



CITY OF KIRKLAND
Planning and Community Development Department
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MEMORANDUM

To: Eric R. Shields, AICP, Planning Director
From: Jon Regala, Senior Planner
Date: December 1, 2011
Subject: **SEPA ENVIRONMENTAL DETERMINATION
BIG FINN HILL PARK – FIELD CONVERSION
FILE SEP11-00020**

I. BACKGROUND

Big Finn Hill Park is located at 8106 NE 138th Street (see Attachment 1). The entire park contains approximately 218 acres and remains largely undeveloped. The developed portion of the park contains four baseball/softball fields, a picnic/play area, a grass soccer field, and surface parking stalls (see Attachment 2). An unclassified wetland is located south of the existing soccer field based on King County Geographic Information System (GIS) data. Denny Creek is located approximately 500 feet southeast of the soccer field and flows generally southwest approximately 2.5 miles into Lake Washington. Attachment 3 contains a map showing these environmental features.

Kirkland Youth Lacrosse (KYL) and King County Parks are proposing to convert the existing grass soccer field into a synthetic turf field to accommodate both soccer and lacrosse. The project also includes the following:

- Construction of paved field access pathways and the addition of eight parking stalls
- Construction of field curbing, fencing (including gates), bleachers, and netting
- Construction of a field under drainage which includes a large sand filter for water quality treatment
- Installation of field lights
- Identify the future location of a scorekeepers hut and field house
- Stabilization of construction areas

On June 1, 2011, the unincorporated areas north of Kirkland which includes Big Finn Hill Park were incorporated into Kirkland. Prior to the annexation date, KYL submitted a grading permit and SEPA application materials for the project to King County for review. According to the Annexation Interlocal Agreement (ILA) and subsequent Memorandum of Understanding between King County and the City of Kirkland, it was agreed that review of the grading permit would be conducted by King County Department of Development and Environmental Services (DDES) based on the County's regulations while the environmental review will be completed and issued by the City of Kirkland. The City of Kirkland would be responsible for issuing the grading permit and subsequent

inspections. King County would continue to own and maintain the park and associated activities.

With regard to SEPA, King County Department of Parks & Recreation was the initial lead agency for the environmental determination for the project and issued a preliminary SEPA Determination of Non-Significance as part of their initial review of the project. The public comment period was from June 30, 2011 through July 21, 2011. King County Parks & Recreation received public comment and responded to the comments and/or questions. Pursuant to the ILA, the City has now assumed lead agency for the environmental determination.

I have had an opportunity to visit the site and reviewed the attached documents.

- Environmental Checklist (see Attachment 4)
- Project Plans dated October 21, 2011(see Attachment 5)
- King County responses to public comment (see Attachment 6)
- Lighting information (see Attachment 7)
- Traffic Study prepared by Transportation Solutions Inc. dated August 30, 2011 (see Attachment 8)
- Traffic Impact Analysis Memorandum prepared by Thang Nguyen, City of Kirkland Transportation Engineer dated November 2, 2011 (see Attachment 9)
- Synthetic field studies were submitted by the applicant that address health concerns regarding synthetic fields and the use of crumb-rubber. Due to the large number of pages, the studies are available on the City of Kirkland website at the following web address:

http://www.kirklandwa.gov/depart/Planning/Development/BFHP_Renovation.htm

The studies posted on the City of Kirkland website are:

- *An Assessment of Chemical Leaching, Releases to Air and Temperature at Crumb-Rubber Infilled Synthetic Turf Fields.* New York State Department of Environmental Conservation. New York State Department of Health. May 2009
- *Chemicals and Particulates in air above the new generation of artificial turf playing fields, and artificial turf as a risk factor for infection by methicillin-resistant Staphylococcus aureus (MRSA) Literature review and data gap identification.* Office of Environmental Health Hazard Assessment. California Environmental Protection Agency. July 2009.
- *Synthetic Turf Safety Proven with Science.* FieldTurf. FieldTurf website brochure.
- *A Scoping-Level Field Monitoring Study of Synthetic Turf Fields and Playgrounds.* United States Environmental Protection Agency. November 2009.
- *Assessment of Environmental, Health, and Human Safety Concerns Related to the Synthetic Turf Surface at Maple Park in Ridgewood, NJ.* Ridgewood Environmental Advisory Committee. January – October 2009.

- *A Survey of Microbial Populations in Infilled Synthetic Turf Fields.* Andrew S. McNitt, Ph.D. Soil Science and Dianne Petrunak, M.S. Plant Pathology. Penn State. June 2006.
- *Review of the Impacts of Crumb Rubber in Artificial Turf Applications.* Rachel Simon. University of California Berkeley. February 2010.
- *Effectiveness of FieldTurf Artificial Turf for Management of Stormwater.* AKRF, Inc. and D.S. Thaler and Associates, LLC. June 2011.

II. ANALYSIS

Below is my analysis of key environmental issues. Since the proposal involves converting an existing soccer field, my review focuses on potential environmental impacts associated with the new lighting, noise associated with the extended hours, parking/traffic, and the composition of the synthetic turf material. These same issues were also brought up by concerned citizens during the public comment period associated with the County's preliminary SEPA determination. No expansion to the existing field is proposed.

A. LIGHTING

The applicant is proposing to light the new turf field to allow for night use of the field. The park would close at 11 p.m. Lighting is proposed on 4 separate poles at a height of 75 feet. The poles are positioned along the perimeter of the field in order to provide adequate lighting of the sports field. The proposed light system is Musco's Light Structure Green (see Attachment 7). This lighting system is designed to help direct and shield light to reduce spill and glare onto neighboring residential property.

Attachment 7 also contains a lighting photometric detail that calculates the amount of light (measured in foot candles) as measured 3 feet above the ground at various locations in and around the field. The calculations assume a flat site without obstructions such as trees. For reference, the following chart provides an example of outdoor light levels in terms of foot candles.

Condition	Illumination (foot candles)
Sunlight	10,000
Full Daylight	1,000
Overcast Day	100
Very Dark Day	10
Twilight	1
Deep Twilight	.1
Full Moon	.01
Quarter Moon	.001
Starlight	.0001
Overcast Night	.00001

Source: www.EngineeringToolBox.com

The Illumination Summary titled 'Spill @ Juanita Drive' in Attachment 7 calculates that some field light spill (0.01 foot candles) may fall along certain portions of

Juanita Drive when calculated to the hundredth decimal point. Since the calculations do not consider topography or the existing trees, it is very unlikely that the field lights would actually impact Juanita Drive.

The Illumination Summary titled 'Blanket' photometric calculations prepared by Musco in Attachment 7 photometric study shows that light spill approaches near darkness approximately 208 feet from the field at the furthest distance. Foot candle levels provided were rounded to the nearest tenth. The home closest to the field is located at 13433 78th Place NE and is approximately 425 feet southeast of the existing field. The next closest home is approximately 440 feet southwest of the field located at 13452 Juanita Drive NE. The closest home to the north is approximately 800 feet away. Attachment 10 contains a map prepared by me which shows the extent of lighting relative to adjoining properties based on the data provided. Based on this information, there should not be light spill from the field lights onto adjoining property or into neighboring homes.

Although the lights atop the light standards may still be visible at night through the existing trees, the following site characteristics greatly minimize any adverse impacts created by the proposed lighting:

- The large distance between the lights and adjoining residential properties
- The existing mature trees act as a natural buffer
- The combination of the topography change and height of trees reduce sight lines to the proposed lighting
- The orientation of the lights and light shielding design

B. PARKING/TRAFFIC

The proposed soccer field conversion is occurring at the west soccer field at the north end of Big Finn Hill Park east of Juanita Drive (see Attachment 2). Access to this portion of the park is from NE 138th Street which is connected to Juanita Drive NE to the west. Although NE 138th Street extends to the east end of the park to 84th Avenue NE, access between the two areas is restricted due to a gated fire lane.

Near the soccer field, the park also contains a softball field, a children's play area, and two separate surface parking lots containing a total of 63 parking stalls. The lower parking lot near the soccer field currently contains 21 stalls with 8 parking stalls being added with the proposed project. No changes are proposed to the upper parking lot near the children's play area.

The applicant submitted a parking and traffic study prepared by TSI Transportation Solutions, Inc. (see Attachment 8). The study concludes that while yearly field use will be increased, the field conversion will not create additional parking demand nor will traffic volumes rise due to the increased use of the field. Currently, peak use of the western portion of the park occurs during children's soccer practice when four teams occupy the soccer field and the baseball field is in use. According to King County, there have been no problems with parking or traffic during this peak usage of the park. With the new lacrosse use, only two teams would practice at any time. It is anticipated that the traffic volumes and parking demand should remain similar

to existing conditions since the size of the field is not being expanded and therefore capacity or users of the soccer field would not increase. Should problems arise with parking and/or traffic, it is King County Park's policy to make adjustments in scheduling to alleviate such problems.

The City's Transportation Engineer has reviewed the parking and traffic study provided by the applicant and does not recommend that SEPA mitigating measures for parking and traffic impacts be required due to the minor scope of the proposed renovations (see Attachment 9).

C. NOISE

Big Finn Hill Park generates noise associated with community recreational sports leagues. This includes noise from the sport participants, crowd noise, and noise from whistles during practices and games. Currently, the park closes at dusk, which during the summer months, could mean the park is open as late as 10:00 p.m.

The proposal to convert the field also includes the installation of new field lights along the soccer field to allow soccer uses to continue during the darker months and also later into the night. Lacrosse is also being proposed as a new sport that would utilize the new turf field. Traditionally, lacrosse uses air horns to signal substitutions.

According to King County Parks, air horns and amplified sounds will not be allowed at the park and will be enforced through use agreements between King County Parks and the sports leagues. Violation of the use agreement would result in the loss of use privileges for the violating sports league. Generally, King County has not had a problem with sports leagues abiding by the agreed upon use agreements. Whistles would still be allowed.

Since the park is currently open until 10:00 p.m. during the summer months, the new lighting system would allow use of the park until 10:00 p.m. during the darker months. The noise impacts should be the same as during the summer months. However, King County Parks is proposing that the sports field be open until 11:00 p.m. Since noise impacts from 10:00 p.m. and 11:00 p.m. would not have been reviewed as part of any previous County review, staff has identified this topic as potentially having an adverse impact to neighboring residential properties.

The applicant did not submit a noise study with the SEPA checklist, however I was able to review Chapter 3.6 - Noise - Final Supplemental Environmental Impact Statement (FSEIS) for Sand Point Magnuson Park issued July 12, 2002 (see Attachment 11). In the noise study, sound level measurements were taken at various sporting events to understand the types of noise associated with the different events. I found this information to be relevant with the proposal at Big Finn Hill Park.

Briefly, noise is commonly measured on a weighted logarithmic scale (A-scale) in decibels (dBA). Many jurisdictions' regulations that limit noise levels use this scale.

The measurements are reported in a variety of ways, each having a specific meaning. The following were used in staff's analysis:

- L_{max} is the maximum sound level recorded during the measurement period.
- L_{25} is the sound level exceeded 25 percent of a period of time.

The table below was taken from page 3-76 of the Magnuson Park FSEIS.

Event	L_{25}	L_{max}
Youth Baseball Practice	52	68
Youth Baseball Game	52	75
Adult Baseball/Softball Game	56	79
Youth Soccer/Ultimate Frisbee Practice	55	75
Youth Soccer/Ultimate Frisbee Game	55	75
Adult Soccer Game	48	69

King County Code requires that the maximum sound level for a residential district source (the park is located within a residential district) to another residential district source (single-family homes) is 55 dBA. After 10:00 p.m., this limitation is reduced by 10 dBA therefore reducing the maximum limit to 45 dBA. Below is the formula used to determine sound levels at a desired distance if certain factors are known.

$$X_2 = X_1 - 20 * \text{LOG} (Y_2/Y_1)$$

X_1 = sound level at known reference distance

X_2 = sound level at desired distance

Y_1 = distance where X_1 was measured

Y_2 = distance for which sound level X_2 is being calculated

At 10:00 p.m., Big Finn Hill Park will be used by adults. Therefore the Magnuson Park data for adult soccer games is being used as part of staff's analysis. The results of the calculations below are very conservative in nature and do not include other factors which would reduce the sound levels i.e. lower crowd attendance, topography, vegetation, and sound absorption by the atmosphere and the ground.

Closest Distance to Residential Property Lines (approximate distance measured from the perimeter of soccer field at centerline)	Predicted Noise Level with source of 48 dBA (L_{25})	Predicted Noise Level with source of 69 dBA (L_{max})
354 feet to southwest	37.02	58.02
486 feet to southeast	34.27	55.27
772 feet to north	30.25	51.25

My analysis shows that for the majority of the soccer game duration, the generated noise levels are below the County noise standard of 45 dBA after 10:00 p.m. At certain instances, the calculations show that noise levels peak at around 58 dBA and occur intermittently during the games. For comparison, normal human conversation heard at approximately 3 feet away generates a noise level which ranges anywhere from 40 to 60 dBA. The peak noise level for the field is likely to be even lower given that factors that reduce sound were not included in the calculation. Therefore, staff has not identified any significant impacts regarding this topic that would warrant any project mitigation. However, King County should confirm compliance with County noise regulations as part of their grading permit process.

D. TREES

One tree is proposed to be removed near the proposed improvements to the parking lot and access pathway northeast of the field. Two additional trees located southeast of the field may be removed due to their close proximity to the proposed sand filter drainage system. Grading in the area of the trees could affect the trees' roots. The applicant is proposing to replace any trees that are removed with similar type trees. All other trees on the subject property are either beyond the limits of disturbance or will have tree protection fencing during construction to help ensure long term viability of the trees.

E. WETLAND IMPACTS

An unclassified wetland is located south of the existing soccer field based on King County Geographic Information System (GIS) data. If hydrology of the wetland is increased, due to additional runoff from the new field, a concern would be an increased water level which could negatively affect wetland plant life.

The proposed drainage for the project includes installation of a field underdrain system that will collect and hold water beneath the soccer/lacrosse field. The water will then be control released into and treated by a water quality sand filter located east of the field. This system will detain water and help prevent flooding downstream. In addition, an existing storm drain serves the parking lot and driveway north of the field. Water from this area flows into an existing pipe under the field to a catch basin located at the southwest corner of the field. From the catch basin, water flows into a culvert and into an existing bioswale. The bioswale is separated by four check dams with each section heavily vegetated.

Runoff collected from both the field/sand filter (east of the field) and the bioswale (south of the field) drains to the southeast to an existing drainage pond where the water is eventually released, at a regulated rate, through a level spreader in the woods east of the existing pond into Denny Creek then eventually into Lake Washington.

Because the new drainage system design for the new field diverts all runoff to the southeast into the sand filter system and detention pond, water should not enter the wetland to the south. King County DDES should however confirm compliance of the project in respect to the County's wetland regulations.

F. SYNTHETIC TURF

The applicant is proposing to use FieldTurf for the artificial turf surface at Big Finn Hill Park. FieldTurf uses monofilament slit-film fibers that look like blades of grass. The fibers are stitched into a backing material which is then covered with a special coating to further secure the fibers into the backing while maintaining permeability. The field is then filled with large amounts of silica sand and cryogenic rubber (crumb rubber). Cryogenic rubber or crumb rubber is made from recycled tires. The tires are cryogenically frozen then shattered into smooth clean cut granules for use in sports fields. The product chosen by the applicant does not contain lead.

I have reviewed the various studies submitted by the applicant in regards to the crumb rubber used in the proposed synthetic field. My analysis is found below.

Toxins

Use of synthetic turf eliminates the need for fertilizers, herbicides, pesticides, and water associated with the maintenance of grass fields. However, with synthetic fields, there have been environmental and health questions and concerns regarding the use of crumb rubber since it is made from old recycled tires. Recycled tires contain numerous chemicals including zinc and sulfur, and oils that contain polycyclic aromatic hydrocarbons (PAHs) and volatile organic chemicals (VOCs). The applicant has submitted various studies that provide background information regarding the environmental and health concerns regarding synthetic turf fields (see studies provided by the applicant at

http://www.kirklandwa.gov/depart/Planning/Development/BFHP_Renovation.htm)

Below is a chart from the New York Department of Health which summarizes findings based on a number of studies.

Summary of Information for Crumb-Rubber Infilled Synthetic Turf Athletic Fields

Health Concern	Finding
Heat stress	Surface temperatures on crumb-rubber infilled synthetic turf fields can reach levels of discomfort and may contribute to heat stress. This warrants consideration when making decisions about installing and using a synthetic turf field. While watering synthetic turf may briefly reduce surface temperatures, a number of factors may influence its effectiveness. People using these fields should be advised to remain hydrated and to seek relief from the heat in shaded areas.
Injury	Overall, studies have found no consistent differences in injury rates between natural and crumb-rubber infilled synthetic turf.
Infection	Skin cuts and abrasions that may result from contact with athletic fields (natural and synthetic turf) are susceptible to infection. Athletes and others developing skin abrasions should clean the wounds and seek prompt medical attention. Athletes should avoid sharing equipment, razors, towels, soap and other objects with others, because these items can spread germs.
Latex allergy	At the present time, NYSDOH is unaware of any occurrences of latex allergy resulting from contact with crumb rubber or synthetic turf fields.
Chemical exposures	Based on the available information, chemical exposures from crumb rubber in synthetic turf do not pose a public health hazard.
Source: New York Department of Health Fact Sheet - http://www.health.ny.gov/environmental/outdoors/synthetic_turf/crumb-rubber_infilled/fact_sheet.htm	

Heat

Studies provided by the applicant show that synthetic field surfaces are hotter than natural grass fields by as much as 30° F on average while the air above the field was found to only increase 3° F on average. In contrast, tennis court surfaces were measured to be 44° F hotter than the natural grass field. Weather in the Seattle area averages in the high 70°s during the summer months. Based on the information provided, it appears that health concerns related to sporting events on hot days revolve around more about staying hydrated and seeking shade as needed and little to do with the temperature of the field surface. According to the applicant, it is the sports' leagues policy to cancel events if the weather becomes too hot for play.

Drainage

The water quality sand filter required for the project will provide *enhanced* basic treatment. This will result in a more stringent water quality treatment than typically required for standard projects. The treatment includes basic treatment (80% of suspended solids in the water) as well as removal of metals including a 50% reduction of total zinc. In addition, runoff from the parking lot will pass through a vegetated bioswale south of the field which contains several check dams. This will also act as a filter for any crumb rubber that makes it way from the parking lot.

According to the engineers involved with the project (applicant and City), it is highly unlikely that crumb rubber will make its way into Denny Creek whether the crumb rubber is from the field or deposited in the parking lot. This is due to the type of filtering and/or settling of the crumb rubber that would occur given the design of the drainage systems and turf backing being used. Based on the studies provided, chemicals that may leach into water from the crumb rubber had no significant impact to ground water quality.

III. CONCLUSION

It will be necessary to further analyze certain aspects of the applicant's proposal to determine if the project complies with all the applicable County codes and policies. That analysis is most appropriately addressed within the grading permit review to be conducted by King County Department of Development and Environmental Services (DDES). In contrast, State law specifies that this environmental review under the State Environmental Policy Act (SEPA) is to focus only on potential significant impacts to the environment that could not be adequately mitigated through the applicable County regulations.¹ Based on my review of all available information and adopted policies of the City, I am recommending that a Determination of Nonsignificance (DNS) be issued.

¹ESHB 1724, adopted April 23, 1995

SEPA ATTACHMENTS

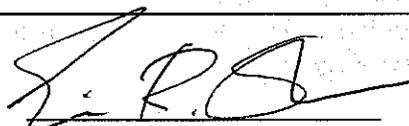
1. Vicinity Map
2. Aerial
3. Sensitive Areas Map
4. Environmental Checklist
5. Project Plans
6. King County Response to Comments
7. Lighting Information
8. Traffic Study prepared by Transportation Solutions dated August 30, 2011
9. TIA Memorandum prepared by Thang Nguyen dated November 2, 2011
10. Aerial - Lighting Info
11. FSEIS on Noise for Sand Point Magnuson Park issued July 12, 2002

REVIEW BY RESPONSIBLE OFFICIAL:

I concur

I do not concur

Comments:



Eric R. Shields, AICP
Planning Director

12/5/11
Date