

Councilmember Peter Steinbrueck
Legislative Department
600 Fourth Avenue Floor 2
PO Box 34025
Seattle, Washington 98124-4025

**Subj: Pole Height Variance for Warren G. Magnuson Park, Project #
2400368 / C.F. # 306574**

1. Based on the information and evidence presented below, I urge you to reject the Seattle Park Department's submission for a pole height variance for Warren G. Magnuson Park until such time as Parks provides the missing data and analysis needed for the City Council to make a reasoned judgment on this matter. To rush to a decision now without this data may result in the construction of a regional sports complex that violates the City's own lighting Code for sensitive habitat areas and the transitional housing areas in the Park.

2. Incomplete, Inadequate and Incorrect Lighting Impact Modeling and Conclusions:

a. No Reflected Light Impacts were Calculated: The EIS states that the artificial turf fields intended for the project will reflect 20% of the (448,000 watts) of light striking the playing surfaces back up into the night air. Because of this, I asked the former Director of Warren G. Magnuson Park, Erik Friedli what software program the Sparling Company used to produce the spill and reflected light diagrams in the December 03 Final, Supplemental EIS for Sand Point Magnuson Park. Mr Friedli replied:

- "According to our lighting engineer, the software program used was AGI 32 by Lighting Analysts."
- I then asked if this software program accounted for reflected light and if so, what values were used in the calculation? **Mr. Friedli replied: "The calculations do not account for reflected light."**

This gross omission invalidates the claims in the EIS and the pole height variance request that spill light (light trespass) is not a problem for nearby habitat, transitional housing residents, and adjacent neighborhoods. Mr. James Benya (PE, FIES, IALD, LC) has stated that the omission of reflected light calculations "*dramatically underestimates the illumination levels of light trespass from the illuminated fields onto adjacent areas.*" **REQUEST 1: The City Council should direct the Parks Department to have Sparling re-run the calculations applying a lighting computer model that uses the acreage of the seven fields as the "floor" of box of light, with a 0 reflectance "ceiling" and upper "walls" surrounding the seven fields. The 20% artificial turf reflectance value referenced in the EIS must then be included in the computer model. These calculations must also account for:**

(1) The light pollution from the shielded, conventional lights planned for the baseball fields.

(2) Reflected light from any lighted parking lots adjacent to the illuminated sports fields.

(3) Light trespass caused by tilted, full-cutoff light fixtures (see paragraph 3, below)

A similar recalculation should be made to account for the additional two fields that the City would (funding permitting) like to illuminate.

b. Incorrect Lighting Standards were Chosen: The Illuminating Engineering Society of North America (IESNA) “Recommended Practice for Outdoor Environmental Lighting RP-33-99” was derived from the “International Commission on Illumination (CIE) TC5.12.” RP-33-99 provides the following maximum light levels measured in the vertical plane:

IESNA “Recommended Practice for Outdoor Environmental Lighting RP-33-99”	
Lighting Environmental Zone (EZ)	Maximum acceptable light trespass before curfew
EZ-1 (natural environment)	1 lux (0.1 foot-candle)
EZ-2 (rural and suburban)	4 lux (0.4 foot-candle)
EZ-3 (medium density urban)	8 lux (0.8 foot-candle)

Observation of Magnuson Park at night clearly supports it being EZ-2. Therefore the EIS and pole height variance submission using a pre-curfew value of 0.8 foot-candles is incorrect. **REQUEST #2: The correct pre-curfew value for the Park should be 0.4 foot-candles. The City Council should direct Parks to use the 0.4 foot-candle criteria when performing the recalculations noted in Request #1.**

c. Actual Lighting Levels will be Higher than Class IV Criteria

(1) Light Bulb Replacement Frequency: According to Mr. Benya, all light bulbs are typically replaced at 70% of the “rated average life” of the bulbs. Rated average life is defined as the point where, on average, half the bulbs have failed. Rated average life depends on how often you switch the bulbs on and off—the less frequent, the longer the life of the bulb. The rated average life of a 1,000 watt metal halide bulb is between 6,750 hours and 9,000 hours (per the McGowan Sports Field Lighting report commissioned by the Parks Department) thus the average life is 7,875 hours. 70% of 7,875 is approximately 5,500 hours. The pole height variance states that the lighting systems would be in use 2.5 to 7 hours/day depending on the season. Assume an average of a 5-hour operating period/day throughout the year

(=1,825 hrs/year). Thus 5,500/1,825 means that all bulbs would be replaced every 3 years.

(2) Designing “Extra Lumens” into a Lighting Project: Metal halide lamps suffer from “lumen depreciation” as they age. At the 70% of “rated average life” point when the lights are scheduled to be replaced, the amount of lumens is only about 70%-75% of the initial lamp brightness. Plus, the lamp coverings become dirty over time, further reducing the lumen output compared to the initial lamp brightness. Mr. Benya has stated that the lumen depreciation and lamp cover dirtiness means that at the time of scheduled bulb replacement, the bulbs are putting out barely 60% of what they put out when they were new. So when lighting engineers calculate the number of lights (total lumens) needed to meet designated a chosen field lighting level, **it is standard industry practice to install more than the minimum number of lights so that the desired lighting level (in the case of Magnuson Park: Class IV) is still achieved when it is time to replace the lights (3 years later).** Thus the fields will initially be lit to levels as much as 30 to 40% greater than Class IV for the majority of the life-time of the regional sports complex. **REQUEST #3: Direct Parks to accurately describe the actual lighting levels that transitional housing and surrounding neighborhood families will be subjected to.**

(3) Adherence to IESNA Class IV level of lighting. The pole height variance repeatedly states that the sports field lighting would be designed to a Class IV lighting level, as prescribed by the Illuminating Engineering Society of America (IESNA) Standard RP-6. The Class IV standard for soccer and rugby fields is an average field light level of 20 foot candles (see page 2-9 of the June 2001 “Ballfield Lighting Study” written by McGowan Brothers Engineering and commissioned by the Parks Department). The pole height variance request states that soccer and rugby fields will be designed to an average field light level of 25 foot candles. **Why the increase of 5 foot-candles?**

d. Tilted, Full-cutoff Lighting Fixtures: In response to repeated questions by thousands of concerned citizens, the Park Department continues to claim that “state-of-the-art” full cut-off lights will mitigate the effects of light pollution. A visit to look at the new, “state-of-the-art” full-cutoff lights at Jane Adams and Nathan Hale (in the Meadowbrook neighborhood) will disprove this mitigation claim - *remember, these are only two fields, not 7 fields next to a large body of water.* One of the major reasons for the light pollution to Meadowbrook neighborhoods is due to the full-cutoff lights being mounted tilting upward – thus increasing glare. Mr. Benya has stated that tilting is a practice that is commonly used since it shines light over a larger portion of the field, thereby reducing the number of fixtures needed to give full field coverage. In other words, this is a technique that reduces the cost of lighting a field and increases light pollution for surrounding neighborhoods. The glare from these luminaires will also be quite noticeable to surrounding neighborhoods. The reason for this is that the uppermost light vector from the titled fixture will strike neighborhoods far above the proposed light fixture

height. Mr. Benya further states that if the fixtures are not mounted horizontally, they can not be called full-cutoff fixtures. **REQUEST 4: Request that the Parks Department report to the City Council regarding whether the full-cutoff lights proposed for Magnuson Park will be mounted correctly (horizontal to the ground) or tilted. If the Parks Department chooses to use tilted fixtures, they must provide the City Council a diagram to show how far up (elevation) light will actually strike surrounding neighborhoods. See attached photograph (taken at the 250 foot above sea level in View Ridge) of conventional shielded and full-cutoff lights that were hung from cranes at an approximate height of 75 feet (approximately 115 foot above sea level). Contrary to the claim made on page 8 of the pole height variance request, these full-cutoff lights caused glare at elevations over twice the elevation of the lighting fixture.**

e. Security Lighting Height: The pole height variance states that security lights will be mounted on top of the light standards. This technique was also used at Jane Adams and Nathan Hale. I fail to see why this is necessary. Adequate post-curfew security lighting after the last game of the night should be able to be provided by mounting the lights at the same height on the 58 poles as normal street lighting. **REQUEST 5: Request that the City Council direct the Parks Department to ensure that security lights are mounted at or below the height specified in City Code for Single Family 7200 zoning (35 feet).**

6. Mitigation Actions Are Inadequate: The pole height variance submittal for Warren G. Magnuson Park repeatedly states that the lighted sports fields will result in “significant light and glare impacts” but that mitigation measures have been built into the design of the lighting system to reduce these impacts. This is a gross misinterpretation of the conclusions in the EIS. A thorough reading of the EIS clearly shows that the significant light and glare impacts exist AFTER these mitigation measures are in place.

Sincerely,

cc:

Jean Godden, Seattle City Council
Nick Licata, Seattle City Council
Richard Conlin, Seattle City Council
Dave Asher, Kirkland City Council
Hawthorne Hills Community Council
Laurelhurst Community Club
Seattle Community Council Federation
Market Neighborhood Association of Kirkland
Paisley Place Homeowners Association
Seattle Audubon Society
Magnuson Environmental Stewardship Alliance
Sand Point Community Liaison
Dark Skies Northwest
James Benya, (PE, FIES, IALD, LC)

David Della, Seattle City Council
Tom Rasmussen, Seattle City Council
Richard McIver, Seattle City Council
View Ridge Community Council
Windermere North Community Association
Northeast District Council
Moss Bay Neighborhood Association of Kirkland
46th Legislative District Democrats
Seattle Group of the Sierra Club
PAWS
Citizens Sand Point Planning Association
Resource Alliances
Seattle Astronomical Society