PUBLIC WORKS COMMITTEE
AGENDA

Online via Zoom

Thursday, March 17, 2022
8:00 AM

1. Call to Order
2. Roll Call
3. Approval of Minutes: Public Works Committee, February 17, 2022
4. 2022 Pedestrian Improvements (Mary Heather Ames)
5. Barnes Lake Management District (LMD) Annual Work Plan, Operating Budget, and 2022-2035 Assessment Increase (Dan Smith)
6. Additional Items
7. Adjourn

Remote Meeting Information
To comply with Governor Inslee's Proclamation 20-28, the City of Tumwater meetings will be conducted remotely, not in-person, using a web-based platform. The public will have telephone and online access to all meetings.

Watch Online
https://us02web.zoom.us/j/84985062919?pwd=dEVyb25tcE40dnJGM0RSbEhpTnY0UT09

Listen by Telephone
Call (253) 215-8782, listen for the prompts and enter the Webinar ID 849 8506 2919 and Passcode 068046.

Post Meeting
Audio of the meeting will be recorded and later available by request, please email CityClerk@ci.tumwater.wa.us

Accommodations
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TUMWATER PUBLIC WORKS COMMITTEE
MINUTES OF VIRTUAL MEETING
February 17, 2022 Page 1

CONVENE: 8:00 a.m.

PRESENT: Chair Eileen Swarthout and Councilmember Charlie Schneider.

Excused: Councilmember Michael Althauser.

Staff: City Administrator John Doan, Water Resources and Sustainability Director Dan Smith, Transportation and Engineering Director Brandon Hicks, City Attorney Karen Kirkpatrick, Transportation Manager Mary Heather Ames, Capital Projects Manager Don Carney, and Administrative Assistant Cathy Nielsen.

THIRD AMENDMENT TO SERVICE PROVIDER AGREEMENT FOR CITY OF TUMWATER MAINTENANCE & OPERATIONS FACILITY:

Manager Carney reported in 2014, the City acquired property at 79th Avenue and Trails End Drive (former Trails End Arena) for a future Public Works Operations and Maintenance Facility. In 2016, the City entered into a Service Provider Agreement with TCF Architecture for development of a Master Plan for the site and a pre-design for $152,052. Since then, two amendments have been executed extending the agreement. The third amendment increases the contract by $9,980 and extends the term to December 2022. Staff presented a financial plan for design and construction of the facilities at the December 9, 2021 City Council worksession. The Council asked staff to re-engage with the community given significant time has passed since the original efforts. The proposed third amendment provides for additional work, 3-D renderings of buildings, modeling of vehicular maneuvers within the site, and preparation of exhibits for follow-up discussion and engagement.

Staff requests the Public Works Committee recommend the City Council approve and authorize the Mayor to sign the third amendment to the Service Provider Agreement with TCF Architecture extending the term of the agreement to December 31, 2022, and increasing the not-to-exceed contract amount to $162,042.69.

Councilmember Schneider asked about the timing for community outreach. Manager Carney said community outreach has not been scheduled pending additional work with the consultant to finalize plans prior to presenting information to the community. It is likely, staff will meet with the consultants in late March/early April with the committee receiving a presentation before proceeding further.

Councilmember Schneider mentioned previous plans to include natural gas in the buildings. He urged staff to avoid using natural gas and asked whether staff investigated the additional costs of using natural gas. Manager Carney said he would need to follow-up with staff on the status of cost estimates.

Manager Ames noted that staff is exploring ways to avoid using natural gas in new facilities.

Chair Swarthout conveyed appreciation for those efforts, as the City of Olympia is considering ways to electrify all new construction of city buildings. It would be wise for the City of Tumwater to explore similar options.

Chair Swarthout suggested timing the public meeting/outreach when the 3-D renderings become available. Manager Carney noted that the 3-D renderings only depict one large site with buildings rather than a 3-D rendering of structures or a rendering at a street level view. Chair Swarthout commented on the difficulty of ascertaining the amount of a space a building consumes on a property, as there were some concerns about the proximity of the buildings to adjacent neighborhoods. She would like the ability to conceptualize the size of the buildings and the space consumed on the site. Manager Carney affirmed he would follow up on the request with the consultant team to determine what could be provided.

Councilmember Schneider asked about the ability for the facility and the site to accommodate growth in the City. Manager Carney replied that the site includes more parking than vehicles at this time enabling additional vehicles. The community meeting area enables future expansion of the building.

CONSENSUS: **The Public Works Committee recommended the City Council approve and authorize the Mayor to sign the third amendment to the Service Provider Agreement with TCF Architecture extending the term of the agreement to December 31, 2022, and increasing the not-to-exceed contract amount to $162,042.69.**

GREER ENVIRONMENTAL CONSULTING SERVICE PROVIDER AGREEMENT:

Director Smith reported the proposed contract would provide project management services in support of nine projects within the Storm and Sanitary Sewer Utilities. Overall the services would vary by project but generally include overall project management and reporting on the progress of the projects. Services would include permitting, grant management, consultant and construction coordination and oversight for projects, and any Council updates on projects.

Director Smith reviewed the timing, location, grant funding allocated to each project, and the project scope of the nine projects followed each by the estimated project management cost and the estimated total project cost, respectively:

Project 1 - Percival Creek Fish Passage Barrier Removal ($38,925.00 & $1,178,925.00) The barrier was identified by the Washington Department of Fish and Wildlife (WDFW) in 2015 as a full barrier due to slope. This project has been a priority for the City of Tumwater for many years and has been identified on the Capital Improvements Project list for the last 15 years. Staff applied for an $850,000 grant with the City prequalifying for some of

the work to complete 60% design to resubmit an application for the grant.

Project 2 - Pioneer Park Riparian Restoration ($31,020.00) ($476,800.79) The project goal is to reduce fine sediment loading and improve riparian cover along a 400-foot section of Deschutes River. The site has been identified as one of the top ten fine sediment-loading areas in Thurston County. In addition, the site was called out specifically in the Deschutes River TMDL as needing a 48% reduction in fine sediment and a 50% increase in shade cover.

Chair Swarthout asked whether the construction cost is factored in the final cost. Director Smith said the consultant will need to resurvey the area and develop a best practices proposal for sediment and erosion control. The current image is a draft of one of the alternatives designed under an earlier component of the project. The consultant will be required to redo the work to determine the best design for the City's approval to initiate construction likely next year dependent upon approval by the Department of Ecology.

Project 3 - East Linwood Basin Retrofit ($32,470.00) ($202,190.00 (does not include construction costs)) The East Linwood Basin Retrofit project would provide stormwater treatment and flow reductions to the 81.5-acre basin currently discharging untreated stormwater into the Deschutes River. The Department of Ecology requested completion of another alternatives analysis. Dependent upon the outcome, the Department of Ecology would fund the construction of the alternative or the City would need to consider other funding options to construct the alternative.

Project 4 - Thurston County Equity Index and REEP Audience Analysis ($18,700.00) ($30,748.53) The planning projects would create a GIS tool for the City (Equity Tool) and identify areas of the City that may be over or under-served (REEP).

Chair Swarthout asked whether the City is sharing the cost of the contract with the City of Olympia and Thurston County for the Equity Tool. Director Smith affirmed the costs are shared between the jurisdictions. He offered to forward information on the cost of the Action Mapping project for the Equity Index.

Project 5 - Septic to Sewer Program with Velkommen Mobile Home Park ($48,110.00) ($1,047,964.78) The project is a septic to sewer analysis. The City received a $500,000 grant from the Department of Ecology to identify barriers and benefits for conversion of septic to sewer for 39 residential units within the mobile home park. The project would identify the infrastructure required and some of the costs and affects on the residents by converting to sewer. Following completion of the first phase of the project, the City and the Velkommen Mobile Home Park would work together to construct connections if the identified hurdles can be overcome.

Chair Swarthout cited some costs associated with Social Marketing Campaign/Blueprint Creation, design, and construction and asked how the costs are allocated. Director Smith advised that the costs associated with construction are for construction; however, the City would not be funding full construction costs, as grant funds would be included as well as private funds. Construction costs will be defined after identifying the full cost of conversions as the costs are based on estimates at this point. The costs associated with the social marketing campaign also include working with the property owners to determine motivation or reasons for conversion to sewer. The capital program for the utility also includes funding earmarked for septic to sewer conversions.

Project 6 - Stormwater Management Action Planning for Three Priority Subbasins ($28,475.00) ($227,840.63) The project would assist Tumwater in meeting its NPDES permit compliance while aligning stormwater projects, programs, and policies. The 2019 issuance of the Department of Ecology's NPDES permit included a requirement for all Phase II jurisdictions to complete a Stormwater Management Action Plan (SMAP) for the highest priority subbasin as ranked by each jurisdiction.

Project 7 - Tumwater Valley Regional Golf Course Parking Lot Stormwater Retrofit ($23,460.00) ($128,355.55) The project was identified as one of the conditions for the Tumwater Valley Regional Golf Course to receive Salmon Safe certification.

Chair Swarthout asked whether the project would be considered prior to improving the parking lot. Director Smith affirmed both projects would be coordinated jointly.

Project 8 - Deschutes River Flood Reduction and Erosion Study ($18,020.00) ($83,020.00) The study is to develop solutions to flooding and erosion along the lower Deschutes River between Brewery Park at Tumwater Falls and Henderson Boulevard. The two efforts along the Deschutes River are complementary but are not addressing the same issues. The Pioneer Park project is stream bank riparian restoration and erosion control while the flood reduction and erosion study examines the area as a whole as it floods annually. The study will identify potential ways to reduce erosion and preserve water quality.

Project 9 - Tumwater Valley Regional Stormwater Facility ($45,170.00) ($2,240,170.00 Total Contract Cost Not to Exceed $284,350.00) The project has been in place for many years with stalls occurring in 2019 and 2020 with the property owner to coordinate a mitigation project as the facility would impact wetlands that requires mitigation by the City. The next phase would re-identify or reevaluate the alternatives identified many years ago. The next step is identifying new mitigation sites and funding options

for grant applications.

The committee and staff discussed costs associated with septic to sewer conversion, options for property owners to form a local improvement district to fund the conversions, and how mobile home unit owners do not own the underlying property, which speaks to the process identifying the barriers and the best mechanisms to fund the conversions. The cost analysis for conversion would not bind mobile home owners to convert, as well as any commitment by the City to fund the conversion. The project identifies barriers to conversion and ways to overcome the barriers. The outcome of the project does not require either the mobile home park or the City to move forward with conversion.

Director Smith described the reasons for contracting with Greer Environmental Consulting. As the City recovers from the pandemic and returns to a normal work environment temporary teleworking will need to be reconsidered for management of the projects. During the department reorganization, the Water Resources Division lost some project management capacity. During that time, Meridith Greer was able to assume project management and work on many of the projects. As the owner of Green Environmental Consulting, Ms. Greer has worked for the City for three years and was responsible of developing and seeking funding sources for most of the nine projects. Mr. Greer is capable of acting as an extension of staff as the department has limited project management capacity. Mr. Greer has the critical background for the projects with no anticipation of project delays because of her familiarity with the projects avoiding the risk of losing grant funding if the project should encounter a delay. Seven of the nine projects are grant funded because of her efforts. Additionally, staff compared the scope of work, services, and the rates of other consulting firms, Ms. Greer's rates are very competitive while offering some variable rates for different tasks. All contractual conditions have been satisfied by Greer Environmental Consulting.

The proposal is a three-year contract anticipated to commence on March 15, 2022 based on the project timeline. Director Smith added that $47,000 of the amount is dependent upon earlier decisions and $32,000 is allocated for contingency for additional elements not identified or missing in the initial scope of work. Most of the project management fees are grant eligible reimbursements. The project management fee represents approximately 3% of the total $5.5 million project list.

Staff recommends the Public Works Committee recommend the City Council approve and authorize the Mayor to sign a Professional Services Agreement with Greer Environmental Consulting for project management services in an amount not to exceed $284,350.00.

Councilmember Schneider said he assumes Ms. Greer is still an employee of

the City. He asked whether contracting with Ms. Greer would create a conflict of interest. Director Smith advised that it would not be possible for Ms. Greer to assume both positions. The proposal presents an opportunity for Ms. Greer because project management has been her personal goal. She recently submitted a letter of resignation to the City effective March 15, 2022. He added that the proposed contract with Greer Environmental Consulting has completed a risk analysis and legal review by the City.

CONSENSUS: **The Public Works Committee recommended the City Council approve and authorize the Mayor to sign a Professional Services Agreement with Greer Environmental Consulting for project management services in an amount not to exceed Two Hundred Eighty Four Thousand Three Hundred and Fifty Dollars ($284,350.00).**

ADJOURNMENT: **With there being no further business, Chair Swarthout adjourned the meeting at 8:58 a.m.**

Prepared by Puget Sound Meeting Services, psmsoly@earthlink.net

TO: Public Works Committee

FROM: Mary Heather Ames, Transportation Manager

DATE: March 17, 2022

SUBJECT: 2022 Pedestrian Improvements

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1) Recommended Action:

Staff requests Public Works Committee authorize staff to solicit bids for construction of the 2022 Pedestrian Improvements project, and recommend the City Council make a motion to award and authorize the Mayor to sign a public works contract with the lowest responsible bidder.

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2) Background:

Each year, the Capital Facilities Plan (CFP) and budget identify monies to be used for pedestrian improvements and traffic calming. The project for 2022 includes sidewalk and crossing improvements.

The project will consist of three main parts: 1) installation of a pedestrian crossing for the south approach Custer Way and Capitol Boulevard intersection; 2) a Rectangular Rapid Flashing Beacon (RRFB) crossing on Capitol Boulevard north of Trosper Road (roughly at 5110 Capitol Boulevard S); and 3) various sidewalk deficiencies on residential streets that were identified through data collection as part of the recent Americans with Disabilities Act (ADA) Transition Plan Update.

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3) Policy Support:

C. Create and Maintain a Transportation System Safe for All Modes of Travel
- Construct an inter-connected bicycle and pedestrian system, including developing improved neighborhood connections and enhancing overall bicycle and pedestrian safety

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4) Alternatives:

- ❑ Revise the project.

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5) Fiscal Notes:

This project is included in the CFP and partially funded by the Transportation Benefit District.

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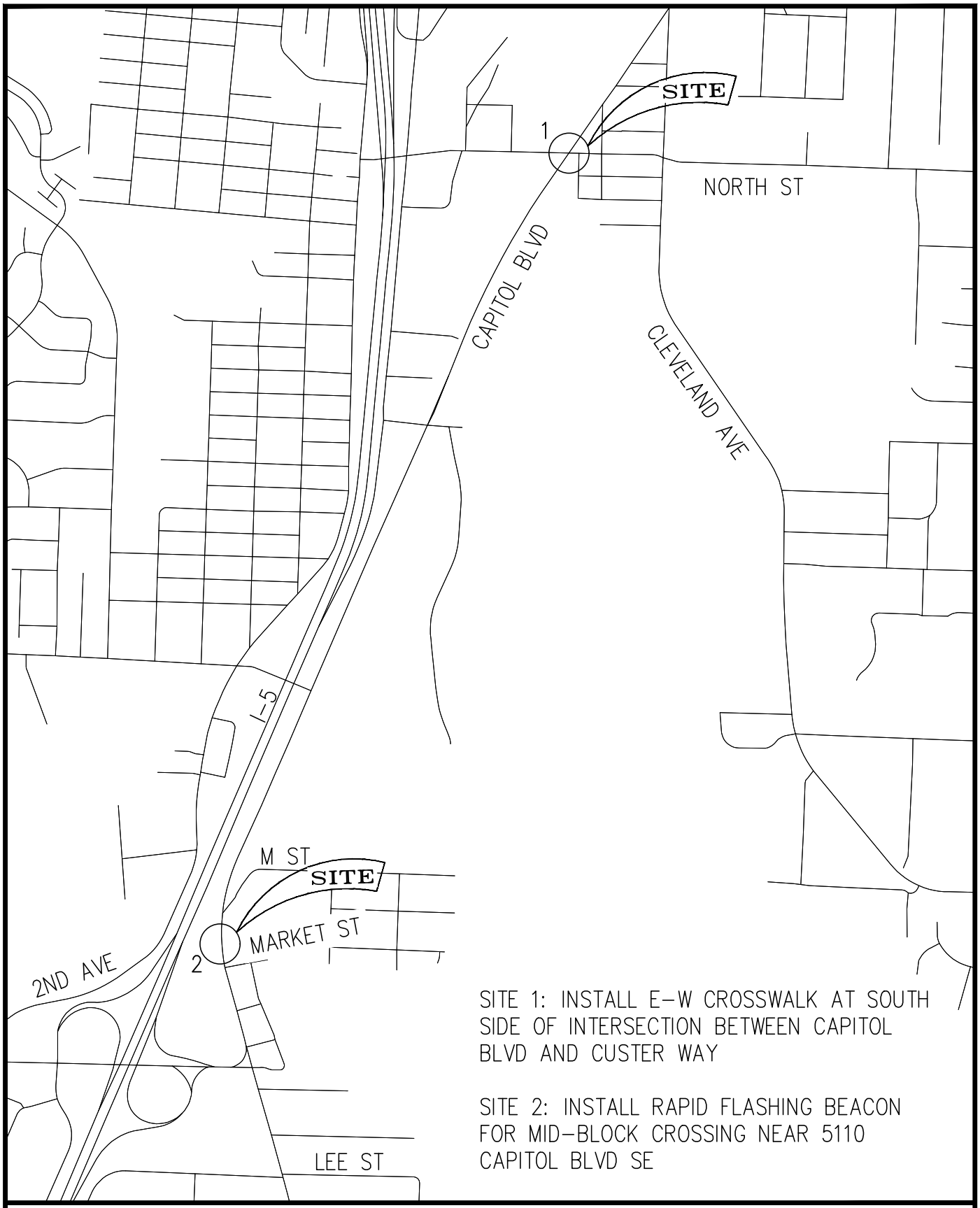
6) Attachments:

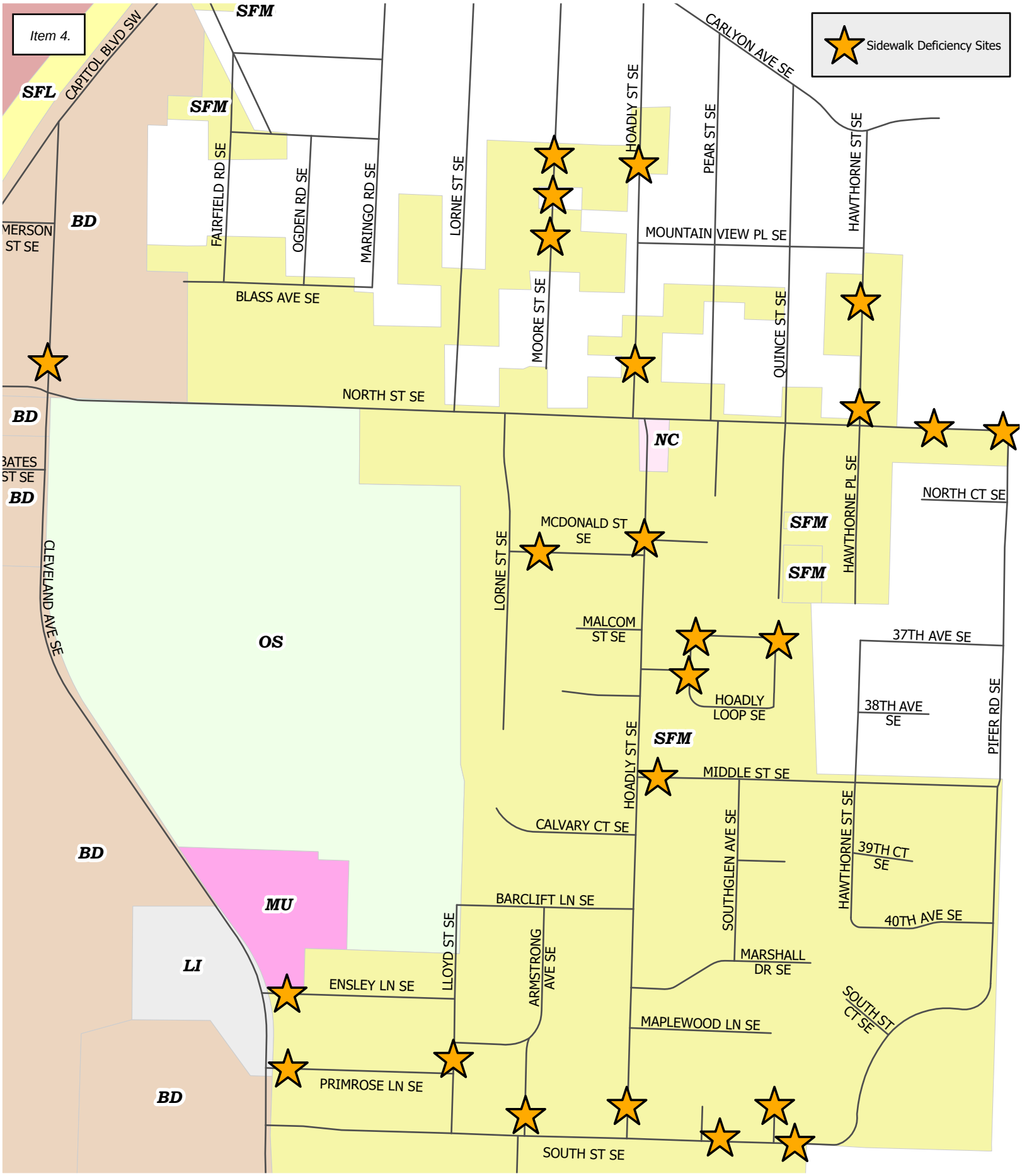
A. Vicinity Maps



2022 PEDESTRIAN IMPROVEMENTS PROJECT

VICINITY MAP

NOT TO SCALE



2022 Pedestrian Improvements Project
Vicinity Map
Not to scale

TO: Public Works Committee

FROM: Dan Smith, Water Resources & Sustainability Director

DATE: March 17, 2022

SUBJECT: Barnes Lake Management District (LMD) Annual Work Plan, Operating Budget, and 2022-2035 Assessment Increase Public Hearing

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1) Recommended Action:

Staff requests the Public Works Committee take the following actions regarding the Barnes Lake Management District:

a. Recommend the City Council make a motion to approve the 2022 Barnes LMD work plan and operating budget; and
b. Set a Public Hearing on April 21, 2022 to hear testimony and make a recommendation to the City Council regarding a proposed 5% annual increase to LMD Roll of Rates and Charges.

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2) Background:

The 2022 Barnes LMD annual operational documents, Operating Budget and Work Plan, have been reviewed and recommended for adoption by the LMD Steering Committee. Also included is the 2021 Treatment Report, which staff will review with the Committee.

On March 2, the LMD Committee held a public listening session and invited all members of the LMD to learn more about the proposed assessment increase and future work plans. On March 9, the LMD Committee motioned to recommend City Council take action to implement the increase which will result in a five percent (5%) annual increase for years 2022 through 2035 to support lake management efforts for the remainder of the LMD's approved duration. The LMD has not increased the rate of assessments since its inception in 2005.

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3) Policy Support:

Ordinance O2004-041 – LMD Formation and Ordinance O2004-042, Public Works Committee Assignment

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4) Alternatives:

- ❑ No identified alternatives.

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5) Fiscal Notes:

The 2022 Operating Budget is consistent with the LMD forecast and adopted City budget for 2022-2023. The proposed assessment increase provides $113,842 in new revenue to address long term budget impacts due to increasing costs to manage vegetation impacts.

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6) Attachments:

A. 2022 Barnes Lake Management District Work Plan
B. 2022 Barnes Lake Expense Budget
C. 2021 Barnes Lake Treatment Report
D. 2022-2035 Barnes Lake Assessment Increase Matrix

Attachment A

Barnes Lake Management District – *2022 Work Plan*

For more information, visit: www.ci.tumwater.wa.us/BLMD.htm

The following tasks are outlined by month. Unforeseen circumstances may delay completion as expected.

January / February

1. ☒ *Review 2021 Treatment Summary Report and update IAVMP and work plan as needed*
2. ☐ *Submit 2022 Annual Work Plan & Operating Budget for Council review and approval*
3. ☒ *Prepare, review and distribute Member Outreach materials to be distributed in March*
4. ~~☐ *Update and execute vegetation treatment contract for Northwest Aquatic Eco-Systems*~~
5. ☒ *Review SOP for volunteer monitoring program*

March / April

1. ☒ *Host listening session for LMD membership to discuss proposed fee increase*
2. ☒ *Distribute outreach materials to LMD members relating to 2022 work plan, budget, schedule, and 2021 Treatment Summary Report.*
3. ☐ *Update/acquire supplies for water quality monitoring program*
4. ☐ *Complete training of volunteers for summer water quality monitoring program*
5. ☐ *Begin "Private Lake Treatment" opportunity outreach efforts*
6. ☐ *Conduct City Council reviews of proposed assessment increase.*
7. ☐ *Submit revised roll of rates and charges to Tumwater Finance Department, as needed*
8. ☐ *Communicate updates to finance for distribution of revised assessment letters.*

May / June

1. ☐ *Conduct chemical treatment(s) on lake if possible (dependent on growth & water levels)*
2. ☐ *Contractor to provide floating mats to volunteer property owners for removal, as available.*
3. ☐ *Conduct aerial photo assessment of lake, as conditions permit*
4. ☐ *Review Steering Committee Appointments; announce vacancies as needed*
5. ☐ *Conduct May round of water quality monitoring*
6. ☐ *Conduct June round of water quality monitoring*
7. ☐ *Steering Committee's Annual Lake "Walk About"*

July / August

1. ☐ *Conduct shoreline treatment(s) on lake if possible (dependent on growth & water levels)*
2. ☐ *Conduct chemical treatment(s) on lake if possible (dependent on growth & water levels)*
3. ☐ *Conduct July round of water quality monitoring*
4. ☐ *Conduct August round of water quality monitoring*

September / October

1. ☐ *Conduct follow-up aerial photo assessment of lake, as conditions permit*
2. ☐ *Deliver "End-of-Season" update outreach materials for LMD Stakeholders via web and US Mail*
3. ☐ *Conduct September round of water quality monitoring*
4. ☐ *Conduct final round of water quality monitoring*
5. ☐ *Update water quality summary report with 2022 data*
6. ☐ *Review permit compliance needs and requirements for 2023*
7. ☐ *Review budgetary needs for 2023*

November / December

1. ☐ *Develop 2023 work plan based on 2022 activities, LMD needs and available budget*
2. ☐ *Develop draft Operational budget for 2023*
3. ☐ *Finalize meeting schedule for 2023*
4. ☐ *Annual election of Steering Committee officers – Chair, Vice-Chair, Recorder*

Attachment B

Expense Budget

Barnes Lake Management District **2022**

PROJECT # 2022005

Administrative		Budget	Actual	$ Balance	%
COT Admin	120.30.538.300.91.01	$ 2,000	$ -	$ 2,000	100%
Printing / Supplies	120.30.538.300.31.00	$ 350	$ -	$ 350	100%
Misc Admin	120.30.538.300.31.00	$ -	$ -	$ -	
Operating		**Budget**	**Actual**	**$ Balance**	**%**
Contract Services	120.30.538.300.41.08	$ 13,770	$ -	$ 13,770	100%
Vegetation Survey & Treatment		$ 7,650	$ -		
Floating Mat Management		$ -	$ -		
Admin Services*		$ 6,120	$ -		
Public Outreach	120.30.538.300.33.00	$ 500	$ -		
Water Quality Monitoring	120.30.538.300.41.08	$ 325	$ -	$ 325	
NPDES Permit Fee	120.30.538.300.49.18	$ 725	$ -	$ 725	100%
Misc Operating	120.30.538.300.33.00	$ 500	$ -	$ 500	100%
Operating Reserve		$ 9,140	$ -	$ 9,140	
Total Expenses		**Budget**	**Actual**	**$ Balance**	**%**
		$ 18,170	$ -	$ 18,170	100%
Total Income		**Budget**	**Actual**		
Assessments		$ 18,170	$ -		
Misc Credits		$ -	$ -		
Fund Balance from Previous Year / Reserves		$ 9,140	$ 9,140		
Total		**$ 27,310**	**$ 9,140**		
Fund Balance		**$ 9,140**	**$ 9,140**		

Barnes Lake

2021 Aquatic Macrophyte Control Program

Prepared By
Northwest Aquatic Eco-Systems
855 Trosper Road SW #108-313
Tumwater, WA 98512
360-357-3285
Pondweeds@comcast.net

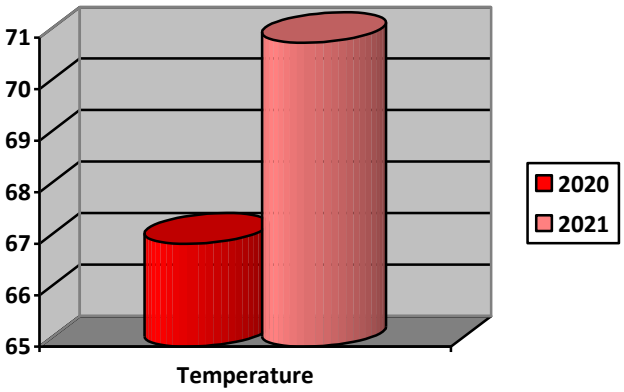
Project Overview

Program components were substantially reduced during 2021 as a result of the whole lake 2020 fluridone treatment. No submersed weed control activities were conducted under the LMD sponsored protocol. Floating plant control directed at lily pad growth was performed once during the season before water level issues restricted access. The major event that had previously occurred within the Barnes Lake system was the treatment of the lake with fluridone to control (eradicate) non-native bladderwort during the 2020 season. The 2020 fluridone application was initiated later in the year than the 2017 campaign and resulted in bladderwort control, fragrant water lily control and brasenia control. Fluridone use during 2020 was anticipated to mimic past protocol by eliminating large yearly treatment expenses during post treatment years. 2021 was the first post treatment year resulting from the 2020 application. The success of the treatment eliminated but did not eradicate the bladderwort infestation from Barnes Lake. Low water level and the late treatment start date required the second fluridone booster application to be applied earlier than anticipated. Water level issues likely created bladderwort plants that may have become landlocked within the floating islands resulting in a reduced exposure interval for these plants. High winter water levels may have dislodged untreated bladderwort into the main lake basin. Not only may low water levels have impacted bladderwort control, lily pads once floating on the water's surface may have also become victims of low water, remaining viable in the soft bottom sediment muck but without access to fluridone infused lake water. Anticipated reduced expenditures for the years 2021, 2022, 2023 and possibly 2024 were incorporated into the future planning model.

The main component for 2021 was to observe the lake's response related to past efforts and provide timely minimal shoreline control activities for lily pads and spot applications for submersed weeds when deemed appropriate.

Survey 5-15-21

The initial and only survey performed during 2021 was undertaken on May 15. This survey date was within a few days of the 2020 campaign. Water level was adequate to access all the lake areas. Noted was the elevated lake temperature from the 2020 survey. Lake temperature had increased from 67 degrees to 71 degrees.



Survey Protocol

A macrophyte survey map is produced each year and incorporated into the baseline IAVMP for Barnes Lake. The surveys are then utilized to monitor yearly weed growth and assist in establishing potential management sites. Electronic bottom surveys have been conducted since 2015.

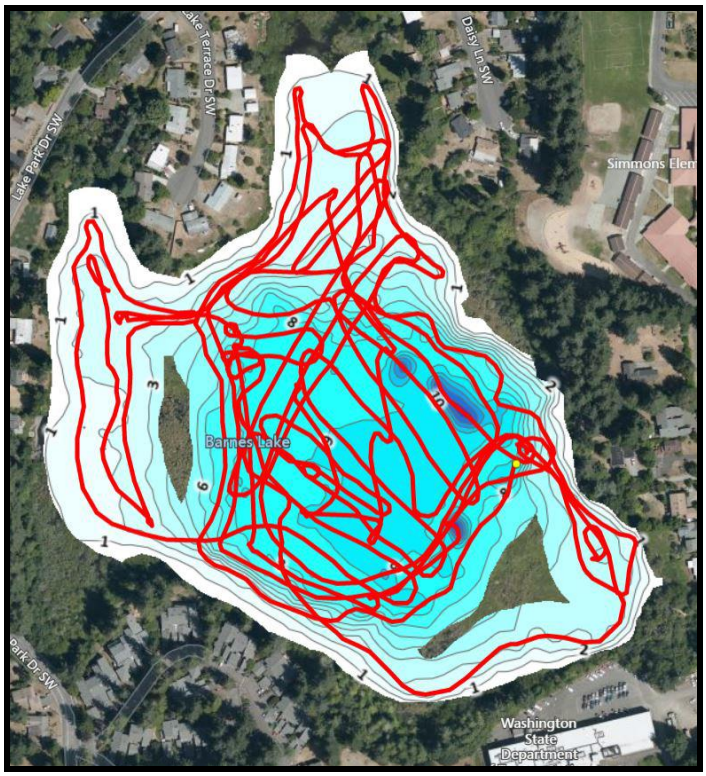
The NWAE mapping protocol utilizes state of the art Bio Base mapping technology. This system produces three map types consisting of a bathymetric contour, a sediment composition profile and a macrophyte density map. All maps are GIS friendly and can be exported into any GIS program. Maps are color coded so they can be easily evaluated by any viewer.

Mapping technology utilizes specialized transducers that electronically collect thousands of data points as the survey boat transects the lake's littoral zone. Data is recorded and viewed onboard. Each file contains one hour of survey data. A completed survey may be comprised of one or more files. Upon completion, all the program files are downloaded and processed. The survey and sonar log produces a stored electronic file of the lake bottom that can be viewed in house at any time and allows the ability to view plant growth along the boat's survey track.

Our protocol encompasses a surface vehicle transecting the lake along the entire littoral zone. Boat tracks are designed to be approximately 150 feet apart. Sonar beam data collection extends approximately 150 feet from all directions surrounding the boat. To ensure the efficacy of the survey, a bottom sampling rake is thrown from the boat at various locations lake-wide. The rake is then drawn across the lake bottom, brought to the surface and into the boat. Plants attached to the rake are identified and confirmed as being the same species as noted through the structure scan or visually noted through the water column. This sampling point is then incorporated into the file data log as a single point reference, noting the species captured during the rake tow. These points are then added to the final project map.

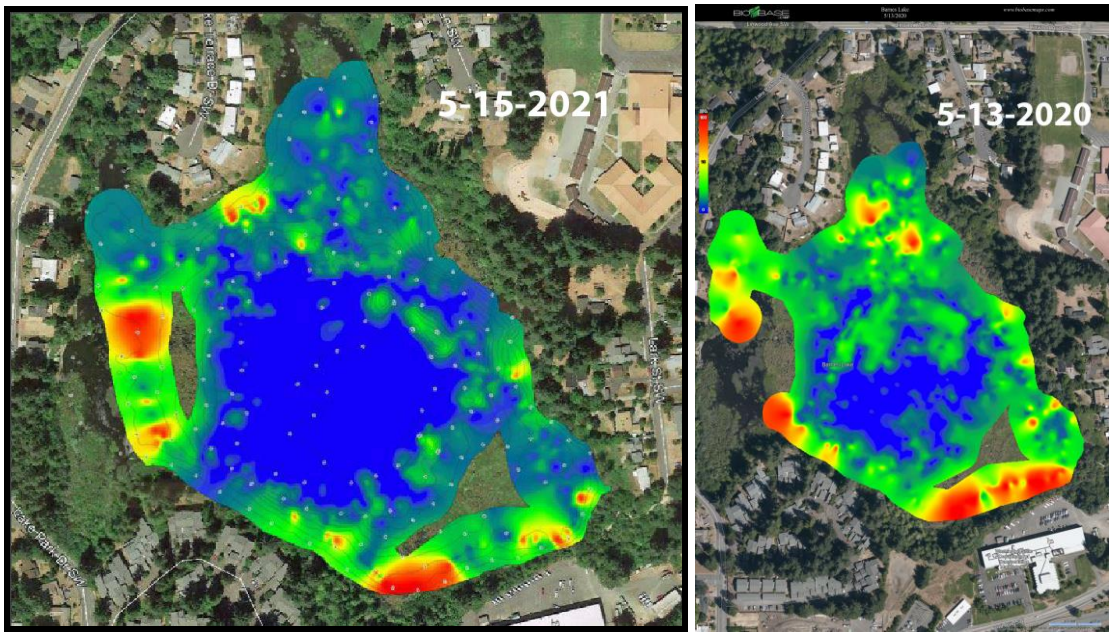
BioBase survey technology provides accuracy in water depths of greater than 2.5 feet. Data collected below the three foot threshold may be skewed because of signal related issues from the reflected bottom transducer readings from the shallow depths. These

depth issues and data acquisition distributions are typical for the Branes Lake shallow canal and island associated segments of the lake. In general, the surveys efficacy was limited to the main lake basin.



May 2021 Survey Tracks

NWAE had only one successful drone survey of the lake performed on Oct 3, 2021. Although an earlier spring survey was performed, the data was processed later in the year and the file was found to be corrupt. These drone surveys establish a clear visual interpretation of lake conditions at the time of the aerial survey. Pre-treatment pictures/video are typically evaluated against post treatment aerials taken at the end of the season.



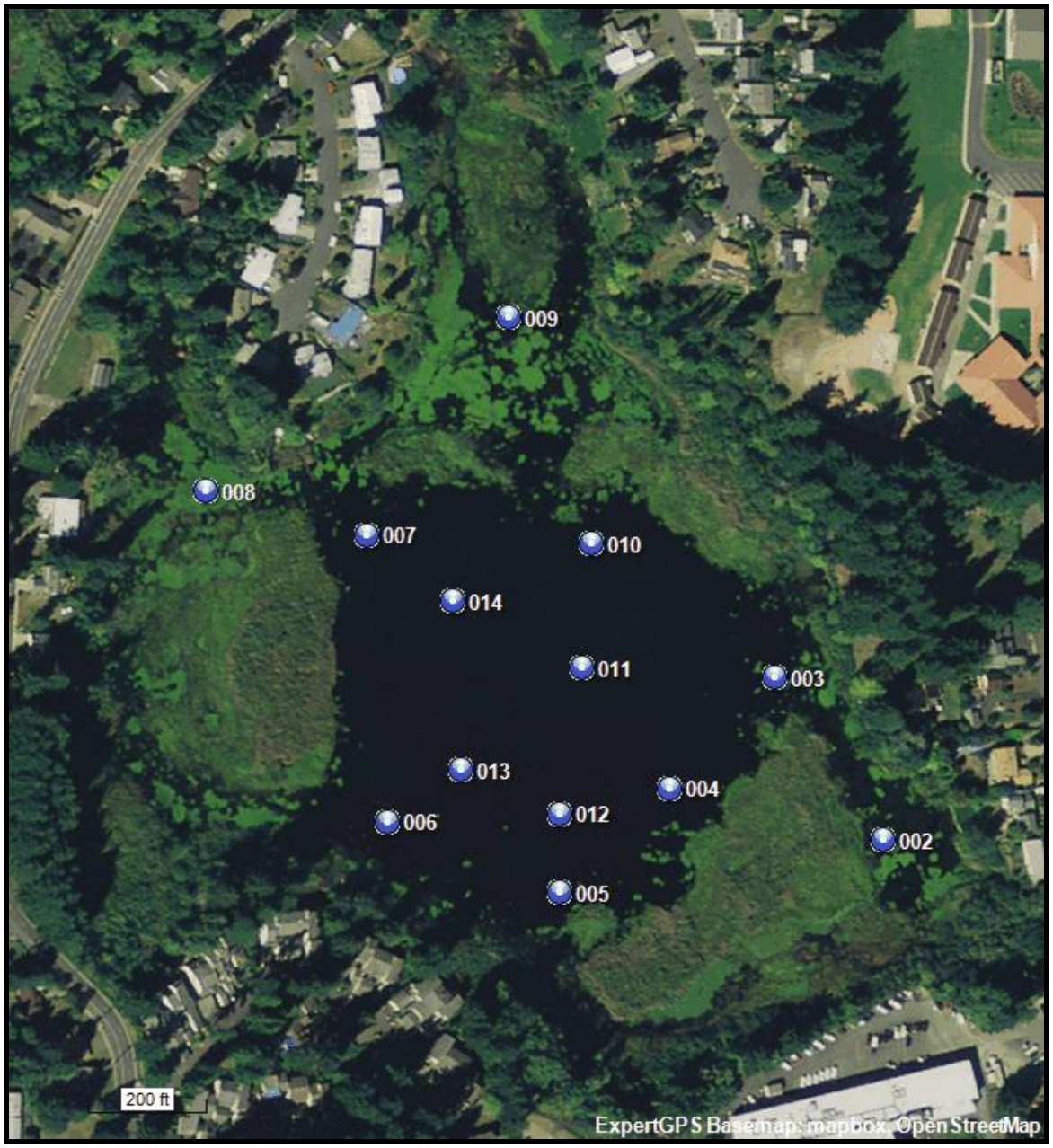
All of the dark blue areas represent biomass densities within the water column of 0 %. The remaining green areas represent densities of less than 40%. While the red areas constitute densities of 100%.

A majority of the green shaded areas were experiencing a filamentous algae growth, nitella. This plant looks similar to aquatic macrophytes but is an algae species. When trying to identify aquatic plants many residents misidentify this species as a plant simply because of the its physical and growth characteristics. Nitella seldom creates water related recreational issues.

Nitella

GPS Grab Sample GPS Coordinates

During the survey, 13 sampling data points were collected. Additional sites can be incorporated into the file at any time if warranted. Only one site (003) identified bladderwort while the remaining sites exhibited no weed growth. Four sites exhibited the presence of nitella. These sampling points can now be used yearly to monitor changes in weed species at each site. Although only four sites identified nitella within the rake tows, visual observations as the boat conducted the survey noted a much greater range.

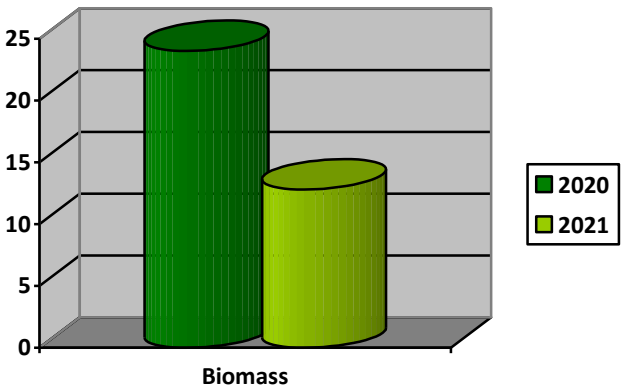


Data Point	Lat	Long	Species	Depth
002	N47 00.185’	W122 54.814’	NO	4.08
003	N47 00.230’	W122 54.858’	BLAD, NI	8.65
004	N47 00.199’	W122 54.900’	NO, NI	14.86
005	N47 00.171’	W122 54.945’	NO	8.65
006	N47 00.190’	W122 54.014’	NO, NI	8.20
007	N47 00.269’	W122 54.023’	NO, NI	6.95
008	N47 00.282’	W122 54.088’	NO	2.66
009	N47 00.330’	W122 54.965’	NO	2.54
010	N47 00.267’	W122 54.932’	NO	8.50
011	N47 00.233’	W122 54.936’	NO	9.71
012	N47 00.192’	W122 54.945’	NO	9.74
013	N47 00.205	W122 54.984’	NO	9.16
014	N47 00.251	W122 54.987’	NO	8.90

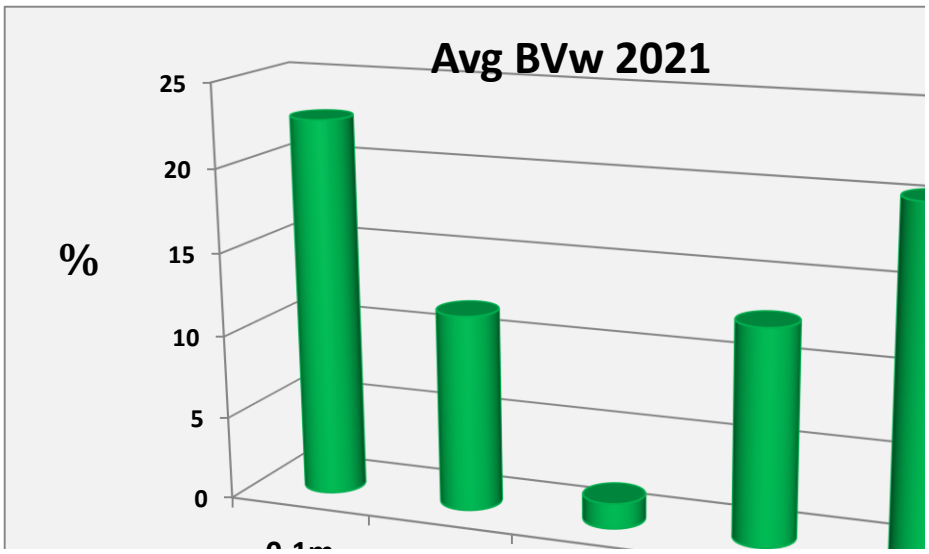
Grab Sample Point Dictionary

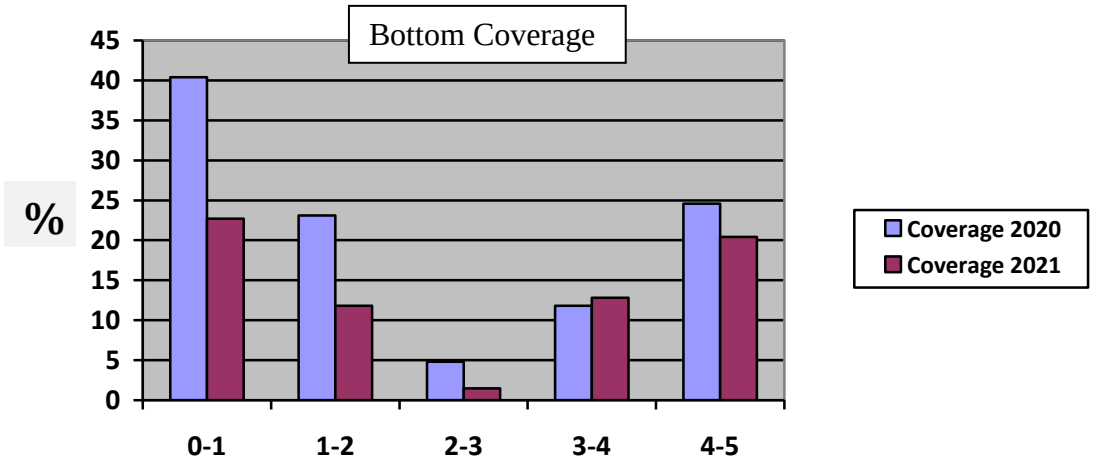
NO - No Macrophytes present, algae not included
BLAD – Bladderwort
NI - Nitella

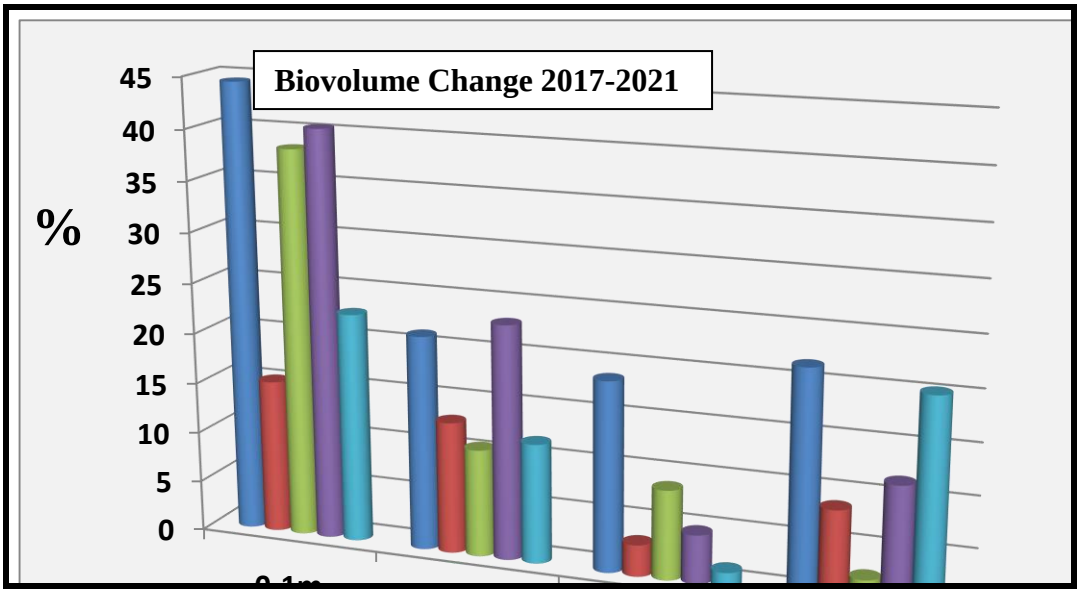
In evaluating all of the data utilizing a grid format (considered within the industry to be the most accurate summary of a surveyed area) and a plant bio volume matrix, the following volumes were noted. Plant biovolume is the percentage of plant biomass taken up in the water column by vegetation when plants exist. When no plants are noted a zero is added into the calculations. The complete 2021survey identified that only 12.8% of the surveyed water volume supported plant growth in comparison to 24% in 2020.



One can further fine tune the analysis and determine bio volumes at one meter intervals.


Avg BVw 2021
%
25
20
15
10
5
0


Bottom Coverage
%
45
40
35
30
25
20
15
10
5
0
0-1
1-2
2-3
3-4
4-5
Coverage 2020
Coverage 2021


Biovolume Change 2017-2021
%
45
40
35
30
25
20
15
10
5
0

Limited historical change was noted. Much of the shallow lake areas that are exposed during the late summer typically support varying densities of emergent, floating and submerged species. Mid basin growth through the years will increase and likely trigger the next fluridone treatment. Bladderwort is a free floating plant that resides dormant on the lake bottom in small ball like configurations. These free floating masses drift along the lake bottom eventually reaching the shoreline.

Pre-Treatment Residential Notice

Notices were mailed to all of the property owners within the lake management district from a mailing list provided by the City of Tumwater. The notice identified the materials to be used and the approximate time-frame when spraying would occur. Mailings were delivered on or about May 1, 2021.

6-03-2021 Treatment

Only one application was administered during the 2021 season. This application targeted floating lily pads, brasenia and yellow flag iris. Prior to treatment, shoreline residents were notified of the pending treatment. Notices were hand delivered to each parcel abutting the lake.

Imazapyr and triclopyr based herbicides were applied to the lake shoreline at a 1% tank solution. In addition to the herbicide, a spray adjuvant was added to the mixture. Spray adjuvants are wetting agent activators that allow for better penetration of the herbicide into the plants' leaf structures. Spraying was accomplished using a 16 foot Airgator airboat. The application boat was equipped with two 25-gallon spray tanks. Once the herbicide, adjuvant and water were mixed, the boat traveled along the shoreline spraying all infestations noted and that were within range of the application equipment.

Drone Survey 10-03-2021

An aerial survey of Barnes Lake was conducted on October 3, 2021. Imagery was collected from two shoreline locations. Although the water level was low, the data collected clearly identifies late seasonal Brasenia growth along a number of the shallow shoreline areas. Both an early and August spraying should be considered. Typically by August our ability to utilize the current launch site leaves few options to complete the August spraying. On other projects we have been able to hand carry and launch a smaller boat with the spraying operation being conducted utilizing a gas powered back pack sprayer.

Recommendations for 2022

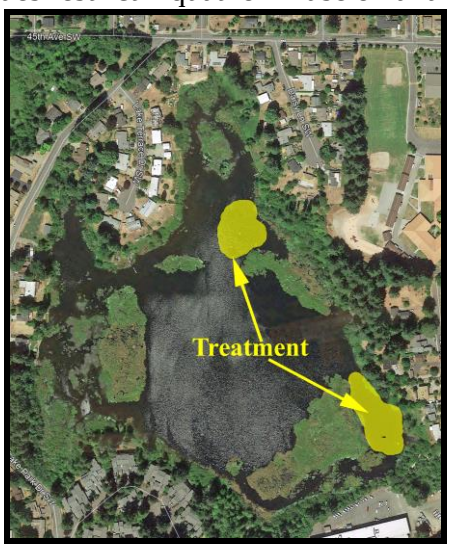
2022 will be the second year after the total lake fluridone application of 2020. We anticipate no bladderwort issues that would warrant spot treatments. Minor lily pad and pondweed control will, however, likely be required. Most all residential lily pad infestations lake wide have been reduced or eliminated. None restrict recreational lake use.

Our program on the lake continues to evolve as new issues may develop. Pondweed control, if necessary, will be accomplished with the use of Aquathol K. There are no label restrictions associated with swimming, fishing or irrigation. Herbicide costs have increased considerably over the last six months with some materials experiencing a 200% increase while other materials may not be available until late second quarter of 2022.

1. Continue early and late seasonal drone surveys of the lake. One early (late May) seasonal electronic and bottom sampling lake event. If water level provides access,

an additional electronic survey and bottom sampling event will be conducted. A late seasonal survey was not available for 2021. Now that survey data points have been established, these sites will be visited each year in an effort to document macrophyte changes on a per site basis. This will provide for an historical timeline, noting yearly changes at each site. These sampling stations will assist in determining the threshold for future fluridone treatments.

2. During 2019 two areas of the lake were identified as potential pondweed control candidates. Both these areas maintain water throughout the summer months and if inundated with submersed pondweed growth may restrict small craft access to the main water body. We have estimated both sites totaling no more than two acres. Control will be performed utilizing Aquathol K in either the liquid or granular formulations. Costs would range between $910.00 and $1,200.00 per treated acre. Budgetary issues restrict Aquathol K use on a large scale basis.



Potential Problematic Weed Growth Areas.

3. Continue use of triclopyr and imazapyr in the control of lily pads and yellow flag iris. Spring and possible late summer applications will be scheduled.

4. Program essentials consist of planned fluridone applications when bladderwort densities impede lake use. Threshold levels that determine treatment are under the discretion of the LMD with recommendations being provided by the consultant. It is anticipated that such treatments will be required on a three to five year basis. Efficacy of fluridone applications is largely dependent on the water level allowing fluridone to reach infestations lodged within the floating islands. Untreated bladderwort, as water levels decline, will potentially refloat during the winter months as once exposed muck bogs are now submerged.

2018 Water levels

5. Modification to the current launch site will again be attempted. Failed attempts to correct the launch shortfalls during 2021 resulted in no changes to the site. Targeted changes would include removal of stumps and placement of large rock along the launch site shoreline.

6. Barnes Lake is currently in a maintenance mode requiring limited treatment.

Budget 2022

Funding for the 2022 program will require increases in associated labor related services as a result of the current available workforce. Material costs and transportation have skyrocketed with some products not being available until the second quarter of 2022. Some products will not be available at all. Pricing continues to change monthly with some materials already experiencing a 125% increase from 2021 levels.

2022 NPDES permit fee		$ 725.00
Insurance		$ 675.00
Spring Electronic Bottom Survey		$ 2,000.00
Fall Electronic Bottom Survey		$ 2,000.00
Aerial Survey (2)		$ 1,000.00
Pre Treatment Mailing		$ 175.00
Shoreline Posting Day of Treatment		$ 210.00
Mobilization		$ 500.00
Imazapyr 1 gal	@	$ 175.00
Triclopyr 1 gal	@	$ 150.00
Aquathol K 1 gal	@	$ 95.00
Airboat Operator		$ 100.00/hr.
Technician		$ 75.00/hr.
Year End Report @ $90.00/hr.		$ 630.00

COSTS ASSOCIATED WITH ONE DAY ON THE LAKE

Mobilization		$ 500.00
Airboat Operator	8 @ $100.00	$ 800.00
Technician	8 @ $75.00	$ 600.00

State of Washington
Department of Agriculture
Olympia, Washington 98504

PESTICIDE APPLICATION RECORD (Version 3)
NOTE: This form must be completed same day as the application and it must be retained for 7 years. (Ref. RCW 17.21)

3. Date of Application-Year: 2021 **Month:** June **Date:** 03 **Time:** 10:00

2. Name of person for whom the pesticide was applied: Barnes Lake Improvement District, City of Tumwater
Firm Name (if applicable):
Street Address: 555 Israel Road **City:** Tumwater 98512

3. Licensed Applicator's Name (if different from #2 above): Douglas Dorling
Firm Name): Northwest Aquatic Eco-Systems
4426 Bush Mountain Drive SW.
Olympia, WA. 98512
360-357-3285
License # 375

4. Name of person who applied the pesticide (if different than #3 above):

License No(s). if applicable:

5. Application Crop or Site: Barnes Lake

6. Total Area Treated (acre, sq. ft., etc.): 1 acre

7. Was this application made as a result of a WSDA Permit ? No

8. Pesticide information (please list all information for each pesticide in the tank mix):

a) Product Name Pesticide Applied	b) EPA Reg. No.	c) Total Amount of Pesticide Applied in Area Treated	d) Pesticide Applied/Acre or other measure)	e) Concentration Applied ppm
Imazapyr	81927-24	.25 gal		1.0%
Triclopyr	70506-176	1 gal		1.0 %

9. Address or exact location of application NOTE: If the application made to one acre or more of Agricultural land, the field location must also be shown on the map on page two of this form. Barnes :Lake Tumwater, WA. 98512, WA 98512

10. Date: 6-03-21 **11. Name of person making application:** Douglas Dorling

12. License No: 375 **13. Apparatus License. Plate No.:** G424

14. Start: 10:00 **Stop:** 2:30

15. Acres completed : 1

16. Wind Direction: SW **Wind Velocity:** 0-5

17. Temperature: 76

Location of Application (If the application covers more than one township or range, please indicate the township & range for the top left section of the map only):
Township: T18N
Range: E OR W (please indicate) 02W

Section(s): 34
County: Thurston

PLEASE NOTE:
The map is divided into 4 sections with each section divided into quarter-quarter sections. Please complete it by marking the appropriate section number(s) on the map and indicate as accurately as possible the location of the area treated.

Northwest Aquatic Eco-Systems

855 Trosper Road SW #108-313
Tumwater, Washington 98512
Telephone: (360) 357-3285

E-MAIL: PONDWEEDS @ COMCAST.NET

Herbicide Treatment
Business and Residential Notice

Distribution Date: 05-01-21 Barnes Lake will be treated with herbocides to control non native pondweeds, lily pads and shoreline emergent vegetation from May 20 through July 30 as required. Treatment dates are dependent on lake water levels and the ability to access the lake. Targeted treatment dates will be May 25 through June 25 . A secondary application may be applied later in the season depending on our ability to access the lake. Notices of applications will be hand delivered to each property owner no longer than 48 hours prior to treatment. Notices will state any water use restrictions or advisories.

Product(s) planned for use:

Diquat—diquat dibromide
Imazapyr (shoreline plant & iris control)
Aquathol K- dipotassium salt of endothall
Triclopyr—triclopyr

Location of Treatment(s): Lily pad control will take place anywhere throughout the lake. Shoreline emergent plant control will only occur at residential properties abutting the lake who have agreed to the treatment. Pondweed control will be limited if required to a few acres. The lake proper is adjacent to Daisy Lane SW. Tumwater. If you are withdrawing water for potable or domestic water use, livestock watering, or irrigation, and have no alternate water source, please contact the applicator Northwest Aquatic Eco-Systems at 360-357-3285 or pondweeds@comcast.net to arrange an alternate water supply.

If you would like to request additional notification prior to treatment, or have further questions, please contact Northwest Aquatic EcoSystems using the information above.

This herbicide treatment is regulated under a permit (NPDES) issued by the Washington State Department of Ecology. **Permit # WAG 994137**

Management Practices for Lakes • Watersheds • Aquatic Plants • Wetlands

Attachment D

5% ANNUAL INCREASE	TOTAL # OF UNITS	2021	2022	2023	2024	2025	2026	2027	2028	2029
Residential w/ View Only (no access) and Condominium without View (access)	50	$ 96.00	$ 100.80	$ 105.84	$ 111.13	$ 116.69	$ 122.52	$ 128.65	$ 135.08	$ 141.84
Residential Lakefront	26	$ 240.00	$ 252.00	$ 264.60	$ 277.83	$ 291.72	$ 306.31	$ 321.62	$ 337.70	$ 354.59
Condominium Lakefront	21	$ 192.00	$ 201.60	$ 211.68	$ 222.26	$ 233.38	$ 245.05	$ 257.30	$ 270.16	$ 283.67
Condominium w/ View Only (no access)	5	$ 77.00	$ 80.85	$ 84.89	$ 89.14	$ 93.59	$ 98.27	$ 103.19	$ 108.35	$ 113.76
Public / Commercial	3	$ 480.00	$ 504.00	$ 529.20	$ 555.66	$ 583.44	$ 612.62	$ 643.25	$ 675.41	$ 709.18
Undeveloped Residential Lakefront	3	$ 120.00	$ 126.00	$ 132.30	$ 138.92	$ 145.86	$ 153.15	$ 160.81	$ 168.85	$ 177.29
Undeveloped w/ View Only	1	$ 48.00	$ 50.40	$ 52.92	$ 55.57	$ 58.34	$ 61.26	$ 64.32	$ 67.54	$ 70.92
	2005-2020	$ 17,305.00	$ 18,170.25	$ 19,078.76	$ 20,032.70	$ 21,034.34	$ 22,086.05	$ 23,190.36	$ 24,349.87	$ 25,567.37
Total Revenue Collected:	**$ 276,880.00**	**$ 294,185**	**$ 312,355.25**	**$ 331,434.01**	**$ 351,466.71**	**$ 372,501.05**	**$ 394,587.10**	**$ 417,777.46**	**$ 442,127.33**	**$ 467,694.70**

2030	2031	2032	2033	2034	2035	TOTAL % CHANGE	TOTAL NEW $$ / Unit	TOTAL NEW $$ / All Units
$ 148.93	$ 156.37	$ 164.19	$ 172.40	$ 181.02	$ 190.07	98%	$ 631.54	$ 31,577.11
$ 372.32	$ 390.93	$ 410.48	$ 431.01	$ 452.56	$ 475.18	98%	$ 1,578.86	$ 41,050.24
$ 297.86	$ 312.75	$ 328.39	$ 344.80	$ 362.04	$ 380.15	98%	$ 1,263.08	$ 26,524.77
$ 119.45	$ 125.42	$ 131.70	$ 138.28	$ 145.19	$ 152.45	98%	$ 506.55	$ 2,532.75
$ 744.64	$ 781.87	$ 820.96	$ 862.01	$ 905.11	$ 950.37	98%	$ 3,157.71	$ 9,473.13
$ 186.16	$ 195.47	$ 205.24	$ 215.50	$ 226.28	$ 237.59	98%	$ 789.43	$ 2,368.28
$ 74.46	$ 78.19	$ 82.10	$ 86.20	$ 90.51	$ 95.04	98%	$ 315.77	$ 315.77
$ 26,845.73	$ 28,188.02	$ 29,597.42	$ 31,077.29	$ 32,631.16	$ 34,262.72			**$ 113,842.04**
$ 494,540.43	**$ 522,728.45**	**$ 552,325.87**	**$ 583,403.17**	**$ 616,034.33**	**$ 650,297.04**			**TOTAL NEW REVENUE**