



City and Borough of Sitka Public Works Department Water Division

100 Lincoln St. • Sitka, Alaska 99835
907 747-4060

2016 WATERSHED CONTROL REPORT

This Watershed Control Report (WCR) addresses the requirements as follows:

- A) IDENTIFY ANY SPECIAL CONCERNS ABOUT THE WATERSHED AND HOW THEY ARE BEING HANDLED
 - B) DESCRIBE ACTIVITIES IN THE WATERSHED THAT EFFECT WATER QUALITY
 - C) PROJECT WHAT ADVERSE ACTIVITIES ARE EXPECTED TO OCCUR IN THE FUTURE AND DESCRIBE HOW THE PUBLIC WATER SYSTEM EXPECTS TO ADDRESS THEM.
 - D) REPORT CERTIFICATION STATEMENT AND SIGNATURES
- A) IDENTIFY ANY SPECIAL CONCERNS ABOUT THE WATERSHED AND HOW THEY ARE BEING HANDLED

RECREATION: During 2016 the Blue Lake access road was closed to the public. Historically, the primary human activity in the watershed is sightseeing from the vista point overlooking Blue Lake. The view of the lake and surrounding mountains is popular with both locals and visitors alike. Many people do not even leave their cars for this activity and in the past even fewer have walked down the steep switchback to the water's edge some 350 feet below. With the dam raised and the lake level 83 feet higher, access to the water's edge will be much easier. A new upper gate will limit vehicular access to the water. Fishing, hunting, hiking and guided bike tours to the vista point are other activities for the more hearty that are expected to return in 2017. **An official date has not been set as to when the lower access gate will be opened, but it is expected to occur in 2018. When the access road reopens to the public, recreational activity will be monitored to evaluate the level of activity and the effect on Water Quality. To date, recreational activities have not resulted in "special concerns" for Blue Lake Water Quality.**

With the access road closed to the public for all of 2016 there was effectively no human recreation in the watershed. Recreation has been limited to a few people who have walked or biked to the lake to fish for trout from the bank. In the past, increased public awareness has reduced the amount of littering near the vista point and shore line. The City and Borough of Sitka (CBS) Water Department encourages public involvement in keeping the watershed clean and in the past has worked with various community groups for large scale litter clean up, although this has not been necessary since 1999. There is no indication that fishing, hunting, hiking, or camping has increased since 1992. CBS will continue to monitor the use of the area by camping permit and inspection visits once the access reopens in 2018. **There are no indications that past, present or expected future levels of human activities in Blue Lake watershed are having or will have any adverse effects on source water quality and only a minimal threat of contamination exists.**

VANDALISM: There have been very few acts of vandalism in the past and none since the access was restricted in 2015. New signs were installed in December 2014. To date there have been no deliberate or accidental activities that have impacted the water intake or water quality. The original intake was near the access point on the shore line. The new intake structure/tunnel entrance is no longer near the public access to the shore line. The intake structure/tunnel entrance is located around a sheer cliff rock outcrop and closer to the face of the dam. CBS plans to maintain public access to the lake similar to what was previously available by use of a gate that has been installed at the crest of the road just inside the watershed. **Water quality monitoring in 2016 continues to verify that we do not have any realistic “special concerns” with the Blue Lake Watershed or its water quality.**

DIOXIN; In 1996, the community of Sitka requested the Agency for Toxic Substances and Disease Registry (ATSDR) to determine if the Blue Lake water supply is safe for consumption.

The ATSDR concluded: “... the potential exposure to dioxin in the water is not of public concern”. The report can be found at http://www.atsdr.cdc.gov/HAC/PHA/alaskap/apc_p1.html.

CRYPTOSPORIDIUM: Is a microscopic parasite that is regulated by the EPA. CBS voluntarily tested for this waterborne pathogen in our raw water source in 1998 and 1999. The results (zero and 1.6 oocysts/100L, respectively) were published in the annual Consumer Confidence Reports (CCR) for those years. These results are significantly lower than the average of 43 oocysts/100L reported in a national study (EPA Dec., 1993). CBS is complying with EPA’s Cryptosporidium inactivation requirements. In 2015 CBS completed construction of an ultraviolet light (UV) disinfection system which was added to our treatment processes to inactivate Crypto, and to add a second disinfection barrier to comply with this rule. The UV facility started up for testing in May-2015 and has been running continuously since. DEC is in the process of reviewing the final drawings and will likely issue a Final Approval To Operate by July 2017.

B) ACTIVITIES IN THE WATERSHED THAT EFFECT WATER QUALITY

LANDSLIDES AND AVALANCHES: Both occur and may affect water quality. Slides and avalanches are naturally occurring and not affected by the limited human activity in the watershed. Slide control is considered unfeasible due to the steepness of the terrain and therefore, not recommended. At times in the past, Sitka has experienced increases in turbidity as did occur following the August 18, 2015 torrential rains at high elevation which resulted in a number of landslides on the west coast of Baranof Island. These higher than normal turbidity readings could not be specifically related to a known slide or slides. No slides were seen during inspection of the watershed. Perhaps there was a slide underwater or the turbidity may have been caused by heavy rains on high rocky slopes not covered by snow or ice. CBS continues to use the 2 additional Hach 1720E Turbidimeters to monitor the water quality of the lake during the dam expansion. One is installed off the penstock at the Blue Lake Campground hydro which serves as an advanced warning of turbidity on the way to Blue Lake Water Plant. During blasting for the new penstock, short duration turbidity spikes of a few minutes were generated. Using the known time delay in the penstock, water operators were able to stop the water flowing through the treatment plant and let the turbidity spike flow past and through the turbine generators therefore the drinking water system avoided the higher turbidity water. This procedure was very effective. The other turbidimeter was installed near the end of the transmission main at the CCF (Jarvis Street Corrosion Control Facility). The Water Division will continue to use these for routine monitoring.

DEBRIS REMOVAL: In 1995, the CBS Electrical Department, in coordination with the Water Department, began an annual debris removal project in the intake area. Clean ups typically occurred onshore only and occurred when the lake level subsided enough to leave the debris high and dry. The trend of decreasing amounts of debris coupled with the structured annual cleanup resulted in reduced potential water quality impacts from the removal efforts. This routine practice reduced the effort required to perform the clean up as well as prevented water quality degradation resulting from accumulating debris. These annual preventative maintenance projects have shown only slight effects in some years on turbidity and no noticeable effect on overall water quality.

The higher dam and flooding of uplands will generate more floating debris than in the past. A containment boom has been installed at the head of the lake where the greatest area of land and forest will be inundated. Debris captured by the boom are contained and will be moved by a contractor to a holding location. Debris floating near the dam and intake area, which is protected by a second containment boom, will be collected and moved by the contractor to the holding location at the far end of the lake. The collected debris will be burned annually on a bench of land that will be dry during annual lake level cycles. This site is four miles from the intake. No adverse water quality impacts are anticipated from this debris management.

Eventual decay of organic matter, such as alder and salmon berry leaves, hemlock and spruce needles is expected to gradually increase the total organic carbon (TOC) and regulated disinfection by-products (TTHM & HAA5) in our drinking water, although no such increase has been detected to date. These parameters will continue to be closely monitored. If increases in TOC and related disinfection by-products are detected they are expected to gradually decrease back to the previous low levels. This gradual rise in TOC followed by a return to previous levels has been reported for other reservoirs where the level was raised.

An increased concentration of floating hemlock needles were visible near the dam as the lake filled to a higher level. Needles have been reported to be captured in a manually cleaned strainer on the fish hatchery's supply (~ 5 MGD). The amount of needles seen and captured has steadily decreased since the original filling of the lake after the dam was raised. A small amount of plant matter is expected as the lake fills to new levels. The new intake has an air-bubble curtain in front of it to form a barrier for small debris.

In 2016 debris removal was carried out per the inundation plan without adversely affecting the water quality.

C. PROJECT WHAT ADVERSE ACTIVITIES ARE EXPECTED TO OCCUR IN THE FUTURE AND DESCRIBE HOW THE PUBLIC WATER SYSTEM WILL ADDRESS THEM

HUMAN ACTIVITIES: The Forest Plan for the Tongass National Forest became final in May 1997. This plan changed the federal land use designation of Blue Lake and Indian River watersheds to: "MUNICIPAL WATERSHEDS" which emphasizes protection of municipal water supplies and flows by assuring that watershed planning, maintenance, and activities comply with State of Alaska Drinking Water Regulations and Water Quality Standards for water supply. The Forest Plan was reviewed in 2007; no changes affected the designated watershed areas.

Management prescriptions include the provision for the Forest Service to consult, coordinate, and seek concurrent approval from City and Borough of Sitka on various activities, and directs development of a written agreement consistent with 18 AAC 80.520 (c)(3). The "Municipal Watershed" designation itself provides commitment by the landowner to control human activities that may have an adverse impact on the microbiological quality of the water supply, which 18 AAC 80.520 (c) (3) seeks. Since the initial project construction, no land development had taken place within the watershed until the 2013/14 construction activity for the dam expansion. No additional land development is expected after completion of the dam construction. New fencing will be installed in 2017 to protect the public from the steep slopes around the areas made more accessible by the dam project which will limit access into the watershed.

Construction for the Blue Lake Expansion Project, i.e. raising the dam and lake level by 83 feet, began in February 2013. A new power house near sea level has been constructed. The original 30" drinking water transmission main's location interfered with the new power house's location. In February and March of 2013, a section of the 30" main was rerouted with 24" ductile iron pipe down the water treatment plant access road and across the old steel bridge, around the new power house location and connected to the 30" main at the SMC Rd./access road intersection.

Raising the elevation of the dam and filling the lake may affect the drinking water quality. The project has given water quality a very high priority as a special water quality monitoring plan was established. Of particular interest will be the flooding of 430 additional acres as the lake fills. The new intake tunneled into the rock face near the dam was constructed on a sheer rock face away from potential shoreline contamination or turbidity issues, as had been observed in the past, to help maintain/improve water quality. The new intake will draw water from approximately the same depth below the lake's surface as the original intake to maintain the same relationship with the lake's thermocline.

There are no projected improvements to enhance recreation inside the Blue Lake Watershed. Overnight camping continues to be monitored by permit and the CBS Watershed Ordinance (No. 92-1091) prohibits any act that would degrade water quality either directly or indirectly. Overnight camping seldom occurs. Permits provide information to the campers about the watershed and the watershed rules. Campers register with the police department (24 hour/day); and a copy of the permit is sent to the Water Department Office so that timely inspections can be performed. Camping Permits and reports are kept on file at the Corrosion Control Facility. There were no camping permits in 2016. The Blue Lake access road has been closed to the public and will remain so until completion of the Blue Lake Expansion Project and repair of damage to the access road that occurred during the storm August 18, 2015. The CBS Electrical Department also inspects the Blue Lake access road and the penstock closure facility on a regular basis, coordinating with the Water Department as it relates to watershed activities. The Water Department keeps an inspection log of 9 parameters; 2016 data indicates no recorded public use. **The CBS Water Division will closely monitor water quality for impacts due to the new lake level. CBS does not foresee any present or future human activities within the Blue Lake Watershed that will adversely affect the water quality.**

FUTURE HUMAN ACTIVITIES: Public interest in drinking water continues to increase throughout the country and Sitka is no exception. CBS's water operators continue to conduct facility tours which include watershed protection information. The citizens of Sitka have become more aware of the need to protect their drinking water source. Each year has required less effort to clean up after the public.

Since the access road has been closed to the public the Sitka Police Department has suspended their inspections at the Blue Lake vista area. Once the access road is reopened they will resume their inspections. Their presence at the vista point is a deterrent to vandalism and improper use of the area. CBS is the owner of the access road from the campground, outside the watershed to the lake. If necessary, they could close the road to eliminate vehicular traffic into the Blue Lake Watershed. The USFS typically prohibits access to motorized vehicles from the first significant snow fall to until after all snow has melted off the road the following year. Access to Blue Lake road was closed to the public on December 13, 2012. The road will remain closed to the public until construction of the Blue lake Expansion Project is completed and significant damage to the road repaired.

As the lake level rose much of the difficult steep switch back access road was flooded reducing that impediment to lake access. The Electric and Water Departments have designed an access gate to maintain access restrictions similar to those naturally provided by the previous steep switchback road. **It is unknown how the higher lake elevation will affect human activity at the lake. The CBS Water Division will monitor human activity and its effect on water quality and report in future years.**

D. REPORT CERTIFICATION

The USFS and CBS are the owners of the Watershed. For water system and water quality related activities the operator is CBS.

I hereby certify the contents of this report to be true and correct to the best of my knowledge.

Signature: Shilo Williams Date: April 19, 2017

Shilo Williams, CBS Environmental Superintendent