Woodinville Water District's Coliform Monitoring Plan

April 2017

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SECTION I

REVISED TOTAL COLIFORM RULE (RTCR)

1.0 General Information

On April 1, 2016 the State of Washington implemented the EPA Revised Total Coliform Rule (RTCR). RTCR establishes a maximum contaminant level (MCL) for *E. coli* and uses *E. coli* and total coliform to initiate a "find and fix" approach to address fecal contamination that could enter into the distribution system. It requires public water systems (PWS) to perform assessments to identify sanitary defects and subsequently take action to correct them. The RTCR applies to all PWS's. Implementation of the RTCR will result in a decrease in the pathways by which fecal contamination can enter the drinking water distribution system. Reduction in fecal contamination should reduce the potential risk from all waterborne pathogens including bacteria, viruses, parasitic protozoa, and their associated illnesses.

The Woodinville Water District (WWD) is one of approximately 27 separate water systems that purchase their water from Seattle Public Utilities (SPU). SPU and its wholesale customers have been participating in a regional, DOH approved, coliform monitoring program since 1972. As part of the regional program, wholesale customers are responsible installing and maintaining designated coliform monitoring sample stands, while SPU collects the routine monthly samples, WWD is responsible to collect any repeat sampling. With WWD's population of 48,400; **50 routine total coliform sample are required to be collected each month**.

12 Routine sample sites represent the varying conditions that exist throughout the distribution system. With these properly located sites, the District can identify water quality conditions in the

distribution system and identify problems before they exist. Sample sites reflect the complexity of the system and focus on areas of concern, such as low-pressure zones, cross-connections hazards, dead end lines, deteriorating water mains, areas susceptible to stagnation due to low water use, or other questionable conditions. The samples are collected at regular intervals throughout the month. The minimum number of required routine samples depends on the population the water system serves each month. The population for each month comes from the population reported on you *Water Facilities Inventory* form. The general coliform monitoring requirements are in Table 2 of WAC 246-290-300.

WWD has dedicated sample stands for routine coliform sampling and has dedicated meter sample setters upstream and downstream of each sample site location for repeat sampling.

1.1 System Information

Plan Date: April 2017 **Water System Name:** Woodinville Water District

System I.D. Number: 41600Y **County:** King

Name of Preparer: Tim Cantwell **Position:** Water Quality Coordinator **Daytime Phone:** 425-487-4125

Sources: #S02 - Tolt Pipeline and backed up by #S01 - Cedar Pipeline

Number of Routine Sample Required each Month: 50

Number of Sample Sites in Distribution System: 12

Storage:

WWD's distribution system is comprised of 8 reservoirs with approximately 14.8 MG storage, over 295 miles of water supply and distribution mains, 2587 hydrants and 45 pressure reducing stations. There are no lead service lines within the distribution system and very few copper lines. 150,000 feet of Asbestos/Cement, 81,000 feet of cast iron, and 1,310,000 ductile iron water mains.

1.2 Pressure Zones

Water Facilities					
Pressure Zones	**Air Release**	**Taps**	**Connections**	***Est. Population x 3.3**	**Coliform Sample Stands**
260 West	11		1102	3,637	104-1, 104-12
305 West			74	244	
420 West			88	264	
420 West (N)	2		131	432	
510 West	26	5	2829	9,335	104-3
350 Central	1		171	564	104-6
420 Central	19	1	1850	6,105	104-4
420 Central (NE)			7	23	
420 Central (NW)	19		1120	3,696	
420 Central (S)	3		634	2,092	104-13
570 Central	42	2	3404	11,233	104-2, 104-7, 104-9
570 Central (E)	11		527	1,739	104-8
585 Central			61	201	
650 Central	17	2	542	1,788	104-11
460 East	2		146	481	
485 East			168	554	
570 East			36	118	
570 East (N/S)	14		674	2,135	104-10 (DBP only)
670 East	26	1	807	2,663	104-5
770 East	1		26	85	
Total	**194**	**11**	**14397**	**48,400**	

***Calculated by WWD population divided by connections**

1.3 Reservoir Locations

Tank Name	Install Year	Address	Capacity (Million Gallons)	Depth (Feet)	Diameter (Feet)	Overflow Elevation	Pressure Zone
Sammamish Reservoir	1991	15004 132nd Avenue NE	2.8	34.50	115	300	510 West
Kingsgate Reservoir	1972	13006 NE 144th Place	1.13	100	44	510	510 West

Wellington Reservoir and Flow Control Vault	1977	15600 NE 203rd Street	1.4	78	56	570	570 Central
James C. Bard Memorial Reservoir	1993	22636 NE 169th Street	1.8	20	125	575	670 East
Aspenwood Reservoir	1998	20433 223rd Avenue NE	1.1	116.5	40	670	670 East
Hollywood Reservoir	1978	15546 168th Avenue NE	2.4	27	125	570	650 Central
South Hollywood Reservoir	1985	14368 174th Avenue NE	1.74	88	58	579	570 Central
Brookside Reservoir	1979	15305 181st Ave NE	2.5	18	154	420	570 Central

Reservoirs are cleaned on a 5 Year schedule and inspected weekly

1.5 Tap Locations

Tap #'s

53	158th Ave NE (Wellington)
57	176th Ave NE (South Hollywood Reservoir)
76	124th Ave NE (Station 1)
77	132nd Ave NE & NE 140th St (Station 16)
78	232nd Ave NE (Ringhill)
79	Avondale Road (Avondale Flow Vault)
80	168th Ave NE (Hollywood Reservoir)
123 & 167	132nd Ave NE (Sammamish Reservoir)
125	180th PL NE (Brookside Reservoir)
195	132nd Ave NE & 144th (Kingsgate Reservoir)

1.6 Woodinville Water District Main Type

Water Main Material Length (ft.) By Pressure Zone					
Pressure Zone	**AC**	**CI**	**DI**	**HDPE**	**PVC**
260 West	25,600	6,700	165,500	0	900
305 West	0	0	2,700	0	0
420 West	0	0	3,900	0	0
420 West (N)	0	0	7,300	600	0
510 West	18,000	42,600	109,400	0	300
350 Central	0	0	23,900	0	0
420 Central	36,600	800	159,400	0	200
420 Central (NE)	0	0	3,700	0	0
420 Central (NW)	4,400	3,500	107,500	300	0
420 Central (S)	4,300	0	63,100	0	0
570 Central	47,100	18,500	293,500	600	0
570 Central (E)	0	9,100	45,200	0	0
585 Central	1,100	0	8,000	0	0
650 Central	9,500	0	66,200	300	0
460 East	0	0	18,600	0	0
485 East	3,200	0	20,800	0	0
570 East	0	0	6,500	0	0
570 East (N/S)	0	0	98,000	0	800
670 East	800	0	113,300	200	100
770 East	0	0	4,400	0	0
Totals	**150,600**	**81,200**	**1,320,900**	**2,000**	**2,300**

1.7 Pressure Reducing Valve

Facility ID	Diameter	Elevation	Supply Pressure Zone	Receive Pressure Zone
PRV 1	6	318.3	TT-76	510 West
PRV 2	6	310.7	510 West	420 West (N)
PRV 3	6	183.9	420 West (N)	260 West
PRV 4	6	185	420 Central (NW)	260 West
PRV 5	6	451	650 Central	570 Central
PRV 6	6	482.5	650 Central	570 Central
PRV 7	6	465	650 Central	585 Central
PRV 8	6	320.9	570 Central	420 Central (NW)
PRV 9	6	447.7	670 East	570 East (N/S)
PRV 10	6	337.8	570 East (N/S)	485 East

PRV 11	12	199	TT-79	570 Central (E)
PRV 12	6	313.7	570 Central	420 Central
PRV 13	8	298.8	570 Central	420 Central (NW)
PRV 14	8	298.8	420 Central (NW)	260 West
PRV 15	8	296	570 Cnetral	420 Central
PRV 16	6	381	TT-77	510 West
PRV 17	6	144.6	420 Central (NW)	260 West
PRV 18	6	210.7	420 Central (NW)	260 Central
PRV 19	8	285.9	NUD	510 West
PRV 21	6	345	570 Central (E)	420 Central (NE)
PRV 22	6	342.6	570 Central	420 Central (S)
PRV 23	6	328.8	570 Central	420 Central (S)
PRV 24	6	303.5	570 Central	420 Central (NW)
PRV 25	8	449.6	670 East	570 East (N/S)
PRV 26	6	474.3	TT-53 and 650 Central	570 Central
PRV 27	8	342.3	570 Central	420 Central (NW)
PRV 28	6	168.8	420 Central (NW)	260 West
PRV 29	6	324.9	570 Central	420 Central (S)
PRV 30	6	325.2	570 East (N/S)	420 Central
PRV 31	6	361.5	570 Central	420 Central (S)
PRV 32	6	162.2	420 Central	350 Central
PRV 33	6	438.5	TT-53	570 Central
PRV 34	6	503.2	TT-53	650 Central
PRV 35	6	383.1	TT-53	570 Central
PRV 36	6	267.9	510 West	420 West
PRV 37	6	222	485 East	420 Central
PRV 38	6	135.6	420 Central	350 Central
PRV 39	8	448.8	670 East	570 East (N/S)
PRV 40	6	277.6	TT-79	420 Central
PRV 41	12	494.8	TT-79	570 Central (E)
PRV 42	6	438.2	670 East	570 East
PRV 44	6	210.2	510 West	305 West
PRV 45	6	338	570 East (N/S)	460 East

1.8 Routine Sample Stand Locations

Sample Stand #	Location	Area
104-1	136 Ave NE & NE 190 PL	Emerald Lake
104-2	NE 195 ST & 168 Ave NE	Leota Lake
104-3	132 Ave NE & NE 132	Totem Lake
104-4	172 & Mink Rd NE	Ringhill
104-5	228 Ave NE & NE 150 ST	Ringhill
104-6	198 Dr NE & NE 128	Tuscany
104-7	NE 153 ST & 158 Ave NE	Hollywood Hill
104-8	19117 194 AVE NE	Reintree
104-9	NE 142 ST & 180 Ave NE	English Hill
*104-10	19500 216th Ave NE	Aspenwood
104-11	16525 NE 160th St	Hollywood Hill
104-12	17402 135th Ave NE	Downtown
104-13	16100 NE 135th St	Grousemont

*Note sample stand 104-10 is for DBP compliance only.

See Section II for Repeat sampling sites.

1.9 Sample Stand Water Source

104-1
Sample stand 104-1 is located in the 260 West zone; the main feeds are from Sammamish Reservoir and Wellington Reservoir through PRVs #13 & #14.

104-2
Sample stand 104-2 is located in the 570 Central (North section) zone; the main feed is Wellington Reservoir.

104-3
Sample stand 104-3 is located in the 510 West (South section) zone; the main feeds are the Kingsgate Reservoir and PRV's #1 & #16.

104-4
Sample stand 104-4 is located in the 420 Central zone; the main feed is Brookside Reservoir & PRV #40 from Avondale
Tap.

104-5
Sample stand 104-5 is located in the 670 East zone; the main feed is from Ringhill Pump Station & Aspenwood Reservoir.

104-6
Sample stand 104-6 is located in the 350 Central zone; the main feed is from Ringhill Pump Station & Bard Reservoir.

104-7
Sample stand 104-7 is located in the 570 Central zone; the main feed is Hollywood Reservoir through PRV #26.

104-8
Sample stand 104-8 is located in the 570 Central (Eastern section) zone; the main feed is PRV #41 from the Avondale tap.

104-9
Sample stand 104-9 is located in the 570 Central (South portion) zone; the main feed is from South Hollywood Reservoir.

104-10
Sample stand 104-10 is located in the 570 East/North zone; the main feed is PRV #39.

104-11
Sample stand 104-11 is located in the 650 Central zone; the main feed is Hollywood Reservoir.

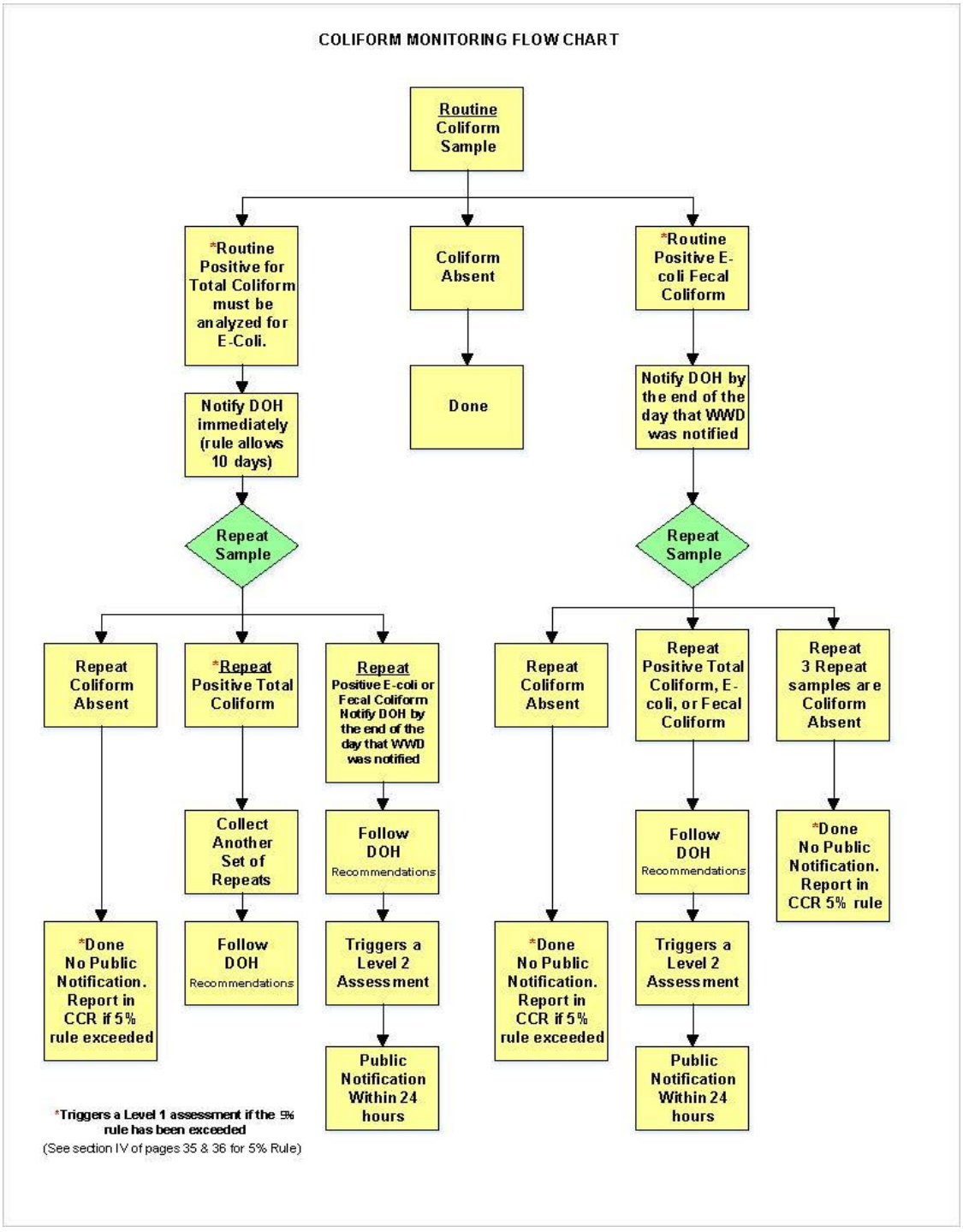
104-12
Sample stand 104-12 is located in the 260 West zone; the main feeds are Sammamish Reservoir and Wellington Reservoir through PRV's #13 & #14.

104-13
Sample stand 104-13 is located in the 420 Central South zone; the main feed is PRV #29 from Hollywood Reservoir.

SECTION II

COLIFORM SAMPLING REQUIREMENTS

2.0 Coliform Monitoring Flow Chart



2.1 Laboratory Information

Lab Name: Seattle Public Utility Water Quality Laboratory
Address: 800 S Stacy St Seattle, WA 98134
Phone #'s: Front Desk 206-684-7834, if front desk is unavailable leave voice mail,
After hours emergency 206-386-1800
Weekend/Holiday samples contact Microbiology 206-684-7407

Contacts: Wylie Harper Lab Director 206-684-7880
Lynn Kirby Water Quality Engineer 206-684-0216
Lynn.kirby@seattle.gov
Hours Monday-Friday 8 am-4:30 pm

Lab Name: AM Test Laboratories
Address: 13600 NE 126th PL Suite C Kirkland, WA 98034
Phone #'s: 425-820-0245, after hours leave message.
Email customerservice@amtestlab.com
Hours Monday-Friday 7am-5pm

2.2 Routine Coliform Sampling

(See Section III for Coliform Sampling Procedures)

WWD with the population of 48,400 is required to collect **50 total coliform sample each month** (see 2.6 for routine and repeat sample sites)**.** SPU collects the routine samples from 12 sample stands located throughout the WWD distribution system. WWD is responsible to collect any repeat sampling.

- Each total coliform-positive (TC+) routine sample must be tested for the presence of *E. coli.*
- If any TC+ sample is also *E. coli*-positive (EC+), then the EC+ sample result must be reported to the state by the end of the day that the District is notified.
- If any routine sample is TC+ repeat samples are required. (Report the TC+ to the State within 10 days)

(SEE SAMPLING FLOW CHART (2.0) FOR SAMPLING REQUIREMENTS)

2.3 Routine Sampling Schedule

2017 New Routes - Week 1						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
11NE	**12NE**	**13NE**	**14NE**			
104-4, 104-7, 104-9	**104-3, 104-2, 104-8**	**104-11, 104-13, 104-4**	**104-1, 104-5, 104-6**			
						12
2016 New Routes - Week 2						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		23NE	**24NE**	**25NE**	**26NE**	
		104-2, 104-1, 104-9	**104-7, 104-12, 104-13, 104-5**	**104-3, 104-6, 104-4. 104-8**	**104-1, 104-11**	
						13
2016 New Routes - Week 3						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31NE	**32NE**	**33NE**	**34NE**			
104-6, 104-13, 104-7	**104-8, 104-11, 104-2,**	**104-1, 104-12, 104-5**	**104-3, 104-4, 104-9**			
						12
2016 New Routes - Week 4						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		43NE	**44NE**	**45NE**	**46NE**	
		104-2, 104-4, 104-6, 104-11	**104-12, 104-8, 104-3, 104-13**	**104-9, 104-7, 104-2**	**104-1, 104-5**	
						13

Total Samples 50

2.4 Repeat Coliform Sampling

(See Section III for Coliform Sampling Procedures)

WWD is responsible to collect any repeat samples once notified there is a TC+. You must take a total of **THREE REPEAT** samples within **24 hours** of learning of a TC+ routine sample results, at least 3 repeat samples must be collected and analyzed for total coliform.

Repeat Sampling Requirements. You must take a total of three repeat samples for each unsatisfactory routine sample. The samples must come from the following locations:

- One repeat sample must be collected from the same tap as the original TC+ routine sample.
- One repeat sample must be collected from within five active service connections upstream from the original TC+ routine sample location.
- One repeat sample must be collected from within five active service connections downstream from the original TC+ routine sample location.
- District may use alternative sampling location in lieu of the requirement to collect at least one repeat sample upstream and one downstream of the original sampling site. **You must have Department of Health approval for the alternative location.**

If one or more repeat samples are TC+:

- The TC+ sample must be analyzed for the presence of *E. coli.*
- If any repeat TC+ sample is also EC+, then the EC+ sample results must be reported to the state by the end of the day that the District is notified.
- The District must collect another set of repeat samples, unless an assessment has been triggered and the District has notified the state.
  (See sampling flow chart, section 2.0, page 13 for sampling requirements)

2.5 Invalid Samples

The state can invalidate a positive total coliform sample under three conditions:

1. The laboratory determines that improper sample analysis caused the total coliform-positive result,
2. The state determines that the positive coliform sample resulted from a domestic or other non-distribution system plumbing problem (the state cannot invalidate a sample on the basis of repeat sample results unless all repeat samples collected at the same tap as the original total coliform-positive sample are also total coliform-positive, and all repeat samples collected within five service connections of the original tap are total coliform-negative), or
3. The state has substantial grounds to believe that a total coliform positive result is due to a circumstance or condition which does not reflect water quality in the distribution system. In this case, all required samples are still required.

A laboratory must invalidate a total coliform sample (unless total coliforms are detected) if the sample produces a turbid culture in the absence of gas production, using an analytical method where gas formation is examined produces turbid culture in the absence of an acid reaction in the presences-absence coliform test, or exhibits confluent growth or produces colonies Too Numerous To Count. If this type of invalidation occurs another routine sample collected from the same location as the original sample needs to be collected within 24-hours of notification from the lab of the invalidated sample.

2.6 Routine and Repeat Coliform Sample Locations

SAMPLE STAND 104-1

First five connections to the West
*Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
*1	18921 136 AVE NE	45515411
2	18913 136 AVE NE	45510854
3	18825 136 AVE NE	45516909
4	18807 136 AVE NE	45510852
5	18713 136 AVE NE	45521031

Sample Stand 104-1
Emerald Lake
18921 136th Ave NE
Woodinville, WA 98072

First five connections to the North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
1	18920 136 AVE NE	45521346
2	19008 136 AVE NE	45521295
*3	13540 NE 190 PL	45516672
4	19020 136 AVE NE	45521343
5	19106 136th AVE NE	45510859

SAMPLE STAND 104-2

First five connections West
*Recommended sample repeat location with sample stand setter

WEST	LOCATION	METER#
1	16654 NE 195 ST	45517115
*2	16628 NE 195 ST	45512676
3	19301 168 AVE NE	45517591
4	16420 NE 195 ST	45512642
5	19540 166 AVE NE	45515307

Sample Stand 104-2
Lake Leota
16804 NE 195th St
Woodinville, WA 98270

First five connections East
*Recommended sample repeat locations with sample stand setter

EAST	LOCATION	METER#
1	16812 NE 195 ST	45520441
*2	16824 NE 195 ST	45516844
3	16844 NE 195 ST	45513676
4	19507 170 AVE NE	45521191
5	17022 NE 195 ST	45520819

SAMPLE STAND 104-3

First five connections to the South
*Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
*1	13010 132 AVE NE	45516826
2	13008 132 AVE NE	45508055
3	13002 132 AVE NE	45508054
4	13000 132 AVE NE	45508050
5	12980 132 AVE NE	45508051

Sample Stand 104-3
Totem Lake
13008 132nd Ave NE
Kirkland, WA 98034

First five connections North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
1	13101 132 AVE NE	45515617
2	13116 NE 132 ST	45510459
3	13129 NE 133 Ct	45508744
4	13302 132 AVE NE	45515442
*5	13304 132 AVE NE	45515443

SAMPLE STAND 104-4

First five connections North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
1	17009 MINK RD NE	45518070
2	17023 MINK RD NE	45518069
*3	17203 MINK RD NE	45518067
4	17109 205 AVE NE	45513650
5	17354 MINK RD NE	46953878

Sample Stand 104-4
Mink Farm Road
17000 Mink Road
Woodinville, WA 98072

First five connections South
*Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
1	16915 MINK RD NE	45518072
*2	20521 NE 169 PL	45518071
3	20505 NE 169 PL	45518115
4	16813 MINK RD NE	45518117
5	16805 MINK RD NE	45513648

SAMPLE STAND 104-5

First five connections West
*Recommended repeat sample location with sample stand setter

WEST	LOCATION	METER#
1	22729 NE 150 ST	45518122
2	22726 NE 150 ST	45518156
*3	22711 NE 150 ST	45514797
4	15028 227 AVE NE	45518154
5	22627 NE 150 ST	45514796

Sample Stand 104-5
Ring Hill
22817 NE 150th St
Woodinville, WA 98072

First five connections East
* Recommended repeat sample location with sample stand setter

EAST	LOCATION	METER#
*1	22817 NE 150 ST	45517125
2	22828 NE 150 ST	45507662
3	22917 NE 150 ST	45517122
4	22916 NE 150 ST	45521068
5	22932 NE 150 ST	45521029

SAMPLE STAND 104-6

First five connections North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
1	13300 198 DR NE	45507746
*2	19654 NE 133 ST	45514849
3	19660 NE 133 ST	45518099
4	19815 NE 133 ST	45508610
5	19845 NE 133 ST	45508608

Sample Stand 104-6
Tuscany
12600 198th Dr NE
Woodinville, WA 98072

First five connections South
* Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
1	12822 198 DR NE	45508526
*2	12806 198 DR NE	45516306
3	12714 198 DR NE	45508525
4	12702 198 DR NE	45508527
5	12705 198 DR NE	45508558

SAMPLE STAND 104-7

First five connections East
*Recommended repeat sample location with sample stand setter

EAST	LOCATION	METER#
1	15806 NE 153 ST	45511163
2	15809 NE 153 ST	45520932
3	15823 NE 153 ST	45520929
*4	15820 NE 153 ST	45511162
5	15905 NE 153 ST	45514943

Sample Stand 104-7
Hollywood Hills
15806 NE 153rd ST
Woodinville, WA 98072

First five connections West
*Recommended repeat sample location with sample stand setter

WEST	LOCATION	METER#
1	14826 156 PL NE	46407134
2	15727 NE 153 ST	46407154
*3	15712 NE 153 ST	45508762
4	15707 NE 153 ST	45512901
5	15625 NE 153 ST	45512900

SAMPLE STAND 104-8

First five connections North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
1	19205 194 AVE NE	45521596
2	19215 194 AVE NE	45521595
*3	19204 194 AVE NE	45518341
4	19324 194 AVE NE	45518337
5	19319 194 AVE NE	45521582

Sample Stand 104-8
Reintree
19200 194th Ave NE
Woodinville, WA 98072

First five connections South
*Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
1	19117 194 AVE NE	45521597
2	19103 194 AVE NE	45521598
3	19086 194 AVE NE	45518338
*4	19016 194 AVE NE	45518340
5	19025 194 AVE NE	45521599

SAMPLE STAND 104-9

First five connections South
*Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
1	14128 180 AVE NE	45519001
*2	14114 180 AVE NE	45519002
3	14117 180 AVE NE	45518698
4	14107 180 AVE NE	45508616
5	14036 180 AVE NE	45518997

Sample Stand 104-9
English Hills
14200 180th Ave NE
Redmond, WA 98052

First five connections North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
*1	14200 180 AVE NE	45519003
2	14212 180 AVE NE	45519004
3	14231 180 AVE NE	45514863
4	14238 180 AVE NE	45519005
5	14246 180 AVE NE	45519006

SAMPLE STAND 104-11

First five connections to the West
*Recommended repeat sample location with sample stand setter

WEST	LOCATION	METER#
*1	16725 NE 160 ST	45509745
2	16104 167 AVE NE	45521817
3	16109 167 AVE NE	45521818
4	16619 NE 160 ST	45521803
5	16528 NE 160 ST	45511815

Sample Stand 104-11
Hollywood Hill
16725 NE 160 ST
Woodinville, WA 98072

First five connections to the South
*Recommended repeat sample location with sample stand setter

SOUTH	LOCATION	METER#
*1	15825 168 AVE NE	45509746
2	15824 168 AVE NE	45511887
3	15805 168 AVE NE	45509747
4	15812 168 AVE NE	45511886
5	15724 168 AVE NE	45511885

SAMPLE STAND 104-12

First five connections to the West
*Recommended repeat sample location with sample stand setter

WEST	LOCATION	METER#
1	13377 NE 173 ST	15592857
2	17120 133 AVE NE	15592858
*3	13311 NE 173 AVE	45522004
4	13311 NE 173 AVE	15592856
5	17143 133 AVE NE	45513715

Sample Stand 104-12
Downtown
17402 135 AVE NE
Woodinville, WA 98072

First five connections to the North
*Recommended repeat sample location with sample stand setter

NORTH	LOCATION	METER#
*1	17320 135 AVE NE	45521857
2	17330 135 AVE NE	45513585
3	17331 135 AVE NE	45513560
4	17401 135 AVE NE	45513555
5	13505 NE 175 ST	45513557

SAMPLE STAND 104-13

First five connections to the West
*Recommended repeat sample location with sample stand setter

WEST	LOCATION	METER#
*1	13428 160th AVE NE	45515164
2	16020 NE 135 ST	45514992
3	15926 NE 135 ST	45515157
4	15916 NE 135 ST	45514983
5	15921 NE 135 ST	45515341

Sample Stand 104-13
Grousemont
16100 NE 135 ST
Woodinville, WA 98072

First five connections to the East
*Recommended repeat sample location with sample stand setter

EAST	LOCATION	METER#
1	16219 NE 135 ST	47090163
2	16301 NE 135 ST	47090180
*3	16302 NE 135 ST	45515248
4	16325 NE 135 ST	45516922
5	16324 NE 135 ST	45510569

SECTION III

COLIFORM SAMPLING PROCEDURES

3.0 Coliform Sample Site Evaluation

Sample collectors need to evaluate each sample site every time, before a sample is collected. The collector is authorized to choose NOT to sample for a scheduled site if the evaluation reveals current or recent unusual events at the sample site. Unusual events include construction at the facility where the sample site is located, modification to the plumbing at the sample site, or an activity at the sample site that may have compromised the sanitary integrity of the sample faucet. The sample collector has the knowledge and authority to choose a different site when circumstances make the scheduled site unsuitable to give a sample that represents the distribution system. Remind sample collectors to measure the free chlorine residual when they collect each sample. Collectors should note the measurement on the sample form submitted to the lab. (Section X, form 10.2)

3.1 Supplies Needed: (Located in Orange Bucket in Water Quality cabinet building D)

(1) Sampling rod (in WQ cabinet)
(2) 100 mL bacteriological bottle for coliform repeat sampling, at least four bottles (in orange bucket).
(3) Chlorine test kit (in WQ cabinet)
(4) Chain of custody record (in orange bucket)
(5) Waterproof pen (in orange bucket)
(6) Map of locations or addresses of sample stand (in SOP handbook, on orange bucket in WQ cabinet).
(7) Keys to sample stand (see 3.2)

(8) Thermometer and watch (in Cl2 kit, in WQ cabinet)

(9) Cooler with ice (cooler in WQ cabinet, ice in freezer)

(10)Disinfectant (chlorine 5% solution, alcohol, flame), (in WQ cabinet)

(11)Clean paper towels or wipes (in orange bucket)

(12)Sterile gloves (in orange bucket)

3.2 Location of Sample Stand Keys;

There are three copies: # 8CA5X

- Water Quality Coordinator's Office (Tim Cantwell top right desk drawer)
- Steve Brown
- In key vault (Joe's Office)

3.3 Sample Location Selection:

Three repeat samples must be collected from the area where the coliform positive/*E. coli* present sample was taken within 24 hours after confirmation by SPU laboratory that a routine sample tested positive for coliform/*E. coli*. Repeat samples include three samples as follows: (See section II for repeat sample locations)

1. One sample must be collected from the same sample site that the original coliform presence results came from.
2. *One sample must be taken within 5 service connections upstream of the original, positive *routine sample*
3. *One sample must be taken within 5 service connections downstream of the original, positive coliform *routine sample.*

*Use sample stand setter listed in section II, 2.6 for repeat samples locations.

3.4 Flushing Considerations:

Recent activities within the area of the bad sample shall be researched to determine if a cross-connection or other source caused the positive sample. Do not assume source water is contaminated until all other possibilities have been eliminated. Chlorine

samples should be taken, if the residual is below .30 ppm appropriate measure should be taken to boost the chlorine levels in the system. A decision on whether the area will be flushed or not needs to be made. When flushing, lightly flush the area in order to not break up biofilm.

3.5 Location Preparation:

Continuous Flowing Sample Stand:

1. Water should be flowing, do not adjust flow.
2. Disinfect sample port one of three ways:
    a Spray with chlorine solution (5 to 1 solution of water to bleach) (recommended)
    b Spray with alcohol
    c Heat (flame/ torch) unless the tap would be damaged
3. Let water run for several minutes
4. Collect sample (see 3.6)
5. Turn flow up after collecting sample and flush for 1 minute; turn flow back down but leave running.

Non Flowing Sample Stand:

1. Open valve to run water, flush water for 5 minutes.
2. Disinfect sampling port one of three ways:
    a Spray with chlorine solution on the end of sample pipe (5 to 1 solution of water to bleach) (recommended)
    b Spray with alcohol
    c Heat (flame/ torch) unless the tap would be damaged
3. Let water run for several minutes
4. Collect sample (see 3.6)
5. Turn off valve when done, use pump to pump water out of piping when done.

Sample Stand Setter:

1. Spray male and female connections with the chlorine solution then connect sampling rod to sample stand setter.
2. Turn on valve and run water for 5 minutes.
3. Disinfect sample port one of three ways:
   a Spray with chlorine solution (5 to 1 solution of water to bleach) (recommended)
   b Spray with alcohol
   c Heat (flame/ torch) unless the tap would be damaged
4. Flush sampling rod for several minutes.
5. Collect sample (see 3.6)

Be careful not to damage property with water.

Home or other non-setter location:

1. For homes, flush hard at first, and then return flow to steady stream.
2. Disinfect sample port one of three ways:
   a Spray with chlorine solution (5 to 1 solution of water to bleach) (recommended)
   b Spray with alcohol
   c Heat (flame/ torch) unless the tap would be damaged
3. Let water run for several minutes
4. Collect sample (see 3.6)

Note: When taking a sample from locations other than sample stand setters avoid:

1. Drinking fountains
2. Janitor sinks
3. Hoses, aerators, filters, screens
4. Fire hydrants
5. Swivel faucets and faucets with single lever
6. Leaking or spraying faucets

7. Frost free hose bibs
8. Flooded valve vaults and meter boxes
9. Spray sample collection tap with chlorine solution
10. Let water run for a few minutes
11. Collect sample (see 3.6)

3.6 Coliform Sampling Collection Procedures/SOP:

(Sample Collection for 100 mL Bac-T Bottles)

See: Coliform Sampling Video and Power Point links;

G:\Operations\WATER QUALITY - CCS FOLDER\WATER QUALITY\Coliform Monitoring

G:\Operations\WATER QUALITY - CCS FOLDER\WATER QUALITY\Coliform Monitoring\Coliform Video

1. Measure chlorine residual (required) and temperature (optional), record data. Note: If a low chlorine residual (below .30 ppm) is found, additional flushing and other appropriate measures to boost the chlorine levels in the system shall be undertaken.
2. Make sure you have a cooler with ice packs on hand. Bac-T bottles are the small 100mL clear plastic bottles with a white lid. Check the condition of the bottle seal. If the seal is already broken, do not use that bottle.
3. Put on sterile gloves. When you are ready to collect a sample, hold the bottle at the base, remove the seal and unscrew the cap. Hold the cap so that the threads are facing downwards. Do not set the sample cap down and do not allow your fingers to touch the inner surface of the cap.
4. Do not rinse the bottle. The white powder inside the bottle is sodium thiosulfate for dechlorination of the sample.
5. Immediately fill the sample bottle up to the shoulder leaving ample air space (there is a 100 mL fill line). Avoid splashing while filling the bottle and do not overflow the bottle. If you do overfill the bottle, get a new sample bottle and try again. <u>At no point during the sampling should the sample bottle or lid touch the sample tap or any other surface.</u>