

November 3, 2017

Ms. Cathleen Goodwin
Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

**Subject: Request for Cease and Desist Order
Forestville Water District Wastewater Treatment Facility
B&R File No. 3226.01**

Dear Ms. Goodwin:

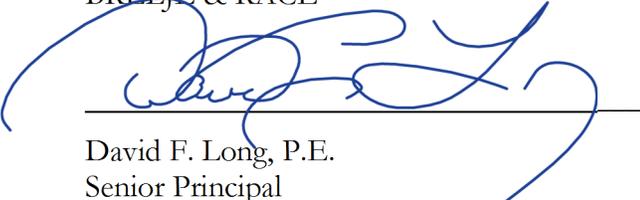
On January 19, 2012, the North Coast Regional Water Quality Control Board (RWQCB) adopted Order No. R1-2012-0012 (Order) for the Forestville Wastewater Treatment Facility (WWTF). The WWTF is owned by the Forestville Water District (FWD). The Permit contains prohibitions, limitations, and provisions regulating constituents in the WWTF discharge. In the cases of ammonia, nitrate and cyanide, sampling and testing of discharges during the current cycle of the Order indicates that FWD will be unable to consistently comply with limitations likely to be established in the upcoming Waste Discharge Requirements Order anticipated for adoption in early 2018. Imposition of additional enforcement (e.g., Minimum Mandatory Penalties) and/or legal actions based on unattainable discharge limits will severely limit the ability of FWD to implement changes to plant operations and processes that will enable compliance. Therefore, FWD hereby requests that the Regional Water Board issue a Cease and Desist Order (CDO) with associated time schedules and interim limits for these constituents that would allow FWD to carry out a planned course of action towards compliance. The attached Technical Memorandum sets forth the basis of and proposed schedule for the proposed actions.

Due to the inability to comply with ammonia, nitrate and cyanide effluent limitations, the RWQCB also indicated that they will be unable to grant FWD an exception to the Basin Plan's one percent flow limitation. Therefore, FWD also requests a CDO which would allow them to continue discharging to Jones Creek at the rate of one percent of the flow as measured in Green Valley Creek until FWD is able to carry out the plan of action to meet water quality objectives.

Thank you for your assistance and cooperation with preparing a CDO to accommodate this request for a compliance schedule. We look forward to working productively together on this important matter. Please feel free to contact our office with any questions or concerns that may arise.

Very truly yours,

BRELJE & RACE



David F. Long, P.E.
Senior Principal

TECHNICAL MEMORANDUM

TO: Cathleen Goodwin, North Coast Regional Water Quality Control Board

FROM: David F. Long

SUBJECT: Compliance Schedule for Ammonia, Nitrate and Cyanide
Forestville Water District Wastewater Treatment Facility
B&R File No. 3226.01

DATE: November 3, 2017



COMPLIANCE ANALYSIS

The analyses contained herein are submitted to the North Coast Regional Water Quality Control Board (RWQCB) to demonstrate the inability of Forestville Water District (FWD) to comply with the proposed water quality based effluent limits for ammonia, nitrate and cyanide. This inability also prevents the Regional Water Board from granting FWD an exception to the one-percent rule in the Basin Plan.

Ammonia and Nitrate

FWD's current waste discharge permit (Order No. R1-2012-0012) stipulates monthly monitoring for nitrate nitrogen and ammonia nitrogen at the discharge point to Jones Creek. The permit also sets an average monthly limit for Nitrate Nitrogen, Total (as N) of 10 mg/L but does not set limits for ammonia. It is understood that the renewed permit would maintain the current limits for nitrate and set new limits for ammonia.

Ammonia limits are dependent on the presence or absence of freshwater mussels in the receiving water body. If FWD chooses to assume that mussels are not present in the receiving waters, higher limits will be initially set, but the assumption must be proven true or false through a survey study. If mussels are not present, ammonia limits of 8.9 mg/L (maximum daily) and 4.9 mg/L (average monthly) would be set. If mussels are present, then more stringent (lower) limits of 4.96 mg/l and 1.7 mg/l, respectively, would be set. FWD can also choose to initially assume that mussels are present, forgo the survey study and take steps to comply with the more stringent limits.

FWD discharges tertiary treated wastewater to Jones Creek. Based on a desktop study of historical information, there is evidence to believe that mussels are present in Green Valley Creek, the receiving water body of Jones Creek. FWD therefore chooses to assume that mussels are present in their receiving waters, forgoing the mussel survey and triggering the more stringent limits.

Figure 1 shows test results for nitrate samples taken over the course of the last permit period at the discharge point to Jones Creek. Two of the 15 nitrate samples exceeded the current 10 mg/L limit. Figure 2 shows test results for ammonia samples taken over the course of the last permit period at the discharge point to Jones Creek. Twelve of the 14 ammonia samples exceeded the potential new average monthly limit of 1.7 mg/L. However, the dates of the two compliant ammonia samples coincided with the dates for the two samples that exceeded the nitrate limit.

Figure 1: Nitrate Nitrogen, Total (as N) Concentrations Measured at Discharge Point

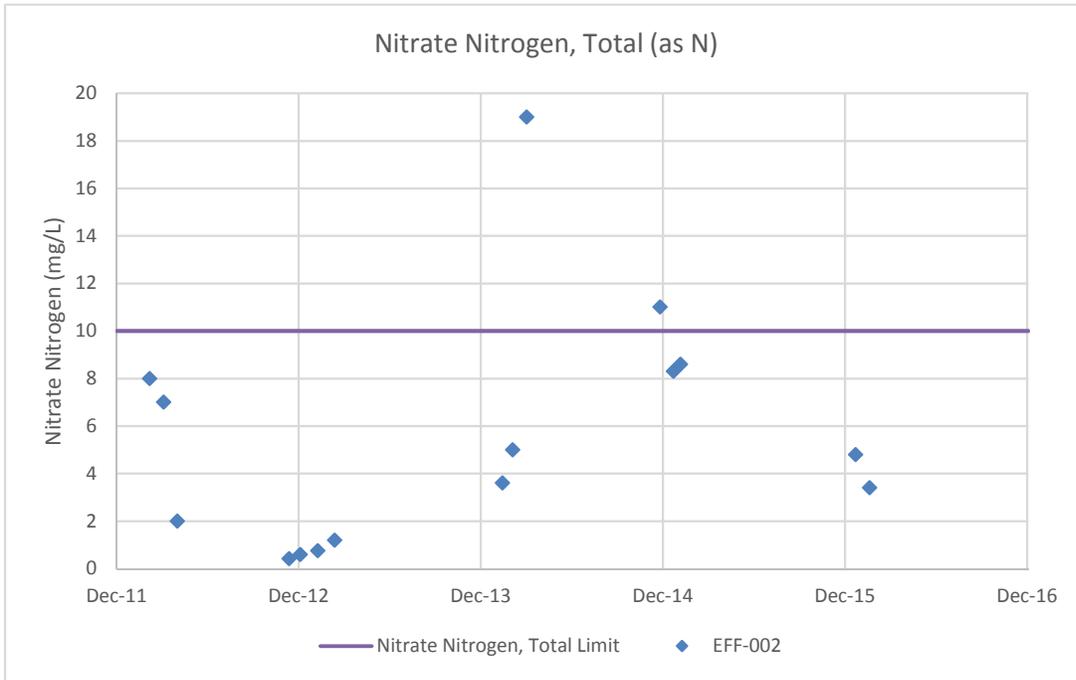
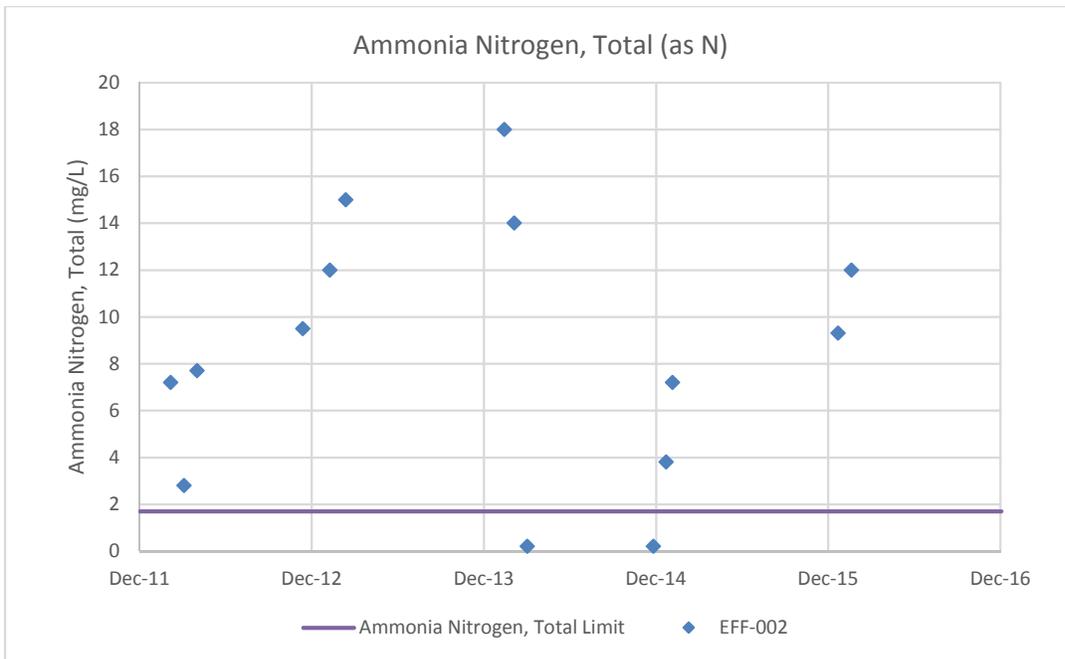


Figure 2: Ammonia Nitrogen, Total (as N) Concentrations Measured at Discharge Point



FWD's effluent had an average nitrate concentration of approximately 5.6 mg/L and an average ammonia concentration of approximately 8.5 mg/L. Typical wastewater influent streams have an ammonia concentration of between 12 and 45 mg/L. Based on this data, it is likely that the FWD treatment plant is not completely nitrifying or denitrifying.

Although the treatment facility often complies with final effluent limits for nitrate, the data suggests that this is only because the treatment process is holding nitrogen in a form other than nitrate nitrogen.

FWD is requesting a compliance schedule for both nitrate and ammonia because the two constituents are related. Making the changes necessary to convert ammonia may impact the treatment plant's ability to meet nitrate limits; therefore such changes should only be made in conjunction with considering the potential impact to the plant's denitrifying capability.

The FWD staff have recently taken extra samples at the outfall into the effluent storage (final) pond and had them tested for ammonia. The first sample showed <0.2 mg/L entering the pond, but a sample taken the same day from EFF-002 (pond discharge to Jones Creek) had an ammonia concentration of 3.9 mg/L. The final pond is an open reservoir and no treatment is accomplished therein other than some mixing by means of return flow from the recycled water pumping station. This indicates that the treatment plant is likely capable of treating the waste to meet the ammonia limits and the exceedances may be caused by activity in the storage pond. However, without known nitrate concentrations, it is impossible to tell if the nitrogen was being stored in a form other than ammonia for these same samples. This request does not make any definitive conclusions regarding the cause of high ammonia concentrations in the effluent, but the compliance schedule will include work to investigate the possibility of storage causing elevated ammonia levels.

Cyanide

FWD's current permit also requires monthly monitoring for cyanide at the discharge point to Jones Creek and sets an average monthly limit for Cyanide, Total (as CN) of 4.2 µg/L and a maximum daily limit of 8.7 µg/L. It is understood that the renewed permit would maintain the current cyanide limits.

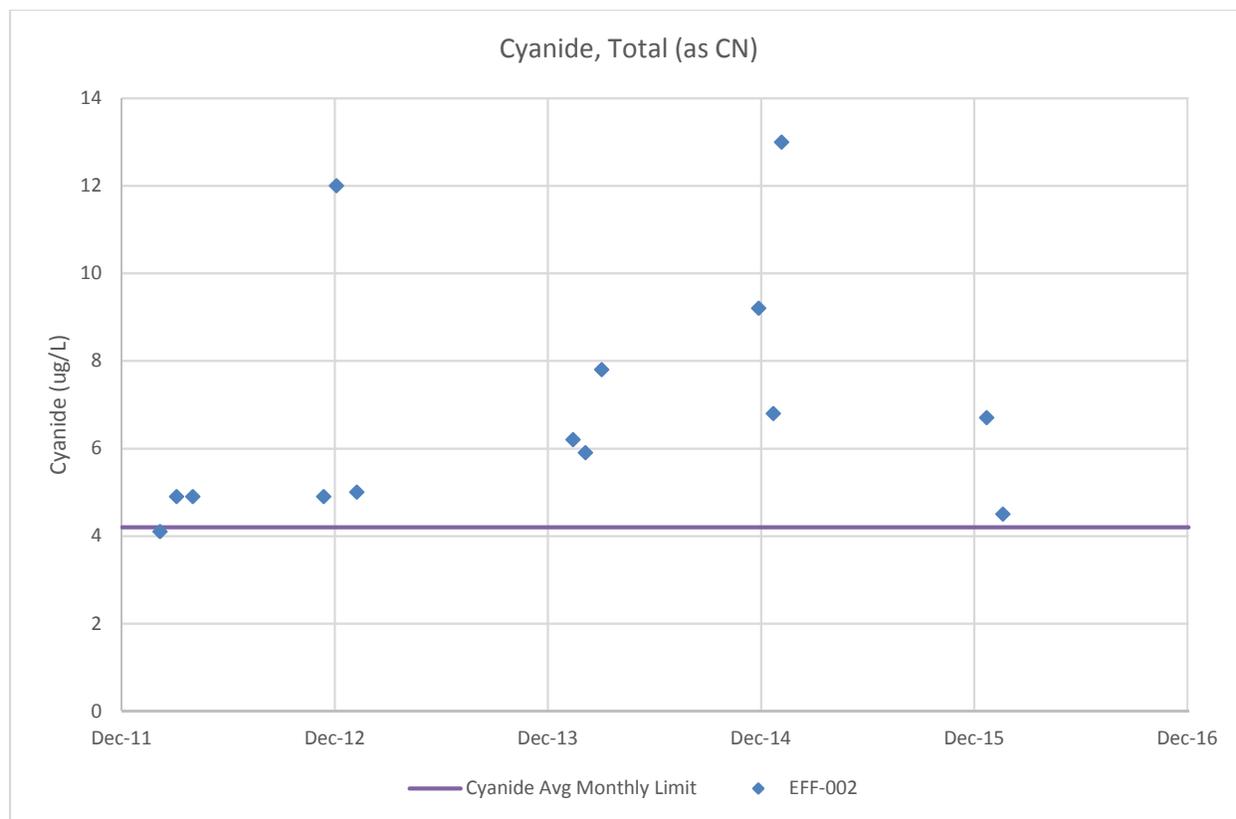
Over the last permit period, FWD received 16 cyanide-related violations from the period of April 2012 to February 2016. Figure 3, on the following page, is a graph of the cyanide samples taken throughout the current permit period as well as the permit limit.

There are two issues that deserve further study and evaluation before FWD should continue being held to the cyanide limits in their current permit. First, it appears that the RWQCB has elected to establish limits for cyanide using Total Cyanide concentration, which limits were determined by utilizing the EPA Recommended Aquatic Life Criteria of 5.2 µg/L expressed as Free Cyanide. The application of a Free Cyanide concentration to set a Total Cyanide concentration limit points to the discharger being held to a more stringent standard than necessary and deserves study and consideration of establishing new limits and test methods to determine compliance or perhaps even eliminating the need to including cyanide limits in the permit.

Second, hold time requirements of the approved cyanide testing method and FWD's geographic location, dictate the use of sodium hydroxide (NaOH) as a sample preservative. Testing performed at the Los Angeles County Sanitation District, the City of Roseville and the City of Vacaville show strong evidence that the use of NaOH preservative causes falsely elevated and erratic cyanide concentrations. The study conducted by the City of Vacaville found that preserved samples on average resulted in 427% higher cyanide concentrations than the unpreserved samples. In addition, 82% of preserved samples would have exceeded effluent limits whereas only 5% of the unpreserved samples would have resulted in a limit exceedance (*Problems Associated with Using Current EPA Approved Total Cyanide Analytical Methods for Determining Municipal Wastewater Treatment Plant NPDES Permit Compliance, Guidice et al, 2009*).

There have been studies performed that show cyanide does not quickly volatilize in unpreserved samples. Therefore samples can be held for much longer than 15 minutes without causing test results to be artificially low. Therefore FWD would like to perform a hold time study and submit it for approval to use unpreserved samples for compliance testing.

Figure 3: Cyanide, Total (as CN) Concentrations Measured at Discharge Point



One-Percent Basin Plan Exception

Attachment F Section II.B.3 of FWD’s current permit states that “the Discharger will be required to submit a formal request for an exception to the Basin Plan one percent flow limitation requirement if the Discharger plans to continue to discharge to Jones Creek at this rate beyond the term of this permit.” FWD submitted this request with their 2016 Report of Waste Discharge. Based on the information presented in the exception requests and the reasonable potential of the ammonia, nitrate and cyanide to effect water quality in Jones Creek, it appears that the Regional Water Quality Control Board will not grant FWD this exception to the Basin Plan.

FWD does not currently have the ability to discharge directly to Green Valley Creek and is requesting the ability to continue discharging to Jones Creek at the rate of one percent as measured in Green Valley Creek, at least until the investigative and implementation efforts associated with for ammonia, nitrate and cyanide are complete . One percent of Green Valley Creek flow is estimated to be approximately equivalent to 25 percent of the flow in Jones Creek. FWD believes that once they have completed the compliance schedules for ammonia, nitrate and cyanide, they will be able to meet effluent water quality limitations. When FWD is able to comply with these constituent limits they will submit another request for an exception to the Basin Plan one percent flow limitation requirement that the RWQCB would then likely be willing to grant.

The pipeline used to transfer effluent to Iron Horse could possibly be used to discharge effluent directly to Green Valley Creek, but significant improvements and modification would be necessary in order to accommodate the discharge flow rates required. FWD would be willing to investigate the improvements that would need to be made in the case that they have continued issues meeting effluent limitations.

PROPOSED ACTIONS AND ASSOCIATED SCHEDULES

Ammonia and Nitrate

In order to solve the problems of periodic, inadequate conversion of ammonia and nitrate by the FWD treatment plant, a study must be performed in order to fully understand the basis for developing viable solutions. Therefore FWD plans to implement a monitoring program for nitrogen species throughout the treatment plant.

Based on the results from the monitoring program, potential operational modifications and infrastructure improvements will be identified. Operational modifications will be implemented prior to the consideration of infrastructure improvements. Table 1 details the proposed tasks to be completed during the next permit period to aid FWD in complying with water quality objectives for ammonia and nitrate.

Table 1: FWD Proposed Ammonia and Nitrate Compliance Schedule

Task No.	Task	Estimated Time to Complete
1	Submit Ammonia and Nitrate Study Work Plan for Executive Officer Approval	6 months
2	RWQCB Approval of Work Plan	3 months
3	Apply for and secure a Planning Grant to fund Tasks 4 through 7	6 months
4	Conduct monitoring program for nitrogen species throughout WWTF at key locations	1 year
5	Prepare and Submit Preliminary Assessment Report for RWQCB Approval. The Report will include: <ul style="list-style-type: none"> a) Summary of data collected to date b) Evaluation of treatment facility performance with regard to ammonia and nitrate removal c) Evaluation of potential operational modifications to meet ammonia and nitrate limits d) Evaluation of potential infrastructure improvements to meet ammonia and nitrate limits 	9 months
6	Implement, monitor and report on operational modifications identified in Preliminary Assessment Report	1 year
7	If operational modifications are unsuccessful, select best infrastructure improvement option identified in the Preliminary Assessment Report. Prepare construction documents for infrastructure improvements to meet ammonia and nitrate limits	1 year
8	Bid and Construct infrastructure improvements	2 years

Cyanide

FWD believes that there are two reasons that they do not typically meet the effluent limitations for cyanide. One is associated with the misapplication of EPA established criteria in setting discharge limits and the other is because of a false indication of elevated concentration in the sample due to the

addition of NaOH preservative. FWD would like to investigate both of these issues through a study that would include the following general elements:

1. Investigate the influence of NaOH preservative by testing for Free and Total Cyanide in preserved and unpreserved samples of effluent.
2. Investigate the validity of extending the unpreserved sample hold time up to several hours to allow transportation of samples to a lab that is certified to perform Cyanide testing in-house.
3. Determine the average ratio of Free Cyanide to Total Cyanide for the purpose of applying it to past results and determining if past violations were truly warranted.

Table 2: FWD Proposed Cyanide Compliance Schedule

Task No.	Task	Estimated Time to Complete
1	Submit Cyanide Study Work Plan for EPA Approval	3 months
2	EPA Review and Approval of Work Plan	6 months
3	Conduct Cyanide Study ¹	6 months ¹
4	Prepare and Submit Assessment Report of Study for EPA approval.	6 months
5	EPA/RWQCB Approval of Report Findings	6 months
6	If Report Findings indicate actual presence of Cyanide concentrations in excess of justified limits, submit Cyanide Source Investigation Work Plan for RWCQB Approval	9 months
7	RWQCB Approval of Cyanide Source Investigation Work Plan	3 months
8	Conduct Cyanide Source Investigation	1 year
9	Implement Cyanide Source Controls	9 months

1. Depending on the estimated cost to conduct the Study, FWD may require grant funding assistance. IN this case approximately 6 months would need to be inserted into the Compliance Schedule between Tasks 2 and 3.

SUMMARY

The analysis above indicates that compliance with final effluent limits for ammonia, nitrate and cyanide is not feasible immediately upon the issue of a renewed NPDES Permit for the FWD treatment facility. FWD plans to implement the compliance schedules detailed in the preceding section to address the compliance issues. If FWD is financially burdened by enforcement while working to comply with these effluent limits, the success of the compliance schedule could be compromised. FWD therefore requests that the RWQCB issue a Cease and Desist Order (CDO) that includes the tasks listed in Tables 1 and 2. Additionally FWD requests that the CDO includes the ability for continued discharge to Jones Creek at a rate of one percent as measured in Green Valley Creek until water quality objectives can be met and the RWQCB would be comfortable granting FWD with an exception to the Basin Plan one percent flow limitation.

Pending the outcomes of the Cyanide Study and the operational changes or infrastructure improvements implemented based on the Ammonia and Nitrate Assessment Report, the District expects to achieve full compliance with the final effluent limits for ammonia, nitrate and cyanide by July 1, 2025.