



DEPARTMENT OF HEALTH & HUMAN SERVICES

PUBLIC HEALTH SERVICE
NATIONAL INSTITUTES OF HEALTH

FOR US POSTAL SERVICE DELIVERY:

Office of Laboratory Animal Welfare
6700B Rockledge Drive, Suite 2500, MSC 6910
Bethesda, Maryland 20892-6910
Home Page: <http://grants.nih.gov/grants/olaw/olaw.htm>

FOR EXPRESS MAIL:

Office of Laboratory Animal Welfare
6700B Rockledge Drive, Suite 2500
Bethesda, Maryland 20817
Telephone: (301) 496-7163
Facsimile: (301) 480-3387

February 28, 2022

Re: Animal Welfare Assurance
A3627-01 [OLAW Case J]

Dr. Jason Carter
Vice President for Research and
Economic Development
Montana State University
P O Box 17460, (b) (4)
Bozeman, MT 59717

Dear Dr. Carter,

The Office of Laboratory Animal Welfare (OLAW) acknowledges receipt of your February 17, 2022 letter reporting a serious deviation from the provisions of the *Guide for the Care and Use of Laboratory Animals* at Montana State University, following up on an initial telephone report on February 11, 2022. According to the information provided, OLAW understands that 10 zebrafish died and 16 required euthanasia after chlorine entered the tank water due to a reverse osmosis (RO) system membrane failure. The fish were on a teaching protocol and supported by NSF grant HRD-1663753.

The corrective actions consisted of testing the tank water quality, adding a chlorine binding agent to the water, and contacting a vendor to conduct preventive maintenance, change filters, and flush the system. Preventive measures taken included labeling the filter cartridges and membrane housings with dates for replacement and adding the RO preventive maintenance schedule to the Annual Master List Spreadsheet for the animal facility.

Based on its assessment of this explanation, OLAW understands that measures have been implemented to correct and reduce the likelihood of a recurrence of the problem. OLAW concurs with the actions taken by the institution to comply with the PHS Policy on Humane Care and Use of Laboratory Animals.

Sincerely,

(b) (6)

Axel Wolff, M.S., D.V.M.
Deputy Director
Office of Laboratory Animal Welfare

cc: IACUC Chair
NSF Animal Welfare Officer

A3627-J



February 17, 2022

Axel Wolf f, MS,DVM
Deputy Director
Office of Laboratory Animal Welfare
National Institutes of Health
Rockledge 1, Suite 360
7505 Rockledge Drive
Bethesda, MD 20892

Dear Dr., Wolff:

Montana State University (MSU), Animal Welfare Assurance #D16-00379, provides this report of in accordance with PHS Policy IV.F.3 regarding the following:

- Reverse osmosis (RO) system membrane failure causing trace amounts of chlorine in the water system; resulting in the death of 10 and euthanasia of 16 zebrafish.

This incident was reported to OLAW on February 11, 2022, via phone call by MSU's, Office of Research Compliance (ORC).

During routine husbandry observations, 2 adult zebrafish were found dead and 2 were exhibiting abnormal behavior. The zebrafish were housed in a stand-alone ten gallon tank containing a total of 26 fish.

Water quality parameters were evaluated at the request of the Attending Veterinarian (AV). Trace amounts of chlorine were present and all other water quality parameters were within normal limits. The RO water was checked at the source, and trace amounts of chlorine were detected. As directed by the AV, API Stress Coat (aquarium water conditioner that binds chlorine) was added to the tank housing the fish.

The RO water vendor was called in for an emergency site visit and verified the presence of trace amounts of chlorine in the RO water. It was determined that a membrane filter, failed. Preventative maintenance and filter changes were performed in accordance with manufacturer recommended schedules. The membrane filter was changed, and no chlorine was detected. The system was flushed to remove any residual chlorine. Water in the tank housing the animals was replaced. Animal health observations and water quality evaluations were continued.

Over the next five days, zebrafish housed in the stand-alone tank were found dead or euthanized due to abnormal behavior. On day five after the initial event, a decision was made to euthanize all remaining fish due to concern for their welfare.

The zebrafish were housed under the IACUC protocol entitled "Making Use of the Zebrafish Model for Teaching". A review of billing records showed that all direct costs associated with procurement, care, and use of the animals were paid from NSF Grant HRD-1663753.

On February 16, 2022, the IACUC reviewed the information regarding the RO membrane failure.

To facilitate trouble shooting the RO system the following items have been implemented:

Office of Research and
Economic Development
207 Montana Hall
P.O. Box 172460
Bozeman, MT 59717-2460
Tel (406) 994-2891
Fax (406) 994-2893
www.montana.edu/wwwvr

- Filter cartridges and membrane housings will be labeled with the due date for the next scheduled change.
- RO preventative maintenance schedule will be added to the "ARC Annual Master To Do Task Spreadsheet".

MSU is committed to protecting the welfare of animals used in research and appreciates the guidance and assistance provided by OLAW in this regard. Should you have any questions regarding this matter, please contact (b) (6)

Thank you for your consideration of this matter.

Sincerely,

(b) (6)

2/17/2022 | 8:20 AM MST

Jason Carter
Vice President for Research and Economic Development & Graduate Education
Montana State University
P O Box 17460, Montana Hall, (b) (4)
Bozeman, MT 59717

Cc: (b) (6)

Wolff, Axel (NIH/OD) [E]

From: OLAW Division of Compliance Oversight (NIH/OD)
Sent: Friday, February 18, 2022 8:30 AM
To: (b) (6)
Cc: OLAW Division of Compliance Oversight (NIH/OD)
Subject: RE: Montana State University A3627-01 Report of Mechanical Failure

Thank you for this report, (b) (6) We will send a response soon.

Axel Wolff, M.S., D.V.M.
Deputy Director, OLAW

From: (b) (6)
Sent: Thursday, February 17, 2022 10:42 AM
To: OLAW Division of Compliance Oversight (NIH/OD) <olawdco@od.nih.gov>
Cc: (b) (6) Carter, Jason <jcarter@montana.edu>
Subject: [EXTERNAL] Montana State University A3627-01 Report of Mechanical Failure

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and are confident the content is safe.

To Whom it May Concern,

Attached is MSU's final report, per PHS Policy IV.F.3, to OLAW. The report provides a detailed explanation of the circumstances, a corrective action plan, along with all of the pertinent facts as required by OLAW. In addition, a preliminary report to OLAW was submitted, via telephone, on February 11, 2022.

Please contact the Office of Research Compliance if you have any additional questions or concerns.

Regards,

(b) (6)