

Western Fisheries Research Center – Seattle
Notice of Standard Operating Procedure Deviation

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Sent to: WFRC IACUC, WFRC IBC, WFRC I.O. (Rolland), WFRC Facilities Manager (Sato)

This report serves as written documentation of a deviation in WFRC Standard Operating Procedure B-1 V.04 “WFRC Seattle Wet Laboratory Procedure Manual” and “Pathogen Exposure Plan - Appendix M (Provisional SOP)”.

Relevant text from B-1 SOP regarding effluent treatment from main wet laboratory:

Pg. 4 of SOP states:

“The laboratory effluent is treated for 1 hour using at least 2.5 ppm free chlorine using a chlorine solution generated on site. This provides an effective Biosafety Level-2 quarantine facility in which pathogens endemic to the Pacific Northwest can be studied safely.”

Pg. 25 states:

“Effluent Chlorination System: The maintenance staff is responsible for the operation of the chlorination system. Any adjustment or repairs to the chlorination equipment will be made by maintenance personnel after advising the lab manager.”

Relevant text from Appendix M regarding effluent treatment from main wet laboratory:

The WFRC main wet laboratory is an approved aquatic species quarantine and research facility when the effluent is treated to at a 2.0 ppm free chlorine concentration for 10 minutes as defined by The Salmonid Disease Control Policy of the Fisheries Co-Managers of Washington State (Revised July 2006). The treated effluent will be tested quarterly to ensure that chlorine decontamination levels of at least 1.0 PPM are still present at the outfall of the laboratory (approximately 1 hour after initial treatment).

History of SOP deviation:

On 06/29/2017, routine testing of total chlorine levels in a water sample taken from the outflow pipe (prior to dechlorination with sulfur dioxide) at the WFRC main gate water grate, yielded no detectable total chlorine. Ideally, we are seeking to ensure that ≥ 1.0 PPM chlorine is still present at the outfall of the laboratory at approximately 1 hour after initial treatment. Science staff last tested the outfall on 1/17/2017 and obtained a reading of 1.6 PPM. Science staff contacted Kyle Sato. Mr. Sato arrived within minutes and determined the chlorine meter system lines were clogged due to sodium hypochlorite precipitates. There are no alarms on the chlorine meter; the last time facilities staff examined the unit was on approximately 06/12/2017 and the meter was determined to be functioning properly. The chlorination system has a bypass valve that allows chlorine to bypass the meter and feed directly into the outflow via a pipe in the egg room. This manual bypass valve was turned on and chlorination of effluent was restored immediately.

Manual chlorination via the bypass valve into the egg room was initiated at ~ 11 a.m. on 6/29/17 at a rate of 0.7 L/min. Two hours later (~ 1 pm), chlorine readings at the gate were 0.26 PPM. The chlorine rate was turned up and by 7:30 A.M. on 6/30/17 the measured chlorine at the gate was ~2.5 PPM. The chlorine reservoir tanks had noticeably dropped overnight and these gate readings were too high. Chlorine rates were manually adjusted over the next few days to obtain an ideal rate.

Calculations of current chlorine treatment:

Maximum effluent flow = 250 gal / min (950 L / min)

Stock chlorine input rate = 0.3 L / min (measured as 3'30" to fill a 1 L beaker)

Stock chlorine concentration = 9950 PPM (measured by titration on 7/5/17)

Chlorine input (stock conc / effluent flow) = 10.5 PPM / L

Chlorine input rate = 3.0 PPM / min

Average reading at outflow = 1.98 PPM (range = 1.46 – 2.59 recorded between 7/5/17 – 7/21/17)

Provisional SOP – Manual Chlorination with Enhanced Monitoring by Science Staff

In consultation with facilities, we have opted to continue treating effluent through the bypass pipe in the egg room.

We have posted a log sheet in the egg room with the following monitoring guidelines:

Once Daily – Visual check to ensure the chlorine is flowing from egg room pipe.

Minimum 3x per week – Measure the chlorine flow as the number of seconds required to fill a 1L beaker (present target is 3'30")

Minimum 3x per week – Measure the total chlorine at the outfall gate and ensure that the reading is ≥ 1 PPM.

Minimum 2x per month – Ensure that there is adequate salt in the chlorination bin to make brine solution.

Minimum 1x per month – Titrate the concentration of the stock chlorine and ensure that it is greater > 8000 PPM.

Any readings that fall below target values will be reported immediately to facilities and the IACUC / IBC chair.

Manual chlorination via the bypass valve with enhanced monitoring will continue until facilities can implement an alarmed effluent monitoring system.