HORSESHOE LAKE MANAGEMENT COMMITTEE AGENDA

5:00 P.M. - THURSDAY, JUNE 11, 2015

Woodland Police Station - Council Chambers
200 East Scott Avenue
Woodland, WA 98674

Call to Order

Citizen Communications for items NOT on the Agenda

Citizen Communications for items ON the Agenda

I. Approval of Minutes for April 9, 2015

II. Continued Business

A. Pump & Lake Update
- PacificCorp Flow Modification
- Lake Tracking

B. Water Quality Testing
- Hydrolab/Phosphorous/E. Coli
- WDFW Survey
- Blue/Green Algae Testing

C. 2015 Centennial Grant Update

D. Goals & Priorities
- Goals & Priorities List Review
- Grant Opportunities
- Milfoil Eradication
- Pollution Control

E. Committee Vacancy

III. New Business

A. Shoreline Master Plan Update

IV. Other

V. Adjourn - Next Meeting July 9, 2015 at 5:00 P.M.

CITY OF WOODLAND
HORSESHOE LAKE COMMITTEE MINUTES
APRIL 9, 2015

The regular meeting of the Horseshoe Lake Management Committee (HSLMC) was held on the above date, at the Woodland Police Station - Council Chambers, 200 East Scott Avenue, Woodland, WA 98674.

Chairman Tom Golik called the meeting to order at approximately 5:07 p.m. Roll call found the following:

COMMITTEE MEMBERS:

Tom Golik, Chairman
Mike Curry
Bill Dunlap
Terry Jones
Francis Patnode (Absent)
Pat Rychel
Neil Van Horn
VACANCY

MAYOR/COUNCIL/OTHER:

None

STAFF:

Jody Bartkowski, Engineering Technician

PRESENTATION

Centennial Grant, Cowlitz County Environmental Health Services. Chris Bischoff introduced himself and Season Long, then Hilarie Larson as the new grant hire that will be assisting the Horseshoe Lake and Silver Lake Committees. Discussion was held regarding the Quality Assurance Project Plan (QAPP), hydrolab purchase, volunteer and boat hours, increased public participation, the location of current testing data, and funding sources for clean water.

CITIZEN COMMUNICATION

Walt Church, Truth Street. Mr. Church presented a handout and spoke regarding the construction of retaining walls and the water level of Horseshoe Lake, Best Management Practices (BMPs) as defined by the "Final Report Horseshoe Lake Project" dated September 1999, and Horseshoe Lake's buoys. Discussion ensued regarding the high water mark, shoreline development, Planning Department involvement, Committee review of the BMPs, limiting the number of buoys, Lake level as determined by the outlet structure, level variations, erosion, and historic levels. Staff will forward Mr. Church's suggestions to the Planning Department for inclusion in the Shoreline Master Program (SMP) comments.

MINUTES

The February 12, 2014 minutes were approved as presented. The March meeting was previously cancelled.

CONTINUED BUSINESS

A. **Goals and Priorities.** Discussion was held regarding Washington State Department of Fish and Wildlife (WDFW) participation, pending WDFW survey, status of the outflow structure repairs, lack of response to the goal/priority review, weed mapping and fish counts by Smith Root, and cormorant population.

B. **Water Quality & Sampling.** Discussion was held regarding data consistency, high pH readings, meter calibrations, and continuance of the current testing schedule.

C. **Pump and Lake Update.** Chairman Golik gave a history of the outlet structure and lake level variations. Discussion was held regarding development along the shoreline, ordinary high water, water level fluctuation, dock heights, and building/planning department information regarding shorelines.

D. **Vacancy**. Discussion ensued regarding the current vacancy and a possible candidate.

E. **2015 Budget.** Open discussion was held regarding the balance after testing expenses, tabling expenditures until the goal/priority review is complete, and grass carp delivery.

NEW BUSINESS

NONE

OTHER

Additional discussion was held regarding replacement of the existing buoys and Park Board activity.

ADJOURNMENT

The meeting was adjourned at approximately 6:30 p.m. The next regular meeting will be held Thursday, May 14, 2015, at 5:00 p.m. at the Woodland Police Station - Council Chambers, 200 East Scott Avenue, Woodland WA 98674.

Tom Golik - Chairman	Date
Jody Bartkowski - Secretary	Date

Jody Bartkowski

From: Bart Stepp
Sent: Monday, April 27, 2015 4:49 PM
To: Jody Bartkowski
Subject: FW: PacifiCorp Merwin Hydro Project (P-935) Flow Modification Notice

FYI

Bart Stepp, PE
City of Woodland
Public Works Director
PO Box 9; 300 E. Scott Ave.
Woodland, WA 98674
(360) 225-7999
(360) 225-7467 (fax)
"Serving Community Needs Day and Night"

From: Weatherly, Briana [mailto:Briana.Weatherly@pacificorp.com]
Sent: Monday, April 27, 2015 4:45 PM
To: undisclosed-recipients
Subject: PacifiCorp Merwin Hydro Project (P-935) Flow Modification Notice

With this email PacifiCorp is providing notification to the Aquatic Coordination Committee (ACC) and the Federal Energy Regulatory Commission (FERC), that in accordance with Article 415 of the Merwin Hydroelectric Project FERC License (Project No. 935) and Sections 6.24 and 6.2.5 of the Lewis River Settlement Agreement, PacifiCorp will be reducing flow releases below Merwin as described below.

The Lewis River Flow Coordination Committee (FCC) and Washington Department of Ecology held a conference call on April 23 to discuss reducing Merwin flows to 2,300 cubic feet per second (cfs), 400 cfs less than the FERC License required minimum. In attendance was PacifiCorp (Briana Weatherly and Erik Lesko), NOAA Fisheries (Michelle Day), Washington Department of Fish and Wildlife (Eric Kinne), U.S. Fish and Wildlife Service (Mark Celedonia) and Washington Department of Ecology (Jennifer Holderman and Jim Pacheco). The agreed upon flow reduction schedule is as follows:

Date	License Required Flow (cfs)	Reduced Flow (cfs)
April 27-June 30	2,700	2,300

The current conditions are that we are at approximately 19 percent of average for snow water equivalent in the Lower Columbia River Basin and the long-term forecast is calling for a continued drought conditions and a dry hot summer. We currently have approximately 18 feet of vacant storage in the Lewis River reservoirs and reducing flows as described above will allow us to refill the reservoirs in an effort to preserve water for increased flows in the fall during the more biologically sensitive spawning period. Please contact Briana Weatherly or Frank Shrier with any questions or concerns.

Briana Weatherly
Manager, Environmental Compliance | PacifiCorp Hydro Resources
briana.weatherly@pacificorp.com | o: 503.813.7039 | m: 503.819.2281
825 NE Multnomah, Suite 1500 | Portland, OR. 97232

HORSESHOE LAKE TRACKING
2015

Date	River Level 8:00 AM	Days High Temp	24-Hr Rainfall	Lake			Valve Status (Turns Open)	Pump (GPM)	Comments
				Level	Temp	Visibility			
1-May-15	8.50	71°	0.00				0		Level averaged (vacation).
2-May-15	8.23	71°	0.00				0		
3-May-15	8.37	75°	0.00				0		
4-May-15	8.68	70°	0.00				0	2,511	
5-May-15	8.90	64°	0.18				0		Weather station #9 down, used #1.
6-May-15	8.67	62°	0.04				0		Weather station #9 down, used #1.
7-May-15	8.54	74°	0.01				0		Weather station #9 down, used #1.
8-May-15	8.67	83°	0.00				0	2,528	Weather station #9 down, used #1.
9-May-15	8.78	84°	0.00				0		Weather station #9 down, used #1.
10-May-15	8.90	68°	0.00	-6	60°	6	0		Weather station #9 down, used #1.
11-May-15	9.09	57°	0.70				0	2,634	
12-May-15	9.28	60°	0.71				0		
13-May-15	9.43	62°	0.03				0		Level projected.
14-May-15	9.43	70°	0.00				0		Level projected.
15-May-15	9.43	63°	0.00	-6			0	2,602	Level projected; tested water quality.
16-May-15	9.18	61°	0.00				0		
17-May-15	8.57	86°	0.00	-6	58°	6	0		
18-May-15	8.65	74°	0.00				0	2,570	
19-May-15	9.07	67°	0.00				0		Level projected.
20-May-15	9.38	73°	0.00				0		Level projected.
21-May-15	9.38	80°	0.00				0		Level projected.
22-May-15	9.62	62°	0.00				0	2,740	Level projected; cleaned screens.
23-May-15	9.85	66°	0.00				0		Level projected.
24-May-15		68°	0.00				0		
25-May-15		66°	0.00				0		
26-May-15		74°	0.00				0		
27-May-15		79°	0.00				0		
28-May-15		84°	0.00				0		
29-May-15	10.03	79°	0.00				0	3,264	
30-May-15	9.62	78°	0.00	-7	68°	8	0		
31-May-15	8.70	82°	0.00				0		

HORSESHOE LAKE TRACKING
2015

Date	River Level 8:00 AM	Days High Temp	24-Hr Rainfall	Lake			Valve Status (Turns Open)	Pump (GPM)	Comments
				Level	Temp	Visibility			
1-Jun-15	8.55	65°	0.64				0		
2-Jun-15	8.82	65°	0.41				0		
3-Jun-15	9.27	70°	0.03				0		
4-Jun-15	9.14	74°	0.00				0		Level projected.
5-Jun-15	9.25	84°	0.00				0		Level projected.
6-Jun-15	9.15	88°	0.00				0		
7-Jun-15	9.31	88°	0.00	-7	71°	8	0		
8-Jun-15	9.44						0		
9-Jun-15	9.41						0		Level projected.
10-Jun-15	9.88						0		Level projected.
11-Jun-15	10.15						0		Level projected.
12-Jun-15	10.22						0		Level projected.
13-Jun-15	9.77						0		
14-Jun-15							0		

HORSESHOE LAKE TRACKING
2014

Date	River Level 8:00 AM	Days High Temp	24-Hr Rainfall	Lake			Valve Status (Turns Open)	Pump (GPM)	Comments
				Level	Temp	Visibility			
1-May-14	13.69	88°					Fully Open		
2-May-14	14.38	75°					Fully Open	2,850	
3-May-14	13.53	59°					Fully Open		
4-May-14	12.89	60°		1	65°	10'	Fully Open		
5-May-14	12.85	61°					Fully Open	2,900	
6-May-14	13.55	66°					Fully Open		
7-May-14	14.15	66°					Fully Open		
8-May-14	13.95	57°					Fully Open		Began testing water quality for 2014.
9-May-14	13.96	57°					Fully Open	2,880	
10-May-14	14.04	65°					Fully Open		
11-May-14	14.03	70°		1	63°	10'	Fully Open		
12-May-14	13.97	78°					Fully Open	2,714	Weather getting warmer.
13-May-14	14.22	85°					Fully Open		
14-May-14	14.32	88°			67°		Fully Open		Weather is HOT.
15-May-14	13.36	82°					Fully Open		
16-May-14	12.87	72°					Fully Open		
17-May-14		69°					Fully Open		
18-May-14		60°					Fully Open		
19-May-14	14.44	72°					Fully Open	2,948	
20-May-14	14.20	74°					Fully Open		
21-May-14	14.34	73°					Fully Open		
22-May-14	13.92	81°					Fully Open		
23-May-14	13.38	70°					Fully Open	2,877	
24-May-14	13.68	68°					Fully Open		
25-May-14	13.59	67°					Fully Open		
26-May-14	13.77	70°		0	68°	8'	Fully Open		Murky.
27-May-14	13.47	68°					Fully Open	2,864	
28-May-14	13.78	61°					Fully Open		
29-May-14	13.99	67°					Fully Open		
30-May-14	13.69	76°		1	68°	8'	Closed	3,049	
31-May-14	14.50	75°					Closed		

HORSESHOE LAKE TRACKING
2014

Date	River Level 8:00 AM	Days High Temp	24-Hr Rainfall	Lake			Valve Status (Turns Open)	Pump (GPM)	Comments
				Level	Temp	Visibility			
1-Jun-14	13.40	74°					Closed		
2-Jun-14	12.59	75°					Closed	2,635	
3-Jun-14	13.13	71°					Closed		
4-Jun-14	12.95	73°					Closed		Tested water quality.
5-Jun-14	12.60	75°					Closed		
6-Jun-14	12.45	79°					Closed	2,910	
7-Jun-14	12.45	76°					Closed		
8-Jun-14	12.10	78°					Closed		
9-Jun-14	11.97	74°					25		Water above retaining wall.
10-Jun-14	11.37	75°					25		
11-Jun-14	11.20	80°					25		
12-Jun-14	10.98	63°					Closed		
13-Jun-14	10.82	63°					Closed	2,723	
14-Jun-14	10.65	69°					Closed		
15-Jun-14	10.65	67°		2	70°	8.5'	Closed		

Woodland's Horseshoe Lake - HydroLab Data

2015		April 23, 2015							May 15, 2015						
		Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi	Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi
#	Location	Temp	DO	pH	Temp	DO	pH	Disk	Temp	DO	pH	Temp	DO	pH	Disk
1	Inlet	14.31	11.10	8.07	14.28	10.99	8.50	6.00	16.64	10.82	9.39	16.60	10.88	9.47	4.00
2	Skate Park	14.31	10.85	8.64	14.29	11.09	8.73	7.00	16.50	10.94	9.52	16.57	11.07	9.58	4.00
3	Fleischman Dock	14.16	11.20	8.84	14.15	11.35	8.92	7.00	16.37	10.89	9.59	16.37	11.18	9.60	5.00
4	Left of Kitchen	14.20	10.78	8.91	14.18	11.25	8.94	7.00	16.35	11.13	9.63	16.34	11.22	9.62	4.00
5	Dunlap Shop	14.50	10.12	8.96	14.52	10.24	8.98	7.00	16.61	10.87	9.53	16.59	11.02	9.53	5.00
6	Perry House	14.87	10.04	8.91	14.87	10.17	8.91	6.00	16.71	10.57	9.52	16.69	10.86	9.52	5.00
7	Raspberry Drain	15.07	9.88	8.92	15.05	10.18	8.91	6.00	16.96	11.01	9.60	17.02	11.07	9.61	5.00
8	Marker	15.13	10.02	8.88	15.14	10.18	8.83	6.00	17.26	10.73	9.65	17.22	10.92	9.65	5.00
9	Walt's Fence Line	15.26	9.99	8.88	15.26	10.23	8.93	7.00	17.39	10.82	9.74	17.40	10.86	9.71	4.00
10	Outlet	15.98	9.99	9.04	15.99	10.24	9.07	5.00	17.88	10.85	9.72	17.87	10.94	9.71	5.00

Testing Notes: Light algae bloom at Walt's fence Surface algae at kitchen, tree at Raspberry

2014		April							May 8, 2014						
		Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi	Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi
#	Location	Temp	DO	pH	Temp	DO	pH	Disk	Temp	DO	pH	Temp	DO	pH	Disk
1	Inlet								17.44						9.00
2	Skate Park														
3	Fleischman Dock								17.72						10.00
4	Left of Kitchen								17.61						8.00
5	Dunlap Shop														
6	Perry House														
7	Raspberry Drain								17.28						8.00
8	Marker														
9	Walt's Fence Line								17.34						8.00
10	Outlet														

Testing Notes:

2013		April 10, 2013							May 14, 2013						
		Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi	Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi
#	Location	Temp	DO	pH	Temp	DO	pH	Disk	Temp	DO	pH	Temp	DO	pH	Disk
1	Inlet	13.56						9.00	19.00						9.50
2	Skate Park														
3	Fleischman Dock	13.44						10.00	19.06						10.50
4	Left of Kitchen	13.56						9.00	19.22						9.00
5	Dunlap Shop														
6	Perry House														
7	Raspberry Drain	13.17						8.00	19.39						9.00
8	Marker														
9	Walt's Fence Line	13.44						8.00	19.56						11.00
10	Outlet														

Testing Notes:

2012		April							May						
		Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi	Hydro Lab 1 Ft			Hydro Lab 3 Ft			Secchi
#	Location	Temp	DO	pH	Temp	DO	pH	Disk	Temp	DO	pH	Temp	DO	pH	Disk
1	Inlet														
2	Skate Park														
3	Fleischman Dock														
4	Left of Kitchen														
5	Dunlap Shop														
6	Perry House														
7	Raspberry Drain														
8	Marker														
9	Walt's Fence Line														
10	Outlet														

* Lake Bottom - No Secchi Disk Reading

Phosphorus

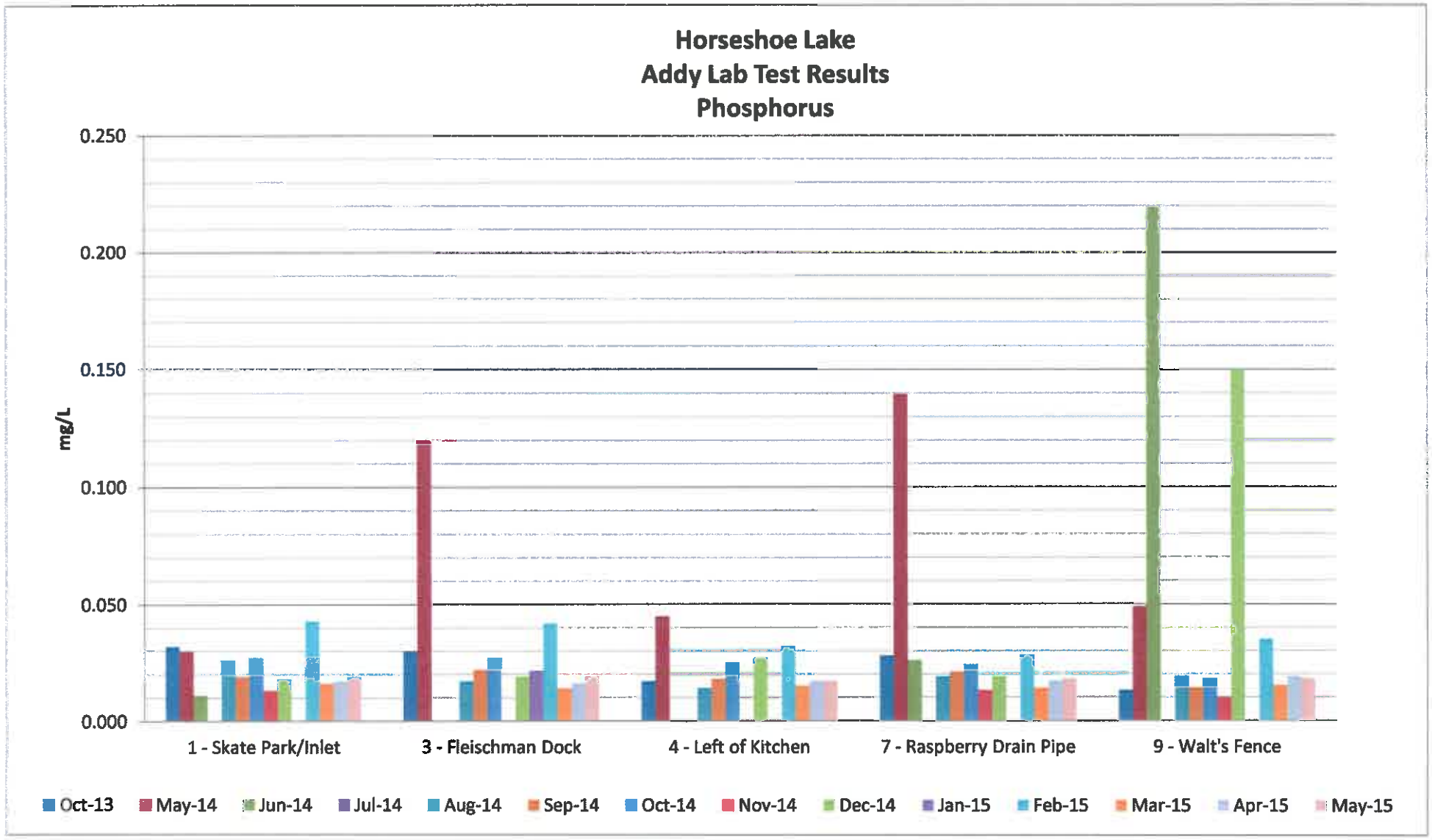
2015		Jan 1/21	Feb 2/13	Mar 3/23	Apr 4/23	May 5/15	Jun	July	Aug	Sept	Oct	Nov	Dec	Average
2	Inlet	ND	0.043	0.016	0.017	0.019								0.024
3	Fleischman Dock	0.022	0.042	0.014	0.016	0.019								0.023
7	Left of Kitchen	ND	0.032	0.015	0.017	0.017								0.020
10	Raspberry Drain	ND	0.028	0.014	0.017	0.018								0.019
12	Walt's Fence	ND	0.035	0.015	0.019	0.018								0.022

2014		Jan	Feb	Mar	Apr	May 5/8	Jun 6/4	July 7/2	Aug 8/13	Sept 9/19	Oct 10/17	Nov 11/26	Dec 12/12	Average
2	Inlet					0.030	0.011	ND	0.026	0.019	0.027	0.013	0.018	0.021
3	Fleischman Dock					0.120	ND	ND	0.017	0.022	0.027	ND	0.019	0.041
7	Left of Kitchen					0.045	ND	ND	0.014	0.018	0.025	ND	0.027	0.026
10	Raspberry Drain					0.140	0.026	ND	0.019	0.021	0.024	0.013	0.019	0.037
12	Walt's Fence					0.049	0.220	ND	0.019	0.014	0.018	0.010	0.150	0.069

2013		Jan 1/7	Feb 2/5	Mar 3/4	Apr 4/10	May 5/14	Jun 6/3	July 7/12	Aug 8/8	Sept 9/11	Oct 10/17	Nov	Dec	Average
2	Inlet	ND	0.002	0.003	0.009	0.003	0.005	0.018	0.007	0.012	0.032			0.010
3	Fleischman Dock	0.004	0.006	0.004	0.011	0.010	0.005	0.010	0.007	0.014	0.030			0.010
7	Left of Kitchen	0.005	ND	0.005	0.011	0.012	0.004	0.012	0.007	0.012	0.017			0.009
10	Raspberry Drain	0.002	ND	0.005	0.010	0.012	0.006	0.006	0.006	0.013	0.028			0.010
12	Walt's Fence	ND	ND	0.009	0.014	0.012	0.006	0.010	0.014	0.014	0.013			0.012

2012		Jan	Feb	Mar	Apr	May	Jun	July	Aug 8/20	Sept 9/5	Oct 10/25	Nov	Dec 12/6	Average
2	Inlet								0.012	0.009	0.034		0.027	0.021
3	Fleischman Dock								0.013	0.008	0.030		0.019	0.018
7	Left of Kitchen								0.011	0.008	0.030		0.015	0.016
10	Raspberry Drain								0.013	0.006	0.017		0.019	0.014
12	Walt's Fence								0.014	0.008	0.026		0.012	0.015

Averages By Year		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Average
2015	All Locations	0.022	0.036	0.015	0.017									0.022
2014	All Locations					0.077	0.086	ND	0.019	0.019	0.024	0.012	0.047	0.040
2013	All Locations	0.004	0.004	0.005	0.011	0.010	0.005	0.011	0.008	0.013	0.024			0.010
2012	All Locations								0.013	0.008	0.027		0.018	0.017


Horseshoe Lake
Addy Lab Test Results
Phosphorus
mg/L
0.250
0.200
0.150
0.100
0.050
0.000
1 - Skate Park/Inlet
3 - Fleischman Dock
4 - Left of Kitchen
7 - Raspberry Drain Pipe
9 - Walt's Fence
Oct-13
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15

E. Coli

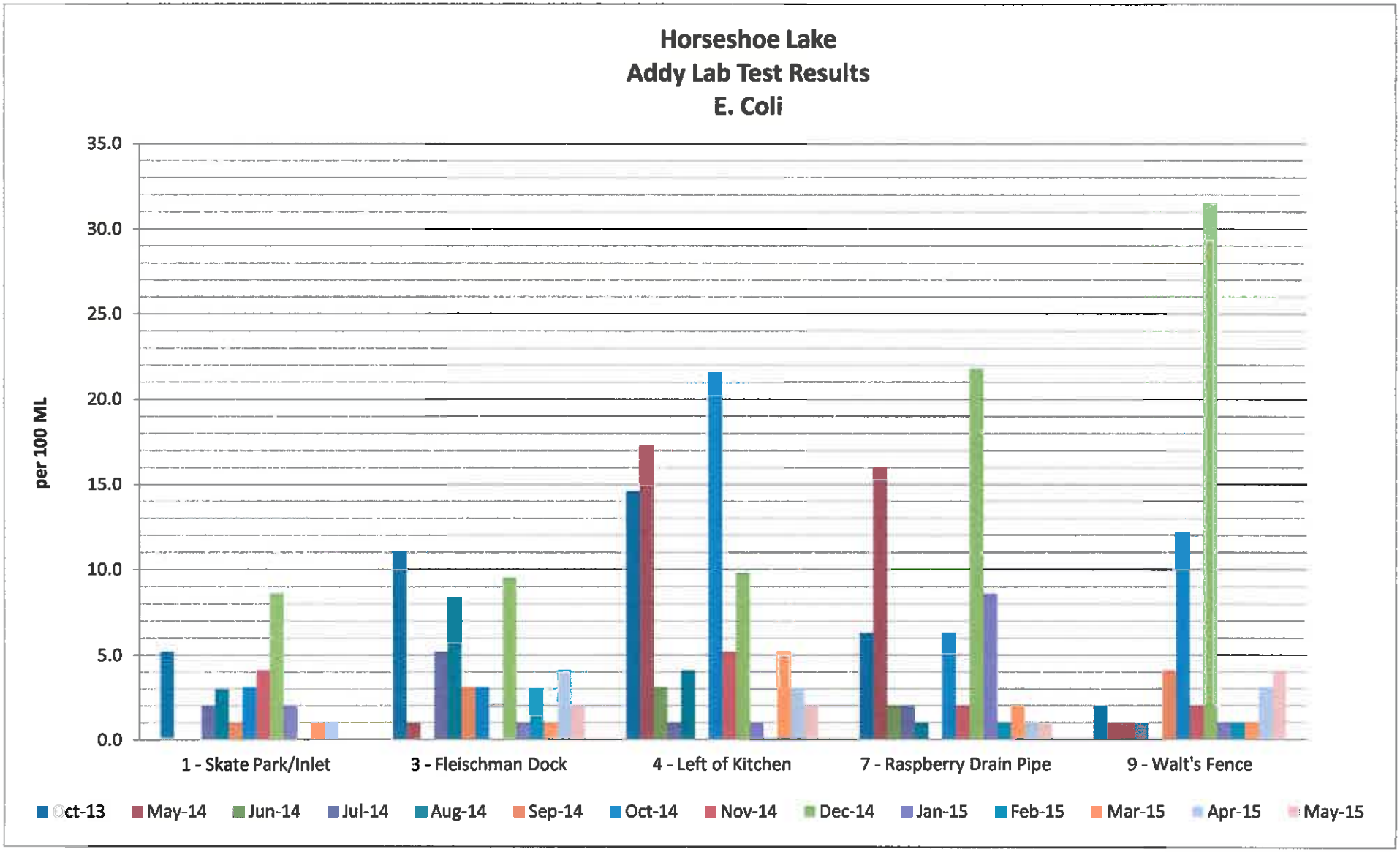
2015		Jan 1/21	Feb 2/13	Mar 3/23	Apr 4/23	May 5/15	Jun	July	Aug	Sept	Oct	Nov	Dec	Average
2	Inlet	2.000	0.000	1.000	1.000	0.000								0.800
3	Fleischman Dock	1.000	3.000	1.000	4.100	2.000								2.220
7	Left of Kitchen	1.000	0.000	5.200	3.000	2.000								2.240
10	Raspberry Drain	8.600	1.000	2.000	1.000	1.000								2.720
12	Walt's Fence	1.000	1.000	1.000	3.100	4.100								2.040

2014		Jan	Feb	Mar	Apr	May 5/8	Jun 6/4	July 7/2	Aug 8/13	Sept 9/19	Oct 10/17	Nov 11/26	Dec 12/12	Average
2	Inlet					0.000	0.000	2.000	3.000	1.000	3.100	4.100	8.600	2.725
3	Fleischman Dock					1.000	0.000	5.200	8.400	3.100	3.100	0.000	9.500	3.788
7	Left of Kitchen					17.300	3.100	1.000	4.100	0.000	21.600	5.200	9.800	7.763
10	Raspberry Drain					16.000	2.000	2.000	1.000	0.000	6.300	2.000	21.800	6.388
12	Walt's Fence					1.000	1.000	1.000	0.000	4.100	12.200	2.000	31.500	6.600

2013		Jan 1/7	Feb 2/5	Mar 3/4	Apr 4/10	May 5/14	Jun 6/3	July 7/12	Aug 8/8	Sept 9/11	Oct 10/17	Nov	Dec	Average
2	Inlet		0.000	1.000	0.000	5.200	1.000	1.000	1.000	1.000	5.200			1.711
3	Fleischman Dock		0.000	0.000	0.000	5.200	3.000	1.000	2.000	4.100	11.000			2.922
7	Left of Kitchen		3.100	2.000	1.000	1.000	1.000	1.000	6.300	9.700	14.600			4.411
10	Raspberry Drain		8.400	1.000	0.000	21.100	19.700	1.000	3.100	3.000	6.300			7.067
12	Walt's Fence		9.800	0.000	1.000	6.200	2.000	1.000	2.000	1.000	2.000			2.778

2012		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Average
2	Inlet													
3	Fleischman Dock													
7	Left of Kitchen													
10	Raspberry Drain													
12	Walt's Fence													

Averages By Year		Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Average
2015	All Locations	2.720	1.000	2.040	2.440									2.050
2014	All Locations					7.060	1.220	ND	3.300	1.640	9.260	2.660	16.240	5.911
2013	All Locations		4.260	0.800	0.400	7.740	5.340	1.000	2.880	3.760	7.820			3.778
2012	All Locations													


Horseshoe Lake
Addy Lab Test Results
E. Coli
per 100 ML
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1 - Skate Park/Inlet
3 - Fleischman Dock
4 - Left of Kitchen
7 - Raspberry Drain Pipe
9 - Walt's Fence
Oct-13
May-14
Jun-14
Jul-14
Aug-14
Sep-14
Oct-14
Nov-14
Dec-14
Jan-15
Feb-15
Mar-15
Apr-15
May-15

Rescheduled to the week of June 22nd due to weather complications.

Jody Bartkowski

From: Kelsey, Stacie L (DFW) [Stacie.Kelsey@dfw.wa.gov]
Sent: Friday, May 08, 2015 4:53 PM
To: Jody Bartkowski
Subject: Survey

Going to be doing a full on survey next Thursday/Friday. E-fishing/gill nets/fyke nets.

It will be at night. I'll let the local police know too. We will work around the houses first so that we aren't making too much noise late.

Let me know if you guys have questions!

BLUE/GREEN ALGAE TESTING

From: Bart Stepp
To: Jody Bartkowski
Subject: FW: Algal Toxin Testing
Date: Friday, April 03, 2015 11:11:10 AM
Attachments: 332-151 HAB mon for wat sys 3-5-15.pdf

Something to put in Horseshoe Lake Committee for discussion. Something to think about doing in late summer possibly.

Bart Stepp, PE
City of Woodland
Public Works Director
PO Box 9; 300 E. Scott Ave.
Woodland, WA 98674
(360) 225-7999
(360) 225-7467 (fax)
"Serving Community Needs Day and Night"

From: Cherry, Janet G (DOH) [mailto:Janet.Cherry@DOH.WA.GOV]
Sent: Friday, April 03, 2015 11:04 AM
To: (ATelecky@cityofhoquiam.com); Robert Choate; 'cwdplant@centurytel.net'; Christopher Dickinson; manager@crescentwater.com; Bart Stepp; Dale Hammrich (dale.hammrich@southbend-wa.gov); Ilwaco Water plant (water@ilwaco-wa.gov); Dave Vasilauskas; Dave Vorse (crpwd@ci.castle-rock.wa.us); Brad Page; (Duncan@townofcathlamet.com); Ian Jablonski; James Burke; Jason Baar; 'S&E Farms,LLC'; 'Kathleen Cahall'; Keith Cournyer (mortonwatertx@gmail.com); Kelly Rasmussen; Michael Spears; mikek@clallampud.net; Mike Randich (mrandich@aberdeenwa.gov); 'mstevens@cityofcamas.us'; NPS Pat Oberfranc ; Paul Reebs (preebs@kelso.gov); Ed Mullins (lcwd3@lewiscounty.com); regan@wwest.net; Justin Phelps (jtphelps20@gmail.com); Rich Eitel (reitelre@msn.com); Shirley Kook; Eric Hansen (eric@ci.stevenson.wa.us); Todd Turner (turnert@co.cowlitz.wa.us); 'Tom Vance'
Cc: Derek Zock; Walker, Teresa (DOH); Anderson, Andy (DOH); Rottell, Katherine (DOH); Zaklikowski, Anna E (DOH); Grimm, Regina (DOH); Petro, Sophia M (DOH)
Subject: Algal Toxin Testing

Dear Surface Water Operators and Owners:

Given the recent algal bloom in Lake Erie that resulted in a do-not-drink advisory for nearly 500,000 people in and around Toledo, Ohio, I wanted to let you know about a state algal toxin testing program that you may find useful. The program is funded by the state legislature, coordinated by the Washington State Department of Ecology (Ecology), and supported by the Department of Health. Analytical costs are paid by the program; however, you have to pay for mailing the sample to the laboratory for testing. Your local health jurisdiction may have sampling kits on hand.

Specific directions for collecting a sample and associated forms are available at the following website www.nwtoxicalgae.org/ReportBloom.aspx. Additional information is in the attached fact sheet. When you are ready to start the sampling process, please use the automated sample number generator at the link above. This link has additional background information about toxic algae and photos of previous blooms in the state.

Please contact Lizbeth Seebacher at Ecology with any questions about this algal toxin testing at (360) 407-6938 and via email lsee461@ecy.wa.gov. You can also contact Joan Hardy, the freshwater harmful algal bloom (HABs) contact at the Department of Health, at (360) 236-3173 or joan.hardy@doh.wa.gov for additional information.

I will be sending this information in hard copy also, but wanted you to have the electronic version so you can utilize the links. Even though some of you have intakes in the free-flowing section of the river, algae can still be present in the water if there is an impoundment upstream of your intake where algae has bloomed. Therefore, I wanted all of you to have access to the free testing. If you have questions, please call me. Thanks.

Janet Cherry, PE
Southwest Drinking Water Regional Operations
Washington State Department of Health
PO Box 47823
Olympia, WA 98504-7823
Phone: 360-236-3036
Fax: 360-664-8058

March 2015
DOH Pub. 332-151

Harmful Algal Blooms: Water Systems Guidance

Washington State Department of Health

Cyanobacteria, also called "blue-green algae," occur naturally in freshwater lakes, ponds, and river impoundments. Some blooms of cyanobacteria generate toxins called cyanotoxins. These toxins can harm pets and people who play, wade, swim, or water ski in lakes with toxic blooms. Exposure can also occur when people or pets drink water containing cyanotoxins.

Health effects from exposure to cyanotoxins may include skin rashes and lesions, vomiting, gastroenteritis, headaches, and eye, ear, and throat irritations. Cyanotoxins can cause more severe symptoms by affecting the liver or nervous systems.

Drinking Water Ban. *Toledo, Ohio, issued an urgent water advisory based on microcystins in its water source, Lake Erie (August 2014).*

Drinking Water Exposure

Although Washington has not documented many incidents of toxic cyanobacteria in surface water sources used for drinking water, this problem does occur. The following information explains how to get water samples tested for cyanotoxins if you suspect a toxic algae bloom in your source.

Freshwater Algae Control Program

The Washington State Department of Ecology's Freshwater Algae Control Program funds a laboratory to conduct toxicity tests of lake samples for the cyanotoxins microcystins and cylindrospermopsins (liver toxins) and anatoxin-a and saxitoxins (nerve toxins). The Department of Health works with local health jurisdictions to determine necessary actions, if any, based on toxicity results.

How to sample

- Use a clean glass container, dark if possible, collect at least 250 milliliters, use a secure lid.
- Generate a sample number and data sheet using NWToxicalgae.com
- Select sample site(s). You should collect samples of both raw and treated water. Many water treatment processes effectively remove cyanobacteria and some toxins.
  - Collect raw water from the intake plumbing just prior to all treatment processes.
  - Collect treated water after all treatment processes at the entry point to distribution.
- After collecting a sample, label the bottle (not the cap) with the date, time, name, system name, and sample location. Keep the sample cool.
- Deliver or mail ASAP to King County Environmental Laboratories (see address at right).

If you mail, use an overnight delivery service and ship the sample at the beginning of the week (NOT on Friday). Include ice or a frozen gel pack - if samples get too warm, the lab will have to throw them out.
Deliver samples from 8 a.m. to 5:30 p.m., M-F, excluding holidays. Driving directions are at http://dnr.metrokc.gov/wlr/locations/envlab.htm

King County Environmental Laboratory
322 West Ewing Street
Seattle, WA 98119-1507

Contacts

For Toxicology Information: Joan Hardy 360-236-3173
For Treatment Information: Sam Perry 253-395-6755

Check NWToxicalgae.com for historical information and the latest HAB data on Washington's lakes.

Preventing Exposure from Drinking Water

Many treatment processes effectively remove or destroy cyanobacteria and their toxins. Here are some ways you can protect your water system:

Reduce introduction of cyanobacteria into the treatment plant.

- Don't recycle backwash water.
- Use an alternate water source or adjust your intake to minimize the amount of cyanobacteria entering the treatment plant.

Optimize filtration to remove cyanobacteria intact - this will prevent release of toxins in cells.

- Don't use an algaecide if a bloom is present. It will break cells and release toxins.
- Minimize preoxidation prior to filtration; it can break cells. Some preoxidation may still be needed for effective treatment performance.

Reduce or remove algal toxins by oxidation and adsorption.

Powdered activated carbon (PAC), granular activated carbon (GAC), and post filtration disinfection (chlorine and ozone) can effectively remove or chemically oxidize cyanotoxins.

Microcystins

Microcystins are the most thoroughly investigated cyanobacterial toxins. Microcystin-LR is the most common of the many variants identified. Microcystins can be produced by *Anabaena, Microcystis*, *Oscillatoria* (*Planktothrix*), *Nostoc,* and *Anabaenopsis* species and from the terrestrial genus *Hapalosiphon*. More than one microcystin may be found in a particular cyanobacteria strain.

Microcystins primarily affect the liver in animals. A lethal dose of microcystins causes death in vertebrates by liver necrosis within hours or up to a few days.

Liver injury from a non-lethal dose is likely to go unnoticed. Noticeable symptoms occur only in severe cases. Other studies show that microcystin toxicity is cumulative. Researchers suspect microcystins are liver carcinogens, which could increase cancer risk to humans following continuous, low level exposure.

Anatoxin-a

Anatoxin-a is one of three neurotoxic alkaloids isolated from cyanobacteria. It is produced by various species of cyanobacteria including *Anabaena*, *Planktothrix* (*Oscillatoria*), *Aphanizomenon*, *Cylindrospermum,* and *Microcystis*. Anatoxin-a was first detected in Canada in the 1960s. Since then, cattle, elk, cat and dog poisonings have been reported.

Anatoxin degrades readily to nontoxic products in sunlight and at a high pH. In natural blooms in eutrophic lakes, anatoxin-a half-life is typically less than 24 hours.

Algal cells retain anatoxin-a in favorable growth conditions. However, cells release the toxin into the gastrointestinal tract if an animal consumes contaminated water. Therefore, pets that lick scum from their fur are at highest risk from anatoxin-a exposure. Ingestion of a sub-lethal dose of these neurotoxins leaves no chronic effects and recovery appears to be complete.

Cyanobacteria toxins found in Washington

Microcystins (liver toxins)

Anatoxin-a (nerve toxin)

Cylindrospermopsins (liver toxins)

Saxitoxins (liver toxins)

Resources

Oregon: Oregon Health Authority – Best Management Practices for Harmful Algae Blooms for Drinking Water Providers.
DOH: Blue-Green Algae and Human Health
Ecology: Freshwater Algae Control Program
EPA: Cyanobacteria and Cyanotoxins: Information for Drinking Water Systems
ASDWA: Association of State Drinking Water Administrators: Harmful Algal Blooms (HABs) website

HORSESHOE LAKE MANAGEMENT COMMITTEE
GOALS & PRIORITIES
JUNE 2015

ITEM	RANK
Testing phosphorus & e-coli (budgeted)	2.3
Milfoil monitoring & treatment (carp, chemical, etc.)	3.0 *
Work with WDFW (testing, carp, fish health, plant type, etc.)	3.0 *
Pump/screen repairs by WSDOT	3.3
Testing nitrates (not budgeted - $25 sample/$125 month)	5.3
Testing the Lewis River	6.3
Erosion control (shoreline rebuild at the kitchen area)	7.7
Pollution control (runoff, storm drainage, etc.)	8.3
Buoy replacement (public works will remove & install)	8.7
Grant applications	9.7
Public involvement & education	11.0
Septic tank monitoring (Clark & Cowlitz Counties)	11.3
Signage (consolidation, replacement, & new)	11.7
Geese/cormorant monitoring	13.3

* Tie for 2nd/3rd place.

NOTE: RESULTS BASED ON THREE RESPONSES!

Purpose: Effectively focus and direct Committee efforts based upon which issues are deemed to be the most pressing and/or important. Eliminate discussing the same thing time and again with little movement toward resolution.