



**Parks, Recreation  
&  
Cultural Services/  
Tree Board**

**Agenda Packet**

**April 27, 2017**



**Parks, Recreation and Cultural Services Board  
2017 Meeting Schedule**

* May 18	7:00 p.m.	City Hall Council Chamber/Room 104
Joint meeting with Planning Commission/Regular meeting		
June 22	7:00 p.m.	Shoreline City Hall Council Chamber
* July 24	5:00 p.m.	Shoreline City Hall, Room 104
City Council/PRCS/Tree Board Tour of Parks		
* August 24	7:00 p.m.	Kruckeberg Botanic Garden
September 28	7:00 p.m.	Shoreline City Hall, Room 303
October 26	7:00 p.m.	Shoreline City Hall, Room 303
December 7	7:00 p.m.	Shoreline City Hall, Room 303

\*Please note the change in meeting date and/or location. No meeting May 25 or July 27.



**AGENDA**  
**PARKS, RECREATION & CULTURAL SERVICES/TREE BOARD**  
**REGULAR MEETING**

Thursday, April 27, 2017  
7:00 p.m.

Shoreline City Hall Room 303  
17500 Midvale Ave North

		Estimated Time
<b>1. CALL TO ORDER/ATTENDANCE</b>		<b>7:00</b>
<b>2. APPROVAL OF AGENDA</b>	Action	7:02
<b>3. ELECTION OF OFFICERS</b>	Action	7:03
<b>4. APPROVAL OF MARCH MEETING MINUTES</b>	Action	7:08
<b>5. PUBLIC COMMENT</b>		<b>7:10</b>
<i>Members of the public may address the PRCS/Tree Board <b>on agenda items or any other topic</b> for three minutes or less. When representing the official position of a State registered non-profit organization or agency or a City-recognized organization, a speaker will be given 5 minutes and it will be recorded as the official position of that organization. Each organization shall have only one, five-minute presentation. Please be advised that each speaker's testimony is being recorded. Speakers are asked to sign up prior to the start of the Public Comment period. *</i>		
<b>6. ANNUAL REPORTS BY COMMUNITY PARTNERS</b>	Information	7:15
a. Shoreline Historical Museum		
b. Shoreline-Lake Forest Park Arts Council		
c. Kruckeberg Botanic Garden		
<b>7. DIRECTOR'S REPORT</b>	Information	7:55
<b>8. RONALD BOG PARK WETLANDS PROPOSAL</b>	Action	8:05
<b>9. SYNTHETIC TURF INFILL MATERIAL</b>	Action	8:15
<b>10. PROS PLAN DISTRIBUTION</b>	Discussion	8:25
<b>11. COMMENTS FROM THE BOARD</b>	Discussion	8:40
<b>12. STAFF RECOGNITION</b>	Discussion	8:45
<b>13. ADJOURN</b>	Action	9:00

*The PRCS/Tree Board meeting is wheelchair accessible. Any person requiring a disability accommodation should contact the City Clerk's Office at 801-2230 in advance for more information. For TTY telephone service call 546-0457.*

## COMMUNITY EVENTS (not Parks-sponsored)

### **Earth Day in the Park**

Date: 04/29/2017 10:00 AM - 3:30 PM  
Location: Hillwood Park

### **Mother's Day Plant Sale**

Date: May 12, 13 & 14, 2017 10:00 AM - 5:00 PM  
Location: Kruckeberg Botanic Garden

### **Richmond Beach Celebration**

Date: 05/13/2017 10:00 AM - 5:00 PM  
Location: Richmond Beach Library

### **Arts & Crafts 50th Anniversary Sale**

Date: 05/13/2017 10:00 AM - 5:00 PM  
Location: Richmond Beach Library

### **Car Show**

Date: 05/13/2017 10:00 AM - 2:00 PM  
Location: Richmond Beach Rehabilitation Center

### **Strawberry Festival**

Date: 05/13/2017 12:00 PM - 5:00 PM  
Location: Richmond Beach Community Park

## **PROS Plan Schedule**

### **May 18, 2017**

Joint meeting of the PRCS/Tree Board and Planning Commission

### **June 12, 2017**

City Council Final Presentation of PROS Plan

### **June 22, 2017**

PRCS/Tree Board Meeting, Recommend Adoption to City Council PROS Plan Document

### **July 17, 2017**

City Council Meeting, Park Impact Fee, PROS Plan Document Public Hearing

### **July 24, 2017**

City Council Meeting, PROS Plan Adoption

### **July 31, 2017**

City Council Meeting, Park Impact Fee Adoption



## Memorandum

**DATE:** April 27, 2017  
**TO:** Park, Recreation and Cultural Services/Tree Board  
**FROM:** Eric Friedli, Director  
**RE:** Election of Chair and Vice-Chair

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### **Requested Board Action**

The Board should take nominations and elect a Chair and Vice chair.

### **Project or Policy Description and Background**

The Park, Recreation, and Cultural Services/Tree Board by-laws (Section 3:C) calls for election of a Chair and Vice-chair each year at its April meeting. The April meeting is conducted by the outgoing Chair or Vice-Chair until the election is held, after which the newly elected Chair conducts the remainder of the meeting.

Section 3: A & B describe the duties of the officers as follows: The Chair shall preside at all meetings and call special meetings when necessary. The Chair shall be a full voting member of the Parks Board. The Chair shall sign minutes and official papers and may delegate duties to other Parks Board members with the consent of the Parks Board. The Chair shall speak on behalf of the Parks Board before the City Council and to the public.

The Vice-Chair shall perform the duties of the Chair in the absence of the Chair  
In the past, the Board has taken verbal nominations followed by a vote.

### **Key Policy Issues**

None

### **Public Involvement Process**

None

### **Schedule**

N/A

### **Additional Information**

Eric Friedli  
206-801-2601  
efriedli@shorelinewa.gov



## Minutes for the Parks, Recreation and Cultural Services/Tree Board Regular Meeting

Thursday, March 23, 2017

7:00 PM

Audio recording started: 7:00 PM Thursday, March 23, 2017

### 1. Call to Order/Attendance

**The meeting was called to order by Vice-Chair Schielke at 7:00 p.m.**

**Park Board Members Present:** Cindy Dittbrenner, Katie Schielke, Bill Franklin, Christina Arcidy, Christine Southwick, John Hoey, Gillian Lauter

**Absent:** Betsy Robertson, Natalia Sandico

**City Staff Present:** Director Eric Friedli, Administrative Assistant III Lynn Gabrieli

2. **Approval of Agenda:** Vice-Chair Schielke called for approval of the agenda. The Board pointed out that Item 7, Aquatics Feasibility Study, should be a discussion item rather than an action item. Mr. Hoey moved to adopt revised agenda as amended; seconded by Ms. Dittbrenner. The motion carried.
3. **Approval of Minutes:** Vice-Chair Schielke called for approval of the February minutes. So moved by Ms. Dittbrenner and seconded by Ms. Southwick. The motion carried.
4. **Public Comment:** None
5. **Director's Report:**
  - A Poetry reading will be held at Darrell's Tavern on April 3rd sponsored by the Public Art Program.
  - All three incumbent Board members are being recommended by the City Council subcommittee to be reappointed. The City Council votes on March 27.
  - Ms. Colaizzi presented the PROS Plan to the Planning Commission last week. The Goals and Policies are part of the City's Comprehensive Plan. There were no comments.
  - King Conservation District/National Plant Society trained their first class of Shoreline urban forest stewards. Graduation is April 21 in Council Chambers. The stewards will present projects followed by a short graduation ceremony. The Board is welcome to attend.
  - Sound Transit is hosting a public meeting on Ronald Bog mitigation on April 13 at 7:00 p.m. to solicit community input on the impact of mitigation efforts at Ronald Bog Park.
  - Sound Transit is also hosting a public meeting on Light Rail impacts to Ridgecrest Park on May 9.

- Registration for summer camps began this week. All camps based at Spartan are full with wait lists. The expectation is that all camps will fill by the end of the week. 3101 registrations were processed the first day, totaling \$309,000 in revenue.
- Parks Maintenance is preparing fields for ball season.
- Work has continued on the Hidden Lake project that has included coordination with downstream stakeholders, and developing and vetting concepts for holistic stream restoration. Big picture objectives and funding sources are still being explored.
- The City Council will be acting on staff's recommendation to dissolve the Library Board due to decreased need and efficacy at their May 1 meeting. The recommendation will be to add an annual report by the Library Cluster Manager to the PRCS Board agenda.

#### 6. **Joint Use Agreement with Shoreline School District**

Mr. Friedli introduced Marla Miller, Deputy Superintendent of the Shoreline School District.

JUA's are common amongst jurisdictions. Shoreline's JUA has not been reviewed since 2000. It consists of the basic agreement followed by addenda pertaining to particular facilities. Mr. Friedli and Recreation Superintendent Reidy from the City and Ms. Miller and Mr. Dalziel from the School District have engaged in conversations over the past several months to get to this point.

Mr. Friedli highlighted key points of change from the prior JUA identified in red in the agenda packet. The Board inquired about the future of the Shoreline Center property. While no plans are solid, Ms. Miller stated that the SSD will likely hold it to use for school-related purposes.

Mr. Franklin about signage at the Meridian Park Tennis Courts to indicate that they are available to the public. A closed, locked gate to the south gives the appearance that this court is off limits. Ms. Southwick inquired about why the Parks Dept. is maintaining an asset that the public cannot get to for security reasons.

Mr. Hoey inquired about public use of the track and plans for Einstein Middle School. The track is available for public use during non-school hours. Ms. Miller expressed an interest in working with the City to explore potential ways to share space and collaborate on park use. Vice-Chair Schielke inquired about the potential for public access areas such as teen spaces in the new middle schools. Ms. Miller indicated that public use in the schools is a possibility. Ms. Arcidy praised the good will between the School District and the City and inquired about ways the Parks Department can support students more fully. Ms. Miller emphasized after school partnerships and the Recreation Superintendent's involvement in conversations about the school calendar to share responsibility and opportunities for student care and oversight.

#### 7. **Aquatics/Community Center Feasibility Study**

Vice-Chair Schielke asked the subcommittee to provide feedback about their process in the development of the study. There was some discussion about whether the indoor track is truly feasible, but after hearing from the City Council to think big the track was left in for discussion. It was acknowledged that this comes with a huge price tag and would require tremendous political will. Surprise was expressed about the lack of critical comments or questions from the public during the year-long process.

Mr. Friedli presented both optimistic and pessimistic cost recovery scenarios for Maintenance and Operation costs as a result of building a new pool and community center. The result of the analysis is that the optimistic scenario offers 90% cost recovery and the pessimistic one, 60%.

Mr. Friedli displayed estimated construction and related costs via PPT, the impact of voter debt on a median priced home, and an anticipated schedule of upcoming levy votes impacting Shoreline including those related to the Fire District, the School District, and King County.

Board suggestions included:

- Edit the document for redundancy
- Shoreline City areas should be shown first followed by regional use when it comes to demographic usage
- Include "improved access to natural areas" on page 19 as a bullet if site appropriate
- Site diagrams: why is the weight/cardio room shown as double story? Could a mezzanine level be added over the weight room instead?
- Is the child care area too remote?
- Could a public meeting room or conference room be added off the lobby with wifi and a fee structure for rentals?
- Page 22 makes no mention of public art

Staff will review and incorporate these comments.

The schedule for PROS Plan adoption was reviewed followed by funding plan development, narrowing the site selection, engaging potential partners, refining the design, City Council review, and the voters' decision. Mr. Friedli discussed the importance of establishing a technical committee and bond committee as we enter the prospect of approaching voters.

## 8. **Comments from the Board**

- Mr. Friedli began with a few comments:
  - The PRCS/Tree Board Agenda Planner was distributed and these exceptions to the regular schedule were noted: May 18 joint meeting with the Planning Commission in the Council Chamber, June 22nd in the Council Chamber, July 24 joint City Council/Board tour 5:30 - 6:45, August 24 meeting at Kruckeberg Botanic Garden.
  - Election of Board officers will take place at the April meeting.
  - No decision has been made re: synthetic turf. Mr. Friedli asked whether they want to revisit their recommendation given the following info:
    - WA State Department of Health released results of a study that concluded the incidence of cancer is not increased by the surface material. Ms. Lauter stated that she read the study and saw the study as ambiguous.
    - OTAK studied potential environmental effects of crumb rubber on fish and the environment. Their conclusion was that there was no negative environmental impact. The Board requested to see the report. The



recommendation will go to the City Council in May so the Board was given the opportunity to revisit their recommendation at the April meeting.

- The Board agreed to revisit this topic at the April Board meeting with additional information from staff.
- Ms. Arcidy announced a town hall meeting in Shoreline on April 18 at Shoreline Community College with Congresswoman Pramila Jayapal.
- The Board requested information about the Trail under the Rails meeting.
- How will we celebrate the completion of the PROS Plan?
- What is the plan for art at the Park at Town Center?

9. **Adjourn**

**Hearing no further business, Vice-Chair Schielke called for a motion to adjourn. So moved by Mr. Franklin; seconded by Ms. Southwick. The meeting adjourned at 8:57 p.m.**

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Signature of Vice-Chair  
Katie Schielke

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Date

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Signature of Minute Writer  
Lynn Gabrieli

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Date

DRAFT



## Memorandum

**DATE:** April 27, 2017

**TO:** Parks, Recreation and Cultural Services/Tree Board

**FROM:** Maureen Colaizzi, Park Project Coordinator  
Eric Friedli, PRCS Director

**RE:** Light Rail Wetland Mitigation Opportunity – Ronald Bog Park - **Discussion #2**

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### **Requested Board Action**

The PRCS/Tree Board is asked to concur with the staff recommendation to allow Sound Transit to create a new wetland in Ronald Bog Park as depicted in Attachment A: Split Option as mitigation for impacts from its light rail line.

### **Project or Policy Description and Background**

At its February 23, 2017 meeting the PRCS/Tree Board was asked to provide input on a proposal to create new wetland in Ronald Bog Park as mitigation for impacts from Sound Transit's light rail line (Attachment B). Staff made a presentation and the Board engaged in a discussion about the proposed project. Since that meeting, City and Sound Transit staff reviewed the Boards discussion, developed alternative wetland designs and hosted a public meeting. Based on the Boards comments and the results of the public meeting PRCS staff are recommending a wetland design for Sound Transit to move forward with through the design and permitting phase.

### **Light Rail Wetland Impacts and Mitigation Needs**

Sound Transit's Lynnwood Link Extension project will unavoidably impact some category III wetlands in the Thornton Creek watershed on the east side of Interstate 5 just south of Shoreline Fire District Station 65. Sound Transit (ST) and City staff have been working together to consider viable options for meeting City, state and federal regulations for wetland impact mitigation in the City preferably at one site. ST and staff reviewed a number of possible locations for wetland mitigation projects in or close to the Thornton Creek Watershed including on private property adjacent to location of impacts, Paramount Open Space, Twin Ponds Park, and Ronald Bog Park. Although Paramount Park and Twin Ponds Park were considered, they

were not ideal for wetland creation without possibly impacting existing critical areas or active recreation uses. ST and the City identified Ronald Bog Park as the best viable location for an approximately one (1) acre wetland restoration/creation project plus associated protective buffer that could meet all layers of mitigation regulations and meet other city, and park system needs and goals.

### **Shoreline's Plan for Parks, Recreation and Cultural Services Needs**

The possibility of creating a new wetland project at Ronald Bog Park is a great opportunity to meet the goals, implementation actions and capital improvement needs of Shoreline's Plan for Parks, Recreation and Cultural Services (PROS Plan). This project meets Goal 1 and Policy 1.1 of the PROS Plan which encourages preservation, enhancement and restoration of our natural resources including education and stewardship. If implemented, this project would further the goals of the Action Initiatives 2, 6 and 7 by expanding opportunities to connect with nature by constructing nature trails on site and from Ronald Bog Park to James Keough Park and by restoring wetland buffer with native trees and plants. In addition, several capital improvement project ideas for Ronald Bog Park could be implemented through this proposal including native vegetation improvements, new nature trails, tree planting, and trail corridor connections to James Keough Park.

### **Forward Thrust Requirements**

Ronald Bog Park was originally acquired by King County through the Forward Thrust bond initiative and was transferred to the City with the deed restriction that park and recreation facilities acquired with these funds:

*"shall not be transferred or conveyed except by agreement providing that such lands shall continue to be used for the purposes contemplated by this resolution, or be converted to a different use unless other equivalent lands and facilities within the County or City shall be received in exchange therefore...However, nothing in this resolution shall prevent the grant of easements or franchises or the making of joint use agreements not incompatible with the use of Public Park and Recreation Facilities for the purposes of this resolution" (King County Resolution No. 34571, approved December 18, 1967).*

The proposed mitigation project at Ronald Bog would not transfer or convey the park lands out of city park use. The required easement for protection of the new mitigation area in perpetuity can be agreed to under the Forward Thrust resolution language provided that it is determined that the mitigation plan is not incompatible with the use of the park. Staff has discussed options for improving existing informal paths for public access on the north east portion of the park, to the extent allowable by adopted critical area regulations and possibly with permission from WSDOT for trail in the adjacent limited access ROW extending to James Keough Park. These trails improvements would be required of ST by the City to maintain public use and access to the park in exchange for restricting access in the current grassy area where the wetland mitigation area and buffer are proposed.

## **Regulatory Requirements**

Both the US Army Corps of Engineers and the WA Department of Ecology have indicated that the basic concept proposed at Ronald Bog could meet federal and state requirements. In order to meet federal requirements, public access must be excluded from the new wetland and buffer areas, minimum size requirements must be met, and the area must be protected as a mitigation site in perpetuity through an easement or similar deed restriction.

A modification of the City's critical area regulations through ST's Special Use Permit application process would be necessary in order to allow for development or expansion of trails within the required wetland and stream buffers that overlay the eastern portion of the park. Planning & Community Development (PCD) staff are reviewed the concept and determined that the necessary code modifications can be supported through the required Special Use Permit application process.

## **Project Scope of Work**

As part of the design process, Sound Transit must monitor ground water levels in the project area to inform design. They are also required to test the existing soil for any contamination. The mitigation work itself would involve:

- relocation of the public art sculpture, benches, and shelter currently located within the mitigation area;
- limited tree removal;
- re-grading of the site;
- soil amendments;
- wetland and buffer plantings;
- placement of habitat logs;
- installation of a split rail fence to restrict public access to the mitigation area; and
- Environmental critical area identification signage on the split rail fence.

## **Public Involvement Process**

At its February 23, 2017 meeting the PRCS/Tree Board was asked to provide input on a proposal to create new wetland in Ronald Bog Park as mitigation for impacts from Sound Transit's light rail line. Staff made a presentation and the Board engaged in a discussion about the proposed project. Staff presented an initial plan for the wetlands mitigation project (Attachment B).

The Board inquired about current usage of the park: birding, fishing, dog walking, and occasional use of the shelter. They commented on the value to the community of accessing to the water's edge.

Board recommendations:

- Leave large snags for habitat
- Leave some grassy area for duck habitat
- Involve the public in the discussion very early in the design process

The City's adopted critical area and permitting regulations do not require a neighborhood meeting as part of the permitting process for this mitigation project; however PCD, PRCS staff and the PRCS Board strongly recommended that a neighborhood meeting be held by Sound Transit to present the proposed project and solicit comments from the neighborhood for the proposed project. A public meeting was held on April 13, 2017.

Three design options were presented at the public meeting. The original proposal (Attachment B) and two alternatives (Attachments A and C) were presented to the community. The alternatives were developed to provide the required area needed for the (1) acre wetland mitigation while maximizing public access to the bog and the rest of the park.

There was general support for wetland creation at Ronald Bog Park at the public meeting. Forty-six people sign in but approximately 55-60 attended. Some the attendees were students from a high school biology class who actively participated by asking thoughtful questions about wetlands and wetland creation. Feedback includes:

- **Key Topics During the Q/A Session:**
  - General support
  - Park safety
  - Why the mitigation would happen at Ronald Bog
  - How the mitigation projects work
- **General Comment on Feedback Form:**
  - To create maximum ecological functions from this public land, please restrict public access as much as possible
- **Comments on Original Proposal (Attachment B):**
  - How could more access to the water be created in the plans?
  - KISS (suggestion to locate it west of the parking lot)
  - Maximum number of trails. Elevate on boardwalks as needed
  - The current lawn is a mucky mess. I like adding wetland
- **Comments on Recommended Option (Attachment A):**
  - Keep trees for birds
  - Heron habitat / cormorants / cutthroat trout ARE salmonids / osprey / otters / beavers
  - I have seen large fish, possibly cutthroat, in the lake
  - Access to water is important value
  - (pointing to shelter) Eagle scout / boy scout project – should remain
  - Protect shelter – green roof is a cultural asset – Scandinavian style – ask Vicki Stiles
  - Use board walks not gravel for trails
  - Preferred option
  - Like “green roof” option for shelter
  - 152nd St. wetland vault could be very destructive. Pevgly Pond was destroyed by their detention vault
  - Least favorite option
- **Comments on Central Option (Attachment C):**
  - I prefer this option – as much wetland as possible
  - Can shelter be further from the street?
  - Keep as many shore trees as possible / maintain access to the bog – little kids able to play at the shore NE corner
  - I like this option! Can we add on an option for access to kayaks on the bog

- Instead of gravel trails can we make something for bikes?
- Keep the trees / increased public access to water
- 1st Choice – public access to the water / trails expanding / like increased wetlands
- First Choice! Central option
- Taking down shelter building and rebuilding is a waste of money
- Have boy scouts build another building
- No trails past this point (first east flow mark)
- Like trails, but not too close to edge near homes
- This is my preferred option. I wonder if access to lake for public is possible to add. I love the idea of increased wetlands.

### **Staff Recommendation**

Staff is recommending the option depicted in Attachment A: Split Option because it:

- achieves the goals of wetland creation
- maintains the most useable configuration of lawn area
- retains access to the Bog that is historic and familiar to the community
- improves trails in the arboretum

### **Anticipated Schedule**

The following is the estimated possible schedule for this project.

#### February 2017 – July 2018

- Field data collection to inform design of mitigation project
- Project design by ST consultant team
- ST to request permission from WSDOT for trail segment on WSDOT limited access area

#### March 2017 – December 2017

- Permitting submittals, reviews, and permit issuance

#### 2018 – 2023 (and beyond)

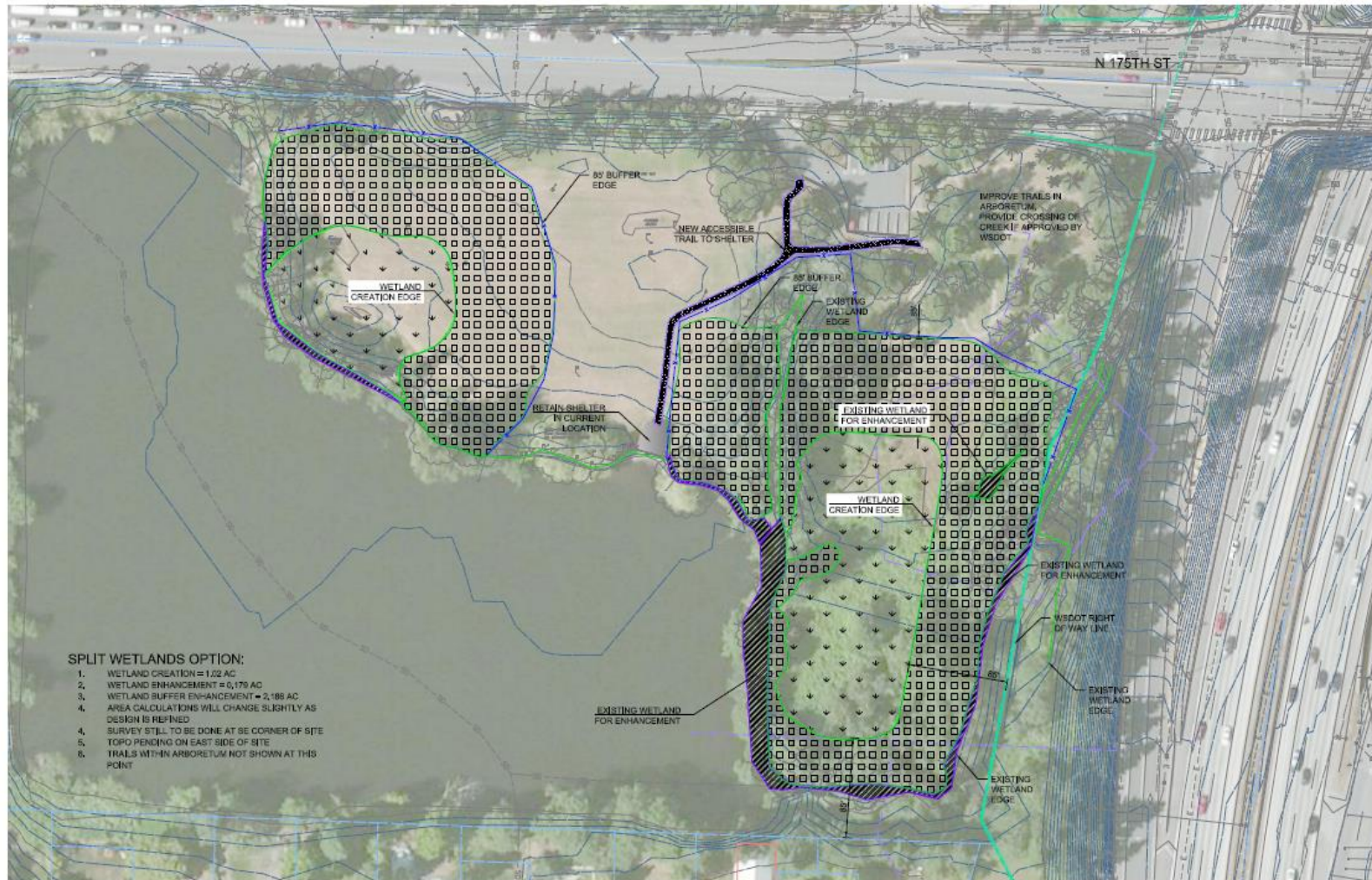
- Construction of wetland mitigation site before light rail starts operation – timing within this window not yet know
- 10 year of maintenance and monitoring by ST required by federal regulations after construction is complete.

### **Budget Implications**

There are no direct City budget implications. This is a project completely undertaken and funded by Sound Transit as mitigation for the new light rail system in Shoreline. Improvements tentatively identified for this park through the PROS planning process may be accomplished through this project without additional funding needs.

## Attachment A: Split Option

### Staff Recommended Configuration





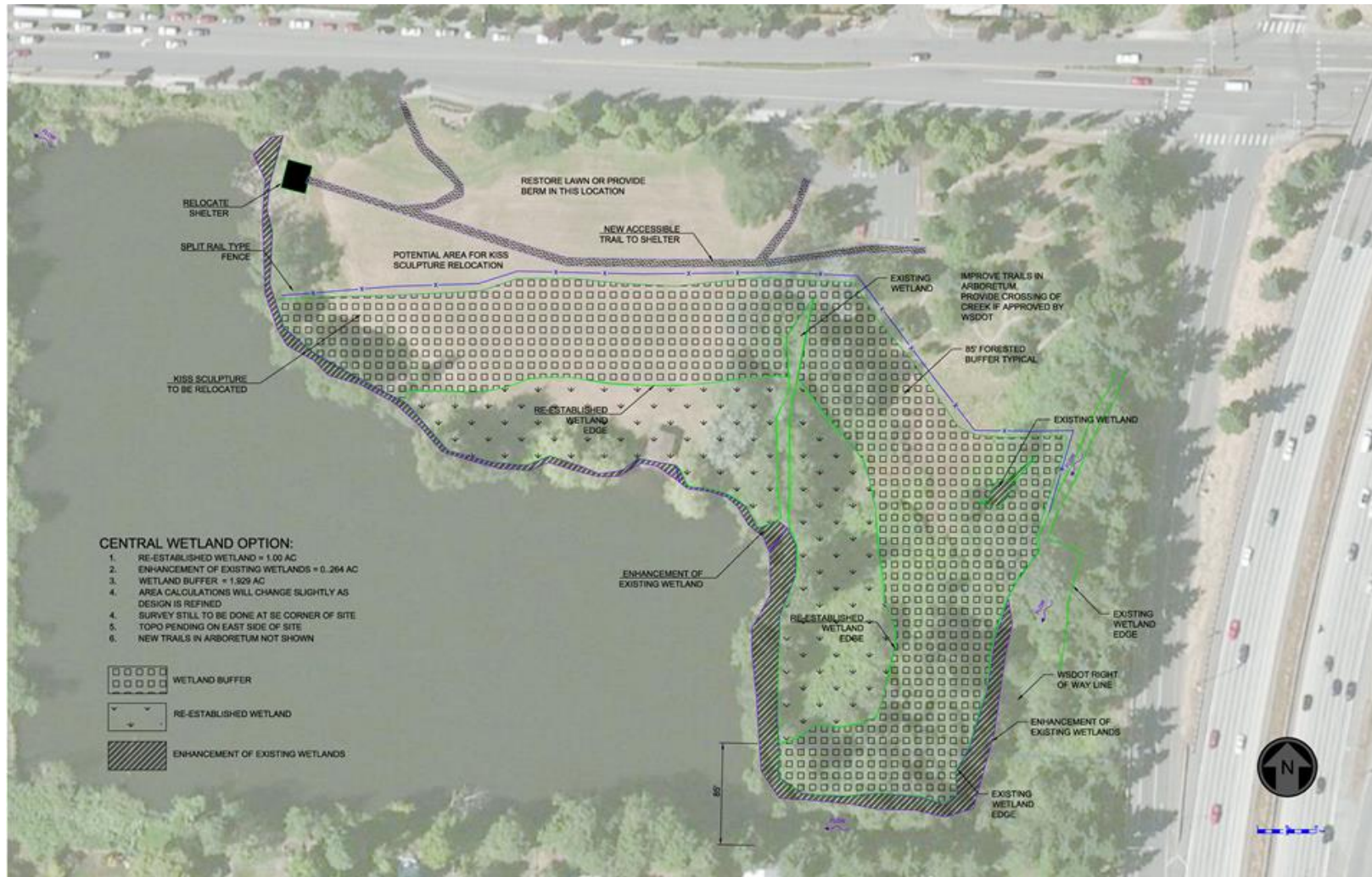
## Attachment B: West Option

As presented to PRCS/Tree Board on February 23, 2017





**Attachment C: Central Option**





## Memorandum

**DATE:** April 27, 2017

**TO:** Parks, Recreation and Cultural Services/Tree Board

**FROM:** Eric Friedli, Director

**RE:** Revisit recommendation on infill material selection for Synthetic Turf Replacement at Twin Ponds Soccer Field

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### **Requested Board Action**

At its December, 2016 meeting the Board recommended that crumb rubber not be used as the infill material for the synthetic turf field at Twin Ponds Park. Given that new information is available relating to the health and environmental safety of crumb rubber and that the project has been delayed, the Board is being offered the opportunity to reconsider its recommendation and requested to concur with the Staff recommendation to use SBR crumb rubber as the infill material for the soccer field at Twin Park.

*New information is presented below in underlined, italics font.*

### **Staff Recommendation:**

Staff recommends using Styrene Butadiene Rubber (SBR), referred to as SBR crumb rubber, as the infill material for the soccer field at Twin Ponds Park. Recognizing that a new federal study on the health effects of the SBR crumb rubber is due to be published by the end of 2016 this recommendation may be changed. If that study is published in a timely manner and reveals substantial health concerns exist then the recommendation would be to proceed with another product. *Note: An update to the EPA study was published at the end of 2016. It is described below.*

### **Project or Policy Description and Background**

The replacement of the synthetic turf soccer field at Twin Ponds Park is scheduled to complete by August 2017. The \$1.66 million project is funded through the CIP with \$250,000 from a State youth athletic fields grant. In addition to the field replacement the project will replace field lights and add security lighting along the pathway from the parking lots to the field. The project is scheduled for construction during the summer, a

low use period and optimum construction weather. The project will be bid in May and construction is expected to start in July.

Infill material is used to fill in between the blades of artificial grass and gives the field surface its resiliency. The most frequently used infill material is SBR crumb rubber. It is what is used at the Twin Ponds field now as well as at Shoreline A&B.

The use of SBR crumb rubber has been questioned due to ongoing concerns about its potential negative health effects. There have been a number of news stories on this topic. Searching the internet for 'news about crumb rubber' results in numerous stories about concerns over the use of the material made from old car and truck tires. Some parks and recreation agencies have stopped using the material opting for alternatives, while others continue to install it.

The key trade-off is between the higher cost of using alternative materials and the potential health effect of crumb rubber.

### ALTERNATIVE MATERIALS

Attachment A is a detailed consultant's report summarizing the variety of infill materials currently available. Below is a summary of that report.

Alternatives to crumb rubber include:

- Coated Crumb Rubber (standard crumb rubber coated with a pigmented acrylic or polyurethane coating which encapsulates the SBR crumb rubber, preventing direct exposure),
- coconut base material,
- granular cork,
- thermo-plastic elastomer – TPE ( similar to what plastic wine corks are made of),
- scrap from the sneaker manufacturing process (Nike Grind)
- Zeofill/Zeolite.

Some of these materials do not provide the resiliency of SBR crumb rubber and require an additional underlayment (pad) that increases the resiliency.

The products have a variety of unique characteristics. Cost is a primary decision factor. SBR crumb rubber is estimated to cost between 14% and 75% less than the alternative products.

Updated estimated costs for an 80,000 square foot synthetic turf project based on recent bids reviewed by our consultant:

Material	Estimated Cost	Difference from SBR Crumb Rubber
SBR Crumb Rubber	\$508,000	0
Cork & Pad	\$658,000	+\$56,000-\$120,000
TPE & Pad	\$888,000	+\$380,000
Coated SBR Crumb Rubber	\$580,000	+\$72,000
Nike Grind	\$616,000	+\$108,000

PRECEDENT

It is likely that whatever decision is made now regarding infill material for the Twin Ponds field will set a precedent for replacement of the fields at Shoreline Park - A&B. Shoreline A&B is a two field complex that is expected to be replaced in 2018 (dependent on funding availability). Given those fields are roughly double the size of Twin Ponds field it is likely that the costs above would be doubled.

Estimated costs for a 160,000 square foot synthetic turf project:

<i>Material</i>	<i>Estimated Cost</i>	<i>Difference from SBR Crumb Rubber</i>
<i>SBR Crumb Rubber</i>	<i>\$1,016,000</i>	<i>0</i>
<i>Cork &amp; Pad</i>	<i>\$1,316,000</i>	<i>+\$112,000-\$240,000</i>
<i>TPE &amp; Pad</i>	<i>\$1,776,000</i>	<i>+\$760,000</i>
<i>Coated SBR Crumb Rubber</i>	<i>\$1,160,000</i>	<i>+\$144,000</i>
<i>Nike Grind</i>	<i>\$1,232,000</i>	<i>+\$216,000</i>

HEALTH ASSESSMENT OF CRUMB RUBBER

For over a decade there have been health concerns and research studies considering the health and safety of synthetic turf fields. Searching the internet for 'health studies of synthetic turf fields' results in numerous studies and additional information about synthetic turf fields. The federal government is undertaking a new study of the health effects of synthetic turf fields that is scheduled to be completed by the end of 2016 ( <https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playing-fields>).

The federal government recent study of the health effects of synthetic turf fields resulted in a status report at the end of 2016. The federal study reports that there are between 12,000 and 13,000 synthetic turf recreation fields in the U.S. with 1,200 to 1,500 added each year. The status report does not present any conclusions about the safety or health effects of crumb rubber or any other surface material. The EPA has collected field samples that it will study more extensively. (<https://www.epa.gov/chemical-research/federal-research-recycled-tire-crumb-used-playing-fields>). There is no firm schedule for when additional information might be available.

In January 2017 the Washington State Department of Health issued a report on its "Investigation of Reported Cancer among Soccer Players in Washington State." The study was conducted in response to about the incidence of cancer among soccer players and particularly goalies. The Health Department formed a team with researchers from the University Of Washington School Of Public Health to investigate the incidence of cancer and review the relationship of crumb rubber and artificial turf to human health. They found that "seven review articles published in the last ten years all concluded that playing on artificial turf fields is unlikely to expose children, adolescents

or adults to sufficient levels of chemicals from fields to significantly affect health.” They did acknowledge that there are some limitations to the existing research. The study found less cancer than expected among the soccer players when compared to the population in general. The final conclusion from the report is “The Washington State Department of Health recommends that people who enjoy soccer continue to play irrespective of the type of field surface.”

Several research studies are also summarized in the Additional Information section below.

Of the numerous studies completed over the past decade the conclusion is that SBR crumb rubber does not present a risk to people using fields with that infill material. Two recent, local studies have concluded that:

“The studies acknowledge that turf materials contain hazardous constituents and that the public, notably children, are in contact with these hazardous constituents. What has not been demonstrated, however, is an exposure pathway by which he constituents can enter the body of the field users and do damage or initiate disease.” (Attachment A: Elisabeth Black CIH, EMB Consulting, April 14, 2015)

“Based on the data publically available for this analysis, he chemical levels found in FieldTurf SBR and Geoturf infill do not present a risk to people playing on or using the fields with these products. These conclusions are consistent with those of multiple regulatory agencies that have evaluated the risk from artificial turf products in general.” (Attachment B: Gradient Corp., May 26, 2015).

Additional abstracts of scientific studies are included under Additional Information below.

#### ENVIRONMENTAL ASSESSMENT OF TWIN PONDS FIELD REPLACEMENT

In addition to concerns about the health effects of crumb rubber there has also been concern about the impact on the environment. Twin Ponds field is in a unique location given its proximity to the ponds and the creek that flows through the park. PRCS contracted with an environmental consulting firm (Otak, Inc.) to conduct an assessment of the potential impact of the replacing the lights and the field surface (Attachment A).

The study concluded:

1. No adverse impacts to Fish and Wildlife Habitat Critical Areas (FWHCAs) due to increases in noise levels above those that currently pertain will occur as a result of the project.
2. Less light spill into nearby FWHCAs will occur under proposed conditions compared to existing conditions, and adverse impacts to FWHCAs due to lighting are not anticipated to occur due to the proposed project.
3. Adverse impacts to water quality and impacts to aquatic habitat and associated FWHCAs are not anticipated to occur as a result of the proposed project.

Comparatively little independent research is available on the health or environmental effects of alternative materials.

## **Public Involvement Process**

The public has been made aware of this discussion through regular PRCS/Tree Board meeting announcements.

## **Schedule**

12/1/2016	PRCS Board discussion
4/28/2017	PRCS Board discussion
5/8/2017	City Council discussion
5/2017	Contract awarded
Summer 2017	Construction

## Additional Information

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[Environ Sci Technol](#). 2014 Feb 18;48(4):2114-29. doi: 10.1021/es4044193. Epub 2014 Feb 6.

## **Environmental and health impacts of artificial turf: a review.**

[Cheng H<sup>1</sup>](#), [Hu Y](#), [Reinhard M](#).

### Author information

- <sup>1</sup>State Key Laboratory of Organic Geochemistry Guangzhou Institute of Geochemistry, Chinese Academy of Sciences Guangzhou 510640, China.

### **Abstract**

With significant water savings and low maintenance requirements, artificial turf is increasingly promoted as a replacement for natural grass on athletic fields and lawns. However, there remains the question of whether it is an environmentally friendly alternative to natural grass. The major concerns stem from the infill material that is typically derived from scrap tires. Tire rubber crumb contains a range of organic contaminants and heavy metals that can volatilize into the air and/or leach into the percolating rainwater, thereby posing a potential risk to the environment and human health. A limited number of studies have shown that the concentrations of volatile and semivolatile organic compounds in the air above artificial turf fields were typically not higher than the local background, while the concentrations of heavy metals and organic contaminants in the field drainages were generally below the respective regulatory limits. Health risk assessment studies suggested that users of artificial turf fields, even professional athletes, were not exposed to elevated risks. Preliminary life cycle assessment suggested that the environmental impacts of artificial turf fields were lower than equivalent grass fields. Areas that need further research to better understand and mitigate the potential negative environmental impacts of artificial turf are identified.

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[PubMed - indexed for MEDLINE]

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[Environ Sci Pollut Res Int](#). 2013 Jul;20(7):4980-92. doi: 10.1007/s11356-012-1390-2. Epub 2013 Jan 18.

## **Environmental-sanitary risk analysis procedure applied to artificial turf sports fields.**

[Ruffino B<sup>1</sup>](#), [Fiore S](#), [Zanetti MC](#).

### Author information

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### **Abstract**



Owing to the extensive use of artificial turfs worldwide, over the past 10 years there has been much discussion about the possible health and environmental problems originating from styrene-butadiene recycled rubber. In this paper, the authors performed a Tier 2 environmental-sanitary risk analysis on five artificial turf sports fields located in the city of Turin (Italy) with the aid of RISC4 software. Two receptors (adult player and child player) and three routes of exposure (direct contact with crumb rubber, contact with rainwater soaking the rubber mat, inhalation of dusts and gases from the artificial turf fields) were considered in the conceptual model. For all the fields and for all the routes, the cumulative carcinogenic risk proved to be lower than  $10^{-6}$  and the cumulative non-carcinogenic risk lower than 1. The outdoor inhalation of dusts and gases was the main route of exposure for both carcinogenic and non-carcinogenic substances. The results given by the inhalation pathway were compared with those of a risk assessment carried out on citizens breathing gases and dusts from traffic emissions every day in Turin. For both classes of substances and for both receptors, the inhalation of atmospheric dusts and gases from vehicular traffic gave risk values of one order of magnitude higher than those due to playing soccer on an artificial field.

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[J Toxicol Environ Health A](#). 2011;74(17):1150-74. doi: 10.1080/15287394.2011.586942.

## **Human health risk assessment of synthetic turf fields based upon investigation of five fields in Connecticut.**

[Ginsberg G](#)<sup>1</sup>, [Toal B](#), [Simcox N](#), [Bracker A](#), [Golembiewski B](#), [Kurland T](#), [Hedman C](#).

### **Author information**

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### **Abstract**

Questions have been raised regarding possible exposures when playing sports on synthetic turf fields cushioned with crumb rubber. Rubber is a complex mixture with some components possessing toxic and carcinogenic properties. Exposure is possible via inhalation, given that chemicals emitted from rubber might end up in the breathing zone of players and these players have high ventilation rates. Previous studies provide useful data but are limited with respect to the variety of fields and scenarios evaluated. The State of Connecticut investigated emissions associated with four outdoor and one indoor synthetic turf field under summer conditions. On-field and background locations were sampled using a variety of stationary and personal samplers. More than 20 chemicals of potential concern (COPC) were found to be above background and possibly field-related on both indoor and outdoor fields. These COPC were entered into separate risk assessments (1) for outdoor and indoor fields and (2) for children and adults. Exposure concentrations were prorated for time spent away from the fields and inhalation rates were adjusted for play activity and for children's greater ventilation than adults. Cancer and noncancer risk levels were at or below de minimis levels of concern. The scenario with the highest exposure was children playing on the indoor field. The acute hazard index (HI) for this scenario approached unity, suggesting a potential concern, although there was great uncertainty with this estimate. The main contributor was benzothiazole, a rubber-related semivolatile organic chemical (SVOC) that was 14-fold higher indoors than outdoors. Based upon these findings, outdoor and indoor synthetic turf fields are not associated with elevated adverse health risks. However, it would be prudent for building operators to provide adequate ventilation to prevent a buildup of rubber-



related volatile organic chemicals (VOC) and SVOC at indoor fields. The current results are generally consistent with the findings from studies conducted by New York City, New York State, the U.S. Environmental Protection Agency (EPA), and Norway, which tested different kinds of fields and under a variety of weather conditions.

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# Technical Memorandum



To: Eric Friedli  
City of Shoreline Parks and Recreation

From: Kevin O'Brien, Senior Ecologist

Copies: File

Date: March 17, 2017

Subject: Twin Ponds Park Soccer Field Replacement  
Memo

Project No.: 32850

## Introduction

The City of Shoreline proposes to replace an existing artificial turf athletic field and existing unshielded lighting at Twin Ponds Park with a new artificial turf athletic field and shielded lighting. The existing athletic field footprint will not be expanded, and the number of existing unshielded light poles will be reduced.

Per the Shoreline Municipal Code 20.80.270, fish and wildlife habitat conservation areas are considered critical areas, and are required to be evaluated for potential impacts associated with proposed projects. Fish and wildlife habitat conservation areas are considered to include all regulated streams and wetlands and their associated buffers as determined by a qualified specialist.

On behalf of the City, Otak, Inc. biologists conducted stream and wetland reconnaissance and qualitative habitat assessments at Twin Ponds Park (15401 1st Ave NE, Parcel # 2881700590). The purpose of the site visit was to: 1) confirm and update environmental information regarding streams and wetlands in the Twin Ponds Park, 2) assess the existing artificial turf soccer field, and 3) evaluate potential impacts to fish and wildlife habitat conservation areas of replacing the existing artificial turf field and existing lighting.

## Methodology

Two Otak scientists conducted a site reconnaissance to confirm previous work conducted By Otak in 2015 and by Touchstone Ecoservices (TES) in 2016. Wetlands on the site were originally assessed by

Otak biologists in 2015, using the methodology derived from the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2010) and the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987). Full wetland delineations were not conducted for this work. Work was conducted on the City-owned parcels identified above; no work was performed on privately-held parcels. TES conducted full wetland delineations in the Twin Ponds Park and issued a wetland delineation report dated July 29, 2016. The Otak stream and wetland assessment (January 29, 2016) and the TES report were both referenced for the site reconnaissance.

Stream systems were qualitatively assessed in 2015 for in-stream habitat units, substrate, large wood, riparian habitat, and potential fish presence/fish habitat; Otak scientists confirmed these assessments as part of the 2017 site reconnaissance. Full stream habitat surveys and/or fish surveys were not conducted for this work. Streams were typed per Shoreline Municipal Code (SMC) 20.80.270.B(5), and buffers were established based on stream type and presence of fish habitat per SMC 20.80.280.C.

The soccer field was examined to qualitatively assess existing conditions, existing drainage, and distance of the existing light stanchions from wetland edges.

Geologic hazard areas, flood hazard areas, and aquifer recharge areas were not evaluated as components of this work.

## **Results**

Otak identified two wetlands in Twin Ponds Park (see Figure 1). Two streams were also identified on the Twin Ponds parcels. Buffers for these critical areas are also depicted in the two Figures. A number of privately held properties are within the buffers for the wetlands and streams on both the Paramount Open Space and Twin Ponds Park areas.

TES identified three wetlands in the Twin Ponds Park. Figure 2, reprinted from the TES report, illustrates the wetlands.

## **Existing Conditions—Fish and Wildlife Habitat Conservation Areas**

Per SMC 0.80.270, Fish and Wildlife Habitat Conservation Areas (FWHCAs) are areas where State or Federally designated threatened, endangered, or sensitive species have a primary association; areas where State priority habitat and/or species occur; commercial and recreational shellfish areas; and Waters of the State (and regulated wetlands).

### ***State or Federally Designated Threatened, Endangered, or Sensitive Species***

No state or federally designated threatened, endangered, or sensitive (TES) species occur in the Twin Ponds Park area. Much of the area surrounding the Park is substantially developed and disturbed, and habitat for TES species is not present on the Park site.

### ***State Priority Habitat and Species (PHS)***

Washington Department of Fish and Wildlife (WDFW, 2017a) maps wetlands (priority habitat) and cutthroat trout (*Onchorhynchus clarkii*)—a priority species—as occurring in Twin Ponds Park. Both documented PHS types are associated with the streams and wetlands on site, and are addressed below.

### ***Commercial and Recreational Shellfish Areas***

No commercial or recreational shellfish areas are associated with Twin Ponds Park.

### ***Wetlands***

Otak identified two wetlands on the Twin Ponds site—a 4.85 acre wetland that included both ponds and surrounding wetlands and a 0.215 acre wetland associated with a stream (Meridian Creek, detailed below). TES delineated three wetlands, and included all three wetlands within the 4.85 acre wetland identified by Otak.

Table 1 lists the wetlands, wetland classification, size, and buffers for the project wetlands. Both the Otak report and TES report were largely in agreement concerning wetland characterization, vegetation, soils, hydrology, and ratings and buffers.

Information on hydrology, soils, vegetation, and wetland classification and wetland buffers follows, based on requirements from the City of Shoreline Critical Areas Ordinance, updated on December 7, 2015.



**City of Shoreline Planning Commission**  
Twin Ponds Park Soccer Field Replacement Memo

Page 5  
March 17, 2017

Notes:

- A. Based on the Otak (January 29, 2016) *Paramount Open Space and twin Ponds Park Area Wetlands and Streams Assessment*.
- B. Based on TES (July 29, 2016) *Wetland Delineation Report Twin Ponds Park*.
- C. Cowardin et al. (1979) or National Wetland Inventory (NWI). Class based on vegetation: PFO = Palustrine Forested; PSS = Palustrine Scrub-Shrub; PEM = Palustrine Emergent; OW = Open Water; PUB = Palustrine Unconsolidated Bottom.
- D. Hydrogeomorphic (HGM) classification according to Brinson (1993).
- E. Wetland rating according to the Shoreline Municipal Code, Chapter 20.80.330 (City of Shoreline, 2016) and based on the Washington State Department of Ecology *Washington State Wetland Rating System for Western Washington 2014 Update* (Hruby, 2014).
- F. Wetlands sizes measured only within Study Area. ">" indicates that the wetland extends outside of Study Area.
- G. Based on the Washington State Department of Ecology *Washington State Wetland Rating System for Western Washington 2014 Update*
- H. Wetland buffer width according to the Shoreline Municipal Code, 20.80.330 (City of Shoreline, 2017) and habitat scores for the wetlands.

**Hydrology**

The Twin Ponds Park wetlands display hydrologic regimes that are largely supported by groundwater, although stream systems are associated with the wetlands and in close proximity to them. Most of the wetlands have a depressional component, and water in the various wetlands may pond either permanently or seasonally. Large portions of the Twin Ponds Park wetlands are permanently ponded and have an open water component. The riverine wetlands displayed evidence of either groundwater expression or also showed evidence of ponding and/or overbank inundation.

All of the wetlands showed high groundwater levels during the reconnaissance work, and soils were saturated to the surface. Many areas of the wetlands showed surface water at depths ranging from less than one inch to several feet in the Twin Ponds Parks wetlands. All wetlands in the Twin Ponds Park areas showed one or more primary wetland hydrology indicators, thus meeting the criterion for wetland hydrology.

**Soils**

Soils in the Twin Ponds Park wetlands display dark soils, with low values (typically values of 2, occasionally 3), and low chroma (typically 1, occasionally 2). Most of the sampled wetland soils had distinct hydrogen sulfide odors, and many of the soils had organic components such as decaying vegetative detritus. Although loamy soils were the dominant wetland soil type, significant components of clay and silt were often present as well. All wetlands in the Twin Ponds Park areas showed one or more primary wetland hydric soil indicators, thus meeting the criterion for wetland soils.

Soils in the Twin Ponds Park are generally derived from Vashon till. Dominant parent soils are mostly Everett gravelly loam soils, although the Twin Pond Park also contains peat soils, as well (TetraTech/KCM, 2004).

### **Vegetation**

Wetland plant communities at the the Twin Ponds Park sites were mainly forested communities, with some emergent and scrub/shrub communities either interspersed within the wetland matrix or occurring beneath the forested canopy. Typically, red alder (*Alnus rubra*) was the dominant tree species in the forested wetland communities, with species such as black cottonwood (*Populus trichocarpa*) and western red cedar (*Thuja plicata*) occurring occasionally in and along the edges of the wetlands. Salmonberry (*Rubus spectabilis*) was the dominant shrub species, although willow species (*Salix* spp) occurred in small patches and/or locally dense thickets. Other, less common wetland shrub species included red osier dogwood (*Cornus sericea*) and beaked hazelnut (*Corylus cornuta*). Common herbaceous wetland species at the Twin Ponds sites included creeping buttercup (*Ranunculus repens*), lady fern (*Athyrium filix-feminina*), horsetail (*Equisetum* spp), false lily-of-the-valley (*Maianthemum dilatatum*), western skunk cabbage (*Lysichiton americanus*), and invasive species such as reed canary grass (*Phalaris arundinacea*) and bittersweet nightshade (*Solanum dulcamera*). More aquatic-adapted plants such as water parsley (*Oenanthe sarmentosa*), hardstem bulrush (*Scirpus acutus*), pondweed species (*Potamogeton* spp), and the invasive yellow flag iris (*Iris pseudacorus*) were associated with the open water areas.

Tree species surrounding the wetlands and associated with upland habitat included western hemlock (*Tsuga heterophylla*), big-leaf maple (*Acer macrophyllum*), and Douglas fir (*Pseudotsuga menziesii*). Common upland shrub species included common snowberry (*Symphiocarpus albus*), dull Oregon grape (*Mahonia nervosa*), vine maple (*Acer circinatum*), and osoberry (*Oemleria cerasiformis*). Common herbaceous species associated with upland conditions include sword fern (*Polystichum munitum*) and wood sorrel (*Oxalis oregana*), as well as non-native herbaceous species such as herb-Robert (*Geranium robertum*). Invasive non-native species were also present, and included Himalayan blackberry (*Rubus armeniacus*), reed canary grass, English ivy (*Hedera helix*), English holly (*Ilex aquifolium*), and cherry laurel (*Prunus laurocerasus*). Twin Ponds Park, however, showed a high species richness of both native shrub and herbaceous species during the site visit.

*City of Shoreline Wetland Classifications and Buffers:* The City of Shoreline has recently updated its wetland rating classification system, per SMC 20.80.320. Wetlands are classified as Type I through Type IV wetlands, based on the following criteria excerpted from the SMC.

**City of Shoreline Planning Commission**  
Twin Ponds Park Soccer Field Replacement Memo

Page 7  
March 17, 2017

1. *Category I. Category I wetlands are those that represent unique or rare wetland types, are more sensitive to disturbance than most wetlands, are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions. The following types of wetlands are Category I:*
  - a. *Relatively undisturbed estuarine wetlands larger than one acre;*
  - b. *Wetlands of high conservation value that are identified by scientists of the Washington Natural Heritage Program/DNR;*
  - c. *Bogs;*
  - d. *Mature and old-growth forested wetlands larger than one acre;*
  - e. *Wetlands in coastal lagoons; and*
  - f. *Wetlands that perform many functions well (scoring 23 points or more based on functions).*
  
2. *Category II. Category II wetlands are those that are difficult, though not impossible to replace and provide high levels of some functions. The following types of wetlands are Category II:*
  - a. *Estuarine wetlands smaller than one acre, or disturbed estuarine wetlands larger than one acre;*
  - b. *Interdunal wetlands larger than one acre or those found in a mosaic of wetlands; and*
  - c. *Wetlands with a moderately high level of functions (scoring between 20 and 22 points)*
  
3. *Category III. Category III wetlands are those with a moderate level of functions, generally have been disturbed in some ways, can often be adequately replaced with a well-planned mitigation project, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands. The following types of wetlands are Category III:*
  - a. *Wetlands with a moderate level of functions (scoring between 16 and 19 points); or*
  - b. *Interdunal wetlands between 0.1 and one acre.*
  
4. *Category IV. Category IV wetlands are those with the lowest levels of functions (scoring below 16 points) and are often heavily disturbed. These are wetlands that should be able to replace, or in some cases to improve. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and also need to be protected.*

Most of the wetlands on the Twin Ponds Park sites are less than one-half acre in size, contain a forested wetland class, and score between 18 and 19 points per Washington State Department



of Ecology (Ecology) wetland functions rating system. These wetlands are categorized as Category III wetlands per the SMC. Per SMC 20.80.330, wetland buffers are based on wetland categories and on habitat scores and associated functions—both higher wetland categories and higher habitat scores are reflected in a greater assigned buffer width. All of the wetlands at the Twin Ponds Park sites have habitat scores of either 5 or 6 points, and buffer widths are, respectively, either 105 feet or 165 feet.

Per SMC 20.80.090, in all cases the standard buffer shall apply unless the Director determines that additional buffer width is necessary or reduced buffer is sufficient to protect the functions and values consistent with the provisions of this chapter and the recommendations of a qualified professional.

**Streams**

A total of two stream reaches were identified in the Twin Ponds Park area. Table 2 lists the streams, stream classification, and buffers for the streams on the sites. Additional information on stream characterization follows.

**Table 2—Stream Locations, Classifications, and Buffers**

Stream	Cross-Referenced Stream Reach Designation <sup>I</sup>	Location	Stream Typing		Standard Buffer Width (feet) <sup>M</sup>
			DNR <sup>J</sup>	City of Shoreline	
Thornton Creek	TC3 & TC7	Twin Ponds Park	Np/ <sup>L</sup>	F, non-anadromous	75 ft.
Meridian Creek	TC4	Twin Ponds Park	NA <sup>K</sup>	F, non-anadromous	75 ft.

Notes:

- I. Cross-references based on wetland identification conventions established in the *Thornton Creek and West Lake Washington Basins Characterization Report* (TetraTech/KCM, 2004)
- J. Stream typing based on Washington Department of Natural Resources (DNR). Type Ns: non fish-bearing seasonal stream; Type Np: non fish-bearing perennial stream; Type F: fish bearing stream; Type S: Shoreline of the State.
- K. Not Available—stream is not mapped by DNR.
- L. Thornton Creek is rated as Type N downstream of the ponds, Type F within the ponds themselves.
- M. Stream rating according to the Shoreline Municipal Code, Chapter 20.80.270 (City of Shoreline, 2016). Little Creek Tributaries 2A, 3A, and 4A may be provisionally rated as Ns with 45 foot buffers, or as stormwater ditches with no buffers.

### **Stream Characteristics**

All of the streams in the Twin Ponds Park sites belong to the broader Thornton Creek drainage.

*Thornton Creek and Meridian Creek at Twin Ponds Park:* At the Twin Ponds Park site, Thornton Creek drains approximately 1,300 acres of largely residential land in the City of Shoreline. Thornton Park. Thornton Creek then passes into the south pond prior to flowing through Peverly Pond and into a long culvert beneath I-5. Representative bankful width and bankful depth measurements taken for Thornton Creek were approximately 22 feet and 2 feet, respectively, taken at two locations downstream of the southern pond, and 8-10 feet and 2-3 feet, respectively, taken upstream of the northern pond. Riffles and glides were the dominant habitat units, and pool habitat was relatively scarce. Stream substrate consisted of stream gravels and fines, and embeddedness was high. Riparian vegetation is considered moderately disturbed due to the density of non-native invasives such as Himalayan blackberry, Japanese/giant knotweed (*Polygonum cuspidatum/sachalinenses*), and field bindweed (*Convolvulus arvensis*), the nearby presence of human activities and land use, and the relatively young age of the tree canopy. Large woody debris associated with the system was scarce and tended to consist of smaller pieces that provide lower in-stream habitat complexity and function.

Meridian Creek flows into the Twin Ponds Park site from the west. Meridian Creek, also known as Evergreen Creek, is a poorly channelized system that is associated with a riparian wetland (Wetland J). Meridian Creek is likely an intermittent system, given that previous studies had indicated that the system dries up at times (TetraTech/KCM, 2004). Dominant substrate consisted of fines, particularly upstream of the point where the Meridian Creek system discharges into the southern pond. Bankful width and depth were estimated at 9-12 feet and 2-2.5 feet, respectively, at points in the system where channelization was more pronounced. Similar to Thornton Creek, riparian vegetation is moderately disturbed due to the presence of invasives, proximal land use and activities, and relatively young age of the canopy. Creek flows into Twin Ponds Park from the north, passing through a residential neighborhood in a system of open channels, ditches, and pipes before discharging into the north pond in Twin Ponds Park.

### **Fisheries**

A number of observations indicate that Thornton Creek in the vicinity of the Twin Ponds Park site contains salmonid species—primarily resident cutthroat trout (WDFW, 2017b; TetraTech/KCM, 2004). Although there is some anecdotal evidence that coho juveniles have

been observed in Thornton Creek in the vicinity of Twin Ponds Park, this has been attributed to release of juveniles into the system through elementary school programs—downstream culverts associated with I-5 are considered a complete fish passage barrier to anadromous salmonids. Meridian Creek is linked to the Thornton Creek and Twin Ponds system via a surface water connection during at least a portion of the year, with no fish passage barrier interposed between the two streams. Meridian Creek is also considered to provide habitat for cutthroat trout during a portion of the year. The Thornton Creek Watershed Plan concludes that resident (non-anadromous) salmonid use of the system from the mouth of Meridian Creek upstream for 200-250 feet is a reasonable presumption (R. W. Beck, 2009).

### **City of Shoreline Stream Classifications and Buffers**

The City of Shoreline has its own stream classification system, per SMC 20.80.270 for classification of Fish and Wildlife Habitat Conservation Areas—specifically, Waters of the State. Streams are classified based on the following criteria excerpted from the SMC.

#### *Waters of the State.*

*Waters of the state include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington, as classified in WAC 222-16-030.3. Streams and wetlands and their associated buffers that provide significant habitat for fish and wildlife are those areas where surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or surface water runoff devices or other entirely artificial watercourses, unless they are used by fish or are used to convey streams naturally occurring prior to construction. A channel or bed need not contain water year-round; provided that there is evidence of at least intermittent flow during years of normal rainfall.*

*Streams shall be classified in accordance with the Washington Department of Natural Resources water typing system (WAC 222-16-030) hereby adopted in its entirety by reference and summarized as follows:*

- a. Type S: streams inventoried as “shorelines of the state” under Chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW;*
- b. Type F: streams which contain fish habitat. Not all streams that are known to exist with fish habitat support anadromous fish populations, or have the potential for anadromous fish occurrence because of obstructions, blockages or access restrictions resulting from existing conditions. Therefore, in order to provide special consideration of and increased protection for anadromous fish in the application of development standards, Shoreline streams shall be further classified as follows:*
  - i. Anadromous fishbearing streams (Type F-anadromous). These streams include:*

1. *Fish bearing streams where naturally recurring use by anadromous fish populations has been documented by a government agency;*
2. *Streams that are fish passable or have the potential to be fish passable by anadromous populations, including those from Lake Washington or Puget Sound, as determined by a qualified professional based on review of stream flow, gradient and natural barriers (i.e. natural features that exceed jumping height for salmonids), and criteria for fish passability established by the Washington Department of Fish and Wildlife; and*
3. *Streams that are planned for restoration in a six-year capital improvement plan adopted by a government agency or planned for removal of the private dams that will result in a fish passable connection to Lake Washington or Puget Sound; and*

*ii. Non-anadromous fishbearing streams (Type F-non-anadromous). These include streams which contain existing or potential fish habitat, but do not have the potential for anadromous fish use due to natural barriers to fish passage, including streams that contain resident or isolated fish populations. The general areas and stream reaches with access for anadromous fish are indicated in the City of Shoreline Stream and Wetland Inventory and Assessment (2004) and basin plans. The potential for anadromous fish access shall be confirmed in the field by a qualified professional as part of a critical area report.;*

*c. Type Np: perennial nonfish habitat streams;*

*d. Type Ns: seasonal nonfish habitat streams; and*

*e. Piped stream segments: those segments of streams, regardless of their type, that are fully enclosed in an underground pipe or culvert. (Ord. 398 § 1, 2006; Ord. 238 Ch. VIII § 4(B), 2000)*

Thornton Creek and Meridian Creek are categorized as Type F, non-anadromous streams, based on the documented presence of cutthroat trout and other fish in Thornton Creek and the Twin Ponds, the surface water connection and potential for use of the Meridian Creek system by cutthroat trout and other fish during some portion of the year, and the existing complete lack of accessibility to anadromous species.

## **Potential Project Effects**

Potential project impacts to fish and wildlife conservation areas—specifically the Twin Ponds Park streams and wetlands—may be categorized as direct impacts associated with the construction required to replace the existing soccer field, and indirect impacts associated with operation of the new artificial turf soccer field.

## **Potential Direct Impacts**

During construction, potential direct impacts to fish and wildlife conservation areas in the vicinity are anticipated to be limited to possible noise disturbances associated with operation of heavy equipment, and the possibility of sediment or possible fuel spills to be mobilized into the aquatic environment of the site. Potential noise impacts will be limited to daytime construction hours, and will not extend into the evening hours, and will occur outside of streams and wetlands. Significant adverse impacts to the fish and wildlife conservation areas associated with noise are not anticipated to occur due to daytime construction.

Best Management Practices (BMPs) to avoid/minimize sediment mobilization (e.g. silt fences, straw bales, etc.) and to avoid/manage potential fuel spills (e.g. Stormwater Pollution Prevention Plan, etc.) will be put into place during construction. Significant adverse impacts to the fish and wildlife conservation areas associated with potential release of sediment or other contaminants are not anticipated to occur due construction.

## **Potential Indirect Impacts**

Potential indirect impacts are associated with ongoing operation of the proposed soccer field, and the athletic activities that take place on the field over time. Three potential impacts that may be associated with a lighted artificial turf athletic field are evaluated below: noise, light, and water quality.

### **Noise**

Under existing conditions, the lighted artificial turf soccer field is used for formally scheduled games and for more informal, unscheduled games and general usage. Increases in field usage are not expected to occur as a result of the project, and no changes in ambient noise levels are anticipated to occur subsequent to the replacement of the field. Noise levels on the field that may be conducted into the nearby FWHCAs are not expected to increase. No adverse impacts to FWHCAs due to increases in noise levels above those that currently pertain will occur as a result of the project.

### **Light**

There is an existing lighting system that can provide illumination during nighttime games. The proposed lighting system will entail installation of new shielded floodlights, galvanized steel poles, conduit, wiring and electrical pedestals should be installed. Recommended lighting levels are at a Class III per IES recommendations at an average maintained level of 30.0 foot candles – LED lights designed and located to reduce off site impacts as much as possible.

Under existing conditions, three unshielded lights are located on the west side of the field and one light is located on the south side of the field. The three lights on the west side of the field will be replaced with two shielded lights designed to generate less light spill into the Twin Ponds wetland areas. The existing light on the south side of the field near Thornton Creek will be removed and not replaced. The other four shielded lights will be located on the east side of the field adjacent to the 1<sup>st</sup> Ave. NE roadway. Less light spill into nearby FWHCAs will occur under proposed conditions compared to existing conditions, and adverse impacts to FWHCAs due to lighting are not anticipated to occur due to the proposed project.

### **Water Quality**

The new athletic field is proposed to have a styrene butadiene rubber (SBR) infill material to provide cushioning during play and field surface resiliency. Currently, precipitation falling onto the existing field either infiltrates into the subsurface soil layer, or percolates through an underdrain of crushed rock, and discharges into Thornton Creek to the south through a six-inch pipe. Drainage conditions and discharge for the proposed new field will be identical to existing conditions.

SBR is a synthetic rubber compound that is commonly used in vehicle tires, due in part to its resistance to abrasion and tendency to display fairly stable physical properties. Some concerns regarding the use of SBR include potential impacts to human health as a result of playing on the fields, as well as impacts to the aquatic environment as a result of runoff from precipitation interacting with the components of artificial turf and discharging into receiving water bodies. The mobilization of zinc from artificial turf infill has been implicated as the primary potential contaminant of concern for aquatic habitat.

Concerns regarding potential leaching of SBR infill into water percolating through such material have been raised in the past, and studies have offered mixed results concerning leaching of pollutants: some evidence exists that leaching does not occur, or occurs at negligible levels (i.e. well below background pollutant levels), while others conclude that aromatic polycyclic hydrocarbons (PAHs) and zinc leaching may reach significant levels. No known water quality issues are associated with water moving over the inert fibers of new athletic fields, although some concerns about lead had been raised in the past with older field fiber.

Liu *et al.* (1998) presented a review of studies conducted to assess the potential for leaching of metal and organic pollutants into water moving through rubber fill associated with a variety of different civil engineering projects. Generally, all of the pollutants of concern occurred at levels below drinking water regulatory standards as water moved through the rubber fill. Although

instances of pollutant loading were seen, these all occurred under conditions of extreme pH levels (metals leached under very acidic conditions, organics leached under very basic conditions).

Kallqvist (2005), the Norwegian Building Research Institute (2004), and Keml (2006) have all published papers examining contamination of water from synthetic turf fields. The rubber in-fill used in these fields was derived from recycled vehicle tires. The investigators tested for a wide variety of contaminants in water exposed to the rubber in-fill, including heavy metals, polychlorinated biphenyls (PCBs), PAHs, phenols, and phthalates. Results indicated that zinc and certain PAHs and other organics leached into water percolating through the rubber in-fill. The amounts of zinc leaching exceeded the Norwegian Pollution Control Authority's Quality Class V (very strongly polluted) standards (NBRI, 2004). PAHs leaching into water percolating through the in-fill exceeded Canadian Environmental Guidelines for freshwater life, and included high levels of anthracene, fluoroanthene, pyrene, and nonylphenols (NBRI, 2004). Keml (2006) studies indicated that zinc leachate from water percolating through rubber in-fill exceeded the Canadian zinc criteria for surface water. Kallqvist (2005) concludes that zinc leaching into water exposed to rubber in-fill from artificial turf fields poses the greatest environmental risk for metal contaminants, and that 4-t-octylphenol is the compound which poses the greatest environmental risk for organic compounds. All three studies were consistent in their conclusions that zinc leaching into water exposed to rubber in-fill derived from recycled tires represented the greatest risk of environmental contamination—although these studies typically utilized laboratory conditions of prolonged exposure of water to the infill material and were not necessarily representative of conditions to be expected in the field.

Other work by Verschoor (2007) indicated that zinc release from infill rainfall may increase over time, and can potentially damage aquatic biota. The Connecticut Department of Environmental Protection (2010) concluded that the only potential risk to surface waters identified in the stormwater collected from the artificial turf fields is zinc, since it was the only chemical parameter that was detected above the acute aquatic life criterion of 120 ug/l—and was associated with acute aquatic toxicity (<90% survival) to aquatic model organisms (Daphnia and fathead minnow).

Additional studies indicate that water moving through artificial turf infill may not constitute a significant threat to aquatic life. Milone and MacBroome (2008) conducted field studies and detected zinc in the stormwater from four of their six sampling dates, with a maximum concentration of 31 ug/l, which was below acute aquatic toxicity criterion of 120 ug/l (EPA) and 65 ug/l (State of Connecticut). The New York Department of Environmental Conservation (2009) conducted investigations that concluded that zinc may impact aquatic life if infill is derived entirely from truck tires. However, mixed tires (cars, trucks, other vehicles) showed no significant adverse impacts to aquatic life. Cheng and Rheinhard (2010) concluded that

rainwater percolating through artificial turf infill could absorb relatively large quantities of zinc, but that adsorption of zinc to the underlying rock drainage sub-field layer resulted in much less zinc in the water that would eventually be expected to discharge to a receiving water body. Johns and Goodlin (2008) reviewed a number of studies associated with water quality of precipitation percolating through artificial turf athletic fields, and concluded that the amount of zinc that would leach into stormwater under field conditions would be of little environmental relevance.

Based on available data and analyses, it appears unlikely that stormwater falling onto the proposed new field would accumulate potential contaminants of concern. Residence time of stormwater moving through the infill layer of the new field will be quite short under the majority of precipitation events, and the longer exposure times of water and infill associated with the laboratory studies previously cited will not occur. Zinc appears to be the primary potential contaminant of concern; other compounds/potential contaminants appear to have a very small likelihood of being mobilized as stormwater moves through the artificial turf and underlying strata.

Based on expected conditions during rain events, small amounts of zinc may be leached into stormwater percolating through the artificial turf. However, adsorption of zinc to the underdrain rock and/or the surrounding soils is anticipated to remove most of the zinc that might leach into stormwater infiltrating into the proposed athletic field. Adverse impacts to water quality and impacts to aquatic habitat and associated FWHCAs are not anticipated to occur as a result of the proposed project.

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**City of Shoreline Planning Commission**  
Twin Ponds Park Soccer Field Replacement Memo

Page 16  
March 17, 2017

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**City of Shoreline Planning Commission**  
Twin Ponds Park Soccer Field Replacement Memo

Page 17  
March 17, 2017

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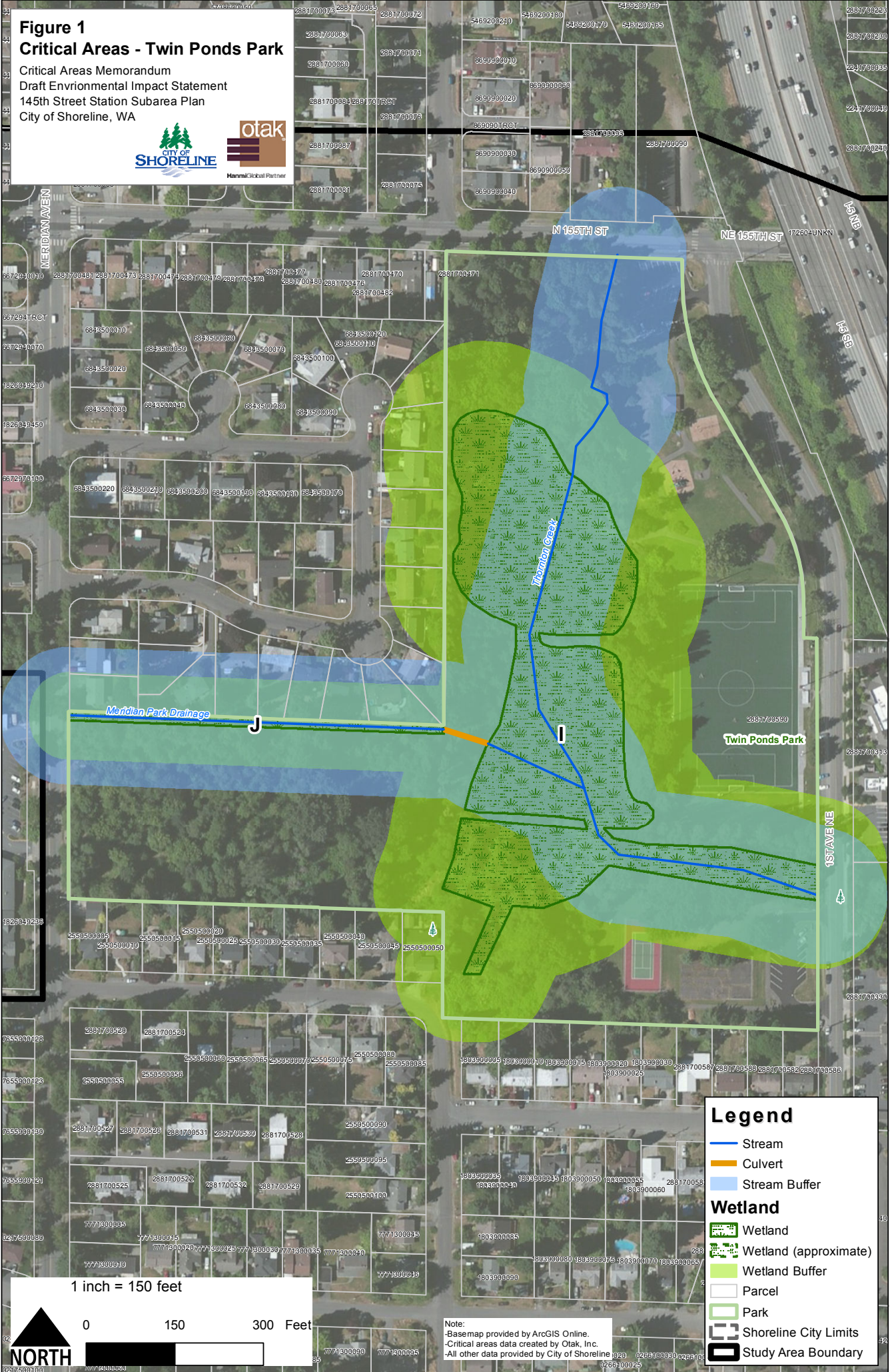
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# Figure 1 Critical Areas - Twin Ponds Park

Critical Areas Memorandum  
Draft Environmental Impact Statement  
145th Street Station Subarea Plan  
City of Shoreline, WA



**Legend**

- Stream
- Culvert
- Stream Buffer

**Wetland**

- Wetland
- Wetland (approximate)
- Wetland Buffer
- Parcel
- Park
- Shoreline City Limits
- Study Area Boundary

1 inch = 150 feet

**NORTH**

0      150      300 Feet

Note:  
-Basemap provided by ArcGIS Online.  
-Critical areas data created by Otak, Inc.  
-All other data provided by City of Shoreline



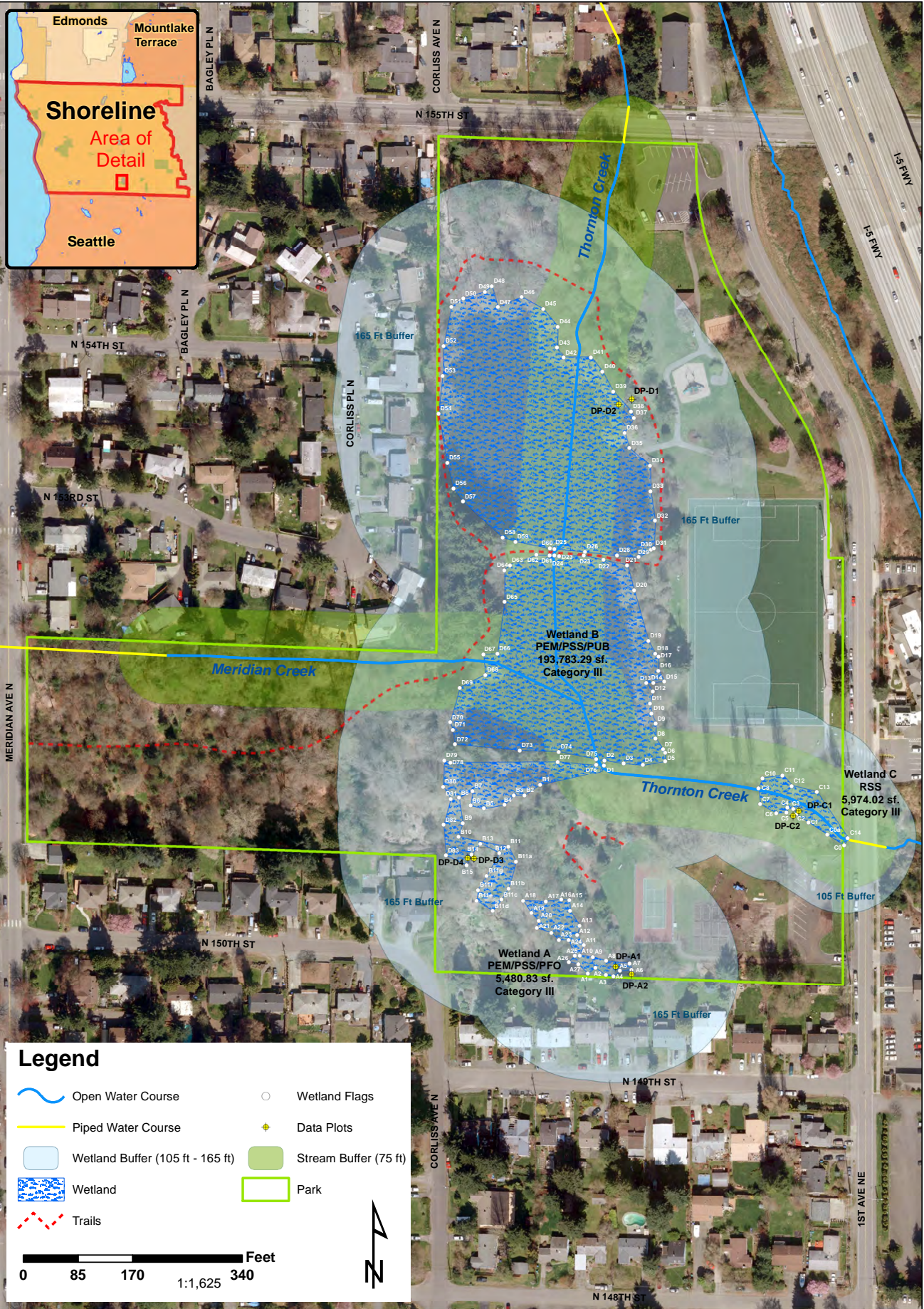
# Twin Ponds Park - Overview

## Wetland and Buffer Locations

Figure 2



07/14/16 © EarthCorps





## Memorandum

**DATE:** April 27, 2017

**TO:** Parks, Recreation and Cultural Services/Tree Board

**FROM:** Maureen Colaizzi, Park Project Coordinator  
Eric Friedli, PRCS Director

**RE:** Parks, Recreation and Open Space Plan Distribution

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### **Requested Board Action**

No action is requested at this time.

### **Project or Policy Description and Background**

The development of the Parks, Recreation and Open Space Plan 2017-2023 (PROS Plan) began in January, 2016 with a survey of households in Shoreline. The PRCS/Tree Board has been closely involved through the 16-month process by commenting and reviewing on various components of the Plan. The final result is a plan for the future of parks, recreation, open space and culture services for Shoreline based on the theme of Securing our Foundation and Shaping our Future.

The community input and PRCS/Board review and comments have been incorporated into a Draft Plan that will be distributed to the Board on April 27<sup>th</sup> for final review and comments.

We will discuss timing and format for comments and next steps.

### **Anticipated Schedule**

April 27: Distribution of Draft Plan  
May 18: Comments and discussion on Draft Plan  
June 12: Draft Plan presented to City Council  
June 22: Final PRCS/Tree Board review and recommendation of PROS Plan  
July 17: PROS Plan presentation to City Council and Public Hearing  
July 24: City Council action on PROS Plan

### **Additional Information**

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