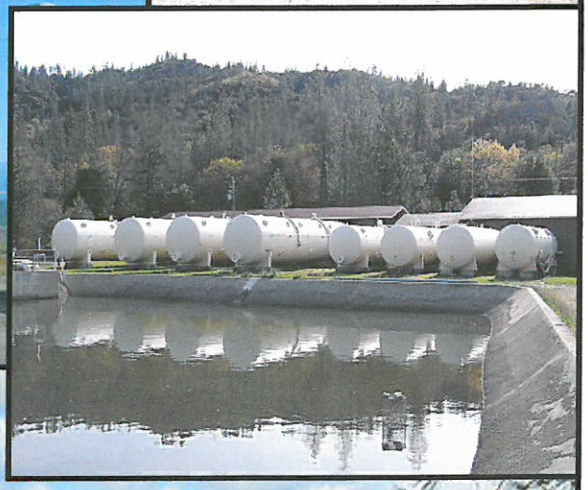
Clear Creek Community Services District
Pollution Prevention Plan



Pollution Prevention Plan

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Clear Creek Community Services District

CLEAR CREEK COMMUNITY SERVICES DISTRICT

POLLUTION PREVENTION PLAN – 2012

The purpose of this plan is to satisfy the request of the State Water Resources Control Board and provide evidence of compliance with the needs of the plan components.

Clear Creek Community Services District has a potable water treatment facility located at the base of Whiskeytown dam in Shasta County. The plant has a maximum optimum capacity of 25 mgd with an average annual flow of 5,500 acre feet. The raw water is treated with chlorine, pac and polymers as part of the treatment process. Backwash water is held in settling ponds where the water is allowed to settle before being discharged, eventually into Clear Creek via an un-named tributary. Depending on the time of year, this is what dictates the amount of backwash water produced. Winter backwash averages 52,000 gallons per day. Summer backwash averages 131,000 gallons per day. The treatment facility was renovated in 1995/1996 in an effort to comply with new regulations imposed within the 'Surface Water Treatment Rule', and the Department of Public Health Services. A part of the renovation process included the construction of the rinse water containment pond and the backwash settling ponds where all of the backwash water was diverted to 'settle' before being discharged into an un-named tributary and eventually ending up in Clear Creek. Due to the newly added plant capacity, four total discharge ponds were constructed to allow for maximum plant production, one for rinse water collection with 100% recycle incorporated and three for backwash discharge.

Since the construction of the treatment facility in the mid 90's, environmental concerns have come to the spotlight and in an effort to better protect the habitat, the district will make every effort to comply with the requirements of the discharge permit issued by the State Water Resources Control Board.

The plan components are:

1) Minimum use of treatment chemicals necessary to safely meet production requirements and meet the requirements of Department of Public Health water quality standards. Determine whether chlorine contains by-products and whether pre-chlorination is needed.

2) Test to determine where the manganese is coming from. Identify whether or not it is a by-product from one of the treatment chemicals. Efforts to reduce or elimination of the mineral.

3) Test to determine where the aluminum is coming from. Efforts to reduce or eliminate the aluminum.

4) Ultimate goal to eliminate discharge.

MINIMUM USE: Chlorine

Currently the District uses the minimum amount of treatment chemicals determined to be necessary for the finished water to meet the requirements set forth by the Department of Public Health Services. After discussing the chemical process with treatment staff it was determined that it might be possible to decrease the pre-chlorination dosing to the raw water even more. The primary purpose of the pre-chlorination is to prevent bacterial contamination in the filter beds and to cause a reduction in turbidity levels during the treatment process. During the winter months the pre chlorine injection is set to 0.40 PPM. This will be adjusted down to a 0.30 PPM in an effort to reduce the residual chlorine in the backwash water. During the summer months the pre chlorination is set to 0.60 PPM. This dose will also be decreased to a 0.50 PPM in an effort to reduce the cl2 residual found in the backwash water. During the peak flow season, daily monitoring of chlorine results in an average residual of less than 0.02 mg/l at the point of discharge due to the de-chlor used as the water is discharged to the settling ponds. Dichlorobromomethane is a by-product of chlorine and a member of the THMS. The District has completed quarterly tests and more recently in order to be in compliance with the SWRCB requests, have started sampling monthly. The results have been within acceptable MCL limits however, it is hoped that by reducing the chlorine injection to the raw water, this will reduce the levels of dichlorobromomethane found in the backwash water. Staff will monitor and document the levels of dichlorobromomethane detected in the water before and after the adjustments are made.

The last five results from 2011/2012 are:

• June – 2011	0.1ug/l
• March – 2011	0.2ug/l
• Sept. – 2011	0.3ug/l
• Dec. – 2011	0.3ug/l
• June – 2012	0.5ug/l

The maximum contaminate level for dichlorobromomethane (bromodichloromethane) is 1.3 ug/l. Sample data results reflects the district is continuously well below the MCL.

MANGANESE: Test to determine

This is a naturally occurring mineral found in many parts of Shasta County.
Treatment staff has repeatedly tested the raw, backwash, and treated water for levels of manganese in an effort to discover where the highest concentration was to help reduce the levels found.

Latest test results are as follows:

• RSW-001 (raw water)	6.0 ug/l
• RSW-001 (chlorinated)	6.8 ug/l
• EFF-001 (at discharge point)	115 ug/l
• In the soil from backwash pond	1111 mg/k

The above samples were taken in February 2012. The soil sample was taken only once in an effort to help determine the source of the manganese. The raw water coming into the treatment facility already has a measurable amount of manganese. After the backwash process the manganese content increases by a .8 ug/l. Treatment staff also tested both the polymer and pac for manganese with the following results received on 07.16.2012.

• POLY (Zeta 20)	0.2 ug/l
• PAC	3.0 ug/l
• BLANK	ND

The test results indicate the chemicals used for treatment are not the source of the manganese found in the backwash water although they could be considered to be contributing in a small way.

It is thought the existing ground could be a contributing factor due to the location of the ponds and that previously this was mine tailings and a dirt deposit site during the construction of Whiskeytown Dam. Treatment staff has also determined that manganese is present in the raw water. During the treatment process chlorine oxidizes the manganese and turns it into an insoluble. During a backwash the trapped manganese would be discharged into the backwash ponds. Treatment staff will lower the dose rate for the raw water cl2 injection from an average of 0.04 ppm to a 0.03 ppm and monitor the results. The new requirements of the NPDES permit require the district sample for manganese once a month. Manganese is a secondary, naturally occurring, non-regulated mineral.

Latest test, June 08, 2012, resulted in a 88.0 ug/l. After examining past records it was discovered the results for manganese has shown a decline in 2011. After reviewing sample reports from 2009 forward, analysis shows a decline in manganese content by 52% since 2009, averaging each year. The maximum contaminate level for manganese

is determined by USEPA's secondary standard of 0.05 mg/l. In the discharge permits summary of reasonable potential the MCL is listed at 50 ug/l. See attachment 'A' for test results beginning in 2009 and ending in 2011.

In an effort to reduce the manganese concentration in the discharge the District plans to allow the backwash ponds to dry and remove the sludge that has built up over the years. Because of the high level of manganese found in the soils in the ponds this should help to reduce the high concentration found. Additionally as mentioned earlier in this report, treatment staff will reduce the pre-chlorination dose in an effort to further reduce the manganese found in the discharge water.

ALUMINUM: Test to determine

The concern is the by-products that are introduced as a residual element of the backwash process and a component of the pac chemical used during the pre-treatment process. The Pac used is pac 926 from NTU technologies. This chemical coagulant contains water soluble aluminum compounds and is likely to be the source of the detectable compounds found during the water analysis performed by the district. Treatment staff has experimented with jar tests to determine the best possible quantity of this coagulant to use to achieve the best results. Treatment staff has attempted to use other manufacturers of pac but have not returned acceptable results. In an effort to reduce the aluminum compounds, treatment staff reduced the dose from 0.90 mg/l down to 0.60 mg/l. Typically it is easier to reduce the dosage during the summer months when the temperature of the water is warmer.

Treatment staff has used different types of pac but every coagulant of this chemical compound contains aluminum. Staff has contacted the manufacturer of the pac to see if there is a chemical to help remove the aluminum by-product when the water is settling in the backwash ponds. There is no known method to remove the aluminum content but there is a chemical solution that could replace the pac. It is acrylate polymer and unfortunately this chemical is extremely difficult to treat with. After researching this product and discussing it with other treatment operators outside of Clear Creek, it was discovered that if not used correctly this product will disrupt filter beds causing significant damage to the media. The district will continue to research different treatment products in an effort to reduce the aluminum content found in the pac.

The District samples for aluminum quarterly and for 2011 the average was 82.125 ug/L.

The District will continue to monitor the discharge water as requested by SWRCB in an effort to remain in compliance and further reduce the chemicals/minerals found to be in the discharge water.

SOLUTION: Ultimate goal

Ultimately the district seeks to eliminate the discharge via 100% recycle of the backwash water. Currently the project is being engineered by PACE engineering, the

district has applied for funding through the USDA, and the environmental work to be performed by the USBR has been approved by the BOD and authorizes the General Manager to sign the letter of agreement. In addition, staff has met with PACE, Diaz Planning, USBR staff, and SWRCB staff member Kevin Kratzke to discuss and plan the project. The recycle backwash water project will be completed in a timely fashion and staff will remain focused on the project to ensure completion at the earliest possible date. Staff plans to investigate other funding opportunities as well as the USDA as there are other agencies with programs in place to help fund projects such as this one.

ATTACHMENT A

MANGANESE TEST RESULTS – 2009 – 2011

2009	
January	255 ug/l
March	143 ug/l
June	315 ug/l
September	154 ug/l
December	333 ug/l
Average	240 ug/l

2010	
March	119 ug/l
June	383 ug/l
September	296 ug/l
December	171 ug/l
Average	242 ug/l

2011	
March	189 ug/l
April	78.3 ug/l
June	95.2 ug/l
September	88.2 ug/l
December	124 ug/l
Average	114.9 ug/l