



Report Date: March 14, 2018

File: 11596

Report Number: 079263

Marine Harvest Canada
124-1334 Island Highway
Campbell River BC V9W 8C9

Dear Marine Harvest Canada:

Re: Non-compliance Advisory Letter, Permit 11596, Marine Harvest Processing Plant, Port Hardy

On February 21, 2018, Ministry of Environment and Climate Change Strategy, Environmental Protection Division staff conducted an inspection of Marine Harvest Processing Plant, in Port Hardy BC with authorization number 11596 under the *Environmental Management Act*. Ministry staff were accompanied on site by Stephen Hall, Marine Harvest; Adam McFee, Marine Harvest; and Greg Payne, Marine Harvest.

This Advisory, the alleged violations and the circumstances to which it refers will form part of the compliance history of Marine Harvest Canada, and will be taken into account in the event of future non-compliance.

Please note that this authorization is considered to be out of compliance until such a time as it can be confirmed to meet the authorization requirements.

Inspection Details:

Requirement Description:	Environmental Management Act, Environmental Management Act 6 (4): (4) Subject to subsection (5), a person must not introduce waste into the environment in such a manner or quantity as to cause pollution.
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Details/Findings:	On February 21, 2018 BC Ministry of Environment and Climate Change Strategy (ENV) Environmental Protection Officer Darren Stewart (Officer Stewart) inspected Marine Harvest Canada (Marine Harvest) for compliance with its fish processing plant effluent discharge permit 11596. Permit 11596 was originally issued on August 20, 1993 and last amended on April 11, 2017. Samples of the processing effluent were taken by Officer Stewart at the time of the inspection. The samples were collected after the effluent had passed through the authorized treatment works, prior to discharge through the outfall. A single sample of the processing effluent was collected; therefore, there are insufficient available data at this time to determine whether the effluent has substantially altered or impaired the usefulness of the environment. The analytical results of the effluent (Laboratory Certificate of Analysis attached) were: <table><tr><td>Parameter</td><td>Result</td><td>Units</td><td>Results</td></tr><tr><td>pH</td><td>7.14</td><td></td><td></td></tr><tr><td>Total Suspended Solids</td><td>77.1</td><td>mg/L</td><td></td></tr><tr><td>Ammonia, Total (as N)</td><td>3.31</td><td>mg/L</td><td></td></tr><tr><td>Nitrate (as N)</td><td>0.30</td><td>mg/L</td><td></td></tr><tr><td>Nitrite (as N)</td><td>0.10</td><td>mg/L</td><td></td></tr><tr><td>Total Nitrogen</td><td>36</td><td>mg/L</td><td></td></tr><tr><td>Total Organic Nitrogen</td><td>32.7</td><td>mg/L</td><td></td></tr><tr><td>Phosphorus (P), Total</td><td>0.70</td><td>mg/L</td><td></td></tr><tr><td>BOD</td><td>234</td><td>mg/L</td><td></td></tr><tr><td>COD</td><td>470</td><td>mg/L</td><td></td></tr><tr><td>Oil and Grease</td><td>1.2</td><td>mg/L</td><td></td></tr></table> Toxicity 96 hr (Static) Single Concentration = not acutely lethal @ 73% test concentration. Microtox test 5 minute (Static) IC50 = not acutely toxic 15 minute (Static) IC50 = not acutely toxic	Parameter	Result	Units	Results	pH	7.14			Total Suspended Solids	77.1	mg/L		Ammonia, Total (as N)	3.31	mg/L		Nitrate (as N)	0.30	mg/L		Nitrite (as N)	0.10	mg/L		Total Nitrogen	36	mg/L		Total Organic Nitrogen	32.7	mg/L		Phosphorus (P), Total	0.70	mg/L		BOD	234	mg/L		COD	470	mg/L		Oil and Grease	1.2	mg/L	
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Requirement Description:	1. AUTHORIZED DISCHARGES 1.1 Authorized Source 1.1.1: 1.1 This section applies to the discharge of effluent from a fish processing plant. The site number for this discharge is E219092. 1.1.1 The maximum authorized rate of discharge is 800 m3/d.																																																

Details/Findings:	Officer Stewart conducted a records review of discharge rates submitted by Marine Harvest and noted the following 75 reported exceedances of the maximum authorized daily rate of discharge: 21-Jun-17 818 m3/d 22-Jun-17 803 m3/d 26-Jun-17 894 m3/d 28-Jun-17 804 m3/d 29-Jun-17 882 m3/d 05-Jul-17 904 m3/d 06-Jul-17 818 m3/d 10-Jul-17 907 m3/d 12-Jul-17 902 m3/d 13-Jul-17 911 m3/d 18-Jul-17 884 m3/d 19-Jul-17 954 m3/d 20-Jul-17 986 m3/d 21-Jul-17 911 m3/d 24-Jul-17 925 m3/d 25-Jul-17 921 m3/d 26-Jul-17 1204 m3/d 27-Jul-17 867 m3/d 28-Jul-17 843 m3/d 31-Jul-17 875 m3/d 01-Aug-17 900 m3/d 02-Aug-17 942 m3/d 03-Aug-17 944 m3/d 04-Aug-17 892 m3/d 08-Aug-17 874 m3/d 09-Aug-17 934 m3/d 10-Aug-17 939 m3/d 11-Aug-17 987 m3/d 14-Aug-17 819 m3/d 15-Aug-17 847 m3/d 16-Aug-17 909 m3/d 17-Aug-17 948 m3/d 18-Aug-17 878 m3/d 23-Aug-17 830 m3/d 25-Aug-17 867 m3/d 28-Aug-17 827 m3/d 30-Aug-17 856 m3/d 31-Aug-17 956 m3/d 01-Sep-17 874 m3/d 05-Sep-17 846 m3/d 06-Sep-17 889 m3/d 07-Sep-17 931 m3/d 08-Sep-17 850 m3/d 11-Sep-17 835 m3/d 12-Sep-17 851 m3/d 13-Sep-17 904 m3/d 18-Sep-17 865 m3/d 20-Sep-17 1019 m3/d 25-Sep-17 896 m3/d 26-Sep-17 886 m3/d 27-Sep-17 929 m3/d 28-Sep-17 880 m3/d 03-Oct-17 847 m3/d 04-Oct-17 904 m3/d 05-Oct-17 831 m3/d 10-Oct-17 914 m3/d 12-Oct-17 815 m3/d 16-Oct-17 829 m3/d 17-Oct-17 918 m3/d
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19-Oct-17	903 m3/d
24-Oct-17	905 m3/d
30-Oct-17	808 m3/d
31-Oct-17	833 m3/d
01-Nov-17	955 m3/d
02-Nov-17	856 m3/d
07-Nov-17	918 m3/d
08-Nov-17	884 m3/d
09-Nov-17	911 m3/d
14-Nov-17	893 m3/d
15-Nov-17	900 m3/d
21-Nov-17	864 m3/d
22-Nov-17	1081 m3/d
28-Nov-17	849 m3/d
30-Nov-17	938 m3/d
24-Jan-18	819 m3/d

Compliance:	Out
Actions to be taken:	
Requirement Description:	1. AUTHORIZED DISCHARGES 1.1 Authorized Source 1.1.3: 1.1 This section applies to the discharge of effluent from a fish processing plant. The site number for this discharge is E219092.1.1.3 The characteristics of the discharge shall be of a quality such that any measurement at the point of discharge is equivalent to or better than the following parameters: Parameter - pH, Maximum Annual Average - 6.0 - 8.5, Maximum Daily Concentration - 6.0 - 8.5; Parameter - ammonia (NH3), Maximum Annual Average - 50 mg/L, Maximum Daily Concentration - 50 mg/L; Parameter - 5-day Biochemical Oxygen Demand (BOD5), Maximum Annual Average - 360 mg/L, Maximum Daily Concentration - 840 mg/L; Parameter - Oil & Grease (O&G), Maximum Annual Average - 2.5 mg/L, Maximum Daily Concentration - 36 mg/L; Parameter - Phosphorus (P), Maximum Annual Average - 0.2 mg/L, Maximum Daily Concentration - 1 mg/L Parameter - Total Suspended Solids (nonfilterable residue=TSS) , Maximum Annual Average - 90 mg/L, Maximum Daily Concentration - 405 mg/L.

Details/Findings:	As stated in the Permit 11596 Marine Harvest PHPP - 2017 Annual Report ("2017 Annual Report"), pH, ammonia (NH3), 5-day Biochemical Oxygen Demand (BOD5), Oil & Grease (O&G) and Total Suspended Solids (nonfilterable residue=TSS) concentrations were all within the maximum annual average and maximum daily concentrations stated in this section of the permit. Officer Stewart confirmed compliance with these parameters by reviewing the effluent quality sample analysis reports from Maxxam laboratories included as Attachment A in the 2017 Annual Report. Samples of the processing effluent were taken by Officer Stewart at the time of the inspection. The samples were collected after the effluent had passed through the authorized treatment works, prior to discharge through the outfall. All sample results were compliant with parameter limits specified in this section. The analytical results of the effluent (Laboratory Certificate of Analysis attached) were: <table><tr><td>Parameter</td><td>Result</td><td>Units</td></tr><tr><td>pH</td><td>7.14</td><td></td></tr><tr><td>Total Suspended Solids</td><td>77.1</td><td>mg/L</td></tr><tr><td>Ammonia, Total (as N)</td><td>3.31</td><td>mg/L</td></tr><tr><td>Nitrate (as N)</td><td>0.30</td><td>mg/L</td></tr><tr><td>Nitrite (as N)</td><td>0.10</td><td>mg/L</td></tr><tr><td>Total Nitrogen</td><td>36</td><td>mg/L</td></tr><tr><td>Total Organic Nitrogen</td><td>32.7</td><td>mg/L</td></tr><tr><td>Phosphorus (P), Total</td><td>0.70</td><td>mg/L</td></tr><tr><td>BOD</td><td>234</td><td>mg/L</td></tr><tr><td>COD</td><td>470</td><td>mg/L</td></tr><tr><td>Oil and Grease</td><td>1.2</td><td>mg/L</td></tr></table>	Parameter	Result	Units	pH	7.14		Total Suspended Solids	77.1	mg/L	Ammonia, Total (as N)	3.31	mg/L	Nitrate (as N)	0.30	mg/L	Nitrite (as N)	0.10	mg/L	Total Nitrogen	36	mg/L	Total Organic Nitrogen	32.7	mg/L	Phosphorus (P), Total	0.70	mg/L	BOD	234	mg/L	COD	470	mg/L	Oil and Grease	1.2	mg/L
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Details/Findings:	As stated in the 2017 Annual Report, both total and dissolved phosphorus were analyzed as the phosphorus form was not defined within the listed parameters in Section 1.1.3. However, in permit Section 3.3 Discharge Analysis the phosphorous parameter specified for monthly analysis is Total P which indicates the phosphorous parameter in the section is intended to be Total P. While measured dissolved phosphorus concentrations in the effluent were less than both maximum annual average and maximum daily concentrations (for 2017), total phosphorus concentrations exceeded the maximum allowable annual average of 0.2 mg/L. 2017 Total P Annual Average = 0.497 mg/L There was one exceedance of the maximum daily concentration for total phosphorus of 1.0mg/L: January 16, 2018 = 1.12 mg/L.
Compliance:	Out
Actions to be taken:	Marine Harvest has been analyzing for both total P and dissolved P, however, the Permit stipulates that the effluent should be analyzed for Total P. Therefore, compliance will be against the measurement of Total P in process effluent. Please contact the ENV Authorizations group if you wish to discuss this permit requirement.
Requirement Description:	1. AUTHORIZED DISCHARGES 1.1 Authorized Source 1.1.4: 1.1 This section applies to the discharge of effluent from a fish processing plant. The site number for this discharge is E219092. 1.1.4 The discharge is authorized from Authorized Works, which are a process and wash water collection system with a fine primary screen rotary drum (0.6 millimetres apertures or finer), screenings wet well, equalization tank, flocculation tube, a dissolved air flotation (DAF) tank, DAF sludge tank centrifuge, fine secondary drum screen (0.02 millimetres apertures of finer), UV reactors and a single outfall (extending at least 100 m from mean low water to a depth of 30 m below mean low water) and related appurtenances located approximately as shown on Site Plan A.

Details/Findings:	Officer Stewart observed all authorized works specified in this section on location and operational during the inspection.
Compliance:	In
Actions to be taken:	
Requirement Description:	1. AUTHORIZED DISCHARGES 1.1 Authorized Source 1.1.5: 1.1 This section applies to the discharge of effluent from a fish processing plant. The site number for this discharge is E219092. 1.1.5 The permittee must not discharge under this authorization unless the Authorized Works are complete and fully operational.
Details/Findings:	Officer Stewart observed the Authorized Works to be complete and fully operational during the site inspection.
Compliance:	In
Actions to be taken:	
Requirement Description:	2. OPERATIONS 2.1 Bypasses 2.1: 2.1 The permittee must not permit any discharge authorized by this authorization to bypass the authorized works, except with the prior written approval of the Director.
Details/Findings:	Mr. Hall confirmed with Officer Stewart that there were no bypasses of the authorized works during the inspection period, therefore compliance with this requirement was not applicable.
Compliance:	Not Applicable

Actions to be taken:	
Requirement Description:	2. OPERATIONS, 2.2 Plans - Works 2.2: The permittee must ensure the plans and specifications of the works described in Section 1.1 of the definition of Authorized Works are certified by a Qualified Professional and are submitted to the Director on or before June 19, 2017. The permittee must cause a Qualified Professional to certify that the works have been constructed in accordance with such plans and specifications before discharge commences under this authorization. The permittee must ensure that "as built" drawings for each of the authorized works are certified correct and sealed by a qualified professional and are submitted to the Director within 30 days of completion of the works or as otherwise specified by the Director.
Details/Findings:	Officer Stewart observed "as built" drawings for each of the authorized works certified correct and sealed by a qualified professional submitted to the Director on June 19, 2017 by Marine Harvest.
Compliance:	In
Actions to be taken:	
Requirement Description:	2. OPERATIONS, 2.3 Pathogen Control 2.3: 2.3 The permittee shall adhere to any federal or provincial procedures regarding the processing of diseased fish and/or pertaining to bloodwater treatment and/or disease monitoring.
Details/Findings:	No evaluations were made with the permittees adherence to federal or provincial procedures that were not directly referenced in this permit. It is not within the ENV's mandate to assess compliance with other federal or provincial agencies procedures. Therefore, compliance with this requirement could not be determined
Compliance:	Not Determined

Actions to be taken:	Despite this requirement being Not Determined, this inspection record and its findings do not relieve the permit holder from complying with any requirements of federal, provincial, regional district or municipal authorities.
Requirement Description:	2. OPERATIONS, 2.4 Facility Classification and Operator Certification 2.4: 2.4 The permittee, in a manner and on timelines specified by the Director, must have the authorized works classified (and the classification must be maintained) by the Environmental Operators Certification Program Society (Society). The permittee must cause the authorized works to be operated and maintained by: a) persons certified within and according to the program provided by the Society to the satisfaction of the Director, or b) persons who are qualified in the safe and proper operation of the facility for the protection of the environment, as demonstrated to the satisfaction of the Director. The permittee must notify the Director of the classification level of the facility and certification levels of the operators, and changes of operators and/or operator certification levels within 30 days of any change.
Details/Findings:	According to the Environmental Operators Certification Program Society (Society) database, the authorized works are classified as a MWWT-II (facility #2093) with a classification date of April 30, 2012 and the classification is maintained.
Compliance:	In
Actions to be taken:	
Requirement Description:	2. OPERATIONS, 2.4 Facility Classification and Operator Certification 2.4: 2.4 The permittee, in a manner and on timelines specified by the Director, must have the authorized works classified (and the classification must be maintained) by the Environmental Operators Certification Program Society (Society). The permittee must cause the authorized works to be operated and maintained by: a) persons certified within and according to the program provided by the Society to the satisfaction of the Director, or b) persons who are qualified in the safe and proper operation of the facility for the protection of the environment, as demonstrated to the satisfaction of the Director. The permittee must notify the Director of the classification level of the facility and certification levels of the operators, and changes of operators and/or operator certification levels within 30 days of any change.
Details/Findings:	According to the Society operator database, Mr. Gregory Payne (certification #8555) is currently deemed "not certified" due to his Continuing Education Units ("CEUs") not being met for the reporting period "01-01-2016 to 31-12-2017, Requirement 2.4, Status: Not Met, Outstanding -2.4".

Compliance:	Out
Actions to be taken:	Have the authorized works operated and maintained by persons certified and/or qualified as specified in this section.
Requirement Description:	3. MONITORING, 3.1 Discharge Flow Measurement and Fish Processing Plant Production 3.1: 3.1 By June 19, 2017, the permittee must install and maintain a flow measuring device suitable to the Director and record once per day the effluent volume discharged over a 24-hour period. The permittee must retain the records for inspection by Ministry staff. Fish processing plant production records shall be maintained, and the quantity and duration of fish processing production shall be recorded each day. The permittee must retain the records for inspection by Ministry staff.
Details/Findings:	As stated in the 2017 Annual Report, total effluent discharge was initially calculated as the sum of two flow meters. On August 20, 2017, a single outfall meter was installed immediately prior to the outfall. During the inspection, Officer Stewart observed flow being measured by three Siemens flow meters (one installed on each of the active UV disinfection units). Mr. Payne confirmed that these three volumes over a 24-hour period were summed to obtain a total effluent volume discharged over a 24-hour period. Marine Harvest retained the effluent volume discharge records for inspection by Officer Stewart, including the summed totals from the three Siemens flow meters. Mr. McFee informed Officer Stewart that Marine Harvest has recently ordered an electromagnetic flowmeter which will be installed in the near future to further improve the accuracy of flow volume measurements.
Compliance:	In
Actions to be taken:	

Requirement Description:	3. MONITORING 3.2 Discharge Composite Sampling of Effluent 3.2: 3.2 By June 19, 2017, the permittee must install and maintain a sampling facility acceptable to the Director, and collect samples of the effluent authorized by Section 1.1.3 each month in accordance with this section. The sample must consist of seven discrete samples collected hourly over an eight hour period and mixed to form a single sample. Alternatively, the permittee may use a flow proportional continuous sampler which is acceptable to the Director. Based on an initial 12 months of compliance with the quality limits authorized by Section (S.) 1.1.3, frequency of sampling shall be altered to once every quarter. If, under quarterly sampling, any excursions to S. 1.1.3 occur, then sampling will return to monthly sampling until such time that 12 consecutive months of compliance with S. 1.1.3 are attained—at which time quarterly sampling shall resume. The permittee must take due care in sampling, storing and transporting the samples to control temperature and avoid contamination, breakage, and any other factor or influence that may compromise the integrity of the samples.
Details/Findings:	Officer Stewart observed sample ports in the UV treatment discharge pipes where they empty into the treated effluent collection sump which empties into the outfall. Mr. Payne confirmed this location with Officer Stewart as Marine Harvest's sample collection site for obtaining discrete grab samples to form a single composite sample. The permittee is not using a flow proportional continuous sampler.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.3 Discharge Analysis 3.3: 3.3 Monthly samples of effluent obtained prior to discharge, per Section 3.2, shall be analyzed by an independent accredited lab. The following shall be tested. Parameter Frequency Type pH monthly Composite grab total ammonia monthly Composite grab BOD5 monthly Composite grab Oil & Grease monthly Composite grab pH monthly Composite grab total P monthly Composite grab total suspended solids monthly Composite grab This data shall be uploaded to EMS by the analyzing laboratory following analysis and submitted to the province in accordance with the reporting requirements of this permit defined in Section 4

Details/Findings:	Mr. McFee informed Officer Stewart that monthly samples of effluent obtained prior to discharge are sent to Maxxam, an independent accredited lab, for analysis. Officer Stewart reviewed monthly sample reports contained in the 2017 Annual Report and pH, total ammonia, BOD5, Oil & Grease, total P, and total suspended solids were tested monthly as required. Officer Stewart observed sample results uploaded to EMS each month for all parameters between the date range June 2017 and February 2018. Results were uploaded to EMS ID E306729. It should be noted this is not the EMS ID (E219092) specified for the discharge of effluent from this fish processing facility in section 1.1 of this permit. Site ID E306729 is sequential with the EMS ID's listed in the receiving environment program and Officer Stewart is unaware of where this EMS ID number was generated. However, this permit clause requires data to be uploaded to EMS by the analyzing laboratory following analysis and does not specify the EMS ID, therefore the permittee is in compliance.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.4 Toxicity 3.4: 3.4 Once every three months, a composite sample of the effluent shall be analyzed for effluent toxicity to fish using a dilution series toxicity test to determine the 96-h LC50. The composite sample shall consist of combined grab samples of final effluent taken hourly over an eight-hour period during processing and clean-up operations. Analyses for determining the 96-h LC50 of liquid effluent to fish shall be carried out in accordance with the procedures described in the most recent edition of "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout" (EPS1/RM/13) or by suitable alternative procedures as authorized by the Director. The dilution series shall determine the 96-h LC50 for Rainbow Trout (<i>Oncorhynchus mykiss</i>). Based on a review of at least one year of annual monitoring, the frequency of sampling may be altered subject to approval by the Director. A copy of the above manual may be purchased from the Queen's Printer Publication Centre, P.O. Box 9452, Stn. Prov. Govt. Victoria, British Columbia, V8W 9V7, (1-800-663-6105 or (250) 387-6409). The manual may also be available for review at Ministry regional offices or on the Ministry website (currently, subject to change, at: http://publications.gc.ca/collections/collection_2013/ec/En49-24-1-13-eng.pdf).

Details/Findings:	As stated in the 2017 Annual Report, 96-h LC50 toxicity tests on rainbow trout were conducted on September 06, 2017 and December 12, 2017, with no mortality observed over the 96 hr test duration in all effluent concentrations. Officer Stewart collected a grab sample of the effluent during the inspection and submitted the sample to the Environment Canada Vancouver-PY Lab for Environmental Testing for a dilution series toxicity test to determine the 96-h LC50. Due to the salinity of the sample (12.3 ppt), a full 96-h LC50 toxicity test using rainbow trout was unable to be performed. However, toxicity was assessed via Microtox test (using luminescent bacteria) and an acute lethality test (using rainbow trout 96 hr (Static) Single Conc. @ 73 %). Officer Stewart sample results are included as Attachment B of this report. Both tests determined the effluent to be not acutely lethal. Toxicity Results: 96 hr (Static) Single Concentration = not acutely lethal @ 73% test concentration. Microtox test 5 minute (Static) IC50 = not acutely toxic 15 minute (Static) IC50 = not acutely toxic
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.5 Receiving Environment Monitoring 3.5: 3.5 Receiving environment monitoring shall begin within one year of issuance of the permit and be conducted in a maximum of two yearly bouts. To allow for comparison to applicable Water Quality Guidelines (WQGs), each bout of receiving environment monitoring shall include five rounds of samples, taken weekly, collected within 30 consecutive days (at each of the sites specified by Section 3.6). Sampling shall be conducted to ensure that at least one round of sampling occurs: (a) during a period that includes operation of at least 80% of peak annual production. If excursions above applicable WQG's are detected in the above samples, a second round of sampling shall be conducted (b) within the period of highest ambient temperatures and lowest dissolved oxygen in the impacted waters (summer). The permittee must immediately notify the Director of any excursions above WQGS. Based on a review of at least one year of annual monitoring, the frequency of sampling may be altered subject to approval by the Director.

Details/Findings:	The 2017 Annual Report stated Pacificus Biological Services Ltd. conducted monitoring in the receiving environment over 5 consecutive weeks within a 30 day period during August 2017, which is within one year of issuance. Officer Stewart reviewed the "RECEIVING ENVIRONMENT WATER SAMPLING FOR THE MARINE HARVEST CANADA FISH PROCESSING PLANT IN HARDY BAY, BC" dated October 19, 2017 that was conducted, prepared and certified/stamped by Qualified Professionals at Pacificus Biological Services ("Pacificus"). In the 2017 Annual Report, Attachment B: Receiving Environment Water Sampling Report, stated that samples were collected between August 01-30, 2017 during operation of at least 80% of peak annual production. Sites A, B and C were sampled in the first trial during peak production, while Sites D, E and F were sampled during the second trial with the highest temperature and lowest oxygen conditions. The water sampling involved measuring the following parameters within the receiving waters environment: Ammonia, Nitrate, Temperature, Dissolved Oxygen, pH, Specific Conductivity and Salinity. The receiving environment monitoring summary report concluded that ammonia and nitrate levels were well within acceptable ranges with no excursions above WQGS. All pH values over the first sampling trial fell within the guidelines. All surface (1m depth) dissolved oxygen values were above the recommended minimum. Field measured temperature, dissolved oxygen, pH, specific conductivity and salinity at Sites A, B and C were compared to the Background site and applicable water quality guidelines and reported field parameters for sites near the Marine Harvest outfall closely followed values recorded for the background site.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.6 Receiving Environment Grab Sampling & Depth Profile Sites and Replicates 3.6: 3.6 Grab samples of ambient seawater shall be collected from a maximum of seven sampling sites. These grab samples shall be taken weekly such that 5 sample sets are collected within 30 consecutive days to allow for comparison to applicable WQGs. For quality control, a field blank shall be collected during each sampling session and duplicates shall be collected for a minimum of 10% of the samples collected. A monitoring report shall be submitted to the Director annually, per Section 4.3, within six months of completion of each year's sampling. The sites shall be located as follows: a. Site A (EMS site number E306730): 50.723583n, 127.469889w, b. Site B (EMS site number E306731): 50.723583n, 127.468417w, c. Site C (EMS site number E306732): 50.723222n, 127.472556w, and d. Background (EMS site number E306733): Background (EMS site number E306733): 50.728547n, 127.482925w. If the first bout of sampling at Sites A-C detect any excursions from parameters for appropriate WQG's then additional sites D-F shall be sampled in the subsequent bout of sampling at the following locations: e. Site D (EMS site number E306734): 50.722833n, 127.473806w, f. Site E (EMS site number E306735): 50.724472n, 127.471417w, and g. Site F (EMS site number E306736): 50.725361n, 127.471611w.

Details/Findings:	Officer Stewart reviewed Attachment B: Receiving Environment Water Sampling Report, included with the 2017 Annual Report and observed results from seven sampling sites of grab samples of ambient seawater collected at locations specified in this section of the permit. Officer Stewart observed confirmation in the report that quality assurance targets were achieved during this sampling program with the collection of a duplicate sample and an equipment blank for 14% of samples collected, which met the minimum target of 10% specified in this section.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.7 Receiving Environment Profile Monitoring Depths 3.7: 3.7 At the sites and dates as specified by Section 3.6, the permittee must ensure that, at the following depths, receiving environment profile data is recorded prior to collection of each set of grab samples: a. at one metre depth, b. at five metres depth, c. every two metres from 10 m to 28 m depth, d. every five metres from 30 m until one m from the bottom, and e. one metre from the bottom.
Details/Findings:	Officer Stewart observed receiving environment profile monitoring data as described in this section, included in the 2017 Annual Report, collected at the following depths (if applicable due to some locations deeper than others): 1m, 5m, 10m, 12m, 14m, 16m, 18m, 20m, 22m, 24m, 26m, 28m, 30m, 35m, 40m, 45m, 50m, 55m, and 60m.
Compliance:	In
Actions to be taken:	

Requirement Description:	3. MONITORING 3.8 Receiving Environment Grab Sampling Depths 3.8: 3.8 At the sites and dates as specified by Section 3.6, the permittee must ensure that receiving environment grab samples are collected at the following depths: (a) Site A: 1 m depth, 17 m depth, 1 m above bottom, (b) Site B: 1 m depth, 17 m depth, 1 m above bottom, (c) Site C: 1 m depth, 23 m depth, 1 m above bottom, (d) Site D: 1 m depth, 23 m depth, 1 m above bottom, (e) Site E: 1 m depth, 20 m depth, 1 m above bottom, (f) Site F: 1 m depth, 20 m depth, 1 m above bottom, and (g) Background: 1 m depth, 20 m depth, 1 m above bottom
Details/Findings:	Officer Stewart observed "Table 1. Sample sites, locations, EMS site numbers and depths for the MHC Hardy Bay Receiving Waters Monitoring program" included in the receiving environment monitoring report. Specified sample depths for all locations were 1m, 17m or 23m or 20m, and 1m above bottom as required by this section.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.9 Field Measures for Profile Monitoring 3.9: 3.9 At sites specified in Section 3.6 and depths specified in Section 3.7, the discharger must ensure that profile measurements of the following, are obtained prior to grab sampling: (a) Temperature, (b) Dissolved Oxygen (mg/L), (c) pH, (d) Specific Conductivity (µS/cm), and (e) Salinity. This data shall be tabulated and submitted to the province annually per Section 4.3.
Details/Findings:	Officer Stewart observed profile measurement data for (a) Temperature, (b) Dissolved Oxygen (mg/L), (c) pH, (d) Specific Conductivity (µS/cm), and (e) Salinity, tabulated and submitted, in Appendix 2, Tables 1-5 of the receiving environment monitoring report prepared by Pacificus.
Compliance:	In
Actions to be taken:	

Requirement Description:	3. MONITORING, 3.10 Analyses for Receiving Environment Grab Samples 3.10: 3.10 At sites specified in Section 3.6 and depths specified in Section 3.8, the discharger must ensure that analyses of receiving environment grab samples are obtained for the following: (a) ammonia, and (b) nitrate. This data shall be uploaded to EMS by the analyzing laboratory within one month of completion of analysis as well as tabulated and submitted to the province annually per Section 4.3.
Details/Findings:	Officer Stewart observed analyses of receiving environment grab samples data for a) ammonia, and (b) nitrate, included (tabulated and graphed values) on pages 13 (ammonia) and 14 (nitrate) of the Pacificus compiled receiving environment report. Officer Stewart observed this data within the EMS database.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING, 3.11 Monitoring Summary 3.11: 3.11 For greater clarity, monitoring requirements are summarized as follows: Site - Site A; Frequency and timing - Five weekly samples in a 30-day period during peak production, conducted prior to discrete grab samples (see NOTE 2); Depths - 1m, 5m, 10m, 12m, 14m, 16m, 18m, 20m, 22m, 24m, 26m, 28m, 30m, 35m, 40m etc. (five-metre intervals) to 1 m from the bottom; Method - Profile data; Parameters to be measured - Temperature, Dissolved Oxygen, pH, Specific Conductivity, Salinity Site - Site B; Frequency and timing - Five weekly samples in a 30-day period during peak production, conducted prior to discrete grab samples (see NOTE 2); Depths - 1m, 5m, 10m, 12m, 14m, 16m, 18m, 20m, 22m, 24m, 26m, 28m, 30m, 35m, 40m etc. (five-metre intervals) to 1 m from the bottom; Method - Profile data; Parameters to be measured - Temperature, Dissolved Oxygen, pH, Specific Conductivity, Salinity Site - Site C; Frequency and timing - Five weekly samples in a 30-day period during peak production, conducted prior to discrete grab samples (see NOTE 2); Depths - 1m, 5m, 10m, 12m, 14m, 16m, 18m, 20m, 22m, 24m, 26m, 28m, 30m, 35m, 40m etc. (five-metre intervals) to 1 m from the bottom; Method - Profile data; Parameters to be measured - Temperature, Dissolved Oxygen, pH, Specific Conductivity, Salinity Background Site D (see NOTE 1); Frequency and timing - Five weekly samples in a 30-day period during peak production (see NOTE 2); Depths - 1m, 17m, 1m above bottom; Method - Discrete grab samples; Parameters to be measured - Ammonia, Nitrate Background Site E (see NOTE 1); Frequency and timing - Five weekly samples in a 30-day period during peak production (see NOTE 2); Depths - 1m, 17m, 1m above bottom; Method - Discrete grab samples; Parameters to be measured - Ammonia, Nitrate Background Site F (see NOTE 1); Frequency and timing - Five weekly samples in a 30-day period during peak production (see NOTE 2); Depths - 1m, 17m, 1m above bottom; Method - Discrete grab samples; Parameters to be measured Ammonia, Nitrate NOTE 1 - Sites D, E and F are only required should results from Sites A-C excursion from applicable BC Water Quality Guidelines. NOTE 2 - Should excursions occur during peak production sampling, a second 5-in-30 sampling event will be required within the period of highest ambient temperatures and lowest dissolved oxygen in the impacted waters.

Details/Findings:	This is a summary table of monitoring requirements for which compliance was already assessed in earlier sections of this inspection report.
Compliance:	In
Actions to be taken:	
Requirement Description:	3. MONITORING 3.12 Sampling Procedure 3.12: 3.12 The permittee is required to carry out sampling in accordance with the procedures described in the "British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples, 2013 Edition (Permittee)" or most recent edition, or by alternative procedures as authorized by the Director. A copy of the above manual is available on the Ministry website at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html (subject to change).
Details/Findings:	The Pacificus receiving environment report confirms on page 6, Sampling Procedures, that sampling was carried out in accordance with the procedures described in the most recent edition of the "British Columbia Field Sampling Manual for Continuous Monitoring and the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples (2013). Mr. McFee confirmed that composite samples are analyzed by Maxxam Analytics laboratories, which Officer Stewart confirmed via Maxxam data reports, are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation and procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.
Compliance:	In
Actions to be taken:	

Requirement Description:	3. MONITORING 3.13 Analytical Procedure 3.13: 3.13 The permittee must carry out analyses in accordance with procedures described in the "British Columbia Laboratory Manual (2015 Permittee Edition)", or the most recent edition or by alternative procedures as authorized by the Director. A copy of the above manual is available on the Ministry website at www.env.gov.bc.ca/epd/wamr/labsys/lab_meth_manual.html (subject to change).
Details/Findings:	Mr. McFee confirmed with Officer Stewart that all sample analyses are carried out by external accredited and certified laboratories (Maxxam for composite samples of effluent and ALS for receiving environment monitoring). However, Officer Stewart did not confirm the analytical procedures used by these independent external labs, therefore compliance with this requirement was not determined.
Compliance:	Not Determined
Actions to be taken:	
Requirement Description:	3. MONITORING 3.14 Posting of Outfall 3.14: The permittee must erect by the date that discharge commences and maintain a sign along the alignment of the outfall above the high water mark. The sign must identify the nature of the works. The permittee must confirm whether the wording and size of the sign is acceptable to the Director prior to installing the sign.
Details/Findings:	Officer Stewart observed a rectangular sign stating "OUTFALL" above the high water mark where the outfall exits the foreshore and enters the marine environment. Officer Stewart was unable to locate any correspondence between the permittee and Director confirming that this wording and sign size is acceptable, therefore compliance with this requirement was not determined.
Compliance:	Not Determined

Actions to be taken:	Please confirm whether the wording and size of the outfall sign is acceptable to the Director. In most instances involving outfall signage requirements, ENV defers to the BC Municipal Wastewater Regulation ("MWR") section 101: Marking of Outfalls, that specifies: 101. A discharger must ensure that all outfalls are marked on shore with a sign that meets the following requirements: (a) the sign must indicate, with wording acceptable to a director, the length and depth of the outfall; (b) the sign must be at least 1 m²; (c) the colours of the lettering and the background of the sign must contrast sufficiently with each other, and the sign must be located, such that the wording is clearly visible from both land and water.
Requirement Description:	3. MONITORING 3.15 Outfall Inspection 3.15: At least every five years, the permittee must conduct a dye test on the outfall pipe, or inspect the outfall pipe by another method acceptable to the Director. The Director may, in writing, vary the frequency of testing or inspection.
Details/Findings:	Officer Stewart reviewed the summary outfall inspection report titled "Re: Port Hardy Processing Plant Outfall Terminus - ROV Inspection" dated December 31, 2017 written by BCL Biotechnologies Ltd. The report detailed that on December 12, 2017 the entire length of the outfall was inspected with an ROV and a diver/video survey was previously conducted on November 17, 2017. This outfall inspection report included observations that the outfall pipeline was in good condition, with no evidence of damage or movement on the bottom, and that there were no apparent breaches in the pipe between the beach and the terminal end port. Outfall inspections via ROV and/or divers are deemed other methods acceptable to the Director.
Compliance:	In
Actions to be taken:	
Requirement Description:	4. REPORTING 4.1 Spill Reporting 4.1: 4.1 The permittee must immediately report all spills to the environment (as defined in the Spill Reporting Regulation) in accordance with the Spill Reporting Regulation, which among other things, requires notification to the Provincial Emergency Program at 1-800-663-3456.

Details/Findings:	Mr. Hall confirmed with Officer Stewart there have been no spills to the environment (as defined in the Spill Reporting Regulation) during the inspection period, therefore compliance with this requirement was not applicable.
Compliance:	Not Applicable
Actions to be taken:	
Requirement Description:	4. REPORTING 4.2 Environmental Monitoring System Reporting 4.2: 4.2 The permittee must ensure that all data collected under the monitoring plans are uploaded into the EMS database within one month of completion of analysis.
Details/Findings:	Mr. McFee informed Officer Stewart that contracted sample analysis laboratories upload data collected under the monitoring plans into EMS on behalf of the permittee. Officer Stewart confirmed this by observing the data uploaded in EMS.
Compliance:	In
Actions to be taken:	

Requirement Description:	4. REPORTING 4.3 Annual Report and Evaluation 4.3: 4.3 The permittee must, within six months of the collection of the last set of receiving environment sampling during the term of this authorization, prepare and submit to the Director an Annual Report that is satisfactory to the Director and includes, but is not limited to, the following: (a) The Annual Report must review and interpret the measurements for effluent volume and quality and receiving environment monitoring data for the preceding calendar year, and provide a graphical analysis, with suitable interpretation by a qualified professional, of any trends in monitoring results. The report should include a determination, using the dilution model, of the location at which the 96-h LC50 (as determined by Section 3.4) is estimated to occur. Based on the results of the quality assurance program required under Section 3.6, an evaluation of the onsite laboratory analysis, quality and precision must be reported. (b) The Annual Report must include an evaluation of the performance of the treatment works and identify any necessary changes. The Annual Report must include an implementation schedule for any alterations to the treatment and disposal works. Results of the Effluent Monitoring and Receiving Environment Monitoring programs should be reported in accordance with the applicable sections of the most recent edition of "Technical Guidance 4, Environmental Management Act Authorizations, Annual Reporting Under The Environmental Management Act, A Guide for Mines in British Columbia" or by suitable alternative procedures as approved by the Director, written and signed off by a qualified professional. A copy of the above manual may be purchased from the Queen's Printer Publication Centre, P. O. Box 9452, Stn. Prov. Govt. Victoria, British Columbia, V8W 9V7 (1-800-663-6105 or 250-387-6409). The manual may also be available for review at Environmental Protection offices or on the Ministry website at: http://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/mining-smelt-energy/2015_annual_reporting_guidance_for_mines_final.pdf (subject to change). Based on the results of the monitoring program and/or other information obtained in connection with this discharge, the Director may require permittee to provide additional information in a
Details/Findings:	The collection of the last set of receiving environment sampling occurred the last week of August 2017. Within six months of this data collection, the permittee prepared and submitted to the Director an Annual Report on February 02, 2018. Officer Stewart reviewed the 2017 Annual Report which included: - Measurements of effluent volume and quality - Receiving environment monitoring data - Graphical analysis and interpretation of trends in receiving environment data - Determination of the 96-h LC50 on effluent - Evaluation of the onsite laboratory analysis, quality and precision - Evaluation of the treatment works and required changes The 2017 Annual Report also included all effluent sample analytical data from Maxxam laboratories and the receiving environment monitoring report compiled and written by qualified professionals at Pacificus.
Compliance:	In
Actions to be taken:	

Requirement Description:	4. REPORTING 4.4 Non-Compliance Reporting 4.4: If the permittee fails to comply with any of the requirements of this authorization, the permittee must, within 30 days of such non-compliance, submit to the Director a written report that is satisfactory to the Director and includes, but is not necessarily limited to, the following: (a) all relevant test results obtained by the permittee related to the noncompliance, (b) an explanation of the most probable cause(s) of the noncompliance, and (c) a description of remedial action planned and/or taken by the permittee to prevent similar noncompliance(s) in the future. The permittee must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Non-Compliance Reporting Submission Mailbox (NCRSM) at EnvironmentalCompliance@gov.bc.ca. For guidelines on how to report a non-compliance or for more information visit the Ministry website: http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/non-compliance-reporting-mailbox
Details/Findings:	On April 20, 2017, Marine Harvest submitted a non-compliance report describing occasional malfunctioning of the UV light disinfection system while in the process of preparing their as-built schematics. The date of the non-compliance was April 17, 2017 and the report was submitted within 30 days of such non-compliance. Officer Stewart observed all required information specified in this section included in the report. On February 22, 2018, Marine Harvest submitted a non-compliance report for a discharge volume daily flow exceedance occurring on January 24, 2018. Officer Stewart observed all required information specified in this section included in the report.
Compliance:	In
Actions to be taken:	
Requirement Description:	4. REPORTING 4.4 Non-Compliance Reporting 4.4: If the permittee fails to comply with any of the requirements of this authorization, the permittee must, within 30 days of such non-compliance, submit to the Director a written report that is satisfactory to the Director and includes, but is not necessarily limited to, the following: (a) all relevant test results obtained by the permittee related to the noncompliance, (b) an explanation of the most probable cause(s) of the noncompliance, and (c) a description of remedial action planned and/or taken by the permittee to prevent similar noncompliance(s) in the future. The permittee must submit all non-compliance reporting required to be submitted under this section by email to the Ministry's Non-Compliance Reporting Submission Mailbox (NCRSM) at EnvironmentalCompliance@gov.bc.ca. For guidelines on how to report a non-compliance or for more information visit the Ministry website: http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/non-compliance-reporting-mailbox

Details/Findings:	Marine Harvest submitted a non-compliance report dated June 19, 2017 that reported "...we have exceeded the maximum allowable (800 m3/d) on occasion, ranging from 781 - 904 m3/d on full processing days". Explanations and descriptions of the non-compliance were included, however specific dates with associated flow amounts were not included. Officer Stewart requested discharge flow rate data, and upon review post-inspection observed 75 reported exceedances of the maximum daily maximum authorized rate of discharge between June 21, 2017 to January 24, 2018. These flow exceedances occurred after the June 19, 2017 non-compliance report and therefore were not reported to ENV as required by this section of the permit. On February 22, 2018, Marine Harvest submitted a non-compliance report for a total phosphorous exceedance occurring on January 16, 2018. Officer Stewart observed all required information specified in this section included in the report, however the written report was not submitted within 30 days of the non-compliance.
Compliance:	Out
Actions to be taken:	Please submit a written report to the Director if Marine Harvest fails to comply with any of the requirements of this authorization, within 30 days of any such non-compliance. The written report shall include all information specified in this section and be submitted to the Ministry's Non-Compliance Reporting Submission Mailbox (NCRSM) at EnvironmentalCompliance@gov.bc.ca.

Compliance History:

August 07, 2013: IR 11207 - Advisory for daily flow exceedances. It should be noted this inspection assessed compliance against a previous version of Permit 11596, prior to the 2017 amendment, that had a different permitted maximum discharge volume and compliance points.

Please submit all annual/quarterly/monthly reports and data submissions to the Ministry's Routine Environmental Reporting Submission Mailbox at EnvAuthorizationsReporting@gov.bc.ca. More information about the reporting requirements may be found at <http://www2.gov.bc.ca/gov/content/environment/waste-management/waste-discharge-authorization/data-and-report-submissions/routine-environmental-reporting-submission-mailbox>

Please be advised that this inspection report may be published on the provincial government website within 7 days.

Below are attachments related to this inspection.

If you have any questions about this letter, please contact the undersigned.

Yours truly,

Darren Stewart

Environmental Protection Officer

cc:

Attachments:

- 1) IR79263 Photo Record Permit 11596.pdf Photo Record
- 2) L2059371_COA.pdf Attachment A. Sample Results
- 3) V18B061_1 Detailed 2018 03 07 1642.pdf Attachment B. Toxicity Test Results

Deliver via:

Email: ☒ Fax: ☐ Mail: ☐
Registered Mail: ☐ Hand Delivery: ☐

**Ministry of Environment
and Climate Change
Strategy**

Compliance
Environmental
Protection Division

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Nanaimo BC V9E 6J9

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Facsimile: 250 751 3103
Website: www.gov.bc.ca/env

DISCLAIMER:

Please note that sections of the permit, regulation or code of practice referenced in this inspection record are for guidance and are not the official version. Please refer to the original permit, regulation or code of practice.

To see the most up to date version of the regulations and codes of practices please visit
<http://www.bclaws.ca>

If you require a copy of the original permit, please contact the inspector noted on this inspection record.

It is also important to note that this inspection record does not necessarily reflect each requirement or condition of the authorization therefore compliance is noted only for the requirements or conditions listed in the inspection record.

Authorization: 11596	Client Name: Marine Harvest Canada
NRIS IR #: 79263	Site Inspection Date: February 21, 2018

Photo 1

Offload area where fish are vacuum pumped up to the processing plant.



Photo 2

Offload hopper where boat hold water can be sent back to vessel or into the wastewater treatment system.



Authorization: 11596	Client Name: Marine Harvest Canada
NRIS IR #: 79263	Site Inspection Date: February 21, 2018

Photo 3

Bloodwater
storage tank.



Photo 4

Offal trailer
where
removed fish
offal is stored
prior to
shipping to a
fish waste
processor.



Authorization: 11596	Client Name: Marine Harvest Canada
NRIS IR #: 79263	Site Inspection Date: February 21, 2018

Photo 5

Two fine primary screen rotary drums for initial screening of effluent.

Screenings waste is collected in totes and added into the offal trucks for off-site disposal.



Photo 6

Equalization tank for storage of effluent prior to further treatment.



Authorization: 11596	Client Name: Marine Harvest Canada
NRIS IR #: 79263	Site Inspection Date: February 21, 2018

Photo 7

Flocculation
area



Photo 8

Dissolved air
flotation
(DAF) tank
with scum
skimmed off
into which
enters the
sludge tank.



Authorization: 11596	Client Name: Marine Harvest Canada
NRIS IR #: 79263	Site Inspection Date: February 21, 2018

Photo 9

Two fine secondary drum screens.



Photo 10

Ultraviolet (UV) disinfection system.



Authorization: 11596	Client Name: Marine Harvest Canada
NRIS IR #: 79263	Site Inspection Date: February 21, 2018

Photo 11

Discharges from the UV reactor units into the single outfall.



Photo 12

Effluent outfall location leaving the foreshore.

Inset:
Outfall Sign



Document : IR79263 Photo Record Permit 11596.pdf

Document comment: Photo Record



BC MINISTRY OF ENVIRONMENT -
Compliance - Surrey
ATTN: Darren Stewart
200-10470 152 Street
Surrey BC V3R 0Y3

Date Received: 22-FEB-18
Report Date: 01-MAR-18 18:12 (MT)
Version: FINAL

Client Phone: 604-582-5216

Certificate of Analysis

Lab Work Order #: L2059371
Project P.O. #: 50234675
Job Reference: OUTFALL SAMPLE #1
C of C Numbers:
Legal Site Desc:

Other Client: CL
Information: EMS ID: E311191

Dean Watt, B.Sc.
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 8081 Lougheed Hwy, Suite 100, Burnaby, BC V5A 1W9 Canada | Phone: +1 604 253 4188 | Fax: +1 604 253 6700
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

		Sample ID Description Sampled Date Sampled Time Client ID	L2059371-1 21-FEB-18 11:00 E311191_REG	L2059371-2 21-FEB-18 11:00 E311191_BLF			
Grouping	Analyte						
WATER							
Physical Tests	pH (pH)		7.14				
	Total Suspended Solids (mg/L)		77.1				
Anions and Nutrients	Ammonia, Total (as N) (mg/L)		3.31				
	Nitrate (as N) (mg/L)		<0.30 ^{DLDS}				
	Nitrite (as N) (mg/L)		<0.10 ^{DLDS}				
	Total Kjeldahl Nitrogen (mg/L)		36.0				
	Total Nitrogen (mg/L)		36.0				
	Total Organic Nitrogen (mg/L)		32.7				
	Phosphorus (P)-Total (mg/L)		0.70				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		52.8				
Inorganic Parameters	Chlorine, Free (mg/L)		0.30				
Aggregate Organics	BOD (mg/L)		234	<2.0			
	COD (mg/L)		470				
	Oil and Grease (mg/L)		1.2				

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Total Organic Carbon	MS-B	L2059371-1
Matrix Spike	COD	MS-B	L2059371-1

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.			
CARBONS-TOC-VA	Water	Total organic carbon by combustion	APHA 5310B TOTAL ORGANIC CARBON (TOC)
This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)".			
CL2-FREE-VA	Water	Chlorine (Residual), Free	APHA 4500-CL G. (DPD)
Chlorine, as free or total, is analyzed using procedures adapted from APHA 4500-CL "G" Chlorine.			
COD-COL-VA	Water	Chemical Oxygen Demand by Colorimetric	APHA 5220 D. CHEMICAL OXYGEN DEMAND
This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.			
EC-SCREEN-VA	Water	Conductivity Screen (Internal Use Only)	APHA 2510
Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.			
N-T-COL-VA	Water	Total Nitrogen in water by Colour	APHA4500-P(J)/NEMI9171/USGS03-4174
This analysis is carried out using procedures adapted from APHA Method 4500-P (J) "Persulphate Method for Simultaneous Determination of Total Nitrogen and Total Phosphorus" and National Environmental Methods Index - Nemi method 5735.			
N-T-ORG-CALC(TN)-VA	Water	Total Organic Nitrogen (Calc from TN)	EN12260/J. ENVIRON. MONIT, 2005/EPA 300
Total Organic Nitrogen is a calculated parameter. Total Organic Nitrogen = Total Nitrogen - {Ammonia + (Nitrate+Nitrite)}.			
NH3-F-VA	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.			
NO2-L-IC-N-VA	Water	Nitrite in Water by IC (Low Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
NO3-U-IC-N-VA	Water	Nitrate in Water by IC (Ultra Level)	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
OGG-LL-SF-VA	Water	Oil & Grease by Gravimetric	BCMOE (2013), EPA1164A
The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease. ALS Environmental's routine detection limit, or Limit of Reporting (LOR), for this method is 1 mg/L for a 1L sample volume.			
P-T-PRES-COL-VA	Water	Total P in Water by Colour	APHA 4500-P Phosphorus
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. Samples with very high dissolved solids (i.e. seawaters, brackish waters) may produce a negative bias by this method. Alternate methods are available for these types of samples.			
Arsenic (5+), at elevated levels, is a positive interference on colourimetric phosphate analysis.			
PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value
This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode			
It is recommended that this analysis be conducted in the field.			

Reference Information

TKN-CALC-VA Water TKN in Water (Calculation) BC MOE LABORATORY MANUAL (2005)

Total Kjeldahl Nitrogen is a calculated parameter. Total Kjeldahl Nitrogen (calc) = Total Nitrogen - [Nitrite (as N) + Nitrate (as N)].

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA
----	---

Chain of Custody Numbers:

Additional Information:

Average Cooler Temperature (Deg Celsius): 2.5

Sampling Agency Code: 10

GLOSSARY OF REPORT TERMS

Surrogate - A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

mg/kg - milligrams per kilogram based on dry weight of sample.

mg/kg ww - milligrams per kilogram based on wet weight of sample.

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight of sample.

mg/L - milligrams per litre.

< - Less than.

D.L. - The reported Detection Limit, also known as the Limit of Reporting (LOR).

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Document : L2059371_COA.pdf

Document comment: Attachment A. Sample Results



Report of Analysis

812-CE / CL- EPD COMPLIANCE 2017/18

Connor Fraleigh
MOE
BC
Lower Mainland

Siute 200-10470 152 Street
Surry, BC
V3R 0Y3

Work Order: V18B061

Reported: 2018-03-07
Printed: 2018-03-07

Authorization:

Lauretta Liem For Graham van Aggelen
Manager, PYLET

The results reported pertain only to the samples submitted to and tested by the Environment and Climate Change Canada (ECCC) laboratory indicated in the report.

These ECCC laboratories are accredited by the Canadian Association for Laboratory Accreditation (CALA) to the standard ISO/IEC 17025 for each of the reported analytes, except where indicated by an asterisk (). Please refer to the CALA website (www.cala.ca) to view the full Scope(s) of Accreditation.*

Project: 812-CE / CL- EPD COMPLIANCE 2017/18
Work Order: V18B061

Client: Connor Fraleigh

ABSTRACT

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<<mailto:ec.coordonnateurdusoutiendelaboratoire-labsupportcoordinator.ec@canada.ca>>

Phone: (604) 903-4413

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Phone: (604) 903-4411

<u>Unit</u>	<u>Description</u>
% by Volume	Percent by volume

<u>Qualifier</u>	<u>Description</u>
NAL	Not Acutely Lethal
*	Non-Accredited Analysis/Analyte
ND	Not Detected at Reporting Limit (RL)
NR	Not Recoverable

SAMPLE DESCRIPTION

<u>Lab ID</u>	<u>Client ID</u>	<u>Station ID</u>	<u>Matrix</u>	<u>Date/Time Sampled</u>	<u>Date Received</u>	<u>Sample Type</u>
V18B061-01	OUTFALL SAMPLE SITE #1		Water	2018-02-21 00:00 PAC Sampled By: Darren Sytewar	2018-02-23	Grab

REFERENCES

<u>Method ID</u>	<u>Laboratory Method</u>	<u>Reference</u>
V0503W	V_Microtox_IC50ML	EPS 1/RM/24
<u>Toxicology Containers</u>		<u>Temperature °C</u>

ACUTE LETHALITY TEST USING RAINBOW TROUT (96 HOUR SINGLE CONCENTRATION) - REPORT

LAB SAMPLE ID: V18B061-01

Analyst: CWB

DESCRIPTION OF SAMPLE:

-brown; E219092

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

The fish were held at $15 \pm 2^\circ\text{C}$ for ≥ 2 weeks prior to the use in the test. Fish were not fed < 16 hours before the start of the test. Testing was started ≤ 5 days of sample collection. Tests were conducted in glass aquarium or plastic tanks lined with disposable polyethylene liners. Test solutions were randomly assigned to test locations. The height of the test solution was ≥ 15 cm. Aeration of oil-free compressed air was provided at a rate of 6.5 ± 1 ml/min.L through airstones. Photoperiod was 16 ± 1 hour light / 8 ± 1 hour dark with an intensity of 100-500 lux. All pH and conductivity measurements were performed using instruments that were automatically temperature compensated. Conductivity measurements are corrected for 25°C . Unless otherwise noted, all test conditions and validity criteria as specified by the Environment Canada test method were met.

pH Adjustment: Samples are normally tested without pH adjustment.

PROTOCOL USED:

Test was performed as prescribed in the laboratory's Standard Operating Procedure and the Environment Canada biological test method, Report EPS 1/RM/13 Second Edition 2000, amended May 2007 and February 2016.

TEST METHOD and/or SOP DEVIATIONS:

The control solutions were $< 14^\circ\text{C}$ at the start of the test. The requirement is $15 \pm 1^\circ\text{C}$.

ANALYSIS TYPE: 96 hr (Static) Single Conc. @ 73 % Test Volume: 1 kg Replicates: 1 Fish / Vessel: 2 Temp. ($^\circ\text{C}$): 15 ± 1

CONTROL/DILUTION WATER: Fresh Water ($\leq 10\text{‰}$) Source: PYLET Well Water

TEST ORGANISM: Species: Rainbow Trout *Oncorhynchus mykiss*

Batch ID: 171227T6/rbt-fw Tank #: 6

Source: Aqua Farms

Mortality for 7d immediately preceding test: $< 2\%$

CONTROL FISH DATA: Control Fish Status: no mortality, normal behaviour

Fork Length (cm) Mean: Min.: Max.:

Weight (g) Mean: Min.: Max.: Loading Density (g/L):

TEST CONDITIONS - WATER QUALITY

Start Date: 2018-02-23 Aeration Start Time: Pre-aeration Time (min): Test Start Time: 13:00

Conc. (%)		Control	Ctrl 9ppt salt	73
D.O. (mg/L)	Initial	10.5	10.1	9.2
	Final	10.3	9.7	9.6
Temp. ($^\circ\text{C}$)	Initial	13.8	13.0	14.3
	Final	13.7	13.7	13.7
pH	Initial	7.65	7.55	7.22
	Final	7.92	7.98	8.08
Conductivity ($\mu\text{S/cm}$)	Initial	420	15930	15950

ACUTE LETHALITY TEST USING RAINBOW TROUT (96 HOUR SINGLE CONCENTRATION) - REPORT

LAB SAMPLE ID: V18B061-01

TEST CONDITIONS - CUMULATIVE MORTALITY / OBSERVATIONS †

Time Check	Concentration (%)					
	Control		Ctrl 9ppt salt		73	
	mortality	obs.	mortality	obs.	mortality	obs.
24 hr	0		0		0	
48 hr	0		0		0	
72 hr	0		0		0	
96 hr	0		0		0	

† Test observation Codes - EPS 1/RM/9 July 1990 amended May 1996 and 2007 Appendix E

** immediate stress, coughing & erratic swimming + behaviour cannot be observed **Integument:** A Shedding B Mucous C Hemorrhaging **Pigmentation:** D Light E Dark F Mottled

General behavior: G Quiescent H Hyperexcitable I Irritated J Surfacing K Sounding L Twitching M Tetanic N Normal Δ Moribund

Swimming: O Ceased P Erratic Q Gyration R Skittering S Inverted T On side **Respiration:** U Rapid V Slow W Coughing X Surface Z Irregular

QUALITY CONTROL: Reference Toxicant Test

Test Date: 2018-02-23 96 hr (Static) LC50 = 8.6 mg/L 95% confidence limits: 8.0 & 9.3

Chemical: Phenol Geomean 96 hr LC50 = 10.7 mg/L 95% warning limits: 8.2 & 13.8 (n = 20)

ANALYSIS RESULTS:

Conc. (%)	Control	Ctrl 9ppt salt	73
96 hr Mortality (%)	0	0	0

96 hr (Static) Single Concentration = not acutely lethal @ 73% test concentration.

Where the single concentration (SC) is percent mortality of the test organisms held in a particular test solution over an exposure period of 96 hours.

RESULTS NOTES:

The test solution at 73 % has a salinity of 9.1 ppt.

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

LAB SAMPLE ID: V18B061-01

Analyst: CB

DESCRIPTION OF SAMPLE:

- 250mL sub-sample from 4x20L carboys of orange liquid

DESCRIPTION OF TEST FACILITIES & CONDITIONS:

Testing was started $\leq$ 72 hours of sample collection. Tests were conducted in glass cuvettes. Test instrument was the Microtox M500. Test results were calculated using Microtox Omni software. All physical chemical measurements were performed using instruments that were automatically temperature compensated where necessary. Unless otherwise noted, all test conditions and validity criteria as specified by the Environment Canada test method were met.

PROTOCOL USED:

Test was performed as prescribed in the lab Standard Operating Procedure and the Environment Canada biological test method, Toxicity Test Using Luminescent Bacteria, Report EPS 1/RM/24 November 1992.

TEST METHOD and/or SOP DEVIATIONS:

The test was conducted at $15 \pm 0.5^\circ\text{C}$.

ANALYSIS TYPE:

5 & 15 min IC50 Basic Test Turbidity correction: No Colour correction: No Test Equipment: Model 500 Analyzer

Test Volume: 1 mL Control Replicates: 1 Test Replicates: 1 Start date: 2018-02-27 Start time: 14:20 Test Temp. ($^\circ\text{C}$): 15 ± 0.5

TEST CONCENTRATIONS (%):

1.	0	2.	0.195	3.	0.391	4.	0.781	5.	1.563	6.	3.125	7.	6.25	8.	12.5	9.	25	10.	50
----	---	----	-------	----	-------	----	-------	----	-------	----	-------	----	------	----	------	----	----	-----	----

CONTROL/DILUTION WATER TYPE and SOURCE:

Type: 2% NaCl Adjusted Source: DI Water

TEST ORGANISM:

Species: *Vibrio fischeri* Strain: NRRL B-11177 Source: Modern Water Reagent lot #: 17E4123A Receive date: 2017-10-31

Reagent expiry date: 2019-06-01 Reagent reconstitution time: 13:25 Test start time from reagent reconstitution (min): 55

SAMPLE ADJUSTMENTS:

Osmotic Adjustment: 2% NaCl by weight Source: Fisher Scientific (ACS)

QUALITY CONTROL: Reference Toxicant Test

Test Date: 2018-02-27 15 min (Static) IC50 = 20.4 mg/L 95% confidence limits: 15.3 & 27.2

Chemical: Phenol Geomean 15 min (Static) IC50 = 22.8 mg/L 95% warning limits: 16.8 & 30.8 (n = 20)

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

LAB SAMPLE ID: V18B061-01

ANALYSIS RESULTS:

5 minute (Static) IC50 = not acutely toxic 95% confidence limits: &

Where the inhibition concentration (IC50) is the concentration of material in water that is calculated to cause a 50% decrease in light emission of the test organisms over an exposure period of 5 minutes.

15 minute (Static) IC50 = not acutely toxic 95% confidence limits: &

Where the inhibition concentration (IC50) is the concentration of material in water that is calculated to cause a 50% decrease in light emission of the test organisms over an exposure period of 15 minutes.

15 minute (Static) IC25 = n/a 95% confidence limits: - & -

Where the inhibition concentration (IC25) is the concentration of material in water that is calculated to cause a 25% decrease in light emission of the test organisms over an exposure period of 15 minutes.

The statistical method used to generate the results was the MicrotoxOmni Software for Windows® Version 1.18 95/98/NT: [Copyright by Azur Environmental 1999, issued by Strategic Diagnostics Inc. 2004].

RESULTS NOTES:

The sample was not acutely toxic to *Vibrio fischeri* (Microtox® bacteria) over 5 minutes of exposure.

The sample was not acutely toxic to *Vibrio fischeri* (Microtox® bacteria) over 15 minutes of exposure.

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

LAB SAMPLE ID: V18B061-01

Microtox Report

Acute Liquid Phase Microtox Test Report

Date: - -

Test Protocol: Basic-type Test

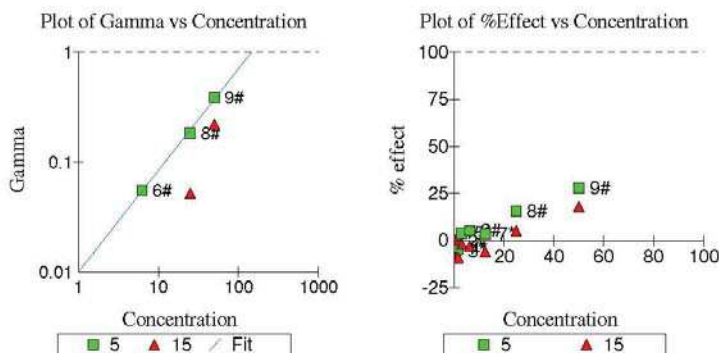
Sample: V18B061-01

Toxicant:

Reagent Lot no.:

Test description: Outfall Sample Site #1 E219092

Data File: V18B061-02 Outfall Sample Site #1 E219092.K5; V18B061-02 Outfall Sample Site #1 E219092.K15;



Sample	Conc	Io	5 Mins Data:			15 Mins Data:		
			It	Gamma	% effect	It	Gamma	% effect
Control	0.000	92.23	85.76	0.9298 #		82.80	0.8978 #	
1	0.1953	85.64	82.84	-0.0387 *	-4.028%	83.88	-0.0834 *	-9.100%
2	0.3906	87.66	81.79	-0.0034 *	-0.3428%	78.47	0.0028 *	0.2888%
3	0.7813	84.92	83.50	-0.0543 *	-5.746%	82.85	-0.0798 *	-8.674%
4	1.563	86.06	83.63	-0.0431 *	-4.508%	84.29	-0.0833 *	-9.098%
5	3.125	90.27	80.80	0.0388 *	3.738%	82.55	-0.0182 *	-1.863%
6	6.250	92.38	81.40	0.0552 #	5.238%	85.40	-0.0288 *	-2.973%
7	12.50	86.94	78.02	0.0361 *	3.490%	82.67	-0.0558 *	-5.918%
8	25.00	89.54	70.30	0.1843 #	15.56%	76.39	0.0523 #	4.970%
9	50.00	89.95	60.34	0.3861 #	27.86%	66.14	0.2209 #	18.10%

- used in calculation; * - invalid data; D - deleted from calcs.
Autocalc has been used.

Calculations on 5 Mins data:

IC50 Concentration:145.1% (95% confidence range: 33.72 to 623.9)

95% Confidence Factor: 4.301

IC50 value is greater than 100%

Estimating Equation:LOG C =1.078 x LOG G +2.162

Coeff. of Determination (R²):0.9972

Slope: 0.9254

Correction Factor: 0.9298

Calculations on 15 Mins data:

IC50 Concentration:103.4%

Calculated from two data points, therefore no confidence range given.

LIQUID PHASE - TOXICITY TEST USING LUMINESCENT BACTERIA - *Vibrio fischeri* (5 & 15 MINUTE IC50) - REPORT

LAB SAMPLE ID: V18B061-01

Microtox Report Con't

Estimating Equation: $\text{LOG C} = 0.4810 \times \text{LOG G} + 2.014$
Slope: 2.079
Correction Factor: 0.8978

Signature: _____

Printed: 06/03/6-18 03:20 PM

#	ENVIROAT	Element
01	Discrete Sample	Gas: Instantane
02	Duplicate Sample	Duplicate: Duplicate
03	TriPLICATE Sample	TriPLICATE: TriPLICATE
06	Composite Sample	Composite: Composite
08	TriPLeT	TriPLeT: Blanc transport
09	Blank Spike	Blank Spike: Matrice enrichie
11	Pool Sample	Pool: Blanc en commun
12	Field Blank	Field Blank: Blanc terrain
24	Field Spike	Field Spike: Enrichi terrain
28	TriPLeT Spike	TriPLeT Spike: Enrichi transport

OR LABORATORY USE ONLY / À L'USAGE DU LABORATOIRE SEULEMENT.

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Sample Type Code/Code du type d'échantillon		
#	ENVIRODAT	Element
01	Discrete Sample	Grab-/Instantané
03	Duplicate Sample	Duplicate:::Duplicate
04	Triplicate Sample	Triplicate:::Triplicate
06	Composite Sample	Composite:::Composite
08	Trip Blank	Trip Blank: Blanc transport
09	Matrix Spike	Matrix Spike: Matrice enrichie
11	Pooled Sample	Pooled::Mise en commun
22	Field Blank	Field Blank: Blanc terrain
24	Field Spike	Field Spike: Enrichi terrain
28	Trip Spike	Trip Spike: Enrichi transport

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Document : V18B061_1 Detailed 2018 03 07 1642.pdf

Document comment: Attachment B. Toxicity Test Results