

Appendix B

DOH Sanitary Survey

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STATE OF WASHINGTON
DEPARTMENT OF HEALTH
 SOUTHWEST DRINKING WATER REGIONAL OPERATIONS
P.O. Box 47823 Olympia, Washington 98504-7823
TDD Relay 1-800-833-6388

November 2, 2017 Mike Peterson City of Woodland Post Office Box 9 Woodland, Washington 98674	City of Woodland ID #982002	
	County:	Cowlitz
	System Type:	Community
	Operating Permit Color:	Green
	Surveyors:	Teresa Walker Fern Schultz
	Inspection Date:	September 21, 2017

I would like to thank you and Mike Karnofski for meeting with me to conduct a survey of this water system on September 21, 2017. Sanitary surveys are the Office of Drinking Water's (ODW) way to inspect public water systems through a field visit. ODW is also able to offer technical assistance to help utilities improve their system operations and ensure that public health is protected.

This report documents the findings of this survey. Deficiencies that need your attention are summarized below. As you correct the items, send me documentation that demonstrates the items have been completed as directed. Include the system name, ID number, and the date the deficiencies were corrected. You can send them to me by e-mail at teresa.walker@doh.wa.gov or by mail at PO Box 47823, Olympia, Washington 98504-7823.

If you are not able to correct these deficiencies, you must submit a Corrective Action Plan by the date assigned describing how and when the work will be completed.

SIGNIFICANT DEFICIENCIES* - NONE FOIUND

SIGNIFICANT FINDINGS - BY DECEMBER 18, 2017**

1. Please provide photos of screened air vents and hatch sealing gaskets for both reservoirs.
2. The media depth of the filters is unknown. Please measure the depths of anthracite and sand and compare these to design depths at the time of installation for the three filters.

OBSERVATIONS

3. The wastewater plant may not be adequately protected from cross connections and should have an air gap. Please have your cross connection specialist evaluate the wastewater plant for hazard isolation. Contact Bill Bernier at (360) 236-3562 for assistance in evaluating what type of protection is needed at this facility.
4. All source monitoring should be collected following the treatment plant. The system has had several VOC detections since 2006, possibly due to incorrect sampling location. Please take a VOC sample following treatment (clearwell) to confirm whether there are any detections post treatment.

RECOMMENDATIONS

5. The filter housings for filters 1 and 2 are severely corroded and in need of painting. Please plan to paint or replace the filter housings within the next three years.
6. The operators should become familiar with calculating dosages for purposes of historical record and for monthly reporting purposes.
7. A revised contact time of 127 minutes was approved following the ODW funded tracer study. Please make this change on your monthly reports.
8. To qualify for reduced DBP sampling, you must collect monthly raw water total organic carbon (TOC) samples for one year in accordance with 40 CFR 141.132. The raw water TOC annual average must be less than or equal to 4.0 mg/l in order to qualify for reduced sampling.
9. Operators should try to lower the threshold shut off value for filter-to-waste to 0.09 NTU in order to consistently meet optimization criteria.
10. Reservoirs should be cleaned and inspected every five years.

SYSTEM INFORMATION

Woodland is located in south Cowlitz County along the Lewis River and I5. It has only one source, which is the Lewis River, a surface water source. Water is pumped to the treatment plant from the Ranney well laterals through 4,200 feet of 12-in transmission line. There are two reservoirs following treatment which gravity feed the entire distribution system. This system is a typical community and has approximately 2,500 connections, serving schools, retirement places, and hospitals. The system is approved for an unspecified number of connections.

SECTION 1: SOURCE

Source ID #	Name:	Description:	Ecology Tag #	Listed on WFI	
				Yes	No
S01	Lewis River	Ranney Well	NA	<input checked="" type="checkbox"/>	<input type="checkbox"/>

See the Rapid Rate Filter Plant report for descriptions of source and watersheds.

SECTION 2: DISINFECTION

See the enclosed Sanitary Survey of a Rapid Rate Filter Plant for a description of the system's disinfection treatment.

Operators take daily distribution residuals with a digital Hach Colorimeter. Distribution residuals are maintained above 0.3 ppm.

SECTION 3: OTHER TREATMENTS

See the enclosed Sanitary Survey of a Rapid Rate Filter Plant for A description of the system's treatment.

SECTION 4: DISTRIBUTION SYSTEM

The system is comprised of one pressure zone, fed by gravity from the large reservoirs at the treatment plant. There is an area of low pressure, approximately 10 homes, located near the Water Treatment Plant (WTP) and reservoirs, which is below 30 pounds per square inch (psi). There is a planned booster pump station to serve the Scot Hill homes and the new park facility located behind the treatment plant.

The city has been replacing the service meters throughout the city. The three and four inch meters have been replaced and all the one and two inch meters will be replaced by the end of 2014. The City contracts out meter reading.

FEATURES	Yes	No
Service area and facility map	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Minimum pressure requirements met	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Service meters (reading frequency <u>bimonthly</u>)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Leak detection program	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water system leakage (%)	10	
Adequate valving for flushing and pipe repair	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Blow-offs on dead ends	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Routine flushing (frequency <u>annually</u>)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Routine valve exercise (frequency <u>annually</u>)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

CROSS CONNECTION CONTROL (Community Systems)	Yes	No
System has enabling authority	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Ongoing hazard inspections	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High hazards identified	<input checked="" type="checkbox"/>	<input type="checkbox"/>
High hazards protected	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Annual testing	<input checked="" type="checkbox"/>	<input type="checkbox"/>
System has installation standards	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CCS on staff or under contract	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cross connections observed have been eliminated	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Jody Herz has taken over the cross connection program for the City with Bob Choate and Bart Stepp leaving. The City sends out testing reminders. Public Works and Building and Planning meet regularly to discuss issues including recommending backflow devices for new construction. Operators were unsure of whether the wastewater plant was protected with an air gap. Bill Bernier may be available for a site visit to assist in evaluating the plant for proper backflow protection, you can contact Bill at (360) 236-3562. **Please evaluate the wastewater plant to see if adequate protection is provided.**

SECTION 5: FINISHED WATER STORAGE

Water from the Treatment plant is pumped to both the 1.1 million gallon (MG) glass lined reservoir and the 0.5 MG concrete reservoir. The larger one is also used for contact time for disinfection treatment. Two pressure transducers control the water level in both storage tanks. The storage tanks gravity feed the distribution system.

The old reservoir constructed in 1912 is still located at the site, but physically disconnected from the system.

RESERVOIR	RESERVOIR NAME	DESCRIPTION	YEAR BUILT	TOTAL VOLUME (GAL)
1	Steel Tank	Glass Lined Bolted Steel	1990	1.5 MG
2	Concrete Tank		1962/2005	0.5 MG

TOP OF RESERVOIR	Res #1		Res #2	
	Yes	No	Yes	No
**Hatch: Locked	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Hatch: Watertight seal or gasket	<input checked="" type="checkbox"/>	<input type="checkbox"/>	unknown	
Hatch: Over-lapping cover	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Screened air vent	unknown		unknown	
*Openings sealed/protected	unknown		unknown	

Please provide photos of screened air vents and hatch sealing gaskets for both reservoirs. Drains and overflows flow into a common manhole with a duckbill type of valve. The manhole discharges to a ditch below the facility. The concrete reservoir has an internal baffle.

FEATURES	Res #1		Res #2	
	Yes	No	Yes	No
Separate inlet/outlet	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Protected drain outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Protected overflow outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
*Overflow line discharges into a sanitary sewer with an air gap	NA		NA	
Operational water level gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Bypass piping or isolation possibility	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
**Protected from unauthorized entry	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Low level alarms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample tap at outlet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Chlorine samples from the 1.1 MG reservoir are pumped to the treatment plant and sampled continuously along with pH and temperature with a reagentless Kuntz K400 analyzer. The lowest residual of the day is reported on the monthly reporting form for calculating contact time. Operators have noted troubles in calibrating this analyzer.

MAINTENANCE	Res #1	Res #2
	Yes No	Yes No
Frequency of structural and coating inspection	unknown	unknown
Frequency of cleaning	2011	2011
Frequency of appurtenance inspection	unknown	unknown
Frequency of routine site visit	daily	daily
**Structure in good condition	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
Clear of excessive vegetation	<input checked="" type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>

Reservoirs should be cleaned and inspected every five years. Please incorporate this maintenance into your ongoing operations and maintenance (O&M) plans. The reservoirs should be climbed annually to inspect the roof vents, hatches, and general condition.

SECTION 6: PRESSURE TANKS

This system has one pressure tank located within the WTP for boosting pressure in the plant.

BLADDER	Site: 1	
	Yes	No
Isolation valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure relief valve	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure gauge	<input checked="" type="checkbox"/>	<input type="checkbox"/>
In good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SECTION 7: BOOSTER PUMPS AND FACILITIES

None.

SECTION 8: WATER QUALITY MONITORING AND REPORTING

Refer to the Water Quality Monitoring Schedule for your monitoring requirements and status. If you have any questions on source monitoring, please contact Sophia Petro at (360) 236-3046.

CHEMICAL	
Sample Point	Description
1	Raw water prior to treatment

CHEMICAL	Sample Point 1	
	Yes	No
Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ODW WQ data reviewed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Sample collection sites correct	<input type="checkbox"/>	<input checked="" type="checkbox"/>

CHEMICAL	Sample Point 1	
	Yes	No
System has prior:		
<input type="checkbox"/> Nitrate results above 5 mg/L		
<input type="checkbox"/> Nitrite results above 0.5 mg/L		
<input type="checkbox"/> Primary MCL		
<input type="checkbox"/> Secondary MCL exceedance(s)		
<input type="checkbox"/> Organic detections		
<input checked="" type="checkbox"/> Other VOC detections		

Source water quality samples are still being collected prior to treatment. **All source monitoring should be collected following the treatment plant. The system has had several VOC detections since 2006, possibly due to incorrect sampling location. Please take a VOC sample following treatment (clearwell) to confirm whether there are any detections post treatment.**

COLIFORM	Yes	No
Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Monitoring plan adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Monitoring plan followed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
# of violations since last survey	0	

The system takes between 8 and 10 samples per month at dedicated sampling stations throughout the City. The last positive sample was in 2014. A revised Coliform Monitoring plan was received at the survey.

LEAD & COPPER	Yes	No
Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Results below action level	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Corrosion Control by soda ash injection occurs following filtration at the treatment plant. Target pH is between 7.0 and 7.1.

DISINFECTION BYPRODUCTS	Yes	No
Monitoring adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Monitoring plan adequate	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Monitoring plan followed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Results satisfactory	<input checked="" type="checkbox"/>	<input type="checkbox"/>

The system takes two (both THMs and HAA5) samples quarterly, and THM results averaged 17 ug/l in 2016/2017 and HAA5 averaged 9 ug/l. To qualify for reduced DBP sampling, you must collect monthly raw water total organic carbon (TOC) samples for one year in accordance with 40 CFR 141.132. The raw water TOC annual average must be less than or equal to 4.0 mg/l in order to qualify for reduced sampling.

SECTION 9: SYSTEM MANAGEMENT AND OPERATIONS

The City has had three public works directors since 2014 and Mike Karnofski, the current Director, is in an interim position while the City hires a permanent Director. As such, it has lost some continuity and personnel. A new public works director has been hired who will start in late October 2017.

PROJECT/PLANNING	Yes	No
System approved	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Current WSP/SWSMP	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Year WSP/SWSMP approved	2013	
Emergency response plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>

This system was approved for 5663 equivalent residential units (ERU) in the 2013 WSP. No additional capacity was requested with the Ranney well upgrades although the system capacity was increased through this Project. Our new planner, Fern Schultz, attended the survey. The system is very interested in having a rate analysis done. The WSP update is due in 2018 and the system has budgeted for it.

REPORTING	Yes	No
WFI reviewed and updated with purveyor	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Consumer confidence report (Community only)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Water use efficiency report (Municipal Water Suppliers)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cross connection control annual report (> 1000 conn)	<input checked="" type="checkbox"/>	<input type="checkbox"/>

OPERATOR CERTIFICATION

This system is required to have one WTPO3, two WTPO2s, and one WDM2. The three operators below satisfy these requirements.

If you have any questions or this information is inaccurate, please contact Operator Certification at (800) 525-2536.

Name of Operator	Certification Number	Certifications	Mandatory Operator
Mike Peterson	7707	WTPO3 (t), WDM3, CCS	<input checked="" type="checkbox"/>
Dennis Ripp	2375	WTPO2, WDM2	<input checked="" type="checkbox"/>
Derrek Amburgey	10808	WTPO2 WDM2	<input type="checkbox"/>
Jody Herz	14237	CCS	<input type="checkbox"/>

WDS-Water Distribution Specialist; WDM-Water Distribution Manager; WTPO-Water Treatment Plant Operator; BTO-Basic Treatment Operator; CCS-Cross Connection Specialist; BAT-Backflow Assembly Tester

Mike is taking the WTPO3 test in October. Dennis is in charge of distribution. Mike and Derek are the primary plant operators. Jody now runs the cross connection program.

OPERATIONS	Yes	No
Operational records maintained	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Complaints followed up	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Complaints documented	<input checked="" type="checkbox"/>	<input type="checkbox"/>
# of complaints recorded at ODW (since last survey)	0	
Operation and maintenance program	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Previous survey deficiencies/findings corrected, if no list below.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

The system has received high chlorine complaints lately. The customer wants Woodland to stop chlorination. They have been very responsive and invited the customer to visit the plant.

Unaddressed deficiencies include:

1. Evaluate proper protection for the wastewater facility
2. Take source samples following treatment.

CLOSING

This is a surface water system and your survey frequency is every three years. Your next survey is due in 2020.

Regulations establishing a schedule of fees, including fees for sanitary surveys, were adopted March 18, 2012 (WAC 246-290-990). The amount due is \$2,142. An itemized worksheet is enclosed with the invoice.

If you have any questions, please contact me at (360) 236-3032 or by e-mail at teresa.walker@doh.wa.gov.

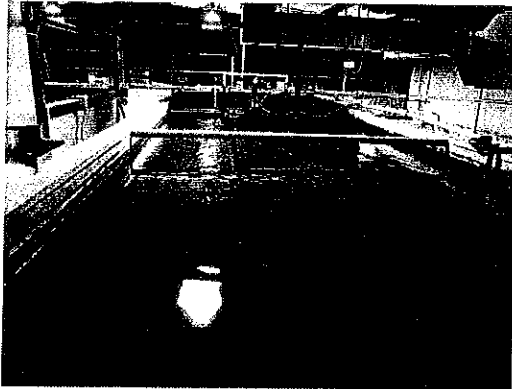
Sincerely,



Teresa Walker
Office of Drinking Water, Regional Engineer

Enclosures

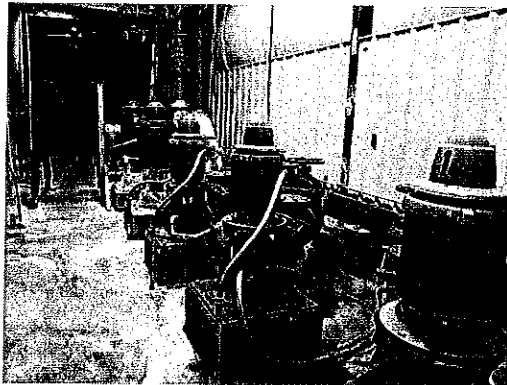
cc: Cowlitz County Environmental Health
Denise Miles, ODW



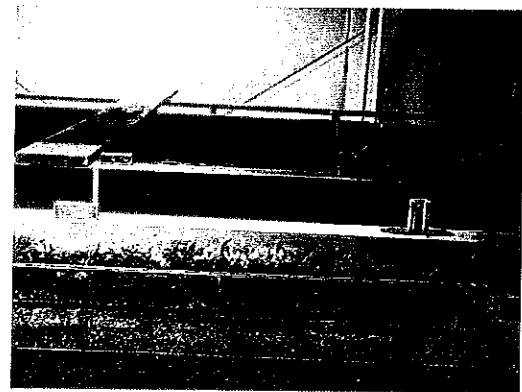
Filtration skid with CAC



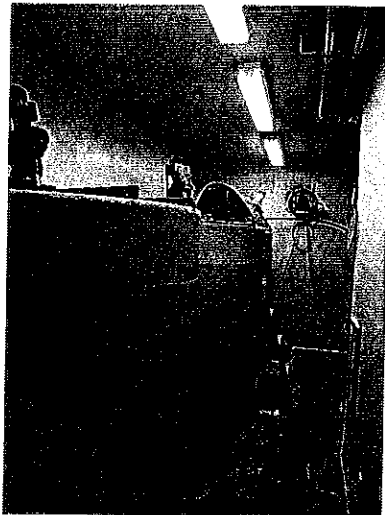
Backwash Basin



High service pumps from clearwell



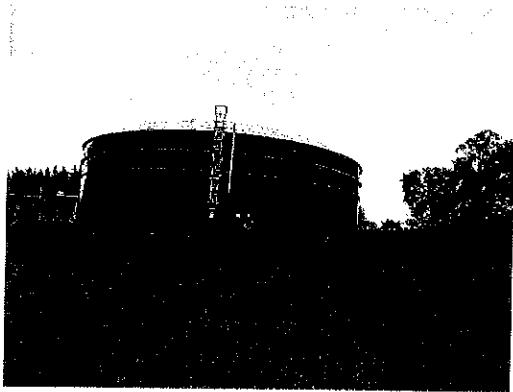
Corrosion on filter housings



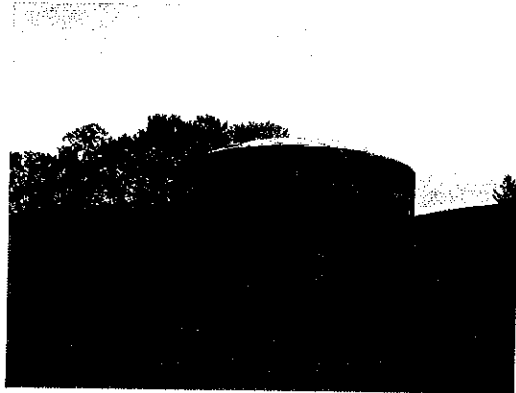
Soda ash injection room



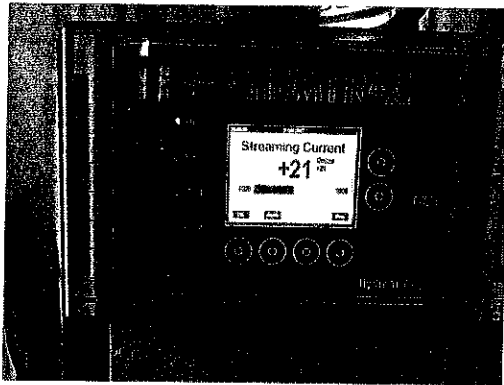
Kuntze K400 analyzer



1.1 MG glass lined reservoir



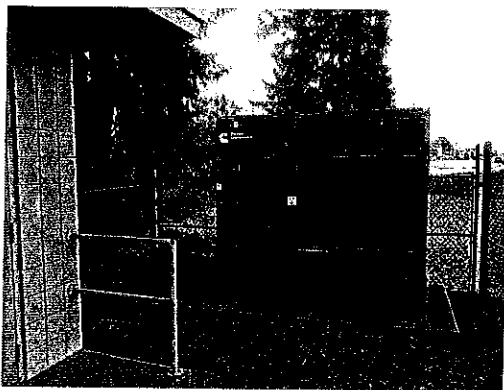
0.5 MG concrete reservoir



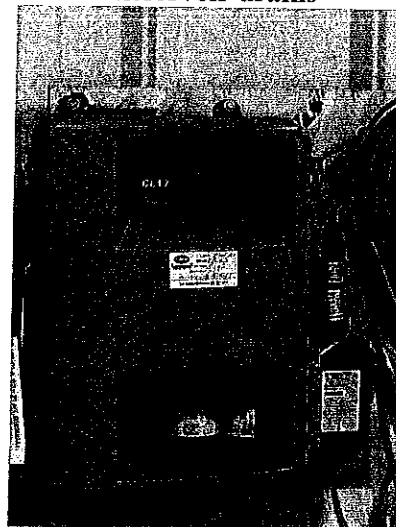
New Chemtrack Streaming Current Monitor



Reservoir drains



Ranney well generator



CL17

System Name City of Woodland	I.D. Number 982002	Date November 2, 2017	Evaluation By Teresa Walker	
Operator(s) Mike Peterson – present Derrek Amburgey – not present Dennis Ripp – not present	WTPO# 05583 10808 2375	Certification Level WTPO3 (Temp) WTPO2 WTPO2	Title Water Plant Manager Operator Operator	Phone Number (360)225-6174

Bob Choate left in 2017 and Mike Peterson is now the lead operator. Dennis and Derek are the relief operators. Mike has a temporary Level 3 operator certificate and signs the reports. Dennis and Derek were not present for the survey. The interim public works director, Mike Karnofski was present for the survey. Mike passed his WTPO3 in late October.

Source Water & Watershed Information (Review Watershed Risk Report from Surface Water Database (SWDB); Gather information needed if incomplete) Intake: Protection provided to Intake facilities; adequate screening; adjustable levels of withdrawal; pumped or gravity (reliability concerns)? Frequency and location of raw water turbidity and fecal coliform samples.

The raw water intake is a Ranney Well located on the Lewis River. The Lewis River is a large collector and the intake is downstream of many agricultural users, open to the public. For these reasons the watershed risk rating is moderate. The Lewis River is flow controlled by upstream dams and hydroplants owned by PP&L.

The gallery is accessible through a pit in the Intake Building. Three new variable frequency drive (VFD) pumps, rated at 100 HP each, were installed in 2008. New pumps rated at 1000 gpm were installed with the 2014 Ranney well improvements and controlled by SCADA. Two pump to the plant at a time. The Intake building is locked. A new propane generator was installed in the Ranney Well Rehabilitation Project and has a manual startup.

In 2014, Woodland installed three new laterals under the Lewis River, and abandoned three of the older laterals. Three existing laterals were cleaned, so the system now has a total of six laterals and an increased capacity of 2,800 gpm. There is a level indicator in the Ranney well. Operators record well levels, river levels, and temperature on a weekly basis. Iron build-up is a problem in the laterals and the pumps, most likely due to sediment below the river. The pumps are cleaned annually, one per year. The treatment plant runs at 1300 gpm with two filters operating together.

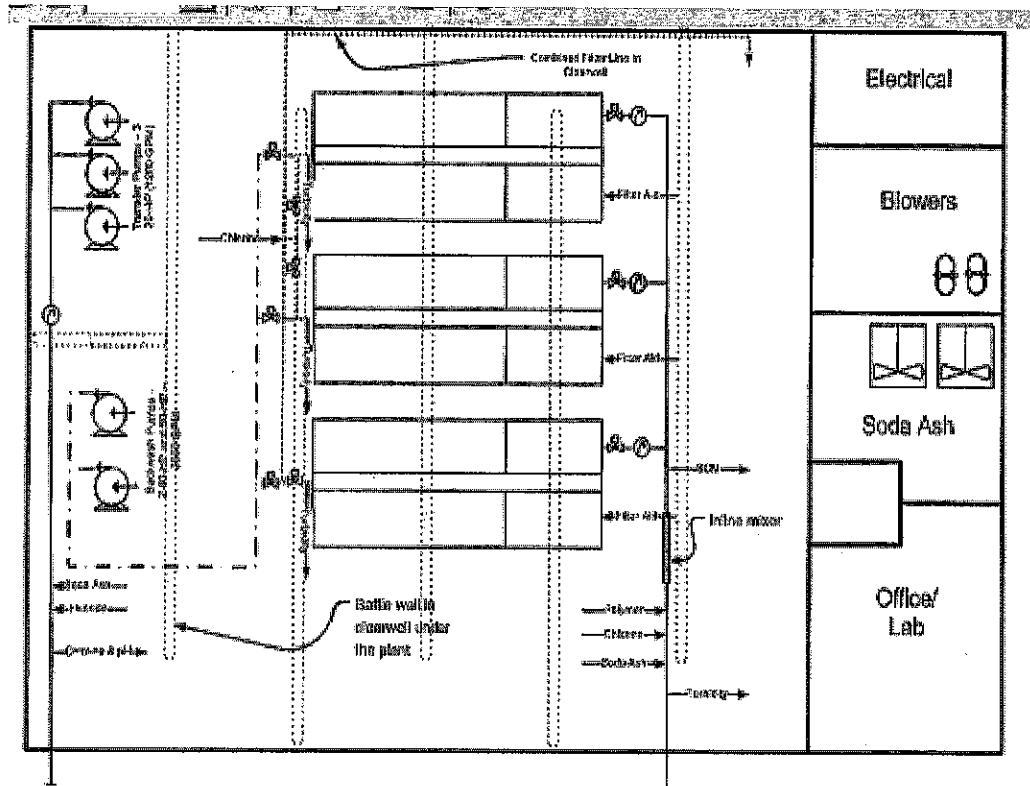
There is a 12-inch transmission main from the Ranney collector pump station to the WTP. It was cleaned (pigged out) in 2014, which reduced raw water iron levels, following the Ranney installations. Pigging the transmission main is conducted twice a year.

Raw water has elevated iron levels approximately 3 milligrams per liter (mg/L). Raw water turbidity is taken at the water plant following the transmission main, and typically ranges between 5 and 15 NTU. It is measured with a surface scatter and may not represent true turbidity due to high iron content. Iron and color are read as turbidity in raw water samples as the transmission main has iron and possibly iron bacteria in it.

The system takes one raw water coliform sample per month at the plant prior to treatment, which are typically less than 2/100ml. This also satisfies the LT2 round 2 sampling requirement. A bin classification is required to be reported following the two year sampling period.

Raw water source samples are still being collected prior to treatment and several VOC detections have occurred in these samples. The reason for this is unclear but should be eliminated once post treatment sampling is instituted. **All source samples should be collected following treatment and before storage.**

Plant Schematic – Use schematic from Comprehensive Performance Evaluation (CPE) report, if available; Show actual compliance monitoring locations for Combined Filter Effluent (CFE) turbidity, Concentration of Residual x Time of Contact (CT), and residuals @ entry point to Distribution System (DS); Place arrow and letter at chemical addition points and identify in tables below.



Chemical Addition - Coagulant(s), Filter Aid(s), pH Adjustment, Pre-Cl₂ /Rapid Mix:

Chemical	Dosage	Location
Ultrion 8185	1.18 mg/l	prior to static mixer
NaClear 8170	unknown	added at CAC
Chlorine	3.8 mg/l	pre static mixer
Soda Ash	8 mg/l	post clearwell

All chemical used in the WTP NSF Standard 60 Approved: yes

Note: PACl = Polyaluminum Chloride; CAP = Coagulant Aid Polymer; FAP = Filter Aid Polymer; Insert name(s).

How are dosages determined; how are they controlled? (Jar tests, Visual floc formation, streaming current monitor, historical, monitoring data, etc.); what turbidity variation triggers a change? (Compare monthly chemical usage to dosage.) Bulk storage? Day tanks?

Chlorine and CA polymer are added by injection ports directly into static mixer, prior to filter trains. A new streaming current monitor (SCM) (Chemtrak) was installed in 2016. It analyzes but does not adjust chemical dosages. The Filter aid (NaClear) is injected prior to the clarifiers after the static mixer. Dosages are based on historical usage and not changed much. Chlorine is added as an oxidant for iron removal as well as additional contact time. Raw and finished water iron is tested daily. Manganese content is not tested.

LMI chemical feed pumps were removed and replaced with peristaltic Grunfos pumps with higher capacities and easier maintenance. Information regarding calculating chemical dosages from cylinder drawdowns was handed out during the survey.

Rapid Mix Type: Static Mixer Mechanical Mixers Injection Mixers In-line Blender Mixers

Chemical dosages are not changed for NaClear 8185, dosage level is 1.18 mg/l. **The operators should become familiar with calculating dosages for purposes of historical record and for monthly reporting purposes.** A dosage calculation spreadsheet was forwarded to Mike.

Flocculation:

Flocculator Type: NONE

Sedimentation/Clarification:

NONE (Direct Filtration) Horizontal-flow rectangular Tube Settlers Dissolved Air Flotation
Adsorption Clarifier Horizontal-flow round Inclined-plate Other _____

Basin Dimensions: Length: 8.9 ft. Width: 7.9 ft Depth: 3.5 feet

Number of basins 3 Total Basin Volume: 7943 Gallons

Contact clarifier media type? Cleaning frequency?

Each train has a contact absorption clarifier, which uses plastic beads as a medium. Settled water is obtained from a grab sample on a weekly basis. CAC is run 400 minutes then flushed.

Flush cycle has air scour for 30 seconds then 700 gpm (plant flow) for 200 seconds using raw water. Turbidity in flush cycle varies widely and settled water turbidity is widely variable, depending on where in cycle it is taken.

Settled water turbidity is taken off the top of the filter by grab sample once per week mid CAC cycle.

Filtration:

Single Media Dual Media Mixed Media Pressure Filter Deep Bed Mono-media
Media Type: Sand Anthracite Garnet Other: _____

Filter Dimensions: Length: _____ Width: _____ No. Filters: 3
Total Area: 140 sq ft sq ft Max. plant flow rate: 1300 gpm with two filters Filter Rate: 5 gpm/sq ft

Individual Filter Turbidimeters Combined Filter Effluent Turbidimeter Calibration Date: 9/20/17

Backwash criteria: 1600 min. Rate: 15 gpm/sq ft Time: 10 min

Backwash to: Lagoon Lagoon To Raw Water Plant intake Sanitary Sewer

Filter-to-waste: No Yes Time: 5 - 15 min Stopped @ 0.1_{ntu}

Condition of media (mounding, cracking, mudballs); when replaced; Control of filter rate and backwash rate; Variability of filter rate; Turbidimeters properly operating? Numbers reported when plant is running? Models of turbidimeters: continuous and benchtop; filter to waste (FTW) at all start-ups or after backwash (BW)? Recycle backwash water, thickener supernatant, or sludge dewatering process liquid? Where to? Request to see required records.

Filter media depths are unknown. Information regarding how to collect media depths was handed out during the survey. **Please measure the depth of anthracite and sand compare it to design depths.**

There are three filters, each equipped with a HACH 1720E turbidimeter. There is no combined filter effluent monitoring so the system reports the highest of the individual monitors. The system contracts with Hach to calibrate instruments quarterly.

Filter to waste is stopped at 0.1 NTU, which is typically the daily maximum reported turbidity. We discussed lowering this value to 0.09 NTU which Mike thought would be achievable for optimization purposes. **Please try to lower the FTW cutoff to 0.09 NTU in order to meet optimization criteria.** The plant always starts up with a FTW cycle.

Backwash begins with a low flow rate, followed by air scour and high flow rate, which lasts for 13 minutes. A total of 19,000 gallons are used for backwash and filter to waste. Backwashes are staggered between two filter runs. Two filters operate at a time and are alternated daily, the combined flow rate is 1300 gpm.

Most of the recommendations from the 2008 CPE have been implemented, including equipment replacements. Gray and Osborne also completed an evaluation of plant needs in 2017. **The filter housings for the two oldest filters (1 and 2) are in need of rehabilitation and/or replacement as they are severely corroded.**

Backwash is discharged to backwash basins. Discharge from the transmission main pigging is collected here. The backwash basin decants back to the Lewis River though an NPDES discharge permit.

Chemical Addition – Disinfection:

<u>Chemical</u>	<u>Location</u>	<u>Dose</u>	<u>Chemical</u>	<u>Location</u>	<u>Dose</u>
NaOCl	<input checked="" type="checkbox"/> prior to static	8 mg/l	<input type="checkbox"/>	_____	_____
			<input type="checkbox"/>	_____	_____

Clearwell Dimensions: Length: _____ Width: _____ Depth: _____

<u>Parameter Monitored</u>	<u>Location</u>	<u>When/ Frequency</u>
pH	Post reservoir	continuous
Temperature	Post reservoir	continuous
Disinfectant Residual	CL17 - read lowest of day post clearwell	continuous
Disinfectant Residual	K400 out of reservoir	continuous
Peak Hourly Flow (PHF)	1300 gpm out of clearwell	

Other:

Redundancy of equipment; Contact time (T) evaluation – how derived, variable or constant; How is Peak Hourly Flow (PHF) determined – compare to value used for T in CT calcs; Check CT Summary Report in database, complete as necessary (If CT summary Report is not available, review CT determination in system files); Clearwell vents and screens; Calibration of pH meters and disinfectant residual monitors

A CL17 monitors chlorine residual out of the clearwell. The CL17 is checked with a colorimeter bench test weekly. HACH reps come out twice a year to calibrate instrumentation. They have had some trouble with verification and calibration of the K400.

Water in the clearwell flows over a fixed height weir into a wet well where it is pumped to the storage reservoirs by one of three pumps at 2100 gpm. An ODW contracted tracer study was performed for Woodland in 2017. A previously assumed baffling factor (T10/T) of 0.7 was evaluated. The tracer study resulted in a lower baffling factor to 0.6.

In 2015 the City asked for contact time credit for the reservoirs. Contact time is now given for Reservoir #1 (the 1.5 MG reservoir) which has a low volume at 17 feet of 1,159,090 gallons. **The revised contact time is 127 minutes. Please make this change on your monthly reports.**

If all three filters are run together, the approved contact time must be revised. Please refer to the tracer study approval letter.

A revised CT summary is included with this report.

There is no post chlorination. Water from the clearwell is routed first to the 1.1 million gallon reservoir and to a 0.5 million gallon reservoir if needed. A sampling line was installed post reservoirs for continuous monitoring of chlorine residuals and pH. Temperature is taken with a daily grab sample.

Chemical Addition – Corrosion Control/Stability/Other:

Soda Ash is injected now only prior to the clearwell at approximately 8 mg/l. The pH target is 7.0 to 7.1.

New chemical feed pumps, Grundfos, were installed in 2013 and are better than LMI pumps for soda ash feeds.

Alkalinity is measured weekly and ranges between 20 and 90 mg/l seasonally dependent.

Fluoridation was stopped in October 2013.

General Plant Operations/ Cross-Connection Protection (CCP)

Has purveyor had plant hazard evaluation by Cross Connection Control Specialist (CCS)? If so, when?

Internal CCP – chemical makeup; use of day tanks; chemical feed/ makeup interconnections; split chemical feeds? submerged inlets in chemical feed tanks? surface washers? FTW connections? Protection from overfeed? Connections to pumps? Hoses/ hose bibs? Any other treatment provided?

Domestic water at the plant is protected by a double check and is pumped by a small booster pump.

Is plant staffed during all times of operation?

No

Yes

Hours of operation: Start: 8:30 am

Stop: 5:00 pm

Number of Shifts: one

SCADA has been improved and Mike may now access and control the plant remotely. However the SCADA cannot operate remotely to turn the plant off and on.

Ventilation within the plant has been greatly improved by installing many large fans that run 24/7.

In 2016, Gray and Osborne researched and wrote a report of proposed Water Treatment Plant upgrades. It recommended HVAC along with other improvements. This was not submitted to ODW.

There is a diesel emergency generator for the plant. However it is presently inoperable due to a fire and will require replacement.

The facility is located behind a locked chain link fence. The WTP facility and the gate to the site are locked when operators are not present.

Critical Water Quality Alarms:

Parameter	Monitoring Point	Alarm Level	Shutdown Level	Response
Turbidity - Raw	At plant	none		
Turbidity - IFE				
Chlorine Residual	CL17 clearwell K400- reservoir	0.6- low 1.7 -high	0.6- low 1.7 -high	callout
pH - Finished				
Turbidity - Finished		0.1 NTU	FTW	No shut down
Reservoir	19 ft call plant	23 ft high 18 ft low		callout
SCM	Pre static mixer	200		Call out

Alarms are tested monthly

SANITARY SURVEY FEE WORKSHEET

Department of Health Office of Drinking Water Sanitary Survey Time Tracking		PWS ID # 982002
System Name	Woodland, City of	
Surveyor	Teresa Walker, Fern Schultz	Date: 09/21/17
System over 10,000 Connections?	NO	
Department of Health Paid Costs		
	Quantity	Cost
	Hours/Miles	
Survey program RO Coordination	1 \$	102 \$ 102.00
Survey Program Administrative Support	1 \$	102 \$ 102.00
Travel expenses (Mileage)	170 (# Miles) x (\$.337/Mile)	\$ 57.23
Technical Assistance	2 \$	102 \$ 204.00
Travel Time <10,000	4	102 \$ 408.00
Total Department of Health Costs to Perform All Surveys		\$ 873.23
Water System Paid Costs		
	Hours	
Scheduling, research, prep	8 \$	102 \$ 816.00
Survey Field Work	5 \$	102 \$ 510.00
Survey documentation – preparation of survey report to the purveyor	8 \$	102 \$ 816.00
Additional Water System Paid Costs for systems serving 10,000 or more connections		
	Hours	
	-	\$ -
Total Cost of Survey		\$ 3,015.23
Total Department of Health Unreimbursed Costs		\$ 873.23
Water System Paid Costs (Less than 10,000 Connections)		\$ 2,142.00



Office of Drinking Water
INVOICE

Engineering, Planning, and Sanitary Survey Review Form

TO: MICHAEL PETERSON
WOODLAND, CITY OF
PO BOX 9
WOODLAND WA 98674

ATTN: ACCOUNTS PAYABLE DEPT

Invoice Number	SW2013	
Invoice Date	November 2, 2017	
Billing Period	30 days	SW

DATE	DESCRIPTION	QTY	COST	AMOUNT
11/2/2017	SURVEY FEE WOODLAND, CITY OF COWLITZ COUNTY PWS ID 98200 DATE OF SURVEY: 9/21/2017	1	1	\$2,142.00
	DOH Share			<u>0</u>
	Total			\$2,142.00
Payment due within 30 days. Interest shall accrue at 1% per month after 30 days.				

Make Checks Payable to Department of Health

Return Lower Portion to:

Department of Health
PO Box 1099
Olympia, WA 98507-1099

Office of Drinking Water
Engineering, Planning, and Sanitary Survey Review Form

NAME	WOODLAND, CITY OF	
INVOICE NUMBER	SW2013	
INVOICE DATE	November 2, 2017	SW
AMOUNT	\$2,142.00	

Return to:
Department of Health
Revenue Section
PO Box 1099
Olympia, WA 98507-1099

DOH Form #331-332

For persons with disabilities, this document is available on request in other formats. To submit a request, please call 1-800-525-0127 (TTY 1-800-833-6388).

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