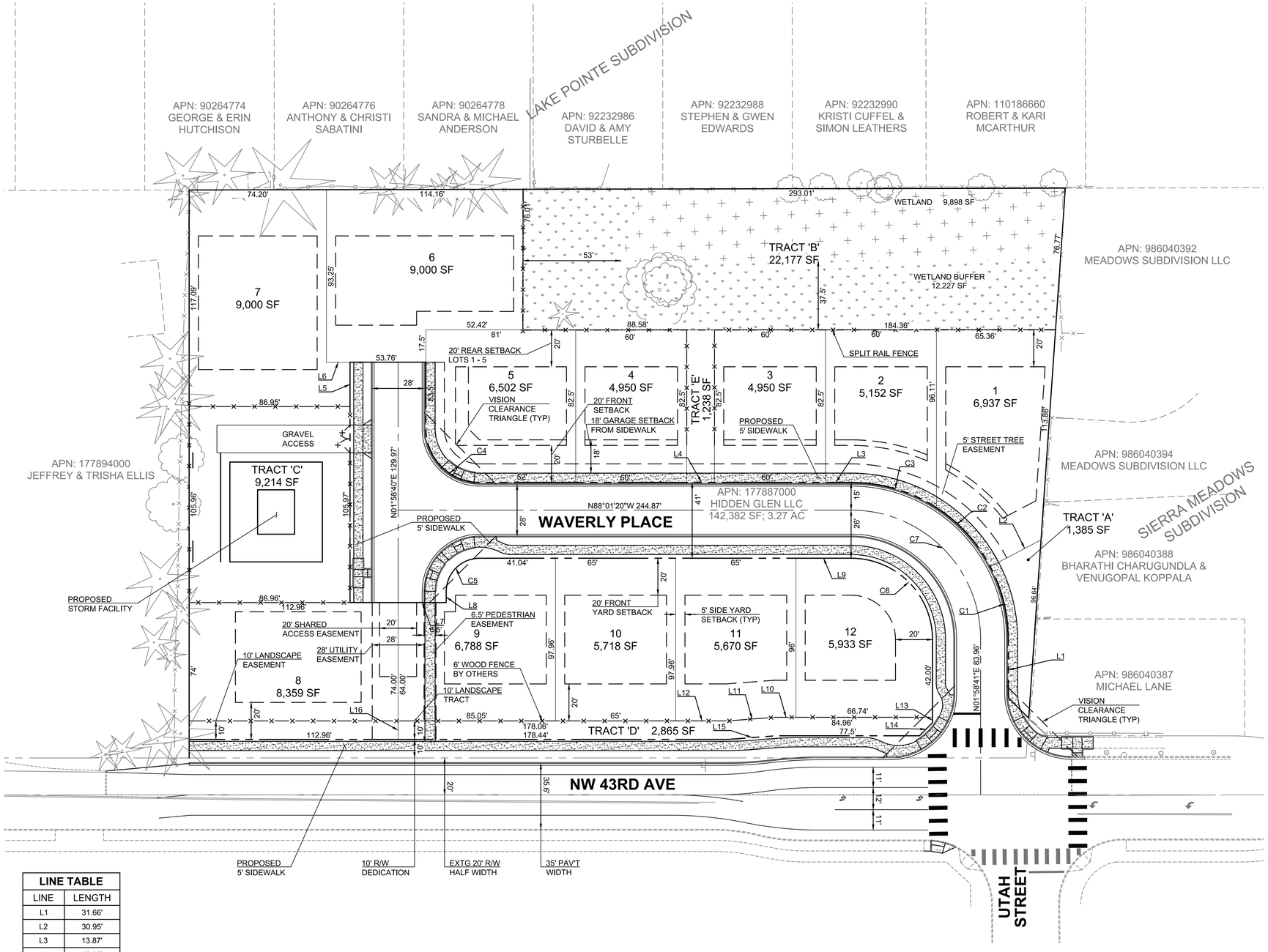
STATE OF WASHINGTON
JOHN A. NUTTBROCK
No. 893 EXP. 05/14/2018
LICENSED LANDSCAPE ARCHITECT

PRELIMINARY

DESIGNED: JAN
CHECKED: JAN
APR 2018
75345.000

SHEET ID
SP-102

SHEET 4 OF 12



Plan Notes:

The proposal is to develop a 12-lot residential subdivision with wetland and storm tracts. The proposal includes all associated roadway and sidewalk improvements. The site currently has a single-family residence with associated parking area and out building.

Transportation and Utilities:
The project site is located on the north side of NW 43rd Avenue, to the west of the intersection with NW Utah Street. The property is bound TO the north by R-12 zoned properties, with R-7.5 zoned properties to the east and west.

The development proposes a new intersection on the east side of the proposed site, across from the existing Utah Street intersection. The new Waverly Place, will include full right-of-way build out with two travel lanes, planting strips, and sidewalks. The existing NW 43rd Avenue will be fully improved for the street half-width fronting the site. This includes 10' right-of-way dedication, widening of the roadway, installation of curb, planter strip, and sidewalk, and a left turn lane into the development.

There is an existing water main running in NW 43rd Avenue, with City of Camas as the purveyor. The development proposes to connect to this water main to serve the lots. Sanitary Sewer is available in NW 43rd Avenue, immediately to the east of the site, with City of Camas as the purveyor. This project proposes the extension of this sewer main into the development to serve the lots, then out of the development and continuing east for future connections.

Stormwater:
Stormwater runoff will be collected, detained, and treated on site, then released at mitigated rates to the existing drainage on the west side of the site. See preliminary TIR report submitted with this application.

Solid Waste & Recycling:
Solid waste and recycling will be collected at the curb side of NW 43rd Avenue.

Project Information:

Zone:	Residential-7,500 (R-7.5)
Comp Plan Designation:	Single-Family_Medium (SFM)

Dimensional Standards:	Required	Proposed
Maximum Density	5.8 d.u./AC	d.u./AC
Minimum Lot Size -	5,250 SF	4,950 SF
Maximum Lot Size -	9,000 SF	9,000 SF
Min Lot Width -	60 FT	60 FT
Min Lot Depth -	80 FT	82.5 FT
Front Setback -	20 FT	20 FT
Side Setback -	5 FT	5 FT
Street Side Setback -	20 FT	20 FT
Rear Setback (corner lot) -	5 FT	5 FT
Rear Setback -	25 FT	25 FT
Maximum Lot Coverage -	40%	Will Meet
Maximum Building Height -	35 FT	Will Meet

LOT TABLE		
LOT 1	6,937 SF	0.16 AC
LOT 2	5,152 SF	0.12 AC
LOT 3	4,950 SF	0.11 AC
LOT 4	4,950 SF	0.11 AC
LOT 5	6,502 SF	0.15 AC
LOT 6	9,000 SF	0.21 AC
LOT 7	9,000 SF	0.21 AC
LOT 8	8,359 SF	0.19 AC
LOT 9	6,788 SF	0.16 AC
LOT 10	5,718 SF	0.13 AC
LOT 11	5,670 SF	0.13 AC
LOT 12	5,933 SF	0.14 AC
TRACT 'A'	1,385 SF	0.03 AC
TRACT 'B'	22,177 SF	0.51 AC
TRACT 'C'	9,214 SF	0.21 AC
TRACT 'D'	2,865 SF	0.07 AC
TRACT 'E'	1,238 SF	0.03 AC
R/W DEDICATION	26,544 SF	0.61AC
TOTAL	**142,382 SF**	**3.27 AC**
EXISTING	**142,382 SF**	**3.27 AC**

LINE TABLE	
LINE	LENGTH
L1	31.66'
L2	30.95'
L3	13.87'
L4	15.00'
L5	24.00'
L6	12.76'
L7	26.00'
L8	5.97'
L9	29.82'
L10	10.76'
L11	25.92'
L12	28.39'
L13	2.93'
L14	10.01
L15	25.92'
L16	10.00'

CURVE TABLE	
CURVE	LENGTH
C1	41.10'
C2	43.62'
C3	48.77'
C4	45.55'
C5	28.28'
C6	69.12'
C7	109.96'

Scale 1" = 30'
0 15 30 60

PRELIMINARY

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PRELIMINARY SITE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

DESIGNED: JAN
CHECKED: JAN
APR 2018
75345.000

SHEET ID
SP-103
SHEET 5 OF 12

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LAKE POINTE SUBDIVISION

SILT FENCE (TYP)

EXISTING FLOW (TYP)

PROPOSED WETLAND BOUNDARY (TYP)

PROPOSED WETLAND BUFFER (TYP)

EXISTING WETLAND BOUNDARY (TYP)

TRACT 'B'

SILT FENCE (TYP)

2:1 (TYP)

PROPOSED CONTOUR (TYP)

INLET PROTECTION (TYP)

TRACT 'E'

SIERRA MEADOWS SUBDIVISION

EXISTING WETLAND BUFFER (TYP)

177894000

TRACT 'C'

WAVERLY PLACE

TRACT 'A'

EXISTING CONTOUR (TYP)

10' LANDSCAPE EASEMENT

4:1 (TYP)

STABILIZED CONSTRUCTION ENTRANCE (100' MIN LENGTH)

TRACT 'D'

NW 43RD AVE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

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PRELIMINARY EROSION CONTROL & GRADING PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

RICHARD E. DARLAND STATE OF WASHINGTON 13972 REGISTERED PROFESSIONAL ENGINEER PRELIMINARY

DESIGNED: DPS

CHECKED: RED

APR 2018

75345.000

SHEET ID

C-201

SHEET 6 OF 12

LAKE POINTE SUBDIVISION

PROPOSED WETLAND BOUNDARY (TYP)

TRACT 'B'

PROPOSED WETLAND BUFFER (TYP)

DITCH INLET (TYP)

TRACT 'E'

41' R/W

EMERGENCY OVERFLOW

5' S/W

5'

6' S/W

CONTROL MANHOLE
W/18" DIAM x 4' HIGH RISER ASSEMBLY
ORIFICE 1 DIAMETER 2.90"
RECTANGULAR NOTCH
WIDTH AND HEIGHT 0.05'x0.80'

177894000

WETLAND CONVEYANCE PIPE (TYP)

EXISTING WETLAND BOUNDARY (TYP)

CATCH BASIN (TYP)

SIERRA MEADOWS SUBDIVISION

EXISTING WETLAND BUFFER (TYP)

15' WIDE ACCESS ROAD

TRACT 'C'

TRACT 'A'

WAVERLY PLACE

PERK FILTER TREATMENT VAULT W/21 CARTRIDGES (12" HIGH)

5+61.21 WAVERLY PLACE=
1+50.00 HAMMERHEAD

R=70.00'
L=109.96'
=90°00'01"
T=70.00'

6' TALL BLACK VINYL COATED CHAIN LINE FENCE

STORM PIPE (TYP)

28' WIDE UTILITY EASEMENT

6.5' PEDESTRIAN ACCESS EASEMENT

5.5'

5' S/W

5'

28'

6' SW

41' R/W

14'

ADA RAMP

STORM MANHOLE (TYP)

CATCH BASIN (TYP)

TRACT 'D'

EXTG 3" STEP FM

EXTG 24" SD

EXTG 18" WATER

NW 43RD AVE

32' ½ WIDTH R/W

ADA RAMP

15+26.69 NW 43RD AVENUE=
10+00.00 WAVERLY PLACE

UTAH STREET

Scale 1" = 30'

0 15 30 60

PRELIMINARY

PBS Engineering and Environmental Inc.
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PRELIMINARY STREET & STORM DRAINAGE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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RICHARD E. DIRLAND
STATE OF WASHINGTON
33172
REGISTERED
PROFESSIONAL ENGINEER
PRELIMINARY

DESIGNED:	DPS
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APR 2018	75345.000
SHEET ID	C-301
SHEET	7 OF 12

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LAKE POINTE SUBDIVISION

TRACT 'B'

TRACT 'E'

TRACT 'C'

TRACT 'A'

TRACT 'D'

WAVERLY PLACE

SIERRA MEADOWS SUBDIVISION

177894000

NW 43RD AVE

UTAH STREET

6 7 5 4 3 2 1 8 9 10 11 12

2" STANDARD BLOWOFF (TYP)

STEP SANITARY CLEANOUT (TYP)

STEP SEWER SERVICE (TYP)

6" DI CL52 WATER (TYP)

8" DI CL52 WATER (TYP)

1" WATER SERVICE (TYP)

EXTG CONTOUR (TYP)

FIRE HYDRANT (TYP)

3" STEP SAN FM

28' WIDE UTILITY EASEMENT

EXTG 24" SD

EXTG 18" WATER

EXTG 3" STEP FM

IRRIGATION METER

REMOVE EXTG CLEANOUT AND CONNECT TO EXTG SAN FM

CONNECT NEW 8" DI (W) TO EXTG 18" (W)

PC 0+06.08

PT 9+16.04

6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00

Scale 1" = 30'

0 15 30 60

PRELIMINARY

PRELIMINARY SANITARY SEWER & WATER PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

PBS Engineering and Environmental Inc.
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STATE OF WASHINGTON
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DESIGNED: DPS
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75345.000

SHEET ID
C-401
SHEET 8 OF 12

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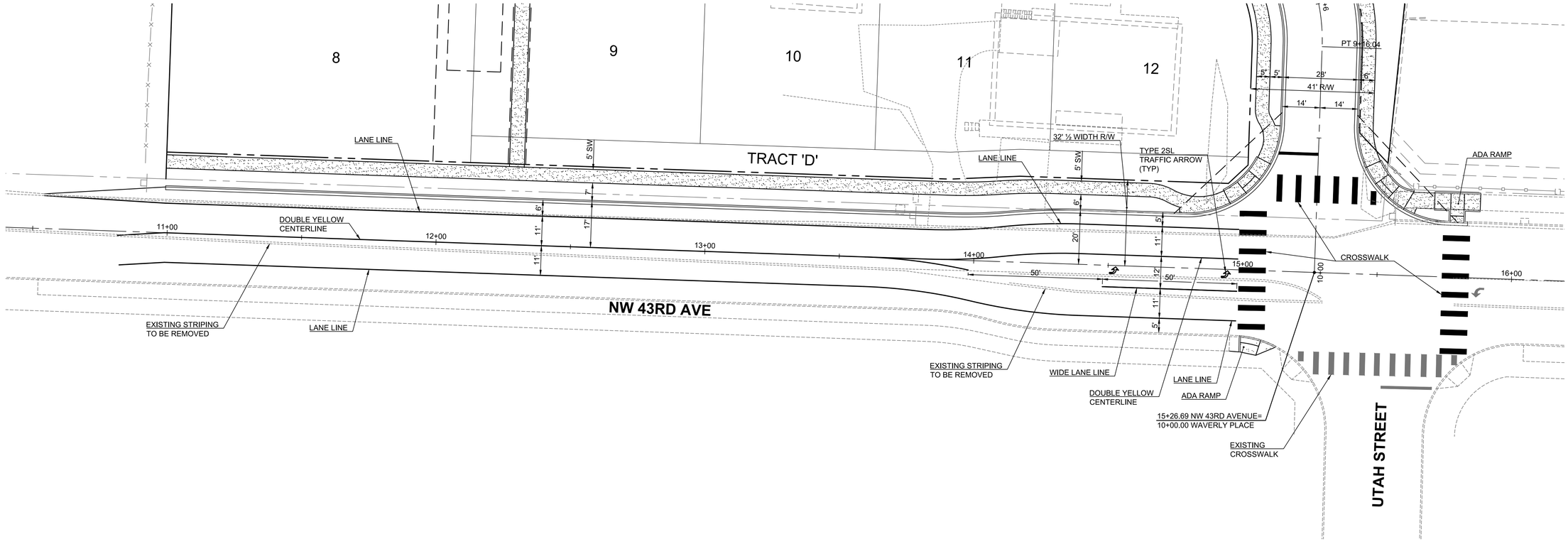

Scale 1" = 20'

0 10 20 40

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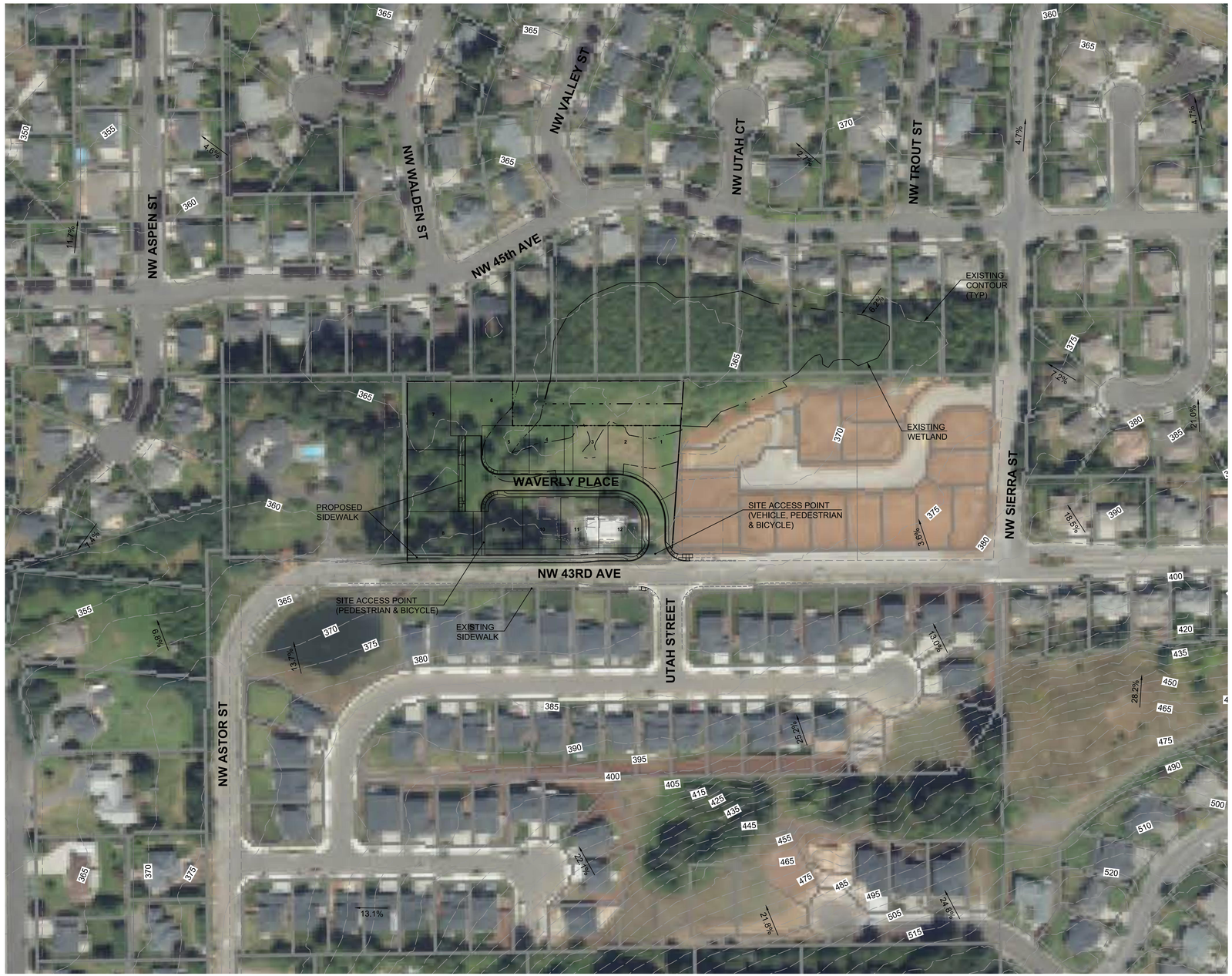
PRELIMINARY STRIPING PLAN FOR: 43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's below. Call before you dig.

DESIGNED:	DPS
CHECKED:	RED
APR 2018	75345.000
SHEET ID	C-501
SHEET	9 OF 12



Scale 1" = 100'

0 50 100 200

NOTE:

1. **TRANSIT ROUTES DO NOT SERVICE PROPOSED SITE.**
2. **THE EXISTING WETLAND IN THE NORTHEASTERN CORNER OF THE SITE IS THE ONLY ENVIRONMENTALLY SENSITIVE AREA NEAR THE PROPOSED SITE.**

PRELIMINARY

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CIRCULATION PLAN FOR: 43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

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DESIGNED:	DPS
CHECKED:	RED
APR 2018	75345.000
SHEET ID	C601
SHEET	10 OF 12

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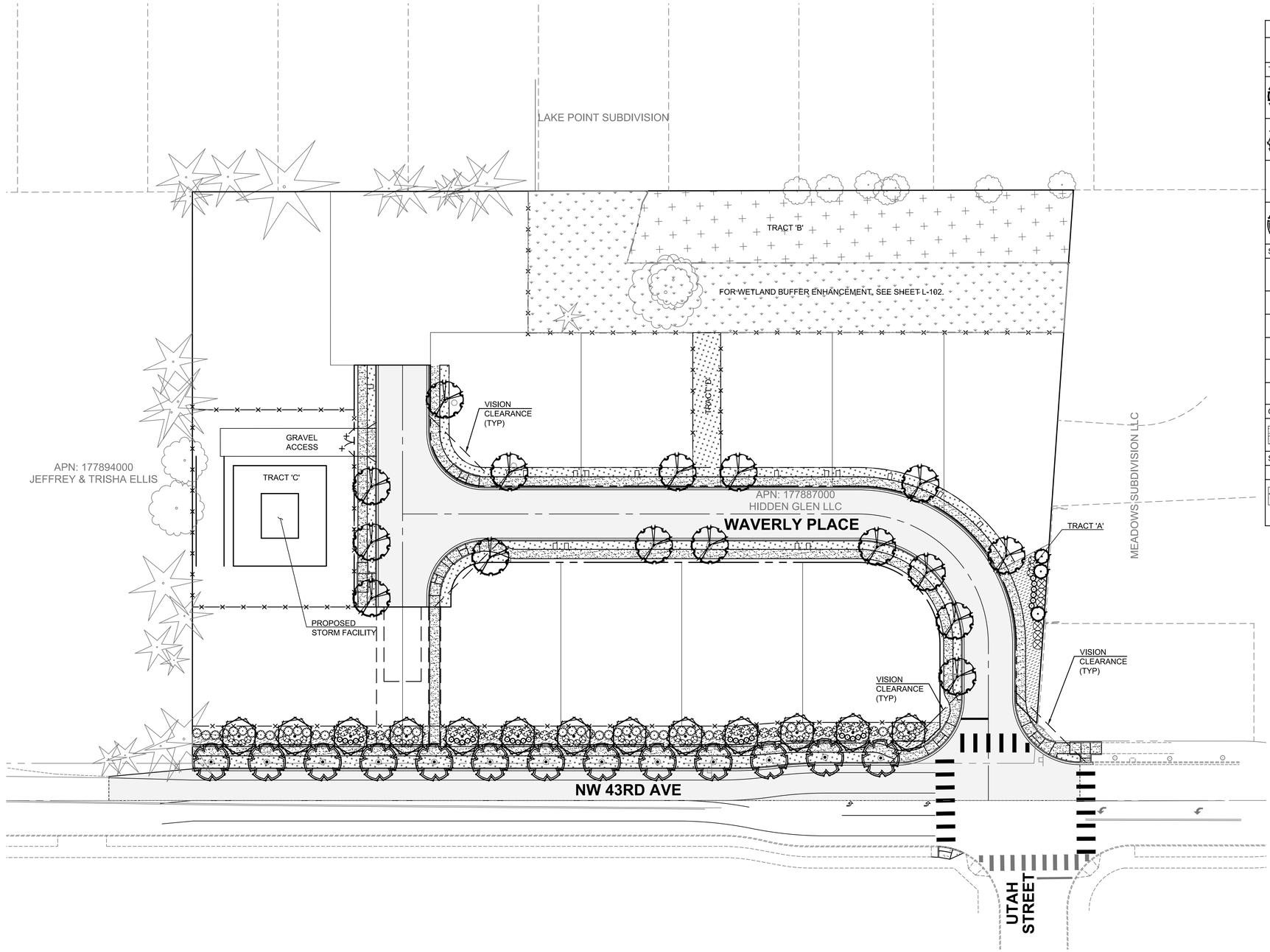


Scale 1" = 30'

0 15 30 60

PLANT LIST

SYM	QTY	NAME	SIZE	CONT.	SPACING
TREES					
	17	*Acer rubrum 'Franksred'* Red Sunset Maple	2" Cal	B&B	As Shown
	13	*Ginkgo biloba 'Princeton Sentry'* Princeton Sentry Ginkgo	2" Cal.	B&B	As Shown
	3	*Picea glauca 'Pendula'* Weeping White Spruce	6' Height	B&B	As Shown
	13	*Pyrus calleryana 'Chanticleer'* Chanticleer Flowering Pear	2" Cal	B&B	As Shown
SHRUBS					
	25	*Berberis thunberii 'Crimson Pygmy'* Crimson Pygmy Barberry	12" Height Min	2 Gal	As Shown
	33	*Cistus x purpureus* Purple Rock Rose	30" Height Min	5 Gal	As Shown
	6	*Pieris japonica 'Mountain Fire'* Moutain Fire Lily of the Valley	30" Height Min	5 Gal	As Shown
	44	*Rhaphiolepis umbellata 'Minor'* Dwarf Yedda Hawthorn	30" Height Min	5 Gal	As Shown
	36	*Spiraea japonica 'Goldmound'* Golmound Spirea	12" Height Min	2 Gal	As Shown
	6	*Viburnum davidii* David Viburnum	12" Height Min	2 Gal	As Shown
GROUNDCOVERS					
	282	*Cotoneaster dammeri 'Lowfast'* Bearberry Cotoneaster	Fully Rooted	4" Pot	36" O.C.
SEED MIX					
		'DOT Multipurpose' Mix			
	6900 SF (0.16 acres)	*Lolium perenne var Blazer 4* *Lolium perenne var Allstar III* *Festuca r. spp fallax var Windward* *Festuca r. var Garnet*	Blazer 4 Perennial Rye Express II Perennial Rye Wind. Chewings Fescue Garnet Creeping Red Fescue		300 lbs PLS / acre

NOTES:

1. Street tree location is based on assumed driveway locations. Grass seed is shown in entire planter strip for reference, install seed after driveway installation for each lot.
2. Landscape for each lot shall be installed at the time of home construction. All Tract landscape shall be installed at time of road construction.
3. Irrigation will be design build by the landscape contractor. All irrigation for the lot frontages will be installed at the time of home construction and be operated and maintained by the home owner.
4. All Tract irrigation will be installed at the time of road construction. Tract irrigation will be operated and maintained by the home owners association.
5. City of Camas must receive written notice 30 days prior to any removal or replanting of vegetation.
6. Monitoring of vegetation survival may be required.

PRELIMINARY

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
360.695.3488
pbsusa.com

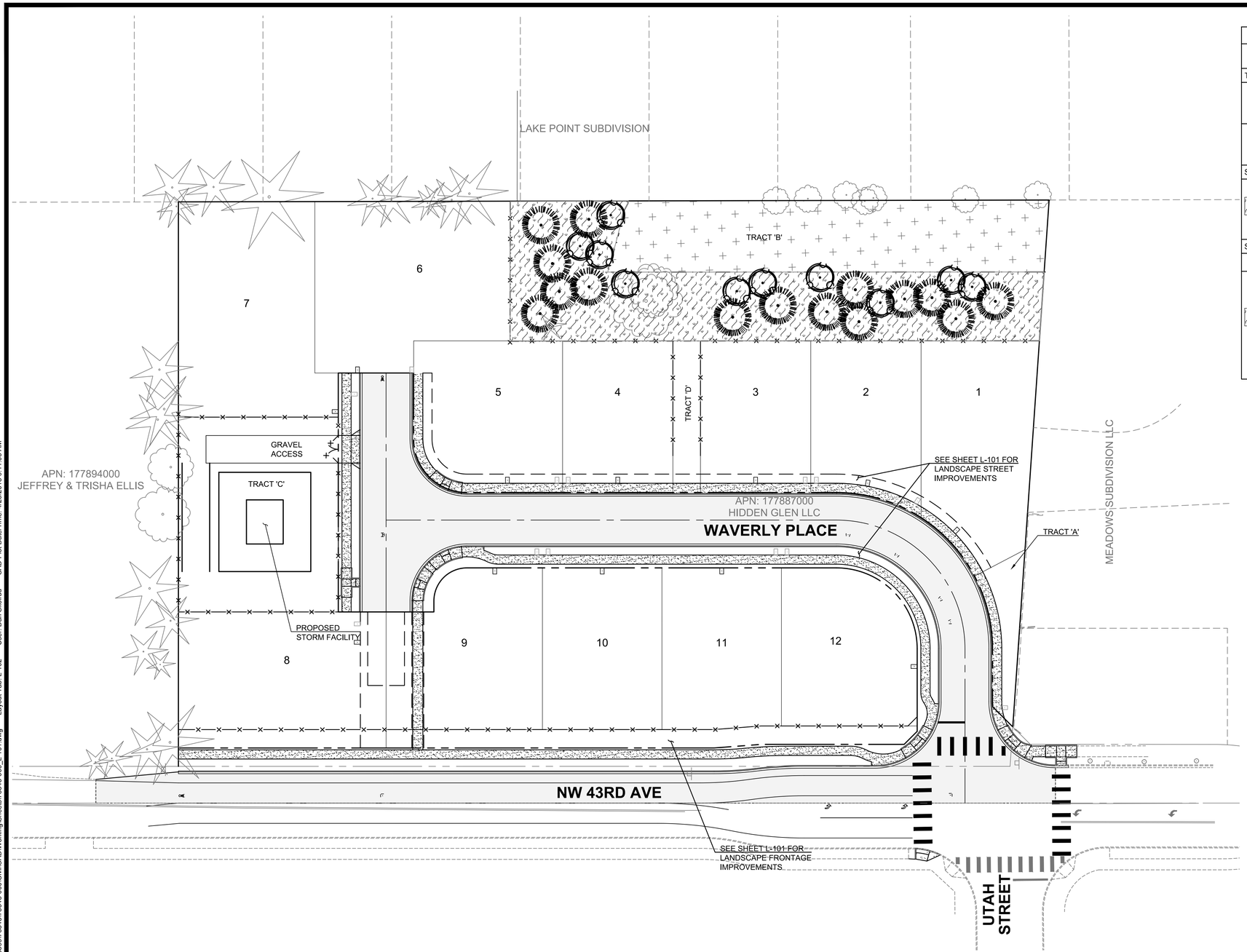
PBS

PRELIMINARY LANDSCAPE PLAN FOR:
43RD AVENUE SUBDIVISION
A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

811 Know what's **below.** **Call** before you dig.

STATE OF WASHINGTON
JOHNA. NUTTBROCK
PRELIMINARY
NO. 0983 EXP. 05/4/2018
LICENSED LANDSCAPE ARCHITECT

DESIGNED:	JAN
CHECKED:	JAN
APR 2018	75345.000
SHEET ID	L-101
SHEET	11 OF 12



Scale 1" = 30'

0 15 30 60

PLANT LIST					
SYM	QTY	NAME	SIZE	CONT.	SPACING
TREES					
	10	*Fraxinus latifolia* Oregon Ash	2" Cal	B&B	As Shown
	15	*Thuja plicata* Western Red Cedar	6' Height	B&B	As Shown
SHRUBS					
	200 100 100 100 50 300	*Cornus sericea* - Red Osier Dogwood *Fraxinus latifolia* - Oregon Ash *Oemleria cerasiformis* - Indian plum *Rubus specatibilis* - Salmonberry *Sambucus racemosa* - Red Elderberry *Symphoricarpos albus* - Snowberry	18" minimum	Bare root	4' O.C. (randomly mixed throughout)
SEED MIX					
		'Shrub Swamp' Mix			
	13,100 SF (0.30 acres)	*Hordeum brachyantherum* - Meadow Barley *Bromus carinatus* - California Brome *Festuca rubra rubra* - Native Red Fescue *Glyceria occidentallis* - Northwestern Mannagrass *Deschampsia cespitosa* - Tufted Hairgrass *Agrostis exarata* - Spike Bentgrass *Rosa nutkana* - Nootka Rose *Symphoricarpos alba* - Common Snowberry *Spirea dougalsii* - Douglas Spirea *Mahonia aquafilolium* - Tall Oregon Grape *Holiduscus discolor* - Oceanspray			50lbs PLS / acre

NOTES:

1. No work or construction access shall occur within the wetland.
2. Wetland Buffer Enhancement work shall be completed prior to construction of site improvements as first priority of work
3. Seed of the type specified on this sheet shall be certified in accordance with WAC 16-302. 30 days prior to application the Contractor shall submit testing results for approval to the Wetland Specialist or Landscape Architect. Certification shall show each lot of seed of each specified species for verification, purity, germination, noxious weeds and other crop seeds.
4. Prior to seeding of the Wetland Buffer, soils shall be prepared by removing all undesirable vegetation and by scarification, cultivating or ripping the top 6 inches of the existing soils leaving a bare soil condition. All ruts and construction debris shall be removed in preparation for seeding.
5. Seeding application dates shall be hydroseeded in the Fall (September 1 to October 1) only unless approved by Wetland Scientist or Landscape Architect.
6. All plant installation within the Wetland Buffer shall be occur between October 1 to March 15.
7. City of Camas must receive written notice 30 days prior to any removal or replanting of vegetation.
8. Monitoring of vegetation survival may be required.

PRELIMINARY

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
360.695.3488
pbsusa.com

PRELIMINARY LANDSCAPE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

STATE OF WASHINGTON
JOHNA. NUTTBROCK
No. 1083 EXP. 05/4/2018
LICENSED LANDSCAPE ARCHITECT
PRELIMINARY

DESIGNED:	JAN
CHECKED:	JAN
APR 2018	75345.000
SHEET ID	L-102
SHEET	12 OF 12

Filename: L:\Projects\71000_FromOtherOffices\75000\75300-75399\75345\75345-000\Civil\CAD\Working\Sheets\75345-000_L-101.dwg Layout Tab: L-102 User: Dan Skolrud CAD Plot Date/Time: 4/26/2018 9:11:03 AM

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

Exhibit 16

Critical Areas Report for NW 43rd Avenue Subdivision

2223 NW 43rd Avenue
Camas, Washington

Prepared for:
Waverly Homes, LLC
3205 NE 78th Street, Suite 10
Vancouver, WA 98665

May 4, 2018
PBS Project No. 75345.000

PBS
314 WEST 15TH STREET
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

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SUPPORTING DATA

TABLES

APPENDICES

1 PROJECT INFORMATION

Applicant
Brett Simpson, Manager
Waverly Homes, LLC
3205 NE 78th Street, Suite 10
Vancouver, WA 98665
brett@mywaverlyhomes.com
(360) 524-2128

Location
Current Address: 2223 NW 43rd Avenue in Camas, Washington (Figure 1)
Clark County Parcel ID: 177887000 in the southwest ¼ of Section 34, Township 2 North, Range 3 East
Elevation: 360 to 374 feet NGVD29(47) (PBS 2017a)
City of Camas Comprehensive Plan Designation: Single-Family Medium (SFM)

2 DESCRIPTION OF THE PROPOSAL

The applicant proposes to develop a new residential subdivision of 12 lots for single-family detached dwellings (Figure 2). Each lot would contain a dwelling with an attached garage, paved driveway, and yard area. The proposed project would include a new street (Waverly Place) extending north from NW 43rd Avenue, then bending west and terminating in a hammerhead configuration. Waverly Place would approximately bisect the site with seven lots and a natural area on the north side and five lots on the south side of the street. New utilities and stormwater drainage infrastructure is also proposed. PBS Engineering and Environmental (PBS) has identified the following critical areas within the subject property per Title 16 of the Camas Municipal Code (CMC) (City of Camas 2018).

- Wetlands. PBS completed a wetland delineation report in October 2017. 0.53-acre of Category IV wetlands were delineated in the northeast part of the subject property (Appendix A) (PBS 2017b). The wetland has a 50-foot buffer that totals 0.63-acre (please note: the buffer boundary was re-drawn for this submittal with true 50-foot offsets from the wetland boundary. This reduced the buffer are by 0.01-acre compared to the March 9, 2018 report). The applicant proposes to fill 0.12-acre of the wetland and 0.54-acre of the buffer. The balance of the wetland and buffer acreage would be contained in a dedicated tract (Tract B shown on Figure 2). Ten (10) trees located in the in the wetland and buffer are proposed to be removed during site grading. Twenty-five (25) replacement trees would be planted in Tract B which exceeds the minimum 2:1 replacement ratio described in CMC Chapter 16.51.125.B. Permits requested: wetland permit and vegetation removal permit.

  As part of the wetland rating included with the wetland delineation report, wetlands within 300 feet of the subject property were mapped (Appendix A, Figure A). PBS' fieldwork and fieldwork conducted by other consultants on adjacent lands indicate the buffer for all wetlands is 50 feet. No shoreline areas, water features, floodplains, other critical areas or related buffers are known within 300 feet of the subject property.

- Critical Aquifer Recharge Areas (CARA). The City of Camas *CARA Map* (City of Camas 2012) does not indicate *Wells Serving Over 20 People* or *Wellhead Protection Areas* on or near the subject property. According to the Clark County GIS (Clark County 2018), the subject property is not within the *Critical Aquifer Recharge Area - Category 1* layer.

- Frequently Flooded Areas. PBS reviewed Flood Insurance Rate Map Number 53011C0531D (NFIP 2012) and the Clark County GIS (Clark County 2018). No frequently flooded areas occur within the subject property.

- Geologically Hazardous Areas. CMC Chapter 16.59.010 identifies four types of geologically hazardous areas: erosion hazard, landslide hazard, seismic hazard, or other geological events including, mass wasting, debris flows, rock falls, and differential settlement. The Clark County GIS (Clark County 2018) does not map the subject property in the *Severe Erosion Hazard* or *Landslide Hazard Areas* layers. The *Earthquake Hazard: NEHRP* layer designates *Site Class C* for ground shaking amplification potential, which is relatively low. The *Earthquake Hazard: Liquefaction* layer indicates *Low* liquefaction potential. The *Faults 24K* layer does not indicate any faults in the area. PBS completed a geotechnical engineering report for the subject property in December 2017 (Appendix B) (PBS 2017c). No geologically hazardous areas were identified.
- Fish and Wildlife Habitat Conservation Areas. CMC Chapter 16.61.010 identifies the following fish and wildlife habitat conservation areas:
    1. Areas with which state or federally designated endangered, threatened, and sensitive (TES) species have a primary association. No known TES species occur within the subject property.
    2. State Priority Habitats and areas associated with state priority species. The *Priority Habitats on the Web* mapper (WDFW 2018) does not indicate any Priority Habitats on or near the subject property.
    3. Habitats of local importance as identified by the city's parks and open space plan as natural open space. No Oregon White Oak or Camas Lily populations were observed during PBS' wetland field study.
    4. Naturally occurring ponds under 20 acres. No ponds occur on the subject property.
    5. Waters of the state. No non-wetland waters of the state occur on the subject property.
    6. Bodies of water planted with game fish by a governmental or tribal entity. No bodies of water occur on the subject property.
    7. State natural area preserves and natural resource conservation areas. No state natural area preserves or natural resource conservation areas occur within the subject property.

3 PREPARER

This Critical Areas Report was prepared by PBS' Professional Wetland Scientist Greg Swenson. Mr. Swenson has over 17 years of consulting experience in land and water resources assessment and permitting. Mr. Swenson conducted the fieldwork on September 15, 2017.

4 DESCRIPTION OF WETLANDS

PBS delineated Wetland A in the northeast part of the study area (Figure 2). The Cowardin (Cowardin et. Al. 1979) and hydrogeomorphic (HGM) (Hruby 2014) classifications of Wetland A are palustrine, emergent and slope, respectively. Dominant plant species consist of aggressive non-native invaders such as Himalayan Blackberry (*Rubus armeniacus*) and Reed Canary Grass (*Phalaris arundinacea*) with a few Oregon Ash (*Fraxinus latifolia*) trees with in the overstory (PBS 2017b). Soils within Wetland A are mapped as *Odne silt loam, 0 to 5 percent slopes* (NRCS 2018a). The hydric *Odne* mapping unit consists of poorly-drained soils formed in alluvium in basins and drainageways on terraces (NRCS 2018b). The fieldwork confirmed the presence of hydric soil indicators within the wetland boundary. Due to the late summer timing of the wetland delineation fieldwork, secondary hydrology indicators were documented to confirm the presence of wetland hydrology.

Wetland Rating & Buffer

PBS rated Wetland A as Category IV using the 2014 version of the *Washington State Wetland Rating System for Western Washington* (Hruby 2014). The proposed project has a density of more than one unit per acre, which

makes the project a high intensity land use. A Category IV wetland with a high intensity land use has a required buffer width of 50 feet, as per CMC Table 16.53.040-1, to protect water quality functions.

5 IMPACT MINIMIZATION

Due to the configuration of Wetland A, total avoidance of wetland and buffer impacts is not feasible and would be inconsistent with the City of Camas comprehensive plan. The applicant initially anticipated a 14-lot subdivision which would have resulted in filling 0.64-acre of wetland buffer and 0.43-acre of wetland (Figure 3). To minimize these impacts, the applicant removed two lots which reduced the impacts to the following:

Table 1. Proposed Impact Summary

Impact ID	Wetland Category	Cowardin Class	HGM Class	Proposed Impact
Wetland A	IV	Palustrine, emergent	Slope	0.12-ac. direct, permanent 0.20-ac. indirect, permanent
Wetland A Buffer	N/A	Upland	N/A	0.54-ac. direct, permanent

As proposed, the 0.42-acre Tract B would consist of 0.21-acre wetland buffer and 0.21-acre of avoided wetland.

Alternative Layouts Discussion

The preliminary lot layout has gone through several iterations to achieve the maximum amount of wetland and wetland buffer area, while still giving a sufficient number of reasonably-sized lots to provide an economically-viable project with marketable houses that meet the building coverage, height, and setback standards. One concept was presented in the pre-application conference (File No. PA17-31) and was discarded during the initial design phase as not avoiding enough of the wetlands, not providing any wetlands buffer, and not having enough turning width around the proposed street. Another 13-lot concept was developed which eliminated the looped street, but still did not avoid enough of the wetlands or provide any wetlands buffer. This concept was discarded as well without ever being presented to the City. The original submittal contained the third concept (Figure 3B) reducing the number of lots from 13 to 12, ending the new street in a hammerhead, and providing a tract containing avoided wetlands and wetlands buffer. The fourth concept submitted with this report (Figure 2) still has 12 lots but has increased the avoided wetlands from the previous 2,428 square feet to 9,091 square feet, with a buffer reduction from 24,657 square feet to 23,585 square feet for a net increase in Tract B from 17,039 square feet to 22,177 square feet.

The fourth concept proposes a buffer reduction as allowed per CMC 16.53.050.C.1.b. which states buffer widths may be reduced up to 25 percent if the buffer is restored or enhanced from a pre-project condition that is disturbed (e.g., dominated by invasive species), so that functions of the post-project wetland and buffer are equal or greater. It should be noted the subject site does not contain any other priority habitat areas necessitating a vegetated corridor of a minimum 100 feet wide between the wetland and priority habitat area. In the original submittal, the buffer area provided between 55 and 60 feet of depth between the wetland and the rear lot lines of Lots 1 through 5. In the fourth concept, this depth has been reduced to approximately 39 feet in depth.

Consistent with the buffer reduction, an enhancement plan has been included on Sheet L-102 showing plantings of a variety of native plants including Oregon ash, red osier dogwood, salmonberry, tufted hairgrass, and nootka rose. The proposed enhancement area is located in Tract B adjacent to the same wetland that is being impacted as required by priority in CMC 16.53.050.D.2.a.i. The proposed planting plan is providing wetland mitigation through enhancement as allowed per CMC 16.53.050.D.3.a.c. The goal is to enhance the

existing wetland functions by planting native vegetation as depicted on Sheet L-102, removing existing invasive and non-native plant species, and preserving existing significant trees within Tract B. The proposed ecological restoration approach will provide an overall net gain in native understory and canopy diversity with a functional lift in wetland habitat.

6 MITIGATION

Mitigation Sequencing

CMC 16.53.050.D.1. refers to sequencing for wetland activities, specifically requiring demonstration that a range of project alternatives were given consideration with the intent to avoid or minimize impacts to wetlands. The on-site wetlands are Category IV wetlands; the hierarchy in CMC 16.53.050.D.1. for Category IV wetlands is as follows:

- *Avoid impacts to wetlands unless avoiding all impact will result in a project that is not feasible to construct.*

The preliminary lot layout has gone through several iterations to achieve the maximum amount of wetland and wetland buffer area, while still giving a sufficient number of reasonably-sized lots to provide an economically-viable project with marketable houses that meet the building coverage, height, and setback standards. A close review of the existing wetlands boundary line and buffer area in relation to its proximity to the only available spot for an approach quickly reveals that complete avoidance of the delineated wetlands and buffer would eliminate the project. There is simply not enough area between the existing wetland buffer and where the new street needs to be placed to allow for meeting street design standards, specifically the turning radius necessary to safely negotiate the curve for automobiles and emergency services vehicles. Placing the approach anywhere other than the southeast corner of the site is not allowable because of sight distance requirements.

- *Minimize impacts to wetlands if complete avoidance is infeasible through seeking reasonable relief that may be provided through application of other city zoning and design standards and site design*

The fourth concept submitted with this report has increased the wetland avoidance area by 6,663 square feet by reducing lot depths and sizes of Lots 1 through 5. The south line of Tract B has been moved 5 feet to the south for a 5-foot depth reduction in Lots 1 through 5, which thereby decreases the lot sizes as well. The public street right-of-way width has been reduced from 52 feet to 41 feet by placing the required sidewalk and planter strip on its north side on the lots in easements rather than in the dedicated right-of-way. This reduction also allows for a shift to the south of Lots 1 through 5, thereby increasing depth dimension and area of Tract B. The changes presented in the current concept are utilizing requests for flexibility in lot size and rear setback standards for Lots 1 through 5 as per CMC 18.09.060.D. and a deviation request for the public local street standards pursuant to CMC 17.19.040.B.10.f. The flexibility and deviation requests are addressed in detail in the revised narrative.

- *Compensate for wetland impacts that will occur, after efforts to minimize have been exhausted, with findings that:*
  - *The affected wetlands are restored to the conditions existing at the time of the initiation of the project*

Sheet L-102 of the revised submitted plan set provides a wetland buffer enhancement plan for the entire area in Tract B designated as wetland buffer. The wetland area in Tract B will remain undisturbed and the seven

trees along the north boundary of Tract B will remain. Non-native, invasive plant species will be removed from the buffer area as part of the enhancement plan. Plantings of native trees and shrubs will take place and a monitoring plan will be put in place to ensure the viability of the enhancement plantings.

- *Unavoidable impacts are mitigated in accordance with Chapter 16.53*

The applicant proposes to offset the proposed wetland and buffer impacts by purchasing credits from the Terrace Mitigation Bank (TMB). The subject property is within the service area of TMB as required by CMC Chapter 16.53.050.D.2.b. and 16.53.050.D.5.a.iii. As further required under CMC Chapter 16.53.050.D.5.a.i., TMB is currently certified under state and federal rules, has palustrine, emergent and buffer (case-by-case) credits available, and the use of credits is consistent with the terms and conditions of the certified bank instrument. As per CMC Chapter 16.53.050.D.5.a.ii. and the TMB certified instrument, the following replacement ratios apply:

Table 2. Credit-Debit Ratios

Resource Impact	Bank Credits: Impact Acreage	Proposed Credits
Wetland, Category I	Case-by-Case	N/A
Wetland, Category II	1.2:1	N/A
Wetland, Category III	1:1	N/A
Wetland, Category IV	0.85:1	0.85*0.20=0.17 credit
Critical Area Buffer	Case-by-Case	0.20*0.57=0.114 credit[1]

[1]TMB contains both wetland and enhanced uplands within the bank boundary. A common concept is that upland areas associated with wetlands generates 1 mitigation credit for every 5 acres. In other words, each mitigation credit contains approximately 20% upland which equates to a 0.20:1 ratio.

- *Required mitigation is monitored and remedial action is taken when necessary to ensure the success of mitigation activities.*

The Terrace Mitigation Bank is monitored and maintained according to the approved mitigation bank instrument.

Location of Wetland Mitigation

The applicant acknowledges that CMC 16.53.050.D.2. prioritizes on-site mitigation over off-site mitigation. However, the applicant's proposal is consistent with the federal mitigation hierarchy which favors the use of mitigation bank credits over other forms of mitigation. This hierarchy exists because small mitigation areas have high failure rates and require a disproportionate amount of maintenance. In PBS' professional opinion, mitigation bank credits provide a better solution for this project.

7 PROTECTION OF TRACT B

During construction, the outer perimeter of Tract B would be marked with temporary orange construction/silt fencing to prevent unauthorized intrusion. The temporary fencing would be maintained through the entire construction period. A permanent vinyl-coated chain link fence is proposed along the perimeter of the tract for long-term protection. As required at CMC Chapter 16.53.040.C.2.b., signs would be installed, worded substantially as follows:

"Wetland and Buffer Area -- Retain in a natural state."

Tract B would be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be

recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

REFERENCES

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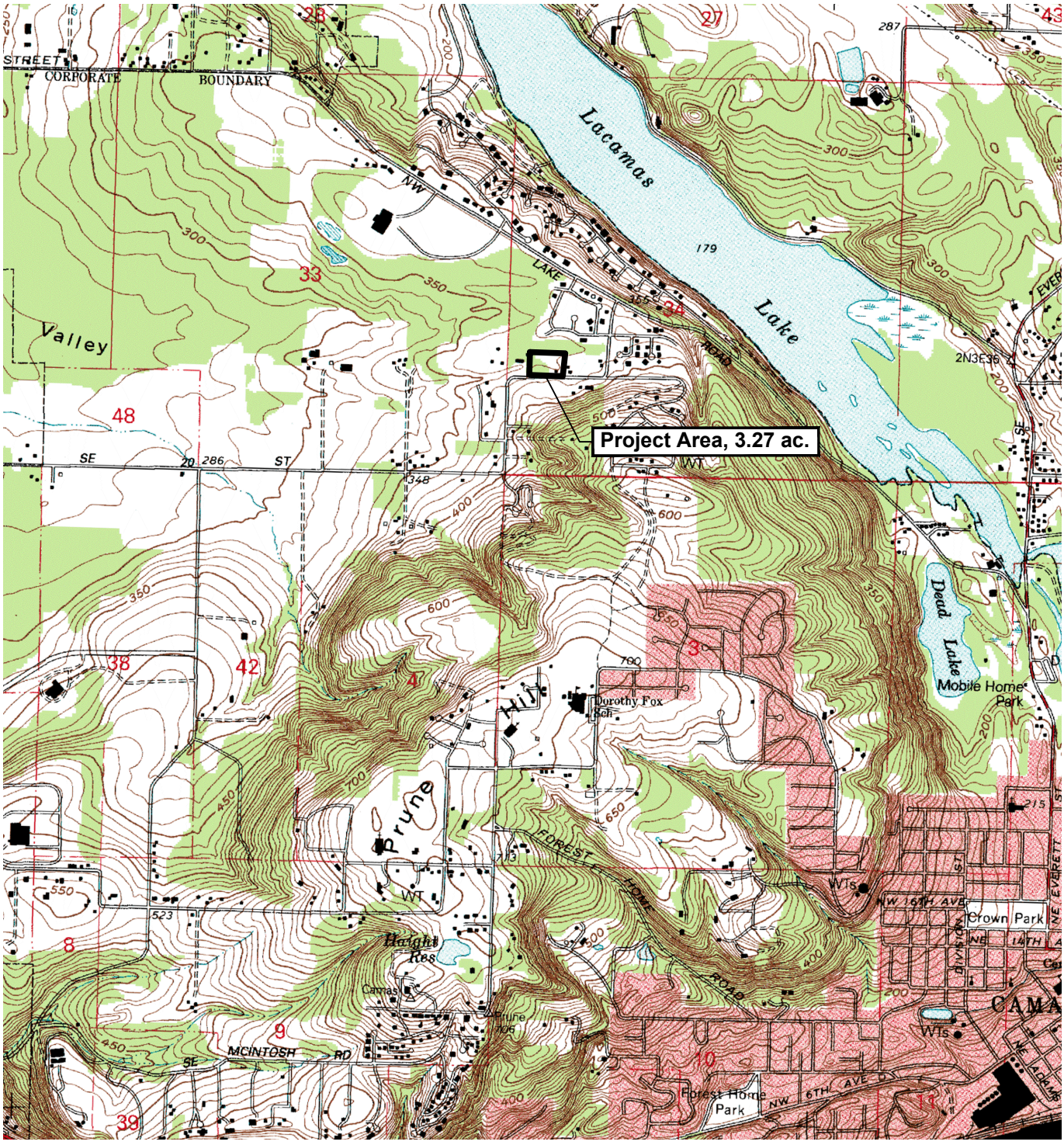

SOURCE: USGS CAMAS, WA-OR QUADRANGLE, 1993.

WASHINGTON

SCALE: 1" = 2,000'

0 1,000' 2,000' 4,000'

PREPARED FOR: WAVERLY HOMES.

VICINITY MAP

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAY 2018
75345.000

FIGURE
1

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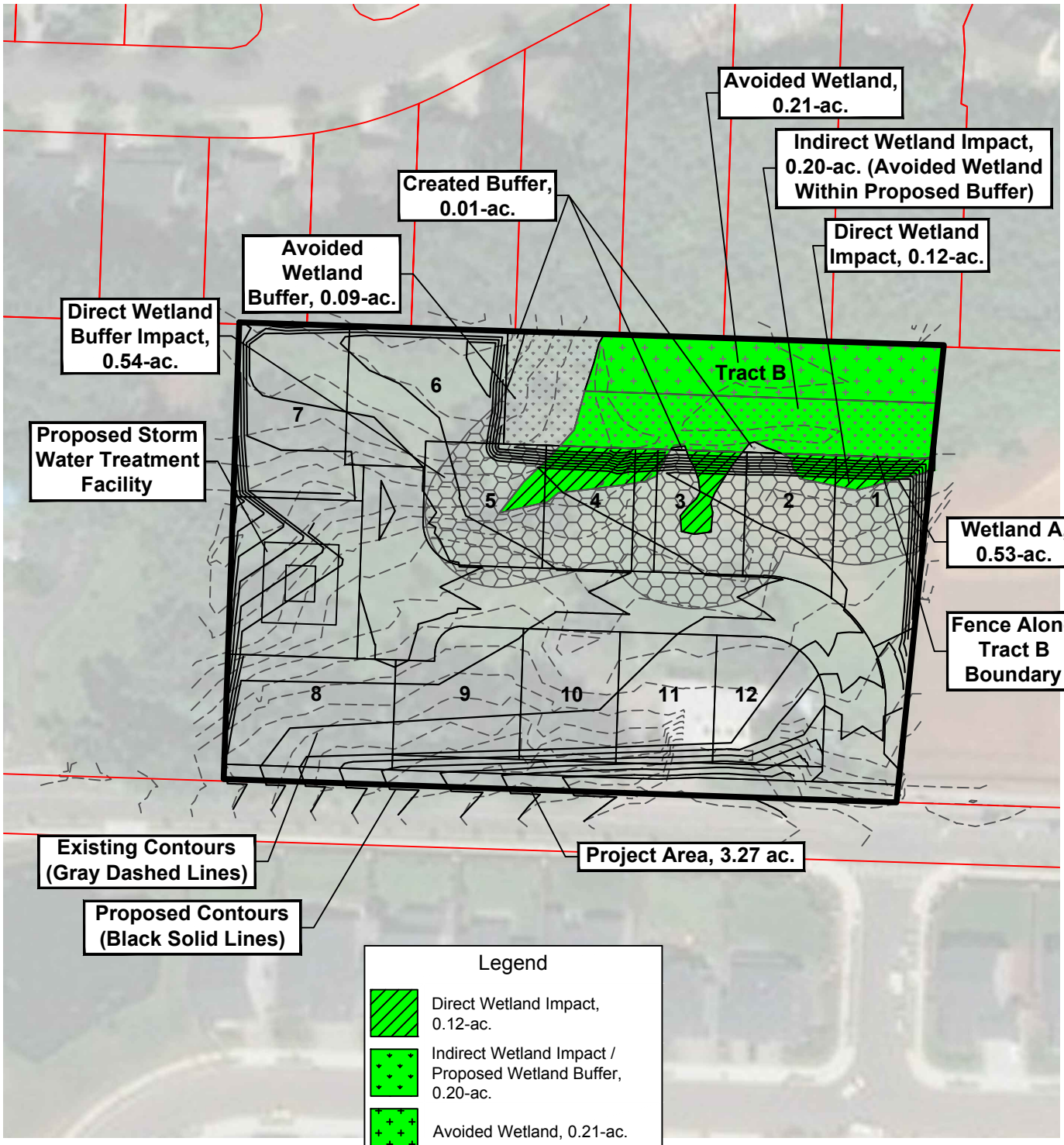

Legend

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- Indirect Wetland Impact / Proposed Wetland Buffer, 0.20-ac.
- Avoided Wetland, 0.21-ac.
- Direct Wetland Buffer Impact, 0.54-ac.
- Avoided & Created Wetland Buffer, 0.10-ac.

SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

N

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

PROPOSED DEVELOPEMENT - PLAN VIEW

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAY 2018
75345.000

FIGURE
2

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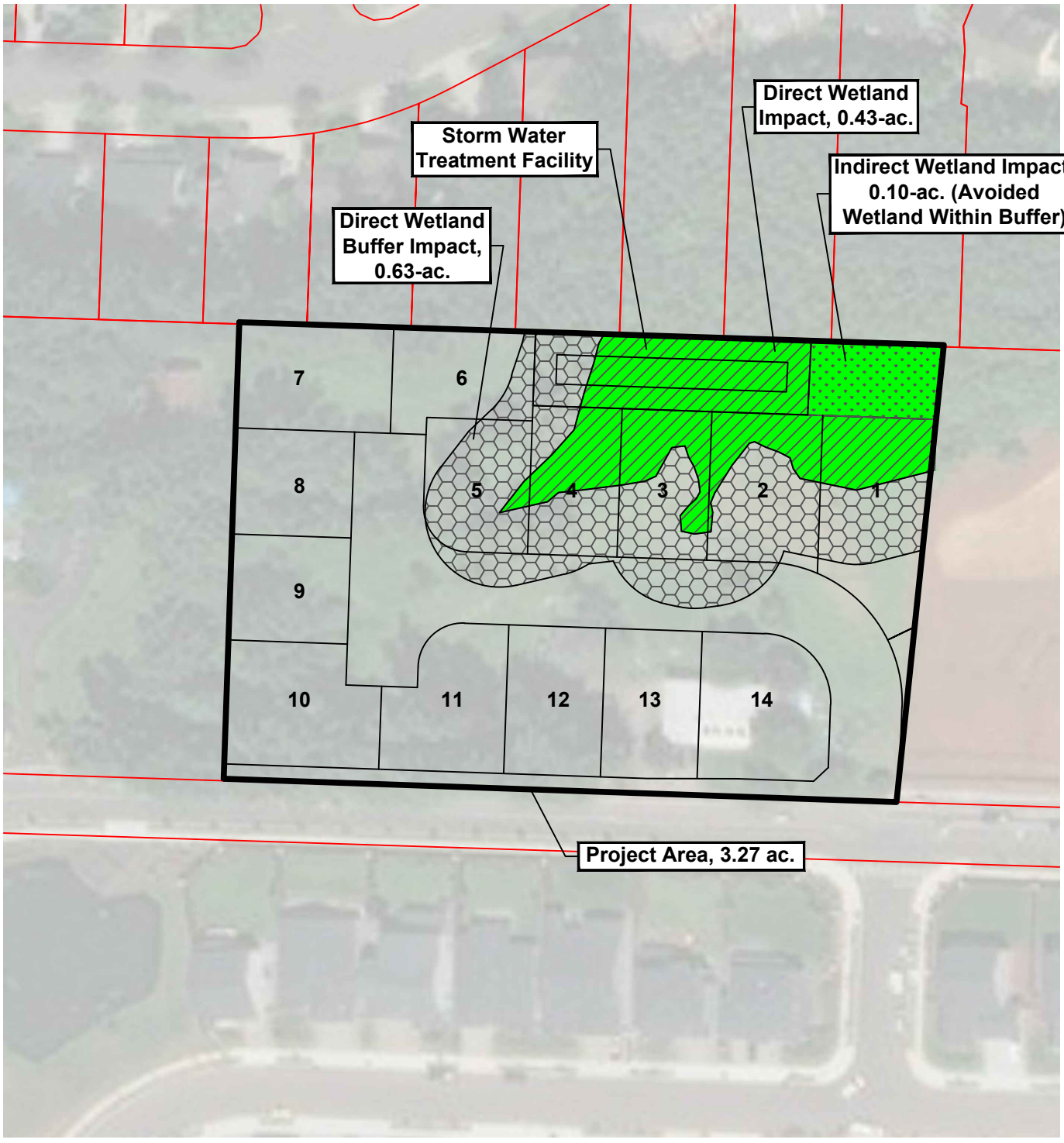

SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

Legend

- Direct Wetland Impact, 0.43-ac.
- Indirect Wetland Impact / Wetland Buffer, 0.10-ac.
- Direct Wetland Buffer Impact, 0.63-ac.

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

REJECTED ALTERNATIVE #1- PLAN VIEW

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAY 2018
75345.000

FIGURE
3A

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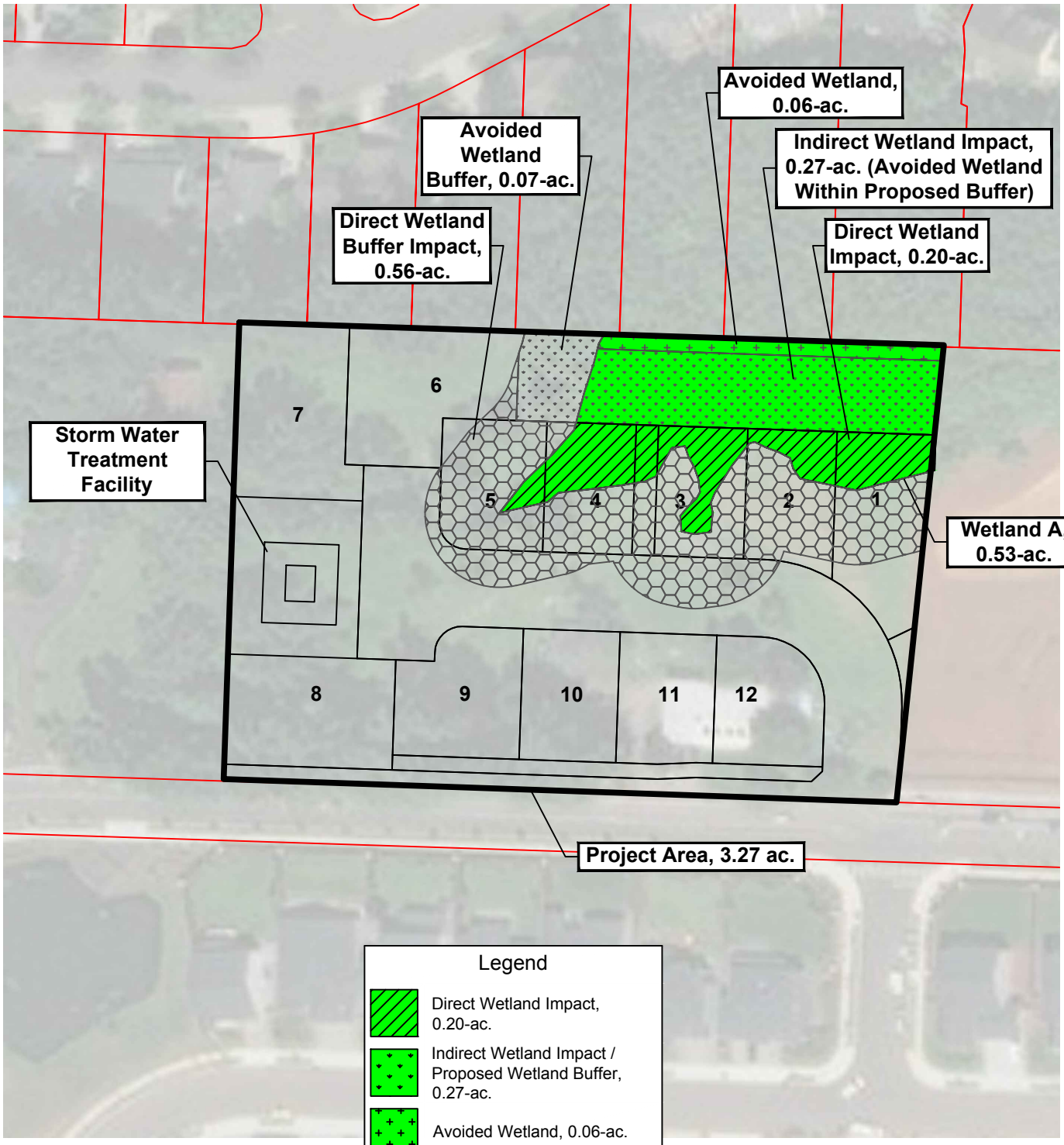

Legend

- Direct Wetland Impact, 0.20-ac.
- Indirect Wetland Impact / Proposed Wetland Buffer, 0.27-ac.
- Avoided Wetland, 0.06-ac.
- Direct Wetland Buffer Impact, 0.56-ac.
- Avoided Wetland Buffer, 0.07-ac.

SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

REJECTED ALTERNATIVE #2- PLAN VIEW

PARCEL NO. 177887000 CRITICAL AREAS REPORT
CAMAS, CLARK COUNTY, WASHINGTON

MAY 2018
75345.000

FIGURE
3B

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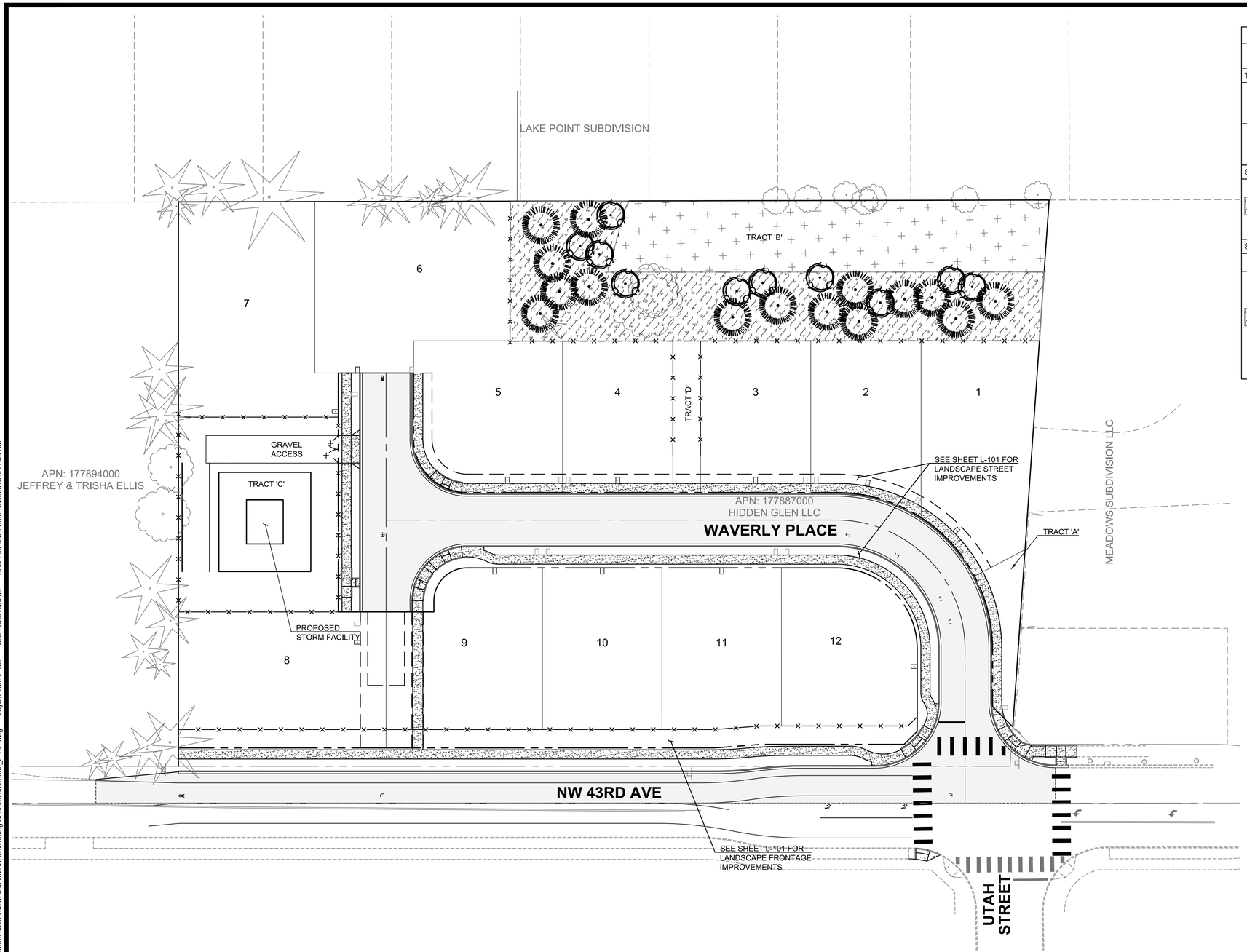

Scale 1" = 30'

0 15 30 60

PLANT LIST					
SYM	QTY	NAME	SIZE	CONT.	SPACING
TREES					
	10	*Fraxinus latifolia* Oregon Ash	2" Cal	B&B	As Shown
	15	*Thuja plicata* Western Red Cedar	6' Height	B&B	As Shown
SHRUBS					
	200 100 100 100 50 300	*Cornus sericea* - Red Osier Dogwood *Fraxinus latifolia* - Oregon Ash *Oemleria cerasiformis* - Indian plum *Rubus specatibilis* - Salmonberry *Sambucus racemosa* - Red Elderberry *Symphoricarpos albus* - Snowberry	18" minimum	Bare root	4' O.C. (randomly mixed throughout)
SEED MIX					
		'Shrub Swamp' Mix			
	13,100 SF (0.30 acres)	*Hordeum brachyantherum* - Meadow Barley *Bromus carinatus* - California Brome *Festuca rubra rubra* - Native Red Fescue *Glyceria occidentallis* - Northwestern Mannagrass *Deschampsia cespitosa* - Tufted Hairgrass *Agrostis exarata* - Spike Bentgrass *Rosa nutkana* - Nootka Rose *Symphoricarpos alba* - Common Snowberry *Spirea dougalsii* - Douglas Spirea *Mahonia aquafilolium* - Tall Oregon Grape *Holiduscus discolor* - Oceanspray			50lbs PLS / acre

NOTES:

1. No work or construction access shall occur within the wetland.
2. Wetland Buffer Enhancement work shall be completed prior to construction of site improvements as first priority of work
3. Seed of the type specified on this sheet shall be certified in accordance with WAC 16-302. 30 days prior to application the Contractor shall submit testing results for approval to the Wetland Specialist or Landscape Architect. Certification shall show each lot of seed of each specified species for verification, purity, germination, noxious weeds and other crop seeds.
4. Prior to seeding of the Wetland Buffer, soils shall be prepared by removing all undesirable vegetation and by scarification, cultivating or ripping the top 6 inches of the existing soils leaving a bare soil condition. All ruts and construction debris shall be removed in preparation for seeding.
5. Seeding application dates shall be hydroseeded in the Fall (September 1 to October 1) only unless approved by Wetland Scientist or Landscape Architect.
6. All plant installation within the Wetland Buffer shall be occur between October 1 to March 15.
7. City of Camas must receive written notice 30 days prior to any removal or replanting of vegetation.
8. Monitoring of vegetation survival may be required.

PRELIMINARY

PBS Engineering and Environmental Inc.
415 W 6th Street, Suite 601
Vancouver, WA 98660
360.695.3488
pbsusa.com

PRELIMINARY LANDSCAPE PLAN FOR:

43RD AVENUE SUBDIVISION

A SITE LOCATED IN THE CITY OF CAMAS, WASHINGTON

Know what's below. Call before you dig.

STATE OF WASHINGTON
JOHNA. NUTTBROCK
No. 1083 EXP. 05/4/2018
LICENSED LANDSCAPE ARCHITECT
PRELIMINARY

DESIGNED:	JAN
CHECKED:	JAN
APR 2018	75345.000
SHEET ID	L-102
SHEET	12 OF 12

Filename: L:\Projects\71000_FromOtherOffices\75000\75300-75399\75345\75345-000\Civil\CAD\Working\Sheets\75345-000_L-101.dwg Layout Tab: L-102 User: Dan Skolrud CAD Plot Date/Time: 4/26/2018 9:11:03 AM

Full Size Sheet Format Is 22x34; If Printed Size Is Not 22x34, Then This Sheet Format Has Been Modified & Indicated Drawing Scale Is Not Accurate.

APPENDIX A

Wetland Delineation Report for Clark County Parcel 177887000

Wetland Delineation Report for Clark County Parcel 177887000

2223 NW 43rd Avenue
Camas, Washington

Waverly Homes
3205 NE 78th Street, Suite 10
Vancouver, Washington 98665

October 8, 2017
PBS Project No. 75345.000

PBS
314 WEST 15TH STREET
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

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1 INTRODUCTION

PBS Engineering and Environmental (PBS) was contracted by Waverly Homes to conduct a wetland delineation in preparation of a new residential subdivision. The study area is located at 2223 NW 43rd Avenue, north of the Camas city center, Clark County, Washington (Appendix A, Figure 1). The 3.59-acre study area consists of Clark County parcel ID 177887000 in Township 2 North, Range 3 East, Section 34 (Clark County 2017). The delineation fieldwork was completed on September 15, 2017 by Greg Swenson, Professional Wetland Scientist.

The wetland boundaries described in this report are PBS' best professional opinion based on the circumstances and site conditions encountered at the time of this study. The final determination of the wetland boundary, classification, and required buffer will be made by local, state, and federal jurisdictions.

2 METHODS

The method used for delineating wetland boundaries followed the routine approach of the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys and Coast Supplement (Version 2.0)* (Supplement) (U.S. Army Corps of Engineers 2010). Soils, vegetation, and indicators of hydrology were recorded at four sample plot locations on standard wetland determination data forms (Appendix B). Wetland plant ratings were assigned based on the *2016 National Wetland Plant List* (Lichvar et. al. 2016). No modification of the standard methodologies was necessary during the delineation. Wetland boundaries, sample plot locations, and snapshot photograph locations (Appendix C) were recorded in the field using a Trimble GeoXT handheld GPS unit. The wetlands documented during the field study were rated using the *Washington State Wetland Rating System for Western Washington 2014 Update* (Hruby 2014). The Wetland Rating Form is included in Appendix D.

The following information was reviewed prior to the field study:

- U.S. Geological Survey 7.5-minute topographic quadrangle map for Camas, WA-OR (USGS 1993), included in Appendix A, Figure 1
- U.S. Fish and Wildlife Service National Wetlands Inventory (USFWS 2017)
- Clark County critical areas mapping (Clark County 2017), wetland polygon included in Appendix A, Figure 2
- Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2017a) soils map of the study area, included in Appendix A, Figure 3
- Aerial photograph (ESRI 2017), included as the background to Figures 2, 3, and 4 (Appendix A)
- Washington Department of Fish and Wildlife Priority Habitats and Species on the Web (WDFW 2017)
- Washington Department of Natural Resources Forest Practices Interactive Water Typing Map (i.e., Forest Practices Application Review System [FPARS]) (WDNR 2017)

3 RESULTS AND DISCUSSION

3.1 Topography

The study area is located at the eastern edge of the Willamette Valley Level IV Ecoregion 3a: Portland / Vancouver Basin (USGS 2017). This ecoregion is characterized by undulating terraces and floodplains at lower elevations (USGS 2017). Local upland topography is somewhat rolling with a gentle to moderate northward slope. A broad swale runs roughly east to west along the north part of the study area. According to previous

wetland delineation work conducted in the area (TRC 2015), the swale occupies the lowest elevations in the vicinity, most of which is north of the study area.

3.2 Plant Communities

Most plant species documented within the study area are aggressive non-native invaders. The upland plant community is dominated by Spreading Bent (*Agrostis stolonifera*), Himalayan Blackberry (*Rubus armeniacus*), and Canadian Thistle (*Cirsium arvense*) with occasional Oregon Ash (*Fraxinus latifolia*) saplings. The wetland plant community was dominated by similar weeds but had a greater amount of Oregon Ash with Reed Canary Grass (*Phalaris arundinacea*) in the understory.

3.3 Soils

According to the NRCS (NRCS 2017a), three soil mapping units occur within the study area: *Hesson clay loam, 0 to 8 percent slopes* (mapping unit HcB), *Hesson clay loam, 8 to 20 percent slopes* (mapping unit HcD), and *Odne silt loam, 0 to 5 percent slopes* (mapping unit OdB).

Hesson clay loam, 0 to 8 percent slopes and *Hesson clay loam, 8 to 20 percent slopes* are mapped in the northwest, west, and south parts of the study area. The non-hydric *Hesson* soil consists of well drained soils formed in old alluvium on high terraces and terrace escarpments (NRCS 2017b). Plot 1 was established in the *Hesson* mapping unit and was generally within the NRCS-described range of characteristics for the mapping unit.

The *Odne silt loam, 0 to 5 percent slopes* mapping unit occurs in the north and central parts of the study area. The hydric *Odne* unit consists of poorly drained soils formed in alluvium in basins and drainageways on terraces (NRCS 2017b). Plots 2, 3, and 4 were established within the mapped boundaries of the *Odne* unit. Plots 2 and 4 had hydric soil indicators but were outside the NRCS-described range of characteristics for the *Odne* soil. Plot 3 lacked hydric soil indicators.

3.4 Hydrology

The closest WETS climate station with a similar elevation as the study area is the Vancouver 4 NNE station (NRCS 2017c). Historical (1971-2000 period) average annual rainfall is listed as 41.51 inches in Vancouver. Recent precipitation data were not available from the WETS Vancouver 4 NNE station, therefore the recent data were obtained from the Vancouver Pearson Field Airport station (National Weather Service 2017). Table 1 shows the monthly precipitation averages for the water year preceding the field study.

Table 1. Observed and Normal Monthly Precipitation for Vancouver, Washington

Month	Actual	Vancouver, WA 1971-2000			% of Average	Above or Below Normal
		30% chance will have		Average		
		Less than	More than			
October 2016	8.22	1.87	3.87	3.18	258	Above
November 2016	6.88	4.15	7.39	6.18	111	Normal
December 2016	4.76	4.44	7.54	6.35	75	Normal
January 2017	4.31	3.74	6.83	5.69	76	Normal
February 2017	10.38	3.44	5.72	4.83	215	Above
March 2017	7.05	3.32	4.85	4.21	167	Above
April 2017	4.25	2.23	3.62	3.07	138	Above
May 2017	1.79	1.69	3.18	2.64	68	Normal
June 2017	1.24	1.16	2.11	1.76	70	Normal
July 2017	Trace	0.34	0.93	0.80	0	Below
August 2017	0.10	0.41	1.25	1.06	9	Below
September 1-15, 2017	0.09	0.39 (Prorated)	1.03 (Prorated)	0.88 (prorated)	10	Below
Water Year Through September 15, 2017	**49.07**	**27.18**	**48.32**	**40.65**	**121**	**Above**

Rainfall recorded prior to the field study was below average and below the normal range. Due to the late summer timing of the field study, all wetland data plots lacked primary hydrology indicators. The determination of wetland hydrology was based on the presence of two secondary hydrology indicators.

Hydrology modifications in the form of excavated ditches were observed during the field study. The ditches appeared to be old and poorly maintained. Nonetheless, their function for draining runoff from the south to the north and, ultimately, offsite, appeared to be intact. Excavated Ditch 1 appeared to augment seasonal hydrology to the south part of Wetland A while Excavated Ditch 2 appeared to somewhat drain the north part of Wetland A.

3.5 Existing Wetland Mapping

The configuration and area of the wetlands documented during the field study roughly corresponds to those mapped on the Clark County *Wetland Presence* mapping (Clark County 2017). The National Wetland Inventory (NWI) (USFWS 2017) does not map wetlands within the study area.

3.6 Findings

Wetland A (0.52-ac.) is located in the northeast part of the study area. The Cowardin (Cowardin et. al. 1979) and hydrogeomorphic (HGM) (Hruby 2014) classifications of Wetland A are palustrine, emergent and slope, respectively. Soils within Wetland A exhibited hydric soil indicators and secondary indicators of wetland hydrology were present. The contrasting uplands lacked hydric soils and wetland hydrology indicators. Landscape position was the primary method for identifying the upland / wetland boundary.

4 CONCLUSIONS

The wetland area, wetland rating, and local buffering requirements (City of Camas 2017) are shown below in Table 2.

Table 2. Wetland Summary

Wetland	Area (acre)	Wetland Rating	Wetland Buffer Dimensions (feet)
Wetland A	0.53	IV	50[1]

[1]Based on high intensity use.

5 JURISDICTION

Wetland A likely falls under local, state, and federal jurisdictions. Any impacts to jurisdictional wetlands, waters, and/or buffers will require review by USACE, Washington Department of Ecology, and the City of Camas. Excavated Ditch 1 appears to have been entirely created in uplands for the explicit purpose of facilitating stormwater drainage. The ditch appears to be outside of local, state, and federal jurisdictions. Excavated Ditch 2 appears to have been created in existing wetlands and is likely jurisdictional.

6 DISCLAIMER

This report is based on observations of vegetation, soils, and hydrology at the time of the study. Changing environmental conditions or human activities may alter those parameters which may change the conclusions presented in this report. The conclusions in this report represent the investigator's interpretation of the specified technical manuals and best available science and may not correspond with observations or conclusions of others, including government agencies.

This report was prepared to meet current local, state, and federal regulations. PBS is not responsible for changes made to regulations and reporting requirements after the report has been completed. Final authority regarding jurisdiction and permitting requirements rests with the appropriate agencies.

This report is for the exclusive use of the Client for design of the development and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the expressed written consent of the Client and PBS.

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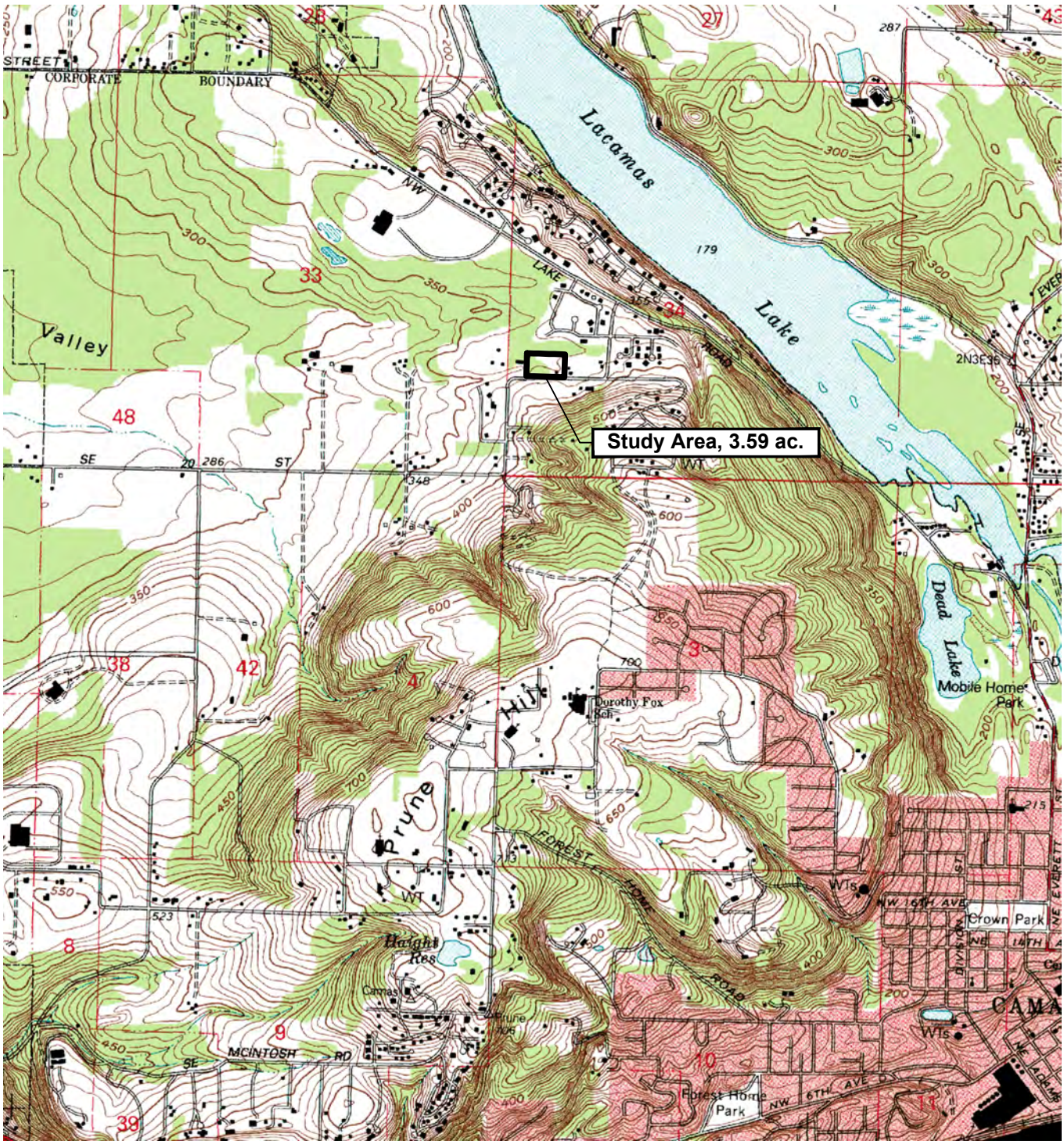
APPENDIX A

Figures



SOURCE: USGS CAMAS, WA-OR QUADRANGLE, 1993.

WASHINGTON

SCALE: 1" = 2,000'

0 1,000' 2,000' 4,000'

PREPARED FOR: WAVERLY HOMES.

VICINITY MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
1

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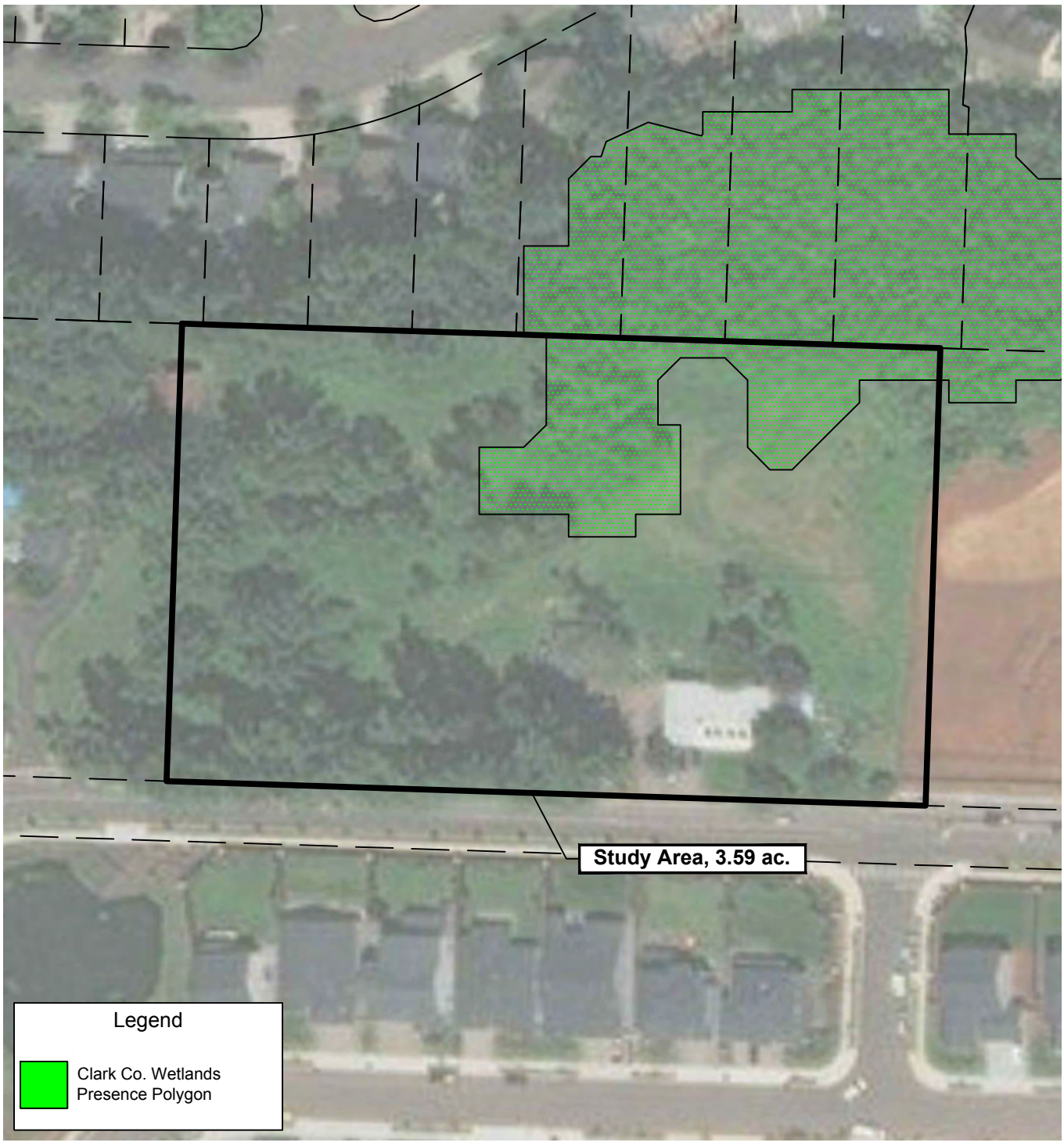

SOURCE: ESRI IMAGERY. CLARK CO. WETLAND PRESENCE POLYGON.

WASHINGTON

NO NWI WETLANDS MAPPED IN STUDY AREA

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

PBS

NATIONAL LOCAL WETLAND INVENTORY MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
2

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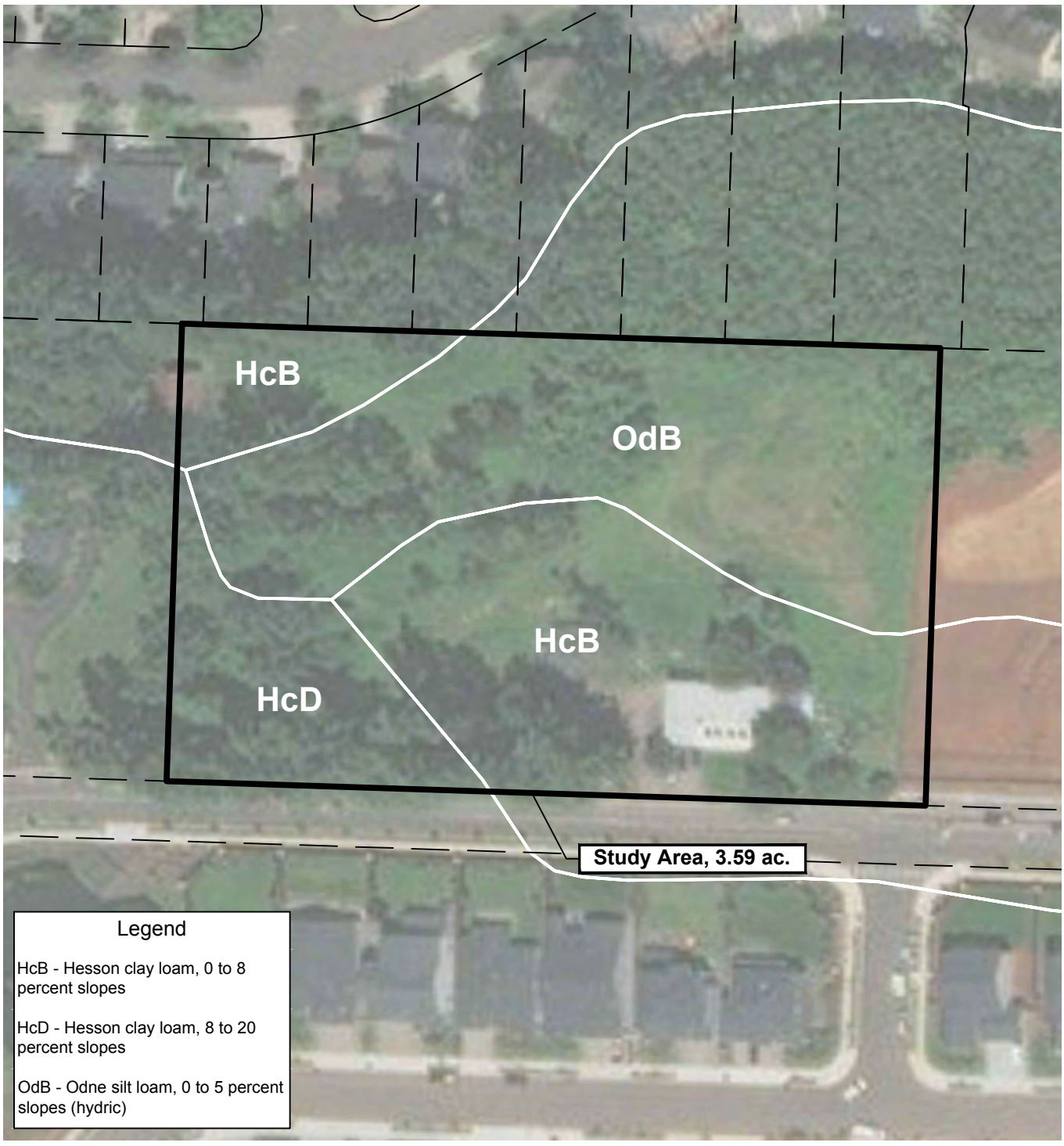


SOURCE: NRCS SOIL MAPPING POLYGONS. AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

SCALE: 1" = 100'

0 50' 100' 200'

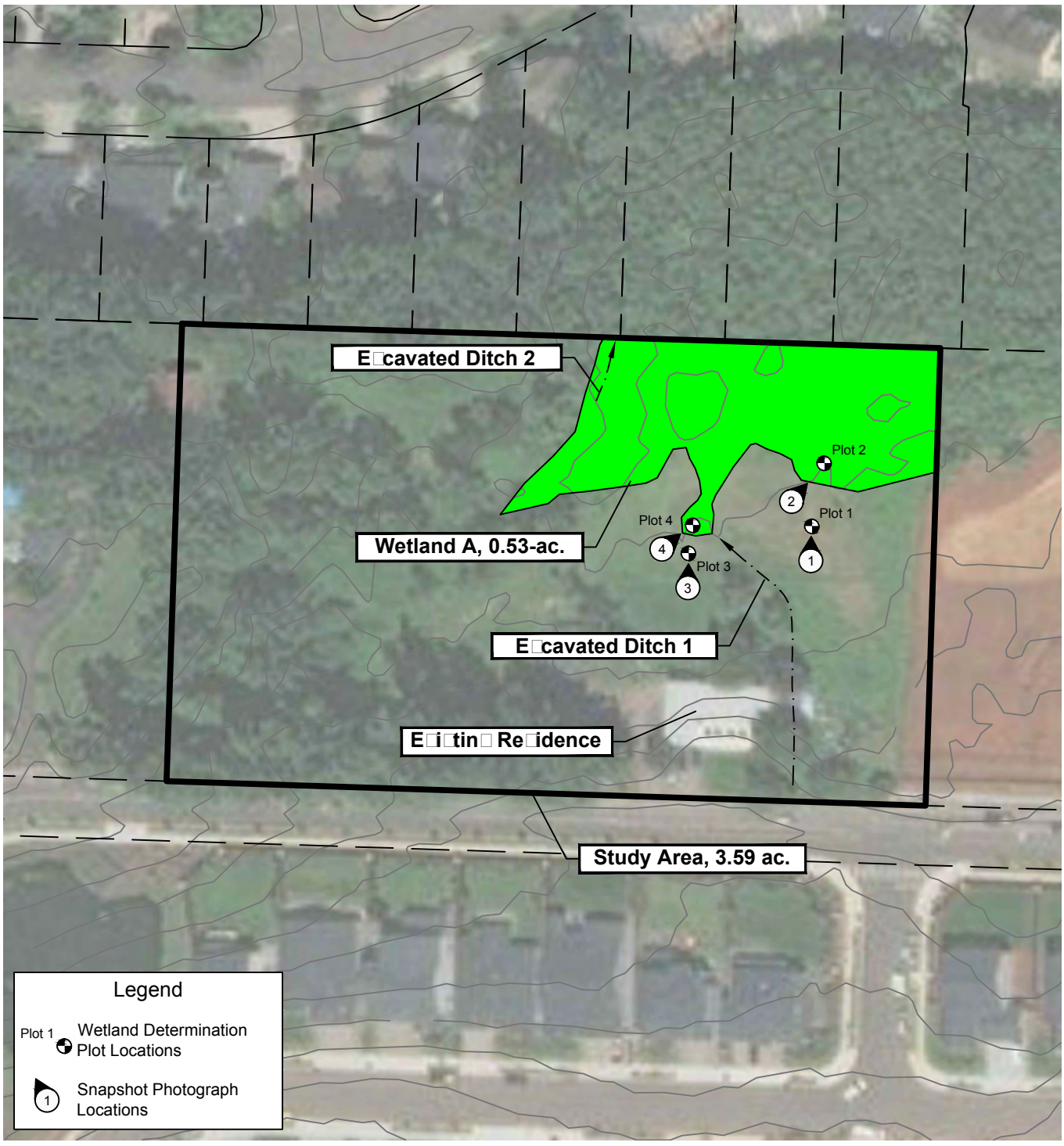
PREPARED FOR: WAVERLY HOMES.

SOIL MAPPING UNITS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
3



SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

SCALE: 1" = 100'

0 50' 100' 200'

PREPARED FOR: WAVERLY HOMES.

WETLAND DELINEATION MAP

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
4

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:28:58 PM

APPENDIX B

Wetland Data Forms

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 1
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Toeslope Local relief: Convex Slope (%): 4
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611040 Long: -122.431847 Datum: WGS84
Soil Map Unit Name: Hesson clay loam, 0 to 8 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes		No	**X**
Wetland Hydrology Present?	Yes		No	**X**

Is the Sampled Area within a wetland? **Yes** ____ **No** **X**

Remarks: Northeast part of study area, 115 feet south of north study area boundary and 80 feet west of east study area boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Fraxinus latifolia*	5	Yes	FACW
2.			
3.			
4.			
5.			
Total Cover:	5		
Herb Stratum (Plot size: 5' r)			
1. *Agrostis stolonifera*	85	Yes	FAC
2. *Cirsium arvense*	5	No	FAC
3. *Holcus lanatus*	5	No	FAC
4. *Schedonorus arundinaceus*	5	No	FAC
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	5 x 2 =	10
FAC species	100 x 3 =	300
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	105 (A)	310 (B)

Prevalence Index = B/A = 2.95

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No** ____

Remarks:

SOIL

Sampling Point: 1

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

Depth	Matrix		Redox Features				Texture	Remarks
(in.)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-12	5YR 3/2	100					scl	dry
12-16	5YR 3/2	100					cl	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.

[2]Location: 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]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present?

Yes ___ **No** X

Remarks:

Rock fragment refusal at 16".

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ___ 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, and 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 (D4)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (in):	
Water Table Present?	Yes ___	No X	Depth (in):	>16
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (in):	>16

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 2
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Broad swale Local relief: Concave Slope (%): 2
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611156 Long: -122.431817 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes	**X**	No	
Wetland Hydrology Present?	Yes	**X**	No	

Is the Sampled Area within a wetland? **Yes X** **No**

Remarks: Northeast part of study area, 35 feet north of Plot 1 and 1 foot lower.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Fraxinus latifolia*	10	Yes	FACW
2. *Rubus armeniacus*	5	Yes	FAC
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95	Yes	FACW
2. *Cirsium arvense*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0 x 1 =	
FACW species	105 x 2 =	210
FAC species	10 x 3 =	30
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	115 (A)	240 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks:

SOIL

Sampling Point: 2

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

Depth (in.)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-12	7.5YR 2.5/2	95	7.5YR 3/4	5	C	M	cl	dry
12-20+	7.5YR 2.5/2	95	7.5YR 3/4	5	C	M	c	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10)
	Red Parent Material (TF2)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks:

12-20+" horizon has 1% rounded gravels and 10% 5YR 4/6 sandy parent material.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**		Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
	High Water Table (A2)				
	Saturation (A3)		Salt Crust (B11)		Drainage Patterns (B10)
	Water Marks (B1)		Aquatic Invertebrates (B13)		Dry-Season Water Table (C2)
	Sediment Deposits (B2)		Hydrogen Sulfide Odor (C1)		Saturation Visible on Aerial Imagery (C9)
	Drift Deposits (B3)		Oxidized Rhizospheres along Living Roots (C3)	X	Geomorphic Position (D2)
	Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)		Shallow Aquitard (D3)
	Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils (C6)	X	FAC-Neutral Test (D5)
	Surface Soil Cracks (B6)		Stunted or Stressed Plants (D1) (**LRR A**)		Raised Ant Mounds (D6) (**LRR A**)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)		Frost-Heave Hummocks (D4)
	Sparsely Vegetated Concave Surface (B8)				

Field Observations:

Surface Water Present?	Yes		No X	Depth (in):	
Water Table Present?	Yes		No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes		No X	Depth (in):	>20

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 3
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Toeslope Local relief: Convex Slope (%): 4
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.610984 Long: -122.432168 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes **X** No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	**X**	No	
Hydric Soil Present?	Yes		No	**X**
Wetland Hydrology Present?	Yes		No	**X**

Is the Sampled Area within a wetland? **Yes** **No** **X**

Remarks: Northeast part of study area, 140 feet south of north study area boundary and 165 west of east study area boundary.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1. *Rubus armeniacus*	15	Yes	FAC
2.			
3.			
4.			
5.			
Total Cover:	15		
Herb Stratum (Plot size: 5' r)			
1. *Cirsium arvense*	50	Yes	FAC
2. *Agrostis stolonifera*	40	Yes	FAC
3. *Phalaris arundinacea*	10	No	FACW
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	10 x 2 =	20
FAC species	105 x 3 =	315
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	115 (A)	335 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** **X** **No**

Remarks:

SOIL

Sampling Point: 3

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

Depth	Matrix		Redox Features				Texture	Remarks
(in.)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-15	7.5YR 2.5/2	100					c	dry
15-20+	7.5YR 3/2	100					sc	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: 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]:

- ___ 2 cm Muck (A10)
- ___ Red Parent Material (TF2)
- ___ Very Shallow Dark Surface (TF12)
- ___ Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present?

Yes ___ **No** X

Remarks:

15-20+" horizon has 10% 5YR 4/6 sandy parent material inclusions.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ 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 (B9) (**except MLRA 1, 2, 4A, and 4B)**
- ___ 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, and 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 (D4)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (in):	
Water Table Present?	Yes ___	No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (in):	>20

Wetland Hydrology Present?

Yes ___ **No** X

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

Remarks:

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

Project/Site: Clark Co. Parcel 177887000 City/County: Camas / Clark Sampling Date: 9/15/2017
Applicant/Owner: Waverly Homes State: Washington Sampling Point: 4
Investigator(s): G. Swenson Section/Township/Range: Sec. 34, T. 2N, R. 3E
Landform (hillslope, terrace etc.): Broad swale Local relief: Concave Slope (%): 3
Subregion (LRR): A - Northwest Forests and Coast Lat: 45.611036 Long: -122.432160 Datum: WGS84
Soil Map Unit Name: Odne, 0 to 5 percent slopes NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____ ,Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? (If needed, explain any answers in remarks) Yes X No
Are Vegetation ____ ,Soil ____ , or Hydrology ____ naturally problematic?

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

Hydrophytic Vegetation Present?	Yes	X	No	
Hydric Soil Present?	Yes	X	No	
Wetland Hydrology Present?	Yes	X	No	

Is the Sampled Area within a wetland? Yes X No

Remarks: Northeast part of study area, 20 feet north of Plot 3 and 1 foot lower.

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
Total Cover:	0		
Sapling/Shrub Stratum (Plot size: 30' r)			
1.			
2.			
3.			
4.			
5.			
Total Cover:	0		
Herb Stratum (Plot size: 5' r)			
1. *Phalaris arundinacea*	95	Yes	FACW
2. *Cirsium arvense*	5	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum (Plot Size: 30' r)			
1.			
2.			
Total Cover:	0		

% Bare Ground in Herb Stratum 0 %

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:
OBL species	0 x 1 =	
FACW species	95 x 2 =	190
FAC species	5 x 3 =	15
FACU species	0 x 4 =	
UPL species	0 x 5 =	
Column Totals:	100 (A)	205 (B)

Prevalence Index = B/A = 2.05

Hydrophytic Vegetation Indicators:
- 1- Rapid Test for Hydrophytic Vegetation
- X 2- Dominance Test is >50%
- 3- Prevalence Index is ≤3.0[1]
- 4- Morphological Adaptations1 (Provide supporting data in Remarks or on a separate sheet)
- 5- Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: 4

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

Depth (in.)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 3/2	95	7.5YR 4/4	5	C	M	cl	dry
14-16	7.5YR 4/4	95	2.5Y 2.5/1	5	C	M	scl	dry

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

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

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

Indicators for Problematic Hydric Soils[3]:

	2 cm Muck (A10)
	Red Parent Material (TF2)
	Very Shallow Dark Surface (TF12)
	Other (Explain in Remarks)

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

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present? **Yes** X **No**

Remarks: Refusal at 16" due to rock fragment. 0-14" horizon has 5% bits of black charcoal. 14-16" horizon has 20% 7.5YR 5/8 sandy parent material throughout. 2.5Y 2.5/1 redox concentrations/concretions increase with depth.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

	Surface Water (A1)		Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B)**
	High Water Table (A2)		
	Saturation (A3)		Salt Crust (B11)
	Water Marks (B1)		Aquatic Invertebrates (B13)
	Sediment Deposits (B2)		Hydrogen Sulfide Odor (C1)
	Drift Deposits (B3)		Oxidized Rhizospheres along Living Roots (C3)
	Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)
	Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils (C6)
	Surface Soil Cracks (B6)		Stunted or Stressed Plants (D1) (**LRR A**)
	Inundation Visible on Aerial Imagery (B7)		Other (Explain in Remarks)
	Sparsely Vegetated Concave Surface (B8)		

Secondary Indicators (2 or more required)

	Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B)**
	Drainage Patterns (B10)
	Dry-Season Water Table (C2)
	Saturation Visible on Aerial Imagery (C9)
X	Geomorphic Position (D2)
	Shallow Aquitard (D3)
X	FAC-Neutral Test (D5)
	Raised Ant Mounds (D6) (**LRR A**)
	Frost-Heave Hummocks (D4)

Field Observations:

Surface Water Present?	Yes	No X	Depth (in):	
Water Table Present?	Yes	No X	Depth (in):	>20
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (in):	>20

Wetland Hydrology Present? **Yes** X **No**

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

Remarks:

APPENDIX C

Snapshot Photographs

Photo 1. Panoramic photo of the east-central part of the study area (upland). View is to the north. Sample plot 1 is visible just left of center. Photo taken September 15, 2017.

Photo 2. Panoramic photo of the northeast part of the study area (Wetland A). View is to the northeast. Sample plot 2 is visible in the center. Photo taken September 15, 2017.

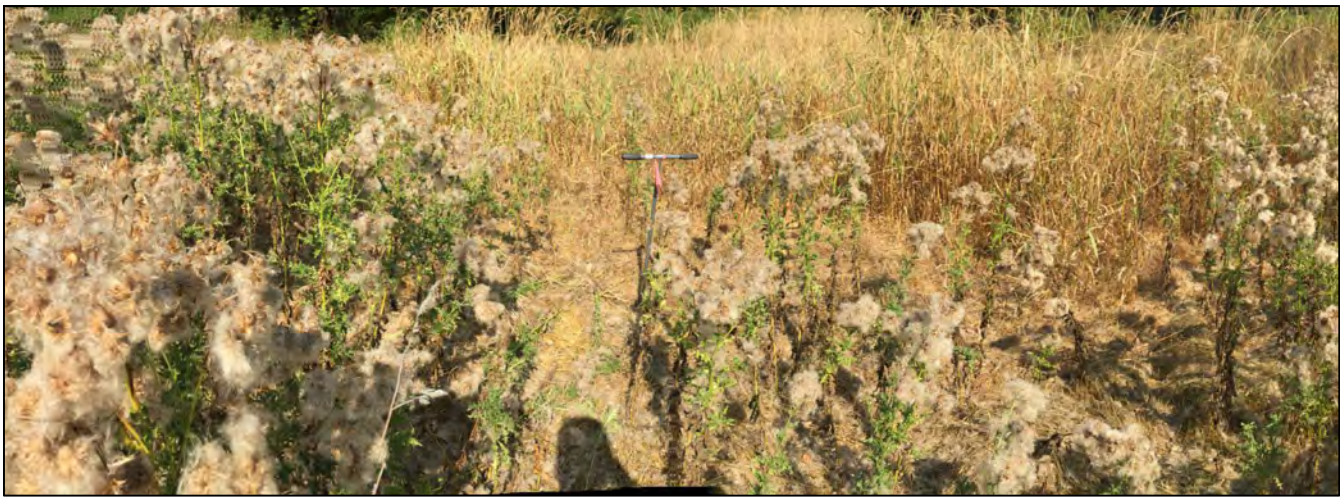


Photo 3. Panoramic photo of the central part of the study area (upland). View is to the north. Sample plot 3 is visible in the center. Photo taken September 15, 2017.

Photo 4. Panoramic photo Wetland A where Excavated Ditch 1 (not visible) discharges. View is to the northeast. Sample plot 4 is visible in the center. Photo taken September 15, 2017.

APPENDIX D

Wetland Rating Form & Figures

Wetland name or number A

RATING SUMMARY – Western Washington

Name of wetland (or ID #): Wetland A Date of site visit: 9/15/17

Rated by Greg Swenson Trained by Ecology? Yes No Date of training 9/24-25/14

HGM Class used for rating Slope Wetland has multiple HGM classes? Y X N

NOTE: **Form is not complete without the figures requested** *(figures can be combined)*.

Source of base aerial photo/map ESRI / ArcGIS

OVERALL WETLAND CATEGORY ____ (based on functions X or special characteristics___)

1. Category of wetland based on FUNCTIONS

_____**Category I** – Total score = 23 - 27

_____**Category II** – Total score = 20 - 22

_____**Category III** – Total score = 16 - 19

X **Category IV** – Total score = 9 - 15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
		Circle the appropriate ratings		
Site Potential	H M (L)	H (M) L	H M (L)	
Landscape Potential	H (M) L	H (M) L	H M (L)	
Value	(H) M L	H M (L)	H (M) L	**TOTAL**
Score Based on Ratings	6	5	4	15

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY
Estuarine	**I II**
Wetland of High Conservation Value	**I**
Bog	**I**
Mature Forest	**I**
Old Growth Forest	**I**
Coastal Lagoon	**I II**
Interdunal	**I II III IV**
None of the above	X

Wetland name or number A

Maps and figures required to answer questions correctly for Western Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	D 1.3, H 1.1, H 1.4	
Hydroperiods	D 1.4, H 1.2	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 4.3, D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	
Hydroperiods	H 1.2	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of unit vs. width of stream *(can be added to another figure)*	R 4.1	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	L 1.1, L 4.1, H 1.1, H 1.4	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes	H 1.1, H 1.4	A
Hydroperiods	H 1.2	A
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	A
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	A
Boundary of 150 ft buffer (can be added to another figure)	S 2.1, S 5.1	A
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	B
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	C
Screen capture of list of TMDLs for WRIA in which unit is found (from web)	S 3.3	D

Wetland name or number A

HGM Classification of Wetlands in Western Washington

For questions 1-7, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

1. Are the water levels in the entire unit usually controlled by tides except during floods?

   (NO) – go to 2 **YES** – the wetland class is **Tidal Fringe** – go to 1.1

   1.1 Is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)?

   NO – Saltwater Tidal Fringe (Estuarine) **YES – Freshwater Tidal Fringe**
   *If your wetland can be classified as a Freshwater Tidal Fringe use the forms for **Riverine** wetlands. If it is Saltwater Tidal Fringe it is an **Estuarine** wetland and is not scored. This method **cannot** be used to score functions for estuarine wetlands.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.

   (NO) – go to 3 **YES** – The wetland class is **Flats**
   *If your wetland can be classified as a Flats wetland, use the form for **Depressional** wetlands.*

3. Does the entire wetland unit **meet all** of the following criteria?
   ___The vegetated part of the wetland is on the shores of a body of permanent open water (without any plants on the surface at any time of the year) at least 20 ac (8 ha) in size;
   ___At least 30% of the open water area is deeper than 6.6 ft (2 m).

   NO – go to 4 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

4. Does the entire wetland unit **meet all** of the following criteria?
   X The wetland is on a slope (*slope can be very gradual*),
   X The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks,
   X The water leaves the wetland **without being impounded**.

   NO – go to 5 (YES) **–** The wetland class is **Slope**

   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 ft deep).

5. Does the entire wetland unit **meet all** of the following criteria?
   ___The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river,
   ___The overbank flooding occurs at least once every 2 years.

Wetland name or number A

(NO) – go to 6 **YES** – The wetland class is **Riverine**

NOTE: The Riverine unit can contain depressions that are filled with water when the river is not flooding

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year? *This means that any outlet, if present, is higher than the interior of the wetland.*

(NO) – go to 7 **YES** – The wetland class is **Depressional**

7. Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding? The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

(NO) – go to 8 **YES** – The wetland class is **Depressional**

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

   NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary of depression	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A

SLOPE WETLANDS

Water Quality Functions - Indicators that the site functions to improve water quality

S 1.0. Does the site have the potential to improve water quality?	
S 1.1. Characteristics of the average slope of the wetland: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft of horizontal distance*) Slope is 1% or less points = 3 Slope is > 1%-2% points = 2 Slope is > 2%-5% points = 1 Slope is greater than 5% points = 0	2
S 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions)*: Yes = 3 No = 0	0
S 1.3. Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 in.* Dense, uncut, herbaceous plants > 90% of the wetland area points = 6 Dense, uncut, herbaceous plants > ½ of area points = 3 Dense, woody, plants > ½ of area points = 2 Dense, uncut, herbaceous plants > ¼ of area points = 1 Does not meet any of the criteria above for plants points = 0	2
Total for S 1 Add the points in the boxes above	4

Rating of Site Potential If score is: ___**12 = H** ___**6-11 = M** X **0-5 = L** *Record the rating on the first page*

S 2.0. Does the landscape have the potential to support the water quality function of the site?	
S 2.1. Is > 10% of the area within 150 ft on the uphill side of the wetland in land uses that generate pollutants? Yes = 1 No = 0	1
S 2.2. Are there other sources of pollutants coming into the wetland that are not listed in question S 2.1? Other sources _____ Yes = 1 No = 0	0
Total for S 2 Add the points in the boxes above	1

Rating of Landscape Potential If score is: X **1-2 = M** ___**0 = L** *Record the rating on the first page*

S 3.0. Is the water quality improvement provided by the site valuable to society?	
S 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, lake, or marine water that is on the 303(d) list? Yes = 1 No = 0	0
S 3.2. Is the wetland in a basin or sub-basin where water quality is an issue? *At least one aquatic resource in the basin is on the 303(d) list*. Yes = 1 No = 0	1
S 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality? *Answer YES if there is a TMDL for the basin in which unit is found.* Yes = 2 No = 0	2
Total for S 3 Add the points in the boxes above	3

Rating of Value If score is: X **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

SLOPE WETLANDS

Hydrologic Functions - Indicators that the site functions to reduce flooding and stream erosion

S 4.0. Does the site have the potential to reduce flooding and stream erosion?	
S 4.1. Characteristics of plants that reduce the velocity of surface flows during storms: Choose the points appropriate for the description that best fits conditions in the wetland. *Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows.* Dense, uncut, **rigid** plants cover > 90% of the area of the wetland points = 1 All other conditions points = 0	1

Rating of Site Potential If score is: X **1 = M** ___**0 = L** *Record the rating on the first page*

S 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
S 5.1. Is more than 25% of the area within 150 ft upslope of wetland in land uses or cover that generate excess surface runoff? Yes = 1 No = 0	1

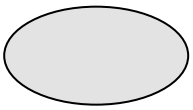
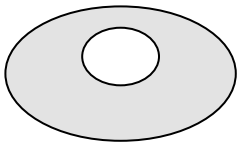
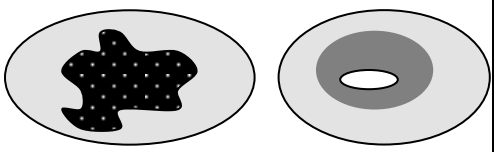
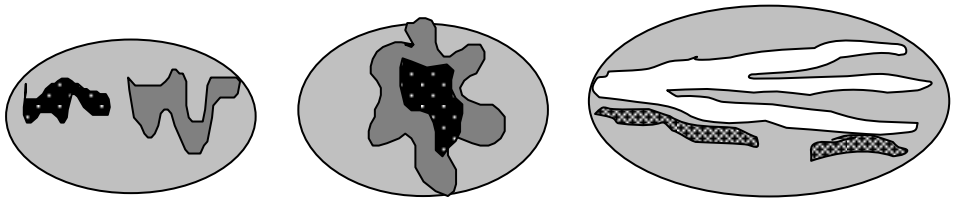
Rating of Landscape Potential If score is: X **1 = M** ___**0 = L** *Record the rating on the first page*

S 6.0. Are the hydrologic functions provided by the site valuable to society?	
S 6.1. Distance to the nearest areas downstream that have flooding problems: The sub-basin immediately down-gradient of site has flooding problems that result in damage to human or natural resources (e.g., houses or salmon redds) points = 2 Surface flooding problems are in a sub-basin farther down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2. Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for S 6 Add the points in the boxes above	0

Rating of Value If score is: ___**2-4 = H** ___**1 = M** X **0 = L** *Record the rating on the first page*

NOTES and FIELD OBSERVATIONS:

Wetland name or number _A__

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	
H 1.0. Does the site have the potential to provide habitat?	
H 1.1. Structure of plant community: *Indicators are Cowardin classes and strata within the Forested class.* Check the Cowardin plant classes in the wetland. *Up to 10 patches may be combined for each class to meet the threshold of ¼ ac or more than 10% of the unit if it is smaller than 2.5 ac. Add the number of structures checked.* ____Aquatic bed — 4 structures or more: points = 4 __X__Emergent — 3 structures: points = 2 ____Scrub-shrub (areas where shrubs have > 30% cover) — 2 structures: points = 1 __X__Forested (areas where trees have > 30% cover) — 1 structure: points = 0 *If the unit has a Forested class, check if:* ____The Forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the Forested polygon	1
H 1.2. Hydroperiods Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ ac to count (*see text for descriptions of hydroperiods*). ____Permanently flooded or inundated — 4 or more types present: points = 3 __X__Seasonally flooded or inundated — 3 types present: points = 2 ____Occasionally flooded or inundated — 2 types present: points = 1 ____Saturated only — 1 type present: points = 0 ____Permanently flowing stream or river in, or adjacent to, the wetland ____Seasonally flowing stream in, or adjacent to, the wetland ____**Lake Fringe wetland** — **2 points** ____**Freshwater tidal wetland** — **2 points**	0
H 1.3. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. *Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.* ***Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Canadian thistle*** If you counted: > 19 species — points = 2 5 - 19 species — points = 1 < 5 species — points = 0	1
H 1.4. Interspersion of habitats Decide from the diagrams below whether interspersion among Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, moderate, low, or none. *If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points  **Low** = 1 point  **Moderate** = 2 points All three diagrams in this row are **HIGH** = 3points 	2

Wetland name or number A

H 1.5. Special habitat features: Check the habitat features that are present in the wetland. *The number of checks is the number of points.* X Large, downed, woody debris within the wetland (> 4 in diameter and 6 ft long). X Standing snags (dbh > 4 in) within the wetland ____Undercut banks are present for at least 6.6 ft (2 m) **and/or** overhanging plants extends at least 3.3 ft (1 m) over a stream (or ditch) in, or contiguous with the wetland, for at least 33 ft (10 m) ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 30 degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)* ____At least ¼ ac of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated *(structures for egg-laying by amphibians)* ____Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)	2
Total for H 1 Add the points in the boxes above	6

Rating of Site Potential If score is:___**15-18 = H** ___**7-14 = M** X **0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support the habitat functions of the site?	
H 2.1. Accessible habitat (include *only habitat that directly abuts wetland unit*). *Calculate:* % undisturbed habitat 0 **+** [(% moderate and low intensity land uses)/2] 0.5 **=** 0.5 % If total accessible habitat is: > 1/3 (33.3%) of 1 km Polygon points = 3 20-33% of 1 km Polygon points = 2 10-19% of 1 km Polygon points = 1 < 10% of 1 km Polygon points = 0	0
H 2.2. Undisturbed habitat in 1 km Polygon around the wetland. *Calculate:* % undisturbed habitat 17 **+** [(% moderate and low intensity land uses)/2] 6.5 **=** 23.5 % Undisturbed habitat > 50% of Polygon points = 3 Undisturbed habitat 10-50% and in 1-3 patches points = 2 Undisturbed habitat 10-50% and > 3 patches points = 1 Undisturbed habitat < 10% of 1 km Polygon points = 0	1
H 2.3. Land use intensity in 1 km Polygon: If > 50% of 1 km Polygon is high intensity land use points = (- 2) ≤ 50% of 1 km Polygon is high intensity points = 0	-2
Total for H 2 Add the points in the boxes above	-1

Rating of Landscape Potential If score is:___**4-6 = H** ___**1-3 = M** X **< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose only the highest score that applies to the wetland being rated.* Site meets ANY of the following criteria: points = 2 — It has 3 or more priority habitats within 100 m (see next page) — It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists) — It is mapped as a location for an individual WDFW priority species — It is a Wetland of High Conservation Value as determined by the Department of Natural Resources — It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats (listed on next page) within 100 m points = 1 Site does not meet any of the criteria above points = 0	1

Rating of Value If score is:___**2 = H** X **1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

WDFW Priority Habitats

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland unit: ***NOTE:*** *This question is independent of the land use between the wetland unit and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

X **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Herbaceous Balds:** Variable size patches of grass and forbs on shallow soils over bedrock.

— **Old-growth/Mature forests:** Old-growth west of Cascade crest – Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) > 32 in (81 cm) dbh or > 200 years of age. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

— **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

— **Westside Prairies:** Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (*full descriptions in WDFW PHS report p. 161 – see web link above*).

— **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Nearshore**: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (*full descriptions of habitats and the definition of relatively undisturbed are in WDFW report – see web link on previous page).*

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

X **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 20 in (51 cm) in western Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

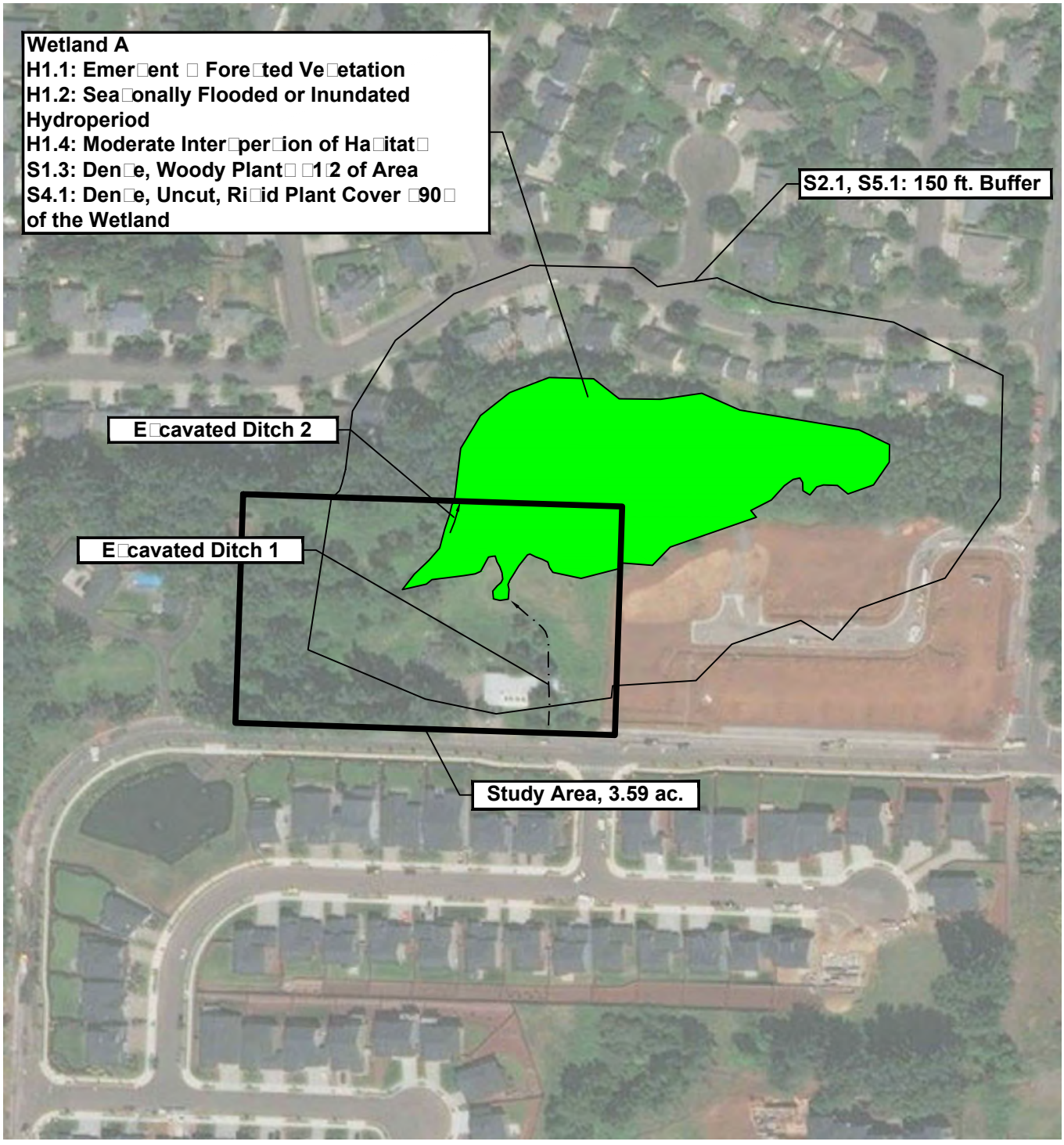
Wetland name or number A

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Estuarine wetlands Does the wetland meet the following criteria for Estuarine wetlands? — The dominant water regime is tidal, — Vegetated, and — With a salinity greater than 0.5 ppt Yes –Go to **SC 1.1** (No) **Not an estuarine wetland**	
SC 1.1. Is the wetland within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151? Yes = **Category I** No - Go to **SC 1.2**	**Cat. I**
SC 1.2. Is the wetland unit at least 1 ac in size and meets at least two of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. (If non-native species are *Spartina*, see page 25) — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland has at least two of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands. Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 2.0. Wetlands of High Conservation Value (WHCV) SC 2.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? (Yes) – Go to **SC 2.2** No – Go to **SC 2.3** SC 2.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes **= Category I** (No) **= Not a WHCV** SC 2.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 2.4** No **= Not a WHCV** SC 2.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and listed it on their website? Yes **= Category I** No **= Not a WHCV**	**Cat. I**
SC 3.0. Bogs Does the wetland (or any part of the unit) meet both the criteria for soils and vegetation in bogs? *Use the key below.* ***If you answer YES you will still need to rate the wetland based on its functions.*** SC 3.1. Does an area within the wetland unit have organic soil horizons, either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? Yes – Go to **SC 3.3** (No) – Go to **SC 3.2** SC 3.2. Does an area within the wetland unit have organic soils, either peats or mucks, that are less than 16 in deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 3.3** (No) **= Is not a bog** SC 3.3. Does an area with peats or mucks have more than 70% cover of mosses at ground level, AND at least a 30% cover of plant species listed in Table 4? Yes = **Is a Category I bog** No – Go to **SC 3.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 4 are present, the wetland is a bog. SC 3.4. Is an area with peats or mucks forested (> 30% cover) with Sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 4 provide more than 30% of the cover under the canopy? Yes = **Is a Category I bog** No **= Is not a bog**	**Cat. I**

Wetland name or number A

SC 4.0. Forested Wetlands Does the wetland have at least 1 contiguous acre of forest that meets one of these criteria for the WA Department of Fish and Wildlife's forests as priority habitats? ***If you answer YES you will still need to rate the wetland based on its functions.*** — **Old-growth forests** (west of Cascade crest): Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/ac (20 trees/ha) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 in (81 cm) or more. — **Mature forests** (west of the Cascade Crest): Stands where the largest trees are 80- 200 years old OR the species that make up the canopy have an average diameter (dbh) exceeding 21 in (53 cm). Yes = **Category I** (No) = **Not a forested wetland for this section**	**Cat. I**
SC 5.0. Wetlands in Coastal Lagoons Does the wetland meet all of the following criteria of a wetland in a coastal lagoon? — The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks — The lagoon in which the wetland is located contains ponded water that is saline or brackish (> 0.5 ppt) during most of the year in at least a portion of the lagoon *(needs to be measured near the bottom)* Yes – Go to **SC 5.1** (No) = **Not a wetland in a coastal lagoon** SC 5.1. Does the wetland meet all of the following three conditions? — The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of aggressive, opportunistic plant species (see list of species on p. 100). — At least ¾ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland. — The wetland is larger than $^{1}/_{10}$ ac (4350 ft^2) Yes = **Category I** No = **Category II**	**Cat. I** **Cat. II**
SC 6.0. Interdunal Wetlands Is the wetland west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)? ***If you answer yes you will still need to rate the wetland based on its habitat functions.*** In practical terms that means the following geographic areas: — Long Beach Peninsula: Lands west of SR 103 — Grayland-Westport: Lands west of SR 105 — Ocean Shores-Copalis: Lands west of SR 115 and SR 109 Yes – Go to **SC 6.1** (No) = **not an interdunal wetland for rating** SC 6.1. Is the wetland 1 ac or larger and scores an 8 or 9 for the habitat functions on the form (rates H,H,H or H,H,M for the three aspects of function)? Yes = **Category I** No – Go to **SC 6.2** SC 6.2. Is the wetland 1 ac or larger, or is it in a mosaic of wetlands that is 1 ac or larger? Yes = **Category II** No – Go to **SC 6.3** SC 6.3. Is the unit between 0.1 and 1 ac, or is it in a mosaic of wetlands that is between 0.1 and 1 ac? Yes = **Category III** No = **Category IV**	**Cat I** **Cat. II** **Cat. III** **Cat. IV**
Category of wetland based on Special Characteristics If you answered No for all types, enter "Not Applicable" on Summary Form	N/A



SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

SCALE: 1" = 200'

0 100' 200' 400'

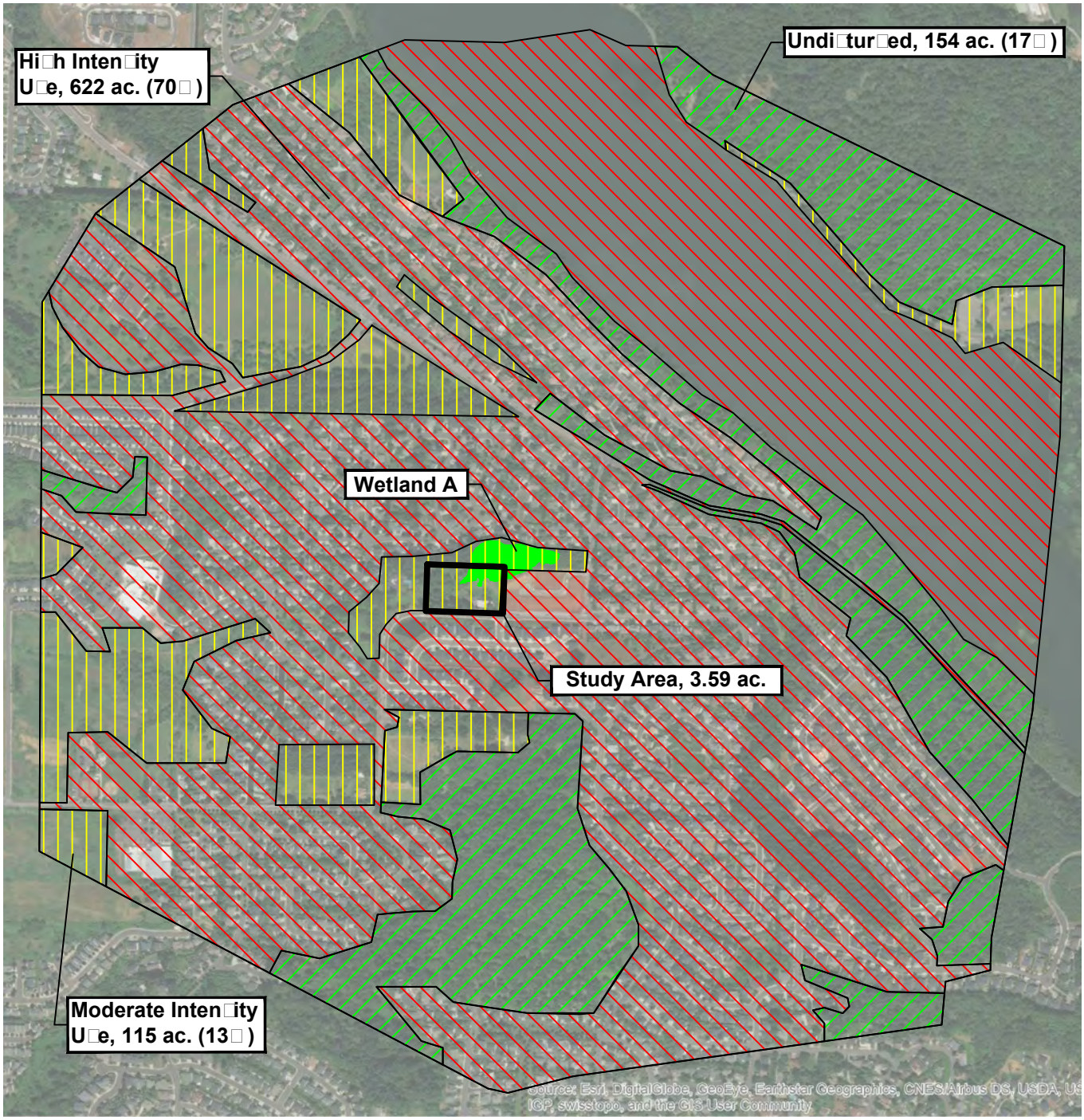
PREPARED FOR: WAVERLY HOMES.

WETLAND RATINGS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

OCT 2017
75345.000

FIGURE
A



SOURCE: AERIAL PHOTOGRAPH FROM ESRI (2017).

WASHINGTON

SCALE: 1" = 1,000'

0 500' 1,000' 2,000'

PREPARED FOR: WAVERLY HOMES.

WETLAND RATINGS

PARCEL NO. 177887000 WETLAND DELINEATION
CAMAS, CLARK COUNTY, OREGON

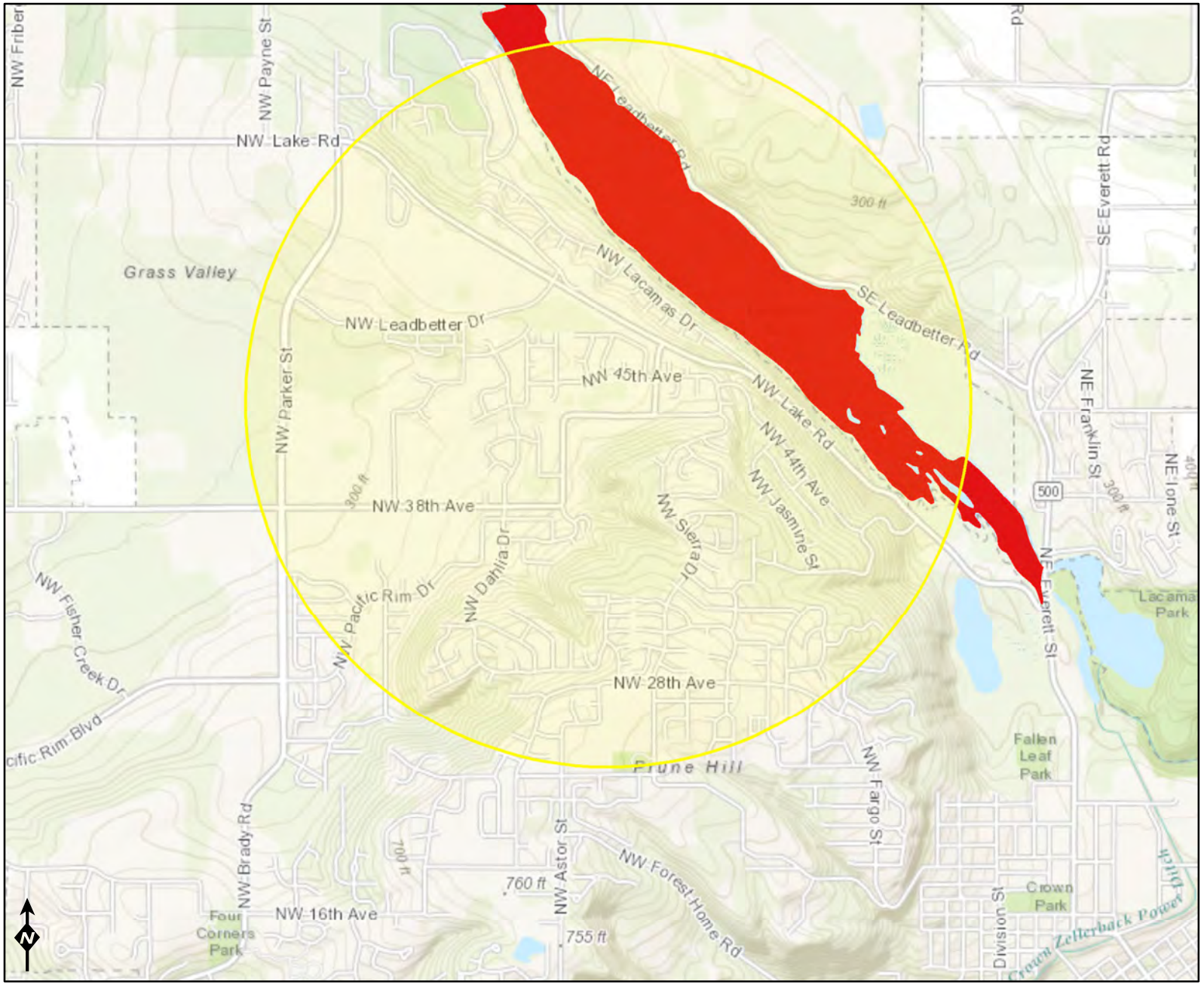
OCT 2017
75345.000

FIGURE
B

Filename: L:\Projects\75000\75300-75399\75345\75345-000\GIS\CAD\Camas.dwg CAD Plot Date/Time: 10/8/2017 1:32:20 PM

October 7, 2017

Clark Co. Parcel 177887000 Wetland Rating Figure C



Assessed Waters/Sediment

Water
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

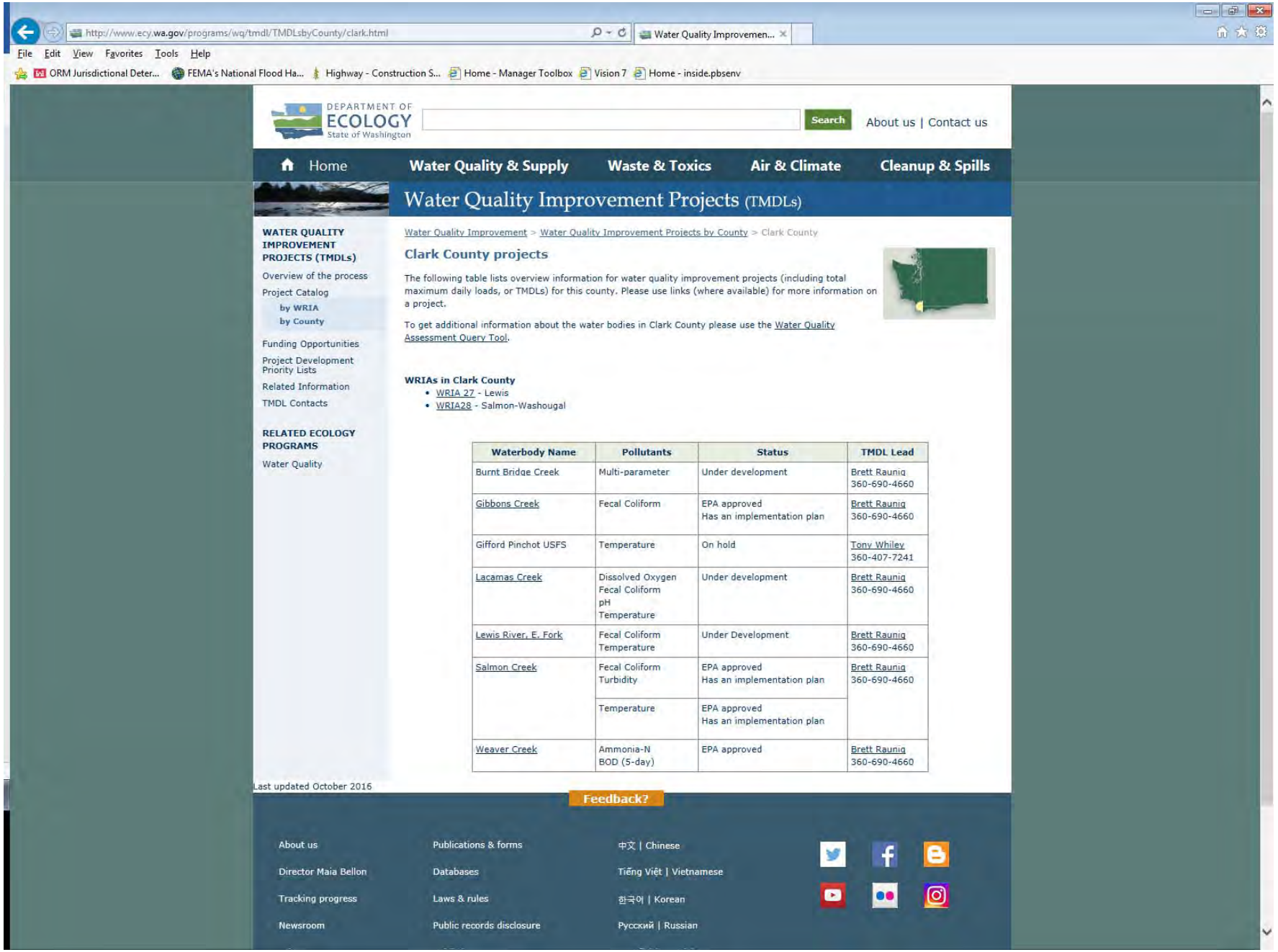
Sediment
- Category 5 - 303d
- Category 4C
- Category 4B
- Category 4A
- Category 2
- Category 1

Miles
0 0.25 0.5 1

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, ©

DEPARTMENT OF ECOLOGY
State of Washington

Clark Co. Parcel 177887000 Wetland Rating Figure D



APPENDIX B

Geotechnical Engineering Report Proposed Subdivision 2223 NW 43rd Avenue
Camas, Washington 98607
(See Tab 8 of the Preliminary Land Use Application)

May 7, 2018

Sarah Fox
City of Camas Community Development
616 NE 4th Ave
Camas, WA 98607

Via email: sfox@cityofcamas.us

Regarding: File No. SUB18-01
43rd Avenue Subdivision
PBS Project 75345.000

Dear Ms. Fox:

This letter is in response to your letter dated March 27, 2018 regarding the above-referenced File No. SUB18-01. Please see below for information required to complete the application and a discussion on the other issues and staff notes outlined in your letter.

INFORMATION REQUIRED FOR A COMPLETE APPLICATION

1. The development notice sign was posted on the subject property by the applicant as required and pictures of the posted sign were provided to the City of Camas (the City) via email on April 9, 2018. Copies of the pictures and email are included as an attachment to this letter as well.
2. The archaeological report was emailed to the tribes and the proof of such emailing was emailed to the City on April 9, 2018. One copy of the email string is provided as an attachment to this letter as well.
3. The certified mailing labels were provided with the initial submittal on March 13, 2018 as confirmed by the City on March 29, 2018.
4. The Preliminary Stormwater Report has been revised to reference the latest edition of Ecology's SWMMWW (2014 Edition) and to include documentation that Minimum Required #5 (LID) has been addressed. The revised report is included as an attachment to this letter. Specifically note page 8 of the revised report for Minimum Requirement #5 and a LID Report on page 31 of the revised report.

With the City's receipt of the four items listed above, the application should be able to be deemed complete to proceed with further processing and scheduling the hearing.

OTHER ISSUES AND STAFF NOTES

1. **Wetland Impact Minimization**
2. **Sequencing Criteria**

A revised Critical Areas Report, dated May 4, 2018, has been submitted as an attachment with this letter. The revised report addresses staff concerns with minimization measures noted in Item 1 of "Other Issues and Staff Notes" from the City's letter dated March 27, 2018. Specifically, pages 3 and 4 of said revised report provide a discussion on impact minimization. Please see the revised narrative and revised plan set which also address the concerns.

The revised Critical Areas Report also addresses sequencing criteria in greater detail on pages 4 and 5 of said revised report.

3. Circulation Plan

A Circulation Plan has been included with this revised submittal as Sheet C601. A detailed discussion of CMC 17.19.040.B takes places in the revised narrative attached with this letter. Deviations are detailed in the revised narrative.

4. Public Street Dimension Deviation

The revised plan set submitted as an attachment with this letter shows a reduced right-of-way width for the proposed street from 52 feet to 41 feet. The required elements of a 28-foot pavement width and sidewalk and planter strips on each side of the street are still being provided. A detailed discussion of how these elements are being provided and why the requested deviation allows for an increase in wetland preservation area takes place in the revised narrative attached with this letter. See 17.09.040.B in the narrative.

5. CAO

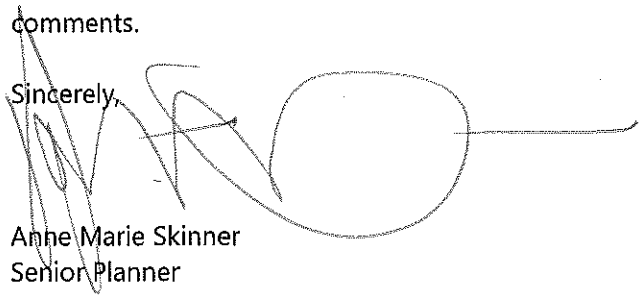
Please refer to the revised Critical Areas Report, dated May 4, 2018, included as an attachment with this letter. Said revised report, along with the submitted revised narrative and revised plan set, address staff concerns in Item 5 of "Other Issues and Staff Notes" from the City's letter dated March 27, 2018.

6. Tree Survey

A tree survey of the existing trees on the site has been provided by Ian Scott, Certified Arborist #PN5408-BUM, with Davey Resource Group resulting in an arborist report, dated May 2018, attached with this letter. A complete discussion of tree preservation and retention takes places in the revised narrative attached with this letter.

Please feel free to contact me at 503.417.7684 or annemarie.skinner@pbsusa.com with any questions or comments.

Sincerely,



Anne Marie Skinner
Senior Planner

cc: Brett Waverly via email brett@mywaverlyhomes.com

Attachment(s): Pictures of posted site and email proof of posting
Email string of emailing archaeological report to tribes
Revised Preliminary Stormwater Report dated April 24, 2018
Revised Critical Areas Report dated May 4, 2018
Arborist Report dated May 2018
Revised Project Narrative dated May 7, 2018
Revised Project Plan Set
Existing Tree Priority Exhibit
CD containing PDFs of all documents included as attachments

Exhibit 18

Preliminary Plat Subdivision Review

43rd Avenue Subdivision
City of Camas, Washington

Applicant:
Waverly Homes LLC
3205 NE 78th Street, Suite 10
Vancouver, Washington 98665

Revised May 7, 2018
PBS Project No. 75345.000

PBS
415 W 6TH STREET, SUITE 601
VANCOUVER, WA 98660
360.695.3488 MAIN
866.727.0140 FAX
PBSUSA.COM

TABLE OF CONTENTS

INTRODUCTION & SUMMARY

This narrative is for the Type III Preliminary Plat Approval Application for Waverly Homes LLC (the Applicant) to develop a 12-lot residential subdivision on a site containing an existing single-family dwelling. The application will be submitted to the City of Camas (City) pursuant to the City of Camas's Municipal Code (CMC) Chapter 18.55 and will include residential lots, a wetland and wetland buffer tract, a landscape buffer tract, an open space tract, a new public street, and a storm facility tract. The final plat will be recorded prior to application for building permits for the new houses.

This narrative addresses the following substantive areas of the CMC:

- CMC Title 16: Environment
  - CMC 16.51: General Provisions for Critical Areas
  - CMC 16.53: Wetlands
- CMC Title 17: Land Development
  - CMC 17.11: Subdivisions
  - CCC 17.19: Design and Improvement Standards
- CMC Title 18: Zoning
  - CMC 18.05: Zoning Map and Districts
  - CMC 18.09: Density and Dimensions
  - CMC 18.11: Parking
  - CMC 18.13: Landscaping
  - CMC 18.17: Supplemental Development Standards
  - CMC 18.31: Sensitive Areas and Open Space
  - CMC 18.55: Administration and Procedures

The following table lists the project team and contact information. Inquiries should be directed to Brett Simpson as the primary point of contact.

Table 1: Project Team and Contact Information

Applicant: WAVERLY HOMES	**Brett Simpson** **Waverly Homes LLC** 3205 NE 78th Street, Suite 10 Vancouver, WA 98665 (360) 314-6877 brett@mywaverlyhomes.com

Planner/Landscape Architect/Civil Engineer/Surveyor/Traffic Engineer: 	**PBS Engineering and Environmental** 415 W. 6th Street, Suite 601 Vancouver WA 98660 (360) 695-3488 **Andy Nuttbrock, RLA** andy.nuttbrock@pbsusa.com **Rich Darland, P.E.** rich.darland@pbsusa.com **Terry Goodman, PLS** terry.goodman@pbsusa.com

PROJECT LOCATION

The project parcel is comprised of one tax lot, identified as property account number 177887000, and is located within the SW 1/4 of Section 34, Township 2N, Range 3E, of the Willamette Meridian. Specifically, the tax lot is known as #11 SEC 34 T2N R3EWM 3.48A and has a property situs address of 2223 NW 43rd Avenue, Camas, Washington 98607. The project site is located on the north side of NW 43rd Avenue, to the west of the NW 43rd Avenue/NW Utah Street intersection.

PROPERTY BACKGROUND

The subject parcel currently has two structures on the site: a single-family dwelling with an attached garage and finished basement built in 1965, and a detached shed built in 1973. The site also contains a residential driveway and accompanying residential landscaping. Clark County GIS information has Hidden Glen LLC at 9208 NE Highway 99 PMB 145, Suite 107, Vancouver, Washington 98665, listed as the current property owner.

PROJECT NEEDS AND GOALS

This project is needed to provide housing for families in the area. The proposed project will provide 12 single-family dwellings in similarity to those in residential subdivisions surrounding the site.

SITE DESCRIPTION

The following subsections describe the existing conditions associated with the site.

Zoning

The project site is zoned Residential 7,500 (R-7.5) with a Comprehensive Plan designation of Single-Family Medium (SFM). The subject property is not located within any overlay zones.

Existing Conditions/Structures

The existing site is a single parcel consisting of 142,382 square feet, or 3.27 acres, in area. The site has an existing single-family residential structure with a finished basement and an attached garage with a residential driveway. The site also contains a detached general-purpose shed. Existing structures, driveways, and residential landscaping will be demolished as part of this project.

The subject site slopes generally from the south to the north. There is an existing wetland in the northeast corner of the subject property. The site contains trees, shrubs, and residential landscaping in front of the existing house. The site is in the Lacamas Creek watershed and the Dwyer Creek sub-watershed. The water

resource inventory area for the site is the Burnt Bridge sub-basin. The site is outside the flood hazard area and does not have a shoreline designation. The site is not within a critical aquifer recharge area. There aren't any mapped steep slopes or geological hazards on the site. Liquefaction is noted as being very low. The site does not contain any designated fish and wildlife habitat area. The site has a high to moderate-high to moderate archaeological probability, with no mapping indicators that the property is a historic site.

Single-family residential subdivisions are located along the adjoining north and east property lines. To the south is NW 43rd Avenue, and south of that is another single-family residential subdivision. The property to the west contains one single-family dwelling. Further west is a single-family residential subdivision. Zoning designations of adjacent properties are R-7.5 to the south, east, and west and R-12 to the north, all with the comprehensive plan designation of SUM.

PROJECT DESCRIPTION

Construction Schedule

Infrastructure installation and site development is anticipated to begin once the approvals are given. Submittal of building permit applications will take place upon recording of the final plat.

Proposed Lots and Tracts

Table 2: Lot and Tract Breakdown

Lot/Tract	Area
Lot 1	6,937 square feet
Lot 2	5,152 square feet
Lot 3	4,950 square feet
Lot 4	4,950 square feet
Lot 5	6,502 square feet
Lot 6	9,000 square feet
Lot 7	9,000 square feet
Lot 8	8,359 square feet
Lot 9	6,788 square feet
Lot 10	5,718 square feet
Lot 11	5,670 square feet
Lot 12	5,933 square feet
Tract A	1,385 square feet
Tract B	22,177 square feet
Tract C	9,214 square feet
Tract D	2,865 square feet
Tract E	1,238 square feet
ROW Internal	26,544 square feet
Total	**142,382 square feet**

Description of Uses

Single-family Detached Dwellings

Upon completion and recording of the final plat, building permit applications for single-family detached dwellings with attached garages for a total of 12 new houses will be submitted for processing.

Access
The subject site fronts NW 43rd Avenue as its south boundary. A new public street, Waverly Place, will be constructed within the development intersecting with existing NW 43rd Avenue. A hammerhead turnaround will be provided at the end of Waverly Place. Each lot will have an individual driveway from Waverly Place to access houses. No lots will directly access NW 43rd Avenue.

Parking
Parking will be provided on each individual lot via the residential driveways and attached garages.

Solid Waste and Recycling
Residents will place their residential bins for solid waste and recycling at the curbside of NW 43rd Avenue for weekly pick-up and disposal.

Common Mailboxes
One grouping of common mailboxes for the development will be placed within the subdivision in the right-of-way.

TITLE 18 ZONING

CHAPTER 18.01 GENERAL PROVISIONS

18.01.030 Standards designated

This narrative and accompanying drawings, plans, reports, and attachments will demonstrate compliance with CMC Title 18, thus showing the project is in the interest of the public health, safety, and general welfare.

CHAPTER 18.05 ZONING MAP AND DISTRICTS

18.05.020 Districts designated

The proposed project is located within the R-7.5 zoning district.

18.05.040 Residential and multifamily zones

The R-7.5 zone is intended for single-family dwellings with densities of five to six dwellings per acre. The project site consists of 3.27 gross acres to be developed as 12 lots for construction of single-family dwellings on each lot.

18.05.060 Overlay zones/special planning areas

The subject site is not within any overlay zones or special planning areas.

18.05.070 Park zoning

The subject site is not within a park zoning district, nor is it held in public trust. As stated previously, the property is owned by Hidden Glen LLC.

CHAPTER 18.07 USE AUTHORIZATION

18.07.040 Residential and multifamily land uses

Table 2 in CMC Section 18.07.040 lists detached single-family dwellings as a permitted use in a residential zone. This development in the R-7.5 zone proposes construction of detached single-family dwellings on each of the 12 lots upon completion and approval of site development and final platting.

CHAPTER 18.09 DENSITY AND DIMENSIONS

18.09.040 Density and dimensions—Single-family residential zones

The tables below show the requirements for development within the R-7.5 zoning district and how each lot will meet the requirements. Sheet SP-103 of the submitted plan set illustrates the dimensions of and setbacks for each lot, noting that the south line of Lots 8 through 12 is along NW 43rd Avenue and is therefore a street side setback of 20 feet.

Table 3: Density and Dimensions for R-7.5 zoning district

Density Transfer Lots	R-7.5 Required	Proposed
Maximum density (dwelling units/net acre)	5.8 dwelling units/2.8 net acres = maximum 16 dwelling units	12 dwelling units
Minimum lot size (square feet)	5,250	4,950 (see 18.09.060)
Maximum lot size (square feet)[3]	9,000	9,000
Minimum lot width	60	60
Minimum lot depth	80	82.5
Maximum building lot coverage[5]	40%	Will be met; verify with building permit
Maximum building height (feet)[2]	35	Will be met; verify with building permit

1 For additional density and dimension provisions see CMC Sections 18.09.060 through 18.09.180.
2 Maximum building height: three stories and a basement, not to exceed height listed.
3 For parcels with an existing dwelling, a one-time exception may be allowed to partition from the parent parcel a lot that exceeds the maximum lot size permitted in the underlying zone. Any further partitioning of the parent parcel or the oversized lot must comply with the lot size requirements of the underlying zone.
4 Average lot area is based on the square footage of all lots within the development or plat. The average lot size may vary from the stated standard by no more than five hundred square feet.
5 The maximum building lot coverage for single-story homes may be up to forty-five percent in R-6 and R-7.5 zones, and forty percent in R-10 and R-12 zones. To qualify for increased lot coverage, a single-story home cannot include a basement or additional levels.

Table 4: Building Setbacks for R-7.5 zoning district[1]

Lot Area	5,000 to 11,999 sf Required	Proposed
Minimum front yard (feet)	20	20; verify with building permit
Minimum side yard and corner lot rear yard (feet)	5	5; verify with building permit
Minimum side yard flanking a street (feet)	20	20; verify with building permit
Minimum rear yard (feet)	25	25, except 20 for Lots 1-5 as per 18.09.060; verify with building permit
Minimum lot frontage on a cul-de-sac or curve (feet)	30	43.62

1 Setbacks may be reduced to be consistent with the lot sizes of the development in which it is located. Notwithstanding the setbacks requirements of this chapter, setbacks and/or building envelopes clearly established on an approved plat or development shall be applicable.

18.09.060 Density transfers

A. *Purpose. To achieve the density goals of the comprehensive plan with respect to the urban area, while preserving sensitive lands and the livability of the single-family residential neighborhoods, while also maintaining compatibility with existing residences.*

The subject site is within the urban area, surrounded by established single-family residences, and does contain wetlands. To achieve 12 buildable lots, provide access and utilities for the lots, and avoid wetland and wetland

buffer area on the site, it is necessary to utilize the allowed density transfer provisions outlined in CMC Section 18.09.060. It should be noted the subject site is relatively small at 3.27 acres. It is also adjacent to the R-12 zoning district along the north boundary which requires utilization of the R-7.5 zoning district's maximum lot size of 9,000 square feet for the two lots in the northwest corner. Additionally, because of sight distance, the only allowed approach to the development is the proposed access in the southeast corner of the project. Adjacent existing, approved developments to the north, east, and west preclude use of any other access points or creation of any street extensions or connections. The site, then, is constrained by its small area, adjacent higher-density zoning, existing wetlands, and lack of options for access other than what is proposed.

B. Scope. This section shall apply to new development in all residential (R) zoning districts.
The proposed project is new development for 12 single-family residential lots in the R-7.5 zoning district.

C. Where a land division proposes to set aside a tract for the protection of a critical area, natural open space network, or network connector (identified in the City of Camas parks plan), or approved as a recreational area, lots proposed within the development may utilize the density transfer standards under CMC Section 18.09.040 Table-2.
The northeast corner of the development will be set aside as Tract B for the protection of the identified wetland and wetland buffer critical area. Tract B is proposed at 22,177 square feet (0.51 acres) comprised of 9,898 square feet of wetland and 12,227 square feet of wetland buffer. Accordingly, lots within the development are utilizing the density transfer standards under CMC Section 18.09.040 Table-2 and as addressed above in this narrative's Table 3: Density and Dimensions for R-7.5 zoning district.

D. Where a tract under "C" above, includes one-half acre or more of contiguous acreage, the city may provide additional or negotiated flexibility in lot sizes, lot width, depth, or setback standards. In no case shall the maximum gross density of the overall site be exceeded.
As noted in "C" above, the tract protecting the wetland and wetland buffer area is 22,177 square feet or 0.51 acres. The tract is contiguous acreage, contained in the northeast corner of the development, approximately 293 feet long by 77 feet deep. Accordingly, the project proposes utilization of the allowance for lot size and setback standard flexibility provided for in CMC Section 18.09.060.D. It is noted the maximum gross density of the overall site is 16 lots, as previously stated in this narrative, and the proposal is for 12 lots, so the gross density is not being exceeded.

The flexibility being requested is limited to certain lots, namely Lots 1 through 5. The intent of the request for flexibility is not to circumvent the standards or achieve more lots than what is allowed or appropriate for the site. Rather, the Applicant is desirous of providing a comfortable and attractive development, compatible with the existing homes surrounding it, with desirable and livable building footprints for families, all while preserving the existing wetland in the northeast portion of the site. To achieve these goals and due to only one available option for access, the small size of the overall site, and the existence of the wetlands, the Applicant is left with no choice other than to seek the City's approval for the flexibility requests detailed below, noting the requests for deviation from standards are quite narrow in scope to maintain the intent of the R-7.5 zoning district and compatibility with the surrounding area.

The minimum lot size in the R-7.5 zoning district with utilization of the density transfer standards is 5,250 square feet. The Applicant is only asking for three lots to be reduced below that minimum: Lot 2 reduced to 5,152 square feet and Lots 3 and 4 reduced to 4,950 square feet. The reduction in size to Lot 2 is only 98 square feet below the minimum, and the reduction in size to Lots 3 and 4 is only 300 square feet below the minimum. All three of the lots are still quite large enough to provide a desirable house footprint for future residents, while maintaining the maximum allotment of 40 percent for building coverage, the minimum side

setback standards, and the minimum front house and garage entrance setback standards. Sheet SP-103 of the submitted plan shows the proposed dimensions and square footages for Lots 2, 3, and 4 as well as illustrating the setback lines to clearly depict the area still left for a house and attached garage. The other nine lots in the development exceed the minimum square footage requirement by at least 420 square feet. Additionally, it is noted again, that Lots 6 and 7 are 9,000 square feet each, which is the maximum lot size for the R-7.5 zoning district, since they are abutting the R-12 zoning district.

The only other request for a deviation from lot standards is a rear setback reduction from 25 feet to 20 feet, but only for Lots 1 through 5. All other setback standards are being met throughout the development. The Applicant feels this is a justifiable request as the rear lot lines for Lots 1 through 5 are immediately adjacent to the 22,177-square-foot area of wetland and wetland buffer in Tract B. Generally, setback standards are established to maintain privacy between adjacent land uses. In this specific case, there is a built-in and automatic 76-foot rear setback between the neighbors to the north and the rear lot line of Lots 1 through 5 because of Tract B. With the additional 20-foot rear setback, there is a total of a 96-foot building setback essentially. Reducing the standard from 25 to 20 feet allows for that five feet of reduced setback area to be contained in Tract B to avoid more of the wetland and wetland buffer area as non-buildable and non-developable. The setback reduction does not lessen the amount of privacy between Lots 1 through 5 and the neighbors to the north as the 96-foot depth dimension does not change – either it's the proposed 76-foot deep Tract B and 20-foot rear setback or it's a 71-foot deep Tract B and a 25-foot rear setback. The net result in the amount of distance to the north lots is the same, but the result to Tract B and Lots 1 through 5 is an increase in the wetland and wetland buffer area in Tract B and a slight increase in the depth of the building footprint on Lots 1 through 5 while not sacrificing privacy to the northern neighbors.

18.09.080 Lot sizes
The proposed project is not a planned residential development, and it is only requesting 12 lots out of the 16-lot maximum. It is also adjacent to the R-12 zoning district to the north. When creating new lots via a subdivision adjacent to a different residential zone designation, the new lots along the common boundary shall be the maximum lot size allowed for the zone designation of the new development (if a lower density adjacent zone), as based on CMC 18.09.040 Table 2, Section A. The subject site is zoned R-7.5 and the adjacent development to the north is zoned R-12. The adjacent R-12 is a greater density than the subject site's R-7.5 zone. The maximum lot size allowed in the R-7.5 zone using density transfer standards is 9,000 square feet. Lots 6 and 7 abut the adjacent R-12 lots to the north and are 9,000 square feet in area, which is the maximum allowed in the R-7.5 zone using density transfer standards. Lot sizes are depicted on Sheet SP-103 of the submitted plan set.

18.09.090 Reduction prohibited
No reductions to open space or off-street parking area are proposed as part of this project. CMC Section 18.09.060.D allows for flexibility in lot size and setback standards. As discussed above, requests for flexibility in lot area for Lots 2, 3, and 4 and in the rear setback for Lots 1 through 5 are being sought as part of this application.

18.09.100 Lot exception
Not applicable. This is a subdivision request to create new lots in accordance with current CMC standards.

18.09.110 Height—Exception
Not applicable. To be addressed with the building permit phase.

18.09.120 Roof overhang permitted

Not applicable. To be addressed with the building permit phase.

18.09.130 Setback—Exception
Not applicable. To be addressed with the building permit phase.

18.09.140 Front yard—Exception
18.09.150 Side yard—Exception
18.09.160 Side yard—Flanking street
18.09.170 Rear yard—Exception
These exceptions apply only to commercial and industrial districts. As stated previously, the subject site is in a residential district.

18.09.180 Elevated decks
Not applicable. To be addressed with the building permit phase.

CHAPTER 18.11 PARKING

18.11.030 Location
CMC Section 18.11.030(A) requires off-street parking spaces for single-family dwellings to be provided on the same lots with the structures they are required to serve. The project proposes to install paved driveways on each lot for utilization of the residents of the house on that same lot. Houses will also contain attached garages.

18.11.100 Residential parking
CMC Section 18.11.100 requires the residential off-street parking spaces to consist of a parking strip, driveway, garage, or a combination therefore, and to be located on the lot they are intended to serve. The project proposes to install paved driveways in front of the attached garages on each lot. Each lot, therefore, will be provided with adequate off-street parking in the form of both the driveway and the garage.

18.11.130 Standards
According to Table 18.11-1 in CMC Section 18.11.130, the required number of off-street parking spaces for a single-family dwelling is two spaces per dwelling unit. The proposed subdivision will construct one paved driveway in front of the attached garage for each house on each lot. The driveways and the attached garages, in combination, will satisfy the off-street parking requirement.

CHAPTER 18.13 LANDSCAPING

18.13.020 Scope
CMC Section 18.13.020 states that landscaping standards shall apply to all new multifamily, commercial, industrial, governmental uses, and any development subject to design review. The proposed project is a single-family residential subdivision, not subject to design review; therefore, landscaping standards in CMC Chapter 18.13 are not applicable to this project.

CHAPTER 18.15 SIGNS

This application does not propose any signage.

CHAPTER 18.17 SUPPLEMENTAL DEVELOPMENT STANDARDS

18.17.030 Vision clearance area
Since the subject site is in the R-7.5 zoning district and since there is a new intersection of NW 43rd Avenue and Waverly Place, the vision clearance area requirements apply. The vision triangles at the new intersection

and around the hammerhead are depicted throughout the plan set. Specifically, Sheet L-101, the Preliminary Landscape Plan, shows the vision triangle areas being clear of plantings.

18.17.040 Accessory structures
This application does not include a request for any accessory structures.

18.17.050 Fences and walls
This application does not propose construction of any walls. A new six-foot tall sight-obscuring wooden fence will be installed along the south portion of the development, on the north line of the ten-foot wide landscape tract, identified as Tract D, bordering the rear of Lots 9 through 12. The fence will be extended across the south side of Lot 8 as part of a ten-foot wide landscape easement bordering said south side of Lot 8. The fence will be installed around the vision triangle area on the southeast corner of Lot 12. Since the fence is not proposed to be taller than six feet, a building permit is not required. No fencing is proposed in the front yards of any of the lots for this application. A wooden split-rail fence will also be installed along the west and south lines of Tract B but will not be taller than six feet.

18.17.060 Retaining walls
This project does not propose any retaining walls.

CHAPTER 18.18 SITE PLAN REVIEW
As already noted in the narrative, this project is a land division of the subject property into 12 lots. Per CMC Section 18.18.020(B)2, site plan review is not required for a land division.

CHAPTER 18.19 DESIGN REVIEW
Per CMC Section 18.19.025, design review only applies to parcels located within the downtown commercial zone. As previously stated, the subject site is in the R-7.5 zoning district; therefore, design review is not required.

CHAPTER 18.31 SENSITIVE AREAS AND OPEN
18.31.020 Scope
Land proposals below are subject to the criteria, guidelines, conditions, performance standards, and procedural requirements contained in this chapter:
F. Subdivision
The project is a 12-lot subdivision with wetland area in the northeast corner of the subject property; therefore, CMC Chapter 18.31 is applicable.

18.31.030 Administration
The notes from the pre-application meeting held on September 21, 2017 state a critical areas report is required per CMC Chapter 16.51. CMC Title 16 is addressed in detail through a combination of this narrative and the critical areas report included with the application submittal.

18.31.080 Tree retention
A. A tree survey, conducted by a qualified biologist, landscape architect, or arborist, shall be conducted for all lands proposed to be developed and listed under Section 18.31.020. A survey shall not be required for lands proposed to be retained as undeveloped open space.
The proposed project is a subdivision. Subdivisions are listed under CMC Section 18.31.020 as needing to comply with the requirements of CMC Chapter 18.31. Accordingly, Sheet SP-102 of the submitted plan set depicts the required tree survey of the subject site. The required arborist report included with this submittal,

dated May 2018, has been prepared by Ian Scott, who is an International Society of Arboriculture (ISA) Certified arborist (NE-6913A), with Davey Resource Group, Inc. The submitted arborist report provides an assessment of all the trees listed in the tree survey on Sheet SP-102 of the submitted plan set.

B. To the extent practical, existing healthy significant trees shall be retained.
Significant trees are defined in CMC 18.03.050 as evergreen trees eight inches dbh, and deciduous trees, other than red alder or cottonwood, twelve inches dbh. The arborist report identified all 79 trees on Sheet SP-102 as being significant per the City's definition. The arborist report further identified the health of the 79 significant trees and provided the following data as noted on pages 2 and 7 of the submitted arborist report:

- 31 of the significant trees are trees that should be removed (priority four)
- 11 of the 79 significant trees are not worthy of retention efforts (priority three)
- 25 of the 79 significant trees are fair (priority two), require minor maintenance, and should be retained and protected
- 12 of the 79 significant trees are good (priority one), identified as being in particularly good condition, and should be protected at all reasonable cost

Of the 79 significant trees on the site, only 12 are identified as being "good" (priority one), worthy of preservation at all reasonable cost and 25 as being fair (priority two) to be retained and protected, but not at all reasonable cost. The project can reasonably preserve one of the 12 "good" (priority one) significant trees, Tree Number 55, and one of the 25 "fair" (priority two) significant trees, Tree Number 48. An exhibit titled "Existing Tree Priority Exhibit" has been included with this submittal. This exhibit shows the 12 "good" (priority one) significant trees and the 25 "fair" (priority two) significant trees, along with their critical root zones (green dashed for "good" priority one and blue solid for "fair" priority two), in relation to the lot and tract layout, new street location, and overall site grading needed to develop the project. A careful review of this exhibit shows most of the 37 "good" (priority one) or "fair" (priority two) significant trees are located along the south boundary. Unfortunately, the south boundary requires substantial grading to complete the City's required improvements to the NW 43rd Avenue street frontage, install the required landscape buffer tract, and construct the required six-foot tall wooden fence with stone columns every 50 feet. Satisfaction of these aforementioned-requirements results in the removal of all the trees along the south boundary.

The rest of the "good" (priority one) and "fair" (priority two) significant trees shown on the submitted exhibit are within lots or tracts that require grading and fill. Tree Number 68 has a critical root zone that spreads across the building footprint of a large portion of Lot 7 and the corner of Lot 6; preservation of this tree would prohibit construction of a house on Lot 7. Tree Number 75 is in the storm facility tract and will have to be removed to accomplish grading and installation of water quality plantings, pipes, etc. Tree Number 78 has a critical root zone that covers most of the building footprint area for Lot 8 and its preservation would prevent construction of a house on Lot 8. There are several trees along the south portion of Lots 9 and 10 that, if preserved, would make Lots 9 and 10 non-buildable. Tree Numbers 42 and 44 will be destroyed during grading for Waverly Place and installation of fill and sidewalk along the south boundary of Waverly Place. Tree Number 56 can't be retained and still accomplish the grading and fill necessary to direct storm water from Tract B to Tract C and provide a level building pad for house construction on Lot 5.

All trees in Tract B, regardless of size or health, will be preserved including the ones on the east portion of the north property line. Additionally, 25 native trees will be planted in the wetland buffer area of Tract B for buffer enhancement, which will serve a dual purpose of replacing most of the healthy significant trees being removed due to construction.

18.31.090 Vegetation removal

A. Exceptions

As depicted on Sheets SP-101 and SP-102 of the submitted plan set, there are existing trees and vegetation and on the site. Pursuant to CMC Section 18.31.090(A), the removal of the following items is exempt from the requirements of the vegetation removal permit: the vegetation outside of the designated wetland and wetland buffer area (identified as Tract B); removal of the trees four inches or less in diameter; removal of the dead, diseased or dying vegetation and trees; removal of the nonnative invasive plant species on the site (Himalayan blackberries and ivy); and, removal of the vegetation related to the construction and installation of the public utilities needed for the development.

B. Vegetation Removal Permit Required.

Healthy trees over four inches in diameter will be removed from the entire subject site, and healthy, noninvasive vegetation and trees will be removed from the existing wetland area on the subject site; therefore, a vegetation removal permit is required for this project.

C. Preliminary Review

A vegetation removal permit is required for this project as noted above.

D. Vegetation Management Plan as Part of Vegetation Removal Permit

A vegetation management plan will be required for this project since the vegetation removal permit is required.

E. Vegetation Management Plan—Standards. Vegetation management plans shall meet the following standards:

1. *Vegetation management plans shall be prepared by a qualified arborist or biologist;*
   The submitted preliminary landscape plan (Sheets L-101 and L-102) serves as the vegetation management plan prepared by Andy Nuttbrock, a licensed landscape architect.

2. *If the proposed vegetation removal impacts a steep slope or area with potentially unstable soils, the vegetation management plan shall contain a certification by a qualified geotechnical engineer that the removal of vegetation in accordance with the vegetation management plan will not cause erosion or increase the likelihood of a landslide;*
   A geotechnical report, dated December 28, 2017, stamped by Ryan White at PBS, has been included with this application packet. As noted in the report, the site is relatively flat; therefore, the removal of vegetation does not need to be mitigated for erosion or landslides.

3. *Where possible, proposed vegetation removal activities adjacent to environmentally sensitive areas should be configured in a manner which avoids impacts;*
   Trees and vegetation removed adjacent to and within Tract B, the designated wetland tract for the project, will be removed only as necessary and with the least impact as possible to the wetland.

4. *Where possible, limbing, pruning, or thinning should be utilized in lieu of removal of vegetation;*
   Tree removal is necessary to perform required grading and construction of utilities, the stormwater facility, and the new street.

5. *Vegetation removal should normally be mitigated through vegetation enhancement in the form of additional plantings;*

Sheets L-101 and L-102 of the submitted plan set show proposed plantings to mitigate for vegetation removal. Sheet L-102 specifically shows plantings in Tract B as the wetland buffer enhancement plan. Proposed plantings on the entire site include multipurpose grass seed mix, bearberry cotoneaster, red sunset maple, and weeping white spruce. The full planting list for the development is detailed on Sheet L-101.

Trees to be planted specifically within the designated wetland buffer area are 15 western red cedar and ten Oregon ash. There will also be a seed mix installed in the wetland buffer area along with shrubs including red osier dogwood, Oregon ash, Indian plum, salmonberry, red elderberry, and snowberry. The wetland buffer enhancement is detailed on sheet L-102.

6. *Vegetation management should be done in the manner that takes into consideration stormwater runoff, slope stability, view enhancement, and wildlife habitat;*
   The subject site does not have any view corridors or wildlife habitat. Slope stability has not been indicated to be an issue by the geotechnical report or Clark County GIS mapping information. The square footage of designated wetland area for the development will retain the seven existing trees along the east portion of the north property line. The area in Tract B to be designated as wetland buffer area will contain 25 newly-planted natives trees, a variety of native shrubs, and native grass mix.

7. *The schedule for removal and planting should be done in such a manner as to optimize the survival of the modified vegetation and new plantings;*
   Removal of vegetation will take place as soon as appropriate approvals and permits have been received. As noted in Note Number 2 on Sheet L-101, landscape for each lot shall be installed at the time of house construction, and all tract landscape shall be installed at the time of road construction.

8. *Monitoring of vegetation survival may be required, and should normally include reports and photographs to the community development director or designee;*
   The Applicant shall abide by any conditions of approval pertaining to monitoring of vegetation survival. Note number 6 on Sheet L-101 indicates monitoring of vegetation survival may be required.

9. *Vegetation removal for purposes of view enhancement shall be limited to view corridors, as opposed to removal of vegetation over a larger area;*
   None of the vegetation removal is for view enhancement. Vegetation removal is necessary for site grading, expansion of NW 43rd Avenue, new construction of Waverly Place, new construction of the proposed storm facility, and grading of the lots for construction of the new houses.

10. *Vegetation management plans shall bear the certification of the qualified arborist and any other registered professional involved in its preparation or implementation;*
    Sheets L-101 and L-102 bear the seal of Andy Nuttbrock, the project's licensed landscape architect.

11. *Vegetation management plans should contain a provision requiring thirty days' written notice to the city prior to any removal or replanting of vegetation.*
    Note number 5 on Sheet L-101 indicates the required written notice to the city prior to any removal or replanting of vegetation.

F. *Bonding*
Applicant acknowledges the possibility of a bond requirement pursuant to CMC Section 18.31.090(F).

G. Incorporation

Applicant will include the provisions of the approved vegetation management plan in the covenants, conditions, and restrictions of the proposed subdivision, as well as referencing them on the final plat.

H. Process

Applicant acknowledges the required vegetation removal permit for removal of vegetation in the critical area of the subject site shall be processed as a Type I administrative review.

18.31.110 Mandatory preservation

A. As a condition of development approval for any development application set forth in Section 18.31.020(A) of this chapter, the applicant shall set aside and preserve all sensitive areas, except as otherwise permitted by this chapter. To ensure that such areas are adequately protected, the applicant shall cause a protective mechanism acceptable to the city to be put in place.

The areas to be set aside for wetland and wetland buffer have been designated as Tract B in the project and will be identified as non-developable on the final plat and in the conditions, covenants, and restrictions that accompany the finished development.

B. For property zoned single-family residential or multifamily residential, the applicant shall receive a density transfer to the remainder of the parcel that is equal to the density lost due to the property set aside, except that the density transfer shall not exceed thirty percent of the allowable density for the entire development if it were not encumbered with sensitive lands.

The subject site is zoned R-7.5 and the proposed development is taking advantage of the density transfer allowed under CMC Section 18.31.110(B). Tract B, in the amount of 22,177 square feet or 0.51 acres, represents the area of wetland and wetland buffer being set aside as non-developable property. This results in a loss of three lots (0.51 acres multiplied by 5.8 dwelling units equals 2.9 or 3 lots). The net acreage of the development is 140,997 square feet (142,382 gross square feet less 23,087 identified existing wetland) or 2.74 acres which would yield a maximum density of 16 lots (2.74 acres multiplied by 5.8 dwelling units equals 15.9 or 16 lots), and 30 percent of 16 lots equals 4.8 or 5 lots. The three lots lost due to the area being avoided for wetland and wetland buffer do not exceed the five-lot 30-percent requirement.

18.31.120 Negotiated preservation

No negotiated preservation as described in CMC Section 18.31.120 is taking place as part of this application.

CHAPTER 18.32 PARK AND OPEN SPACE ZONING

The regulations of this chapter apply only to land held in public trust. As stated previously in this narrative, the subject site is owned by Hidden Glen LLC not a public trust; therefore, CMC Chapter 18.32 is not applicable to this application.

CHAPTER 18.55 ADMINISTRATION AND PROCEDURES

18.55.030 Summary of decision making processes

Table 1 in CMC Section 18.55.030 lists an archaeological permit as a type II or III process, a preliminary subdivision plat as a type III process, sensitive areas as a type II or III process, and the SEPA threshold determination as SEPA. This type III application includes a preliminary subdivision plat, archaeological review, SEPA review, and critical areas review, as well as a vegetation removal permit with accompanying vegetation management plan.

18.55.050 Initiation of action

Except as otherwise provided, Type I, II, III, or BOA applications may only be initiated by written consent of the owner(s) of record or contract purchaser(s).
The deed for the subject site lists Hidden Glen LLC as the property owner, who has signed the submitted application.

18.55.060 Preapplication conference meeting—Type II, Type III
The Applicant attended a pre-application meeting with the City on September 21, 2017. City employees present were Sarah Fox, Senior Planner; Norm Wurzer, Engineer; Bob Cunningham, Building Official; and Ron Schumacher, Fire Marshal. The pre-application meeting is valid for 180 days or until March 20, 2018.

18.55.110 Application—Required information
Type II or Type III applications include all the materials listed in this subsection. The director may waive the submission of any of these materials if not deemed to be applicable to the specific review sought. Likewise, the director may require additional information beyond that listed in this subsection or elsewhere in the city code, such as a traffic study or other report prepared by an appropriate expert where needed to address relevant approval criteria. In any event, the applicant is responsible for the completeness and accuracy of the application and all of the supporting documentation. Unless specifically waived by the director, the following must be submitted at the time of application:

A. A copy of a completed city application form(s) and required fee(s);
The completed application forms and required fees have been included as part of this submittal package.

B. A complete list of the permit approvals sought by the applicant;
The Applicant is seeking type III preliminary subdivision plat approval. Additionally, this application includes an archaeological predetermination report, a critical areas report addressing the sensitive areas, the vegetation removal permit and accompanying vegetation management plan, and the SEPA threshold determination. A wetlands delineation report and geotechnical engineering report are also included for review.

C. A current (within thirty days prior to application) mailing list and mailing labels of owners of real property within three hundred feet of the subject parcel, certified as based on the records of Clark County assessor;
The application package submitted to the City includes the required current mailing list and mailing labels.

D. A complete and detailed narrative description that describes the proposed development, existing site conditions, existing buildings, public facilities and services, and other natural features.
This document is the narrative detailing the required information and is part of the application.

E. Necessary drawings in the quantity specified by the director;
Complete plan sets consisting of the preliminary cover sheet, preliminary typical sections, existing conditions plan, existing tree survey, preliminary site plan, preliminary erosion control and grading plan, preliminary street and storm drainage plan, preliminary sanitary sewer and water plan, preliminary striping plan, and preliminary landscape plan are included with this application submittal.

F. Copy of the preapplication meeting notes (Type II and Type III);
A copy of the notes from the pre-application meeting held on September 21, 2017 is included with this application submittal.

G. SEPA checklist, if required;

The required SEPA checklist is included with this application submittal.

H. *Signage for Type III applications and short subdivisions*
The required sign for this type III application will be posted on the subject property along the NW 43rd Avenue street frontage prior to the application being deemed complete and prior to the public hearings. The required signage shall remain until the conclusion of the Type III process and shall be removed in the appropriate timeframe.

TITLE 17 LAND DEVELOPMENT
CHAPTER 17.11 SUBDIVISIONS
17.11.010 Scope
This application is for a 12-lot subdivision. Pursuant to CMC Section 17.11.010, any land being divided into ten or more lots for sale or gift shall conform to the procedures and requirements of CMC Chapter 17.11. Accordingly, this narrative addresses CMC Chapter 17.11 below.

17.11.020 Decision process
This subdivision application is being submitted for type III review as per CMC Chapter 18.55.

17.11.030 Preliminary subdivision plat approval
A. Preapplication.
The required pre-application meeting was held on September 21,2017. A copy of the pre-application meeting notes is included with this submittal.

B. Application.
1. *Completed general application form as prescribed by the community development director, with the applicable application fees;*
   The general application form for a type III preliminary plat review has been completed and included as part of the submittal package, along with the applicable fees.

2. *A complete and signed SEPA checklist. The SEPA submittal should also include a legal description of the parcel from deed;*
   The SEPA checklist has been completed, signed, and included as part of the submittal package.

3. *Complete applications for other required land use approvals applicable to the proposal;*
   This application is seeking approval for the type III preliminary plat application and the type I vegetation removal permit with accompanying vegetation management plan. Applicant also seeks approval of the SEPA threshold determination, critical areas report, and archaeological predetermination report. All documents and completed applications have been included with this submittal for review and approval.

4. *A vicinity map showing location of the site;*
   Sheet C-001 of the submitted plan set shows the required vicinity map in the upper right corner with the project site identified.

5. *A survey of existing significant trees as required under CMC Section 18.31.080;*
   Per CMC Section 18.31.080 a survey of existing trees has taken place and the results are depicted on Sheet SP-102 of the submitted plan set.

6. *All existing conditions shall be delineated. Site and development plans shall provide the following information:*
   Sheet SP-101 of the submitted plan set illustrates the delineation of all existing conditions of the subject site.

7. *For properties with slopes of ten percent or greater a preliminary grading plan will be required with the development application that shows:*
   Sheet C-201 of the submitted plan set is the required preliminary grading plan.

8. *Preliminary stormwater plan and report;*
   Sheet C-301 is the preliminary street and storm drainage plan for the proposed project. A stormwater report has also been completed and included as part of the submittal package.

9. *For properties with development proposed on slopes of ten percent or greater a preliminary geotechnical report will be consistent with CMC Chapter 16.59;*
   A geotechnical engineering report, dated December 28, 2017, and stamped by Ryan White, a professional engineer at PBS, has been included as part of the submittal package.

10. *Clark County assessor's maps which show the location of each property within three hundred feet of the subdivision;*
    The required Clark County assessor's maps have been submitted with the application.

11. *Applicant shall furnish one set of mailing labels for all property owners as provided in CMC Section 18.55.110;*
    Applicant has submitted one set of mailing labels, pursuant to CMC Section 18.55.110, as part of the application package.

12. *Complete and submit a transportation impact study to determine the adequacy of the transportation system to serve a proposed development and to mitigate impacts of the proposal on the surrounding transportation system; and*
    A sight distance certification for the intersection of Waverly Place and NW 43rd Avenue has been included as part of the application package.

13. *A narrative addressing ownership and maintenance of open spaces, stormwater facilities, public trails and critical areas, and the applicable approval criteria and standards of the Camas Municipal Code. It should also address any proposed building conditions or restrictions.*
    The proposed development does not contain any public trails. All the tracts will be owned and maintained by the homeowners' association through maintenance conditions contained in the covenants, conditions, and restrictions that will be recorded for this subdivision.

C. Review Procedures

The review process for this type III application will follow the guidelines of CMC Chapter 18.55.

D. Criteria for Preliminary Plat. The hearings examiner decision on an application for preliminary plat approval shall be based on the following criteria:

1. *The proposed subdivision is in conformance with the Camas comprehensive plan, parks and open space comprehensive plan, neighborhood traffic management plan, and any other city adopted plans;*

Please see the entirety of this application for compliance with applicable sections of the CMC and applicable city-adopted plans.

2. *Provisions have been made for water, storm drainage, erosion control, and sanitary sewage disposal for the subdivision that are consistent with current standards and plans as adopted in the Camas Design Standard Manual;*
Sheets C-201, C-301, and C-401 depict preliminary plans for erosion control, storm drainage, and sewer and water, respectively. Erosion control best management practices will be used to prevent sediment-laden flow from existing the site. Public water through the City is available via an existing mainline in NW 43rd Avenue. The development proposes to connect to this water main to serve the new lots. Sanitary sewer, also through the City, is available in NW 43rd Avenue, immediately to the east of the site. This sewer main line will be extended into the development to serve the lots, then out of the development and continued to the east for future connections.

   The site's development plan proposes to grade the site to collect the site stormwater runoff and convey it to the proposed detention pond located along the western edge of the project. The volume of the detention pond was determined by the Western Washington Hydrology Model. Stormwater runoff from the site will be collected and treated in a Perk Filter Treatment Vault located next to the detention pond. After the stormwater runoff is treated in the Perk Filter Treatment Vault, it will be discharged into the detention pond. The Perk Filter treatment system has a General Use Level Designation (GULD) for basic and phosphorus treatment. The water from the wetland and wetland buffer areas in Tract B will flow to a ditch inlet in the north end of Tract E. The water will be conveyed through pipes and discharged to the existing 15-inch pipe located near the stormwater facility. The wetland conveyance pipe will discharge the water at the point the water left the property prior to the development of the site.

3. *Provisions have been made for road, utilities, street lighting, street trees, and other improvements that are consistent with the six-year street plan, the Camas Design Standard Manual and other state adopted standards and plans;*
The subject site's NW 43rd Avenue frontage will be improved, and a new public street, Waverly Place, will be constructed for access to the development, all in accordance with the Camas Design Standard Manual. Street improvements are shown on Sheets C-002, C-201, C-301, and C-501. Water, storm drainage, and sanitary sewage disposal are being provided for each lot and for street improvements as depicted on Sheets C-201, C-301, and C-401 of the submitted plan set. Street lighting will be addressed as part of the final engineering phase. Proposed street tree plantings are shown on Sheet L-101 of the submitted plan set. The proposed street tree along Waverly Place is the red sunset maple and the chanticleer flowering pear is proposed along NW 43rd Avenue.

4. *Provisions have been made for dedications, easements and reservations;*
The project includes only one dedication to the public in the form of ten feet of right-of-way along the subject site's NW 43rd Avenue frontage. There is a proposed 28-foot wide utility easement between Lots 8 and 9 as depicted on Sheet C-301 of the submitted plan set. There is also a 20-foot wide by 40-foot deep shared access easement between Lots 8 and 9 for access only for those two lots from Waverly Place. Tract B shall be non-developable and non-buildable wetland and wetland buffer to be owned and maintained by the homeowners' association. Finally, there is a proposed 6.5-foot wide pedestrian easement along the west boundary of Lot 9 to provide pedestrian access from the public sidewalk on Waverly Place to the public sidewalk along NW 43rd Avenue.

5. *The design, shape and orientation of the proposed lots are appropriate to the proposed use;*
   The proposed lots are largely rectangular with side lines having right angles to Waverly Place. Lot size and dimension requirements of CMC Title 18 have been discussed earlier in this document under CMC Section 18.09. Sheet SP-103 shows the proposed lots and dimensions, along with setbacks, to demonstrate the proposed use of single-family detached dwellings will be achievable once the final plat is recorded.

6. *The subdivision complies with the relevant requirements of the Camas land development and zoning code, and all other relevant local regulations;*
   This application, narrative, and all accompanying documents, reports, exhibits, and attachments demonstrate compliance with the relevant requirements of the CMC and other applicable regulations.

7. *Appropriate provisions are made to address all impacts identified by the transportation impact study;*
   A transportation impact study is not required for this 12-lot subdivision. The only traffic-related item required is a sight distance certification for the new NW 43rd Avenue/Waverly Place intersection, which has been completed and included as part of this application submittal. Based upon the submitted analysis, there is sufficient intersection sight distance at the subdivision's proposed access location.

8. *Appropriate provisions for maintenance of commonly owned private facilities have been made;*
   All proposed tracts will be owned by the homeowners' association. Maintenance for all tracts will be the responsibility of the homeowners' association via covenants, conditions, and restrictions to be recorded as part of the final plat process.

9. *Appropriate provisions, in accordance with RCW 58.17.110, are made for:*
   a. The public health, safety, and general welfare and for such open spaces, drainage ways, streets, or roads, alleys or other public ways, transit stops, potable water supplies, sanitary wastes, parks and recreation, playgrounds, schools and school grounds and all other relevant facts, including sidewalks and other planning features that assure safe conditions at school bus shelter/stops, and for students who walk to and from school, and
   This application, narrative, and all accompanying documents, reports, exhibits, and attachments demonstrate that appropriate provisions have been included in the proposed project for the public health, safety, and general welfare.

   b. The public use and interest will be served by the platting of such subdivision and dedication;
   Approval of this subdivision and right-of-way dedication will serve the current and future citizens of the City by providing much-needed single-family detached dwellings.

10. *The applicant and plans shall be consistent with the applicable regulations of the adopted comprehensive plans, shoreline master plan, state and local environmental acts and ordinances in accordance with RCW 36.70B.030.*
    This application, narrative, and all accompanying documents, reports, exhibits, and attachments demonstrate consistency with applicable regulations and adopted standards.

17.11.040 Phasing

The proposed subdivision will be developed in one phase.

17.11.050 Limitations on further subdivision

Under the current zoning of R-7.5, none of the resulting lots will be large enough for further division.

17.11.060 Expiration
It is Applicant's intent to begin preparation of the final engineering drawings and final plat immediately upon receipt of the preliminary plat approval, with submittal for review taking place as soon as the drawings and final plat are prepared.

CHAPTER 17.19 DESIGN AND IMPROVEMENT STANDARDS

17.19.030 Tract, block and lot standards

A. Environmental Considerations

1. *Critical Areas. Land that contains a critical area or its buffer as defined in Title 16 of this code, or is subject to the flood hazard regulations, shall be platted to show the standards and requirements of the critical areas.*
   The subject property contains the critical area of wetlands and wetlands buffer in the northeast corner of the site. Tract B has been identified as the area to be set aside as non-developable wetland and wetland buffer areas.

2. *Vegetation. In addition to meeting the requirements of CMC Chapter 18.31, Tree Regulations, every reasonable effort shall be made to preserve existing significant trees and vegetation and integrate them into the land use design.*

Significant trees are defined in CMC 18.03.050 as evergreen trees eight inches dbh, and deciduous trees, other than red alder or cottonwood, twelve inches dbh. The arborist report identified all 79 trees on Sheet SP-102 as being significant per the City's definition. The arborist report further identified the health of the 79 significant trees and provided the following data as noted on pages 2 and 7 of the submitted arborist report:

- 31 of the significant trees are trees that should be removed (priority four)
- 11 of the 79 significant trees are not worthy of retention efforts (priority three)
- 25 of the 79 significant trees are fair (priority two), require minor maintenance, and should be retained and protected
- 12 of the 79 significant trees are good (priority one), identified as being in particularly good condition, and should be protected at all reasonable cost

Of the 79 significant trees on the site, only 12 are identified as being "good" (priority one), worthy of preservation at all reasonable cost and 25 as being fair (priority two) to be retained and protected, but not at all reasonable cost. The project can reasonably preserve one of the 12 "good" (priority one) significant trees, Tree Number 55, and one of the 25 "fair" (priority two) significant trees, Tree Number 48. An exhibit titled "Existing Tree Priority Exhibit" has been included with this submittal. This exhibit shows the 12 "good" (priority one) significant trees and the 25 "fair" (priority two) significant trees, along with their critical root zones (green dashed for "good" priority one and blue solid for "fair" priority two), in relation to the lot and tract layout, new street location, and overall site grading needed to develop the project. A careful review of this exhibit shows most of the 37 "good" (priority one) or "fair" (priority two) significant trees are located along the south boundary. Unfortunately, the south boundary requires substantial grading to complete the City's required improvements to the NW 43rd Avenue street frontage, install the required landscape buffer tract, and construct the required six-foot tall wooden fence with stone columns every 50 feet. Satisfaction of these aforementioned-requirements results in the removal of all the trees along the south boundary.

The rest of the "good" (priority one) and "fair" (priority two) significant trees shown on the submitted exhibit are within lots or tracts that require grading and fill. Tree Number 68 has a critical root zone that spreads across the building footprint of a large portion of Lot 7 and the corner of Lot 6; preservation of this tree would prohibit construction of a house on Lot 7. Tree Number 75 is in the storm facility tract and will have to be removed to accomplish grading and installation of water quality plantings, pipes, etc. Tree Number 78 has a critical root zone that covers most of the building footprint area for Lot 8 and its preservation would prevent construction of a house on Lot 8. There are several trees along the south portion of Lots 9 and 10 that, if preserved, would make Lots 9 and 10 non-buildable. Tree Numbers 42 and 44 will be destroyed during grading for Waverly Place and installation of fill and sidewalk along the south boundary of Waverly Place. Tree Number 56 can't be retained and still accomplish the grading and fill necessary to direct storm water from Tract B to Tract C and provide a level building pad for house construction on Lot 5.

All trees and vegetation within the area defined as Tract B will be preserved including the ones on the east portion of the north property line, except removal of invasive or non-native plants in the defined buffer area will take place as part of the buffer enhancement. Additionally, 25 native trees will be planted in the wetland buffer area of Tract B for buffer enhancement, which will serve a dual purpose of replacing most of the healthy significant trees elsewhere on the site being removed due to construction.

3. *Density transfers may be applicable if developer preserves critical areas. See Chapter 18.09 of this code.*
   Density transfers are applicable to this project and are discussed earlier in this narrative under Chapter 18.09.

B. Blocks. Blocks shall be wide enough to allow two tiers of lots, except where abutting a major street or prevented by topographical conditions or size of the property, in which case the approval authority may approve a single tier.

Sheet SP-103 of the submitted plan set shows one row of lots on the north side of Waverly Place and one row of lots on the south side of Waverly Place. Due to the site's south boundary being NW 43rd Avenue (a collector), the existence of wetlands in the northeast portion of the site, and the small area (3.27 gross acres) and narrow depth of the parent parcel, it is not possible to include any additional lots on either side of the proposed rows and still meet lot area, lot dimension, and access standards.

C. Compatibility with Existing Land Use and Plans

The subject site is in a residential zone with a residential comprehensive plan designation. It is surrounded by other residentially-zoned properties, all within the same residential comprehensive plan designation of SMU. There are single-family residential subdivisions to the north, south, east, and west of the site. The proposed development of single-family residential dwellings is like the surrounding existing development. None of the surrounding developments contain stub or dead-end streets; therefore, connection or extension with adjacent developed areas is not possible for this project.

D. Lots

1. *Each lot must have frontage and access onto a public street.*
   Sheet SP-103 of the submitted plan set shows the lots have both frontage on and access to Waverly Place, the new public street constructed as part of this development.

2. *Side Lot Lines. The side lines of lots shall run at right angles to the street upon which the lots face as far as practical, or on curved streets they shall be radial to the curve;*
   A review of Sheet SP-103 of the submitted plan set shows the proposed side lot lines run at right angles to Waverly Place.

3. *Building Envelopes. No lot shall be created without a building envelope of a size and configuration suitable for the type of development anticipated. For single-family residential zones, a suitable size and configuration generally includes a building envelope capable of siting a forty-foot by forty-foot square dwelling within the building envelope.*
   Sheet SP-103 of the submitted plan set shows the lot dimensions, lot areas, and yard setbacks to demonstrate a 40-foot by 40-foot square dwelling can be placed on each lot within the minimum setback areas.

4. *Where property is zoned and planned for commercial or industrial use*
   As stated previously in this narrative, the subject property is zoned for residential use.

5. *Flag lots, access tracts, and private roads may be permitted only when the community development director or designee finds the applicant meets the criteria listed hereinafter:*
   a. The pole of a flag lot must be a minimum of twenty feet wide with a minimum of twelve feet of pavement and shall serve no more than one lot;
   b. The structure(s) accessed by a flag lot, access tract, or private road will be required to furnish a minimum of two off-street parking spaces per residential unit. Under no circumstances will required parking be allowed along the flag pole lot;
   c. An approved address sign, in accordance with the Camas Municipal Code, must be posted for each residence where the flag lot leaves the public road or access tract; and
   c. To protect the character of the immediate neighborhood, the city may impose special conditions, where feasible, including access configuration and separation, setbacks, fencing and landscaping.
   The project does not propose any access tracts or private roads. Lot 7 is the only proposed flag lot for the development. Sheet SP-103 of the submitted plan set shows the width of the flag pole as 24 feet. The flag pole will only serve Lot 7 and will be a paved width of at least 12 feet. An approved address sign will be placed at the east end of the flag pole, which is where the pole meets Waverly Place.

6. *Double Frontage Lots. Residential lots which have street frontage along two opposite lot lines shall be avoided, except for double frontage lots adjacent to an arterial or collector, which must comply with the following design standards:*
   A review of Sheet SP-103 of the submitted plan set shows Lots 9 through 12 as having street frontage along two opposite lines with Waverly Place running along their north lot lines and NW 43rd Avenue running along their south lot lines. NW 43rd Avenue is a collector street, so the proposed double frontage lots are allowed, provided they meet the design standards discussed below.

   a. Landscaping. A ten-foot landscaped tract is provided along the rear property line to visually buffer the rear yards from public view and prevent vehicular access.
   Sheet SP-103 of the submitted plan set depicts the required ten-foot wide landscape tract, along the rear property line of Lots 9 through 12, which will serve to visually buffer these rear yards from public view of NW 43rd Avenue as well as prevent vehicular access to NW 43rd Avenue. All lots in the subdivision, including the double frontage lots, will access from Waverly Place. None of the lots will take direct access from NW 43rd Avenue. Although not required, the ten-foot width of landscaping along the south lot line of Lots 9 through 12 will be extended along the south lot line of Lot 8 to the

west edge of the subdivision, as a ten-foot wide landscape easement, to provide aesthetic continuity for the frontage of the development.

Sheet L-101 of the submitted plan set shows the proposed landscaping for the site, including the landscaping plan for the ten-foot wide landscape tract. This tract will contain trees (Princeton sentry ginkgo) every 30 feet on center, three-foot tall shrubs (including purple rock rose and dwarf yedda hawthorn) to form a continuous screen, and groundcover (bearberry cotoneaster) to fully cover the remainder of the tract. Sheet L-101 notes in the plant list the trees will be two-inch caliper trees at the time of planting.

b. Fencing and Walls. A sight-obscuring fence or masonry wall shall be located at the line that separates the lot from the ten-foot landscape tract.
Sheet L-101 of the submitted plan set shows a six-foot tall wooden fence on the north side of the ten-foot wide landscape tract to separate Lots 9 through 12 from said tract. The proposed six-foot tall wooden fence will contain stone columns every 50 lineal feet to reduce the massing effect of the wood fencing material.

c. Architectural Design.
House elevations and facades have not been prepared for this project, and this application does not include any building permit requests. When the houses for Lots 9 through 12 are designed, the facades visible from NW 43rd Avenue will be consistent with the front building façade along Waverly Place. Houses on Lots 9 through 12 will avoid large blank walls on facades visible to NW 43rd Avenue. These items will be reviewed for compliance as part of the building permit process.

d. Setbacks. Minimum of twenty-foot setback will be provided from the property line separating the lot from the tract that is adjacent to the arterial or collector;
The required ten-foot wide landscape tract is adjacent to NW 43rd Avenue, which is a collector street. Sheet SP-103 of the submitted plan set shows the required 20-foot street side setback from the north line of the landscape tract.

7. *Corner Lots. Corner lots may be required to be platted with additional width to allow for the additional side yard requirements.*
Sheet SP-103 of the submitted plan set shows Lot 12 as being the only corner lot in the project. Side yard setbacks are shown on the lot demonstrating the lot is capable of siting a house and meeting the yard requirements.

8. *Restricted Corner Lots. Corner lots restricted from access on side yard flanking street shall be treated as interior lots and conform to front, side and rear yard interior setbacks of CMC Chapter 18.09; and*
Sheet SP-103 of the submitted plan set shows Lot 12 as being the only corner lot in the project. Access will be restricted and only allowed from the north property line to Waverly Place. Access will not be allowed from the east property line. All yard interior setbacks are depicted on Sheet SP-103.

9. *Redivision.*
Sheet SP-103 shows the largest lot in the proposed development is 9,000 square feet in area. This is not large enough for re-division in the R-7.5 zone as 7,500 square feet is the minimum standard lot size, and 5,250 square feet is the minimum density transfer lot size; therefore, re-division standards are not applicable to this application.

E. Tracts and Trails

The subject site is not located in an area of an officially designated trail and no trails are proposed as part of this development. Proposed tracts are shown on Sheet SP-103 of the submitted plan set. Tract A is an open space tract that will contain landscaping. Tract B is the proposed wetland and wetland buffer areas tract. Tract C is the storm facility. Tract D is the required landscape tract separating Lots 9 through 12 from NW 43rd Avenue. Tract E will contain stormwater pipe and a ditch inlet to convey water from Tract B to the development's stormwater system. All tracts will be owned and maintained by the homeowners' association. Maintenance standards will be outlined in the covenants, conditions, and restrictions to be recorded as part of the final development process. A 6.5-foot wide pedestrian easement will be provided along the west boundary of Lot 9 to allow for pedestrian access between the public sidewalk on Waverly Place and the public sidewalk on NW 43rd Avenue.

F. Landscaping

1. Each dwelling unit with a new development shall be landscaped with at least one tree in the planting strip of the right-of-way, or similar location in the front yard of each dwelling unit, with the exception of flag lots and lots accessed by tracts.

CMC Section 17.19.030(F) requires every dwelling unit to have at least one tree in the planting strip or front yard, excepting flag lots. Sheet L-101 of the submitted plan set shows the location of the proposed tree required for each lot. As discussed previously, Lot 7 is a flag lot and thus does not show a tree as one is not required.

G. Non-City Utility Easements

No non-city utility easements are proposed.

H. Watercourse Easements

The subject site is not traversed by any watercourses, drainageway, channels, or streams requiring stormwater easements or drainage rights-of-way.

I. Street Signs

Applicant shall pay for the initial cost of required street name or number signs, or street markings, including installation thereof, as part of developing the proposed project.

J. Lighting

Applicant shall pay for the cost of the design and installation of the street lighting system, acknowledging street lighting shall conform to the Clark public utility standards and be approved by the city. Street lighting design will be addressed during final engineering.

K. All residential streets shall conform to the guidelines and standards of the city neighborhood traffic management plan.

The project proposes one new residential street, Waverly Place. Sheet C-002 of the submitted plan set shows the required typical section for Waverly Place as well as the hammerhead turnaround at the west end. Also shown is the typical section for the required NW 43rd Avenue street frontage improvements.

17.19.040 Infrastructure standards

A. Private Street

The project does not propose any private streets. The new street will be public.

B. Streets

1. *Half Width Improvement.*
   The subject site has NW 43rd Avenue frontage as its south boundary. This frontage will be improved to meet standards in the Design Standard Manual. A typical section is shown on Sheet C-002 of the submitted plan set. Sheet C-501 of the submitted plan set provides a preliminary striping plan for NW 43rd Avenue and the new intersection of NW 43rd Avenue and Waverly Place.

2. *Streets abutting the perimeter of a development shall be provided in accordance with CMC 17.19.040(B)(1) above, and the Design Standard Manual.*
   No streets are adjacent to the perimeter of the development, except NW 43rd Avenue along the south boundary, because the subject site is abutting a fully-developed parcel to the west and developed subdivisions to the north and east. Due to the existing development, it is not possible to construct streets abutting the north, east, or west perimeter of the development.

3. *The city engineer may approve a delay of frontage street improvements for development proposals under any of the following conditions:*
   No delays are anticipated or proposed for the frontage improvements.

4. *In the event the frontage improvement is delayed, the owner must provide an approved form or financial surety in lieu of said improvements.*
   Applicant intends to construct all frontage improvements upon approval and receipt of necessary permits. Should there be a delay, it is acknowledged financial surety must be provided in lieu of the improvements.

5. *Dedication of additional right-of-way may be required for a development when it is necessary to meet the minimum street width standards or when lack of such dedication would cause…*
   An additional ten feet of right-of-way will be dedicated along the subject site's existing NW 43rd Avenue frontage as part of this project to meet City minimum street width standards for a collector.

6. *Extension. Proposed street systems shall extend existing streets at the same or greater width unless…*
   No street extensions are proposed as part of this project as there are no abutting streets adjacent to the site.

7. *Names. All street names, street numbers, and building numbers shall be assigned in accordance with CMC 12.24.*
   Addressing will take place in accordance with CMC 12.24 through another phase of the development. Waverly Place is the requested street name for the new public street.

8. *Right-of-way, tract and pavement widths for streets shall be based on Table 17.19.040-1 and Table 17.19.040-2.*
   Waverly Place is a new public street, shown throughout the submitted plan set as a 41-foot wide dedicated right-of-way area, within which contains 28 feet of pavement width. It is noted that all houses in the development will be equipped with automatic fire sprinkler systems complying with NFPA 13D or 13R. CMC Table 17.19.040-2 identifies the required right-of-way width as 52 feet with 28 feet of pavement width, and five-foot detached sidewalks on both sides with planter strips. While the proposed right-of-way width of 41 feet is less than the 52-foot wide requirement, it is noted that the street section requirements detailed in CMC Table 17.19.040-2 are being met. Sheet C-002 shows the typical section for Waverly Place, including the required sidewalk on both sides. The difference

between the required section and what is proposed is that the required sidewalk and planter strip on the north side of Waverly Place will be contained in easements on the lots rather than contained in the dedicated public right-of-way. The north sidewalk will be curb-tight (rather than detached) in a public sidewalk easement on the lots, with the planter strip easement containing the street trees adjacent to the back of the sidewalk. All required elements are present, but not in dedicated right-of-way. A discussion takes place below in Section 17.19.040.B.10.f. regarding the requested deviation from 52-foot right-of-way requirement.

Sheet C-002 also shows the typical section for NW 43rd Avenue, with the ten-foot wide right-of-way dedication shown on Sheet SP-103. The proposed improvements for NW 43rd Avenue as depicted on C-002 meet the minimum standards outlined in CMC Table 17.19.040-2.

9. *Intersection. Any intersection of streets that connect to a public street, whatever the classification, shall be at right angles as nearly as possible, shall not exceed fifteen degrees, and not be offset insofar as practical. All right-of-way lines at intersections with arterial streets shall have a corner radius of not less than twelve feet.*
   The proposed intersection of Waverly Place and NW 43rd Avenue is at right angles as depicted on Sheet SP-103 of the submitted plan set.

10. *Street Layout. Street layout shall provide for the most advantageous development of the land development, adjoining area, and the entire neighborhood. Evaluation of street layout shall take into consideration potential circulation solutions for vehicle, bicycle and pedestrian traffic, and, where feasible, street segments shall be interconnected.*
    a. *Circulation Plan. Applicants shall submit a circulation plan at application which includes the subject site and properties within six hundred feet of the proposed development site. The plan shall incorporate the following features both on-site and off-site:*
       i. *The circulation plan shall be to an engineering scale at one inch = one hundred feet or the scale may be increased or decreased at a scale approved by the director;*
       ii. *Existing and proposed topography for slopes of ten percent or greater, with contour intervals not more than ten feet;*
       iii. *Environmental sensitive lands (geologic hazards, wetlands, floodplain, shoreline, etc.);*
       iv. *Existing and proposed streets, bicycle/pedestrian pathways, trails, transit routes; and*
       v. *Site access points for vehicles, pedestrians, bicycles, and transit.*

    Sheet C601 of the submitted plan set is the required Circulation Plan. The scale is 1" equals 100'. Existing and proposed topography is shown. The only environmentally-sensitive land on the site is the wetland area in the northeast corner and this is shown on the plan. The project does not propose any trails or transit routes. Only one new street is proposed. The new street is public and will have public sidewalks on both sides of the street. No bicycle pathways are proposed. There will be one pedestrian pathway along the west side of Lot 9 to provide connection between the public sidewalk of Waverly Place and the public sidewalk along NW 43rd Avenue. The site access point is a new approach at the southeast corner of the project and will provide access for vehicles, pedestrians, and bicycles. The site is not currently serviced by public transportation. The closest public transportation is in the City of Vancouver, via buses, approximately 14 miles to the west.

    b. *Cross-circulation shall be provided that meets the following:*
       i. *Block lengths shall not exceed the maximum access spacing for the roadway class per the city's design standards manual.*

The project only provides one block and one access. The access has been placed in the only location possible to achieve sight distance requirements. A sight distance certificate has been submitted with this application package certifying sight distance standards have been met.

ii. Cul-de-sacs and permanent dead-end streets over three hundred feet in length may be denied unless topographic or other physical constraints prohibit achieving this standard. When cul-de-sacs or dead-end streets are permitted, a direct pedestrian or bicycle connection shall be provided to the nearest available street or pedestrian oriented use.

The proposed public street is a permanent dead-end street ending in a hammerhead. The proposed street is also over 300 feet in length. However, access to the site is constrained because of its location. Specifically, the site is located adjacent to existing developments to the north, east, and west that preclude street connections or interconnectivity which would enable elimination of the permanent dead-ended proposed Waverly Place. The entire north boundary of the site is Lake Pointe Subdivision. Sheet C601 shows a continuous row of lots with existing houses in the portion of Lake Pointe Subdivision adjacent to the subject site's north boundary. The City did not require the Lake Point project to provide any street stubs to its south line for future connection with the subject site; thus, it is not possible to have the proposed Waverly Place extend to the north and connect with either NW 45th Avenue or NW Walden Street as there are houses and private property blocking such a connection.

The east boundary of the site is Sierra Meadows Subdivision. Construction of houses on lots adjacent to the subject site's east boundary is underway. The City did not require Sierra Meadows Subdivision to extend its NW 44th Avenue to the subject site's east boundary for purposes of future connection. Rather, the street (NW 44th Avenue) in Sierra Meadows Subdivision is a permanent dead-end street, also over 300 feet in length. As evidenced by a review of Sheet 601, there is no opportunity for street connection between the subject site's Waverly Place and NW 44th Avenue in Sierra Meadows because privately-owned residential lots, which will soon contain houses, obstruct such a connection.

A review of Sheet C601 also shows existing development on the adjacent west parcel in the form of a house, accessory structures, and a swimming pool. And, west of this adjacent west parcel is another fully-developed subdivision, Sun Valley Subdivision, with existing houses and privately-owned property obstructing right-of-way dedication for a western connection of proposed Waverly Place to NW Aspen Court.

The only outlet, then, to prevent a permanent dead-end of Waverly Place would be to either loop it through the project to the southeast access point or to loop it to the south to NW 43rd Avenue as another approach. Unfortunately, again due to location as well as the relatively short east-west span of the subject site's south line, there is not enough distance between the existing driveway on the adjacent west parcel and the location of the proposed new approach in the southeast corner of the subject development to accommodate a third approach on NW 43rd Avenue. A third approach between the existing west driveway and the new Waverly Place approach does not meet sight distance requirements, especially with the existence of the curve at the west end of NW 43rd Avenue where it goes into NW Astor Street. Therefore, looping Waverly Place to the south and connecting into NW 43rd Avenue at the west end of the project is not possible. The subject site is relatively small at 3.27 acres and has the wetlands in the northeast corner. The combination of the small size and preservation of the

wetlands does not allow enough area for Waverly Place to loop internally and come back out again at the original approach in the southeast corner and still meet turning radius requirements for the loop. With no viable outlets to the north, east, west, or south as has been discussed above, there is no alternative but to permanently dead-end the new street at a length that provides access to all 12 lots, which happens to be longer than 300 feet.

iii. The city engineer may recommend approval of a deviation to the design standards of this section based on findings that the deviation is the minimum necessary to address the constraint and the application of the standard if impracticable due to topography, environmental sensitive lands, or existing adjacent development patterns.

As explained above, the project is unable to comply with the maximum 300-foot long permanent dead-end street requirement due to location, small size, existing wetlands, and existing adjacent development patterns. Pursuant to CMC Section 17.19.040.B.10.b.iii. the application respectfully requests approval to exceed the maximum-allowed length of a permanent dead-end street for all the previously-stated reasons.

c. While it is important to minimize the impact to the topography from creating an integrated road system, improved site development and circulation solutions shall not be sacrificed to minimize the amount of cut and fill requirements of the proposal.

For all the reasons stated above, the new approach and access street for the project is placed in the only location possible. The location was not based upon minimizing cut and fill requirements; rather the location of Waverly Place as based upon sight distance requirements, lot size and dimension standards, size of the parent parcel, and preservation of the wetland and wetland buffer areas in the northeast corner.

d. Where critical areas are impacted, the standards and procedures for rights-of-way in the critical areas overlay zone shall be followed.

No right-of-way is proposed in the subject site's wetlands and wetland buffer area in Tract B.

e. Where the proposed development's average lot size is seven thousand four hundred square feet or less, one additional off-street parking space shall be required for every five units, notwithstanding the requirements of CMC Chapter 18.11. These spaces are intended to be located within a common tract.

The proposed development's average lot size is less than 7,400 square feet; one additional off-street parking space for every five units equals two off-street parking spaces intended to be in a common tract. The project is unable to provide a separate common tract for two parking spaces due to the small size of the original parcel at 3.27 acres, the size of water quality facility needed for treatment, and the preservation of wetland and wetland buffer area in the northeast corner. It is noted, however, that all driveways will be sized to allow parking for two cars and attached garages will be two-car garages providing for four off-street parking spaces on each lot and respectfully requests an exception to this common tract parking intention, noting that the code does not **require** the additional spaces to be in a common tract, just that they are intended to be in a common tract. In this case, the project will exceed the requirement of additional spaces by providing four spaces on each lot. Now, they won't be in a common tract, but the two-car driveways and two-car garages on each lot will provide off-street parking to meet the requirement for additional parking when average lot size is less than 7,400 square feet.

f. *When, on the basis of topography, projected traffic usage or other relevant facts, it is unfeasible to comply with the foregoing right-of-way, tract and street width standards, the approval authority, upon recommendation from the city engineer, may permit a deviation from the standards of Table 17.19.040-1 and Table 17.19.040-2.*
The proposed Waverly Place will be a public local street. The standards for a public local street are noted in CMC Table 17.19.040-2 as requiring a 52-foot right-of-way within which is contained a 28-foot pavement width, five-foot detached sidewalk on both sides, with planter strip, and no parking on one side. This application will provide the required 28-foot pavement width with a five-foot detached sidewalk and planter strip on the south side within a decreased right-of-way from 52 feet to 41 feet. The north side of the street will also have the required five-foot sidewalk and planter strip, but they will be within easements on the individual lots and the sidewalk will be curb-tight. The development, therefore, is providing all the required features of 28-foot pavement width, five-foot sidewalk and planter strip on both sides of the street, and no parking on one side of the street. The only deviation, then, is to the right-of-way width from 52 feet to 41 feet which will allow for the required sidewalk and planter strip on the north side of the street to be in easements on the lots with the curb-tight sidewalk. This enables the north row of lots adjacent to the wetlands to be as far south as possible, while still maintaining enough square footage in the lots to meet front and side setback standards and produce a viable house footprint. The purpose in moving the north row of lots as far south as possible, and thus decreasing the right-of-way and asking for the deviation, is to avoid the wetland and wetland buffer area in the northeast corner of the project. This requested deviation allows for an increase in the avoided wetland and wetland buffer area from 17,073 square feet to 22,177 square feet, or an increase of 5,104 square feet of avoided wetland area. This increase is not possible without the requested deviation as described above.

g. *The city engineer or designee may determine a wider width is necessary due to site circumstances, including but not limited to topography, traffic volume, street patterns,…*
The city engineer has not made any determinations to require a wider paved width to Waverly Place other than the standard 28-foot width which is being provided as part of this project.

h. *When existing streets adjacent to or within land to be developed are of inadequate width, additional right-of-way shall be provided at the time of land development.*
The existing NW 43rd Avenue adjacent to the project is lacking the required right-of-way width. This project will dedicate ten feet of its property along the south parcel line to comply with City requirements for right-of-way along the site's NW 43rd Avenue frontage.

11. *Access Management.*
The site does not contain any marginal access streets. A new local street will be constructed off NW 43rd Avenue to provide all access to the 12 new lots. A sight distance certification stating there is sufficient intersection sight distance at the project's proposed access location has been included with this submittal package.

12. *Street Design.*
Sheet C-002 of the submitted plan set shows the typical street sections. Sheet C-201 shows the preliminary street grading plan to illustrate preliminary compliance with the Camas Design Standard Manual, and, specifically, to show the grade of the proposed Waverly Place does not exceed the 12-

percent maximum. Final engineering drawings will show specific street design details to meet requirements in the Camas Design Standard Manual.

13. *Sidewalks shall be constructed as specified in Camas Design Standard Manual.*
Sidewalks will be constructed on both sides of Waverly Place, both sides of the hammerhead, and along the subject site's NW 43rd Avenue frontage. The typical street sections shown on Sheet C-002 of the submitted plan set illustrate the width of the sidewalks. The proposed sidewalks are also shown on all applicable sheets of the submitted plan set. Final engineering drawings will contain sidewalk design specifics. Sidewalks shall be installed prior to final acceptance of the development.

14. *Cul-de-sacs.*
The project does not propose any cul-de-sacs.

15. *Turn-arounds.*
The project proposes a hammerhead turnaround at the west end of Waverly Place. The hammerhead typical section is shown on Sheet C-002 of the submitted plan set in accordance with the Camas Design Standard Manual.

C. *Utilities*

1. *Generally. All utilities designed to serve the development shall be placed underground and, if located within a critical area, shall be designed to meet the standards of the critical areas ordinance.*
All utilizes for the new subdivision shall be placed underground as part of site development. No utilities are proposed within the wetland or wetland buffer areas in Tract B.

2. *Sanitary sewers shall be provided to each lot at no cost to the city and designed in accordance with city standards.*
Sheet C-401 of the submitted plan set illustrates the proposed sewer extension from NW 43rd Avenue, through the development, and back down to NW 43rd Avenue, along with showing the typical STEP sewer services to each new lot. This sheet shows the existing three-inch STEP sanitary mainline in NW 43rd Avenue adjacent to the site's southeast corner and demonstrates how it is being extended through the development and back to NW 43rd Avenue. A STEP sanitary cleanout is provided at the north end of the proposed hammerhead as well as at the west edge of the development in NW 43rd Avenue.

3. *Storm Drainage. The storm drainage collection system shall meet the requirements of the city's officially adopted storm water standards.*
The site's development plan proposes to grade the site to collect the stormwater runoff and convey it to the proposed detention pond located along the western edge of the project. The volume of the detention pond was determined by the Western Washington Hydrology Model. Stormwater runoff from the site will be collected and treated in a Perk Filter Treatment Vault located next to the detention pond. After the stormwater runoff is treated in the Perk Filter Treatment Vault, it will be discharged into the detention pond. The Perk Filter treatment system has a General Use Level Designation (GULD) for basic and phosphorus treatment. The water from the wetland and wetland buffer areas in Tract B will flow to a ditch inlet in the north end of Tract E. The water will be conveyed through pipes and discharged to the existing 15-inch pipe located near the stormwater facility. The wetland conveyance pipe will discharge the water at the point the water left the property prior to the development of the site.

4. *Water System.*
   There is an existing 18-inch ductile iron pipe water mainline adjacent to the subject site in NW 43rd Avenue. Proposed lots will have one common connection to this existing 18-inch mainline via installation of an eight-inch water line that will connect to the existing mainline and run through Waverly Place, transitioning to a six-inch water line in the hammerhead portion of Waverly Place. One-inch water services are proposed on each lot from the newly-installed water line in Waverly Place. Sheet C-401 of the submitted plan set depicts the existing and proposed water lines and services. The required service for an irrigation meter in Tracts A and D is shown on Sheet L-101 of the submitted plan set.

   Installation of a new public fire hydrant will take place south of the common property corner of Lots 4 and 5 as shown on Sheet C-401 of the submitted plan set. It is noted that Low Flow Life Safety Residential Fire Sprinklers are required to be installed in all the new houses of the development.

TITLE 16 ENVIRONMENT

SEPA

A SEPA threshold determination has been included as part of this application submittal.

ARCHAEOLOGICAL

An archaeological report has been included as part of this application submittal. The report, dated October 6, 2017, was prepared by Archaeological Investigations Northwest, Inc. (AINW), specifically Sarah L. Dubois, a professional archaeologist as defined by RCW 27.53.030(8) and WAS 25-48-020(4). The report recommends an archaeological resource survey is not necessary and states the following findings and conclusions:

> "The project is located within an area indicated as having a moderate, moderate-high, to high probability for pre-contact sites under the Clark County Predictive Model. No pre-contact or historic-period archaeological material was identified during the pedestrian survey and shovel testing. No archaeological sites have been recorded nearby. AINW recommends no further archaeological work is needed for this work."

Regardless, if any cultural or historical resources are discovered during construction activity, construction shall cease until a qualified archaeologist assesses the find.

CRITICAL AREAS

CHAPTER 16.51 GENERAL PROVISIONS FOR CRITICAL AREAS

16.51.070 Critical areas—Regulated

CMC Section 16.51.070(A) states the critical areas regulated by CMC Chapter 16.52 are wetlands (CMC Chapter 16.53), critical aquifer recharge areas (CMC Chapter 16.55), frequently flooded areas (CMC Chapter 16.57), geologically hazardous areas (CMC Chapter 16.59), and fish and wildlife habitat conservation areas (CMC Chapter 16.61). CMC Section 16.51.070(B) states all areas within the City meeting the definition of one or more critical areas, platted natural open space area, and conservation covenant areas are designated critical areas and are subject to these provisions. The subject property has identified wetlands in the northeast corner of the site; therefore, the development is subject to CMC Chapter 16.51 and CMC Chapter 16.53.

16.51.090 Applicability

CMC Section 16.51.090(H) lists a subdivision as an activity subject to the criteria, guidelines, report requirements, conditions, and performances standards in CMC Title 16.

16.51.125 Vegetation removal permit
A vegetation removal permit request and vegetation management plan have been included with this application submittal and were addressed earlier in this document under the heading of Chapter 18.31.

16.51.130 Review required
The required critical areas report has been submitted with this application.

16.51.140 Critical area reporting evaluation—Requirements
The completed critical areas report addressing the criteria listed in CMC Section 16.51.140 is included with this application submittal.

16.51.150 Critical area report—Modifications to requirements
This project does not propose any modifications to the requirements.

16.51.160 Mitigation requirements
16.51.170 Mitigation sequencing
16.51.180 Mitigation plan requirements
16.51.190 Innovative mitigation
The project proposes to offset the proposed wetland and buffer impacts by purchasing credits from the Terrace Mitigation Bank (TMB). The subject property is within the service area of TMB as required by CMC Chapter 16.53.050.D.2.b. and 16.53.050.D.5.a.iii. As further required under CMC Chapter 16.53.050.D.5.a.i., TMB is currently certified under state and federal rules, has palustrine, emergent and buffer (case-by-case) credits available, and the use of credits is consistent with the terms and conditions of the certified bank instruments. The replacement ratios are listed in *Table 2 Credit-Debit Ratios* in the Critical Areas Report included with this application submittal.

Additional information regarding mitigation is contained in the submitted Critical Areas Report.

16.51.200 Unauthorized critical area alterations and enforcement
The project does not propose or anticipate any unauthorized critical area alterations to the subject site.

16.51.210 Critical area markers, signs and fencing
During construction, the outer perimeter of Tract B will be marked with temporary orange construction/silt fencing to prevent unauthorized intrusion. The temporary fencing will be maintained through the entire construction period. A permanent wooden split-rail fence is proposed along the perimeter of the tract for long-term protection. As required by CMC Chapter 16.53.040.C.2.b., signs will be installed, worded substantially as follows:

"Wetland and Buffer Area – Retain in a natural state"

Tract B will be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

16.51.220 Notice on title

Tract B will be recorded on documents of title and shown on the recorded drawings as required by CMC Chapters 16.51.240 and 16.53.040.C.4. As required by 16.53.040.C.3., "a conservation covenant shall be recorded in a form approved by the city as adequate to incorporate the other restrictions of this section and to give notice of the requirement to obtain a wetland permit prior to engaging in regulated activities within a wetland or its buffer."

16.51.240 Critical area protective mechanism

The identified critical area, being the wetland and wetland buffer areas in the northeast portion of the proposed development, is being set aside as Tract B and shall be non-developable. During construction, the outer perimeter of Tract B will be marked with temporary orange construction/silt fencing to prevent unauthorized intrusion. The temporary fencing will be maintained through the entire construction period. A permanent wooden split-rail fence is proposed along the perimeter of the tract for long-term protection. As required by CMC Chapter 16.53.040.C.2.b., signs will be installed, worded substantially as follows:

"Wetland and Buffer Area – Retain in a natural state"

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16.51.250 Bonds to ensure mitigation, maintenance, and monitoring

Required bonds to ensure mitigation, maintenance, and monitoring of proposed Tract B shall be established as part of the platting and final approval process.

CHAPTER 16.53 WETLANDS

The subject site has wetland and wetland buffer areas, as identified in the wetland delineation report, dated October 8, 2017, and included as part of this submittal. The Critical Areas Report included with this application gives a detailed discussion on the project's compliance with CMC Chapter 16.53.

The development proposes use of buffer reduction per CMC 16.53.050.C.1(b) by enhancing the remaining on-site wetland buffer width with a combined native seed and plant installation ecological restoration approach. Following removal of non-native and undesirable vegetation the wetland buffer area will be seeded with a native grass and woody species mix for immediate erosion control and long-term establishment followed by planting of native woody species typical of the area. Bare root material is proposed at a dense (4' o.c.) spacing to provide quick cover and competition from weed intrusion. Seeding and plant installation will occur in the dormant season to promote for a higher establishment success. 25 native trees will be planted following the requirements per CMC Chapter 16.51.125.B. The proposed ecological restoration approach will provide an overall net gain in native understory and canopy diversity with a functional lift in wetland habitat.

It is noted that complete avoidance of the identified existing wetlands on the site is inconsistent with the City's comprehensive plan and would also render the project not feasible to construct. The comprehensive plan identifies areas for residential use. The subject site is designated as Single-Family-Medium with the corresponding zone of R-7.5 in the City's comprehensive plan. No portion of the subject site is identified as a designated open space/green space area in the comprehensive plan. CMC 18.05.040.D states the following: "R-7.5 Residential-7,500. This zone is intended for single-family dwellings with densities of five to six dwellings per acre." Further, the maximum density for the R-7.5 zone is 5.8 dwelling units/net acre as noted in CMC

18.09.040. The subject site is gross 3.27 acres, with a net acreage of 2.74 acres which yields a maximum density of 16 lots (2.74 acres multiplied by 5.8 dwelling units equals 15.9 or 16 lots). The lower end at 5 dwelling units per acre yields a total of 14 lots. The project is only providing 12 lots to minimize wetland and wetland buffer impact, while still producing a viable project. Technically, though, since the zone designation of R-7.5 specifically calls for five to six dwellings per acre, at 12 lots, the project is not consistent with the medium density residential requirements for the comprehensive plan. The minimization to the wetland and wetland buffer impacts proposed by this development, then, have created a conflict between the comprehensive plan's desired density of 14 to 16 lots for the subject site and complete avoidance of the entire identified wetland area. It is noted that complete avoidance of the wetlands which would result in an even further loss of lots and decrease the lot count below 12, making the project even more inconsistent with the medium density residential requirements for the comprehensive plan.

Additionally, the loss of any more lots below the 12 being presented, makes the project economically non-feasible to construct. The applicant must make a small profit on the project, or at least break even, to move forward with the development. Any lot reduction below 12 would create a net loss for the applicant, and thus it would not make any sense financially to proceed with infrastructure installation and house construction.

The City's land use portion of the comprehensive plan has been specifically designed to accommodate a population of 34,098 people by 2035. To provide housing for the projected growth, the comprehensive plan has designated residential properties in the City as single-family-high, medium, and low with corresponding zones that provide a required density standard to meet the housing demand resulting from the projected population influx. Not following the density standards set forth will result in a lack of housing for the anticipated new residents.

For the reasons stated above, the applicant feels he has demonstrated avoiding all impact will result in a project that is inconsistent with the City's comprehensive plan and not feasible to construct as required by CMC Chapter 16.53.050.D.1.a.ii.(A) and (C).

CHAPTER 16.55 CRITICAL AQUIFER RECHARGE AREAS

As confirmed in the critical areas report, the subject site does not contain any critical aquifer recharge areas.

CHAPTER 16.57 FREQUENTLY FLOODED AREAS

As confirmed in the critical areas report, the subject site does not contain any frequently flooded areas.

CHAPTER 16.61 FISH AND WILDLIFE HABITAT CONSERVATION AREAS

As confirmed in the critical areas report, the subject site does not contain any fish and wildlife habitat conservation areas.

TITLE 15 BUILDING AND CONSTRUCTION

Compliance with the City's Building and Construction Code will be demonstrated with the submittal of individual building and construction permit requests. Fire protection will be provided through provisions for apparatus access and provisions of fire protection water supplies as required by the International Fire Code. Apparatus access will be provided from existing NW 43rd Avenue through the proposed Waverly Place, with a fire apparatus turnaround at the end of Waverly Place. Fire protection supplies will be accomplished through a public fire hydrant located south of the common property corner of Lots 4 and 5 as shown on Sheet C-401 of the submitted plan set. Low Flow Life Safety Residential Fire Sprinklers are required in all the new dwellings. Nothing in the proposed application will preclude compliance with CMC Title 15.

CONCLUSION

A development to meet the needs of the existing and future residents of the City is being provided. The proposal complies with all applicable portions of the CMC and furthers the goals of the City's adopted Comprehensive Plan.