3.13 Light and Glare

This section summarizes the Thurston Highlands Master Planned Community *Light and Glare Technical Report* (R.W. Droll Landscape Architect, October 2007). Additional detail, illustrations, and definition of terms are provided in that document.

Adverse impacts of light and glare are, in most cases, the result of an increase in ambient light levels at various locations near the source of the light, or a visual impact created by a new light source in areas that were previously not illuminated – as seen from a distant location. For example, locations near a light source may be impacted by glare if bright lights are used at the source. Or, locations distant from a light source may experience altered views due to glare in the night sky. As another example, views from sparsely developed hillsides in the suburbs of a large city may be adversely impacted by significant "sky glow" – dull, orange-brown light – emanating from the large metropolis several miles away.

AFFECTED ENVIRONMENT

The Thurston Highlands property is currently undeveloped. As former Weyerhauser managed forest land, the vegetative cover of the site is predominantly "reprod" forest – a dense stand of Douglas fir trees ranging in age from 5 to 25 ears (Coot Company 2008B). Other types of vegetative cover include wetlands and open meadows. There is some variation in topography on the site in the form of hillocks, ridges and ravines. Former logging roads meander throughout most areas of the site, with several of these roads accessing parcels to the east. The Centralia Power electrical transmission line easement, a treeless swath 100 feet wide and a little more than one mile in length, traverses the western side of the property. As there is no development on the Thurston Highland property at the present time, there are no existing sources of light or glare on, or emitting from, the site. There is the potential for maintenance vehicles to travel along the power line access road or any of the existing logging roads on the site during evening or nighttime hours. This could result in light from headlights or spotlights within the Highlands. However, nighttime maintenance activity is not likely, and is not known to occur.

Land uses adjacent to the Thurston Highlands site include the Fort Lewis Military Reservation (to the west and northwest), rural residential properties (to the north, south and southeast), and the Tahoma Terra Master Planned Community (to the east), which is currently developing at an urban density (see Figure 3.14-1 in Draft EIS Section 3.14). Impacts of light and glare from these and other surrounding properties are noticeable from higher points of elevation on the Thurston Highlands site, predominantly from a ridge in the south-central portion. From this vantage point, light sources have been observed from adjacent properties.

Other sources of light have been seen from the Highlands at night (from the same ridge as described above), but without directly impacting the property with light or glare. These sources include a "sky glow" of light reflecting off low cloud cover, coming from the direction of downtown Yelm (approximately 1.5 miles to the northeast); and bright lights from the football stadium at Yelm High School (approximately one mile to the northeast).[1]

[1] Personal communication with Steve Shanewise, Coot Company, May 2007.

POTENTIAL IMPACTS DURING CONSTRUCTION

Full Build-Out Conceptual Land Use Alternatives

Regardless of which conceptual land use alternative is selected for implementation, it is likely that area residents in newly-established neighborhoods in the Tahoma Terra development east of the Highlands site would observe temporary sources of light and glare on construction sites within the Thurston Highlands property during site development. Sources of lighting may include nighttime security lighting, or illumination from the headlights of vehicles or construction equipment in early morning or late afternoon hours, during winter months. Sources of glare may include reflections from plastic or synthetic coverings used to cover stockpiles and stored construction material. During evening or early morning hours, lights associated with construction activity could potentially be seen from other properties as well, depending on the extent of forest clearing and grading changes to the topography on the Highlands site. Lights from construction activity may also temporarily affect resident wildlife, specifically in the Wetland H complex in the northeastern corner of the site (see Figure 3.4-1 in Draft EIS Section 3.4).

Full build-out of any of the conceptual land use alternatives would include development of additional residential neighborhoods, streets, and retail commercial and professional office areas. Sources of lighting during additional construction on the Thurston Highlands site would potentially be seen from established neighborhoods or commercial areas on the Highlands site, as well as from adjacent properties. It is likely that certain institutional settings (e.g., schools and parks) would be constructed after the establishment of residential neighborhoods. Residences adjacent to these sites may experience temporary light and glare impacts during construction operations.

Phase 1 Development Concept

Sources of light and glare generated on the Thurston Highlands site during Phase 1 construction would be similar in character to those described above for conditions during construction of the Master Planned Community as a whole. Phase 1 sources may be most noticeable to residents of Tahoma Terra, due to the adjacency of these two sites.

No Action Alternative

Under the No Action Alternative, there would be no construction on the Thurston Highlands site in the near-term, and thus no construction-related light or glare.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Full Build-Out Conceptual Land Use Alternatives

Site planning for the Thurston Highlands Master Planned Community was in a conceptual phase at the time of this writing. Alternative land use plans schematically depict possible locations and features of various elements of the Thurston Highlands Master Planned Community that likely will produce light and glare such as residential neighborhoods, commercial areas, a village center, streets and street corridors, and institutional facilities (e.g., schools, parks, a fire station, and a Regional Sports Complex). No final determinations had been made at the time of this writing as to the specific layout and size of various built features (e.g., single-family homes, multi-family units, office buildings, other commercial structures, streets, or parks), or other significant schemes that may impact light and glare, such as type and

size of fixtures, or landscape plantings to be used for screening. Consequently, the light and glare impact analysis is somewhat generalized.

Development of any of the conceptual land use alternatives would introduce a substantial number of new sources of light and glare that would be generated from several different sources. Lighting from new residences (interior and exterior lights); institutional facilities; retail commercial and office facilities; plazas; street lights; vehicles traveling on local and collector roads; and pedestrian-oriented lights along sidewalks, pathways or bikeways all may contribute to a combination of light and glare throughout the Thurston Highlands Master Planned Community. The most significant source of light and glare will likely be the proposed Regional Sports Complex. Sports field lighting will require the use of higher wattage lights mounted on taller standards than elsewhere within the development. Lighting will be directed downward onto the fields, in order to minimize the amount of glare and light trespass from these fixtures.

Adverse impacts of light and glare would likely differ somewhat between the three conceptual land use alternatives. For example, in the Preferred Alternative, impacts of light and glare would be most concentrated in commercial areas. Impacts in residential neighborhoods would vary, depending on housing densities. In the Traditional Development Alternative, impacts would be more widespread throughout the Master Planned Community, where single-family neighborhoods and small-scale neighborhood convenience areas would be the norm. In the Urban Village Alternative, compact areas of high-density residential uses interspersed with commercial uses around a village square, as well as more two- and three-story buildings, may have a greater potential to create sky glow. Adverse impacts from light and glare would be less in surrounding areas of the Urban Village Alternative, where lower residential densities and a larger expanse of open space would provide more vegetative screening between the Master Planned Community and surrounding neighborhoods.

Over the 10- to 30-year build-out of the Thurston Highlands Master Planned Community, in conjunction with other development by others within the City of Yelm and its Urban Growth Area, there would be an increase in nighttime sky-glow associated with increasing urbanization of this area.

Phase 1 Development Concept

The Phase 1 conceptual site plan would create approximately 1,008 dwelling units (single-family detached and multi-family) on approximately 351 acres, in the northeastern portion of the Thurston Highlands property (see Figure 2.5-6 in Draft EIS Chapter 2). Phase 1 development under any build alternative is anticipated to be traditional neighborhood development, for compatibility with the adjacent Tahoma Terra neighborhood to the east. Higher-density residential development and a village center are proposed west and south of the traditional neighborhood, in future phases of the Thurston Highlands Master Planned Community.

The extent of light and glare that would be experienced by the first residents of the Phase 1 development will depend on the level of development of streets and street corridors, walkways and number of dwelling units. Sources of off-site light and glare will include the adjacent Tahoma Terra neighborhood to the east (depending on the amount of vegetative buffer between the two developments), and nighttime lighting in the developed community closer to and including downtown Yelm. Likewise, light spillage may fall onto Tahoma Terra property from the Thurston Highlands development, depending on landscape treatments along the common property line.

No Action Alternative

There would be no new sources of light or glare on the site under the No Action Alternative if no development were to occur on the property at this time.

MITIGATION MEASURES

Incorporated Plan Features. Thurston Highland Master Planned Community conceptual land use plan development does not yet describe proposals for lighting. Lighting plans would be evaluated during review of project-specific development proposals under the Final Master Site Plan. Proposals would include minimizing the amount of glare, light trespass and sky glow generated by lighting from residential neighborhoods and streets, pedestrian and vehicular corridors, commercial and village centers, and the Regional Sports Complex through a combination of measures. These measures may include:

- State-of-the-art lighting system components and controls used for maximum efficiency and effect.
- Light fixture shielding systems to emit light down to areas intended to be illuminated, and not into surrounding areas of the community.
- Use of lighting design principles that focus on appropriate selection of fixtures, levels of lighting, and mounting heights to limit potential impacts to surrounding neighborhoods.
- Appropriate selection of painted or treated surfaces for standards and fixtures to minimize the amount of reflected light glare generated.
- Consideration regarding the location and orientation of athletic fields in relation to adjoining residential properties.
- Landscape plantings to provide visual screening, particularly around the edges of the Regional Sports Complex and along property boundaries.

Applicable Regulations. Construction-related noise would be regulated by Washington Administrative Code (WAC) 173-60. Work hours limited by the State noise rule and City of Yelm development standards would also have the secondary affect of limiting nighttime illumination on the site during construction. Subject to some restrictions on the duration of maximum allowable noise levels, WAC 173.60.050 exempts noise related to construction activity between the hours of 7:00 AM to 10:00 PM. Provided that no variance is sought to allow nighttime work, these hours of operation would also minimize the amount of lighting associated with construction activity, particularly during winter months. Temporary variances may potentially be sought from these limits, if periods of nighttime construction become necessary during the course of the work.

Yelm City Code and the Development Agreement (or similar instrument) to be created between the City and the applicant for the Master Planned Community will address lighting requirements with the intent to ensure efficient, aesthetically-pleasing, and non-intrusive lighting throughout the Thurston Highlands development.

Other Possible Mitigation Measures. The following list provides additional guidelines that could be followed for the design and implementation of lighting standards that would minimize impacts of light and glare on residents of the Thurston Highlands Master Planned Community, as well as passers-by and/or residents on adjacent properties.

- Street lighting provided for vehicular and pedestrian circulation should meet standards equal to or greater than those typically required by the City of Yelm.
- Lighting for building exteriors, parking lots, and all vehicular and pedestrian circulation should be designed with sensitivity to surrounding and/or adjacent neighborhoods.
- Exterior lighting fixtures should use appropriate shielding to reduce light spill into surrounding areas.
- Lighting fixtures should be carefully located and oriented to avoid glare or light trespass into surrounding or adjacent neighborhoods.
- Operational standards could place limits on the hours of operation of lighted athletic fields at the Regional Sports Complex.
- Timers and other lighting controls should be incorporated, if possible, into the lighting design of the Regional Sports Complex to assure that light fixtures would be turned off when no longer needed.
- Street lighting standards should not exceed a maximum height, to minimize light spillage and light trespass (e.g., light standards in residential areas should not exceed 35 feet in height).
- Walkway and trail lighting should have a maximum height of 15 feet; use of bollard or ground lighting could be an alternative to lighting on poles.
- No up-lighting of environmental features or building facades should be allowed.
- Low-reflectivity materials should be incorporated on building surfaces to minimize the amount of glare.
- Landscape features such as street trees should be incorporated in neighborhood streetscapes to diffuse light and glare.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Development of the Master Planned Community under any of the conceptual land use alternatives would substantially increase the amount of light and glare on the Thurston Highlands property. The impact of this change likely would be interpreted differently by different observers, with some objecting to a significant level of light and glare where there was none before. Others may be accepting of additional light and glare introduced with urban development of the site, provided it is implemented with as much sensitivity to surrounding environments as possible. The Thurston Highlands property is within the City of Yelm, and thus is anticipated to develop as an urban community, whether at this time or in the foreseeable future.