GOLDER

REPORT

Water Quality Management and Optimization Plan Progress Update

Phase 3: Finalize Meliadine Mine Effluent Discharge Benchmarks for Total Dissolved Solids

Submitted to:

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1.0 INTRODUCTION

The purpose of this Water Quality Management and Optimization Plan (WQ-MOP) update is to present the findings of the validation monitoring that has been conducted to date under Phase 2 of the approach detailed in the approved WQ-MOP Rev2 (Golder 2020) and to provide supporting rationale for the recommendations as per Phase 3 of the WQ-MOP Rev2 for:

- the maximum average concentration (MAC) and maximum grab concentration (MGC) for discharge from CP1 to Meliadine Lake (i.e., effluent quality criteria; EQC); and
- the benchmark concentration to be achieved at the edge of the mixing zone in Meliadine Lake, which would also be consistent with the site-specific water quality objective [SSWQO]) for longer-term management of the receiving environment of Meliadine Lake

This progress update also describes the adaptive management thresholds associated with the management of water in CP1 and in the receiving environment (edge of mixing zone in Meliadine Lake) that are proposed for triggering measures that would be implemented to reduce the potential for the targets associated with discharge to Meliadine Lake to be exceeded.

On 2 June 2020, the WQ-MOP Rev2 (Golder 2020) was submitted to the Nunavut Water Board (NWB) as a requirement under NWBs Reason for Decision (NWB 2020) to approve Agnico Eagle Mines (Agnico Eagle) Emergency Amendment to their Type "A" Water Licence (No. 2AM-MEL-1631), submitted 24 March 2020, for effluent discharges associated with the Meliadine Mine located in the Kivalliq Region of Nunavut. This amendment, along with the WQ-MOP Rev2, was approved with Minister's consent on 12 May 2020 and discharges to Meliadine Lake were initiated on 5 June 2020. The objective of the WQ-MOP was to formalize a procedure for management of effluent discharges that follows a systematic and science-based framework for determining acceptable discharge quality conditions. The WQ-MOP Rev2 is provided in Appendix A and considers the operational discharge of water to Meliadine Lake via the existing in-lake diffuser.

The WQ-MOP Rev 2 included a summary of the water management plan for the Mine associated with the Meliadine Lake discharge and described the interim targets for total dissolved solids (TDS) that were developed for the effluent discharge and for receiving environment conditions at the edge of the mixing zone during the emergency amendment. This plan also detailed monitoring studies to monitor discharge and receiving environment conditions of Meliadine Lake under the approved temporary (May to October 2020) amendment to Agnico Eagle's Type "A" Water Licence (No. 2AM-MEL-1631), which permitted the following:

- Authorization to temporarily discharge water from Containment Pond 1 (CP1) to Meliadine Lake that contains a maximum average concentration of TDS up to 3,500 mg/L, which exceeds the current limit described in Part F, Item 3 of the current Water Licence of 1,400 mg/L

Under the approved Water Licence Emergency Amendment, Meliadine Mine has been discharging from CP-1 to Meliadine Lake since 5 June 2020. Water quality monitoring described in detail in the approved WQ-MOP Rev 2 (Appendix A) and summarized in Table 1 of Section 3.0 is on-going and, as of 17 July 2020, the sampling program has been operational for a period of approximately 6 weeks. Available results that have been reported for the chemistry and toxicology components over the discharge period (between 3 June and 17 July 2020) are summarized and interpreted in Appendix B.

Within the WQ-MOP Rev2 (Appendix A), a three-phased approach was developed that included developing interim discharge and edge of mixing zone targets for TDS, designing and completing validation studies for the discharge and receiving environment, and finalizing the TDS benchmarks. At this time, Phase 1 (Develop Interim Targets) is complete, which proposed TDS targets for the discharge and the edge of the mixing zone. These proposed targets were reviewed by the Water Management Working Group (WMWG) and, following responses to comments from Environment and Climate Change Canada (ECCC) and Kivalliq Inuit Agency (KivIA) (Agnico Eagle 2020), as well as discussions through the WMWG, the following represent the agreed upon interim targets:

- A maximum average concentration (MAC) and a maximum grab concentration (MGC) of 3,500 mg/L TDS and 5,000 mg/L TDS, respectively, for the discharge
- An edge of mixing zone target of 1,000 mg/L TDS in the Meliadine Lake receiving environment at a radius of 100 m surrounding the in-lake diffuser

Phase 2 of the WQ-MOP (Conduct Validation Study) details the validation studies specific to the emergency amendment, which commenced in conjunction with the release of discharge from the Meliadine Mine to Meliadine Lake on 5 June 2020. This phase is ongoing in 2020, with the results being used to meet the intent of Phase 3. The scope of the on-going Phase 2 validation studies is summarized in Section 3.0 and details on the preliminary monitoring results available as of 17 July 2020 are provided in Appendix B.

Phase 3 (Finalize Meliadine Mine Benchmarks) involves incorporating the findings of Phase 1 into the assessment of results from the Phase 2 validation studies and determining the discharge limits (EQCs) and edge of mixing zone (SSWQO) benchmarks, which will provide for the ongoing long-term protection of Meliadine Lake from unacceptable effects (see Section 2.0 for details). As of 17 July 2020, monitoring results collected to date support the agreed upon interim targets, as the discharge has not been acutely toxic, adverse effects from chronic toxicity tests conducted on receiving environment samples have not been observed, and the discharge appears to be rapidly assimilated in the receiving environment. These data suggest that a MAC TDS concentration of 3,500 mg/L will remain protective of the receiving environment; however, the Phase 2 validation studies need to be completed to finalize the edge of mixing zone benchmark (SSWQO). As Phase 2 is ongoing, results of the validation monitoring collected in 2020 will be available to the Board during the technical review process; following each monthly monitoring event, results from the validation monitoring are collated, reviewed, and presented to the WMWG, which is represented by the NWB, KivIA, ECCC, and Crown Indigenous Relations and Northern Affairs Canada (CIRNAC).

1.1 Report Structure

This updated WQ-MOP provided as part of the 2020 Water Licence Amendment application has been structured as follows:

- Approach for Benchmark Development (Section 2.0)
- Summary of Validation Study Components (Section 3.0)
- Development of Meliadine Mine Benchmarks for Longer-term Water Management (Section 4.0)
- Conclusions (Section 5.0)

2.0 APPROACH FOR BENCHMARK DEVELOPMENT

For Phase 1, the guiding principle outlined in the WQ-MOP is that site-specific water quality benchmarks should be developed that satisfy the following conditions:

- protective of the environment
- satisfy regulatory requirements
- based on science (rather than strictly on considerations of policy or precedent)
- customized to the site-specific conditions of water quality and quantity

Adoption of fixed numerical benchmarks, either as static discharge limits or generic water quality guidelines, is unlikely to satisfy some parts of the above guiding principle. TDS benchmarks can, however, be developed using a toxicity-based approach that satisfies all the above conditions. TDS represent a “soup” of multiple component ions, and the behavior of this mixture in the environment is influenced by the relative toxicities of the component ions and the ability of some ions (e.g., calcium) to ameliorate the toxicity of others. For effective regulation of TDS, an approach is required that considers the toxicological potential of the mixture, and the point of compliance for different types of responses.

From our communications with ECCC, a conceptual approach was developed in the WQ-MOP Rev 2 that is consistent with guiding principles and has three main components in the development of numerical targets:

- Effluent discharges must not result in acute toxicity at the point of release
- Effluent discharges must not result in unacceptable chronic toxicity at the edge of the mixing zone (a regulated boundary located 100 m around the diffuser) following initial dilution
- Effluent discharges must not exceed the capacity of the receiving environment to accommodate long-term loadings of constituents (i.e., assimilative capacity)

For broader management of TDS in Nunavut, instead of promulgating an uncertain numerical value for TDS or its individual component(s), Agnico Eagle developed interim targets for managing TDS in the discharge and receiving environment (to apply at the edge of the mixing zone) that reflect the site-specific mixture of ions, confirmed through standardized toxicity tests and evaluation of assimilative capacity. As detailed in the WQ-MOP Rev2, a validation monitoring program was designed and was implemented with the onset of discharge on 5 June 2020 to validate interim targets developed as part of the WQ-MOP and to provide data to inform development of firm discharge limits and receiving environment benchmarks (or EQCs and SSWQOs) for long-term application. The discharge limit and SSWQO benchmarks can then be applied to guide an adaptive management approach for managing site water.

Since the approval of the emergency amendment, and following consent from the Minister of Northern Affairs on 12 May 2020, monitoring data collected at the end of pipe and in the receiving environment (at the edge of the mixing zone) following the commencement of discharge on 5 June 2020 (i.e., Phase 2 of the validation framework) have been compared to interim discharge and edge of mixing zone limits applied at the end of pipe and in the receiving environment, respectively.

The intent of Phase 3 is the integration of the benchmark recommendations made in Phase 1 and the results of Phase 2 to formalize the science-based interim targets as EQC and SSWQO benchmarks, as described in the WQ-MOP Rev2, that are applicable to future conditions at the Meliadine Mine. As described in Section 4.0, the validation monitoring conducted to date support the proposed interim targets; however, on-going validation monitoring studies (i.e., regular time-based field physico-chemical measurements, plume delineation studies, water chemistry analyses, and sampling for toxicity testing [acute and chronic testing] of the discharge and the receiving environment) are expected to provide greater evidence to support the conditions required to satisfy establishing these interim targets as firm targets for long-term water management at the Site. These studies, especially the supplemental sublethal toxicity testing of the effluent, will be used to validate and/or refine the science-based interim TDS target for the discharge and edge of mixing zone. The scope for these investigations is summarized in Section 3.0.

3.0 PHASE 2: CONDUCT VALIDATION STUDY

In conjunction with the 2020 releases that have occurred, and are continuing to occur, at the Meliadine Mine, as approved under Amendment 1 of the Mine's Type "A" Water Licence, supporting studies are being conducted to monitor conditions and validate the science-based interim targets, as well as produce additional information on receiving environment assimilation (including plume delineation). This section presents the general conceptual design for the monitoring studies required as a condition under Amendment 1. A more detailed description of the discharge monitoring program is provided in the WQ-MOP Rev2 (Appendix A).

A discharge event to dewater CP1 was approved by NWB and discharge was initiated on 5 June 2020. The discharge is ongoing and the Meliadine Mine is currently permitted to discharge effluent up to a MAC of 3,500 mg/L TDS and an MGC of 5,000 mg/L TDS until October 2020. As a result, TDS concentrations in the discharge will be elevated relative to the receiving environment during this discharge event, presenting an opportunity to conduct site validation for the TDS targets for the discharge and for the receiving environment at the edge of the mixing zone. The conceptual design for the approved validation study described in the WQ-MOP Rev2 (Appendix A) consists of three components: water quality monitoring, toxicity testing, and plume delineation.

These three components are complimentary and are being conducted with the following primary objectives:

- **Water Quality Monitoring:** The surface water quality monitoring program is being conducted to validate the model predictions that TDS will be dispersed to less than 1,000 mg/L at the edge of the mixing zone, to provide detailed chemical characterization of the effluent and receiving environment during the discharge, and to provide information on the ionic composition of water used during the toxicity testing program.
- **Toxicity Testing:** The acute and chronic toxicity testing programs are being conducted to confirm that the ionic composition measured in the discharge and the receiving environment during the surface water quality monitoring program are not at levels that would cause adverse biological effects. As described in detail in the WQ-MOP Rev2 (Appendix A) and summarized in Table 1 below, acute toxicity tests are being conducted on the discharge to validate that the discharge is not acutely toxic. A suite of chronic toxicity tests is being conducted on both the effluent and receiving environment samples to validate that TDS concentrations measured at the edge of the mixing zone are not at levels that would cause chronic toxicity. As per commitments arising from responses to comments from ECCC and KivIA (Agnico Eagle 2020), as well as discussions through the WMWG, starting during the second monthly sampling event (see Table 1 for details), chronic toxicity testing of the discharge will be conducted monthly using a dilution series test design similar to that being performed on the edge of mixing zone receiving environment stations.
- **Plume Delineation Study**—The plume delineation study will be conducted in mid and late summer to assess the vertical and horizontal extent of the effluent plume during seasonal periods that reflect the two distinct open water hydrological conditions in Meliadine Lake: just after freshet flows in July when the ice has gone from the lake, and in August when in lake open water flows are low. The emphasis of these studies will be through *in situ* specific conductivity profiling of the water column using a handheld meter with a sensor that will be lowered through the water column, with a subset of locations sampled for TDS. The relationship

between field measured specific conductivity and laboratory measured TDS will be established to validate the use of specific conductivity as a tracer of TDS in the receiving environment. The information retrieved will be used to confirm model predictions related to effluent dilution and assimilation in the receiving environment, and to confirm that receiving environment monitoring stations are adequately characterizing conditions with respect to surface water chemistry and the potential for adverse biological effects.

An overview of the validation monitoring design that will be conducted in 2020 is presented in Table 1. Figure 1 depicts the locations of the selected monitoring stations.

Starting in 2021, it is expected that the validation monitoring, with respect to discharge and edge of mixing zone locations and sampling frequency, will return to the monitoring design as required under the approved water licence.

Table 1: Conceptual design for validation of interim TDS limits for discharge and receiving environment to be conducted in 2020 as part of the emergency amendment to Agnico Eagle's Type "A" Water Licence (No. 2AM-MEL-1631)

Water Quality Monitoring Program			
Sampling Media	**Discharge**	**Mixing Zone**	**Receiving Environment** (beyond mixing zone)
Sample Timing	During discharge and during collection of samples for toxicity testing	During discharge[(a)]	During discharge[(a)]
Sampling Locations	MEL-14	3 stations at the edge of the mixing zone (MEL-01-01, MEL-01-07 and MEL-01-10)[(b)]	4 stations - 1 mid-field (MEL-02-05), 3 references (MEL-03-02, MEL-04-05, and MEL-05-04)
Number of Samples	Per regulatory and operational requirements	1 sample per station	1 sample per station
Frequency of Sampling	Weekly during discharge	Weekly during discharge or as per NWB's direction	Monthly during discharge or as per NWB's direction
Test Parameters	▪ Daily monitoring of discharge flow volumes ▪ Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence[(c)]	▪ Field physico-chemical water column profile measurements (temperature, specific conductivity, pH, DO) ▪ Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence[(c)]	▪ Field physico-chemical water column profile measurements (temperature, specific conductivity, pH, DO) ▪ Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence
Toxicity Testing Program			
Sampling Media	**Discharge**	**Mixing Zone**	**Receiving Environment** (beyond mixing zone)
Sample Timing	During discharge	During discharge[(a)]	During discharge[(a)]
Sampling Locations	MEL-14	3 stations at the edge of the mixing zone (MEL-01-01, MEL-01-07 and MEL-01-10)[(b)]	4 stations - 1 mid-field (MEL-02-05), 3 references (MEL-03-02, MEL-04-05, and MEL-05-04)
Number of Samples	Per regulatory and operational requirements	1 composite sample per station	1 composite sample per station
Frequency of Sampling	Weekly acute tests during discharge; monthly chronic toxicity tests beginning during the second monthly event[(d)]	Monthly during discharge	Monthly during discharge or as per NWB direction
Test Parameters	Acute toxicity tests with: ▪ Rainbow Trout ▪ *Daphnia magna* Chronic toxicity tests[(d)] with: ▪ Pelagic crustacean (*Daphnia magna*) ▪ Epibenthic Invertebrate (*Hyalella azteca*)	Chronic toxicity tests with: ▪ Pelagic crustacean (*Daphnia magna*) ▪ Epibenthic Invertebrate (*Hyalella azteca*) ▪ Macrophyte (duckweed) ▪ ELS fish (Fathead Minnow)	Chronic toxicity tests with: ▪ Pelagic crustacean (*Daphnia magna*) ▪ Epibenthic Invertebrate (*Hyalella azteca*) ▪ Macrophyte (duckweed) ▪ ELS fish (Fathead Minnow)

Table 1: Conceptual design for validation of interim TDS limits for discharge and receiving environment to be conducted in 2020 as part of the emergency amendment to Agnico Eagle's Type "A" Water Licence (No. 2AM-MEL-1631)

	▪ Macrophyte (duckweed) ▪ ELS fish (Fathead Minnow)		
Plume Delineation Study			
Sampling Media	**Discharge**	**Receiving Environment** (within mixing zone and beyond)	
Sample Timing	During discharge[e]	During discharge[e]	
Sampling Locations	MEL-14	22 survey locations (see Appendix B) at distance intervals of 50 m from the diffuser, 100 m (i.e., edge of mixing zone), 175 m, and 250 m; potentially adjusted to include further afield samples if necessary[f]	
Frequency of Program	2 events during discharge (early and late summer)	2 events during discharge (early and late summer)	
Test Parameters	▪ TDS and major ions ▪ General parameters[g]	▪ Field physico-chemical water column profile measurements (temperature and specific conductivity) ▪ Water quality samples collected at a subset (a maximum of 10 stations) stations alongside profile measurements and analyzed for TDS, major ions, and general parameters[f]	

Notes:

(a) The timing of sampling for each program is expected to occur continuously during the discharge period as outlined in the sample frequencies listed above for each sample media and test type. However, sample timing will be dependent on safe access to the lake. The period of anticipated discharge will likely coincide with the transition period between ice covered and open water conditions on Meliadine Lake. If samples cannot be collected at the required time due to safety considerations, contingency measures may be implemented, as outlined in Section 3.4.

(b) Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence include Conventional Parameters (bicarbonate alkalinity, chloride, carbonate alkalinity, turbidity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphate, pH, total alkalinity, TDS, TSS, total cyanide, free cyanide, and weak acid dissociable [WAD] cyanide), Nutrients (ammonia-nitrogen, total Kjeldahl nitrogen, nitrate-nitrogen, nitrite-nitrogen, orthophosphate, total phosphorus, total organic carbon, dissolved organic carbon, and reactive silica), and Total and Dissolved Metals (aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc).

(c) Mixing zone stations MEL-01-01 and MEL-01-07 are routinely sampled by the mine during the EEM/AEMP programs. MEL-01-10 represents a new sampling station. Further details on the selected mixing zone sampling stations are provided in Section 3.1.

(d) As per commitments arising from responses to comments from ECCC and KivIA and discussions through the WMWG following the first monthly sampling event, chronic toxicity testing of the MEL-14 effluent will be conducted monthly beginning on the second monthly sampling event.

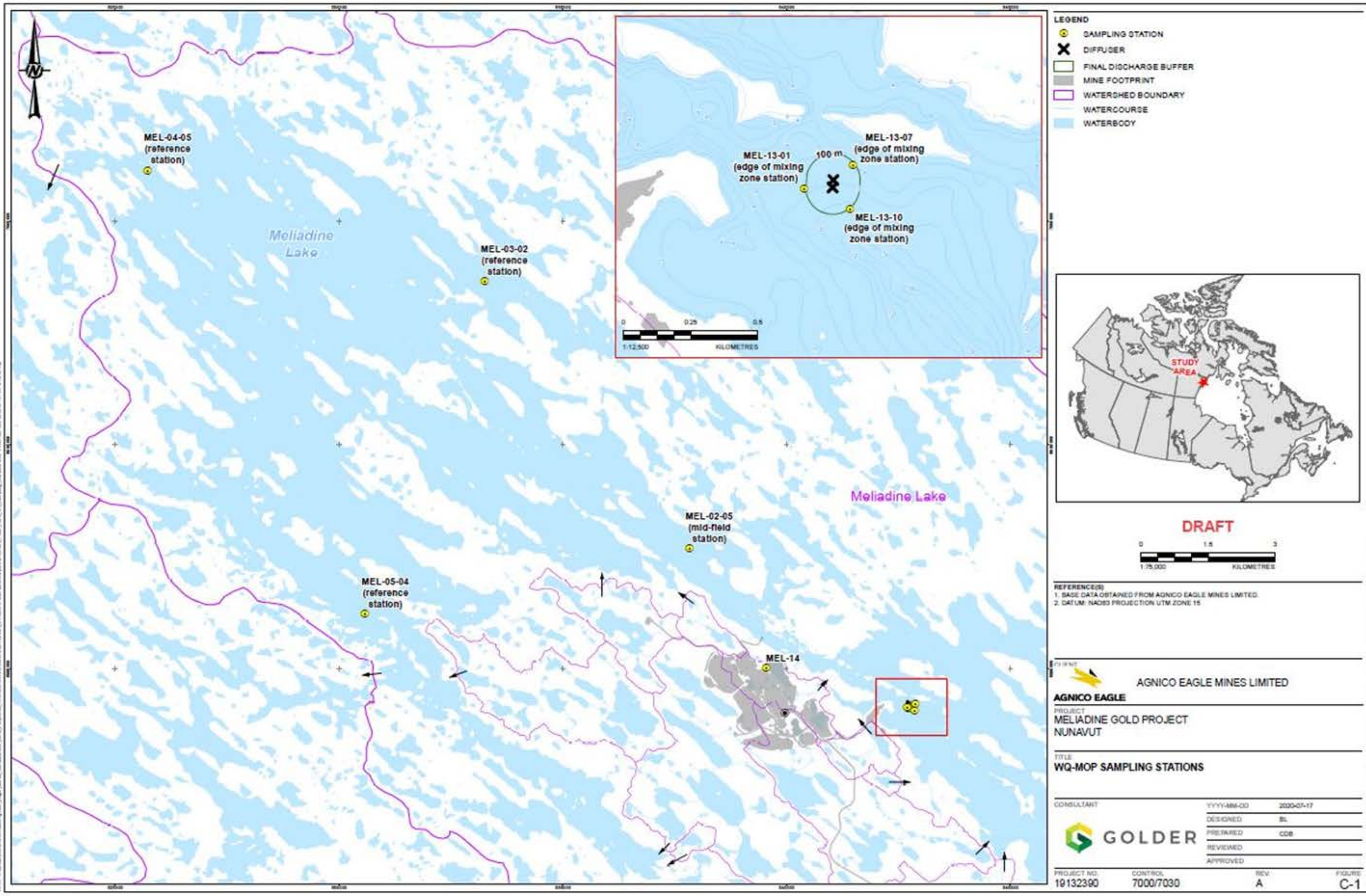
(e) Sample timing will be dependent on boat access to the lake. The period of anticipated discharge will likely coincide with the transition period between ice covered and open water conditions on Meliadine Lake. Access of the lake will occur as soon as open water conditions permit safe boat access.

(f) The maximum spatial extent of plume delineation monitoring may be extended past 250 m should the proportion of effluent be estimated to contribute >10% of TDS at 250 m (estimated based on field specific conductivity measurements).

(g) General parameters = total and bicarbonate/carbonate alkalinity, turbidity, laboratory specific conductivity, hardness, laboratory pH, and total suspended solids.

ELS = early life-stage; TDS = total dissolved solids.

Figure 1. Phase 2 WQ-MOP validation study sampling stations



4.0 PHASE 3: FINALIZE MELIADINE MINE BENCHMARKS

As previously described, the Meliadine Mine has been discharging from CP1 to Meliadine Lake since 5 June 2020, as approved under Amendment 1 of the Mine's Type "A" Water Licence. As such, water quality monitoring outlined in Table 1 is on-going and, as of 17 July 2020, the sampling program has been operational for a period of approximately 6 weeks. Results reported for the chemistry and toxicology components over this period are summarized and interpreted in Appendix B. Results available as of 17 July 2020 are as follows:

- Seven discharge chemistry sampling events
- Four weekly acute toxicity test results with Rainbow Trout and *D. magna* on the discharge
- One sampling event at edge of mixing zone sampling stations – the ice was not safe to access during the weeks of 14, 21, and 28 June, and 5 July due to potential health and safety concerns; however, remote data loggers were deployed and will provide information on temperature and specific conductivity at the edge of mixing zone stations over this period and for the duration of the discharge period. Edge of mixing zone stations will be sampled weekly following ice-free conditions
- One round of monthly receiving environment chemistry results - due to unsafe ice conditions, edge of mixing zone station MEL-13-10 was not able to be collected during the first monthly sampling event. This sample will be collected during subsequent monthly sampling events now that Meliadine Lake is ice free
- One round of monthly receiving environment chronic toxicity test results with each of the four test species – due to the time required to conduct these chronic tests (e.g., up to 21-days for the *D. magna* test, 14-d *H. azteca*). Final results are only available for the Duckweed and Fathead Minnow tests as of 17 July 2020

Detailed discussion of the results of this testing are provided in Appendix B. The following represents the primary conclusions of this data analysis and interpretation of results:

- TDS concentrations measured in the discharge were less than the MAC of 3,500 mg/L in each of the weekly sampling events and ranged between 1,510 and 3,100 mg/L measured TDS (2,502 and 2,588 mg/L calculated TDS).
- The discharge was not found to be acutely toxic in four rounds of acute toxicity tests conducted with *D. magna* and Rainbow Trout, as the LC_{50} values were >100% discharge in each of the tests.
- TDS concentrations measured at the edge of mixing zone stations were more than 10-fold lower than the proposed interim target of 1,000 mg/L during the 7 June 2020 sampling event, suggesting that the discharge has a high assimilation rate and that TDS concentrations rapidly decrease in the receiving environment to concentrations below which adverse effects on biological receptors would be expected.
- Consistent with the low TDS concentration results reported in the receiving environment, adverse toxicological effects were not identified during the first monthly chronic toxicity testing program; final results of the *H. azteca* and *D. magna* tests are pending.

Based on the agreed upon site-specific benchmark derivation procedure outlined in the WQ-MOP Rev2 (Appendix A) and summarized in Section 2.0, the validation monitoring conducted to date support the proposed interim targets because:

- Discharges were measured at TDS concentrations ranging between 1,510 and 3,100 mg/L measured TDS (2,502 and 2,588 mg/L calculated TDS), which did not result in acute toxicity at the point of release

- Discharges have not resulted in unacceptable chronic toxicity at the edge of the mixing zone following initial dilution (i.e., at a 100 m radius surrounding the diffuser in Meliadine Lake)
- Discharges do not appear to be exceeding the capacity of the receiving environment to accommodate long-term loadings of constituents (i.e., assimilative capacity), as indicated by the observation that effluent was rapidly diluted to well below (i.e., >10-fold less) the proposed edge of mixing zone target of 1,000 mg/L TDS during the June 7, 2020 sampling event

Based on these observations, it is likely that the MAC (3,500 mg/L) can be adopted as a firm benchmark for managing the discharge (as an EQC), subject to confirmation by additional testing in Summer 2020. Monitoring efforts outlined in Table 1 in Section 3.0 will continue for the duration of the permitted temporary discharge of CP1; these data will be used in Phase 3 to ratify the mixing zone target as a firm benchmark (and SSWQO) in Meliadine Lake for long-term water management at the Site.

5.0 ADAPTIVE MANAGEMENT

As described in NWB's (2020) Reason for Decision, adaptive management measures related to the emergency discharge will be discussed on an ongoing basis throughout the discharge event during meetings with the WMWG comprised of the KivIA, CIRNAC, ECCC, and NWB. The thresholds and management responses will apply to discharges beyond 2020.

Based on the adaptive management thresholds and triggers to be implemented during water quality monitoring of the discharge, as stipulated by NWB (2020), and the recommendation from the KivIA following their review of the WQ-MOP Rev2, the following adaptive management table has been developed by Agnico Eagle (Table 2). The table identifies an operating level ranging from Level 0 (green; normal operating condition) to Level 3 (red; high risk situation), the thresholds that trigger each level, and a list of management strategies and actions for consideration in response to mitigate and/or rectify the condition, if required.

Water quality (i.e., TDS) and toxicity testing monitoring data collected in CP1 (representing the discharge) and at the edge of the mixing zone will be compared to the benchmarks determined by Phase 3 of the WQ-MOP.

These adaptive management measures will be implemented if the above referenced management thresholds are triggered. NWB will be notified promptly of any adaptive management measures that are implemented throughout the discharge period. Additional adaptive management responses or actions besides those listed in Table 2 may be considered on a case-by-case basis depending on the management level triggered, or if the results of on-going monitoring (such as the Phase 2 validation monitoring conducted in 2020) identifies other non-conformances. These include:

- Decreasing the rate of effluent discharge or temporary cessation of pumping of the discharge could be considered to increase dispersion and to decrease the overall size of the plume.
- Consideration given to collecting additional edge of the mixing zone sample(s) for exploratory chronic toxicity testing to confirm the threshold at the edge of the mixing zone. These additional samples could be amended with ionic salts in an ionic composition relevant to the edge of mixing zone and tested as a dilution series. The purpose would be to facilitate testing at concentrations both above and below the concentrations measured at the time of sampling, for the purpose of developing a concentration-response curve.
- Consideration given to additional targeted toxicity testing (e.g., validation test, or toxicity identification evaluation to explore the cause for an observed toxicological response), either in response to an acute toxicity outcome (e.g., mortality to crustacean *D. magna*) or for a moderate- to high-magnitude chronic

toxicity response. Such toxicity is not anticipated to occur during the program (i.e., the thresholds have been set specifically to avoid such responses); however, if an anomalous response is observed, a TIE could help elucidate the cause.

Table 2: Surface water quality adaptive management strategy for CP1 discharge to Meliadine Lake

Adaptive Management Level	Threshold	Management Activity / Response /Action
Green (Level 0) Normal Operating Condition	Measured concentrations are less than the MAC discharge limit and the edge of mixing zone threshold level	■ Continue monitoring as per Water Licence requirements ■ Continue water management as per Water Management Plan
Yellow (Level 1)	Two consecutive end-of-pipe TDS concentrations equivalent to, or greater than, the MAC discharge limit, or Two consecutive edge-of-mixing-zone TDS concentrations equivalent to, or greater than, 75% of the edge of mixing zone threshold	■ Conduct a follow up sampling event to confirm trigger ■ Collect additional edge of the mixing zone sample(s) for chronic toxicity testing ■ Increase sampling frequency at end of pipe to twice weekly or at edge on mixing zone to bi-weekly
Orange (Level 2)	Three consecutive end-of-pipe TDS concentrations equivalent to, or greater than, the MAC discharge limit, or An end-of-pipe TDS measurement is equivalent to, or greater than the MGC discharge limit, or Three consecutive edge-of-mixing-zone TDS concentrations equivalent to, or greater than, 75% of the edge of mixing zone threshold	■ Conduct a follow up sampling event to confirm trigger ■ Decrease the rate of effluent discharge or temporarily cease pumping of the discharge ■ Consider alternative management of CP1 water (e.g., divert to waterline)
Red (Level 3)	Two consecutive end-of-pipe TDS concentrations greater than 5,000 mg/L	■ Cease pumping of the discharge to Meliadine Lake ■ Conduct a follow up sampling event to confirm trigger ■ Consider alternative management of CP1 water, such as diversion of CP1 water into the Waterline

An additional adaptive management strategy includes the utilization of an alternative to the water management plan; that is, use of the waterline as a supplemental option for water transfer from CP1. This alternative relates to the management of surface contact water and the potential opportunity to use the proposed waterline, which is new mine infrastructure provided in a Project Certificate Reconsideration Application currently before the NIRB for review. As described in the Type A Water Licence 2AM-MEL1631 Amendment (Main Application Document), Agnico Eagle is proposing to increase the currently approved discharge rate to 6,000 to 12,000 m^3 of water per day to Melvin Bay. Treated saline groundwater effluent will be conveyed through waterlines from the treatment plant to the discharge facility at the Itivia Fuel Storage Facility for discharge during the open water season (May to October). Surface contact water from CP1 can be directed to the waterline and co-mingled with the treated contact water from the underground mine in the waterline. The treated contact water from the underground mine with the CP1 surface contact water will be discharged in a controlled manner to Melvin Bay through an engineered diffuser in compliance with the required discharge criteria. Treated final effluent quality will be required to meet MDMER criteria prior to discharge (GC 2019). The addition of the CP1 water to the treated contact water from the underground mine will not impact the ability of the discharge limits to be met. Further, supplemental assessments of the potential effects of redirecting CP1 water to the waterline were evaluated with respect to Meliadine Lake and Melvin Bay:

- the redirection of CP1 water to the waterline instead of to Meliadine Lake shows that this will only result in a small reduction in overall flows in Meliadine Lake and negligible effects on the levels of Meliadine Lake (further details are provided in Appendix I of the Type A Water Licence 2AM-MEL1631, included as part of the 2020 Water Licence Application package).
- preliminary modelling results indicate that effective dispersion of the waterline discharge can be achieved over the planned four months of discharge during open water conditions; the minimum dilution factor is well above the target ratio of 11:1 as used in the previous Melvin Bay Diffuser Design Report (i.e., 2-D dispersion modelling assessment, Tetra Tech April 2020). Taking into account effluent accumulation over time, the minimum dilution factor (corresponding to the maximum concentration) at the edge of the 100 m mixing zone boundary ranges from about 40:1 to 90:1. Furthermore, the preliminary modelling indicates that the discharge is effectively dispersed in Melvin Bay and flushed out of the bay as there are no discernible areas of effluent stagnation or significant accumulation over the discharge period. As a result, the characteristics of the diffuser system and the operating conditions of the discharge (e.g., discharge volume, discharge rates, discharge timing) combined with the hydrodynamic conditions of the bay (primarily tidal regime) results in the efficient flushing of the entire bay. Once discharge ceases, and ice cover occurs on Melvin Bay, further dispersion of the remaining discharge in the bay is actively dispersed through ongoing tidal circulation. The effectiveness of the immediate discharge and the low proportion of discharge in Melvin Bay means that marine habitat and water quality in the Bay will remain protected.

Additional adaptive management strategies, if necessary, would be proposed to the WMWG in advance of the next scheduled meeting to facilitate discussion and agreement prior to implementation.

6.0 CONCLUSIONS

This updated version of the WQ-MOP provides a roadmap that facilitates the evaluation of current and planned information from the Phase 2 (Conduct Validation Study) component of the WQ-MOP Rev2, as well as a process for the completion of Phase 3 (Finalize Meliadine Mine Benchmarks) to determine:

- the MAC and MGC for discharge from CP1 to Meliadine Lake (i.e., effluent quality criteria; EQC); and
- the benchmark concentration to be achieved at the edge of the mixing zone in Meliadine Lake, which would also be consistent with the SSWQO for longer-term management of the receiving environment of Meliadine Lake.

Based on the monitoring results from the Phase 2 validation studies to date (to July 17, 2020), the interim MAC TDS concentration of 3,500 mg/L (developed in Phase 1) remains protective of the receiving environment. However, the Phase 2 validation studies are on-going and need to be completed to finalize the MAC, as well as the edge of mixing zone benchmark (SSWQO). This will be the outcome of Phase 3, which will be completed as a consequence of water quality and toxicity testing information collected from the discharge and the receiving environment (e.g., the edge of mixing zone) in Meliadine Lake in 2020.

There are several uncertainties that are outlined in Appendix B that are expected to be addressed as the validation monitoring program progresses in 2020. Nonetheless, based on the available data as of 17 July 2020, it is likely that that the MAC of 3,500 mg/L will be adopted in Phase 3 as the firm discharge limit for managing the discharge (i.e., EQC). Validation of the MGC TDS limit and the interim receiving environment TDS target of 1,000 mg/L at the edge of the mixing zone (and SSWQO) will be proposed in September 2020 (during the NWB water licence amendment process).

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APPENDIX A

WQ-MOP Rev2

REPORT

Water Quality Management and Optimization Plan

Implementation Plan for Total Dissolved Solids

Submitted to:

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1.0 INTRODUCTION

This report provides a Water Quality Management and Optimization Plan (WQ-MOP) for effluent discharges associated with the Meliadine Mine located in the Kivalliq Region of Nunavut. The objective is to formalize a procedure for management of effluent discharges that follows a systematic and science-based framework for determining acceptable effluent quality conditions.

The WQ-MOP presented herein is focussed on development of interim targets for total dissolved solids (TDS) for effluent discharge and receiving environment conditions at the edge of the mixing zone, but within a framework that can be extended to longer-term management of site water. Although currently specific to the Meliadine Mine, it is intended to align with a process that can be generalized to other Agnico Eagle Mines Limited (Agnico Eagle) projects in Nunavut.

On 24 March 2020, Agnico Eagle submitted an emergency request for an amendment to their Type "A" Water Licence (No. 2AM-MEL-1631), specifically seeking the following amendment:

- Authorization to temporarily discharge water from Containment Pond 1 (CP1) to Meliadine Lake that contains a maximum average TDS concentration up to 3,500 mg/L, which exceeds the current limit described in Part F, Item 3 of the current Water Licence of 1,400 mg/L

The emergency request issued by Agnico Eagle was based on the determination that the water storage capacity of CP1 would be exceeded if dewatering was not conducted prior to or in conjunction with the 2020 spring freshet. If the dewatering was not permitted, and the water storage capacity of CP1 was exceeded, this could represent a significant risk to site infrastructure, as well as human and environmental health. On 29 April 2020, the Nunavut Water Board (NWB 2020) recommended approval of Licence Amendment 1 for Agnico Eagle's Type "A" Water Licence, which permits the following:

- *The time-limited discharge (May 2020 – October 2020) of effluent from the Containment Pond 1 (CP1) into Meliadine Lake through the Meliadine Lake Diffuser (Monitoring Program Station MEL-14) and the Water discharge shall not exceed 3,500 mg/L for the Maximum Average Concentration (MAC) of the Total Dissolved Solids (TDS)*

The NWB's approval of Emergency Amendment 1 is contingent on conditions outlined in NWB's (2020) Reason for Decision. To respond to these conditions and requirements, the following have been addressed in this Updated WQ-MOP:

- **Water Quality Validation Study**—The NWB approval states that *"the Licensee, in addition to the requirement as referred to in Part I, Item 6, during the 2020 discharge, shall undertake the Water Quality Program provided in Table 3 of Schedule I.*" The scope for this study is provided in Section 3.0 of the WQ-MOP (Conduct Validation Study).
- **Plume Delineation Study**—The NWB approval states that "*the Licensee shall provide to the Board for review the 2020 Discharge Plume Delineation Study summary report as soon as all necessary data and results become available."* A detailed study design for the 2020 Discharge Plume Delineation Study has been included in Appendix B of the WQ-MOP, and a summary of program sampling requirements is included in Section 3.3 of the WQ-MOP.
- **Response Plan**—The WQ-MOP now includes adaptive management recommendations. This includes the addition of chemical and toxicological endpoint thresholds that monitoring data collected at the end of pipe or at the edge of the mixing zone can be compared, as well as a list of management actions or protocols that could be implemented in response to non-compliance.

- **Field Contingencies**—The WQ-MOP now includes contingency plans that could be implemented if logistical complications (e.g., safety concerns due to ice-cover or COVID-19) arise during the required 2020 water quality sampling program*.*

NWBs recommended approval of Amendment 1 received Minister's consent from the Honourable Daniel Vandal, Minister of Northern Affairs on 12 May 2020.

1.1 Site-Specific Benchmark Development Procedure

The guiding principle for the WQ-MOP is that water quality benchmarks should be developed that satisfy the following conditions:

- protective of the environment
- satisfy regulatory requirements
- based on science (rather than strictly on considerations of policy or precedent)
- customized to the site-specific conditions of water quality and quantity

Adoption of fixed numerical benchmarks, either as static discharge limits or generic water quality guidelines, is unlikely to satisfy some parts of the above guiding principle. TDS benchmarks can, however, be developed using a toxicity-based approach that satisfies all the above conditions. TDS represent a "soup" of multiple component ions, and the behavior of this mixture in the environment is influenced by the relative toxicities of the component ions and the ability of some ions (e.g., calcium) to ameliorate the toxicity of others. For effective regulation of TDS, an approach is required that considers the toxicological potential of the mixture, and the point of compliance for different types of responses.

From our communications with Environment and Climate Change Canada (ECCC), a conceptual approach has been developed that is consistent with the guiding principle, and that has three main components in the development of numerical targets:

- Effluent discharges must not result in acute toxicity at the point of release
- Effluent discharges must not result in unacceptable chronic toxicity at the edge of the mixing zone following initial dilution
- Effluent discharges must not exceed the capacity of the receiving environment to accommodate long-term loadings of constituents (i.e., assimilative capacity)

For broader management of TDS in Nunavut, instead of promulgating an uncertain numerical value for TDS or its individual component(s), we recommend development of interim targets for managing TDS in the effluent discharge and receiving environment (to apply at the edge of the mixing zone) that reflect the site-specific mixture of ions, confirmed through standardized toxicity tests and evaluation of assimilative capacity. Much of this information has already been collected for Meliadine Mine, and Agnico Eagle has designed a validation program to validate interim targets and provide data to inform development of effluent quality criterion (EQC) and site-specific water quality objective (SSWQO) benchmarks for long-term application (see Section 3.0). The EQC and site-specific water quality objectives (SSWQO) benchmarks can be applied to guide an adaptive management approach to processing of site water.

1.2 Phasing the Water Quality Management and Optimization Plan

As communicated to NWB by Agnico Eagle, the upcoming 2020 freshet season will result in accumulation of site water that exceeds the water storage capacity of the mine at CP1, requiring a managed release of site water to the environment. In anticipation of this condition, Amendment 1 was approved by NWB for Meliadine Mine's Type "A" Water Licence, allowing Meliadine Mine to dewater CP1 prior to or in conjunction with the 2020 freshet, avoiding "emergency" conditions. This decision received Minister's consent from the Honourable Daniel Vandal, Minister of Northern Affairs, on 12 May 2020.

The operational needs dictate a phased approach to the WQ-MOP, in which short-term needs for monitoring and validation are met, while remaining consistent with the overall WQ-MOP framework.

- **Phase 1: Develop Interim Targets**—Application of the general process described in Section 1.1, entailing review of literature and results of site-relevant toxicity testing, and subsequent establishment of science-based TDS targets, for use on an interim basis.
- **Phase 2: Conduct Validation Study**—In conjunction with the upcoming release of discharge from Meliadine Mine to Meliadine Lake commencing during freshet, Agnico Eagle will conduct supporting studies in 2020 to validate and/or refine the science-based interim targets and produce additional information on receiving environment assimilation. The scope for this study is provided in Section 3.0 of the WQ MOP (Conduct Validation Study).
- **Phase 3: Finalize Meliadine Mine Benchmarks**—Integrate the results of Phase 1 and Phase 2 to formalize the science-based interim targets as EQC and SSWQO benchmarks, with a framework for their implementation (e.g., adaptive management), that is applicable to future conditions at Meliadine Mine. Phase 3 will be submitted as part of the amendment application of the existing Meliadine Water Licence to the Nunavut Water Board.

This document emphasizes Phase 1 (Section 2.0) and Phase 2 (Section 3.0) of the WQ-MOP; sufficient detail is provided for the validation and plume delineation studies to indicate conformance with the Mine's monitoring requirements outlined in the NWB's (2020) Reason for Decision. Additional details of sample collection, handling, and chain-of-custody are being developed separately for use by the field crew and analytical laboratories.

2.0 PHASE 1: DEVELOP INTERIM TARGETS

2.1 Interim TDS Target for Effluent

This section presents the proposed interim target for effluent of 3,500 mg/L calculated TDS for the Meliadine Mine; the target is expressed as a Maximum Average Concentration (MAC). This target is proposed as an interim value, pending implementation of Phase 2 and Phase 3 of the WQ-MOP. The interim target of 3,500 mg/L calculated TDS was proposed following a review of site acute toxicity data collected for Meliadine Mine (Appendix A) and was approved (Amendment 1) on 4 May 2020 as the temporary (May 2020 to October 2020) TDS MAC permitted to be discharged from CP1 into Meliadine Lake at the Meliadine Mine Lake Outfall diffuser (Monitoring Program Station MEL-14).

As discussed in Appendix A, the toxicity of TDS across different site waters varies by ionic composition and the relative proportion of ions in the mixture. Low effect concentrations for acute endpoints (e.g., survival) have been reported in the literature for individual ions for select species, but these tests reflect exposure conditions accounting for a single ion, and not a balanced TDS mixture representative of most field conditions. Considering this, the proposal of an interim target focussed on review of site-specific acute toxicity data collected for site-relevant mixtures (e.g., treated effluent, influent, Collection Pond water; Appendix A, Section A2.0).

The approved interim TDS target for effluent of 3,500 mg/L is supported by:

- No acute toxicity to *D. magna* or Rainbow Trout was observed with influent and effluent TDS concentrations of equal to or less than 5,420 mg/L (measured TDS concentrations of equal to or less than 4,925 mg/L)—details are provided in Appendix A.
- No mortality to other organisms has been observed in tests using Fathead Minnows or *C. dubia* in chronic exposures; as of January 2020, these tests covered calculated TDS concentrations up to 2,357 mg/L (measured TDS concentrations of 2,490 mg/L). Chronic test endpoints are not used in a regulatory context to evaluate the acute toxicity of the effluent, but the lack of mortality in chronic tests provides encouraging information.
- The record of acute toxicity depicted in Appendix A (Table A-4) provides evidence of the lack of acute toxicity even at high TDS concentrations. As of March 2020, nine acute toxicity tests have been conducted with calculated TDS concentrations above 3,500 mg/L. For this reason, some caution is recommended in the development of the interim TDS target for effluent. The no-effect concentration of 5,420 mg/L calculated TDS was therefore reduced by 30% and rounded down to the value of 3,500 mg/L.

Validation of the interim TDS target to demonstrate that the effluent is consistently not acutely lethal will be conducted through monitoring during the discharge period as presented in Section 3.0. Sensitive species that form the basis for the validation would include test species *D. magna* and Rainbow Trout, as these are the species used to assess compliance for acute lethality under the Metal and Diamond Mining Effluent Regulations (MDMER; Government of Canada 2002).

2.2 Interim TDS Target at the Edge of the Mixing Zone

An interim target of 1,000 mg/L (as calculated TDS) to apply in the receiving environment at the edge of the mixing zone is proposed for the protection against chronic toxicity to representative aquatic species. This interim target is intended to evaluate the condition (from Section 1.1) that effluent discharges must not result in unacceptable chronic toxicity at the edge of the mixing zone following initial dilution. The target is proposed as an interim value for use in the short-term, pending implementation of Phase 2 and Phase 3 of the WQ-MOP. The interim target of 1,000 mg/L in the receiving environment at the edge of the mixing zone was supported by the NWB (2020) in their Reasons for Decision related to the approval of Amendment 1 of the Type “A” Water Licence.

The proposed interim target was derived using methods described in Appendix A and summarized below:

- Characterization of the Meliadine TDS profile (Section A1.1)—water chemistry data collected at the Meliadine Mine were used to profile the anticipated water quality in the receiving environment, including composition of major component ions in the TDS mixture.
- Review of water quality benchmarks (Section A1.2)—review of TDS benchmarks developed for locations with a similar TDS composition to Meliadine Mine.
- Literature review (Section A1.3)—review of peer-reviewed literature to determine the threshold for chronic toxicity with a focus on TDS mixtures of similar composition to Meliadine Mine (i.e., dominance of chloride, sodium, and calcium ions).

- Review of site-specific chronic toxicity data (Section A1.4)—review of site toxicity data and corresponding TDS and major ion chemistry of treated effluent and influent samples for Meliadine Mine, as collected during routine and regulatory compliance toxicity testing.
- Weight of Evidence (Section A1.5)—integration of the above information to justify the interim target of 1,000 mg/L TDS to apply at the edge of the mixing zone.

The interim TDS target includes the following assumptions:

- Ambient water hardness should remain within the current range to ameliorate potential chloride toxicity (i.e., through demonstration of non-toxicity of chloride under site-relevant ranges of hardness).
- Additional site-specific validation of the TDS threshold should be conducted to confirm that the mixture of ions represented by the effluent and near-field exposure conditions does not result in acute or chronic toxicity. Such studies are planned, as discussed in Section 3.0.
- Effluent chemistry profiles, particularly with respect to the proportions of major ions, will remain generally consistent in the future.

There is already strong scientific evidence to support the interim target as protective of the aquatic community. The results of toxicity testing do not indicate that an exceedance above 1,000 mg/L TDS will result in harm to aquatic life but provide reasonable certainty of no harm up to 1,000 mg/L. The key lines of evidence are presented in Appendix A, and are supported by the following considerations:

- The Meliadine Mine effluent contains a balance of major ions that is advantageous for limiting the toxic potency of the TDS mixture (Section A1.5.1).
- The Snap Lake site, which applies the same TDS concentration as a SSWQO, provides similar ionic mixtures and biological communities (Section A1.5.2).
- The chronic toxicity data set for Meliadine Mine site water, which includes a battery of four sensitive aquatic species, supports the interim TDS target as a defensible no-effect concentration (Section A1.5.3).
- The ionic balance has been stable in Meliadine Mine water, such that an interim TDS target can be developed without requiring development of targets for individual component ions (Section A1.5.4).

2.3 Assimilation Capacity Evaluation

The ability of the receiving environment to assimilate the concentrations and loading of constituents in effluent is the last component of the WQ-MOP implementation. Consideration of assimilation capacity provides confidence that constituents will not gradually accumulate to concentrations that would degrade the receiving environment.

The approach to TDS management set out in the WQ-MOP is not expected to affect the quality, quantity, or flow of the waters in Meliadine Lake. TDS levels during and after the 2020 discharge will continue to be managed to minimize adverse effects of the licenced deposit of effluent on the aquatic ecosystem of Meliadine Lake, and discharges would continue to meet the stringent requirements set by the MDMER. Confidence in this conclusion comes from plume delineation surveys, preliminary dilution estimates from dispersion models, and consideration of the Meliadine Lake hydrology.

The evidence for sufficient assimilation efficiency in Meliadine Lake to accommodate the interim TDS target for effluent of 3,500 mg/L comes from:

- **Consistency with Previous Impact Assessment Outcomes**—Based on the predictions included in the Final Environmental Impact Statement (FEIS) for the Meliadine Mine Gold Project (Golder 2014), the one-time release of mine wastewater to Meliadine Lake under this amendment would not be expected to result in potential additional project effects. That is, water quality in the receiver and downstream environment would remain within the predictions included in the FEIS. For the FEIS assessment, a Maximum Allowable Concentration (MAC; referred to as the Maximum Allowable Effluent Concentration [MAEC] in the FEIS) of TDS in the discharge of 4,685 mg/L was calculated based on the approach applied in the province of Quebec (MDDEP 2007), where the mixing ratio in a lake is set to a value of 10 to 1. The calculation of the MAC is dependent on the background concentrations (BG) in the lake, the water quality criteria (WQG; the guideline), and the mixing ratio (MR), as established by the following equation:

  $$MAC = MR \times (WQG - BG) + BG.$$

  Where for TDS:

  MR = 10 (as per MDDEP)

  WQG = 500 mg/L (Guidelines for Canadian Drinking Water Quality [GCDWQ; HC 2010], aesthetic objective)

  BG = 35 mg/L

  Therefore:

  $$MAC = 10 \times (500 – 35) + 35 = 4{,}685 \text{ mg/L}$$

  This MAC is well above the proposed interim target of 3,500 mg/L proposed in this amendment.

- **Plume Delineation Results**—Under operating conditions, a plume delineation survey based on specific conductivity results was conducted in 2018 in the near-field region of Meliadine Lake as part of the Environmental Effects Monitoring (EEM)/Aquatic Effects Monitoring Program (AEMP). The EEM plume delineation study used field surveys of specific conductivity to evaluate effluent dispersion with distance from the diffuser. The study evaluated dilution factors at a series of monitoring stations up to, and extending beyond, 250 m from the diffuser, based on the specific conductivity of the effluent and the measured field values through the water column at each the stations. To account for background values, two scenarios were used:

  - Scenario A: near-field average specific conductivity for 2015 to 2016; and
  - Scenario B: near-field average specific conductivity for 2017

  An observed slight increase in specific conductivity between 2015 to 2016 (pre-construction) and 2017 (construction) was the impetus for considering the two scenarios.

  Observations from the survey indicated a minimum dilution factor of 53 at 50 m away from the diffuser, and a minimum dilution factor range of 56 (Scenario A) and 85 (Scenario B) at the edge of the 100 m mixing zone boundary (Table 1). This study was also useful because it served to validate the performance of the submerged diffuser, which had previously been assessed by Tetra Tech as part of their design (Tetra Tech 2017) and re-assessed in 2018 (Tetra Tech 2018). As part of their reassessment in 2018, Tetra Tech concluded that the predicted minimum dilution of 23:1 was achieved at the edge of the 100 m mixing zone and that water quality criteria were met. The minimum dilution factor was more than twice the mixing ratio of

10:1 that was used to derive the MAC in the 2014 FEIS; it was based on a multi-year modelling scenario[1] where the minimum dilution at 100 m at the end of the first year of discharge was 72:1. The latter ratio is consistent with earlier modelling work to support a conceptual diffuser in 2015 (Agnico Eagle 2015), which indicated that the minimum dilution factor was 65:1.

In summary, the range of dilution factors observed at 100 m distance from the diffuser (representing the edge of the mixing zone) determined from the EEM plume delineation study are greater than the minimum dilution factor (23:1) developed in the performance assessment of the diffuser completed by Tetra Tech in 2018 based on multi-year simulations. The dilution factors remain in broad agreement with Tetra Tech's assessment for the first year of discharge (72:1) and the early work completed by Golder (65:1).

Table 1: Dilution Factors in the Near-field Exposure Area at Meliadine Lake[(a)]

Sampling Station	Maximum Specific Conductivity in 2018 (µS/cm)	Dilution Factor – Scenario A	Dilution Factor – Scenario B
50-01	99.8	63	104
50-03	105.5	53	79
100-01	93.4	80	159
100-03	104	56	85
100-04	102.6	58	90
100-05	98.9	65	109
100-06	88.5	101	266
100-08	96.6	71	125

(a) Listed data represent a portion of the data listed in Table 2.4-10 of Golder (2019)

µS/cm = microsiemens per centimetre

The 2018 EEM plume delineation results suggest that the effluent concentration observed at the 100 m mixing zone boundary was less than 2% of concentrations observed at end of pipe. Furthermore, the survey results showed that the plume remained at depths of roughly between 3 and 7 m, indicating that the receiving water and the effluent discharged had similar densities and/or intense mixing. The measured data from 2018 showed that at the time of the survey, the plume was more distinct to the south-west of the diffuser, which indicates a preferential direction of plume advection during the time of survey. Changes in wind speed and direction including current direction and speed are key factors determining the plume dispersion direction on any given day.

- **Mixing Ratio Calculations**—Preliminary calculations of the MAC have been completed based on standard industry practices as well as the results of the near-field modeling completed by Golder, as shown in Table 2.

[1] The multi-year simulation included annual diffuser discharge to Lake Meliadine over the 14 year construction and operations timeline (Year -3 to Year 11). This scenario was included to assess the effects of water quality constituent build-up in the lake on the dilution factor.

Table 2: Calculations of Maximum Average Concentrations for TDS

Report	Guideline for Canadian Drinking Water Quality for TDS (HC 2010) (mg/L)	Assumed Meliadine Lake Average Background TDS Concentration (mg/L)	Assumed Mixing Factor	Maximum Average Concentration (mg/L)
2014[(a)]	500 mg/L	35 mg/L	10:1	4,685
2015[(b)]			65:1	30,260[(c)]
2018[(d)]			23:1	10,730[(c)]
2019[(e)]			56:1	26,075[(c)]

Notes:

(a) Golder 2014. Water and Sediment Quality Model – Meliadine Mine Gold Project, Nunavut. Appendix 7.4-A.

(b) Agnico Eagle (2015) (see Appendix E, Water Management Plan).

(c) Concentration of maximum average effluent TDS is conceptual only; effluent would **not** be discharged at TDS concentrations of this magnitude as it could result in acute toxicity at the point of discharge.

(d) Tetra Tech (2018).

(e) Golder. 2019. Appendix G – Field Data in the Near-field Exposure Area at Meliadine Lake Under the Plume Delineation Study, 2018.

For the preliminary calculations, the mixing ratio (MR) was established as:

- 2014—reflects approach applied by the province of Quebec (MDDEP 2007), where the mixing ratio in a lake is set a value of 10:1.
- 2015—reflects minimum mixing factor predicted by near-field modeling.
- 2018—reflects minimum mixing factor as modelled for diffuser design (Tetra Tech 2017, 2018).
- 2019—reflects minimum mixing factor calculated from observations of plume delineation survey at edge of the 100 m mixing zone.

TDS = total dissolved solids; mg/L = milligrams per litre.

Based on the model calculations and the observation of the plume delineation study, it is likely that the discharge of effluent with a TDS concentration at 3,500 mg/L, even at the lowest measured mixing ratio of 72, would result in negligible risk of sublethal toxicity at the edge of the mixing zone. This mixing potential at the edge of the mixing zone boundary limits the potential for a sublethal response.

Beyond the mixing zone, into the near- and far-field in Meliadine Lake, effluent will be carried by currents within the lake and further mixed with ambient water. The location of the effluent outfall diffuser is also within the expected main flow channel of the lake, which will act to convey and further disperse the effluent toward the lake outlet.

The assimilative capacity of the 100 m mixing zone will be validated through a detailed monitoring program, for which a conceptual design is provided in Section 3.0.

3.0 PHASE 2: CONDUCT VALIDATION STUDY

In conjunction with the 2020 releases that are planned to occur prior to or in conjunction with the freshet at Meliadine Mine and that have been approved under Amendment 1 of the Mine's Type "A" Water Licence, supporting studies are required to be conducted in spring/summer 2020 to validate the science-based interim targets and produce additional information on receiving environment assimilation (including plume delineation). This section presents the general conceptual design for the spring/summer 2020 monitoring study required as a condition under Amendment 1. The monitoring study will be undertaken both to assess conditions experienced in Meliadine Lake during the discharge event, and for use as a validation component of the WQ-MOP.

A discharge event to dewater Collection Pond 1 (CP1) has been approved by NWB and will occur at the Mine site in the spring/summer of 2020. TDS concentrations in the effluent will be elevated relative to the receiving environment during this discharge event, presenting an opportunity to conduct site validation for the interim TDS targets for the effluent and for the receiving environment at the edge of the mixing zone. These studies also provide the opportunity to collect additional information for the potential development of TDS EQC and SSWQO benchmarks, for use in adaptive management. The conceptual design for the proposed validation would consist of three components: water quality monitoring (Section 3.1), toxicity testing (Section 3.2), and plume delineation (Section 3.3).

These three components are complimentary and will be conducted with the following primary objectives:

- **Water Quality Monitoring:** The surface water quality monitoring program will be conducted to validate the model predictions that TDS will be diluted to less than 1,000 mg/L at the edge of the mixing zone, to provide detailed chemical characterization of the effluent and receiving environment during the discharge, and to provide information on the ionic composition of water used during the toxicity testing program.
- **Toxicity Testing:** The acute and chronic toxicity testing programs will be conducted to confirm that the ionic composition measured in the effluent and the receiving environment during the surface water quality monitoring program are not at levels that would cause adverse biological effects. As described in detail in Section 3.2 and summarized in Table 3, acute toxicity tests will be conducted on the effluent and a suite of chronic toxicity tests will be conducted on receiving environment samples.
- **Plume Delineation Study**—The plume delineation study will be conducted to assess the vertical and horizontal extent of the effluent plume. This will primarily be assessed through *in situ* specific conductivity profiling of the water column using a handheld meter with a sensor that will be lowered through the water column, with a subset of locations sampled for TDS. The relationship between field measured specific conductivity and laboratory measured TDS will be established to validate the use of specific conductivity as a tracer of TDS in the receiving environment. The information retrieved will be used to confirm model predictions related to effluent dilution and assimilation in the receiving environment, and to confirm that receiving environment monitoring stations are adequately characterizing conditions with respect to surface water chemistry and the potential for adverse biological effects.

An overview of the conceptual design is presented in Table 3 and discussed in detail by component below.

Table 3: Conceptual Design for Proposed Validation of Interim TDS Limits for Effluent and Receiving Environment

Water Quality Monitoring Program			
Sampling Media	**Effluent**	**Mixing Zone**	**Receiving Environment** (beyond mixing zone)
Sample Timing	During effluent discharge and during collection of effluent samples for toxicity testing	During effluent discharge[(a)]	During effluent discharge[(a)]
Sampling Locations	MEL-14	3 stations at the edge of the mixing zone (MEL-01-01, MEL-01-07 and MEL-01-10)[(b)]	4 stations - 1 mid-field (MEL-02-05), 3 references (MEL-03-02, MEL-04-05, and MEL-05-04)
Number of Samples	Per regulatory and operational requirements	1 sample per station	1 sample per station
Frequency of Sampling	Weekly during discharge	Weekly during discharge or as per NWB's direction	Monthly during discharge or as per NWB's direction
Test Parameters	▪ Daily monitoring of effluent flow volumes ▪ Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence[(c)]	▪ Field physico-chemical water column profile measurements (temperature, specific conductivity, pH, DO) ▪ Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence[(c)]	▪ Field physico-chemical water column profile measurements (temperature, specific conductivity, pH, DO) ▪ Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence

Table 3: Conceptual Design for Proposed Validation of Interim TDS Limits for Effluent and Receiving Environment

Toxicity Testing Program			
Sampling Media	**Effluent**	**Mixing Zone**	**Receiving Environment** (beyond mixing zone)
Sample Timing	During effluent discharge	During effluent discharge[a]	During effluent discharge[a]
Sampling Locations	MEL-14	3 stations at the edge of the mixing zone (MEL-01-01, MEL-01-07 and MEL-01-10)[b]	4 stations - 1 mid-field (MEL-02-05), 3 references (MEL-03-02, MEL-04-05, and MEL-05-04)
Number of Samples	Per regulatory and operational requirements	1 composite sample per station	1 composite sample per station
Frequency of Sampling	Weekly during discharge	Monthly during discharge	Monthly during discharge or as per NWB direction
Test Parameters	Acute toxicity tests with: ▪ Rainbow Trout ▪ *Daphnia magna*	Chronic toxicity tests with: ▪ Pelagic crustacean (*Daphnia magna*) ▪ Epibenthic Invertebrate (*Hyalella azteca*) ▪ Macrophyte (duckweed) ▪ ELS fish (Fathead Minnow)	Chronic toxicity tests with: ▪ Pelagic crustacean (*Daphnia magna*) ▪ Epibenthic Invertebrate (*Hyalella azteca*) ▪ Macrophyte (duckweed) ▪ ELS fish (Fathead Minnow)
Plume Delineation Study			
Sampling Media	**Effluent**	**Receiving Environment** (within mixing zone and beyond)	
Sample Timing	During effluent discharge[d]	During effluent discharge[d]	
Sampling Locations	MEL-14	22 survey locations (see Appendix B) at distance intervals of 50 m from the diffuser, 100 m (i.e., edge of mixing zone), 175 m, and 250 m; potentially adjusted to include further afield samples if necessary[e]	
Frequency of Program	1 event during discharge	1 event during discharge	
Test Parameters	▪ TDS and major ions ▪ General parameters[f]	▪ Field physico-chemical water column profile measurements (temperature and specific conductivity) ▪ Water quality samples collected at a subset (a maximum of 10 stations) stations alongside profile measurements and analyzed for TDS, major ions, and general parameters[f]	

Notes:

(a) The timing of sampling for each program is expected to occur continuously during the discharge period as outlined in the sample frequencies listed above for each sample media and test type. However, sample timing will be dependent on safe access to the lake. The period of anticipated discharge will likely coincide with the transition period between ice covered and open water conditions on Meliadine Lake. If samples cannot be collected at the required time due to safety considerations, contingency measures may be implemented, as outlined in Section 3.4.

(b) Parameters as listed in Schedule I Group 2 of the 2AM-MEL1631 NWB Water Licence include Conventional Parameters (bicarbonate alkalinity, chloride, carbonate alkalinity, turbidity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphate, pH, total alkalinity, TDS, TSS, total cyanide, free cyanide, and weak acid dissociable [WAD] cyanide), Nutrients (ammonia-nitrogen, total Kjeldahl nitrogen, nitrate-nitrogen, nitrite-nitrogen, orthophosphate, total phosphorus, total organic carbon, dissolved organic carbon, and reactive silica), and Total and Dissolved Metals (aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, mercury, molybdenum, nickel, selenium, silver, strontium, thallium, tin, titanium, uranium, vanadium, and zinc).

(c) Mixing zone stations MEL-01-01 and MEL-01-07 are routinely sampled by the mine during the EEM/AEMP programs. MEL-01-10 represents a new sampling station. Further details on the selected mixing zone sampling stations are provided in Section 3.1.

(d) Sample timing will be dependent on boat access to the lake. The period of anticipated discharge will likely coincide with the transition period between ice covered and open water conditions on Meliadine Lake. Access of the lake will occur as soon as open water conditions permit safe boat access.

(e) The maximum spatial extent of plume delineation monitoring may be extended past 250 m should the proportion of effluent be estimated to contribute >10% of TDS at 250 m (estimated based on field specific conductivity measurements).

(f) General parameters = total and bicarbonate/carbonate alkalinity, turbidity, laboratory specific conductivity, hardness, laboratory pH, and total suspended solids.

ELS = early life-stage; TDS = total dissolved solids.

3.1 Water Quality Sampling

Water quality samples will be collected and analyzed for a suite of parameters (conventional parameters, nutrients, and total and dissolved metals) to characterize water quality conditions of the effluent and the receiving environment of Meliadine Lake. The water quality results will also inform the ionic composition of effluent and receiving environment samples used during toxicity testing for site-specific validation of the interim target established for the edge of the mixing zone (see Section 3.2). The water quality data will also provide confirmation that TDS in water released at sampling station MEL-14 remains within permitted levels established through Amendment 1 (i.e., MAC is ≤3,500 mg/L TDS; edge of mixing zone ≤1,000 mg/L TDS). Samples of effluent for water chemistry analysis should, to the extent possible, be collected on the same day as edge of mixing zone and receiving environment (mid-field and reference locations) samples and analyzed for the same suite of parameters. As described in NWB's (2020) Reasons for Decision document, water quality samples within the discharge period will be collected as follows from monitoring stations routinely sampled during the mine's EEM/AEMP program:

- **Effluent samples:** The effluent (defined as sampling station MEL-14) will be sampled weekly during discharge for conventional parameters, nutrients, and total and dissolved metals.
- **Edge of mixing zone samples:** Three stations located at the edge of the mixing zone will initially be sampled weekly during the discharge for conventional parameters, nutrients, and total and dissolved metals. These edge of mixing zone sampling stations were selected following review of the 2018 plume delineation study results. The stations include MEL-01-01 and MEL-01-07, which are located approximately 100 m northwest and northeast of the diffuser, respectively. These stations are routinely sampled as part of the mine's EEM/AEMP program. To improve spatial coverage surrounding the diffuser, it was determined that a water quality sample should be collected at the edge of the mixing zone towards the southeast of the diffuser. MEL-01-06 represents a station located southeast of the diffuser that is currently monitored under the mine's EEM/AEMP program; however, this station is located outside of the 100 m mixing zone boundary (i.e., ~200 m from the diffuser). As a result, a new station, MEL-01-10, will be monitored at the edge of the mixing zone. MEL-01-10 was selected to provide spatial coverage at the edge of the mixing zone (i.e., 100 m radius surrounding the diffuser) and will correspond with the station 100-04 selected for the plume delineation study described in Appendix B. The UTM coordinates of this station (Easting 542861.3, Northing 6989059.1) are further described in Figure 2 and Table 1 of Appendix B. The specific water depths that will be sampled at each station will be determined in the field based on the specific conductivity profile observed at the time of sampling, to account for changes in plume conditions that could occur over time. As such, the depth sampled at each edge of mixing zone station may change between rounds of sampling. The sampling frequency may also be adjusted during the program based on results and conversations held during the Water Management Working Group review meetings.
- **Receiving environment – mid-field samples:** One mid-field station (MEL-02-05) will initially be sampled monthly during the discharge for conventional parameters, nutrients, and total and dissolved metals. The sampling frequency may be adjusted during the program based on results and conversations held during the Water Management Working Group review meetings.
- **Receiving environment – reference Samples:** Three reference stations (MEL-03-02, MEL-04-05, and MEL-05-04) will initially be sampled monthly during the discharge for conventional parameters, nutrients, and total and dissolved metals. The sampling frequency may be adjusted during the program based on results and conversations held during the Water Management Working Group review meetings.

Physico-chemical profiling of the lake water column will be measured *in situ* using water quality meters (e.g., Hanna, YSI, Eureka or equivalent) equipped with a 20 m or longer cable at each edge of mixing zone and receiving environment sample location. Samples for laboratory water quality analysis will be collected at each location based on the depth determined to have the highest specific conductivity.

Additionally, to facilitate the collection of *in situ* physico-chemical data (i.e., specific conductivity, dissolved oxygen concentrations, temperature, and pH) at the edge of the mixing zone during the period where ice cover transitions to open water across the lake, prohibiting safe lake access, Agnico Eagle will install remote monitoring stations at the edge of the mixing zone prior to the discharge event. This monitoring will collect and log specific conductivity and temperature data at several depths at these stations, which will be recovered once the lake can be safely accessed.

3.2 Sampling for Toxicity Testing

The 2020 discharge event provides an opportunity to evaluate TDS toxicity under site-relevant conditions. During discharge, representative water samples will be collected and tested for laboratory-based toxicity using standardized protocols for aquatic toxicity. The toxicity testing program will include separate test protocols for effluent and receiving water samples.

Effluent samples from sampling station MEL-14 will be collected and tested using the suite of toxicity test species and standard protocols conducted for acute lethality testing and EEM under the MDMER. As outlined in NWB's (2020) Reasons for Decision document, the effluent (sample ID: MEL-14) will be sampled weekly during the discharge and tested for acute toxicity using the following acute toxicity test protocols:

- 96-hour Rainbow Trout survival test using the Environment Canada (2007a) standard biological test method (EPS 1/RM/9)
- 48-hour *Daphnia magna* survival test using the Environment Canada (1996) standard biological test method (EPS 1/RM/11)

As outlined in NWB's (2020) Reasons for Decision document, receiving environment stations will be sampled monthly during the discharge and tested using a suite of chronic toxicity tests that were agreed upon following consultation with the Water Management Working Group. Edge of mixing zone and receiving environment (i.e., mid-field and refence locations) samples will be tested for chronic toxicity using a multi-species approach that uses standardized chronic toxicity test protocols:

- **21-day *Daphnia magna* survival and reproduction test using the ASTM (2007) standard biological test method (Method E1193-97)**—*D. magna* was selected as a chronic test species to evaluate receiving environment water quality, as it is well studied and sensitive pelagic crustacean, and found to be more ecologically relevant to northern lake communities relative to other crustaceans such as *Ceriodaphnia dubia*. The 21-d *D. magna* test was selected over the 7-d *Ceriodaphnia dubia* survival and reproduction test because the former is native to Meliadine Lake, and was recommended by stakeholders in the consultation stage to be preferred as a monitoring species.
- **14-day *Hyalella azteca* water-only survival and growth test using the Environment Canada (2017) standard biological test method (EPS 1/RM/33)**—*H. azteca* was selected as a chronic test species to evaluate receiving environment water quality, as it is a well studied and sensitive invertebrate species. *H. azteca* was selected over the freshwater midge, *Chironomus dilutus,* as *H. azteca* is considered an epibenthic species (i.e., inhabits the microenvironment at the sediment-water interface), whereas *C. dilutus* is a benthic infaunal species that burrows in sediment and would have less direct exposure to receiving

waters. The feeding strategy of *H. azteca*, which derives little nutrition from the sediments, and responds primarily to contaminants in the overlying water column (including water and food; Wang et al. 2004), is well suited to an evaluation of environmental responses associated with effluent discharges. Similarly, the other benthic invertebrate group considered, mayflies, were considered less relevant as the candidate test species tend to prefer either more flowing habitats (e.g., *Centroptilum* representative of Eastern North America streams and rivers), or temperate lakes and streams (e.g., *Hexagenia* representative of slow moving streams and ponds of the Great Lakes), which are less relevant for the northern lentic Meliadine Lake environment. Mayflies are less commonly tested and with lower degree of protocol standardization, such that obtaining representative, reliable, and repeatable results was considered a potential project risk.

- **7-day *Lemna minor* (duckweed) growth test using the Environment Canada (2007b) standard biological test method (EPS 1/RM/37)**—*L. minor* was selected as a chronic test species to evaluate receiving environment water quality, as it is a well studied and sensitive macrophyte species. NWB (2020) approved either the 7-day *Lemna minor* or the 72-h green alga (*Pseudokirchneriella subcapitata*) growth test for evaluating receiving environment water quality with respect to primary producers. *L. minor* was selected for testing as it was identified as the more sensitive of the two species during site-specific testing of CP1 water during the derivation of the proposed interim thresholds (Appendix A).

- **7-day larval Fathead Minnow (*Pimephales promelas*) survival and growth test using the Environment Canada (2011) standard biological test method (EPS 1/RM/22)**—Fathead Minnow were selected as a chronic test species to evaluate receiving environment water quality, as it is a well studied and sensitive early life-stage fish species. NWB (2020) approved either the 7-day Fathead Minnow survival and growth test or the 7-d Rainbow Trout embryo development test for evaluating receiving environment water quality with respect to early life-stage fish. Fathead minnows were selected for testing because the Rainbow Trout embryo development test is contingent on being able to secure viable embryos. Because the testing is expected to occur monthly during the discharge, it was identified that quality Rainbow Trout embryos may not be consistently available throughout the program, which would complicate temporal interpretation of chronic toxicity test results. As a result, the 7-day Fathead Minnow test was selected as the preferred option for early life-stage chronic fish testing.

Three types of samples will be collected from the receiving environment during each monthly sampling event for evaluation using the suite of chronic toxicity tests listed above. These samples include the following:

- **Edge of mixing zone samples**—Three stations located at the edge of the mixing zone (MEL-01-01, MEL-01-07, and MEL-01-10, as described in Section 3.1) will be sampled during each monthly sampling event for chronic toxicity testing. Prior to toxicity testing, physico-chemical water quality profiling of the water column at mixing zone sampling stations will be conducted to identify the samples with the highest specific conductivity (measured *in situ*). Samples will be collected at the depth with the highest conductivity for toxicity testing. Mixing zone stations will be tested for chronic toxicity using a standard dilution approach (i.e., 100%, 50%, 25%, 12.5% and 6.25% volume to volume dilutions) with the suite of chronic toxicity tests identified above. Dilutions will be conducted with laboratory water selected to provide broad comparability to Meliadine Lake.

- **Receiving environment – mid-field samples**—One mid-field station (MEL-02-05) will be sampled during each monthly sampling event for chronic toxicity testing. This mid-field sample will be tested for chronic toxicity using the full-strength sample with no dilution series (i.e., pass/fail test design).

- **Receiving environment – reference samples**—Three reference stations (MEL-03-02, MEL-04-05, and MEL-05-04) will be sampled during each monthly sampling event for chronic toxicity testing. These reference samples will be tested for chronic toxicity using the full-strength sample with no dilution series.

As the primary constituent of concern is TDS (including its component ions), concentrations would not be expected to decrease significantly during storage of a few weeks duration. As a result, a sufficient volume of sample for chronic toxicity testing will be collected at each station once per month. The samples will be collected with minimal headspace and transported under cool dark conditions to the respective toxicology laboratories. Upon arrival at the laboratories, samples will be stored in the dark at 4ºC until test initiation. For chronic tests that call for renewals of test solutions during the exposure period, the refresh solution will be obtained from the bulk sample used to supply water at test initiation. The advantage to this approach is that the exposure concentration experienced by the organisms during the test will be held constant and will correspond directly with samples collected for detailed chemistry. The chronic toxicity test protocols require that conductivity be monitored during the tests, which should provide confirmation that TDS exposure concentrations remain relatively constant throughout the exposure duration.

Attempts will be made to conduct toxicity tests within the respective hold time requirements (i.e., 3 days for chronic tests) specified in the test protocols; however, slight deviations from hold time requirements may be unavoidable due to the mine's remote location and due to the current situation surrounding COVID-19. For the purposes of this study, hold time exceedances are not considered to represent a deviation from the test protocol because TDS concentrations are not expected to measurably change during storage. To validate this assumption, if samples are initiated outside the respective hold times, a subset of the stored toxicity samples will be tested for TDS so that comparisons can be made with the samples collected for analytical chemistry in the field.

3.3 Plume Delineation Study

A plume delineation study will be conducted in the near-field area of Meliadine Lake immediately outside of the mixing zone once it is safe to access the lake during effluent discharge to characterize the effluent plume configuration, validate model predictions related to effluent dilution and assimilation in the receiving environment, and to confirm that receiving environment monitoring stations are adequately characterizing edge of mixing zone conditions. Study timing will be dependent on safe lake access. Although discharge will likely commence during ice cover conditions and continue during the transition period between ice cover and open water conditions on Meliadine Lake, boat access to the lake is required to conduct the plume delineation study. Therefore, the plume delineation study will occur once open water conditions permit safe boat access.

Specific conductivity and temperature depth profiling at different spatial intervals from the effluent diffuser (i.e., collected at 50 m, 100 m, 175 m, and 250 m distances at 22 stations around the diffuser; potentially adjusted to include further afield samples if necessary) will be used to depict the dimensions and behaviour of the plume. A subset of the planned sampling stations (i.e., a maximum of 10 of the 22 identified locations) will be sampled for laboratory analysis of TDS, major ions, and other general parameters. Samples selected for more detailed analyses will be selected to encompass the range of specific conductivity measures observed surrounding the outfall. These data from the plume delineation study will provide:

- validation that the water quality at the edge of the mixing zone is consistent with predictions of TDS and major ion concentrations (as estimated using existing water quality from the effluent and modeling of the receiving environment)
- confirmation that the relationship between specific conductivity and water quality is sufficiently reliable for use in future plume delineation
- representation of the rate of effluent dispersion in the near-field region in Meliadine Lake, to address the assimilation capacity portion of the WQ-MOP.

This study would occur over one to two days during the effluent discharge once safe access to the lake is possible. A detailed study plan for the Plume Delineation Study is provided in Appendix B and is similar in scope to plume monitoring conducted during the 2018 Meliadine Mine EEM/AEMP.

3.4 Contingency Planning

Field monitoring and data collection will be conducted by Agnico Eagle Mine personnel, with support from Golder on an as-needed basis. Golder will provide the detailed study design for each component, specific work instructions, program coordination, data analysis, and reporting. Sample collection, chain-of-custody, and health and safety will be the responsibility of Mine staff. Due to the remote location of the Meliadine Mine site, the seasonal lake conditions during ice melt, and the current public health situation surrounding COVID-19, contingency planning for unforeseen complications related to the monitoring program are necessary to provide a framework that can be safely implemented in the event that certain aspects of the proposed monitoring program become unworkable. This section summarizes some of the factors that could influence the need to modify the sampling program, and the measures that will be undertaken to maintain program implementation within the practical and safety constraints.

Following discussions between Agnico Eagle and the Water Management Working Group, NWB (2020) has stipulated that the following contingency measures should be considered in case complications prohibit sampling and analysis as outlined in Table 3:

- *Use of specific conductivity or TDS field measurements as a surrogate for laboratory measured TDS and the contributing ions (development of a statistical relationship between field measurements of specific conductivity and laboratory TDS)*
- *Agnico Eagle should consult with the Water Management Working Group in respect of all monitoring and adaptive management measures* (see Section 3.5) *implemented by Agnico Eagle over the course of the CP1 discharges in 2020*

Where schedule allows, and where adaptations would result in a significant departure from the study design, input will be sought from the Working Group. Therefore, this section emphasizes circumstances that may require revisions to the program with a few days notice, and for which a formal consultation step is not feasible.

3.4.1 Ice Melt

Due to the timing of effluent discharge during freshet, safe access to Meliadine Lake may pose a challenge due to melting ice conditions. It is anticipated that effluent discharge will begin before the lake is completely ice-free to alleviate on-site water storage capacity limitations. Therefore, the edge of mixing zone and receiving environment monitoring conducted as part of this study may not be possible at certain times during the discharge due to safety concerns associated with ice melt. The following outlines contingency measures that could be implemented if the receiving environment is not accessible at the start of the discharge event:

- **Option 1—Delay open-water environment sampling (edge of mixing zone and receiving environment [mid-field and reference locations])**. Depending on the ice cover conditions and the long-term weather forecast at the time of initial discharge, it may be prudent to delay the first round of open-water sampling, to provide improvement in conditions and safety, without any other changes required to the sampling program.
- **Option 2—Temporary replacement of open water sampling with expanded effluent testing using dilutions**. The discharge monitoring station, MEL-14, is located on land and is therefore expected to be accessible when lake ice prohibits receiving environment sampling (both edge of mixing zone samples and receiving environment samples). As a result, if receiving environment samples cannot be sampled during the

first month due to unsafe sampling conditions caused by melting ice on Meliadine Lake, additional whole effluent samples from MEL-14 could be sent to the toxicology laboratory and tested using an extended dilution series that encompasses a larger range of TDS concentrations than would be expected in the receiving environment. These tests would be simulations of water quality and toxicological responses to approximate the field conditions, with a return to direct sampling of field conditions as soon as appropriate. Such chronic toxicity data could then be compared to *in situ* monitoring data that would be collected following ice-free conditions to validate the interim targets established at the edge of the mixing zone. Although this contingency would have uncertainty related to the estimation of effluent dilution in the mixing zone, it has the added benefit of providing site-specific chronic toxicity data at test concentrations greater than those expected at the edge of the mixing zone. These data would be informative for both the short-term monitoring needs, but also to validate longer-term benchmarks for TDS in the effluent (EQC-setting) and receiving environment (SSWQO). Such benchmarks would support a future application for a permanent amendment to these targets under the mine's water licence (i.e., support WQ-MOP Phase 3—long-term management of TDS).

3.4.2 Laboratory Testing

The study design has been developed to provide a high level of care and quality management, but laboratory testing always carries some risk of uncontrollable disruption:

- **Shipment Delay**—Due to the remote location of the site, and the multiple legs required for shipment from Nunavut to the Quebec transfer location, and subsequently to the analytical laboratories, there is a possibility of holding time exceedances for chemical or toxicological analyses (these times vary by test type but are generally a few days in duration). The potential for time delays increases during the Covid-19 condition due to the reduced options for alternate shipping routes. In the event of a minor holding time exceedance, we propose to continue with testing of the samples as promptly as can be accommodated by the laboratories, with associated documentation of the necessary protocol deviations. The contaminant types of primary interest in the samples (i.e., major ions and metals) are resistant to rapid sample degradation. Cancellation or rescheduling of the testing program would result in loss of information and associated uncertainty that far outweighs the consideration of holding time. Additional chemical analysis (e.g., both test initiation and termination) can be used to provide confidence in the stability of the chemical mixtures.

- **Test Failure**—A low percentage of toxicity tests result in test failures (i.e., unacceptable performance of negative control media, or other major disqualification, such as a prolonged power outage causing violation of rules for controlled environmental conditions). We have attempted to anticipate potential causes of control failures (e.g., fungal infestation of water samples, essential micronutrient levels of tests). If other unforeseeable factors result in a test failure, the default approach will be to proceed in order of:

  - Consult the laboratory to determine if the cause of failure can be identified
  - Restart the test using additional archived sample, if available
  - If test cannot be repeated with confidence, repeat test with fresh sample in the subsequent monitoring event (with additional water volume provided to support follow-up investigation of cause, if needed)
  - If multiple rounds of testing indicate a systematic problem with test quality, consider replacement testing (e.g., new laboratory, replacement test protocol)

- **Inadequate Sample Volumes**—In the event that water volumes are inadequate (e.g., sample containers compromised or lost in transit), attempts will be made to salvage the testing round through minor adjustments to the design, such as:
  - Replacement of site water with a synthetic water sample designed to mimic the ionic composition of the site water (e.g., laboratory preparation of a simulated Meliadine Lake ambient background water composition)
  - Modification of the dilution series to make efficient use of available sample

The contingency measures provided above represent an initial planning step and are not expected to address all potential complications that could arise during the monitoring program. As a result, these planning steps should be viewed as preliminary measures that are expected to evolve as the program progresses. Golder and Agnico Eagle will work together to identify additional contingency measures where necessary during the program and, where practical, will provide new contingency plans to the Water Management Working Group for comment and discussion prior to implementation.

3.5 Adaptive Management

As described in NWB's (2020) Reason for Decision, adaptive management measures related to the emergency discharge will be discussed on an ongoing basis throughout the discharge event during meetings with the Water Management Working Group comprised of the Kivalliq Inuit Association, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Environment and Climate Change Canada (ECCC), and NWB. However, prior to the first Water Management Working Group meeting, which is tentatively scheduled for two weeks following initiation of the discharge, NWB (2020) has stipulated that the following preliminary adaptive management thresholds and triggers be implemented during water quality monitoring of the discharge event:

- *If two consecutive end-of-pipe sampling events identify TDS concentrations equivalent to, or greater than, 3,500 mg/L, Agnico Eagle will increase sampling frequency*
- *If two consecutive edge-of-mixing-zone sampling events identify TDS concentrations equivalent to, or greater than, 75% of the interim target of 1,000 mg/L, Agnico Eagle will increase sampling frequency*

These preliminary adaptive management measures will be implemented if the above referenced management targets are not achieved. NWB will be notified promptly of any adaptive management measures that are implemented throughout the discharge period. Additional adaptive management strategies that may be considered on a case-by-case basis if non-compliance with the above targets are observed, or if the results of the validation studies identify other non-conformances are:

- Decreasing the rate of effluent discharge or temporary cessation of pumping of the discharge could be considered to increase dilution and decrease the overall size of the plume.
- Consideration given to collecting additional edge of the mixing zone sample(s) for exploratory chronic toxicity testing to further validate the proposed interim target at the edge of the mixing zone. These additional samples could be amended with ionic salts in an ionic composition relevant to the edge of mixing zone and tested as a dilution series. The purpose would be to facilitate testing at concentrations both above and below the concentrations measured at the time of sampling, for the purpose of developing a concentration-response curve.

- Consideration given to additional targeted toxicity testing (e.g., validation test, or toxicity identification evaluation to explore the cause for an observed toxicological response), either in response to an acute toxicity outcome (e.g., mortality to crustacean *D. magna*) or for a moderate- to high-magnitude chronic toxicity response. Such toxicity is not anticipated to occur during the program (i.e., the thresholds have been set specifically to avoid such responses); however, if an anomalous response is observed, a TIE could help elucidate the cause.

If additional testing or analysis is conducted, per the second or third bullets above, the data would be useful both as a contingency measure and for longer-term management (i.e., WQ-MOP Step 3). These approaches have been applied at other northern mine sites to better understand the concentration-response and define the lower bound of where TDS may cause chronic toxicity in site-specific mixtures. Multiple chronic toxicity tests have already been conducted in recent years, and these support the proposed interim target at the edge of the mixing zone; additional tests would expand on that knowledge, clarifying the nature of TDS concentration-response, and the influence of modifying factors.

Additional adaptive management strategies, if necessary, would be proposed to the Water Management Working Group in advance of the next scheduled meeting to facilitate discussion and agreement prior to implementation.

4.0 CONCLUSIONS

The application of the WQ-MOP framework provides a basis for management of effluent discharges from Meliadine Mine to Meliadine Lake that:

- Is protective of the environment (both in the mixing zone and broader ecological condition of Meliadine Lake), as demonstrated in this memorandum, which provides Phase 1 and the conceptual elements of Phase 2 of the WQ-MOP
- Will satisfy regulatory requirements for the short-term (Phase 1 and 2) and long-term (Phase 3) management of TDS:
  - interim targets for TDS proposed herein satisfy short-term regulatory requirements for management of TDS during the 2020 discharge, subject to conditions outlined in Emergency Amendment 1, and endorsement of the interim targets for effluent and at the edge of the mixing zone
  - interim targets for TDS proposed herein form the basis for development of TDS targets for effluent (EQC) and receiving environment (SSWQO), following validation monitoring, for future application under an adaptive management framework
- Is based on science, including both site-specific evaluations of toxicity and comparison to other project approvals with similar composition of TDS
- Is customized to the site-specific conditions of water quality and quantity (with revisions as appropriate should these conditions change)

It is acknowledged that the aspects of the interim targets for TDS and, if required, future development of EQC and SSWQO, will benefit from additional confirmatory study. Our revised WQ-MOP provides the technical basis for these studies, and leverages the environmental monitoring of the 2020 discharge, which provides an opportunity to collect the data necessary for both short-term validation (i.e., Phase 2 of the WQ-MOP) and long-term management (i.e., Phase 3 of the WQ-MOP).

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https://golderassociates.sharepoint.com/sites/117232/project files/5 technical work/6000_sswq_tds_benchmarks/6020_tds_memo/rev2/19132390-751-rpt-wqmop-meliadine-rev2a.docx

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APPENDIX A

Supporting Information for the Interim TDS Targets

APPENDIX A: SUPPORTING INFORMATION FOR INTERIM TDS TARGETS

This Appendix presents the supporting information and rationale for the proposed interim targets of: (a) 1,000 mg/L calculated TDS to apply at the edge of the mixing zone (Section A1.0) and (b) 3,500 mg/L calculated TDS to apply for effluent discharge (Section A2.0).

To prepare the interim targets, Golder Associates Ltd. (Golder) was requested to build from existing work performed on TDS benchmarks (i.e., Golder 2019), including the following:

- Incorporation of site-specific toxicity data.
- Integration with the framework discussed with regulators for developing interim water quality targets for TDS that reflect the site-specific mixture of ions, confirmed through standardized toxicity tests (acute and chronic toxicity testing) and evaluation of assimilative capacity.
- Establishment of a process for validation of interim targets in summer 2020.

The development of interim water quality targets for Agnico Eagle Nunavut operations was discussed with Environment and Climate Change Canada (ECCC) in several recent meetings and associated reviews:

- *Meeting on 9 December 2019 (Agnico Eagle 2019)*. This meeting discussed the technical approach to development of site-specific water quality objectives (SSWQO) for multiple projects (and constituents of interest) in Nunavut.
- *TDS Technical Memorandum (Golder 2019)*. This memorandum was prepared as a draft document to support a technical approach to development of SSWQOs for TDS.
- *Meeting on 9 January 2019 (Agnico Eagle 2020)*. This meeting discussed the technical approach to development of SSWQOs specific to TDS and its components, following from the ECCC review of Golder (2019).
- *Final Public Hearings for the Whale Tail Expansion Project, Baker Lake NU, February 13–14, 2020*. The hearings included contributions from ECCC (as Intervenors), and from Agnico Eagle (in the Proponent's concluding statements) and included areas of general agreement regarding a conceptual approach to regulation of TDS.

A1.0 INTERIM TDS TARGET AT THE EDGE OF THE MIXING ZONE

The benchmark of 1,000 mg/L calculated TDS is proposed as an interim value for use in the short-term, pending implementation of Phase 2 and Phase 3 of the WQ-MOP.

The proposed interim target was derived as summarized below and detailed in the subsequent sections:

- Characterization of the Meliadine TDS profile (Section A1.1)—water chemistry data collected at the Meliadine Mine were used to profile the anticipated water quality in the receiving environment, including composition of major component ions in the TDS mixture.
- Review of water quality benchmarks (Section A1.2)—review of TDS benchmarks developed for locations with a similar TDS composition to Meliadine Mine.
- Literature review (Section A1.3)—review of peer-reviewed literature to determine the threshold for chronic toxicity with a focus on TDS mixtures of similar composition to Meliadine (i.e., dominance of chloride, sodium, and calcium ions).

- Review of site-specific chronic toxicity data (Section A1.4)—review of site toxicity data and corresponding TDS and major ion chemistry for Meliadine treated effluent and influent samples, as collected during routine and regulatory compliance toxicity testing.
- Weight of Evidence (Section A1.5)—integration of the above information to justify an interim target TDS concentration of 1,000 mg/L to apply at the edge of the mixing zone.

A1.1 Characteristics of Total Dissolved Solids

A1.1.1 Definition

The TDS parameter is defined as the sum of the concentrations of all common dissolved ions in freshwaters (e.g., sodium [Na^+], calcium [Ca^{2+}], magnesium [Mg^+], potassium [K^+], sulphate [SO_4^{2-}], bicarbonate [HCO^{3-}], chloride [Cl^-], nitrate [NO^{3-}], fluoride [F^-], and silicate [SiO_3^{2-}]), and is essentially an expression of salinity. TDS can be calculated using the following equation (APHA 2005):

$$TDS_{calculated\ (mg/L)} = \sum[Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, F^-, SO_4^{2-}, SiO_3^{2-}, 4.42 \times NO_3^-\ (as\ N), 0.6\ \times\ total\ alkalinity\ (as\ CaCO_3)]$$

Concentrations of TDS may also be measured gravimetrically by analytical laboratories. However, calculated TDS is used herein as the primary basis for derivation of interim targets for TDS and screening because:

- Laboratory interference can reduce the accuracy of measured TDS (Evaristo-Cordero 2011). In particular, waters with high calcium, magnesium, and chloride concentrations can form hydroscopic residues that absorb water under normal laboratory conditions, potentially biasing the measured TDS higher than actual concentrations (APHA 2005; Evaristo-Cordero 2011). In contrast, calculated TDS is based on the major ions that can measurably contribute to TDS and is therefore, not influenced by any changes that may occur from those ions being taken out of solution.
- Calculated TDS incorporates explicit consideration of the ionic composition, which is important for evaluating the toxicity of the TDS mixture (as discussed below).
- Calculated TDS is forecasted, using predictive modelling, to estimate potential TDS concentrations in effluent and receiving environment under future mine conditions; use of calculated TDS for the interim target provides an equivalence for comparison relative to modelled conditions.

In recent meetings, ECCC expressed a preference that concentrations of TDS be expressed on a measured concentration basis. Agnico Eagle has committed to presenting monitoring results using both methods (calculated and measured).

A1.1.2 General Fate and Effects

Dissolved solids occur naturally in water, with the composition and concentration of individual ion constituents varying by location based on natural factors, such as the geology and soil in the watershed, atmospheric precipitation and the water balance (evaporation-precipitation) (Weber-Scannell and Duffy 2007). Anthropogenic activities can alter the concentration of TDS in the aquatic environment, with effluent from mining or industrial treatment of water identified as common sources of elevated TDS (Soucek 2007; Weber-Scannell and Duffy 2007). Differences in the ratios of calcium to magnesium (Ca:Mg) or relative contribution of sulphate or chloride to the total TDS concentration are common indicators of anthropogenic influence.

The primary toxicity modifying factor for TDS is ionic composition, reflecting the fact that individual ionic components exhibit different potential to exert toxicity. For example, Mount et al. (1997) reported 48-hr LC_{50} values ranging from 390 to >5,610 mg/L in *C. dubia* and 96-hr LC_{50} values ranging from <510 to 7,960 mg/L in the Fathead Minnow exposed to various ion combinations, respectively. In general, a balanced mixture of ions results in lower toxicity than strong dominance by an individual ion, particularly dominance by an individual ion with relatively high toxicity. Mount et al. (1997) reported that the relative ion toxicity to freshwater biota was generally potassium > carbonate ≈ magnesium > chloride > sulphate, with calcium and sodium exhibiting relatively low toxicity. Therefore, the toxicity of a TDS mixture depends largely on the composition of ions within the mixture, rather than the total TDS concentration, which on its own is not an accurate predictor of toxicity. If the mixture is well characterized, and the composition of that mixture is similar to samples for which mixture-based toxicity testing has already been conducted, the confidence in predictions of toxicological potential increases substantially.

A1.1.3 Site-Specific Composition

Monitoring data for Meliadine effluent (MEL-14) were compiled for surface water samples collected between September 2017 and October 2019 and monitoring data for the near-field in Meliadine Lake (MEL-01; stations MEL-01-01 and MEL-01-06 to MEL-01-08) were compiled for surface water samples collected between July 2015 and September 2019. The date range selected for the effluent TDS data begins in 2017 because it coincides with period of increasing effluent TDS concentrations. The near-field TDS composition has been relatively stable over time; data were included for a broader time period to reflect the chronic exposure condition. Summary statistics for major ion chemistry, TDS, and water hardness are presented in Table A-1.

The interim target was developed considering that the ionic composition would fall within the bounds of the ionic composition of the effluent and near-field receiving water. In other words, the effluent and near-field receiving environment samples bracket the range of mixture types expected for future samples of water upon initial mixing. Average measured TDS in the effluent was approximately 930 mg/L and consisted predominantly of chloride (470 mg/L; 52% of TDS), sodium (167 mg/L; 18% of TDS), calcium (125 mg/L; 13% of TDS), sulphate (56 mg/L; 6% of TDS), carbonate (20 mg/L; 2% of TDS), and relatively low concentrations of magnesium, potassium, fluoride, nitrate, and reactive silica (combined 9% of TDS; Figure A-1). Average measured TDS in the near-field receiving environment (MEL-01) was lower (44 mg/L) with a broadly similar ionic composition to the effluent but with a higher overall proportion of carbonate and lower proportion of chloride, sodium, and calcium. TDS in the near-field consisted predominantly of chloride (12 mg/L; 28% of TDS), carbonate (18 mg/L; 24% of TDS), sodium (5.8 mg/L; 13% of TDS), calcium (7.7 mg/L; 18% of TDS), sulphate (4.5 mg/L; 10% of TDS), and relatively low concentrations of magnesium, potassium, fluoride, nitrate, and reactive silica (combined 6% of TDS; Figure A-2). On a site-wide basis, TDS composition relevant to the Meliadine interim TDS target is an ionic composition dominated by chloride, sodium, and calcium (from highest to lowest concentration), with lower contribution from carbonate. It is anticipated that, should TDS increase in the receiving environment relative to current conditions, the relative proportion of carbonate would decline as the relative proportions of chloride, sodium and calcium increase. Dominant ions of chloride, sodium, and calcium represent the lower range of toxicity potential relative to potassium, carbonate, and magnesium (Mount et al. 1997).

From November 2019 to March 2020, ten water quality samples were collected in Containment Pond 1 (CP1). The ionic composition of these samples were consistent with the ionic composition reported above for MEL-14 and MEL-01; average measured TDS in CP1 from November 2019 to March 2020 was approximately 4,403 mg/L and consisted predominantly of chloride (2,160 mg/L; 51% of TDS), sodium (806 mg/L; 19% of TDS), calcium

(483 mg/L; 11% of TDS), sulphate (349 mg/L; 8% of TDS), carbonate (87 mg/L; 2% of TDS), and relatively low concentrations of magnesium, potassium, fluoride, nitrate, and reactive silica (combined 9% of TDS).

Hardness may modify ion-specific toxicity, thereby ameliorating the toxicity of a mixture by reducing the toxicity of individual ions (Kennedy et al. 2005). For example, calcium has been identified as a specific component of hardness that ameliorates sulphate toxicity (Davies and Hall 2007; Mount et al. 2016). Hardness is not considered a toxicity modifying factor in the case of TDS, because hardness is a component of the TDS mixture and is therefore not an independent factor distinct from ionic composition. However, hardness can be considered for the evaluation of ion-specific toxicity, given that some ions (e.g., chloride, sulphate) are less toxic in hard water. Water hardness was calculated as calcium carbonate ($CaCO_3$) using the following equation:

$$[CaCO_3] = 2.5 \times [Ca^{2+}] + 4.1 \times [Mg^{2+}]$$

Average calculated water hardness in the effluent was 408 mg/L as $CaCO_3$ (i.e., very hard water), compared to 25 mg/L (i.e., soft water) in the near-field receiving environment.

Table A-1: Water chemistry results for TDS and associated constituents in Meliadine Mine effluent (MEL-14) collected between September 2017 to October 2019 and near-field (MEL-01) collected between July 2015 and September 2019

Parameter (mg/L)	MEL-14					MEL-01[(a)]				
	Median	Average	Maximum	Minimum	Sample Count	Median	Average	Maximum	Minimum	Sample Count
Calculated TDS	923	930	1,213	634	28	42	44	69	33	43
Measured TDS	1,185	1,203	1,760	860	28	52	54	94	25	43
Carbonate[(b)]	20	20	34	4	28	10	11	17	8	43
Chloride	470	487	660	300	28	12	12	19	8	43
Sodium	167	165	236	94	28	5.6	5.8	9.4	4.1	43
Calcium	125	122	220	17	28	7.3	7.7	13	5.8	43
Sulphate	53	56	90	7	28	4.3	4.5	6.6	3.4	43
Magnesium	26	25	36	4	28	1.3	1.4	2.4	1.0	43
Potassium	14	14	17	10	28	1.0	1.0	1.7	0.8	43
Fluoride	—[(c)]	—[(c)]	—[(c)]	—[(c)]	0	0.03	0.03	0.03	0.02	43
Nitrate (as N)	11	9	15	3	28	0.01	0.01	0.08	0.01	43
Reactive Silica	0.73	0.79	3.60	0.05	28	—[(d)]	—[(d)]	—[(d)]	—[(d)]	1
Calculated Water Hardness (as $CaCO_3$)[(e)]	407	408	698	59	28	24	25	41	19	43

Notes:

All concentrations expressed in milligrams per litre.

(a) MEL-01 measurements are from near-field stations MEL-01-01, MEL-01-06, MEL-01-07, MEL-01-08, and MEL-01-09.

(b) Calculated from total alkalinity as total alkalinity (as $CaCO_3$) × 0.6

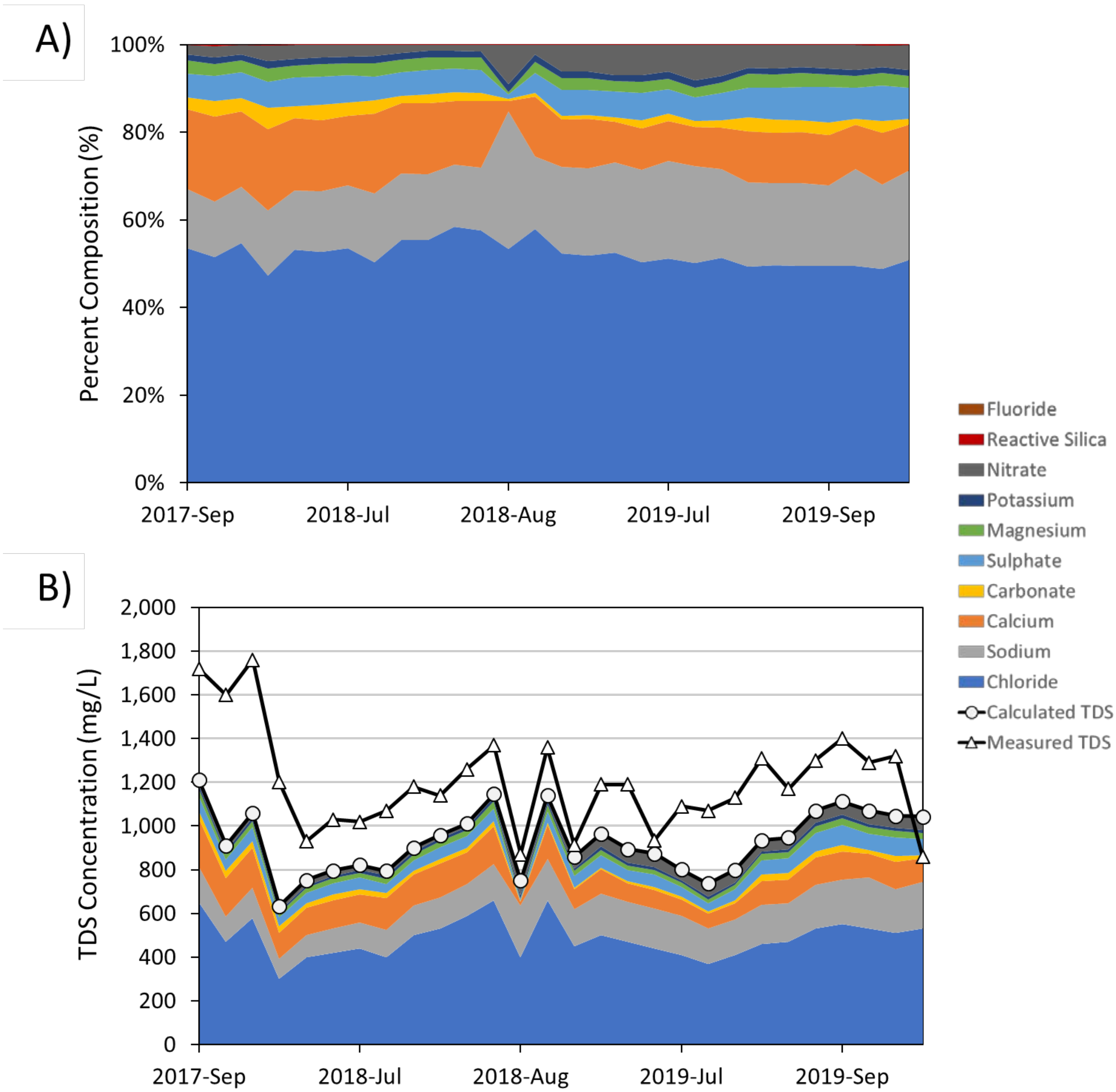
(c) Fluoride was not measured for data collected between September 2017 and October 2019, which precluded the calculation of summary statistics. However, these data would not result in significant changes to the understanding of ionic composition, given that fluoride provides only a trace component of both halides and TDS in Meliadine water samples.

(d) Reactive silica was only measured in one sample for data collected between September 2017 and October 2019, which precluded the calculation of summary statistics.

(e) Calculated as $(2.5 \times [Ca^{2+}]) + (4.1 \times [Mg^{2+}])$

mg/L = milligrams per litre; $CaCO_3$ = calcium carbonate; N = Nitrogen; — = not measured.

Figure A-1: Percent composition of TDS (%) (Panel A) and TDS concentration (mg/L) (Panel B) at station MEL-14 (treated effluent) for samples collected between September 2017 and October 2019 at Meliadine Mine.

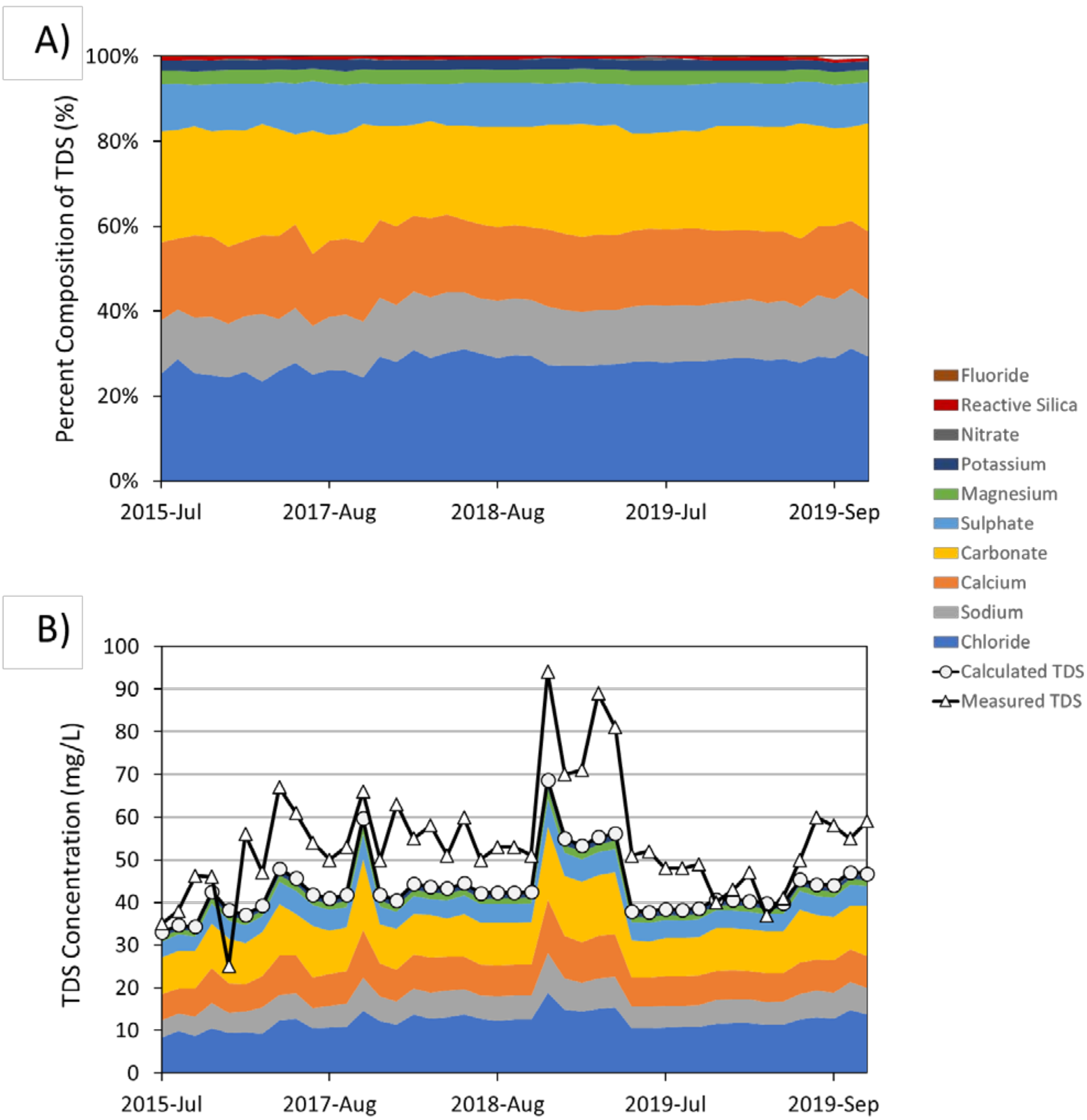


Notes:

Ionic composition was calculated as: $TDS_{calculated\ (mg/L)} = \sum[Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, F^-, SO_4^{2-}, SiO_3^{2-}, 4.42 \times NO_3^- \ (as\ N), 0.6 \times total\ alkalinity\ (as\ CaCO_3)]$.

Data for ionic composition from effluent (MEL-14) was collected between September 2017 and October 2019.

Figure A-2: Percent composition of TDS (%) (Panel A) and TDS concentration (mg/L) (Panel B) at station MEL-01 (near-field) for samples collected between July 2015 and September 2019 at Meliadine Mine.



Notes:

Ionic composition was calculated as: $TDS_{calculated\ (mg/L)} = \sum[Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, F^-, SO_4^{2-}, SiO_3^{2-}, 4.42 \times NO_3^- \ (as\ N), 0.6 \times total\ alkalinity\ (as\ CaCO_3)]$.

Data for ionic composition from near-field (MEL-01) was collected from stations MEL-01-01, MEL-01-06, MEL-01-07, and MEL-01-08 between July 2015 and September 2019.

A1.2 Benchmarks from Other Sites

Currently, there is no federal, Provincial or Territorial water quality guideline for TDS in Canada. Several US States have developed state or site-specific TDS criteria focussed on the protection of aquatic life. In Alaska, TDS criteria range from 500 to 1,500 mg/L (ADEC 2009), depending on the TDS composition and whether the receiving environment is potential salmon spawning habitat. Permits are required for discharges to receiving water that result in an increase in TDS concentration in the waterbody between 500 and 1,000 mg/L. Chapman et al. (2000) reported that studies conducted for Coeur Alaska's Kensington Mine site resulted in the first site-specific TDS permit in Alaska. The permit states that TDS may not exceed 1,000 mg/L in Sherman Creek, the receiving waterbody of Kensington Mine effluent (ADEC 2017). Alaska also granted a site-specific permit for Red Dog Mine effluent (ADEC 2013; Brix et al. 2010). Concentrations of TDS up to 1,500 mg/L are permitted during periods when salmonids are not spawning, provided calcium is greater than 50% by weight of the total cations (ADEC 2013; Brix et al. 2010). During spawning periods, the limit was set at 500 mg/L (Brix et al. 2010). However, the studies used to establish the Alaskan TDS water quality criterion were based on ionic compositions dominated by calcium sulphate, whereas the Meliadine effluent and near-field TDS is predominantly sodium chloride and calcium chloride (Chapman et al. 2000; Brix et al. 2010). Therefore, these benchmarks are not directly applicable to Meliadine Mine.

In 2004, the Iowa Department of Natural Resources (IDNR) adopted an interim TDS standard of 1,000 mg/L in receiving streams; the standard was used as a screening value to determine whether site-specific toxicity testing was required (IDNR 2009). However, IDNR since recommended replacing the TDS standard with numerical sulphate and chloride criteria (IDNR 2009) under the assumption that the individual ions provide a more defensible basis for evaluating toxicity relative to the sum of the ions.

The Snap Lake Mine in the Northwest Territories currently has a site-specific water quality objective (SSWQO) for TDS of 1,000 mg/L (Golder 2014; Chapman and McPherson 2015). The SSWQO was derived following toxicity testing with multiple receptor groups (fish, invertebrates, and plants) using a TDS ionic composition specific to Snap Lake Mine dominated by chloride, calcium, and sodium. The typical composition of Snap Lake water includes ~45% to 47% chloride, 20% to 21% calcium, 10% to 11% sodium, 9% sulphate, 5% to 7% carbonate, 4% nitrate, and 2% to 3% magnesium, with minor contributions from potassium and fluoride. This composition is broadly similar to that of Meliadine effluent. The test species and effects endpoints for the TDS SSWQO dataset, as reported by Chapman and McPherson (2015) and discussed in detail in Golder (2014), are presented in Table A-2. Additional testing was also conducted with the non-resident water flea, *Ceriodaphnia dubia*. As discussed by Chapman (2014a) the results from multiple rounds of testing with *C. dubia* were highly variable (potentially confounded by laboratory artifacts) and could not be relied upon to derive a protective SSWQO for Snap Lake Mine. Because species of the genus *Ceriodaphnia* do not reside in Snap Lake, species of the genus *Daphnia* are observed in Snap Lake, the chronic reproduction *D. magna* results were considered more representative of daphnids in Snap Lake. Following a resident taxa approach for deriving a SSWQO using the dataset in Table A-2, the TDS SSWQO for Snap Lake was set as 1,000 mg/L. The SSWQO was considered protective of aquatic life, and "if not exceeded, will avoid harm to the Snap Lake ecosystem" (Chapman 2014a, p.5). As discussed by Chapman (2014c), the results of toxicity testing do not indicate that an exceedance above 1,000 mg/L TDS will result in harm to aquatic life but provide "reasonable certainty of no harm up to 1,000 mg/L" (Chapman 2014a, p.5).

Table A-2: Chronic toxicity testing dataset for Snap Lake TDS SSWQO as summarized by Chapman and McPherson (2015)

Test Species	Common Name	Life stage	Test Duration	Endpoint	Test Statistic[(a)]	Result (mg/L TDS)	Reference
Salvelinus namaycush	Lake Trout	early life-stage		dry fertilization survival	LC_{20}	990	Baker et al. 2015
				dry fertilization growth	IC_{20}	>1,490	
				wet fertilization survival	LC_{20}	>1,480	
				wet fertilization growth	IC_{20}	>1,480	
Daphnia magna	water flea	<24 hr	21-d	reproduction	IC_{20}	>1,100	Chapman 2014b
Brachionus calyciflorus	rotifer		48-hr	population	IC_{10}	>1,330	Chapman 2014c
Chironomus dilutus	chironomid		10-d	growth	IC_{10}	>1,390	Chapman 2014c
Thymallus arcticus	Arctic Grayling	early life-stage		dry fertilization survival	LC_{20}	>1,420	Baker et al. 2015
				dry fertilization growth	IC_{20}	>1,420	
				wet fertilization survival	LC_{20}	>1,410	
				wet fertilization growth	IC_{20}	>1,410	
Pseudokirchneriella subcapitata	green alga	population	72-h	growth	IC_{10}	>1,470	Chapman 2014c
Navicula pelliculosa	diatom	population	120-h	growth	IC_{10}	>1,490	Chapman 2014c
Cyclops vernalis	copepod		20-d	growth	IC_{20}	>1,510	Marus et al. 2015; Chapman 2014c; Chapman 2014a
Pimephales promelas	Fathead Minnow	early life-stage	32-d	hatching, survival and growth	IC_{20}	>2,200	Chapman 2014c

Notes:

(a) As reported in Chapman and McPherson (2015) for the "*lowest reliable, technically defensible endpoint for each test*." A discussion of the selection of endpoints is provided in Golder (2014).

mg/L = milligrams per litre; TDS = total dissolved solids; LC_x = lethal concentration causing a lethal effect to x% of the test population; IC_x = inhibitory concentration that causes an x% inhibitory effect in the sublethal endpoint being measured.

The Snap Lake SSWQO validation excluded test results for the water flea, *C. dubia,* because multiple rounds of testing produced highly variable effect concentrations that were not reliable. Variability in the reproductive endpoint for *C. dubia* was attributed to confounding factors associated with the testing laboratory (e.g., dilution and acclimation water), and such variations have also been reported elsewhere (Lasier et al. 2006; Pacholski et al. 2016; Mount et al. 2016). Golder (2011; 2014) and Chapman and McPherson (2015) concluded that *D. magna* are more relevant surrogate for resident cladoceran species in Snap Lake mine because zooplankton surveys in Snap Lake reported the genus *Daphnia* but not the genus *Ceriodaphnia*. The same logic would apply for Meliadine Lake, where zooplankton surveys conducted as part of Aquatic Effects Monitoring in 2015, 2016, and 2017 reported *Daphnia* presence but not *Ceriodaphnia* (Golder 2019).

A1.3 Review of Chronic Toxicity Literature

Golder (2011; 2014) conducted an extensive literature review for total dissolved solids that was updated by Chapman and McPherson (2015); the literature review is presented in Appendix A of Golder (2011; 2014) and summarized in Chapman and McPherson (2015). This literature is separate from the values derived from site-specific toxicity testing at Snap Lake Mine as reported in Table A-2. Golder (2011; 2014) and Chapman and McPherson (2015) concluded that the toxicity of TDS was highly dependent on the ionic composition, the species tested, and the life stage; they identified the following trends for generic TDS mixtures:

- Phytoplankton—overall high tolerance of phytoplankton to TDS toxicity with effect concentrations higher than 1,000 mg/L.
- Benthic invertebrates—in general, adverse effect concentrations were above 1,000 mg/L, with the following exceptions. Relatively high sensitivity was reported for oligochaete worms (96-hour immobilization EC_{50} of 281 mg/L calcium chloride to the oligochaete worm *Tubifex*; Khangarot 1991), and the glochidia of a freshwater mussel (48-hour EC_{50} of 560 mg/L sodium chloride to glochidia of *Lampsilis fasciola*; Bringolf et al. 2007). Lower effect concentrations were also reported for the fingernail clam (*Sphaerium simile*; 96-hour survival LC_{50} of 740 mg/L; GLEC and INHS 2008; Soucek et al. 2011) but these represented individual ion exposure, which may not accurately predict chloride toxicity under mixture conditions.
- Zooplankton—cladoceran species were generally the most sensitive to TDS. Effect concentrations for calcium chloride salts ranged from 600 to 7,000 mg/L. A review of the chronic dataset presented by Golder (2011; 2014) indicated that effect concentrations for sodium chloride generally ranged from 750 mg/L (7-d reproduction no-effect concentration (NOEC) for *C. dubia*; Cooney et al. 1992) to 2,400 mg/L (7-d survival lowest effect concentration for *C. dubia*; Cooney et al. 1992).
- Fish—the sensitivity of fish to TDS toxicity varied by life-stage, with fertilization and egg-hardening life stages identified as the most sensitive toxicological endpoints. Fish were also generally less sensitive to TDS toxicity than zooplankton, with effect concentrations for calcium chloride ranging from 4,600 mg/L to greater than 15,000 mg/L. A review of the chronic dataset presented by Golder (2011; 2014) indicated that effect concentrations for sodium chloride generally ranged from 800 mg/L (8-d NOEC *Oncorhynchus mykiss*; Camargo and Tarazona 1991) to 8,000 mg/L (7-d NOEC *Pimephales promelas*; Pickering et al. 1996).

Lower effect concentrations have been reported for individual ions for select species, but these tests reflect exposure conditions accounting for a single ion, and not a balanced TDS mixture representative of most field conditions. A review of the literature indicates that when accounting for toxicity for TDS the following observations apply as summarized by Chapman and McPherson (2015):

- TDS toxicity is lower with the presence of more than one cation.
- Hardness may ameliorate TDS toxicity and the toxicity of individual ions (e.g., chloride and sulphate).
- The relative ratios of ions within the TDS mixture may affect TDS toxicity (e.g., Ca^{2+}:Mg^{2+}).

More recent research by Mount et al. (2016) support the conclusions by Chapman and McPherson (2015). Following extensive toxicity testing exposing *C. dubia* to different salt mixtures, Mount et al. (2016) concluded that inferring toxicity from individual ions is difficult due in part to interdependence among ions. Buchwalter et al. (2013) concluded that TDS toxicity is complicated by the findings that:

1) individual ions vary in toxicity;

2) some ions in solution can modify the toxicity of other ions; and

3) relative toxicities of ions are not consistent across species.

The results from Mount et al. (2016) also support the conclusion that toxicity of TDS mixtures varies by ionic composition, and that the characteristics of the TDS mixture influence the toxicity of other ions in the mixture.

A1.4 Site-Specific Chronic Toxicity Data

The information from the literature discussed in Section A1.3, particularly for Snap Lake, provides an indication of chronic exposure levels for TDS that are protective of aquatic life in a northern freshwater ecosystem. However, the identified importance of ionic composition means that site-specific results should carry the greatest weight in the interpretation of biological and ecological significance.

Chronic toxicity testing data and corresponding water chemistry data have been collected by Agnico Eagle as part of routine and regulatory monitoring at stations MEL-14 (treated effluent), and MEL-12 (influent from the water treatment plant). Chronic toxicity tests performed (all standard Environment Canada test protocols commonly applied in the Canadian environmental effects monitoring framework) were:

- Biological Test Method: Test of Reproduction and Survival Using the Cladoceran, *Ceriodaphnia dubia* (EC 2007a)
- Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows (EC 2011)
- Biological Test Method: Growth Inhibition Test Using a Freshwater Alga (EC 2007b)
- Biological Test Method: Test for Measuring the Inhibition of Growth Using the Freshwater Macrophyte, *Lemna minor* (EC 2007c)

Chronic toxicity test results and corresponding water chemistry data for calculated TDS (and measured) and chloride are presented in Table A-3. The results of the chronic testing indicate:

- No effects to *C. dubia* survival at TDS concentrations up to and including 2,357 mg/L (measured TDS of 2,450 mg/L). Reduced *C. dubia* reproduction was observed at TDS concentrations between 1,140 mg/L to 2,202 mg/L (measured TDS of 1,360 to 2,490 mg/L).
- No effects to Fathead Minnow survival or growth at TDS concentrations up to and including 2,357 mg/L (measured TDS of 2,450 mg/L).
- Growth inhibition to *P. subcapitata* was observed in two samples collected in September and October 2019 at TDS concentrations of 2,202 mg/L and 2,357 mg/L, respectively (measured TDS of 2,490 mg/L and 2,450 mg/L, respectively). However, follow up testing conducted in October indicated no effect to growth inhibition at a TDS concentration of 2,350 mg/L (measured TDS of 2,370 mg/L). No effect to growth inhibition was observed in remaining samples at TDS concentrations up to and including 1,140 mg/L (measured TDS of 1,360 mg/L).
- Effects to *L. minor* frond count were observed at TDS concentrations between 2,202 mg/L to 2,357 mg/L (measured TDS of 2,490 mg/L to 2,450 mg/L). Although effects to *L. minor* frond count were occasionally observed at TDS concentrations of approximately 1,000 mg/L the effect was not consistently observed. For example, no effect to frond count (IC_{25} >97% vol/vol) was observed on three occasions at TDS

concentrations ranging between 800 to 1,140 mg/L (measured TDS of 1,130 to 1,360 mg/L). Effects to *L. minor* biomass were observed in two of eight samples at TDS concentrations of 1,011 mg/L and 2,357 mg/L (measured TDS 1,260 mg/L to 2,450 mg/L). No effects to *L. minor* biomass were observed in six of eight samples at TDS concentrations of 800 to 2,350 mg/L (measured TDS of 1,130 mg/L to 2,370 mg/L).

In summary, multiple rounds of chronic toxicity testing indicate no effects to survival of fish or crustaceans across a wide range of TDS concentrations (i.e., unbounded no-effect level of 2,357 mg/L), and no reliable indications of sublethal toxicity have been observed at 1,000 mg/L. Moderate to high magnitude sublethal responses to *C. dubia* and aquatic plants/algae are evident at calculated TDS concentrations that exceed 2,000 mg/L. Collectively, these results provide evidence that the interim TDS target for Snap Lake of 1,000 mg/L remains protective for Meliadine Lake. A higher threshold TDS concentration protective of aquatic life may be supportable once the validation study (Phase 2 of WQ-MOP) is complete.

Table A-3: Chronic toxicity data for MEL-14 and MEL-12 samples collected between 2018 to 2019 with corresponding total dissolved solids and chloride concentrations

Sample Location	Sample Date	Chronic Toxicity							Water Chemistry (mg/L)		
		Water flea *Ceriodaphnia dubia*		Fathead minnow *Pimephales promelas*		Green alga *P. subcapitata*	Duckweed *Lemna minor*				
		3-brood Survival LC_{50} (% vol/vol)	3-brood Reproduction IC_{25} (% vol/vol)	7-d Survival LC_{50} (% vol/vol)	7-d Growth IC_{25} (% vol/vol)	72-hr Cell Inhibition IC_{25} (% vol/vol)	7-d Frond Count IC_{25} (% vol/vol)	7-d Biomass IC_{25} (% vol/vol)	Measured TDS	Calculated TDS	Chloride
MEL-14	07 August 2018	>100	>100	>100	>100	>90.9	72.3	>97	1,140[a]	958[a]	530[a]
	13 August 2018	—	—	>100	>100	>90.9	38.2	42	1,260	1,011	590
	3 September 2018	>100	90.1	>100	>100	>90.9	>97	>97	1,360	1,140	660
	9 July 2019	—	—	—	—	—	>97	>97	1,190	965	500
	13 August 2019	—	—	—	—	—	>97	>97	1,130	800	410
MEL-12	24 September 2019	>100	24.3	>100	>100	60.8	26.3	>97	2,490	2,202	1,100
	1 October 2019	>100	58.8	>100	>100	88.2	29.4	66.2	2,450	2,357	1,200
	8 October 2019	>100	20.1	>100	>100	>90.9	59	>97	2,370	2,350	1,200

Notes:

(a) Corresponding water chemistry data was not collected for this sample. However, a sample collected on 5 August 2018 from the same location is reported here for comparison.

mg/L = milligrams per litre; vol/vol = volume per volume; TDS = total dissolved solids; LC_X = lethal concentration causing a lethal effect to x% of the test population; IC_X = inhibitory concentration that causes a x% inhibitory effect in the sublethal endpoint being measured.

A1.5 Weight of Evidence Summary for Proposed Site-Specific Water Quality Objective

An interim TDS target of 1,000 mg/L to apply at the edge of the mixing zone was proposed following integration of information obtained through characterization of the Meliadine TDS profile (Section A1.1), review of water quality benchmarks for TDS developed for similar mixtures (Section A1.2), a literature review of TDS toxicity (Section A1.3), and a review of site-specific chronic toxicity data for Meliadine treated effluent and influent samples (Section A1.4). Sections A1.5.1 to 1.5.4 summarize the weight of evidence behind the proposed interim TDS target.

Several considerations, summarized in Sections A1.5.1 through A1.5.4, provide confidence in the application of the interim TDS target and also bode well for outcomes of the Phase 2 validation studies. The literature and site-specific data review provide a basis to propose an interim target for TDS; implementation of Phase 2 validation studies will provide increased precision and reliability in the interim target.

A1.5.1 Ionic Balance is Favorable

Effect concentrations reported in the Snap Lake dataset were derived from exposures using a balanced TDS mixture, whereas effect concentrations from the literature are generally derived from exposures using single salt mixtures (e.g., sodium chloride or calcium chloride) that do not consider TDS mixture effects. Meliadine TDS ionic composition resembles the ionic composition evaluated during the validation of the Snap Lake TDS SSWQO of 1,000 mg/L. As indicated in Section A1.0, Meliadine TDS contains a high relative proportion of calcium and sodium ions (on average 31% of TDS); these dominant ions are among the least toxic according to Mount et al. (1997), and have been identified as key components of TDS that ameliorate toxicity of other ions (Davies and Hall 2007, Mount et al. 2016, Soucek et al. 2018, Scheibener et al. 2017). Concentrations of the relatively toxic potassium and magnesium ions are predicted to remain low in Meliadine effluent; potassium and magnesium ions make up approximately 4% to 5% of TDS in effluent and the near-field. The information from the ionic composition analysis (Section A1.0), and comparison to the Snap Lake TDS SSWQO dataset (Section A2.0), although not conclusive, suggests that the Meliadine TDS mixture would not exhibit chronic toxicity from TDS components at concentrations of TDS below approximately 1,000 mg/L. Some literature studies indicate toxicity to select invertebrate species at concentrations below 1,000 mg/L TDS, but these toxicity tests are limited to test solutions that contain predominantly one or two ions, which do not apply to the complex mixture conditions of Meliadine TDS, nor incorporate the beneficial effect of calcium and sodium for ameliorating toxicity of other ions in these mixtures.

A1.5.2 Comparability to Well-Validated Snap Lake

Effect concentrations derived from extensive validation of the SSWQO at Snap Lake mine indicated no effects to site-resident or relevant surrogate species below 1,100 mg/L TDS. The effect concentration for *D. magna*, the most sensitive species in the dataset, was unbounded indicating no effects at the highest tested TDS concentration. Unbounded effect concentrations were also reported for all other test species in the Snap Lake dataset. Therefore, concentrations of TDS above 1,000 mg/L may pose no risk to aquatic life but there is uncertainty in proposing an interim TDS target to apply at the edge of the mixing zone of higher than 1,000 mg/L because exposure concentrations used in the Snap Lake dataset did not reach toxicity thresholds for the species tested.

A1.5.3 Available Site-Specific Toxicity Data Support the Benchmark

The chronic toxicity data tested with Meliadine mixtures supports the proposed interim target to apply at the edge of the mixing zone of 1,000 mg/L (Section A4.0). During routine and regulatory chronic toxicity testing with

MEL-14 and MEL-12 samples, no chronic effects to *C. dubia* survival, early life-stage Fathead Minnow survival or growth, or growth of the green alga *P. subcapitata* were observed at TDS concentrations of approximately 1,140 mg/L (measured TDS of 1,360 mg/L). The reduction of *C. dubia* reproduction at 1,140 mg/L (measured TDS of 1,360 mg/L) was not large (IC_{25} for reproduction of 90.1% vol/vol at TDS concentrations of 1,140 mg/L). Overall, these results support the proposed interim TDS target of 1,000 mg/L to apply at the edge of the mixing zone, but site-specific validation is necessary to verify these results and develop a TDS SSWQO for long-term application.

A1.5.4 Ionic Balance is Stable

The stable ionic balance over several years of monitoring (Figure 2) is suited to development of a single benchmark for TDS, without requiring development of individual benchmarks for component ions. The TDS interim target incorporates contributions from chloride and sulphate (along with other ionic components) and it is not recommended at this time that separate benchmarks be developed for chloride and sulphate as individual ions. However, the concentrations of individuals ions can be prorated from the recommended TDS interim target of 1,000 mg/L. For Meliadine TDS, the relative proportion of chloride at the recommended interim target of 1,000 mg/L would range between 280 to 520 mg/L, depending on the ionic composition. The upper bound of chloride proportion is based on an ionic composition derived from TDS in the effluent; it is anticipated that the ionic composition for TDS in the receiving environment would not have as high a proportion of chloride as effluent. For comparison, Snap Lake TDS including chloride of up to approximately 450 to 470 mg/L demonstrated negligible toxicity.

The proposed TDS interim target to apply at the edge of the mixing zone was derived from the anticipated ion composition for Meliadine based on monitoring data for effluent and near-field. Modelled chemistry data are not available for the ionic composition anticipated under future discharge conditions at Meliadine, requiring confirmation that ionic mixtures are expected to remain consistent in terms of proportions of major ions. If future effluent quality with respect to TDS constituents is markedly different, then re-evaluation of the proposed TDS threshold may be warranted.

A2.0 INTERIM TDS TARGET FOR EFFLUENT—SITE-SPECIFIC ACUTE TOXICITY RESULTS

Acute toxicity testing data and corresponding water chemistry data were collected by Agnico Eagle as part of routine and regulatory monitoring at stations MEL-14 (treated effluent), MEL-12 (influent from the water treatment plant), and CP1 (Collection Pond 1). Acute toxicity tests performed were:

- Biological Test Method: Reference Method for Determining Acute Lethality of Effluent to *Daphnia magna* (EC 2000a).
- Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout (EC 2000b).
- Biological Test Method: Acute Lethality Test Using Threespine Stickleback (*Gastrosteus aculeatus*) (ECCC 2017).

Acute toxicity test species include the standard protocols (*D. magna* and Rainbow Trout) used to assess compliance for acute lethality under the Metal and Diamond Mining Effluent Regulations (Government of Canada 2002). Two additional tests were conducted with Threespine Stickleback in November and December 2019. The Threespine Stickleback results were included for comparative purposes, although this species is currently not a required standard test species for regulatory testing related to discharge of effluent to Meliadine Lake. Acute toxicity test results and corresponding water chemistry data for TDS (measured and calculated) and chloride are presented in Table A-4.

Acute toxicity testing conducted between 2017 to 2020 with influent (MEL-12 and CP1) and effluent (MEL-14) has indicated no acute toxicity (i.e., LC_{50} >100% vol/vol) to *D. magna* or Rainbow Trout survival with TDS concentrations of up to and including 5,420 mg/L (measured TDS concentrations of up to 4,925 mg/L). Reduced survival (60% in full-strength sample) in Rainbow Trout was observed in a CP1 sample collected 17 December 2017 at TDS concentration of 3,150 mg/L. However, mortality did not exceed 50%, and since 2017 several samples have been tested with measured and TDS concentrations greater than 3,150 mg/L, all of which indicated no acutely toxic effects to Rainbow Trout.

Threespine Stickleback were tested on two occasions in November and December 2019 with CP1 sample. Measured TDS concentrations of up to and including 3,410 mg/L did not result in acutely toxic effects in Threespine Stickleback.

Table A-4: Acute toxicity data for MEL-14, MEL-12, and CP1 samples collected between 2017 to 2020 with corresponding total dissolved solids and chloride concentrations

Sample Location	Sample Date	Acute Toxicity			Water Chemistry (mg/L)		
		Daphnia magna	Rainbow Trout *Oncorhynchus mykiss*	Threespine Stickleback *Gastrosteus aculeatus*	Measured TDS	Calculated TDS	Chloride
		48-hour Survival LC_{50} (% vol/vol)	96-hour Survival LC_{50} (% vol/vol)	96-hour Survival LC_{50} (% vol/vol)			
MEL-14	9 August 2017	>100	>100	—	1,600	911	470
	27 August 2017	>100	>100	—	1,760	1,061	580
	24 June 2018	>100	>100	—	1,200	634	300
	1 July 2018	>100	>100	—	930	752	400
	5 August 2018	>100	>100	—	1,140	958	530
	3 September 2018	>100	>100	—	1,360	1,140	660
	24 June 2019	>100	>100	—	915	859	450
	9 July 2019	>100	>100	—	1,190	965	500
	3 September 2019	>100	>100	—	1,300	1,070	530
CP1	21 June 2017	>100	>100	—	1,190	575	290
	12 July 2017	>100	>100	—	908	707	350
	05 November 2017	—	>100	—	2,230	— (b)	— (b)
	11 November 2017	>100	>100	—	2,791	— (b)	— (b)
	19 November 2017	>100	>100	—	— (c)	— (b)	— (b)
	17 December 2017	>100	NC (60% survival)(d)	—	3,150	— (b)	— (b)
	10 June 2018	>100	>100	—	685	477	210
	17 June 2018	>100	>100	—	540	281	180
	25 November 2019	—	—	>100	2,960	3,055	1,500
	15 December 2019	—	—	>100	3,410	— (b)	— (b)
	05 January 2020	>100	>100	—	4,830	4,465	2,400
	12 January 2020	>100	>100	—	4,150	3,815	1,900

Sample Location	Sample Date	Acute Toxicity			Water Chemistry (mg/L)		
		Daphnia magna	Rainbow Trout *Oncorhynchus mykiss*	Threespine Stickleback *Gastrosteus aculeatus*	Measured TDS	Calculated TDS	Chloride
		48-hour Survival LC_{50} (% vol/vol)	96-hour Survival LC_{50} (% vol/vol)	96-hour Survival LC_{50} (% vol/vol)			
	26 January 2020	>100	>100	—	4,160	3,659	1,900
	02 February 2020	>100	>100	—	4,080	4,263	2,100
	09 February 2020	>100	>100	—	4,330	4,219	2,100
	16 February 2020	>100	>100	—	4,880	4,352	2,300
	01 March 2020	>100	>100	—	5,350	4,946	2,500
	08 March 2020	>100	>100	—	4,870	4,816	2,400
	15 March 2020	>100	>100	—	5,420	4,925	2,500
MEL-12	24 September 2019	>100	>100	—	2,490	2,202	1,100
	01 October 2019	— (e)	>100	—	2,450	2,357	1200
	08 October 2019	>100	>100	—	2,370	2,350	1,200

Notes:

(a) Test was conducted with full-strength sample (100% vol/vol) and laboratory control.

(b) Corresponding major ion chemistry data were not measured in this sample; therefore, calculated TDS could not be determined.

(c) Corresponding water chemistry data were not collected for this sample.

(d) A 96-hour LC_{50} could not be calculated because this test was conducted as a screening (pass/fail) test, whereby full-strength (100% vol/vol effluent) sample was tested with a laboratory control. To estimate the LC_{50} a multi-concentration dilution series must be conducted. The result reported here in brackets is percent survival in the full-strength effluent sample.

(e) Due to a laboratory error during testing with *Daphnia magna* the results of the 1 October 2019 test were invalidated and were not reported by the laboratory.

TDS = total dissolved solids; MEL-14 = treated effluent; MEL-12 = untreated influent; CP1 = Containment Pond 1; mg/L = milligrams per litre; LC_X = lethal concentration causing a lethal effect to x% of the test population; vol/vol = volume per volume; NC = not calculable.

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APPENDIX B

Plume Delineation Study Design

B.1 INTRODUCTION

The Meliadine Gold Mine (Mine) is located in the Kivalliq District of Nunavut near the western shore of Hudson Bay, in Northern Canada (Figure 1). The nearest community is Rankin Inlet (coordinates: 62°48’35’’N;092°05’58’’W), approximately 25 km south of the Tiriganiaq deposit (coordinates: 63°01’03’’N, 92°12’03’’W). The Mine is located within the Meliadine Lake watershed of the Wilson Water Management Area (Nunavut Water Regulations Schedule 4).

As communicated to the Nunavut Water Board (NWB) by Agnico Eagle Mines Limited (Agnico Eagle), the 2020 freshet season will result in accumulation of site water that exceeds the water storage capacity of the mine at containment pond 1 (CP1), requiring a managed release of site water to the environment. In anticipation of this condition, Amendment 1 was approved by NWB for the Meliadine Mine Type “A” Water Licence (No. 2AM-MEL-1631), allowing Meliadine to dewater CP1 prior to freshet, avoiding “emergency” conditions. Specifically, Amendment 1 permits the following:

- *The time-limited discharge (May 2020 – October 2020) of effluent from the Containment Pond 1 (CP1) into Meliadine Lake through the Meliadine Lake Diffuser (Monitoring Program Station MEL-14) and the Water discharge shall not exceed 3,500 mg/L for the Maximum Average Concentration (MAC) of the Total Dissolved Solids (TDS)*

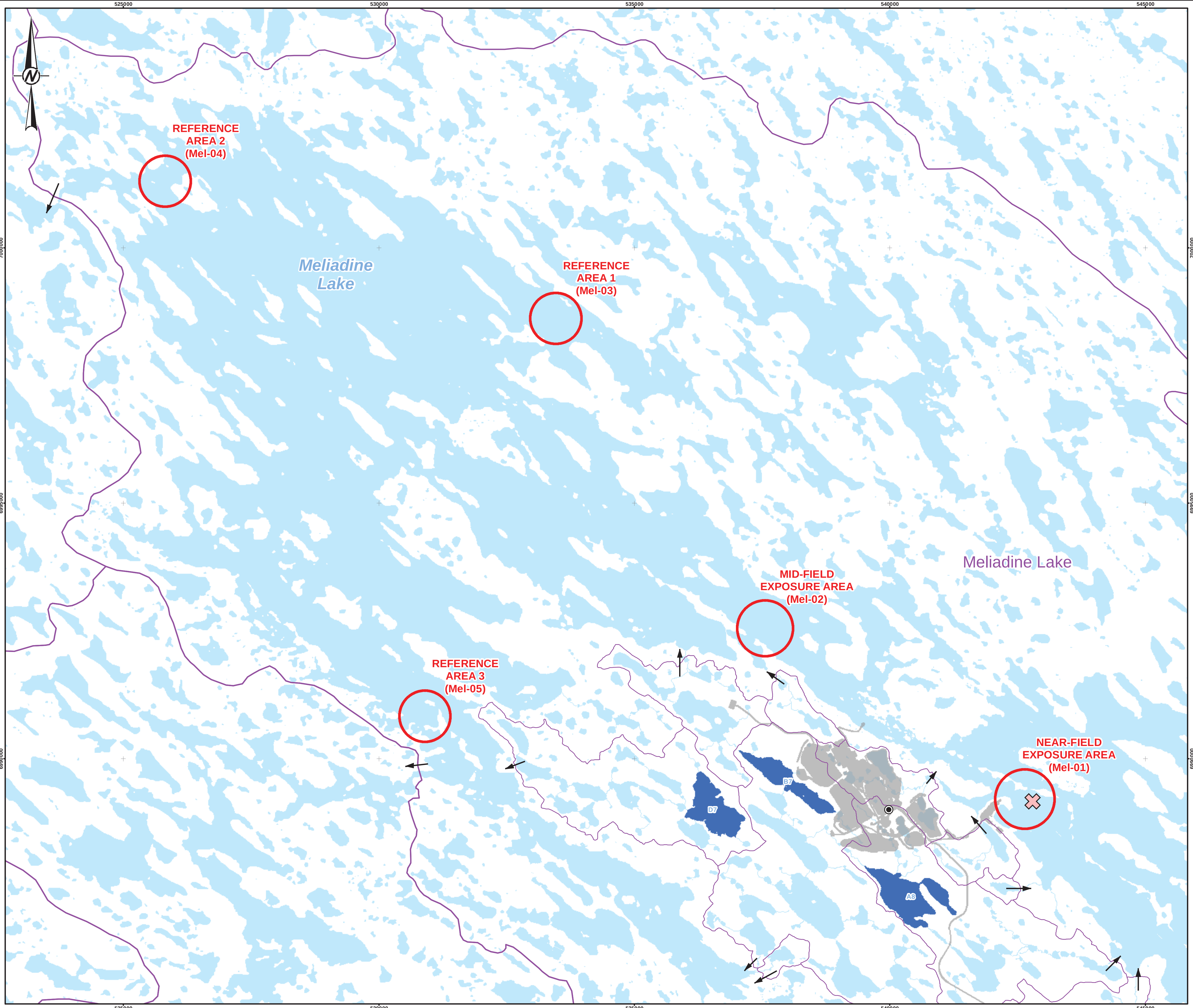
The NWB approval is contingent on several conditions outlined in NWB’s (2020) Reason for Decision. Among these conditions is the requirement for Agnico Eagle to conduct a Plume Delineation Study during the discharge event to characterize plume dispersion in the receiving environment of Meliadine Lake. The purpose of the Plume Delineation Study is to provide confidence that the dispersion of the CP1 discharge will follow the anticipated pattern of flow and mixing in the receiving environment, such that environmental protection objectives at the edge of the mixing zone will be satisfied.

A submerged diffuser was installed in Meliadine Lake in August 2017 to disperse the water discharged from containment ponds 1 and 5 (CP1 and CP5). The diffuser is 30 m long, 400 mm diameter, with a nearly north-south orientation, and connected to the pipelines through a T-connection. Ten 51 mm ports are evenly spaced at every 3 m along the diffuser (Tetra Tech 2017).

This document provides details on the proposed plume delineation study (e.g., sampling design and methods) to evaluate plume dispersion dynamics during the planned release of effluent from CP1. This plan has been designed to address reporting requirements under Amendment 1 for a Plume Delineation Study, as outlined in Insert Item 25, Part I of NWB’s (2020) Reasons for Decision. The period of anticipated discharge is expected to commence during ice cover on Lake Meliadine and continue through the transition period between ice cover and open water conditions, and into open water conditions on Meliadine Lake. Safe boat access to the lake is required to successfully conduct the plume delineation study. Therefore, the detailed plume delineation study will be conducted over 1 to 2 days as soon as open water conditions permit safe boat access.

B.2 BACKGROUND INFORMATION

Turbulent mixing caused by the diffusers results in an initial effluent plume adjacent to the diffusers. The term “plume” in this report refers to the mixture of effluent and lake water that is chemically distinguishable from the surrounding ambient lake water.



LEGEND

DIFFUSER

MINE FOOTPRINT

WATERSHED BOUNDARY

WATERCOURSE

WATERBODY

0 1.5 3

1:75,000 KILOMETRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

SITE LOCATION

CONSULTANT

GOLDER

YYYY-MM-DD	2018-07-04
DESIGNED	ER
PREPARED	MH
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
1787610	5000/5010	A	1

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The diffuser in Meliadine Lake is oriented on a nearly north-south alignment, forming a “T” at the end of the pipe (Tetra Tech 2018; Figure 1). The constructed diffuser differed from the original project design (see Tetra Tech 2017) in terms of its horizontal position and depth of diffuser system at T-connection (42 m horizontal shift and a 3.2 m shallower depth). Therefore, the performance of the diffuser system was reassessed by Tetra Tech (2018). Despite the deviations from the original design, the predicted minimum dilution of 23:1 was achieved at the edge of the mixing zone, and water quality criteria were met (Tetra Tech 2018).

Based on previous experience in low conductivity sub-arctic lakes, specific conductivity was considered an appropriate tracer to delineate the effluent plume in Meliadine Lake, because effluent conductivity (i.e., specific conductance, temperature-corrected to 25°C) is higher than the specific conductivity of natural lake water. Specific conductivity measurements are a rapid, inexpensive, and reliable way of measuring the ionic content in a solution; the main constituents of interest in Meliadine Lake discharge are ionic parameters (e.g., chloride and other components of total dissolved solids). Specific conductivity in CP1 ranged from 5,300 to 9,000 microsiemens per litre (µS/cm) between November 2019 and March 2020 (Appendix A), whereas specific conductivity in Meliadine Lake (Near-field exposure area) ranged from 49 to 99 µS/cm in 2017 (Golder 2018c). This gradient in specific conductivity provides a reliable basis for tracing the direction and intensity of the plume during the release event, with chemical measurements from samples collected at select monitoring stations used to confirm the water quality details.

B.3 METHODS

B.3.1 Sampling Design

The sampling design selected for the plume delineation in Meliadine Lake is a nearly radial model that allows measurement of plume dispersion in all directions. According to the *MVLWB/GNWT Guidelines for Effluent Mixing Zones* (GNWT 2017), the regulated mixing zone is defined as an area where concentrations of some substances may not comply with site-specific water quality objectives for the receiving environment, but is nevertheless suitable for reducing constituent concentrations from full strength discharges to those that provide protection against chronic effects to aquatic life. For lakes in the Mackenzie Valley, regulated mixing zones commonly have a maximum of 100 m radius from the discharge point (GNWT 2017). In contrast, site characterization under the MDMER/MMER (GC 2017) requires a description of the manner in which the effluent mixes within the exposure area at 250 m from each final discharge point. Using these distances as a basis for monitoring design, a modified radial grid containing 22 sampling stations was developed (Figure 2). Coordinates of sampling stations are provided in Table 1.

Table 1: Coordinates of plume delineation study sampling stations

Sample ID	UTM Coordinates (NAD 83, Zone 15V)	
	Easting	Northing
50-01	542803.3	6989212.3
50-02	542847.2	6989144.7
50-03	542792.6	6989085.7
50-04	542748.4	6989153.2
100-01	542807.5	6989262.1
100-02	542875.5	6989226.9
100-03	542897.3	6989140.6
100-04	542861.3	6989059.1

Sample ID	UTM Coordinates (NAD 83, Zone 15V)	
	Easting	Northing
100-05	542788.4	6989035.9
100-06	542719.9	6989070.2
100-07	542699.0	6989157.3
100-08	542728.6	6989233.4
175-01	542813.8	6989336.8
175-02	542971.8	6989134.3
175-03	542782.1	6988961.1
175-04	542624.1	6989163.6
250-01	543046.7	6989128.0
250-02	542958.1	6988944.5
250-03	542775.8	6988886.4
250-04	542605.4	6988972.9
250-05	542549.2	6989170.0
250-06	542622.9	6989339.8

Two central markers are depicted in Figure 2 that outline the north and south ends of the diffuser, which is approximately 30 m in length. From each of these central markers, semicircles of 50, 100, 175, and 250 m were drawn, and within each arc, sampling stations have been placed along up to eight transects radiating from the diffuser (Figure 2). The number of stations at each distance varied, with the larger station numbers applied to the 100 m and 250 m distances. Some of the candidate sampling stations along transects were removed from the design as they were located on islands or shallow areas of Meliadine Lake.

The distances from sampling stations to central markers (i.e., diffuser ends) were selected to provide higher resolution close to the diffusers and to characterize the edge of the mixing zone per the GNWT and MDMER frameworks.

B.3.2 Field Work Instructions

As described by Golder (2018a), the method selected for plume delineation relies on vertical profiles of specific conductivity in near-field exposure areas of Meliadine Lake. Vertical profiles of the lake water column will be measured using water quality meters (e.g., Hanna, YSI, Eureka, or equivalent) equipped with a 20 m or longer cable. Before commencing the profile, the water quality sensor will be placed in lake water for at least one minute to allow readings to stabilize. If, following extended submersion (beyond one minute if necessary), the equipment is not providing stable readings, measurements will be taken using a different meter.

At each sampling station, profile measurements will be taken from surface (i.e., 0.3 m) and at 1-m water depth intervals, starting from 1 m below surface to 1 m above the lake bottom. Temperature and specific conductivity (and if possible, dissolved oxygen concentration, dissolved oxygen saturation, and pH) will be entered on field data sheets. If possible, wind direction and speed will be estimated and recorded.

A maximum of ten water samples will be collected from a subset of the planned sampling stations for laboratory analysis of TDS, major ions, and general parameters (i.e., total and bicarbonate/carbonate alkalinity, turbidity, laboratory specific conductivity, hardness, laboratory pH, and total suspended solids). These samples will be collected from the depth of highest specific conductivity through the water volume at these stations, as determined from the specific conductivity water column profile. Samples identified for more detailed analyses will be selected to encompass the range of specific conductivity measures observed surrounding the diffuser. These data will be used to validate the assumption that TDS concentrations in the receiving environment can be adequately traced using specific conductivity.

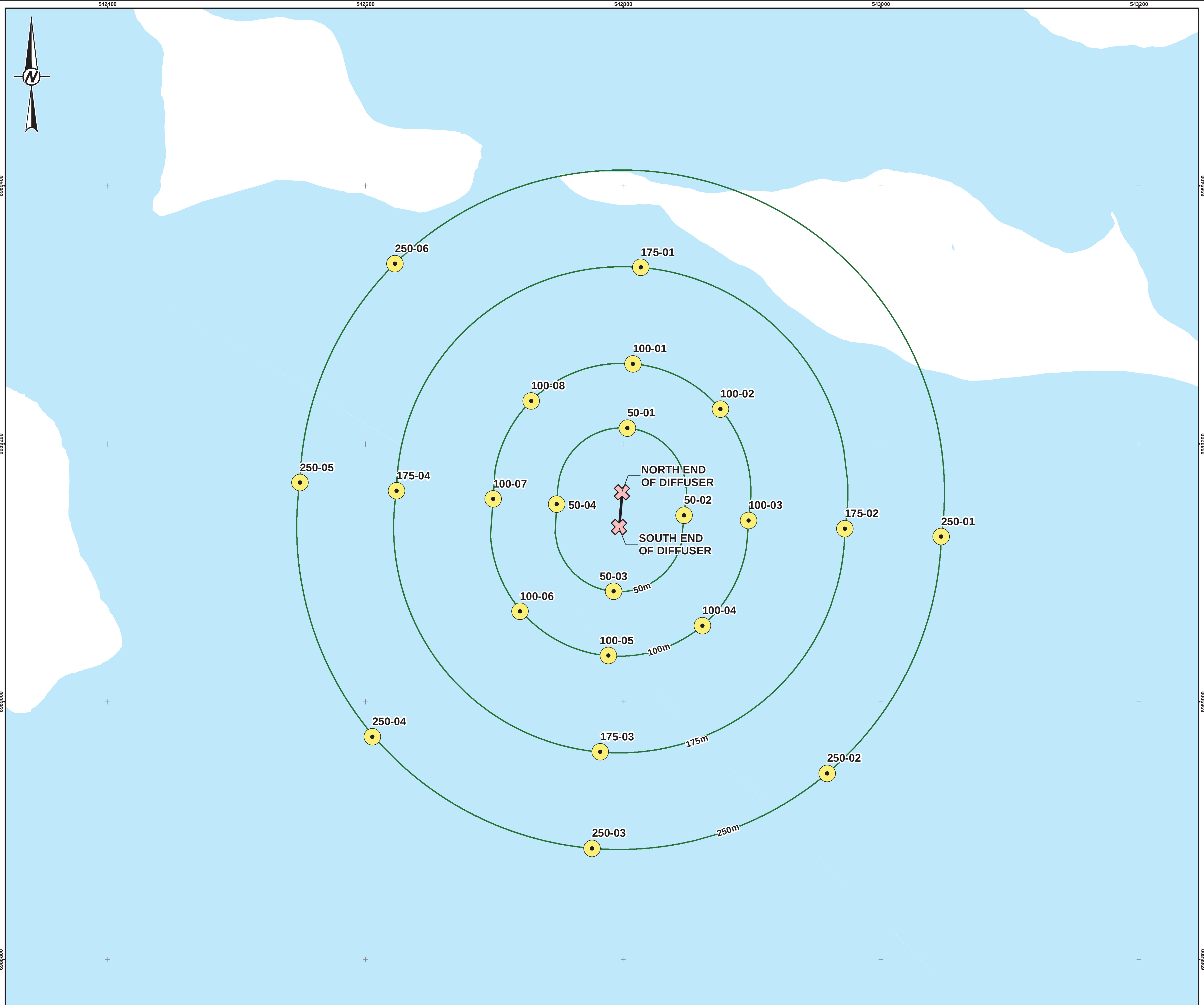
Field work for this study will commence as soon as open water conditions are present on Meliadine Lake, and there is safe access to the sampling locations by boat. Field work will be completed within a timely manner to avoid influence of confounding factors associated with weather conditions and discharge variability. Although it is expected that it will take one full day of work for a two-person field crew to complete the field program, additional days might be required depending on weather conditions. The program will be conducted during discharge to satisfy reporting requirement under Amendment 1 for a plume delineation study, as outlined in Insert Item 25, Part I of NWB's (2020) Reasons for Decision. In addition, a corresponding sample of the discharge from MEL-14 is required to be collected for the program. Therefore, the timing of the field work for this study should be planned around the weekly MEL-14 sampling schedule.

Quality assurance and quality control (QA/QC) procedures will be undertaken to obtain accurate data. QA/QC will include field staff training, routine calibration of field equipment, and documentation. Meter calibration will be re-checked at least once during each day of field work. In case the field staff notice that results are deviating from the expected range of values, a new check with calibration standards will be performed at a sampling station and, if necessary, the probe will be recalibrated. Calibration checks or re-calibration will be documented in the field book.

B.3.3. Data Analysis and Reporting

Following field work, data will be reviewed, and summary tables and figures will be prepared for presentation and discussion during the next available Water Management Working Group meeting. The plume will be described in terms of its size, shape, and vertical distribution. The relationship between field measured specific conductivity and laboratory measured TDS and calculated TDS (from the sum of major ions, where these data are available for each of the selected substations) will be established to validate the use of specific conductivity as a tracer of TDS in the receiving environment. The information retrieved will be used to confirm model predictions related to effluent dilution and assimilation in the receiving environment, and to confirm that receiving environment monitoring stations are adequately characterizing conditions with respect to surface water chemistry and toxicity testing (Sections 3.1 and 3.2 of the main body of the report, respectively).

Results from the plume delineation study will be presented as a stand-alone report, including spatial delineation of the plume and estimated dilution factors at each sampling station. This report will be submitted for review by the Water Management Working Group.



LEGEND

DIFFUSER

SAMPLING LOCATION

FINAL DISCHARGE BUFFER

AS-BUILT DIFFUSER

0 60 120

1:3,000 METRES

REFERENCE(S)

1. BASE DATA OBTAINED FROM AGNICO EAGLE MINES LIMITED.
2. DATUM: NAD83 PROJECTION UTM ZONE 15

CLIENT

AGNICO EAGLE MINES LIMITED

PROJECT

MELIADINE GOLD PROJECT
NUNAVUT

TITLE

SAMPLING DESIGN FOR PLUME DELINEATION STUDY AT MELIADINE LAKE NEAR-FIELD EXPOSURE AREA

CONSULTANT

GOLDER

YYYY-MM-DD	2018-07-04
DESIGNED	ER
PREPARED	MH
REVIEWED	
APPROVED	

PROJECT NO.	CONTROL	REV.	FIGURE
1787610	5000/5010	A	2

APPENDIX B REFERENCES

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Tetra Tech 2018. Effluent Discharge Modelling for the As-Built Diffuser at the Meliadine Gold Project, Nunavut. Prepared for Agnico Eagle Mines Limited. May 2018.

GOLDER

golder.com

APPENDIX B

Available 2020 Discharge Monitoring Results Collected Between 3 June 2020 and 17 July

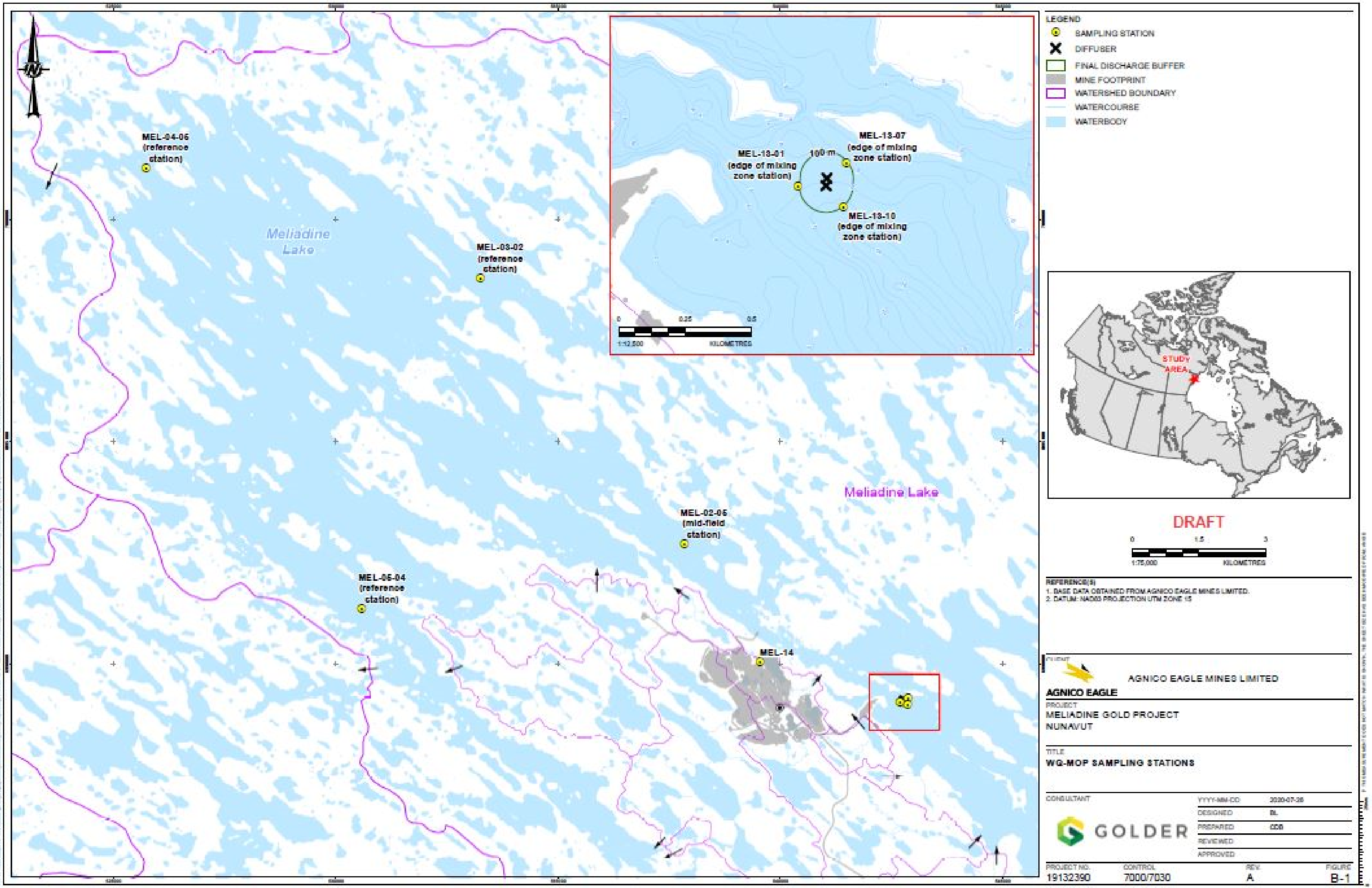
APPENDIX B: AVAILABLE DISCHARGE MONITORING RESULTS COLLECTED BETWEEN 5 JUNE AND 17 JULY 2020

This Appendix presents the 2020 Meliadine Mine emergency discharge validation monitoring program results as of 17 July 2020. These monitoring results have been collected to support regulatory requirements and commitments outlined in Amendment 1 to the Meliadine Mine Type “A” Water Licence (No. 2AM-MEL-1631). As outlined in the Golder (2020) Water Quality Monitoring and Optimization Plan (WQ-MOP Rev2; Appendix A), the monitoring program provides the opportunity to assess and validate the interim total dissolved solid (TDS) targets established for both the discharge (3,500 mg/L calculated TDS) and the receiving environment at the edge of the mixing zone (1,000 mg/L calculated TDS at a 100 m radius surrounding the outfall diffuser). A detailed description of the study design, including analytical testing being performed as part of the 2020 Meliadine Mine emergency discharge monitoring program, is outlined in Section 3.0 of the WQ-MOP (Appendix A). The sampling stations assessed during this monitoring program are depicted in Figure B-1.

The purpose of this Appendix is to provide a high-level summary of key analytical measures (e.g., TDS concentrations in the discharge and receiving environment, results of toxicity tests) that have been collected to date, in order to assess these measures relative to predictions and targets established in the Golder (2020) WQ-MOP. This evaluation of monitoring results is organized as follows:

- Summary of key analytical chemistry results related to TDS in the discharge and receiving environment (Section B1.0)
- Summary of acute toxicity testing with the MEL-14 discharge (Section B2.0)
- Summary of chronic toxicity testing with Meliadine Lake receiving environment water samples (Section B3.0)
- Uncertainties (Section B4.0)
- Conclusions on the results of the monitoring program, as they relate to predictions and targets established in the Golder (2020) WQ-MOP (Section B5.0)

Figure B-1: WQ-MOP Sampling Stations



B1.0 SUMMARY OF ANALYTICAL CHEMISTRY RESULTS

Water chemistry monitoring results from the WQ-MOP sampling program performed between 5 June 2020 (commencement of discharge) and 17 July 2020 were tabulated by Agnico Eagle and provided to Golder (see Attachment B1). Monitoring events currently include the following:

- Seven MEL-14 discharge water chemistry sampling events.
- One edge of mixing zone water chemistry sampling event on 7 June 2020—due to melting ice conditions on Meliadine Lake (health and safety concerns), weekly sampling events during the weeks of 14 June, 21 June, 28 June, and 5 July were not conducted. However, remote data loggers were deployed and will provide information on temperature and specific conductivity at the edge of mixing zone stations over this period and for the duration of the discharge period.
- One monthly water chemistry sampling event at receiving environment stations MEL-13-01, MEL-13-07, MEL-02-05, MEL-03-02, MEL-04-05, and MEL-05-04. Due to unsafe local ice conditions, edge of mixing zone station MEL-13-10 was not accessible during the first monthly sampling event. This remaining mixing zone sample will be collected during subsequent monthly sampling events now that Meliadine Lake is ice-free.

Figure B-2 summarizes the results of weekly sampling of the MEL-14 discharge for specific conductivity, chloride, TDS (calculated), and TDS (measured). In total, 589,249 m^3 of effluent was discharged to Meliadine Lake between 5 June and 17 July 2020 (Figure B-3), with daily discharge rates ranging from 2,197 to 17,518 m^3/day (Figure B-2). TDS concentrations remained within the 3,500 mg/L MAC limit permitted under Amendment 1 during each weekly sampling event. Concentrations of TDS ranged between 2,502 and 2,588 mg/L calculated TDS (1,510 and 3,100 mg/L measured TDS).

Table B-1 summarizes TDS concentrations measured in the receiving environment of Meliadine Lake. Concentrations of TDS were low at each monitoring station, indicative of effective dispersal of the discharge plume. Edge of mixing zone TDS concentrations were more than 10-fold lower than the proposed interim target of 1,000 mg/L, demonstrating a high discharge assimilation rate that reduces TDS concentrations to well below concentrations for which adverse effects on biological receptors would be expected. TDS concentrations at edge of mixing zone stations ranged between 35 and 50 mg/L measured TDS (55 to 65 mg/L calculated TDS).

All collected water quality data are screened against applicable water licence discharge limits (discharge quality) and CCME water quality guidelines for the protection of freshwater aquatic life (receiving environment water quality) in Attachment B1. To date, the results indicate that water quality has remained within these limits in each of the water quality samples collected as part of the WQ-MOP sampling program, except for zinc at the MEL-13-07 station.

Dissolved zinc exceeded the CCME long-term water quality guideline of 10.7 µg/L (the chronic dissolved zinc guideline is pH, hardness, and dissolved organic carbon dependent) at the MEL-13-07 edge of mixing zone station on 7 June 2020, as the dissolved concentration was 18 µg/L (total zinc was measured at 29 µg/L), However, the effluent monitoring data (Attachment B1) does not suggest that zinc has been elevated in the effluent, as total and dissolved concentrations ranged between <5 µg/L and <25 µg/L during the seven weekly sampling events collected to date, with reported concentrations of <25 µg/L total Zn and 19 µg/L dissolved Zn on the day that the exceedance was measured in the receiving environment (7 June 2020). Furthermore, these concentrations of zinc were well below the permitted discharge limits of 400 µg/L for the Maximum Average Concentration (MAC) and 800 µg/L for the Maximum Grab Concentration (MGC). As a result, the observed exceedance at MEL13-07 does not appear to be directly correlated with the MEL-14 discharge; however, monitoring is on-going and additional receiving environment monitoring data will provide a better understanding of zinc concentrations in the Meliadine Lake receiving environment.

Figure B-2: MEL-14 discharge sampling results for key parameters collected between 5 June 2020 and 17 July 2020

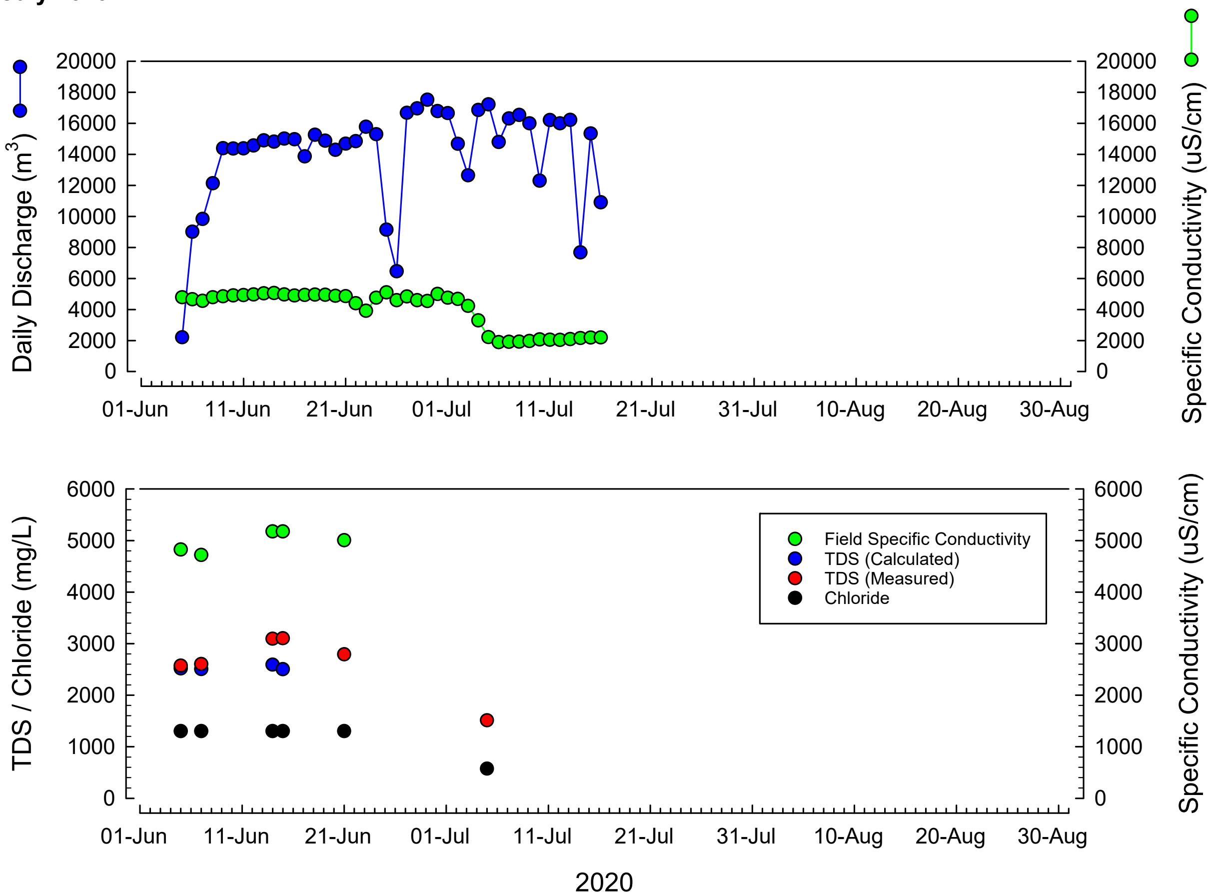
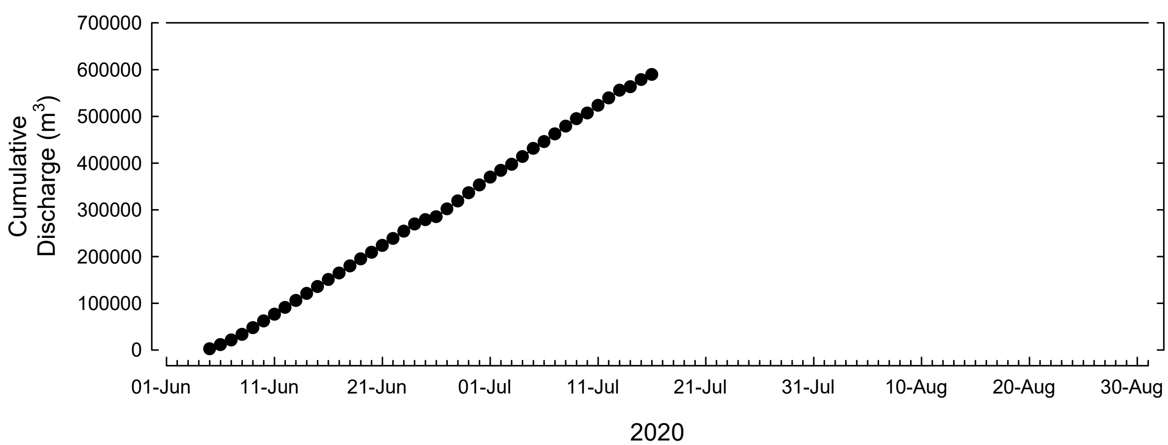


Figure B-3: Cumulative CP1 Water discharge to Meliadine Lake between 5 June 2020 and 16 July 2020



Notes: m^3 = metres cubed; mg/L = milligrams per litre; µS/cm = microsiemens per centimetre.

Table B-1: Meliadine Lake receiving environment sampling results for key parameters collected on 7 June 2020.

Sample Type	Sample Station	Specific Conductivity (µS/cm)	TDS (mg/L as Calculated)	TDS (mg/L as Measured)	Chloride (mg/L)
Edge of Mixing Zone	MEL-13-01	130	65	50	18
	MEL-13-07	110	55	35	16
Mid-field	MEL-02-05	120	60	35	16
Reference	MEL-03-02	61	29	30	7.8
	MEL-04-05	92	46	40	8.6
	MEL-05-04	100	52	40	9.8

Notes: TDS = total dissolved solids; mg/L = milligrams per litre; µS/cm = microsiemens per centimetre.

B2.0 SUMMARY OF ACUTE TOXICITY TEST RESULTS

Acute toxicity tests were conducted on the MEL-14 discharge weekly throughout the discharge period that began on 5 June 2020. As of 17 July 2020, results for four rounds of weekly acute toxicity testing programs were reported using the 96-hour Rainbow Trout and 48-hour *Daphnia magna* survival tests. Table B-2 summarizes the results of these tests; detailed laboratory reports from each of the four tests are provided in Attachment B2.

Acute toxicity tests indicate that the discharge has not been acutely toxic to Rainbow Trout or *D. magna* across the range of TDS concentrations tested (i.e., between 2,570 and 3,100 mg/L measured TDS; Section B1.0). The LC_{50} values (lethal concentration effecting 50% of organisms) were >100% (full-strength) discharge in each of the tests. Furthermore, 100% of organisms have survived in the undiluted full-strength samples. These findings are in agreement with acute toxicity testing of pit water collected throughout 2019 and early 2020, which have consistently indicated a lack of acute toxicity at concentrations similar to, and exceeding, those observed in the weekly samples during discharge release.

The results of these tests were confirmed as valid by the testing laboratory (Aquatox Laboratories, Guelph, ON), as the tests met control and test acceptability requirements outlined in the respective test methods (see Appendix B2 for details).

Table B-2: Weekly acute toxicity test results from MEL-14 during the emergency discharge monitoring program (results include available test results up until 17 July 2020).

Sample Date	TDS Concentration (mg/L as Measured)	96-hour Rainbow Trout Survival Results		48-hour *Daphnia magna* Survival Results	
		LC50 Value (% Discharge)	Survival in 100% Full Strength Discharge (%)	LC_{50} Value (% Discharge)	Survival in 100% Full Strength Discharge (%)
7 June 2020	2,600	>100	100	>100	100
14 June 2020	3,090	>100	100	>100	100
21 June 2020	2,790	>100	100	>100	100
28 June 2020	2,910	>100	100	>100	100

Notes: TDS = total dissolved solids; mg/L = milligrams per litre; % = percent; LC_{50} = lethal concentration effecting 50% of organisms.

B3.0 SUMMARY OF CHRONIC TOXICITY TEST RESULTS

One component of the WQ-MOP monitoring program involves chronic toxicity testing of monthly receiving environment samples from Meliadine Lake. The goal of the testing is to assess the potential for chronic effects to aquatic receptors at, and beyond, the edge of the mixing zone (i.e., a 100 m radius surrounding the diffuser in Meliadine Lake). As outlined in the WQ-MOP Rev2 (Golder 2020), chronic effects are not anticipated at the edge of the mixing zone based on earlier chronic toxicity tests of pit water and predicted exposure concentrations. Nevertheless, four chronic toxicity test species were identified to monitor conditions in the receiving environment during the required monthly toxicity testing. These tests include:

- 21-day *Daphnia magna* (freshwater crustacean) survival and reproduction test
- 14-day *Hyalella azteca* (benthic invertebrate) survival and growth test
- 7-day *Lemna minor* (Duckweed; aquatic macrophyte) survival and growth test
- 7-day Fathead Minnow (freshwater fish) survival and growth test

The low hardness receiving environment of Meliadine Lake (ranging between approximately 20 and 40 mg/L hardness; 2019 AEMP[1]) poses a challenge for conducting chronic toxicity testing, as the organisms used in the selected tests are typically cultured in higher hardness waters (i.e., 80–110 mg/L for *D. magna*; ~140 mg/L *H. azteca*; ~100 mg/L for *L. minor*, 130–140 mg/L for Fathead Minnow). This was identified as a project risk during conversations with Bureau Veritas Laboratories (BV Labs; chronic toxicity laboratory), as the transfer of organisms from the higher hardness culture waters to the lower hardness test waters could elicit osmotic stress to the organisms and, therefore, bias the results of the test. During conversations with the laboratory, it was concluded that potential for osmotic stress would be less of a concern for Fathead Minnows and Duckweed, as these species tend to have a larger range of tolerance to different water types. However, hardness concentrations in the Meliadine Lake receiving environment were considered to be on the lower end of the tolerance range for the two invertebrate species (*D. magna* and *H. azteca*). To reduce the potential for a confounding effect of osmotic stress, it was considered necessary to acclimate organism cultures prior to testing.

The chronic toxicity testing for Meliadine Lake is further complicated by the fact that the primary contaminant of concern being investigated in the MEL-14 discharge is TDS, requiring consideration of the influence of dilution water on the concentrations and ratios of major ions. Toxicity associated with TDS is typically caused by osmotic stress and is influenced by the specific ratios of the component major ions (i.e., calcium, magnesium, sodium, potassium, chloride, sulphate, and alkalinity). Chronic toxicity tests are commonly performed using dilution series tests on the discharge being investigated and, therefore, ionic concentrations tend to be greater than control/dilution water used in the tests. The standard control/dilution water used during testing is typically the same water that the organisms are cultured in. However, for tests conducted in receiving environment samples (Meliadine Lake), the ambient TDS is low relative to the culture media, such that standard dilution waters may increase TDS in receiving environment samples at higher dilutions. Therefore, a site-specific test design was required to:

1. Control for the low hardness conditions in Meliadine Lake and assess normal organism response in lower hardness waters
2. Select relevant references to compare against organism responses in exposure areas

[1] Azimuth Consulting Group Partnership. 2020. Aquatic Effects Monitoring Program, 2019 Annual Report, Meliadine Gold Project. Prepared for Agnico Eagle Mines Limited. Project No. AEM-19-04 / MEL AEMP 2019.

3. Set-up the test design so that the test acceptability (e.g., organism health and validity of the tests) can be properly assessed, while also accounting for the non-standard (low hardness) exposure conditions of site media

To address these site-specific complications, a modified test design was developed and applied during the chronic toxicity testing associated with each of the four test species. Additional controls were implemented so that organism responses resulting from low conductivity waters of the receiving environment, rather than an adverse toxicological response to TDS, can be discerned. The following represents the various components of the modified chronic toxicity test design:

- **Controls**—Three types of control water are used during the testing:
  - **Laboratory control**—standard culture water used for each species during regular testing at the laboratory. This control is used to assess test validity per standard protocol requirements; it is intended to facilitate comparison of organism response to a normal performance range for cultured organisms in non-contaminated media.
  - **Soft water control**—standard culture water used for each species during regular testing is diluted down to a hardness of ~40 mg/L, while keeping ionic ratios intact. This control is used to assess organism response in low hardness waters, but at typical ratios of major ions used during standard testing. This control serves as a baseline for the receiving environment tests because endpoints such as growth or reproduction could be lower than the laboratory control in lower ionic strength waters, due to suboptimal exposure conditions for the cultured organisms. This control is compared to the response in the laboratory control to assess for potential differences in organism performance that was independent of the influence of the discharge.
  - **Site Control**—synthetic dilution water control. The site control is a synthetic water recipe developed based on ionic ratios reported in the 2019 AEMP [Azimuth 2020] and based on the pooled reference conditions in Meliadine Lake. The difference between the soft water control and the site control is that the former used a standard recipe of ions used for organism culturing, whereas the latter is customized to ambient site conditions. The site control is used to evaluate organism response in clean test water using ionic ratios that are representative of Meliadine Lake reference sites, as identified during the most recent AEMP. This water is also used as the dilution water in the dilution series tests outlined below, as this provides a more realistic assessment of how the discharge is expected to be diluted within the receiving environment. The site control is used to assess how well organisms respond to the synthetic dilution water. Results are compared to the soft water control to assess how organisms respond to water with a similar hardness (i.e., soft water control), but with ionic ratios that more closely resemble Meliadine Lake conditions.
- **Meliadine Lake Receiving Environment Monitoring Samples**—Two types of tests are conducted using receiving environment samples during the discharge event:
  - **Full strength tests**—full strength tests (sometimes called “pass/fail” tests) are performed with samples of undiluted Meliadine Lake water, including samples from the mid-field station MEL-02-05 and the three reference stations (MEL-03-02, MEL-04-05, and MEL-05-04). The reference station results are compared statistically to the mid-field results, as well as to the dilution series test results (next bullet) to investigate whether significant differences are apparent, and whether these differences could be related to the influence of the discharge.

- **Dilution series tests**—Meliadine Lake edge of mixing zone stations (MEL-13-01, MEL-13-07, and MEL-13-10) are tested using a standard volumetric dilution series (e.g., 100%, 50%, 25%, 12.5%, 6.25%, 3.13%, and 1.56% volume/volume sample). Due to the larger test set-up for these dilution series (i.e., greater number of test vessels), dedicated controls are specified for each station to control for subtle temperature or light differences in the test chambers that may influence survival, growth, or reproduction endpoints in the tests. The chronic toxicity test results in the 100% undiluted edge of mixing zone samples are compared statistically to the results in the reference stations (MEL-03-02, MEL-04-05, and MEL-05-04) to assess whether edge of mixing zone stations show statistically significant reductions in survival, growth, or reproduction. The statistical assessment includes comparison to each individual reference station, as well as the pooled average of the reference station results. Where statistical differences are identified, the dilution series test design facilitates the investigation of any concentration-response relationships observed along the dilution series, which are expected to facilitate the calculation of relevant IC/EC_X values (inhibitory / effect concentrations influencing X% of the population). This information will be useful for confirming: 1) whether effects are apparent and not simply reflective of confounding factors (e.g., subtle temperature, light, or feeding differences); and 2) determining at what level of dilution the observed effects decrease to ambient levels.

As a result, chronic toxicity test results are assessed using the following tiered approach:

1. Compare results of the undiluted edge of mixing zone and mid-field stations to the range in response observed at the reference stations—There is natural variability in sub-lethal endpoints such as growth and reproduction and, therefore, it is necessary to evaluate the range in response observed in reference water relative to the range observed at exposure sites.
2. Evaluate the dose response relationship observed along the dilution series for edge of mixing zone stations—It is important to also consider the pattern of response as a function of dilution to determine whether the pattern suggests that a higher percentage of site water causes a larger decrease in organism performance.
3. Assess the response in the laboratory controls to determine the potential confounding influence of low hardness—The controls, both standard negative control and low hardness controls, are not compared directly to organism response in site water, as the lab water is not necessarily consistent in character as the receiving environment (e.g., micronutrients, DOC, etc.). These controls are instead used to assess test validity. In the case of the site water control (also the dilution water), the results are included as a treatment along the dilution series test design (e.g., 0% sample [site control], 1.56% sample, etc.).

The following sections discuss the results of the first round of monthly chronic toxicity testing. Due to the time required to conduct these chronic tests (e.g., up to 21-days for the *D. magna* test, 14-d *H. azteca*), final results are only available for the Duckweed and Fathead Minnow tests as of 17 July 2020. Results for the Fathead Minnow test are discussed in Section B3.1 and the results of the Duckweed test are discussed in Section B3.2. Detailed laboratory reports for these two tests are provided in Attachment B3.

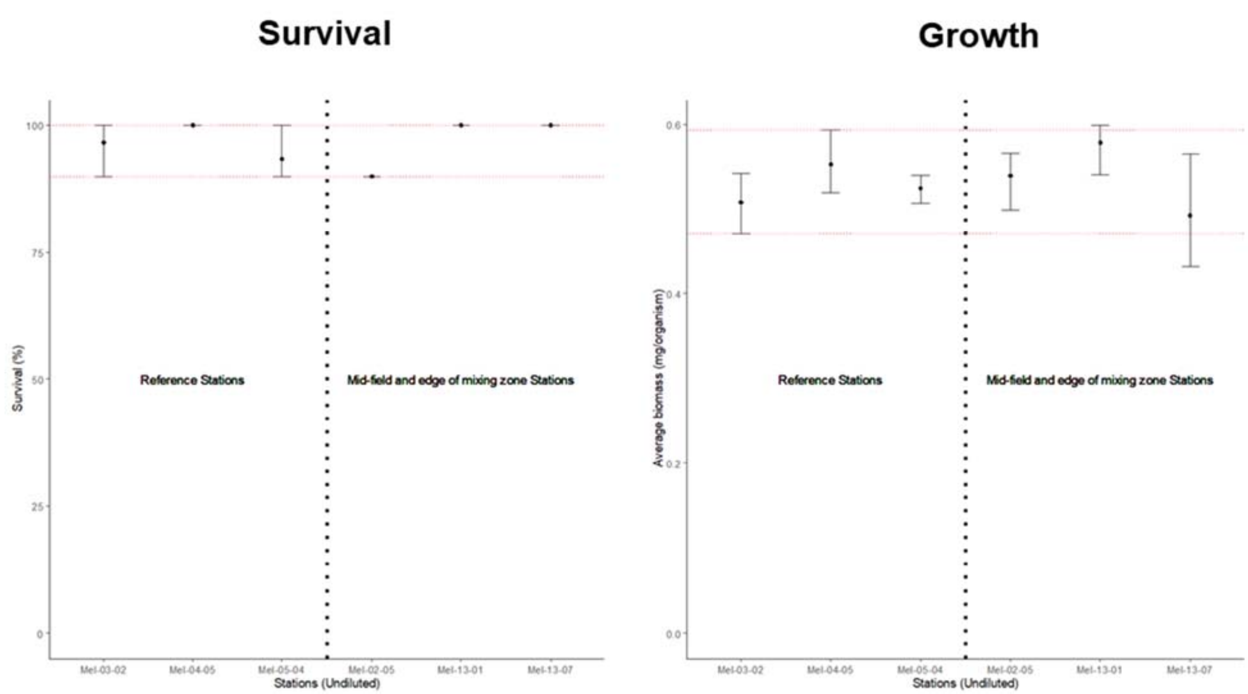
B3.1 Fathead Minnow Results

The 7-day Fathead Minnow larval survival and growth tests conducted on receiving environment samples collected on 7 June 2020 did not indicate impairment of survival or growth endpoints relative to organism response observed at the reference stations. This was true for organisms exposed to both edge of mixing zone and mid-field water samples. Survival and growth endpoints measured in undiluted 100% samples from the edge of mixing zone and mid-field stations encompassed a similar range of response as the reference stations (Figure B-4). Furthermore, as discussed in the laboratory report provided in Appendix B3, statistically significant effects on survival or growth ($p < 0.05$) were not identified in the edge of mixing zone stations and the mid-field station, relative to the responses observed in each of the three reference stations, or to the pooled reference station response.

These receiving environment results using full strength samples are consistent with the results reported for the edge of mixing zone dilution series testing (Table B-3). For the latter, the survival EC_{50} value (effect concentration impacting 50% of organisms) and the sub-lethal growth EC_{25} value (effect concentrations impacting 25% of organisms) were both >100% discharge in each of the two edge of mixing zone stations (MEL-13-01 and MEL-13-07).

The results of these tests were considered valid by the testing laboratory (Bureau Veritas, Burnaby, BC), as the tests met control and test acceptability requirements outlined in the respective test methods (see Appendix B3 for details).

Figure B-4: Fathead minnow survival and growth results for the full strength (100%) edge of mixing zone and mid-field stations sampled on 7 June 2020 relative to the response observed at the three reference stations



Notes: % = percent; mg/organism = milligrams per organism; points represent the mean response in the treatment; error bars represent the range in organism response (i.e., maximum and minimum response) observed between replicates in each treatment; red lines represent the range in response (maximum and minimum) observed in the Reference Stations.

Table B-3: Edge of mixing zone fathead minnow dilution series results from MEL-13-01 and MEL-13-07 from the 7 June 2020 sampling event

Sample Date	MEL-13-01		MEL-13-07	
	Survival LC_{50} Value (% Discharge)	Growth IC_{25} Value (% Discharge)	Survival LC_{50} Value (% Discharge)	Growth IC_{25} Value (% Discharge)
7 June 2020	>100	>100	>100	>100

Notes: % = percent; LC_{50} = lethal concentration effecting 50% of organisms; IC_{25} = inhibitory concentration affecting 25% of organisms.

B3.2 Duckweed Results

The results of the 7-day Duckweed growth tests conducted on receiving environment samples collected on 7 June 2020 did not indicate impairment of frond count or growth endpoints relative to organism response observed at the reference stations. This was true for organisms exposed to both edge of mixing zone and mid-field stations.

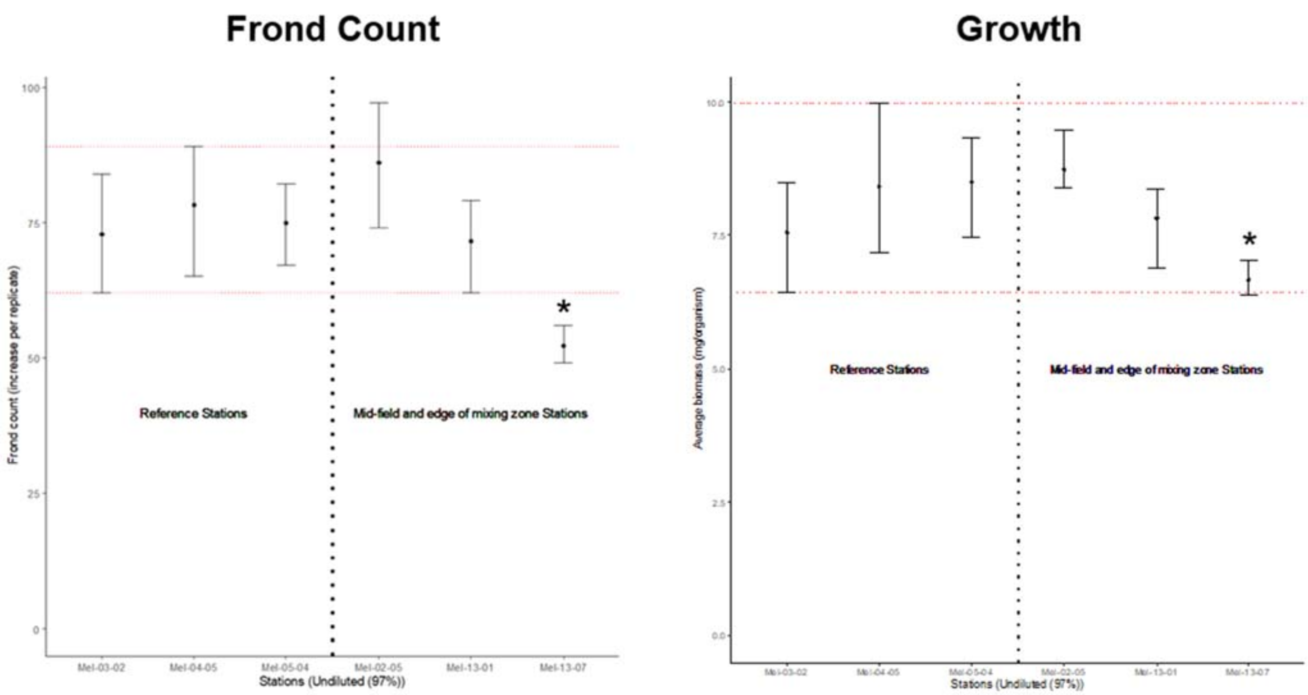
Frond count and growth endpoints measured in undiluted 100% samples from the edge of mixing zone and mid-field stations encompassed a similar range of response as that in the reference stations, with the exception of MEL-13-07 (Figure B-5). As discussed in the laboratory report provided in Appendix B3, the following outcomes of statistical comparisons ($p < 0.05$) were observed for the Duckweed endpoints:

- Significant effects on frond count or growth of organisms were not evident at the MEL-13-01 edge of mixing zone station; this applied relative to responses observed in each of the three reference stations, as well as the pooled reference station response.
- Significant effects ($p < 0.05$) for the frond count endpoint were observed at the MEL-13-07 station relative to responses observed in each of the three reference stations, as well as the pooled reference station response. Significant effects were also observed on organism growth at the MEL-13-07 station relative to the MEL-04-05 and MEL-05-04 reference stations, as well as the pooled reference response. However, as described in Table B-4 and depicted in Figure B-6, these significant differences appear to be artifacts of the test design (i.e., variation due to factors other than discharge influence). The concentration-response relationship observed along the dilution series of the MEL-13-07 edge of mixing zone station did not suggest an association between exposure magnitude and toxicological response. The calculated IC_{25} values for the frond count and growth endpoints were both determined by the toxicology laboratory (Bureau Veritas Laboratories, Burnaby, BC) to be >97% discharge (the maximum dilution series concentration of 97% rather than 100% is due to the dilution of the 100% sample by a nutrient formulation required by the standard test protocol; Environment Canada 2007).
- Significant effects on frond count and growth of organisms were not evident at the MEL-02-05 mid-field station; this applied relative to responses observed in each of the three reference stations, as well as the pooled reference station response.

Results reported for the edge of mixing zone dilution series testing (Table B-4) indicated that both the frond count and growth EC_{25} values were >97% discharge in each of the two edge of mixing zone stations (MEL-13-01 and MEL-13-07). These results indicate that water collected at the edge of the mixing zone in Meliadine Lake on 7 June 2020 did not result in chronic effects on growth to Duckweed.

The results of these tests were considered valid by the testing laboratory (Bureau Veritas, Burnaby, BC), as the tests met control and test acceptability requirements outlined in the respective test methods (see Appendix B3 for details).

Figure B-5: Duckweed frond count and growth results for the full strength (100%) edge of mixing zone and mid-field stations sampled on 7 June 2020 relative to the response observed at the three reference stations



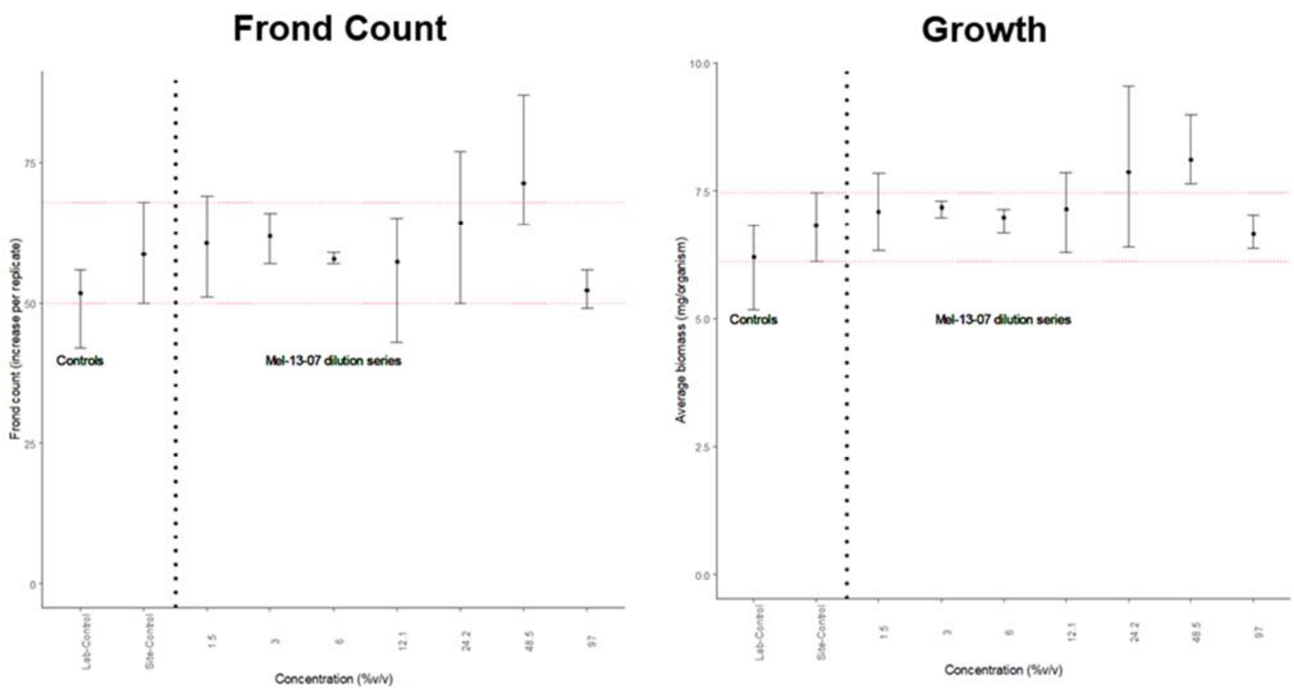
Notes: mg/organism = milligrams per organism; points represent the mean response in the treatment; error bars represent the range in organism response (i.e., maximum and minimum response) observed between replicates in each treatment; red lines represent the range in response (maximum and minimum) observed in the Reference Stations; * represents that the response in a edge of mixing zone or mid-field station was determined to be statistically different ($p < 0.05$) than the response observed in one or more reference stations.

Table B-4: Edge of mixing zone duckweed dilution series results from MEL-13-01 and MEL-13-07 from the 7 June 2020 sampling event

Sample Date	MEL-13-01		MEL-13-07	
	Frond Count IC25 Value (% Discharge)	Growth IC25 Value (% Discharge)	Frond Count IC25 Value (% Discharge)	Growth IC25 Value (% Discharge)
7 June 2020	>97	>97	>97	>97

Notes: % = percent; IC_{25} = inhibitory concentration affecting 25% of organisms.

Figure B6: Duckweed frond count and growth results for the MEL-13-07 edge of mixing zone dilution series test sampled on 7 June 2020



Notes: mg/organism = milligrams per organism; points represent the mean response in the treatment; error bars represent the range in organism response (i.e., maximum and minimum response) observed between replicates in each treatment; red lines represent the range in response (maximum and minimum) observed in the Site control.

B4.0 UNCERTAINTY ANALYSIS

All monitoring programs are subject to uncertainty because the environmental monitoring components cannot assess every individual area for every possible ecological factor. Typical sources of uncertainty in an environmental monitoring programs include: how representative sampling stations are for assessing potential impacts, the timing of sample collection, the potential effect of cumulative exposures, and extrapolating effects between species or between observations in the laboratory and under field conditions. These uncertainties are common to all monitoring programs and are compensated for by using appropriately conservative approaches. Specific uncertainties of the current program include the following:

- Limited number of edge of mixing zone sampling events—Due to melting ice conditions on Meliadine Lake, weekly sampling events during the weeks of 14 June, 21 June, 28 June, and 5 July were not conducted due to health and safety concerns. Interpretation of the discharge assimilation capacity is limited to a single sampling event that was conducted on 7 June 2020. The 7 June 2020 sampling event indicated that assimilation was rapid, as measured TDS concentrations at the edge of mixing zone were more than 10-fold lower than the proposed interim target of 1,000 mg/L; however, the one sampling event precludes the ability to investigate temporal trends or the effects of longer duration discharge in the mixing zone. Remote data loggers were deployed as a supplemental monitoring effort to measure in situ data in the transition period between ice cover and open water, and will provide information on temperature and specific conductivity at the edge of mixing zone stations over this period and for the duration of the discharge period.

- Spatial characterization—The edge of mixing zone station MEL-13-10 was not safely accessible during the first monthly sampling event, which represents some limitations in the spatial delineation of edge of mixing zone conditions. This sample will be collected during subsequent monthly sampling events now that Meliadine Lake is ice-free; however, as samples at MEL-13-10 have not been collected to date, TDS concentrations and chronic toxicity at this station is currently a source of uncertainty.
- Full species battery still pending—Chronic toxicity tests have not indicated adverse biological effects in the receiving environment. However, testing has only been conducted during a single round of testing and final results are currently only available for two of the four test species. As a result, there is some uncertainty related to temporal variability in conditions within the receiving environment, as well as the sensitivity of *D. magna* and *H. azteca*. Testing is ongoing and subsequent rounds of testing will provide more conclusive outcomes.
- Limited exposure range—TDS concentrations measured in the edge of mixing zone stations sampled for chronic toxicity testing on June 7 were well below the edge of mixing zone target of 1,000 mg/L, which provides confirmation that discharge assimilation is effective during the early stage of discharge, as predicted from the dispersion models for the site. However, the low concentrations of TDS and other exposure indicators limit the degree to which the receiving environment water quality benchmarks can be validated. Testing at higher TDS concentrations is important for validating the interim benchmark and for providing recommendations for a final water quality objective at the edge of the mixing zone for long-term management of Meliadine Lake. Of relevance to the edge of mixing zone target validation testing are commitments related to monthly chronic toxicity testing of the MEL-14 discharge arising from responses to comments from ECCC and KivIA (Agnico Eagle 2020) and discussions through the WMWG. This supplemental chronic testing will be initiated during the second monthly sampling event and will involve chronic toxicity testing of the full-strength discharge plus volumetric dilutions. This testing is expected to be useful for validation of the interim target of 1,000 mg/L at the edge of mixing zone, as the discharge dilution series testing is expected to encompass exposures both above and below the proposed target of 1,000 mg/L calculated TDS.

B5.0 CONCLUSIONS

Based on the results obtained during the WQ-MOP monitoring program as of 17 July 2020, the following represents the primary conclusions based on data analysis and interpretation from the analytical chemistry and toxicology testing programs:

- TDS concentrations measured in the discharge were less than the MAC of 3,500 mg/L in each of the weekly sampling events and ranged between 2,502 and 2,588 mg/L calculated TDS (1,510 and 3,100 mg/L measured TDS).
- The discharge was not found to be acutely toxic in four rounds of acute toxicity tests conducted with *D. magna* and Rainbow Trout, as the LC_{50} values were >100% discharge in each of the tests.
- TDS concentrations measured at the edge of mixing zone stations were more than 10-fold lower than the proposed interim target of 1,000 mg/L during the 7 June 2020 sampling event, suggesting that the discharge has a high assimilation rate and that TDS concentrations rapidly decrease in the

receiving environment to concentrations below which adverse effects on biological receptors would be expected.

- Consistent with the low TDS concentration results reported in the receiving environment, adverse toxicological effects were not identified during the first monthly chronic toxicity testing program; final results of the *H. azteca* and *D. magna* tests are pending.

Based on the agreed upon site-specific benchmark derivation procedure outlined in Section 1.1 of the Golder (2020) WQ-MOP Rev2 (Appendix A), the validation monitoring conducted to date support the proposed interim targets because:

- Discharges were measured at calculated TDS concentrations ranging between 2,502 and 2,588 mg/L calculated TDS (1,510 and 3,100 mg/L measured TDS), which did not result in acute toxicity at the point of release
- Discharges have not resulted in unacceptable chronic toxicity at the edge of the mixing zone following initial dilution (i.e., at a 100 m radius surrounding the diffuser in Meliadine Lake)
- Discharges do not appear to be exceeding the capacity of the receiving environment to accommodate long-term loadings of constituents (i.e., assimilative capacity), as indicated by the observation that effluent was rapidly diluted and mixing zone water quality was well below the interim target of 1,000 mg/L during the June 7 2020 sampling event.

Based on these observations, it is likely that the MAC can be adopted as a firm target for managing the discharge, subject to confirmation by additional testing in Summer 2020. Monitoring efforts outlined in Table 1 of the main body of this report will continue for the duration of the permitted discharge of CP1.

Due to the limited number of chronic toxicity test events conducted to date, and the fact that concentrations in the receiving environment have been substantially below the edge of mixing zone target of 1,000 mg/L, it is recommended that further monitoring be conducted to validate the proposed edge of mixing zone target as a site-specific water quality objective (SSWQO) in Meliadine Lake. These programs have already been designed and are being implemented this summer. Specifically, the monthly chronic toxicity testing of the MEL-14 discharge (arising from responses to comments from ECCC and KivIA and discussions through the WMWG) will be initiated during the second monthly sampling event and will involve chronic toxicity testing of the discharge on each of the four selected chronic test species. These tests will be conducted using a dilution series similar to that being performed on the edge of mixing zone stations. This testing is expected to be useful for validation of the interim target of 1,000 mg/L at the edge of mixing zone and can be combined with other site-specific chronic toxicity data in support of a final regulatory benchmark for TDS.

APPENDIX B REFERENCES

Agnico Eagle (Agnico Eagle Mines). 2020. Water Licence 2AM-MEL1631 WQ-MOP Update IR Responses. Submitted to Nunavut Water Board. June 25, 2020.

Azimuth (Azimuth Consulting Group Partnership). 2020. Aquatic Effects Monitoring Program, 2019 Annual Report, Meliadine Gold Project. Prepared for Agnico Eagle Mines Limited. Project No. AEM-19-04 / MEL AEMP 2019.

Environment Canada. 2007b. Biological Test Method: Test for Measuring the Inhibition of Growth using the Freshwater Macrophyte (*Lemna minor*). EPS 1/RM/37, Second Edition, January 2007.

Golder (Golder Associates Limited). 2020. Water Quality Monitoring and Optimization Plan. Implementation Plan for Total Dissolve Solids. Prepared for Agnico Eagle Mining Limited. Project No. 19132390-751-RPT-Rev2.

ATTACHMENT B-1

Table 1. MEL-14 Discharge Analytical Chemistry Results Collected Between 5 June 2020 and 5 July 2020

Parameter	MEL-14 MAXIMUM GRAB CONCENTRATION LIMIT[a]	MEL-14 MAXIMUM AVERAGE CONCENTRATION LIMIT[a]	Unit	2020-06-05	2020-06-07	2020-06-14	2020-06-15	2020-06-21	2020-06-28	2020-07-01	2020-07-05
			Sample Name	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14
			Location	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14	MEL-14
			SAMPLE_TYPE_CODE	N	N	N	N	N	N	N	N
Field Measured											
pH			pH units	7.05	7.29	7.08	6.88	7.01	6.87	6.99	-
Conductivity			uS/cm	4825	4718	5176	4919	5005	4960	2303	-
Temperature			°C	5.6	6.5	4.7	5.7	8.7	7.4	11.2	-
Dissolved oxygen			mg/L	12.07	11.65	11.81	-	-	11.57	9.08	-
Dissolved oxygen			%	97.8	96.4	93.6	99.6	99.9	98	83.4	-
Conventional Parameters											
pH	9.5	9.5	pH units	7.52	7.58	7.66	7.66	7.41	7.43	-	7.25
Specific conductivity			umhos/cm	4700	4600	5100	4900	4800	4700	-	2300
Hardness, as CaCO3 (Dissolved)			mg/L	1040	1020	1140	1050	1070	1120	-	488
Hardness, as CaCO3 (Total)			mg/L	1050	1050	1040	1020	1080	1090	-	530
Total alkalinity, as CaCO3			mg/L	110	110	120	110	110	97	-	37
Total dissolved solids (calculated)		3500	mg/L	2600	2600	-	-	-	-	-	-
Total dissolved solids (measured)	5000		mg/L	2570	2600	3090	3100	2790	2910	-	1510
Total suspended solids	30	15	mg/L	5	6	8	6	6	7	-	5
Total organic carbon			mg/L	14	14	14	14	13	12	-	5.8
Dissolved organic carbon			mg/L	13	12	13	13	12	11	-	5.1
Turbidity			NTU	1.6	1.7	1.7	1.6	1.2	1.7	-	0.9
Dissolved Oxygen			mg/L	9.17	9.99	9.55	10.2	10.0	9.66	-	9.52
Major Ions											
Bicarbonate, as CaCO3			mg/L	110	110	120	110	110	96	-	36
Calcium			mg/L	297	293	327	302	303	321	-	138
Carbonate, as CaCO3			mg/L	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	-	< 1.0
Chloride			mg/L	1300	1300	1300	1300	1300	1200	-	570
Cyanide	1	0.5	mg/L	0.0068	0.0070	0.011	0.0095	0.012	0.0055	-	< 0.0050
Fluoride			mg/L	< 0.10	< 0.10	-	-	-	-	-	-
Magnesium			mg/L	71.8	70.5	78.8	72.5	76.8	77.6	-	34.9
Potassium			mg/L	34.0	34.0	36.7	33.9	35.3	34.7	-	14.9
Sodium			mg/L	480	474	510	470	509	506	-	209
Sulphate			mg/L	240	230	230	220	250	230	-	110
Silica			mg/L	5.3	8.3	6.1	6.8	4.8	3.8	-	1.5
Cyanide (free)			mg/L	0.033	0.045	0.032	0.029	0.017	0.0033	-	0.0035
Cyanide (WAD)			mg/L	0.0051	0.0053	0.0046	0.0060	0.0049	0.0026	-	0.0014
Nutrients and Chlorophyll a											
Nitrate			mg/L	26.9	26.5	28.1	28.1	29.2	26.1	-	13.0
Nitrite			mg/L	0.083	0.084	0.091	0.083	0.111	0.088	-	0.108
Nitrate + nitrite			mg/L	27.0	26.6	28.1	28.2	29.3	26.2	-	13.1
Total ammonia	18	14	mg/L	11	10	11	10	12	9.4	-	3.4
Total Kjeldahl nitrogen			mg/L	11	9.4	14	11	13	12	-	4.2
Total phosphorus	4	2	mg/L	0.072	0.035	0.020	0.062	0.057	0.039	-	0.057
Orthophosphate			mg/L	< 0.010	< 0.010	0.016	0.023	0.012	< 0.010	-	< 0.010
Biochemical Oxygen Demand, 5 Day			mg/L	2	3	2	2	< 2	< 2	-	< 2
Total Metals											
Aluminum	3	2	mg/L	0.448	0.632	0.643	0.561	0.661	0.79	-	0.65
Antimony			mg/L	< 0.0025	< 0.0025	< 0.0010	< 0.0010	< 0.0025	< 0.0050	-	< 0.00050
Arsenic	0.6	0.3	mg/L	0.0629	0.0723	0.0700	0.0584	0.0156	0.0047	-	0.00541
Barium			mg/L	0.151	0.155	0.151	0.153	0.155	0.153	-	0.0711
Beryllium			mg/L	< 0.00050	< 0.00050	< 0.00020	< 0.00020	< 0.00050	< 0.0010	-	< 0.00010
Bismuth			mg/L	< 0.0050	< 0.0050	< 0.0020	< 0.0020	< 0.0050	< 0.01	-	< 0.0010
Boron			mg/L	0.456	0.499	0.47	0.453	0.523	< 0.5	-	0.247
Cadmium			mg/L	0.000080	0.000101	0.000078	0.000085	0.000095	< 0.00010	-	0.000029
Calcium			mg/L	299	299	300	295	303	311	-	151
Chromium			mg/L	< 0.0050	< 0.0050	< 0.0020	< 0.0020	< 0.0050	< 0.01	-	< 0.0010
Cobalt			mg/L	0.0030	0.0031	0.00331	0.00313	0.0033	0.0029	-	0.00133
Copper	0.4	0.2	mg/L	0.0031	0.0031	0.0032	0.0031	0.0028	< 0.0050	-	0.00131
Iron			mg/L	0.25	0.213	0.154	0.163	0.113	< 0.1	-	0.097
Lead	0.4	0.2	mg/L	< 0.0010	< 0.0010	0.00070	0.00061	< 0.0010	< 0.0020	-	0.00041
Lithium			mg/L	0.142	0.139	0.155	0.146	0.15	0.144	-	0.0699
Magnesium			mg/L	72.4	74.4	71.4	70.2	78.7	75.9	-	37.1
Manganese			mg/L	1.33	1.33	1.3	1.28	1.37	1.3	-	0.455
Mercury			mg/L	< 0.00010	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00010	-	< 0.00010
Molybdenum			mg/L	< 0.0050	< 0.0050	0.0045	0.0043	< 0.0050	< 0.01	-	0.0022
Nickel	1	0.5	mg/L	0.0088	0.0087	0.0096	0.0094	0.0103	< 0.01	-	0.0043
Potassium			mg/L	34.5	34.1	33.6	33.9	36	34.2	-	15.7
Selenium			mg/L	0.00063	0.00074	0.00066	0.00060	0.00069	< 0.0010	-	0.00023
Silicon			mg/L	1.74	1.94	1.82	1.81	1.67	1.54	-	0.753
Silver			mg/L	< 0.00010	< 0.00010	< 0.000040	< 0.000040	< 0.00010	< 0.00020	-	< 0.000020
Sodium			mg/L	479	462	474	470	512	492	-	226
Strontium			mg/L	5.22	5.6	5.8	5.7	5.45	5.36	-	2.65
Sulphur			mg/L	82.9	84.3	83.7	82.5	97.3	77.4	-	41.7
Thallium			mg/L	< 0.000050	0.000052	0.000047	0.000049	0.000056	< 0.00010	-	0.000030
Tin			mg/L	< 0.025	< 0.025	< 0.01	< 0.01	< 0.025	< 0.05	-	< 0.0050
Titanium			mg/L	< 0.025	< 0.025	< 0.01	< 0.01	< 0.025	< 0.05	-	< 0.0050
Uranium			mg/L	0.00185	0.00189	0.00211	0.00212	0.00189	0.0014	-	0.00019
Vanadium			mg/L	< 0.025	< 0.025	< 0.01	< 0.01	< 0.025	< 0.05	-	< 0.0050
Zinc	0.8	0.4	mg/L	< 0.025	< 0.025	0.021	0.023	< 0.025	< 0.05	-	< 0.0050
Zirconium			mg/L	< 0.00050	< 0.00050	< 0.00020	< 0.00020	< 0.00050	< 0.0010	-	< 0.00010
Dissolved Metals											
Aluminum			mg/L	0.13	0.21	0.174	0.136	0.113	0.115	-	0.0776
Antimony			mg/L	< 0.0010	< 0.0010	< 0.0025	< 0.0025	< 0.0025	< 0.0050	-	< 0.00050
Arsenic			mg/L	0.0541	0.0626	0.0611	0.0477	0.00803	0.0026	-	0.00356
Barium			mg/L	0.154	0.149	0.164	0.154	0.149	0.157	-	0.0685
Beryllium			mg/L	< 0.00020	< 0.00020	< 0.00050	< 0.00050	< 0.00050	< 0.0010	-	< 0.00010
Bismuth			mg/L	< 0.0020	< 0.0020	< 0.0050	< 0.0050	< 0.0050	< 0.01	-	< 0.0010
Boron			mg/L	0.472	0.462	0.554	0.498	0.532	< 0.5	-	0.236
Cadmium			mg/L	0.000081	0.000079	0.000097	0.000086	0.000081	< 0.00010	-	0.000029
Chromium			mg/L	< 0.0020	< 0.0020	< 0.0050	< 0.0050	< 0.0050	< 0.01	-	< 0.0010
Cobalt			mg/L	0.00311	0.00301	0.0035	0.0031	0.0033	0.0028	-	0.00127
Copper			mg/L	0.00287	0.00279	0.0031	0.0029	0.0026	< 0.0020	-	0.00111
Iron			mg/L	0.164	0.137	0.097	0.115	0.076	0.057	-	0.0441
Lead			mg/L	< 0.00040	< 0.00040	< 0.0010	< 0.0010	< 0.0010	< 0.0020	-	< 0.00020
Lithium			mg/L	0.138	0.132	0.179	0.159	0.148	0.153	-	0.0698
Manganese			mg/L	1.35	1.3	1.5	1.36	1.39	1.35	-	0.436
Mercury			mg/L	< 0.00010	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00010	-	< 0.00010
Molybdenum			mg/L	0.0046	0.0044	< 0.0050	< 0.0050	< 0.0050	< 0.01	-	0.0020
Nickel			mg/L	0.0088	0.0084	0.0107	0.0096	0.0100	< 0.01	-	0.0039
Selenium			mg/L	0.00058	0.00065	0.00071	0.00052	0.00057	< 0.0010	-	0.00019
Silicon			mg/L	1.71	1.68	1.9	1.77	1.66	1.55	-	0.674
Silver			mg/L	< 0.000040	< 0.000040	< 0.00010	< 0.00010	< 0.00010	< 0.00020	-	< 0.000020
Strontium			mg/L	5.32	5.37	6.08	5.63	5.48	5.45	-	2.6
Sulphur			mg/L	80.4	82.3	88	84	89	84	-	39.7
Thallium			mg/L	0.000040	0.000047	0.000058	< 0.000050	0.000061	< 0.00010	-	0.000026
Tin			mg/L	< 0.01	< 0.01	< 0.025	< 0.025	< 0.025	< 0.05	-	< 0.0050
Titanium			mg/L	< 0.01	< 0.01	< 0.025	< 0.025	< 0.025	< 0.05	-	< 0.0050
Uranium			mg/L	0.00197	0.00181	0.00211	0.00202	0.00176	0.0013	-	< 0.00010
Vanadium			mg/L	< 0.01	< 0.01	< 0.025	< 0.025	< 0.025	< 0.05	-	< 0.0050
Zinc			mg/L	0.019	0.019	< 0.025	< 0.025	< 0.025	< 0.05	-	< 0.0050
Zirconium			mg/L	< 0.00020	< 0.00020	< 0.00050	< 0.00050	< 0.00050	< 0.0010	-	< 0.00010
Organics											
Benzene			mg/L	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	-	< 0.00020
Ethylbenzene			mg/L	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	-	< 0.00020
Toluene			mg/L	0.00023	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	-	< 0.00020
Xylenes			mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040
m,p-Xylenes			mg/L	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	< 0.00040	-	< 0.00040
o-Xylene			mg/L	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	< 0.00020	-	< 0.00020
F1 (C6-C10)-BTEX			mg/L	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
F1 (C6-C10)			mg/L	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	-	< 0.025
F2 (C10-C16)			mg/L	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	< 0.1
F3 (C16-C34)			mg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
F4 (C34-C50)			mg/L	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	-	< 0.2
Toxicity											
Daphnia 48 h static acute test - LC50			%	-	> 100	> 100	-	> 100	> 100	-	-
Daphnia 48 h Static Acute Test - EC50			%	-	> 100	> 100	-	> 100	> 100	-	-
LC50 (96h) - Rainbow Trout			%	-	> 100	> 100	-	> 100	> 100	-	-
Radionuclides											
Radium-226			Bq/l	0.014	0.016	0.013	-	0.019	1.1	-	< 0.0050

Notes:

[a] represents discharge limits outlined in Water Licence 2AM-MEL1631 issued by the Nunavut Water Board, including Emergency Amendment 1

"<" indicates a parameter was less than the laboratory detection limit.

"-" indicates a parameter was not analyzed or a criteria is not defined.

Output generated by GalReport and provided to Golder by Agnico Eagle.

Table 2: Meliadine Lake Receiving Environment Water Quality Summary (7 June 2020 Sampling Event)

Parameter	Unit	CCME Guidelines for the protection of: Aquatic Life		Sampling Sites: Edge of mixing zone		Mid-field	Reference		
				MEL-13-01	MEL-13-07	MEL-02-05	MEL-03-02	MEL-04-05	MEL-05-04
		Acute	Chronic	43989.7215	43989.7542	43989.588	43989.4486	43989.6299	43989.3708
Conventional Parameters									
pH	-	-	6.5 - 9.0	7.3	7.3	7.2	7.2	7.4	7.4
Specific conductivity	umhos/cm	-	-	130	110	120	61	92	100
Hardness, as $CaCO_3$	mg/L	-	-	37	29	35	19	27	31
Total alkalinity, as $CaCO_3$	mg/L	-	-	28	23	27	12	24	26
Total dissolved solids (calculated)	mg/L	-	1000*	65	55	60	29	46	52
Total dissolved solids (measured)	mg/L	-	-	50	35	35	30	40	40
Total suspended solids	mg/L	-	-	2.0	2.0	1.0	1.0	1.0	1.0
Total organic carbon	mg/L	-	-	4.4	3.5	3.8	2.2	2.6	3.0
Dissolved organic carbon	mg/L	-	-	4.3	3.5	3.6	2.1	2.6	2.7
Turbidity	NTU	-	-	0.20	0.40	0.60	1.2	0.10	0.20
Major Ions									
Bicarbonate, as $CaCO_3$	mg/L	-	-	27	23	27	12	24	26
Calcium	mg/L	-	-	12	9.6	11	5.1	8.6	9.8
Carbonate, as $CaCO_3$	mg/L	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloride	mg/L	640	120	18	16	16	7.8	11	12
Cyanide	mg/L	-	0.0050	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoride	mg/L	-	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium	mg/L	-	-	2.0	1.7	1.9	0.93	1.4	1.6
Potassium	mg/L	-	-	1.5	1.2	1.3	0.70	1.1	1.2
Sodium	mg/L	-	-	7.9	6.7	7.3	3.6	5.5	6.1
Sulphate	mg/L	-	-	7.5	6.0	5.9	3.0	4.4	4.9
Silica	mg/L	-	-	0.67	0.53	0.56	0.18	0.30	0.32
Nutrients									
Nitrate	mg-N/L	124	2.9	<0.1	<0.1	<0.1	0.11	<0.1	<0.1
Nitrite	mg-N/L	-	0.060	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nitrate + nitrite	mg-N/L	-	-	<0.1	<0.1	<0.1	0.11	<0.1	<0.1
Total ammonia	mg-N/L	-	4.1 - 161(a)	<0.05	0.19	<0.05	<0.05	0.15	<0.05
Total Kjeldahl nitrogen	mg-N/L	-	-	0.21	0.25	0.19	0.18	0.15	0.11
Total nitrogen (calculated)	mg-N/L	-	-	0.21	0.25	0.19	0.29	0.15	0.11
Total phosphorus	mg-P/L	-	-	<0.02	<0.02	<0.02	0.025	<0.02	<0.02
Orthophosphate	mg-P/L	-	-	-	-	<0.01	<0.01	<0.01	<0.01
Total Metals									
Aluminum	mg/L	-	0.0050 - 0.10(b, c)	<0.003	0.017	0.0032	0.0066	<0.003	<0.003
Antimony	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	-	0.0050	0.00047	0.00064	0.00043	0.0011	0.00023	0.00029
Barium	mg/L	-	-	0.012	0.0095	0.016	0.011	0.0097	0.011
Beryllium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	29	1.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	mg/L	0.00011 - 0.00077(d)	0.000040 - 0.000070(d)	<0.00001	<0.00001	<0.00001	0.000020	<0.00001	<0.00001
Calcium	mg/L	-	-	12	9.1	11	5.9	8.5	9.8
Chromium	mg/L	-	0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	mg/L	-	0.0020(d)	0.0011	0.0017	0.0011	0.00077	0.00093	0.0011
Iron	mg/L	-	0.30	<0.01	0.038	0.098	0.073	<0.01	<0.01
Lead	mg/L	-	0.0010(d)	<0.0002	<0.0002	<0.0002	0.00022	<0.0002	<0.0002
Lithium	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Magnesium	mg/L	-	-	2.0	1.6	1.9	1.0	1.4	1.6
Manganese	mg/L	-	-	0.0013	0.0022	0.0011	0.0026	<0.001	<0.001
Mercury	mg/L	-	0.000026	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	-	0.073	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	-	0.025(d)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Potassium	mg/L	-	-	1.4	1.1	1.4	0.80	1.1	1.2
Selenium	mg/L	-	0.0010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon	mg/L	-	-	0.31	0.26	0.26	<0.1	0.14	0.15
Silver	mg/L	-	0.00025	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Sodium	mg/L	-	-	7.5	6.0	7.1	3.8	5.1	5.5
Strontium	mg/L	-	-	0.068	0.054	0.064	0.031	0.044	0.049
Sulphur	mg/L	-	-	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Thallium	mg/L	-	0.00080	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Uranium	mg/L	0.033	0.015	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Vanadium	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.011 - 0.049(e)	**0.0063 - 0.017(f)**	<0.005	**0.029(C)**	<0.005	0.0066	<0.005	<0.005
Zirconium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Dissolved Metals									
Aluminum	mg/L	-	-	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Antimony	mg/L	-	-	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic	mg/L	-	-	0.00046	0.00046	0.00043	0.0010	0.00027	0.00028
Barium	mg/L	-	-	0.012	0.0098	0.013	0.0076	0.0094	0.011
Beryllium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	mg/L	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cadmium	mg/L	-	-	<0.00001	0.000013	0.000026	0.000020	0.000013	<0.00001
Chromium	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	mg/L	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	mg/L	-	-	0.0011	0.00095	0.0012	0.00070	0.00078	0.00082
Iron	mg/L	-	-	0.0062	0.0052	0.0094	0.012	<0.005	<0.005
Lead	mg/L	-	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Lithium	mg/L	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	mg/L	-	-	<0.001	0.0012	<0.001	0.0026	<0.001	<0.001
Mercury	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nickel	mg/L	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Selenium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silicon	mg/L	-	-	0.28	0.23	0.23	<0.1	0.13	0.13
Silver	mg/L	-	-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Strontium	mg/L	-	-	0.062	0.052	0.055	0.024	0.039	0.044
Sulphur	mg/L	-	-	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Thallium	mg/L	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Tin	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Uranium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Vanadium	mg/L	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.011 - 0.049(g)	**0.0063 - 0.017(h)**	<0.005	**0.018(C)**	<0.005	0.0062	<0.005	<0.005
Zirconium	mg/L	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

Notes:

"<" = indicates a parameter was less than the laboratory detection limit.
"-" = indicates a parameter was not analyzed or a criteria is not defined.
"*" = the agreed upon interim edge of mixing zone target for TDS

(a) = the ammonia guideline is pH and temperature dependent. The guideline that results in the minimum ammonia guideline (4.12 mg-N/L) is based on the combination of field pH (7.6) and water temperature (1.8°C). Guidelines calculated with temperature and pH values falling outside the defined range (i.e., pH 6.0 to 10.0 and temperature 0°C to 30°C) should be used with caution, as the WQG does not necessarily accurately reflect toxic effects at the low and high pH and temperature extremes. The guideline is calculated based on the individual field pH and temperature measurements for each sample.

(b) = guideline is pH dependent. The guideline range shown is based on the pH range observed in the dataset (6.0 to 7.6). The guideline is calculated based on the individual pH for each sample.

(c) = guideline is pH dependent: 0.005 mg/L at pH < 6.5 and 0.1 mg/L at pH ≥ 6.5.

(d) = guideline is hardness dependent. The guideline range shown is based on the hardness range observed in the dataset (2 to 37 mg/L). The guideline is calculated based on the individual hardness value for each sample.

(e) = guideline is for dissolved zinc, but comparison to total zinc is appropriate when no dissolved zinc concentrations are available. The acute dissolved zinc guideline is hardness and DOC dependent. The guideline that results in the minimum acute zinc guideline (11.3 µg/L) is based on the combination of Hardness (2.3 mg/L) and DOC (0.2 mg/L). Guidelines calculated with Hardness and DOC values falling outside the defined range (i.e., Hardness 13.8 to 250.5 mg/L and DOC 0.3 to 17.3 mg/L) should be used with caution, as the WQG does not necessarily accurately reflect toxic effects at the low and high hardness and DOC extremes. The guideline is calculated based on the individual hardness and DOC measurements for each sample.

(f) = guideline is for dissolved zinc, but comparison to total zinc is appropriate when no dissolved zinc concentrations are available. The chronic dissolved zinc guideline is pH, hardness and DOC dependent. The guideline that results in the minimum chronic zinc guideline (6.3 µg/L) is based on the combination of field pH (6.0), Hardness (2.3 mg/L) and DOC (0.2 mg/L). Guidelines calculated with pH, Hardness and DOC values falling outside the defined range (i.e., pH 6.5 to 8.13, Hardness 23.4 to 399 mg/L and DOC 0.3 to 22.9 mg/L) should be used with caution, as the WQG does not necessarily accurately reflect toxic effects at the low and high pH, hardness and DOC extremes. The guideline is calculated based on the individual pH, hardness and DOC measurements for each sample.

(g) = the acute dissolved zinc guideline is hardness and DOC dependent. The guideline that results in the minimum acute zinc guideline (11.3 µg/L) is based on the combination of Hardness (2.3 mg/L) and DOC (0.2 mg/L). Guidelines calculated with Hardness and DOC values falling outside the defined range (i.e., Hardness 13.8 to 250.5 mg/L and DOC 0.3 to 17.3 mg/L) should be used with caution, as the WQG does not necessarily accurately reflect toxic effects at the low and high hardness and DOC extremes. The guideline is calculated based on the individual hardness and DOC measurements for each sample.

(h) = the chronic dissolved zinc guideline is pH, hardness and DOC dependent. The guideline that results in the minimum chronic zinc guideline (6.3 µg/L) is based on the combination of field pH (6.0), Hardness (2.3 mg/L) and DOC (0.2 mg/L). Guidelines calculated with pH, Hardness and DOC values falling outside the defined range (i.e., pH 6.5 to 8.13, Hardness 23.4 to 399 mg/L and DOC 0.3 to 22.9 mg/L) should be used with caution, as the WQG does not necessarily accurately reflect toxic effects at the low and high pH, hardness and DOC extremes. The guideline is calculated based on the individual pH, hardness and DOC measurements for each sample.

(C) = concentration is greater than the chronic aquatic life CCME guideline or outside the recommended pH, DO or total alkalinity range.
Bolded concentrations are greater than a water quality guidelines.
Water quality data and guidelines shown in this table were rounded to reflect laboratory or field instrument precision *after* comparisons to guidelines. Therefore, values slightly above guidelines may be displayed as being equal to the guidelines and identified as exceedances. Concentrations equal to the guideline values were not identified as exceedances.

Output generated by GalReport and provided to Golder by Agnico Eagle.

Table 3. MEL-14 Discharge Summary (5 June 2020 to 16 July 2020)

Date	Daily discharge to Meliadine Lake (m^3)	Cumulative discharge to Meliadine Lake (m^3)	Specific conductivity (µS/cm)
05-Jun-20	2,197	2,197	4,780
06-Jun-20	9,001	11,198	4,650
07-Jun-20	9,830	21,028	4,548
08-Jun-20	12,137	33,165	4,780
09-Jun-20	14,389	47,554	4,843
10-Jun-20	14,369	61,923	4,896
11-Jun-20	14,373	76,296	4,923
12-Jun-20	14,561	90,857	4,960
13-Jun-20	14,901	105,758	5,028
14-Jun-20	14,812	120,570	5,054
15-Jun-20	15,012	135,582	4,967
16-Jun-20	14,965	150,547	4,894
17-Jun-20	13,857	164,404	4,930
18-Jun-20	15,254	179,658	4,948
19-Jun-20	14,872	194,530	4,945
20-Jun-20	14,291	208,821	4,874
21-Jun-20	14,688	223,509	4,851
22-Jun-20	14,842	238,351	4,396
23-Jun-20	15,767	254,118	3,906
24-Jun-20	15,295	269,413	4,750
25-Jun-20	9,141	278,553	5,090
26-Jun-20	6,456	285,009	4,589
27-Jun-20	16,678	301,688	4,829
28-Jun-20	16,961	318,649	4,588
29-Jun-20	17,518	336,167	4,534
30-Jun-20	16,786	352,953	4,989
01-Jul-20	16,656	369,609	4,750
02-Jul-20	14,670	384,279	4,665
03-Jul-20	12,646	396,925	4,223
04-Jul-20	16,860	413,785	3,285
05-Jul-20	17,211	430,995	2,206
06-Jul-20	14,792	445,787	1,883
07-Jul-20	16,313	462,100	1,905
08-Jul-20	16,529	478,629	1,913
09-Jul-20	15,996	494,625	1,952
10-Jul-20	12,299	506,924	2,053
11-Jul-20	16,202	523,126	2,038
12-Jul-20	15,992	539,118	2,027
13-Jul-20	16,213	555,331	2,075
14-Jul-20	7,674	563,005	2,146
15-Jul-20	15,340	578,345	2,180
16-Jul-20	10,904	589,249	2,188

Notes: m^3 = metres cubed; µS/cm = microsiemens per centimetre.

ATTACHMENT B-2

AQUATOX

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna

EPS 1/RM/14

Work Order : 242474
Sample Number : 63745

SAMPLE IDENTIFICATION

Company :	Agnico Eagle Mines Limited - Meliadine Project		
Location :	Rankin Inlet NU	Date Collected :	2020-06-07
GPS Location:	63*02'15.5" 92*13'06.3"	Time Collected :	13:40
Substance :	MEL - 14	Date Received :	2020-06-11
Sampling Method :	Grab	Time Received :	09:30
Sampled By :	MG	Temperature on Receipt :	21 °C
Sample Description :	Clear, pale yellow, mild strong odour.	Date Tested :	2020-06-11

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna*. Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Effect	Value	95% Confidence Limits	Calculation Method
LC50	>100%	–	–
EC50	>100%	–	–

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	7.8 days
Organism Batch :	Dm20-11	Average Brood Size :	41.3 young
Culture Mortality :	2.7% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	1
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	10
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Historical Mean LC50 :	6.4 g/L
Date Tested :	2020-06-09	Warning Limits (± 2SD) :	5.6 - 7.4 g/L
LC50 :	5.7 g/L	Organism Batch :	Dm20-11
95% Confidence Limits :	5.4 - 6.0 g/L	Analyst(s) :	JCS
Statistical Method :	Spearman-Kärber		

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Date : 2020-06-26
yyyy-mm-dd

Approved By :
Project Manager

AQUATOX

TOXICITY TEST REPORT
Daphnia magna
EPS 1/RM/14

Work Order: 242474
Sample Number: 63745

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Water Chemistry (100%) :	7.2	8.5	4690	19	99	>1000 mg/L

0 hours

Date & Time 2020-06-11 16:30
Analyst(s) : JCS (JL)

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	0	0	7.2	8.5	4690	19	99	>1000
50	0	0	7.9	8.5	2586	19	–	–
25	0	0	8.2	8.5	1688	19	–	–
12.5	0	0	8.3	8.6	1307	19	–	–
6.25	0	0	8.5	8.6	1073	19	–	–
Control	0	0	8.5	8.8	796	19	100	230

Notes:

24 hours

Date & Time 2020-06-12 16:30
Analyst(s) : SV

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	–	0	–	–	–	20
50	–	0	–	–	–	20
25	–	0	–	–	–	20
12.5	–	0	–	–	–	20
6.25	–	0	–	–	–	20
Control	–	0	–	–	–	20

Notes:

48 hours

Date & Time 2020-06-13 16:30
Analyst(s) : SV

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	8.1	8.3	4660	20
50	0	0	8.4	8.3	2669	20
25	0	0	8.4	8.4	1808	20
12.5	0	0	8.5	8.4	1381	20
6.25	0	0	8.5	8.5	1093	20
Control	0	0	8.5	8.4	813	20

Notes:

Number immobile does not include number dead.

– = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : AW
Date : 2020-06-16

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13

Work Order : 242474
Sample Number : 63745

SAMPLE IDENTIFICATION

Company :	Agnico Eagle Mines Limited - Meliadine Project		
Location :	Rankin Inlet NU	Date Collected :	2020-06-07
GPS Location:	63*02'15.5" 92*13'06.3"	Time Collected :	13:40
Substance :	MEL - 14	Date Received :	2020-06-11
Sampling Method :	Grab	Time Received :	09:30
Sampled By :	MG	Temperature on Receipt :	21 °C
Sample Description :	Clear, pale yellow, mild strong odour.	Date Tested :	2020-06-11

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
LC50	>100%	–	–

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	36.0 mm (±7.8)
Organism Batch :	T20-12	Range of Fork Lengths :	32 - 43 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.40 g (±0.25)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.28 - 0.67 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.2 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	16
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	Date Tested :	2020-06-04
Organism Batch :	T20-12	Historical Mean LC50 :	3794 mg/L
LC50 :	4171 mg/L	Warning Limits (± 2SD) :	2914 - 4939 mg/L
95% Confidence Limits :	3684 - 4601 mg/L	Analyst(s) :	FS, TL, KP
Statistical Method :	Linear Regression (MLE)		

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Date : 2020-06-26
yyyy-mm-dd

Approved By :
Project Manager

Work Order : 242474
Sample Number : 63745

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (μmhos/cm)	Temperature (°C)	O_2 Saturation (%)*
Initial Water Chemistry (100%) :	7.2	7.6	4571	16	84
After 30 min pre-aeration :	7.2	7.9	4569	16	86

0 HOURS

Date & Time 2020-06-11 14:30
Analyst(s) : KP

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*
100	0	0	7.2	7.9	4569	16	86
50	0	0	7.9	9.3	2799	16	–
25	0	0	8.2	9.4	1747	16	–
12.5	0	0	8.3	9.4	1317	16	–
6.25	0	0	8.4	9.3	1080	16	–
Control	0	0	8.3	9.3	831	16	99

Notes:

24 HOURS

Date & Time 2020-06-12 14:30
Analyst(s) : RK(FS)

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
50	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2020-06-13 14:30
Analyst(s) : MJT(FS)

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
50	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2020-06-14 14:30
Analyst(s) : MDH

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
50	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2020-06-15 14:30
Analyst(s) : KP

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	7.9	9.7	4629	15
50	0	0	8.1	9.7	2817	15
25	0	0	8.1	9.8	1710	15
12.5	0	0	8.1	9.8	1271	15
6.25	0	0	8.1	9.7	1026	15
Control	0	0	8.1	9.7	755	15

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
* adjusted for temperature and barometric pressure

Test Data Reviewed By : EJS
Date : 2020-06-16

CHAIN OF COUSTODY RECORD

AQUATOX

AquaTox Work Order No: 242474

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number:	644699
Field Sampler Name (print):	MG
Signature:	
Affiliation:	Agnico Eagle Mines - Meliadine
Sample Storage (prior to shipping):	Refrigerator/cooler
Custody Relinquished by:	Laura Hanson
Date/Time Shipped:	2020-06-08

Client:	Agnico Eagle Meliadine Project Rankin Inlet, Nunavut, Canada
Phone:	(819) 759-3555
Fax:	
Contact:	Dan Gorton, Sean Arruda

Sample Identification					Analyses Requested									Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Pseudokirchneriella subcapitata* Growth	Microtox	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2020-06-07	13:40	MEL-14	63745	21		✓		✓						✓		2 pails (40L)

For Lab Use Only	
Received By:	CW / CG
Date:	2020/06/11
Time:	9:30
Storage Location:	
Storage Temp (°C):	

Please list any special requests or instructions:

Add on certificate GPS location 63*02'15.5" 92*13'06.3"

Standard COC with Microtox rev 3 2016 09 01 TC

AquaTox Testing & Consulting Inc.
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Puslinch, ON N0B 2J0
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TOXICITY TEST REPORT

Daphnia magna
EPS 1/RM/14

Work Order : 242545
Sample Number : 63833

SAMPLE IDENTIFICATION

Company :	Agnico Eagle Mines Limited - Meliadine Project		
Location :	Rankin Inlet NU	Date Collected :	2020-06-14
GPS location	63*02'15.5" 92*13'06.3'	Time Collected :	13:40
Substance :	MEL-14	Date Received :	2020-06-18
Sampling Method :	Grab	Time Received :	10:00
Sampled By :	RS/LH	Temperature on Receipt :	22 °C
Sample Description :	Clear, light yellow, mild odour.	Date Tested :	2020-06-18

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Effect	Value	95% Confidence Limits	Calculation Method
LC50	>100%	–	–
EC50	>100%	–	–

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	7.8 days
Organism Batch :	Dm20-11	Average Brood Size :	41.7 young
Culture Mortality :	7.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	1
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	10
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Historical Mean LC50 :	6.4 g/L
Date Tested :	2020-06-09	Warning Limits (± 2SD) :	5.6 - 7.4 g/L
LC50 :	5.7 g/L	Organism Batch :	Dm20-11
95% Confidence Limits :	5.4 - 6.0 g/L	Analyst(s) :	JCS
Statistical Method :	Spearman-Kärber		

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Approved By : ______________________
Project Manager

AQUATOX

Work Order: 242545
Sample Number: 63833

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Water Chemistry (100%) :	7.1	8.2	5020	18	95	>1000 mg/L

0 hours

Date & Time 2020-06-18 16:00
Analyst(s) : JCS (JL)

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	0	0	7.1	8.2	5020	18	95	>1000
50	0	0	7.7	8.5	2903	18	–	–
25	0	0	8.0	8.6	1898	18	–	–
12.5	0	0	8.1	8.7	1437	18	–	–
6.25	0	0	8.3	8.8	1113	18	–	–
Control	0	0	8.6	8.9	776	18	100	230

Notes:

24 hours

Date & Time 2020-06-19 16:00
Analyst(s) : SJG (SV)

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	–	0	–	–	–	20
50	–	0	–	–	–	20
25	–	0	–	–	–	20
12.5	–	0	–	–	–	20
6.25	–	0	–	–	–	20
Control	–	0	–	–	–	20

Notes: Test organisms in the 100% concentration appeared to be trapped in settled solids. 2020-06-19 SJG

48 hours

Date & Time 2020-06-20 16:00
Analyst(s) : SV

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	0	1	8.1	8.2	5000	20
50	0	0	8.3	8.1	2568	20
25	0	0	8.3	8.3	1765	20
12.5	0	0	8.4	8.3	1293	20
6.25	0	0	8.4	8.4	1058	20
Control	0	0	8.5	8.3	782	20

Notes:

Number immobile does not include number dead.

– = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2020-06-21

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Puslinch, ON N0B 2J0
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TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13

Work Order :	242545
Sample Number :	63833

SAMPLE IDENTIFICATION

Company :	Agnico Eagle Mines Limited - Meliadine Project		
Location :	Rankin Inlet NU	Date Collected :	2020-06-14
GPS location	63*02'15.5" 92*13'06.3'	Time Collected :	13:40
Substance :	MEL-14	Date Received :	2020-06-18
Sampling Method :	Grab	Time Received :	10:00
Sampled By :	RS/LH	Temperature on Receipt :	22 °C
Sample Description :	Clear, light yellow, mild odour.	Date Tested :	2020-06-18

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
LC50	>100%	–	–

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	43.5 mm (±6.2)
Organism Batch :	T20-13	Range of Fork Lengths :	38 - 49 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.65 g (±0.25)
Cumulative stock tank mortality rate :	0.1% (previous 7 days)	Range of Wet Weights :	0.45 - 0.78 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.4 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	16
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	Date Tested :	2020-06-18
Organism Batch :	T20-13	Historical Mean LC50 :	3793 mg/L
LC50 :	3464 mg/L	Warning Limits (± 2SD) :	2915 - 4934 mg/L
95% Confidence Limits :	3207 - 3742 mg/L	Analyst(s) :	MJT, MDH, TL
Statistical Method :	Linear Regression (MLE)		

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : ______________________

Project Manager

Work Order : 242545
Sample Number : 63833

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*
Initial Water Chemistry (100%) :	7.1	8.6	4961	16	93
After 30 min pre-aeration :	7.2	9.0	4981	16	97

0 HOURS

Date & Time 2020-06-18 15:10
Analyst(s) : MDH

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*
100	0	0	7.2	9.0	4981	16	97
50	0	0	7.7	9.6	3118	14	–
25	0	0	8.0	9.8	1994	14	–
12.5	0	0	8.1	9.6	1443	14	–
6.25	0	0	8.2	9.5	1189	14	–
Control	0	0	8.2	9.8	880	14	100

Notes:

24 HOURS

Date & Time 2020-06-19 15:10
Analyst(s) : FS

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
50	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2020-06-20 15:10
Analyst(s) : FS

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	16
50	0	0	–	–	–	16
25	0	0	–	–	–	16
12.5	0	0	–	–	–	16
6.25	0	0	–	–	–	16
Control	0	0	–	–	–	16

Notes:

72 HOURS

Date & Time 2020-06-21 15:10
Analyst(s) : MDH

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	16
50	0	0	–	–	–	16
25	0	0	–	–	–	16
12.5	0	0	–	–	–	16
6.25	0	0	–	–	–	16
Control	0	0	–	–	–	16

Notes:

96 HOURS

Date & Time 2020-06-22 15:10
Analyst(s) : TL

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	7.9	9.0	4952	16
50	0	0	8.1	9.1	3101	16
25	0	0	8.2	9.1	1962	16
12.5	0	0	8.2	9.1	1395	16
6.25	0	0	8.2	9.1	1145	16
Control	0	0	8.2	9.1	815	16

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
* adjusted for temperature and barometric pressure

Test Data Reviewed By : AW
Date : 2020-06-23

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 242545

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number:	644699
Field Sampler Name (print):	RS/LH
Signature:	
Affiliation:	Agnico Eagle Mines - Meliadine
Sample Storage (prior to shipping):	Refrigerator/cooler
Custody Relinquished by:	Randy Schwandt
Date/Time Shipped:	2020-06-15

Client:	Agnico Eagle Meliadine Project Rankin Inlet, Nunavut, Canada
Phone:	(819) 759-3555
Fax:	
Contact:	Dan Gorton, Sean Arruda

Sample Identification					Analyses Requested									Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Pseudokirchneriella subcapitata* Growth	Microtox	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2020-06-14	13:40	MEL-14	63833	22		✓		✓						✓		2 pails (40L)
	Time provided by client via email JR															

For Lab Use Only	
Received By:	SJG/FS
Date:	2020-06-18
Time:	10:00
Storage Location:	
Storage Temp.(°C)	

Please list any special requests or instructions:
Add on certificate GPS location 63*02'15.5" 92*13'06.3"

JR

Standard COC with Microtox rev 3 2016 09 01 TC

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Daphnia magna

EPS 1/RM/14

Work Order :	242603
Sample Number :	63909

SAMPLE IDENTIFICATION

Company :	Agnico Eagle Mines Limited - Meliadine Project	Date Collected :	2020-06-21
Location :	Rankin Inlet NU	Time Collected :	13:37
GPS Location:	63*02'15.5" 92*13'06.3"	Date Received :	2020-06-25
Substance :	MEL-14	Time Received :	09:45
Sampling Method :	Grab	Temperature on Receipt :	20 °C
Sampled By :	D.M., G. L.	Date Tested :	2020-06-25
Sample Description :	Clear, yellow, mild odour.		

Test Method : Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* . Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments).

48-HOUR TEST RESULTS

Effect	Value	95% Confidence Limits	Calculation Method
LC50	>100%	–	–
EC50	>100%	–	–

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	8.2 days
Organism Batch :	Dm20-12	Average Brood Size :	41.4 young
Culture Mortality :	3.2% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	1
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	10
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	0.0%
Hardness Adjustment :	None	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Historical Mean LC50 :	6.4 g/L
Date Tested :	2020-06-23	Warning Limits (± 2SD) :	5.5 - 7.4 g/L
LC50 :	5.9 g/L	Organism Batch :	Dm20-12
95% Confidence Limits :	5.6 - 6.2 g/L	Analyst(s) :	JCS
Statistical Method :	Spearman-Kärber		

COMMENTS

All test validity criteria as specified in the test method were satisfied.

Approved By : ______________________

Project Manager

AQUATOX

TOXICITY TEST REPORT
Daphnia magna
EPS 1/RM/14

Work Order: 242603
Sample Number: 63909

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Water Chemistry (100%) :	7.2	8.4	4920	19	96	>1000 mg/L

0 hours

Date & Time 2020-06-25 16:05
Analyst(s) : JCS (AW)

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	0	0	7.2	8.4	4920	19	96	>1000
50	0	0	7.8	8.5	2803	19	–	–
25	0	0	8.0	8.6	1835	19	–	–
12.5	0	0	8.1	8.7	1325	19	–	–
6.25	0	0	8.2	8.7	1020	19	–	–
Control	0	0	8.6	8.9	758	19	100	220

Notes:

24 hours

Date & Time 2020-06-26 16:05
Analyst(s) : SV

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	–	0	–	–	–	20
50	–	0	–	–	–	20
25	–	0	–	–	–	20
12.5	–	0	–	–	–	20
6.25	–	0	–	–	–	20
Control	–	0	–	–	–	20

Notes:

48 hours

Date & Time 2020-06-27 16:05
Analyst(s) : SV

Concentration (%)	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	8.1	8.3	4910	20
50	0	0	8.2	8.3	2723	20
25	0	0	8.3	8.3	1780	20
12.5	0	0	8.4	8.4	1289	20
6.25	0	0	8.4	8.4	1013	20
Control	0	0	8.5	8.5	761	20

Notes:

Number immobile does not include number dead.

"–" = not measured/not required
* adjusted for temperature and barometric pressure

Test Data Reviewed By : EJS
Date : 2020-06-30

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13

Work Order :	242603
Sample Number :	63909

SAMPLE IDENTIFICATION

Company :	Agnico Eagle Mines Limited - Meliadine Project	Date Collected :	2020-06-21
Location :	Rankin Inlet NU	Time Collected :	13:37
GPS Location:	63*02'15.5" 92*13'06.3"	Date Received :	2020-06-25
Substance :	MEL-14	Time Received :	09:45
Sampling Method :	Grab	Temperature on Receipt :	20 °C
Sampled By :	D.M., G. L.	Date Tested :	2020-06-25
Sample Description :	Clear, yellow, mild odour.		

Test Method(s) : Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments).

96-HOUR TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
LC50	>100%	–	–

The results reported relate only to the sample tested and as received.

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Average Fork Length (± 2 SD) :	43.0 mm (±7.5)
Organism Batch :	T20-13	Range of Fork Lengths :	37 - 48 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.67 g (±0.36)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.43 - 0.90 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	Date Tested :	2020-06-18
Organism Batch :	T20-13	Historical Mean LC50 :	3793 mg/L
LC50 :	3464 mg/L	Warning Limits (± 2SD) :	2915 - 4934 mg/L
95% Confidence Limits :	3207 - 3742 mg/L	Analyst(s) :	MJT, MDH, TL
Statistical Method :	Linear Regression (MLE)		

COMMENTS

•All test validity criteria as specified in the test method were satisfied.

Approved By : ____________________

Project Manager

Work Order : 242603
Sample Number : 63909

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*
Initial Water Chemistry (100%) :	7.0	8.4	4859	16	91
After 30 min pre-aeration :	7.1	8.9	4875	16	97

0 HOURS

Date & Time 2020-06-25 15:00
Analyst(s) : KP/MDH

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*
100	0	0	7.1	8.9	4875	16	97
0	0	0	7.8	9.3	2882	16	–
25	0	0	8.0	9.4	1938	16	–
12.5	0	0	8.1	9.4	1434	16	–
6.25	0	0	8.1	9.3	1179	16	–
Control	0	0	8.1	9.2	876	16	100

Notes:

24 HOURS

Date & Time 2020-06-26 15:00
Analyst(s) : MJT(FS)

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
0	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2020-06-27 15:00
Analyst(s) : MJT(FS)

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
0	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2020-06-28 15:00
Analyst(s) : TL

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	–	–	–	15
0	0	0	–	–	–	15
25	0	0	–	–	–	15
12.5	0	0	–	–	–	15
6.25	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2020-06-29 15:00
Analyst(s) : TL

Concentration (%)	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100	0	0	7.9	9.1	4854	16
0	0	0	8.2	9.1	2870	16
25	0	0	8.2	9.2	1925	16
12.5	0	0	8.2	9.2	1406	16
6.25	0	0	8.2	9.2	1147	16
Control	0	0	8.2	9.1	866	16

Notes:

"–" = not measured/not required
Number impaired does not include number dead.
* adjusted for temperature and barometric pressure

Test Data Reviewed By : EJS
Date : 2020-06-30

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 242603

Shipping Address: AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, Ontario Canada N0B 2J0

Voice: (519) 763-4412 **Fax:** (519) 763-4419

P.O. Number:	644699
Field Sampler Name (print):	DM/GL
Signature:	
Affiliation:	Agnico Eagle Mines - Meliadine
Sample Storage (prior to shipping):	Refrigerator/cooler
Custody Relinquished by:	Daphne Morin
Date/Time Shipped:	2020-06-21

Client:	Agnico Eagle Meliadine Project Rankin Inlet, Nunavut, Canada
Phone:	(819) 759-3555
Fax:	
Contact:	Dan Gorton, Sean Arruda

Sample Identification					Analyses Requested									Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	*Daphnia magna* Single Concentration	*Daphnia magna* LC50	Fathead Minnow Survival & Growth	*Ceriodaphnia dubia* Survival & Reproduction	*Lemna minor* Growth	*Pseudokirchneriella subcapitata* Growth	Microtox	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2020-06-21	13:37	MEL-14	63909	20		✓		✓						✓		2 pails (40L)

For Lab Use Only

Received By:	CW/MJ
Date:	2020/06/25
Time:	9:45
Storage Location:	
Storage Temp.(°C)	

Please list any special requests or instructions:
Add on certificate GPS location 63*02'15.5" 92*13'06.3"

AquaTox Testing & Consulting Inc.
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
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PRELIMINARY

ACUTE LETHALITY REPORT SUMMARY

Work Order : 242677

Sara Savoie
Agnico Eagle Mines Limited - Meliadine Project
Meliadine Division
Rankin Inlet NU
X0C 0G0

RESULTS

Substance	Date Collected	Date Tested	Species / Test	LC50	Mortality in 100% Concentration (%)
MEL-14	2020-06-28	2020-07-06	RBT LC50	>100%	0
	2020-06-28	2020-07-06	Dm LC50	>100%	0

RBT = rainbow trout
Dm = *Daphnia magna*
* = pH Stabilized
SC = single concentration

Test Protocols

Reference Method for Determining Acute Lethality of Effluents to Daphnia magna. Environment Canada EPS 1/RM/14 (Second Edition, December 2000, with February 2016 amendments)

Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 and February 2016 amendments) .

Although test results are generated under strict QA/QC protocols, the results provided herein, along with any unsigned test reports, faxes, or emails are considered preliminary.

ATTACHMENT B-3

www.bvlabs.com

BUREAU VERITAS LABORATORIES
4606 Canada Way
Burnaby, BC V5G 1K5

Office 604 734 7276
Toll Free 800 665 8566
Fax 604 731 2386

FATHEAD MINNOW TOXICITY TEST ON:

MEL-13-01, MEL-13-07,& MEL-02-05

Prepared for:

Agnico Eagle Mines Ltd.
10200, Route de Preissac
Rouyn-Noranda, QC
J0Y 1C0

Prepared by:

Ecotoxicology Group
Bureau Veritas Laboratories

Job No.: C039804
July 2020

Summary of Test Results for Samples from
Agnico Eagle Mines Ltd
Job C039804

Sample: MEL-13-01

Test		IC25 or LC25 (%v/v)	IC50 or LC50 (%v/v)
Fathead minnow:	Survival	-	>100 (N/A, N/A)
	Biomass	>100 (N/A, N/A)	-

Significant Effect vs		MEL-03-02	MEL-04-05	MEL-05-04	Pooled references
Fathead minnow:	Survival	No	No	No	No
	Biomass	No	No	No	No

N/A = Not available
95% confidence limits in parentheses

Sample: MEL-13-07

Test		IC25 or LC25 (%v/v)	IC50 or LC50 (%v/v)
Fathead minnow:	Survival	-	>100 (N/A, N/A)
	Biomass	>100 (N/A, N/A)	-

Significant Effect vs		MEL-03-02	MEL-04-05	MEL-05-04	Pooled references
Fathead minnow:	Survival	No	No	No	No
	Biomass	No	No	No	No

Summary of Test Results for Samples from
Agnico Eagle Mines Ltd
Job C039804

Sample: MEL-02-05

Significant Effect vs		MEL-03-02	MEL-04-05	MEL-05-04	Pooled references
Fathead minnow:	Survival	No	No	No	No
	Biomass	No	No	No	No

N/A = Not available
95% confidence limits in parentheses

Sample: Site Control (Synthetic Control)

Significant Effect vs		MEL-03-02	MEL-04-05	MEL-05-04
Fathead minnow:	Survival	No	No	No
	Biomass	No	No	No

Fathead Minnow Test Data Summary

Client Name/Location	Agnico-Eagles Mines Ltd. / Rouyn-Noranda, QC
Testing Lab/Location	Bureau Veritas Laboratories / Burnaby, BC
Collection Approach	6 samples, each split into 3-6 subsamples
Sample	
Sample Names	MEL-13-01, MEL-13-07, MEL-02-05, MEL-03-02, MEL-04-05, and MEL-05-04
Information on labelling/coding	See Chain of Custody form
Sample collection date (y/m/d)	2020/June/06 & 2020/June/07
Date (y/m/d)/time of sample receipt at lab	2020/Jun/11 @ 08:20
Test Organisms Imported from External Supplier	The Environment Canada document on the importation of test organisms has been followed (September 1999)
Species	*Pimephales promelas*
Source	Aquatic Bio Systems Inc., Fort Collins, CO.
Age at start of test	<24 hour old larvae
Unusual appearance, behaviour, or treatment of larvae by supplier before shipping or by lab immediately preceding the test	See organism supplier letter and Organism History sheet from Aquatic Biosystems Inc., and Acclimation and Holding Conditions sheet
Swim bladders inflated & actively feeding	Bladders were inflated and larvae were actively feeding
Temp. & DO of shipping water immediately before shipped and upon arrival	See Organism History sheet from Aquatic Biosystems Inc. and Acclimation and Holding Conditions sheet
Acclimation rate & procedure	See Acclimation and Holding Conditions sheet for details.
Culturing conditions	There were no deviations from test-method-specific “must” requirements for culturing of test organisms, facilities, apparatus used for culturing test organisms, and culture/holding-water conditions.
Mortality upon arrival and 24h preceding test	See Acclimation and Holding Conditions sheet
Test Conditions & Facilities	
Test method	EPS 1/RM/22 Second Edition – February 2011 BBY2SOP-00002 Fathead Minnow 7 Day Survival and Growth Test
Dates or days when subsamples used	See Test Observations sheet
Date for test start (y/m/d)	2020/Jun/12
Date for test completion (y/m/d)	2020/Jun/19

Test vessels	600mL polypropylene plastic beakers
Persons performing test	Y. Su, M. Brassil, M. Hamad, N. Shergill, M. O'Toole
Rate of preaeration	<100 bubbles/min
Duration of preaeration	See Test Observations sheet
Duration/rate of aeration during test	No aeration
pH adjustment procedure	No pH adjustment of samples
Filtration procedure	No filtration of samples
Control/dilution water	Lab Control: Deionized water hardened to 140 mg/L $CaCO_3$ Site Water (Synthetic water): Deionized water mixed with various chemicals as per client's request Soft water control: Lab Control water diluted with deionized water to 40 mg/L $CaCO_3$
Type & quantity of chemicals added to control/dilution water	$NaHCO_3$, $CaSO_4$, $MgSO_4$, and KCl in the ratio of 1.6:0.8:1.0:0.07
Number and conc. of test solutions	7 (100, 50, 25, 12.5, 6.25, 3.13 and 1.56%v/v) plus a control
Volume and depth of solution	250 mL & 4.5 cm depth
Number of replicates per conc.	3
Number of organisms per test vessel	10
Type of food, frequency of feeding, and ration of food delivered to each replicate	50uL of concentrated, live *Artemia* nauplii (<24 hours old) was fed to each replicate twice daily; 2 hours prior to water renewal and in the afternoon following water renewal Ration of food is decreased by half in any replicate with ≤5 surviving fish
Manner & rate of exchange of test solutions	Daily - 80% of solution was removed with debris and uneaten *Artemia*
DO & Temperature of sample just before its use	See Test Observations sheet
Conductivity, Temperature, DO, & pH of test solutions and controls at the beginning of the 24-hr period	See Water Quality Measurements sheet; 'initial' water quality measurements
Temperature, DO & pH of test solutions and controls at the end of the 24-hr period	See Water Quality Measurements sheet; 'final' water quality measurements

Test observations and/or deviations from test method and standard practices	There was nothing unusual about the tests, no deviations from the test method, and no problems with the tests.
Results	Results contained in this report refer only to the testing of samples as submitted.
Survival endpoint statistics	
Name and citation of program(s) and methods used for calculating statistical endpoint(s)	CETIS v1.9.2.4: Linear Interpolation (ICPIN) Fisher Exact Test
Behaviour, number & percent mortality in each test vessel	See Test Observations sheet and Survival Data sheet
Mean (±SD) percent mortality for each treatment	See Survival Data sheet

Percent of control fish which either appear moribund, display loss of equilibrium or show atypical swimming behaviour	0 % appeared abnormal in any way. See Test Observations sheet
Growth (Biomass) endpoint statistics	
Name and citation of program(s) and methods used for calculating statistical endpoint(s)	CETIS v1.9.2.4: Linear Interpolation (ICPIN) Equal Variance t Two-Sample Test
Weighting techniques applied?	N/A
Residuals Analysis	N/A
Outliers?	None
QA	
Did the test pass the validity criteria of: • ≤ 20% mortality and abnormality in controls • Average dry weight of ≥ 250 µg in the controls	Yes: • Percent mortality and abnormality: o MEL-13-01: 0% o MEL-13-07: 0% o MEL-02-05: 0% o MEL-03-02: 0% o MEL-04-05: 0% o MEL-05-04: 0% • Average dry weight : o MEL-13-01: 497 µg o MEL-13-07: 573 µg o MEL-02-05: 554 µg o MEL-03-02: 554 µg o MEL-04-05: 554 µg o MEL-05-04: 554 µg
Reference Toxicant test: LC50 (95% CL) (g NaCl/L) for survival	7.0 (6.5, 7.6)
Reference toxicant test historic mean & 2SD range (g NaCl/L) for survival	6.7; 2SD range: (5.5, 8.0)
Reference Toxicant test: IC50 (95% CL) (g NaCl/L) for biomass	6.4 (5.9, 6.9)
Reference toxicant test historic mean & 2SD range (g NaCl/L) for biomass	6.2; 2SD range: (5.3, 7.2)
Invalid Reference toxicant test?	No
Date of Reference toxicant test (y/m/d) and test duration	2020 June 12 7 days
Conditions of reference toxicant test	Same as test conditions, same batch of organisms

CETIS Analytical Report

Report Date: 03 Jul-20 12:44 (p 1 of 1)
Test Code: PP-10735-0220 | 20-2104-0068

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	19-3214-2414	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:18	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 1		100	1.0000	Exact	1.0000	Non-Significant Effect

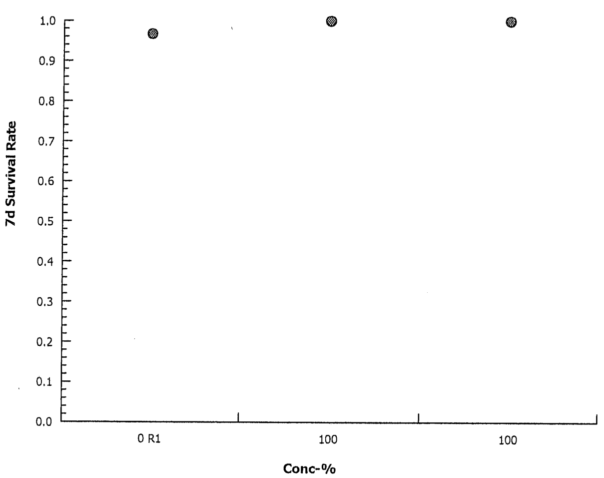
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R1	29	1	30	0.9667	0.03333	0.0%
100		30	0	30	1	0	-3.45%

7d Survival Rate Detail

onc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000

Graphics



2020 Jul 03 dml
Analyst:________

2020 Jul 09
QA: PH

CETIS Analytical Report

Report Date: 03 Jul-20 12:44 (p 1 of 1)
Test Code: PP-10735-0220 | 20-2104-0068

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	07-6206-0559	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:18	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 2		100	1.0000	Exact	1.0000	Non-Significant Effect

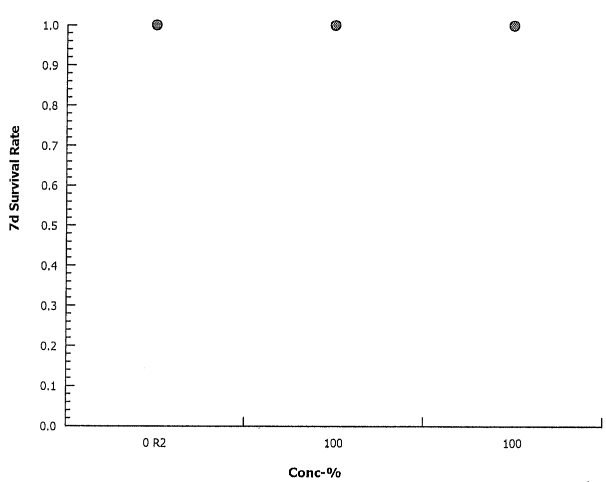
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R2	30	0	30	1	0	0.0%
100		30	0	30	1	0	0.0%

7d Survival Rate Detail

onc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000

Graphics



2020 Jul03 dml
2020 Jul09

CETIS Analytical Report

Report Date:	03 Jul-20 12:44 (p 1 of 1)
Test Code:	PP-10735-0220 | 20-2104-0068

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	13-9111-9604	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:18	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 3		100	1.0000	Exact	1.0000	Non-Significant Effect

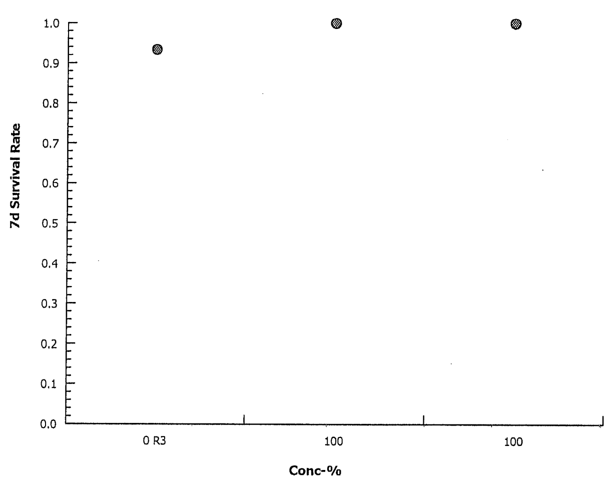
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R3	28	2	30	0.9333	0.06667	0.0%
100		30	0	30	1	0	-7.14%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.9000	1.0000	0.9000
100		1.0000	1.0000	1.0000

Graphics



CETIS Analytical Report

Report Date: 03 Jul-20 12:43 (p 1 of 1)
Test Code: PP-10735-0220 | 20-2104-0068

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	13-4579-2189	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:23	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Group 1	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
0		100	1.0000	Exact	1.0000	Non-Significant Effect

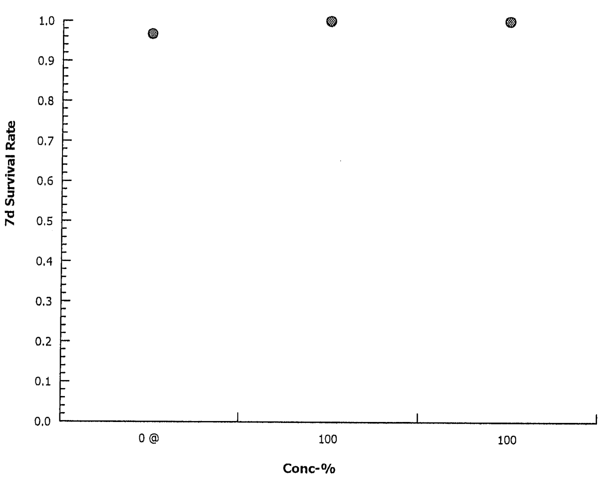
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	@	87	3	90	0.9667	0.03333	0.0%
100		30	0	30	1	0	-3.45%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9
0	@	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000						

Graphics



CETIS Analytical Report

Report Date:	03 Jul-20 12:39 (p 1 of 2)
Test Code:	PP-10735-0220 | 20-2104-0068

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	14-7306-7307	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:18	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	397496	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>100	n/a	n/a	<1	n/a	n/a
EC10	>100	n/a	n/a	<1	n/a	n/a
EC15	>100	n/a	n/a	<1	n/a	n/a
EC20	>100	n/a	n/a	<1	n/a	n/a
EC25	>100	n/a	n/a	<1	n/a	n/a
EC40	>100	n/a	n/a	<1	n/a	n/a
EC50	>100	n/a	n/a	<1	n/a	n/a

7d Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	S1	3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	30	30
1.56		3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	3.33%	29	30
3.3		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	30	30
6.25		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	30	30
12.5		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	30	30
25		3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	3.33%	29	30
50		3	0.9333	0.9000	1.0000	0.0333	0.0577	6.19%	6.67%	28	30
100		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.0%	30	30

7d Survival Rate Detail

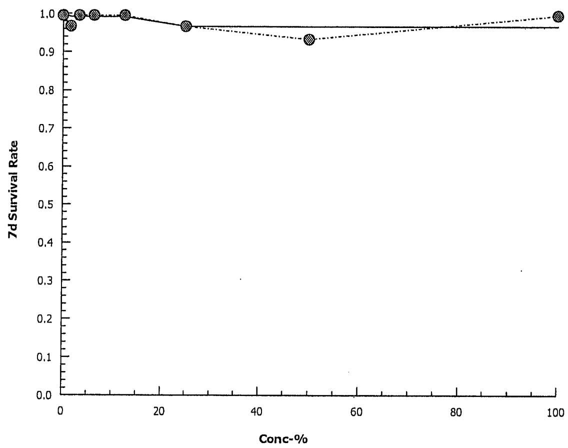
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	S1	1.0000	1.0000	1.0000
1.56		0.9000	1.0000	1.0000
3.3		1.0000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000
25		1.0000	0.9000	1.0000
50		1.0000	0.9000	0.9000
100		1.0000	1.0000	1.0000

2020 Jul 03 2020 Jul 09
Analyst: dmi QA: PH

Fathead Minnow 7-d Larval Survival and Growth Test | **Bureau Veritas Laboratories**

Analysis ID:	14-7306-7307	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:18	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Analyst: 2020 Jul 03 dmr QA: PH 2020 Jul 09

ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd. (Agnico)

Sample ID: MEL-13-01

Job / Sample #: C039804 XX3664

# Surviving Organisms													
Conc. (% v/v)	Replicate #	# Of Fish Seeded	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	% Survival	% Mortality	% Mean Mortality	SD (%)
	Date	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun				
Control	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
Site Control	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
1.56	A	10	10	10	10	10	10	10	9	90%	10%	3.3%	5.8%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
3.13	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
6.25	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
12.5	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
25	A	10	10	10	10	10	10	10	10	100%	0%	3.3%	5.8%
	B	10	10	10	10	10	9	9	9	90%	10%		
	C	10	10	10	10	10	10	10	10	100%	0%		
50	A	10	10	10	10	10	10	10	10	100%	0%	6.7%	5.8%
	B	10	10	10	9	9	9	9	9	90%	10%		
	C	10	10	10	9	9	9	9	9	90%	10%		
100	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
Analyst		MHM	MB	NS	YS	MHM	MB	MYM	YS				

*** see test comments**

Proofed: [signature] 2020JUL02

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	02-4926-0225	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	11.78%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1		100	-2.504	2.132	0.06	4	CDF	0.9667	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.224	1.887	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0074202	0.0074202	1	6.268	0.0665	Non-Significant Effect
Error	0.0047353	0.0011838	4			
Total	0.0121555		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.22	199	0.9007	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8647	0.43	0.2060	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	3	0.5083	0.4187	0.5979	0.511	0.471	0.543	0.02083	7.10%	0.00%
100		3	0.5787	0.4975	0.6598	0.596	0.541	0.599	0.01885	5.64%	-13.84%

Mean Dry Biomass-mg Detail

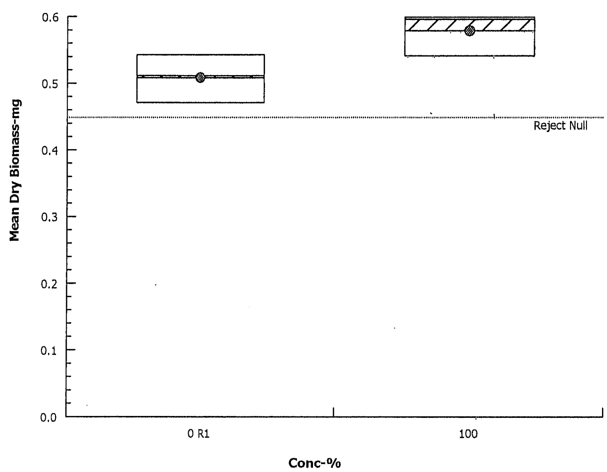
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	0.471	0.511	0.543
100		0.596	0.599	0.541

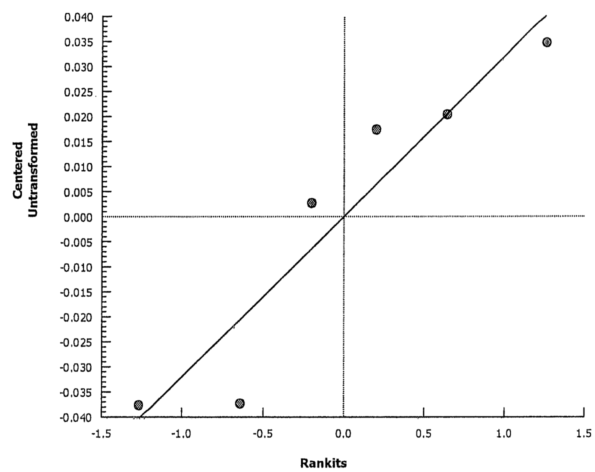
2020 Jul03 — 2020Jul09

Fathead Minnow 7-d Larval Survival and Growth Test | **Bureau Veritas Laboratories**

nalysis ID:	02-4926-0225	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	01-0334-8083	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	11.13%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2		100	-0.8771	2.132	0.062	4	CDF	0.7850	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.285	1.887	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	0.0009627	0.0009627	1	0.7693	0.4300	Non-Significant Effect
Error	0.0050053	0.0012513	4			
Total	0.005968		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.347	199	0.8522	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9184	0.43	0.4939	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	3	0.5533	0.4592	0.6475	0.547	0.519	0.594	0.02188	6.85%	0.00%
100		3	0.5787	0.4975	0.6598	0.596	0.541	0.599	0.01885	5.64%	-4.58%

Mean Dry Biomass-mg Detail

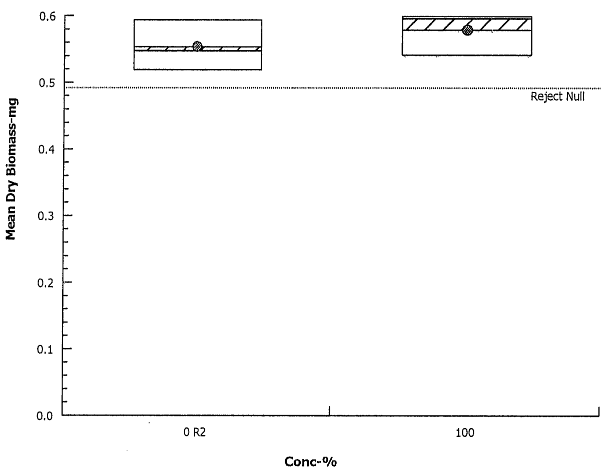
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	0.519	0.594	0.547
100		0.596	0.599	0.541

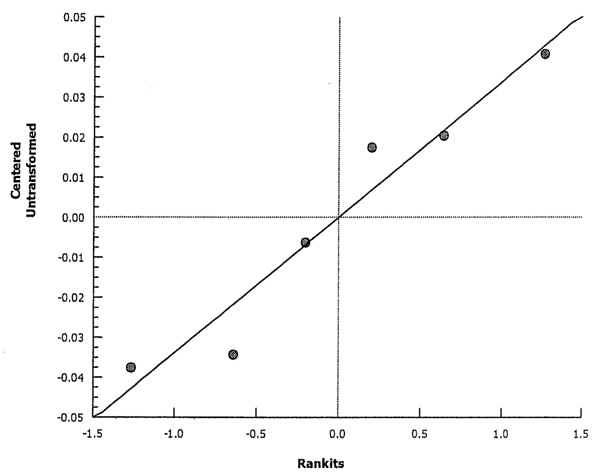
2020 Jul 03   2020 Jul 09

Fathead Minnow 7-d Larval Survival and Growth Test | **Bureau Veritas Laboratories**

nalysis ID:	01-0334-8083	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 JUL03 dm QA: PH 2020JUL09

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	07-7609-8501	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	8.60%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3		100	-2.515	2.132	0.045	4	CDF	0.9672	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.622	1.887	0.3541	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	0.0042667	0.0042667	1	6.327	0.0657	Non-Significant Effect
Error	0.0026973	0.0006743	4			
Total	0.006964		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.777	199	0.4187	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.864	0.43	0.2033	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	3	0.5253	0.4836	0.5671	0.529	0.507	0.54	0.009701	3.20%	0.00%
100		3	0.5787	0.4975	0.6598	0.596	0.541	0.599	0.01885	5.64%	-10.15%

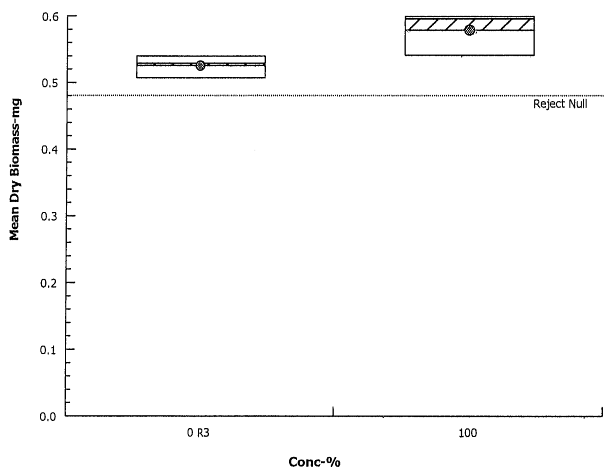
Mean Dry Biomass-mg Detail

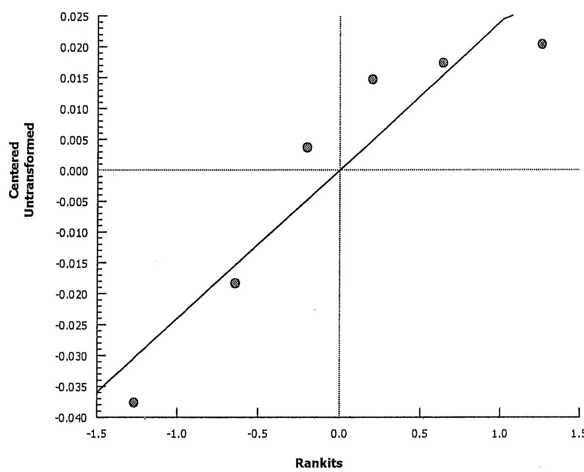
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.54	0.507	0.529
100		0.596	0.599	0.541

Fathead Minnow 7-d Larval Survival and Growth Test **Bureau Veritas Laboratories**

nalysis ID:	07-7609-8501	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	18-5244-7317	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	7.67%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0 pooled		100	-2.219	1.812	0.041	10	CDF	0.9746	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.031	2.412	0.3017	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0055503	0.0055503	1	4.925	0.0508	Non-Significant Effect
Error	0.0112707	0.0011271	10			
Total	0.0168209		11			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.071	199.4	1.1358	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9628	0.8025	0.8230	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	9	0.529	0.503	0.555	0.529	0.471	0.594	0.01127	6.39%	0.00%
100		3	0.5787	0.4975	0.6598	0.596	0.541	0.599	0.01885	5.64%	-9.39%

Mean Dry Biomass-mg Detail

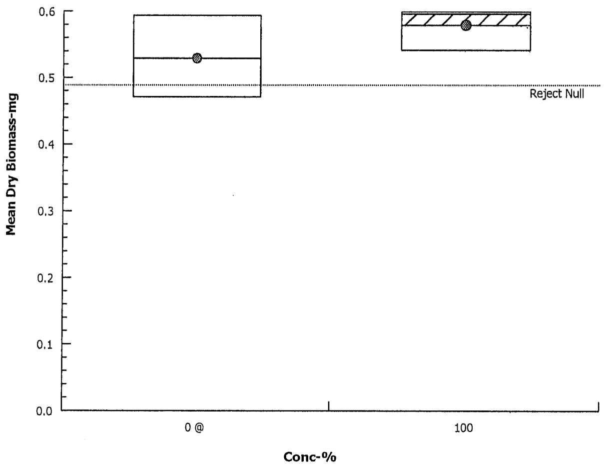
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9
0	@	0.54	0.507	0.529	0.519	0.594	0.547	0.471	0.511	0.543
100		0.596	0.599	0.541						

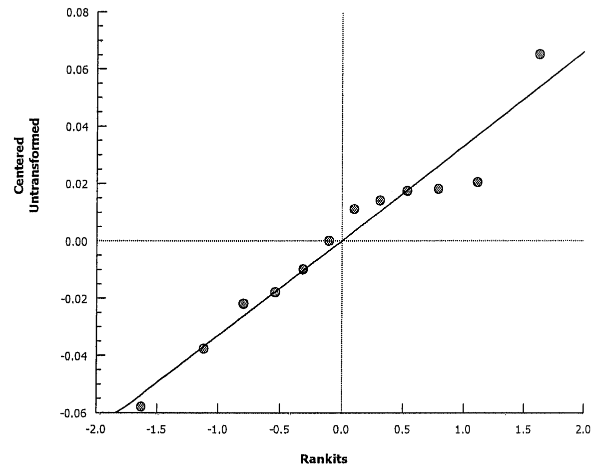
Analyst: 2020 Jul 03 dml QA: 2020 Jul 09 PH

Fathead Minnow 7-d Larval Survival and Growth Test **Bureau Veritas Laboratories**

nalysis ID:	18-5244-7317	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:08	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	12-0613-8884	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:11	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 13:30	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 16:07	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 3h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	11-2996-7815	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-01		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	263105	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.066	2.802	0.7544	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>100	n/a	n/a	<1	n/a	n/a
IC10	>100	n/a	n/a	<1	n/a	n/a
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
IC40	>100	n/a	n/a	<1	n/a	n/a
IC50	>100	n/a	n/a	<1	n/a	n/a

Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S1	3	0.5603	0.539	0.573	0.01073	0.01858	3.32%	0.0%
1.56		3	0.5303	0.524	0.538	0.004096	0.007094	1.34%	5.35%
3.3		3	0.5157	0.455	0.581	0.03645	0.06313	12.24%	7.97%
6.25		3	0.5647	0.529	0.608	0.02313	0.04005	7.09%	-0.77%
12.5		3	0.5097	0.455	0.558	0.0299	0.05179	10.16%	9.04%
25		3	0.5477	0.472	0.589	0.03789	0.06562	11.98%	2.26%
50		3	0.5257	0.486	0.56	0.02153	0.03729	7.09%	6.19%
100		3	0.5787	0.541	0.599	0.01885	0.03265	5.64%	-3.27%

Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	S1	0.569	0.539	0.573
1.56		0.529	0.524	0.538
3.3		0.455	0.581	0.511
6.25		0.557	0.529	0.608
12.5		0.455	0.558	0.516
25		0.582	0.472	0.589
50		0.486	0.531	0.56
100		0.596	0.599	0.541

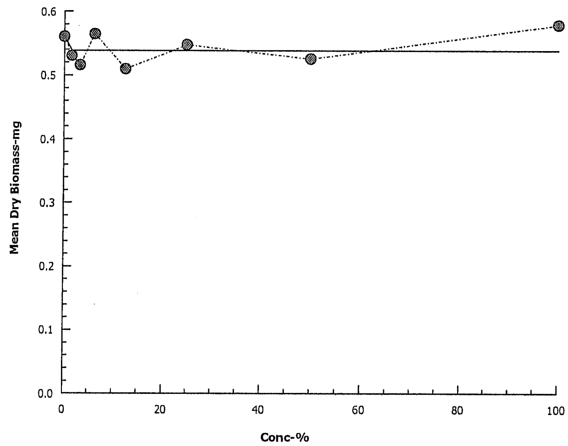
2020 Jul03 dm — 2020 Jul09

Analyst: dm QA: PH

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	12-0613-8884	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:11	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-01
Weighing Dates: 2020 June 17, 2020 Jun 20
Balance ID: bby-0260
Job / Sample #: C039804 XX3664
Drying Time (h): >24
Drying Temp (°C): 60

Boat #	Conc. & Replicate	Initial # Of Fish	Boat Wt. (g)	Boat & Fish Wt. (g)	Wt. of Fish (mg)	Biomass/Replicate[1] (mg)	Mean Biomass/Conc[1] (mg)	SD
275	0-A	10	0.80154	0.80641	4.87	0.487	0.497	0.03
276	B	10	0.80728	0.81255	5.27	0.527		
277	C	10	0.81578	0.82055	4.77	0.477		
278	Site Ctrl-A	10	0.80451	0.81020	5.69	0.569	0.560	0.02
279	B	10	0.79960	0.80499	5.39	0.539		
280	C	10	0.80923	0.81496	5.73	0.573		
281	1.56%-A	10	0.80425	0.80954	5.29	0.529	0.530	0.01
282	B	10	0.80329	0.80853	5.24	0.524		
283	C	10	0.82841	0.83379	5.38	0.538		
284	3.13%-A	10	0.82530	0.82985	4.55	0.455	0.516	0.06
285	B	10	0.80330	0.80911	5.81	0.581		
286	C	10	0.78898	0.79409	5.11	0.511		
287	6.25%-A	10	0.79284	0.79841	5.57	0.557	0.565	0.04
288	B	10	0.78756	0.79285	5.29	0.529		
289	C	10	0.79521	0.80129	6.08	0.608		
290	12.5%-A	10	0.78925	0.79380	4.55	0.455	0.510	0.05
291	B	10	0.79870	0.80428	5.58	0.558		
292	C	10	0.79851	0.80367	5.16	0.516		
293	25%-A	10	0.81684	0.82266	5.82	0.582	0.548	0.07
294	B	10	0.81718	0.82190	4.72	0.472		
295	C	10	0.79996	0.80585	5.89	0.589		
296	50%-A	10	0.81018	0.81504	4.86	0.486	0.526	0.04
297	B	10	0.81173	0.81704	5.31	0.531		
298	C	10	0.78729	0.79289	5.60	0.560		
299	100%-A	10	0.78313	0.78909	5.96	0.596	0.579	0.03
300	B	10	0.78252	0.78851	5.99	0.599		
301	C	10	0.79014	0.79555	5.41	0.541		
302	QA/QC		0.78708	0.78712	0.04			
303	QA/QC		0.80186	0.80178	-0.08			
275	0-A	10	0.80145	0.80645	5.00			
Analyst			NS	DML				

[1] Biomass is calculated as the weight of fish per replicate divided by the number of fish initially seeded into that replicate (i.e. **10** fish per replicate).

Average Dry Weight of Control Fish (Average dry weight of control fish must be ≥ 250 μg for test to be valid)

Boat #	Conc. & Replicate	# Surviving Fish	Wt. of Fish (mg)	Mean Wt./ Fish (μg)	Mean Dry Wt. (μg)
275	0-A	10	4.87	487	**497**
276	B	10	5.27	527	
277	C	10	4.77	477	

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Job / Sample #: CU39804/XX3664
Date Started: June 12, 2020
Sample ID: MEL-13-01
Date Ended: June 19, 2020
Organism Lot #: AB200612
Analyst(s): MHamad Y.S.U. N.Shergill M.O'Toole
Deviations - See BLNC: □
Worksheet Created: □

Before Use Measurements (After temperature adjustment)

Day	Date	Initial D.O. (% Sat)	Initial Temp (°C)	Aerated (min.)*	Post Aeration D.O. (% Sat)	Post Aeration Temp (°C)	Analyst
0	June 12, 2020	103.3	25.6	20	99.2	25.4	MHM
1	June 13, 2020	105.1	25.6	20	103.1	25.6	MHM
2	June 14, 2020	109.7	26.0	20	107.2	26.0	mo
3	June 15, 2020	107.4	24.3	20	100.0	24.1	ys
4	June 16, 2020	106.0	25.1	20	100.5	25.0	MHM
5	June 17, 2020	109.6	25.9	20	101.4	25.7	MHM
6	June 18, 2020	110.2	25.6	20	102.0	25.5	MHM

*Aeration rate must be ≤100 bubbles/min
Instrument ID's: BB42-0366
Sample Description: clear and colourless
Initials: MHamad
Sample Hardness (mg /L CaCO3) (A) ~~72~~ 75
Initials: ys
Room # 106

Observations during the Test (Organism behaviour, additional test information)

Day		Analyst
0	Date: June 12, 2020 Carboy / Bottle #: 1	MHM / ys
	Pre-Aeration Time: 09:22-09:42 Test Seeded @: 13:30	
	Feeding PM: 16:15 Feeding Volume (uL): 50	
1	Date: June 13, 2020 Carboy / Bottle #: 2	MHM / ue
	Pre-Aeration Time: 14:49-15:09 Water change @: 14:45	
	Feeding AM: 08:15 Feeding PM: 17:00 Feeding Volume (uL): 50	
	WQ Rep: A	
2	Date: June 14, 2020 Carboy / Bottle #: 3	NS ys
	Pre-Aeration Time: 10:20-10:40 Water change @: 15:20	
	Feeding AM: 0905 Feeding PM: 16:10 Feeding Volume (uL): 50	
	WQ Rep: B	

(A) WE. ys 2020 June 12

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates (Agnico)
Job / Sample #: C039804/XX3664
Sample ID: MEL-13-01

Day		Analyst
3	Date: June 15, 2020 Carboy / Bottle #: 1	VS
	Pre-Aeration Time: 0 14:45 - 15:05 Water change @: 16:30	
	Feeding AM: 07:00 Feeding PM: 17:30 Feeding Volume (uL): 50	
	WQ Rep: C	
4	Date: June 16, 2020 Carboy / Bottle #: C1	MHM
	Pre-Aeration Time: 09:40 - 10:00 Water change @: 14:31	
	Feeding AM: 07:45 Feeding PM: 15:20 Feeding Volume (uL): 50	
	WQ Rep: A	
5	Date: June 17, 2020 Carboy / Bottle #: 2	MHM / UB
	Pre-Aeration Time: 08:15 - 08:35 Water change @: 12:30	
	Feeding AM: 07:45 Feeding PM: 14:20 Feeding Volume (uL): 50	
	WQ Rep: B	
6	Date: June 18, 2020 Carboy / Bottle #: 3	MHM
	Pre-Aeration Time: 13:07 - 13:27 Water change @: (A)	
	Feeding AM: 08:15 Feeding PM: (A) Feeding Volume (uL): 50	
	WQ Rep: C	
7	Date: June 19, 2020	yo
	Test ended @ 16:07 WQ rep: A	

(A) Feeding time and water change time missed
Feeding at approx. 15:00 MHM 20200709

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd.
Sample ID: MEL-13-01 Job / Sample #: C039804/ XX3664
Analyst(s): MHamad, Y. Su, N. Shergill, A. Rassool, M. O'Toole

Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	458	463	462	504	453	452	452
	Final	513	480	481	512	515	513	478
Temp. (°C)	Initial	24.4	24.6	24.9	24.9	25.3	25.0	25.0
	Final	24.0	24.7	24.0	24.8	25.4	24.6	25.3
D.O. (mg/L)	Initial	8.1	7.8	8.2	8.0	8.1	8.4	8.3
	Final	7.1	6.9	7.7	6.6	6.5	6.6	6.1
pH	Initial	8.2	8.2	8.1	8.1	8.2	8.1	8.1
	Final	8.0	8.0	8.0	7.9	7.7	7.8	7.7

Synthetic / Site Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	126	126	129	130	129	129
	Final	140	148	139	134	150	147	149
Temp. (°C)	Initial	23.8	25.0	25.3	24.7	24.8	25.0	25.0
	Final	24.6	24.7	24.0	24.6	25.1	25.0	25.3
D.O. (mg/L)	Initial	8.2	8.1	8.3	7.9	8.2	8.3	8.2
	Final	6.9	6.8	7.1	6.9	6.2	6.3	6.4
pH	Initial	8.0	7.7	7.5	7.9	7.7	7.5	7.6
	Final	7.3	8.1	7.1	7.4	7.2	7.3	7.2

1.56%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	127	126	128	128	128	129
	Final	135	137	133	135	146	148	147
Temp. (°C)	Initial	24.0	25.0	25.4	24.9	24.9	25.1	25.0
	Final	24.4	24.4	24.2	25.0	24.8	24.8	25.2
D.O. (mg/L)	Initial	8.4	8.1	8.3	Ⓐ ~~7.9~~ 8.0	8.2	8.3	8.2
	Final	7.0	7.1	7.3	6.8	6.5	6.4	6.6
pH	Initial	7.8	7.6	7.5	7.8	7.4	7.4	7.5
	Final	7.1	7.9	7.1	7.3	7.1	7.3	7.2

3.13%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	126	126	127	128	128	128
	Final	134	137	134	132	139	137	144
Temp. (°C)	Initial	24.0	25.0	25.4	25.1	24.9	25.1	25.0
	Final	24.1	24.4	24.9	25.2	25.3	24.6	25.1
D.O. (mg/L)	Initial	8.4	8.2	8.3	8.2	8.3	8.3	8.2
	Final	7.1	7.1	7.1	6.6	6.2	6.4	6.4
pH	Initial	7.8	7.6	7.4	7.6	7.5	7.5	7.5
	Final	7.1	7.7	7.1	7.1	7.0	7.1	7.1

mo ys

Ⓐ WE. YS 2020 June 15

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd.
Sample ID: MEL-13-01
Job / Sample #: C039804 / XX3664

6.25%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	126	126	126	127	127	128	128
	Final	133	141	142	133	138	139	147
Temp. (°C)	Initial	24.0	25.0	25.4	25.1	24.8	25.1	25.2
	Final	24.0	24.4	24.6	24.9	25.3	25.2	24.9
D.O. (mg/L)	Initial	8.4	8.2	8.3	8.2	8.3	8.3	8.3
	Final	7.2	7.0	6.8	6.8	6.3	6.3	6.6
pH	Initial	7.7	7.5	7.2	7.6	7.5	7.4	7.5
	Final	7.1	7.6	7.0	7.1	7.0	7.1	7.1
Analyst		MM MM	MM NS	MO MM	YS MM	MM MM	MM MM	M
Daily WQ Reviewed by:		M M	MM NS	MO M	YS M	MM MM	MM M	M

12.5%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	126	126	126	127	128	128	128
	Final	134	137	135	131	142	141	140
Temp. (°C)	Initial	24.0	25.0	25.4	25.0	24.8	25.1	25.2
	Final	24.0	24.5	24.8	25.1	24.8	24.8	25.0
D.O. (mg/L)	Initial	8.4	8.3	8.3	8.3	8.3	8.3	8.3
	Final	7.2	6.9	7.0	6.5	6.5	6.6	7.0
pH	Initial	7.6	7.4	7.3	7.6	7.5	7.5	7.6
	Final	7.1	7.6	7.1	7.0	7.0	7.1	7.1

25%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	127	127	127	128	128	129	129
	Final	134	139	139	126	143	144	142
Temp. (°C)	Final	24.1	24.9	25.5	25.1	24.8	25.2	25.2
	Final	24.5	24.3	24.8	25.2	24.4	24.6	24.8
D.O. (mg/L)	Initial	8.4	8.3	8.3	8.3	8.3	8.3	8.3
	Final	6.8	7.0	7.2	6.5	6.6	6.5	6.9
pH	Initial	7.4	7.3	7.3	7.5	7.5	7.5	7.5
	Final	7.0	7.5	7.2	7.0	7.1	7.2	7.1

50%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	128	128	128	129	129	129	129
	Final	141	138	139	127	142	143	141
Temp. (°C)	Initial	24.5	24.8	25.6	25.0	24.8	25.3	25.3
	Final	24.1	24.3	24.5	25.2	24.8	24.5	24.9
D.O. (mg/L)	Initial	8.4	8.4	8.4	8.3	8.3	8.3	8.3
	Final	7.0	7.1	7.2	6.5	6.6	6.6	6.7
pH	Initial	7.3	7.2	7.2	7.5	7.5	7.4	7.4
	Final	7.1	7.5	7.2	7.0	7.1	7.1	7.2

100%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	130	130	130	132	130	130	132
	Final	137	141	138	130	145	145	141
Temp. (°C)	Initial	25.0	25.7	25.8	24.1	24.9	25.5	25.5
	Final	24.1	24.4	24.8	25.1	25.3	24.8	24.8
D.O. (mg/L)	Initial	8.4	8.6	8.5	8.5	8.4	8.3	8.3
	Final	6.8	7.1	7.3	6.5	6.2	6.3	6.0
pH	Initial	7.2	7.1	7.1	7.4	7.4	7.4	7.5
	Final	7.0	7.5	7.3	7.0	7.0	7.1	7.3
Analyst		MM MM	MM NS	MO MM	YS MM	MM MM	MM MM	M MM
Daily WQ Reviewed by:		M M	MM NS	MO M	YS M	M M	MM M	M M

ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd.

Sample ID: MEL-13-01

Job / Sample #: C039804 / XX3664

# Surviving Organisms													
Conc. (% v/v)	Replicate #	# Of Fish Seeded	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	% Survival	% Mortality	% Mean Mortality	SD (%)
	Date	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun				
Control	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
Site Control (Synthetic)	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
1.56	A	10	10	10	10	10	10	10	9	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
3.13	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
6.25	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
12.5	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
25	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	Ⓐ ~~9~~ 10	10	9	9	9	-	-		
	C	10	10	10	Ⓐ ~~9~~ 10	10	10	10	10	-	-		
50	A	10	10	10	10	10	10	10	Ⓑ ~~9~~ 10	-	-	-	-
	B	10	10	10	9	9	9	9	9	-	-		
	C	10	10	10	9	9	9	9	9	-	-		
100	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
Analyst		YS/MH	WB	NS	YS	M	WB	W	YS				

* see test comments

Ⓐ WE. YS 2020 June 15
Ⓑ WE. YS 2020 June 19

ECOTOXICOLOGY

Randomization Chart

Client Name: Golder (Agnico)

Sample Name: MEL-13-01

Start Date: 2020 Jun 12

Use the coloured dot to find appropriate conc'ns and put beakers back in proper position following daily water change.

Back Wall — **Position Map**

4	8	12	16	20	24
3	7	11	15	19	23
2	6	10	14	18	22
1	5	9	13	17	21

Front of Counter

Position #	Treatment	Replicate	Colour
6		A	
18	Control	B	Red
3		C	
21		A	
20	Site Control	B	White
25	(Synthetic)	C	
13		A	
26	1.56%	B	Orange
10		C	
2		A	
23	3.13%	B	Yellow
14		C	
5		A	
7	6.25%	B	Fl. Green
24		C	
4		A	
9	12.5%	B	Green
15		C	
27		A	
1	25%	B	Blue
16		C	
8		A	
12	50%	B	Purple
17		C	
22		A	
19	100%	B	Pink
11		C	

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	12-6274-6755	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 16:54	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 1	mel03-02	100	1.0000	Exact	1.0000	Non-Significant Effect

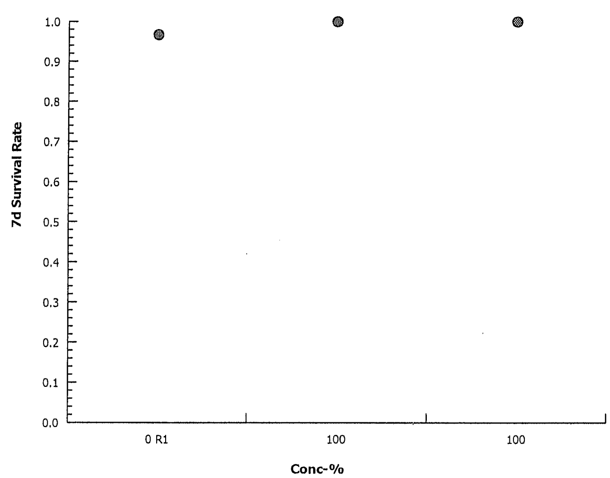
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R1	29	1	30	0.9667	0.03333	0.0%
100		30	0	30	1	0	-3.45%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	11-7786-8713	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 16:54	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 2	mel0405	100	1.0000	Exact	1.0000	Non-Significant Effect

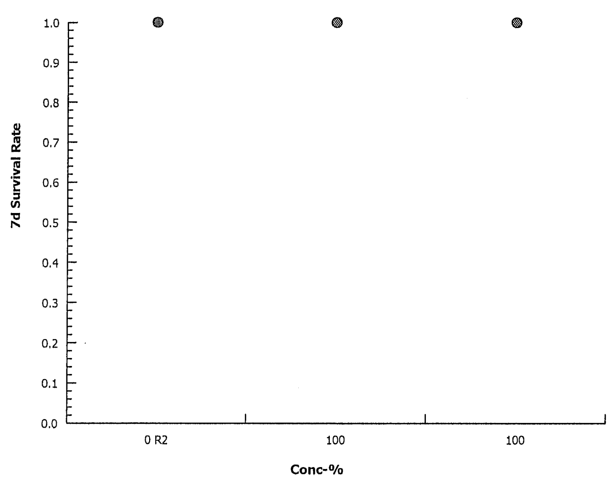
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R2	30	0	30	1	0	0.0%
100		30	0	30	1	0	0.0%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	1.0000	1.0000	1.0000
100		1.0000	1.0000	1.0000

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	19-9820-7893	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 16:55	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 3	me10504	100	1.0000	Exact	1.0000	Non-Significant Effect

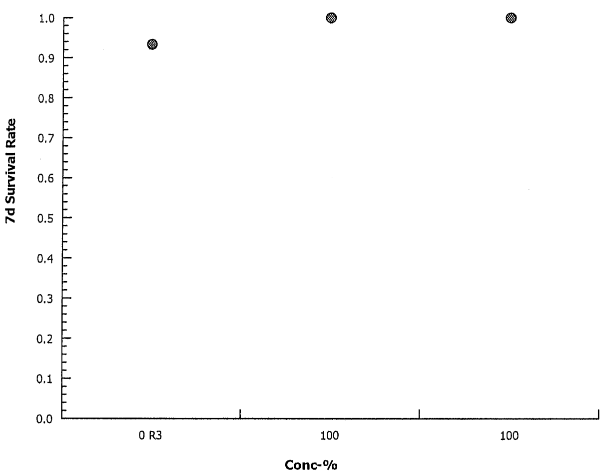
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R3	28	2	30	0.9333	0.06667	0.0%
100		30	0	30	1	0	-7.14%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.9000	1.0000	0.9000
00		1.0000	1.0000	1.0000

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	08-9538-1652	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 16:55	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Group 1 vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
0 pooled	100	1.0000	Exact	1.0000	Non-Significant Effect

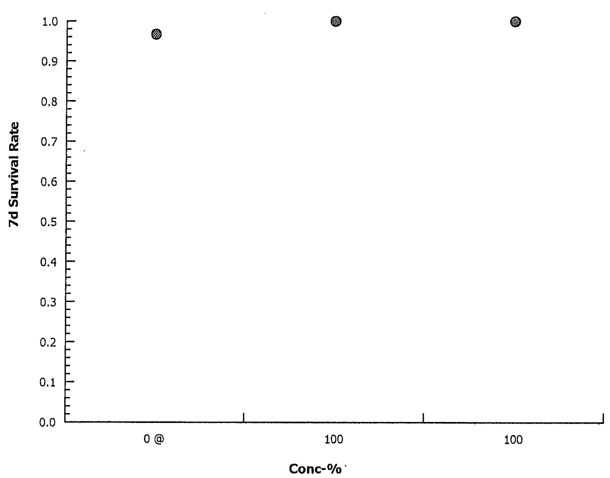
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	@	87	3	90	0.9667	0.03333	0.0%
100		30	0	30	1	0	-3.45%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9
0	@	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
100		1.0000	1.0000	1.0000						

Graphics



CETIS Analytical Report

Report Date:	19 Jun-20 17:04 (p 1 of 2)		
Test Code:	PP-10735-0320 | 20-9088-9222		

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	21-1698-4845	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 16:54	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1155209	200	Yes	Two-Point Interpolation

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC5	>100	n/a	n/a	<1	n/a	n/a
EC10	>100	n/a	n/a	<1	n/a	n/a
EC15	>100	n/a	n/a	<1	n/a	n/a
EC20	>100	n/a	n/a	<1	n/a	n/a
EC25	>100	n/a	n/a	<1	n/a	n/a
EC40	>100	n/a	n/a	<1	n/a	n/a
EC50	>100	n/a	n/a	<1	n/a	n/a

7d Survival Rate Summary

			Calculated Variate(A/B)								
Conc-%	**Code**	**Count**	**Mean**	**Min**	**Max**	**Std Err**	**Std Dev**	**CV%**	**%Effect**	**A**	**B**
0	S1	3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	0.0%	29	30
1.56		3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	0.0%	29	30
3.13		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%	30	30
6.25		3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	0.0%	29	30
12.5		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%	30	30
25		3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	0.0%	29	30
50		3	0.9667	0.9000	1.0000	0.0333	0.0577	5.97%	0.0%	29	30
100		3	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%	30	30

7d Survival Rate Detail

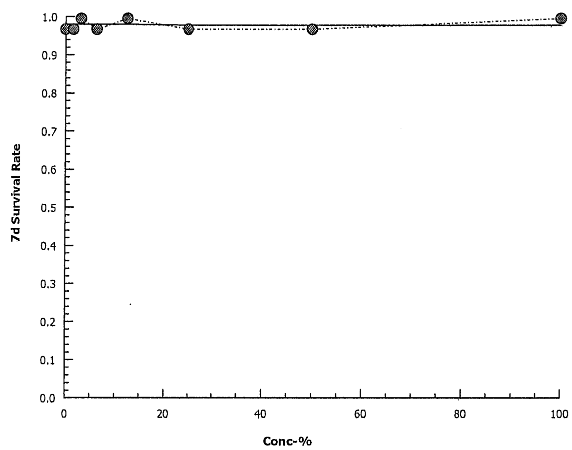
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	S1	1.0000	0.9000	1.0000
1.56		1.0000	0.9000	1.0000
3.13		1.0000	1.0000	1.0000
6.25		0.9000	1.0000	1.0000
12.5		1.0000	1.0000	1.0000
25		1.0000	1.0000	0.9000
50		0.9000	1.0000	1.0000
100		1.0000	1.0000	1.0000

Analyst: dml 2020 Jun19 QA: PH 2020Jul02

Fathead Minnow 7-d Larval Survival and Growth Test | **Bureau Veritas Laboratories**

nalysis ID:	21-1698-4845	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 16:54	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd. (Agnico)

Sample ID: MEL-13-07

Job / Sample #: C039804 XX3665

# Surviving Organisms													
Conc. (% v/v)	Replicate #	# Of Fish Seeded	Day 1	2	3	4	5	6	7	% Survival	% Mortality	% Mean Mortality	SD (%)
	Date	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun				
Control	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
Site Control	A	10	10	10	10	10	10	10	10	100%	0%	3.3%	5.8%
	B	10	10	10	10	10	10	10	9	90%	10%		
	C	10	10	10	10	10	10	10	10	100%	0%		
1.56	A	10	10	10	10	10	10	10	10	100%	0%	3.3%	5.8%
	B	10	10	10	10	10	10	10	9	90%	10%		
	C	10	10	10	10	10	10	10	10	100%	0%		
3.13	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
6.25	A	10	10	10	10	10	10	10	9	90%	10%	3.3%	5.8%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
12.5	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
25	A	10	10	10	10	10	10	10	10	100%	0%	3.3%	5.8%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	9	90%	10%		
50	A	10	10	10	9	9	9	9	9	90%	10%	3.3%	5.8%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
100	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
Analyst		MHM	MHM	NS	YS	MHM	MB	MHM	MHM				

*** see test comments**

Proofed: [signature]
2020JUL02

CETIS Analytical Report

Test Code: PP-10735-0320 | 20-9088-9222

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	20-0622-9798	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	18.38%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1	mel0302	100	0.3498	2.132	0.093	4	CDF	0.3721	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.499	1.887	0.5782	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0003527	0.0003527	1	0.1223	0.7441	Non-Significant Effect
Error	0.0115307	0.0028827	4			
Total	0.0118833		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.43	199	0.4514	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9814	0.43	0.9583	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	3	0.5083	0.4187	0.5979	0.511	0.471	0.543	0.02083	7.10%	0.00%
100		3	0.493	0.327	0.659	0.481	0.433	0.565	0.03857	13.55%	3.02%

Mean Dry Biomass-mg Detail

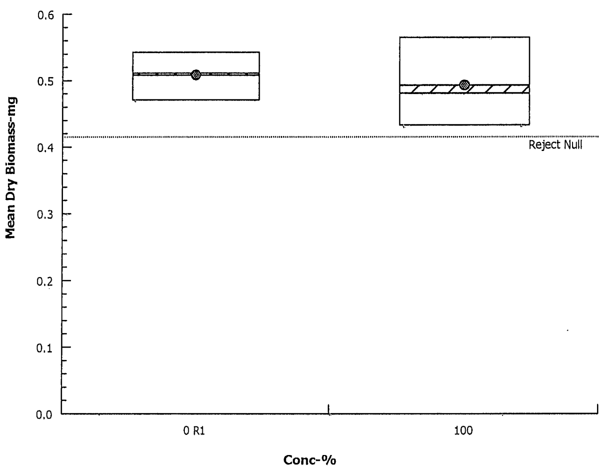
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	0.471	0.511	0.543
100		0.433	0.481	0.565

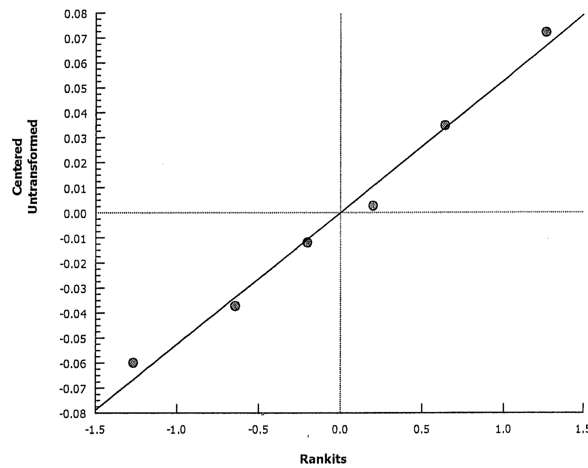
Analyst: dml 2020 JUN22 QA: PH 2020JUL02

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	20-0622-9798	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:52	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





dml 2020 Jun22 2020Jul02

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	14-7223-4339	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	17.09%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2	mel 0405	100	1.36	2.132	0.095	4	CDF	0.1227	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.482	1.887	0.6137	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0054602	0.0054602	1	1.851	0.2453	Non-Significant Effect
Error	0.0118007	0.0029502	4			
Total	0.0172608		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.108	199	0.4869	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9598	0.43	0.8183	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	3	0.5533	0.4592	0.6475	0.547	0.519	0.594	0.02188	6.85%	0.00%
100		3	0.493	0.327	0.659	0.481	0.433	0.565	0.03857	13.55%	10.90%

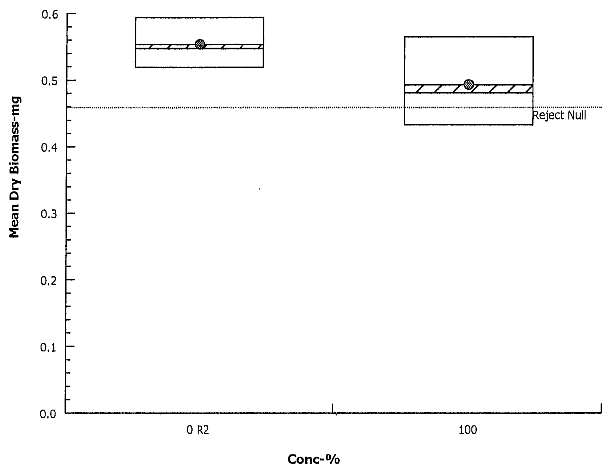
Mean Dry Biomass-mg Detail

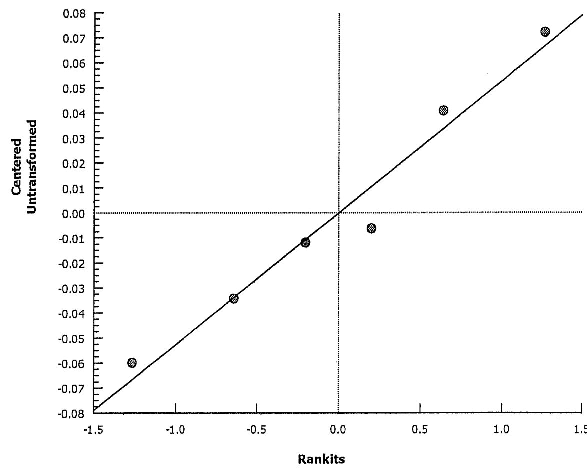
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	0.519	0.594	0.547
100		0.433	0.481	0.565

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	14-7223-4339	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:53	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





DML 2020 Jun22   2020Jul02

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	15-8419-1907	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	16.14%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3	mel050	100	0.8129	2.132	0.085	4	CDF	0.2309	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.652	1.887	0.3058	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0015682	0.0015682	1	0.6608	0.4619	Non-Significant Effect
Error	0.0094927	0.0023732	4			
Total	0.0110608		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	15.81	199	0.1190	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9611	0.43	0.8285	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	3	0.5253	0.4836	0.5671	0.529	0.507	0.54	0.009701	3.20%	0.00%
100		3	0.493	0.327	0.659	0.481	0.433	0.565	0.03857	13.55%	6.15%

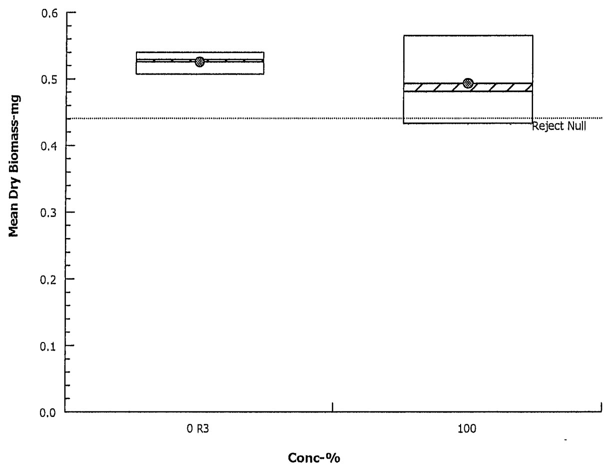
Mean Dry Biomass-mg Detail

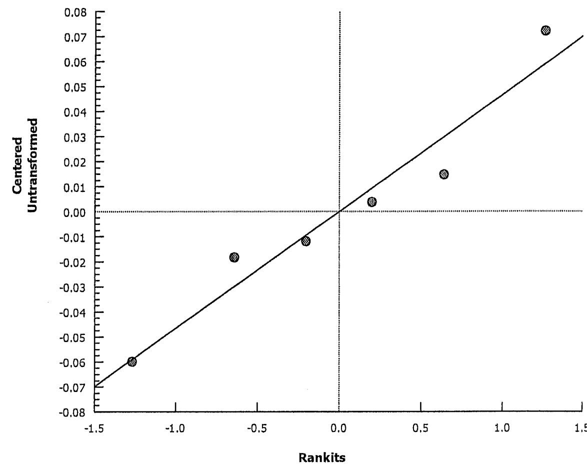
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.54	0.507	0.529
100		0.433	0.481	0.565

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	15-8419-1907	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	00-6604-9624	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
nalyzed:	22 Jun-20 16:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	9.71%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	pooled	100	1.27	1.812	0.051	10	CDF	0.1163	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.777	2.412	0.7027	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.002916	0.002916	1	1.614	0.2327	Non-Significant Effect
Error	0.018066	0.0018066	10			
Total	0.020982		11			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.908	11.04	0.1309	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9364	0.8025	0.4524	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	9	0.529	0.503	0.555	0.529	0.471	0.594	0.01127	6.39%	0.00%
100		3	0.493	0.327	0.659	0.481	0.433	0.565	0.03857	13.55%	6.81%

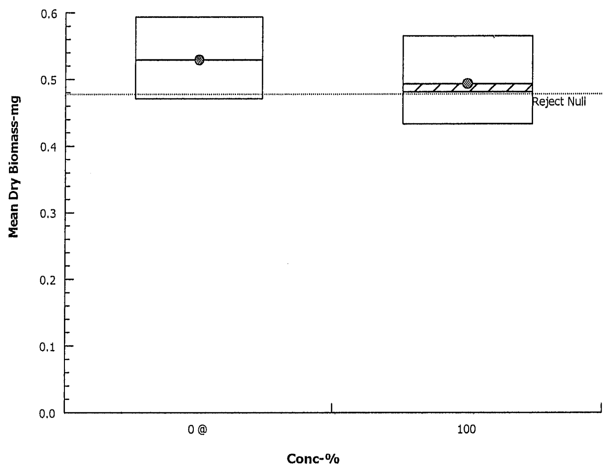
Mean Dry Biomass-mg Detail

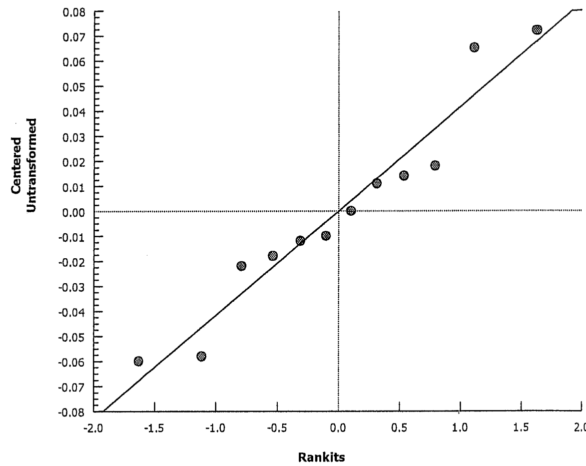
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9
0	@	0.54	0.507	0.529	0.519	0.594	0.547	0.471	0.511	0.543
100		0.433	0.481	0.565						

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	00-6604-9624	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:55	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date:	22 Jun-20 16:55 (p 1 of 2)
Test Code:	PP-10735-0320 | 20-9088-9222

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	18-2082-1589	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
nalyzed:	22 Jun-20 16:52	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:23	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 15:45	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	07-1013-0430	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 14h	**Station:**	MEL 13-07		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	1924986	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.997	2.802	0.9186	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	68.6	48.27	n/a	1.458	n/a	2.072
IC10	93.98	45.26	n/a	1.064	n/a	2.209
IC15	>100	n/a	n/a	<1	n/a	n/a
IC20	>100	n/a	n/a	<1	n/a	n/a
IC25	>100	n/a	n/a	<1	n/a	n/a
`40	>100	n/a	n/a	<1	n/a	n/a
ıC50	>100	n/a	n/a	<1	n/a	n/a

Mean Dry Biomass-mg Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S1	3	0.506	0.446	0.562	0.03355	0.0581	11.48%	0.0%
1.56		3	0.5167	0.449	0.587	0.03986	0.06904	13.36%	-2.11%
3.13		3	0.558	0.506	0.599	0.0274	0.04747	8.51%	-10.28%
6.25		3	0.5457	0.443	0.621	0.05317	0.09209	16.88%	-7.84%
12.5		3	0.6043	0.527	0.673	0.04237	0.07338	12.14%	-19.43%
25		3	0.5537	0.532	0.576	0.01271	0.02201	3.98%	-9.42%
50		3	0.5927	0.559	0.628	0.01994	0.03453	5.83%	-17.13%
100		3	0.493	0.433	0.565	0.03857	0.06681	13.55%	2.57%

Mean Dry Biomass-mg Detail

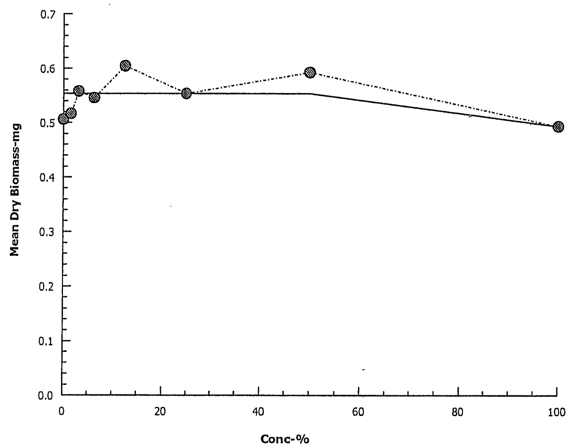
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	S1	0.562	0.446	0.51
1.56		0.587	0.514	0.449
3.13		0.506	0.569	0.599
6.25		0.443	0.573	0.621
12.5		0.613	0.673	0.527
25		0.532	0.576	0.553
50		0.559	0.591	0.628
100		0.433	0.481	0.565

Analyst: dm 2020 Jun22 QA: PH 2020Jul02

Fathead Minnow 7-d Larval Survival and Growth Test | **Bureau Veritas Laboratories**

nalysis ID:	18-2082-1589	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 16:52	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Analyst: [signature] 2020 Jun 22 QA: PH 2020 Jul 02

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-07
Weighing Dates: 2020 June 17, 2020 Jun 20
Balance ID: bby2-0260
Job / Sample #: C039804 XX3665
Drying Time (h): >24
Drying Temp (°C): 60

Boat #	Conc. & Replicate	Initial # Of Fish	Boat Wt. (g)	Boat & Fish Wt. (g)	Wt. of Fish (mg)	Biomass/Replicate[1] (mg)	Mean Biomass/Conc[1] (mg)	SD
304	0-A	10	0.80144	0.80714	5.70	0.570	0.573	0.06
305	B	10	0.80493	0.81008	5.15	0.515		
306	C	10	0.80810	0.81443	6.33	0.633		
307	Site Ctrl-A	10	0.79177	0.79739	5.62	0.562	0.506	0.06
308	B	10	0.80906	0.81352	4.46	0.446		
309	C	10	0.81217	0.81727	5.10	0.510		
310	1.56%-A	10	0.81361	0.81948	5.87	0.587	0.517	0.07
311	B	10	0.80485	0.80999	5.14	0.514		
312	C	10	0.79729	0.80178	4.49	0.449		
313	3.13%-A	10	0.80236	0.80742	5.06	0.506	0.558	0.05
314	B	10	0.78473	0.79042	5.69	0.569		
315	C	10	0.82537	0.83136	5.99	0.599		
316	6.25%-A	10	0.81461	0.81904	4.43	0.443	0.546	0.09
317	B	10	0.79856	0.80429	5.73	0.573		
318	C	10	0.79863	0.80484	6.21	0.621		
[illegible]9	12.5%-A	10	0.80023	0.80636	6.13	0.613	0.604	0.07
320	B	10	0.80637	0.81310	6.73	0.673		
321	C	10	0.79973	0.80500	5.27	0.527		
322	25%-A	10	0.79829	0.80361	5.32	0.532	0.554	0.02
323	B	10	0.78474	0.79050	5.76	0.576		
324	C	10	0.78370	0.78923	5.53	0.553		
325	50%-A	10	0.79626	0.80185	5.59	0.559	0.593	0.03
326	B	10	0.80695	0.81286	5.91	0.591		
327	C	10	0.79326	0.79954	6.28	0.628		
328	100%-A	10	0.80523	0.80956	4.33	0.433	0.493	0.07
329	B	10	0.80372	0.80853	4.81	0.481		
330	C	10	0.80518	0.81083	5.65	0.565		
331	QA/QC		0.79185	0.79201	0.16			
332	QA/QC		0.79620	0.79639	0.19			
304	0-A	10	0.80152	0.80738	5.86			
Analyst			NS	DML				

[1] Biomass is calculated as the weight of fish per replicate divided by the number of fish initially seeded into that replicate (i.e. **10** fish per replicate).

Average Dry Weight of Control Fish (Average dry weight of control fish must be ≥ 250 µg for test to be valid)

Boat #	Conc. & Replicate	# Surviving Fish	Wt. of Fish (mg)	Mean Wt./ Fish (µg)	Mean Dry Wt. (µg)
304	0-A	10	5.70	570	**573**
305	B	10	5.15	515	
306	C	10	6.33	633	

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Job / Sample #: C039804 / XX3665
Date Started: June 12, 2020
Sample ID: MEL-13-07
Date Ended: June 19, 2020
Organism Lot #: AB200612
Analyst(s): MHamad / Y.SU, ~~Nassif~~ NShergill
Deviations - See BLNC: □
Worksheet Created: □

Before Use Measurements (After temperature adjustment)

Day	Date	Initial D.O. (% Sat)	Initial Temp (°C)	Aerated (min.)*	Post Aeration D.O. (% Sat)	Post Aeration Temp (°C)	Analyst
0	June 12, 2020	105.7	25.3	20	103.9	25.6	MHM
1	June 13, 2020	105.1	25.8	20	103.6	25.7	MHM
2	June 14, 2020	110.2	26.0	20	108.5	25.9	NS
3	June 15, 2020	109.6	24.4	20	103.8	24.0	YS
4	June 16, 2020	110.1	25.5	20	101.8	25.1	MHM
5	June 17, 2020	113.2	25.9	20	101.9	25.7	MHM
6	June 18, 2020	111.3	25.7	20	101.2	25.7	MHM

*Aeration rate must be ≤100 bubbles/min
Instrument ID's: BBY2-0366
Sample Description: Clear and Colourless
Initials: MHamad
Sample Hardness (mg /L CaCO3): 32
Initials: YS
Room #: 106

Observations during the Test (Organism behaviour, additional test information)

Day		Analyst
0	Date: June 12, 2020 — Carboy / Bottle #: 1	MHM
	Pre-Aeration Time: 09:22-09:42 — Test Seeded @: 14:23	
	Feeding PM: 16:15 — Feeding Volume (uL): 50	
1	Date: June 13, 2020 — Carboy / Bottle #: 3	MHM / CEF
	Pre-Aeration Time: 14:49-15:09 — Water change @: 16:20	
	Feeding AM: 08:15 — Feeding PM: 17:00 — Feeding Volume (uL): 50	
	WQ Rep: A	
2	Date: June 14, 2020 — Carboy / Bottle #: 1	NS YS
	Pre-Aeration Time: 10:20-10:40 — Water change @: 15:08	
	Feeding AM: 09:05 — Feeding PM: 16:10 — Feeding Volume (uL): 50	
	WQ Rep: B	

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates (Agnico) Job / Sample #: C039804 / XX3665
Sample ID: MEL-13-07

Day		Analyst
3	Date: June 15, 2020 Carboy / Bottle #: 2	YS
	Pre-Aeration Time: 14:45 ~ 15:05 Water change @: 16:50	
	Feeding AM: 07:00 Feeding PM: 17:50 Feeding Volume (uL): 50	
	WQ Rep: C	
4	Date: June 16, 2020 Carboy / Bottle #: 3	MHM
	Pre-Aeration Time: 09:40-10:00 Water change @: 14:20	
	Feeding AM: 07:45 Feeding PM: 15:20 Feeding Volume (uL): 50	
	WQ Rep: A	
5	Date: June 17, 2020 Carboy / Bottle #: 3	MHM / WB
	Pre-Aeration Time: 08:15-08:35 Water change @: 11:58	
	Feeding AM: 07:45 Feeding PM: 14:20 Feeding Volume (uL): 50	
	WQ Rep: B	
6	Date: June 18, 2020 Carboy / Bottle #: 1	M
	Pre-Aeration Time: 13:07-13:27 Water change @: 14:10	
	Feeding AM: 08:15 Feeding PM: 15:00 Feeding Volume (uL): 50	
	WQ Rep: C	
7	Date: June 19, 2020	MHM
	Test ended @ 15:45 WQ rep: A	

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-07 Job / Sample #: C039804/XX3665
Analyst(s): Y.Su, M.Hamad, N.Brassil, M.O'Toole, N.Shergill

Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	458	463	462	504	453	452	454
	Final	466	475	479	508	515	509	511
Temp. (°C)	Initial	24.4	24.6	24.9	24.9	25.3	25.0	25.0
	Final	24.0	24.3	24.7	25.3	24.7	24.3	24.6
D.O. (mg/L)	Initial	8.1	7.8	8.2	8.0	8.1	8.4	8.0
	Final	6.9	7.2	7.2	6.8	6.8	6.6	6.8
pH	Initial	8.2	8.2	8.1	8.1	8.2	8.1	8.3
	Final	7.6	8.0	7.8	7.8	7.9	8.0	8.0

Synthetic

Site Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	126	126	129	130	129	129
	Final	140	153	133	140	141	137	138
Temp. (°C)	Initial	23.8	25.0	25.3	24.7	24.8	25.0	25.2
	Final	23.8	24.3	25.0	25.3	24.7	24.6	24.6
D.O. (mg/L)	Initial	8.2	8.1	8.3	7.9	8.2	8.3	8.2
	Final	7.3	6.9	7.1	6.5	6.9	6.9	6.9
pH	Initial	8.0	7.7	7.4	7.9	7.7	7.5	~~8.2~~ 7.8
	Final	7.3	8.0	7.2	7.3	7.4	7.3	7.2

1.56%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	126	125	127	130	128	129
	Final	138	139	133	136	142	137	133
Temp. (°C)	Initial	24.1	24.8	25.3	25.0	24.8	24.9	25.3
	Final	23.7	24.4	25.0	25.3	24.3	24.6	24.6
D.O. (mg/L)	Initial	8.4	8.0	8.3	8.2	8.3	8.3	8.2
	Final	7.3	6.8	7.3	6.7	7.1	7.0	7.0
pH	Initial	7.5	7.7	7.3	7.5	7.7	7.7	7.7
	Final	7.1	7.8	7.2	7.2	7.3	7.3	7.3

3.13%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	124	125	125	125	127	127	128
	Final	134	136	135	133	142	133	134
Temp. (°C)	Initial	24.1	24.8	25.3	25.3	24.8	24.9	25.3
	Final	23.9	24.2	25.2	25.1	24.3	24.6	24.7
D.O. (mg/L)	Initial	8.4	8.2	8.3	8.2	8.3	8.3	8.2
	Final	7.2	6.9	6.9	7.0	7.2	7.3	7.3
pH	Initial	7.5	7.5	7.3	7.5	7.6	7.5	7.5
	Final	7.1	7.7	6.9	7.1	7.2	7.2	7.2

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Ⓐ QC MH 2020 Jun 18

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-07 Job / Sample #: C039804 / XX3665

6.25%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	123	124	124	125	126	127	127
	Final	136	139	132	133	140	140	139
Temp. (°C)	Initial	24.0	24.8	25.2	25.3	24.7	24.9	25.4
	Final	23.9	24.0	25.2	25.4	24.6	25.0	24.6
D.O. (mg/L)	Initial	8.4	8.2	8.3	8.2	8.3	8.3	8.2
	Final	7.2	7.1	(A) ~~25.2~~ 6.5	6.8	7.0	7.1	6.9
pH	Initial	7.5	(A) ~~8.2~~ 7.3	7.3	7.5	7.6	7.5	7.6
	Final	7.1	7.6	7.0	7.1	7.1	7.1	7.1
Analyst		MM MHM	MM NS	MO MM	YS MHM	MHM	MHM	MHM
Daily WQ Reviewed by:		M MHM	M NS	MO M	YS MHM	MHM	MHM	MHM

12.5%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	122	123	123	123	124	125	126
	Final	131	133	129	136	140	139	14
Temp. (°C)	Initial	24.1	24.9	25.3	25.3	24.7	25.0	25.4
	Final	23.8	24.2	25.2	25.0	24.8	24.8	25.0
D.O. (mg/L)	Initial	8.4	8.2	8.3	8.3	8.3	8.3	8.2
	Final	7.2	7.1	(B) ~~25.3~~ 6.8	7.1	6.9	7.0	7.0
pH	Initial	7.4	7.3	7.3	7.4	7.5	7.5	7.5
	Final	7.0	7.6	7.1	7.2	7.1	7.1	7.2

25%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	118	119	119	120	121	122	122
	Final	128	131	127	131	131	131	133
Temp. (°C)	Final	24.2	24.9	25.3	25.0	24.8	24.9	25.4
	Final	23.7	24.3	25.4	25.0	25.1	24.8	24.8
D.O. (mg/L)	Initial	8.4	8.2	8.4	8.3	8.3	8.3	8.3
	Final	7.2	7.0	6.1	6.8	6.6	6.4	6.9
pH	Initial	7.3	7.3	7.3	7.4	7.5	7.3	7.5
	Final	7.0	7.5	6.9	7.0	7.0	7.0	7.1

50%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	112	114	112	114	115	116	114
	Final	124	227*	164	136	130	135	131
Temp. (°C)	Initial	24.4	24.9	25.5	25.2	24.8	25.0	25.5
	Final	24.0	24.3	25.4	25.3	25.0	24.8	24.6
D.O. (mg/L)	Initial	8.5	8.3	8.5	8.3	8.3	8.3	8.2
	Final	7.1	7.0	5.8	6.8	6.3	6.3	6.8
pH	Initial	7.3	7.3	7.2	7.4	7.5	7.4	7.5
	Final	7.0	7.4	7.0	7.1	7.0	7.0	7.1

100%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	99	100	98	102	102	102	100
	Final	106	111	106	138	117	118	109
Temp. (°C)	Initial	25.0	25.0	25.9	24.8	24.9	25.2	25.4
	Final	24.0	24.5	25.4	25.3	24.1	24.6	24.8
D.O. (mg/L)	Initial	8.5	8.4	8.7	8.5	8.4	8.3	8.2
	Final	7.1	6.8	6.0	6.3	6.4	6.6	6.6
pH	Initial	7.1	7.4	7.1	7.2	7.4	7.4	7.4
	Final	7.0	7.5	6.9	7.1	7.0	7.0	7.1
Analyst		MM MHM	MM NS	MO MHM	YS MM	MHM MM	MHM MM	MM MM
Daily WQ Reviewed by:		M M	M NS	MO M	YS M	MM M	MHM M	M M

* Rep A = 272 µs/cond & Rep C = 242 µs/cm –NS 2020 Jun 14

(A) WE MHM 2020 Jun 13 (B) WE MHM 2020 Jun 15

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico) Sample ID: MEL-13-07
Job / Sample #: C039804 / XX3665

# Surviving Organisms														
Conc. (% v/v)	Replicate #	# Of Fish Seeded	Day 1	2	3	4	5	6	7	% Survival	% Mortality	% Mean Mortality	SD (%)
	Date	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun				
Control	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
Site Control (Synthetic)	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	9	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
1.56	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	9	-	-		
	C	10	0	10	10	10	10	10	10	-	-		
3.13	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
6.25	A	10	10	10	10	10	10	10	9	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
12.5	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
25	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	9	-	-		
50	A	10	10	10	9	9	9	9	9	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
100	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
Analyst		M	MH	NS	YS	MH	dB	M	MH				

*** see test comments**

Randomization Chart

Client Name: Golder (Agnico)

Start Date: 2020 Jun 12

Sample Name: MEL-13-07

Use the coloured dot to find appropriate conc'ns and put beakers back in proper position following daily water change.

Back Wall

Position Map

4	8	12	16	20	24
3	7	11	15	19	23
2	6	10	14	18	22
1	5	9	13	17	21

Front of Counter

Position #	Treatment	Replicate	Colour
17		A	
7	Control	B	Red
27		C	
26		A	
5	Site Control	B	White
8	(Synthetic)	C	
20		A	
25	1.56%	B	Orange
1		C	
11		A	
9	3.13%	B	Yellow
14		C	
4		A	
13	6.25%	B	Fl. Green
18		C	
19		A	
16	12.5%	B	Green
6		C	
12		A	
15	25%	B	Blue
21		C	
10		A	
23	50%	B	Purple
22		C	
3		A	
2	100%	B	Pink
24		C	

CETIS Analytical Report

Report Date:	03 Jul-20 13:35 (p 1 of 1)	Test Code:	PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	12-9023-4371	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:06	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:

Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 1		100	0.3060	Exact	0.3060	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R1	29	1	30	0.9667	0.03333	0.0%
100		27	3	30	0.9	0.1	6.9%

7d Survival Rate Detail

onc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	1.0000	0.9000	1.0000
100		0.9000	0.9000	0.9000

Analyst: 2020 Jul 03 dm QA: 2020 Jul 09 PH

CETIS Analytical Report

Report Date:	03 Jul-20 13:35 (p 1 of 1)
Test Code:	PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	08-0119-1629	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:13	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:

Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 2		100	0.1186	Exact	0.1186	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R2	30	0	30	1	0	0.0%
100		27	3	30	0.9	0.1	10.0%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	1.0000	1.0000	1.0000
100		0.9000	0.9000	0.9000

Analyst: 2020 Jul 03 QA: PH 2020Jul09

CETIS Analytical Report

Report Date:	03 Jul-20 13:35 (p 1 of 1)
Test Code:	PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	02-5070-3213	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	19 Jun-20 17:13	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:

Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Control	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
Ref 3		100	0.5000	Exact	0.5000	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R3	28	2	30	0.9333	0.06667	0.0%
100		27	3	30	0.9	0.1	3.57%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.9000	1.0000	0.9000
100		0.9000	0.9000	0.9000

CETIS Analytical Report

Report Date:	03 Jul-20 13:35 (p 1 of 1)
Test Code:	PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	15-0572-5468	Endpoint:	7d Survival Rate	CETIS Version:	CETISv1.9.2
Analyzed:	19 Jun-20 17:13	Analysis:	Single 2x2 Contingency Table	Official Results:	Yes

Batch ID:	13-1526-7178	Test Type:	Growth-Survival (7d)	Analyst:	M. Hamad
Start Date:	12 Jun-20 14:10	Protocol:	EC/EPS 1/RM/22	Diluent:	Reconstituted Water
Ending Date:	19 Jun-20 14:44	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	7d 1h	Source:	Aquatic Biosystems, CO	Age:	

Sample ID:	07-4234-1571	Code:	C039804	Client:	Agnico Eagle Mines
Sample Date:	06 Jun-20	Material:	Water	Project:	
Receipt Date:	11 Jun-20 08:20	Source:	Agnico Eagle Mines		
Sample Age:	6d 14h	Station:	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	100% passed 7d survival rate

Fisher Exact Test

Group 1	vs	Group	Test Stat	P-Type	P-Value	Decision(α:5%)
0		100	0.1643	Exact	0.1643	Non-Significant Effect

Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	@	87	3	90	0.9667	0.03333	0.0%
100		27	3	30	0.9	0.1	6.9%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9
0	@	0.9000	1.0000	0.9000	1.0000	1.0000	1.0000	1.0000	0.9000	1.0000
100		0.9000	0.9000	0.9000						

Analyst: dm 2020 Jul 03 QA: PH 2020Jul09

CETIS Analytical Report

Report Date:	03 Jul-20 13:35 (p 1 of 1)	**Test Code:**	PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	20-7398-8377	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:

Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	Ref 1 passed 7d survival rate

Fisher Exact Test

Control vs	Control	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 1	0.5000	Exact	0.5000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.826	1.887	0.0968	No Outliers Detected

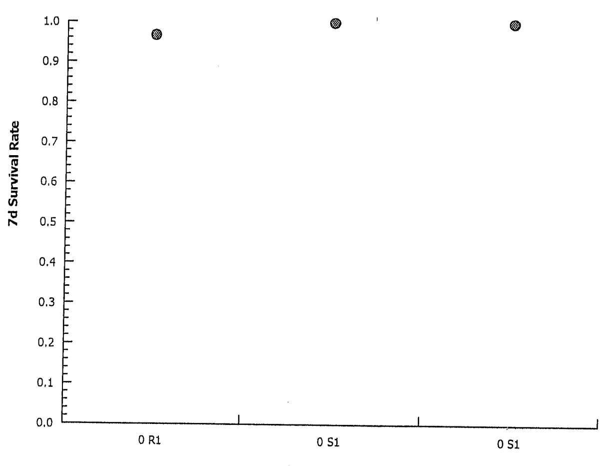
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
	R1	29	1	30	0.9667	0.03333	3.33%
0	S1	30	0	30	1	0	0.0%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	1.0000	0.9000	1.0000
0	S1	1.0000	1.0000	1.0000

Graphics



Analyst: 2020 Jul03 dml QA: 2020Jul09 PH

CETIS Analytical Report

Report Date:	03 Jul-20 13:35 (p 1 of 1)
Test Code:	PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	18-5152-9513	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	Ref 2 passed 7d survival rate

Fisher Exact Test

Control vs	Control	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 2	1.0000	Exact	1.0000	Non-Significant Effect

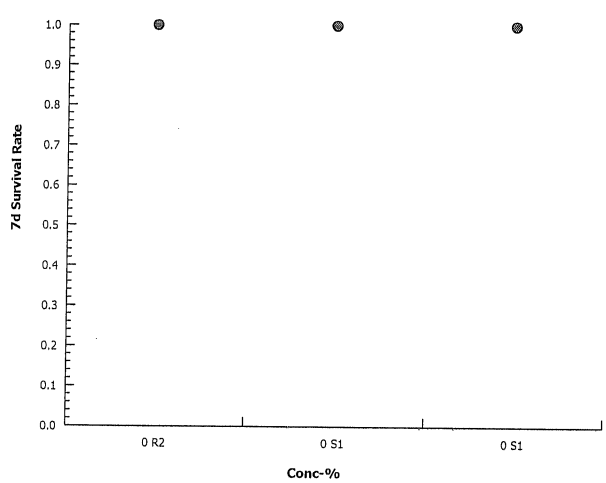
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
0	R2	30	0	30	1	0	0.0%
0	S1	30	0	30	1	0	0.0%

7d Survival Rate Detail

onc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	1.0000	1.0000	1.0000
0	S1	1.0000	1.0000	1.0000

Graphics



dml 2020 Jul03 Analyst:

2020Jul09 QA: pH

CETIS Analytical Report

Report Date: 03 Jul-20 13:34 (p 1 of 1)
Test Code: PP-10735-0120 | 00-3690-9242

Fathead Minnow 7-d Larval Survival and Growth Test — Bureau Veritas Laboratories

Analysis ID:	16-2650-6810	**Endpoint:**	7d Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Single 2x2 Contingency Table	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result
Untransformed	C > T	Ref 3 passed 7d survival rate

Fisher Exact Test

Control vs	Control	Test Stat	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 3	0.2458	Exact	0.2458	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.826	1.887	0.0968	No Outliers Detected

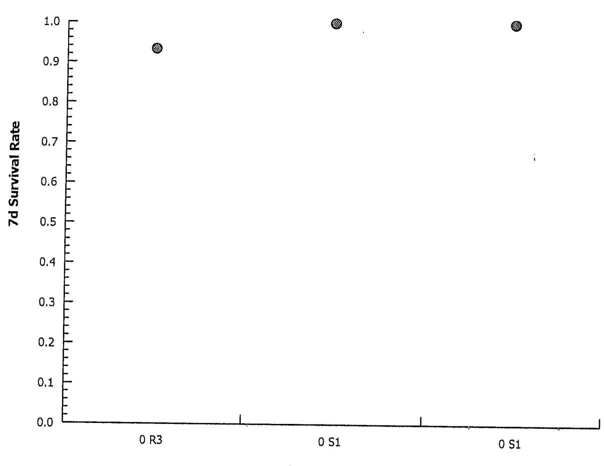
Data Summary

Conc-%	Code	NR	R	NR + R	Prop NR	Prop R	%Effect
	R3	28	2	30	0.9333	0.06667	6.67%
0	S1	30	0	30	1	0	0.0%

7d Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.9000	1.0000	0.9000
0	S1	1.0000	1.0000	1.0000

Graphics



Analyst: 2020 Jul 03 Jml QA: PH 2020Jul09

ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd. (Agnico)

Sample ID: Various

Job / Sample #: C039804

# Surviving Organisms													
Conc. (% v/v)	Replicate #	# Of Fish Seeded	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	% Survival	% Mortality	% Mean Mortality	SD (%)
	Date	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun				
Control	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
Site Control	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
Soft Water Control	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
MEL-02-05 100%	A	10	10	10	10	10	10	10	9	90%	10%	10.0%	0.0%
	B	10	10	10	10	10	10	10	9	90%	10%		
	C	10	10	10	9	9	9	9	9	90%	10%		
MEL-03-02 100%	A	10	10	10	10	10	10	10	10	100%	0%	3.3%	5.8%
	B	10	10	10	9	9	9	9	9	90%	10%		
	C	10	10	10	10	10	10	10	10	100%	0%		
MEL-04-05 100%	A	10	10	10	10	10	10	10	10	100%	0%	0.0%	0.0%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	10	10	10	10	10	10	10	100%	0%		
MEL-05-04 100%	A	10	10	10	10	10	10	10	9	90%	10%	6.7%	5.8%
	B	10	10	10	10	10	10	10	10	100%	0%		
	C	10	9	9	9	9	9	9	9	90%	10%		
Analyst		MHM	MHM	NS	YS	MHM	MB	MHM	MHM				

*** see test comments**

Proofed: DHawes
2020JUL02

CETIS Analytical Report

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	18-0089-4097	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	12.29%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1		100	-1.069	2.132	0.062	4	CDF	0.8273	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.266	1.887	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0014727	0.0014727	1	1.143	0.3453	Non-Significant Effect
Error	0.0051553	0.0012888	4			
Total	0.006628		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.02	199	0.9903	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8796	0.43	0.2671	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	3	0.5083	0.4187	0.5979	0.511	0.471	0.543	0.02083	7.10%	0.00%
100		3	0.5397	0.4509	0.6284	0.554	0.499	0.566	0.02063	6.62%	-6.16%

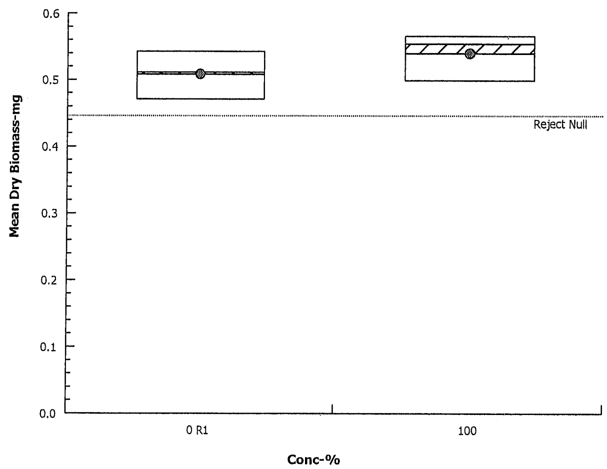
Mean Dry Biomass-mg Detail

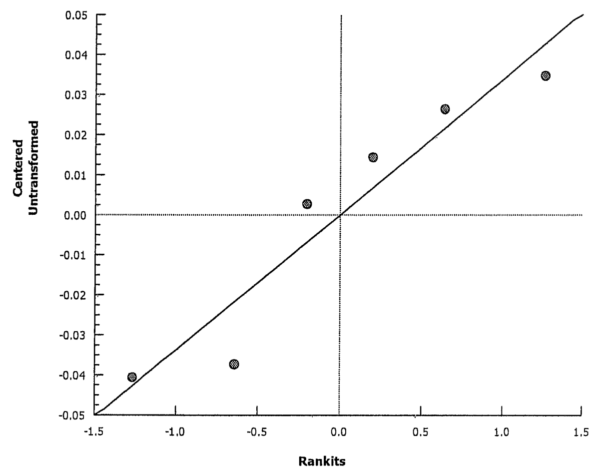
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	0.471	0.511	0.543
100		0.499	0.566	0.554

2020 Jul 03 Analyst: dmi   2020Jul09 QA: AH

nalysis ID:	18-0089-4097	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 Jul03 dm QA: PH 2020Jul09

Fathead Minnow 7-d Larval Survival and Growth Test — Bureau Veritas Laboratories

Analysis ID:	00-8392-7028	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	11.59%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2		100	0.4545	2.132	0.064	4	CDF	0.3365	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.235	1.887	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0002802	0.0002802	1	0.2066	0.6730	Non-Significant Effect
Error	0.0054253	0.0013563	4			
Total	0.0057055		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.125	199	0.9410	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9331	0.43	0.6039	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	3	0.5533	0.4592	0.6475	0.547	0.519	0.594	0.02188	6.85%	0.00%
100		3	0.5397	0.4509	0.6284	0.554	0.499	0.566	0.02063	6.62%	2.47%

Mean Dry Biomass-mg Detail

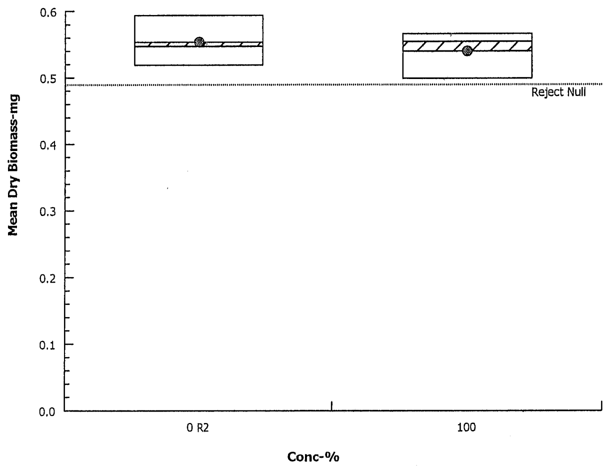
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	0.519	0.594	0.547
100		0.499	0.566	0.554

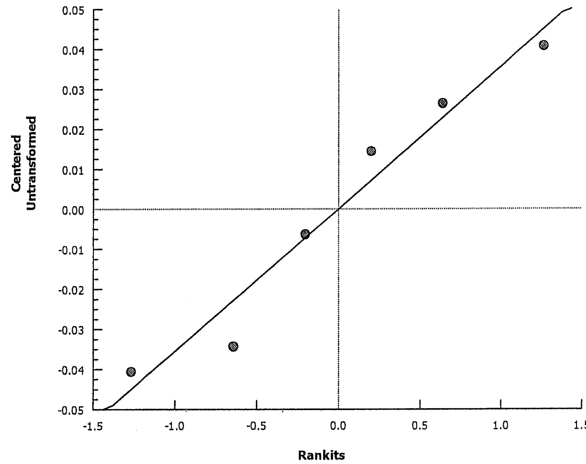
2020 Jul 03 2020 Jul 09

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	00-8392-7028	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	19-1297-1011	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
nalyzed:	22 Jun-20 17:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	9.25%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3		100	-0.6288	2.132	0.049	4	CDF	0.7182	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.629	1.887	0.3429	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	0.0003082	0.0003082	1	0.3954	0.5636	Non-Significant Effect
Error	0.0031173	0.0007793	4			
Total	0.0034255		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	4.521	199	0.3623	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9108	0.43	0.4415	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	3	0.5253	0.4836	0.5671	0.529	0.507	0.54	0.009701	3.20%	0.00%
100		3	0.5397	0.4509	0.6284	0.554	0.499	0.566	0.02063	6.62%	-2.73%

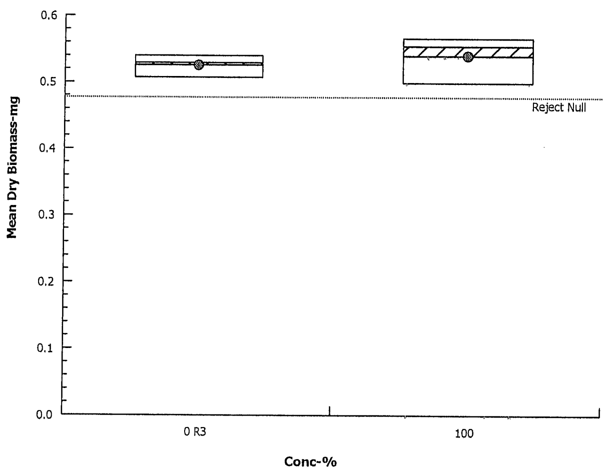
Mean Dry Biomass-mg Detail

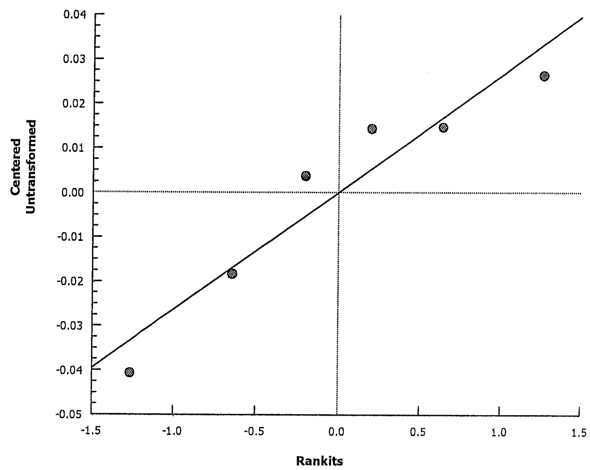
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.54	0.507	0.529
100		0.499	0.566	0.554

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	19-1297-1011	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test **Bureau Veritas Laboratories**

nalysis ID:	19-4011-8204	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	100% passed mean dry biomass-mg	7.81%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	pooled	100	-0.468	1.812	0.041	10	CDF	0.6751	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.994	2.412	0.3457	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	0.000256	0.000256	1	0.219	0.6499	Non-Significant Effect
Error	0.0116907	0.0011691	10			
Total	0.0119467		11			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.117	11.04	0.7466	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9736	0.8025	0.9447	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	9	0.529	0.503	0.555	0.529	0.471	0.594	0.01127	6.39%	0.00%
100		3	0.5397	0.4509	0.6284	0.554	0.499	0.566	0.02063	6.62%	-2.02%

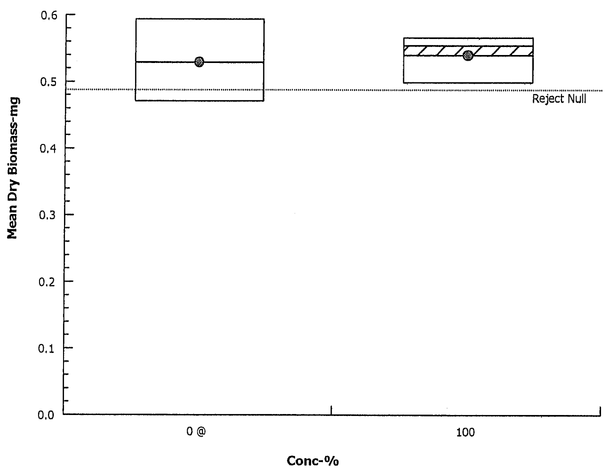
Mean Dry Biomass-mg Detail

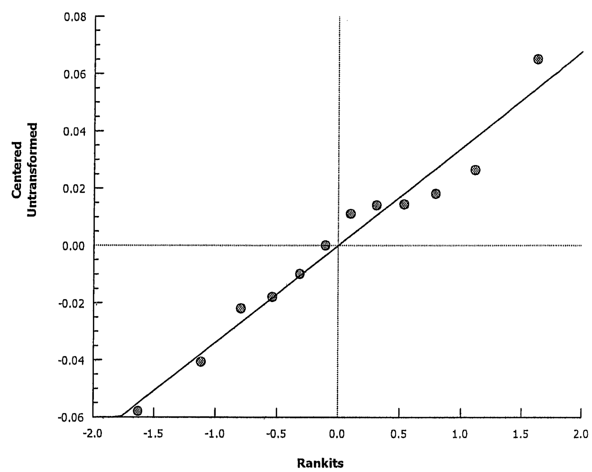
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9
0	@	0.54	0.507	0.529	0.519	0.594	0.547	0.471	0.511	0.543
100		0.499	0.566	0.554						

Fathead Minnow 7-d Larval Survival and Growth Test | **Bureau Veritas Laboratories**

nalysis ID:	19-4011-8204	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	22 Jun-20 17:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





2020 JUL 03 dmc 2020JUL09

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	17-3150-3433	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Ref 1 passed mean dry biomass-mg	8.81%

Equal Variance t Two-Sample Test

Control vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 1	0.1732	2.132	0.045	4	CDF	0.4354	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.61	1.887	0.3735	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.017E-05	2.017E-05	1	0.03	0.8709	Non-Significant Effect
Error	0.0026887	0.0006722	4			
Total	0.0027088		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	30.26	199	0.0640	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9398	0.43	0.6574	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	3	0.5083	0.4187	0.5979	0.511	0.471	0.543	0.02083	7.10%	0.00%
0	S1	3	0.512	0.4957	0.5283	0.511	0.506	0.519	0.003786	1.28%	-0.72%

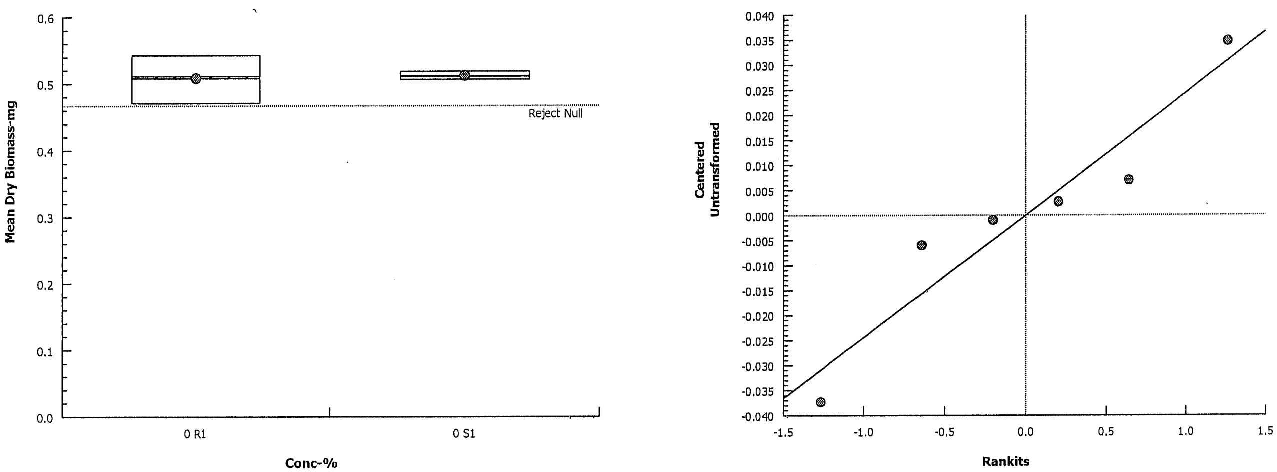
Mean Dry Biomass-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R1	0.471	0.511	0.543
0	S1	0.511	0.506	0.519

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

ıalysis ID:	17-3150-3433	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
ʌnalyzed:	29 Jun-20 16:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics



Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	08-4655-4348	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	
Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Ref 2 passed mean dry biomass-mg	9.25%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr		Ref 2	-1.861	2.132	0.047	4	CDF	0.9319	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.672	1.887	0.2771	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0025627	0.0025627	1	3.465	0.1362	Non-Significant Effect
Error	0.0029587	0.0007397	4			
Total	0.0055213		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	33.4	199	0.0581	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9283	0.43	0.5669	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	3	0.5533	0.4592	0.6475	0.547	0.519	0.594	0.02188	6.85%	0.00%
0	S1	3	0.512	0.4957	0.5283	0.511	0.506	0.519	0.003786	1.28%	7.47%

Mean Dry Biomass-mg Detail

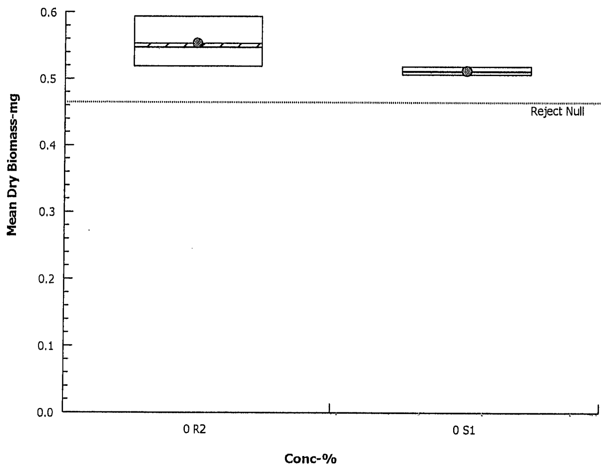
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R2	0.519	0.594	0.547
0	S1	0.511	0.506	0.519

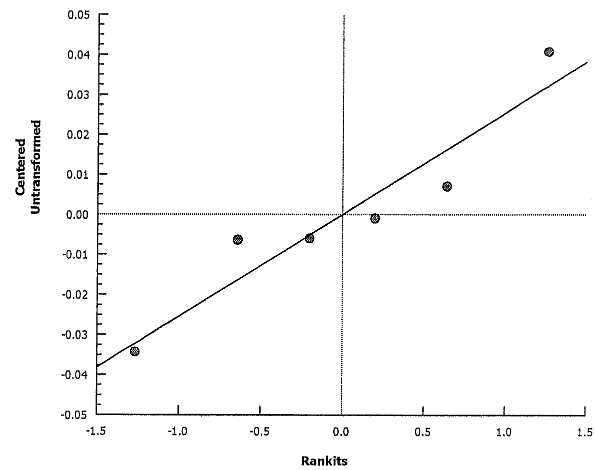
Analyst: 2020 Jul 03 QA: PH 2020 Jul 09

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	08-4655-4348	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

Analysis ID:	10-9293-1933	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	13-1526-7178	**Test Type:**	Growth-Survival (7d)	**Analyst:**	M. Hamad
Start Date:	12 Jun-20 14:10	**Protocol:**	EC/EPS 1/RM/22	**Diluent:**	Reconstituted Water
Ending Date:	19 Jun-20 14:44	**Species:**	Pimephales promelas	**Brine:**	Not Applicable
Duration:	7d 1h	**Source:**	Aquatic Biosystems, CO	**Age:**	

Sample ID:	07-4234-1571	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 14h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C > T	Ref 3 passed mean dry biomass-mg	4.34%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr		Ref 3	-1.28	2.132	0.022	4	CDF	0.8652	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.607	1.887	0.3782	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0002667	0.0002667	1	1.639	0.2696	Non-Significant Effect
Error	0.0006507	0.0001627	4			
Total	0.0009173		5			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	6.566	199	0.2643	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9821	0.43	0.9616	Normal Distribution

Mean Dry Biomass-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	3	0.5253	0.4836	0.5671	0.529	0.507	0.54	0.009701	3.20%	0.00%
0	S1	3	0.512	0.4957	0.5283	0.511	0.506	0.519	0.003786	1.28%	2.54%

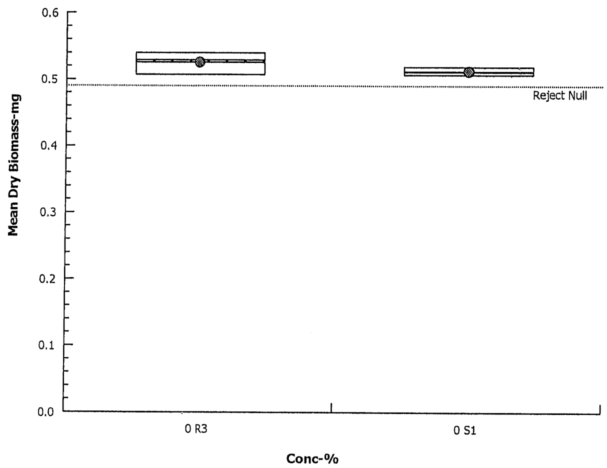
Mean Dry Biomass-mg Detail

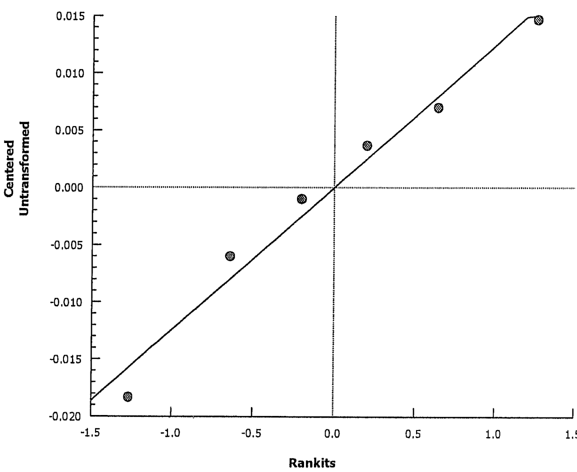
Conc-%	Code	Rep 1	Rep 2	Rep 3
0	R3	0.54	0.507	0.529
0	S1	0.511	0.506	0.519

Fathead Minnow 7-d Larval Survival and Growth Test — **Bureau Veritas Laboratories**

nalysis ID:	10-9293-1933	**Endpoint:**	Mean Dry Biomass-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:24	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: Various
Weighing Dates: 2020 Jun 17, 2020 Jun 22
Balance ID: bby2-0260

Job / Sample #: C039804
Drying Time (h): >24
Drying Temp (°C): 60

Boat #	Conc. & Replicate	Initial # Of Fish	Boat Wt. (g)	Boat & Fish Wt. (g)	Wt. of Fish (mg)	Biomass/Replicate[1] (mg)	Mean Biomass/Conc[1] (mg)	SD
333	0-A	10	0.80753	0.81357	6.04	0.604	0.554	0.04
334	B	10	0.79958	0.80483	5.25	0.525		
335	C	10	0.79940	0.80473	5.33	0.533		
336	Site Ctrl-A	10	0.80069	0.80580	5.11	0.511	0.512	0.01
337	B	10	0.80624	0.81130	5.06	0.506		
338	C	10	0.79919	0.80438	5.19	0.519		
339	Soft Water Ctrl-A	10	0.80924	0.81460	5.36	0.536	0.566	0.03
340	B	10	0.80080	0.80640	5.60	0.560		
341	C	10	0.79555	0.80158	6.03	0.603		
342	MEL-02-05 100%-A	10	0.81810	0.82309	4.99	0.499	0.540	0.04
343	B	10	0.81632	0.82198	5.66	0.566		
344	C	10	0.80144	0.80698	5.54	0.554		
345	MEL-03-02 100%-A	10	0.79452	0.79923	4.71	0.471	0.508	0.04
346	B	10	0.79925	0.80436	5.11	0.511		
347	C	10	0.79903	0.80446	5.43	0.543		
[illegible]	MEL-04-05 100%-A	10	0.79742	0.80261	5.19	0.519	0.553	0.04
349	B	10	0.78833	0.79427	5.94	0.594		
350	C	10	0.80137	0.80684	5.47	0.547		
351	MEL-05-04 100%-A	10	0.79964	0.80504	5.40	0.540	0.525	0.02
352	B	10	0.80213	0.80720	5.07	0.507		
353	C	10	0.78768	0.79297	5.29	0.529		
354	QA/QC		0.79520	0.79534	0.14			
355	QA/QC		0.79277	0.79295	0.18			
333	0-A	10	0.80757	0.81355	5.98			
Analyst			NS	DML				

[1] Biomass is calculated as the weight of fish per replicate divided by the number of fish initially seeded into that replicate (i.e. **10** fish per replicate).

Average Dry Weight of Control Fish (Average dry weight of control fish must be ≥ 250 µg for test to be valid)

Boat #	Conc. & Replicate	# Surviving Fish	Wt. of Fish (mg)	Mean Wt./ Fish (µg)	Mean Dry Wt. (µg)
333	0-A	10	6.04	604	**554**
334	B	10	5.25	525	
335	C	10	5.33	533	

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Job / Sample #: C039804
Date Started: June 12, 2020
Sample ID: various
Date Ended: June 19, 2020
Organism Lot #: AB200612
Analyst(s): MHamad, Y.SO, M.O'Toole, [illegible]

Deviations - See BLNC: ☐
Worksheet Created: ☐

Before Use Measurements (After temperature adjustment)

Day	Date	Sample	Initial D.O. (% Sat)	Initial Temp (°C)	Aerated (min.)*	Post Aeration D.O. (% Sat)	Post Aeration Temp (°C)	Analyst
0	June 12, 2020	MEL-02-05	103.3	25.8	20	98.8	25.4	MHM
		MEL-03-02	104.6	25.9	20	100.9	25.5	MHM
		MEL-04-05	105.7	25.9	20	102.1	25.4	MHM
		MEL-05-04	106.3	25.9	20	104.3	25.4	MHM
1	June 13, 2020	MEL-02-05	98.3	25.7	NA	NA	NA	MHM
		MEL-03-02	92.2	25.7	NA	NA	NA	MHM
		MEL-04-05	95.4	25.9	NA	NA	NA	MHM
		MEL-05-04	91.9	25.8	NA	NA	NA	MHM
2	June 14, 2020	MEL-02-05	111.5	25.6	20	107.4	25.8	MO
		MEL-03-02	109.1	25.6	20	108.3	25.7	MO
		MEL-04-05	110.9	25.8	20	109.2	25.8	MO
		MEL-05-04	111.7	25.9	20	107.3	25.8	MO
3	June 15, 2020	MEL-02-05	111.8	24.1	20	102.2	24.0	YS
		MEL-03-02	109.2	24.9	20	103.5	24.0	YS
		MEL-04-05	109.3	24.7	20	103.0	24.1	YS
		MEL-05-04	108.0	24.4	20	97.4	24.1	YS
4	June 16, 2020	MEL-02-05	109.3	25.2	20	98.4	25.1	MHM
		MEL-03-02	110.2	25.5	20	100.3	25.3	MHM
		MEL-04-05	110.5	25.5	20	98.9	25.3	MHM
		MEL-05-04	109.7	25.2	20	101.4	25.2	MHM
5	June 17, 2020	MEL-02-05	111.8	25.2	20	103.3	25.8	MHM
		MEL-03-02	111.1	25.6	20	100.8	25.7	MHM
		MEL-04-05	113.0	26.0	20	100.1	25.7	MHM
		MEL-05-04	112.6	25.8	20	100.7	25.7	MHM
6	June 18, 2020	MEL-02-05	111.8	25.7	20	100.0	25.7	MHM
		MEL-03-02	110.1	25.7	20	99.2	25.6	MHM
		MEL-04-05	110.8	25.7	20	99.4	25.7	MHM
		MEL-05-04	111.6	25.8	20	101.6	25.6	MHM

*Aeration rate must be ≤100 bubbles/min

Instrument ID's: BBY2-0366
Room # ~~107~~ 106 PH 2020Jul02

Sample Descriptions:

MEL-02-05	Clear, colourless	Initials	MHM
MEL-03-02	Clear, colourless	Initials	MHM
MEL-04-05	Clear, colourless	Initials	MHM
MEL-05-04	Clear, colourless	Initials	MHM

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico) Job / Sample #: C039804
Sample ID: Various

Sample Hardness (mg /L CaCO3):

MEL-02-05	32	Initials:	YS
MEL-03-02	22	Initials:	YS
MEL-04-05	28	Initials:	YS
MEL-05-04	36	Initials:	YS

Observations during the Test (Organism behaviour, additional test information)

Day		Analyst
0	Date: June 12, 2020 — Carboy / Bottle #: 1, 1, 2, 1	mm/YS
	Pre-Aeration Time: 13:06-13:26 — Test Seeded @: 14:10	
	Feeding PM: 16:15 — Feeding Volume (uL): 50	
1	Date: June 13, 2020 — Carboy / Bottle #: 1, 2, 2, 1	MM / AR
	Pre-Aeration Time: — Water change @: 15:12	
	Feeding AM: 08:15 — Feeding PM: 17:00 — Feeding Volume (uL): 50	
	WQ Rep: A	
2	Date: June 14, 2020 — Carboy / Bottle #:	RS YS
	Pre-Aeration Time: — Water change @: 14:58	
	Feeding AM: 09:05 — Feeding PM: 16:10 — Feeding Volume (uL): 50	
	WQ Rep: B	
3	Date: June 15, 2020 — Carboy / Bottle #: 1, 2, 2, 3	YS
	Pre-Aeration Time: 14:50 ~ 15:10 — Water change @: 17:05	
	Feeding AM: 07:00 — Feeding PM: 17:50 — Feeding Volume (uL): 50	
	WQ Rep: C	
	(A)	
4	Date: June 16, 2020 — Carboy / ~~Bottle~~ #: 1, 3, 3	MM
	Pre-Aeration Time: 09:40-10:00 — Water change @: 13:10	
	Feeding AM: 07:45 — Feeding PM: 15:20 — Feeding Volume (uL): 50	
	WQ Rep: D	

(A) WE MHM 2020 JUN 16

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: various

Job / Sample #: C039804

Day		Analyst
5	Date: June 17, 2020 Carboy / Bottle #: 2, 2, 2, 2	KMM / ML
	Pre-Aeration Time: Water change @: 13:14	
	Feeding AM: 07:45 Feeding PM: 14:20 Feeding Volume (uL): 50	
	WQ Rep: B	
6	Date: June 18, 2020 Carboy / Bottle #: 1, 2, 2, 3	mn
	Pre-Aeration Time: Water change @: 14:40	
	Feeding AM: 08:15 Feeding PM: 15:00 Feeding Volume (uL): 50	
	WQ Rep: C	
7	Date: June 19, 2020	MM
	Test ended @ 14:44 WQ rep: A	

A WEMHM 2020-01-09

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: Various
Job / Sample #: C020804
Analyst(s): M Hamad, Y. Su, M Arcossi, M. O'Toole, N Sherogle

Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	458	463	461	504	453	452	454
	Final	478	479	480	512	495	499	512
Temp. (°C)	Initial	24.4	24.6	24.4	24.9	25.3	25.0	25.0
	Final	24.0	24.2	24.8	25.5	25.0	25.0	25.0
D.O. (mg/L)	Initial	8.1	7.8	8.2	8.0	8.1	8.4	8.6
	Final	7.4	7.1	7.3	6.3	7.3	7.2	7.3
pH	Initial	8.2	8.2	8.1	8.1	8.2	8.1	8.3
	Final	7.7	8.1	7.9	7.5	7.6	7.6	7.5

Synthetic

Site Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	126	130	129	130	129	129
	Final	137	139	142	135	141	142	140
Temp. (°C)	Initial	23.8	25.0	24.8	24.7	24.8	25.0	25.2
	Final	24.0	24.2	25.0	25.3	24.6	24.6	24.8
D.O. (mg/L)	Initial	8.2	8.1	8.3	7.9	8.2	8.3	8.2
	Final	7.5	7.2	7.3	6.3	7.2	7.1	7.2
pH	Initial	8.0	7.7	Ⓐ ~~8.0~~ 7.5	7.9	7.7	7.5	7.8
	Final	7.5	8.2	7.2	7.2	7.3	7.3	7.4

Soft Water Control	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	104	105	105	108	109	110	111
	Final	120	134	122	118	123	120	124
Temp. (°C)	Initial	23.6	24.7	24.7	24.5	24.7	24.4	24.5
	Final	24.0	24.2	25.1	24.2	24.3	24.6	24.9
D.O. (mg/L)	Initial	8.8	8.1	8.2	8.2	8.2	8.3	8.2
	Final	7.6	7.2	7.3	7.0	7.0	7.1	7.0
pH	Initial	7.5	7.6	7.5	7.6	7.7	7.6	7.6
	Final	7.3	8.0	7.2	7.2	7.2	7.2	7.3

MEL-02-05 100%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	125	123	123	122	123	123	123
	Final	134	133	131	130	134	135	130
Temp. (°C)	Initial	24.8	25.5	25.4	24.5	24.6	24.7	24.9
	Final	24.0	24.2	25.1	24.0	24.9	24.8	25.0
D.O. (mg/L)	Initial	8.6	8.1	8.7	8.7	8.2	8.4	8.3
	Final	7.6	7.3	7.3	7.1	6.8	6.8	7.0
pH	Initial	7.3	7.1	7.0	7.2	7.7	7.4	7.4
	Final	7.3	7.8	7.3	7.2	7.2	7.2	7.1

Ⓐ WE MO 2020 JUN 14

ECOTOXICOLOGY **FATHEAD MINNOW SURVIVAL AND GROWTH TEST**

Client Name: Golder Associates Ltd. (Agnico)

Sample ID: various Job / Sample #: C039804

MEL-03-02 100%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	70	68	69	68	69	69	69
	Final	79	86	78	75	81 ~~87~~	70	76
Temp. (°C)	Initial	25.3	25.6	25.3	24.4	24.6	24.5	24.9
	Final	24.2	24.1	25.0	25.0	24.1	24.8	24.9
D.O. (mg/L)	Initial	8.4	7.4	8.9	8.8	8.3	8.3	8.2
	Final	7.5	7.5	7.3	6.5	6.8	6.6	6.5
pH	Initial	7.2	7.1	7.1	7.2	7.5	7.4	7.4
	Final	7.2	7.7	7.0	7.0	7.0	7.1	7.2
Analyst		MM MHM	MM NS	MO MM	YS MM	MHM MHM	MHM MM	MH MM
Daily WQ Reviewed by:		MM MM	MM NS	MO MM	YS MM	MM MHM	MHM MM	MM MM

MEL-04-05 100%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	104	103	103	104	98	103	104
	Final	116	116	108	120	115	117	121
Temp. (°C)	Initial	25.3	25.7	25.5	25.0	24.6	24.5	24.9
	Final	24.1	24.1	25.3	24.0	25.0	25.0	24.8
D.O. (mg/L)	Initial	8.4	7.7	8.9	8.6	8.2	8.2	8.6
	Final	7.5	7.5	7.2	7.2	6.2	6.3	6.0
pH	Initial	7.2	7.1	7.1	7.4	7.5	7.5	7.3
	Final	7.2	7.8	7.1	7.2	7.0	7.1	7.3

MEL-05-04 100%	Day	1	2	3	4	5	6	7
Conductivity (µs/cm)	Initial	97	100	96	105	97	100	104
	Final	112	116	103	112	118	119	113
Temp. (°C)	Final	25.3	25.7	25.5	24.7	24.8	24.7	24.9
	Final	24.0	24.0	25.4	24.0	24.8	24.8	25.0
D.O. (mg/L)	Initial	8.5	7.5	8.8	8.6	8.3	8.3	8.4
	Final	7.6	7.6	6.8	7.2	6.4	6.5	7.2
pH	Initial	7.3	7.1	7.1	7.4	7.5	7.5	7.3
	Final	7.2	7.9	7.0	7.3	7.1	7.1	7.3

Daily WQ Reviewed by:	MM MHM	MHM NS	MO MM	YS MM	MHM MM	MHM MM	MM MM

(B) WE MHM 2020 Jun 17

ECOTOXICOLOGY

FATHEAD MINNOW SURVIVAL AND GROWTH TEST

Client Name: Golder Associates Ltd. (Agnico)
Job / Sample #: C039804
Sample ID: Various

# Surviving Organisms														
Conc. (% v/v)	Replicate #	# Of Fish Seeded	Day 1	2	3	4	5	6	7	% Survival	% Mortality	% Mean Mortality	SD (%)
	Date	12-Jun	13-Jun	14-Jun	15-Jun	16-Jun	17-Jun	18-Jun	19-Jun				
Control	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
Site Control (Synthetic)	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
Soft Water Control	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
MEL-02-05 100%	A	10	10	10	10	10	10	10	9	-	-	-	-
	B	10	10	10	10	10	10	10	9	-	-		
	C	10	10	10	9	9	9	9	9	-	-		
MEL-03-02 100%	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	9	9	9	9	9	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
MEL-04-05 100%	A	10	10	10	10	10	10	10	10	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	10	10	10	10	10	10	10	-	-		
MEL-05-04 100%	A	10	10	10	10	10	10	10	9	-	-	-	-
	B	10	10	10	10	10	10	10	10	-	-		
	C	10	9	9	9	9	9	9	9	-	-		
Analyst		MM	MM	NS	SS	MM	WB	MM	MM				

*** see test comments**

Randomization Chart

Client Name: Golder (Agnico)

Start Date: 2020 Jun 12

Sample Name: Various

Use the coloured dot to find appropriate conc'ns and put beakers back in proper position following daily water change.

Back Wall

Position Map

4	8	12	16	20	24
3	7	11	15	19	23
2	6	10	14	18	22
1	5	9	13	17	21

Front of Counter

Position #	Treatment	Replicate	Colour
10	Control	A	Red
9		B	
17		C	
7	Site Control (synthetic)	A	White
5		B	
8		C	
4	Soft Water Control	A	Orange
21		B	
19		C	
2	MEL-02-05	A	Yellow
13		B	
3		C	
15	MEL-03-02	A	Fl. Green
16		B	
12		C	
20	MEL-04-05	A	Green
14		B	
18		C	
1	MEL-05-04	A	Blue
11		B	
6		C	

ORGANISMS - ACCLIMATION AND HOLDING CONDITIONS

Client #'s : 10735, 3120

Date & Time of Arrival: 2020 Jun 12 @ 11:30

Organism Lot #: AB200612

Age upon Arrival: ≤ 24hr

Water (L) per Shipping Bag: ~22

Organism: Fathead Minnow

Number of Shipping Bags: 2

Ordered: 1780

Light Intensity (lux): 100-500

Arrival Conditions

Bag ID	# Dead	% Dead	Cond (µS/cm) Salinity (ppt)	Temp (°C)	DO (mg/L)	pH	Feeding	Analyst
A	0	0	360	24.2	9.7	7.5	N/A	MHM
			PH 2020 June 29					

Daily Conditions During Holding/Acclimation

Date	Mortalities # Dead	% Dead	Water Quality Cond (µS/cm) Salinity (ppt)	Temp (°C)	DO (mg/L)	pH	Feeding	Analyst
B	0	0	360	24.3	10.8	7.4	N/A	MHM
				PH 2020 Jun 29				
Total Mortalities								

Equipment ID: BBY2-0036

Comments (e.g. feeding times and quantities; fish behaviour, acclimation conditions): | Analyst

did WQ. Fish look normal | YP

N/A MD 2020 JUL 08

FATHEAD MINNOW WATER HARDNESS ADJUSTMENT

BATCH ID: 2020 Jun 09
(Date Hardened)

(For water hardness 100-140 mg/L)

	Enter Numbers Here
Volume of Water (L)	200
Desired Hardness (mg/L)	130

Keep this set to a desired hardness of 130, so water will always be on the harder side, as fathead minnows are cultured in water at a hardness of **103-142** mg/L $CaCO_3$.

Chemical Weights	**$MgSO_4$ (g)**	**$CaSO_4$ (g)**	**$NaHCO_3$ (g)**	**KCl (g)**
Brand	Fisher	Alfa Aesar	Fisher	Fisher
Lot #	183674	Q09E068	189522	195613
Calculated	19.5000	15.3400	31.2000	1.3000
Actual	19.4998	15.3401	31.1999	1.3003

Balance: BBY2-0260

Analyst: M. Thompson

Date: 2020 Jun 09

Water Quality:

Temp (°C): 24.2 pH: 8.1 Hardness (mg/L $CaCO_3$): 136

DO (mg/L): 7.4

Conductivity (µS/cm): 456 Instrument ID: BBY2-0366

Analyst: M.Hamael Date: 2020Jun10

Comments: N/A

Note: Hardness = Ca and Mg as mg/L $CaCO_3$

FATHEAD MINNOW WATER HARDNESS ADJUSTMENT

BATCH ID : 2020 Jun 14
(Date Hardened)

(For water hardness 100-140 mg/L)

	Enter Numbers Here
Volume of Water (L)	200
Desired Hardness (mg/L)	130

Keep this set to a desired hardness of 130, so water will always be on the harder side, as fathead minnows are cultured in water at a hardness of **103-142** mg/L $CaCO_3$.

Chemical Weights	$MgSO_4$ (g)	$CaSO_4$ (g)	$NaHCO_3$ (g)	KCl (g)
Brand	Fisher	Alfa Aesar	Fisher	Fisher
Lot #	187776	R09E068	187782	172053
Calculated	19.5000	15.3400	31.2000	1.3000
Actual	19.5004	15.3401	31.2004	1.3004

Balance: BB42-0260

Analyst: NSluergill

Date: 2020 Jun 14

Water Quality:

Temp (°C): 25.8 pH: 7.7 Hardness (mg/L $CaCO_3$): 136

DO (mg/L): 8.1

Conductivity (µS/cm): 458 Instrument ID: BBY2-0366

Analyst: MHamad Date: 2020 Jun 16

Comments: N/A

Note: Hardness = Ca and Mg as mg/L $CaCO_3$

2-11-20003 Synthetic Water FHM + Lemna

Moderately hard water		96	60	60	4	0	0			
	Amount of salt (mg) in 1L of water	26	0	7	5	8	23	12	sum	Difference from target (max)
Molar Mass	Salts	NaHCO3	CaSO4*2H2O	MgSO4	KCl	CaCO3	CaCl*2H2O	NaCl		
60.01		18.54802663							18.54802663	-1.9
40.08			0				8.262436139		8.262436139	0.9
35.45					2.377598927		7.307968092	7.26558497	16.95115199	-1.8
-									0	0.0
24.30				1.413260219					1.413260219	-0.3
39.10					2.622401073				2.622401073	1.5
23.10		7.139800285						4.73441503	11.87421532	2.3
96.06			0	5.586739781					5.586739781	0.6
18.02			0				7.429595769		7.429595769	#VALUE!
1.01		0.312173086							0.312173086	#VALUE!
	Total check (mg/L)	26	0	7	5	0	23	12		
	g/200L	5.2	0.0	1.4	1.0	0.0	4.6	2.4		
	Actual wt (g)	5.2004	—	1.4004	1.0004	—	4.6000	2.4003		

Balance: BBY2-0260

Analyst. PH

Date: 2020 Jun 11

	Brand	Lot #
$NaHCO_3$	Fisher	189522
$MgSO_4$	Fisher	183674
KCl	Fisher	172053
(A) ~~$CaCO_3$~~	—	—
$CaCl \cdot 2H_2O$	Fisher	171430
NaCl	Fisher	193465

(A) PH we 2020 Jun 11

Synthetic Water (WQ)

Conductivity = 126.0 uS/cm

pH = 7.5

Temperature = 24.1

DO (mg/L) = 8.3

DO (%Sat) = 99.2

Hardness: 32 mg/L $CaCO_3$

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LEMNA MINOR TOXICITY TEST ON:

MEL-13-01, MEL-13-07,& MEL-02-05

Prepared for:

Agnico Eagle Mines Ltd
10200, Route de Preissac
Rouyn-Noranda, QC
J0Y 1C0

Prepared by:

Ecotoxicology Group
Bureau Veritas Laboratories

Job No.: C039804
July 2020

Summary of Test Results for Samples from
Agnico Eagle Mines Ltd
Job C039804

Sample: MEL-13-01

Test		IC25 or LC25 (%v/v)	IC50 or LC50 (%v/v)
Lemna Minor:	Frond Increase	-	>97 (N/A, N/A)
	Dry weight	>97 (N/A, N/A)	-

Significant Effect vs		MEL-03-02	MEL-04-05	MEL-05-04	Pooled references
Lemna Minor:	Frond Increase	No	No	No	No
	Dry weight	No	No	No	No

N/A = Not available
95% confidence limits in parentheses

Sample: MEL-13-07

Test		IC25 or LC25 (%v/v)	IC50 or LC50 (%v/v)
Lemna Minor:	Frond Increase	-	>97 (N/A, N/A)
	Dry weight	>97 (N/A, N/A)	-

Significant Effect vs		MEL-03-02	MEL-04-05	MEL-05-04	Pooled references
Lemna Minor:	Frond Increase	Yes (I)	Yes (I)	Yes (I)	Yes (I)
	Dry weight	No	Yes (I)	Yes (I)	Yes (I)

N/A = Not available
(I) = Sample Inhibition
95% confidence limits in parentheses

Summary of Test Results for Samples from
Agnico Eagle Mines Ltd
Job C039804

Sample: MEL-02-05

Significant Effect vs		**MEL-03-02**	**MEL-04-05**	**MEL-05-04**	**Pooled references**
Lemna Minor:	Frond Increase	No	No	No	No
	Dry weight	No	No	No	No

Sample: Site Control (Synthetic Control)

Significant Effect vs		**MEL-03-02**	**MEL-04-05**	**MEL-05-04**
Lemna Minor:	Frond Increase	No	No	No
	Dry weight	No	No	No

Lemna minor Test Data Summary

Client Name/Location	Agnico-Eagles Mines Ltd. / Rouyn-Noranda, QC
Testing Lab/Location	Bureau Veritas Laboratories / Burnaby, BC
Collection Approach	6 samples, each split into 3-6 subsamples
Sample Information	
Sample ID	MEL-13-01, MEL-13-07, MEL-02-05, MEL-03-02, MEL-04-05, and MEL-05-04
Sample collection date (y/m/d)	2020/June/06 & 2020/June/07
Date (y/m/d)/time of sample receipt at lab	2020/Jun/11 @ 08:20
Test Organisms	
Species	*Lemna minor* (Landolt clone 7730)
Source	Axenic in-house culture started from organisms obtained from Canadian Phycological Culture Centre, CPCC #492
Growth medium used for culturing	Hoagland's E+ Medium
Age of culture at start of test	10 days
Appearance/Any unusual treatment of culture	Good. No unusual appearance or treatment of culture prior to use in test
Culture health monitoring	Mean number of fronds in health monitoring vessels (38.3) displayed a ≥8-fold increase by the end of 7 days in APHA medium. See "Plant Subculture and Acclimation for Tests" data sheet.
Acclimation time and test medium	Plants were acclimated to APHA medium 18-24 hours prior to testing
Test Conditions & Facilities	
Test method	EPS 1/RM/37 Second Edition - January 2007 BBY2SOP-00053 Lemna minor 7 Day Growth Inhibition Test
Test type	Static
Date test started (y/m/d)	2020/Jun/12
Date test completed (y/m/d)	2020/Jun/19
Test vessels	200 mL transparent polypropylene cups with plastic Petri dish lids
Persons performing test	N. Shergill, M. Brassil, P. Howes, Y. Su
Test location	Temperature and photoperiod controlled room, under same conditions as culture vessels
Light intensity, quality & photoperiod	24 hour full spectrum fluorescent light: 74-90 µmol/(m^2s)
Rate and duration of preaeration	~100 bubbles/minute for 20 minutes
Procedure for pH adjustment	No pH adjustment of sample
Procedure for filtration	The sample was not filtered
Control(s)	Lab control: APHA medium Site water (Synthetic water) control: Control/ dilution water based on client recipe (Deionized water with reagent grade

	chemicals) Soft water control: Fathead minnow lab control water diluted with deionized water to 40 mg/L $CaCO_3$
Chemicals added to control/dilution water	APHA Nutrient stocks A, B, and C, as described in method at 10ml/L Test medium prepared using Milli-Q water (ASTM type 1)
Type and quantity of chemicals added to test sample prior to testing (i.e., nutrient spiking)	APHA Nutrient stocks A, B, and C, as described in method at 10 ml/L
Number and concentration of test solutions	7 (97, 48.5, 24.2, 12.1, 6.0, 3.0, 1.5% v/v) plus laboratory control, synthetic/site water control, and soft water control (Where applicable)
Volume and depth of solution in test vessels	150 mL & ≥4 cm
Number of replicates per concentration	4 (plus 1 for measurements)
Number of fronds/plant and Number of plants/test vessel	3 fronds per plant; 2 plants per test vessel
Sample pH before and after addition of APHA stocks A, B, and C	See "Test Data and Observations" sheet
Temperature of test solutions and control during the test	See "Test Data and Observations" sheet
pH of test solutions and control at test initiation and completion	See "Test Data and Observations" sheet
Test observation frequency	Plants were observed daily for growth, necrosis, chlorosis, algal growth, and any abnormalities
Test observations	Plant growth appeared healthy and fronds appeared dark green in the control and the 1.5 to 97% v/v concentrations for all samples. Green algae present in 48.5% and 97% for sample MEL-13-01 Green algae present in 97% for sample MEL-13-07.
Test observations and/or deviations from test method and standard practices	There was nothing unusual about the test, no other deviations from the test method, and no problems with the test.
Results	Results contained in this report refer only to the testing of samples as submitted.
Frond increase endpoint statistics	
Name and citation of program(s) and methods used for calculating statistical endpoint(s)	CETIS v1.9.2.4 – Linear Interpolation (ICPIN) Equal Variance t Two-Sample Test
Weighting techniques applied?	N/A
Residuals Analysis	N/A
Frond increase in controls and in each treatment (mean ± SD)	See "Frond Increase" data sheet
Significant stimulation in sample	No, see Dunnett Multiple Comparison Test and Equal Variance t Two-Sample Test in CETIS
Percent stimulation for frond increase	See "Frond Increase" spreadsheet

in the test solutions	
Any outliers and justification for their removal	None
Dry weight endpoint statistics	
Name and citation of program(s) and methods used for calculating statistical endpoint(s)	CETIS v1.9.2.4 – Linear Interpolation (ICPIN) Equal Variance t Two-Sample Test
Weighting techniques applied?	N/A
Residuals Analysis	N/A
Dry weights (mean ± SD)	See "Dry Weights" data sheet
Significant stimulation in sample	No, see Dunnett Multiple Comparison Test and Equal Variance t Two-Sample Test in CETIS
Percent stimulation for dry weight in the test solutions	See "Dry Weights" data sheet
Any outliers and justification for their removal	None
Quality Assurance	

Test validity criteria
• Average number of fronds in the control are ≥48 fronds
• A minimum of an 8-fold frond increase
	• Average number of fronds in Controls:
	  ○ MEL-13-01: 66.5
	  ○ MEL-13-07: 57.8
	  ○ MEL-02-05: 70.5
	  ○ MEL-03-02: 70.5
	  ○ MEL-04-05: 70.5
	  ○ MEL-05-04: 70.5
	• Amount of Frond Increase:
	  ○ MEL-13-01: 11.1 fold
	  ○ MEL-13-07: 9.6 fold
	  ○ MEL-02-05: 11.8 fold
	  ○ MEL-03-02: 11.8 fold
	  ○ MEL-04-05: 11.8 fold
	  ○ MEL-05-04: 11.8 fold

Reference Toxicant test: IC25 (95% CL) (µg Ni/L) for frond increase	8.6 (N/A, 75.9)
Reference toxicant test historic mean IC25 & 2SD range (µg Ni/L) for frond increase	10.1; 2SD range: (4.6, 22.4)
Invalid Reference toxicant test?	No
Date of Reference toxicant test and test duration	2020/Jun/04 7 days
Conditions of reference toxicant test	Same as test conditions

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

Analysis ID:	08-5028-2771	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	19.51%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1	mel 0302	97	0.2155	2.447	14.19	6	CDF	0.8365	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.481	2.127	0.9357	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	3.125	3.125	1	0.04644	0.8365	Non-Significant Effect
Error	403.75	67.2917	6			
Total	406.875		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.71	47.47	0.6704	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9535	0.6451	0.7461	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	72.75	58.09	87.41	72.5	62	84	4.608	12.67%	0.00%
97		4	71.5	60.29	82.71	72.5	62	79	3.524	9.86%	1.72%

Frond Increase Detail

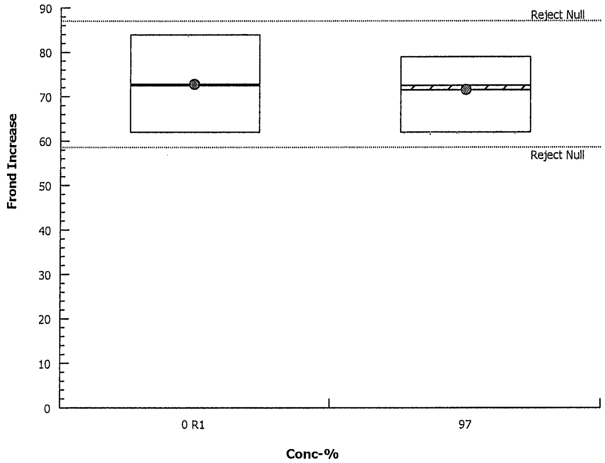
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	84	70	62	75
97		73	72	62	79

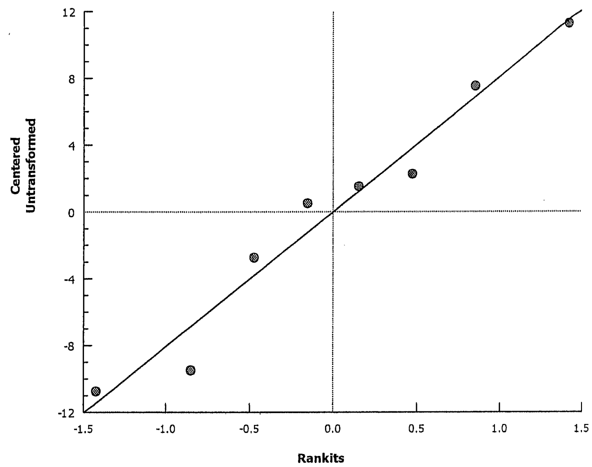
2020 Jun29 dml
2020Jul02

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	08-5028-2771	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	02-2119-2854	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	21.88%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2	mel 0405	97	0.9645	2.447	17.12	6	CDF	0.3720	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.446	2.127	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	91.125	91.125	1	0.9302	0.3720	Non-Significant Effect
Error	587.75	97.9583	6			
Total	678.875		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.945	47.47	0.3988	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9197	0.6451	0.4273	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	78.25	59.01	97.49	79.5	65	89	6.047	15.45%	0.00%
97		4	71.5	60.29	82.71	72.5	62	79	3.524	9.86%	8.63%

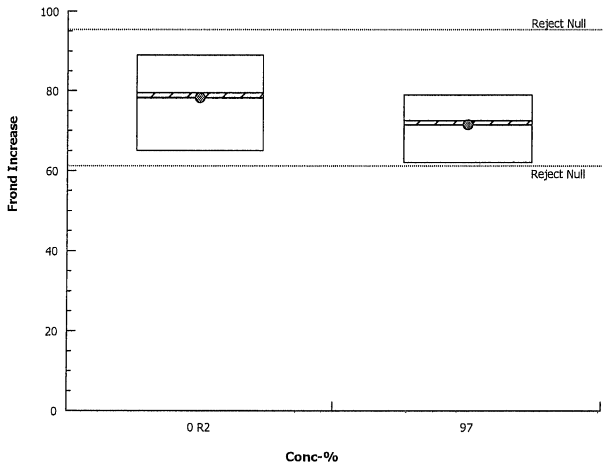
Frond Increase Detail

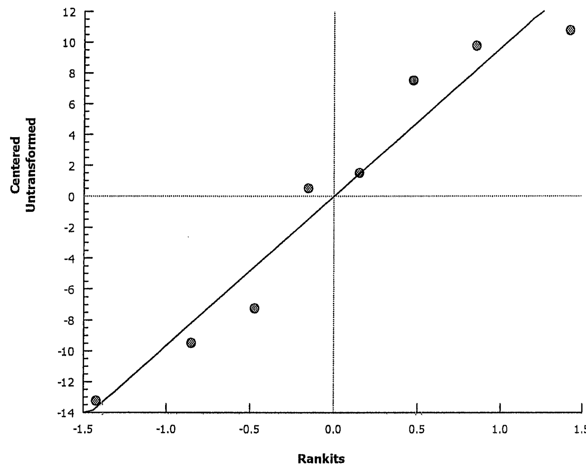
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	71	65	88	89
97		73	72	62	79

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	02-2119-2854	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

Analysis ID:	10-6581-0165	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	16.93%

Equal Variance t Two-Sample Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3 me10504	97	0.6746	2.447	12.69	6	CDF	0.5250	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.399	2.127	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	24.5	24.5	1	0.4551	0.5250	Non-Significant Effect
Error	323	53.8333	6			
Total	347.5		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.168	47.47	0.9016	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8961	0.6451	0.2666	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	75	62.88	87.12	75.5	67	82	3.808	10.15%	0.00%
97		4	71.5	60.29	82.71	72.5	62	79	3.524	9.86%	4.67%

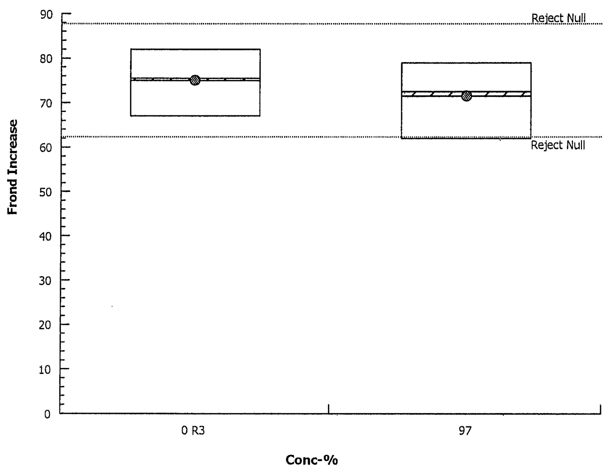
Frond Increase Detail

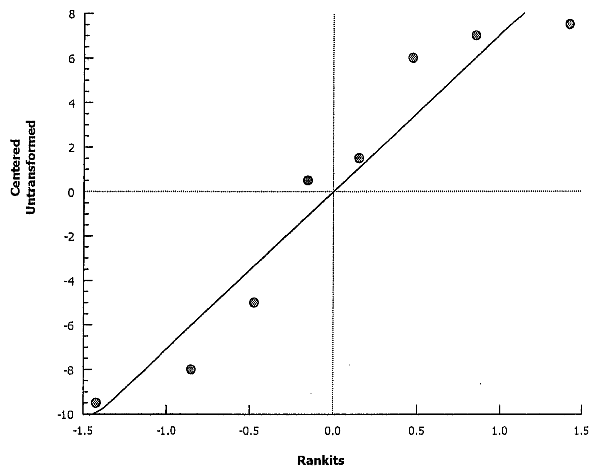
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	70	67	81	82
97		73	72	62	79

Analyst: 2020 Jun 29 dml QA: PH 2020 Jul 02 2020Jul02

nalysis ID:	10-6581-0165	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	12-4272-6527	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	14.42%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	pooled	97	0.7568	2.145	10.86	14	CDF	0.4617	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.612	2.586	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	44.0833	44.0833	1	0.5727	0.4617	Non-Significant Effect
Error	1077.67	76.9762	14			
Total	1121.75		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.7	43.52	0.7295	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9546	0.8408	0.5663	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	12	75.33	69.5	81.17	73	62	89	2.652	12.20%	0.00%
97		4	71.5	60.29	82.71	72.5	62	79	3.524	9.86%	5.09%

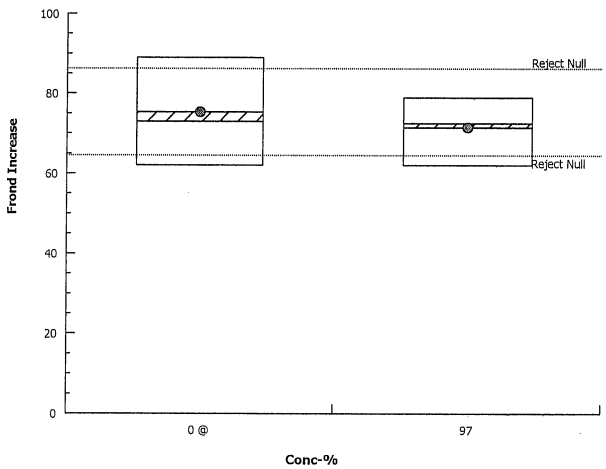
Frond Increase Detail

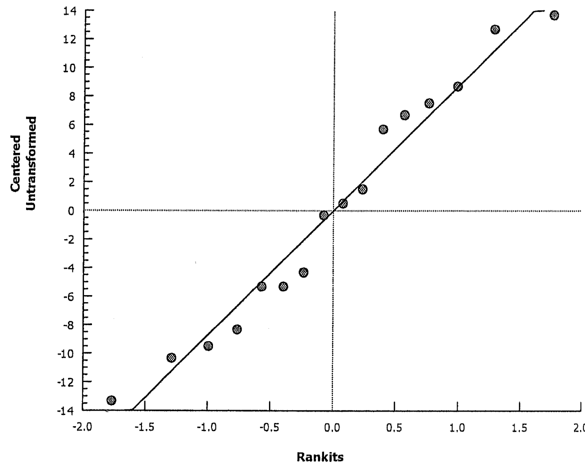
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	@	70	67	81	82	71	65	88	89	84	70
		62	75								
97		73	72	62	79						

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	12-4272-6527	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

Analysis ID:	07-3944-7550	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:51	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C <> T	97	> 97	n/a	1.031	20.18%

Dunnett Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	1.5	0.1478	2.814	14.28	6	CDF	1.0000	Non-Significant Effect
	3	0.4435	2.814	14.28	6	CDF	0.9976	Non-Significant Effect
	6	0.1971	2.814	14.28	6	CDF	1.0000	Non-Significant Effect
	12.1	1.084	2.814	14.28	6	CDF	0.8043	Non-Significant Effect
	24.2	0.9363	2.814	14.28	6	CDF	0.8862	Non-Significant Effect
	48.5	0.8378	2.814	14.28	6	CDF	0.9287	Non-Significant Effect
	97	0.1478	2.814	14.28	6	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.455	2.938	0.3237	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	163.469	23.3527	7	0.4537	0.8578	Non-Significant Effect
Error	1235.25	51.4688	24			
Total	1398.72		31			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	8.573	18.48	0.2848	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9737	0.9081	0.6065	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S1	4	70.75	61.62	79.88	69	66	79	2.869	8.11%	0.00%
1.5		4	71.5	57.12	85.88	67.5	66	85	4.518	12.64%	-1.06%
3		4	73	69.1	76.9	73	70	76	1.225	3.36%	-3.18%
6		4	69.75	60.53	78.97	70.5	62	76	2.898	8.31%	1.41%
12.1		4	76.25	71.32	81.18	77	72	79	1.548	4.06%	-7.77%
24.2		4	75.5	56.3	94.7	74.5	62	91	6.035	15.99%	-6.71%
48.5		4	75	63.45	86.55	76.5	65	82	3.629	9.68%	-6.01%
97		4	71.5	60.29	82.71	72.5	62	79	3.524	9.86%	-1.06%

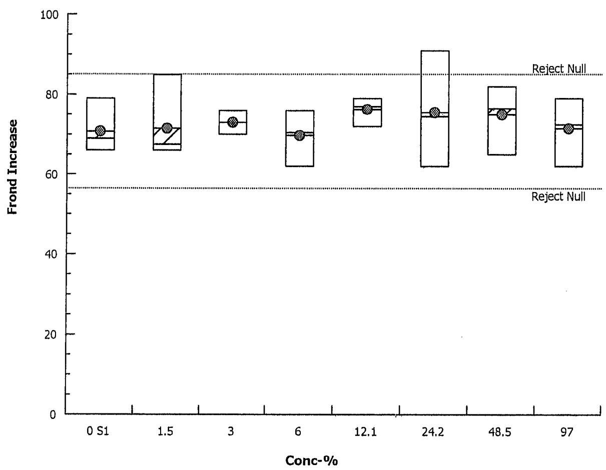
Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

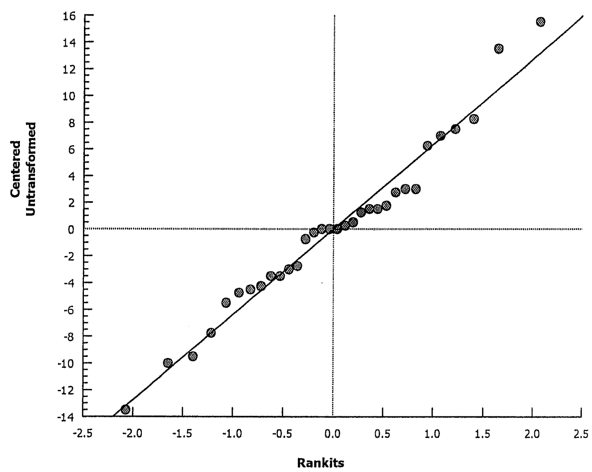
nalysis ID:	07-3944-7550	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:51	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	66	79	68	70
1.5		67	85	66	68
3		76	70	73	73
6		70	71	62	76
12.1		79	76	72	78
24.2		62	72	91	77
48.5		75	78	65	82
97		73	72	62	79

Graphics





Analyst: 2020Jun29 dm QA: PH 2020Jul02

CETIS Analytical Report

Report Date:	29 Jun-20 16:51 (p 1 of 2)
Test Code:	LM-10735-0220 | 14-6119-7024

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	09-2478-3308	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:45	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	449937	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.455	2.938	0.3237	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>97	n/a	n/a	<1.031	n/a	n/a
IC10	>97	n/a	n/a	<1.031	n/a	n/a
IC15	>97	n/a	n/a	<1.031	n/a	n/a
IC20	>97	n/a	n/a	<1.031	n/a	n/a
IC25	>97	n/a	n/a	<1.031	n/a	n/a
`40	>97	n/a	n/a	<1.031	n/a	n/a
,C50	>97	n/a	n/a	<1.031	n/a	n/a

Frond Increase Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S1	4	70.75	66	79	2.869	5.737	8.11%	0.0%
1.5		4	71.5	66	85	4.518	9.037	12.64%	-1.06%
3		4	73	70	76	1.225	2.449	3.36%	-3.18%
6		4	69.75	62	76	2.898	5.795	8.31%	1.41%
12.1		4	76.25	72	79	1.548	3.096	4.06%	-7.77%
24.2		4	75.5	62	91	6.035	12.07	15.99%	-6.71%
48.5		4	75	65	82	3.629	7.257	9.68%	-6.01%
97		4	71.5	62	79	3.524	7.047	9.86%	-1.06%

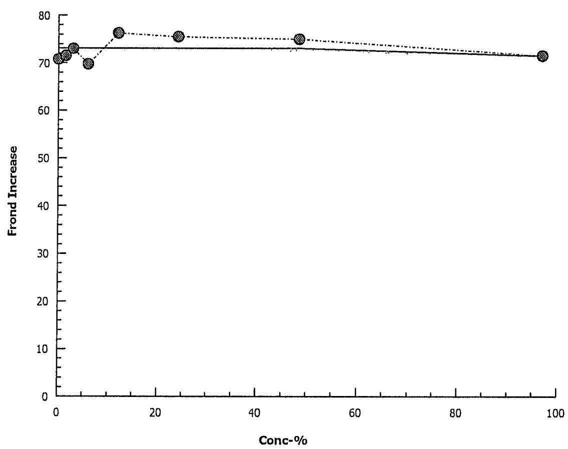
Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	66	79	68	70
1.5		67	85	66	68
3		76	70	73	73
6		70	71	62	76
12.1		79	76	72	78
24.2		62	72	91	77
48.5		75	78	65	82
97		73	72	62	79

Lemna Growth Inhibition Test **Bureau Veritas Laboratories**

nalysis ID:	09-2478-3308	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:45	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



2020 Jun29 dm 2020Jul02

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-01
Analyst(s): N. Shergill, M. Brassil

Job# / Sample #: C039804 XX3664
Start Date: June 12, 2020
End Date: June 19, 2020

Conc. & Replicate	Initial Number of Fronds	Final Number of Fronds	Frond Increase	Mean Increase in # Fronds per Conc'n	SD	% Stimulation
Control-A	6	62	56	60.5	3.7	--
B	6	66	60			
C	6	67	61			
D	6	71	65			
Site Control-A	6	72	66	70.8	5.7	16.94
B	6	85	79			
C	6	74	68			
D	6	76	70			
1.5%-A	6	73	67	71.5	9.0	18.18
B	6	91	85			
C	6	72	66			
D	6	74	68			
3.0%-A	6	82	76	73.0	2.4	20.66
B	6	76	70			
C	6	79	73			
D	6	79	73			
6.0%-A	6	76	70	69.8	5.8	15.29
B	6	77	71			
C	6	68	62			
D	6	82	76			
12.1%-A	6	85	79	76.3	3.1	26.03
B	6	82	76			
C	6	78	72			
D	6	84	78			
24.2%-A	6	68	62	75.5	12.1	24.79
B	6	78	72			
C	6	97	91			
D	6	83	77			
48.5%-A	6	81	75	75.0	7.3	23.97
B	6	84	78			
C	6	71	65			
D	6	88	82			
97%-A	6	79	73	71.5	7.0	18.18
B	6	78	72			
C	6	68	62			
D	6	85	79			
Analyst	NS	MB				

N/S - No growth stimulation (frond increase) compared to the Control

Control Validity Criteria: Mean final # of fronds in Controls on day 7 must be ≥8 times initial # of fronds

Mean Final # of Fronds on Day 7	66.5
Control Frond Increase	11.1
Validity Criteria Met?	Yes

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	09-2706-4563	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	17.61%

Equal Variance t Two-Sample Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1 mel 0302	97	0.502	2.447	1.328	6	CDF	0.6336	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.569	2.127	0.7319	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.148513	0.148513	1	0.252	0.6336	Non-Significant Effect
Error	3.53638	0.589396	6			
Total	3.68489		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.57	47.47	0.7201	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9308	0.6451	0.5235	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	7.545	6.195	8.895	7.635	6.43	8.48	0.4243	11.25%	0.00%
97		4	7.817	6.74	8.895	8.005	6.89	8.37	0.3387	8.66%	-3.61%

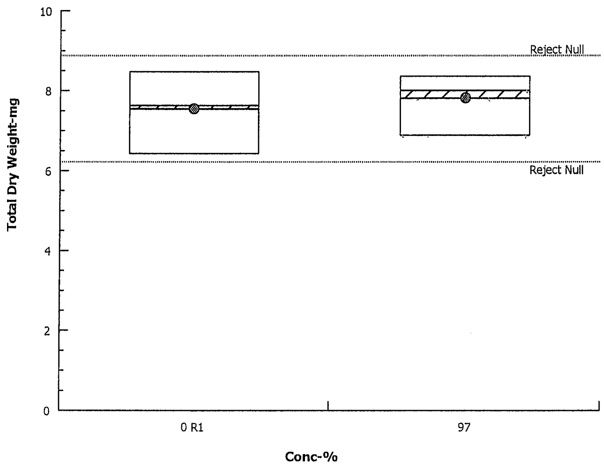
Total Dry Weight-mg Detail

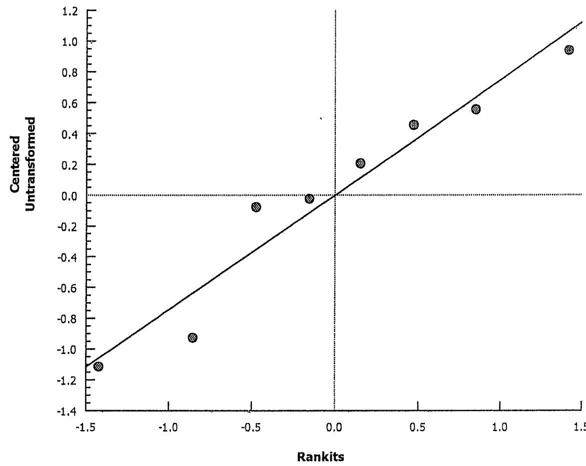
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	8.48	7.75	6.43	7.52
97		8.37	8.27	6.89	7.74

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	09-2706-4563	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:56	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	11-3013-9805	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 17:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	20.08%

Equal Variance t Two-Sample Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2 mel0405	97	0.865	2.447	1.69	6	CDF	0.4203	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.73	2.127	0.4288	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.714012	0.714012	1	0.7483	0.4203	Non-Significant Effect
Error	5.72517	0.954196	6			
Total	6.43919		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.16	47.47	0.3699	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9713	0.6451	0.9079	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	8.415	6.499	10.33	8.25	7.18	9.98	0.602	14.31%	0.00%
97		4	7.817	6.74	8.895	8.005	6.89	8.37	0.3387	8.66%	7.10%

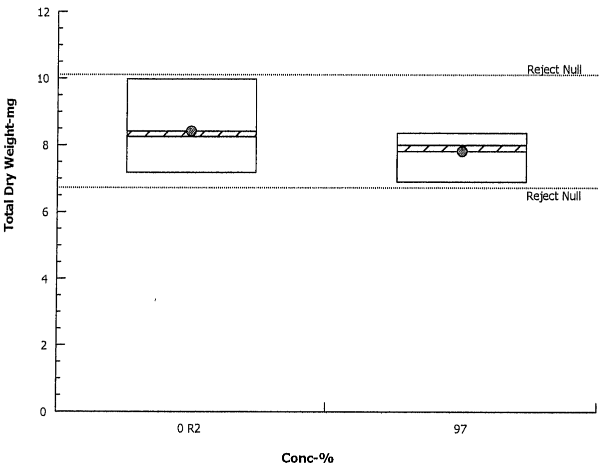
Total Dry Weight-mg Detail

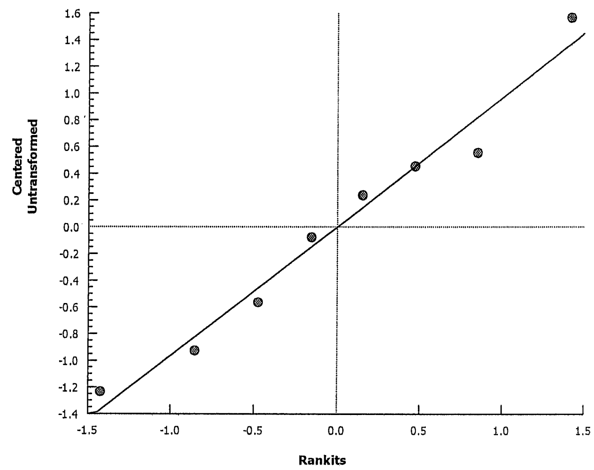
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	7.85	7.18	8.65	9.98
97		8.37	8.27	6.89	7.74

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	11-3013-9805	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 17:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	09-7933-2576	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 17:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	16.65%

Equal Variance t Two-Sample Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3 meloscut	97	1.176	2.447	1.415	6	CDF	0.2840	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.371	2.127	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.9248	0.9248	1	1.384	0.2840	Non-Significant Effect
Error	4.01035	0.668392	6			
Total	4.93515		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.914	47.47	0.6073	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8837	0.6451	0.2042	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	8.497	7.006	9.989	8.605	7.46	9.32	0.4685	11.03%	0.00%
97		4	7.817	6.74	8.895	8.005	6.89	8.37	0.3387	8.66%	8.00%

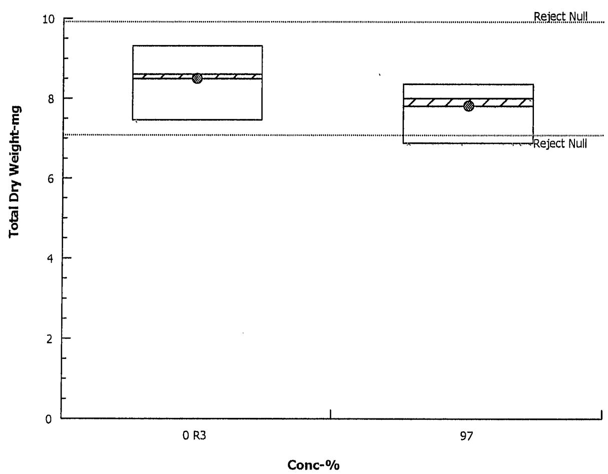
Total Dry Weight-mg Detail

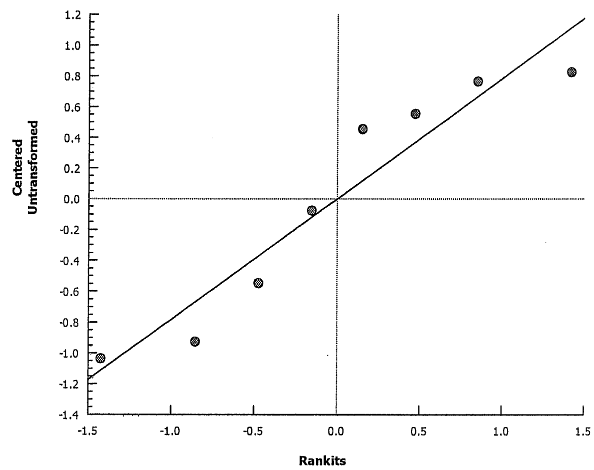
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	7.95	7.46	9.26	9.32
97		8.37	8.27	6.89	7.74

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	09-7933-2576	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 17:01	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 Jun29 dmi QA: PH 2020JUl02

CETIS Analytical Report

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	15-8155-2611	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 17:29	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	14.49%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	pooled	97	0.6081	2.145	1.182	14	CDF	0.5529	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.982	2.586	0.5643	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.336675	0.336675	1	0.3698	0.5529	Non-Significant Effect
Error	12.7473	0.910521	14			
Total	13.084		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.253	43.52	0.5471	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9845	0.8408	0.9893	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	12	8.152	7.507	8.798	7.9	6.43	9.98	0.2935	12.47%	0.00%
97		4	7.817	6.74	8.895	8.005	6.89	8.37	0.3387	8.66%	4.11%

Total Dry Weight-mg Detail

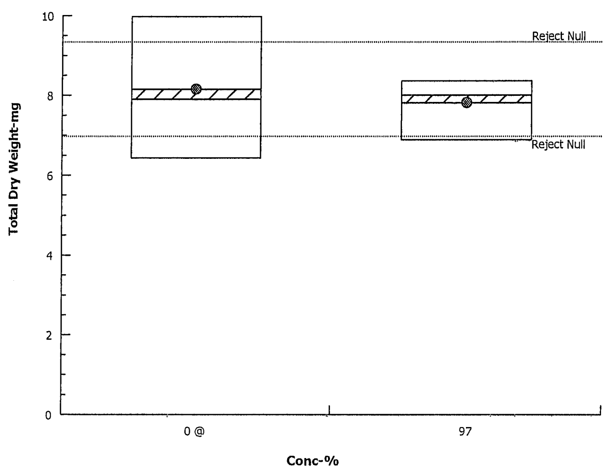
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	@	7.95	7.46	9.26	9.32	7.85	7.18	8.65	9.98	8.48	7.75
		6.43	7.52								
97		8.37	8.27	6.89	7.74						

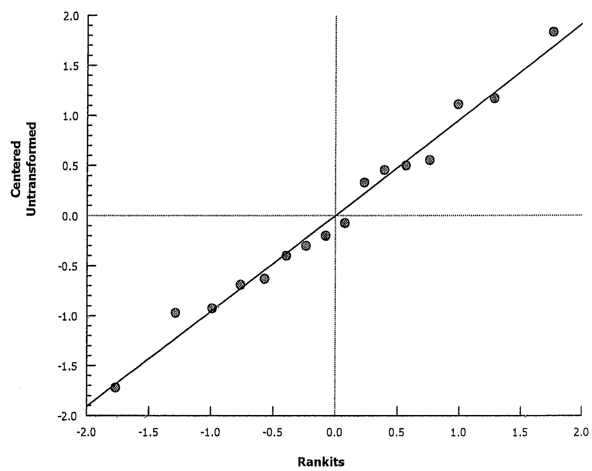
2020 Jul 02 dml — 2020 Jul 09

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	15-8155-2611	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 17:29	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





2020 Jul 02
2020 Jul 09

Analyst: QA: PH

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	15-8497-4482	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:57	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C <> T	97	> 97	n/a	1.031	17.98%

Dunnett Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	1.5	0.4838	2.814	1.425	6	CDF	0.9960	Non-Significant Effect
	3	0.1037	2.814	1.425	6	CDF	1.0000	Non-Significant Effect
	6	0.7554	2.814	1.425	6	CDF	0.9556	Non-Significant Effect
	12.1	0.6468	2.814	1.425	6	CDF	0.9796	Non-Significant Effect
	24.2	0.1728	2.814	1.425	6	CDF	1.0000	Non-Significant Effect
	48.5	0.4048	2.814	1.425	6	CDF	0.9986	Non-Significant Effect
	97	0.2123	2.814	1.425	6	CDF	1.0000	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.742	2.938	0.1135	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.4963	0.213757	7	0.4168	0.8823	Non-Significant Effect
Error	12.3075	0.512811	24			
Total	13.8038		31			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	9.497	18.48	0.2189	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9674	0.9081	0.4305	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S1	4	7.925	7.068	8.782	7.725	7.53	8.72	0.2693	6.80%	0.00%
1.5		4	7.68	6.192	9.168	7.395	6.9	9.03	0.4677	12.18%	3.09%
3		4	7.872	7.593	8.152	7.825	7.73	8.11	0.08778	2.23%	0.66%
6		4	7.542	6.712	8.373	7.52	7.06	8.07	0.2608	6.92%	4.83%
12.1		4	8.253	7.392	9.113	8.295	7.59	8.83	0.2704	6.55%	-4.13%
24.2		4	8.012	6.01	10.01	7.785	6.74	9.74	0.6291	15.70%	-1.10%
48.5		4	8.13	7.258	9.002	8.175	7.42	8.75	0.274	6.74%	-2.59%
97		4	7.817	6.74	8.895	8.005	6.89	8.37	0.3387	8.66%	1.36%

2020 Jun29 dm Analyst: dm

2020Jul02 QA: PH

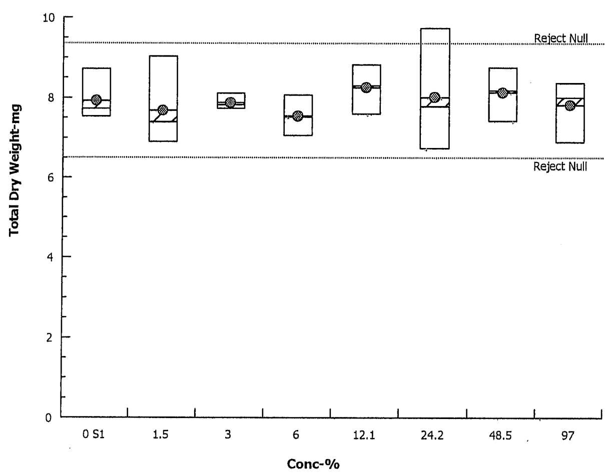
Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

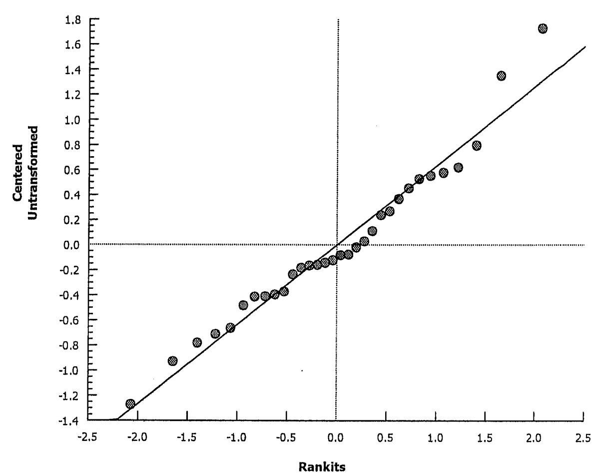
nalysis ID:	15-8497-4482	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:57	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Total Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	7.69	8.72	7.76	7.53
1.5		7.52	9.03	7.27	6.9
3		8.11	7.9	7.73	7.75
6		7.13	7.91	7.06	8.07
12.1		8.83	8.52	7.59	8.07
24.2		6.74	7.64	9.74	7.93
48.5		7.42	8.24	8.11	8.75
97		8.37	8.27	6.89	7.74

Graphics





Analyst: 2020 Jun29 dml QA: 2020Jul02 PH

CETIS Analytical Report

Report Date: 29 Jun-20 16:58 (p 1 of 2)
Test Code: LM-10735-0220 | 14-6119-7024

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	01-2247-1043	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:56	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	10-5417-7042	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	16-3674-6015	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 0h	**Station:**	MEL 13-01		

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	777968	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.742	2.938	0.1135	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	>97	n/a	n/a	<1.031	n/a	n/a
IC10	>97	n/a	n/a	<1.031	n/a	n/a
IC15	>97	n/a	n/a	<1.031	n/a	n/a
IC20	>97	n/a	n/a	<1.031	n/a	n/a
IC25	>97	n/a	n/a	<1.031	n/a	n/a
IC40	>97	n/a	n/a	<1.031	n/a	n/a
IC50	>97	n/a	n/a	<1.031	n/a	n/a

Total Dry Weight-mg Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S1	4	7.925	7.53	8.72	0.2693	0.5387	6.80%	0.0%
1.5		4	7.68	6.9	9.03	0.4677	0.9353	12.18%	3.09%
3		4	7.872	7.73	8.11	0.08778	0.1756	2.23%	0.66%
6		4	7.542	7.06	8.07	0.2608	0.5216	6.92%	4.83%
12.1		4	8.253	7.59	8.83	0.2704	0.5408	6.55%	-4.13%
24.2		4	8.012	6.74	9.74	0.6291	1.258	15.70%	-1.1%
48.5		4	8.13	7.42	8.75	0.274	0.548	6.74%	-2.59%
97		4	7.817	6.89	8.37	0.3387	0.6773	8.66%	1.36%

Total Dry Weight-mg Detail

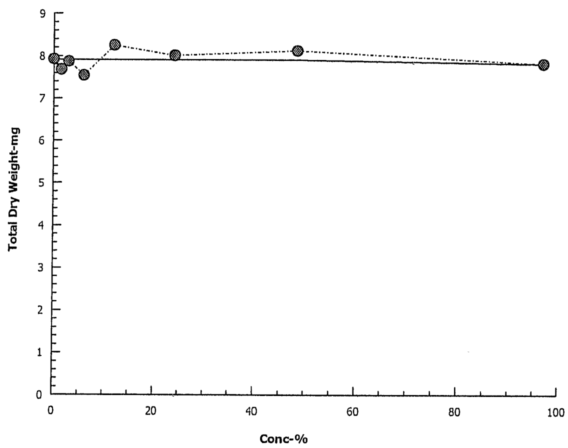
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	7.69	8.72	7.76	7.53
1.5		7.52	9.03	7.27	6.9
3		8.11	7.9	7.73	7.75
6		7.13	7.91	7.06	8.07
12.1		8.83	8.52	7.59	8.07
24.2		6.74	7.64	9.74	7.93
48.5		7.42	8.24	8.11	8.75
97		8.37	8.27	6.89	7.74

Analyst: 2020 Jun29 dm QA: PH 2020Jul02

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	01-2247-1043	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	29 Jun-20 16:56	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



ECOTOXICOLOGY

Lemna minor Growth Inhibition Test Data

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-01
Weighing Dates: 2020 Jun 17, 2020 Jun 22
Analyst(s): NS, DML

Job# / Sample #: C039804 XX3664
Oven Temp (°C): 60
Drying Time (h): >24
Balance ID: bby2-0260

Boat #	Conc. & Replicate	Final # of Fronds	Boat Wt. (g)	Boat & Frond Dry Weight (g)	Dry Weight per Rep. (mg)	Mean Dry Weight per Conc (mg)	SD	% Stimulation
356	Control-A	62	0.81216	0.81852	6.36	6.67	0.43	--
357	B	66	0.79954	0.80616	6.62			
358	C	67	0.79011	0.79653	6.42			
359	D	71	0.80579	0.81308	7.29			
360	Site Control-A	72	0.80900	0.81669	7.69	7.93	0.54	18.77
361	B	85	0.81090	0.81962	8.72			
362	C	74	0.79486	0.80262	7.76			
363	D	76	0.80918	0.81671	7.53			
364	1.5%-A	73	0.81227	0.81979	7.52	7.68	0.94	15.10
365	B	91	0.81294	0.82197	9.03			
366	C	72	0.80552	0.81279	7.27			
367	D	74	0.80177	0.80867	6.90			
368	3.0%-A	82	0.77881	0.78692	8.11	7.87	0.18	17.98
369	B	76	0.82365	0.83155	7.90			
370	C	79	0.81335	0.82108	7.73			
371	D	79	0.80623	0.81398	7.75			
372	6.0%-A	76	0.80242	0.80955	7.13	7.54	0.52	13.04
373	B	77	0.79516	0.80307	7.91			
374	C	68	0.79782	0.80488	7.06			
375	D	82	0.80229	0.81036	8.07			
376	12.1%-A	85	0.82225	0.83108	8.83	8.25	0.54	23.68
377	B	82	0.80671	0.81523	8.52			
378	C	78	0.80391	0.81150	7.59			
379	D	84	0.81179	0.81986	8.07			
380	24.2%-A	68	0.82027	0.82701	6.74	8.01	1.26	20.08
381	B	78	0.80153	0.80917	7.64			
382	C	97	0.80776	0.81750	9.74			
383	D	83	0.78941	0.79734	7.93			
384	48.5%-A	81	0.79660	0.80402	7.42	8.13	0.55	21.84
385	B	84	0.80489	0.81313	8.24			
386	C	71	0.80677	0.81488	8.11			
387	D	88	0.80218	0.81093	8.75			
388	97%-A	79	0.79783	0.80620	8.37	7.82	0.68	17.16
389	B	78	0.79715	0.80542	8.27			
390	C	68	0.80507	0.81196	6.89			
391	D	85	0.79323	0.80097	7.74			
392	QA/QC	N/A	0.79050	0.79066	0.16	-	-	-
393	QA/QC	N/A	0.79464	0.79473	0.09	-	-	
356	0-A	62	0.81211	0.81875	6.64	-	-	
Analyst		MB	NS	DML				

N/S - No growth stimulation (dry weight) compared to the Control

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd.
Start Date: June 12, 2020
Sample ID: MEL-13-01
End Date: June 19, 2020
Sample Date: 2020 Jun 07
Job# / Sample #: C039804 / XX3664
Analyst(s): N.Shergino, U.Brassil, P.Hawes
Organism Lot #: ~~CP200526~~ CP 200602 LEWE ?? 2020 Jul 09

pH of raw sample	pH after addition of APHA stocks A, B, & C	Pre-aeration time	pH after aeration
7.~~68~~.5	7.6	20min	7.8

APHA Stocks Prep Date: 2020 Feb 24 WE NS2020 Jun12
Instrument IDs: BB42 - 0042
Thermometer ID: BB42 - 0438
Plant Shelf #: 3
Test Volume (mL): 150ml
Sample Description: clear & colourless

Concentration (%)	Temperature Monitoring Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	pH Monitoring Day 0	Day 7
Control	25	26	27	ⓐ~~26~~ 27	27	26	26	27	8.2	8.5
Site Control	25	27	27	ⓐ~~26~~ 27	27	26	26	27	8.3	8.5
1.5	25	26	27	27	27	26	26	27	8.3	8.6
3.0										
6.0										
12.1	25	26	27	27	27	26	26	27	8.3	8.8
24.2										
48.5										
97.0	25	27	26	27	27	26	26	27	8.1	9.4
Analyst	NS	UB	NS	PH	UB	UB	UB	UB	NS	UB
Date	2020 Jun12	2020 June13	2020 Jun14	2020 June15	2020 June16	2020 June17	2020 June18	2020 June19	2020 Jun12	2020 June19

Observations during the Test

Day 0 (Test Initiation)

Date: June 12, 2020
Analyst: UBrassil
# of Plants per Test Vessel: 2
# of Fronds per Plant: 3
Plant Observations: Dark green, healthy
Test Seeded @: 15:22
Other comments: ~~soft water control pH = 8.3 temp=~~ 4FEB2020 Jun12 N/a

Day 1

Date: June 13, 2020
Analyst: UBrassil

Observations:

Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG,H	DG, H	DG,H	DG,H	DG,H	DG, H	DG,H	DG, H	DG,H

Other Comments: All sol'ns clear + colourless

ⓐ PH WE 2020 June15

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd.
Start Date: June 12, 2020

MEL-13-01

Job# / Sample #: C039804 / XX3664

Day 2

Date: June 14, 2020
Analyst: NVorgo

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H

Other Comments: n/a

Day 3

Date: June 15, 2020
Analyst: P-Hawes

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H

Other Comments: n/a

Day 4

Date: June 16, 2020
Analyst: uBrassil

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 5

Date: June 17, 2020
Analyst: uBrassil

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H

Other Comments: All sol'ns appear clear + colourless.

Day 6

Date: June 18, 2020
Analyst: uBrassil

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H,A

Other Comments: n/a

Day 7

Date: June 19, 2020
Analyst: uBrassil

Test End Time: 2020 June 19 @ 12:10

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H	DG,H,A	DG,H,A

Other Comments: some green algae at bases of 48.5% + 97% reps, others clear + colourless.

Legend:

- **DG** = Dark Green
- **LG** = Light Green
- **H** = Healthy, Normal
- **C** = Chlorosis
- **N** = Necrosis
- **G** = Gibbosity
- **A** = Green Algae
- **T** = Transparent
- **S** = small fronds
- **CD** = Colony destroyed
- **RD** = Roots destroyed

Other :

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd.
Job# / Sample #: C039804
Sample ID: MEL-13-01
Start Date: June 12, 2020
Analyst(s): [illegible]
End Date: June 19, 2020

Conc. & Replicate	Initial Number of Fronds	Final Number of Fronds	Frond Increase	Mean Increase in # Fronds per Conc'n	SD	% Stimulation
Control-A	6	62	--	--	--	--
B	6	66	--			
C	6	67	--			
D	6	71	--			
Site Control-A	6	72	--	--	--	N/S
B	6	85	--			
C	6	74	--			
D	6	76	--			
1.5%-A	6	73	--	--	--	N/S
B	6	91	--			
C	6	72	--			
D	6	74	--			
3.0%-A	6	82	--	--	--	N/S
B	6	76	--			
C	6	79	--			
D	6	79	--			
6.0%-A	6	76	--	--	--	N/S
B	6	77	--			
C	6	68	--			
D	6	82	--			
12.1%-A	6	85	--	--	--	N/S
B	6	82	--			
C	6	78	--			
D	6	84	--			
24.2%-A	6	68	--	--	--	N/S
B	6	78	--			
C	6	97	--			
D	6	83	--			
48.5%-A	6	81	--	--	--	N/S
B	6	84	--			
C	6	71	--			
D	6	88	--			
97%-A	6	79	--	--	--	N/S
B	6	78	--			
C	6	68	--			
D	6	85	--			
Analyst		[illegible]				

N/S - No growth stimulation (frond increase) compared to the Control

Control Validity Criteria: Mean final # of fronds in Controls on day 7 must be ≥8 times initial # of fronds

Mean Final # of Fronds on Day 7	#DIV/0!
Control Frond Increase	#DIV/0!
Validity Criteria Met?	#DIV/0!

Randomization Chart

Client Name: Golder

Test Date: 2020 Jun 12

Sample Name: MEL-13-01

Shelf #: 3

Back Wall — **Position Map**

5	10	15	20	25	30	35	40
4	9	14	19	24	29	34	39
3	8	13	18	23	28	33	38
2	7	12	17	22	27	32	37
1	6	11	16	21	26	31	36

Front of Counter

Position #	Treatment	Replicate	Colour
21		A	
42		B	
30	Control	C	Red
10		D	
6		Measure	
35		A	
38		B	
26	Site Control	C	White
29		D	
5		Measure	
39		A	
33		B	
20	1.5%	C	Orange
8		D	
18		Measure	
22		A	
4		B	
15	3.0%	C	Yellow
13		D	
43		Measure	
19		A	
7		B	
14	6.0%	C	Fl. Green
40		D	
9		Meas.	
27		A	
25		B	
41	12.1%	C	Teal
23		D	
45		Measure	
28		A	
11		B	
12	24.2%	C	Blue
1		D	
3		Measure	
36		A	
34		B	
2	48.5%	C	Purple
17		D	
37		Measure	
44		A	
32		B	
31	97%	C	Pink
24		D	
16		Measure	

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	15-2720-0159	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed frond increase	16.23%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1		97*	4.248	2.447	11.81	6	CDF	0.0054	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.78	2.127	0.3542	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	840.5	840.5	1	18.04	0.0054	Significant Effect
Error	279.5	46.5833	6			
Total	1120		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	10.29	47.47	0.0871	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9624	0.6451	0.8327	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	72.75	58.09	87.41	72.5	62	84	4.608	12.67%	0.00%
97		4	52.25	47.68	56.82	52	49	56	1.436	5.50%	28.18%

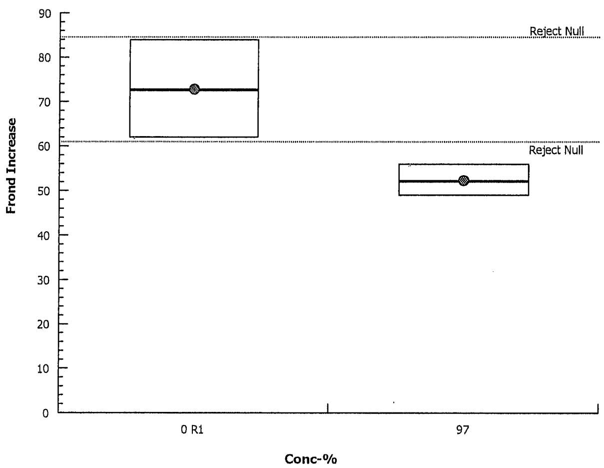
Frond Increase Detail

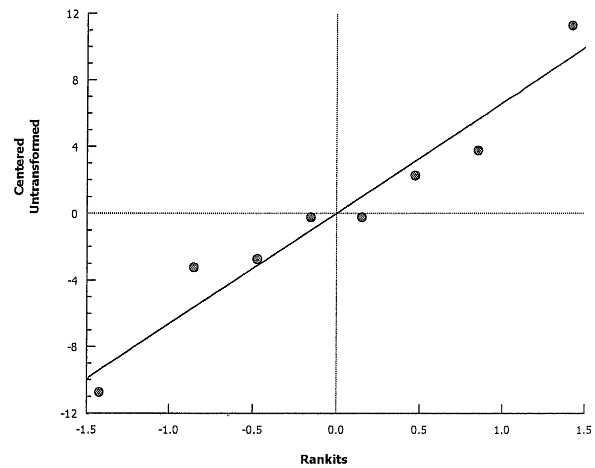
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	84	70	62	75
97		52	56	49	52

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	15-2720-0159	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:49	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	00-7787-2605	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed frond increase	19.43%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2		97*	4.183	2.447	15.21	6	CDF	0.0058	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.628	2.127	0.6091	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1352	1352	1	17.5	0.0058	Significant Effect
Error	463.5	77.25	6			
Total	1815.5		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	17.73	47.47	0.0412	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9628	0.6451	0.8359	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	78.25	59.01	97.49	79.5	65	89	6.047	15.45%	0.00%
97		4	52.25	47.68	56.82	52	49	56	1.436	5.50%	33.23%

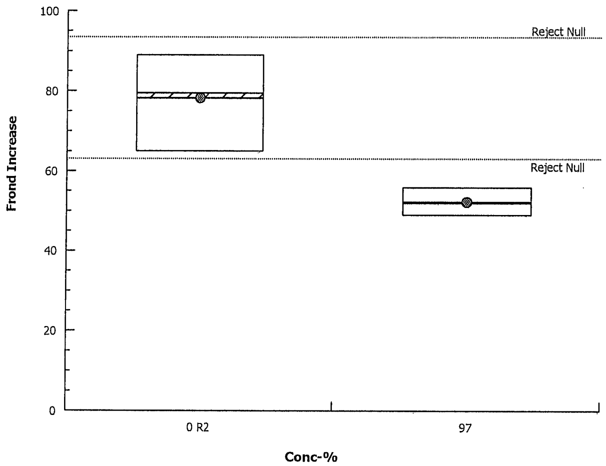
Frond Increase Detail

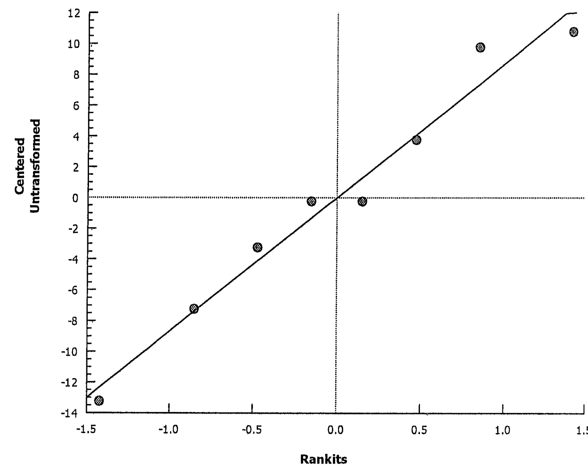
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	71	65	88	89
97		52	56	49	52

2020 Jul 02 Analyst: dnl QA: PH 2020 Jul 09

nalysis ID:	00-7787-2605	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





2020 Jul 02 2020 Jul 09

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	00-6910-7817	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
nalyzed:	02 Jul-20 18:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed frond increase	13.28%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3		97*	5.59	2.447	9.958	6	CDF	0.0014	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.501	2.127	0.8864	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
tween	1035.12	1035.12	1	31.25	0.0014	Significant Effect
Error	198.75	33.125	6			
Total	1233.88		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	7.03	47.47	0.1435	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9556	0.6451	0.7668	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	75	62.88	87.12	75.5	67	82	3.808	10.15%	0.00%
97		4	52.25	47.68	56.82	52	49	56	1.436	5.50%	30.33%

Frond Increase Detail

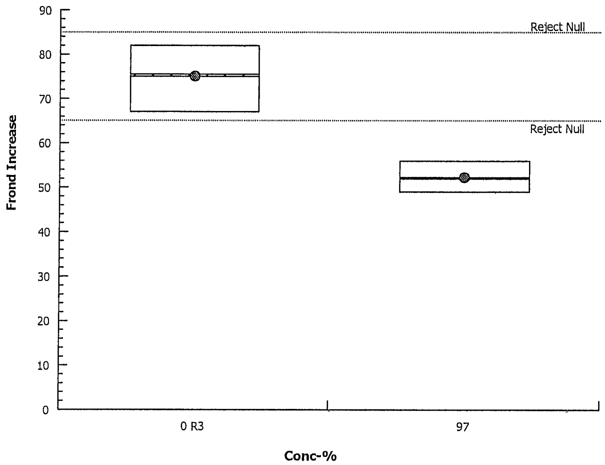
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	70	67	81	82
97		52	56	49	52

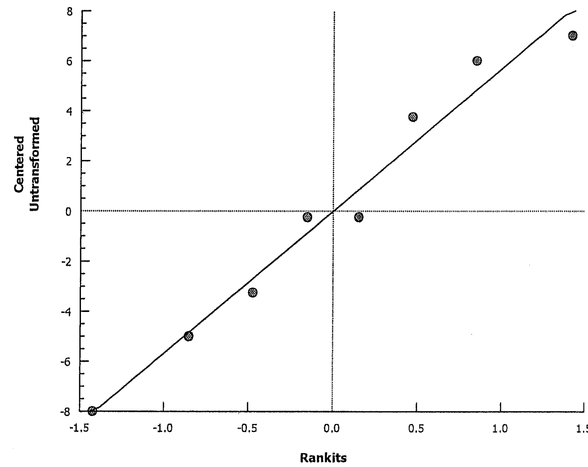
2020 Jul 02

2020 Jul 09

Analysis ID:	00-6910-7817	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

Analysis ID:	09-1079-3559	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed frond increase	13.56%

Equal Variance t Two-Sample Test

Conc-%	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	pooled	97*	4.845	2.145	10.22	14	CDF	2.6E-04	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.714	2.586	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1598.52	1598.52	1	23.47	2.6E-04	Significant Effect
Error	953.417	68.1012	14			
Total	2551.94		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	10.23	43.52	0.0807	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9704	0.8408	0.8443	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	12	75.33	69.5	81.17	73	62	89	2.652	12.20%	0.00%
97		4	52.25	47.68	56.82	52	49	56	1.436	5.50%	30.64%

Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	@	70	67	81	82	71	65	88	89	84	70
		62	75								
97		52	56	49	52						

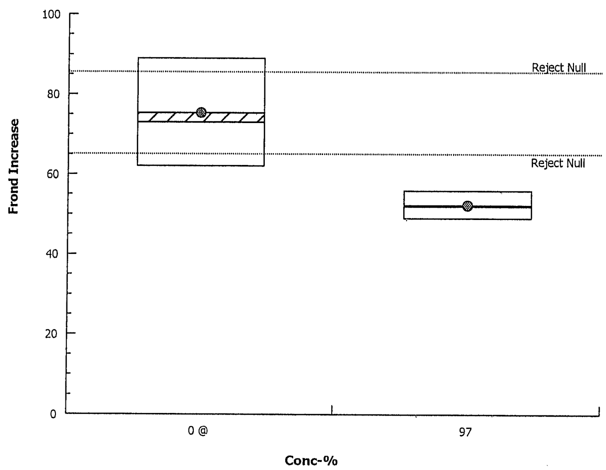
2020 Jul 02 | 2020 Jul 10

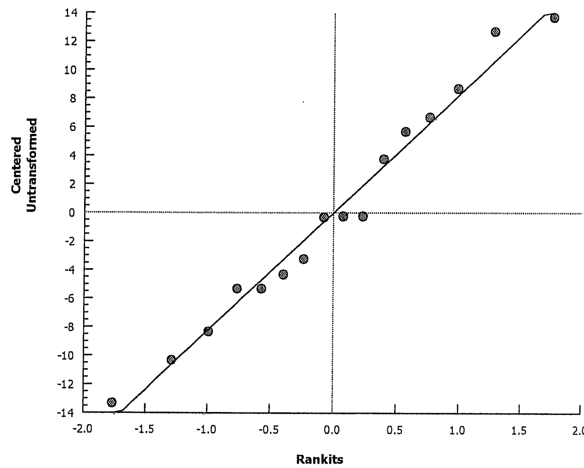
(A) PH/MC 2020 Jul 10

Lemna Growth Inhibition Test — Bureau Veritas Laboratories

Analysis ID:	09-1079-3559	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:50	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 Jul02 dmc QA: PH 2020Jul10

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

ıalysis ID:	00-1687-2728	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
ᴧnalyzed:	02 Jul-20 18:51	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C <> T	97	> 97	n/a	1.031	26.48%

Dunnett Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	1.5	0.3617	2.814	15.56	6	CDF	0.9993	Non-Significant Effect
	3	0.5878	2.814	15.56	6	CDF	0.9878	Non-Significant Effect
	6	0.1809	2.814	15.56	6	CDF	1.0000	Non-Significant Effect
	12.1	0.2713	2.814	15.56	6	CDF	0.9999	Non-Significant Effect
	24.2	0.9948	2.814	15.56	6	CDF	0.8562	Non-Significant Effect
	48.5	2.261	2.814	15.56	6	CDF	0.1535	Non-Significant Effect
	97	1.176	2.814	15.56	6	CDF	0.7455	Non-Significant Effect

ıxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.289	2.938	0.5553	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	884.719	126.388	7	2.067	0.0874	Non-Significant Effect
Error	1467.25	61.1354	24			
Total	2351.97		31			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	15.31	18.48	0.0322	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9844	0.9081	0.9125	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S1	4	58.75	46.89	70.61	58.5	50	68	3.728	12.69%	0.00%
1.5		4	60.75	47.6	73.9	61.5	51	69	4.131	13.60%	-3.40%
3		4	62	55.77	68.23	62.5	57	66	1.958	6.32%	-5.53%
6		4	57.75	56.23	59.27	57.5	57	59	0.4787	1.66%	1.70%
12.1		4	57.25	41.75	72.75	60.5	43	65	4.871	17.02%	2.55%
24.2		4	64.25	45.9	82.6	65	50	77	5.764	17.94%	-9.36%
48.5		4	71.25	54.34	88.16	67	64	87	5.313	14.91%	-21.28%
97		4	52.25	47.68	56.82	52	49	56	1.436	5.50%	11.06%

2020 Jul 02 dmw 2020 Jul 10

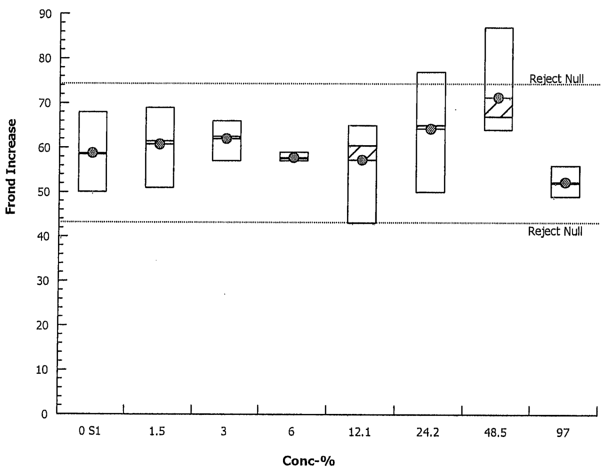
Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

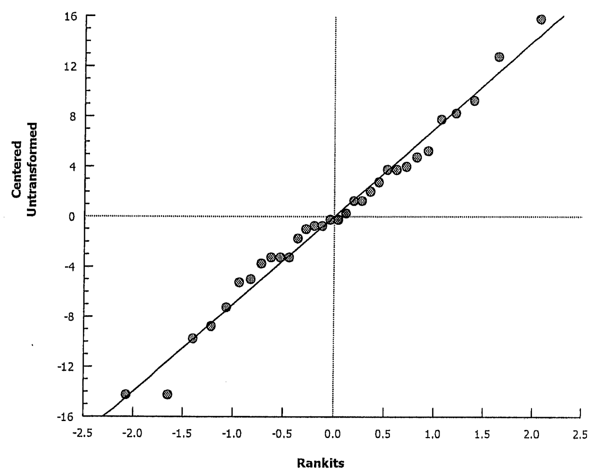
Analysis ID:	00-1687-2728	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:51	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	60	68	57	50
1.5		57	66	69	51
3		61	64	66	57
6		57	57	59	58
12.1		60	61	65	43
24.2		77	61	69	50
48.5		66	64	68	87
97		52	56	49	52

Graphics





Analyst: 2020 Jul 02 dml QA: PH 2020 Jul 10

CETIS Analytical Report

Report Date:	02 Jul-20 18:53 (p 1 of 2)
Test Code:	LM-10735-0320 | 10-2620-0901

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

ıalysis ID:	09-8821-3810	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
⌐nalyzed:	02 Jul-20 18:51	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes
Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	242089	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.289	2.938	0.5553	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	60.85	n/a	75.97	1.643	1.316	n/a
IC10	76.27	48.68	n/a	1.311	n/a	2.054
˙˜15	95.55	65.46	n/a	1.047	n/a	1.528
,20	>97	n/a	n/a	<1.031	n/a	n/a
IC25	>97	n/a	n/a	<1.031	n/a	n/a
IC40	>97	n/a	n/a	<1.031	n/a	n/a
IC50	>97	n/a	n/a	<1.031	n/a	n/a

Frond Increase Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S1	4	58.75	50	68	3.728	7.455	12.69%	0.0%
1.5		4	60.75	51	69	4.131	8.261	13.60%	-3.4%
3		4	62	57	66	1.958	3.916	6.32%	-5.53%
6		4	57.75	57	59	0.4787	0.9574	1.66%	1.7%
12.1		4	57.25	43	65	4.871	9.743	17.02%	2.55%
24.2		4	64.25	50	77	5.764	11.53	17.94%	-9.36%
48.5		4	71.25	64	87	5.313	10.63	14.91%	-21.28%
97		4	52.25	49	56	1.436	2.872	5.50%	11.06%

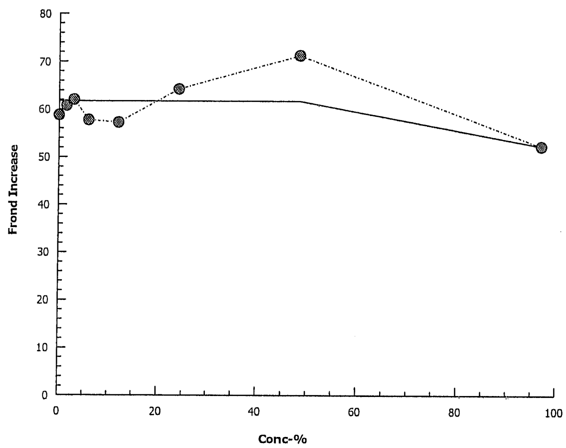
Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	60	68	57	50
1.5		57	66	69	51
3		61	64	66	57
6		57	57	59	58
12.1		60	61	65	43
24.2		77	61	69	50
48.5		66	64	68	87
97		52	56	49	52

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	09-8821-3810	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:51	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: MEL-13-07
Analyst(s): N. Shergill, M. Brassil

Job# / Sample #: C039804 XX3665
Start Date: June 12, 2020
End Date: June 19, 2020

Conc. & Replicate	Initial Number of Fronds	Final Number of Fronds	Frond Increase	Mean Increase in # Fronds per Conc'n	SD	% Stimulation
Control-A	6	61	55	51.8	6.6	--
B	6	62	56			
C	6	60	54			
D	6	48	42			
Site Control-A	6	66	60	58.8	7.5	13.53
B	6	74	68			
C	6	63	57			
D	6	56	50			
1.5%-A	6	63	57	60.8	8.3	17.39
B	6	72	66			
C	6	75	69			
D	6	57	51			
3.0%-A	6	67	61	62.0	3.9	19.81
B	6	70	64			
C	6	72	66			
D	6	63	57			
6.0%-A	6	63	57	57.8	1.0	11.59
B	6	63	57			
C	6	65	59			
D	6	64	58			
12.1%-A	6	66	60	57.3	9.7	10.63
B	6	67	61			
C	6	71	65			
D	6	49	43			
24.2%-A	6	83	77	64.3	11.5	24.15
B	6	67	61			
C	6	75	69			
D	6	56	50			
48.5%-A	6	72	66	71.3	10.6	37.68
B	6	70	64			
C	6	74	68			
D	6	93	87			
97%-A	6	58	52	52.3	2.9	0.97
B	6	62	56			
C	6	55	49			
D	6	58	52			
Analyst	NS	MB				

N/S - No growth stimulation (frond increase) compared to the Control

Control Validity Criteria: Mean final # of fronds in Controls on day 7 must be ≥8 times initial # of fronds

Mean Final # of Fronds on Day 7	57.8
Control Frond Increase	9.6
Validity Criteria Met?	Yes

Proofed By: [signature]
2020 Jul 10

CETIS Analytical Report

Report Date:	02 Jul-20 19:01 (p 1 of 10)
Test Code:	LM-10735-0320 | 10-2620-0901

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	16-0143-1980	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	14.60%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1		97	1.977	2.447	1.102	6	CDF	0.0954	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.892	2.127	0.2177	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	1.5842	1.5842	1	3.908	0.0954	Non-Significant Effect
Error	2.4322	0.405367	6			
Total	4.0164		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	7.939	47.47	0.1227	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9577	0.6451	0.7883	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	7.545	6.195	8.895	7.635	6.43	8.48	0.4243	11.25%	0.00%
97		4	6.655	6.176	7.134	6.615	6.37	7.02	0.1506	4.53%	11.80%

Total Dry Weight-mg Detail

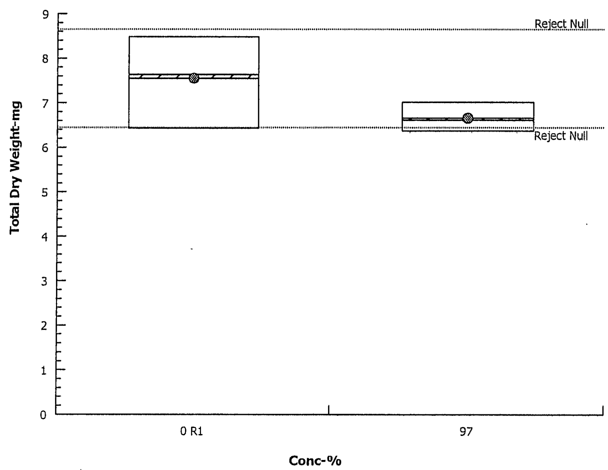
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	8.48	7.75	6.43	7.52
97		6.45	7.02	6.37	6.78

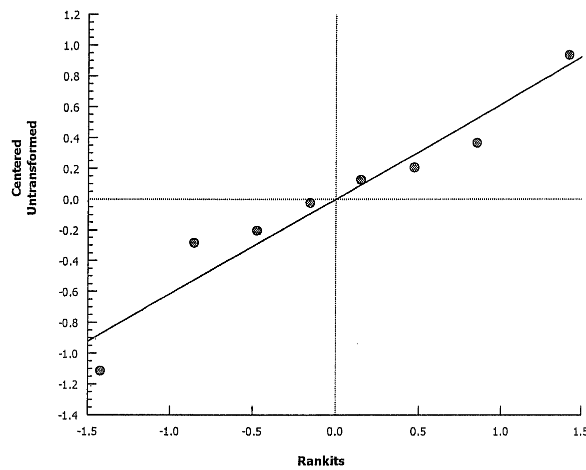
2020 Jul 02 dm — 2020 Jul 10

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	16-0143-1980	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 18:59	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	05-6579-7956	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed total dry weight-mg	18.04%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2		97*	2.836	2.447	1.518	6	CDF	0.0297	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.926	2.127	0.1833	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.1952	6.1952	1	8.044	0.0297	Significant Effect
Error	4.621	0.770167	6			
Total	10.8162		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	15.98	47.47	0.0476	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9525	0.6451	0.7369	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	8.415	6.499	10.33	8.25	7.18	9.98	0.602	14.31%	0.00%
97		4	6.655	6.176	7.134	6.615	6.37	7.02	0.1506	4.53%	20.92%

Total Dry Weight-mg Detail

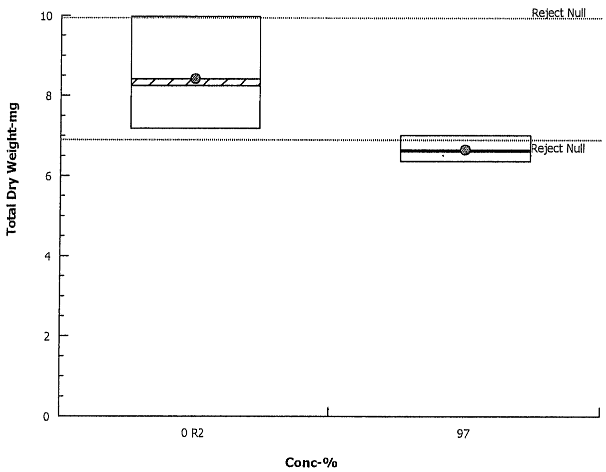
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	7.85	7.18	8.65	9.98
97		6.45	7.02	6.37	6.78

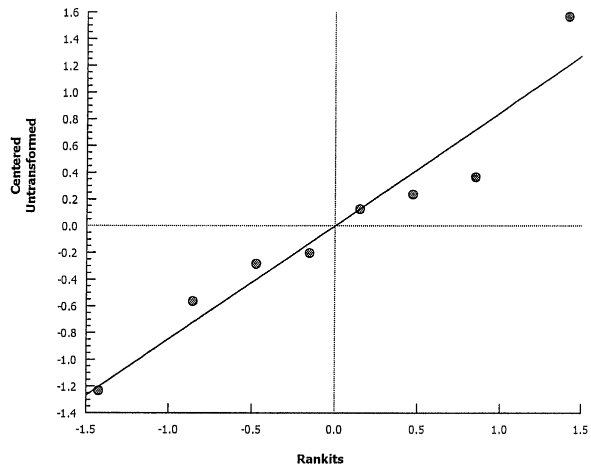
2020 Jul 02 2020Jul10
Analyst: dm QA: PH

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

\nalysis ID:	05-6579-7956	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





2020 Jul02 dm Analyst:_______ 2020Jul10 QA: PH

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	07-7062-5135	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed total dry weight-mg	14.17%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3		97*	3.744	2.447	1.204	6	CDF	0.0096	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.61	2.127	0.6451	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	6.78961	6.78961	1	14.02	0.0096	Significant Effect
Error	2.90618	0.484363	6			
Total	9.69579		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	9.681	47.47	0.0945	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9622	0.6451	0.8309	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	8.497	7.006	9.989	8.605	7.46	9.32	0.4685	11.03%	0.00%
97		4	6.655	6.176	7.134	6.615	6.37	7.02	0.1506	4.53%	21.68%

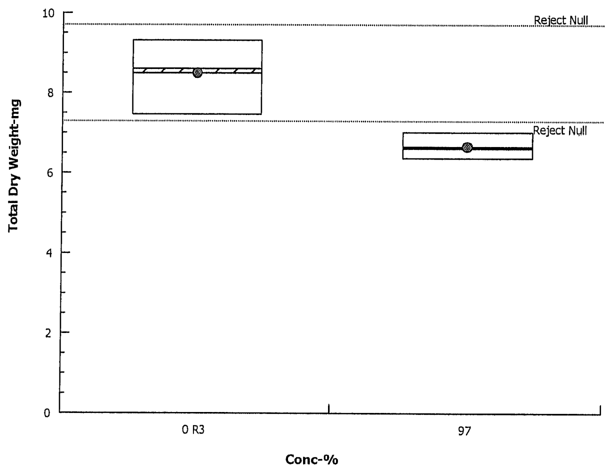
Total Dry Weight-mg Detail

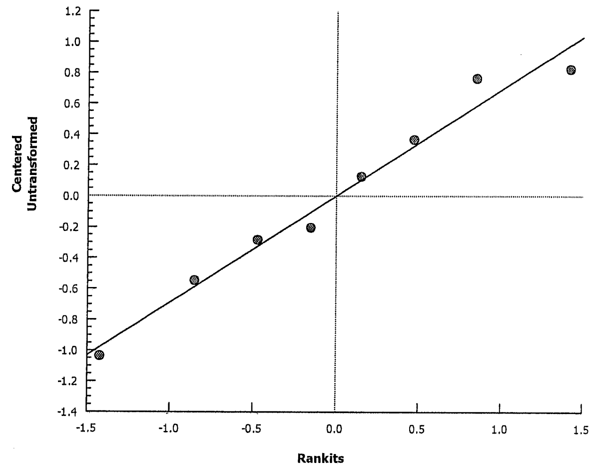
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	7.95	7.46	9.26	9.32
97		6.45	7.02	6.37	6.78

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	07-7062-5135	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	08-0213-8976	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% failed total dry weight-mg	13.85%

Equal Variance t Two-Sample Test

Conc-%	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0 pooled		97*	2.844	2.145	1.129	14	CDF	0.0130	Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.074	2.586	0.4200	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	6.72752	6.72752	1	8.089	0.0130	Significant Effect
Error	11.6431	0.831652	14			
Total	18.3706		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	11.4	43.52	0.0694	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9757	0.8408	0.9207	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	12	8.152	7.507	8.798	7.9	6.43	9.98	0.2935	12.47%	0.00%
97		4	6.655	6.176	7.134	6.615	6.37	7.02	0.1506	4.53%	18.37%

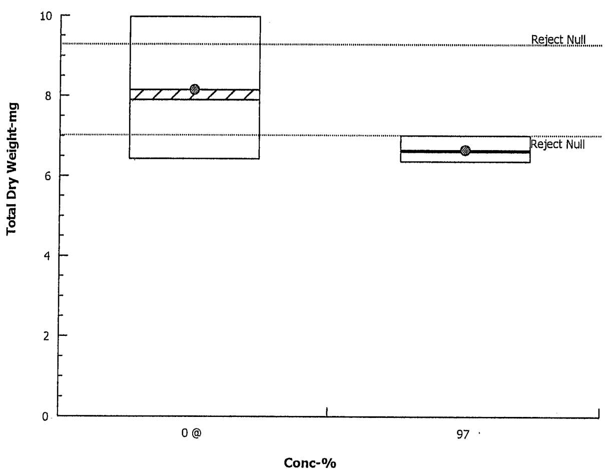
Total Dry Weight-mg Detail

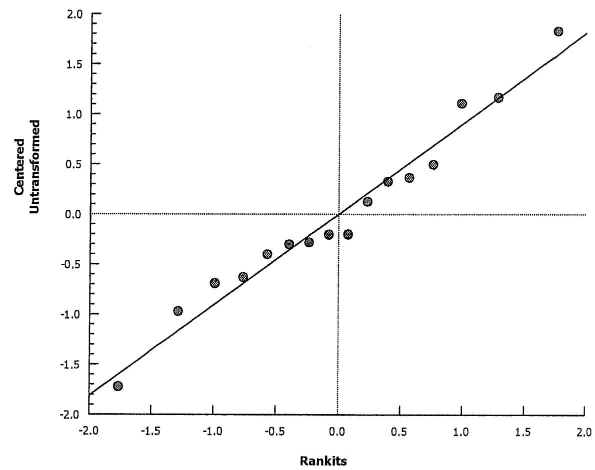
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	@	7.95	7.46	9.26	9.32	7.85	7.18	8.65	9.98	8.48	7.75
		6.43	7.52								
97		6.45	7.02	6.37	6.78						

Lemna Growth Inhibition Test — Bureau Veritas Laboratories

nalysis ID:	08-0213-8976	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	17-7682-7977	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Untransformed	C <> T	97	> 97	n/a	1.031	19.71%

Dunnett Multiple Comparison Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	1.5	0.5706	2.814	1.344	6	CDF	0.9896	Non-Significant Effect
	3	0.7643	2.814	1.344	6	CDF	0.9531	Non-Significant Effect
	6	0.3141	2.814	1.344	6	CDF	0.9997	Non-Significant Effect
	12.1	0.6701	2.814	1.344	6	CDF	0.9755	Non-Significant Effect
	24.2	2.188	2.814	1.344	6	CDF	0.1757	Non-Significant Effect
	48.5	2.712	2.814	1.344	6	CDF	0.0622	Non-Significant Effect
	97	0.3455	2.814	1.344	6	CDF	0.9995	Non-Significant Effect

uxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.819	2.938	0.0831	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	7.12722	1.01817	7	2.232	0.0674	Non-Significant Effect
Error	10.9463	0.456095	24			
Total	18.0735		31			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance Test	16.28	18.48	0.0227	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9732	0.9081	0.5931	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	S1	4	6.82	5.941	7.699	6.845	6.12	7.47	0.2761	8.10%	0.00%
1.5		4	7.092	5.895	8.29	7.105	6.33	7.83	0.3762	10.61%	-4.00%
3		4	7.185	6.948	7.422	7.24	6.97	7.29	0.07444	2.07%	-5.35%
6		4	6.97	6.642	7.298	7.04	6.67	7.13	0.103	2.95%	-2.20%
12.1		4	7.14	6.092	8.188	7.21	6.28	7.86	0.3293	9.23%	-4.69%
24.2		4	7.865	5.712	10.02	7.76	6.4	9.54	0.6766	17.21%	-15.32%
48.5		4	8.115	7.164	9.066	7.915	7.64	8.99	0.2988	7.37%	-18.99%
97		4	6.655	6.176	7.134	6.615	6.37	7.02	0.1506	4.53%	2.42%

2020 Jul02 Analyst: [signature] 2020Jul10 QA: PH

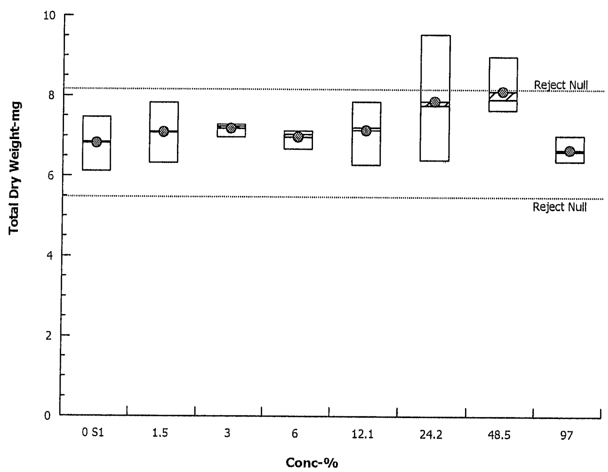
Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

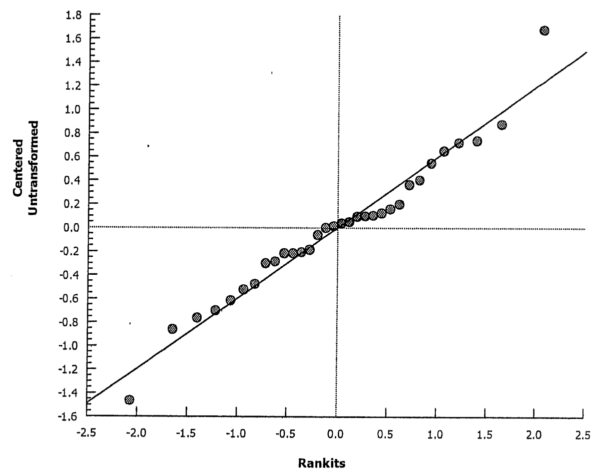
Analysis ID:	17-7682-7977	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:00	**Analysis:**	Parametric-Control vs Treatments	**Official Results:**	Yes

Total Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	6.87	7.47	6.82	6.12
1.5		6.57	7.83	7.64	6.33
3		7.28	7.2	7.29	6.97
6		7.13	6.67	7.01	7.07
12.1		7.08	7.86	7.34	6.28
24.2		9.54	7.25	8.27	6.4
48.5		7.9	7.64	7.93	8.99
97		6.45	7.02	6.37	6.78

Graphics





Analyst: 2020 Jul02 dm QA: PH 2020Jul10

CETIS Analytical Report

Report Date: 02 Jul-20 19:01 (p 1 of 2)
Test Code: LM-10735-0320 | 10-2620-0901

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	21-3654-8647	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:01	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Batch ID:	14-7281-3650	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:39	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 13:25	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	6d 22h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	08-2245-2202	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	07 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	5d 16h	**Station:**	MEL 13-07		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Linear Interpolation Options

X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method
Log(X+1)	Linear	793261	200	Yes	Two-Point Interpolation

Residual Analysis

Attribute	Method	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.819	2.938	0.0831	No Outliers Detected

Point Estimates

Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
IC5	71.37	58.26	n/a	1.401	n/a	1.716
IC10	>97	n/a	n/a	<1.031	n/a	n/a
IC15	>97	n/a	n/a	<1.031	n/a	n/a
IC20	>97	n/a	n/a	<1.031	n/a	n/a
IC25	>97	n/a	n/a	<1.031	n/a	n/a
IC40	>97	n/a	n/a	<1.031	n/a	n/a
IC50	>97	n/a	n/a	<1.031	n/a	n/a

Total Dry Weight-mg Summary

			Calculated Variate						
Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect
0	S1	4	6.82	6.12	7.47	0.2761	0.5523	8.10%	0.0%
1.5		4	7.092	6.33	7.83	0.3762	0.7523	10.61%	-4.0%
3		4	7.185	6.97	7.29	0.07444	0.1489	2.07%	-5.35%
6		4	6.97	6.67	7.13	0.103	0.2059	2.95%	-2.2%
12.1		4	7.14	6.28	7.86	0.3293	0.6587	9.23%	-4.69%
24.2		4	7.865	6.4	9.54	0.6766	1.353	17.21%	-15.32%
48.5		4	8.115	7.64	8.99	0.2988	0.5977	7.37%	-18.99%
97		4	6.655	6.37	7.02	0.1506	0.3012	4.53%	2.42%

Total Dry Weight-mg Detail

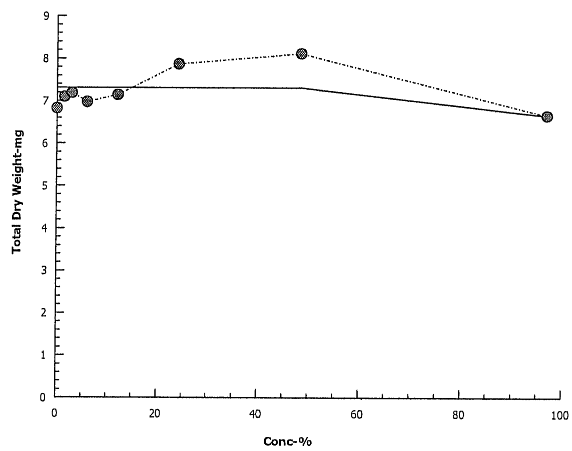
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	S1	6.87	7.47	6.82	6.12
1.5		6.57	7.83	7.64	6.33
3		7.28	7.2	7.29	6.97
6		7.13	6.67	7.01	7.07
12.1		7.08	7.86	7.34	6.28
24.2		9.54	7.25	8.27	6.4
48.5		7.9	7.64	7.93	8.99
97		6.45	7.02	6.37	6.78

2020 Jul 02 Analyst: dm   2020Jul10 QA: PH

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	21-3654-8647	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:01	**Analysis:**	Linear Interpolation (ICPIN)	**Official Results:**	Yes

Graphics



ECOTOXICOLOGY

Lemna minor Growth Inhibition Test Data

Client Name: Golder Associates Ltd. (Agnico)
Job# / Sample #: C039804 XX3665
Sample ID: MEL-13-07
Oven Temp (°C): 60
Weighing Dates: 2020 Jun 17 2020 Jun 22
Drying Time (h): >24
Analyst(s): NS, DML
Balance ID: bby2-0260

Boat #	Conc. & Replicate	Final # of Fronds	Boat Wt. (g)	Boat & Frond Dry Weight (g)	Dry Weight per Rep. (mg)	Mean Dry Weight per Conc (mg)	SD	% Stimulation
394	Control-A	61	0.78949	0.79591	6.42	6.21	0.71	--
395	B	62	0.80679	0.81362	6.83			
396	C	60	0.79501	0.80142	6.41			
397	D	48	0.79968	0.80486	5.18			
398	Site Control-A	66	0.80784	0.81471	6.87	6.82	0.55	9.82
399	B	74	0.79743	0.80490	7.47			
400	C	63	0.80527	0.81209	6.82			
401	D	56	0.80723	0.81335	6.12			
402	1.5%-A	63	0.79938	0.80595	6.57	7.09	0.75	14.21
403	B	72	0.80944	0.81727	7.83			
404	C	75	0.79139	0.79903	7.64			
405	D	57	0.79573	0.80206	6.33			
406	3.0%-A	67	0.79342	0.80070	7.28	7.19	0.15	15.70
407	B	70	0.79119	0.79839	7.20			
408	C	72	0.79878	0.80607	7.29			
409	D	63	0.80213	0.80910	6.97			
410	6.0%-A	63	0.80182	0.80895	7.13	6.97	0.21	12.24
411	B	63	0.80304	0.80971	6.67			
412	C	65	0.79402	0.80103	7.01			
413	D	64	0.79725	0.80432	7.07			
414	12.1%-A	66	0.79000	0.79708	7.08	7.14	0.66	14.98
415	B	67	0.79829	0.80615	7.86			
416	C	71	0.79561	0.80295	7.34			
417	D	49	0.79705	0.80333	6.28			
418	24.2%-A	83	0.81704	0.82658	9.54	7.87	1.35	26.65
419	B	67	0.80075	0.80800	7.25			
420	C	75	0.79392	0.80219	8.27			
421	D	56	0.79398	0.80038	6.40			
422	48.5%-A	72	0.80422	0.81212	7.90	8.11	0.60	30.68
423	B	70	0.80685	0.81449	7.64			
424	C	74	0.80295	0.81088	7.93			
425	D	93	0.80715	0.81614	8.99			
426	97%-A	58	0.78571	0.79216	6.45	6.65	0.30	7.17
427	B	62	0.79683	0.80385	7.02			
428	C	55	0.80369	0.81006	6.37			
429	D	58	0.79182	0.79860	6.78			
430	QA/QC	N/A	0.79855	0.79834	-0.21	-	-	-
431	QA/QC	N/A	0.80432	0.80418	-0.14	-	-	
394	0-A	61	0.78951	0.79607	6.56	-	-	
Analyst	MB	NS	DML					

N/S - No growth stimulation (dry weight) compared to the Control

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico)
Start Date: June 12, 2020
Sample ID: MEL-13-07
End Date: June 19, 2020
Sample Date: 2020Jun07
Job# / Sample #: C039804
Analyst(s): NShergill, C.Brassil, P.Hawes
Organism Lot #: CP200602

pH of raw sample	pH after addition of APHA stocks A, B, & C	Pre-aeration time	pH after aeration
7.8	7.8	20min	7.8

APHA Stocks Prep Date: 2020 Feb24
Instrument IDs: BBY2-0042
Thermometer ID: BBY2-0438
Plant Shelf #: 4
Test Volume (mL): 150
Sample Description: Clear & colourless

Concentration (%)	Temperature Monitoring Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	pH Monitoring Day 0	Day 7
Control	24	25	25	26	27	25	26	26	8.3	8.3
Site Control	24	25	25	25	27	26	25	26	8.3	8.5
1.5	24	25	25	26	27	25	26	26	8.3	8.6
3.0										
6.0										
12.1	24	25	25	25	27	25	25	26	8.3	8.5
24.2										
48.5										
97.0	24	25	25	26	27	25	25	26	8.1	9.0
Analyst	NS	CB	NS	PH	CB	CB	CB	CB	NS	CB
Date	2020 Jun12	2020 Jun13	2020 Jun14	2020 Jun15	2020 Jun16	2020 Jun17	2020 Jun18	2020 Jun19	2020 Jun12	2020 Jun19

Observations during the Test

Day 0 (Test Initiation)

Date: June 12, 2020
Analyst: CBrassil
# of Plants per Test Vessel: 2
# of Fronds per Plant: 3
Plant Observations: Dark green & healthy
Test Seeded @: 15:39
Other comments: n/a site control measure fell over, re-seeded @16:15 - NS Jun12

Day 1

Date: June 13, 2020
Analyst: CBrassil

Observations:	Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: All sol'ns appear clear & colourless.

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico) MEL-13-07

Start Date: June 12, 2020

Job# / Sample #: C039804

Day 2

Date: June 14, 2020 Analyst: [illegible]

Observations: Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 3

Date: June 15, 2020 Analyst: P. Hewes

Observations: Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 4

Date: June 16, 2020 Analyst: [illegible]

Observations: Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 5

Date: June 17, 2020 Analyst: [illegible]

Observations: Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: All sol'ns appear clear + colourless

Day 6

Date: June 18, 2020 Analyst: [illegible]

Observations: Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 7

Date: June 19, 2020 Analyst: [illegible]

Test End Time: 13:25

Observations: Control	Site Control	1.5%	3%	6%	12.1%	24.2%	48.5%	97%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H, A

Other Comments: some green algae on base of 97% reps, others clear + colourless

Legend:

- **DG** = Dark Green
- **LG** = Light Green
- **H** = Healthy, Normal
- **C** = Chlorosis
- **N** = Necrosis
- **G** = Gibbosity
- **A** = Green Algae
- **T** = Transparent
- **S** = small fronds
- **CD** = Colony destroyed
- **RD** = Roots destroyed

Other :

ECOTOXICOLOGY

Lemna minor Growth Inhibition Test Data

Client Name: Golder Associates Ltd.
Sample ID: MEL-13-07
Weighing Dates: 2020 Jun 19
Analyst(s): [initials]

Job# / Sample #: C039804
Oven Temp (°C): 60
Drying Time (h): >24
Balance ID: BBY2-0260

Boat #	Conc. & Replicate	Final # of Fronds	Boat Wt. (g)	Boat & Frond Dry Weight (g)	Dry Weight per Rep. (mg)	Mean Dry Weight per Conc (mg)	SD	% Stimulation
394	Control-A	64			--	--	--	--
395	B	62			--			
396	C	60			--			
397	D	48			--			
398	Site Control-A	66			--	--	--	N/S
399	B	74			--			
400	C	63			--			
401	D	56			--			
402	1.5%-A	63			--	--	--	N/S
403	B	72			--			
404	C	75			--			
405	D	57			--			
406	3.0%-A	67			--	--	--	N/S
407	B	70			--			
408	C	72			--			
409	D	63			--			
410	6.0%-A	63			--	--	--	N/S
411	B	63			--			
412	C	65			--			
413	D	64			--			
414	12.1%-A	66			--	--	--	N/S
415	B	67			--			
416	C	71			--			
417	D	49			--			
418	24.2%-A	83			--	--	--	N/S
419	B	67			--			
420	C	75			--			
421	D	56			--			
422	48.5%-A	72			--	--	--	N/S
423	B	70			--			
424	C	74			--			
425	D	(A) 93			--			
426	97%-A	~~X~~ 58			--	--	--	N/S
427	B	62			--			
428	C	55			--			
429	D	58			--			
430	QA/QC	N/A			--	-	-	-
431	QA/QC	N/A			--	-	-	
394	0-A	61			--	-	-	
Analyst		[initials]						

N/S - No growth stimulation (dry weight) compared to the Control

(A) [initials] 2020 June 19

Client Name: Golder (Agnico)

Test Date: 2020 Jun 12

Sample Name: MEL-13-07

Shelf #: 4

Back Wall

Position Map

5	10	15	20	25	30	35	40
4	9	14	19	24	29	34	39
3	8	13	18	23	28	33	38
2	7	12	17	22	27	32	37
1	6	11	16	21	26	31	36

Front of Counter

Position #	Treatment	Replicate	Colour
16		A	
27		B	
21	Control	C	Red
22		D	
30		Measure	
24		A	
28		B	
42	Site Control	C	White
41		D	
43		Measure	
9		A	
12		B	
11	1.5%	C	Orange
36		D	
10		Measure	
37		A	
17		B	
1	3.0%	C	Yellow
33		D	
3		Measure	
40		A	
4		B	
32	6.0%	C	Fl. Green
14		D	
6		Meas.	
38		A	
23		B	
13	12.1%	C	Teal
39		D	
25		Measure	
29		A	
8		B	
7	24.2%	C	Blue
20		D	
18		Measure	
2		A	
31		B	
34	48.5%	C	Purple
5		D	
45		Measure	
26		A	
44		B	
15	97%	C	Pink
35		D	
19		Measure	

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	12-0437-6506	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	22.66%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1		97	1.967	2.447	16.49	6	CDF	0.0968	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.36	2.127	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	351.125	351.125	1	3.867	0.0968	Non-Significant Effect
Error	544.75	90.7917	6			
Total	895.875		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.138	47.47	0.9177	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9256	0.6451	0.4773	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	72.75	58.09	87.41	72.5	62	84	4.608	12.67%	0.00%
97		4	86	70.36	101.6	86.5	74	97	4.916	11.43%	-18.21%

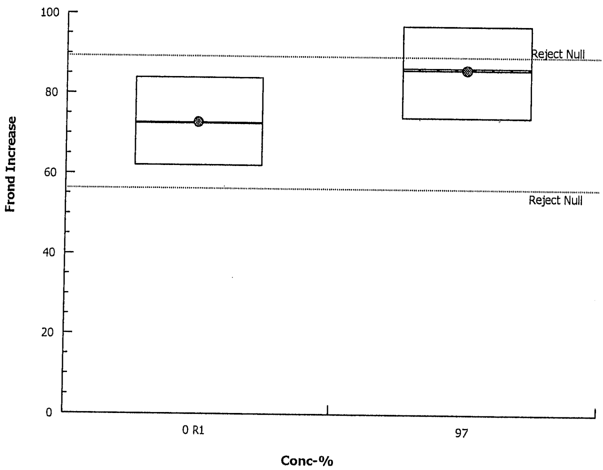
Frond Increase Detail

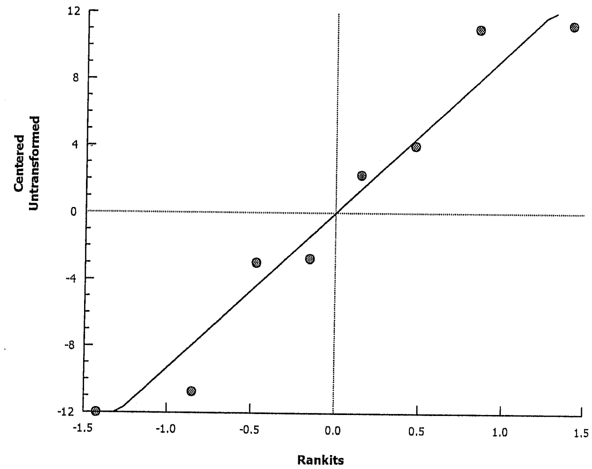
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	84	70	62	75
97		97	90	74	83

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	12-0437-6506	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 Jul02 dm1 QA: PH 2020Jul09

Lemna Growth Inhibition Test | Bureau Veritas Laboratories

nalysis ID:	06-8709-7378	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	24.37%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2		97	0.9945	2.447	19.07	6	CDF	0.3584	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.299	2.127	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	120.125	120.125	1	0.989	0.3584	Non-Significant Effect
Error	728.75	121.458	6			
Total	848.875		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.513	47.47	0.7419	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8742	0.6451	0.1658	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	78.25	59.01	97.49	79.5	65	89	6.047	15.45%	0.00%
97		4	86	70.36	101.6	86.5	74	97	4.916	11.43%	-9.90%

Frond Increase Detail

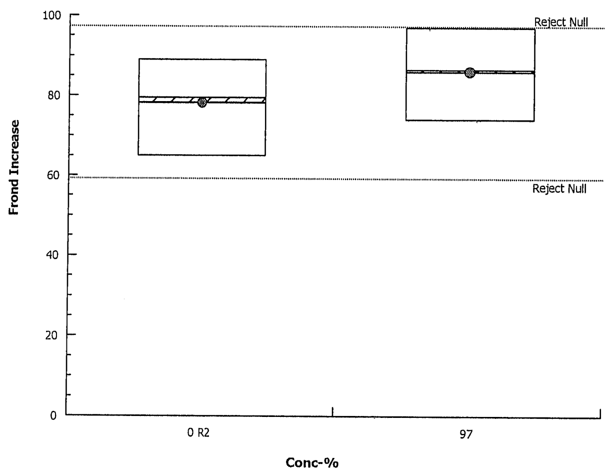
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	71	65	88	89
97		97	90	74	83

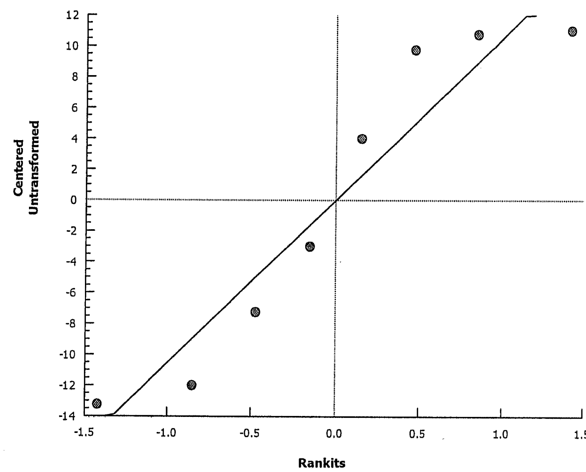
Analyst: 2020 Jul02 dmt QA: PH 2020Jul09

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	06-8709-7378	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	06-6189-1907	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:

Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	20.29%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3		97	1.769	2.447	15.22	6	CDF	0.1273	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.474	2.127	0.9543	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	242	242	1	3.129	0.1273	Non-Significant Effect
Error	464	77.3333	6			
Total	706		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.667	47.47	0.6850	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9489	0.6451	0.6996	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	75	62.88	87.12	75.5	67	82	3.808	10.15%	0.00%
97		4	86	70.36	101.6	86.5	74	97	4.916	11.43%	-14.67%

Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	70	67	81	82
97		97	90	74	83

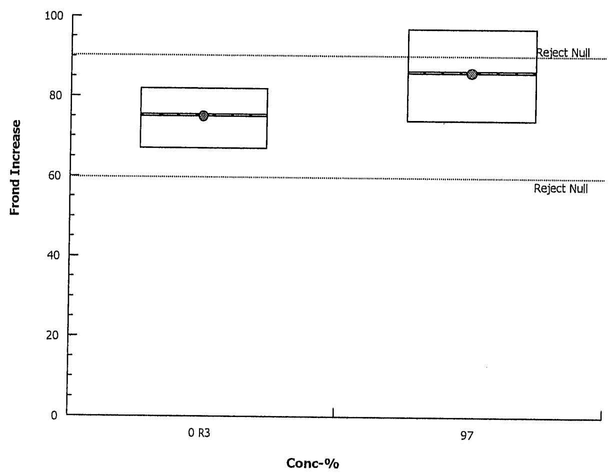
2020 Jul 02 2020 Jul 09

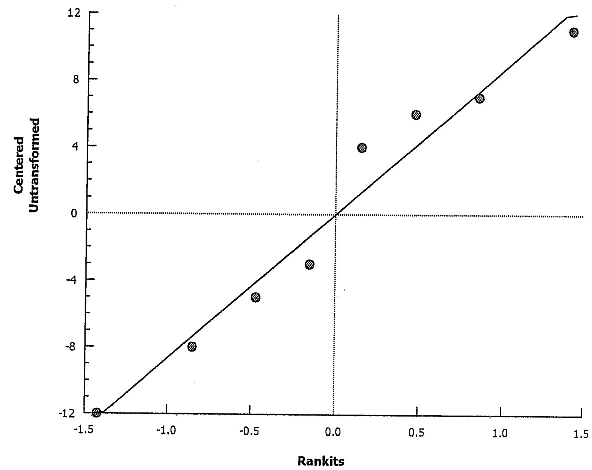
Analyst: QA: DH

Lemna Growth Inhibition Test — Bureau Veritas Laboratories

Analysis ID:	06-6189-1907	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test

Bureau Veritas Laboratories

Analysis ID:	16-7201-3528	Endpoint:	Frond Increase	CETIS Version:	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	Analysis:	Parametric-Two Sample	Official Results:	Yes

Batch ID:	16-1531-7750	Test Type:	Lemna Growth	Analyst:	M. Brassil
Start Date:	12 Jun-20 15:01	Protocol:	EC/EPS 1/RM/37	Diluent:	APHA Media
Ending Date:	19 Jun-20 15:22	Species:	Lemna minor	Brine:	Not Applicable
Duration:	7d 0h	Source:	Canadian Phycological Culture Centre	Age:	

Sample ID:	00-5473-3468	Code:	C039804	Client:	Agnico Eagle Mines
Sample Date:	06 Jun-20	Material:	Water	Project:	2-11-0691
Receipt Date:	11 Jun-20 08:20	Source:	Agnico Eagle Mines		
Sample Age:	6d 15h	Station:	MEL 02-05		

Comments:

Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed frond increase	15.34%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	pooled	97	1.98	2.145	11.55	14	CDF	0.0677	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.516	2.586	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
etween	341.333	341.333	1	3.921	0.0677	Non-Significant Effect
Error	1218.67	87.0476	14			
Total	1560		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.145	7.6	0.7478	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9391	0.8408	0.3387	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	12	75.33	69.5	81.17	73	62	89	2.652	12.20%	0.00%
97		4	86	70.36	101.6	86.5	74	97	4.916	11.43%	-14.16%

Frond Increase Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	@	70	67	81	82	71	65	88	89	84	70
		62	75								
97		97	90	74	83						

Analyst: 2020 Jul02 dmt

QA: 2020Jul09 PH

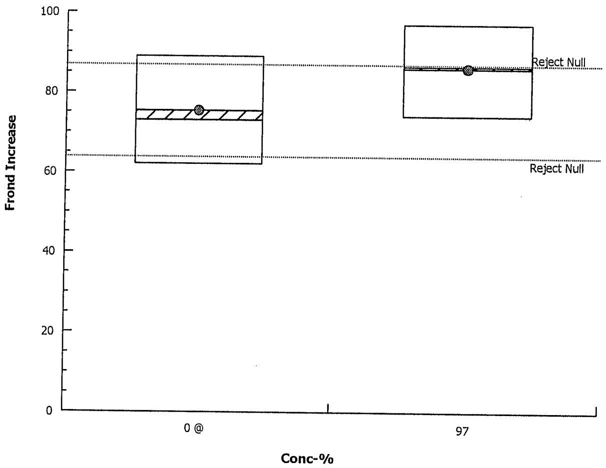
CETIS Analytical Report

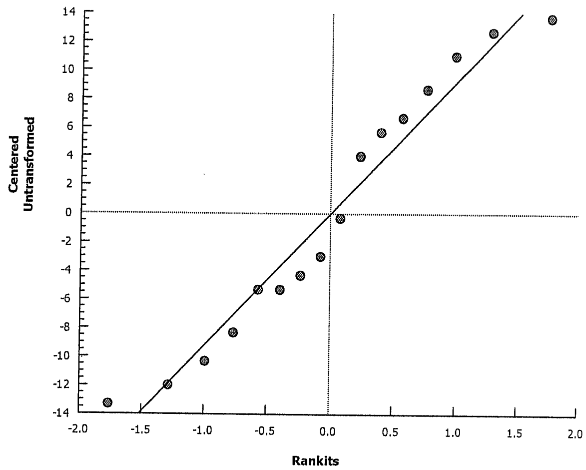
Report Date:	02 Jul-20 19:13 (p 8 of 16)
Test Code:	LM-10735-0120 | 12-1579-4175

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	16-7201-3528	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Report Date: 02 Jul-20 19:27 (p 1 of 6)
Test Code: LM-10735-0120 | 12-1579-4175

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	13-7372-6587	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	Ref 1 passed frond increase	16.19%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr		Ref 1	0.1542	2.447	11.9	6	CDF	0.8825	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.767	2.127	0.3734	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.125	1.125	1	0.02379	0.8825	Non-Significant Effect
Error	283.75	47.2917	6			
Total	284.875		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	8.784	47.47	0.1075	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9677	0.6451	0.8792	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	72.75	58.09	87.41	72.5	62	84	4.608	12.67%	0.00%
0	S1	4	73.5	68.55	78.45	73.5	70	77	1.555	4.23%	-1.03%

Frond Increase Detail

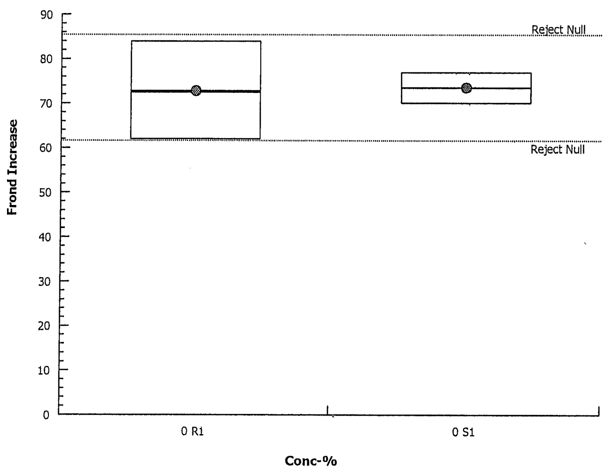
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	84	70	62	75
0	S1	72	77	75	70

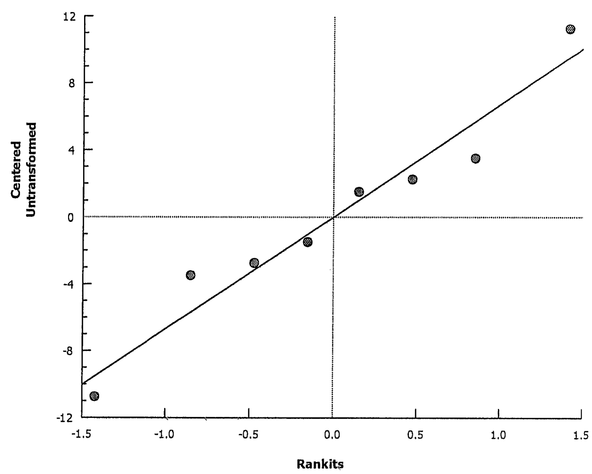
2020 Jul 02 dm — 2020 Jl 09

Lemna Growth Inhibition Test **Bureau Veritas Laboratories**

nalysis ID:	13-7372-6587	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





2020 Jul02 dml 2020Jul09

Analyst: dml QA: PH

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	07-0803-5533	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	Ref 2 passed frond increase	20.78%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr		Ref 2	0.7608	2.447	15.28	6	CDF	0.4756	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.621	2.127	0.6237	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	45.125	45.125	1	0.5788	0.4756	Non-Significant Effect
Error	467.75	77.9583	6			
Total	512.875		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	15.13	47.47	0.0514	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9694	0.6451	0.8931	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	78.25	59.01	97.49	79.5	65	89	6.047	15.45%	0.00%
0	S1	4	73.5	68.55	78.45	73.5	70	77	1.555	4.23%	6.07%

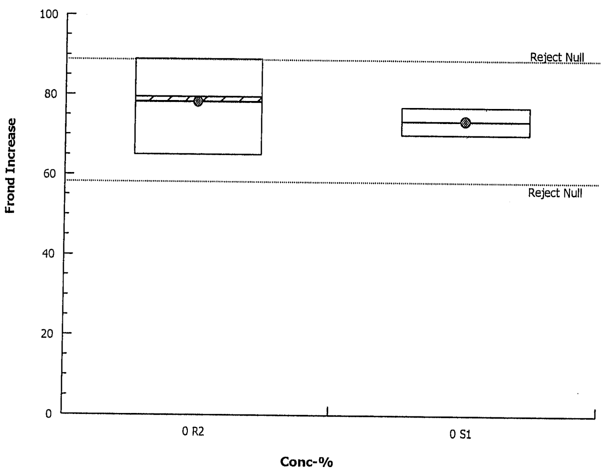
Frond Increase Detail

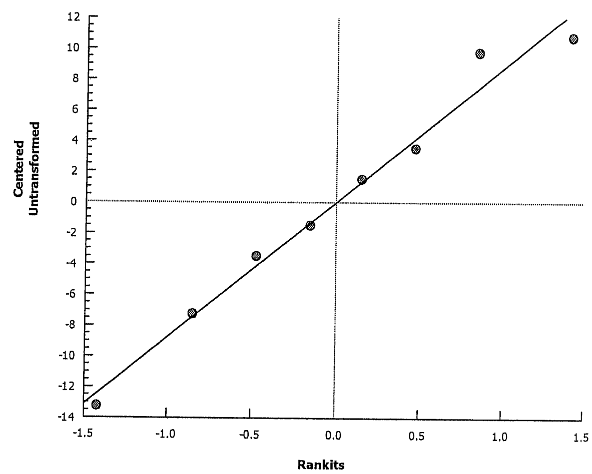
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	71	65	88	89
0	S1	72	77	75	70

Lemna Growth Inhibition Test **Bureau Veritas Laboratories**

nalysis ID:	07-0803-5533	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test **Bureau Veritas Laboratories**

nalysis ID:	13-0256-6817	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	Ref 3 passed frond increase	13.69%

Equal Variance t Two-Sample Test

Control	vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr		Ref 3	0.3647	2.447	10.06	6	CDF	0.7278	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.486	2.127	0.9251	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	4.5	4.5	1	0.133	0.7278	Non-Significant Effect
Error	203	33.8333	6			
Total	207.5		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	6	47.47	0.1753	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9587	0.6451	0.7976	Normal Distribution

Frond Increase Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	75	62.88	87.12	75.5	67	82	3.808	10.15%	0.00%
0	S1	4	73.5	68.55	78.45	73.5	70	77	1.555	4.23%	2.00%

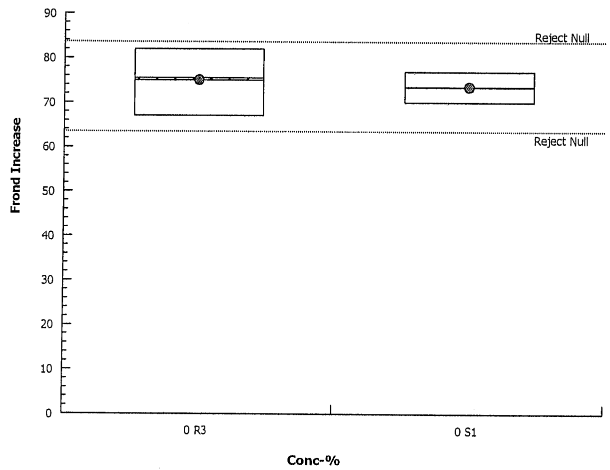
Frond Increase Detail

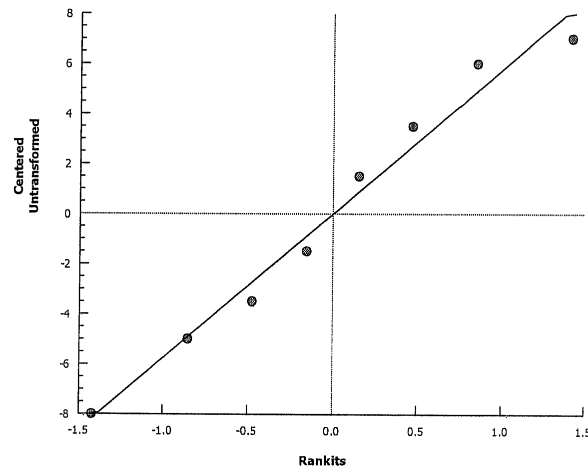
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	70	67	81	82
0	S1	72	77	75	70

2020 Jul02 dml 2020Jul09
Analyst: dml QA: PH

Analysis ID:	13-0256-6817	**Endpoint:**	Frond Increase	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: Various
Analyst(s): M. Brassil

Job# / Sample #: C039804
Start Date: June 12, 2020
End Date: June 19, 2020

Conc. & Replicate	Initial Number of Fronds	Final Number of Fronds	Frond Increase	Mean Increase in # Fronds per Conc'n	SD	% Stimulation
Control-A	6	67	61	64.5	4.8	--
B	6	73	67			
C	6	66	60			
D	6	76	70			
Site Control-A	6	78	72	73.5	3.1	13.95
B	6	83	77			
C	6	81	75			
D	6	76	70			
Soft Water Ctrl-A	6	73	67	75.3	12.3	16.67
B	6	69	63			
C	6	88	82			
D	6	95	89			
MEL-02-05 97.0-A	6	103	97	86.0	9.8	33.33
B	6	96	90			
C	6	80	74			
D	6	89	83			
MEL-03-02 97.0-A	6	90	84	72.8	9.2	12.79
B	6	76	70			
C	6	68	62			
D	6	81	75			
MEL-04-05 97.0-A	6	77	71	78.3	12.1	21.32
B	6	71	65			
C	6	94	88			
D	6	95	89			
MEL-05-04 97.0-A	6	76	70	75.0	7.6	16.28
B	6	73	67			
C	6	87	81			
D	6	88	82			
Analyst	MB	MB				

N/S - No growth stimulation (frond increase) compared to the Control

Control Validity Criteria: Mean final # of fronds in Controls on day 7 must be ≥8 times initial # of fronds

Mean Final # of Fronds on Day 7	70.5
Control Frond Increase	11.8
Validity Criteria Met?	Yes

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	13-7741-7594	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	15.95%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 1		97	2.414	2.447	1.204	6	CDF	0.0523	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.731	2.127	0.4277	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	2.82031	2.82031	1	5.828	0.0523	Non-Significant Effect
Error	2.90377	0.483963	6			
Total	5.72409		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.905	47.47	0.4045	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9574	0.6451	0.7846	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	7.545	6.195	8.895	7.635	6.43	8.48	0.4243	11.25%	0.00%
97		4	8.733	7.94	9.525	8.53	8.4	9.47	0.2489	5.70%	-15.74%

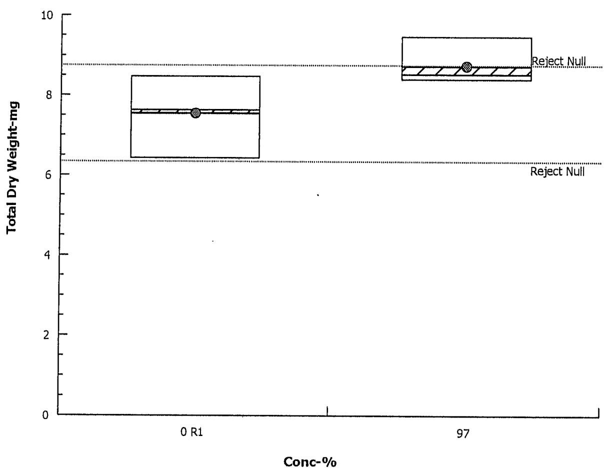
Total Dry Weight-mg Detail

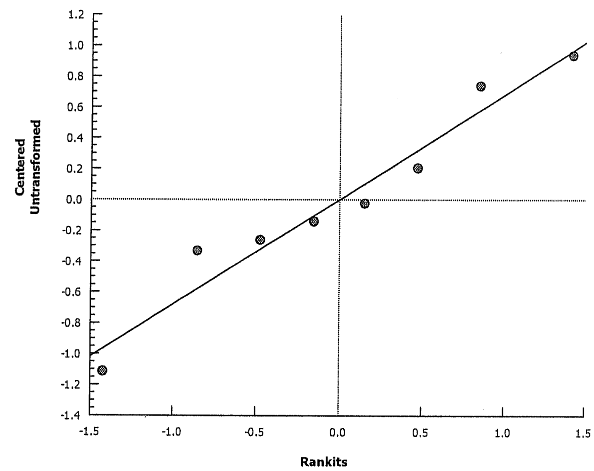
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	8.48	7.75	6.43	7.52
97		8.47	9.47	8.4	8.59

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	13-7741-7594	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 Jul02 dm QA: 2020Jul09 PH

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

Analysis ID:	01-0954-7558	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	18.94%

Equal Variance t Two-Sample Test

Control	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 2		97	0.4874	2.447	1.594	6	CDF	0.6433	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.835	2.127	0.2823	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.201613	0.201613	1	0.2375	0.6433	Non-Significant Effect
Error	5.09257	0.848762	6			
Total	5.29419		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	5.848	47.47	0.1809	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9611	0.6451	0.8202	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	8.415	6.499	10.33	8.25	7.18	9.98	0.602	14.31%	0.00%
97		4	8.733	7.94	9.525	8.53	8.4	9.47	0.2489	5.70%	-3.77%

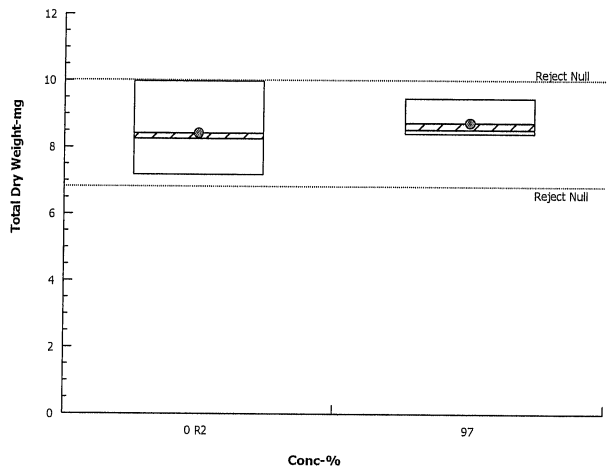
Total Dry Weight-mg Detail

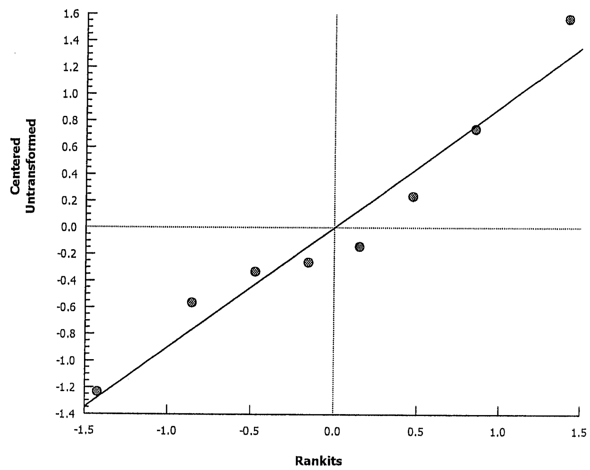
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	7.85	7.18	8.65	9.98
97		8.47	9.47	8.4	8.59

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	01-0954-7558	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	21-2236-1088	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	15.28%

Equal Variance t Two-Sample Test

Control vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Ref 3	97	0.4429	2.447	1.298	6	CDF	0.6733	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.494	2.127	0.9054	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.11045	0.11045	1	0.1962	0.6733	Non-Significant Effect
Error	3.37775	0.562958	6			
Total	3.4882		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.542	47.47	0.3266	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8901	0.6451	0.2344	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	8.497	7.006	9.989	8.605	7.46	9.32	0.4685	11.03%	0.00%
97		4	8.733	7.94	9.525	8.53	8.4	9.47	0.2489	5.70%	-2.77%

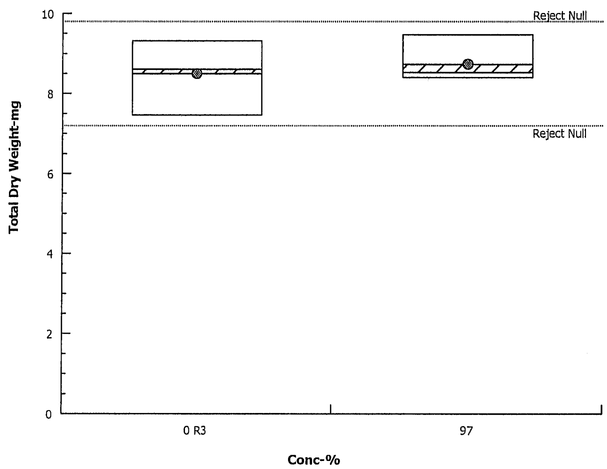
Total Dry Weight-mg Detail

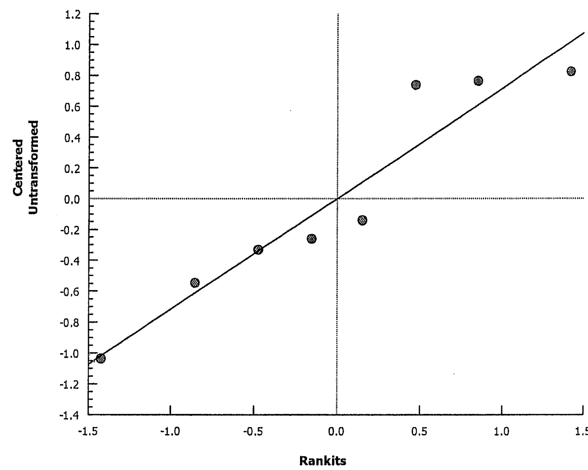
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	7.95	7.46	9.26	9.32
97		8.47	9.47	8.4	8.59

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	21-2236-1088	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Analyst: 2020 Jul 02 dmc QA: PH 2020 Jul 09

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	09-9059-2020	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	97% passed total dry weight-mg	14.13%

Equal Variance t Two-Sample Test

Conc-%	vs	Conc-%	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
0	Pooled	97	1.08	2.145	1.152	14	CDF	0.2984	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	2.034	2.586	0.4800	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.0092	1.0092	1	1.166	0.2984	Non-Significant Effect
Error	12.1147	0.865336	14			
Total	13.1239		15			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	4.17	43.52	0.2664	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9686	0.8408	0.8157	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	@	12	8.152	7.507	8.798	7.9	6.43	9.98	0.2935	12.47%	0.00%
97		4	8.733	7.94	9.525	8.53	8.4	9.47	0.2489	5.70%	-7.11%

Total Dry Weight-mg Detail

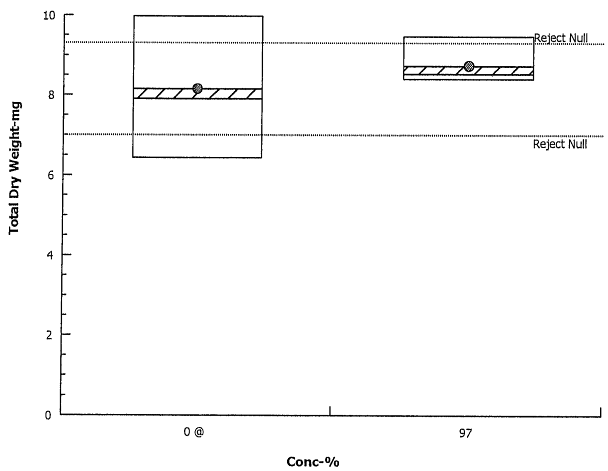
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	@	7.95	7.46	9.26	9.32	7.85	7.18	8.65	9.98	8.48	7.75
		6.43	7.52								
97		8.47	9.47	8.4	8.59						

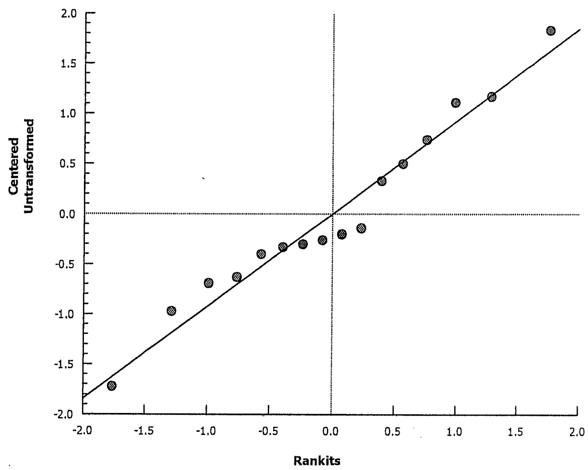
2020 Jul 02 dm — 2020 Jul 09

Lemna Growth Inhibition Test **Bureau Veritas Laboratories**

Analysis ID:	09-9059-2020	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:12	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	19-2388-2019	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	Ref 1 passed total dry weight-mg	17.13%

Equal Variance t Two-Sample Test

Control vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 1	0.2191	2.447	1.312	6	CDF	0.8339	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.588	2.127	0.6914	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0276125	0.0276125	1	0.04799	0.8339	Non-Significant Effect
Error	3.45237	0.575396	6			
Total	3.47999		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	1.672	47.47	0.6833	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9665	0.6451	0.8693	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R1	4	7.545	6.195	8.895	7.635	6.43	8.48	0.4243	11.25%	0.00%
0	S1	4	7.662	6.618	8.707	7.7	6.99	8.26	0.3282	8.57%	-1.56%

Total Dry Weight-mg Detail

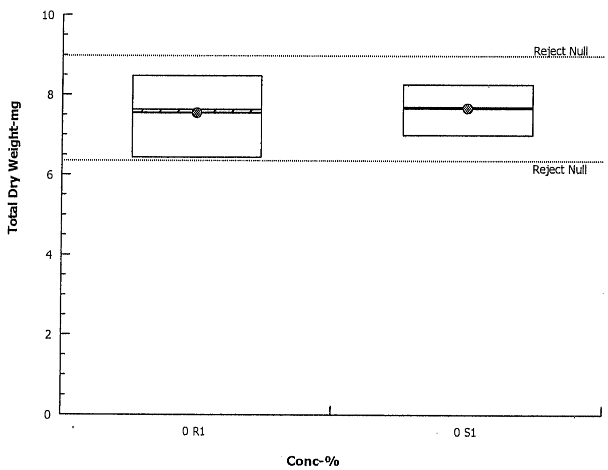
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R1	8.48	7.75	6.43	7.52
0	S1	6.99	8.19	8.26	7.21

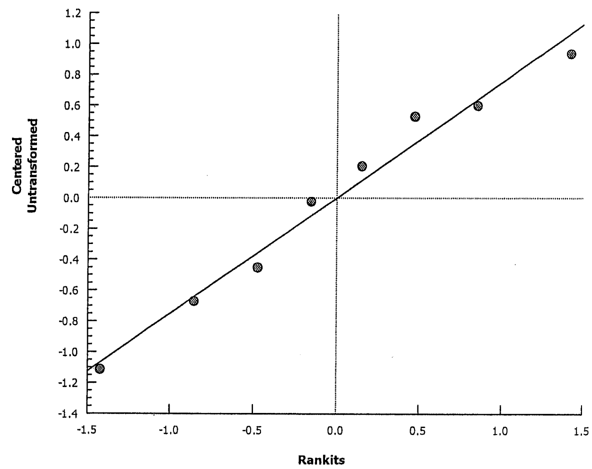
2020 Jul02 dmr　　2020Jul09

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	19-2388-2019	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:26	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

nalysis ID:	12-3333-3104	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes
Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	
Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	Ref 2 passed total dry weight-mg	21.89%

Equal Variance t Two-Sample Test

Control vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 2	1.098	2.447	1.678	6	CDF	0.3145	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.743	2.127	0.4088	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.13251	1.13251	1	1.205	0.3145	Non-Significant Effect
Error	5.64117	0.940196	6			
Total	6.77369		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	3.365	47.47	0.3455	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.9591	0.6451	0.8013	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R2	4	8.415	6.499	10.33	8.25	7.18	9.98	0.602	14.31%	0.00%
0	S1	4	7.662	6.618	8.707	7.7	6.99	8.26	0.3282	8.57%	8.94%

Total Dry Weight-mg Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R2	7.85	7.18	8.65	9.98
0	S1	6.99	8.19	8.26	7.21

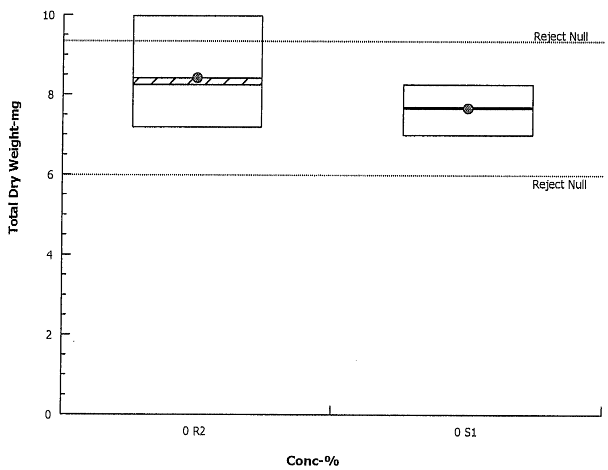
Analyst: 2020 Jul 02 dm

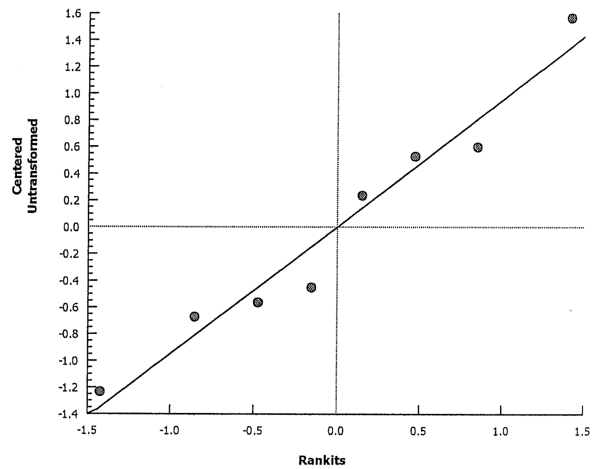
QA: PH 2020 Jul 09

Lemna Growth Inhibition Test | **Bureau Veritas Laboratories**

nalysis ID:	12-3333-3104	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





CETIS Analytical Report

Lemna Growth Inhibition Test — **Bureau Veritas Laboratories**

Analysis ID:	21-1856-4958	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Batch ID:	16-1531-7750	**Test Type:**	Lemna Growth	**Analyst:**	M. Brassil
Start Date:	12 Jun-20 15:01	**Protocol:**	EC/EPS 1/RM/37	**Diluent:**	APHA Media
Ending Date:	19 Jun-20 15:22	**Species:**	Lemna minor	**Brine:**	Not Applicable
Duration:	7d 0h	**Source:**	Canadian Phycological Culture Centre	**Age:**	

Sample ID:	00-5473-3468	**Code:**	C039804	**Client:**	Agnico Eagle Mines
Sample Date:	06 Jun-20	**Material:**	Water	**Project:**	2-11-0691
Receipt Date:	11 Jun-20 08:20	**Source:**	Agnico Eagle Mines		
Sample Age:	6d 15h	**Station:**	MEL 02-05		

Comments:
Ref1 is Mel-03-02. Ref2 is Mel-04-05. Ref3 is Mel-05-04.

Data Transform	Alt Hyp	Comparison Result	PMSD
Untransformed	C <> T	Ref 3 passed total dry weight-mg	18.27%

Equal Variance t Two-Sample Test

Control vs	Control II	Test Stat	Critical	MSD	DF	P-Type	P-Value	Decision(α:5%)
Site Water Contr	Ref 3	1.46	2.447	1.4	6	CDF	0.1946	Non-Significant Effect

Auxiliary Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:5%)
Extreme Value	Grubbs Extreme Value Test	1.385	2.127	1.0000	No Outliers Detected

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.39445	1.39445	1	2.131	0.1946	Non-Significant Effect
Error	3.92635	0.654392	6			
Total	5.3208		7			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Variance Ratio F Test	2.038	47.47	0.5735	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8577	0.6451	0.1140	Normal Distribution

Total Dry Weight-mg Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	R3	4	8.497	7.006	9.989	8.605	7.46	9.32	0.4685	11.03%	0.00%
0	S1	4	7.662	6.618	8.707	7.7	6.99	8.26	0.3282	8.57%	9.83%

Total Dry Weight-mg Detail

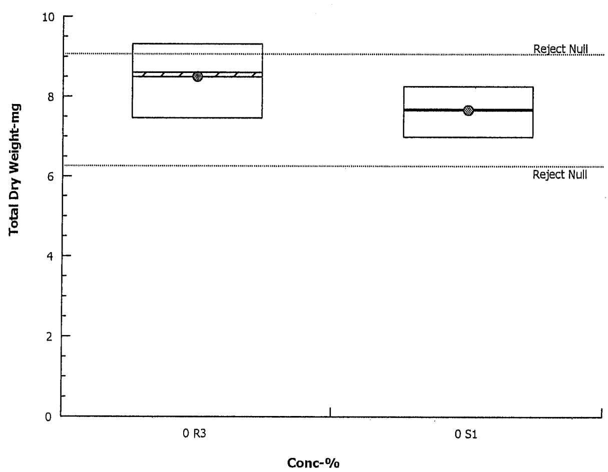
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	R3	7.95	7.46	9.26	9.32
0	S1	6.99	8.19	8.26	7.21

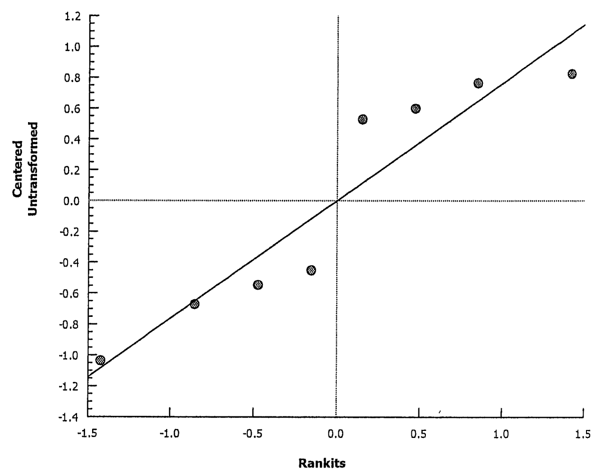
2020 Jul 02 dml
Analyst:______ 2020 Jul 09 QA: PH

Lemna Growth Inhibition Test **Bureau Veritas Laboratories**

nalysis ID:	21-1856-4958	**Endpoint:**	Total Dry Weight-mg	**CETIS Version:**	CETISv1.9.2
Analyzed:	02 Jul-20 19:25	**Analysis:**	Parametric-Two Sample	**Official Results:**	Yes

Graphics





ECOTOXICOLOGY

Lemna minor Growth Inhibition Test Data

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: Various
Weighing Dates: 2020 Jun 17 2020 Jun 22
Analyst(s): NS YS

Job# / Sample #: C039804
Oven Temp (°C): 60
Drying Time (h): >24
Balance ID: bby2-0260

Boat #	Conc. & Replicate	Final # of Fronds	Boat Wt. (g)	Boat & Frond Dry Weight (g)	Dry Weight per Rep. (mg)	Mean Dry Weight per Conc (mg)	SD	% Stimulation
432	Control-A	67	0.78390	0.79073	6.83	6.95	0.19	--
433	B	73	0.80892	0.81579	6.87			
434	C	66	0.80701	0.81387	6.86			
435	D	76	0.80104	0.80827	7.23			
436	Site Control-A	78	0.80316	0.81015	6.99	7.66	0.66	10.29
437	B	83	0.80249	0.81068	8.19			
438	C	81	0.80605	0.81431	8.26			
439	D	76	0.79264	0.79985	7.21			
440	Soft Water Ctrl-A	73	0.81297	0.82065	7.68	7.92	0.97	13.93
441	B	69	0.81633	0.82319	6.86			
442	C	88	0.81984	0.82777	7.93			
443	D	95	0.81678	0.82597	9.19			
444	MEL-02-05 97.0-A	103	0.80030	0.80877	8.47	8.73	0.50	25.69
445	B	96	0.80120	0.81067	9.47			
446	C	80	0.80291	0.81131	8.40			
447	D	89	0.80124	0.80983	8.59			
448	MEL-03-02 97.0-A	90	0.78696	0.79544	8.48	7.55	0.85	8.60
449	B	76	0.77420	0.78195	7.75			
450	C	68	0.78711	0.79354	6.43			
451	D	81	0.82981	0.83733	7.52			
452	MEL-04-05 97.0-A	77	0.80185	0.80970	7.85	8.42	1.20	21.12
453	B	71	0.81271	0.81989	7.18			
454	C	94	0.79491	0.80356	8.65			
455	D	95	0.79198	0.80196	9.98			
456	MEL-05-04 97.0-A	76	0.77873	0.78668	7.95	8.50	0.94	22.31
457	B	73	0.77861	0.78607	7.46			
458	C	87	0.76705	0.77631	9.26			
459	D	88	0.80609	0.81541	9.32			
460	QA/QC	N/A	0.79519	0.79521	0.02	-	-	-
461	QA/QC	N/A	0.78767	0.78762	-0.05	-	-	
432	0-A	67	0.78388	0.79085	6.97	-	-	
Analyst		MB	NS	YS				

N/S - No growth stimulation (dry weight) compared to the Control

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico)
Start Date: June 12, 2020
Sample ID: various
End Date: June 19, 2020
Sample Date: 2020 Jun06
Job# / Sample #: C039804
Analyst(s): N.Shergue w.Brassil
Organism Lot #: CP200602

pH of raw sample	pH after addition of APHA stocks A, B, & C	Pre-aeration time	pH after aeration
① 7.9 ② 8.0 ③ 8.0 ④ 8.0	① 7.6 ② 7.8 ③ 7.7 ④ 7.8	20min	① 7.8 ② 8.2 ③ 7.8 ④ 7.9

APHA Stocks Prep Date: 2020 Feb24
Instrument IDs: BB42-0042
Thermometer ID: BB42-0438
Plant Shelf #: 3
Test Volume (mL): 150
Sample Description: clear & colourless

Concentration (%)	Temperature Monitoring								pH Monitoring	
	Day 0	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 0	Day 7
Control	24	27	27	26	26	26	26	27	8.3	8.9
Site Control	24	27	27	26	26	26	26	27	8.3	8.6
Soft Water Control	24	27	27	27	26	26	26	27	8.3	8.7
① MEL-02-05 97.0	25	27	27	27	26	26	26	27	7.9	8.9
② MEL-03-02 97.0	25	27	27	27	26	26	26	27	8.2	9.2
③ MEL-04-05 97.0	25	27	27	26	26	26	26	27	7.9	9.2
④ MEL-05-04 97.0	25	27	27	27	26	26	26	27	7.9	9.1
Analyst	WB	WB	NS	PH	WB	WB	WB	WB	WB	WB
Date	2020 June12	2020 June13	2020 Jun14	2020 June15	2020 June16	2020 June17	2020 June18	2020 June19	2020 June12	2020 June19

Observations during the Test

Day 0 (Test Initiation)

Date: June 12, 2020
Analyst: WBrassil
# of Plants per Test Vessel: 2
# of Fronds per Plant: 3
Plant Observations: Dark green, healthy
Test Seeded @: 15:01
Other comments: n/a

Day 1

Date: June 13, 2020
Analyst: WBrassil

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: All sol'ns appear clear & colourless

Client Name: Golder Associates Ltd.
Start Date: June 12, 2020

Lemna minor Growth InhibitionTest Data

4 SAMPLES

Job# / Sample #: ~~C0S~~ C03A804 (WE DMC 2020 JUN 19)

Day 2

Date: June 14, 2020 Analyst: NShergill

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG H	DG H	DG H	DG H	DG H	DG H	DG H

Other Comments: n/a

Day 3

Date: June 15, 2020 Analyst: P. Hawes

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 4

Date: June 16, 2020 Analyst: uFrassl

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 5

Date: June 17, 2020 Analyst: uFrassl

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: All sol'ns appear clear & colourless.

Day 6

Date: June 18, 2020 Analyst: uFrassl

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a

Day 7

Date: June 19, 2020 Analyst: uFrassl

Test End Time: 15:22

Observations:

Control	Site Control	Soft Water Control	MEL-02-05 97.0%	MEL-03-02 97.0%	MEL-04-05 97.0%	MEL-05-04 97.0%
DG, H	DG, H	DG, H	DG, H	DG, H	DG, H	DG, H

Other Comments: n/a.

Legend:

DG = Dark Green	**C** = Chlorosis	**A** = Green Algae	**CD** = Colony destroyed
LG = Light Green	**N** = Necrosis	**T** = Transparent	**RD** = Roots destroyed
H = Healthy, Normal	**G** = Gibbosity	**S** = small fronds	

Other :

Lemna minor Growth InhibitionTest Data

Client Name: Golder Associates Ltd. (Agnico)
Sample ID: various
Analyst(s): NB rasgl

Job# / Sample #: C02A804
Start Date: June 12, 2020
End Date: June 19, 2020

Conc. & Replicate	Initial Number of Fronds	Final Number of Fronds	Frond Increase	Mean Increase in # Fronds per Conc'n	SD	% Stimulation
Control-A	6	67	--	--	--	--
B	6	73	--			
C	6	66	--			
D	6	76	--			
Site Control-A	6	78	--	--	--	N/S
B	6	83	--			
C	6	81	--			
D	6	76	--			
Soft Water Ctrl-A	6	73	--	--	--	N/S
B	6	69	--			
C	6	88	--			
D	6	95	--			
MEL-02-05 97.0-A	6	103	--	--	--	N/S
B	6	96	--			
C	6	80	--			
D	6	89	--			
MEL-03-02 97.0-A	6	90	--	--	--	N/S
B	6	76	--			
C	6	68	--			
D	6	81	--			
MEL-04-05 97.0-A	6	77	--	--	--	N/S
B	6	71	--			
C	6	94	--			
D	6	95	--			
MEL-05-04 97.0-A	6	76	--	--	--	N/S
B	6	73	--			
C	6	87	--			
D	6	88	--			
Analyst		NB				

N/S - No growth stimulation (frond increase) compared to the Control

Control Validity Criteria: Mean final # of fronds in Controls on day 7 must be ≥8 times initial # of fronds

Mean Final # of Fronds on Day 7	#DIV/0!
Control Frond Increase	#DIV/0!
Validity Criteria Met?	#DIV/0!

Randomization Chart

Client Name: Golder (Agnico)

Test Date: 2020 Jun 12

Sample Name:

Shelf #: 3

Back Wall

Position Map

5	10	15	20	25	30	35	40
4	9	14	19	24	29	34	39
3	8	13	18	23	28	33	38
2	7	12	17	22	27	32	37
1	6	11	16	21	26	31	36

Front of Counter

Position #	Treatment	Replicate	Colour
1	Control	A	Red
21		B	
31		C	
4		D	
17		Measure	
14	Site Control	A	White
24		B	
28		C	
30		D	
35		Measure	
26	Soft Water Control	A	Orange
8		B	
32		C	
13		D	
27		Measure	
12	MEL-02-05	A	Yellow
22		B	
34		C	
3		D	
11		Measure	
9	MEL-03-02	A	Fl. Green
29		B	
6		C	
10		D	
7		Meas.	
25	MEL-04-05	A	Teal
16		B	
23		C	
19		D	
15		Measure	
20	MEL-05-04	A	Blue
5		B	
2		C	
33		D	
18		Measure	

Modified APHA Medium Preparation Sheet *(Lemna minor)*

APHA Medium is the test medium recommended for testing samples of effluent, leachate, or receiving water, using *L. minor.*

To prepare 1L of APHA test medium, the following are added to 970 mL of Type 1 deionized water. The medium is aerated vigorously for at least 2 hours. If larger volume (>4 L) of media is prepared, overnight aeration of the medium is recommended to stabilize the pH of the medium. Immediately before testing, the pH of the test medium is adjusted to 8.3+/-0.1 using 1N NaOH or 1N HCl).

Volume Prepared (L):	20 x
Date of Preparation:	2020 Jun 10
Date of Use:	2020 Jun 11
Analyst:	N Snergiel

(2 carboys = 40L)

(APHA Transfer) 2020 Jun 12 (tests)

Stock Solution	Date of Preparation	Nominal Amount (mL)	Actual Amount (mL)	Pipette
Stock Solution A	2020 Feb24	200	200	A
Stock Solution B	2020 Feb24	200	200	A
Stock Solution C	2020 Feb24	200	200	A

A Used grad. cylinder

Volume of media prepared	Theoretical aeration time	Actual aeration time
1-4 L	At least 2 hours	N/A
>4 L	Overnight	✓

Initial pH	8.2
Final pH	n/a

[8.3+/-0.1]

Normality of NaOH:	
Volume of NaOH:	n/a
Normality of HCl:	AB 2020
Volume of HCl:	June 11

[0.5 N]

[0.5 N]

②

ECOTOXICOLOGY

Modified APHA Medium Preparation Sheet *(Lemna minor)*

APHA Medium is the test medium recommended for testing samples of effluent, leachate, or receiving water, using *L. minor.*

To prepare 1L of APHA test medium, the following are added to 970 mL of Type 1 deionized water. The medium is aerated vigorously for at least 2 hours. If larger volume (>4 L) of media is prepared, overnight aeration of the medium is recommended to stabilize the pH of the medium. Immediately before testing, the pH of the test medium is adjusted to 8.3+/-0.1 using 1N NaOH or 1N HCl).

Volume Prepared (L):	20
Date of Preparation:	2020 Jun ~~12~~ 10
Date of Use:	2020 Jun 12
Analyst:	NSnorgaad

WENS 2020Jun10

Stock Solution	Date of Preparation	Nominal Amount (mL)	Actual Amount (mL)	Pipette
Stock Solution A	2020 Feb 24	200	200	A
Stock Solution B	2020 Feb 24	200	200	A
Stock Solution C	2020 Feb 24	200	200	A

A ~~we NS~~ Used grad. cylinder. NS 2020 Jun 10

Volume of media prepared	Theoretical aeration time	Actual aeration time
1-4 L	At least 2 hours	n/a
>4 L	Overnight	✓

Initial pH	8.2
Final pH	n/a

[8.3+/-0.1]

Normality of NaOH:		[0.5 N]
Volume of NaOH:		
Normality of HCl:		[0.5 N]
Volume of HCl:		

WB 2020 June 11 n/a

Stock Culture Information

Parent Culture ID: CP 200526 Culture flask #'s: 1 - 6

Appearance of culture and media prior to subculturing: plants appear dark green & healthy, media appears clear ~~& colourless~~ & light brown
WE UB 2020 June 02 Analyst: UBrassil

Test Subculture and Health Monitoring (7 - 10 days prior to testing)

Date of Transfer: 2020 June 02 New Subculture ID: CP 200602 SC
# of Flasks Prepared: 6 x 500 ml Flask Volume: ~200ml
# of Plants/Flask: 10 Shelf Location: 4
Hoagland's Batch: 2020 May 14 Analyst: UBrassil

Health Monitoring Cups

Date prepared: 2020 ~~May~~ June 02 WE UB 2020 June 02 Test Medium: APHA 2020 May 26
replicates: 3 Shelf #: 4
Fronds seeded/rep: 3 Analyst: UBrassil

Day 7 Counts	Rep A	Rep B	Rep C	Mean	Date	Analyst
	38	38	39	38.3	2020 June 09	USnergill

(Health cup validity: Mean of ≥24 fronds on day 7, when 3 fronds/rep are seeded on day 0)

APHA Acclimation (18-24 hrs prior to testing) for (date): 2020 June 12 **setup**

Date & Time of Transfer: 2020 June 11 16:05 Subculture ID: CP200602SC Shelf Location: 4

Appearance of plants and Hoagland's E+ media prior to transfer to APHA media:
Plants appear dark green & healthy, media appears light brown & clear.

Number of crystallization dishes prepared (2) using # of subculture flasks (6)

APHA Batch: 2020 June 10 Analyst: UBrassil

APHA Acclimation (18-24 hrs prior to testing) for (date): ______ **setup**

Date & Time of Transfer: ______ Subculture ID: ______ Shelf Location: ______

Appearance of plants and Hoagland's E+ media prior to transfer to APHA media:

______

______

Number of crystallization dishes prepared (______) using # of subculture flasks (______)

APHA Batch: ______ Analyst: ______

KS 2020 July 08

ECOTOXICOLOGY
LABORATORY LIGHT LEVELS

Lab Location: Ecotox Room #109

Light Meter ID: BBY2 0459

Light Fixture Correction Factor: Actual Levels X n/a = Corrected Levels
Mercury - (reading x **1.05**) Fluorescent - (reading x **0.91**) Daylight - (reading x **0.95**)

Test Method: Lemna Minor 7 Day Growth Inhibition Test

Required Light Levels and Units: 64 - 90 umol/m²/sec

Date: 2020 June 12 Analyst: Bassil

Site of Measurement		Actual Levels	Corrected Levels
Shelf #1	left back	82	
	left front	83	
	mid. back	81	
	mid. front	84	
	right back	77	n/a
	right front	81	
Shelf #3	left back	74	2020
	left front	84	June 12
	mid back	88	
	mid front	88	
	right back	81	
	right front	77	
Shelf #4	left back	91	
	left front	83	
	mid. back	85	
	mid front	80	
	right back	83	
	right front	73	

FATHEAD MINNOW WATER HARDNESS ADJUSTMENT

BATCH ID : 2020 Jun 09
(Date Hardened)

(For water hardness 100-140 mg/L)

	Enter Numbers Here
Volume of Water (L)	200
Desired Hardness (mg/L)	130

Keep this set to a desired hardness of 130, so water will always be on the harder side, as fathead minnows are cultured in water at a hardness of **103-142** mg/L $CaCO_3$.

Chemical Weights	$MgSO_4$ (g)	$CaSO_4$ (g)	$NaHCO_3$ (g)	KCl (g)
Brand	Fisher	Alfa Aesar	Fisher	Fisher
Lot #	183674	Q09E068	189522	195613
Calculated	19.5000	15.3400	31.2000	1.3000
Actual	19.4998	15.3401	31.1999	1.3003

Balance: BBY2-0260

Analyst: M. Thompson

Date: 2020 Jun 09

Water Quality:

Temp (°C): 24.2 pH: 8.1 Hardness (mg/L $CaCO_3$): 136

DO (mg/L): 7.4

Conductivity (µS/cm): 456 Instrument ID: BBY2-0366

Analyst: MHamad Date: 2020Jun10

Comments: N/A

Note: Hardness = Ca and Mg as mg/L $CaCO_3$

2020 June 12 PH -
For lemna softwater ctrl diluted 1.5L FHM water with DI water to a total of 5L. Hardness ~40mg/L. Spiked 5L softwater ctrl with 50ml of each APHA Stock A, B, C...

2-11-20003 Synthetic Water FHM + Lemna

Moderately hard water 96 60 60 4 0 0

	Amount of salt (mg) in 1L of water	26	0	7	5	8	23	12	sum	Difference from target (max)
Molar Mass	Salts	NaHCO3	CaSO4*2H2O	MgSO4	KCl	CaCO3	CaCl*2H2O	NaCl		
60.01		18.54802663							18.54802663	-1.9
40.08			0				8.262436139		8.262436139	0.9
35.45					2.377598927		7.307968092	7.26558497	16.95115199	-1.8
-									0	0.0
24.30				1.413260219					1.413260219	-0.3
39.10					2.622401073				2.622401073	1.5
23.10		7.139800285						4.73441503	11.87421532	2.3
96.06			0	5.586739781					5.586739781	0.6
18.02			0				7.429595769		7.429595769	#VALUE!
1.01		0.312173086							0.312173086	#VALUE!
	Total check (mg/L)	26	0	7	5	0	23	12		
	g/200L	5.2	0.0	1.4	1.0	0.0	4.6	2.4		
	Actual wt (g)	5.2004	—	1.4004	1.0004	—	4.6000	2.4003		

Balance: BBY2-0260

Analyst. PH

Date: 2020 Jun 11

Synthetic Water (WQ)

Conductivity = 126.0 uS/cm
pH = 7.5
Temperature = 24.1
DO (mg/L) = 8.3
DO (%Sat) = 99.2
Hardness: 32 mg/L CaCO3

* Spiked Lemna synthetic water with APHA stock A, B, C (150 ml of each into 15 L of synthetic water).

	Brand	Lot #
NaHCO3	Fisher	189522
MgSO4	Fisher	183674
KCl	Fisher	172053
(A) ~~CaCO3~~	—	—
CaCl.2H2O	Fisher	171430
NaCl	Fisher	193465

APHA stocks: A - Prep 2020 Feb 24
B - Prep 2020 Feb 24
C - Prep 2020 Feb 24.

(A) PH WE 2020 Jun 11

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