



State of Oregon
Department of
Environmental
Quality

Oregon Department of Environmental Quality

National Pollutant Discharge Elimination System

Permit Fact Sheet Modification #3

Final: March 5, 2024

Western Region – Salem Office
4026 Fairview Industrial Drive SE
Salem, OR 97302

Permittee:	Oregon Department of Fish and Wildlife 4034 Fairview Industrial Drive SE Salem, OR 97302
Existing Permit Information:	File Number: 64500 Permit Number: 101918 Expiration Date: Aug. 31, 2026 EPA Reference Number: OR0029769
Source Contact:	Colby Gonzales , 541-896-3513 Hatchery Manager
Source Location:	43863 Greer Drive Leaburg, OR 97489 Lane County
LLID:	NHD: 17090004001383, 4.25% LLID: 1230673441173, RM 31.5
Receiving Stream/Basin:	McKenzie River / McKenzie Basin
Proposed Action:	Major Modification #3 Application Number: 948462 Date Received: Oct. 25, 2023
Source Category:	NPDES Minor (NPDES-IW-B17-Tier 2)– Industrial
Sources Covered:	Discharges from aquatic animal production facility (Fish Hatchery)
Permit Writer:	Jeffrey Navarro, Senior Water Quality Permit Program Analyst Oct. 26, 2023 David Cole Water Quality Permit Writer / Northwest Region, Water Quality Source Control 9/28/2021

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1.0 Introduction

The Oregon Department of Fish and Wildlife (ODFW) owns and operates McKenzie Fish Hatchery which is owned by the Army Corps of Engineers. The hatchery is located at Mile Post 22 on Highway 126, approximately two miles east of Leaburg, Oregon, and twenty-two miles east of the Interstate Highway 5 and City of Springfield - Highway 126 interchange (see Figure 1). Facility personnel treat and discharge hatchery wastewater into the McKenzie River at River Mile 31.5, through Outfall 001.

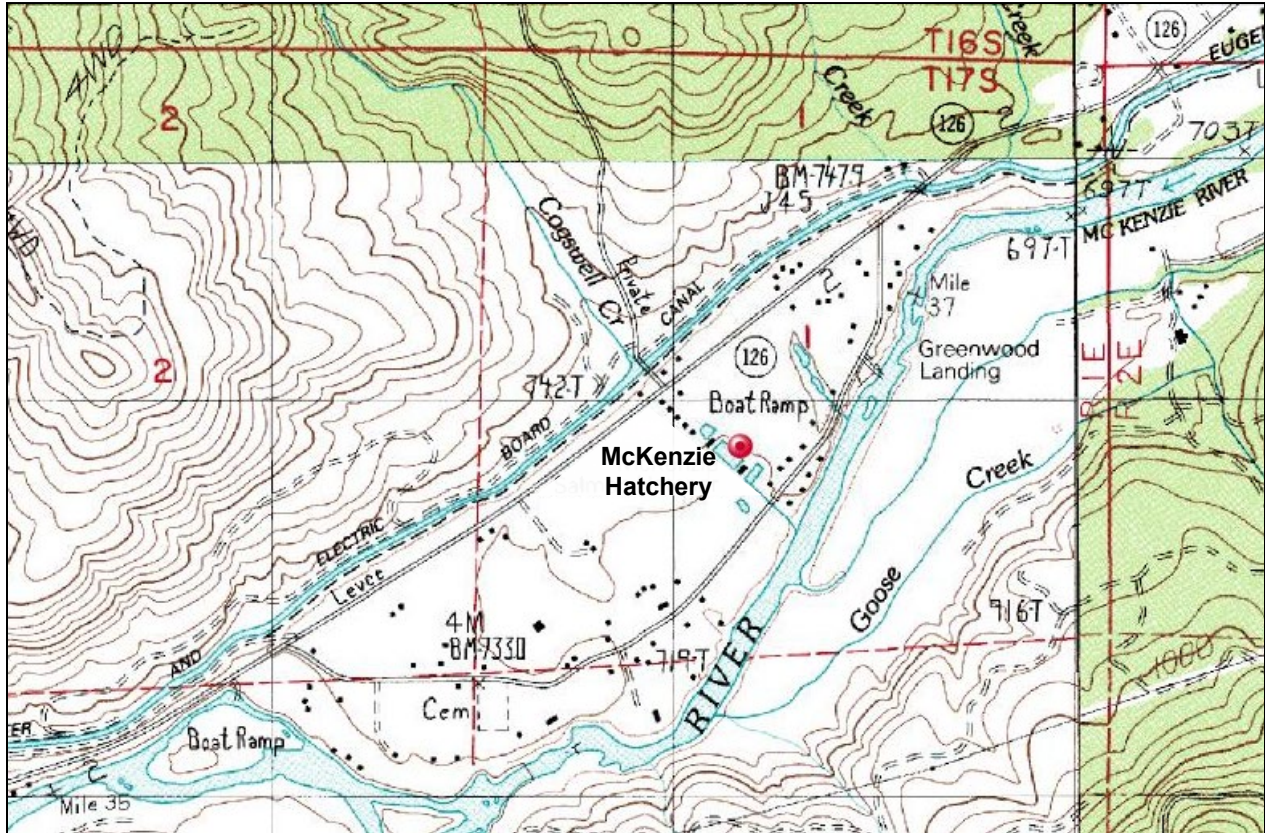


Figure 1: Facility Location

The proposed permit allows and regulates the discharge of water used in the hatchery to the McKenzie River in the McKenzie Sub-basin of the McKenzie Basin.

DEQ received application number 965787 from ODFW on Dec. 27, 2011. The proposed permit is DEQ's action in response to this application.

This permit fact sheet describes the basis and methodology DEQ used to develop the permit. The permit is divided into the following sections:

- Schedule A – Waste discharge limits
- Schedule B – Minimum monitoring and reporting requirements
- Schedule C – Compliance conditions and schedules
- Schedule D – Special conditions
- Schedule F – General conditions

The Federal Water Pollution Control Act of 1972 and its subsequent amendments, as well as Oregon Revised Statutes (ORS 468B.050), require a NPDES permit for the discharge of wastewater to surface waters. This proposed permit action complies with both federal and state requirements.

2.0 Facility Description

2.1 General

The hatchery was originally built in the 1940's and was completely rebuilt in 1976. The U.S. Army Corps of Engineers (COE) funds the operational costs of the fish hatchery. ~~Hatchery expansion served as mitigation for creation of Blue River and Cougar Reservoirs on the upper McKenzie River.~~ Facility personnel use the hatchery for egg incubation and rearing spring Chinook salmon.

The hatchery is a rearing facility located on sixteen acres which includes an office/service building, an incubation/spawning building, a storage building, five homes for the hatchery personnel, thirty 16 by 75 foot rectangular rearing ponds, two adult holding/rearing ponds, 38 stacks of 16 trays of fish egg incubators, and a detention lagoon settling pond. There are two water sources for the hatchery, with water rights for approximately 20 cubic feet per second from Cogswell Creek, and 50 cfs from Leaburg Canal, which the McKenzie River feeds. The water intake sources are located to the northwest of the facility, north of Highway 126. ~~In October 2023, ODFW has communicated that ODFW will cease hatchery operation discharges for the dry season (between April 1 – October 31), and ODFW will not recommence hatchery operation discharges at McKenzie hatchery until ODFW can meet its excess thermal load limit for the dry season (April 1 – October 31). –The water used from each source varies throughout the year, depending on water usage, turbidity, and hatchery temperature requirements. All rearing units use single pass water.~~ One non-chlorinated water well supplies the drinking water for the facility and the homes of the hatchery personnel. The facility has a double-walled above-ground fuel tank, which has a 600 gallon compartment for diesel, and a 400 gallon compartment for gasoline.

2.2 Wastewater Treatment

During normal operations, the fish pen rearing ponds (pens #1-30) east of the service building and west of the incubation building discharge their water through Outfall 001. There is also a pump station between the incubation building and the lagoon for directing flows from the fish pens to the lagoon, rather than Outfall 001. Solids settle in the lagoon and discharge through Outfall 001.

During cleaning operations, facility personnel divert all the fish pen water to the detention lagoon and then discharge it to the McKenzie River through Outfall 001. When facility personnel use Formalin or Hydrogen Peroxide, facility personnel shut the valve(s) that allow discharge to the McKenzie River, and open another valve at the bottom of the fish pens to divert water to the detention lagoon. The two holding ponds for adults are connected to the detention lagoon when facility personnel close a valve to Outfall 001 and divert water to the detention lagoon by pumping through a 12-inch pipe.

The facility uses fresh water ~~on a continuous flow through basis for fish rearing on a continuous flow basis for fish rearing.~~ Facility personnel collect all NPDES water quality monitoring samples from the combined effluent before flowing through Outfall 001. Figure 2 shows the locations of Outfall 001 and water supply intakes.

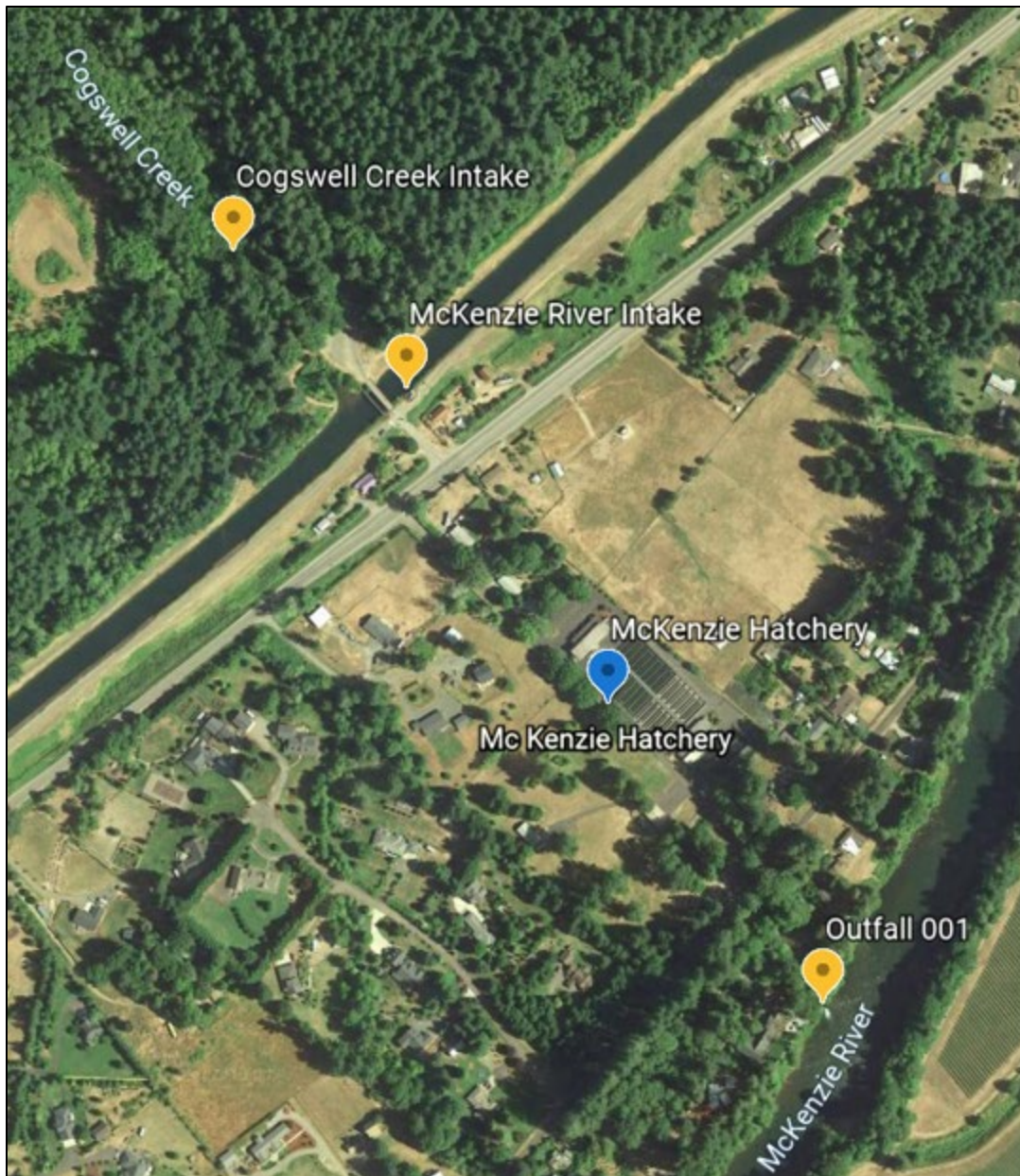


Figure 2. Aerial view of fish hatchery, intakes and Outfall 001

Facility personnel clean the hatchery ponds by lowering the water level in the fish pens, opening the drain valve at the bottom of the fish pens, and brooming the sediments and waste to a drain leading to the lagoon. Fish waste, unused fish food, and sediment from the influent water, collect in the lagoon bottom. The frequency of cleaning the fish pens depends on fish production loading. The average time frame for cleaning the fish pens is every one to two weeks. The lagoon anaerobically treats the fish waste. The treated effluent flows out at the opposite end through a weir gate and discharges into the McKenzie River. Facility personnel collect the NPDES water quality samples from the combined (incubation building, holding and rearing pens) effluent water before it enters the McKenzie River through Outfall 001. Outfall 001 is located southeast of the facility at the end of the six-foot wide fish ladder. An underground pipe routes the rearing pond effluent to Outfall 001. When the piped effluent reaches the top of the fish ladder, a valve can divert it to flow through the fish ladder or directly through the box flume before entering the McKenzie River. The effluent flows through the fish ladder less than 10% of the time. A small portion of the intake supply water flows through the hatchery building and acts as a pond overflow to the neighboring resident's land and flows into the McKenzie River (about 110 feet upstream of Outfall 001) via a streambed. The hatchery does not use this pond overflow water.

Under normal operational procedures, water from the rearing pens discharges directly into the McKenzie River, bypassing the lagoon system. When facility personnel clean a fish pen, the effluent water from that pen flows to the lagoon before discharge to the McKenzie River.

2.3 Wastewater Characteristics

Metals

In the past, the fish pens were all coated with copper base red paint to reduce the amount of organic build up on the walls. Facility personnel painted the fish pens with the copper-based red paint every two years. The last permit contained a condition requiring the permittee to conduct an annual bioassay test on the effluent to determine whether the metals contained in the paint may be present in the effluent at acute or chronic toxicity levels. The permittee no longer uses metal-based paints in any of the pens or troughs in the hatchery, thus eliminating this concern. The results of the bioassay tests indicated that no acute or chronic toxicity existed during sampling.

Formaldehyde

Facility personnel use Formaldehyde in the product called formalin to keep fungi from growing on the eggs and inside the incubation containers. The facility uses the brand of formalin called Parasite-S. Formalin is a US Food and Drug Administration (USFDA) approved chemical for aquaculture use. The amount of formalin that facility personnel use ranges from approximately 189-505 gallons per year. Formalin contains approximately 30 - 50 percent by weight of formaldehyde, and 10 - 30 percent by weight of methanol. Each egg cache has its own formalin drip bottle. Formalin is also used in the rearing pens and starting troughs to reduce the growth of fungus on the fish due to handling the fish and abrasions against concrete pen walls. Before the current permit cycle, facility personnel had not sampled and analyzed the water to determine formaldehyde concentrations in the effluent discharging to the McKenzie River. Therefore, Schedule B of the current permit required quarterly sample collection for analysis to determine if formaldehyde was in the effluent. The permit also required bioassay testing to assess any toxicity associated with this pollutant. Since January 2017, facility personnel have used formaldehyde only three times.

An analysis of the potential impacts of formaldehyde on the receiving stream is presented in Section 5.3.

Ammonia

Facility personnel collected ammonia samples quarterly throughout this permit cycle. Analytical results did not detect significant ammonia concentrations. DEQ conducted a reasonable potential analysis to determine whether ammonia concentrations may violate water quality standards. The analytical results showed no chronic or acute toxicity. DEQ then removed ammonia monitoring from the current permit.

Hydrogen Peroxide

Facility personnel also use a 35% solution of hydrogen peroxide periodically during treatment. Recently (January 2007) Western Chemicals indicated that *PEROX-AID* by Eka Chemicals, Inc. was approved for use, and will replace hydrogen peroxide solutions previously used at fish production facilities. *PEROX-AID* is also a 35% solution and will soon be the only hydrogen peroxide product that can be legally purchased and used at fish production facilities. The amount of peroxide used for this facility in the past five years ranges from approximately 1,100 to 2,063 gallons per year.

There is no prior monitoring data for this chemical, and its use at the facility will most likely increase as a replacement for formaldehyde. DEQ added hydrogen peroxide monitoring during the first year after permit issuance. Hydrogen peroxide quickly breaks down into water and oxygen. DEQ does not believe any hydrogen peroxide present in the discharge has the potential to adversely impact water quality in the McKenzie River.

Other Chemicals

Other chemicals disclosed or listed in the ODFW permit application were Terramycin 100, oxytet, erythromycin, and romet. Other chemicals used on site such as for disinfection purposes would be Idosept II, Iodophor, Argentyne, Bleach, and Finquel MS 222.

The permittee has been submitting a yearly report on the usage of these chemicals at the facility. Many of the chemicals are not used in the hatchery process itself, but are used for other maintenance purposes. DEQ review of

these annual reports does not indicate that there are any other pollutants of concern being discharged from the hatchery process.

The permittee must use chemicals and drugs approved or allowed for hatchery use by the US Food and Drug Administration (USFDA) or US Environmental Protection Agency (USEPA). The permittee shall follow the product labeling instructions and precautions for use and safe disposal of chemically treated water for environmental protection. The use of the chemical shall not violate any applicable water quality standard. It is also proposed that the permittee shall maintain a chemical use log at the facility. This log shall document the name of chemical, name of user, date of application, reason for use, location of use (hatch house or raceway), concentration of active ingredients at the hatchery outfall, dilution required for disposal (as per label), and dilution made before discharge, disposal method/location. This log shall be available for review upon DEQ request. The permittee must submit a summary of chemical use annually or more often as DEQ requests. The annual report must cover the previous calendar year and is due by February 15. The annual summary report must describe the monthly quantity of each chemical used, the reason for application, and the total annual quantity of each chemical used.

In 2019, ODFW developed the Best Management Practices (BMPs) for Leaburg Hatchery Operations that includes a list of the legally available chemicals for fish culture, purpose of use, safe disposal methods, and regulatory authority. Because the McKenzie Fish Hatchery operations are similar to those of the Leaburg facility, DEQ is including the same list of chemicals (see Appendix B).

USFDA approved chemicals include: Investigational New Animal Drugs (INADS), Low Regulatory Priority (LRP) listed drugs, Deferred Regulatory Status (DRS) drugs and veterinary Extra-Labeled drugs. The permittee must follow the conditions detailed in a facility's INAD permit application, treatment restrictions for LRP and DRS drugs, product label instructions for environmental protection, and precautions on labels of chemicals that are Extra-labeled by prescription.

2.4 Treatment Plant Capacity

Unless DEQ otherwise approves in writing, the maximum yearly biomass (pounds of fish) permitted for this facility is 165,000 pounds. The facility has never exceeded this amount. The hatchery produces about 137,313 pounds of cold-water fish per year as an average for the years 2002-2004. Facility personnel reported that in 2019 they produced 130,863 pounds of fish.

2.5 Groundwater Issues

Since there is no known pathway between the hatchery operations covered under this permit and groundwater, DEQ does not expect facility operations to negatively affect groundwater quality.

2.6 Stormwater

This permit does not address stormwater runoff. DEQ does not require general NPDES permits for stormwater for facilities of this type.

2.7 Outfalls

The facility currently has one outfall (designated as Outfall 001). It is located at river mile 31.7, and has coordinates of 44.115945 / -122.635395.

Outfall 001 is located southeast of the facility at the end of the six-foot wide fish ladder. An underground pipe routes the rearing pond effluent to Outfall 001. When the piped effluent reaches the top of the fish ladder, a valve can divert it to flow through the fish ladder or directly through the concrete box flume.

2.8 Solids Management

Facility personnel use the lagoon to settle out solids from the cleaning operations in the rearing pens, and to dissipate and further degrade any residual formalin that is contained in the water from the hatchery building or rearing pens. All water from the rearing pens and from the hatchery building during cleaning operations and formalin use goes through the lagoon before discharge to the McKenzie River. The current permit requires facility personnel to clean sediment and solids from the pollution abatement system once it reaches the maximum allowed sediments and solids, which is 25% of the lagoon's volume capacity. Facility personnel last removed the sediments from the lagoon settling pond in August of 2019. The cleaning process involves drying the ponds for several days and then facility personnel remove the sediments with a backhoe. Facility personnel then haul the sediments and deposit them in a field at the hatchery site. The removed and deposited wastes have no route in which to enter the river system. Although DEQ believes that the wastes are being applied below agronomic rates and thus not likely to pose a threat to groundwater resources, the permit includes a condition requiring the permittee to estimate the volume of wastes applied to land and the approximate area over which the wastes are applied. The condition also requires a one-time nitrogen analysis of the wastes. The permit requires facility personnel to update their operations manual within 60 days of the effective date of the permit. This update must also include the nitrogen monitoring requirement and nitrogen agronomic rates for appropriate crops.

3.0 Permit History

DEQ issued the current permit on July 13, 2007, with an expiration date of June 30, 2012. DEQ received the renewal application, number 965787, on Dec. 27, 2011. ~~The permit was DEQ has~~ administratively extended ~~the permit~~ until DEQ issued the renewal permit.

3.1 Compliance History

During the current permit cycle, DEQ has not taken any enforcement action against the permittee.

4.0 Receiving Water

The facility treats hatchery wastewater and discharges it into the McKenzie River through Outfall 001. The discharge is within the Willamette Basin and Upper Willamette Sub-Basin. The outfall is located southeast of the facility at the end of the six-foot wide fish ladder. Designated beneficial uses for the McKenzie River include the following:

- public and private domestic water supply,
- industrial water supply,
- irrigation,
- livestock watering,
- fish and aquatic life (including Core Cold-Water Habitat and Salmon and Steelhead Spawning Use),
- wildlife and hunting,
- fishing,
- boating,
- water contact recreation,
- aesthetic quality, and
- hydropower.

DEQ developed water quality standards for the Willamette Basin to protect these beneficial uses (OAR 340-041-0340).

4.1 Receiving Stream Water Quality

DEQ's 2018-2020 Integrated Report shows that the McKenzie River, in the vicinity of the facility's outfall, is in assessment unit OR_SR_1709000407_02_103884. The report lists the following Category 5 parameters in the AU:

- Temperature (Year-round)
- Temperature (Spawning)
- Dissolved Oxygen (Spawning)

4.2 Mixing Zone Analysis

The proposed permit contains a mixing zone and zone of initial dilution for Outfall 001 as allowed per OAR 340-041-0053. The regulatory mixing zone is described as follows:

The regulated mixing zone allows mixing with 25 percent of the McKenzie River. The Zone of Immediate Dilution (ZID) allows mixing with 10 percent of the McKenzie River.

Table 2 below shows the dilutions at the edge of the zone of initial dilution and mixing zone for Outfall 001. Effluent flows are based on 2017-2019 discharge monitoring reports. DEQ calculated the dilutions using the percent stream flow allowed for the ZID and mixing zone and the respective effluent flow.

Table 1: Dilution Summary for Outfall 001

Dilution Summary – Outfall 001						
Water Quality Standard	Stream Flow (cfs)		Effluent Flow (mgd)		Dilution	Location
	Statistic	Flow	Statistic	Flow		
Aquatic Life, Acute	1Q10	752	<input type="checkbox"/> ADWDF x PF <input checked="" type="checkbox"/> Max Daily Avg <input type="checkbox"/> Other	36	2	ZID
Aquatic Life, Chronic	7Q10	781	<input type="checkbox"/> ADWDF <input checked="" type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other	35	5	MZ
Human Health, Non-Carcinogen	30Q5	918	<input type="checkbox"/> ADWDF <input checked="" type="checkbox"/> Max Monthly Avg <input type="checkbox"/> Other	35	5	MZ
Human Health, Carcinogen	Harmonic Mean	1600	<input type="checkbox"/> Annual Avg Design <input type="checkbox"/> Annual Avg <input checked="" type="checkbox"/> Other	35	8	MZ

5.0 Permit Limits

There are two categories of effluent limits for NPDES permits: (1) Technology-based effluent limits (TBELs) and (2) Water quality-based effluent limits (WQBELs).

Technology-based effluent limits define a minimum level of treatment using readily-available technology. EPA establishes technology-based effluent limits through Effluent Limitation Guidelines (ELGs) specific to industrial categories. If there are no applicable ELGs, then the permit writer may use best professional judgment.

By contrast, DEQ develops water quality-based effluent limits independent of the available treatment technology, and instead, take into account the receiving stream's water quality and quantity. Water quality-based effluent limits are typically more stringent than technology-based permit limits when the receiving stream is small, is water quality-limited, or shows other evidence of impairment.

When renewing/reissuing a permit, a permit writer typically evaluates the existing limits in the permit against changes to technology based standards and water quality standards that may have occurred during the permit term. With some exceptions, the antibacksliding provisions (described in CFR 122.44(l)) do not allow relaxing effluent limits in renewed/reissued permits. The permit writer must include the most stringent of the existing or new limits in the new permit.

5.1 Existing Permit Limits

1. Waste Discharge Limitations not to be exceeded after permit issuance:

Treated Effluent Outfall 001

- a. Outfall 001 (Normal Operations)

Parameter	Monthly Average	Daily Maximum
Total Suspended Solids (TSS)	5 mg/l	10 mg/l
Settleable Solids (SS)	0.1 ml/l	--
pH	Within the range 6.0 - 9.0 SU	

- b. Outfall 001 (Cleaning Operations)

Parameter	Daily Maximum
Total Suspended Solids (TSS)	15 mg/l
Settleable Solids (SS)	0.2 ml/l
pH	Within the range 6.0 - 9.0 SU

- c. Outfall 001 (Cleaning and Normal Operations)

Parameter	Limitation
Excess Thermal Load	No heat (0 kcal/day)

No wastes may be discharged or activities conducted that cause or contribute to a violation of water quality standards in OAR 340-041 applicable to the Willamette Basin except as provided for in OAR 340-45-0080 and the following regulatory mixing zone which applies to Outfall 001:

The allowable mixing zone is that portion of the McKenzie River that shall not extend downstream beyond thirty feet from the point of discharge and shall not exceed 1/4 of the width of the receiving stream at 7Q10 low flow conditions.

2. All water that has been affected by chemical application or usage must be directed to the settling pond for discharge through Outfall 001. Chemical residuals from the treatment of fish disease or parasites are permitted provided that the chemicals are applied in accordance with USEPA labeling requirements. Unless approved in writing by the Department, permittee must use chemicals approved or allowed for hatchery use by the US FDA or USEPA.
3. Off-site discharge of water incidental to the release of healthy fish into waters of the state is permitted.
4. Unless otherwise approved in writing by the Department, the maximum yearly biomass production permitted for this facility is 165,000 pounds.
5. No activities will be conducted that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed of in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR 340-040).

NOTES:

- a. Outfall 001 is located at the end of the fish ladder.
- b. The TSS concentration of the water supply source may be subtracted from the TSS concentration in the discharge to determine compliance with TSS permit limits.
- c. The SS concentration of the water supply source may be subtracted from the SS concentration in the discharge to determine compliance with SS permit limits.
- d. The thermal load limit is an interim limit and may be modified or eliminated by future permit action. Permittee shall comply with these limits upon completion of the requirements in Schedule C.1-4.

5.2 Technology-Based Effluent Limits

The McKenzie facility produces 100,000 pounds or more of fish annually. Therefore the permittee must follow the federal effluent limitation guidelines, found in 40 CFR, Part 451. These guidelines apply to both flow-through and recirculating systems (40 CFR, Part 451, Subpart A), and net pen systems (40 CFR, Part 451, Subpart B), for concentrated aquatic animal production point sources. The McKenzie facility is a flow-through and recirculating system. Therefore 40 CFR, part 451, Subpart A applies. The permittee has the choice of using Best Practical Control Technology (BPT), Best Available Technology (BAT), or Best Conventional Technology (BCT) to meet the ELG requirements. If the permittee chooses either BAT or BCT, it must meet the requirements of BPT, found in 40 CFR, Part 451. 11, and reproduced below:

a) Solids control

The permittee must:

- 1) Employ efficient feed management and feeding strategies that limit feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth in order to minimize potential discharges of uneaten feed and waste products to waters of the U.S.
- 2) In order to minimize the discharge of accumulated solids from settling ponds and basins and production systems, identify and implement procedures for routine cleaning of rearing units and off-line settling basins, and procedures to minimize any discharge of accumulated solids during the inventorying, grading and harvesting aquatic animals in the production system.
- 3) Remove and dispose of aquatic animal mortalities properly on a regular basis to prevent discharge to waters of the U.S., except in cases where the permitting authority authorizes such discharge in order to benefit the aquatic environment.

b) Materials storage

The permittee must:

- 1) Ensure proper storage of drugs, pesticides, and feed in a manner designed to prevent spills that may result in the discharge of drugs, pesticides or feed to waters of the U.S.
- 2) Implement procedures for properly containing, cleaning, and disposing of any spilled material.

c) Structural maintenance

The permittee must:

- 1) Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.
- 2) Conduct regular maintenance of the production system and the wastewater treatment system in order to ensure that they are properly functioning.

d) Recordkeeping

The permittee must:

- 1) In order to calculate representative feed conversion ratios, maintain records for aquatic animal rearing units documenting the feed amounts and estimates of the numbers and weight of aquatic animals.
- 2) Keep records documenting the frequency of cleaning, inspections, maintenance and repairs.

e) Training

The permittee must:

- 1) In order to ensure the proper clean-up and disposal of spilled material adequately train all relevant facility personnel in spill prevention and how to respond in the event of a spill.
- 2) Train staff on the proper operation and cleaning of production and wastewater treatment systems including training in feeding procedures and proper use of equipment.

5.3 Water Quality-Based Effluent Limits

DEQ designs water quality based effluent limits (WQBELs) to protect the beneficial uses of the receiving water and are independent of the available treatment technology. The process DEQ uses to establish appropriate WQBELs involves developing a pollutants of concern list. DEQ evaluates each of these pollutants to determine whether the amount of the pollutant in the discharge represents a “reasonable potential to exceed” water quality standards in the receiving stream. If the discharge amount of a particular pollutant has a reasonable potential to exceed water quality standards, then DEQ establishes WQBELs for that pollutant.

5.3.1 Pollutants of Concern

The pollutants of concern for the facility include the following:

- Those included in the effluent limit guidelines: The ELGs are primarily best management practices and prohibitions addressing solids, animal drugs, pesticides and feed. Total suspended solids (TSS) and settleable solids (SS) have no water quality criteria or guidance values (they are generally considered indicators of treatment performance), so no quantitative analysis is possible. However, the proposed permit regulates these pollutants under the technology-based limits described above.
- Those identified as being present in the effluent through monitoring: The pollutants identified under previous facility monitoring are the same ones that are included in the ELGs, so they are addressed above.
- Pollutants known to be in the discharge and for which the receiving stream is listed as water quality limited (see Section 4.1): The receiving stream is listed for temperature and dissolved oxygen (DO), so temperature and DO are also included.

- Pollutants with QBELs in any existing permit: There were no QBELs in the previous permit. However, pH was included as a TBEL and is included in the table.
- Other pollutants that are expected or known to be present: The other pollutants expected to be present in the discharge are specific animal drugs or pesticides: formalin, iodophor and antibiotics. While Oregon does not have an official water quality standard for formalin, DEQ has developed guidance values. DEQ has not developed standards or guidance values for iodophor or the antibiotics, so no quantitative analysis is possible. However, the proposed permit regulates using these chemicals under the technology-based limits described above.

The reasonable potential analyses for each of the pollutants of concern are discussed below.

Table 2: Pollutants of Concern

Parameter
pH
Formalin
Temperature
Dissolved Oxygen
Ammonia

DEQ analyzed the potential for pollutants present in fish feed exceed water quality criteria in the final effluent. DEQ received independent laboratory analysis of the fish feed ODF&W uses at its hatchery. The fish feed analysis provided several results for a variety of pollutants, including heavy metals, PCBs and dioxins. DEQ estimated concentrations of pollutants that had the potential to be in the final wastewater, using the fish feed analysis data. DEQ determined that all of the pollutants were well below water quality criteria and therefore are not pollutants of concern.

5.3.2 Reasonable Potential Analysis for pH

The pH of water measures how acidic or basic a solution is. DEQ considers a pH of 7.0 neutral. Most aquatic organisms can only tolerate a fairly narrow range around 7.0.

The applicable water quality standard for the pH of the receiving stream, which is located in the Willamette Basin, is contained in OAR 340-041-0345(1)(a): 6.5 to 8.5.

DEQ ran a reasonable potential analysis of pH, using facility discharge data, and ambient data from DEQ station 10662 (McKenzie River at Hendricks Bridge). The analysis indicates if the discharge’s pH lies between 6.0 and 9.0, then the discharge will not have the potential to exceed the water quality criteria (see Appendix C).

5.3.3 Reasonable Potential Analysis for Formaldehyde

Facility personnel occasionally use *Parasite-S*, which is a brand name for formalin. This is a 37% solution of formaldehyde dissolved in water. Facility personnel use *Parasite-S* to control external parasites on the hatchery fish and their eggs. Whenever facility personnel use *Parasite-S*, they do so as part of cleaning operations, in particular they use it in the rearing pens and starting troughs to reduce the growth of fungus on the fish due to handling the fish and abrasions against concrete pen walls.

In addition to the FDA requirements, during the development of other hatchery NPDES permits, DEQ developed acute and chronic guidance criteria for formaldehyde. DEQ developed these guidance criteria to implement Oregon’s narrative toxics substances standard (OAR 340.041-0033(1)). The guidance values are a chronic criterion of 1.6 mg/L and an acute criterion of 4.6 mg/L.

Since January 2017, facility personnel have used formaldehyde only three times. The following table summarizes the analytical results of formaldehyde sampling of the effluent for the substance during these times.

Date of Use	Result (mg/L)
June 2017	0.14
December 2017	ND
July 2018	0.22

The method detection limit is 0.2 mg/L. DEQ performed a reasonable potential analysis for Outfall 001, using Oregon’s standard procedures for toxics, to determine expected compliance with these values. This analysis, presented in spreadsheet form in Appendix D, indicates that there is no reasonable potential for the discharge to exceed the guidance values for formaldehyde.

5.3.4 Reasonable Potential Analysis for Temperature

Water temperatures affect the life cycles of aquatic species and are critical factors in maintaining and restoring healthy salmonid populations. The purpose of the temperature criteria in OAR 340-041-0028 is to protect designated, temperature-sensitive beneficial uses (including salmonid life cycle stages) from adverse anthropogenic warming. The thermal plume limitations (OAR 340-041-0053(2)(d)), which address thermal impacts in the immediate vicinity of discharges, supplement these criteria.

As with all pollutants in the permittee’s discharge, the effluent temperature must be low enough to assure compliance with applicable water quality criteria. The water quality criteria pertaining to temperature in Oregon are primarily based on the most sensitive aquatic species and life stages present in the water body. The receiving stream (the McKenzie River) has a biologically-based numeric temperature criterion (BBNC) of 13°C as a 7-day average maximum, applicable September 1 through June 15. This criterion supports the fish use of salmonid and steelhead spawning and juvenile rearing, see OAR 340-041-0340, Figure 340B. The receiving stream also has a biologically-based numeric temperature criterion (BBNC) of 16°C as a 7-day average maximum, applicable June 16 through August 31. This criterion supports the fish use of core cold-water habitat, see OAR 340-041-0340, Figure 340A. The stream is included on Oregon’s current (2012) list of impaired waters (303d list) as Category 4A (water quality-limited, TMDL approved) for non-attainment of these temperature criteria.

ODFW has communicated that ODFW will cease hatchery operation discharges for the dry season (between April 1 – October 31), and ODFW will not recommence hatchery operation discharges at McKenzie hatchery until ODFW can meet its excess thermal load limit for the dry season (April 1 – October 31).

As part of the permit development, DEQ conducted the temperature TMDL analysis and the thermal plumes analysis. Summaries of each of these analyses are presented below.

McKenzie River Sub-basin Temperature TMDL

DEQ developed a total maximum daily load (TMDL) addressing each of the temperature criteria applicable to the receiving stream, and EPA approved it on Sept. 29, 2006. In Table 4.1 of the TMDL, DEQ allocated the EWEB Leaburg and Walterville Project reservoir operations all of the human use allowance (0.3°C) upstream of river mile 17.4. The two ODFW fish hatcheries, Leaburg and McKenzie, are upstream of river mile 17.4. Accordingly, DEQ did not provide a wasteload allocation for the hatcheries and there is no portion of the human use allowance that is available to the hatcheries. The TMDL wasteload allocations apply during the April 1 – October 31 period. During the last permit renewal, DEQ included an excess thermal loading (ETL) limit of no heat (0 kcal/day) above the applicable criteria ~~in the current permit~~. The proposed permit will retain this ETL limit, but, to be consistent with the TMDL, the limit applies April 1 – October 31 (the current permit’s ETL limit erroneously applied year-round). Although antibacksliding provisions generally do not allow relaxation of effluent limits in renewal permits, section 303(d)(4)(A) of the Clean Water Act allows relaxation when the receiving water is not in attainment for the limiting or related pollutant, the effluent limit is based on a TMDL

wasteload allocation, and it can be shown that relaxation is consistent with antidegradation requirements. As noted above, the receiving water is water quality limited and the new limit is based on a TMDL WLA. It also complies with the antidegradation requirement since TMDL wasteload allocation ensures the temperature increase is an insignificant increase according to the Antidegradation Rule, OAR 340-041-0004(3)(c). Therefore, the new thermal load limit based on the TMDL wasteload allocation is allowed and is included in the proposed permit. **The flow limit included in this modified permit is not applicable when ODFW is meeting its excess thermal load limit by discharging at temperatures below the applicable standard.**

~~The hatchery will not be able to meet this ETL limit upon renewal of the permit and will need to either perform facility modifications and/or conduct water quality trading in order to meet the limit. Typically, when a permittee is given an effluent limit that cannot be met immediately, a compliance schedule is included in the permit. However, this limit became effective under the previous permit, so a compliance schedule is not allowed pursuant to rule. A Mutual Agreement and Order (MAO) is an agency action that can be used to address this situation in lieu of a compliance schedule. As such, an MAO between DEQ and ODFW to address past and anticipated future violations of this limit has been drafted (see Attachment E) and will be executed upon permit issuance.~~

Thermal Plume Criteria

In addition to the temperature standard discussed above, DEQ's water quality standards also include "temperature thermal plume limitations" in OAR 340-041-0053(2)(d). This rule contains criteria designed to prevent potential adverse impacts that may result from thermal plumes. The criteria as they apply to the permittee's discharge are discussed below:

OAR 340-041-0053(2)(d)(A): Impairment of an active salmonid spawning area where spawning redds are located or likely to be located. This adverse effect is prevented or minimized by limiting potential fish exposure to temperatures of 13 degrees Celsius (55.4 Fahrenheit) or more for salmon and steelhead, and 9 degrees Celsius (48 degrees Fahrenheit) or more for bull trout.

McKenzie Fish Hatchery Discharge: Based on Willamette Basin fish use and salmonid spawning use maps contained in OAR 340-041, Figure 340 B, the McKenzie River is designated as having Salmon and Steelhead spawning and rearing use from September 1 through June 15. Therefore, the steelhead spawning thermal plume criterion does apply to this facility.

As described above, the proposed permit includes effluent limits assuring that the discharge will have no impact above the 13°C salmonid temperature criterion during the spawning season.

OAR 340-041-0053(2)(d)(B): Acute impairment or instantaneous lethality is prevented or minimized by limiting potential fish exposure to temperatures of 32°C or more to less than 2 seconds.

McKenzie Fish Hatchery Discharge: DEQ does not expect the discharge to reach temperatures at, or near, 32°C or greater, thereby preventing or minimizing acute impairment or instantaneous lethality.

OAR 340-041-0053(2)(d)(C): Thermal shock caused by a sudden increase in water temperature is prevented or minimized by limiting potential fish exposure to temperatures of 25°C or more to less than 5% of the cross-section of 100% of the 7Q10 low flow of the waterbody.

McKenzie Fish Hatchery Discharge: DEQ does not expect the discharge to reach temperatures at, or near, 25°C or greater, thereby preventing or minimizing thermal shock.

OAR 340-041-0053(2)(d)(D): Unless ambient temperature is 21°C or greater, migration blockage is prevented or minimized by limiting potential fish exposure to temperatures of 21°C or more to less than 25% of the cross-section of 100% of the 7Q10 low flow of the waterbody.

McKenzie Fish Hatchery Discharge: DEQ does not expect the discharge to reach temperatures at, or near, 21°C or greater, thereby preventing or minimizing migration blockage.

In summary, the thermal plume analysis indicates that the discharges from the McKenzie Fish Hatchery will meet the temperature thermal plume limits in OAR 340-041-0053(2)(d).

5.3.5 Reasonable Potential Analysis for Dissolved Oxygen

Ammonia in the facility's discharge can lead to significant reductions in dissolved oxygen. All ammonia monitoring results from the permittee's sampling efforts have been non-detect. The effluent has very low concentrations of oxygen demanding pollutants. Data from the permittee's discharge monitoring reports also show that effluent BOD is non-detect. DEQ does not expect the facility's discharge to result in a measureable dissolved oxygen reduction in the McKenzie River.

The McKenzie River is relatively cold which will reduce impacts from BOD. The river should also be well aerated further up in the basin which will also reduce any impacts from BOD degradation.

DEQ has therefore determined the discharge does not have the potential to cause or contribute to low dissolved oxygen concentrations in the McKenzie River.

5.3.6 Reasonable Potential Analysis for Ammonia

During the previous permit cycle, DEQ performed a reasonable potential analysis on the facility's discharge to see if ammonia in the discharge had the potential to adversely affect the receiving stream's water quality. The monitoring used to perform the ammonia RPA showed the sample concentrations were consistently low. The maximum concentration out of 21 samples was 0.26 mg/L. The RPA analysis showed no reasonable potential for ammonia to cause either acute or chronic toxicity within the receiving stream. As a result, DEQ no longer considered ammonia a contaminant of concern, and did not include any ammonia limits or ammonia monitoring requirements in the current permit. Therefore there is no need to perform another ammonia RPA.

5.3.7 Permit Limit Derivation

Based on the above analyses, DEQ has developed proposed permit limits based on the more stringent of the TBELs and WQBELs. These include the numeric limits for total suspended solids (TSS), settleable solids (SS), pH and temperature discussed above. In addition, the narrative limits discussed in Sections 5.1 and 5.2 are included. Section 6.2 includes these limits.

5.4 Whole Effluent Toxicity

In the past, facility personnel coated the fish pens with copper-based red paint to reduce the amount of organic build-up on the walls. Facility personnel painted the fish pens with the copper-based red paint every two years. The last permit contained a condition requiring the permittee to conduct an annual bioassay test on the effluent to determine whether the metals contained in the paint may be present in the effluent at acute or chronic toxicity levels. The permittee no longer uses metal-based paints in any of the pens or troughs in the hatchery, thus eliminating this concern. The results of the bioassay tests indicated that no acute or chronic toxicity existed during sampling. Therefore DEQ will not require the permittee to conduct another WET test.

5.5 Trading

Water quality trading is an innovative approach aimed at achieving water quality goals more efficiently than traditional methods. The Clean Water Act authorizes EPA, states, and tribes to develop a variety of programs and activities to control pollution, such as water trading. In addition, Oregon Revised Statute (ORS) 468B.555 directs DEQ to develop and implement a pollutant reduction trading program to achieve water quality objectives and standards in Oregon complying with state and federal water quality regulations and promotes economic efficiency. These provisions are described in Section 6.5, below. If the facility uses trading under this permit, then DEQ will present the trading plan for public comment before implementing the plan.

5.6 Antidegradation

DEQ has performed an antidegradation review for this discharge. The proposed permit contains the same discharge loadings as the existing permit, with the exception of the temperature (thermal load) limits as discussed in Section 5.3.4, above. Under Oregon's Antidegradation Rule, discharges with insignificant temperature increases are not considered degradation (OAR 340-041-0004(3)(c)). Specifically, the rule states that insignificant temperature increases authorized under OAR 340-041-0028(11) and (12) are not considered a reduction in water quality. Section 5.3.4 of this report, along with the analysis presented in the temperature TMDL, provides an analysis of the temperature impacts of this discharge and determines appropriate effluent limits to ensure the discharge will result in temperature increases at or below those authorized under OAR 340-041-0028(11) and (12). Based on OAR 340-041-0004 and the Section 5.3.4 of this report, the discharge from the facility does not have the potential to reduce water quality as it pertains to temperature. Permit renewals with the same discharge loadings as the previous permit are not considered to lower water quality from the existing condition. DEQ is not aware of any information that existing limits are not protective of the receiving stream's designated beneficial uses. DEQ is also not aware of any existing uses present within the water body that are not currently protected by standards developed to protect the designated uses. Therefore, DEQ has determined that the proposed discharge complies with DEQ's antidegradation policy. DEQ's antidegradation worksheet for this permit renewal is available upon request.

6.0 Permit Draft Discussion

6.1 Face Page

The face page provides information about the permittee, a description of the wastewater, outfall locations, receiving stream information, permit approval authority, and a description of permitted activities. The permit authorizes the permittee to construct, install, modify, or operate a wastewater collection, treatment, control, and disposal system. The permit allows discharge to the McKenzie River within Schedule A limits and the following schedules. The permit prohibits all other discharges.

In accordance with state and federal law, NPDES permits will be effective for a fixed term not to exceed 5 years. Upon issuance, this permit will be effective for no more than 5 years.

6.2 Schedule A, Waste Discharge Limitations

The proposed effluent limits for the discharge are as follows:

a. **Outfall 001 (Normal Operations)**

Parameter	Monthly Average	Daily Maximum
Total Suspended Solids (TSS)	5 mg/l	10 mg/l
Settleable Solids (SS)	0.1 ml/l	--
pH	Within the range 6.0 - 9.0 SU	

b. Outfall 001 (Cleaning Operations)

Parameter	Daily Maximum
Total Suspended Solids (TSS)	15 mg/l
Settleable Solids (SS)	0.2 ml/l
pH	Within the range 6.0 - 9.0 SU

c. Outfall 001 (Cleaning and Normal Operations)

Parameter	Limitation
Excess Thermal Load (April 1 – Oct. 31)	No heat (0 kcal/day)

1. Facility personnel must not discharge wastes or conduct activities that cause or contribute to violating water quality standards in OAR 340-041 applicable to the Willamette Basin, except as provided for in OAR 340-45-0080 and the following regulatory mixing zone which applies to Outfall 001:

The regulated mixing zone allows mixing with 25 percent of the McKenzie River. The Zone of Immediate Dilution (ZID) allows mixing with 10 percent of the McKenzie River.

2. Facility personnel must direct all water that has been affected by chemical application or usage to the settling pond for discharge through Outfall 001. Chemical residuals from the treatment of fish disease or parasites are permitted if facility personnel apply the chemicals according to USEPA labeling requirements. Unless DEQ approves in writing, facility personnel must use chemicals approved or allowed for hatchery use by the US FDA or USEPA.
3. The permit allows off-site discharge of water associated with the release of fish into waters of the state.
4. Unless DEQ otherwise approves in writing, the maximum yearly biomass production permitted for this facility is 285,000 pounds or 129,545 kilograms.
5. Facility personnel must not conduct activities that could cause an adverse impact on existing or potential beneficial groundwater uses. Facility personnel must manage and dispose all wastewater and process related residuals in a manner that prevents violating the Groundwater Quality Protection Rules (OAR 340-040).

6.3 Schedule B – Minimum Monitoring and Reporting Requirements

Schedule B describes the minimum monitoring and reporting necessary to demonstrate permit compliance. ORS 468.065(%) requires permittees to report periodically. Self-monitoring requirements are the primary means of assuring that the permittee meets permit limits. The permittee may also need to monitor other parameters when insufficient data exist to establish a limit, but where there is a potential for a water quality concern.

This schedule has six tables, described below:

1. Table B1 of this schedule includes information on the reporting requirements and due dates. Section 2 of the schedule includes standard monitoring and reporting protocol requirements.
2. Table B2 includes monitoring requirements for Outfall 001 during normal and cleaning operations.
3. Table B3 includes monitoring requirements for Supply Water Monitoring.
4. Table B4 includes effluent monitoring requirements for the Pollution Abatement Settling Pond.
5. Table B5 includes Fish Biomass Production requirements.
6. Table B6 includes Solids Removal requirements.

6.4 Schedule C, Compliance Schedules and Conditions

The proposed renewal permit does not contain any Schedule C conditions or requirements.

6.5 Schedule D - Special Conditions

The Schedule D special conditions include the following:

1. The requirement to develop, and update annually, an Emergency Response and Public Notification Plan.
2. The requirement to develop and keep up-to-date a spill/emergency response plan. This plan must address measures and facilities to assure proper drug storage, pesticides and feed in a manner designed to prevent spills that may result in discharging these materials to waters of the state.
3. A pollution prevention plan.
4. Pollution Abatement Ponds Solids Handling requirements.
5. Solids Handling requirements.
6. Drug Use requirements.
7. Discharges due to structural failure or damage.
8. Reporting requirements for failure discovery or damage.
9. Best Management Practices.
10. Guidelines for developing a water quality trading plan.

6.6 Schedule F, NPDES General Conditions

These conditions are standard to all industrial NPDES permits and include language regarding facility operation and maintenance, monitoring and record keeping, and reporting requirements. DEQ has revised the General Conditions since DEQ issued the last permit. A summary of the changes is as follows:

- There are additional citations to the federal Clean Water Act and CFR, including references to standards for sewage sludge use or disposal.
- There is additional language regarding federal penalties.
- Bypass language has been made consistent with the CFR.
- Overflow language has been eliminated.
- Requirements regarding emergency response and public notification plans have been made more explicit.
- Language pertaining to duty to provide information has been made more explicit.
- Confidentiality of information is addressed.
- A definition of CBOD has been added.

7.0 Next Steps

7.1 Public Comment Period

DEQ will make the proposed NPDES permit available for public comment for a minimum of 35 days. DEQ will post public notice and links to the proposed permit on DEQ's website and sent to subscribers to DEQ's pertinent public notice e-mail lists. DEQ will schedule a Public Hearing if 10 or more people request one, or if an authorized person representing an organization of at least 10 people requests one. If DEQ holds a public hearing, then DEQ would publish an additional public notice to advertise the public hearing.

7.2 Response to Comments

DEQ will respond to comments received during the comment period. All those providing comment will receive a copy of DEQ's response. Interested parties may also request a copy of DEQ's response. After DEQ receives and evaluates comments, DEQ will decide whether to issue the permit as proposed, make changes to the permit, or deny the permit. DEQ will notify the permittee of DEQ's decision.

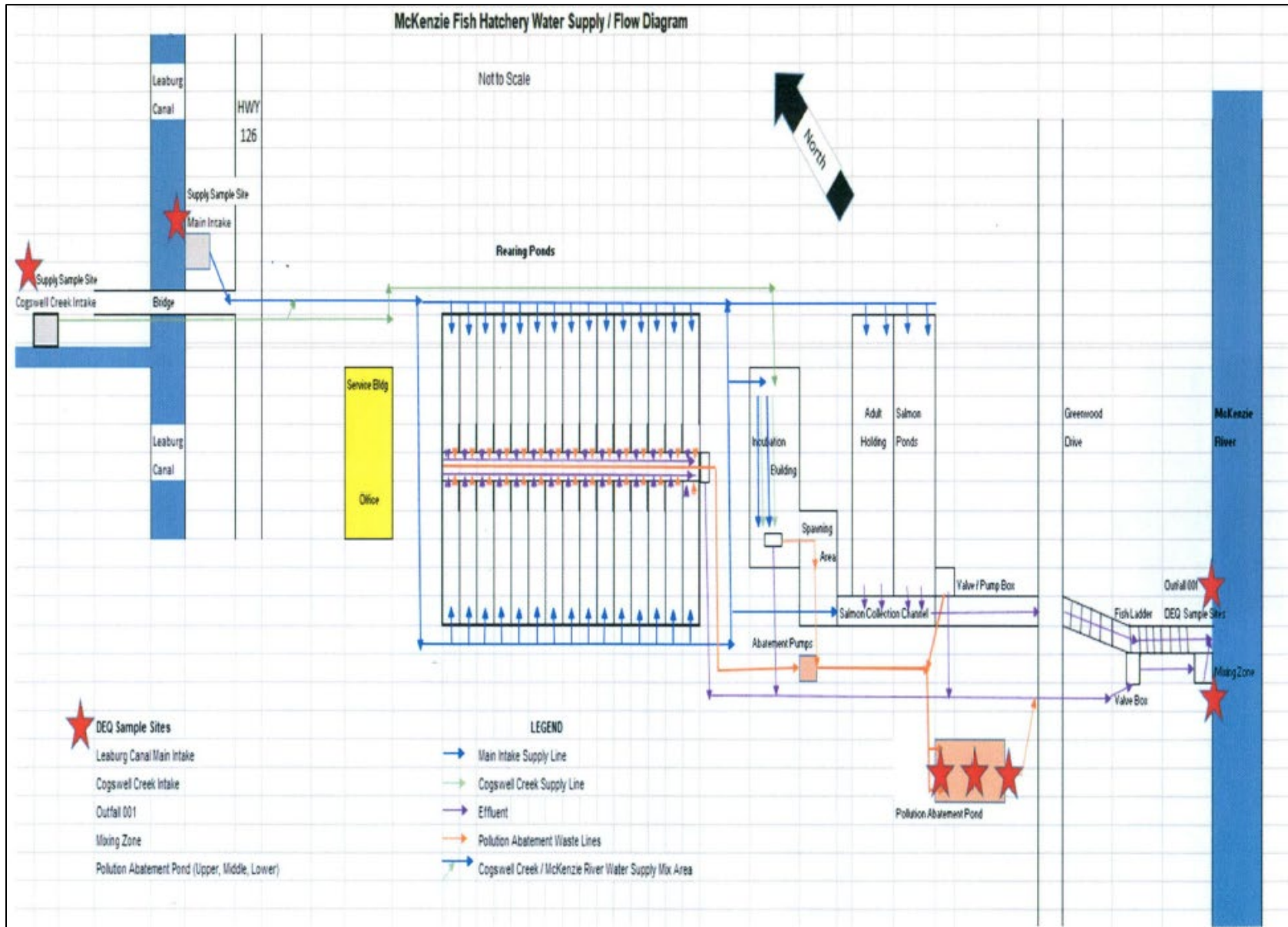
7.3 Modifications to Fact Sheet and Permit Evaluation Report

Depending on the nature of the comments and any changes made to the permit as result of comments, DEQ may modify this permit evaluation report and fact sheet. DEQ may also choose to update the permit evaluation report and fact sheet through memorandum or addendum. If DEQ makes substantive changes to the permit, then an additional round of public comment may occur.

7.4 Issuance

The DEQ mails the finalized, signed permit to the permittee. The permit is effective 20 days from the mailing date.

APPENDIX A: WATER FLOW DIAGRAM



APPENDIX B: LIST OF CHEMICALS APPROVED FOR FISH CULTURE (SEE NOTE 1)

Chemical	Purpose	Disposal Method	Regulator
Formalin (aka, Formalin-F, Formacide-B, Parasite-S)	Used to control fungi on eggs, adults, and to treat external protozoa and trematode parasites.	The New (2019) labeling for environmental precautions suggests, the acute benchmark value for 37% formaldehyde is 4.58 mg/L (12.4 mg formalin/L) for freshwater aquatic life. This benchmark concentration is not a discharge limit, but may be used by the NPDES authority to derive such limits for the permit.	DEQ, FDA
35% Hydrogen Peroxide (Perox-Aid)	Intended for use as an external microbicide for the control of mortality in freshwater-reared finfish eggs due to saprolegniasis, in freshwater-reared salmonids due to bacterial gill disease	Water level in treatment pond is reduced to minimize the quantity of chemical requirement. After the treatment period, a dam board is pulled and fresh flow is applied to eject the treated water to the hatchery effluent through abatement pond for additional dilution. The product label suggested an acute benchmark concentration is 0.7 ppm (one-half the Final Acute Value), and an effluent discharge limits may be needed from the NPDES permit authority.	DEQ, FDA
Chloramine-T (Halamid-Aqua)	It is used as an algacide, bactericide, virucide, fungicide (including spores), and germicide. It is used effectively against bacterial gill outbreaks on fish.	Discharge should be less than 0.10 ppm. Treated waters are adequately diluted in abatement pond or mixing with fresh effluents from other raceways before discharging into state's waters.	DEQ, FDA
Diquat (Reward)	Reward is a liquid concentrate of Diquat dibromide that under the INAD provides use to control external bacteria. Containers with Diquat in them must be labeled correctly.	Diquat is diluted and discharged into abatement or mixing zone.	DEQ, FDA (INAD 10-969)
Potassium permanganate	Used to control external parasites	The NPDES permit recognized Potassium permanganate as a Low Regulatory Priority (LRP) listed drug and there are no DEQ discharge limits/requirements for potassium permanganate. FDA lists status as "not to be low regulatory priority but regulatory action deferred."	DEQ
Salt (Sodium Chloride)	Therapeutic use for fish transportation or as a stress reducer on fish, and control of parasites	Sodium chloride is a listed LRP drug. There are no DEQ discharge requirements for salt.	DEQ
Epsom Salt (Magnesium sulfate)	Epsom salt if mixed with feed acts as a laxative to control hexamita a gut parasite (endo-parasite).	NPDES permit-listed LRP drug. There are no DEQ discharge requirements for Epsom salt.	DEQ
Tricaine Methanesulfonate (MS-222, Tricaine-S, Finquel)	MS-222 is an anesthetic. It is intended for the temporary immobilization of fish during manual spawning, weighing, measuring, marking and transport.	The preferred method of disposal is to pour the solution in a bio swell (depression in the lawn) or evaporate on concrete or asphalt, not to be discharged near open waterways.	DEQ, FDA

Aqui-S 20E	Aqui-S is an anesthetic/sedative used to immobilization for the fish handling such as, spawning, weighing, measuring, marking and transporting fish	Method of disposal is to carefully pour the solution in a bio swell (depression in the lawn), pit, or allow to evaporate on concrete or asphalt. Not discharged into open waterways.	DEQ, FDA (INAD 11-741)
Chemical	Purpose	Disposal Method	Regulator
Florfenicol (Aquaflor)	Florfenicol medicated feed is administered to treat bacterial diseases	The level of discharge is 20.6 mg/l, and adequate dilution is made in abatement pond or with fresh waters/effluents from other raceways before discharge into streams.	DEQ, FDA
Erythromycin (Aquamycin-100 feed or Erythromycin 200 injectable)	Erythromycin is administered to treat bacterial pathogens (primarily BKD). Juvenile treatments are administered through mixture in the feed. Adults are treated with an injection.	Erythromycin is administered to fish via premix in feed or injection, is metabolized, then excreted in fish feces.	FDA (INAD 6013 (feed) or INAD 12-781 (Injection))
Oxytetracycline (aka, Terramycin 200, TM-200, Oxy-Tet, OTC, Durimycin-injectable)	Oxytetracycline is used to treat bacterial infections either mixed with fish feed or injected in adults.	Discharge method not applicable as it is either injected or fed with feed.	DEQ, FDA (if needed, INAD 9332)
Vibrio vaccine	vaccinate fish from Vibriosis bacterial disease	disposal in septic system	USDA Center for Veterinary Biologics
ERM vaccine	vaccinate fish from Enteric Redmouth Disease, bacterial	disposal in septic system	USDA Center for Veterinary Biologics
Vida Life	Stress reliever, protects slime layer on fish. Used in fish transportation tanks and in the anesthetic tank at the FAFF.	Diluted as it is discharged into effluent.	DEQ
Poly Aqua	Antifoaming agent, therapeutic use for fish transportation or as a stress reducer on fish that protects the natural slime of fish body.	Diluted as it is discharged into effluent.	DEQ
Carbon dioxide	Anesthetic for adult fish.	There are no DEQ discharge requirements for carbon dioxide. Preferred method is solution carefully poured into bio-swell.	DEQ, FDA
Sodium bicarbonate	Used to neutralize carbon dioxide and to buffer MS-222	There are no DEQ discharge requirements for sodium bicarbonate. Preferred method is solution carefully poured into bio-swell.	DEQ

Note 1: The permittee must not use this permit to authorize use of pesticides in a manner inconsistent with FIFRA labeling.

APPENDIX C: REASONABLE POTENTIAL ANALYSIS FOR PH

pH RPA Analysis			
Facility Name: McKenzie River Fish Hatchery	Run Notes:		
Permit Writer: David Cole			
Run Date: 6/1/20			
Data Source, Effluent: McKenzie Fish Hatchery Application			
Data Source, Ambient: Hatchery Application & DEQ Sta. 10662 (M			
INPUT	RPA for pH		Med. pH Calc.
	Lower pH Criteria	Upper pH Criteria	Med. pH Criteria
1. DILUTION FACTOR AT MZ BOUNDARY - $(Q_e+Q_r)/Q_e$	5	5	# *
2. UPSTREAM/BACKGROUND CHARACTERISTICS			
Temperature (deg C):	5.8	15.4	9.9
pH:	7.3	7.6	7.4
Alkalinity (mg CaCO3/L):	20.0	48.2	35.1
3. EFFLUENT CHARACTERISTICS			
Temperature (deg C):	6.5	11.9	9.5
pH (S.U.):	6.0	9.0	--
Alkalinity (mg CaCO3/L):	20.0	48.6	35.3
4. APPLICABLE PH CRITERIA	6.0	9.0	
OUTPUT			
1. IONIZATION CONSTANTS			
Upstream/Background pKa:	6.51	6.42	--
Effluent pKa:	6.50	6.45	--
2. IONIZATION FRACTIONS			
Upstream/Background Ionization Fraction:	0.86	0.94	--
Effluent Ionization Fraction:	0.24	1.00	--
3. TOTAL INORGANIC CARBON			
Upstream/Background Total Inorganic Carbon (mg CaCO3/L):	23.21	51.36	--
Effluent Total Inorganic Carbon (mg CaCO3/L):	82.95	48.74	--
4. CONDITIONS AT MIXING ZONE BOUNDARY			
Temperature (deg C):	5.96	14.74	--
Alkalinity (mg CaCO3/L):	20.00	48.28	--
Total Inorganic Carbon (mg CaCO3/L):	35.16	50.83	--
pKa:	6.50	6.42	--
pH at Mixing Zone Boundary:	6.624	7.699	--
Is there Reasonable Potential?	No	No	

APPENDIX D: REASONABLE POTENTIAL ANALYSIS FOR FORMALDEHYDE

Formalin RPA															
RPA Run Information				Facility Information											
Facility Name:		McKenzie Fish Hatchery		1. Are there dilution #'s from mixing zone study? (Yes/No)				yes							
DEQ File Number:		64500		2. Is the receiving waterbody fresh water? (Yes/No)				yes							
EPA Identification #:		OR0027642		3. If Question 1 = "No", then fill in the following table											
Permit Number:		101918		Eff. Flow Rate		MGD		N/A		Calculated dilution Factors					
Permit Writer Name:		David Cole		Stream Flow: 7Q10		CFS		N/A		Dilution @ ZID		N/A			
Preparation Date:		6/4/2020		Stream Flow: 1Q10		CFS		N/A		Dilution @ MZ		N/A			
Facility Flow Rate (MGD):		35		% dilution at ZID		%		10%							
Outfall Number:		"001"		% dilution at MZ		%		25%							
Determination Date:		6/4/20		4. If answered "Yes" to Question #1, then fill in dilution values				Dilution @ ZID (from study)		2					
RPA Run Notes:								Dilution @ MZ (from study)		5					
Color Key:		"*" = Enter data		5. Enter Water Hardness. Ambient: 7Q10. Effluent: default of 25mg/l. Min/Max 25-400 mg/l CaCO3				Effluent		mg/L CaCO3		25			
Intermediate Calc.s		".." = Will calculate						Up-stream		mg/L CaCO3		*			
Calculation Results								ZID boundary		mg/L CaCO3		#VALUE!			
				6. Please enter statistical Confidence and Probability values (note: defaults already entered)				MZ boundary		mg/L CaCO3		#VALUE!			
								Confidence Level		%		99%			
				Probability Basis		%		95%							
			Identify Pollutants of Concern				Determine In-Stream Conc.			Det. Reasonable Potential					
Pollutant Parameter		Evaluation Required?	# of Sample	Highest Effluent Conc.	Coefficient of Variation	Est. Max Eff. Conc.	RP at end of pipe?	Ambient Conc.	Max Total Conc. @ ZID	Max Total Conc. @ RMZ	WQ Crit: 1 Hour (CMC)	WQ Crit: 4 Day (CCC)	Is there Reasonable Potential to Exceed? (Yes/No)		
		(Yes/No)		(µg/l)	Default=0.6	(µg/l)	(Yes/No)	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)		Acute	Chronic
Formaldehyde		yes	3	220	0.6	858	No	0	429	172	4600	1600	NO	NO	
Notes:															
1. Criteria included above are guidance criteria.															
2. Sampling performed by EPA indicated no ambient concentrations of formaldehyde in waters upstream of fish hatcheries across the NW (Water Sampling and Testing for Formaldehyde at Northwest Fish Hatcheries, EPA Region 10, August 2017).															

~~APPENDIX E: MUTUAL AGREEMENT AND ORDER~~