POLLUTION PREVENTION PLAN
and
BEST MANAGEMENT PRACTICES

EAGLE CREEK NATIONAL FISH HATCHERY
ESTACADA, OREGON

MARCH 1, 2005

CONTENTS

CONTENTS (CONTINUED)

POLLUTION PREVENTION PLAN
and
BEST MANAGEMENT PRACTICES

EAGLE CREEK NATIONAL FISH HATCHERY

1.0 INTRODUCTION

The U.S. Fish and Wildlife Service (FWS) updated the Standard Operating Procedures (SOPs), Best Management Practices (BMPs) and Quality Assurance (QA) issues related to the Eagle Creek National Fish Hatchery (hatchery) in Estacada, Oregon. The location of the site relative to surrounding topographic features is shown in Figure 1. A plan of the site is shown in Figure 2, which provides a diagram of the water flow for the site including discharge points. Figure 3 is a copy of an aerial photograph taken in 2000. The SOPs and BMPs contained in this report were developed to address the hatcheries' National Pollutant Discharge Elimination System (NPDES) permit requirements.

The hatchery was built in 1955 and operates 75 raceways, a hatchery building, adult holding pond and spawning facilities and other maintenance buildings and water control structures.

2.0 BACKGROUND

The hatchery has maintained an NPDES permit (101522) that expired December 31. 2002. On June 5, 2002, Mr. Doug Dysart, the hatchery manager submitted a renewal application for the hatchery's NPDES permit. The renewal application listed three outfalls at the hatchery: the upper raceway, lower raceway and the pollution abatement pond. The past NPDES permit only lists one outfall, the pollution abatement pond. On August 21, 2003, a meeting was held at the hatchery with representations of FWS, GeoEngineers and the Oregon Department of Environmental Quality (ODEQ) at which 14 current outfalls or discharges were discussed.

The following sections provide a description of process water flow at the facility and the SOPs/BMPs for each item. Section 6.0 details the proposed new sampling locations, frequencies and parameters.

3.0 SITE WATER MANAGEMENT

The following section details the flow of water from the hatchery inlet through the entire hatchery system. The discussion first details the water flow through the upper raceway system, then the lower raceway system. Figure 2 depicts the hatchery water flow.

3.1 HATCHERY INLET PIPING

The intake for the hatchery (Item 1 on Figure 2) is a large concrete structure that gravity feeds a 36-inch pipe. The intake valve setting is varied depending on the water level in Eagle Creek and the hatchery's fish production requirements. The valve is adjusted to maintain the proper head within the system. During normal operations, the intake structure is cleaned one to two times per day for the removal of leaves, debris and sticks which float down Eagle Creek and lodge against the intake structure. During the fall months, (mid October through November) cleaning of the structure requires two employees for up to 6 hours per day or more due to the heavily increased loading of leaves in the creek. During storm events, 24-hour maintenance is often required. The hatchery maintains a floating log to direct surface floating debris away from the intake structure. As necessary, the mounting system for the floating log is serviced and maintained.

3.2 SAND SETTLING CHAMBER

The sand settling chamber (Item 2 on Figure 2) assists in settling out suspended materials from the water flowing through the 36-inch intake process line. The chamber measures 11 feet by 88.5 feet and has a volume of 27,300 gallons. The sand settling chamber has two possible discharges back to Eagle Creek. The first is the overflow weir (1b) on the southern side of the chamber. The overflow serves to maintain the proper head within the entire water system. In addition, a 4-inch drain line (1a) is available for draining the settling chamber during emergency maintenance operations. The drainage from the sand settling chamber is designated outfall 001. The water level within the settling chamber is maintained by valve adjustments at the intake structure and at the screen chamber tower valves. Additionally, during normal operations, the valve to the settling chamber is open and the valve to the bypass channel is closed.

The sand settling chamber is cleaned between two and eight times per year. The cleaning frequency is dictated by the amount of sediment observed in the chamber. Prior to removing the sediment, the water in the settling chamber water is pumped into the bypass side channel after the valves regulating water into the settling chamber have been adjusted so that no water is entering the settling chamber. The accumulated sediment (primarily sand, leaves and fir needles) is excavated from the main chamber using a front-end loader and stockpiled along the access road. The potential for an off-site disposal location is under consideration.

3.3 PIPING INTERSECTION

The main 36-inch delivery line splits (Item 3 on Figure 2) into two delivery lines just above the upper raceways. A 30-inch line travels south under Eagle Creek to the upper inclined screen chamber and the 36-inch line continues west to the lower inclined screen chamber.

3.4 UPPER INCLINED SCREEN CHAMBER

The water diverted from the main 36-inch line, travels through a 30-inch line under Eagle Creek to the upper inclined screen chamber (Item 4 on Figure 2). The upper screen chamber is designed to filter out large debris and suspended items from the water. The screens are manually raked or brushed as needed to remove the debris from the screen. The debris is discharged through a 30-inch pipe back to Eagle Creek. This discharge is labeled as outfall 002.The water level in the screen chamber is regulated by opening or closing the tower valve, the street valves which provide water to the upper raceways and by the tower valve for the lower raceways.

3.5 UPPER RACEWAYS

The upper raceways consist of three banks (upper, middle and lower) with 12 raceways each. The upper raceway headbox receives water through two valves to provide a maximum flow of 550 gpm per raceway. This water then flows through the middle and lower banks of raceways providing fish production in those raceways.

Each bank of raceways has two discharge pipelines that can be accessed when the stand pipe is removed from a raceway. One pipeline drains directly to Eagle Creek and the other pipeline drains to the upper pollution abatement pump station. Additionally, the tailrace channel can be directly discharged to the creek through a valve that is in a normally closed position during hatchery operations.

Raceways are cleaned up to two times per week for 20 to 40 minutes each. The cleaning is accomplished by pulling the standpipe and then brushing the pond bottom and sides while the raceway water level lowers. Prior to pulling the standpipe, the discharge outlet to Eagle Creek is closed and the cleaning water from the raceway is directed to the upper pump station.

3.5.1 Upper Raceway Discharge-Upper and Middle Banks

The upper (Item 5 on Figure 2) and the middle (Item 6 on Figure 2) banks of upper raceways can be discharged directly to Eagle Creek but rarely occurs. There may be instances when the water from the upper or middle bank needs to be directed to Eagle Creek to allow for raceway maintenance or fish rearing activities. The upper bank discharge is designated as Outfall 003 and the middle bank is designated as Outfall 004.

3.5.2 Upper Raceway Discharge-Lower Bank

During normal operation, fresh water is delivered to the upper raceways with the middle and lower raceways re-using this water prior to discharge back to Eagle Creek. The discharge outlet of the lower bank of upper raceways (Item 7 on Figure 2) serves as the main water discharge point for the upper raceways and has been designated Outfall 005.

3.6 RE-USE LINE

The hatchery utilizes a 24-inch pipeline that connects the bottom tailrace of the upper raceways with the water supply line for the lower raceways. This pipeline is only utilized during very low water flows in Eagle Creek, allowing water from the upper raceways to be redirected to the lower raceways for maximum utilization of the water. In an effort to maintain fish health in the lower raceways, when this line is not used, the stagnant water that settles within the re-use line during non-use is back-flushed weekly. The back-flushing process requires that the valve delivering water to the lower raceways be closed and the re-use line valve be opened. This allows the water intended for the lower raceways to flow back up through the 24-inch line and discharge at Outfall 005. The water flow is approximately 7,000 gpm and may take up to 10 minutes to complete.

Due to the original design of the hatchery, the back-flushing of the re-use line cannot be directed to the pollution abatement pond.

3.7 LOWER INCLINED SCREEN CHAMBER

The lower screen chamber is designed to filter out large debris and suspended items from the water. The screens are ~~manually raked and brushed~~, as needed to remove the debris from the screen. The debris is discharged through a 30-inch pipe back to Eagle Creek. This discharge is labeled as Outfall 006. The water level in the screen chamber is regulated by opening or closing the tower valve, the water control valve for the lower raceways, the water control valve for the gravel filters and the water control valve for the upper raceways.

pressure washed (change in FY05)

The processed water from this screen chamber is used in the hatchery building or for fish production in the lower raceways. Approximately 500 gpm of the processed water is filtered and used for egg incubation and early fish production rearing in the hatchery building. All remaining water is routed to the lower raceways for fish production.

3.8 HATCHERY ROOM GRAVEL FILTER

The down-flow gravel filter (Item 10 on Figure 2) serves to remove suspended solids from the water prior to the water being used in the hatchery room for egg incubation and steelhead fry initial feeding. The filter is divided into two filtration beds with each bed having a separate intake valve that is normally open. Boards are installed at the end of each filter bed to allow excess water to pass to Outfall 007, which combines with Outfall 006 to form one outfall, labeled 6-7 on Figure 2 prior to discharging to the creek.

Cleaning of the gravel filter occurs weekly, alternating between the two filtration beds unless heavy silt loads occur in Eagle Creek, which results in the cleaning of both beds weekly. The cleaning process involves closing the valve to Outfall 007 causing the overflow water to gravity feed to the lower pump station. A mechanical air blower injects air into the filtration bed through perforated PVC piping which causes the loosened filtered solids to flow from the filtration bed to the lower pump station.

3.9 HATCHERY ROOM

The hatchery room (Item 11 on Figure 2) contains 44 16-tray vertical incubators for coho salmon and winter steelhead eggs and 10 3'x3'x16' fiberglass tanks that are used for the initial feeding of steelhead fry. The water supply from the gravel filter and a limited spring water supply (12 – 15 gpm) is regulated at 3-4 gpm for each incubator stack. In addition, incubators with eggs are treated daily with a 37 percent concentrate of formalin to water at the ratio of 1 to 600 ppm for 15 minutes. The total usage of formalin per year for egg incubation is approximately 110 gallons.

The process water through the incubators and the tanks normally flows to the lower pollution abatement pump station so that the water can be easily pumped to the pollution abatement lagoon during formalin treatment of incubating salmonid eggs. The flow from the hatchery room can be diverted to the creek (Outfall 008) during maintenance work at the pumping station.

3.10 LOWER RACEWAYS

The lower raceways consist of three banks (upper, middle and lower) with 13 raceways each. These raceways receive water at a maximum rate of 550 gpm per raceway from the lower inclined screen chamber, the re-use line, or a combination of the two supply lines. The raceways are primarily fed by a 36-inch water line that has a street supply valve for each bank of raceways. To maximize available production space and water, only the street valve supplying water to the upper bank for raceways is normally used with the water being serially re-used through the middle and lower banks and adult holding facilities. Each bank of raceways has a gate valve that can be opened to allow for direct drainage to Eagle Creek.

Raceways are cleaned up to two times per week for 20 to 40 minutes each. The cleaning is accomplished, after pulling the standpipe, by either brushing the sides and bottom of the entire pond or by brushing only the last 10 feet of the raceway floor while the water lowers. The raceway cleaning effluent flows to the lower abatement pump station and is pumped to the abatement pond.

3.10.1 Lower Raceway Discharge-Upper and Middle Banks

The upper (Item 14 on Figure 2) and the middle (Item 15 on Figure 2) banks of the lower raceways can discharge directly to Eagle Creek. The upper bank discharge is designated as

Outfall 010 and the middle bank is designated as Outfall 011. Both of these discharge points are normally closed with the water flowing to the lower bank of raceways. During raceway maintenance or special fish rearing activities, these discharge points may be utilized.

In addition, the upper head box and the tail races of each bank of lower raceways must be cleaned of sediment and biological growth mats, one or two times per year. In the past, this cleaning was completed by flushing the sediments and growth directly to Eagle Creek through the gate valves with the cleaning taking approximately 20 – 30 minutes per bank. Currently, the hatchery staff is experimenting with procedures for sediment and biological mat removal utilizing the existing pollution abatement pumps without flushing to Eagle Creek.

3.10.2 Lower Raceway Discharge-Lower Bank

The lower bank (Item 16 on Figure 2) serves as one of the main water discharge points for the lower raceways (Outfall 012). When the adult holding pond is not used (typically mid-June to late August), this location serves as the end-point discharge for the hatchery.

3.11 ADULT HOLDING POND

The adult holding pond (Item 17 on Figure 2) is used from September to December as a collection location for returning adult coho salmon. From December to June, this pond serves as a rearing pond for the hatchery's on-station volitional release of coho salmon smolts directly into Eagle Creek. When the holding pond is in use, water from the lower raceways is directed to the pond and down the fish ladder. When the pond is periodically cleaned, the waste is directed to the pond sump from which the waste is pumped to the lower pump station where it is pumped to the abatement lagoon.

3.12 FISH LADDER

When the adult holding pond is in use, the fish ladder (Item 18 on Figure 2) serves as the primary discharge point for the lower raceways (Outfall 013). During periods of low water availability and the hatchery is on water re-use, Outfall 013 serves as the primary discharge point for the entire hatchery. The water level within the fish ladder can vary based on the available water flow during the year.

3.13 POLLUTION ABATEMENT LAGOON

The pollution abatement lagoon (Item 19 on Figure 2) serves as the treatment for the hatchery's cleaning water effluent and chemical treatments. The lagoon receives between 125,000 to 170,000 gallons of water per day and has a holding capacity of approximately 990,000 gallons. Based on the size of the lagoon, the minimum retention time for water prior to discharge is 5.8 days.

The pollution abatement lagoon receives water from both the lower and upper pump stations. Each pump station discharges water through separate 10-inch lines at the east end of the lagoon. The abatement lagoon discharge outlet to Eagle Creek consists of a "V" notch weir (Outfall 014) at the west end of the lagoon. "See Amendment page 15"

4.0 WATER USAGE REPORTING

The hatchery's current NPDES permit no longer requires the reporting of waster usage in millions of gallons daily (MGD) with a standard deviation of less than 10 percent.

Due to numerous mechanical and environmental limitations, the measurement of flow at the other outfalls is not practical. Many of the locations are in submerged pipe locations where flow devices would be inaccurate. In addition, the flow levels in Eagle Creek fluctuate greatly and most, if not all measurement devices could be destroyed during normal winter water flows.

5.0 FISH PRODUCTION PROGRAM

The fish production program at the Eagle Creek National Fish Hatchery involves the trapping and spawning of adults; egg and fry incubation; and transfer or release of coho salmon and winter steelhead in concert with the National Marine Fisheries Service, the Yakama Nation, the Confederated Tribes of the Nez Perce, the Oregon Department of Fish and Wildlife, and Idaho Department of Fish and Game. Currently, the hatchery transfers ~~1.3~~ 1.4 million eyed coho eggs to the Nez Perce, Yakama and Idaho Fish and Game; 500,000 yearling coho salmon to the Yakama Nation; and 550,000 yearling coho salmon to the Nez Perce. The hatchery volitionally releases 500,000 yearling coho smolts and 150,000 yearling winter steelhead smolts directly into Eagle Creek.

5.1 ADULT COLLECTION / SPAWNING ACTIVITIES

Adult coho salmon and winter steelhead return from the Pacific Ocean ascending the Columbia River, the Willamette River, the Clackamas River and Eagle Creek. Coho salmon arrive at the hatchery from mid September to late November and winter steelhead arrive from late December to late March. An electric weir just above the hatchery fish ladder stop further upstream migration of these salmon and direct them to the fish ladder. Coho salmon are trapped and held in the adult holding pond and are moved to the spawning channel via a vertical water lift tower and an 8-inch transfer pipe. Winter steelhead ~~are trapped in the fish ladder and are moved to the spawning channel after being netted and placed in the hatchery's 300 gallon fish tank.~~ now access the spawning area by ascending a 360' underground pipe and fish ladder.

On designated spawning days, the adults are anesthetized in a water bath utilizing carbon dioxide, sodium bicarbonate to neutralize the pH of the water, and anti-foam to eliminate foam on the water surface. Carbon dioxide is introduced constantly into the solution using micro-por tubing. After being anesthetized, the fish are sorted by sex, checked for ripeness, and the fish selected for spawning are killed with a pneumatic operated guillotine which severs the spine and the dorsal aorta allowing the fish to bleed. The killed fish are placed upside down on a specially designed table awaiting the spawning process. After the eggs are removed from the female and sperm applied, a cup of 1% saline solution is added to speed and enhance fertilization success. The fertilized eggs are then taken to the incubation room.

Carcasses of spawned or surplus coho salmon and winter steelhead are provided first to various Native American Tribes. Remaining carcasses of spawned, surplus or pond mortality adults are provided to the U.S. Forest Service for placement in local streams and rivers for nutrient enhancement. Carcasses are provided to Federal Prisons or Food Bank programs.

The Argentyne used for equipment disinfection in the spawning area and fish blood are washed with water through the floor drain to the lower pump station and is pumped to the abatement lagoon. The anesthetic solution (300 gallons water, 3 pounds sodium bicarbonate and 2 ounces anti-foam reagent) is drained for 30 minutes into the spawning channel where it mixes with the water flowing through the channel (approximately 7,000 gallons per minute) .

5.2 INCUBATION

Coho salmon and winter steelhead eggs are incubated in vertical incubation units which have 16 trays for eggs and utilize 3-4 gpm per unit. The water discharge occurring during normal incubation, during chemical treatment and during cleaning is piped to the lower pumping station where it is pumped to the abatement lagoon. Argentyne is used for disinfecting newly fertilized eggs and eggs received from other hatcheries at a concentration of 75 ppm for thirty minutes. Newly fertilized eggs are treated with Formalin beginning the day after fertilization. The egg treatment concentration with Formalin is 1:600 for 15 minutes and is administered each work day until three days prior to hatching. Fish culture equipment, nets, incubators and fry tanks are scrubbed with Argentyne for disinfection with the resulting waste water flowing to the pump station and then to the abatement lagoon. Egg and fry mortality is frozen and removed by the weekly garbage disposal pickup to a landfill site.

5.3 RACEWAY LOADINGS

Coho starting raceways are designated as raceways (1-12) in the upper set of raceways and raceways (37-49) in the lower set of raceways. Coho salmon production is currently set up at 100-115,000 fry weighing 90 pounds per starting raceway, but could be increased to a maximum of 160,000 fish per raceway. Coho fry are placed in the raceway directly from the incubation stack putting one incubator (16 trays) into one raceway. In late June, when the coho are fin clipped and tagged, populations are established at 48-52,000 fish per raceway. The raceway populations do not change until the fish are released or transferred.

In late November, after the spawning of coho salmon is completed, the adult crowder and temporary channel walls are removed from the adult holding pond. The outlet of the pond is screened, the pond refilled with water and the coho destined for release at the hatchery are transferred from their respective raceways into the holding pond, now designated as the volitional release pond.

Winter steelhead are initially ponded inside the hatchery building in fiberglass tanks which measure 3'x3'x16' at 16,500 fish per tank. The steelhead are held in these tanks until early July when they are fin clipped, tagged and placed into their respective raceways until the following April when they are released.

The raceway inventory is derived initially from egg counts. That inventory number is adjusted when the fish are fin clipped and tagged, which is done by hand. The established raceway populations are continually adjusted throughout the rearing cycle by counting and subtracting mortality which occurs. The mortality is picked daily, frozen and removed from the hatchery by the weekly sanitary service.

5.4 FISH FEEDING

Coho salmon and winter steelhead are both fed initially with a combination of hand feeding and 12 hour belt feeders. The feeding rate is projected according to body weight and water temperature to maximize fish health, growth and feed conversion. Feed is not dispersed within 15 feet of the tail out screens to minimize feed loss. The belt feeders (2 per raceway) are filled and checked throughout the day for proper feed delivery. When the fish reach the projected size of 60 fish per pound in September, demand feeders (2 per raceway) are employed to dispense feed. These feeders are checked daily to not waste feed. If feed is over fed to a raceway, it is immediately cleaned to the pump station and pumped to the abatement lagoon.

5.5 FISH DISEASE TREATMENT

The treatment of fish diseases with chemicals or medicinal additives to the feed is very infrequent at the hatchery. With lower raceway population densities, sustained raceway flows at 500-550 gpm and an aggressive cleaning schedule, the incidence of disease is miniscule. Only when a severe incidence of external parasites exists does the hatchery treat the fish with one-hour flow-through or static treatments using formalin (37% formaldehyde) at a concentration of 1:6000 to 1:4000.

The most severe disease problem at the hatchery is cold-water disease, which is caused by a water borne bacteria. Control of this disease has been accomplished with lower numbers of fish at initial ponding (160,000 fry or less per raceway). Although some mortalities occur due to the cold-water bacteria, the need for medicated feed has been eliminated.

5.6 FISH RELEASES and TRANSFERS

The release of fish directly into Eagle Creek currently takes place at two locations at the hatchery. The winter steelhead smolts are volitionally released from the lower bank of upper raceways through Outfall 005 from April 1 to mid May. To facilitate the steelhead release, two dam boards are removed from one side of the tail boards and one short tail board is installed. This action lowers the pond depth, increases water turnover in the raceway and creates an attraction at the outlet. The outlet screens are then removed from the raceway and the fish can volitionally leave the raceway.

The coho salmon smolts are volitionally released from the holding pond through Outfall 013 from April 1 to late May. Their release is facilitated at the conclusion of the trapping of adult winter steelhead in the fish ladder below the holding pond. The adult "V" trap is removed and a receiving pool four boards high is installed just below the wall of boards which block the adult steelhead from jumping into the smolt pond. The screen at the end of the pond is removed which permits the coho smolts to volitionally leave.

Currently, yearling coho salmon are transferred to pre-release sites in the Yakima River and Clearwater River basins from late February through mid-March. When coho are transferred to net pens in the lower Columbia River, these transfers occur during the months of April and May. All transfers involve the pumping of fish from the raceways onto fish distribution trucks provided by the State of Oregon, State of Washington, State of Idaho, Yakama Nation or Nez Perce Tribe.

5.7 PRODUCTION FACILITY CLEAN-UP

After the coho salmon and winter steelhead yearling smolts have been removed from their production raceways, either by pumping or volitional release, each raceway is power sprayed and allowed to air dry prior to re-stocking with fry or fingerlings. Prior to cleaning the raceways, the water is shut off to that set of ponds. The headbox water and accumulated waste material therein is then drained through one pond to the respective pump station for pumping to the abatement lagoon. The material cleaned from the raceways is also pumped to the abatement lagoon.

After all smolts have left the volitional release pond, the incoming water is diverted to the creek through Outfall #12. The water remaining in the spawning raceway and attached volitional release pond is slowly drained until hatchery staff can access a collection sump at the lower end of the pond. A 4-inch trash pump is then installed and moves water, fish feces, leaves, etc to the

lower pump station where the material is pumped to the abatement lagoon. The spawning raceway and holding pond are washed with a fire hose to remove particulate matter from the sides and bottoms of the ponds to the sump.

Cleaning of the hatchery incubation and inside rearing tanks occurs throughout the year as incubation trays are emptied of fry and when winter steelhead are moved to outside rearing raceways in July. When all fish have been removed from the hatching room, the floors and gutters are power washed with the washings flowing to the lower pump station for pumping to the abatement lagoon.

6.0 NPDES MONITORING REQUIREMENTS

Attachment A contains a copy of the current NPDES permit for the hatchery which lists all 14 outfalls. In June 2002, the hatchery submitted a renewal application for the hatchery's NPDES permit noting that the site maintains three main outfalls (upper raceways -005, lower raceways -012, and pollution abatement lagoon -014). Although it is true that there are only three main outfalls, there are 14 discharge points that could be used and considered outfalls. The following sections identify each discharge point and the 3 considered to be outfalls. The following sections also detail sampling requirements and applicable parameters per NPDES requirements.

6.1 SAMPLING FREQUENCY

The current permit specifies that monitoring data shall be collected and recorded during each week and reported each month. The hatchery will continue to conduct NPDES sampling every week for at least two years. In addition, other discharge samples will be collected during activities that require discharge to Eagle Creek. Section 6.2.4 discusses the additional sampling requirements.

6.2 SAMPLING LOCATIONS

Many of the outfalls detailed in the previous sections are engineering controls to maintain the proper water level and head pressure throughout the hatchery. In addition, these outfalls consist of water that has not been in contact with hatchery processes except for the settling or screen devices so are not process water. Based on this and our discussion with ODEQ staff, the hatchery will not sample Outfalls 001, 002, 006 and 007. Each of these outfalls is either a discharge from a sand settling chamber, screen chamber or gravel filter and have not been in contact with hatchery operations.

6.2.1 Raceway Sampling

The hatchery will be required to sample from outfalls 003, 004, 010 and 011 only when that outfall is designated a normal production discharge point. During most sampling events, flow will likely be present only from outfalls 005, 012 and/or 013, the main discharge locations for the hatchery.

6.2.2 Hatchery Building

When production water is utilized in the hatchery and the fish ladder (outfall 13) is not the normal discharge point, the hatchery will be required to sample from outfall 008 at the hatchery building during sampling events.

6.2.3 Pollution Abatement Pond

The hatchery will be required to sample from outfall 014 during each cleaning event only when water is flowing over the discharge weir.

6.2.4 Water Intake

The current permit states that when surface water is used as supply water (as is the case for the hatchery), the influent TSS may be monitored on the day an effluent TSS sample has been collected and for up to two days prior. The maximum daily influent TSS value can be used to derive the net TSS value. When quarterly sampling events are required during storm events, the hatchery will collect a sample from the hatchery inlet at the same time in an effort to determine the TSS load being pulled into the hatchery.

6.2.5 Water Re-Use Line

During the months that the water re-use is not in use, the hatchery flushes the line weekly. The flow through the line is approximately 7,000 gpm and takes up to 10-minutes to complete (70,000 gallons total). The hatchery will be required to collect a sample during each flushing of the re-use line at outfall 005, the location of the flushing discharge. Under monthly flushing conditions, it is likely that these samples would exceed the permit requirements. The hatchery is, therefore, evaluating measures to remedy this situation. The current proposal is to flush the line at such frequency that discharged water does not exceed permitted levels. To determine the necessary frequency to accomplish this, the hatchery will test different frequencies, sampling at each discharge event. Based on the results, a frequency will be selected and followed such that the permit requirements are met. Future sampling would be conducted on the flushing of the re-use line along with the other sampling to verify permit limits are not exceeded.

6.3 WASTE DISCHARGE LIMITATIONS AND MONITORING REQUIREMENTS

Schedule A specifies the waste discharge limitations for the hatchery by outfall.

SCHEDULE A
WASTE DISCHARGE LIMITATIONS

A 1 Outfall 005, 012, 013, and 014

Parameters	Limitations		
	Normal Operations		Cleaning
	Monthly Average	Daily Maximum	Daily Maximum
Total Suspended Solids (TSS)	5 mg/L	10 mg/L	15 mg/L
Settleable Solids	0.1 ml/L	-	0.2 mg/L
Maximum Daily Discharge Temperature	77 °F		
pH	Within the range 6.5 – 8.5 SU		

A2 Outfall 001b, 003, 004, 010, and 011

Parameters	Limitation Cleaning Daily Maximum
Total Suspended Solids (TSS)	15 mg/L
Settleable Solids	0.2 ml/L
Maximum Daily Discharge Temperature	77 °F
pH	Within the range 6.5 – 8.5 SU

Schedule B
Monitoring and Reporting Requirements

B1 Production and Process

Parameter	Units	Minimum Frequency	Type of Sample
Production	Lbs	1/year	Calculate
Discharge Temperature	Deg. F	Daily	Grab
Inlet Temperature	Deg. F	Daily	Grab

Outfalls 005, 012, 013, and 014 and the Inlet are to be sampled. Outfalls 005, 012, 013 and 014 only need be sampled when discharging. All temperature samples shall be taken from between 5PM and 7PM throughout the year.

B2 Outfall 005, 012, 013, and 014

Parameter	Units	Minimum Frequency	Type of Sample
pH	Standard Units	Weekly	Grab
TSS*	mg/L	Weekly/Event	Grab
Settleable Solids*	ml/L	Weekly/Event	Grab

*CLEANING OPERATION SAMPLING – When raceway flows are pumped to the settling pond during cleaning, a composite sample shall be taken from Outfall 014 when discharging. A **composite** sample shall consist of at least four grab samples collected during the cleaning cycle.

Outfalls 005, 012, and 013 shall be sampled during Normal Operations when they are used as outfalls during Normal Operations. Outfalls 005 and 012 shall be sampled for the first two years of the permit and then a waiver from monitoring may be requested from the DEQ Water Quality Permit Writer. The DEQ Permit Writer will analyze the data to determine whether or not to release the site from monitoring these outfalls. Frequency for Normal Operation is 1/week and for cleaning is 1/event.

B3 Outfall 001b, 003, 004, 005, 010, 011, and 012

Parameter	Units	Minimum Frequency	Type of Sample
pH	Standard Units	Weekly	Grab
TSS*	Mg/L	Event	Grab
Settleable Solids*	ml/L	Event	Grab

*CLEANING OPERATION SAMPLING – Composite samples shall be taken from these outfalls during cleaning operations. The **composite** sample shall consist of at least four grab samples collected during the cleaning cycle.

NPDES Sampling Summary Table			
Location	**Sampling Frequency**	**Sampling Parameters**	**Limitations**
Upper Raceway Outfalls (003, 004, 005)	Quarterly (March, April, September, December)	Settleable Solids, TSS Flow	Normal Operations Requirements
Lower Raceway Outfalls (010, 011, 012, 013)	Quarterly (March, April, September, December)	Settleable Solids, TSS Flow	Normal Operations Requirements
Pollution Abatement Pond (014)	Quarterly (March, April, September, December)	Settleable Solids, TSS Flow BOD, Ammonia, Flow	Cleaning Operations Requirements
Re-Use Line (Outfall 005)	As needed to establish flushing frequency then quarterly with upper raceway outfalls	Settleable Solids, TSS Flow BOD, Ammonia, Flow	Cleaning Operations Requirements
Pond Cleaning Activities (Varies)	As Needed	Settleable Solids, TSS Flow BOD, Ammonia, Flow	Cleaning Operations Requirements
Hatchery (008) Building part of Outfall 13	As Needed if a separate outfall	Settleable Solids, TSS Flow	Normal Operations Requirements
As necessary, background TSS samples will be collected at the hatchery intake.			

6.4 SAMPLING PROTOCOL

All outfall samples will be collected in laboratory-prepared sample containers and kept cool at 4°C (39°F) during transport to the testing laboratory. The sample containers shall be filled completely to eliminate headspace in the container. Chain-of-custody procedures will be observed during transport of the water samples to the testing laboratory. The following Table summaries the container requirements for each sampling parameter.

Sample Container Requirements	
Analytical Parameter	**Sample Container**
TSS	250 ml poly unpreserved
Settleable Solids	500 ml poly unpreserved
BOD	500 ml poly unpreserved
pH	250 ml poly unpreserved
Ammonia	250 ml poly w/H_2SO_4
Copper, Lead, Zinc	500 ml poly w/HNO_3
Oil and Grease	1 liter amber w/HCl
Settleable solids and pH are analyzed at the hatchery's onsite laboratory	

Flow samples for the upper raceway system, the lower raceway system and the hatchery building will be performed by an arithmetic mean method.

6.5 CHEMICAL USAGE

The hatchery is required to keep a written record of all chemicals used at the facility. The new NPDES permit requires the maintenance of a written record on all chemicals used at the hatchery. The records shall include:

- Personnel responsible for administering chemicals
- Trade name of chemicals
- Date of application
- Reason for application
- Identification of location (hatchery room, abatement pond, upper raceway, etc) where chemicals were used
- Estimated or measured concentration of active ingredients in the facility effluent at the point of discharge
- Quantity, trade name, method of disposal and location of any disposed spent chemical dip solutions

Currently the hatchery uses the following chemicals:

- Formalin (37% formaldehyde) – 110 gallons annually from October 1 to April 15 for egg fungus treatment
- Salt – 25 pounds annually from October 1 – March 15 for enhancement of sperm activity
- Sodium Bi-Carbonate – 55 pounds annually from October 1 to March 15 to neutralize pH in anesthetic tank
- Argentyne (iodophor disinfectant) – 28 gallons annually from October 1 to March 31 to disinfect eggs and equipment
- Anti-foam – 6 gallons annually from October 1 to March 15 to reduce foaming in anesthetic tank

6.6 REPORTING REQUIREMENTS

The hatchery will submit a discharge monitoring report to the DEQ by the 15th of the month following each sampling event (i.e. the data collected in March is due to the DEQ by April 15. The monitoring report, at a minimum, will include; the date, place, time and methods

of sampling or measurements, the individual who performed the sampling or measurements, the date(s) analyses were performed, the laboratory who performed the analyses, the analytical techniques or methods used, and the results of such analyses QA/QC. In addition, the report will discuss any noncompliance actions that took place during the reporting period.

Appendix B contains a copy of the hatchery's reporting and monitoring logs. The logs include: a chemical application log, flow measurement log, NPDES sampling log, bypass log, and a fish release log.

7.0 TEMPERATURE MANAGEMENT PLAN

Temperature control of the water utilized at the hatchery is greatly dependent upon the ambient water temperature of the incoming Eagle Creek water. During summer flows, the ambient temperature of Eagle Creek approaches 65 degrees F. for a 3-5 hour period during extremely hot weather. During the summer of 2004, the placement of temperature data-loggers in the creek at the hatchery outlet has shown that the temperature of the water leaving the hatchery production raceways actually decreased 0.2 degrees at various times.

In early April, the hatchery covers the fry starting raceways with 80% shade cloth and removes the covers in early November. In mid June, the remaining production raceways are covered with 80% shade cloth prior to the fin clipping and marking of fish. Those covers are also removed in early November. The adult holding pond is not covered during the summer months as no water flows through it during that time frame.

8.0 SPILL PREVENTION PROGRAM

A Spill Prevention, Control, and Countermeasure (SPCC) Plan was prepared for the hatchery by Cascade Earth Sciences, La Grande, OR in 1999 in accordance with the provisions of Title 40 of the Code of Federal Regulations (CFR) part 112. The Plan was required because the hatchery stored petroleum fuel in aboveground storage tanks with greater than 660 gallons capacity. The purpose of the SPCC Plan was to establish the procedures, methods, and equipment used at the hatchery to comply with U.S. Environmental Protection Agency oil spill prevention control and countermeasure standards, and inspection, reporting, training and record keeping requirements.

Major structural changes at the hatchery, involving the installation of a new hazardous material storage building and the construction of new residences has necessitated a review of the SPCC Plan. This review is scheduled for the summer of 2005 and will result in substantial changes as the residences no longer utilize petroleum fuel for heating.

Pollution Prevention Plan and Best Management Practices

Eagle Creek National Fish Hatchery

1. Amendment to Sections 3.13, 6.2.3 6.3 - The construction for an internal mixing of the Pollution Abatement Pond discharge with the lower raceway discharge was completed on December 30, 2005. The purpose of the construction was to eliminate the outfall (# 14) from the Pollution Abatement Pond and to install three automatic refrigerated samplers.
The effluent from the Pollution Abatement Pond outfall #14 is now managed by decanting the pond water supernatant after working hours from 4 PM to 8 AM. The amount of water decanted is controlled by a leveling valve as to not draw the pond down beyond the expected daily cleaning capacity requirement.

Automatic refrigerated samplers were installed to sample the discharges at outfall #5,#12 and #13. The automatic samplers are set for taking 150ml samples every hour for 24 hours.

During the adult fish ladder operations, the decanted Pollution Abatement Pond discharge water flows into the lower pump station sump. This water discharges from the sump station into the upper section of the fish ladder and mixes with the discharge. The water sampler is set up to sample the mixed water before it leaves the ladder and discharges into Eagle Creek.

When the adult fish ladder is not in operation, the decanted Pollution Abatement Pond discharge is mixed with the lower raceway discharge at the head end of the lower bank tail race when discharging at outfall #12. The water sampler is set up to sample the mixed water from a sump box before discharging into Eagle Creek.

The Pollution Abatement Pond discharge outfall #14 is no longer expected to occur during normal or cleaning operations.