



Bill Pramuk, Consulting Arborist

February 27, 2013

Peter Hilliard
On Air LLC
465 First St. West, Ste. 101
Sonoma, CA 95476

Arborist Report

Re: Verizon Wireless *Greystone*: Site No. PSL#250006

Summary

An examination of the site and plans determined that 19 trees will need to be removed, not including dead trees and those less than 6" DBH. None are dominant specimens and most show fair or poor vigor.

Nine trees are at risk because of trenching, grading, excavation and road construction nearby. Many additional trees could be at risk if equipment, vehicles and materials stray from work areas. Harmful effects should be minimized through establishment of tree protection zones, and clearly defined work zones. Cautious excavation should be performed for at least one tower footing to locate any potentially significant roots.

There may be a potential for tall redwoods and Douglas firs downslope from the tower to interfere with the signal as they grow taller, years after installation.

Assignment

Peter Hilliard requested that I meet with him, review plans, and walk the site where Verizon Wireless is planning to construct a new cellular tower and install a utility trench and access road. My assignment is to identify expected tree removals and potential damage and provide a written report of my findings.

Methods

My conclusions are based on visual observations and interpretation of site plans:

- Proposed Equipment Installation, Verizon Wireless Greystone Site No. PSL#250006, Sheet T-1, 7/24/12, Sheet A-1 and A-1.1, 7/24/12, A-1.2, 7/31/12, A-2, 3, 4, 7/24/12, and Sheet G-1, 7/23/12
- Topography Survey, Hayes Surveying and Mapping, Sheet LS-1, 7/23/12 and Sheet LS-2, 4/9/12

I identified trees according to my experience as a consulting arborist. Using a tree diameter tape I measured trunk diameters of trees that appeared to be 6" greater. Smaller diameter trees, dead trees and larger trees well away from planned changes are not included in the observations.

We marked living trees that will need to be removed with a short length of red flagging tape nailed to the trunks. We marked at-risk trees with yellow flagging tape nailed to the trunks.

The location of the lease area site was verified using Peter Hilliard's GPS device in relation to the Geodetic Coordinates shown on Sheet LS-2, "Center of Lease Area".

As stated by Mr. Hilliard, the route of the proposed new 12' wide Access Easement (road) had been previously marked with light green flagging tape tied intermittently to trees and shrubs along both sides of the routes.

Observations

I walked the site with Peter Hilliard and property owner Fred Croshaw on February 21.

Along the route of the planned Utility Easement, which was cleared, apparently, many years ago, I found only one tree that would be at risk: a 10" DBH madrone. No living trees would need to be removed.

Along the route of the Access Easement I found 10 trees that would be removed. Most of these have trunk diameters ranging from about 9" to 12". Two are larger, 16" and 19" DBH. Five trees would be at risk.

In the Lease Area I located 9 trees that would be removed: One large multi-trunk madrone, a leaning and unstable 16.7" Douglas fir, and 7 Douglas firs ranging from 13" to 25.5" DBH.

Adjacent to the outside edge of the lease area I located 3 trees at risk because of grade changes and excavation for tower footings. These are Douglas fir trees with trunk diameters of 22", 17" and 25.5".

Tree species in or near the three areas include:

Douglas fir (*Pseudotsuga menziesii*)
California bay laurel (*Umbellularia californica*)
Madrone (*Arbutus menziesii*)
Coast live oak (*Quercus agrifolia*)
Coast redwood (*Sequoia sempervirens*)

No coast live oaks or coast redwoods would be removed or at significant risk, assuming heavy equipment, vehicles and material remain within areas to be developed.

Details of the trees in the three areas are shown in the following tables.

Utility Easement

DBH	Species	Vigor	At Risk or Remove	Comment
10"	Madrone	Good	At risk	Trench no nearer than 4 feet from trunk

Access Easement

DBH	Species	Vigor	At Risk or Remove	Comment
30"	Douglas fir	Fair	At risk	Protect trunk and roots
10.5"	Douglas fir	Fair	Remove	In road footprint
12.3"	Madrone	Fair	Remove	In road footprint
27.5"	Douglas fir	Good	At risk	Protect trunk and roots
16.7"	Douglas fir	Fair	Remove	In road footprint
8"	California bay laurel	Fair	Remove	In road footprint
8",12"	Madrone	Poor	Remove	In road footprint
47"	Douglas fir	Good	At risk	Protect trunk and roots
11.7"	Madrone	Poor	Remove	In road footprint
12.5"	Madrone	Poor	Remove	In road footprint
19",8"	Madrone	Poor	Remove	In road footprint
9",11"	California bay laurel	Poor	Remove	In road footprint
55"	Douglas fir	Good	At risk	Protect trunk and roots
10,15,9"	Madrone	Good	At risk	Protect trunk and roots
9"	California bay laurel	Fair	Remove	In road footprint

Lease Area

DBH	Species	Vigor	At Risk or Remove	Comment
16.7"	Douglas fir	poor	Remove	In lease area footprint. Leaning & unstable tree
15"	Douglas fir	Fair	Remove	In lease area footprint.
10"-16"	Madrone, large multi trunk specimen	Fair	Remove	Adjacent to edge of lease area. Decay in base.
10"	Douglas fir	Fair	Remove	Rubbing previous Madrone
25.5"	Douglas fir	Fair	Remove	In lease area footprint.
13"	Douglas fir	Fair	Remove	In lease area footprint.
22.5"	Douglas fir	Fair	Remove	In lease area footprint.
19"	Douglas fir	Good	Remove	In lease area footprint.
14.5"	Douglas fir	Good	Remove	In lease area footprint.
22"	Douglas fir	Good	At Risk	Protect roots if possible
17"	Douglas fir	Good	At Risk	Protect roots if possible
25.5"	Douglas fir	Good	At Risk	Protect roots if possible

(Observations, cont.)**Potential Signal Interference from Trees**

The forest floor downslope from the tower site is fairly steep and dominated by Douglas fir and coast redwood. As stated by Mr. Hilliard, the planned height of the tower, the directionality of the signal and the current height of the trees in that direction allow for good signal quality.

Discussion

Potential Signal Interference

Douglas fir and coast redwood are capable of growing much taller than they currently are on the site. The steep slope mitigates much of the potential for trees downslope to grow into the signal pathway. Mr. Hilliard stated that the relatively open canopies and light mass of upper branches is not expected to cause significant interference.

If significant interference does occur years after installation, tree removals could be necessary. Pruning to remove interfering tree tops would be a poor option because topping is a destructive practice.

Removals

In the Access Easement 10 trees would be removed. Of these five show poor vigor and five show fair vigor. None are dominant¹ specimens.

In the lease area, 9 trees would be removed. Of these, one is severely leaning and unstable Douglas fir. The other seven are Douglas firs I classify as intermediate. None are large dominant specimens.

A large multi-trunk second-growth² Madrone with evidence of decay is located near the edge of the lease area. Because of the decay and its close proximity to the lease area, it is advisable to remove rather than attempt to protect and retain this tree.

Tree Protection

A few trees will be at risk from trenching, grading, excavation, and movement of heavy equipment and materials, assuming construction equipment, vehicles, and materials are confined to the pathways and lease areas I examined.

For root protection, it is advisable to establish a Critical Root Zone (CRZ), where grading, trenching and compaction should be avoided. Where changes are expected on only one side of a tree, as is the case for this entire project, the CRZ should be a radius equal to or greater than five times the trunk diameter. (e.g. a tree with a 1 foot diameter trunk gets a 5 foot radius CRZ).

Where excavation must occur within the CRZ, as I expect in particular for one of the Douglas firs adjacent to the lease area (where excavation will be necessary for tower footings) cautious excavation should be performed to locate any large diameter woody roots that might need to be severed. The tree would then need to be evaluated with respect to potential effects on tree health and structural stability.

¹ Forest trees may be described by "Crown Class", relative position in a stand of trees: Suppressed, Intermediate, Codominant, or Dominant.

² Second growth: a tree or cluster of trees arising as stump sprouts from a tree that was taken down.

Conclusions and Recommendations

As it is currently planned, the entire project would require the removal of a total of 19 trees, not including dead trees and those less than 6" DBH. None are dominant specimens and most show fair or poor vigor. These have been marked with a short length of red flagging tape nailed to the trunks.

Nine trees are at risk because of trenching, grading, excavation and road construction. Harmful effects should be minimized through establishment of CRZ's, avoiding trenching within CRZ's and, for one tree in particular, cautious excavation for the tower footing. At risk trees have been marked with a short length of yellow flagging tape nailed to the trunks.

Equipment, vehicles and materials straying from defined construction areas would put additional trees at risk, therefore limits of the construction area should be clearly marked and respected by all construction personnel.

The potential for tree tops growing into the signal pathway and interfering with the signal several years after installation should be considered and reevaluated as the trees continue to grow taller.


Prepared by:



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