

REPORTING REQUIREMENTS



Overview

- How to fill out the monthly SWTR operating reports
 - How often to record turbidities
 - Highest turbidity of the day
 - Peak hourly demand flow
 - CT calculations
- Common mistakes
- What to do when things go wrong



How to fill out the monthly SWTR reports

- There are 4 forms:
 - Conventional/Direct
 - Slow Sand / Membrane / DE / Unfiltered
 - Cartridge
 - UV (if used for *Giardia* credit)
- Must use correct form because each has questions that must be answered that are specific to the filtration type



How to fill out the monthly SWTR reports

Forms have places to report:

- Turbidity
- Peak Hourly Flow
- CT calculations
- Log inactivation requirement (0.5 or 1.0-log, CF/DF only)



Turbidity

- Record how often?
 - Conventional and direct: every 4 hours
 - SSF, DE & Alternative: daily
- Report CFE turbidities
- Answer questions about IFEs
- Highest turbidity of the day (can be between the 4 hour readings)



OHA - Drinking Water Program – Turbidity Monitoring Report Form County: _____
 Conventional or Direct Filtration

System Name:	ID #:	WTP:	Month/Year:				
DAY	12 AM [NTU]	4 AM [NTU]	8 AM [NTU]	NOON [NTU]	4 PM [NTU]	8 PM [NTU]	Highest Reading of the Day [NTU]
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							

OHA - Drinking Water Program – Turbidity Monitoring Report Form County: _____
 Conventional or Direct Filtration


System Name: _____ ID #: _____ WTP: _____ Month/Year: _____

DAY	12 AM [NTU]	4 AM [NTU]	8 AM [NTU]	NOON [NTU]	4 PM [NTU]	8 PM [NTU]	Highest Reading of the Day [NTU]
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							

Conventional or Direct Filtration	Monthly Summary (Answer Yes or No)	
95% of the 4-hour turbidity readings ≤ 0.3 NTU? Yes / No	CT's met everyday? (see back) Yes / No	All Cl ₂ residuals at entry point ≥ 0.2 mg/l? Yes / No
All the 4-hour turbidity readings ≤ 1 NTU? Yes / No		
All turbidity readings < IFE ¹ triggers? Yes / No		
Notes:	PRINTED NAME: _____	
	SIGNATURE: _____ DATE: _____	
	PHONE #: () _____ CERT #: _____	


Including continuous turbidity data, if applicable, for optimization recording purposes. Compliance values in column "12 AM" through "8 PM" may not correspond to continuous readings' maximum. IFE = Indiv's Filter Eff. (OAR 333-081-0040)(1)(g)(B)(C))

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Peak hourly flow

- Report the Peak Hourly Flow
 - greatest volume of water passing through the system during any one hour in a consecutive 24 hr period
- Not the same as Peak Instantaneous Flow
- Report demand flow: flow leaving the clearwell, not plant flow (in most cases)




Method for determining peak hourly demand flow

- On a daily basis, use the best available operational data to identify the hour within the 24 hr period that had the highest demand flow
- For the hour of highest demand flow:
 - Calculate the average flow rate within the one hour period (i.e., add the flow rates and divide by the number of data points).
 - Use as many data points as possible, preferably no less than four data points taken at 15 minute intervals



Method for determining peak hourly demand flow (continued)

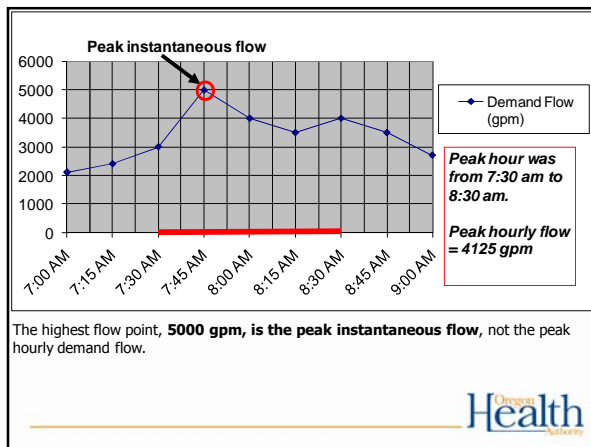
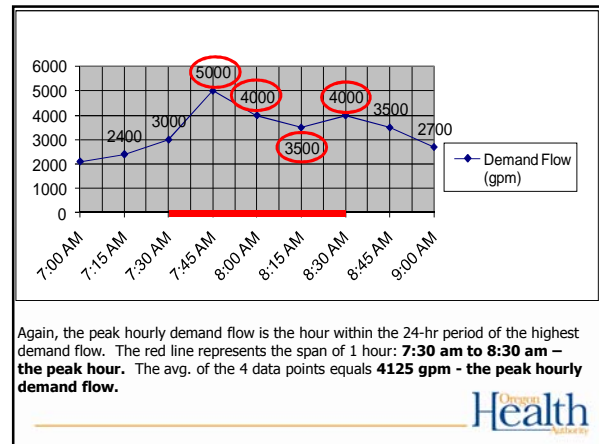
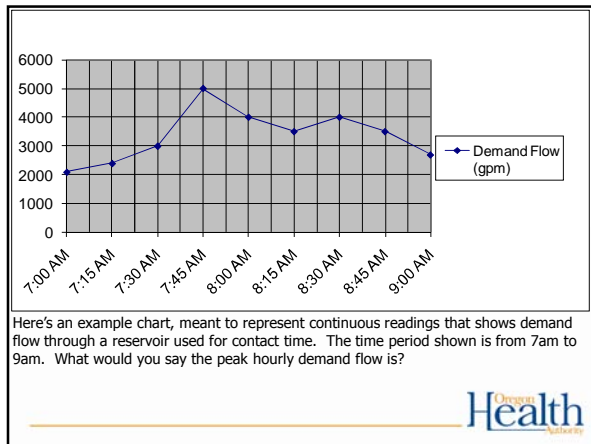
- For systems that only have a flow totalizer, spot check throughout the day to determine the time of peak demand
- Once that time has been identified (e.g., 8am or 9pm for residential; mid-day for industrial), then record how much water is used during that hour each day and divide by 60 minutes to get a peak hour demand



OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

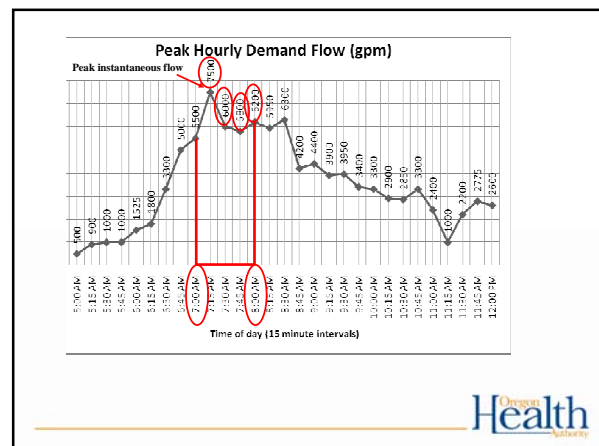
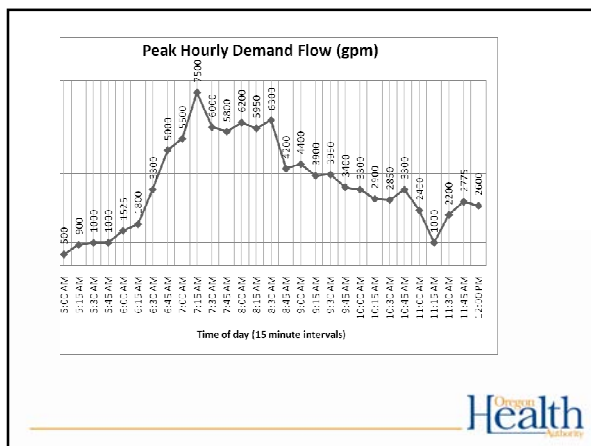
System Name: _____ ID #: _____ WTP: _____ Month/Year: _____ Log Requirement (Circle One): 5.5 / 1.0

Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹	Contact Time (T)	Actual CT	Temp	pH	Required CT	CT Met ²	Peak Hourly Demand Flow
	[ppm or mg/L]	[minutes]	C X T	[° C]		Use tables	Yes / No	[GPM]
1 /								
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								



Exercise #4

- Calculate peak hourly demand flow based on continuous flow rate data




Exercise #4: Calculating Peak Hourly Demand Flow

Directions: Work as a group to determine what the peak hourly demand flow is based on the graph below.


Questions:
 At what 1-hour interval did PHD occur? **7:00 am to 8:00 am**
 What is the peak hourly demand flow (gpm)? **5375 gpm (sum 4 data pts & divide by 4)**
 What was the peak instantaneous demand flow (gpm)? **7500 gpm**

Bonus questions:
 Is it ok to use the peak instantaneous flow instead for calculating time T? **Yes; it's more conservative**
 If so, what are the advantages/disadvantages? **Advantage: easy to determine. Disadvantage: it may exceed the tracer study flow by more than 10%**
 Is it ok to use the average daily flow instead for calculating time T? **No**
 Why or why not? **Averaging the whole day would not be conservative enough (it would not account for sustained period of high flow which is when it is important for CTs to be met)**



How to use the EPA CT tables to figure out CT_{required}


- There are six EPA CT tables based on temp
- Find the correct table based on your water temperature in degrees Celsius.
 - $^{\circ}\text{C} = 5/9 \times (^{\circ}\text{F} - 32)$
- If water temp is between values, then round down
 - Example: for water temp of 12°C, use the 10°C table
 - Even if the water temp is 14.9°C, round down to 10°C
- Water gets more viscous the colder it gets and chemical reactions take longer, so rounding temp down is more conservative.



CT VALUES FOR INACTIVATION OF GIARDIA CYSTS BY FREE CHLORINE AT 10°C *10°C - 14.9°C*


Chlorine Concentration (mg/L)	pH = 6.5									pH = 7.0								
	Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations		
0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	
0.4	12	24	37	49	61	73	15	29	44	59	73	88	117	155	202	259	327	404
0.6	13	25	38	50	63	75	15	30	45	60	75	90	119	158	206	264	332	409
0.8	13	26	39	52	65	78	15	31	46	61	77	92	121	160	208	266	334	411
1	13	26	40	53	66	79	16	31	47	63	79	94	123	162	210	268	336	413
1.2	13	27	40	53	67	80	16	32	48	63	79	95	124	163	211	269	337	414
1.4	14	27	41	55	68	82	16	33	49	65	82	98	126	164	212	270	338	415
1.5	14	28	42	55	69	83	17	33	50	66	83	99	126	164	212	270	338	415
1.8	14	29	43	57	72	86	17	34	51	67	84	101	127	165	213	271	339	416
2	15	29	44	58	73	87	17	35	52	69	87	104	128	166	214	272	340	417
2.2	15	30	45	59	74	89	18	35	53	70	88	105	128	166	214	272	340	417
2.4	15	30	45	60	75	90	18	36	54	71	89	107	129	167	215	273	341	418
2.6	15	31	46	61	77	92	18	37	55	72	92	110	129	167	215	273	341	418
2.8	16	31	47	62	78	93	19	37	56	74	93	111	130	168	216	274	342	419
3	16	32	48	63	79	95	19	38	57	75	94	113	130	168	216	274	342	419

Chlorine Concentration (mg/L)	pH = 7.5									pH = 8.0									pH = 8.5								
	Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations					
0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0										
0.4	21	42	63	83	104	125	25	50	75	100	125	150	175	225	300	375	450	525									
0.6	21	43	64	85	107	129	26	51	76	101	126	151	176	226	301	376	451	526									



How to use the EPA CT tables (cont.)


- There are 7 sections for pH on each table
- Find the section that corresponds to your water's pH level
- If your pH is between the choices, then round up to the higher pH
 - Example: if pH of water is 6.8, use the pH 7.0 section



CT VALUES FOR INACTIVATION OF GIARDIA CYSTS BY FREE CHLORINE AT 10°C *10°C - 14.9°C*


Chlorine Concentration (mg/L)	pH = 6.5									pH = 7.0								
	Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations		
0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	
0.4	12	24	37	49	61	73	15	29	44	59	73	88	117	155	202	259	327	404
0.6	13	25	38	50	63	75	15	30	45	60	75	90	119	158	206	264	332	409
0.8	13	26	39	52	65	78	15	31	46	61	77	92	121	160	208	266	334	411
1	13	26	40	53	66	79	16	31	47	63	79	94	123	162	210	268	336	413
1.2	13	27	40	53	67	80	16	32	48	63	79	95	124	163	211	269	337	414
1.4	14	27	41	55	68	82	16	33	49	65	82	98	126	164	212	270	338	415
1.5	14	28	42	55	69	83	17	33	50	66	83	99	126	164	212	270	338	415
1.8	14	29	43	57	72	86	17	34	51	67	84	101	127	165	213	271	339	416
2	15	29	44	58	73	87	17	35	52	69	87	104	128	166	214	272	340	417
2.2	15	30	45	59	74	89	18	35	53	70	88	105	128	166	214	272	340	417
2.4	15	30	45	60	75	90	18	36	54	71	89	107	129	167	215	273	341	418
2.6	15	31	46	61	77	92	18	37	55	72	92	110	129	167	215	273	341	418
2.8	16	31	47	62	78	93	19	37	56	74	93	111	130	168	216	274	342	419
3	16	32	48	63	79	95	19	38	57	75	94	113	130	168	216	274	342	419

Chlorine Concentration (mg/L)	pH = 7.5									pH = 8.0									pH = 8.5								
	Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations			Log Inactivations					
0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0										
0.4	21	42	63	83	104	125	25	50	75	100	125	150	175	225	300	375	450	525									
0.6	21	43	64	85	107	129	26	51	76	101	126	151	176	226	301	376	451	526									



How to use the EPA CT tables (cont.)

- Use the 0.5 log inactivation column if your plant is rated at 2.5 log removal for *Giardia*
- All others use the 1.0 log inactivation column
- Note: unfiltered surface water must achieve the 3-log inactivation through disinfection



CT VALUES FOR INACTIVATION OF GIARDIA CYSTS BY FREE CHLORINE AT 10°C *10°C - 14.9°C*

Chlorine Concentration mg/L	pH = 6.5					pH = 6.5					pH = 7.0							
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
0.4	12	24	37	49	61	73	15	29	44	59	73	88	17	35	52	69	87	104
0.6	13	25	38	50	63	75	16	30	45	60	75	90	18	36	54	71	89	107
0.8	13	25	38	50	63	75	16	31	46	61	77	92	19	37	55	73	92	110
1	13	25	40	53	66	79	16	31	47	63	79	94	19	37	55	75	93	112
1.2	13	27	40	53	67	80	16	32	48	63	79	95	19	38	57	76	95	114
1.4	14	27	41	55	68	82	16	33	49	65	82	98	19	38	58	77	97	116
1.6	14	28	42	55	69	83	17	33	50	66	83	99	20	40	60	79	99	119
1.8	14	29	43	57	71	85	17	34	51	67	84	101	20	41	61	81	101	122
2	15	29	44	58	73	87	17	35	52	69	87	104	21	41	62	83	103	124
2.2	15	30	45	59	74	89	18	35	53	70	88	105	21	42	64	85	106	127
2.4	15	30	45	60	75	90	18	36	54	71	89	107	22	43	65	86	108	129
2.6	15	31	46	61	77	92	18	37	55	72	92	110	22	44	66	87	109	131
2.8	16	31	47	62	78	93	19	37	56	74	93	111	23	45	67	89	112	134
3	16	32	48	63	79	95	19	38	57	75	94	113	23	46	68	90	114	137

Chlorine Concentration mg/L	pH = 7.5					pH = 8.0					pH = 8.5							
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
0.4	21	42	63	83	104	125	25	50	75	99	124	149	30	59	89	118	148	177
0.6	21	43	64	85	107	129	26	51	76	101	126	151	31	61	92	122	153	183

How to use the EPA CT tables (cont.)

- Match your free chlorine residual on the far left column
- If in between, then round up
 - Rounding chlorine residual up is more conservative because as chlorine residual increases at a given pH, more CT is required
- The point where it intersects with the log inactivation column is the CT_{required}
 - Example: free chlorine residual is 0.6 ppm



CT VALUES FOR INACTIVATION OF GIARDIA CYSTS BY FREE CHLORINE AT 10°C *10°C - 14.9°C*

Chlorine Concentration mg/L	pH = 6.5					pH = 6.5					pH = 7.0							
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
0.4	12	24	37	49	61	73	15	29	44	59	73	88	17	35	52	69	87	104
0.6	13	25	38	50	63	75	16	30	45	60	75	90	18	36	54	71	89	107
0.8	13	25	40	53	66	79	16	31	47	63	79	94	19	37	55	75	93	112
1	13	25	40	53	66	79	16	31	47	63	79	94	19	37	55	75	93	112
1.2	13	27	40	53	67	80	16	32	48	63	79	95	19	38	57	76	95	114
1.4	14	27	41	55	68	82	16	33	49	65	82	98	19	38	58	77	97	116
1.6	14	28	42	55	69	83	17	33	50	66	83	99	20	40	60	79	99	119
1.8	14	29	43	57	71	85	17	34	51	67	84	101	20	41	61	81	101	122
2	15	29	44	58	73	87	17	35	52	69	87	104	21	41	62	83	103	124
2.2	15	30	45	59	74	89	18	35	53	70	88	105	21	42	64	85	106	127
2.4	15	30	45	60	75	90	18	36	54	71	89	107	22	43	65	86	108	129
2.6	15	31	46	61	77	92	18	37	55	72	92	110	22	44	66	87	109	131
2.8	16	31	47	62	78	93	19	37	56	74	93	111	23	45	67	89	112	134
3	16	32	48	63	79	95	19	38	57	75	94	113	23	46	68	90	114	137

Chlorine Concentration mg/L	pH = 7.5					pH = 8.0					pH = 8.5							
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
0.4	21	42	63	83	104	125	25	50	75	99	124	149	30	59	89	118	148	177
0.6	21	43	64	85	107	129	26	51	76	101	126	151	31	61	92	122	153	183

In review:

- temp of 12°C,
- pH of 6.8,
- free chlorine residual of 0.6
 - CT_{required} = 36
- Remember...
 - CT_{achieved} must be > CT_{required}

(CT achieved = chlorine concentration x contact time)



Exercise #5

- Using EPA CT tables to calculate CTs required

Exercise #5: Using EPA CT tables to calculate CTs required

Directions: Use the data provided in the examples below to determine the CTs required for giardia inactivation at the treatment plant for that day

Example #1: Conventional filter plant (2.5-log)

CT parameters measured at the 1st user as follows:
 • Temperature: 10° C
 • pH: 7.0
 • Free chlorine residual: 0.8 ppm
 • Contact time T: 100 minutes
 What are the CTs required for that day? _____
 What was the CT achieved? _____
 Were CTs met? _____

Example #3: Membrane filter plant (2.5-log)

CT parameters measured at the 1st user as follows:
 • Temperature: 8° C
 • pH: 7.3
 • Free chlorine residual: 1.3 ppm
 • Contact time T: 100 minutes
 What are the CTs required for that day? _____
 What was the CT achieved? _____
 Were CTs met? _____

Example #2: Slow sand filter plant (2-log)

CT parameters measured at the 1st user as follows:
 • Temperature: 16° C
 • pH: 6.6
 • Free chlorine residual: 0.5 ppm
 • Contact time T: 46 minutes
 What are the CTs required for that day? _____
 What was the CT achieved? _____
 Were CTs met? _____



Exercise #5: Using EPA CT tables to calculate CTs required

Directions: Use the data provided in the examples below to determine the CTs required for giardia inactivation at the treatment plant for that day.

Example #1: Conventional filter plant (2.5-log)


CT parameters measured at the 1st user as follows:
 •Temperature: 10° C
 •pH: 7.0
 •Free chlorine residual: 0.8 ppm
 •Contact time T: 100 minutes
 What are the CTs required for that day? **18**
 What was the CT achieved? **80**
 Were CTs met? **Yes**

Example #2: Slow sand filter plant (2-log)

CT parameters measured at the 1st user as follows:
 •Temperature: 16° C
 •pH: 6.6
 •Free chlorine residual: 0.5 ppm
 •Contact time T: 46 minutes
 What are the CTs required for that day? **24**
 What was the CT achieved? **23**
 Were CTs met? **No**

Example #3: Membrane filter plant (2.5-log)

CT parameters measured at the 1st user as follows:
 •Temperature: 8° C
 •pH: 7.3
 •Free chlorine residual: 1.3 ppm
 •Contact time T: 100 minutes
 What are the CTs required for that day? **31**
 What was the CT achieved? **130**
 Were CTs met? **Yes**



Bonus: Use the data provided in the examples below to determine the CTs required for virus inactivation at the treatment plant for that day

Table A-7. CT Values for Inactivation of Viruses by Free Chlorine²

Temperature (C)	Log Inactivation					
	2.0-log		3.0-log		4.0-log	
pH >= 6.9	10	6.9	10	6.9	10	
0.5	5	45	9	66	12	90
5	4	30	5	44	8	60
10	3	22	4	33	6	45
15	2	15	3	22	4	33
20	1	11	2	18	3	22
25	1	7	1	11	2	15


CT parameters measured at the 1st user as follows:
 •Temperature: 10° C
 •pH: 7.0

What log inactivation is required for viruses in surface water? ____

What are the CTs required for viruses that day? ____

Assuming a contact time T of 30 minutes, what free chlorine concentration is needed to meet the CT required above? ____

What does this tell you about meeting the CT requirements for viruses compared to meeting the CT requirements for giardia?



Bonus: Use the data provided in the examples below to determine the CTs required for virus inactivation at the treatment plant for that day

Table A-7. CT Values for Inactivation of Viruses by Free Chlorine²

Temperature (C)	Log Inactivation					
	2.0-log		3.0-log		4.0-log	
pH >= 6.9	10	6.9	10	6.9	10	
0.5	5	45	9	66	12	90
5	4	30	5	44	8	60
10	3	22	4	33	6	45
15	2	15	3	22	4	33
20	1	11	2	18	3	22
25	1	7	1	11	2	15


CT parameters measured at the 1st user as follows:
 •Temperature: 10° C
 •pH: 7.0

What log inactivation is required for viruses in surface water? **4.0-log**

What are the CTs required for viruses that day? **6**

Assuming a contact time T of 30 minutes, what free chlorine concentration is needed to meet the CT required above? **0.2 ppm**

What does this tell you about meeting the CT requirements for viruses compared to meeting the CT requirements for giardia? **If you meet CT requirements for giardia, then you automatically meet them for viruses (i.e. it takes more CTs to inactivate Giardia than it does for viruses)**




Filling out the monthly surface water quality report form

OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Cite Oes: 8.3 / 1.8)			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? * Yes / No	Peak Hourly Demand Flow [GPM]
1 /								
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								


So here's our reporting form (available for download on our website...)
 Every day you must calculate the CTs required using the tables and record it on this form.
 So let's enter our data from the example into the form starting w/ temp...



OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Cite Oes: 8.3 / 1.8)			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? * Yes / No	Peak Hourly Demand Flow [GPM]
1 /								
2 /								
3 /								
4 /								
5 /								
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13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								


Here's where we enter temp



OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Cite Oes: 8.3 / 1.8)			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? * Yes / No	Peak Hourly Demand Flow [GPM]
1 /								
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

Here's where we enter pH



OHA - Drinking Water Program – Surface Water Quality Data Form - *Giardia* Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Circle One) 8.3 / 1.8			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6			12	6.8			
2 /								
3 /								
4 /	Here's where we enter free chlorine residual							
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

lth
-Authority

OHA - Drinking Water Program – Surface Water Quality Data Form - *Giardia* Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Circle One) 8.3 / 1.8			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6			12	6.8	36		
2 /								
3 /								
4 /	And here's where we enter CT required 36, which we found from the EPA tables							
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

lth
-Authority

OHA - Drinking Water Program – Surface Water Quality Data Form - *Giardia* Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Circle One) 8.3 / 1.8			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6			12	6.8	36		
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

OK. We now we need to calculate the actual CTs achieved and compare it to the CTs required of 36 to determine if CTs were met for the day.

lth
-Authority

Filling out the monthly surface water quality report (cont.)

- Remember:
 - CT achieved = Chlorine Concentration x Contact Time
- We know the free chlorine residual at the first user is 0.6 ppm
- Contact Time (T) obtained from a disinfection *tracer study*
 - Example: tracer study shows our contact time to be 110 minutes



OHA - Drinking Water Program – Surface Water Quality Data Form - *Giardia* Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Circle One) 8.3 / 1.8			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6	110		12	6.8	36		
2 /								
3 /								
4 /	Here's where we enter contact time T from our tracer study							
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

lth
-Authority

OHA - Drinking Water Program – Surface Water Quality Data Form - *Giardia* Inactivation

System Name:		ID #:	WTP:	Month/Year:	Log Requirement (Circle One) 8.3 / 1.8			
Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6	110		12	6.8	36		
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /	So free chlorine residual C of 0.6 ppm times 110 minutes of contact time T = ?							
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								


lth
-Authority

OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

System Name: ID #: WTP: Month/Year: Log Requirement (State Ord. 8.3 / I.B.)

Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6	110	66	12	6.8	36		
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

CT achieved by the plant is 66. So now we compare this to CT required.




OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

System Name: ID #: WTP: Month/Year: Log Requirement (State Ord. 8.3 / I.B.)

Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6	110	66	12	6.8	36		
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

In order for CTs to be met, CTactual must be greater than CTrequired, which it is.




OHA - Drinking Water Program – Surface Water Quality Data Form - Giardia Inactivation

System Name: ID #: WTP: Month/Year: Log Requirement (State Ord. 8.3 / I.B.)

Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ¹ [ppm or mg/L]	Contact Time (T) [minutes]	Actual CT C X T	Temp [° C]	pH	Required CT Use tables	CT Met? ² Yes / No	Peak Hourly Demand Flow [GPM]
1 /	0.6	110	66	12	6.8	36	Yes	
2 /								
3 /								
4 /								
5 /								
6 /								
7 /								
8 /								
9 /								
10 /								
11 /								
12 /								
13 /								
14 /								
15 /								
16 /								
17 /								
18 /								
19 /								

So in the CT MET column we write YES. CTs were met for this day.




Common mistakes:

- Rounding errors:
 - Must round down for temperature
 - Must round up for pH
 - Must round up for free chlorine residual
- Bad formulas in excel spreadsheets:
 - Make sure you understand your formula
 - Wilkes Equation not allowed, must use Regression Equation



Common mistakes (continued):

- Not calculating CT's daily
 - Don't wait until the end of the month to do the calculations because if you discover you didn't meet CT's, it's too late!
- If adjusting contact time according to flow rate, use the demand flow, not the plant flow.
- Failure to answer questions at bottom of form correctly (or at all)
- Always answering "Yes" to the questions at the bottom of the form without actually looking at the numbers



Conventional or Direct:

Answer all the yes/no questions

Conventional or Direct Filtration	Monthly Summary (Answer Yes or No)	
95% of the 4-hour turbidity readings ≤ 0.3 NTU? Yes / No	CT's met everyday? (see back) Yes / No	All Cl ₂ residuals at entry point ≥ 0.2 mg/l? Yes / No
All the 4-hour turbidity readings ≤ 1 NTU? Yes / No		
All turbidity readings < IFE ² triggers? Yes / No ³		

Notes:


PRINTED NAME: _____

SIGNATURE: _____ DATE: _____

PHONE #: () _____ CERT #: _____

Including continuous turbidity data, if applicable, for optimization recording purposes. Compliance values in columns "12 AM" through "9 PM" may not correspond to continuous readings' maximum. IFE = In-line Filter Eff. (OAR 333-061-0048)(1)(b)(3)(C)

PAGE 1 of 2



Slow Sand/Membrane/DE/Unfiltered

Answer all the yes/no questions

Slow Sand/Membrane/DE Filtration/Unfiltered	Monthly Summary (Answer Yes or No)	
95% of daily turbidity readings ≤ 1 NTU? ² Yes / No	CT's met everyday? (see back) Yes / No	All Cl ₂ residual at entry point ≥ 0.2 mg/l? Yes / No
All daily turbidity readings ≤ 5 NTU? Yes / No		
NOTES:	PRINTED NAME:	
	SIGNATURE:	DATE:
	PHONE #: ()	CERT #:

Including continuous turbidity data, if applicable, for optimization recording purposes. Compliance values in columns "12 AM through 8 PM" may not correspond to continuous readings' maximum. ¹ Filtered systems only.

PAGE 1 of 2



Cartridge/Bag

Answer all the yes/no questions

Cartridge Filtration	Monthly Summary (Answer Yes or No)	
95% of daily turbidity readings ≤ 1 NTU? Yes / No	CT's met everyday? (see back) Yes / No	All Cl ₂ residual at entry point ≥ 0.2 mg/l? Yes / No
All daily turbidity readings ≤ 5 NTU? Yes / No		
NOTES: PSI = pounds per square inch PSID = pounds per square inch difference (before filter – after filter) PSID When to Change Filter = Manufacturer's recommendation; may need to look in manual for manufacturer's specifications when to change the filter, at what PSID.	PRINTED NAME:	
	SIGNATURE:	DATE:
	PHONE #: ()	CERT #:

Including continuous turbidity data, if applicable, for optimization recording purposes. Compliance values in "Daily Turbidity Reading" Column may not correspond to continuous readings' maximum.

PAGE 1 of 2



Everyone needs to fill out the CT section!

Cartridge Filtration	Monthly Summary (Answer Yes or No)	
95% of daily turbidity readings ≤ 1 NTU? Yes / No	CT's met everyday? (see back) Yes / No	All Cl ₂ residual at entry point ≥ 0.2 mg/l? Yes / No
All daily turbidity readings ≤ 5 NTU? Yes / No		
NOTES: PSI = pounds per square inch PSID = pounds per square inch difference (before filter – after filter) PSID When to Change Filter = Manufacturer's recommendation; may need to look in manual for manufacturer's specifications when to change the filter, at what PSID.	PRINTED NAME:	
	SIGNATURE:	DATE:
	PHONE #: ()	CERT #:

Including continuous turbidity data, if applicable, for optimization recording purposes. Compliance values in "Daily Turbidity Reading" Column may not correspond to continuous readings' maximum.

PAGE 1 of 2



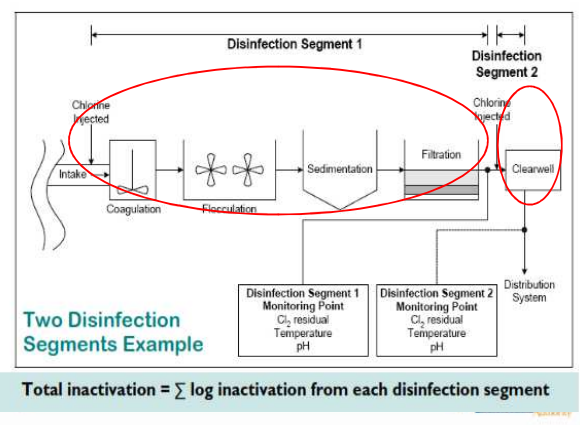
Multiple CT segments

- A "CT segment" is the point between which chlorine is injected and free chlorine residual is measured
- Treatment plants can have multiple CT segments (i.e. multiple chlorine injection points)
- Multiple CT segments can be added together in order to meet CTs
- Do not add contact times "T" together!
 - Why? Chlorine, temp, pH may change throughout the process



Multiple CT segments (cont.)

- Must calculate log inactivation ratios for each segment and add ratios together
 - Inactivation ratio = $\frac{C1T1_{actual}}{CT1_{reqd}} + \frac{C2T2_{actual}}{CT2_{reqd}}$
- Modify reporting form: add column for log inactivation ratios (sum must be >1)
 - Not to be confused with 1-log inactivation



What to do when things go wrong:

Such as:

- Treatment interruptions
- CTs not met
- Turbidity exceeds regulatory limits

What to do:

- Call your regulatory contact at the drinking water program
- Check out the BMPs on the DWS website in the "Water System Operations" section



In Summary:

- In order to verify adequate disinfection is taking place, we need to calculate CT achieved (CT_{actual})
- EPA reviewed many disinfection studies in order to create CT Tables that specify minimum CT requirements needed to achieve specific log reduction levels for *Giardia* ($CT_{required}$)
- CT_{actual} must be equal to or greater than $CT_{required}$



Things you should do:

- Check how T is calculated at your plant
- Do all treatment plant operators understand it?
- Review spreadsheet equation for CTs (if applicable)
- Write an SOP for CT determination
- Arrange for a tracer study if necessary



Exercise #6

- Filling out the monthly surface water quality operating report



OHA - Drinking Water Program – Turbidity Monitoring Report Form County: _____
Conventional or Direct Filtration

System Name: _____ WTP: _____ Month/Year: _____ ID #: _____

DAY	12 AM (NTU)	4 AM (NTU)	8 AM (NTU)	NOON (NTU)	4 PM (NTU)	8 PM (NTU)	Highest Reading of the Day (NTU)
1	0.05	0.07	0.08	0.07	0.15	0.28	0.35
2							
3							
4							
5							

OHA - Drinking Water Program – Surface Water Quality Data Form - *Giardia* Inactivation

System Name: _____ WTP: _____ Month/Year: _____ Log Requirement (Circle One) 0.5 / 1.0 ID #: _____

Date / Time	Minimum CT _{95%} Required at 1st User (C)	Contact Time (T)	Actual CT	Temp (T)	pH	Required CT	CT Met? *	Flow (GPM)
1 /	0.6	100	60	12	7.2	21	Yes	2000
2 /								
3 /								
4 /								
5 /								

Exercise #6: Filling out the monthly surface water report

Example #1: Conventional or direct filter plant

Turbidity

•Use the data in the graph to record the 4-hour daily turbidities on the first day of the month of the Conventional/Direct Filtration monthly reporting form.

•What number should be entered in the "Highest Reading of the Day (NTU)" column? **0.35 NTU**

•Let's say your plant runs 24 hours a day and you have turbidity readings filled in for every 4-hour interval for all 31 days of the month. How many readings could you have that were > 0.3 NTU and still meet the requirement of 95% of readings being ≤ 0.3 NTU? **9**

(6 readings/day x 31 days = 186 readings total. 5% x 186 = 9.3)

•What should you do if you answer "no" to the turbidity question "All readings ≤ 1 NTU?"

- on the bottom of the form? **a**
- 1.Call the state
 - 2.Issue a boil water notice
 - 3.Issue a public notice within 30 days
 - 4.Both a & c


•What should you do if you answer "no" to the turbidity question "All readings < IFE triggers?"

- on the bottom of the form? **a**
- 1.Call the state
 - 2.Issue a boil water notice
 - 3.Issue a public notice within 30 days
 - 4.Both a & c



CT Calculations (assume 2.5-log conventional plant)

- Use the following parameters to calculate the CTs achieved at the plant and fill it in on the form on first day of the month:
 - Free chlorine residual: 0.6 ppm
 - Contact time: 100 minutes
- Use the following parameters to calculate the CTs required using the EPA tables from Exercise 5 and fill it in on the form:
 - Temp: 12°C
 - pH: 7.2
- Are CTs met at the plant for this day? **Yes - CT achieved (60) is > CT required (21)**
- Let's say the Peak Hourly Demand Flow for the day was 2000 gpm. If the Peak Hourly Demand Flow during the tracer study was 1750 gpm, is this a problem? Why or why not? **Yes this is a problem – flow cannot exceed 10% of tracer study flow. $10\% \times 1750 \text{ gpm} = 175 \text{ gpm}$. $1750 + 175 = 1925 \text{ gpm}$. Therefore flow cannot be >1925 gpm or else a new tracer study is needed.**
- What should you do if you answer "no" to either of the CT questions on the turbidity side of form?
 - CTs met at all times?
 - Call the state
 - Issue a boil water notice
 - Issue a public notice within 30 days
 - Both a & c
 - Residual at EP ≥ 0.2 ppm at all times?
 - Call the state
 - Issue a boil water notice
 - Issue a public notice within 30 days
 - Both a & c



OHA - Drinking Water Program – Turbidity Monitoring Report Form County: _____

Slow Sand, Membrane, Diatomaceous Earth Filtration, or Unfiltered Systems


System Name: _____ WTP: _____ Month/Year: _____ ID #: _____

Date	12 AM (NTU)	4 AM (NTU)	8 AM (NTU)	NOON (NTU)	4 PM (NTU)	8 PM (NTU)	Highest Reading of the Day (NTU)
1/			0.2				1.2
2/							
3/							
4/							
5/							

OHA - Drinking Water Program – Surface Water Quality Data Form

System Name: _____ WTP: _____ Month/Year: _____ ID #: _____


Date / Time	Minimum Cl ₂ Residual at 1 st User (C) ³	Contact Time (T)	Actual CT	Temp	pH	Required CT	CT Met? ⁵	Peak Hourly Demand Flow
	(ppm or mg/L)	(minutes)	(C x T)	(° C)			Yes / No	(GPM)
1/	0.3	60	18	9	7.8	66	No	3300
2/								
3/								
4/								
5/								



Example #2: Slow sand, Membrane, or DE filter plant (2-log)


Turbidity

- Use the data in the graph to record the daily CFE turbidity on the first day of the month of the Slow Sand/Membrane/DE Filtration monthly reporting form. Which 4-hour column should be recorded in? Why? **Any of the columns is fine to use. Most people use the column that is closest to the time they observed the turbidity**
- What number should be entered in the "Highest Reading of the Day (NTU)" column? **1.2 NTU**
- Let's say your plant runs everyday and you have turbidity readings filled in once a day for all 31 days of the month. How many readings could you have that were > 1 NTU and still meet the requirement of 95% of readings being ≤ 1 NTU? **1 - 31 readings total. $5\% \times 31 = 1.6$**
- What should you do if you answer "no" to the turbidity question "All readings ≤ 5 NTU?" on the bottom of the form?
 - Call the state
 - Issue a boil water notice
 - Issue a public notice within 30 days
 - Both a & c



CT Calculations

- Use the following parameters to calculate the CTs achieved at the plant and fill it in on the form on first day of the month:
 - Free chlorine residual: 0.3 ppm
 - Contact time: 60 minutes
- Use the following parameters to calculate the CTs required using the EPA tables from Exercise 5 and fill it in on the form:
 - Temp: 9°C
 - pH: 7.8
- Are CTs met at the plant for this day? **No - CT achieved (18) is < CT required (66)**
- What number should be entered in the "Peak Hourly Demand Flow" column? **3300 gpm. Average of flows between 7 am and 8 am.**
- What should you do if you answer "no" to either of the CT questions on the turbidity side of form?
 - CTs met at all times?
 - Call the state
 - Issue a boil water notice
 - Issue a public notice within 30 days
 - Both a & c
 - Residual at EP ≥ 0.2 ppm at all times?
 - Call the state
 - Issue a boil water notice
 - Issue a public notice within 30 days
 - Both a & c





Emerging Issues



Emerging Issues

- Climate change and water supply
- Harmful algae blooms
- www.healthoregon.org/dwp

News & "Hot Topics"

Climate Change and Water Supply

- Earlier and heavier snowpack runoff
- Increasing variability of storm frequency and intensity
- Weather extremes already evident (drought in some States, heavy rain/flooding in others 2011-2012)
- Increased variability in water quality; can affect both surface and groundwater systems.
- Changes in rainfall patterns affect all systems
- Rising sea levels could lead to salt water intrusion or flooding



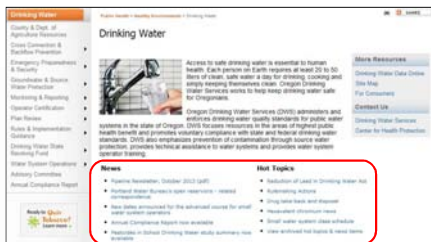
Harmful algae blooms

- Produce toxins that can be harmful
- Occur in warm, slow moving water
- Increasing in frequency and duration
 - happening more or better reporting?
 - more people, more nutrients, warmer water
- Best management practices on our website
- <http://public.health.oregon.gov/HealthyEnvironm/ents/DrinkingWater/Operations/Treatment/Pages/algae.aspx>



www.healthoregon.org/dwp

- News
- Hot Topics



RESOURCES FOR OPERATORS



Tools & Resources

- For surface water systems: www.healthoregon.gov/dwp
- Click on “Water System Operations” on left-side menu list, then “Surface Water Treatment”
 - Monthly Surface Water Quality Report form template
 - Tracer Study form
- Surface Water Treatment Rule guidance manual, Appendix C: Determination of Disinfectant Contact Time



Tools & Resources (continued)

- EPA Rules <http://water.epa.gov/lawsregs/rulesregs/sdwa/currentregulations.cfm>
- AWWA <http://www.pnws-awwa.org/Index.asp>
- OAWU <http://www.oawu.net/>
- Circuit Rider <http://public.health.oregon.gov/HealthyEnvironm/ents/DrinkingWater/Operations/Pages/circuitrider.aspx>



QUESTIONS?

- Call your technical services contact at the State.
- State Drinking Water Services
 - General Info: (971) 673-0405



Information Available Online

www.healthoregon.gov/dwp

“Drinking Water Data Online”
(data specific to each water system)

Contact Us

Current News and Events

Information By Subject

Information By Subject

Drinking Water

- County & Dept. of Agriculture Resources
- Cross Connection & Backflow Prevention
- Emergency Preparedness & Security
- Groundwater & Source Water Protection
- Monitoring & Reporting
- Operator Certification
- Plan Review
- Rules & Implementation Guidance
- Safe Drinking Water Revolving Loan Fund
- Water System Operations
- Advisory Committee
- Public Notice Resources & Templates
- Fact Sheets & Best Management Practices
- Outstanding Performance
- Circuit Rider Program
- Pipeline Newsletter

1. Cross Connection & Backflow Info
 2. Emergency Preparedness & Security
 3. GW & Source Water Protection
 4. Monitoring & Reporting
 5. Operator Certification
 6. Plan Review
 7. Rules & Implementation Guidance
 8. SDW Revolving Loan Fund
9. Water System Operations
- Surface Water Treatment
 - Public Notice Resources
 - Fact Sheets & Best Practices
 - Outstanding Performance
 - Circuit Rider Program
 - Pipeline Newsletter



Drinking Water Data Online

Many data search options are available

Data Search Options

Info by County

Info by Water System

Find Your Water System

[WS Name Look Up](#)

1. Select [WS Name Look Up](#).

2. Enter water system name (e.g., "Salem")

3. Click [Submit Query](#).

Note: You also could have used [WS ID Look Up](#) and entered the ID# for Salem (00731)



Select Your Water System

Select the Water System by Clicking on the PWS ID#

PWS ID # 41....	Water System
05564	BPA-SALEM SUBSTATION
00779	SALEM MOBILE ESTATES/SHADY ACRES
00631	SALEM PUBLIC WORKS
00768	SUBURBAN EAST SALEM WD



Drinking Water Data Online

OR41 00731 SALEM PUBLIC WORKS Classification: COMMUNITY

Contact: SOPHIA HOBEIT Phone: 503-588-6483
 1410 20TH ST SE BLDG 2 County: MARION
 SALEM, OR 97302 Activity Status: ACTIVE - History
 Population: 189,000 Number of Connections: 51,112
 Operating Period: January 1 to December 31 Regulating Agency: REGION 1
 Certified Operator(s) Owner Type: LOCAL GOVERNMENT
 Required: Y Licensed By: USA
 Distribution Class: 4 Approved Drinking Water Protection Plan: No
 Treatment class: 3 Source Water Assessment: Yes
 Filtration Endorsement Required: No Last Sample Date: Aug 23, 2011

General Information

Facility ID	Facility Name	Well Log	Activity Status	Availability	Source Type
EP-A	EP FOR GEREN ISLAND WTP		A		SW
SRC-AA	NORTH SANTIAM RIVER		A	Permanent	SW
SRC-AB	GEREN ISLAND EAST WELL - L75842		A	Seasonal	GW
SRC-AC	GEREN ISLAND WEST WELL - L75839		A	Seasonal	GW
SRC-AD	INFILTRATION GALLERY		A	Seasonal	GW
EP-B	EP FOR ASR WELLS		A		GW
SRC-BA	ASR WELL #1 - MAR10624		A	Seasonal	GW
SRC-BB	ASR WELL #2 - MAR10675		A	Seasonal	GW
SRC-BC	ASR WELL #3 - L19523		A	Seasonal	GW
SRC-CD	ASR WELL #4 - L19587		A	Seasonal	GW
EP-C	EP FOR HEMLOCK WELL		I		GW
SRC-CA	HEMLOCK WELL - L23000		I	Emergency	GW

Sources

State ID	Facility Name	Treatment Process	Treatment Objective	Filter Type
NTP-A	TP FOR GEREN ISLAND	FILTRATION, SLOW SAND	PARTICULATE REMOVAL	SS
NTP-A	TP FOR GEREN ISLAND	FLUORIDATION	OTHER	SS
NTP-A	TP FOR GEREN ISLAND	PHENOLX ADJ-RODA-ASR	CORROSION CONTROL	SS
NTP-A	TP FOR GEREN ISLAND	HYPOCHLORINATION, POST	DISINFECTION	SS

Treatment

General Information

OR41 00731 SALEM PUBLIC WORKS Classification: COMMUNITY

Contact: SOPHIA HOBEIT Phone: 503-588-6483
 1410 20TH ST SE BLDG 2 County: MARION
 SALEM, OR 97302 Activity Status: ACTIVE - History
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 Certified Operator(s) Owner Type: LOCAL GOVERNMENT
 Required: Y Licensed By: N/A
 Distribution class: 4 Approved Drinking Water Protection Plan: No
 Treatment class: 3 Source Water Assessment: Yes
 Filtration Endorsement Required: No Last Sample Date: Aug 23, 2011

System Classification

All written correspondence goes to this person (e.g., violation notices, general mailings, etc.)

View a list of Certified Operators

Sources

Well Log Query Results

Well Tag Nbr: 75842

Well Log	T-R-S/ Q-Q-Q	Taxlot	Street
MARI_58138			

Facility ID Facility Name Well Log
 EPA EP FOR GEREN ISLAND WTP
 SRC-AA NORTH SANTIAM RIVER
 SRC-AB GEREN ISLAND EAST WELL - L75842
 SRC-AC GEREN ISLAND WEST WELL - L75839
 SRC-AD INFILTRATION GALLERY

Clicking on a Well ID allows you to view well logs and data from the Oregon Water Resources Department

Treatment

Treatment Process

State ID	Facility Name	Treatment Process	Treatment Objective	Filter Type
NTP-A	TP FOR GEREN ISLAND	FILTRATION, SLOW SAND	PARTICULATE REMOVAL	SS
NTP-A	TP FOR GEREN ISLAND	FLUORIDATION	OTHER	SS
NTP-A	TP FOR GEREN ISLAND	PHENOLX ADJ-RODA-ASR	CORROSION CONTROL	SS
NTP-A	TP FOR GEREN ISLAND	HYPOCHLORINATION, POST	DISINFECTION	SS

Filter Type:
 SS = Slow Sand
 CT = Cartridge
 BG = Bag
 CF = Conventional Filtration
 DF = Direct Filtration
 MF = Membrane Filtration
 UF = Unfiltered

Sampling Schedules

For further information on this public water system, click on the area of interest below:

System Info : Report for Lenders : Alerts : Violations : Enforcements : Contacts : Site Visits : Public Notice : Plan Review

Coliform Summary : Coliform Results : Coliform Results before 2002 : Sampling Schedule for Coliform

Chemical Group Summary : Latest Chemical Results : Entry Point Detects : Single Analyte Results

Chemical Schedule Summary : Chemical Schedule Details

Lead & Copper : Corrosion Control(LCR) : Nitrates : Arsenic : Radionuclides

DBPs : TOC & Alkalinity : DBP/TOC/Bromate/Chlorine Monitoring : FANs : MRDL : Turbidity : SWTR : RAA

Sampling Schedules:

1. Sampling Schedule for Coliform
 - Includes repeat schedules
2. Chemical Schedule Summary
 - Required chemical sampling
3. Chemical Schedule Details - progress report on chemical sampling
4. Lead & Copper
 - clicking "More Info" at the bottom of the tap sample results allows you to see tap sample schedules, minimum water quality parameters to meet, and major milestones

Sampling Data

For further information on this public water system, click on the area of interest below:

System Info : Report for Lenders : Alerts : Violations : Enforcements : Contacts : Site Visits : Public Notice : Plan Review

Coliform Summary : Coliform Results : Coliform Results before 2002 : Sampling Schedule for Coliform

Chemical Group Summary : Latest Chemical Results : Entry Point Detects : Single Analyte Results

Chemical Schedule Summary : Chemical Schedule Details

Lead & Copper : Corrosion Control(LCR) : Nitrates : Arsenic : Radionuclides

DBPs : TOC & Alkalinity : DBP/TOC/Bromate/Chlorine Monitoring : FANs : MRDL : Turbidity : SWTR : RAA

1. Coliform Summary (by month)
2. Coliform Results (by sample, results before 2002)
3. Chemical Group Summary (VOC, SOC)
4. Latest Chemical Results (individual contaminants)
5. Latest Chemical Results (sorted by date)
6. Entry Point Detects (detections only)
7. Single Analyte Results (individual contaminants)
8. Lead & Copper & Corrosion Control (L&C, pH, etc.)
9. Nitrates, Arsenic, Radionuclides, DBPs, TOC & Alkalinity
10. Turbidity (maximum daily turbidity)
11. SWTR (results from the bottom of the monthly SW report)
12. RAA (DBP running annual average results)

Alerts, Contacts & Site Visits



For further information on this public water system, click on the area of interest below:

System Info :: [Report for Lenders](#) :: [Alerts](#) :: [Violations](#) :: [Enforcements](#) :: [Contacts](#) :: [Site Visits](#) :: [Public Notice](#) :: [Plan Review](#)

[Coliform Summary](#) :: [Coliform Results](#) :: [Coliform Results before 2002](#) :: [Sampling Schedule for Coliform](#)

[Chemical Group Summary](#) :: [Latest Chemical Results](#) :: [Entry Point Detects](#) :: [Single Analyte Results](#)

[Chemical Schedule Summary](#) :: [Chemical Schedule Details](#) ::


[Lead & Copper](#) :: [Corrosion Control\(LCR\)](#) :: [Nitrates](#) :: [Arsenic](#) :: [Radionuclides](#)

[DBPs](#) :: [TOC & Alkalinity](#) :: [DBP/TOC/Bromate/Chlorine Monitoring](#) :: [FANIs](#) :: [MRDL](#) :: [Turbidity](#) :: [SWTR](#) :: [RAA](#)

1. Alerts - Sample results that require State/County/Dept of Ag staff to respond
2. Contacts – Document alert follow-ups and other significant correspondence
3. Site Visits – Document surveys and treatment plant inspections



Violations, Enforcements & Public Notices



For further information on this public water system, click on the area of interest below:

System Info :: [Report for Lenders](#) :: [Alerts](#) :: [Violations](#) :: [Enforcements](#) :: [Contacts](#) :: [Site Visits](#) :: [Public Notice](#) :: [Plan Review](#)

[Coliform Summary](#) :: [Coliform Results](#) :: [Coliform Results before 2002](#) :: [Sampling Schedule for Coliform](#)


[Chemical Group Summary](#) :: [Latest Chemical Results](#) :: [Entry Point Detects](#) :: [Single Analyte Results](#)

[Chemical Schedule Summary](#) :: [Chemical Schedule Details](#) ::

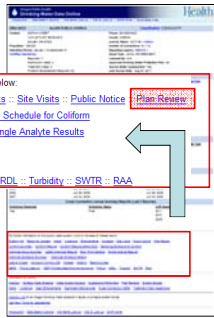
[Lead & Copper](#) :: [Corrosion Control\(LCR\)](#) :: [Nitrates](#) :: [Arsenic](#) :: [Radionuclides](#)

[DBPs](#) :: [TOC & Alkalinity](#) :: [DBP/TOC/Bromate/Chlorine Monitoring](#) :: [FANIs](#) :: [MRDL](#) :: [Turbidity](#) :: [SWTR](#) :: [RAA](#)

1. Violations
 - Also shows related enforcement actions
 - Systems should strive to see "Returned to Compliance"
 - System score should be less than 11 and as close to 0 as possible
2. Enforcements
 - View pdf copies of original Administrative Orders and Bilateral Compliance Agreements as well as their status
3. Public Notice
 - Notices required
 - Notices delivered



Plan Review Information



For further information on this public water system, click on the area of interest below:

System Info :: [Report for Lenders](#) :: [Alerts](#) :: [Violations](#) :: [Enforcements](#) :: [Contacts](#) :: [Site Visits](#) :: [Public Notice](#) :: [Plan Review](#)

[Coliform Summary](#) :: [Coliform Results](#) :: [Coliform Results before 2002](#) :: [Sampling Schedule for Coliform](#)


[Chemical Group Summary](#) :: [Latest Chemical Results](#) :: [Entry Point Detects](#) :: [Single Analyte Results](#)

[Chemical Schedule Summary](#) :: [Chemical Schedule Details](#) ::

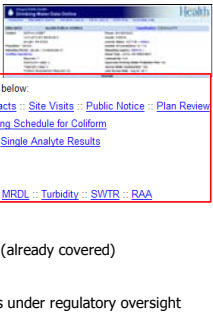
[Lead & Copper](#) :: [Corrosion Control\(LCR\)](#) :: [Nitrates](#) :: [Arsenic](#) :: [Radionuclides](#)

[DBPs](#) :: [TOC & Alkalinity](#) :: [DBP/TOC/Bromate/Chlorine Monitoring](#) :: [FANIs](#) :: [MRDL](#) :: [Turbidity](#) :: [SWTR](#) :: [RAA](#)

1. Project ID and Name
2. Date Plans Received
3. Date Preliminary Approval was Granted (no conditions)
4. Date Conditional Approval was Granted (required items not shown on submitted plans)
5. Date Abandoned (project was not completed)
6. Final Approval Date (approval for use)
7. Reviewer (Initials of State staff engineer reviewing the plans)



System Info & Report For Lenders



For further information on this public water system, click on the area of interest below:

System Info :: [Report for Lenders](#) :: [Alerts](#) :: [Violations](#) :: [Enforcements](#) :: [Contacts](#) :: [Site Visits](#) :: [Public Notice](#) :: [Plan Review](#)

[Coliform Summary](#) :: [Coliform Results](#) :: [Coliform Results before 2002](#) :: [Sampling Schedule for Coliform](#)

[Chemical Group Summary](#) :: [Latest Chemical Results](#) :: [Entry Point Detects](#) :: [Single Analyte Results](#)

[Chemical Schedule Summary](#) :: [Chemical Schedule Details](#) ::

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[DBPs](#) :: [TOC & Alkalinity](#) :: [DBP/TOC/Bromate/Chlorine Monitoring](#) :: [FANIs](#) :: [MRDL](#) :: [Turbidity](#) :: [SWTR](#) :: [RAA](#)

1. System Info
 - Main water system information page (already covered)
2. Report for Lenders
 - Provides proof that the water supply is under regulatory oversight
 - Satisfies lending institutions

