



May 5, 2015

Robert Maul, Planning Director
City of Camas
161 NE 4th Avenue
Camas, WA 98607

Re: Green Mountain Planned Residential Development and Phase 1 Response to WDFW
Comments

Dear Mr. Maul:

Please accept this as a response to George Fornes' letter on behalf of the Washington Department of Fish and Wildlife (WDFW), dated March 17, 2015, regarding Oregon white oak woodlands, Green Mountain Biodiversity Area, Townsend's big-eared bat, Bradshaw's lomatium, and wetlands.

Oregon White Oak Woodlands

Ecological Land Services, Inc. biologists identified 20 Oregon white oaks on or immediately adjacent to the proposed Phase 1 project area. The regulations applicable to these oaks are found in the City's code, which was adopted through a formal public process, including review by the WDFW. While WDFW recommends that all the oaks within Phase 1 be considered priority habitat based on its management recommendations¹, the regulations applicable to this project are found in CCC 16.61.010(A) (3)(a)(i) and CCC 16.61.010(A)(3)(a)(ii). Specifically, these regulations require that oaks greater than 20 inches diameter breast height (dbh) be classified as habitats of local importance (CCC 16.61.010(A) (3)(a)(i)) and that oak stands greater than one acre, when found to be valuable to fish and wildlife (CCC 16.61.010(A) (3)(a)(ii)), are regulated as priority habitat. The Applicant's proposal complies with the applicable requirements of the City's code.

The oaks to be impacted on Phase 1 are located on or adjacent to an active golf course. While the oaks by themselves have the potential to provide overstory habitat, the understory is heavily impacted by planted grass, regular mowing of the golf course fairways and rough, and other landscaping and maintenance activities. Few native species are present and understory structure is virtually non-existent. From an ecological standpoint, the understory lacks species diversity and habitat structure, providing low functions.

AVOIDANCE AND MINIMIZATION

Avoiding the regulated oaks and oak groves was a primary consideration when designing the PRD, including Phase 1. The Applicant and engineering team have re-examined the proposed Phase 1 grading plan, which was created after finalizing the design of Phase 1, to determine if any oaks could be avoided. Oak 2, a 22.5-inch dbh tree, will now be avoided because of its

¹ Larsen, E. and J.Morgan 1998. Management recommendations for Washington's priority habitats: Oregon white oak woodlands. Washington Department of Fish and Wildlife. Olympia, Washington. 37 pgs.

proximity to the site boundary and its location in which minimal grading is proposed. The remaining oaks lie in areas that require 2- to 3.5-feet of grading and cannot be reasonably avoided. The grading plan for subsequent phases has not been created; however, oaks will be avoided where reasonably possible as provided for in the City's code.

MITIGATION

To mitigate for the oaks being removed, we recommend a two-fold strategy of: 1) oak establishment/understory enhancement; and 2), oak preservation/understory enhancement. WDFW's letter commented that the proposed 2:1 stem count ratio was not adequate to replace the functions of mature oak to be removed and that temporal loss of habitat function was a concern. To address these issues, we propose direct establishment of oaks and enhancement of the understory, as well as a separate oak preservation and understory enhancement area. The two-fold approach will replace oak habitat on a canopy cover basis after approximately 10 years. This will preserve and enhance a mature oak grove to offset temporal loss and protect oak habitat over the long-term. We propose mitigating half of the impacts through establishment/ enhancement at a 4:1 and the other half of the impacts through preservation/enhancement at a 6:1.

Oak Establishment/Enhancement Area

The proposed oak establishment/enhancement area is located around the buffers of Wetlands B and D, much of which is currently part of an active golf course. Once the mitigation area is established, the existing high intensity land use will cease and the buffers will return to more natural conditions. To replace oaks removed, large caliper (minimum 1.5-inch diameter) ball & burlap oaks will be planted within the establishment/enhancement area along with overstory trees commonly associated with western Washington oak woodlands and appropriate for this site (Table 1)². This will compensate for 50 percent of the oak canopy cover removed and replace all of the oak habitat (based on overstory canopy cover) after about 10 years (Table 2; Exhibits A and B). The oaks and associated trees will offer greater wildlife habitat than currently exists on the site. The trees will also provide a valuable food source for wildlife when they reach reproductive maturity. In the long-term, cavities, snags, and downed trees will provide good wildlife habitat.

The approximately 6,500 square foot (0.15 acre) oak planting area that was originally proposed in the southern buffer of Wetland D³ will be expanded to accommodate additional area for planting trees and shrubs appropriate for western Washington oak woodlands. Figure 2 shows potential oak mitigation areas in the buffers of Wetlands B and D that set aside a larger area for mitigation than is actually needed (Exhibit B). The precise planting area will be determined at a later date pending further analysis of ecological and site layout considerations. Any extra area not used for the Phase 1 mitigation may be used for advance mitigation for the subsequent phases.

² Larsen and Morgan 1998

³ Ecological Land Services, Inc. Dec 2014

Native shrubs commonly associated with western Washington oak woodlands (Table 1)³ will be installed within the establishment/enhancement area to bolster species diversity and habitat structure. Thus, the understory will benefit from removing the existing land use, planting native shrubs, and allowing native colonizing species to take root in the area. Although most species of oaks do not produce acorns for several decades⁴, natural oak regeneration will be possible in the future under protected status of the oak establishment/enhancement area. These elements will improve the habitat functions of the understory beyond its existing low functions.

To ensure its long-term protection, the oak establishment/enhancement area will be protected in perpetuity with a conservation covenant or similar legal mechanism once the surrounding development has been developed per the PRD plan.

Table 1. Planting specifications for the oak establishment/understory enhancement area

Species	Approximate Spacing (feet on center)	Plant Material Specifications	Approx. Quantity
Tree stratum			
Bigleaf maple (<i>Acer macrophyllum</i> , FACU)	10	18-36 inch bareroot	
Oregon ash (<i>Fraxinus latifolia</i> , FACW)	10	18-36 inch bareroot or container	To be determined
Oregon white oak (<i>Quercus garryana</i> , FACU)	14	1.5-inch caliper B&B	
		Tree Density	Approx. 200 trees/acre
Shrub stratum			
Western serviceberry (<i>Amelanchier alnifolia</i> , FACU)	6-7	18-36 inch bareroot	
Oceanspray (<i>Holodiscus discolor</i> , FACU)	6-7	18-36 inch bareroot	
Tall Oregon-grape (<i>Mahonia aquifolium</i> , FACU)	6-7	12 to 18 inch bareroot or container	To be determined
Nootka rose (<i>Rosa nutkana</i> , FAC)	6-7	18-36 inch bareroot	
Common snowberry (<i>Symphoricarpos albus</i> , FACU)	6-7	18-36 inch bareroot	
		Shrub Density	Approx. 500 shrubs/acre

⁴ Loftis, D. and C. McGee, eds. 1993. Oak Regeneration: Serious problems, Practical recommendations. General Technical Report SE-84. Asheville, North Carolina. U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station.

Oak Preservation/Enhancement Area

The oak preservation/enhancement area is proposed to compensate for 50 percent of the oak canopy impacts by setting aside existing oak habitat along a riparian corridor in the southern PRD (Table 2; Exhibits A and B). The exact boundaries of this mitigation area shown on Figure 2 are to be determined pending ecological and site design considerations. The oak preservation/enhancement area will mitigate for temporal loss, protect oak habitat, and enhance the understory with native shrubs commonly associated with oak woodlands. To enhance species diversity and habitat structure, native shrubs will be installed in selected portions of the understory that are more open and will benefit from an understory stratum.

The area is well suited for preservation because a portion of it lies within the outer 50 percent of a Type Np stream buffer that could be subject to future development through buffer averaging. The oak preservation/enhancement area has greater plant species diversity across all strata with an overstory *and* understory habitat structure, unlike the species diversity and habitat structure associated with the impacted oaks; thus, the preservation/enhancement area will exceed the habitat functions currently provided by the oaks to be impacted. By preserving an established and well developed oak stand, **the project will lower the temporal loss and risk of failure with strictly replacement-based mitigation.** Like the oak establishment/enhancement area, the oak preservation/enhancement area will be protected in perpetuity with a conservation covenant or similar legal mechanism once the surrounding development has been developed per the PRD plan. The conservation covenant will allow for future plantings of oaks, if ecologically appropriate, and would need to accommodate the following:

1. Trails per the PRD plan and/or the City of Camas Parks & Open Space Plan
2. Unavoidable road crossings to allow access to inner part of the site

Table 2. Oregon white oak habitat impacts and mitigation

Impacts		Mitigation						
Total Oaks ¹	Estimated Oak Canopy Cover (sf) ²	Type	Canopy Impact Break-down	Ratio (canopy cover)	Required Canopy Cover (sf) ³	Required Area (acres)	Goals	Location/ Notes
19	15,400	Oak Establishment/ Understory Enhancement	7,700 (50% impact)	4:1	30,800	0.7	<ul style="list-style-type: none"> ▪ To replace oak habitat at approx. 10 yrs ▪ To enhance understory diversity and structure 	<ul style="list-style-type: none"> ▪ Establish area in Wetlands B & D buffers ▪ Plant native understory shrubs
		Oak Preservation/ Understory Enhancement	7,700 (50% impact)	6:1	46,200	1.1	<ul style="list-style-type: none"> ▪ To offset temporal loss ▪ To protect oak habitat ▪ To enhance understory diversity and structure 	<ul style="list-style-type: none"> ▪ Preserve oak stand along Type Np stream ▪ Plant native understory shrubs

¹ Oak 1, 7, 9, 55, 58, 64, and 121 are locally regulated oaks that are proposed to be removed.

² We estimated canopy cover of 1,000 square feet per tree or an estimated drip diameter of about 32 feet per tree. The estimated canopy cover errs on the high side, as some of the oaks do not have completely circular canopies.

³ The canopy cover within the oak preservation/enhancement area is based on an estimate of 1,000 square feet per tree for oaks 20 inches dbh and 700 square feet per tree for oaks 20 inches. See Exhibits A and B.

MITIGATION RATIOS RATIONALE

Mitigation ratios on a few projects (generally public projects) provided as examples by the WDFW have ranged from 5:1 to 8:1 based on amount of canopy cover removed⁵. We propose a 4:1 for oak habitat establishment, which we believe accomplishes the goal of increasing the quality of oak habitat over a reasonable period of time and is more consistent with mitigation ratios typically applied to a private development. The ratio is warranted because:

- Large oak (1.5-inch caliper, ball & burlap) trees will be planted. A 6:1 ratio for canopy cover was required for a residential project in Klickitat County and oaks were specified to be 3 feet tall or a 2 gallon container. The ball & burlap oaks proposed for the Phase 1 mitigation will be considerably larger and are anticipated to outpace the growth of a smaller tree with proper planting and maintenance. Based on our analysis of estimated growth rates of oaks in the area, oaks can be expected to grow approximately 0.7 feet/year. Thus, we anticipate a 7-foot increase in canopy cover over a 10 year period for properly planted and maintained oak trees. The large caliper ball & burlap oak should achieve approximately 75 percent canopy cover after 10 years.

⁵ Information provided by George Fornes, WDFW, April 22, 2015 email

- The establishment area will be coupled with a preservation area at a 6:1. Coupling direct establishment with preservation is similar to the WSDOT SR14 widening project, which both restored and preserved oak habitat (Mitigation ratios were higher with this state-funded project).

ADVANCE OAK MITIGATION

Outside of Phase 1, the subsequent phases of the PRD will also impact oaks; the exact number to be determined pending ecological considerations and site design constraints (Exhibits A and B). Avoidance will always be considered as it is one of the regulatory factors in identifying oaks that may or may not be appropriate to remove; green spaces and parks are already planned in areas with high concentrations of oaks. To be proactive, the Applicant proposes to establish potential advance oak mitigation areas within the Type Np stream corridor and several associated wetland buffers in the southern PRD. Other advanced mitigation areas may be identified onsite as well, including, but not limited to, any surplus buffer area around Wetlands B and D not used for Phase 1 mitigation. Advanced mitigation could potentially take place offsite as well, which would involve further consultation with WDFW.

The advance mitigation is proposed at a 2:1 ratio based on canopy cover impacts. This ratio is warranted because oak and associated trees and shrubs will be established many years before future phases are to be developed. Furthermore, the advance mitigation will have lower temporal loss and risk of failure than concurrent mitigation. Specific annual performance standards will have to be met before credits can be "withdrawn" from the advance mitigation site. An advance oak mitigation plan will be prepared in consultation with WDFW and will be submitted within 6 months of the approval of the PRD, creating the possibility for the first advanced mitigation plantings to take place in the fall/winter of 2015-2016.

Green Mountain Biodiversity Area

The northern portion of Phase 1 is mapped as the Green Mountain Biodiversity Area. According to the WDFW, the area is mapped because it consists of mature conifer forest of large size (approximately 300 acres) located within rapidly expanding development, with high value as refugia/remnant habitat and regular small concentrations of blacktail deer. The area in the northern portion of the site that is mapped as a biodiversity area differs in species, age class, and community structure from offsite forest to the north that is mapped as the same biodiversity area; thus it does not meet the regulatory criteria to be classified as a biodiversity area.

OFFSITE MAPPED AREA

The forested area immediately north of the northern project boundary consists of a mature coniferous forest dominated by Douglas-fir. We estimate the stand to be 70 to 75 years. This mature Douglas-fir forest provides a nearly 100 percent coniferous overstory cover. The understory consists of native shrubs and herbaceous species. Understory density is low because of shading by the overstory. This area is within the mapped Green Mountain Biodiversity Area and meets the PHS designation as we understand it.

ONSITE MAPPED AREA

In contrast, the area that lies within the mapped Green Mountain Biodiversity Area in the northern portion of Phase 1 differs from the dense coniferous forest located in the mapped area offsite. The young forested area onsite is comprised of approximately 15 percent coniferous trees and 85 percent deciduous. The mixed deciduous overstory is 20 to 25 years and dominated by red alder and black cottonwood in the overstory. Douglas-fir and grand fir, the only two species of conifer observed, occupy subordinate positions in the overstory, along with Scouler willow and bigleaf maple. The understory is notably denser than the offsite mapped area because it receives more sunlight than the understory offsite to the north. Shrubs and herbaceous species are fairly dense in the northern portion of Phase 1, and are predominately native (although English holly and Himalayan blackberry are present). Although this area falls within the mapped Green Mountain Biodiversity Area, it is a young, mixed deciduous forest that is structurally different from the offsite mapped area and does not meet the PHS designation of a *mature conifer forest*.

Both the onsite mapped area and offsite logged area have different species composition, age class, and structure from the offsite coniferous forested area to the north and do not satisfy the criteria necessary to be classified as a Biodiversity Area. At some point in the future, the mapped Biodiversity Area will likely need to be amended by WDFW after ground-truthing because there is a discrepancy between the mapping and forest types on the ground (young mixed deciduous forest onsite and the land to the immediate east of the Phase 1 project area that was logged about 5 years ago and has current logging activity are mapped as within the designated Green Mountain Biodiversity Area). Prior to developing subsequent phases in the forested area north of Phase 1, the area will be surveyed by ELS and WDFW biologists to determine its Biodiversity Area status.

Townsend's Big-Eared Bat

The developable areas within Phase 1 do not support topography suitable caves. However, rock outcrops and areas that may contain caves exist in the northern part of the PRD and outside of the Phase 1 project area. Thus, any cave or cave-like feature, if present, would be located in areas that are topographically steep, within the BPA powerline easement, or otherwise non-developable areas. Ecological Land Services biologists and the Applicant have surveyed the proposed Phase 1 project area extensively and no caves or hibernaculums were located within the developable areas. Based on the lack of caves or hibernaculums within the proposed developable area and the lack of bats observed during field investigations, no known bat habitat will be impacted by Phase 1. Field surveys with WDFW biologists will be conducted prior to development of subsequent phases in areas with potential habitat.

Bradshaw's Lomatium

Bradshaw's lomatium (*Lomatium bradshawii*) usually occupies remnant low-elevation grasslands and prairies in wet, seasonally flooded areas adjacent to streams and small rivers⁶.

⁶ Washington Natural Heritage Program rare plant information. Online at: <http://www1.dnr.wa.gov/nhp/refdesk/fguide/pdf/lobr.pdf>.

The lomatium is typically found in transitional areas between wetlands and uplands. This type of habitat may be present in undisturbed stream and wetland buffers onsite; however, the majority of the site is actively used as a golf course. The species typically blooms late April through the first week of May, although flowering may be earlier this spring because of the drier conditions. Fruits are set mid-May to early July and are helpful in positively identifying the species.

Bradshaw's lomatium has been identified in southern Clark County. The nearest identified population is approximately 0.25 miles from the closest PRD boundary⁵.

Rare plant surveys were conducted by Ecological Land Services biologists during the species' flowering period in April and May 2009⁷ and periodic site visits in 2013 and 2014. No Bradshaw's lomatium were identified within the PRD boundaries during these surveys. Additionally, the superintendent for the golf course has a Bachelor's of Science in Horticulture and extensive knowledge of the site and its plants. He can positively identify Bradshaw's lomatium and has never observed the species within the boundaries of the PRD during his many years as superintendent at the course.

Wetlands

WETLAND RATINGS

The *Critical Areas Report* was submitted on December 31, 2014⁸. The Department of Ecology adopted a new wetland rating system that went into effect January 1, 2015. The City's code incorporates the most recent version of Ecology's regulations on this issue. Because the application was submitted to the City prior to Ecology's adoption of the new regulations, under *RCW 58.17.033*, the application is required to be subject to those rules and regulations in effect at the time of the application submittal. Thus, Ecology's 2004 wetland rating system was used in this case.

WETLAND BUFFER REDUCTION WITH ENHANCEMENT

The combined buffer reduction allowed under *CCC 16.53.050(C)(1)(c)* and described in the December 2014 *critical areas report* meets the requirements of *CCC 16.53.050 (C)(1)(a) Lower Impact Land Uses* and *CCC 16.53.050 (C)(1)(b) Restoration* in the following ways:

CCC 16.53.050(C)(1)(a) Lower Impact Land Uses. The buffer widths recommended for proposed land uses with high-intensity impacts to wetlands can be reduced to those recommended for moderate-intensity impacts if both of the following criteria are met:

- i. A relatively undisturbed, vegetated corridor at least one hundred feet wide is protected between the wetland and any other priority habitats that are present as defined by the Washington State Department of Fish and Wildlife; and*

This criteria is met because the wetland is located near the offsite mapped Green Mountain Biodiversity Area.

⁷ Ecological Land Services, Inc. July 2009. Rare Plant Survey for Green Mountain, Camas, Washington. Prepared for GM Camas, LLC.

⁸ Ecological Land Services, Inc. Dec 2014

- ii. *Measures to minimize the impacts of the land use adjacent to the wetlands are applied, such as infiltration of stormwater, retention of as much native vegetation and soils as possible, direction of noise and light away from the wetland, and other measures that may be suggested by a qualified wetlands professional.*

Stormwater is being detained and treated according to the most recent *Stormwater Management Manual for Western Washington*. The wetland buffer area to be enhanced is located in part of an active golf course, and is not dominated by native plants. Native shrubs are proposed to enhance the existing vegetation. Native soils will not be disturbed, except as necessary to plant the proposed shrubs. Street lights and outdoor residential lighting will be fitted with glare protectors to minimize light impacts. Additional measures to minimize dust impacts are described below.

Table 2. Measures to minimize disturbance impacts

Disturbance	Measures to minimize disturbance impacts	Specific measures to minimize disturbance impacts
Lights	<ul style="list-style-type: none"> ▪ Direct lights away from the wetland 	Street lights will be directed away from the wetland and appropriate glare protections will be installed. Outside residential lighting will have appropriate glare protections or be low-wattage to avoid light impacts.
Change in water regime	<ul style="list-style-type: none"> ▪ Infiltrate or treat new runoff from surfaces 	All stormwater runoff will be treated per the most recent <i>Stormwater Management Manual for Western Washington</i> . Hydrology to existing wetlands will be maintained.
Dust	<ul style="list-style-type: none"> ▪ BMPs for dust 	<p>A gravel construction access will be constructed.</p> <p>Silt fencing will be temporarily installed around the boundaries of the construction area where runoff may occur.</p> <p>Contractor will follow BMPs to control sediment from all ground-disturbing activities.</p>

CCC 16.53.030(C)(1)(b) Restoration. Buffer widths may be reduced up to twenty-five 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. To the extent possible, restoration should provide a vegetated corridor of a minimum one hundred feet wide between the wetland and any other priority habitat areas as defined by the Washington State Department of Fish and Wildlife. The habitat corridor must be protected for the entire distance between the wetland and the priority habitat area by some type of permanent legal protection such as a covenant or easement.

The December 2014 *Critical Areas Report* described the proposed enhancement plan for the southern buffer of Wetland D. The buffer to be enhanced is located in a part of an active golf course that is dominated by non-native grass species. The enhancement plan specifies native shrubs and herbaceous species to enhance the existing plant community and improve the species diversity and habitat structure beyond its existing low conditions⁹. The enhanced buffer will be protected in perpetuity with a conservation easement or similar legal mechanism once the surrounding development has been developed per the PRD plan.

We can be contacted at 350-578-1371 with any questions or concerns.

Respectfully,



Mara McGrath
Ecologist



Francis Naglich
President/Wetland Biologist

cc: John Schmidt, Metropolitan Land Group, LLC
Randy Printz, Landerholm

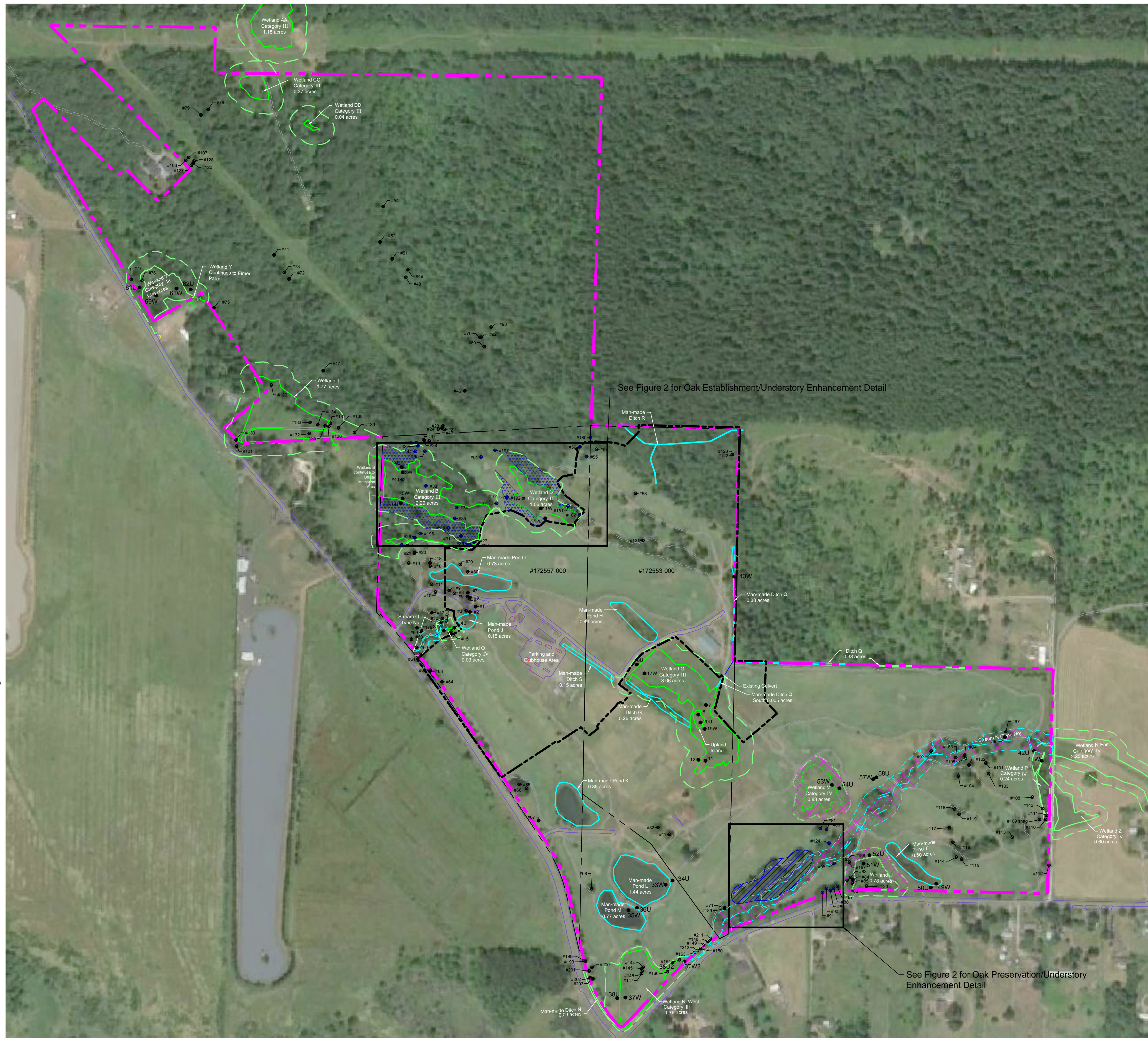
Attachments:

- Figure 1 Site Map
- Figure 2 Oak Mitigation Details
- Exhibit A Oak Summary by Phase, Oak Detail by Pod
- Exhibit B Concurrent and Advance Mitigation Summary

⁹ Table 5 in Ecological Land Services, Inc. Dec 2014

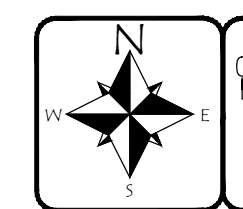
Attachments

Figure 1	Site Map
Figure 2	Oak Mitigation Details
Exhibit A	Oak Summary by Phase, Oak Detail by Pod
Exhibit B	Concurrent and Advance Mitigation Summary



- LEGEND:**
- PRD Boundary
 - Phase I Boundary (Approx. 53 acres)
 - Taxlot Boundary
 - Wetland
 - Wetland Buffer
 - Man-made Pond or Ditch
 - Stream
 - Stream Buffer
 - Existing Gravel Path
 - Existing Pavement
 - #22 ● Oak Tree
 - Tree Survey (WRG Design)
 - Test Plot
 - Oak Preservation/Understory Enhancement Area (Approx. 1.6 acres)
Of the total possible preservation/enhancement area, 1.1 acres to be used
 - Oak Establishment/Understory Enhancement Area (Approx. 2.7 acres)
Of the total possible establishment/enhancement area, 0.7 acres to be used
 - Potential Advance Oak Mitigation Areas (Gross 7.1 acres, Net Approx. 5.7 acres)
Of the total possible advance oak mitigation areas, 2.3 acres to be used

- NOTES:**
1. Aerial photo from Google Earth™
 2. Site surveyed by WRG Design, 2007.
 3. See Figure 2 for oak mitigation details.



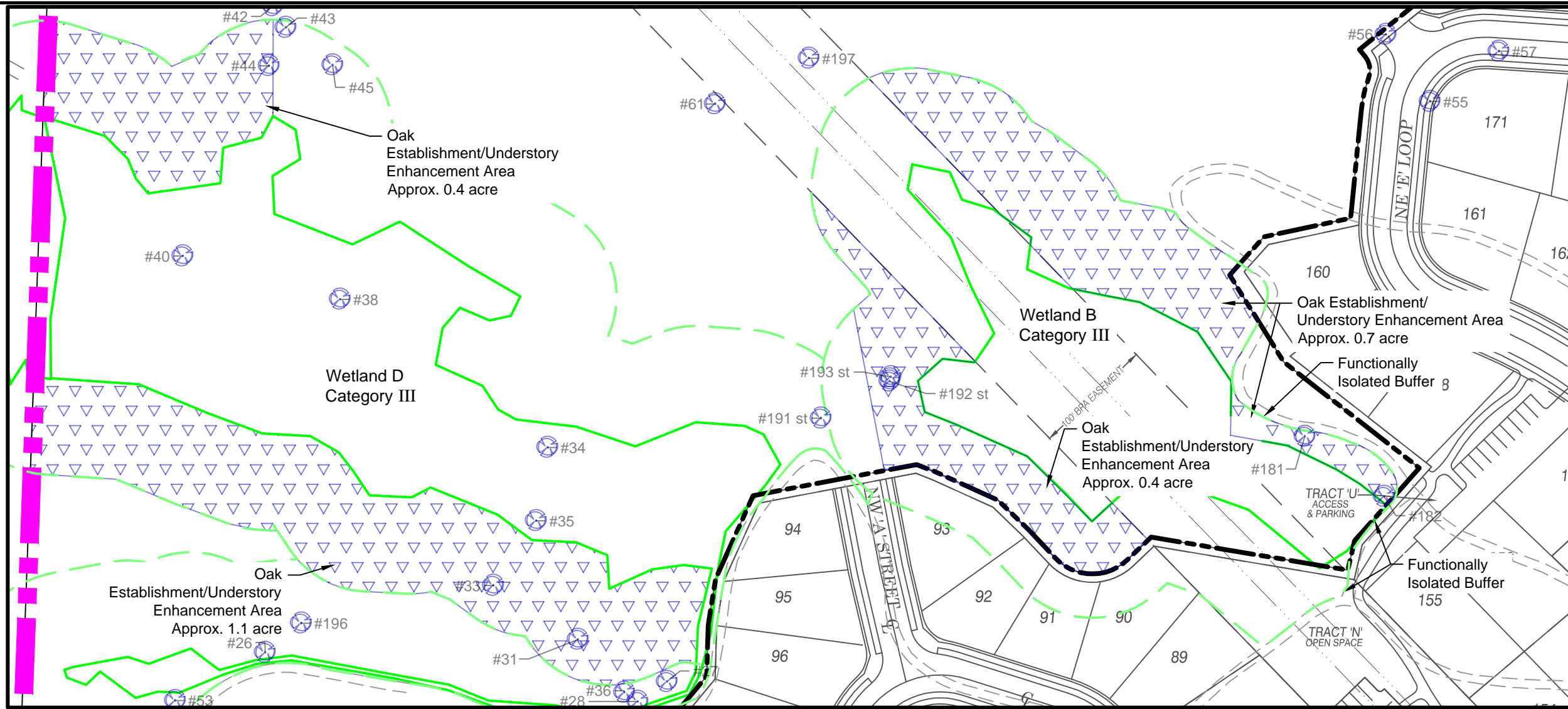
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SCALE IN FEET
1" = 250'

ECOLOGICAL LAND SERVICES, INC.
1157 3rd Ave., Suite 220
Longview, WA 98632
Phone: (360) 578-1371 Fax: (360) 414-9305

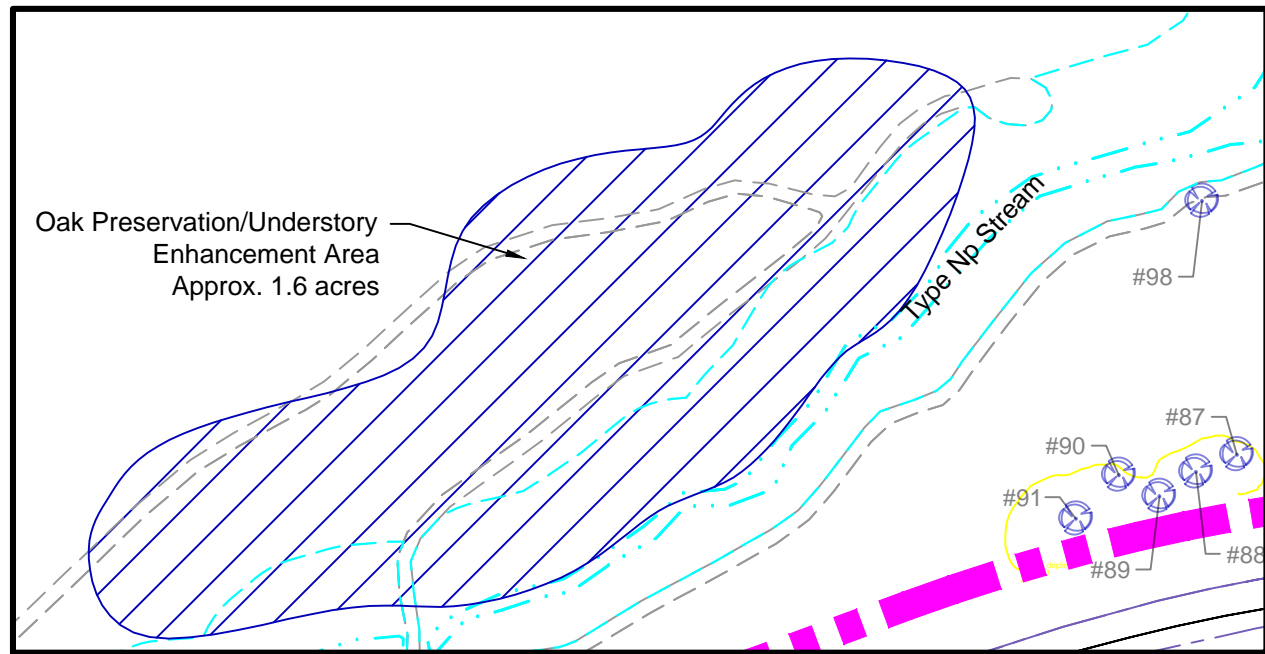
DATE: 6/6/15
DWN: JKJ
REQ. BY: CS
PRJ. MGR: AA/CS
CHK:
PROJECT NO: 2048.01

Figure 1
SITE MAP
Green Mountain Mixed Use PRD - Phase 1
Green Mountain Land, LLC
City of Camas, Clark County, Washington
Section 20, Township 2N, Range 3E, W.M.

5/5/2015 12:31 PM S:\ELSIWA\Clark\Camas\2048-Green Mountain Land, LLC\2048.01-Figures\2048.01_DL-PH1.dwg_cpayne



Oak Establishment/Understory Enhancement



Oak Preservation/Understory Enhancement

LEGEND:

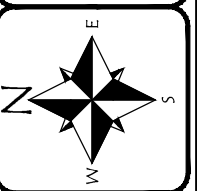
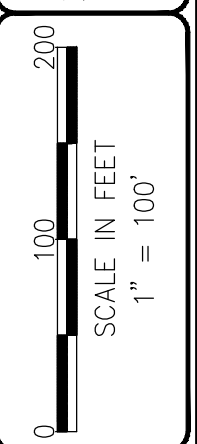
- PRD Boundary
- Phase I Boundary
- Wetland
- Wetland Buffer
- OHWM of Type Np Stream
- 50' Stream Buffer
- Existing Gravel Path
- Existing Pavement
- Oak Establishment/Understory Enhancement Area (Approx. 2.7 acres)
Of the total possible establishment/enhancement area, 0.7 acres to be used
- Oak Preservation/Understory Enhancement Area
(Approx. 84 Oak Trees with an Average DBH of 12" Covering 1.6 acres)
Of the total possible preservation/enhancement area, 1.1 acres to be used
- #81 Existing Oak Tree

Figure 2
OAK MITIGATION DETAILS
 Green Mountain Mixed Use PRD - Phase 1
 Green Mountain Land, LLC
 City of Camas, Clark County, Washington
 Section 20, Township 2N, Range 3E, W.M.

DATE: 5/5/15
 DWN: JKJ
 REQ. BY: CS
 PRJ. MGR: AAC/CS
 CHK:
 PROJECT NO:
 2048.01

ECOLOGICAL LAND SERVICES, INC.

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



**Exhibit A
Oak Tally**

Oak Summary by Phase

Phase	Total Oaks	Total Canopy Cover (sf)
Phase 1	19	15,400
Other Phases	52	49,400

Oak Detail by Pod

Pod	Number of Oaks	Oak Id.	Diameter (inches)	Est canopy cover (sf)	Notes
A1	2	32	32.6	1,000	
		41	37.5	1,000	
A2	2	71	33.0	1,000	
		189	32.0	1,000	
A3	3	80	24.0	1,000	Broken upper trunk
		81	28.5	1,000	
		124a	20.2	1,000	
		124b	24.0		
B1	3	65	50.0	1,000	
		66	48.0	1,000	
		67	66.0	1,000	Downed oak
B2	0	0			
B3	1	61	19.0	700	
B4	0	0			
B5	3	188	24.1	1,000	
		98	26.7	1,000	
		86	19.7	1,000	
C1	8	1	25.0	1,000	Phase 1
		3	15.0	700	
		4	14.5	700	
		5	17.5	700	
		6	19.5	700	
		62	18.0	700	
		63	13.0	700	
64	25.0	1,000			
C2	0	0			Phase 1
D1	5	7	31.7	1,000	Phase 1
		8a	18.0	700	
		8b	18.0		
		9	22.0	1,000	
		29	12.0	700	
D2	1	30	18.0	700	Phase 1
		121	26.0	1,000	
D3	2	122	8.0	700	Phase 1
		123	10.0	700	
D4	7	116	18.5	700	
		115	18.4	700	
		114	22.7	1,000	
		117	14.7	1,000	
		119	26.6	1,000	
		118a	16.6		
		118b	18.5		
118c	23.7	1,000			
E1	3	104	26.8	1,000	Phase 1
		58	26.1	1,000	
		55	21.3	1,000	
		57	13.0	700	

**Exhibit A
Oak Tally**

Pod	Number of Oaks	Oak Id.	Diameter (inches)	Est canopy cover (sf)	Notes
E2	5	101	19.0	700	
		103	17.7	700	
		113	18.7	700	
		109	17.0	700	Snag
		108	21.8	1,000	Snag
E4	3	72	24.0	1,000	
		73a	25.0	1,000	
		73b	31.0		
		74a	13.0		
		74b	23.0	1,000	
		74c	30.0		
F1a	0	0			
F1b	0	0			
F1c	5	106	22.0	1,000	
		107	14.0	700	
		120	28.0	1,000	
		127	23.0	1,000	
		128	19.0	700	
F2	2	78	35.0	1,000	
		79	25.0	1,000	
F3	0	0			
F4	0	0			
G	9	93	16.0	700	
		70	14.0	700	
		92	15.0	700	
		69a	16.0	700	
		69b	16.0		
		48	16.0	700	
		49a	14.0	700	
		49b	14.0		
		51	13.0	700	
		52	13.0	700	
54	18.0	700			
H	7	68		1,000	
		198		1,000	
		199		1,000	
		200		1,000	
		201		1,000	
		202		1,000	
		203		1,000	
				64,800	

Total Oaks all Pods = 71

Total Phase 1 Oaks = 19

Total Advance Mitigation Oaks = 52

NOTE: Trees with multi-trunks listed as a,b,c etc.

**Exhibit B
Concurrent and Advance Mitigation Summary**

Phase 1 Concurrent Mitigation								
	No. Oaks	Avg. Canopy Cover (sf)	Canopy Cover Impacted (sf)					
Total oaks impacted in Phase 1	19							
Jurisdictional oaks (> 20 inches dbh)	7	1,000	7,000					
Non-jurisdictional oaks (< 20 inches dbh)	12	700	8,400					
Total canopy to mitigate for in Phase 1			15,400					
	Location			Mitigation ratio (to 1)	Area Required (sf)	Area Required (acres)	Available acres in target mitigation area	Surplus in target mitigation area (acres)
Use establishment/enhancement to mitigate for 50% of the impact	Buffers of Wetlands B and D		7,700	4	30,800	0.7	2.7	2.0
Use preservation/enhancement of existing oak grove to mitigate for other 50%	Type Np stream corridor		7,700	6	46,200	1.1	1.6	0.5
Advance Oak Mitigation								
	No. Oaks		Canopy Cover Impacted (sf)	Mitigation ratio (to 1)	Area Required (sf)	Area Required (acres)	Available acres in target mitigation area (with 20% area reduction)	Surplus in target mitigation area (acres)
Total oaks impacted in phases outside of Phase 1	52		49,400	2	98,800	2.3	5.7	3.4
Note:								
1. Canopy cover estimated based on 1,000 sf for oaks > 20 inches dbh and 700 sf for oaks < 20 inches.								
2. Advance oak mitigation area total reduced by 20 percent to account for future site design and/or ecological constraints.								