Vermont Department of Environmental Conservation
Watershed Management Division
Wastewater Program
1 National Life Drive, Davis Building, 3rd Floor
Montpelier, VT 05620-3522

Facility Inspection Report

Permittee Name:	Village of Richmond				
Facility Name & Location:	Richmond Wastewater Treatment Facility 281 Esplanade Richmond, VT 05477				
Inspection Type:	Compliance Evaluation Inspection	**Date Announced:**	5/30/2023		
Inspection Date:	6/14/2023	**Time In:**	8:50 AM	**Time Out:**	1:10 PM
NPDES Permit Number:	VT0100617				
State Permit Number:	3-1173				
Permit Type:	NPDES Direct Discharge Permit				
Permit Effective Date:	January 1, 2021				
Permit Expiration Date:	December 31, 2025				
Facility Grade:	Grade III DM				
Facility Class:	Domestic				
Receiving POTW/ Water:	Winooski River				
Onsite Representative/Title:	Nathaniel Fredericks, Chief Operator, Simon Operating Services				
Responsible Official/Title:	Josh Arneson, Town Manager				
INSPECTION RATING:	**Excellent**				

Guidelines for wastewater treatment facility and pretreatment facility inspection ratings:
http://dec.vermont.gov/sites/dec/files/wsm/wastewater/docs/Inspection.PDF

Jamie Bates Environmental Analyst (802) 490-6183 Jamie.Bates@vermont.gov	**Vermont ANR/DEC/Watershed Management Division** **Phone: 802-828-1115**	Jamie Bates Date: 08/01/2023

Areas Evaluated:					
X	Permit		Compliance Schedules		Stormwater
X	Records/Reports		Laboratory		Combined Sewers Overflows
X	Facility Site Review	X	Operations & Maintenance		Sanitary Sewer Overflows
X	Effluent/Receiving Waters		Sludge Handling/Disposal		MS4
X	Flow Measurement		Pretreatment		
X	Self-Monitoring Program		Pollution Prevention		

Inspection Attendees / Facility Contacts:

Name	Title	Grade	Participated in Inspection?
Nathaniel (Nate) Fredericks	Chief Operator, Simon Operating Services	Domestic V	Yes
Allen Carpenter	Assistant Chief Operator, Lead Process Operator, Village of Richmond	Domestic II	Yes
Brad Snow	Operator, Village of Richmond	Active-in Renewal	Yes
Steve Cote	Operator, Village of Richmond	Domestic I	Yes
Elijah Lemieux	Vermont Rural Water Association	Domestic IV	Yes
Josh Arneson	Town Manager	NA	No
Heather Collins	DEC	NA	Yes
Jamie Bates	DEC	NA	Yes

Corrective Actions:

Required:

1. It is required for the operators to not reuse buffer solutions for daily calibrations. This should be changed immediately. The Chief Operator shall mention when this change was made on the monthly DMR submission.
2. Secondary containment is required for the polymer tanks in the sludge press room where there is a floor drain that connects to the wet well before being treated by the headworks. This should be completed as soon as reasonably possible, but no later than 12/31/2023. The Chief Operator shall send photos of the secondary containment implementation to the Secretary no later than the date provided.
3. The effluent auto sampler was not equipped with a NIST traceable thermometer or a thermometer a third-party contractor calibrates annually. It is required for the facility to obtain a NIST traceable thermometer and have it calibrated every year or get a new thermometer every year. The current thermometer should be replaced as soon as reasonably possible. The Chief Operator shall mention when this change was made on the monthly DMR submission.
4. Autosamplers shall be calibrated to ensure 100mL aliquots are being collected when it pulls a sample. This calibration is required and should be completed as soon as reasonably possible, but no later than 12/31/2023. The Chief Operator shall mention when this change was made on the monthly DMR submission.

Recommendations:

1. Records in general could be better organized. It took the operators a few minutes to find the correct record box for 2022-2023 data, a copy of the permit, and plans. It is recommended for the Village to organize their records, so the past 3 years of monitoring data and permit-related documents are readily available.
2. There was a treadmill in the influent pump gallery which was collecting clutter and had no purpose there. It is recommended this be removed.
3. The facility lab manual needs to be updated to reflect the 2022 revised online Laboratory Manual: https://dec.vermont.gov/watershed/wastewater/wastewater-laboratory-assistance
4. The PVC aeration discs were exposed to the sun. It is recommended for the operators to fill with water just to cover the PVC discs to reduce the effects of UV erosion for equipment life expectancy.
5. The Reduced Pressure Zone Backflow Preventers (RPZBP) at the facility are recommended to be checked and serviced every 2 years.

Burlington North Wastewater Treatment Facility (WWTF) Inspection Findings	
Self-Monitoring Data Review Period:	June 1, 2022 – May 31, 2023

The monitoring data submitted during the review period was reviewed after the inspection and no violations were reported.

- Over the past year, the percent removal for BOD_5 averaged 99.5% and the percent removal for TSS averaged 99.5%. These are impressive results considering the high influent BOD (averaging almost 508 mg/l) and influent TSS (averaging 674 mg/l).
- Phosphorous removal at the facility remains excellent. The monthly effluent concentrations averaged 0.08 mg/l over the review period and in 2022 with an annual average discharge of 22.15 lbs.

During the inspection the operators notified and inquired about the results they received from Endyne for their Annual Constituent Monitoring. The results showed Total dissolved Solids and Total Nitrate were high. The facility resampled on 5/24/2023 and received their results at the time of the inspection.

According to the reports:

- The original sample taken on 5/10/23: Nitrate, Nitrite, Total Phosphorus, Total Dissolved Solids were processed. The TKN was rejected, and the oil and grease sample went missing. Endyne still processed these samples without notifying the facility.
- The resample was collected on 5/24/23: TKN, Ammonia, Oil and grease were processed. Sample bottles for nitrate as N, Nitrite as N, Phosphorus total, and total dissolved solids were not analyzed for some reason. They were really confused because Endyne had checked all the samples present in the Chain of Custody and expected results for all ACM constituents, more specifically the Total Nitrate and Total Dissolved Solids that were high in the original sample.

I recommended the facility to resample to have representative data submitted to the Program for their ACM. This data is used to assess the loading treated by the plant, in comparison to the facility design nutrient and solids capacity in addition to being used to calculate the reasonable potential determination. All results must be reported to the Program pursuant to Permit Condition II.D.8 for Additional Monitoring.

The May DMR submission stated they planned to resample June 18th and be reported with the June DMR.

Visual Observation of Effluent Quality:	The effluent at the weir of the WWTF was clear and based on a review of water quality data, is of excellent

	quality.

Equipment Condition:

All equipment was operational at the time of the inspection, except:

- One influent VFD pump leaks and sprays which is an original part from the 1971 facility construction. The second one is a 25-year-old pump that is currently in use that Phil Laramie loaned the Village. The Village mentioned they are working with Hoyle and Tanner on the 20 Year Engineering Evaluation to put this project out to bid as soon as possible.
- The sludge filter press auger for the gear box broke on 6/13/2023 and the system was not operating during the site visit. Steve had completed the repairs and planned to install the repaired gear box the following day with the help of a contract electrician to hook it up properly.
- One of two aeration tanks and one of two secondary clarifiers were in use. Both were operational, but only one needs to run to effectively treat the influent.

The Operators conduct daily checks and typically maintain equipment on a routine basis or if something is broken/not working properly.

Onsite Data Review:

Analytical data, contract lab reports, and bench sheets were reviewed for June 2022 and April 2023. For the months checked, the records were accurate.

A copy of the current permit, OMER Plan and Electric Power Failure Plan were available on site electronically and in paper copy.

Records in general need to be better organized. It took the operators a few minutes to find the correct record box for 2022-2023 data, a copy of the permit, and plans. It is recommended for the Village to organize their records, so the past 3 years of monitoring data and permit-related documents are readily available.

Operational Status and Maintenance Program:

Influent wastewater enters the facility directly into an Equalization (EQ) Wet Well Tank. The RAS and supernatant from the sludge filter press are recycled through the system and conveyed to this wet well. Two pumps are used to pump the wastewater from the EQ tank to the headworks. The pumps can be rotated to help reduce the effects of wearing down over time. Currently, one pump is out of rotation due to it leaking/spraying when in use. This issue was previously discussed in the “Equipment Condition” section of this inspection report.

Influent samples are collected from the EQ tank. There are no obvious places to take the influent sample that would be more representative.

The headworks consists of a Lakeside mechanical screen and aerated grit removal system. Following the grit removal are three anoxic tanks with mixers. Each tank section is approximately 8’ x 10’ x 10’ deep. The Lakeside mechanical screen was installed in 2002/2003. One mixer is planned to be replaced soon. The operators are just waiting for the parts. Flows are manually backwashed to the influent wet well.

Following the anoxic tank, wastewater flows into the aeration tank. Tank #2 is in use currently and tank #1 has recirculating clean water. Both tanks have DO sensors. The aeration pattern looked sufficient in the aeration tank. Operators also lower water levels approximately every five years to inspect aeration discs and clean tanks. The operators are doing a lot of cleaning to prepare for the future upgrade and plan to have both tanks cleaned later this summer/fall. One tank was cleaned out and empty. The PVC aeration discs were exposed to the sun. It is recommended for the operators to fill with water just to cover the PVC discs to reduce the effects of UV erosion for equipment life expectancy.

Sodium Aluminate is dripped into the effluent channel prior to entering the rectangular secondary clarifier. One clarifier is typically used. Operators switch clarifiers every six months. Clarifiers were upgraded with new mechanical equipment in 2005.

Two 10-micron filters follow the clarifiers which are switched every two weeks. This helps in controlling the filter fly population in addition to phosphorus removal.

The UV disinfection system is working well. *E. Coli* levels over the review period are typically 1 colony/100 ml or less, well below the permitted 77 colonies/100 ml limit. The operators clean the UV channels every two weeks and maintain the UV system as needed. The system consists of 2 units with 10 sets of bulbs each.

The Fournier filter press used to dewater sludge at the facility was upgraded in 2010. As mentioned previously this system was temporarily out of service during the inspection.

Collection System:
The Richmond collection system is gravity with the exception of one pump station located on the opposite side of the Winooski River. The collection system consists primarily of residential and commercial users. There is one brewery located on the system, Stone Corral. We did not tour the collection system or visit the pump station as part of this inspection.

Safety Program:

The WWTF has an adequate safety program. Eyewash stations and first aid kits are checked by an outside contractor (CINTAS) approximately every four months. According to the tag on one of the eye wash stations, the last inspection took place in June 2023. Equipment is locked out/tagged out when being maintained or serviced.

There is a permitted confined space on site, below the headworks. The municipality hires a qualified contractor to enter permitted confined spaces because the operators do not have those qualifications.

There is one area (the EQ tank) in the facility that is questionable as to whether it is a confined space or not. The operators do not enter this area very often and have someone stationed above the open tank when they do.

The Reduced Pressure Zone Backflow Preventers (RPZBP) at the facility are recommended to be checked and serviced every year. The previous 2018 inspection report recommended every 2 years.

While general questions about safety may have been asked during the inspection, this was not a comprehensive safety inspection.
As a reminder, the facility should always follow safe operating procedures. Employees must be trained in emergency shut-down, fire control, and spill response procedures, as well as in the use of safety equipment, safe sampling techniques, and safe handling of chemicals and wastes. Employees should not enter confined spaces unless properly trained and equipped. Managers must be aware of the Occupational Safety and Health Administration (OSHA) Right-to-Know laws regarding potentially dangerous chemicals in the workplace. This law specifically requires a written hazard communication program, labeling of chemicals, and the availability of material safety data sheets to employees upon request.
Workplace safety laws may be found here: https://labor.vermont.gov/vermont-occupational-safety-and-health-administration-vosha/rules-publications/rules-regulations

The Vermont Occupational Safety and Health Agency (VOSHA) can assist facilities in creating safe workplaces. VOSHA Compliance Assistance Specialists can provide general information about VOSHA standards and compliance assistance resources. https://labor.vermont.gov/vermont-occupational-safety-and-health-administration-vosha/meet-vosha-requirements

Sludge Management:

The facility does accept septage from several haulers. Tanker trucks unload into a separate headworks. This headworks has a mechanical screen and an aerated holding tank. The septage is then mixed with the WAS in an aerobic digester prior to dewatering.

The operators plan to clean this system by pumping out the sludge slurry and jetting the piping. There was an approximate 3-4 ft of solids in the sludge aeration tanks that are 21 ft wide x 21ft long x 10 ft deep.

The filter press uses about 55 gallons of polymer every 2 days. There is a backflow issue where non-potable water can access the system, but it is not equipped with a back flow preventer valve. There have been two polymer feeding malfunctions since December, where there would be a power surge and the system would pump the polymer barrel until it was empty. The Town is currently working on getting these installed and inspected.

Buildings and Grounds:

The buildings and grounds appeared to be in excellent condition on the day of the inspection.

There was a treadmill in the influent pump gallery which was collecting clutter and had no purpose there. It is recommended this be removed.

Laboratory and Analytical Procedures:

The Richmond WWTF laboratory analyzes pH, Settleable Solids, Temperature and Dissolved Oxygen (DO). BOD_5, TSS, *E.coli* and any additional analysis are sent to a contract lab (Endyne). Richmond does have the ability to analyze for total phosphorous. This is used primarily for process control, monthly samples for total phosphorous are analyzed at Endyne laboratory. In the event Richmond is completing their own analysis of effluent for Total Phosphorus that follows an EPA approved method, this data needs to be reported with the monthly eDMRs. It doesn't need to be reported in the event the process control samples are being collected within the treatment process.

The pH meter is calibrated daily using a three-point calibration. Buffer solutions of 4 standard units (s.u.), 7 and 10 s.u. are used for calibration with a check of 7 s.u. from a different lot. All buffers are supplied by Endyne and are within the expiration dates; ensure buffer lot numbers are transferred to bottles prior to accepting them from Endyne.

It is required for the operators to change buffer solutions for daily pH meter calibrations. Buffers should not be reused.

Equipment is checked and calibrated by an outside contractor annually. Was last done in September of 2022 for the flow meter and January of 2023 for the pH meter.

The effluent auto sampler was not equipped with a NIST traceable thermometer or a thermometer a third-party contractor calibrates annually. It is required for the facility to obtain a NIST traceable thermometer and have it calibrated every year or get a new thermometer every year.

Additionally, the autosampler shall be calibrated to ensure 100mL aliquots are being collected when it pulls a sample. This calibration is required.

Flow checks are completed weekly over the weir. The operators have a calibrated chart to easily record and measure flows.

The facility lab manual needs to be updated to reflect the 2022 revised online Laboratory Manual: https://dec.vermont.gov/watershed/wastewater/wastewater-laboratory-assistance

It was mentioned that the influent flow meter and WAS flow meter are not calibrated by a third-party contractor. The effluent flow meter was scheduled for calibration the following Monday from the inspection with LCS. This is done annually.

The facility uses the SCADA system to track the status of the facility's operations. This system alerts the Operators of any issues at the WWTF. It communicates via Wi-Fi and cellularly. There was mentioned that the backup alert telecommunication system needs work because the landline number changed for the plant.

Operator Certification and Staffing:

There are four certified operators at the facility. They are responsible for operations at the wastewater treatment facility, the water supply facility, for maintaining the wastewater collection system, the pump station and for maintaining the water supply distribution system.

Notes:

HTA is working on completing the Richmond WWTF Phosphorous Optimization Plan and their 20-year Engineering Evaluation. During the site inspection it was mentioned the following projects may be explored for part of the future upgrade:

- Reuse water on site for firehose water rather than using Village water. The facility costs about $35,000-40,000 annually on water.