March 2021
Pioneer Aggregates South Parcel Project

ANCHOR QEA

Landmark Tree Inventory Report

Prepared for CalPortland

March 2021
Pioneer Aggregates South Parcel Project

Landmark Tree Inventory Report

Prepared for
CalPortland – DuPont Plant
4301 Pioneer Avenue
DuPont, Washington 98327

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ABBREVIATIONS

City	City of DuPont
dbh	diameter at breast height
DMC	City of DuPont Municipal Code
MRO	Mineral Resource Overlay
Project	South Parcel Expansion Project

1 Introduction

CalPortland operates the Pioneer Aggregates Mine facility in DuPont, Washington (Figure 1). CalPortland is proposing an expansion of the mine to the south, known as the South Parcel Project (Project), within the City of DuPont's (City's) designated Mineral Resource Overlay (MRO) District.

The South Parcel Project includes mining within areas previously undisturbed by mining (termed the "Expansion Area") and mining deeper within a portion of the existing mine, referred to as the "Re-Mine Area." The Expansion Area is approximately 188 acres and is composed of three subareas (see Figure 2). The Kettle Area is a 10.8-acre previously undisturbed area. The 9.2-acre Buffer Strip is a strip of vegetation that was retained along the inside of the originally permitted mine bordering the South Parcel. The South Parcel is 168 acres located southeast of the original mine and inside the Mineral Resource Overlay in the City of DuPont's adopted Comprehensive Plan. Approximately 126 acres within the 168-acre South Parcel are forested.

All areas to be cleared and mined are within the City's Comprehensive Plan MRO area. The purpose of an MRO designation is to implement the Growth Management Act, the Surface Mining Act, and the DuPont Comprehensive Plan by designating a mineral resource extraction overlay area where mineral extraction is allowed (DMC 25.60.010).

2 Tree Survey Methods

The City of DuPont Municipal Code (DMC) defines a "landmark tree" as "an existing healthy, well-formed tree which poses no safety hazard due to potential collapse," and that is of the following species, trunk type, and minimum diameter measured at breast height (dbh) (Table 1). See DMC 25.10.120.005.

Table 1
Landmark Tree Criteria

Trunk Type	Species	
	Oregon White Oak, Pacific Yew, or Madrone (dbh, inches)	**Douglas Fir, Western Red Cedar, Western Hemlock, or Bigleaf Maple (dbh, inches)**
Single Trunk	24	30
Multi-Trunk (sum of diameters)	30	45

A landmark tree inventory was completed within a Study Area composed of the parcels where trees would be removed as a result of the mine expansion project as shown in Figure 2. Trees were inventoried in the South Parcel, the Kettle Wetland and associated buffer, the 50-foot vegetated buffer to the existing mine left along the border to the South Parcel, and the buffer between the South Parcel Expansion Area and Sequalitchew Creek. The tree inventory was conducted by a two-person team over 6 days in October 2019 and 1 day in September 2020. The team was led by Anchor QEA Biologist and Certified Arborist Joseph Pursley (International Society of Arboriculture PN-7486A). The entire Study Area was inventoried. Trees meeting the species and stem size criteria for landmark trees (Table 1) were evaluated visually to determine if they met the health and form standard defined for landmark trees in the DMC.

Trees that did not exhibit apparent evidence of insect damage, woodpecker damage, rot, dwarf-mistletoe, or other similar tree ailments were considered healthy. Well-formed trees do not have broken leaders, significant wind damage, or exhibit irregular growth, including conifers with multiple stems.

All healthy and well-formed trees meeting the size criteria were marked with high-visibility spray paint, and a numbered aluminum tag was placed on the north side of the tree stem. For multi-trunk and multi-stemmed landmark trees, only one numbered tag was used. The location of each tagged and numbered tree was recorded using a Trimble differential global positioning system. Information collected at each tagged and numbered tree included the dbh of each stem, tag number, and species.

Available maps of Oak Management Units in the city and aerial photographs were also reviewed. Aerial photographs reveal that much of the Study Area was thinned and that many of the larger trees were removed between 1990 and 2002. No Oak Management Units are identified on the City's mapping within the Study Area.

3 Health of Trees Observed

Poorly formed and unhealthy trees, including trees with damaged stems, broken leaders, insect damage, woodpecker damage, evidence of rot, dwarf-mistletoe, and other tree ailments, are prevalent in the study area. Most of the trees within the Study Area that met the landmark size criteria could not be deemed landmark trees because they are unhealthy, damaged, or otherwise poorly formed.

Historical aerial photographs suggest this is a naturally recruited, fairly even-aged stand established on previously logged property. The most common causes of poor health observed were insect damage, including bark beetle, and brown cubical rot. Most of the poorly formed trees appeared to have significant wind damage, resulting in loss of significant branches and lost leaders of conifers. Crowding under the closed canopy has also resulted in many specimens that are oddly formed in response to competition for sunlight.

4 Landmark Tree Inventory Results

The Study Area inventoried for landmark trees included all parcels within the 188-acre South Parcel Expansion Area and the approximately 125-acre Re-Mine Area. As summarized in Table 2 and depicted in Figure 2, 116 trees within the Study Area met the landmark tree criteria of size, species, health, and form (Appendix B).

Table 2
Summary of Landmark Trees Within the Study Area

Common Name	Scientific Name	Total Trees
Bigleaf maple	*Acer macrophyllum*	0
Douglas fir	*Pseudotsuga menziesii*	82
Oregon white oak	*Quercus garryana*	19
Pacific madrone	*Arbutus menziesii*	2
Pacific yew	*Taxus brevifolia*	2
Western hemlock	*Tsuga heterophylla*	0
Western red cedar	*Thuja plicata*	11
	Total	**116**

5 Landmark Tree Impacts

Table 3 lists the total number of landmark trees within the Study Area that will be retained and the number that will be removed, by species.

Table 3
Summary of Impacts to Landmark Trees

	Douglas fir (*Pseudotsuga menziesii*)	**Oregon white oak (*Quercus garryana*)**	**Pacific madrone (*Arbutus menziesii*)**	**Pacific yew (*Taxus brevifolia*)**	**Western red cedar (*Thuja plicata*)**	**Total Trees**
Trees Removed	74	13	1	1	1	90
Trees Retained	8	6	1	1	9	26
Total Landmark Trees	**82**	**19**	**2**	**2**	**10**	**116**

Note: No bigleaf maple (*Acer macrophyllum*) or western hemlock (*Tsuga heterophylla*) that meet landmark tree criteria are present.

6 Landmark Tree Replacement Plan

The Surface Mine Reclamation Act (RCW 78.44) gives the Washington Department of Natural Resource (DNR) exclusive regulatory authority over surface mine reclamation in the state and requires miners to leave property in a condition suitable for its subsequent use following the completion of mining. The reclamation requirements are intended to address landscape concerns on the scope and scale appropriate for mining operations and are consistent with the purpose or intent of the City's landmark tree ordinance.

CalPortland successfully plants trees on the slopes of the existing mine as part of their ongoing mine reclamation program and in compliance with the Surface Mine Reclamation Act (RCW 78.44). Successfully tree planting is one component of the reclamation plan that is reviewed, approved, and inspected for compliance by the DNR. Implementation of the reclamation plan is assured by a financial guarantee provided to the DNR by the CalPortland in the form of a bond.

This practice will continue in the South Parcel and as mining progresses in other areas of the mine consistent with an updated mine reclamation plan reviewed, approved, and inspected by the DNR and required by the Surface Mine Reclamation Act (RCW 78.44).

Soil for future tree planting begins prior to mining when the site is cleared of stumps and debris, slash is ground to chips for later use as a soil amendment, and topsoil is mixed with wood chips and clean clay and silt washed from processed gravel (belt press fines) and stockpiled for later use in reclamation.

As extraction in each mine segment is completed, slopes are cut to final contours. In the South Parcel, slopes (approximately 3 feet horizontal to 1 foot vertical) will border the eastern and southwestern portions of the mine floor and join the existing mine area to the north.

The amended topsoil is then spread across the contoured slopes and cross tracked with a dozer to prevent erosion.

After topsoil placement, holes are dug in the slopes where trees are planted. Tree planting is proposed where new reclaimed slopes planted with trees and suitable to be designated as open space will remain after mining. Once final reclamation is complete, Sequalitchew Village will have approximately 180 acres of these slopes planted with a variety of trees including Douglas fir, red alder (*Alnus rubra*), and Oregon white oak, ranging in age from seedlings to nearly 40 years old.

Tree seedlings are generally planted during the fall and spring. Douglas fir, white oak, and other species are typically planted at an approximate spacing of 10- by 10-foot, establishing a stocking level of approximately 430 trees per acre on the reclaimed slopes. These plantings are

complemented by naturally recruited red alder, bigleaf maple, and Pacific madrone occurring in the buffers adjacent to the mined slopes.

CalPortland proposes removing 90 landmark trees as part of the South Parcel project. A typical tree mitigation plan might require a developer to replace removed trees at a ratio of 50:1 (Table 4). At a stocking ratio of 430 trees per acre, such a plan would require CalPortland to plant trees on only 10.9 acres to achieve a 50:1 replacement ratio for 90 trees, rather than approximately 180 acres as currently proposed.

A typical mitigation plan might require a developer to plant trees for mitigation in a single season and monitor their success for 3 to 5 years. CalPortland will have planted a variety of trees on the reclaimed slopes of Sequalitchew Village over a period of at least three decades and will monitor and ensure their success with a reclamation bond held by DNR during that time.

In 2020 CalPortland began testing plantings of Oregon white oak and will continue to include Oregon white oak in the mix of trees planted in the future to ensure that at least 650 (50X13) white oaks are planted.

As the reclaimed areas mature, a native understory of herbaceous and woody species will also propagate from seed and rhizomes naturally occurring in the redistributed topsoil. Reclaimed slopes along the western boundary of the site are designed in a sinuous fashion to mimic and blend with the native topography that parallels Puget Sound.

Deleterious vegetation such as blackberry and Scotch broom will be removed mechanically, to allow tree establishment and release from shading and competition for nutrients and moisture.

Table 4
Tree Replacement Summary for All Trees

Type	Quantity to Be Removed	Mitigation Ratio	Approximate Number of Trees to Be Planted[1]
Landmark Trees	90	50:1	4,700

Note:

1. The total number of trees to be planted is limited by the areas suitable for planting prior to development of Sequalitchew Village, in accordance with the City of DuPont Comprehensive Plan.

Table 5 summarizes the proposed replacement tree planting. Tree seedlings will be planted during the dormant season. Douglas fir, white oak, and other species will be planted at 10- by 10-foot spacings, establishing a stocking level of approximately 430 trees per acre on the reclaimed slopes. These plantings are expected to be complemented by naturally recruited red alder, bigleaf maple, and Pacific madrone. Based on the success of the reforested slopes in the existing mine, Douglas fir

(1+1 seedling stock) and red alder (plug 1 or yearling pull-ups) are recommended. In 2020 CalPortland began testing plantings of Oregon white oak. If initial plantings are successful then theses species will be added to the mix of trees planted. Based on existing reclamation at the site, volunteer seedlings are expected to propagate on the topsoiled slopes, in addition to the planting described above. The mature forests that buffer the western mine boundary provide an excellent seed source of other native deciduous and conifer species including Pacific madrone, bigleaf maple, western hemlock, and western red cedar.

Table 5
Revegetation Planting Plan

Common Name	Scientific Name	On Center Spacing (feet)	Planting Season
Douglas fir	*Pseudotsuga menziesii*	10	October 15 – March 15
Oregon white oak	*Quercus garryana*	10	October 15 – March 15
Red Alder	*Alnus rubra*	10	October 15 – March 15

7 Request for Modification

To the extent DMC 25.10.120.030 is applicable to land and trees within the City's designated MRO District, CalPortland requests a modification of those requirements as allowed under DMC 25.10.150 given the special circumstances pertaining to the land or the trees on it, including the unique nature and purpose of the MRO District and the enhanced and permanent tree replacement proposed above, which goes far beyond what would be proposed if the site were developed in accordance with its underlying zoning designations.

Non-Landmark Trees. Before turning to landmark trees, we note that the DMC contains tree retention for non-landmark trees in certain use districts. However, the MRO District is not identified as a district where such tree retention is required, as confirmed in the City's Pre-Application Memorandum for this project. See DMC 25.120.010(3); PRE-APPLICATION MEMORANDUM MAY 3, 2019, PAGE 3.

Landmark Trees. With regard to landmark trees, DMC 25.10.120.030 contains standards for both white oak landmark trees and other (non-oak) landmark trees. The DMC calls for retention of all Oregon white oak trees "unless overall neighborhood densities cannot be met" with retention. It also calls for retention of at least half of other (non-oak) landmark trees. It is unclear whether the City intended these retention requirements to apply to areas within the MRO District. In general, the MRO District is subject to special "performance standards" that take into account the unique nature of mining uses. See DMC 25.60.050. These standards provide that the Site Plan approval process will be used to address "loss of tree cover" when property is mined in according with the MRO designation. See DMC 25.60.050. It appears that the City's intent was for this general performance standard to govern the matter of tree retention, tree impacts, and mitigation, rather than the specific retention requirements in DMC 25.120.010 that are geared to typical residential and commercial development rather than mineral resource extraction.

If the City nevertheless determines that the tree retention standards in DMC 25.120.030 are applicable, a modification is requested under DMC 25.120.050 for removal of the additional landmark trees beyond the DMC-specified number, as identified in Table 6. This modification involves the removal and replacement of 13 additional white oaks and 31 non-white oaks over an approximately 200-acre area. This is the equivalent of one white oak for every 15 acres, and one non-white oak for every 6 acres.

Table 6
Summary of Landmark Tree Retention Requirements Per DMC 25.120.030

Comprehensive Plan Zoning	Bigleaf maple (*Acer macrophyllum*)	Douglas fir (*Pseudotsuga menziesii*)	Oregon white oak (*Quercus garryana*)	Pacific madrone (*Arbutus menziesii*)	Pacific yew (*Taxus brevifolia*)	Western hemlock (*Tsuga heterophylla*)	Western red cedar (*Thuja plicata*)	Total Tree Retention
Manufacturing and Research	0	23.5	12	0	0	0	0	35.5
Open Space/Sensitive Areas	0	1	0	0.5	0	0	2	3.5
Residential 4	0	11	1	0.5	0.5	0	0	13
Residential Reserve	0	1.5	0	0	0	0	0	1.5
Total Required Tree Retention	**0**	**37**	**13**	**1**	**0.5**	**0**	**2**	**53.5**
Total Trees to be Retained (Table 5)	**2**	**7**	**0**	**0**	**0**	**0**	**6**	**15**
Total Number of Trees to be Retained under DMC	**0**	**30**	**13**	**1**	**0.5**	**0**	**0**	**38.5**

The DMC allows a modification of the City's tree retention regulations as follows:

> "Anyone with an ownership interest in land may request a modification from the provisions of [Chapter 25.120] based on special circumstances pertaining to the land or the trees on it.."

As stated above, all of the landmark trees proposed for removal are within the designated MRO District in the City's Zoning Map and Comprehensive Plan. The South Parcel Expansion Project proposed by CalPortland at the DuPont Aggregates mine is consistent with these planned land use designations. The extraction of mineral resources will allow for future development generally consistent with the planned zoning. The trees proposed for removal are in the middle of the mining footprint as shown in Figure 2. It is not possible to access the sand and gravel resources protected by the MRO designation without removing these additional trees. This is a special circumstance pertaining to the land and the trees on it.

The process of aggregate mining on this scale takes several years, in contrast to the types of development addressed in the tree retention code (DMC 25.120). This allows the opportunity to propagate large numbers of mature trees during operation of the mine. This is consistent with the segmental reclamation approach that has included planting of trees on the mine slopes over the past 10 years. This approach to reclamation will fully meet the intent of the tree retention code as stated in the purpose.

Requests for modifications are evaluated under DMC 25.120.010. (See DMC 25.120.050.)
DMC 25.120.010 provides as follows:

(1) The purpose of this chapter is to:

- (a) Protect natural habitats, air quality, and ground water recharge,
- (b) Improve the appearance of the community,
- (c) Provide shade and wind protection,
- (d) Reduce stormwater discharge, and
- (e) Conserve water supplies.

(2) this chapter is intended to help achieve these purposes by:

(a) Retaining trees, without reducing developmental densities from those indicated in the comprehensive plan.

Mine operations and reclamation will meet this purpose as follows:

(a) Protect natural habitats, air quality, and ground water recharge. By creating an almost continuous forested corridor on the mine slopes, natural habitats will be protected in perpetuity by the City of DuPont's Critical Areas Ordinance (DMC 25.105). The reforestation of this corridor has already begun and will continue for many years. CalPortland has posted

bonds to ensure this work is completed. These forests are younger and healthier, allowing greater carbon sequestration and ability to remove atmospheric pollution to protect air quality. The entire project will result in 100% infiltration of treated stormwater. This will be enhanced by the filtering of runoff from the forested mine slopes.

(b) Improve the appearance of the community. The forested areas will be visible from the developable portion of the mine, creating a nearly continuous forested hill slope around the future, planned Sequalitchew Village development.

(c) Provide shade and wind protection. The forested areas are densely planted (10 feet on center), creating a high degree of shade, wind attenuation, and a microclimate effect that will mitigate the heat island of future development.

(d) Reduce stormwater discharge. The entire site will be engineered to provide 100% infiltration of stormwater. This water will be treated before infiltration and to the extent practical, clean ground water will be kept segregated from stormwater.

(e) Conserve water supplies. The forested mine slopes will not be irrigated and will be planted with native species acclimated to the local climate.

(f) Allowing tree retention to the extent possible without reducing the development footprint indicated in the Comprehensive Plan and the 2012 Settlement Agreement. The City's tree retention standards in DMC 25.120.030 are for the purpose of "[r]etaining trees, *without reducing developmental densities from those indicated in the comprehensive plan*" DMC 25.120.010(2)(a), emphasis added. Part of the City's planned development density is sand and gravel mining within the City's designed MRO area. The City's tree retention requirements are not intended to preclude the residential densities or mineral resource development planned for in the Comprehensive Plan. Retaining trees, without reducing development densities from those indicated in the Comprehensive Plan (Ord. 02-707 § 1), is not practicable within the MRO. Gravel extraction will require land clearing. These impacts will be fully mitigated by site reclamation in accordance with the DNR reclamation permits for the project. The development density for this land as indicated in the City's MRO designation is mineral extraction of sand and gravel, followed by reclamation for future use. Allowing removal of an additional 13 landmark white oaks and 33 landmark non-oak trees over a 200-acre area (the equivalent of one tree per 4.3 acres) will allow the mineral resource development allowed under the Comprehensive Plan.

Figures

LEGEND:

- Pioneer Aggregates Property (791 ac)
- South Parcel MRO Addition (172 ac)
- Mining Limits (620 ac)
- Sequalitchew Creek
- Kettle Wetland

South Parcel Project

- Expansion Area (188 ac)
- Re-mine Area (125 ac)

NOTES:
Imagery: 2017 USDA NAIP

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Feet

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Figure 1
Vicinity Map
Landmark Tree Inventory Report
Pioneer Aggregates South Parcel Project

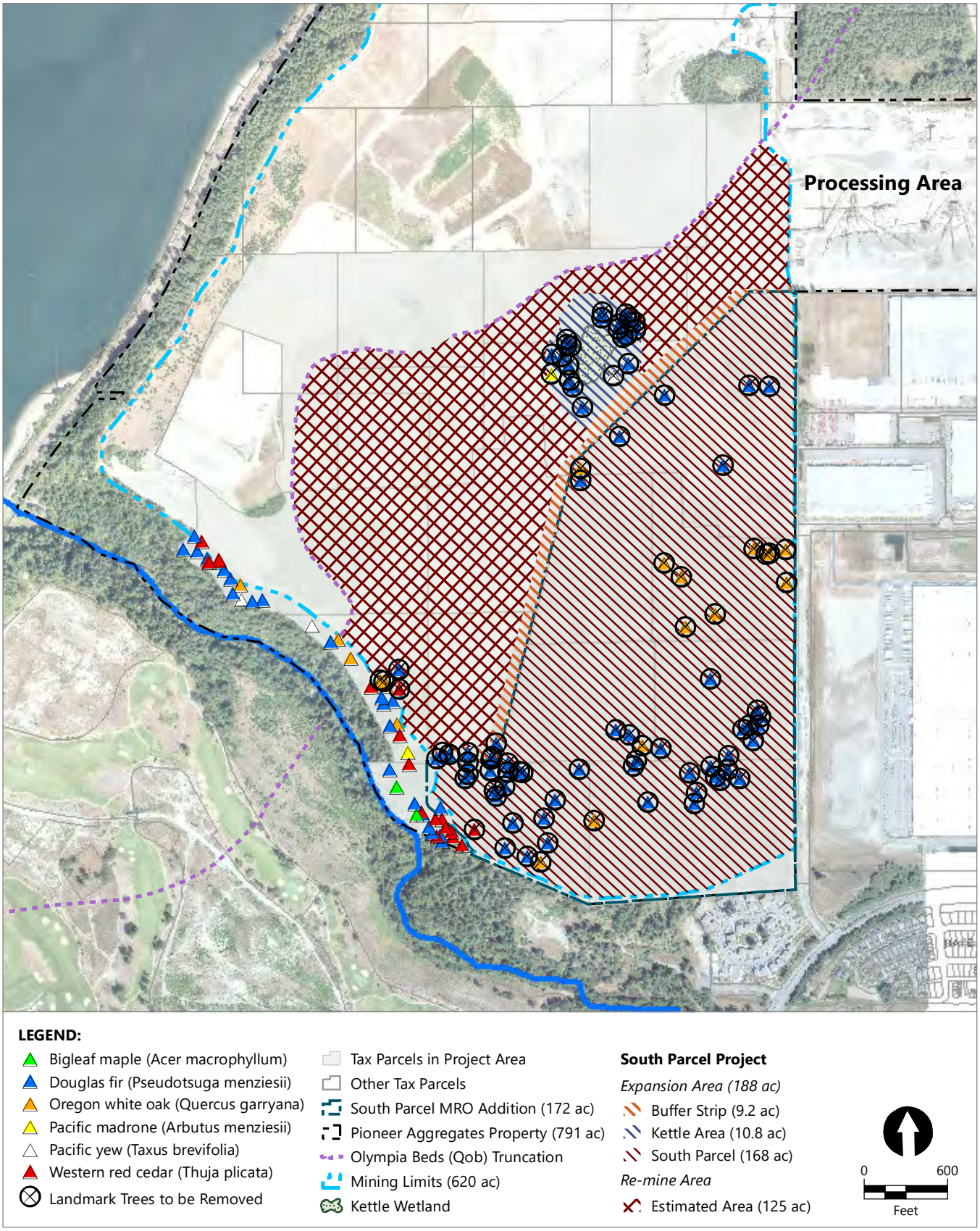

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Figure 2
Landmark Trees Within South Parcel Project Area
Landmark Tree Inventory Report
Pioneer Aggregates South Parcel Project

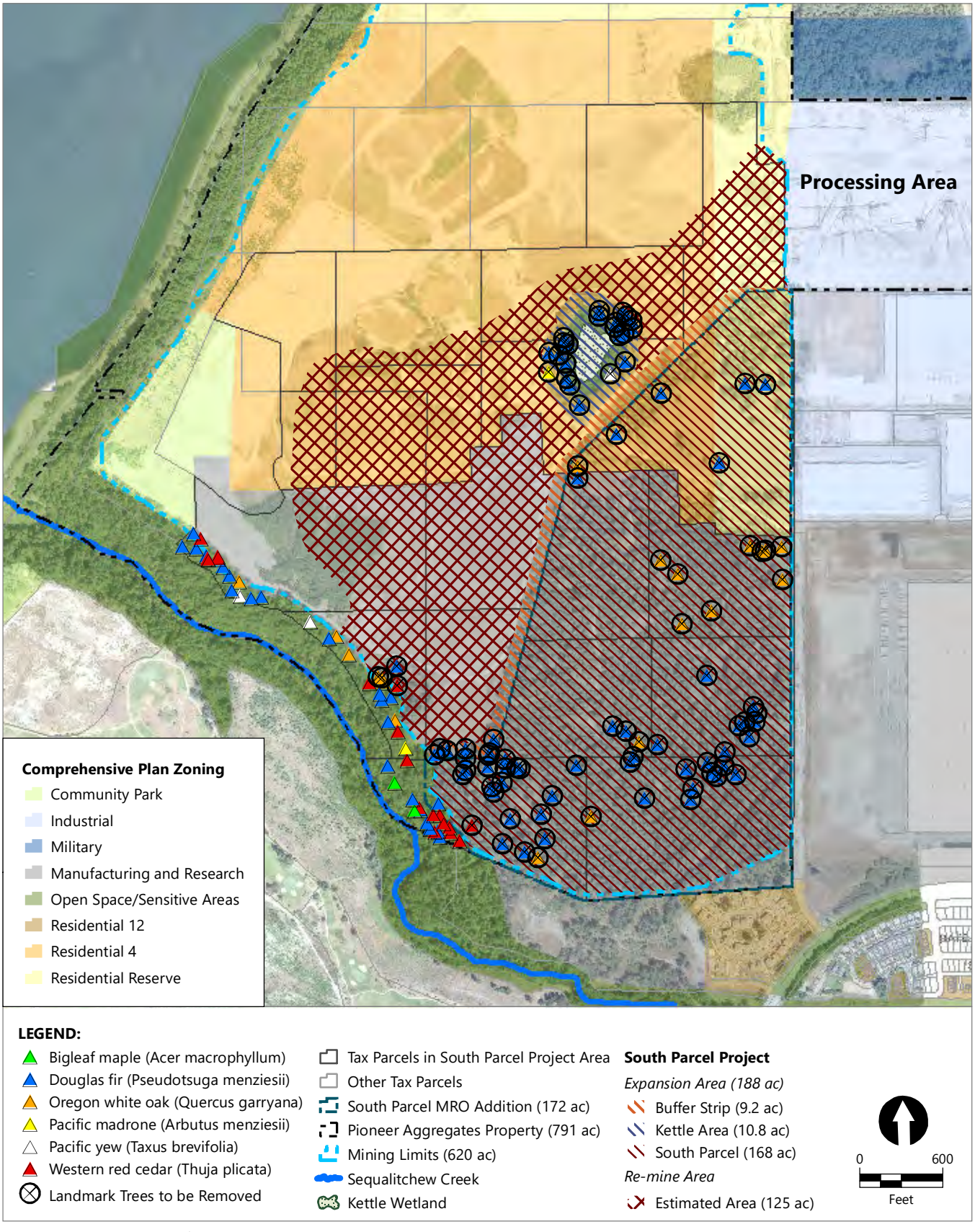

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Figure 3
Landmark Trees and Comprehensive Plan Zoning
Landmark Tree Inventory Report
Pioneer Aggregates South Parcel Project

Appendix A
Weyerhaeuser Pathologist Report

Location • Weyerhaeuser Research
505 N Pearl St
Centralia, WA 98531

8/16/2019

Subject: Weyerhaeuser Dupont Mine Site “Landmark Trees” Recognizance

Author: John Browning (Weyerhaeuser Forest Pathologist)

Weyerhaeuser has a forested area adjacent to the Dupont CalPortland gravel mine. We are interested in removing these trees so the area can be mined for gravel. Most of the trees on this land are Douglas-fir. The city of Dupont has a “Landmark tree” statute as shown in Table 1. On 8/26/2019, Mary Castle (Weyerhaeuser Manager of Western Minerals) and myself walked this land to examine these trees and see if we thought they would qualify as “Landmark trees.”

Table 1. Dupont Landmark tree statute.

25.10.120.005 Landmark tree.

“Landmark tree” means an existing healthy, well formed tree which poses no safety hazard due to potential collapse and that is of the following species, trunk type, and minimum diameter measured at breast height:

	Species	
Trunk type	Oregon white oak, Pacific yew, or madrona	Douglas fir, western red cedar, western hemlock, or big leaf maple
Single trunk	24 inches	30 inches
Multi-trunk (sum of diameters)	30 inches	45 inches

(Ord. 18-1045 § 2 (Exh. A))

Stand Composition:

This stand is primarily Douglas-fir mixed with some Oregon white oak. We also found a small amount of big leaf maple. The majority of the Douglas-fir is probably smaller than the 30" DBH requirement for Landmark Trees but there are still many big trees larger than 30". These are mostly open grown Douglas-fir with very large branches down to the ground. Photos 1-3 show examples of these "Woofy" Douglas-fir.

Damage and Hazards:

Mary and I thought most of the large Douglas-fir would be rejected from the Landmark Tree status due to form and possibly safety concerns. Most of these trees have major damage approximately 30 to 40 feet up the truck were the top had died or been broken out and side branches had taken over. Jim Tweedy (mine manager for Glacier NW) stated that this damage was likely due to a major ice storm back in the 50s. Many of these trees also have forked tops. In addition, quite of few of these trees also have considerable sweep at the base. Photos 4 through 12 show examples of the form issues with these Douglas-fir.

From a hazard tree standpoint there is always concern in large Douglas-fir when the top dies and laterals take over because this will develop a weak area and likely entry point for decay.

We looked for root disease and decay and found some evidence of brown cubical rot (possibly *Schweinitzii* although we did not find any fruiting bodies) decaying smaller Douglas-fir to the point that they were falling over (Photos 13 to 16). While I suspect that there is major decay is some of the larger Douglas-fir I did not find any that had fallen over. There are some with evidence of wounds near the base which could be entry points for decay (Photos 17 to 19). Weyerhaeuser Research does have a Resistograph drill which could be used to test these trees for decay without majorly damaging the trees.

There were Douglas-fir with evidence of woodpecker activity which usually indicates insect infestation (Photo 20). Photos 21 to 23 show large hole evidence of boring activity near the base of the trees. Some trees had lots of sap flow which probably indicates a bark beetle infestation (Photo 24).

Hardwoods.

Most of the hardwoods on this site were Oregon white oaks. We did not find any of these trees large enough to meet the Landmark tree definition of 24" (30" for multiple trunks). We did examine one large bigleaf maple which had lots of decay within 6' of the base (Photo 25).

Trees with good form.

We did find a few Douglas-fir large enough to be classified as "Landmark trees" with good form. Overall, we saw maybe six trees that would meet the "Landmark tree" definition as we interpreted it.

General Form Photos:

Photo 1. Open grown Douglas-fir with large branches down to the ground.

Photos 2 & 3. Open grown Douglas-fir with large branches.

Damage and hazards photos:

Photo 4. Trunk deformed 30’ up.

Photo 5. Douglas-fir with poor form

Photo 6. Douglas-fir with poor form

Photo 7. Douglas-fir with poor form

Photo 8. Douglas-fir with poor form

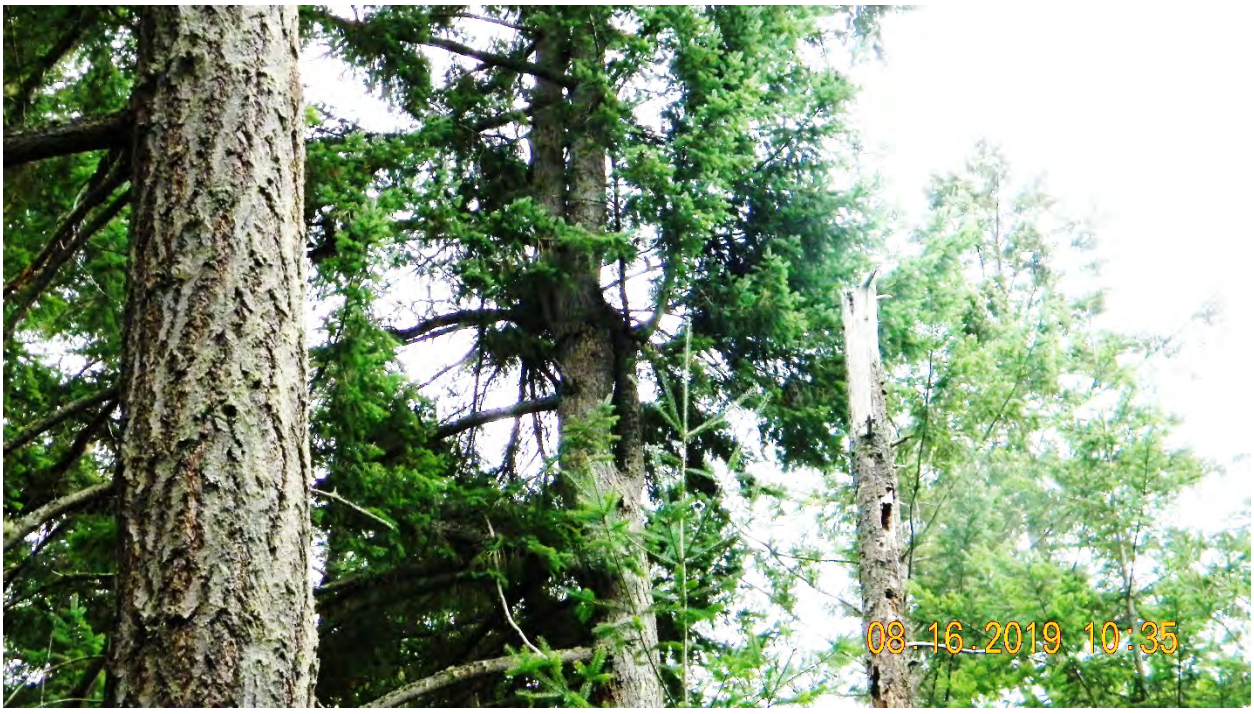

Photo 9. Douglas-fir with poor form

Photo 10. Douglas-fir with poor form

Photo 11. Douglas-fir with poor form

Photo 12. Douglas-fir with poor form

Fallen trees with decay photos:

Photos 13 and 14. Fallen tree with brown cubical rot, possibly *Schweinitzii*.

Photo 15. Fallen tree with brown cubical rot

Photo 16. Falling tree with brown cubical rot

Wound Photos:

Photo 17. Wound on Douglas-fir. Probably allowing decay to enter truck.

Photo 18. Wound on Douglas-fir. Probably allowing decay to enter truck.

Photo 19. Wound on Douglas-fir. Probably allowing decay to enter truck.

Woodpecker activity photos:

Photo 20. Woodpecker activity. Usually indicating tree infested with insects.

Photo 21. Holes near the base of the tree.

Photo 22. Holes near the base of the tree.

Photo 23. Holes near the base of the tree.

Sap flow photo:

Photo 24. Sap flow from truck. Indicating either insect attacks or fungal infections.

Hardwood with decay photo:

Photo 25. Large big leaf maple with evidence of considerable decay

Photos of large Douglas-fir with good form:

Photo 26. Large straight tree, possible “Landmark tree”

Photo 27. Large straight tree, possible “Landmark tree”

Photo 28. Possible “Landmark tree”

Appendix B
Tree Survey Data

Appendix B
Tree Survey Data

Common Name	Scientific Name	Tag Number	Number of Stems	Total dbh (inches)	Within Clearing Limits	City of DuPont Land Use
Douglas fir	*Pseudotsuga menziesii*	1104	1	43	Yes	Residential Reserve
Douglas fir	*Pseudotsuga menziesii*	1135	1	29	Yes	Residential Reserve
Douglas fir	*Pseudotsuga menziesii*	1155	1	29	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1165	1	37	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1176	1	29	Yes	Residential Reserve
Douglas fir	*Pseudotsuga menziesii*	1192	1	34	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1217	1	37	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1226	1	32	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1227	1	33	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1228	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1237	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1238	1	32	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1240	1	34	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1246	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1250	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1263	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1266	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1275	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1276	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1279	1	33	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1280	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1285	1	32	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1301	1	33	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1304	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1323	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1329	1	32	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1341	1	38	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1359	1	30	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1360	1	30	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1413	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1415	1	33	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1419	1	36	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1420	1	40	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1421	1	46	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1422	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1436	1	40	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1496	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1501	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1502	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1503	1	36	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1505	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1506	1	34	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1511	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1512	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1513	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1515	1	31	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1516	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1521	1	30	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1535	1	31	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1536	1	38	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1537	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1538	1	37	Yes	Manufacturing and Research

Appendix B
Tree Survey Data

Common Name	Scientific Name	Tag Number	Number of Stems	Total dbh (inches)	Within Clearing Limits	City of DuPont Land Use
Douglas fir	*Pseudotsuga menziesii*	1540	1	32	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1543	1	38	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1544	1	38	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1546	1	30	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1558	1	32	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1573	1	32	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1577	1	35	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1578	1	33	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1580	1	31	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1584	1	30	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1585	1	33	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1587	1	31	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1589	1	32	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1603	1	32	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1604	1	34	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1609	1	31	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1610	1	30	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1612	1	35	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1613	1	30	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1615	1	33	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1617	1	34	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1621	1	30	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1622	1	30	Yes	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1625	1	40	Yes	Residential 4
Douglas fir	*Pseudotsuga menziesii*	1636	1	32	Yes	Manufacturing and Research
Douglas fir	*Pseudotsuga menziesii*	1649	1	34	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1652	1	32	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1653	1	33	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1659	1	32	No	Open Space/Sensitive Areas
Douglas fir	*Pseudotsuga menziesii*	1672	1	30	No	Open Space/Sensitive Areas
Oregon white oak	*Quercus garryana*	1006	1	28	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1007	1	22	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1008	2	48	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1014	2	30	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1015	1	24	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1041	3	31	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1043	3	34	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1052	4	48	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1098	3	34	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1190	3	39	Yes	Residential 4
Oregon white oak	*Quercus garryana*	1278	3	39	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1292	4	47	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1493	1	30	Yes	Manufacturing and Research
Oregon white oak	*Quercus garryana*	1643	2	31	No	Open Space/Sensitive Areas
Oregon white oak	*Quercus garryana*	1654	3	57	No	Open Space/Sensitive Areas
Oregon white oak	*Quercus garryana*	1656	1	25	No	Open Space/Sensitive Areas
Oregon white oak	*Quercus garryana*	1657	1	27	No	Open Space/Sensitive Areas
Oregon white oak	*Quercus garryana*	1667	3	34	No	Open Space/Sensitive Areas
Oregon white oak	*Quercus garryana*	1671	1	26	No	Open Space/Sensitive Areas
Pacific madrone	*Arbutus menziesii*	1532	1	24	No	Open Space/Sensitive Areas
Pacific madrone	*Arbutus menziesii*	1583	1	24	Yes	Residential 4
Pacific yew	*Taxus brevifolia*	1627	1	24	Yes	Open Space/Sensitive Areas

Appendix B
Tree Survey Data

Common Name	Scientific Name	Tag Number	Number of Stems	Total dbh (inches)	Within Clearing Limits	City of DuPont Land Use
Pacific yew	*Taxus brevifolia*	1676	3	32	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1309	1	41	Yes	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1317	1	33	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1356	1	38	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1357	1	32	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1393	1	35	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1394	1	33	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1395	1	32	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1529	1	40	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1639	1	42	No	Manufacturing and Research
Western red cedar	*Thuja plicata*	1644	1	39	No	Open Space/Sensitive Areas
Western red cedar	*Thuja plicata*	1662	1	34	No	Open Space/Sensitive Areas

Note:

dbh: diameter at breast height