Denison Mines Inc.
1 Horne Walk, Suite 200
Elliot Lake, ON P5A 2A5
Canada

Tel: 705 848-9191
Fax: 705 848-4445

www.denisonmines.com

March 27, 2025

Mr. Devon Brown Project Officer
Canadian Nuclear Safety Commission
Wastes and Decommissioning Division
280 Slater Street
PO Box 1046, Station B
Saskatoon, Saskatchewan K1P 5S9

Ms. Lori Jalak
Ministry of the Environment, Conservation and Parks
70 Foster Drive, Suite 110
Sault Ste Marie, ON P6A 6V4

Dear Mr. Brown and Ms. Jalak:

RE: Denison Mines Inc. 2024 Operating Care and Maintenance Annual Report

Denison Mines Inc. is pleased to submit the Denison Mines Inc. Operating Care and Maintenance Annual Report for 2024. This document has been completed in accordance with: UMDL-Minemill-Denison.01/indf; and UMDL-Minemill-Stanrock.02/indf; and Certificate of Approval (C of A) No. 4-0067-74-766; C of A No. 4-0019-72-006; and C of A No. 4-034-76-006.

Yours truly,

Denison Mines Inc.

Kevin Himbeault

Vice President, Operations
Enclosure

2024 OPERATING CARE & MAINTENANCE ANNUAL REPORT

Denison Mines Inc.

Submitted to the

Canadian Nuclear Safety Commission & **Ministry of the Environment, Conservation and Parks**

2025

Elliot Lake Joint Review Group for Denison Mines Closed Sites

Canadian Nuclear Safety Commission Devon Brown Project Officer Uranium Mines and Mills Division devon.brown@cnsc-ccsn.gc.ca Tel: 639-318-1991 cc: ron.stenson@canada.ca cc: cnsc.ummd-dmucu.ccsn@canada.ca Mailing address: Canadian Nuclear Safety Commission 280 Slater Street, P.O. Box 1046, Station B Ottawa, ON K1P 5S9	**Ministry of Energy, Northern Development and Mines** Trina Rawn Director of Mineral Development trina.rawn@ontario.ca Tel: 1-807-456-3581 cc. Marc Stewart Senior Manager, Mine Rehabilitation Section marc.stewart@ontario.ca Mailing address: Ministry of Energy, Northern Development and Mines 435 James Street South, Suite B002 Thunder Bay, ON P7E 6S7
Environment and Climate Change Canada Catalin Obreja Physical Science Officer, Environmental Stewardship Branch catalin.obreja@canada.ca Tel: 416-739-5973 cc: duck.kim@canada.ca Mailing address: Environment Canada, Environmental Protection Operations 4905 Dufferin Street, 2nd Floor, Office 2S316 Toronto, Ontario M3H 5T4	**Ministry of Natural Resources and Forestry** Jim Trottier Management Biologist, Blind River Field Office jim.trottier@ontario.ca Tel: 705-356-3018 Mailing address: Ministry of Natural Resources and Forestry 62 Queen Avenue, P.O. Box 190 Blind River, ON P0R 1B0
Ministry of the Environment, Conservation and Parks Lori Jalak Senior Environmental Officer, Sault Ste Marie Area Office lori.jalak@ontario.ca Tel: 705-257-6242 Mailing address: Ministry of the Environment, Conservation and Parks 70 Foster Drive, Suite 110 Sault Ste Marie, ON P6A 6V4	**Ministry of Labour, Training and Skills Development** Alain Perreault Northern Regional Mining Program Coordinator alain.perreault@ontario.ca Tel: 705-561-5019 Mailing address: Ministry of Labour, Training and Skills Development Ontario Government Bldg 301-159 Cedar Street, Sudbury, ON P3E 6A5

Additional Distribution List 2024

City of Elliot Lake Rob deBortoli City of Elliot Lake Interim CAO r.debortoli@city.elliotlake.on.ca Tel: 705-848-2287 Mailing address: City of Elliot Lake 45 Hillside Drive North Elliot Lake, ON P5A 1X5	**Elliot Lake Public Library** Mailing address: Elliot Lake Public Library Pearson Plaza 40 Hillside Drive South Elliot Lake, ON P5A 1M7
Serpent River First Nation Chief Wilma-Lee Johnston Wilma-lee.johnston@serpentriverfn.com Tel: 705-844-2418 cc. Taylor Commanda lands.resources@serpentriverfn.com Mailing address: Serpent River First Nation 195 Village Road, P.O. Box 14 Cutler, ON P0P 1B0	**Township of the North Shore** Mayor Tony Moor tmoor@townshipofthenorthshore.ca Tel: 705-849-2213 Mailing address: Township of the North Shore 1385 Hwy 17, P.O. Box 108 Algoma Mills, ON P0R 1A0
Town of Spanish Pam Lortie CAO/Clerk-Treasurer pamlortie@townofspanish.com Tel: 705-844-2300 Mailing address: Town of Spanish 8 Trunk Road, P.O. Box 70 Spanish, ON P0P 2A0	**Denison Mines Inc.** David Cates dcates@denisonmines.com Tel: 416-979-1991
North Shore Tribal Council (Mamaweswen) Allan Moffat, CEO allanm@mamaweswen.ca Michelle Martin, Financial Comptroller michelle@mamaweswen.ca Sonya Cloutier, Emergency Management Coordinator sonya@mamaweswen.ca Mailing address: Main Office 473 Hwy 17 W Cutler, ON P0P 1B0 1-877-633-7558 toll free 705-844-2340	

Table of Contents

List of Tables

Table of Appendices

1 ORGANIZATIONAL INFORMATION

1.1 Licencee

DENISON MINES INC.
1100-40 University Avenue
Toronto, Ontario
M5G 1T1

1.2 Board of Directors

Table 1.1 contains the list of names and titles of the Directors of Denison Mines Inc. (Denison) as of December 31, 2024. All persons listed below may be contacted via the licensee address.

Table 1.1 Denison Mines Inc. Directors as of December 31, 2024

Name	Office
David Cates	Director, President and Chief Executive Officer
Amanda Willett	Director, Corporate Secretary

1.3 List of Officers

Table 1.2 contains the list of names and titles of the Officers of Denison as of December 31, 2024. All persons listed below may be contacted via the licensee address.

Table 1.2 Denison Mines Inc. Officers as of December 31, 2024

Name	Office
David Cates	Director, President and Chief Executive Officer
Elizabeth Sidle	Chief Financial Officer
Amanda Willett	Director, Corporate Secretary

2 FINANCIAL GUARANTEES

Federal and Provincial regulations which apply to the care and maintenance programs of Denison in Elliot Lake require mine operators to provide adequate and secure resources to meet current and future responsibilities with respect to mine closure and long-term care and maintenance.

All expenditures are funded through a reclamation trust fund. Denison currently maintains a balance in the trust equivalent to costs to maintain interim suspension status for the period of 2024 to 2029.

3 LICENCE AND MONITORING PROGRAM MODIFICATIONS

Denison closed mine sites in Elliot Lake are currently managed within the scope of work outlined within a licence regulated by the Federal Canadian Nuclear Safety Commission (CNSC). Currently Denison is the licencee for two Uranium Mine Decommissioning Licences:

1) Denison sites (Tailings Management Area (TMA)-1 and TMA-2) UMDL-Minemill-Denison.01/indf; and
2) Stanrock site UMDL-Minemill-Stanrock.02/indf

Compliance sample stations that require monitoring under the licences include:

1) Stollery Lake Settling Pond Outlet (D-2) for Denison TMA-1;
2) Lower Williams Lake (LWL) Settling Pond Outlet (D-3) for Denison TMA-2; and,
3) Orient Lake Polishing Pond Outlet (DS-4) for Stanrock TMA.

Provincially, Denison is the permittee for three Certificates of Approvals (C of A) regulated by the Ministry of Environment, Conservation and Parks (MECP):

1) Denison Site TMA-1: C of A No. 4-0019-72-006;
2) Denison Site TMA-2 (Lower Williams): C of A No. 4-034-76-006; and
3) Stanrock Site: C of A No. 4-0067-74-766

There were no changes to any of these documents in 2024. A proposed amendment of the C of A for TMA-1 remains in progress.

A State of the Environment (SOE) Report for the Serpent River Watershed has been jointly produced by Denison and Rio Algom Limited (RAL) every five years. The SOE report includes the monitoring programs for the Serpent River Watershed Monitoring Program (SRWMP), Source Area Monitoring Program (SAMP) and the Tailings Management Area (TMA) Operational Monitoring Program (TOMP). There were approved changes to the SAMP, TOMP and SRWMP in 2019 that included approval from Environment and Climate Change Canada (ECCC), CNSC, Ministry of Labour (MOL), Ministry of Natural Resources and Forestry (MNRF) and Ministry of Northern Development and Mines (MNDM) which were presented in the *Cycle 5 Study Design for the SRWMP, SAMP and TOMP* (Cycle 5 Design Study) (Minnow, 2019). A summary of Cycle 5 monitoring requirements is available in Appendix I. The Cycle 5 SOE Report was submitted to regulators in March 2021 (Minnow 2021).

The Cycle 6 Study Design was submitted to regulators in 2024, with implementation in 2025 (Minnow 2024). The Cycle 6 Study Design outlined that the SRWMP demonstrates improving water quality at all monitoring locations over the past 20 years. Based on environmental performance and continuing monitoring and annual reporting for the Serpent River watershed, the Canadian Nuclear Safety Commission (CNSC) and Ontario Ministry of Environment, Conservation, and Parks (MECP) agreed to transition SOE reporting to a 10-year reporting cycle (email D. Brown to H. Heffner, November 6, 2024). The modified schedule includes a Cycle 7 study design, inclusive of benthos/sediment monitoring and reporting requirements in 2029, and a combined Cycle 6/7 SOE Report in March 2030, beginning the 10-year reporting frequency.

4 METHODOLOGY

4.1 Health and Safety

4.1.1 Health and Safety Injury Statistics

Health and safety in the workplace continue to be of great importance to Denison. In 2024, monthly company-wide safety meetings and daily line-up safety meetings were completed. These meetings provide Denison personnel with information regarding safety awareness, updates to the safety program, and a forum to raise issues or concerns. Training for job responsibilities were tracked utilizing a training matrix to ensure comprehensive and timely qualifications for work. All field work is assessed for risk and documented through a Hazard Assessment identifying mitigations to identified hazards.

4.1.2 Gamma Dosimetry

Denison utilized Optically Stimulated Luminescence (OSL) dosimeters during Q1 and Q2 of 2024. Analysis of historical data indicated that worker exposure to gamma radiation has been insignificant and determined that the OSLD badges should be discontinued. The CNSC accepted this proposed change (e-mail Brown to Heisler, September 25, 2024) and workers are no longer classified as Nuclear Energy Workers (NEWs) and no longer participate in a gamma dosimetry program.

4.1.3 Radon Progeny Monitoring

Radon progeny monitoring at all Denison Effluent Treatment Plants (ETPs) is conducted on a quarterly basis, as part of the quarterly health and safety inspections. Radon results are reported in Working Level (WL) units.

Radon level is measured by calculating alpha radiation from radon decay products. The sample is first collected on membrane filters with an air-sampling pump by walking through the entire ETP over a 5-minute period, simulating a normal work routine. The ETP is ventilated as per routine work practice and according to signage on the building before the walkthrough. Alpha radiation is measured with an alpha counter between forty to ninety minutes after the sample has been collected. WL is then calculated based on the counts, count duration, sampling duration, sampling flow rate, decay factor, filter self-absorption value, background count, and efficiency factor.

The reportable action limit for radon exposure at all ETPs is 0.1 WL. To ensure radon levels stay below the reportable action limit, an internal investigation limit of 0.05 WL has been established to trigger a response whereby mitigating measures are implemented to ensure worker exposure to radon gas is reduced and controlled. Mitigating measures include, but are not limited to, the purchase of a ventilation fan and/or posting signage to instruct longer ventilation time before entering an enclosed ETP.

The radon data is used to calculate individual annual dose estimates for all workers.

4.2 Water Quality Monitoring Program

4.2.1 TOMP, SAMP and SRWMP

As part of the closure and decommissioning process, an integrated performance monitoring framework had been developed for Denison and RAL sites for water quality monitoring activities through three integrated programs: TOMP, SAMP and SRWMP. These programs have been described in the Cycle 5 Study Design (Minnow 2019).

4.2.2 TMA Operational Monitoring Program (TOMP)

The TOMP was designed to track the performance of the TMAs and generate data used to make management decisions to maintain performance compliance of the TMAs. The program included water quality monitoring within the TMA basins and groundwater quality, to reflect the operational and treatment performance. The data collected in the program is used as references for water quality trends for Serpent River Watershed receiving environment, however the water quality from Denison and Stanrock TMA sites must comply with the regulatory criteria for the effluents from the treatment plants specified in the licenses and Certificates of Approval (Sample points: D-2, D-3 and DS-4).

4.2.3 Source Area Monitoring Program (SAMP)

The SAMP was designed to monitor the nature and quantity of potential contaminants being discharged from the TMAs to the Serpent River Watershed. Some monitoring stations for the SAMP program were also the TOMP effluent stations, and requirements have been harmonized to serve both programs. The data collected in the program could be used as references for water quality trend and performance for the Serpent River Watershed receiving environment.

4.2.4 Serpent River Watershed Monitoring Program (SRWMP) State of the Environment Report (SOE)

The SRWMP SOE, most recently produced in 2021, was designed to provide an integrated monitoring approach to assess the cumulative effects and watershed-level changes over time, in order to evaluate the recovery of the receiving environment following the implementation of the decommissioning plans. The SRWMP SOE assessed water and sediment chemistry, as well as benthic invertebrate communities in downstream and reference lakes within the watershed. Water quality data collected in the program is compared to the benchmarks established for the SRWMP. The objectives of the SRWMP are:

- Evaluation of cumulative effects of mine discharges on the Serpent River Watershed,
- Evaluation of the effectiveness of mine decommissioning plans, and
- Assessment of long-term trends in environmental quality in the watershed.

An additional SRWMP Water Quality Report is prepared annually to review water quality downstream of the SAMP and TOMP and provides water quality data from watershed monitoring locations from January 1, 2024 through December 31, 2024. The objective of the SRWMP annual data review is to identify anomalous data and evaluate short-term data trends at key locations. Step changes and anomalies are identified in this report by reviewing and compiling the last five years of annual average data for all SRWMP monitoring locations and reviewing the information for any noticeable changes. The 2024 SRWMP report was prepared and submitted under a

separate cover (RAL, Denison, 2025). Results are not presented in this annual report, but the report is recommended to be read in conjunction with the Denison 2024 Annual OCM report.

4.2.5 Program Requirements

Water quality monitoring requirements and criteria as per the licences were fulfilled through the approved TOMP, SAMP and SRWMP. The water quality monitoring locations in this report made up part of the Serpent River Watershed (SRW), which as outlined above, is a shared watershed with RAL sites and their monitoring locations.

The 2024 TOMP and SAMP followed program requirements specific to the following: sampling locations, frequencies, parameters, and analytical protocols. These requirements have been recommended and approved in the Cycle 5 Study Design. Appendix II in this report provides maps of the sampling stations of the water quality program. Tables in Appendix II provide a brief description of each location, the sampling frequency, and parameters monitored, as required by TOMP and SAMP as well as the C of As and decommissioning licenses as identified in Section 3.

4.2.6 Data Quality Objectives

Targeted Detection Limits (TDL) and Data Quality Objectives (DQOs) for TOMP and SAMP requirements are provided in Table 4.2.2 which were derived from the Cycle 5 Study Design. Laboratory data quality assessment is provided in Appendix IV of this report.

4.2.7 Changes in Analytical Methods

There were no changes to analytical methods in 2024. In October 2024, Denison switched to Testmark Laboratories, but analytical methods remained the same. Method detection limits for uranium and sulphate were higher than SAMP and TOMP DQO. Denison is working with Testmark to lower these detection limits.

4.2.8 Data Screening and Assessment Conventions

Data validation was conducted on TOMP and SAMP water quality data throughout the year. The data validation assessment screening process within the electronic database flagged all data points entered or imported that had values outside a rolling minimum 12 value mean $\pm$ 3 standard deviations. Prior to being accepted in the database, all flagged data was reviewed and validated through a quality assurance process.

As part of the TOMP, field quality assurance and quality control sampling were extended to the groundwater monitoring program in 2006. Data quality assessment involved monthly screening of field duplicate and field blank sample data against TOMP and SAMP DQOs found in Table 4.2.2. Detailed surface water and groundwater quality assurance and quality control (QA/QC) results are included in Appendix III of this report.

Laboratory analyses were contracted to Canadian Association of Laboratory Accreditation (CALA) certified laboratories. Laboratory QA/QC reports are provided in Appendix IV of this report.

Monthly data validation of flagged data for 2024 can be found in Appendix III.

Annual water quality reporting was designed to be concise and focused on the presentation of data in a standardized format with limited interpretation. Detailed statistical evaluation of water quality trends are included in the *Serpent River Watershed Cycle 5 (2015-2019) State of the*

Environment Report (SOE) with some updated trends presented in the Cycle 6 Study Design. Data validation, as documented in Data Validation Procedures, ensured prompt response to upset conditions or unusual results. Appendix V includes all 2024 monthly average year to date (YTD) results and detailed raw data water quality monitoring results for surface water results and five years of groundwater quality results.

Surface water stations within the TMAs, as well as effluent, seepages, and downstream surface water stations were compared to SRWMP benchmarks for receiving water quality. Mine sources (i.e. TOMP and SAMP stations) were not expected to achieve the benchmarks that were set for the receiving environment, but these comparisons were made to identify potential variables or sources of concern relative to the downstream receiving environment. Therefore, water quality data in this report is compared to benchmarks established for the SRWMP. These benchmarks were based on water quality criteria for the protection of aquatic life or the upper range of background concentrations (except for pH for which the lower background range was relevant). The most recent federal and provincial (Ontario) guideline was used to determine these benchmarks (or British Columbia Ministry of Environment (BCMOE) water quality guidelines were applied if none existed). A dose-base site-specific benchmark for radium-226 was also developed, as per CNSC request (Minnow, 2019 Appendix C). In this report, benchmarks are presented in Table 4.2.2.

Annual loadings from the TMA final discharge were calculated using monthly monitoring results (volume and average concentration) aligning with the Metal and Diamond Mining Effluent Regulations (MDMER) loadings methodology. Daily flow at the ETP was used to calculate monthly discharge volumes (Litres), except in the case of Williams Lake where flow is measured weekly at the final discharge. Monthly average concentrations were multiplied by monthly volumes to produce monthly loads, and monthly loads were summed to estimate annual loadings. Annual loadings at the final discharge point were calculated for radium-226 (Million Becquerels) and TSS (kilograms per year) for each effluent treatment plant and presented in Appendix V.

Table 4.2.2 Water Quality Benchmarks for SRWMP and Data Quality Objectives for TOMP, SAMP and SRWMP

		Assessment Criteria [1]	Data Quality Objectives [2]							
Parameter	**Units**	**Receiving Environment Criteria**	**Targeted Detection Limit**	**Minimum Detectable Difference**	**Field Blank Criteria**	**Laboratory Blank Criteria**	**Field Precision**	**Laboratory Precision**	**Laboratory Spikes**	**Laboratory Accuracy (CRM) [b]**
Field Parameters										
Conductivity	µs/cm	-	0.1	0.05	-	-	10%	-	-	-
Flow	L/s	-	method [a]	method [a]	-	-	30%	-	-	-
pH	pH units		0.1	0.01 or 0.02	-	-	10%	-	-	-
Lake		6.5								
Wetland/Stream		5.3								
Laboratory Parameters										
Acidity	mg/L	-	1.0	-	2.0	2.0	20%	10%	-	-
Barium	mg/L	1	0.005	-	0.01	0.01	20%	10%	20%	20%
Cobalt	mg/L	0.0025	0.0005	-	0.001	0.001	20%	10%	20%	20%
Iron	mg/L			-	0.04	0.04	20%	10%	20%	20%
Lake		0.755	0.02							
Wetland/Stream		2.49	0.02							
Manganese [3]	mg/L	0.841	0.002	-	0.004	0.004	20%	10%	20%	20%
Radium	Bq/L	0.469	0.005	-	0.01	0.01	20%	10%	20%	-
Sulphate [3]	mg/L	128-429	0.1	-	0.2	0.2	20%	10%	20%	20%
TSS	mg/L	-	1.0	-	2.0	2.0	20%	10%	-	-
Uranium	mg/L	0.015	0.0005	-	0.001	0.001	20%	10%	20%	20%

Notes:

1. Assessment criteria as per Table S.1, Appendix S, Cycle 5 State of the Environment Report for the SRWMP, SAMP and TOMP (Minnow, 2021)
2. Table 6.2 Cycle 5 Study Design for the SRWMP, SAMP and TOMP (Minnow, 2019)
3. Sulphate and manganese criteria taken from Table S.2, Appendix S, Cycle 5 State of the Environment Report for the SRWMP, SAMP and TOMP (Minnow, 2021). Paramenters are hardness dependent.

a. Reporting Limit varies by method

b. CRM (Certified Reference Material)

5 RESULTS AND DISCUSSION

5.1 Health and Safety

5.1.1 Health and Safety Injury Statistics

In 2024, health and safety related training and education continued to be an integral part of monthly safety meetings and daily line-ups for all personnel working at the Denison Elliot Lake Operations. All personnel continued to hold the following certifications and/or had completed the following training: Workplace Hazardous Materials Information System (WHMIS), Cardiopulmonary Resuscitation (CPR) and First Aid certification, as well as the Annual Radiation Safety training. Many workers also completed additional training and certifications to ensure their qualifications for specialty or specific tasks and jobs related to care and maintenance activities were current. There were no medical aid or lost time accidents reported in 2024 for employees at the Elliot Lake sites (Table 5.1.1). Additionally, no medical aids or lost time accidents were reported for contractors on site in 2024.

Table 5.1.1 Health & Safety Injury Statistics

Category	2024		2023		2022	
	Number	Frequency	Number	Frequency	Number	Frequency
Medical Aid	0	0.0	1	5.04	1	4.92
Lost Time	0	0.0	0	0.0	0	0.0
Total	**0**	**0.0**	**1**	**5.04**	**1**	**4.92**
Person-Hours Worked - Denison Employees	**13204**		**39484**		**40682**	

Frequency is Calculated as: Number/Person-hours worked *200,000.

5.1.2 Gamma Dosimetry

Gamma radiation is no longer an area of concern given many years of monitoring utilizing personal dosimeter devices supplied by an approved dosimetry service.

5.1.3 Radon Progeny Monitoring

There were no radon progeny action level exceedances in 2024. The action level criteria are specific to the Elliot Lake area as indicated in the Control Limit Registry companion document. Working Levels (WLs) of radon progeny continued to test at levels far below the action level criteria of 0.10 WL for Denison TMA-1 ETP (Table 5.1.3.1), Denison LWL ETP (TMA-2) (Table 5.1.3.2) and for Stanrock ETP (Table 5.1.3.3). Quarterly values for individual ETPs are provided in their respective tables.

Table 5.1.3.1 Denison TMA-1 ETP Radon Progeny Monitoring Results 2024

Quarter	Radon (WL)
1	0.0009
2	0.0105
3	0.0005
4	0.0029

Table 5.1.3.2 Denison LWL ETP Radon Progeny Monitoring Results 2024

Quarter	Radon (WL)
1	0.0110
2	0.0282
3	0.0070
4	0.0131

Table 5.1.3.3 Stanrock ETP Radon Progeny Monitoring Results 2024

Quarter	Radon (WL)
1	0.0197
2	0.0073
3	0.0011
4	0.0156

5.2 Water Quality Monitoring Program

The objective of the annual water quality data review was to identify atypical data and to provide evaluation and short-term annual averages at select locations. Changes and anomalies were identified by reviewing and compiling the last five years of annual average data for all TOMP and SAMP locations. Unusual results were routinely investigated in accordance with the *Water Quality Assessment and Response Plan,* which is included in Appendix A of the most recent SOE Report (Minnow, 2021).

5.2.1 Surface Water Quality

Appendix III contains detailed QA/QC results compared against DQOs while Appendix IV contains surface water station-specific data including annual statistics and comparisons to SRWMP assessment criteria for the receiving environment (4.2.2).

There were six field blank DQO exceedances in 2024 (Table 5.2.1). Parameters with field blank exceedances included acidity (2), sulphate (3), and iron (1). The sulphate exceedances are explained by a higher MDL utilized after the laboratory change, as all 3 exceedances occurred after the laboratory change. The results received were <0.05 mg/L whereas DQO for sulphate is 0.02 mg/L. The iron sample result was 0.05 mg/L compared to the DQO of 0.04 mg/L and the acidity samples were 3 and 9 mg/L, exceeding the DQO of 2 mg/L. The 2024 DQO exceedances were few and minor. Parameter concentrations are all typically higher than field blank DQOs at the sample location and therefore, the exceedances did not impact surface water quality result interpretation. Field sampling procedures will be reviewed to determine if changes should be made as part of the annual review and update of the QMS.

There were 12 out of 128 field precision exceedance results which did not meet DQOs in 2024 (Table 5.2.1).

The radium-226 field precision DQO of 20% was exceeded in 6 out of 12 samples with a maximum result of 139% in August. The August radium-226 result is more similar to a field blank (<0.005) and there may have been an error in sample labelling or bottle analysis at the laboratory. With the exception of the August result, the exceedances remained consistent with the variability observed in low radium-226 concentrations and did not affect the interpretation of radium-226 water quality results. Results were within values typically observed at this location (D-2).

Iron, cobalt, and manganese field precision exceeded the DQO of 20%; 1 in 12 samples for iron, 3 in 12 samples for cobalt, and 2 of 12 samples for manganese. Precision exceedances for cobalt were at values near the detection limit and uncertainty at these levels is high. Precision exceedance for iron in August of 174%, and relatively high variance for other parameters suggests a bottle labelling or sampling issue in that month. Concentrations of parameters were within values typically observed at these locations (D-2 and DS-2) and the annual precision averages met the DQO criteria for acidity, hardness, TSS, sulphate, uranium, barium, cobalt, iron and manganese (Table 5.2.1).

Table 5.2.1 2024 Surface Water Field Blank and Field Precision Data Summary

	pH	Acidity (mg/L)	TSS (mg/L)	Hardness (mg/L)	SO4 (mg/L)	Ra(T) Bq/L)	U (mg/L)	Ba (mg/L)	Co (mg/L)	Fe (mg/L)	Mn (mg/L)
Field Blank Statistics											
Count	16	4	12	12	12	12	12	12	12	12	12
Average	5.7	6	0.9	0.1	0.3	0.006	0.0003	0	0	0.01	0.000
Max	7.2	9	1	0.3	0.5	0.007	0.001	0.001	0.0001	0.05	0.001
Min	4.5	2	0.7	0.1	0.2	0.005	0.0000	0.000	0.0000	0.01	0.000
Field Blank Exceedances											
DQO Criteria [1]		2.0	2.0	1.0	0.2	0.01	0.001	0.01	0.001	0.04	0.004
# Exceedances	0	2	0	0	3	0	0	0	0	1	0
Field Duplicate Statistics											
Count	16	4	12	12	12	12	12	12	12	12	12
Average	1%	1%	3%	2%	3%	37%	2%	3%	13%	19%	10%
Max	4%	2%	40%	5%	12%	139%	5%	8%	67%	174%	57%
Min	0%	0%	0%	0%	0%	8%	0%	1%	0%	0%	0%
Field Precision Exceedances											
DQO Criteria [1]	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
# Exceedances	0	0	0	0	0	6	0	0	3	1	2

[1] SAMP and TOMP field blank criteria taken from Table 6.2 of the Cycle 5 Study Design for SRWMP, SAMP and TOMP (Minnow, 2019)

5.2.1.1 DensionTMA-1

Site-specific water quality monitoring at the Denison TMA-1 facility was completed in accordance with TOMP and SAMP design requirements. Water quality data from all the sites of the monitoring programs were compared to SRWMP benchmarks (Table 4.2.2) to demonstrate changing water quality, identify potential variables or sources of concern relative to the downstream receiving environment as well as to monitor compliance discharge criteria as it relates to treatment performance. Mine sources (effluent and seepage) were not expected to meet receiving water benchmarks. Detailed water quality results are provided in Appendix V.

Performance of TMA-1 was monitored at the ETP influent station D-1 as part of the TOMP program (Table 5.2.1.1a). Acidity and cobalt levels were consistent over the past five years, whereas pH had remained consistent at near neutral to slightly alkaline between 2020 and 2023; 2024 saw a slight increase in pH to 8.1 as compared to 7.4 the year prior. Acidity and cobalt remained below their respective Targeted Detection Limits (TDL) (Table 5.2.1.1a). Most metal concentrations over the last five years remained below SRWMP benchmarks (Table 4.2.2). 2023 uranium concentrations were slightly higher than the previous four years but were back within historical range for 2024. Sulphate concentrations have been declining as predicted in the 1995 Environmental Impact Statement (DML 1995) with the values generally stable to declining over the past four years. Annual average radium-226 levels have remained stable over the 5-year reporting period. The current barium chloride treatment for radium-226 removal remains adequate to maintain radium-226 control downstream in the final discharge at D-2 (Table 5.2.1.1b). Denison continues to evaluate the understanding of radium-226 in the TMA and downstream and is examining the potential for improved treatment efficiencies. The results of this additional work will be provided under separate cover in 2025.

Table 5.2.1.1a Annual Average Concentrations ETP Influent (D-1)

PARAMETER	Flow (L/s)	ACID mg/L	Hardness mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2020	81.45	<1	108.7	7.5	57.4	1.715	0.094	<0.0005	0.08	0.028	0.0097
2021	29.85	<1	99.3	7.6	52.2	1.511	0.101	<0.0005	0.07	0.022	0.0075
2022	19.13	<1	98.5	7.6	43.0	1.584	0.063	<0.0005	0.09	0.030	0.0077
2023	23.86	<1	116.1	7.4	57.9	1.745	0.082	<0.0005	0.06	0.012	0.0116
2024	17.11	<2	85.3	8.1	39.1	1.595	0.106	0.0001	0.07	0.011	0.0076
Annual Summary Statistics											
Average	34.28	<1	101.6	7.6	49.9	1.630	0.089	<0.0005	0.07	0.021	0.0088
Maximum	81.45	<2	116.1	8.1	57.9	1.745	0.106	<0.0005	0.09	0.030	0.0116
Minimum	17.11	<1	85.3	7.4	39.1	1.511	0.063	0.0001	0.06	0.011	0.0075

Note: Five year annual average, maximum and minimum statistics

Note: Five-year annual average, maximum and minimum statistics

The final point of control at the TMA-1 facility was monitored at the Stollery Settling Pond Outlet (station D-2). Review of the annual average concentrations for TOMP and SAMP parameters for the last five years indicated consistently low TSS levels, stable radium-226 concentrations and near neutral pH values; with all compliance parameters meeting their grab sample and monthly mean discharge limits (Table 5.2.1.1.b). A lower annual average for radium-226 is observed in 2024 compared to 2023 and could be attributed to less water moving through the ETP (fewer

operating days), as well as increased efficiency of barium chloride addition. In addition, with the exception of uranium, all parameters remained below the SRWMP benchmarks (4.2.2) and cobalt remained close to the MDL. Annual average barium concentrations decreased in 2024 compared to the past 4 years. The lower barium concentrations can be attributed to the decreased flow through the treatment plant, and therefore decreased barium chloride addition to the treated water system (Table 5.3.1.2.1). The 2024 barium chloride annual consumption was 6,910 kilograms (kg) compared to 8,659 kg used in 2023 (Table 5.3.1.2.1). Uranium concentrations were elevated compared to influent concentrations due to contribution from dam seepage but are generally stable and are not increasing further downstream (e.g., SRWMP locations). Sulphate concentrations are elevated compared to influent water quality concentrations, but this is reflective of the seepage water from the Dam 10 toe drains, high in sulphate, that discharges into Stollery Settling Pond. (Table 5.2.1.1a). Annual loadings of the compliance parameters radium-226 and TSS are provided in Appendix V.

Table 5.2.1.1b Final Discharge at Stollery Settling Pond Outlet (D-2)

PARAMETER UNITS	Flow (L/s)	Hardness mg/L	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2020	81.69	214.8	7.2	151.3	1	0.163	0.481	0.0006	0.29	0.170	0.0264
2021	39.19	237.4	7.2	163.3	1	0.115	0.284	0.0005	0.28	0.148	0.0281
2022	41.17	259.8	7.2	200.3	1	0.120	0.272	0.0005	0.35	0.170	0.0326
2023	53.42	260.8	7.2	171.4	1	0.109	0.416	0.0004	0.42	0.142	0.0321
2024	37.75	285.9	7.1	240.1	1	0.058	0.202	0.0004	0.41	0.132	0.0338
Annual Summary Statistics											
Average	50.64	251.7	7.2	185.3	1	0.113	0.331	0.0005	0.35	0.152	0.0306
Maximum	81.69	285.9	7.2	240.1	1	0.163	0.481	0.0006	0.42	0.170	0.0338
Minimum	37.75	214.8	7.1	151.3	1	0.058	0.202	0.0004	0.28	0.132	0.0264

Note: Five year annual average, maximum and minimum statistics

Note: Five-year annual average, maximum and minimum statistics

Toxicity was monitored for Denison TMA-1 at the final discharge station D-2 (Stollery Settling Pond Outlet) to estimate the potential effect that the effluent might have on aquatic biota. Toxicity sampling was completed semi-annually in 2024 as per SAMP requirements and included the following tests: acute *Daphnia magna* and rainbow trout toxicity tests and sub lethal *Ceriodaphnia dubia* toxicity test. In 2024, no mortality was observed in the acute lethality tests. *Ceriodaphnia dubia* IC_{25} reproduction results were 3% effluent in the June sampling event and >100% effluent in October (Appendix V). A comparison of the water quality between the June and October tests and historical data does not identify a potential cause for the differences between the test results as most parameters of concern were higher in October compared to June. The D-2 discharge remains not acutely lethal with variability in sublethal toxicity test results. Results will continue to be monitored.

In 2024, TMA-1 effluent quality at the final point of control, D-2, was in compliance with the discharge limits established in the decommissioning licence (Table 5.2.1.1.1).

Table 5.2.1.1.1 2024 TMA-1 Compliance with Discharge Limits at Final Point of Control (D-2)

Month	Samples Required	Number of Times Discharge Limits Were Exceeded					
		pH pH units		TSS mg/L		Ra(T) Bq/L	
		Grab Sample Limit[1]: Upper 9.5 Lower 5.5	Monthly Arithmetic Mean[1]: Upper 9.5 Lower 6.5	Grab Sample Limit[1]: Upper 50 Lower N/A	Monthly Arithmetic Mean[1]: Upper 25 Lower N/A	Grab Sample Limit[1]: Upper 1.11 Lower N/A	Monthly Arithmetic Mean[1]: Upper 0.37 Lower N/A
Jan.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Feb.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Mar.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Apr.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
May	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
June	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
July	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Aug.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Sept.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Oct.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Nov.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Dec.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
YTD	53	0 of 53	0 of 12	0 of 53	0 of 12	0 of 53	0 of 12

[1]Limits established in the Licence UMDL-MINEMILL-DENISON.01/indf issued December 15, 2004.

5.2.1.2 Denison Lower Williams Lake (TMA-2)

Site-specific water quality monitoring at the Denison LWL ETP was completed in accordance with TOMP and SAMP requirements. Detailed monthly average results are provided in Appendix IV.

LWL Influent station (D-22) is used to monitor seepage from Dam 1 and is located in a natural wetland area. Review of annual average concentrations for TOMP parameters at this station indicates variability for some parameters. Water quality at D-22 shows near neutral pH values (Table 5.2.1.2a), that are within the SRWMP benchmark pH limits. Uranium, barium, and cobalt annual concentrations have been generally stable over the past four to five years, and all remained below SRWMP benchmarks (Table 5.2.1.2a and Table 4.2.2). Radium-226 concentrations demonstrate variability over the 5-year period with 2024 representing a below average Ra-226 concentration. The 2024 annual radium-226 concentration in the influent (D-22) remains below the criteria applied to the final point of discharge (D-3). Denison will continue to monitor this trend and if it continues, treatment for radium-226 removal may not be necessary. Sulphate concentrations at D-22 are similar to 2022 and are higher compared to 2020 to 2021 values but are still within historical ranges and are well below the 50 and 100 years post decommissioning porewater concentration predictions (1,600 mg/L sulphate) made in the 1995 EA (Denison 1995). Iron, manganese and uranium annual concentrations are lower this year compared to the past four years.

Table 5.2.1.2a Denison Lower Williams Lake ETP Influent (D-22)

PARAMETER UNITS	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2020	6.8	40.5	0.319	0.045	0.0009	7.68	1.265	0.0019
2021	6.8	67.0	0.436	0.067	0.0010	6.78	0.733	0.0011
2022	6.7	129.0	0.689	0.057	0.0008	7.68	0.924	0.0017
2023	6.7	125.0	0.262	0.046	0.0012	5.74	1.154	0.0013
2024	6.6	124.3	0.369	0.038	0.0009	1.87	0.468	0.0005
Annual Summary Statistics								
Average	6.7	97.2	0.415	0.051	0.0010	5.95	0.909	0.0013
Maximum	6.8	129.0	0.689	0.067	0.0012	7.68	1.265	0.0019
Minimum	6.6	40.5	0.262	0.038	0.0008	1.87	0.468	0.0005

Note: Five year annual average, maximum and minimum statistics

The final discharge from LWL is monitored near the Denison Access Road at Station D-3. Review of annual average concentrations for TOMP and SAMP demonstrate stable pH values and consistently low TSS concentrations (Table 5.2.1.2b). Similar to the influent, the annual average D-3 radium-226 concentration has been stable since 2022, and continues to remain well below discharge criteria. Sulphate concentrations had been increasing between 2020 and 2022, but have been on the decline since 2022 and are in line with the 5-year average (Table 5.2.1.2b).

Radium-226 concentrations remain well below the grab sample (1.1 Bq/L) and monthly mean (0.37 Bq/L) discharge limits. Beaver activity at the inlet and outlet of the settling pond are suspected to play a role in some elevated radium values at D-3 (Appendix V), but these values remained well within compliance limits. Annual average barium concentrations have followed the

same trend over the last five years and can be attributed to the barium chloride addition used for radium-226 removal upstream in the D-22 influent.

Uranium concentrations at D-3 are higher than the influent uranium concentrations at D-22 (Table 5.2.1.2a) however, this is likely attributed to a 1959 operational spill that impacted Lower Williams Lake (DML 1995).

Uranium concentrations at D-3 have remained stable and are below the Canadian water quality guideline for protection of aquatic life (0.0150 mg/L) (CCME, 2020) as well as the guideline for Canadian drinking water quality (0.02 mg/L; Health Canada 2019). Despite some variability, all parameter annual average concentrations consistently met downstream receiving environment water quality criteria (Table 4.2.2).

Table 5.2.1.2b Lower Williams Final Discharge at Denison Access Road (D-3)

PARAMETER UNITS	Flow (L/s)	Hardness mg/L	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2020	10.67	83.5	7.1	45.3	1	0.175	0.391	0.0005	0.25	0.047	0.0029
2021	4.72	101.2	7.1	56.6	1	0.221	0.388	0.0005	0.21	0.040	0.0033
2022	6.02	133.6	7.0	85.0	1	0.154	0.348	0.0005	0.13	0.040	0.0076
2023	6.9	118.4	7.1	79.6	1	0.103	0.316	0.0004	0.11	0.019	0.0063
2024	10.7	105.6	7.1	66.2	1	0.144	0.384	0.0003	0.25	0.053	0.0060
Annual Summary Statistics											
Average	7.80	108.5	7.1	66.5	1	0.159	0.365	0.0004	0.19	0.040	0.0052
Maximum	10.70	133.6	7.1	85.0	1	0.221	0.391	0.0005	0.25	0.053	0.0076
Minimum	4.72	83.5	7.0	45.3	1	0.103	0.316	0.0003	0.11	0.019	0.0029

Note: Five year annual average, maximum and minimum statistics

In 2024, LWL effluent quality at the final point of control, D-3, was in compliance with the discharge limits established in the decommissioning licence (Table 5.2.1.2.1).

Table 5.2.1.2.1 2024 Lower Williams Compliance with Discharge Limits at Final Point of Control (D-3)

Month	Samples Required	Number of Times Discharge Limits Were Exceeded					
		pH pH units		TSS mg/L		Ra(T) Bq/L	
		Grab Sample Limit[1]: Upper 9.5 Lower 5.5	Monthly Arithmetic Mean[1]: Upper 9.5 Lower 6.5	Grab Sample Limit[1]: Upper 50 Lower N/A	Monthly Arithmetic Mean[1]: Upper 25 Lower N/A	Grab Sample Limit[1]: Upper 1.11 Lower N/A	Monthly Arithmetic Mean[1]: Upper 0.37 Lower N/A
Jan.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Feb.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Mar.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Apr.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
May	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
June	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
July	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Aug.	0	Zero Discharge					
Sept.	0	Zero Discharge					
Oct.	1	0 of 1	0 of 1	0 of 1	0 of 1	0 of 1	0 of 1
Nov.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Dec.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
YTD	41	0 of 41	0 of 10	0 of 41	0 of 10	0 of 41	0 of 10

[1]Limits established in the Licence UMDL-MINEMILL-DENISON.01/indf issued December 15, 2004.

5.2.1.3 Stanrock ETP

Discharge, runoff, and seepage from the Stanrock TMA collects into a small holding pond where the ETP influent station is monitored. Samples were analysed within the holding pond prior to treatment (DS-2) to closely monitor and make treatment adjustments as required to ensure compliant water quality at the final discharge station (DS-4).

A five-year review of the annual averages at DS-2 confirms this station to have a low pH with a high acid concentration. The annual average concentrations for most parameters at DS-2 appeared to be relatively stable with some small variability or increases in metal concentrations between 2020 and 2023. Radium-226 decreased slightly over the previous four years, with the lowest annual average of the past five years measured in 2023, however concentrations increased in 2024. Acidity, sulphate, cobalt, iron and uranium concentrations also increased in 2024 and could be attributed to lowering the ETP holding pond for maintenance in the summer of 2024 (Table 5.2.1.3a). These increases at DS-2 did not influence downstream concentrations (Table 5.2.1.3b). Annual averages of radium-226 continue to remain below SRWMP benchmarks (Table 5.2.1.3a). Flows at DS-2 continue to be low due to lower precipitation in the area but are higher compared to the past 3 years due to extra days of treatment for maintenance activities. Detailed results for 2024 are provided in Appendix V of this report and previous results are provided in their respective Annual OCM Reports (Denison, 2019-2023).

Table 5.2.1.3a Stanrock Influent (DS-2)

PARAMETER UNITS	Flow (L/s)	ACID mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2020	65.76	171	3.1	437.5	0.273	0.019	0.0598	28.38	1.067	0.0150
2021	32.09	175	2.9	467.5	0.265	0.017	0.0551	26.65	1.362	0.0120
2022	27.36	160	2.9	457.5	0.242	0.018	0.0411	24.70	1.410	0.0098
2023	31.75	177	2.8	483.3	0.194	0.027	0.0538	28.67	1.438	0.0149
2024	36.1	212	2.8	505.8	0.378	0.019	0.0956	35.83	1.390	0.0448
Annual Summary Statistics										
Average	38.61	179	2.9	470.3	0.270	0.020	0.0611	28.85	1.333	0.0193
Maximum	65.76	212	3.1	505.8	0.378	0.027	0.0956	35.83	1.438	0.0448
Minimum	27.36	160	2.8	437.5	0.194	0.017	0.0411	24.70	1.067	0.0098

Note: Five-year annual average, maximum and minimum statistics

Water quality at the Stanrock Final Point of Control is monitored at Orient Lake Outlet (DS-4). A review of water quality data at DS-4 for the last five years indicated generally stable pH values and TSS levels, that consistently met the discharge limits set out in the licence (Table 5.2.1.3.b). All metal concentrations consistently met receiving environment benchmarks for SRWMP (Table 4.2.2). Radium-226 annual averages continued to remain well below the monthly mean discharge criteria of 0.37 Bq/L and below the grab sample limit of 1.1 Bq/L as set out in the decommissioning licence. Annual radium-226 concentrations have remained generally stable and well below discharge limits. Annual average barium concentrations show little variability over the last five years and are very low.

Table 5.2.1.3b Orient Lake Outlet Stanrock Final Point of Control (DS-4)

PARAMETER UNITS	Flow (L/s)	Hardness	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2020	43.42	279.6	7.0	224.2	1	0.086	0.067	0.0005	0.13	0.040	0.0038
2021	20.42	245.7	7.1	222.5	1	0.128	0.077	< 0.0005	0.09	0.032	0.0050
2022	22.96	283.3	7.2	236.7	1	0.112	0.059	0.0006	0.11	0.047	0.0064
2023	30.77	311.5	7.2	260.8	1	0.094	0.050	0.0004	0.12	0.047	0.0093
2024	32.06	293.3	7.3	262.3	1	0.115	0.044	0.0003	0.02	0.044	0.0072
Annual Summary Statistics											
Average	29.93	282.7	7.2	241.3	1	0.107	0.059	0.0005	0.09	0.042	0.0063
Maximum	43.42	311.5	7.3	262.3	1	0.128	0.077	0.0006	0.13	0.047	0.0093
Minimum	20.42	245.7	7.0	222.5	1	0.086	0.044	0.0003	0.02	0.032	0.0038

Note: Five year annual average, maximum and minimum statistics

Note: Five-year annual average, maximum and minimum statistics

Toxicity was monitored for the Stanrock site at the final discharge (DS-4) as per SAMP requirements. In 2024, toxicity testing was done in the spring and fall and included the same tests that were completed for the Denison TMA-1 final effluent (D-2). The June and September *Daphnia magna* and rainbow trout acute lethality tests resulted in 0% mortality. The June and September IC_{25} *Ceriodaphnia dubia* reproduction test results were 100% and 58% effluent, respectively, indicating some variability and potential sub-lethal issues with reproduction in the fall test. All parameter concentrations in the sample effluent were within typical values for DS-4 and below aquatic toxicity benchmarks; and controls at the laboratory were satisfactory indicating a valid test. The final discharge continues to be not acutely toxic and sublethal toxicity at DS-4 will continue to be monitored in 2025. In 2024, Stanrock TMA effluent quality at the final point of control (DS-4), met the discharge criteria established in the decommissioning licence (Table 5.2.1.3.1).

Table 5.2.1.3.1 2024 Stanrock TMA Compliance with Discharge Limits at Final Point of Control (DS-4)

Month	Samples Required	Number of Times Discharge Limits Were Exceeded					
		pH pH units		TSS mg/L		Ra(T) Bq/L	
		Grab Sample Limit[1]: Upper 9.5 Lower 5.5	Monthly Arithmetic Mean[1]: Upper 9.5 Lower 6.5	Grab Sample Limit[1]: Upper 50 Lower N/A	Monthly Arithmetic Mean[1]: Upper 25 Lower N/A	Grab Sample Limit[1]: Upper 1.11 Lower N/A	Monthly Arithmetic Mean[1]: Upper 0.37 Lower N/A
Jan.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Feb.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Mar.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Apr.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
May	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
June	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
July	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Aug.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Sept.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Oct.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
Nov.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Dec.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
YTD	53	0 of 53	0 of 12	0 of 53	0 of 12	0 of 53	0 of 12

[1]Limits established in the Licence UMDL-Minemill-Stanrock.02/indf issued September, 2010.

5.2.1.3.1 Unnamed Pond Adjacent to Stanrock Mine Site

In 2024, Denison further investigated the depressed pH levels in the unnamed pond adjacent to the Stanrock site. Investigations suggested the potential for some TMA diversion water to be migrating toward the ponded area due to drainage impedance through a diversion channel. Modifications were made to the diversion channel to improve flow in 2024. The influence of this alteration on the ponded water area will be further evaluated in 2025.

An update on unnamed pond water quality along with other investigation results will be provided under separate cover in 2025.

5.2.2 Groundwater Quality

Detailed groundwater QA/QC results against DQOs are included in Appendix III and groundwater station-specific five-year annual data are included in Appendix V. The 2024 groundwater field blank and field precision data summary is presented in Table 5.2.2.

The field precision DQO of 20% for pH, acidity, sulphate and iron was not exceeded in 2024 (Table 5.2.2).

The iron field blank DQO criteria of 0.04 mg/L was exceeded in 2 of 3 samples at <0.07 mg/L and 0.19 mg/L. However, the iron concentration at this location, 98-15A, is much higher (>1,000 mg/L) and therefore this does not impact interpretation of groundwater quality results at this location. The result of 0.19 mg/L was unable to be reanalysed but was a result of sample contamination by laboratory analysis carryover. The sulphate field blank DQO was met in 3 of 3 samples while the acidity field blank DQO was exceeded in 3 of 3 samples. This may indicate contamination of field or laboratory equipment and/or lack of adequate rinsing of field or laboratory equipment. Sampling procedures will be reviewed, updated if warranted, and implemented before the 2025 sampling campaign.

Table 5.2.2 2024 Groundwater Field Blank and Field Precision Data Summary

		pH pH units	SO_4 mg/L	Acidity mg/L	Fe mg/L
Field Blank Statistics					
	Count	3	3	3	3
	Average	6.7	<0.2	**11.7**	**0.09**
	Min	6.2	<0.2	**4**	0.01
	Max	7.2	<0.2	**21**	**0.19**
Field Blank Exceedances					
	DQO Criteria[1]	-	0.2	2	0.04
	# Exceedances	0	0	3	2
Field Precision Statistics					
	Count	3	3	2	3
	Average	1%	4%	1%	1%
	Min	0%	0%	0%	1%
	Max	2%	12%	2%	1%
Field Precision Exceedances					
	DQO Criteria[1]	20%	20%	20%	20%
	# Exceedances	0	0	0	0

[1]Field criteria taken from Table 6.2 of the Cycle 5 Study Design for SRWMP, SAMP and TOMP (Minnow Environmental Inc., 2019)

Bold indicates an exceedance of the criteria

5.2.2.1 Denison TMA-1 Groundwater Results

Sampling attempts were unsuccessful from the nested monitoring stations BH91 D1A and BH91 D1B, at the east end of TMA-1, downstream of Dam 17 on the North Abutment, in 2024 (Appendix V). Samples were not able to be collected at these stations in 2021, 2022 and 2023 therefore, the lack of sample collection in 2024 is not unexpected. Alternative methods to sample this location will be investigated in 2025.

Groundwater quality downstream of Dam 17 in the North Valley (BH91 D3A and BH91 D3B) could be characterized by having stable pH values with relatively high acidity, iron, and sulphate concentrations. BH91 D3A pH remains neutral and is back within historical range at 6.5 after a slight increase in 2023. Concentrations of most measured parameters at these stations were slightly variable over the past five years. Although acidity and iron showed a marked decline at BH91 D3A in 2022 at 48 mg/L and 88.6 mg/L, respectively, these concentrations returned to trend in 2023. In 2024 there was a slight decrease in acidity, and a slight increase in iron compared to 2023. Similarly, iron concentrations decreased to a lesser degree at BH91 D3B to 126 mg/L in 2022 and came back up to 146 mg/L in 2023. Acidity at both stations is trending lower over the past 5 years (Appendix V).

Downstream of Dam 10 (BH91 DG4B) groundwater was characterized by near neutral pH, variable sulphate concentrations, and historically low acidity over the past five years (Appendix V). Iron concentrations continue to be low compared to other wells. Sulphate concentration increased in 2020 but has been slowly declining, with a more marked drop between 2022 and 2023, 700 mg/L to 560 mg/L, respectively (Appendix V). 2024 values for both sulphate and iron continue to decrease.

5.2.2.2 Denison Lower Williams Lake

A review of the last five years of groundwater monitoring results downstream of Dam 1 on the North Ridge (BH91 D9A) indicated relatively stable and near neutral pH levels. Acidity concentrations have generally decreased over the past five years, with a slight increase in 2023, coming back down in 2024 (Appendix V). Sulphate concentrations are similar to other GW stations and are trending slightly lower over the last five years. Iron concentrations saw a slight decline in 2022 and continue to stay lower compared to the two years prior (Appendix V).

5.2.2.3 Stanrock

Groundwater quality was measured at Stanrock downstream of the following dams: Dam A (BH91 SG1A), Dam B (BH98-16A), and Dam C (BH98-15A). Wells BH91 SG3 and BH91 SG3B under Dam D have not produced enough water to sample in the last 5 years.

Dam A groundwater was characterized by low pH levels with consistently elevated sulphate, acidity, and iron concentrations (Appendix V). Iron concentrations had been decreasing steadily over the past five years but came up to 859 mg/L compared to 635 mg/L in 2023. pH and sulphate values saw a decline in 2023 compared to the three years previous but have come back up to historical range in 2024 (Appendix V). Acidity results for BH91 SG1A were not reportable due to analytical error.

Dam B groundwater quality also has a low pH and elevated sulphate, acidity and iron concentrations (Appendix V). Iron and sulphate concentrations are relatively stable with a

slight decrease for all in 2023 and within historical values in 2024 (Appendix V). Acidity results were not reportable due to analytical error.

Groundwater quality monitored downstream of Dam C at BH98 15A indicates depressed pH with consistently high acidity, sulphate and iron, (Appendix V). Acidity, sulphate and iron were all trending slightly lower over the past 5 years with the exception of a slight increase in 2022.

5.2.3 Porewater Quality

TMA porewater quality at the Stanrock site was monitored upstream of Dam A at the following stations: ST3, which includes four nested wells: ST3 P3 (total depth = 5.94 m), ST3 P5 (total depth = 2.64 m), ST3 P6 (total depth = 11.58 m), and ST3 P8 (total depth = 20.91m), and nested wells upstream of Dam D at BH91 SG2A (total depth = 33.31 m), BH91 SG2D (total depth = 4.39 m).

Assessment of the porewater quality data at the above mentioned ST3 stations show low pH levels with the lowest value observed at surface (2.64 m), ranging from 3.3 to 3.5, with high acidity, sulphate, and iron concentrations in all wells (Appendix V). There was not enough sample volume in the ST3 P5 well to measure acidity and iron, but a sulphate sample was collected. Concentrations of acidity, iron, and sulphate were highest in the deeper wells (i.e. ST3 P6 and ST3 P8), with lower concentrations in the shallower wells (ST3 P3 and ST3 P5).

Samples could not be collected at the monitoring well located in the tailings behind Dam D (BH91 SG2D) over the last five years due to no recharge of the well, however samples were collected at BH91 SG2A. Porewater quality results obtained at this station were consistent over the last five years, with elevated concentrations of iron, acidity and sulphate; acidity and iron saw a slight increase in 2023 and iron again in 2024. Acidity results were not reported due to analytical error. This is very similar to all other monitoring stations at Stanrock (Appendix V). It was predicted that porewater quality at the Stanrock site would improve over time but would require treatment for acidity control until year 50 post decommissioning (Denison 1995). Porewater pH and sulphate levels are in line with 10-year post decommissioning values at some locations and depths indicating a longer than initially anticipated transition decommissioning phase for porewater recovery.

5.3 Site Specific Maintenance and Operations Program

Site-specific program reports are provided in the following sections in accordance with the TOMP and SAMP Annual Reporting Requirements. Each section provides the following information:

- Summary of Tailings Management Area (TMA) Maintenance
- Summary of Effluent Treatment Plant (ETP) Operations

5.3.1 Denison TMA-1

5.3.1.1 TMA Maintenance

Routine facility, shaft cap, culvert and sign inspections, preventative maintenance were performed at the Denison TMA-1 as required. All routine seasonal maintenance items were completed including but not limited to: applying herbicide on all dams and roads to control vegetation, grading site roads to prevent erosion, snow removal and sanding as required, brushing sampling locations and flushing dam instrumentation wells. Proper calibrations of monitoring equipment were conducted on a consistent basis and recorded accordingly. A dam

safety inspection with the Engineer of Record (WSP) was performed for all dams/berms on the Denison site; the resulting report will be submitted under separate cover. In addition to the annual dam safety inspection, a 10-year Dam Safety Review by a third-party engineering firm was also conducted in 2024; the resulting report will also be submitted to regulators under separate cover. Both reports conclude that dams at both facilities are operated and maintained in accordance with appropriate practices and meet safety requirements of current guidelines. All maintenance was completed to ensure continued efficiency and safe operations.

Some non-routine maintenance activities for Denison TMA-1 site completed in 2024 are as follows:

- There was a focus on site clean-up in 2024.
  - A new laydown area was identified on site and all old piping laying around site was stockpiled in this location.
  - The floors inside the Effluent Treatment Plant were cleaned and painted.
- Re-keyed all site gate and plant locks to ensure security.
- Effluent Treatment Plant work:
  - Repaired siphon line flanges at ETP.
  - Cleaned the intakes on all siphon lines to be ready for freshet.
  - Lengthened pipe on barium addition point to middle of mixing cell to ensure better mixing of reagent with the effluent water.
  - Replaced shingles that had blown from roof in a windstorm.
  - Washed and cleaned out barium tanks.
  - Replaced faulty pump actuator on barium dosage pump and prepared a hot spare on site in case of future failures.
  - Replaced broken intrusion alarm contact.
  - Installed Starlink as part of a project to improve SCADA communications.
- Excavated and evaluated a small sinkhole discovered approximately 10 m beyond the downstream toe of Dam 10. Details and findings were reported to Denison's Engineer of Record. No risk was identified, and the hole was backfilled to grade.
- Repaired and reinforced beaver deceiver fencing around culverts under Dam 10 access road for the outlet of Little Cinder Lake.
- Brushed out ditch along road to #2 Shaft to assist drainage and protect road from erosion.
- Boulders were installed on a small road to Denison Falls to deter public vehicle access.
- Repaired back road to the Mill Gate. Road had partially washed out due to heavy rains.

- A longer chain was installed, and a redundant latch was removed from the Mill Gate to eliminate a pinch point.
- Shortened standpipes on several monitoring wells that were preventing lids from being secured.

5.3.1.2 ETP Operations

The ETP located at the Denison TMA-1 spillway (D-1) operated for 87 days in 2024 (Table 5.3.1.2.1). The ETP treated approximately 551,000,000 L of water, with a monthly average daily plant flow of 73 L/s. A total of 6,910 kg of barium chloride was used for radium-226 removal, less than the approximately 8,600 kg used in 2023. Sodium hydroxide (NaOH) was not utilized for pH neutralization in 2024 because the TMA-1 influent is already neutral to slightly alkaline, ranging from 7.4 to 9.1 and therefore does not impact pH downstream at the final discharge at D-2 (Table 5.3.1.2.1). An estimated 1,180,000,000 L was discharged from the final point of control at the Stollery Lake Settling Pond Outlet (D-2). Although the ETP only operated for 87 days, discharge at D-2 occurred for 366 days in 2024 (Table 5.3.1.2.1). Annual monthly average daily discharge flow was 37 L/s.

5.3.1.2.1 Operating Summary

In 2024, the TMA-1 ETP operated consistently for 82 days from March to May when it was shut down on May 24. The ETP resumed operation from October 28 to November 1 for an internal study on radium removal. Results of the study will be provided under separate cover in 2025. Various siphon pipelines were used to draw from TMA-1 to maintain a controlled release of water. Lower than normal precipitation, especially snow in 2024, ultimately resulted in the low number of operational days for the ETP.

Table 5.3.1.2.1 2024 TMA-1 Effluent Treatment Plant Flow Rates, Operating Days, and Discharge Days

ITEM	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	Y.T.D. 2024	Y.T.D. 2023
PLANT OPERATIONS														
Operating Days	0	0	28	30	24	0	0	0	0	4	1	0	87	130
Maximum Daily Plant Flow (L/s D-1)	0	0	89	120	119	0	0	0	0	29	29	0	120	83
Minimum Daily Plant Flow (L/s @ D-1)	0	0	29	88	32	0	0	0	0	26	29	0	0	0
Monthly Average Daily Plant Flow (L/s @ D-1)	0	0	46	105	76	0	0	0	0	27	29	0	73	68
Total Volume Treated (ML)	0	0	110	273	157	0	0	0	0	9	3	0	551	759
Barium Chloride Consumption														
total kg/month	0	0	1396	3426	1932	0	0	0	0	127	29	0	6910	8659
monthly average mg/litre	0.00	0.00	12.65	12.57	12.34	0.00	0.00	0.00	0.00	13.45	11.52	0.00	12.53	11.41
Caustic Soda Consumption														
total kg/month	0	0	0	0	0	0	0	0	0	0	0	0	0	0
monthly average mg/litre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFLUENT														
Discharge Days	31	29	31	30	31	30	31	31	30	31	30	31	366	365
Maximum Daily Discharge Flow (L/s D-2)	29	39	86	196	137	29	21	17	13	14	34	41	196	321
Minimum Daily Discharge Flow (L/s D-2)	17	17	55	94	21	10	13	10	13	10	21	17	10	4
Monthly Average Daily Discharge Flow (L/s D-2)	22	27	71	140	66	17	19	13	13	11	24	27	37	47
Total Volume Discharged (ML)	58	69	189	363	175	43	50	35	34	29	63	71	1180	1482

5.3.2 Denison Lower Williams Lake and TMA-2

5.3.2.1 TMA Maintenance

Routine facility, shaft cap, culvert and sign inspections, preventative maintenance were performed at the Denison TMA-2 and the Lower Williams Lake site as required. All routine seasonal maintenance items were completed including but not limited to: applying herbicide on all dams and roads to control vegetation, grading site roads to prevent erosion, snow removal and sanding as required, brushing sampling locations and flushing of select dam instrumentation wells. Proper calibrations of monitoring equipment were conducted on a consistent basis and recorded accordingly. The annual dam safety inspection and 10-year dam safety review noted in Section 5.3.1.1 included inspection of dams and berms at TMA-2 and Lower Williams Lake. All maintenance was completed to ensure continued efficiency and safe operations on site.

Some non-routine maintenance activities for Denison TMA-2 and the Lower Williams Lake site completed in 2024 are as follows:

- Re-keyed all site gate and plant locks to ensure security.
- Effluent Treatment Plant work:
    - Repaired and replaced soffit damaged during a windstorm,
    - Clean and paint floor,
    - Replaced valve on barium drip system to give finer adjustment of reagent addition,
    - Emptied and cleaned out settled barium reagent tank,
    - Raised barium tank off floor to increase availability of reagent in the tank,
    - Repair flapper on barium day tank, flapper manually controls level in tank.
- Installed pond-leveler style beaver deceiver at Williams Lake Outlet (D-3A) to alleviate repeated manual clearing of beaver debris at this particular location. The deceiver appears to be function well with ongoing modifications and maintenance performed as needed.

5.3.2.2 Summary of ETP Operations

The ETP located at the Denison Lower Williams Lake station (D-22) operated for 359 days in 2024 (Table 5.3.2.2.1). The ETP treated approximately 374,000,000 L of water, with a monthly average final discharge flow of 14 L/s. The total amount of barium chloride that was used for radium-226 removal was 2,391 kg, slightly higher than 2023 usage. Although annual radium-226 concentrations had indicated a gradually increasing trend between 2019 and 2021, concentrations were decreasing between 2021 and 2023, then rose slightly in 2024. Radium-226 concentrations are still well below discharge limits at D-3 (Table 5.2.1.2.b). Influent (D-22) radium-226 concentrations in 2024 were just below discharge criteria (0.37 Bq/L monthly mean). An

estimated 335,000,000 L was discharged from the final point of control (D-3) and took place over 275 days of 2024. Annual monthly average daily discharge flow was 14 L/s (Table 5.3.2.2.1).

5.3.2.2.1 Operating Summary

In 2024, the Denison Lower Williams Lake ETP operated every month with a brief break in September. Periodic operation of the ETP was a result of warmer and drier than normal conditions in 2024. Treatment conditions at LWL were for the sole purpose of controlling radium-226 levels in the effluent which are well below the discharge criteria, with 2024 influent concentrations at the discharge criteria level. Neutralization treatment has not been required at this site since 2002.

Table 5.3.2.2.1 2024 Lower Williams Lake ETP Flow Rates, Operating Days, and Discharge Days

ITEM	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	Y.T.D. 2024	Y.T.D. 2023
PLANT OPERATIONS														
Operating Days	31	29	31	30	31	30	31	31	23	31	30	31	359	312
Maximum Daily Plant Flow (L/s @ D-3)	5	7	136	100	35	8	7	0	0	15	17	31	136	79
Minimum Daily Plant Flow (L/s @ D-3)	4	3	12	4	2	1	2	0	0	15	7	5	0	0
Monthly Average Daily Plant Flow (L/s @ D-3)	4	5	46	29	11	3	4	0	0	15	10	14	12	8
Total Volume Treated (ML)	12	11	123	75	30	7	11	0	0	40	27	37	374	224
Barium Chloride Consumption														
total kg/month	206	193	206	200	206	200	206	206	153	206	200	206	2391	2024
monthly average mg/litre	17.52	17.13	1.68	2.66	6.85	28.03	18.14	0.00	0.00	5.14	7.52	5.59	6	9
Caustic Soda Consumption														
total kg/month	0	0	0	0	0	0	0	0	0	0	0	0	0	0
monthly average mg/litre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EFFLUENT														
Discharge Days	31	29	31	30	31	30	31	0	0	1	30	31	275	251
Maximum Discharge Flow (L/s @ D-3)	5	7	136	100	35	8	7	0	0	15	17	31	136	79
Minimum Discharge Flow (L/s @ D-3)	4	3	12	4	2	1	2	0	0	15	7	5	0	0
Monthly Average Discharge Flow (L/s @ D-3)	4	5	46	29	11	3	4	0	0	15	10	14	14	10
Total Volume Discharged (ML)	12	11	123	75	30	7	11	0	0	1	27	37	335	218

5.3.3 Stanrock TMA

5.3.3.1 TMA Maintenance

Routine facility, shaft cap, culvert and sign inspections, preventative maintenance were performed at the Denison Stanrock TMA site as required. All routine seasonal maintenance items were completed including but not limited to: applying herbicide on all dams and roads to control vegetation, grading site roads to prevent erosion, snow removal and sanding as required, brushing sampling locations and flushing dam instrumentation wells. Proper calibrations of monitoring equipment were conducted on a consistent basis and recorded accordingly. The annual dam safety inspection and 10-year dam safety review noted in Section 5.3.1.1 included inspection of dams and berms at the Stanrock TMA. All maintenance was completed to ensure continued efficiency and safe operations on site.

Some non-routine maintenance activities for Denison Stanrock TMA site completed in 2024 are as follows:

- There was a focus on site clean-up in 2024.
    - A new laydown area was identified on site and all old piping laying around site was stockpiled in this location.
    - Removed collapsed plywood bridge downstream of DS-4.
    - The floors inside the ETP and both pumphouses were cleaned and painted.
- ETP work:
    - Oil leak in mixing cell 1 and lime tank agitators fixed, and oil level in mixing cell 2 agitator verified,
    - A new pH transmitter and probe were installed in the ETP bypass creek to allow a pH measurement in the event of a ETP bypass due to high flows,
    - Replaced a faulty electric motor on Lime Pump #1.
    - Replaced worn out packing in Lime Pump #2.
    - Replaced an isolation valve on Lime Pump #2 that was leaking.
    - Removed old pneumatic backup lime addition valve and installed a new electric lime addition valve.
    - Replaced faulty electrical outlet in ETP.
    - Lime and barium tanks emptied and cleaned out.
    - Replaced gasket on manhole door to lime tank that was damaged during door removal for clean out.
    - Brought the holding pond level down to facilitate an intake pipe inspection from the pond to the first mixing cell and from the second mixing cell to the

discharge. Videos were taken and evaluated. All piping was found to be in satisfactory condition

  - Replaced weather stripping on bottom of garage door at Stanrock ETP to stop heat from escaping and to keep rodents from entering.
  - Repaired an old pipe hole in the floor grating identified during a safety audit.
  - Replaced pH probe and transmitter in the ETP with one that allowed for temperature compensation.
  - Fabricated an “air agitator” that could be inserted into mixing chambers or reagent tanks to be used with the compressor to agitate in the event of an agitator failure.

- Dam M and G work:
  - Replaced failed pump #4 at Dam G, its corresponding electrical starter, overload block and fuses. All fusing for all pumps at Dam M and G verified to be correct type and size.
  - Patched hole in Dam M storage shed and installed new lock.
  - Removed remnants of steel butterfly valve from Dam G discharge line.
  - Replaced Wi-Fi radios between Dam M and Dam G pumphouses to restore communications for SCADA.
  - Repaired wooden trestle for Dam G pump discharge lines.
  - Replaced failed pump #2 at Dam G.
  - Replaced failed pump #4 at Dam G a second time.
- TMA work:
  - Re-keyed all site gate and plant locks to ensure security.
  - Installed culverts on swale behind Dam B to eliminate driving trucks through tailings seepage water.
  - Road maintenance between Dam G and Beaver Lake turnoff. Installed riprap drainage where culverts were not possible, added rip rap to sides of roadwork performed in 2023 to eliminate erosion.
  - Replaced missing CNSC License sign on Dam A Gate.
  - Repaired siphon line at head pond.
  - Fabricated and installed new groundwater well casings that had disintegrated (Wells 98-16A and 98-15A).
  - Shortened standpipes on several monitoring wells that were preventing lids from closing and subsequently locking.
  - Installed boulders to prevent ATV trespassing on site (near Canmet gate).

  - Drilled drain hole in Moose Lake Gate pipe post to prevent water from collecting and rusting.
- Work on Dam A ditch to improve water flow to collection system and ETP treatment
  - Rip rap banks installed to narrow collection ditch which will increase flow velocity preventing build up. Banks also allow future access to better maintain them
  - Culverts and ditches cleaned re-establishing water collection. Water is now collected from wetland as intended
- Install Starlink internet at ETP and Dam M as part of a project to improve SCADA communications.

5.3.3.2 Summary of ETP Operations

The Stanrock ETP operated periodically throughout the year for the purpose of pH neutralization and radium-226 removal. The ETP, which was monitored at station DS-2, operated a total of 132 days, with an average monthly daily plant flow of 101 L/s. Throughout 2024, an estimated 1,157,000,000 L of water were treated with barium chloride for radium-226 removal and lime addition for neutralization. In 2024, 741 kg of barium chloride and 157.69 dry tonnes of lime were used at the Stanrock ETP. In total, 999,000,000 L were discharged from the final point of control (DS-4), over a total of 366 days. Monthly average daily discharge flow at DS-4 was 32 L/s for 2024 (Table 5.3.3.2.1).

5.3.3.2.1 Operating Summary

The Stanrock ETP operated as required throughout the year to maintain discharge compliance and control of the Holding Pond water levels. Operating days within each month ranged from 2 to 26 days, operating in ten months of the reporting year. Most of the operating days were during November, early winter and early spring as rainfall and runoff conditions were most often present during these times of the year (Table 5.3.3.2.1). No water entered the Moose Lake Settling Pond from Beaver Lake, and caustic soda was not dispensed into Orient Creek in 2024.

Table 5.3.3.2.1 2024 Stanrock ETP Flow Rates, Operating Days, and Discharge Days

ITEM	JAN	FEB	MAR	APR	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	Y.T.D. 2024	Y.T.D. 2023
PLANT OPERATIONS														
Operating Days	12	4	25	26	16	0	8	12	2	0	13	14	132	107
Maximum Daily Plant Flow (L/s @ DS-2)	125	123	140	145	147	0	138	96	15	0	125	127	147	157
Minimum Daily Plant Flow (L/s @ DS-2)	85	103	77	74	94	0	106	15	10	0	82	85	0	0
Monthly Average Daily Plant Flow (L/s @ DS-2)	101	112	109	105	121	0	124	41	13	0	98	112	101	111
Total Volume Treated (ML)	105	39	236	236	167	0	86	42	2	0	110	135	1157	1024
Barium Chloride Consumption														
total kg/month	83	21	259	157	77	0	10	24	3	0	54	51	741	912
monthly average mg/litre	0.79	0.54	1.10	0.67	0.46	0.00	0.12	0.58	1.55	0.00	0.49	0.38	0.64	0.89
Lime Consumption														
total dry tonnes/month	11.23	3.69	33.61	32.12	27.65	0.00	11.81	4.81	0.55	0.00	16.99	15.23	157.69	106.58
monthly average g/litre	0.11	0.10	0.14	0.14	0.17	0.00	0.14	0.11	0.25	0.00	0.15	0.11	0.14	0.10
NEUTRALIZATION														
Lime Consumption														
Beaver Lake total dry tonnes/month	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0
Site total including ETP Operations	11.23	3.69	33.61	32.12	27.65	0.00	11.81	4.81	0.55	0.00	16.99	15.23	157.69	106.6
EFFLUENT														
Discharge Days	31	29	31	30	31	30	31	31	30	31	30	31	366	365
Maximum Daily Discharge Flow (L/s @ DS-4)	35	13	254	197	67	9	9	3	13	6	25	153	254	323
Minimum Daily Discharge Flow (L/s @ DS-4)	13	6	48	54	5	3	1	1	1	1	9	13	1	1
Monthly Average Daily Discharge Flow (L/s @ DS-4)	21	9	127	100	27	5	5	3	4	3	15	59	32	31
Total Volume Discharged (ML)	57	21	341	260	71	14	13	7	10	9	39	157	999	981

5.4 Summary

All Denison Elliot Lake sites were operated in compliance with regulatory requirements and current guidelines with no significant exceedances or concerns of note.

6 REFERENCES

Minnow Environmental Inc. and Beak International Incorporated, 2001. Serpent River Watershed Monitoring Program – 1999 Study. April 2001.

Minnow Environmental Inc., 2019. The Cycle 5 Study Design for the SRWMP, SAMP and TOMP. Prepared for Rio Algom Limited and Denison Mines Inc. February 2019.

Minnow Environmental Inc., 2021. Serpent River Watershed Cycle 5 (2014 to 2019) State of the Environment Report. Prepared for Rio Algom Limited and Denison Mines Inc. March 2021.

Minnow Environmental Inc., 2022. Investigation into the Surface Water Quality of Unnamed Pond, Stanrock TMA Site, Elliot Lake, ON. February 2022.

Minnow Environmental Inc. 2024. Cycle 6 Study Design for the TOMP, SAMP and SRWMP. Prepared for Rio Algom Limited and Denison Mines Inc. November 2024.

Denison Mines Inc. and Rio Algom Limited. Serpent River Watershed Monitoring Program 2024 Annual Water Quality Report. (Rio Algom Limited and Denison Mines Inc.) March 2025.

Denison Mining Limited (DML). 1995. Environmental Impact Statement (EIS) Decommissioning of the Denison and Stanrock Tailings Management Areas. February 1995.

Golder Associates Ltd. (Golder) 2021a. 2021 Tailings Dam Safety Inspection Report Denison TMA 1&2. June 2022.

Golder Associates Ltd. (Golder) 2021b. 2021 Tailings Dam Safety Inspection Report Denison Stanrock Tailings Management Area. June 2022.

APPENDIX I
Summary of Cycle 5

Summary of Changes to the Elliot Lake Monitoring Programs (IBMP, TOMP, SAMP, and SRWMP) and Associated Documents[b]

Cycle	Report Title	Year	Period Covered	Descriptions of Changes to the Monitoring Programs within Each Cycle
Cycle 1	Serpent River Watershed Monitoring Program Framework Document	1999	historical monitoring data	**IBMP, TOMP, SAMP, and SRWMP** were developed based on program objectives and existing monitoring data collected over the period of operations and decommissioning.
	In-Basin Monitoring Program Report	1999		
	Serpent River Watershed and In-Basin Monitoring Program – Implementation Document	1999		
	Serpent River Watershed Monitoring Program -1999 Study	2001	1999 to 2000	
	In-Basin Monitoring Program for the Uranium Tailings Areas - 1999 Study	2001		
Cycle 2	Overview of Elliot Lake Monitoring Programs and Source Area Monitoring Program Design	2002	2000 to 2004	**Changes only SRWMP** most associated with optimization after first cycle of program was complete: • monitoring substances reduced to mine indicator parameters (barium, cobalt, DOC, iron, manganese, radium-226, selenium, silver, sulphate and uranium); • addition of two lake reference stations (Summers and Semiwite lakes) and 3 stream reference areas (SR-16, SR-17 and SR-18); • removal of shallow lakes for sediment and benthic sampling (Westner, Grassy, Halfmoom, Upper Cinder and Horne lakes); • removal of some stream sediment and benthic stations (D-15, SC-03 and SR-07); • removal of Depot Lake and Serpent Harbour; addition of May Lake; • the transfer of some SRWMP stations to SAMP or TOMP (N-12, ECA-131, P-11, MPE and Q-23); and • fish health assessment eliminated based on performance, fish community assessment added for McCabe Lake and fish tissue monitoring reduced in scope based on performance.
	TMA Operational Monitoring Program Design (TOMP)	2002		
	Cycle 2 Study Design – Serpent River Watershed and In- Basin Monitoring Programs	2004		
	Serpent River Watershed Monitoring Program: Cycle 2 Interpretive Report	2005		
	Serpent River In-Basin Monitoring Program: Cycle 2 Interpretive Report - 2004 Study	2005		
	Serpent River Watershed State of the Environment	2009		
	Monitoring Framework For Closed Uranium Mines Near Elliot Lake	2009		**IBMP** eliminated based on objectives of program being achieved. **TOMP and SAMP:** • removal of silver, selenium based on performance and removal of conductivity based on redundancy with sulphate; and
	In Basin Monitoring Program, Cycle 3 Study Design	2009		

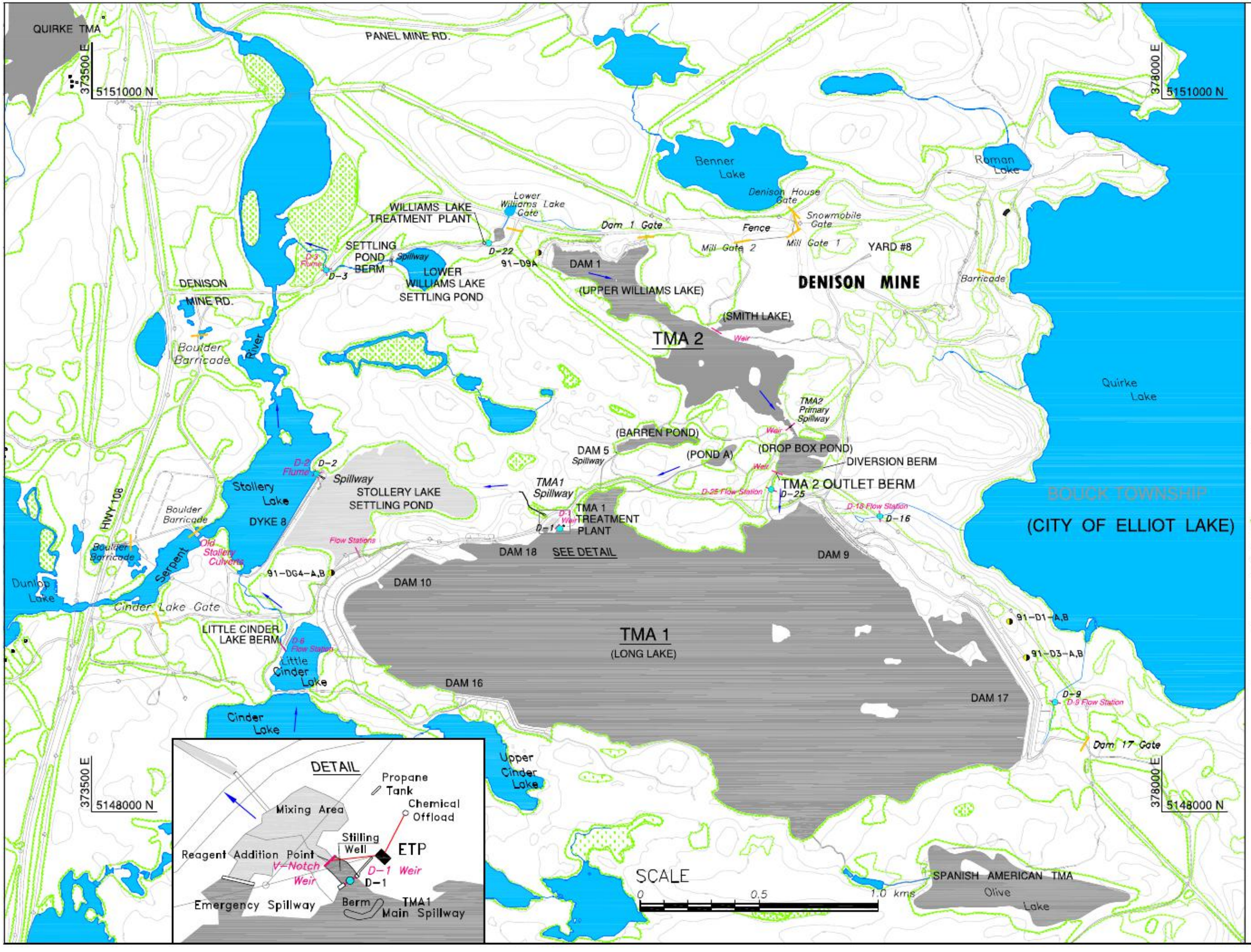
Cycle 3	Serpent River Watershed Monitoring Program: Cycle 3 Study Design	2009	2005 to 2009	• DOC, hardness and flow added at selected stations. **SRWMP:** • removal of selenium and sliver based on performance; • removal of station SR-12, ELO, SR-09, SR-15, SR-02, SR-03, SR-11, P-01, QL-01 and SR-16 and SR-17 based on performance; • monthly monitoring frequency reduced to quarterly; • sediment and benthic monitoring removed from Whiskey, Evans and Cinder lakes based on redundancy; • depositional streams (Q-20, D-6, SR-06, M-01 and SR-08) based on very high natural variability masking results; and • fishing in McCabe Lake and fish tissue monitoring eliminated based on performance.
	Source Area Monitoring Program Revised Study Design	2009		
	Tailing Management Area Monitoring Program (TOMP) Revised Study Design	2009		
	Serpent River Watershed State of the Environment Report	2011		
Cycle 4	Cycle 4 Study Design For the SRWMP, SAMP and TOMP	2014[a]	2010 to 2014	Minor changes to **TOMP** and **SAMP**. **SRWMP**: • elimination of reference stations SR-05, P-222 and SR-14; • removal of cobalt as substance for monitoring, addition of DOC; • far-field lakes removed from the program (Hough, Pecors, and McCarthy); • removal of Rochester Lake as a sediment and benthic reference area; and • reduction in benthic and sediment sampling to 1/10 years based on measured deposition rates.
	Serpent River Watershed Cycle 4 State of the Environment	2016		
Cycle 5	Cycle 5 Study Design For the SRWMP, SAMP and TOMP	2019	2015 to 2019	**TOMP, SAMP, and SRWMP**: • improved approach to trend analysis of surface water quality using the non-parametric seasonal Kendall test. **SRWMP**: • improved approach to calculate benchmark upper limit of background water quality values have previously been calculated based on the upper 95th percentile of values collect across all five years (rather than annual means); • use of a Serpent River Watershed site-specific dose-based radium-226 benchmark for assessment of water quality; • addition of a lake-specific dose-based radium-226 benchmark for assessment of sediment quality; and • sediment and benthic monitoring removed from Elliot Lake based on improvements in water quality, negligible mine-related sediment toxicity, and gradual improvement in benthic invertebrate communities.
	Serpent River Watershed Cycle 5 State of the Environment	2021		

[a] Study Design was submitted to CNSC and JRG in 2014 but reissued with agency comments in 2016.

Notes: IBMP = In Basin Monitoring Program. TOMP = Tailings Management Area Monitoring Program. SAMP = Source Area Monitoring Program. SRWMP = Serpent River Watershed Monitoring Program.

[b] Table 1.2, Cycle 5 State of the Environment Report, Minnow, 2021

APPENDIX II
Site Maps, Sampling Requirements



DENISON MINES

Denison Mines Inc.
Denison
SAMPLE LOCATION MAP

Rev. 2011-00
File 3.2.1
March 2011

Legend

- water covered tailings.
- settling ponds.
- surface water sample location.
- groundwater sample location.
- flow direction.
- roads or trails.
- power line.
- flow station or weir.
- pipeline.
- gate.
- wetlands.

Notes

- OBM © Queens Printer for Ontario, 2008.
- Mine structures and property limits were derived from Denison Mines records.
- Mapping export parameters = NAD83 WGS_1984_UTM Zone_17N (Central Meridian = 81°W).
- Contour Interval = 10 metres.

Issued on: _____

Issued by: _____

Denison Responsible Authority

Denison Mines Inc.
Stanrock Site
SAMPLE LOCATION MAP

Rev. 2011-00
March 2011

SCALE 0 0.5 kms

N W E S

5148000 N
381000 E

NELSON LAKE QUARRY
Nelson Lake
Main Gate
STANROCK MINE
Canmet Gate
Quellette Lake
Quirke Lake
Dam A Gate

TMA
DAM 'B'
DAM 'C'
DAM 'A'
DAM 'D'
DAM 'G'
DAM 'M'
DAM 'J'
DAM 'L'
DAM 'K'
DAM 'F'

BH98-16A
DS-12 Weir
DS-12
COLLECTION POND PUMP HOUSE
DS-13 Weir
DS-13
ST-3A
ST-3A Weir
SPILLWAY
BH98-15A
BH91-SG2A,D
PN-ST3
HEADPOND
BH91-SG1
DS-11
DS-11 Weirs
DS-11 Weir
SPILLWAY
RUNOFF COLLECTION POND
PUMP HOUSE
DS-16
DS-16 Weir
ST-4
ST-3
ST-1
Beaver Lake Siphon Line
L Dam G Pumping Line
DS-14
BH91-SG3A,B
ST-1A Weir
ST-1A
Beaver Lake
HOLDING POND
TREATMENT PLANT
SPILLWAY
DS-2
DS-3
DS-5
DS-5 Flume
MOOSE LAKE SETTLING POND
DS-1 Weir
DS-1
SPILLWAY
SPILLWAY
BH98-17A
DS-6 Weir
DS-6
ORIENT LAKE POLISHING POND
DS-4 Weir
DS-4
OUTLET BERM
Halfmoon Wetland
BERMS
Halfmoon Lake
384000 E
5146000 N
5146000 N
381000 E
STANROCK ROAD
Moose Lake Gate
BUCKLES TOWNSHIP

Legend

- vegetated tailings.
- collection or settling ponds.
- surface water sample location.
- groundwater sample location.
- flow direction.
- roads or trails.
- power line.
- siphon line.
- pipeline.
- wetlands.
- exposed bedrock

Notes

- OBM © Queens Printer for Ontario, 2007.
- Mine structures and property limits were derived from Denison Mines records.
- Mapping export parameters = NAD83 WGS_1984_UTM Zone_17N (Central Meridian = 81°W).

Issued on: _____
Issued by: _____
Denison Responsible Authority

Stanrock C of A
Performance Monitoring

Sampling Station	Location / Description	Coordinates	Purpose	Flow	pH	Conductivity	Sulphate	^{226}Radium (Total)	Acidity	Alkalinity	Hardness	DOC	Iron	SAMP METALS			
														Barium	Cobalt	Manganese	Uranium
DS-11	Seepage of Dam A	N 5146624 E 381977 N 5146692 E 382006	MOE	4	4	4											
DS-12	Seepage of Dam B	N 5147007 E 380926	MOE	4	4	4											
DS-13	Seepage of Dam C	N 5146909 E 381145 N 5146841 E 381158	MOE	4	4	4											
DS-14	Seepage of Dam AD	N 5146658 E 381360	MOE	4	4	4											
DS-18	Halfmoon Lake Outlet	N 5145050 E 383761	MOE	4	4		4	4					4	4	4	4	4
ST-1	Downstream of Dam G	N 5146648 E 380709	MOE		4	4											
ST-1A	Dam J at toe of dam	N 5146524 E 381229	MOE		4	4											
ST-3	Downstream of Dam G	N 5146671 E 380699	MOE		4	4											
ST-3A	Dam G at Toe of Dam	N 5146867 E 380850	MOE		4	4											
ST-4	Within Quirke Lake Delta	N 5146606 E 380354	MOE		4	4	4	4	4	4	4	4	4	4	4	4	4

Denison Groundwater
Performance Monitoring

Sampling Station	Location / Description	Coordinates	Type	Purpose	Elevation	Conductivity	pH	Acidity	Iron
BH91-D1	Dam 17 North Abutment	N 5148801 E 377359	Groundwater (2 wells)	TOMP	2	2	2	2	2
BH91-D3	Dam 17 North Valley, Toe	N 5148649 E 377430	Groundwater (2 wells)	TOMP	2	2	2	2	2
BH91-D9	Dam 1 North Ridge, Toe	N 5150352 E 375379	Groundwater (1 well)	TOMP	1	1	1	1	1
BH91-DG4	Below Dam 10	N 5149006 E 374508	Groundwater (1 well)	TOMP	1	1	1	1	1
BH91-SG2	Upstream of Dam D	N 5146809 E 381477	Porewater (2 wells)	TOMP	2	2	2	2	2
PN-ST3	Upstream of Dam A	N 5146853 E 381897	Porewater (4 wells)	TOMP	4	4	4	4	4
BH91-SG1	Downstream of Dam A	N 5146749 E 382014	Groundwater (1 well)	TOMP	1	1	1	1	1
BH91-SG3	Downstream of Dam D	N 5146669 E 381444	Groundwater (2 wells)	TOMP	2	2	2	2	2
BH98-15	Downstream of Dam C	N 5146851 E 381177	Groundwater (1 well)	TOMP	1	1	1	1	1
BH98-16	Downstream of Dam B	N 5147093 E 380933	Groundwater (1 well)	TOMP	1	1	1	1	1

Denison TOMP/SAMP
Surface Water Performance Monitoring

Sampling Station	Location / Description	Coordinates	Purpose	Elevation	Flow	pH	Conductivity	Sulphate	^{226}Radium (Total)	TSS	Acidity	Hardness	DOC	Iron	SAMP METALS				Toxicity		
															Barium	Cobalt	Manganese	Uranium	Acute *Rainbow Trout*	Acute *Daphnia magna*	Chronic *Ceriodaphnia dubia*
D-1	TMA-1 Overflow	N 5149191 E 375468	TOMP	52	261	261		4	12		4			4	4	4	4	4			
D-2	TMA-1 Stollery Lake Overflow	N 5149421 E 374446	TOMP		261	52			52	52											
D-3	TMA-2 Effluent	N 5150280 E 374485	TOMP		261	52			52	52											
D-22	TMA-2 ETP Influent	N 5150391 E 375169	TOMP			52		4	12					4	4	4	4	4			
D-25	TMA-2 Overflow into TMA-1	N 5149357 E 376357	TOMP			2		2	2		2			2							
DS-1	Stanrock Moose Lake Outlet to Orient Lake	N 5146185 E 383401	TOMP		52	52			4												
DS-2	Stanrock ETP Influent	N 5146416 E 382437	TOMP		261	261		4	12		4			4	4	4	4	4			
DS-3	Stanrock ETP Effluent	N 5146424 E 382483	TOMP			261			12												
DS-4	Stanrock Final Discharge @ Orient Lake Outlet	N 5146327 E 383888	TOMP		52	52			52	52											
DS-5	Orient Creek Discharge into Moose Lake	N 5145956 E 382549	TOMP		4	4	4														
DS-6	Moose Lake Narrows upstream of Dam K	N 5146062 E 383194	TOMP		52	52															
Denison TOMP Sites Sample Subtotal					1256	1153		14	210	156	10			14	12	12	12	12	0	0	0
D-2	TMA-1 Stollery Lake Overflow	N 5149421 E 374446	SAMP		52	52		12	12			12	12	12	12	12	12	12	2	2	2
D-3	TMA-2 Effluent	N 5150280 E 374485	SAMP		52	52		12	12			12	12	12	12	12	12	12			
D-9	Denison TMA-1; Dam 9 Seepage	N 5148462 E 377550	SAMP		4	4		4	4			4	4	4	4	4	4	4			
D-16	Denison TMA-1; Dam 17 Seepage	N 5149244 E 376814	SAMP		4	4		4	4			4	4	4	4	4	4	4			
DS-4	Stanrock Final Discharge @ Orient Lake Outlet	N 5146327 E 383888	SAMP		52	52		12	12			12	12	12	12	12	12	12	2	2	2
DS-16	Stanrock TMA; Quirke Lake Delta	N 5146663 E 380417	SAMP		4	4		4	4			4	4	4	4	4	4	4			
Denison SAMP Sites Sample Subtotal					168	168		48	48	0	0			48	48	48	48	48	4	4	4
Denison Total Samples					1424	1321		62	258	156	10	48	48	62	60	60	60	60	4	4	4
FB	Field Blank							12	12	12		4	4	12	12	12	12	12			
BS	Blind Sample							12	12	12		4	4	12	12	12	12	12			
QA/QC Samples Required based on 2002 operating days.								4.6	19.7	14.4	0.4	5.0	5.0	5.4	5.4	5.4	5.4	5.4			

APPENDIX III
Flagged Data & QA/QC Results

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi	Result		Comment
D-16	U	2024-01-04	0.0002	0.0008	0.000036	mg/L	This result flags low because of the lower MDL being reported. This data is accepted.
D-3	Co	2024-01-09	0.0005	0.0005	0.000056	mg/L	This result flags low because of the lower MDL being reported. This data is accepted.
	U	2024-01-09	0	0.0095	0.0101	mg/L	This result is just above the high flag limit and similar to values measured in the past year.
DS-1	Ra	2024-01-09	0	0.0656	0.07	Bq/L	This result is just above the high flag limit . Compared to 2023 it seems high. Reassay requested and reject this result. Reassay result of 0.019 Bq/L is accepted in and within historical range.
DS-11	CONDF	2024-01-05	56.52397	866.676	985.64	µmho/cm	This result is above high flag. This is a result of using a weighted average of the 2 station components. Previous results used only the lower value. Result not unexpected for this location.
	pH	2024-01-05	5.5	7.5	5.3		
DS-2	Ra	2024-01-03	0.1118	0.2346	0.052	Bq/L	This result is low for this location. Check with lab that this isn't a decimal error. Asking for reassay. Rejecting result due to lab error.
DS-2	Ra	2024-01-03	0.1118	0.2346	0.267	Bq/L	Original result was 0.052, rejected due to lab error. Accepted reassay result 0.267 Bq/L slightly above high flag, but acceptable
	U	2024-01-03	0.0000	0.0497	0.0537	mg/L	This result is slightly above the high flag but similar to historical values.

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi		Result		Comment
FBDST	Ba	2024-01-09	0.0013	0.0081		0.0001	mg/L	This data is inline with FB data but flags because of the lower reported MDL. This data is accepted.
	Co	2024-01-09	0.0001	0.0008		0.000007	mg/L	
	U	2024-01-09	0.00002	0.0010		0.000011	mg/L	
D-3	Co	2024-02-06	0.0005	0.0005		0.000013	mg/L	Result is below low flag. Lower MDL at lab, accepting result
	U	2024-02-06	0	0.0090		0.0175	mg/L	Result is above high flag. Accepting result. 4 last results higher than usual. Continue to monitor
DS-4	DOC	2024-02-06	0.8	2.6		2.6	mg/L	Result is slightly above high flag, but acceptable.
FBDST	Ba	2024-02-06	0.0013	0.0082		0.00008	mg/L	Result is below low flag. Lower MDL at lab, accepting result
	Co	2024-02-06	0.0001	0.0008	<	0.000004	mg/L	Result is below low flag. Lower MDL at lab, accepting result
D-1	Ba	2024-03-05	0	0.1769		0.201	mg/L	Result is above high flag, accept and continue to monitor
	Co	2024-03-05	0.0005	0.0005		0.000095	mg/L	Flag is low. lower detection limit at lab, accept value
D-25	FLOW	2024-03-06	0	43.61		68.01	L/s	Flag is high. accept value, high flows due to precipitation event
D-3	Co	2024-03-05	0.0005	0.0005		0.00183	mg/L	Result is high, reassay confirmed high result, accept original. Potential influence from high flows or beaver activity, results back to historical trends on next samples.
	Fe	2024-03-05	0	0.579		1.58	mg/L	Result is high, reassay confirmed high result, accept original. Potential influence from high flows or beaver activity, results back to historical trends on next samples.
	FLOW	2024-03-05	0	44.88		136	L/s	High flag, high flows due to precipitation event

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi	Result		Comment
D-3	Mn	2024-03-05	0	0.1252	0.42	mg/L	Result is high, reassay confirmed high result, accept original. Potential influence from high flows or beaver activity, results back to historical trends on next samples.
	TSS	2024-03-05	0.33	1.79	3	mg/L	Result is high, reassay confirmed high result, accept original. High flows influencing debris in water
DS-1	FLOW	2024-03-05	0	145.76	212	L/s	Accept values, high flows due to precipitation event
		2024-03-06	0	145.76	222	L/s	
		2024-03-07	0	145.76	175	L/s	
		2024-03-11	0	145.76	195	L/s	Accept values, higher flows due to spring freshet
		2024-03-12	0	145.76	169	L/s	
		2024-03-13	0	145.76	166	L/s	
		2024-03-14	0	145.76	163	L/s	
		2024-03-15	0	145.76	153	L/s	
		2024-03-27	0	145.76	169	L/s	
DS-16	Co	2024-03-05	0.0005	0.0005	0.000261	mg/L	Result is below low flag. Accept value, lower detection limit from lab
	CONDF	2024-03-26	22.2	69.3	88.5	µmho/cm	Result is above high flag. Accept value, continue to monitor
	FLOW	2024-03-05	0	2.55	14	L/s	Accept value, high flows due to precipitation event
	pH	2024-03-05	6.4	7.2	5.26		Low flag, accept value and continue to monitor
		2024-03-22	6.4	7.2	7.5		High flag, accept value and continue to monitor
		2024-03-26	6.4	7.2	6.17		Low flag, accept value and continue to monitor

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi	Result		Comment
DS-16	Ra	2024-03-05	0.0027	0.0093	0.028	Bq/L	Flag is high, asking for reassay. Reject result, Reassay value is <0.005Bq/L
	U	2024-03-05	0.0005	0.0005	0.000338	mg/L	Result is below low flag, accept value, lower detection limit from lab
DS-2	Ra	2024-03-05	0.1046	0.2354	0.27	Bq/L	Result is slightly above high flag, accept value
DS-4	FLOW	2024-03-05	0	197.16	254	L/s	Accept value, high flows due to precipitation event
	pH	2024-03-26	6.7	7.9	8.1		Flag is high, but acceptable within discharge criteria, continue to monitor
	TSS	2024-03-05	0	2.69	3	mg/L	High flag. Accept value, influenced by high flows bringing debris through creeks
DS-6	FLOW	2024-03-05	0	182.66	194	L/s	Accept value, high flows due to precipitation event
		2024-03-13	0	182.66	203	L/s	Accept value, higher flows due to spring freshet
FBDST	Ba	2024-03-05	0.0013	0.0082	< 0.00026	mg/L	Results are below low flag, accept values, lower detection limit from lab
	Co	2024-03-05	0.0001	0.0008	< 0.000004	mg/L	
	U	2024-03-05	1.08E-05	0.00096	0.000006	mg/L	
BSDST	TSS	2024-04-02	1	1	3	mg/L	High flag, result is within acceptable range
D-1	Co	2024-04-02	0.0005	0.0005	0.000111	mg/L	Accepting result, detection limit is now lower
D-16	U	2024-04-02	0.0002	0.0008	0.000031	mg/L	Accepting result, detection limit is now lower
D-3	Co	2024-04-02	0.0005	0.0005	0.000065	mg/L	Accepting result, detection limit is now lower
	FLOW	2024-04-30	0	76.86	100	L/s	Heavy rain, accepting results

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi		Result		Comment
D-9	Ba	2024-04-02	0.0133	0.0259		0.0117	mg/L	Low flag. Result is slightly lower than the low flag, but acceptable.
DS-1	FLOW	2024-04-12	0	194.47		195	L/s	Accepting result, freshet and heavy rain
		2024-04-30	0	194.47		212	L/s	Heavy rain, accepting results
DS-16	Co	2024-04-02	0.0005	0.0005		0.000247	mg/L	Accepting result, detection limit is now lower
	Ra	2024-04-02	0.0025	0.0091		0.032	Bq/L	Result is above high flag. Reassay
	U	2024-04-02	0.0005	0.0005		0.000102	mg/L	Accepting result, detection limit is now lower
DS-2	U	2024-04-02	0	0.0518		0.055	mg/L	Result is slightly above the high flag, but acceptable
DS-4	TSS	2024-04-02	0	2.71		3	mg/L	Result is slightly above the high flag, but within acceptable range.
DS-6	FLOW	2024-04-12	0	212.77		232	L/s	Accepting result, freshet and heavy rain
FBDST	Co	2024-04-02	0.0001	0.0008	<	0.000004	mg/L	Accepting result, detection limit is now lower
BSDST	TSS	2024-05-08	1	1		2	mg/L	Result is above high flag, but within acceptable range
D-2	Ra	2024-05-14	0	0.1462		0.159	Bq/L	High flag, results within historical range
D-3	Co	2024-05-06	0.0005	0.0005		0.000078	mg/L	Low flag, lower detection limit, accepting results
	hard	2024-05-06	56.2	78.7		87.2	mg/L	High flag. Accepting results, within historical range
DS-1	pH	2024-05-01	6.4	8.5		8.8		High flag. Accepting results, within historical range

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi		Result		Comment
FBDST	Ba	2024-05-08	0.0012	0.0082		0.0002	mg/L	Lower detection limit, accepting results
	Co	2024-05-08	0.0001	0.0008	<	0.000004	mg/L	Lower detection limit, accepting results
D-1	Ra	2024-06-04	1.2702	1.7898		2.27	Bq/L	Result is above high flag, but within historical range
D-2	Ra	2024-06-04	0	0.0598		0.068	Bq/L	Result is slightly above high flag, but within historical range
DS-4	Fe	2024-06-18	0.0480	0.0876		0.039	mg/L	Result is below low flag, accepting result
	Ra	2024-06-11	0.0691	0.1570		0.045	Bq/L	Result is below low flag, within historical range, accepting result
		2024-06-25	0.0691	0.1570		0.261	Bq/L	Result is above high flag, accept and continue to monitor
FBDST	Ba	2024-06-18	0.0012	0.0082		0.00011	mg/L	Low flag. Lower detection limit, accepting results
	Co	2024-06-18	0.0001	0.0008	<	0.000004	mg/L	
D-1	pH	2024-07-16	6.8	8.8		9.1		Result just above high flag, accept result
	Ra	2024-07-16	1.58	1.58		1.45	Bq/L	Result similar to flag, accept result
D-13	CONDF	2024-07-11	665.144	927.745		956	µmho/cm	Accepting results
D-14	CONDF	2024-07-11	309.822	523.401		538	µmho/cm	Accepting results
D-16	U	2024-07-11	0.0001	0.0008		0.000125	mg/L	Result just below low flag, accept result
FBDST	Ba	2024-07-16	0.0011	0.0083		0.00013	mg/L	Low flag, blank sample, accept result
	Co	2024-07-16	0.0001	0.0008	<	0.000004	mg/L	Low flag, blank sample, accept result
BH91 SG2A	ACID	2024-08-19	1560.129	3392.78	<	1	mg/L	Analytical error, do not report

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi	Result		Comment
BSDST	hard	2024-08-06	271.8	360.2	249	mg/L	Low flag, simlar to parent sample, accept result
D-13	pH	2024-08-23	6.34	7.1	6.33		Accepting results
D-14	pH	2024-08-23	6.76	7.2	6.72		Accepting results
D-2	Fe	2024-08-06	0.0553	0.5387	0.018	mg/L	Low flag, accept result, continue to monitor
	Mn	2024-08-06	0.0671	0.2396	0.036	mg/L	Low flag, accept result, continue to monitor
DS-1	pH	2024-08-15	6.5	8.5	6.5		Very similar to low flag, accept result
		2024-08-16	6.5	8.5	8.5		Very similar to high flag, accept result
DS-11	CONDF	2024-08-07		1147.282	1650	µmho/cm	Change to weighted average calculation in 2024, very low flow, value as expected
DS-4	Fe	2024-08-06	0.0411	0.0956	0.041	mg/L	Very similar to low flag, accept result
	hard	2024-08-06	294.2	345.2	291	mg/L	Very similar to low flag, accept result
	Ra	2024-08-06	0.0699	0.1641	0.174	Bq/L	Maintenance + dry conditions, continue to monitor
		2024-08-12	0.0699	0.1641	0.222	Bq/L	Maintenance + dry conditions, continue to monitor
FBDST	Ba	2024-08-06	0.0011	0.0083	0.00008	mg/L	Low flag, blanks, accept results
	Co	2024-08-06	0.0001	0.0008	< 0.000004	mg/L	
BSDST	hard	2024-09-03	302.8	345.2	275	mg/L	Low flag, similar to parent sample, accept result
	SO4	2024-09-03	250	250	230	mg/L	Low flag, similar to parent sample, accept result
D-1	Co	2024-09-23	0.0005	0.0005	0.000145	mg/L	Low flag, accept result

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi		Result		Comment
D-2	hard	2024-09-03	316.3	341.7		270	mg/L	Low flag, accept result
		2024-09-10	316.3	341.7		288	mg/L	Low flag, accept result
	U	2024-09-03	0.0316	0.0507		0.0312	mg/L	Low flag, not much lower than flag, accept result
DS-4	hard	2024-09-03	307.0	341.0		284	mg/L	Low flag, accept result
		2024-09-10	307.0	341.0		299	mg/L	Low flag, accept result
	Ra	2024-09-03	0.0810	0.1622		0.182	Bq/L	Within historical range, accept result
		2024-09-10	0.0810	0.1622		0.18	Bq/L	Within historical range, and similar to previous week, accept result
FBDST	Ba	2024-09-03	0.0011	0.0083	<	0.00008	mg/L	Low flag, blank, accept result
	Co	2024-09-03	0.0001	0.0008	<	0.000004	mg/L	Low flag, blank, accept result
D-16	U	2024-10-22	0.0001	0.0008	<	0.001	mg/L	Accept, less than MDL
D-2	Ra	2024-10-29	0.0150	0.0390		0.048	Bq/L	Accept result, within historical range
D-2	TSS	2024-10-01	1	1		1.3	mg/L	Accept result, within historical range
		2024-10-08	1	1	<	0.67	mg/L	Accept, less than MDL
		2024-10-16	1	1	<	0.67	mg/L	
		2024-10-22	1	1	<	0.67	mg/L	
		2024-10-29	1	1		3.7	mg/L	Accept result, within historical range
D-25	ACID	2024-10-31	1	1		5	mg/L	Accept, lab Method detection limit is 5. Ask lab to lower MDL.
D-9	Ra	2024-10-22	0.0028	0.0103		0.011	Bq/L	Accept result, continue to monitor

Denison Mines Inc.
SAMP/TOMP Flagged Data

Location	Analyte	Date	Low	Hi		Result		Comment
FBDST	Ba	2024-10-01	0.0010	0.0083	<	0.001	mg/L	Accept, blank less than MDL
	Co	2024-10-01	0.0001	0.0008	<	0.0001	mg/L	
	SO4	2024-10-01	0.00	0.23	<	0.5	mg/L	Accept, results still low
	U	2024-10-01	0	0.0010	<	0.001	mg/L	Accept, blank less than MDL
D-1	ACID	2024-11-01	1	1	<	5	mg/L	Accept, lab Method detection limit is 5. Ask lab about MDL.
	Co	2024-11-01	0.0005	0.0005		0.0001	mg/L	Accept, low value
D-25	pH	2024-11-12	6.8	8.1		8.33		Accept, continue to monitor
DS-5	FLOW	2024-11-01	0	10.47		13.22	L/s	Accept, flow seems accurate
FBDST	Ba	2024-11-05	0.0010	0.0083	<	0.001	mg/L	Accept, blank lower than MDL
	SO4	2024-11-05	0.00	0.23	<	0.5	mg/L	Accept, blank lower than MDL, ask lab to lower MDL
	U	2024-11-05	0	0.0010	<	0.001	mg/L	Accept, blank lower than MDL, talk to lab about lowering MDL
D-22	pH	2024-12-30	6.1	7.2		6.07		Accept value, rain influence bringing down phs values across all sites. Continue to monitor, ph value back up in week following
DS-16	Co	2024-12-30	0.0005	0.0005		0.0002	mg/L	low value, accept
	U	2024-12-30	0.0005	0.0005	<	0.001	mg/L	Lab MDL change, accept value
FBDST	SO4	2024-12-03	0.00	0.23		7.5	mg/L	Reject value, potential sample contamination, lab reanalysis result was <0.5 mg/L
	U	2024-12-03	0	0.0010	<	0.001	mg/L	Accept, lab MDL change

SAMP and TOMP DATA QUALITY REPORTING
Field Blank 2024
Revision 2007-01

Registry: RF8.5.4-02

	Date	pH	Acid mg/L	TSS mg/L	Hardness mg/L as CaCO3	Sulphate mg/L	Radium Bq/L	Uranium mg/L	Barium mg/L	Cobalt mg/L	Iron mg/L	Manganese mg/L
Blank Criteria												
	SAMP [1]	-	-	-	1.0	0.2	0.01	0.001	0.01	0.0010	0.04	0.004
	TOMP [2]	-	2	2	-	0.2	0.01	0.001	0.01	0.0010	0.04	0.004
FBDST2	2024.01	6.0	2									
FBDST	2024.01	5.3		< 1.0	< 0.1	< 0.2	< 0.005	0.0000	0.000	0.0000	< 0.01	< 0.000
FBDST	2024.02	5.3		< 1.0	< 0.1	< 0.2	< 0.005	0.0000	0.000	< 0.0000	< 0.01	0.000
FBDST	2024.03	5.8		1.0	< 0.1	< 0.2	< 0.005	0.0000	< 0.000	< 0.0000	< 0.01	< 0.000
FBDST	2024.04	5.5		1.0	< 0.1	< 0.2	0.005	0.0000	0.001	< 0.0000	< 0.01	0.000
FBDST2	2024.04	5.4	**3**									
FBDST	2024.05	6.0		1.0	0.1	< 0.2	< 0.005	0.0001	0.000	< 0.0000	< 0.01	0.000
FBDST	2024.06	6.0		1.0	< 0.1	< 0.2	< 0.005	0.0000	0.000	< 0.0000	< 0.01	0.000
FBDST2	2024.07	5.0	2									
FBDST	2024.07	5.8		< 1.0	0.3	< 0.2	< 0.005	0.0001	0.000	< 0.0000	< 0.01	0.000
FBDST	2024.08	6.7		1.0	0.3	< 0.2	< 0.005	0.0000	0.000	< 0.0000	< 0.01	< 0.000
FBDST	2024.09	6.4		< 1.0	< 0.1	< 0.2	< 0.005	< 0.0000	< 0.000	< 0.0000	< 0.01	0.000
FBDST	2024.10	4.5		< 0.7	< 0.1	< **0.5**	< 0.007	< 0.0010	< 0.001	< 0.0001	0.04	< 0.001
FBDST	2024.11	7.2		< 0.7	< 0.1	< **0.5**	< 0.007	< 0.0010	< 0.001	< 0.0001	< 0.02	< 0.001
FBDST2	2024.11	4.5	**9**									
FBDST	2024.12	5.2		< 0.7	< 0.1	< **0.5**	< 0.007	< 0.0010	< 0.001	< 0.0001	**0.05**	< 0.001
Count		16	4	12	12	12	12	12	12	12	12	12
# Exceedances		0	2	0	0	3	0	0	0	0	1	0
Average		5.7	4	0.9	0.1	< 0.3	0.006	0.0003	0.000	0.0000	0.01	0.000
Max		7.2	9	1.0	0.3	< 0.5	0.007	0.0010	0.001	0.0001	0.05	0.001
Min		4.5	2	0.7	0.1	< 0.2	0.005	0.0000	0.000	0.0000	0.01	0.000

[1] Field blank criteria from Table 5.1 Overview of Elliot lake Monitoring Programs and Source Area Monitoring Program Design (Minnow, 2002a)

[2] Field blank criteria from Table 4.1 TMA Operational Monitoring Program (TOMP) Design (Minnow, 2002b)

Bold Indicates an exceedance of the Blank Criteria

SAMP and TOMP DATA QUALITY REPORTING
Field Precision 2024
Revision 2007-01

Location	Date	pH	Acid	Hardness	TSS	Sulphate	Radium (total)	Uranium	Barium	Cobalt	Iron	Manganese
			mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L	mg/L	mg/L	mg/L
D-2	2024.01	7.4		346.0	< 1.0	300.0	0.031	0.0437	0.062	0.0005	0.43	0.183
BSDST		7.3		352.0	< 1.0	300.0	0.024	0.0442	0.063	0.0005	0.45	0.188
variance		1%		2%	0%	0%	**25%**	1%	2%	0%	5%	3%
D-2	2024.02	7.5		350.0	< 1.0	300.0	0.038	0.0456	0.056	0.0005	0.60	0.191
BSDST		7.4		353.0	1.0	300.0	0.018	0.0437	0.055	0.0004	0.57	0.188
variance		1%		1%	0%	0%	**71%**	4%	2%	**22%**	5%	2%
D-2	2024.03	7.2		312.0	< 2.0	250.0	0.050	0.0436	0.076	0.0007	0.62	0.273
BSDST		7.2		301.0	3.0	260.0	0.041	0.0420	0.070	0.0007	0.60	0.271
variance		0%		4%	40%	4%	20%	4%	8%	0%	3%	1%
D-2	2024.04	7.1		198.0	3.0	130.0	0.243	0.0168	0.996	0.0005	0.67	0.140
BSDST		7.2		188.0	3.0	130.0	0.270	0.0160	0.963	0.0005	0.66	0.140
variance		1%		5%	0%	0%	11%	5%	3%	0%	2%	0%
D-2	2024.05	7.5		219.0	2.0	170.0	0.122	0.0270	0.576	0.0004	0.34	0.148
BSDST		7.5		220.0	2.0	170.0	0.095	0.0271	0.583	0.0004	0.33	0.144
variance		0%		0%	0%	0%	**25%**	0%	1%	0%	3%	3%
D-2	2024.06	7.2		243.0	1.0	210.0	0.035	0.0269	0.220	0.0002	0.24	0.063
BSDST		7.2		239.0	1.0	200.0	0.039	0.0268	0.231	0.0002	0.22	0.077
variance		0%		2%	0%	5%	11%	0%	5%	0%	9%	20%
D-2	2024.07	7.4		260.0	1.0	190.0	0.030	0.0240	0.160	0.0001	0.18	0.066
BSDST		7.4		269.0	1.0	200.0	0.035	0.0240	0.162	0.0002	0.20	0.082
variance		0%		3%	0%	5%	15%	0%	1%	**67%**	11%	**22%**
D-2	2024.08	7.5		255.0	1.0	220.0	0.028	0.0258	0.131	0.0001	0.02	0.036
BSDST		7.5		249.0	1.0	220.0	< 0.005	0.0270	0.133	0.0002	0.29	0.065
variance		0%		2%	0%	0%	**139%**	5%	2%	**67%**	**174%**	**57%**
D-2	2024.09	7.2		270.0	< 1.0	230.0	0.021	0.0312	0.112	0.0002	0.25	0.083
BSDST		7.2		275.0	< 1.0	230.0	0.044	0.0308	0.117	0.0002	0.25	0.082
variance		0%		2%	0%	0%	**71%**	1%	4%	0%	0%	1%
D-2	2024.10	7.4		314.0	1.3	258.0	0.018	0.0380	0.105	0.0004	0.48	0.108
BSDST		7.4		316.0	1.3	259.0	0.023	0.0370	0.102	0.0004	0.45	0.104

SAMP and TOMP DATA QUALITY REPORTING
Field Precision 2024
Revision 2007-01

Location	Date	pH	Acid	Hardness	TSS	Sulphate	Radium (total)	Uranium	Barium	Cobalt	Iron	Manganese
			mg/L	mg/L	mg/L	mg/L	Bq/L	mg/L	mg/L	mg/L	mg/L	mg/L
variance		0%		1%	0%	0%	**24%**	3%	3%	0%	6%	4%
D-2	2024.11	7.3		301.0	< 0.7	261.0	0.047	0.0450	0.085	0.0005	0.46	0.142
BSDST		7.6		310.0	< 0.7	286.0	0.051	0.0450	0.088	0.0005	0.48	0.145
variance		4%		3%	0%	9%	8%	0%	3%	0%	4%	2%
D-2	2024.12	7.4		323.0	< 0.7	282.0	0.033	0.0350	0.083	0.0005	0.60	0.119
BSDST		7.4		322.0	< 0.7	251.0	0.040	0.0360	0.080	0.0005	0.59	0.115
variance		0%		0%	0%	12%	19%	3%	4%	0%	2%	3%
DS-2	2024.01	2.9	218.0									
BSDST2		2.9	213.0									
variance		0%	2%									
DS-2	2024.04	3.0	224.0									
BSDST2		3.0	223.0									
variance		0%	0%									
DS-2	2024.07	2.7	219.0									
BSDST2		2.7	223.0									
variance		0%	2%									
DS-2	2024.11	2.7	186.0									
BSDST2		2.7	188.0									
variance		0%	1%									
Count		16	4	12	12	12	12	12	12	12	12	12
Average		1%	1%	2%	3%	3%	37%	2%	3%	13%	19%	10%
Max		4%	2%	5%	40%	12%	139%	5%	8%	67%	174%	57%
Min		0%	0%	0%	0%	0%	8%	0%	1%	0%	0%	0%
Criteria[1]		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
# Exceedances		0	0	0	0	0	6	0	0	3	1	2

[1] SAMP par[a]meter criteria from Table 5.1 Overview of Elliot lake Monitoring Programs and Source Area Monitoring Program Design (Minnow, 2002a); TOMP parameter criteria from Table 4.1 TMA Operational Monitoring Pr

SAMP and TOMP DATA QUALITY REPORTING
Field Blank
Revision 2010.01

Report Form: RF8.5.4-01

Date			Acidity	Sulphate	pHF	Iron
			mg/L as CaCO3	mg/L		mg/L
Blank Criteria		TOMP [1]	2	0.2		0.04
2024.08	FBD-GW2		**21.0**	< 0.2	7.2	**0.19**
2024.08	FBD-GW4		**10.0**	< 0.2	6.7	< **0.07**
2024.08	FBD-GW3		**4.0**	< 0.2	6.2	0.01
Count			3	3	3	3
# Exceedances			**3**	0	0	2
Average			11.7	< 0.2	6.7	0.09
Max			21	< 0.2	7.2	0.19
Min			4	< 0.2	6.2	0.01

[1] Field blank criteria from Table 4.1 TMA Operational Monitoring Program (TOMP) Design (Minnow, 2002b)

Bold Indicates an exceedance of the Blank Criteria

Issued on: August 30, 2010
Expires on: August 30, 2011

SAMP and TOMP DATA QUALITY REPORTING
Groundwater Field Precision
Revision 2010.01

Denison Mines

Registry: RF8.5.4-02

Location	Date	pHF	Sulphate	Acidity	Iron
			mg/L	mg/L	mg/L
98-15A	2024.08	5.7	2200.0	829.0	412.00
BSD-GW2		5.7	2200.0	813.0	416.00
variance		0%	0%	2%	1%
BH91 DG4B	2024.08	6.5	550.0	< 1.0	11.00
BSD-GW3		6.5	620.0	< 1.0	11.10
variance		0%	12%	0%	1%
BH91 SG2A	2024.08	5.9	4600.0	*	1560.00
BSD-GW4		5.9	4600.0	*	1570.00
variance		**0%**	0%		1%
Count		3	3	2	3
Average		0%	4%	1%	1%
Min		0%	0%	0%	1%
Max		0%	12%	2%	1%
Criteria1		20%	20%	20%	20%
# Exceedances		0	0	0	0

[1] Field criteria taken from Table 6.2 of the Cycle 5 Study Design for SRWMP, SAMP and TOMP (Minnow, 2019)
Bold Indicates an exceedance of the Blank Criteria

*Analytical error, results not reportable

Issued by: Environmental Coordinator

Issued on: January 01, 2020
Expires on: January 01, 2024

APPENDIX IV
Laboratory QA/QC Results

REPORT CODE: *DEN-ANN24*

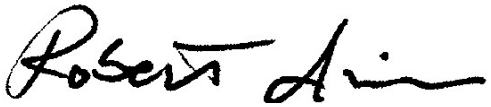
REPORT TITLE: *Annual 2024 Denison Data Quality Report*

REVISION: *1.0*

ISSUED BY:

Quality Coordinator,
SGS Environmental, Lakefield

AUTHORIZED BY:



Technical Manager,
SGS Environmental, Lakefield

DATE: *20 Feb. 2025*

Table of Contents

1. MANAGEMENT SYSTEM

SGS Environmental, Lakefield is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation (CALA), for specific tests listed in the scope of accreditation. ISO/IEC 17025 addresses both the management system and the technical aspects of operating a testing laboratory.

The management system at SGS Environmental consists of a documented quality system, which is directed by the Quality Coordinator who is independent of the production area. All appropriate documentation (quality manual, methods, written instructions, standard operating procedures, and data approval criteria) is in place and includes both general and method specific quality control requirements.

Quality control procedures include duplicate samples, spiked blanks, spiked replicates, reagent/instrument blanks, preparation control samples, certified reference material analysis, and instrument control samples, as appropriate for the individual methods. Matrix matching of reference materials to samples is always attempted. Frequency of insertion of control samples is method specific and follows legislated guidelines. A summary of the quality control recoveries is presented in the tables following.

2. QUALITY CONTROL PARAMETERS

All QC parameters are taken directly from SGS LIMS. Denison samples are processed as part of our “worksheet” batch system. A compilation of all QC data appropriate to the parameters tested has been compiled below.

3. NOTABLE OCCURANCES/ACTIONS

- Data compiled from January 2024 to December 2024
- SGS Environmental, Lakefield laboratory performed 2619 analyses with 2342 QC checks, which represents 89% QC for sample analysis. **Corrective Action**: N/A
- All blank data results were within the data quality objectives. **Corrective Action**: N/A
- All CRM/spike blank data results were within the data quality objectives. **Corrective Action**: N/A
- No duplicate value exceeded the data quality objectives. **Corrective Action:** N/A
- No spike duplicates fell outside of the data quality objectives. **Corrective Action**: N/A

4. QC DATA SUMMARY

4.1. Blank Data

Parameter	Unit	Required Limit	Number of Blanks	Mean Blank Result
Acidity	mg/L as CaCO3	2	22	2.6

Silver	mg/L	0.0001	12	<0.0001
Alkalinity	mg/L as CaCO3	2	3	2
Arsenic	mg/L	0.0005	12	<0.0005
Barium	mg/L	0.005	69	<0.005
Cobalt	mg/L	0.0005	42	<0.0005
Copper	mg/L	0.0005	12	<0.0005
DOC	mg/L	0.5	29	<0.5
Iron	mg/L	0.02	49	<0.02
Manganese	mg/L	0.002	42	<0.002
Nickel	mg/L	0.002	12	<0.002
Lead	mg/L	0.00002	12	<0.00002
Ra226	Bq/L	0.005	81	<0.005
Selenium	mg/L	0.0005	12	<0.0005
Sulphate	mg/L	0.1	71	<0.1
Total Dissolved Solids	mg/L	10	1	<10
Total Suspended Solids	mg/L	1	92	<1
Uranium	mg/L	0.0005	42	<0.0005
Zinc	mg/L	0.001	12	<0.001

4.2. Reference Material/Spiked Blank Data

Parameter	Unit	Number of RM or SB	% Recovery
Acidity	mg/L as CaCO3	22	97.1
Silver	mg/L	12	99.9
Alkalinity	mg/L as CaCO3	3	98.0
Arsenic	mg/L	12	99.3
Barium	mg/L	69	99.2
Cobalt	mg/L	42	100.2
Copper	mg/L	12	100.3
DOC	mg/L	29	99.4
Iron	mg/L	49	100.7
Manganese	mg/L	42	99.9
Nickel	mg/L	12	99.5
Lead	mg/L	12	99.2
Ra226	Bq/L	81	100.4
Selenium	mg/L	12	99.1
Sulphate	mg/L	71	95.7
Total Dissolved Solids	Mg/L	0	
Total Suspended Solids	mg/L	92	96.9

Uranium	mg/L	42	99.9
Zinc	mg/L	12	98.7

4.3. Duplicate Data

Parameter	Unit	RPD* Limit	Number of Duplicates	RPD*
Acidity	mg/L as CaCO3	20	22	ND
Silver	mg/L	20	12	ND
Alkalinity	mg/L as CaCO3	20	3	1.3
Arsenic	mg/L	20	12	8.6
Barium	mg/L	20	69	3.4
Cobalt	mg/L	20	42	5.1
Copper	mg/L	20	12	5.1
DOC	mg/L	20	29	1.2
Iron	mg/L	20	49	2.9
Manganese	mg/L	20	42	3.4
Nickel	mg/L	20	12	5.9
Lead	mg/L	20	12	5.9
Ra226	Bq/L	20	81	11.2
Selenium	mg/L	20	12	9.2
Sulphate	mg/L	20	71	1.5
Total Dissolved Solids	mg/L	20	1	5.0
Total Suspended Solids	mg/L	20	92	1.6
Uranium	mg/L	20	42	3.5
Zinc	mg/L	20	12	4.6

*RPD – Relative Percent Difference

ND – No Data, no detectable concentration of the parameter in the sample

4.4. Spike Duplicate Data

Parameter	Unit	Number of Spike Dups	Mean % Recovery
Silver	mg/L	12	89.7
Arsenic	mg/L	12	102.6
Barium	mg/L	69	100.2
Cobalt	mg/L	42	100.2
Copper	mg/L	12	97.0
DOC	mg/L	29	97.1
Iron	mg/L	49	105.6
Manganese	mg/L	42	102.9

Nickel	mg/L	12	100.8
Lead	mg/L	12	97.6
Selenium	mg/L	65	100.7
Sulphate	mg/L	13	96.8
Uranium	mg/L	11	100.5
Zinc	mg/L	65	106.4

4.5. QC Frequency

Total Number of Blanks:	627
Total Number of Reference Materials/Spiked Blanks:	626
Total Number of Duplicate Samples:	627
Total Number of Spiked Duplicate Samples:	462
Sum of QC Insertion:	**2342**
Total Analysis:	**2619**

TESTMARK Laboratories Ltd.

Committed to Quality and Service

REPORT TITLE: *Annual 2024 Data Quality Report*

REVISION: *1.0*

ISSUED BY:

Brad Woodward

QAQC Director

Testmark Laboratories Ltd.

AUTHORIZED BY:

Brad Woodward

QAQC Director

Testmark Laboratories Ltd.

DATE: *11 Feb. 2024*

Table of Contents

1. MANAGEMENT SYSTEM

Testmark Laboratories Ltd. is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation (CALA), for specific tests listed in the scope of accreditation; and licensed by the MECP. ISO/IEC 17025 addresses the management system and the technical aspects of operating a testing laboratory.

The management system at Testmark Laboratories Ltd. consists of a documented quality system, which is directed by the QAQC Director, who is independent of the production area. All appropriate documentation (quality manual, methods, written instructions, standard operating procedures, and data approval criteria) is in place with the Distributed Lab Information Management System (DLIMS) and includes general and method-specific quality controls.

Quality control procedures include duplicate samples, spiked blanks, spiked replicates, reagent/instrument blanks, preparation control samples, certified reference material analysis, and instrument control samples appropriate for individual testing methods. Reference materials are matched to samples matrices whenever possible. Control sample frequency is method-specific and follows or exceeds legislated guidelines.

2. QUALITY CONTROL PARAMETERS

Quality Control (QC) parameters are read from Testmark Laboratories Ltd. DLIMS. Client samples are processed in batches with associated method-specific quality assurance controls attached to all batches. This data reflects all QC done for the parameters tested for the client within the date range.

3. NOTABLE OCCURANCES/ACTIONS

- Data compiled from January 1st, 2024 to December 31st, 2024
- Performed 8,543 analyses with 6,033 QC checks, which represents 70.6% QC for sample analysis. **Corrective Action**: N/A
- 97.5% of all blank data results were within the data quality objectives; 100% within the expected range of uncertainty. **Corrective Action**: N/A
- 96.3% of all reference material/spike blank data results were within the data quality objectives; 100% within the expected range of uncertainty. **Corrective Action**: N/A
- 99.8% of all duplicate data results were within the data quality objectives; 100% within the expected range of uncertainty. **Corrective Action:** N/A
- 99.7% of all spike duplicate data results were within the data quality objectives; 100% within the expected range of uncertainty. **Corrective Action**: N/A

4. QC DATA SUMMARY

4.1. Blank Data

Parameter	Unit	Required Limit	Number Of Blanks	Mean Blank Result
Acidity	mg/L as CaCO3	15	18	<5
Bromide	mg/L	0.15	35	<0.05
Chloride	mg/L	0.6	35	<0.2
Conductivity	µS/cm	5	7	1.357
Dissolved Aluminum	ug/L	3	16	<1
Dissolved Antimony	ug/L	3	16	<1
Dissolved Arsenic	ug/L	3	16	<1
Dissolved Barium	ug/L	3	23	<1
Dissolved Beryllium	ug/L	3	16	<1
Dissolved Bismuth	ug/L	3	16	<1
Dissolved Boron	ug/L	5	17	2.389
Dissolved Cadmium	ug/L	3	16	<1
Dissolved Calcium	ug/L	150	16	<50
Dissolved Cerium	ug/L	3	16	<1
Dissolved Cesium	ug/L	3	16	<1
Dissolved Chromium	ug/L	3	17	<1
Dissolved Cobalt	ug/L	3	16	<1
Dissolved Copper	ug/L	3	17	<1
Dissolved Europium	ug/L	3	16	<1
Dissolved Gallium	ug/L	3	16	<1
Dissolved Inorganic Carbon	mg/L	1.2	4	<0.4
Dissolved Iron	ug/L	60	17	<20
Dissolved Lanthanum	ug/L	3	16	<1
Dissolved Lead	ug/L	3	16	<1
Dissolved Lithium	ug/L	15	16	<5
Dissolved Magnesium	ug/L	12	16	<4
Dissolved Manganese	ug/L	3	17	<1
Dissolved Mercury	ug/L	0.3	16	<0.1
Dissolved Molybdenum	ug/L	3	17	<1
Dissolved Nickel	ug/L	3	17	<1
Dissolved Niobium	ug/L	3	16	<1

Parameter	Unit	Required Limit	Number Of Blanks	Mean Blank Result
Dissolved Organic Carbon	mg/L	1.2	18	<0.4
Dissolved Phosphorus	ug/L	150	16	<50
Dissolved Potassium	ug/L	300	16	<100
Dissolved Radium-226	Bq/L	0.007	18	<0.007
Dissolved Rubidium	ug/L	3	16	<1
Dissolved Scandium	ug/L	3	16	<1
Dissolved Selenium	ug/L	0.6	16	<0.2
Dissolved Silicon	ug/L	1800	16	<600
Dissolved Silver	ug/L	0.3	16	<0.1
Dissolved Sodium	ug/L	300	16	<100
Dissolved Strontium	ug/L	3	16	<1
Dissolved Sulfur	ug/L	2400	16	<800
Dissolved Tellurium	ug/L	3	16	<1
Dissolved Thallium	ug/L	3	16	<1
Dissolved Thorium	ug/L	3	16	<1
Dissolved Tin	ug/L	3	16	<1
Dissolved Titanium	ug/L	3	16	<1
Dissolved Tungsten	ug/L	3	16	<1
Dissolved Uranium	ug/L	3	16	<1
Dissolved Vanadium	ug/L	3	16	<1
Dissolved Yttrium	ug/L	3	16	<1
Dissolved Zinc	ug/L	3	17	<1
Dissolved Zirconium	ug/L	3	16	<1
Fluoride	mg/L	0.15	35	<0.05
M-Alkalinity (pH 4.5)	mg/L as CaCO3	6	14	2.552
Nitrate (as N)	mg/L	0.15	35	<0.05
Nitrite (as N)	mg/L	0.15	35	<0.05
Radium-226	Bq/L	0.007	8	<0.007
Radium-226	Bq/L	0.007	9	<0.007
Sulphate	mg/L	1.5	35	<0.5
Total Aluminum	ug/L	3	21	2.717
Total Antimony	ug/L	1.5	20	<0.5
Total Arsenic	ug/L	3	20	<1
Total Barium	ug/L	3	29	<1

Parameter	Unit	Required Limit	Number Of Blanks	Mean Blank Result
Total Beryllium	ug/L	3	20	<1
Total Bismuth	ug/L	3	20	<1
Total Boron	ug/L	5	21	3.718
Total Cadmium	ug/L	0.3	20	<0.1
Total Calcium	ug/L	150	20	<50
Total Cerium	ug/L	3	20	<1
Total Cesium	ug/L	3	20	<1
Total Chromium	ug/L	3	20	<1
Total Cobalt	ug/L	3	20	<1
Total Copper	ug/L	3	23	<1
Total Dissolved Solids	mg/L	50	3	<20
Total Europium	ug/L	3	20	<1
Total Gallium	ug/L	3	20	<1
Total Iron	ug/L	60	21	<20
Total Lanthanum	ug/L	3	20	<1
Total Lead	ug/L	1	20	<0.5
Total Lithium	ug/L	10	20	<5
Total Magnesium	ug/L	12	20	<4
Total Manganese	ug/L	3	20	<1
Total Mercury	ug/L	0.3	20	<0.1
Total Molybdenum	ug/L	3	20	<1
Total Nickel	ug/L	3	22	<1
Total Niobium	ug/L	3	20	<1
Total Organic Carbon	mg/L	1.2	1	<0.4
Total Phosphorus	ug/L	150	20	<50
Total Potassium	ug/L	300	20	<100
Total Rubidium	ug/L	3	20	<1
Total Scandium	ug/L	3	20	<1
Total Selenium	ug/L	0.6	20	<0.2
Total Silicon	ug/L	1800	20	<600
Total Silver	ug/L	0.3	20	<0.1
Total Sodium	ug/L	300	20	<100
Total Strontium	ug/L	3	20	<1
Total Sulphur	ug/L	2400	20	<800

Parameter	Unit	Required Limit	Number Of Blanks	Mean Blank Result
Total Suspended Solids	mg/L	10	22	<0.67
Total Tellurium	ug/L	3	20	<1
Total Thallium	ug/L	3	20	<1
Total Thorium	ug/L	3	20	<1
Total Tin	ug/L	3	20	<1
Total Titanium	ug/L	3	20	<1
Total Tungsten	ug/L	3	20	<1
Total Uranium	ug/L	3	20	<1
Total Vanadium	ug/L	3	20	<1
Total Yttrium	ug/L	3	20	<1
Total Zinc	ug/L	3	21	<1
Total Zirconium	ug/L	3	20	<1

4.2. Reference Material/Spiked Blank Data

This subset represents QC checks that report in % Recovery.

Parameter	Unit	Number of RM or SB	% Recovery
Bromide	%	70	99.1
Chloride	%	70	104.5
Dissolved Aluminum	%	16	104.7
Dissolved Antimony	%	16	105.2
Dissolved Arsenic	%	16	102.8
Dissolved Barium	%	23	101.2
Dissolved Beryllium	%	16	100.7
Dissolved Boron	%	17	111.9
Dissolved Cadmium	%	16	99.8
Dissolved Calcium	%	16	96.9
Dissolved Chromium	%	17	101.6
Dissolved Cobalt	%	16	101.8
Dissolved Copper	%	17	98
Dissolved Iron	%	17	104
Dissolved Lead	%	16	102
Dissolved Magnesium	%	16	94.6
Dissolved Manganese	%	17	99.5
Dissolved Mercury	%	16	91
Dissolved Molybdenum	%	17	99.1

Parameter	Unit	Number of RM or SB	% Recovery
Dissolved Nickel	%	17	98.7
Dissolved Phosphorus	%	16	98.8
Dissolved Potassium	%	16	98.2
Dissolved Selenium	%	16	100.8
Dissolved Silicon	%	16	98.8
Dissolved Sodium	%	16	95.6
Dissolved Sulfur	%	16	103.6
Dissolved Thallium	%	16	101.3
Dissolved Uranium	%	16	105.6
Dissolved Vanadium	%	16	101.9
Dissolved Zinc	%	17	100.1
Fluoride	%	70	100.5
Nitrate (as N)	%	70	103.6
Nitrite (as N)	%	70	107.2
Sulphate	%	70	103
Total Aluminum	%	21	109.3
Total Antimony	%	20	100.5
Total Arsenic	%	20	98.5
Total Barium	%	29	102.6
Total Beryllium	%	20	97.6
Total Boron	%	21	113.4
Total Cadmium	%	20	96.7
Total Calcium	%	20	98.1
Total Chromium	%	20	104.9
Total Cobalt	%	20	104.7
Total Copper	%	23	102.5
Total Iron	%	21	116.5
Total Lead	%	20	102.6
Total Magnesium	%	20	97.7
Total Manganese	%	20	105.1
Total Mercury	%	20	84
Total Molybdenum	%	20	104.7
Total Nickel	%	22	102.3
Total Phosphorus	%	20	97.3
Total Potassium	%	20	103.1

Parameter	Unit	Number of RM or SB	% Recovery
Total Selenium	%	20	92.1
Total Silicon	%	20	105.5
Total Sodium	%	20	98.5
Total Sulphur	%	20	102.8
Total Thallium	%	20	102.3
Total Uranium	%	20	109.6
Total Vanadium	%	20	105.2
Total Zinc	%	21	94.2

This subset represents QC checks that report in Specified Units.

Parameter	Unit	Number of RM or SB	Mean Result
Acidity	mg/L as CaCO3	18	104.706
Conductivity	µS/cm	7	509
Dissolved Aluminum	ug/L	16	102.011
Dissolved Antimony	ug/L	16	12.03
Dissolved Arsenic	ug/L	16	9.701
Dissolved Barium	ug/L	23	7.972
Dissolved Beryllium	ug/L	16	1.978
Dissolved Boron	ug/L	17	104.265
Dissolved Cadmium	ug/L	16	1.943
Dissolved Calcium	ug/L	16	530.329
Dissolved Chromium	ug/L	17	13.188
Dissolved Cobalt	ug/L	16	11.125
Dissolved Copper	ug/L	17	15.692
Dissolved Inorganic Carbon	mg/L	4	15.272
Dissolved Iron	ug/L	1	40.528
Dissolved Lead	ug/L	16	4.105
Dissolved Magnesium	ug/L	16	56.491
Dissolved Manganese	ug/L	17	5.968
Dissolved Molybdenum	ug/L	17	21.864
Dissolved Nickel	ug/L	17	19.184
Dissolved Organic Carbon	mg/L	18	15.282
Dissolved Potassium	ug/L	16	385.647
Dissolved Radium-226	Bq/L	36	0.049
Dissolved Selenium	ug/L	16	56.253

Parameter	Unit	Number of RM or SB	Mean Result
Dissolved Sodium	ug/L	16	235.877
Dissolved Strontium	ug/L	16	138.24
Dissolved Thallium	ug/L	16	6.171
Dissolved Uranium	ug/L	16	5.021
Dissolved Vanadium	ug/L	16	14.125
Dissolved Zinc	ug/L	17	41.759
M-Alkalinity (pH 4.5)	mg/L as CaCO3	14	99.63
pH	pH	7	8.047
Radium-226	Bq/L	34	0.05
RedOx (vs. S.H.E.)	mV	2	207.5
RedOx (vs. S.H.E.)	mV	2	247.9
Total Aluminum	ug/L	21	103.769
Total Antimony	ug/L	20	11.48
Total Arsenic	ug/L	20	9.303
Total Barium	ug/L	29	7.939
Total Beryllium	ug/L	20	1.888
Total Boron	ug/L	21	105.48
Total Cadmium	ug/L	20	1.867
Total Calcium	ug/L	20	532.541
Total Chromium	ug/L	20	13.833
Total Cobalt	ug/L	20	11.458
Total Copper	ug/L	23	16.628
Total Dissolved Solids	mg/L	1	230
Total Dissolved Solids	mg/L	2	235
Total Iron	ug/L	1	48.064
Total Lead	ug/L	20	4.114
Total Magnesium	ug/L	20	55.53
Total Manganese	ug/L	20	6.331
Total Molybdenum	ug/L	20	22.953
Total Nickel	ug/L	22	19.497
Total Organic Carbon	mg/L	1	14.351
Total Potassium	ug/L	20	392.14
Total Selenium	ug/L	20	50.738
Total Sodium	ug/L	20	246.54
Total Strontium	ug/L	20	144.139

Parameter	Unit	Number of RM or SB	Mean Result
Total Suspended Solids	mg/L	1	260
Total Suspended Solids	mg/L	22	234.55
Total Thallium	ug/L	20	6.169
Total Uranium	ug/L	20	5.258
Total Vanadium	ug/L	20	14.746
Total Zinc	ug/L	21	38.688

4.3. Duplicate Data

Parameter	Unit	Relative Percent Difference Limit	Number Of Duplicates	Relative Percent Difference
Acidity	mg/L as CaCO3	20	1	0
Chloride	%	20	24	1.66
Conductivity	%	20	7	0.8
Dissolved Aluminum	%	20	8	6.3
Dissolved Antimony	%	20	1	0
Dissolved Arsenic	%	20	1	5
Dissolved Barium	%	20	22	2.27
Dissolved Boron	%	20	8	3.15
Dissolved Calcium	%	20	16	1.65
Dissolved Cobalt	%	20	2	1.75
Dissolved Copper	%	20	1	2.7
Dissolved Gallium	%	20	2	0
Dissolved Inorganic Carbon	%	15	4	0.45
Dissolved Iron	%	20	2	2.9
Dissolved Magnesium	%	20	16	1.74
Dissolved Manganese	%	20	12	2.32
Dissolved Molybdenum	%	20	2	9.5
Dissolved Nickel	%	20	1	1.4
Dissolved Organic Carbon	%	15	7	1
Dissolved Potassium	%	20	14	1.34
Dissolved Radium-226	%	20	18	7.37
Dissolved Rubidium	%	20	6	2.03
Dissolved Selenium	%	20	1	9.8
Dissolved Sodium	%	20	16	2.33
Dissolved Strontium	%	20	16	2.69

Parameter	Unit	Relative Percent Difference Limit	Number Of Duplicates	Relative Percent Difference
Dissolved Sulfur	%	20	14	3.73
Dissolved Tungsten	%	20	2	1.25
Dissolved Uranium	%	20	5	0.82
Fluoride	%	20	1	0
M-Alkalinity (pH 4.5)	%	20	10	5.1
Nitrate (as N)	%	20	6	3.82
pH	%	0.2	7	0.06
Radium-226	%	20	17	6.7
RedOx (vs. S.H.E.)	%	20	4	0.63
Sulphate	%	20	30	1.31
Total Aluminum	%	20	16	5.56
Total Barium	%	20	27	4.02
Total Boron	%	20	12	2.28
Total Calcium	%	20	18	3.24
Total Cobalt	%	20	3	3.37
Total Copper	%	20	3	1.07
Total Dissolved Solids	%	20	2	1.95
Total Gallium	%	20	3	1.27
Total Iron	%	20	7	2.89
Total Magnesium	%	20	18	1.7
Total Manganese	%	20	13	3.05
Total Molybdenum	%	20	2	4.25
Total Nickel	%	20	2	4.3
Total Organic Carbon	%	15	1	0
Total Phosphorus	%	20	1	0.4
Total Potassium	%	20	15	2.28
Total Rubidium	%	20	6	2
Total Selenium	%	20	3	6.9
Total Sodium	%	20	16	2.24
Total Strontium	%	20	18	2.19
Total Sulphur	%	20	15	3.01
Total Suspended Solids	%	20	7	3.64
Total Tungsten	%	20	1	0.8
Total Uranium	%	20	5	0.96

Parameter	Unit	Relative Percent Difference Limit	Number Of Duplicates	Relative Percent Difference
Total Zinc	%	20	2	3.1

4.4. Spike Duplicate Data

Parameter	Unit	Number Of Spike Duplicates	Mean % Recovery
Bromide	%	35	100.4
Chloride	%	35	99.9
Dissolved Aluminum	%	16	101.1
Dissolved Antimony	%	16	103.4
Dissolved Arsenic	%	16	104.4
Dissolved Barium	%	23	102.3
Dissolved Beryllium	%	16	102.8
Dissolved Cadmium	%	16	101.1
Dissolved Chromium	%	17	101.6
Dissolved Cobalt	%	16	101.7
Dissolved Copper	%	17	94.9
Dissolved Inorganic Carbon	%	4	104.5
Dissolved Iron	%	17	95.5
Dissolved Lead	%	16	95.3
Dissolved Manganese	%	17	100.1
Dissolved Molybdenum	%	17	86.5
Dissolved Nickel	%	17	98
Dissolved Organic Carbon	%	18	106.5
Dissolved Radium-226	%	18	95.8
Dissolved Selenium	%	16	106.5
Dissolved Thallium	%	16	101.1
Dissolved Vanadium	%	16	98.5
Dissolved Zinc	%	17	106.4
Fluoride	%	35	102.8
Nitrate (as N)	%	35	103.6
Nitrite (as N)	%	35	101
Radium-226	%	17	97.1
Sulphate	%	35	100.3
Total Aluminum	%	20	104.7
Total Antimony	%	19	100

Parameter	Unit	Number Of Spike Duplicates	Mean % Recovery
Total Arsenic	%	19	99.4
Total Barium	%	28	102.2
Total Beryllium	%	19	100
Total Cadmium	%	19	97.4
Total Chromium	%	19	106.9
Total Cobalt	%	19	105.4
Total Copper	%	22	99
Total Iron	%	20	100
Total Lead	%	19	100.3
Total Manganese	%	19	103.7
Total Molybdenum	%	19	99.8
Total Nickel	%	21	101.5
Total Organic Carbon	%	1	100.4
Total Selenium	%	19	93.7
Total Thallium	%	19	101.8
Total Vanadium	%	19	106.7
Total Zinc	%	20	96.7

4.5. QC Frequency

QC Type	Total Number
Blank Data	2057
Duplicate Data	520
Reference Material / Spiked Blank Data	2527
Spike Duplicate Data	929
Total QC Data Points	**6033**
Total Sample Parameters Analyzed	**8543**
Percentage of QC to Analyzed Parameters	**70.6%**

APPENDIX V
Water Quality Results

BSDST: Blind Sample for D-2

Date	FLOW L/s	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L
2024-01-09	21.00	7.3	300.0	<1	0.024	0.063	0.0005	0.45
2024-02-06	17.00	7.4	300.0	1	0.018	0.055	0.0004	0.57
2024-03-05	86.00	7.2	250.0	2	0.041	0.084	0.0007	0.63
2024-04-02	101.00	7.2	130.0	3	0.270	0.963	0.0005	0.66
2024-05-08	137.00	7.5	170.0	2	0.095	0.583	0.0004	0.33
2024-06-18	14.00	7.2	200.0	1	0.039	0.231	0.0002	0.22
2024-07-16	21.00	7.4	200.0	1	0.035	0.162	0.0002	0.20
2024-08-06	17.00	7.5	220.0	1	<0.005	0.133	0.0002	0.29
2024-09-03	13.00	7.2	230.0	<1	0.044	0.117	0.0002	0.25
2024-10-01	10.00	7.4	259.0	1	0.023	0.102	0.0004	0.45
2024-11-05		7.6	286.0	<1	0.051	0.088	0.0005	0.48
2024-12-03	17.00	7.4	251.0	<1	0.040	0.080	0.0005	0.59
Count	12	13	12	12	12	12	12	12
High	137.00	7.6	300.0	3	0.270	0.963	0.0007	0.66
Low	10.00	7.0	130.0	<1	<0.005	0.055	0.0002	0.20
Mean	42.42	7.3	233.0	1	0.057	0.222	0.0004	0.43
High Criteria		8.5	128-429		0.469	1.000	0.0025	0.76
Low Criteria		6.5						
Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

Date	Mn mg/L	U mg/L	hard mg/L
2024-01-09	0.188	0.0442	352.0
2024-02-06	0.188	0.0437	353.0
2024-03-05	0.275	0.0431	308.0
2024-04-02	0.140	0.0160	188.0
2024-05-08	0.144	0.0271	220.0
2024-06-18	0.077	0.0268	239.0
2024-07-16	0.082	0.0240	269.0
2024-08-06	0.065	0.0270	249.0
2024-09-03	0.082	0.0308	275.0
2024-10-01	0.104	0.0370	316.0
2024-11-05	0.145	0.0450	310.0
2024-12-03	0.115	0.0360	322.0
Count	12	12	12
High	0.275	0.0450	353.0
Low	0.065	0.0160	188.0
Mean	0.134	0.0334	283.4
High Criteria	0.841	0.0150	
Criteria Ex	0	12	0
Frequency	0%	100%	0%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

BSDST2: Blind Sample for DS-2

Date	ACID mg/L	pH
2024-01-03	213	2.9
2024-04-02	223	3.0
2024-07-02	223	2.7
2024-11-12	188	2.7
Count	4	4
High	223	3.0
Low	188	2.7
Mean	212	2.8
Lim Ex	0	0
Frequency	0%	0%
10x Lim Ex	0	0
Frequency	0%	0%

D-1: Denison TMA-1 Overflow (Influent and ETP Operations)

Date	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	NaOHT kg/month	ODays day	pH	SO4 mg/L
2024-01-01				0.00				
2024-01-02			386.85	0.00				
2024-01-03				0.00				
2024-01-04				0.00				
2024-01-05				0.00				
2024-01-06				0.00				
2024-01-07				0.00				
2024-01-08				0.00				
2024-01-09			386.86	0.00			8.2	
2024-01-10				0.00				
2024-01-11				0.00				
2024-01-12				0.00				
2024-01-13				0.00				
2024-01-14				0.00				
2024-01-15				0.00				
2024-01-16			386.89	0.00				
2024-01-17				0.00				
2024-01-18				0.00				
2024-01-19				0.00				
2024-01-20				0.00				
2024-01-21				0.00				
2024-01-22				0.00				
2024-01-23			386.89	0.00				
2024-01-24				0.00				
2024-01-25				0.00				
2024-01-26				0.00				
2024-01-27				0.00				
2024-01-28				0.00				
2024-01-29				0.00				
2024-01-30		0.00	386.89	0.00	0.00	0		
2024-01-31				0.00				
2024-02-01				0.00				
2024-02-02				0.00				
2024-02-03				0.00				
2024-02-04				0.00				
2024-02-05				0.00				
2024-02-06			386.89	0.00			7.7	
2024-02-07				0.00				
2024-02-08				0.00				
2024-02-09				0.00				
2024-02-10				0.00				
2024-02-11				0.00				
2024-02-12				0.00				
2024-02-13			386.90	0.00				
2024-02-14				0.00				
2024-02-15				0.00				
2024-02-16				0.00				
2024-02-17				0.00				
2024-02-18				0.00				
2024-02-19				0.00				
2024-02-20			386.93	0.00				
2024-02-21				0.00				
2024-02-22				0.00				
2024-02-23				0.00				
2024-02-24				0.00				
2024-02-25				0.00				
2024-02-26				0.00				
2024-02-27			386.92	0.00				
2024-02-28		0.00		0.00	0.00	0		
2024-02-29				0.00				
2024-03-01				0.00				
2024-03-02				0.00				
2024-03-03				0.00				
2024-03-04				29.00				
2024-03-05	<1		386.98	30.00			7.4	44.0
2024-03-06				30.00				
2024-03-07				30.00				
2024-03-08				29.00				
2024-03-09				30.00				
2024-03-10				30.00				
2024-03-11				29.00				
2024-03-12			387.02	29.95				
2024-03-13				30.00				
2024-03-14				30.00				
2024-03-15				30.00				
2024-03-16				30.00				
2024-03-17				30.00				
2024-03-18				30.00				
2024-03-19			387.04	30.00				
2024-03-20				29.00				
2024-03-21				55.00				
2024-03-22				55.00				
2024-03-23				55.00				
2024-03-24				55.00				
2024-03-25				55.00				
2024-03-26			387.03	54.00				
2024-03-27				89.00				
2024-03-28		1396.26		88.00	0.00	28		
2024-03-29				88.00				
2024-03-30				89.00				
2024-03-31				89.00				
2024-04-01				89.00				
2024-04-02	<1		387.04	89.00			7.5	47.0
2024-04-03				90.00				
2024-04-04				90.00				
2024-04-05				90.00				
2024-04-06				90.00				
2024-04-07				88.00				
2024-04-08				88.00				
2024-04-09			387.05	89.00				
2024-04-10				88.00				

D-1: Denison TMA-1 Overflow (Influent and ETP Operations)

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	NaOHT kg/month	ODays day	pH	SO4 mg/L
2024-04-11				88.00				
2024-04-12				91.00				
2024-04-13				113.00				
2024-04-14				113.00				
2024-04-15				114.00				
2024-04-16			387.11	114.00				
2024-04-17				113.00				
2024-04-18				119.00				
2024-04-19				120.00				
2024-04-20				118.00				
2024-04-21				117.00				
2024-04-22				116.00				
2024-04-23			387.10	117.00				
2024-04-24				115.00				
2024-04-25				116.00				
2024-04-26				117.00				
2024-04-27				116.00				
2024-04-28		3425.89		116.00	0.00	30		
2024-04-29				114.00				
2024-04-30			387.12	116.00				
2024-05-01				116.00				
2024-05-02				116.00				
2024-05-03				118.00				
2024-05-04				119.00				
2024-05-05				117.00				
2024-05-06				117.00				
2024-05-07				118.00				
2024-05-08				117.00				
2024-05-09			387.11	117.00			8.0	
2024-05-10				117.00				
2024-05-11				51.00				
2024-05-12				51.00				
2024-05-13				51.00				
2024-05-14			387.08	51.00				
2024-05-15				51.00				
2024-05-16				51.00				
2024-05-17				50.00				
2024-05-18				51.00				
2024-05-19				51.00				
2024-05-20				51.00				
2024-05-21			387.05	33.00				
2024-05-22				32.00				
2024-05-23				33.00				
2024-05-24				33.00				
2024-05-25				0.00				
2024-05-26				0.00				
2024-05-27				0.00				
2024-05-28		1932.15	387.02	0.00	0.00	24		
2024-05-29				0.00				
2024-05-30				0.00				
2024-05-31				0.00				
2024-06-01				0.00				
2024-06-02				0.00				
2024-06-03				0.00				
2024-06-04			386.99	0.00			8.5	
2024-06-05				0.00				
2024-06-06				0.00				
2024-06-07				0.00				
2024-06-08				0.00				
2024-06-09				0.00				
2024-06-10				0.00				
2024-06-11			386.98	0.00				
2024-06-12				0.00				
2024-06-13				0.00				
2024-06-14				0.00				
2024-06-15				0.00				
2024-06-16				0.00				
2024-06-17				0.00				
2024-06-18			386.96	0.00				
2024-06-19				0.00				
2024-06-20				0.00				
2024-06-21				0.00				
2024-06-22				0.00				
2024-06-23				0.00				
2024-06-24				0.00				
2024-06-25			386.99	0.00				
2024-06-26				0.00				
2024-06-27				0.00				
2024-06-28		0.00		0.00	0.00	0		
2024-06-29				0.00				
2024-06-30				0.00				
2024-07-01				0.00				
2024-07-02				0.00				
2024-07-03			387.02	0.00				
2024-07-04				0.00				
2024-07-05				0.00				
2024-07-06				0.00				
2024-07-07				0.00				
2024-07-08				0.00				
2024-07-09				0.00				
2024-07-10			387.01	0.00				
2024-07-11				0.00				
2024-07-12				0.00				
2024-07-13				0.00				
2024-07-14				0.00				
2024-07-15				0.00				
2024-07-16			387.00	0.00			9.1	
2024-07-17				0.00				
2024-07-18				0.00				
2024-07-19				0.00				
2024-07-20				0.00				
2024-07-21				0.00				

D-1: Denison TMA-1 Overflow (Influent and ETP Operations)

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	NaOHT kg/month	ODays day	pH	SO4 mg/L
2024-07-22			386.97	0.00				
2024-07-23				0.00				
2024-07-24				0.00				
2024-07-25				0.00				
2024-07-26				0.00				
2024-07-27				0.00				
2024-07-28				0.00				
2024-07-29		0.00		0.00	0.00	0		
2024-07-30			386.94	0.00				
2024-07-31				0.00				
2024-08-01				0.00				
2024-08-02				0.00				
2024-08-03				0.00				
2024-08-04				0.00				
2024-08-05				0.00				
2024-08-06			386.91	0.00				
2024-08-07				0.00				
2024-08-08				0.00				
2024-08-09				0.00				
2024-08-10				0.00				
2024-08-11				0.00				
2024-08-12			386.88	0.00			8.6	
2024-08-13			386.88	0.00				
2024-08-14				0.00				
2024-08-15				0.00				
2024-08-16				0.00				
2024-08-17				0.00				
2024-08-18				0.00				
2024-08-19				0.00				
2024-08-20			386.86	0.00				
2024-08-21				0.00				
2024-08-22				0.00				
2024-08-23				0.00				
2024-08-24				0.00				
2024-08-25				0.00				
2024-08-26				0.00				
2024-08-27			386.84	0.00				
2024-08-28		0.00		0.00	0.00	0		
2024-08-29				0.00				
2024-08-30				0.00				
2024-08-31				0.00				
2024-09-01				0.00				
2024-09-02				0.00				
2024-09-03			386.82	0.00				
2024-09-04				0.00				
2024-09-05				0.00				
2024-09-06				0.00				
2024-09-07				0.00				
2024-09-08				0.00				
2024-09-09				0.00				
2024-09-10			386.80	0.00				
2024-09-11				0.00				
2024-09-12				0.00				
2024-09-13				0.00				
2024-09-14				0.00				
2024-09-15				0.00				
2024-09-16				0.00				
2024-09-17			386.78	0.00				
2024-09-18				0.00				
2024-09-19				0.00				
2024-09-20				0.00				
2024-09-21				0.00				
2024-09-22				0.00				
2024-09-23	<1		386.78	0.00			8.6	5.1
2024-09-24				0.00				
2024-09-25				0.00				
2024-09-26		0.00		0.00	0.00	0		
2024-09-27				0.00				
2024-09-28				0.00				
2024-09-29				0.00				
2024-09-30				0.00				
2024-10-01			386.77	0.00				
2024-10-02				0.00				
2024-10-03				0.00				
2024-10-04				0.00				
2024-10-05				0.00				
2024-10-06				0.00				
2024-10-07			386.77	0.00				
2024-10-08				0.00				
2024-10-09				0.00				
2024-10-10				0.00				
2024-10-11				0.00				
2024-10-12				0.00				
2024-10-13				0.00				
2024-10-14				0.00				
2024-10-15			386.75	0.00				
2024-10-16				0.00				
2024-10-17				0.00				
2024-10-18				0.00				
2024-10-19				0.00				
2024-10-20				0.00				
2024-10-21				0.00				
2024-10-22			386.73	0.00				
2024-10-23				0.00				
2024-10-24				0.00				
2024-10-25				0.00				
2024-10-26				0.00				
2024-10-27				0.00				
2024-10-28				29.00				
2024-10-29			386.72	27.00			7.6	
2024-10-30				26.00				
2024-10-31		126.54		26.91	0.00	4		

D-1: Denison TMA-1 Overflow (Influent and ETP Operations)

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	NaOHT kg/month	ODays day	pH	SO4 mg/L
2024-11-01	<5		386.78	29.00			7.7	60.4
2024-11-02				0.00				
2024-11-03				0.00				
2024-11-04				0.00				
2024-11-05			386.80	0.00				
2024-11-06				0.00				
2024-11-07				0.00				
2024-11-08				0.00				
2024-11-09				0.00				
2024-11-10				0.00				
2024-11-11				0.00				
2024-11-12			386.83	0.00				
2024-11-13				0.00				
2024-11-14				0.00				
2024-11-15				0.00				
2024-11-16				0.00				
2024-11-17				0.00				
2024-11-18				0.00				
2024-11-19			386.83	0.00				
2024-11-20				0.00				
2024-11-21				0.00				
2024-11-22				0.00				
2024-11-23				0.00				
2024-11-24				0.00				
2024-11-25				0.00				
2024-11-26			386.85	0.00				
2024-11-27				0.00				
2024-11-28		28.86		0.00	0.00	1		
2024-11-29				0.00				
2024-11-30				0.00				
2024-12-01				0.00				
2024-12-02				0.00				
2024-12-03			386.85	0.00				
2024-12-04				0.00				
2024-12-05				0.00				
2024-12-06				0.00				
2024-12-07				0.00				
2024-12-08				0.00				
2024-12-09				0.00				
2024-12-10			386.89	0.00				
2024-12-11				0.00				
2024-12-12				0.00				
2024-12-13				0.00				
2024-12-14				0.00				
2024-12-15				0.00				
2024-12-16			386.89	0.00			7.8	
2024-12-17				0.00				
2024-12-18			386.91	0.00				
2024-12-19				0.00				
2024-12-20				0.00				
2024-12-21				0.00				
2024-12-22				0.00				
2024-12-23			386.91	0.00				
2024-12-24				0.00				
2024-12-25				0.00				
2024-12-26				0.00				
2024-12-27				0.00				
2024-12-28				0.00				
2024-12-29				0.00				
2024-12-30				0.00				
2024-12-31		0.00	386.96	0.00	0.00	0		
Count	4	12	56	374	12	12	12	4
High	<5	3425.89	387.12	120.00	0.00	30	9.1	60.4
Low	<1	0.00	386.72	0.00	0.00	0	7.4	5.1
Mean	<2	575.81	386.92	17.11	0.00	7	8.1	39.1
High Criteria							8.5	128-429
Low Criteria							6.5	
Criteria Ex	0	0	0	0	0	0	3	0
Frequency	0%	0%	0%	0%	0%	0%	25%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

D-1: Denison TMA-1 Overflow (Influent and ETP Operations)

Date	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L	hard mg/L
2024-01-09	1.660						
2024-02-06	1.600						
2024-03-05	1.210	0.213	0.0001	0.06	0.010	0.0089	82.6
2024-04-02	1.570	0.068	0.0001	0.06	0.006	0.0081	88.0
2024-05-09	1.420						
2024-06-04	2.270						
2024-07-16	1.450						
2024-08-12	1.380						
2024-09-23	1.720	0.072	0.0001	0.03	0.018	0.0063	80.4
2024-10-29	1.600						
2024-11-01	1.690	0.070	0.0001	0.14	0.008	0.0070	90.0
2024-12-16	1.570						
Count	12	4	4	4	4	4	4
High	2.270	0.213	0.0001	0.14	0.018	0.0089	90.0
Low	1.210	0.068	0.0001	0.03	0.006	0.0063	80.4
Mean	1.595	0.106	0.0001	0.07	0.011	0.0076	85.3
High Criteria	0.469	1.000	0.0025	0.76	0.841	0.0150	
Criteria Ex	12	0	0	0	0	0	0
Frequency	100%	0%	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%

D-16: Denison TMA-1 Dam 9 Seepage

Date	FLOW	hard	pH	SO4	Ra	Ba	Co	Fe
	L/s	mg/L		mg/L	Bq/L	mg/L	mg/L	mg/L
2024-01-04	0.59	279.0	6.3	230.0	0.011	0.021	0.0004	0.62
2024-04-02	1.72	189.0	6.3	160.0	0.022	0.021	0.0009	0.27
2024-07-11	0.68	228.0	6.7	180.0	0.034	0.023	0.0012	3.65
2024-10-22	0.17	316.0	6.3	292.0	0.037	0.035	0.0019	8.35
Count	4	4	4	4	4	4	4	4
High	1.72	316.0	6.7	292.0	0.037	0.035	0.0019	8.35
Low	0.17	189.0	6.3	160.0	0.011	0.021	0.0004	0.27
Mean	0.79	253.0	6.4	215.5	0.026	0.025	0.0011	3.22
High Criteria			8.5	128-429	0.469	1.000	0.0025	0.76
Low Criteria			6.5					
Criteria Ex	0	0	3	0	0	0	0	2
Frequency	0%	0%	75%	0%	0%	0%	0%	50%
10x Criteria Ex	0	0	0	0	0	0	0	1
Frequency	0%	0%	0%	0%	0%	0%	0%	25%

Date	Mn	U
	mg/L	mg/L
2024-01-04	0.436	0.0000
2024-04-02	0.537	0.0000
2024-07-11	1.810	0.0001
2024-10-22	3.340	<0.0010
Count	4	4
High	3.340	<0.0010
Low	0.436	0.0000
Mean	1.531	0.0003
High Criteria	0.841	0.0150
Criteria Ex	2	0
Frequency	50%	0%
10x Criteria Ex	0	0
Frequency	0%	0%

D-2: Denison TMA-1 Stollery Lake Settling Pond Outlet (Final Discharge)

Date	DDays day	FLOW (L/s)	hard mg/L	pH	SO4 mg/L	TSS mg/L	TOXCD IC25	TOXDM %	TOXRT %
2024-01-02		21.00		7.3		<1			
2024-01-09		21.00	346.0	7.4	300.0	<1			
2024-01-16		29.00		7.5		1			
2024-01-23		21.00		7.5		<1			
2024-01-30	31	17.00		7.4		1			
2024-02-06		17.00	350.0	7.5	300.0	<1			
2024-02-13		21.00		7.1		3			
2024-02-20		21.00		7.2		1			
2024-02-28	29	39.00	343.0	7.3	320.0	1			
2024-03-05		86.00	293.0	7.2	260.0	2			
2024-03-12		55.00		7.0		1			
2024-03-19		60.00		7.1		<1			
2024-03-26		81.00		7.2		2			
2024-03-28	31								
2024-04-02		100.00	198.0	7.1	130.0	3			
2024-04-09		94.00		7.1		2			
2024-04-16		196.00		7.4		2			
2024-04-23		130.00		7.5		2			
2024-04-28	30								
2024-04-30		181.00		7.4		1			
2024-05-08		137.00	219.0	7.5	170.0	2			
2024-05-14		52.00		7.5		1			
2024-05-21		52.00		7.4		1			
2024-05-28	31	21.00		7.4		1			
2024-06-04		10.00		7.5		1			
2024-06-11		14.00		7.3		<1			
2024-06-18		14.00	243.0	7.2	210.0	1	3	0	0
2024-06-25		29.00		7.4		1			
2024-06-28	30								
2024-07-02		21.00		7.6		<1			
2024-07-11		17.00		7.6		1			
2024-07-16		21.00	260.0	7.4	190.0	1			
2024-07-22		21.00		7.5		<1			
2024-07-29	31								
2024-07-30		13.00		7.5		<1			
2024-08-06		17.00	255.0	7.5	220.0	1			
2024-08-12		13.00		7.5		1			
2024-08-20		13.00		7.4		1			
2024-08-27		10.00		7.7		<1			
2024-08-28	31								
2024-09-03		13.00	270.0	7.2	230.0	<1			
2024-09-10		13.00	288.0	7.3	230.0	1		0	0
2024-09-17		13.00		7.2		<1			
2024-09-23		13.00		7.4		<1			
2024-09-28	30								
2024-10-01		10.00	314.0	7.3	258.0	1	>100		
2024-10-08		10.00		7.6		<1			
2024-10-16		14.00		7.3		<1			
2024-10-22		10.00		7.4		<1			
2024-10-29		10.00		7.3		4			
2024-10-31	31								
2024-11-05		34.00	301.0	7.3	261.0	<1			
2024-11-12		21.00		7.3		<1			
2024-11-19		21.00		7.5		2			
2024-11-26		21.00		7.3		<1			
2024-11-28	30								
2024-12-03		17.00	323.0	7.4	282.0	<1			
2024-12-10		25.00		7.4		3			
2024-12-18		29.00		7.3		<1			
2024-12-23		21.00		7.4		3			
2024-12-30		41.00		7.1		1			
2024-12-31	31								
Count	12	53	14	53	14	53	3	2	2
High	31	196.00	350.0	7.7	320.0	4	>100	0	0
Low	29	10.00	198.0	7.0	130.0	<1	3	0	0
Mean	31	37.75	285.9	7.4	240.1	1	51	0	0
High Criteria				8.5	128-429				
Low Criteria				6.5					
Criteria Ex	0	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%	0%

D-2: Denison TMA-1 Stollery Lake Settling Pond Outlet (Final Discharge)

Date	Ra	Ba	Co	Fe	Mn	U
	Bq/L	mg/L	mg/L	mg/L	mg/L	mg/L
2024-01-02	0.009					
2024-01-09	0.031	0.062	0.0005	0.43	0.183	0.0437
2024-01-16	0.027					
2024-01-23	0.022					
2024-01-30	0.027					
2024-02-06	0.038	0.056	0.0005	0.60	0.191	0.0456
2024-02-13	0.020					
2024-02-20	0.026					
2024-02-28	0.031	0.065	0.0006	0.57	0.235	0.0425
2024-03-05	0.066	0.073	0.0007	0.60	0.255	0.0401
2024-03-12	0.141					
2024-03-19	0.152					
2024-03-26	0.239					
2024-04-02	0.243	0.996	0.0005	0.67	0.140	0.0168
2024-04-09	0.186					
2024-04-16	0.152					
2024-04-23	0.096					
2024-04-30	0.095					
2024-05-08	0.122	0.576	0.0004	0.34	0.148	0.0270
2024-05-14	0.159					
2024-05-21	0.056					
2024-05-28	0.055					
2024-06-04	0.068					
2024-06-11	0.049					
2024-06-18	0.035	0.220	0.0002	0.24	0.063	0.0269
2024-06-25	0.038					
2024-07-02	0.025					
2024-07-11	0.038					
2024-07-16	0.030	0.160	0.0001	0.18	0.066	0.0240
2024-07-22	0.032					
2024-07-30	0.026					
2024-08-06	0.028	0.131	0.0001	0.02	0.036	0.0258
2024-08-12	0.022					
2024-08-20	0.018					
2024-08-27	0.026					
2024-09-03	0.021	0.112	0.0002	0.25	0.083	0.0312
2024-09-10	0.039	0.106	0.0002	0.28	0.082	0.0321
2024-09-17	0.035					
2024-09-23	0.008					
2024-10-01	0.018	0.105	0.0004	0.47	0.108	0.0380
2024-10-08	0.021					
2024-10-16	0.039					
2024-10-22	0.036					
2024-10-29	0.048					
2024-11-05	0.047	0.085	0.0005	0.46	0.142	0.0450
2024-11-12	0.052					
2024-11-19	0.044					
2024-11-26	0.053					
2024-12-03	0.033	0.083	0.0005	0.60	0.119	0.0350
2024-12-10	0.035					
2024-12-18	0.029					
2024-12-23	0.031					
2024-12-30	0.031					
Count	53	14	14	14	14	14
High	0.243	0.996	0.0007	0.67	0.255	0.0456
Low	0.008	0.056	0.0001	0.02	0.036	0.0168
Mean	0.058	0.202	0.0004	0.41	0.132	0.0338
High Criteria	0.469	1.000	0.0025	0.76	0.841	0.0150
Criteria Ex	0	0	0	0	0	14
Frequency	0%	0%	0%	0%	0%	100%
10x Criteria Ex	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%

D-22: Denison TMA-2 ETP (Influent and ETP Operations)

Date	ACID mg/L	BaCl2T kg/month	ODays day	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L
2024-01-02				6.2				
2024-01-09	<1			6.5	160.0	0.214	0.035	0.0021
2024-01-16				6.6				
2024-01-23				6.4				
2024-01-30		206.46	31	6.5				
2024-02-06				6.6		0.142		
2024-02-13				6.7				
2024-02-20				6.5				
2024-02-27				6.6				
2024-02-28		193.14	29					
2024-03-05				6.2		0.061		
2024-03-12				6.8				
2024-03-19				6.9				
2024-03-26				6.3				
2024-03-28		206.46	31					
2024-04-02	<1			6.7	57.0	0.128	0.021	0.0003
2024-04-09				6.9				
2024-04-16				7.0				
2024-04-23				6.7				
2024-04-28		199.80	30					
2024-04-30				6.4				
2024-05-07				7.0		0.052		
2024-05-14				6.6				
2024-05-21				6.6				
2024-05-28		206.46	31	6.6				
2024-06-04				6.7		0.990		
2024-06-11				6.7				
2024-06-18				6.8				
2024-06-25				6.6				
2024-06-28		199.80	30					
2024-07-02	<1			6.9	65.0	0.102	0.022	0.0004
2024-07-11				6.9				
2024-07-16				7.0				
2024-07-22				6.7				
2024-07-29		206.46	31					
2024-07-30				6.7				
2024-08-06				6.8		0.935		
2024-08-13				6.5				
2024-08-20				6.8				
2024-08-27				7.0				
2024-08-28		206.46	31					
2024-09-03				6.7		1.020		
2024-09-10				6.6				
2024-09-17				6.8				
2024-09-23				6.7				
2024-09-28		153.18	23					
2024-10-01				6.7				
2024-10-08	31			6.8	215.0	0.596	0.073	0.0009
2024-10-15				6.7				
2024-10-22				6.6				
2024-10-29				6.9				
2024-10-31		206.46	31					
2024-11-05				7.1		0.033		
2024-11-12				6.6				
2024-11-19				6.5				
2024-11-26				6.6				
2024-11-28		199.80	30					
2024-12-03				6.3		0.160		
2024-12-11				6.5				
2024-12-18				6.3				
2024-12-23				6.5				
2024-12-30				6.1				
2024-12-31		206.46	31					
Count	4	12	12	53	4	12	4	4
High	31	206.46	31	7.1	215.0	1.020	0.073	0.0021
Low	<1	153.18	23	6.1	57.0	0.033	0.021	0.0003
Mean	9	199.25	30	6.6	124.3	0.369	0.038	0.0009
High Criteria				8.5	128-429	0.469	1.000	0.0025
Low Criteria				6.5				
Criteria Ex	0	0	0	7	0	4	0	0
Frequency	0%	0%	0%	13%	0%	33%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

Date	Fe mg/L	Mn mg/L	U mg/L	hard mg/L
2024-01-09	2.77	0.613	0.0005	175.0
2024-04-02	0.24	0.133	0.0003	74.6
2024-07-02	0.58	0.211	0.0004	100.0
2024-10-08	3.91	0.914	0.0010	274.0
Count	4	4	4	4
High	3.91	0.914	0.0010	274.0
Low	0.24	0.133	0.0003	74.6
Mean	1.87	0.468	0.0005	155.9
High Criteria	0.76	0.841	0.0150	
Criteria Ex	2	1	0	0
Frequency	50%	25%	0%	0%
10x Criteria Ex	0	0	0	0
Frequency	0%	0%	0%	0%

D-25: Denison TMA-2 Overflow into TMA-1

Date	ACID mg/L	pH	SO4 mg/L	Ra Bq/L	Fe mg/L
2024-01-03		7.5			
2024-02-07		7.3			
2024-03-06		7.4			
2024-04-02	<1	7.2	69.0	0.262	0.23
2024-05-08		7.7			
2024-06-04		7.2			
2024-07-03		7.5			
2024-08-20		7.0			
2024-09-23					
2024-10-31	5	7.2	96.0	0.360	0.36
2024-11-12		8.3			
2024-12-06		7.4			
Count	2	12	2	2	2
High	5	8.3	96.0	0.360	0.36
Low	<1	7	69.0	0.262	0.23
Mean	3	7.4	82.5	0.311	0.29
High Criteria		8.5	128-429	0.469	0.76
Low Criteria		6.5			
Criteria Ex	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%

D-3: Denison TMA-2 Effluent (Final Discharge)

Date	DDays	FLOW	hard	pH	SO4	TSS	Ra	Ba
	day	L/s	mg/L		mg/L	mg/L	Bq/L	mg/L
2024-01-02		4.00		7.2		<1	0.118	
2024-01-09		4.00	148.0	7.1	98.0	<1	0.118	0.289
2024-01-16		5.00		7.3		<1	0.149	
2024-01-23		5.00		7.3		<1	0.147	
2024-01-30	31	4.00		7.4		<1	0.087	
2024-02-06		4.00	157.0	7.1	110.0	<1	0.085	0.253
2024-02-13		7.00		7.1		<1	0.099	
2024-02-21		3.00		7.4		<1	0.087	
2024-02-27		4.00		7.2		1	0.082	
2024-02-28	29							
2024-03-05		136.00	92.0	7.1	69.0	3	0.169	0.700
2024-03-12		21.00		7.2		1	0.087	
2024-03-19		15.00		7.3		<1	0.084	
2024-03-26		12.00		7.0		1	0.096	
2024-03-28	31							
2024-04-02		12.00	73.6	7.0	54.0	<1	0.093	0.463
2024-04-09		23.00		7.0		<1	0.126	
2024-04-16		6.00		7.3		<1	0.060	
2024-04-23		4.00		7.0		<1	0.129	
2024-04-28	30							
2024-04-30		100.00		7.1		<1	0.230	
2024-05-06		35.00	87.2	7.3	50.0	<1	0.155	0.514
2024-05-14		3.00		6.8		<1	0.133	
2024-05-21		5.00		6.7		<1	0.147	
2024-05-28	31	2.00		6.8		1	0.106	
2024-06-05		1.00	57.6	6.7	29.0	1	0.190	0.197
2024-06-11		1.00		6.9		<1	0.176	
2024-06-18		1.00		6.8		2	0.211	
2024-06-25		8.00		6.8		1	0.134	
2024-06-28	30							
2024-07-02		7.00	105.0	7.3	59.0	1	0.021	0.466
2024-07-11		6.00		7.2		<1	0.295	
2024-07-16		2.00		7.2		<1	0.022	
2024-07-22		2.00		7.0		1	0.248	
2024-07-29	31							
2024-07-30		0.00		7.0		2	0.388	
2024-08-06		0.00						
2024-08-13		0.00						
2024-08-20		0.00						
2024-08-27		0.00						
2024-08-28	0							
2024-09-03		0.00						
2024-09-10		0.00						
2024-09-17		0.00						
2024-09-23		0.00						
2024-09-28	0							
2024-10-01		0.00						
2024-10-08		0.00						
2024-10-15		0.00						
2024-10-22		0.00						
2024-10-31	1	15.00	92.2	6.9	42.0	1	0.124	0.272
2024-11-05		7.00	110.0	7.2	61.5	<1	0.138	0.289
2024-11-12		17.00		7.1		<1	0.205	
2024-11-19		7.00		7.3		<1	0.166	
2024-11-26		10.00		7.1		<1	0.166	
2024-11-28	30							
2024-12-03		5.00	133.0	7.0	89.3	<1	0.180	0.398
2024-12-10		7.00		7.1		<1	0.147	
2024-12-18		17.00		7.2		<1	0.172	
2024-12-23		9.00		7.2		2	0.174	
2024-12-30		31.00		6.9		1	0.145	
2024-12-31	31							
Count	12	53	11	53	11	43	43	11
High	31	136.00	157.0	7.4	110.0	3	0.388	0.700
Low	0	0.00	57.6	6.7	29.0	<1	0.021	0.197
Mean	23	10.70	105.6	7.1	66.2	1	0.144	0.384
High Criteria				8.5	128-429	10	0.469	1.000
Low Criteria				6.5				
Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

Date	Co	Fe	Mn	U
	mg/L	mg/L	mg/L	mg/L
2024-01-09	0.0001	0.04	0.002	0.0101
2024-02-06	0.0000	0.02	0.002	0.0175
2024-03-05	0.0018	1.58	0.420	0.0043
2024-04-02	0.0001	0.14	0.010	0.0010
2024-05-06	0.0001	0.11	0.009	0.0027
2024-06-05	0.0003	0.18	0.051	0.0018
2024-07-02	0.0001	0.08	0.013	0.0036
2024-09-23				
2024-10-31	0.0001	0.16	0.017	0.0050
2024-11-05	0.0001	0.11	0.005	0.0060
2024-12-03	0.0001	0.09	0.002	0.0080
Count	11	11	11	11
High	0.0018	1.58	0.420	0.0175
Low	0.0000	0.02	0.002	0.0010
Mean	0.0003	0.25	0.053	0.0060
High Criteria	0.0025	0.76	0.841	0.0150
Criteria Ex	0	1	0	1
Frequency	0%	9%	0%	9%
10x Criteria Ex	0	0	0	0
Frequency	0%	0%	0%	0%

D-9: Denison TMA-1 Dam 17 Seepage

Date	FLOW L/s	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L
2024-01-04	1.53	897.0	7.2	720.0	0.009	0.022	0.0031	1.21
2024-04-02	3.34	488.0	6.7	350.0	<0.005	0.012	0.0014	0.49
2024-07-11	1.67	677.0	7.3	620.0	0.008	0.019	0.0018	0.60
2024-10-22	1.20	817.0	7.0	796.0	0.011	0.022	0.0029	0.76
Count	4	4	4	4	4	4	4	4
High	3.34	897.0	7.3	796.0	0.011	0.022	0.0031	1.21
Low	1.20	488.0	6.7	350.0	<0.005	0.012	0.0014	0.49
Mean	1.94	719.8	7.0	621.5	0.008	0.019	0.0023	0.76
High Criteria			8.5	128-429	0.469	1.000	0.0025	0.76
Low Criteria			6.5					
Criteria Ex	0	0	0	3	0	0	2	1
Frequency	0%	0%	0%	75%	0%	0%	50%	25%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

Date	Mn mg/L	U mg/L
2024-01-04	2.460	0.0446
2024-04-02	1.070	0.0245
2024-07-11	1.660	0.0317
2024-10-22	2.080	0.0500
Count	4	4
High	2.460	0.0500
Low	1.070	0.0245
Mean	1.818	0.0377
High Criteria	0.841	0.0150
Criteria Ex	4	4
Frequency	100%	100%
10x Criteria Ex	0	0
Frequency	0%	0%

DS-1: Stanrock Moose Lake Settling Pond Outlet to Orient Lake Polishing Pond

Date	FLOW	pH	Ra
	L/s		Bq/L
2024-01-02	11.00	7.4	
2024-01-09	11.00	7.1	0.019
2024-01-16	51.00	7.2	
2024-01-23	38.00	7.0	
2024-01-30	44.00	7.6	
2024-02-06	6.00	7.6	
2024-02-13	11.00	6.7	
2024-02-20	7.00	7.8	
2024-02-27	6.00	7.1	
2024-03-05	212.00	6.6	
2024-03-12	169.00	6.9	
2024-03-19	58.00	7.5	
2024-03-26	51.00	8.3	
2024-04-02	93.00	7.8	0.029
2024-04-09	81.00	7.4	
2024-04-16	163.00	7.7	
2024-04-23	81.00	7.5	
2024-04-30	212.00	7.8	
2024-05-07	58.00	7.9	
2024-05-14	44.00	7.9	
2024-05-21	11.00	7.6	
2024-05-28	7.00	7.6	
2024-06-04	7.00	7.6	
2024-06-11	4.00	7.8	
2024-06-18	7.00	7.7	
2024-06-25	6.00	7.4	
2024-07-02	4.00	7.9	0.022
2024-07-09	11.00	7.4	
2024-07-16	6.00	7.2	
2024-07-23	4.00	7.3	
2024-07-30	11.00	7.8	
2024-08-06	11.00	7.5	
2024-08-13	7.00	6.9	
2024-08-20	11.00	7.9	
2024-08-27	7.00	7.5	
2024-09-03	7.00	7.0	
2024-09-10	4.00	7.7	
2024-09-17	4.00	7.6	
2024-09-23	16.00	7.4	
2024-10-01	7.00	7.6	
2024-10-08	4.00	7.7	
2024-10-15	4.00	7.6	
2024-10-22	7.00	7.6	
2024-10-29	7.00	7.5	
2024-11-05	11.00	7.4	0.020
2024-11-12	4.00	7.5	
2024-11-19	7.00	7.2	
2024-11-26	26.00	7.2	
2024-12-03	11.00	7.6	
2024-12-10	32.00	7.5	
2024-12-17	32.00	6.9	
2024-12-23	26.00	7.0	
2024-12-30	195.00	7.4	
Count	53	53	4
High	212.00	8.3	0.029
Low	4.00	6.6	0.019
Mean	36.32	7.5	0.023
High Criteria		8.5	0.469
Low Criteria		6.5	
Criteria Ex	0	0	0
Frequency	0%	0%	0%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

Denison Mines

DS-11: Stanrock Seepage from Dam A

Date	CONDF µmho/cm	FLOW L/s	pH
2024-01-05	985.6	0.29	5.3
2024-04-08	665.0	0.78	5.3
2024-08-07	1650.0	0.02	4.6
2024-11-18	972.9	0.41	5.3
Count	4	4	4
High	1650.0	0.78	5.3
Low	665.0	0.02	4.6
Mean	1068.4	0.38	5.1
High Criteria			8.5
Low Criteria			6.5
Criteria Ex	0	0	4
Frequency	0%	0%	100%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

DS-12: Stanrock Seepage from Dam B

Date	CONDF µmho/cm	FLOW L/s	pH
2024-01-08	532.0	<1.00	3.6
2024-04-08	331.0	1.57	3.3
2024-08-07		0.00	
2024-11-18	390.0	0.50	4.6
Count	3	4	3
High	532.0	1.57	4.6
Low	331.0	0.50	3.3
Mean	417.7	1.02	3.8
High Criteria			8.5
Low Criteria			6.5
Criteria Ex	0	0	3
Frequency	0%	0%	100%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

DS-13: Stanrock Seepage from Dam C

Date	CONDF µmho/cm	FLOW L/s	pH
2024-01-08		0.00	
2024-04-08	456.0	0.15	6.2
2024-08-07	1438.0	0.01	6.1
2024-11-18	655.1	0.05	6.4
Count	3	4	3
High	1438.0	0.15	6.4
Low	456.0	0.00	6.1
Mean	849.7	0.05	6.2

Date	CONDF µmho/cm	FLOW L/s	pH
High Criteria			8.5
Low Criteria			6.5
Criteria Ex	0	0	3
Frequency	0%	0%	100%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

DS-16: Stanrock TMA, Seepage from Dam M at Quirke Lake Delta

Date	CONDF µmho/cm	DOC mg/L	FLOW L/s	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2024-01-02			0.00					
2024-01-09			0.00					
2024-01-16			0.00					
2024-01-23			0.00					
2024-01-30			0.00					
2024-02-06			0.00					
2024-02-13			0.00					
2024-02-21			0.00					
2024-02-27								
2024-03-05	35.8	4.8	14.00	14.3	5.3	8.8	<0.005	0.006
2024-03-12	43.3		1.40		6.6			
2024-03-22	43.0		0.00		7.5			
2024-03-26	88.5		0.00		6.2			
2024-04-02	52.0	2.2	0.00	29.0	7.1	19.0	0.006	0.011
2024-04-09	45.0		0.60		6.5			
2024-04-16	40.0		1.10		7.4			
2024-04-23	52.0		0.80		6.5			
2024-04-30	39.0		2.00		7.4			
2024-05-09	43.0		0.10		7.5			
2024-05-14			0.00					
2024-05-21			0.00					
2024-05-28			0.00					
2024-06-04			0.00					
2024-06-11			0.00					
2024-06-18			0.00					
2024-06-25			0.00					
2024-07-02			0.00					
2024-07-09			0.00					
2024-07-16			0.00					
2024-07-24			0.00					
2024-07-30			0.00					
2024-08-06			0.00					
2024-08-13			0.00					
2024-08-20			0.00					
2024-08-27			0.00					
2024-09-03			0.00					
2024-09-10			0.00					
2024-09-17			0.00					
2024-09-23			0.00					
2024-10-01			0.00					
2024-10-08			0.00					
2024-10-15			0.00					
2024-10-22			0.00					
2024-10-29			0.00					
2024-11-05			0.00					
2024-11-12			0.00					
2024-11-19			0.00					
2024-11-26			0.00					
2024-12-03			0.00					
2024-12-10			0.00					
2024-12-17			0.00					
2024-12-23			0.00					
2024-12-30	48.3	4.5	2.50	31.4	6.4	18.2	<0.007	0.009
Count	11	3	53	3	11	3	3	3
High	88.5	4.8	14.00	31.4	7.5	19.0	<0.007	0.011
Low	35.8	2.2	0.00	14.3	5.3	8.8	<0.005	0.006
Mean	48.2	3.8	0.43	24.9	6.8	15.3	0.006	0.008
High Criteria					8.5	128-429	0.469	1.000
Low Criteria					6.5			
Criteria Ex	0	0	0	0	2	0	0	0
Frequency	0%	0%	0%	0%	18%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

Date	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2024-03-05	0.0003	0.07	0.016	0.0003
2024-04-02	0.0002	0.12	0.026	0.0001
2024-12-30	0.0002	0.10	0.011	<0.0010
Count	3	3	3	3
High	0.0003	0.12	0.026	<0.0010
Low	0.0002	0.07	0.011	0.0001
Mean	0.0002	0.09	0.018	0.0005
High Criteria	0.0005	0.76	0.841	0.0150
Criteria Ex	0	0	0	0
Frequency	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0
Frequency	0%	0%	0%	0%

DS-2: Stanrock ETP Influent

Date	ACID mg/L	FLOW L/s	Freeboard(m) m	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L
2024-01-01		0.00	0.9800					
2024-01-03	218	87.00	1.4500	2.9	510.0	0.267	0.022	0.0984
2024-01-04		0.00	1.2000					
2024-01-05		0.00	1.0800					
2024-01-06		0.00	0.9400					
2024-01-07		0.00	0.9100					
2024-01-08		0.00	0.9200					
2024-01-09		0.00	0.8200					
2024-01-10		125.30	1.6500					
2024-01-11		95.00						
2024-01-12		0.00	1.3000					
2024-01-13		0.00	1.1100					
2024-01-14		0.00	0.9800					
2024-01-15		115.00	0.8600					
2024-01-16		85.00	1.5000					
2024-01-17		0.00	1.3500					
2024-01-18		0.00	1.1700					
2024-01-19		100.00	1.0600					
2024-01-20		0.00	1.0500					
2024-01-21		0.00	0.9400					
2024-01-22		113.00	1.9000					
2024-01-23		85.00	1.5000					
2024-01-24		0.00	1.3500					
2024-01-25		0.00	1.2000					
2024-01-26		104.90	1.0900					
2024-01-27		0.00	1.1000					
2024-01-28		0.00	0.9800					
2024-01-29		115.00	0.8900					
2024-01-30		85.00	1.5300					
2024-01-31		0.00	1.4800					
2024-02-01		0.00	1.4600					
2024-02-02		0.00	1.4400					
2024-02-03		0.00	1.4400					
2024-02-04		0.00	1.4200					
2024-02-05		0.00	1.4100					
2024-02-06		0.00	1.4000					
2024-02-07		0.00	1.4000					
2024-02-08		0.00	1.3100					
2024-02-09		0.00	1.2000					
2024-02-10		0.00	1.0800					
2024-02-11		0.00	0.9700					
2024-02-12		0.00	0.8700					
2024-02-13		0.00	0.8200					
2024-02-14		123.00	0.6700					
2024-02-15		0.00	1.4000	2.8		0.244		
2024-02-16		103.00	1.1600					
2024-02-17		0.00	1.1800					
2024-02-18		0.00	1.1700					
2024-02-19		0.00	1.1500					
2024-02-20		0.00	1.1300					
2024-02-21		0.00	1.1100					
2024-02-22		0.00	1.1200					
2024-02-23		0.00	1.0800					
2024-02-24		0.00	1.0600					
2024-02-25		0.00	1.0500					
2024-02-26		0.00	1.0300					
2024-02-27		0.00	1.0200					
2024-02-28		0.00	0.9800					
2024-02-29		111.00	0.9200					
2024-03-01		104.00	1.0400					
2024-03-02		0.00	1.0000					
2024-03-03		0.00	0.8600					
2024-03-04		120.00	0.7200					
2024-03-05		128.00	1.8200	2.9		0.270		
2024-03-06		140.00	1.7700					
2024-03-07		137.00	1.8000					
2024-03-08		135.00	1.8200					
2024-03-09		130.00						
2024-03-10		122.00						
2024-03-11		114.00						
2024-03-12		109.00						
2024-03-13		97.00						
2024-03-14		92.00						
2024-03-15		88.00						
2024-03-16		82.00	1.6300					
2024-03-17		0.00	1.1900					
2024-03-18		118.00	0.9100					
2024-03-19		124.00	0.7800					
2024-03-20		128.00	0.6700					
2024-03-21		102.00						
2024-03-22		82.00	1.6100					
2024-03-23		0.00	1.3200					
2024-03-24		0.00	1.0800					
2024-03-25		118.00	0.8900					
2024-03-26		94.00						
2024-03-27		92.00						
2024-03-28		100.00	1.2800					
2024-03-29		93.00						
2024-03-30		77.00	1.7200					
2024-03-31		0.00	1.4300					
2024-04-01		105.00	1.2000					
2024-04-02	224	82.00	1.7000	3.0	450.0	0.168	0.011	0.0943
2024-04-03		0.00	1.4000					
2024-04-04		117.00	0.9000					
2024-04-05		109.00						
2024-04-06		103.00						
2024-04-07		96.00						
2024-04-08		88.00	1.6100					
2024-04-09		0.00	1.3100					
2024-04-10		116.00	1.0400					
2024-04-11		98.00						
2024-04-12		96.00						
2024-04-13		136.00						
2024-04-14		140.00						
2024-04-15		129.00						
2024-04-16		116.00						
2024-04-17		101.00						

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L
2024-04-18		103.00						
2024-04-19		111.00	1.2700					
2024-04-20		111.00						
2024-04-21		100.00						
2024-04-22		88.00						
2024-04-23		82.00						
2024-04-24		80.00						
2024-04-25		78.00						
2024-04-26		74.00						
2024-04-27		0.00	1.6300					
2024-04-28		0.00	1.2700					
2024-04-29		125.00	1.0300					
2024-04-30		145.00						
2024-05-01		147.00						
2024-05-02		139.00						
2024-05-03		131.00						
2024-05-04		129.00						
2024-05-05		122.00						
2024-05-06		108.00	1.6600					
2024-05-07		103.00						
2024-05-08		103.00						
2024-05-09		103.00	1.9200	2.9		0.170		
2024-05-10		0.00	1.6600					
2024-05-11		0.00	1.5400					
2024-05-12		0.00	1.3300					
2024-05-13		130.00	1.0000					
2024-05-14		113.00						
2024-05-15		94.00	1.7300					
2024-05-16		0.00	1.5300					
2024-05-17		0.00	1.3400					
2024-05-18		0.00	1.1600					
2024-05-19		0.00	0.9900					
2024-05-20		0.00	0.8400					
2024-05-21		0.00	0.6900					
2024-05-22		144.00	0.5600					
2024-05-23		140.00	0.6800					
2024-05-24		0.00	0.6800					
2024-05-25		0.00	0.6700					
2024-05-26		0.00	0.6700					
2024-05-27		0.00	0.6700					
2024-05-28		0.00	0.6700					
2024-05-29		0.00	0.6800					
2024-05-30		126.00	0.6700					
2024-05-31		99.00						
2024-06-01		0.00	1.4800					
2024-06-02		0.00	1.4900					
2024-06-03		0.00	1.4800					
2024-06-04		0.00	1.4800					
2024-06-05		0.00	1.4700					
2024-06-06		0.00	1.4400					
2024-06-07		0.00	1.4300					
2024-06-08		0.00	1.4300					
2024-06-09		0.00	1.4200					
2024-06-10		0.00	1.4400					
2024-06-11		0.00	1.4400					
2024-06-12		0.00	1.4300					
2024-06-13		0.00	1.4300					
2024-06-14		0.00	1.4200					
2024-06-15		0.00	1.4300					
2024-06-16		0.00	1.4300					
2024-06-17		0.00	1.4300					
2024-06-18		0.00	1.4200					
2024-06-19		0.00	1.4200					
2024-06-20		0.00	1.4200					
2024-06-21		0.00	1.4200					
2024-06-22		0.00	1.4200					
2024-06-23		0.00	1.3000					
2024-06-24		0.00	1.2500					
2024-06-25		0.00	1.2300					
2024-06-26		0.00	1.2300					
2024-06-27		0.00	1.1100					
2024-06-28		0.00	0.9500					
2024-06-29		0.00	0.8500					
2024-06-30		0.00	0.5900					
2024-07-01		0.00	0.4300					
2024-07-02	219	138.00	0.4000	2.7	540.0	0.544	0.020	0.0921
2024-07-03		137.00	0.4500					
2024-07-04		132.00	0.6100					
2024-07-05		125.00	0.7500					
2024-07-06		0.00	0.8000					
2024-07-07		0.00	0.7800					
2024-07-08		126.00	0.7600					
2024-07-09		115.00	0.9100					
2024-07-10		113.00	1.0700					
2024-07-11		106.00	1.2100					
2024-07-12		0.00	1.2800					
2024-07-13		0.00	1.2800					
2024-07-14		0.00	1.2800					
2024-07-15		0.00	1.2700					
2024-07-16		0.00	1.2700					
2024-07-17		0.00	1.2700					
2024-07-18		0.00	1.2600					
2024-07-19		0.00	1.2700					
2024-07-20		0.00	1.2700					
2024-07-21		0.00	1.2700					
2024-07-22		0.00	1.2700					
2024-07-23		0.00	1.2800					
2024-07-24		0.00	1.2600					
2024-07-25		0.00	1.2700					
2024-07-26		0.00	1.2800					
2024-07-27		0.00	1.2700					
2024-07-28		0.00	1.2800					
2024-07-29		0.00	1.2700					
2024-07-30		0.00	1.2700					
2024-07-31		0.00	1.2700					
2024-08-01		0.00	1.2800					
2024-08-02		0.00	1.2700					

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L
2024-08-03		0.00	1.2800					
2024-08-04		0.00	1.2900					
2024-08-05		0.00	1.2900					
2024-08-06		0.00	1.2900					
2024-08-07		0.00	1.3000					
2024-08-08		0.00	1.3000					
2024-08-09		0.00	1.3000					
2024-08-10		0.00	1.3100					
2024-08-11		0.00	1.3200					
2024-08-12		0.00	1.3200					
2024-08-13		0.00	1.3100					
2024-08-14		96.00	1.3200					
2024-08-15		66.00	1.9700					
2024-08-16		62.00	1.9500					
2024-08-17		0.00	2.0100					
2024-08-18		0.00	2.0000					
2024-08-19		48.00	2.1800	2.7		0.681		
2024-08-20		41.00	2.0900					
2024-08-21		34.00	2.2800					
2024-08-22		25.00	2.3200					
2024-08-23		25.00	2.3600					
2024-08-24		0.00	2.3400					
2024-08-25		0.00	2.3500					
2024-08-26			2.3300					
2024-08-27		20.00	2.3800					
2024-08-28		15.00	2.4100					
2024-08-29		15.00	2.2600					
2024-08-30		0.00	2.4400					
2024-08-31		0.00	2.4200					
2024-09-01		0.00	2.4200					
2024-09-02		0.00	2.4200					
2024-09-03		10.00	2.4400	2.7		0.974		
2024-09-04		15.00	2.2800					
2024-09-05		0.00	2.2300					
2024-09-06		0.00	4.4000					
2024-09-07		0.00	4.4100					
2024-09-08		0.00	4.4100					
2024-09-09		0.00	4.4000					
2024-09-10		0.00	4.3300					
2024-09-11		0.00	4.2400					
2024-09-12		0.00	4.1600					
2024-09-13		0.00	4.1100					
2024-09-14		0.00	4.0300					
2024-09-15		0.00	3.9600					
2024-09-16		0.00	3.9100					
2024-09-17		0.00	3.8300					
2024-09-18		0.00	3.7700					
2024-09-19		0.00	3.7100					
2024-09-20		0.00	3.6600					
2024-09-21		0.00	3.6000					
2024-09-22		0.00	3.5400					
2024-09-23		0.00	3.4900					
2024-09-24		0.00	3.2300					
2024-09-25		0.00	2.4200					
2024-09-26		0.00	2.4000					
2024-09-27		0.00	2.3800					
2024-09-28		0.00	2.3800					
2024-09-29		0.00	2.3700					
2024-09-30		0.00	2.3700					
2024-10-01		0.00	2.3700					
2024-10-02		0.00	2.3700					
2024-10-03		0.00	2.3000					
2024-10-04		0.00	2.0600					
2024-10-05		0.00	1.8500					
2024-10-06		0.00	1.6600					
2024-10-07		0.00	1.4400					
2024-10-08		0.00	1.4000					
2024-10-09		0.00	1.4000					
2024-10-10		0.00	1.4000					
2024-10-11		0.00	1.3900					
2024-10-12		0.00	1.3900					
2024-10-13		0.00	1.3900					
2024-10-14		0.00	1.3900					
2024-10-15		0.00	1.3900					
2024-10-16		0.00	1.3800					
2024-10-17		0.00	1.3900					
2024-10-18		0.00	1.3900					
2024-10-19		0.00	1.3800					
2024-10-20		0.00	1.3800					
2024-10-21		0.00	1.3700					
2024-10-22		0.00	1.3700					
2024-10-23		0.00	1.3700					
2024-10-24		0.00	1.3700					
2024-10-25		0.00	1.3700					
2024-10-26		0.00	1.3600					
2024-10-27		0.00	1.3600					
2024-10-28		0.00	1.3600					
2024-10-29		0.00	1.3600			0.426		
2024-10-30		0.00	1.3500					
2024-10-31		0.00	1.2500					
2024-11-01		0.00	1.0500					
2024-11-02		0.00	0.9700					
2024-11-03		0.00	0.9300					
2024-11-04		110.00	0.8700					
2024-11-05		86.00	2.0000					
2024-11-06		87.00	2.0000					
2024-11-07		82.00	1.4800					
2024-11-08		99.00	1.2200					
2024-11-09		0.00	1.0700					
2024-11-10		0.00	0.8500					
2024-11-11		123.00	0.5900					
2024-11-12	186	106.00	1.9000	2.7	523.0	0.213	0.023	0.0976
2024-11-13		86.00	1.4000					

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L
2024-11-14		0.00	1.1800					
2024-11-15		0.00	0.9500					
2024-11-16		0.00	0.8800					
2024-11-17		0.00	0.9000					
2024-11-18		0.00	0.8600					
2024-11-19		0.00	0.7000					
2024-11-20		125.00	0.5400					
2024-11-21		105.00	1.9300					
2024-11-22		82.00	1.4000					
2024-11-23		0.00	1.3800					
2024-11-24		0.00	1.3500					
2024-11-25		0.00	1.3200					
2024-11-26		0.00	1.2600					
2024-11-27		0.00	1.1600					
2024-11-28		104.00	1.0400					
2024-11-29		83.00	1.4500					
2024-11-30		0.00	1.2400					
2024-12-01		0.00	1.1700					
2024-12-02		0.00	1.1300					
2024-12-03		0.00	1.0500					
2024-12-04		0.00	0.9400					
2024-12-05		113.00	0.8200					
2024-12-06		85.00	1.4200					
2024-12-07		0.00	1.3500					
2024-12-08		0.00	1.2700					
2024-12-09		0.00	1.1600					
2024-12-10		0.00	0.9700					
2024-12-11		0.00	0.9700					
2024-12-12		120.00	0.6000					
2024-12-13		98.00	1.1300					
2024-12-14		0.00	1.0100					
2024-12-15		0.00	0.9100					
2024-12-16		0.00	0.9200					
2024-12-17		126.00	0.5500					
2024-12-18		108.00	0.9300	2.6		0.203		
2024-12-19		120.00	0.6500					
2024-12-20		100.00	1.9500					
2024-12-21		0.00	1.1000					
2024-12-22		0.00	1.0300					
2024-12-23		106.00	0.9800					
2024-12-24		0.00	0.9900					
2024-12-25		0.00	0.9200					
2024-12-26		0.00	0.8700					
2024-12-27		113.00	0.8000					
2024-12-28		126.00	0.4400					
2024-12-29		127.00						
2024-12-30		117.00	1.8400					
2024-12-31		108.00	1.8900					
Count	4	365	365	12	4	12	4	4
High	224	147.00	4.4100	3.0	540.0	0.974	0.023	0.0984
Low	186	0.00	0.4000	2.6	450.0	0.168	0.011	0.0921
Mean	212	36.10	1.4715	2.8	505.8	0.378	0.019	0.0956
High Criteria				8.5	128-429	0.469	1.000	0.0005
Low Criteria				6.5				
Criteria Ex	0	0	0	12	4	3	0	4
Frequency	0%	0%	0%	100%	100%	25%	0%	100%
10x Criteria Ex	0	0	0	0	0	0	0	4
Frequency	0%	0%	0%	0%	0%	0%	0%	100%

Date	Fe mg/L	Mn mg/L	U mg/L	hard mg/L
2024-01-03	44.40	1.550	0.0537	331.0
2024-04-02	49.60	0.770	0.0550	257.0
2024-07-02	24.70	1.460	0.0377	302.0
2024-11-12	24.60	1.780	0.0330	
Count	4	4	4	4
High	49.60	1.780	0.0550	331.0
Low	24.60	0.770	0.0330	257.0
Mean	35.82	1.390	0.0449	296.7
High Criteria	0.76	0.841	0.0150	
Criteria Ex	4	3	4	0
Frequency	100%	75%	100%	0%
10x Criteria Ex	4	0	0	0
Frequency	100%	0%	0%	0%

DS-3: Stanrock ph Probe Control (ETP Operations)

Date	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2024-01-01					
2024-01-02					11.2
2024-01-03					10.4
2024-01-04					
2024-01-05					
2024-01-06					
2024-01-07					
2024-01-08					
2024-01-09					
2024-01-10					10.6
2024-01-11					10.5
2024-01-12					
2024-01-13					
2024-01-14					
2024-01-15					10.8
2024-01-16					10.5
2024-01-17					
2024-01-18					
2024-01-19					10.9
2024-01-20					
2024-01-21					
2024-01-22					11.2
2024-01-23					10.3
2024-01-24					
2024-01-25					
2024-01-26					10.7
2024-01-27					
2024-01-28					
2024-01-29					10.8
2024-01-30	83.02	11.23	0.00	12	10.8
2024-01-31					
2024-02-01					
2024-02-02					
2024-02-03					
2024-02-04					
2024-02-05					
2024-02-06					
2024-02-07					
2024-02-08					
2024-02-09					
2024-02-10					
2024-02-11					
2024-02-12					
2024-02-13					
2024-02-14					10.8
2024-02-15					10.5
2024-02-16					12.0
2024-02-17					
2024-02-18					
2024-02-19					
2024-02-20					
2024-02-21					
2024-02-22					
2024-02-23					
2024-02-24					
2024-02-25					
2024-02-26					
2024-02-27					
2024-02-28	21.15	3.69	0.00	4	
2024-02-29					10.8
2024-03-01					10.9
2024-03-02					
2024-03-03					
2024-03-04					11.2
2024-03-05					10.9
2024-03-06					10.8
2024-03-07					10.8
2024-03-08					10.8
2024-03-09					10.8
2024-03-10					10.8
2024-03-11					10.7
2024-03-12					10.7
2024-03-13					10.8
2024-03-14					10.8
2024-03-15					10.8
2024-03-16					10.8
2024-03-17					
2024-03-18					
2024-03-19					10.7
2024-03-20					10.6
2024-03-21					10.8
2024-03-22					11.1
2024-03-24					
2024-03-25					11
2024-03-26					10.7
2024-03-27					10.8
2024-03-28	259.33	33.61	0.00	25	10.9
2024-03-29					
2024-03-30					
2024-03-31					
2024-04-01					10.6
2024-04-02					10.7
2024-04-03					
2024-04-04					10.6
2024-04-05					10.6
2024-04-06					
2024-04-07					
2024-04-08					10.4
2024-04-09					
2024-04-10					10.8
2024-04-11					10.6
2024-04-12					10.7
2024-04-13					10.8
2024-04-14					10.8
2024-04-15					10.8
2024-04-16					10.8
2024-04-17					10.8
2024-04-18					10.9
2024-04-19					

DS-3: Stanrock ph Probe Control (ETP Operations)

Date	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2024-04-21					
2024-04-22					11
2024-04-23					10.9
2024-04-24					10.9
2024-04-25					10.9
2024-04-26					10.9
2024-04-27					
2024-04-28	157.22	32.12	0.00	26	
2024-04-29					11.1
2024-04-30					11.9
2024-05-01					10.6
2024-05-02					11
2024-05-03					10.7
2024-05-04					
2024-05-05					
2024-05-06					11.3
2024-05-07					10.7
2024-05-08					11.2
2024-05-09					10.8
2024-05-10					
2024-05-11					
2024-05-12					
2024-05-13					10.8
2024-05-14					10.9
2024-05-15					
2024-05-16					
2024-05-17					
2024-05-18					
2024-05-19					
2024-05-20					
2024-05-21					
2024-05-22					10.8
2024-05-23					12.3
2024-05-24					
2024-05-25					
2024-05-26					
2024-05-27					
2024-05-28	76.80	27.65	0.00	16	
2024-05-29					
2024-05-30					10.7
2024-05-31					10.8
2024-06-01					
2024-06-02					
2024-06-03					
2024-06-04					
2024-06-05					
2024-06-06					
2024-06-07					
2024-06-08					
2024-06-09					
2024-06-10					
2024-06-11					
2024-06-12					
2024-06-13					
2024-06-14					
2024-06-15					
2024-06-16					
2024-06-17					
2024-06-18					
2024-06-19					
2024-06-20					
2024-06-21					
2024-06-22					
2024-06-23					
2024-06-24					
2024-06-25					
2024-06-26					
2024-06-27					
2024-06-28	0.00	0.00	0.00	0	
2024-06-29					
2024-06-30					
2024-07-01					
2024-07-02					10.9
2024-07-03					10.9
2024-07-04					10.7
2024-07-05					10.7
2024-07-06					
2024-07-07					
2024-07-08					10.7
2024-07-09					10.6
2024-07-10					10.6
2024-07-11					10.8
2024-07-12					
2024-07-13					
2024-07-14					
2024-07-15					
2024-07-16					
2024-07-17					
2024-07-18					
2024-07-19					
2024-07-20					
2024-07-21					
2024-07-22					
2024-07-23					
2024-07-24					
2024-07-25					
2024-07-26					
2024-07-27					
2024-07-28					
2024-07-29	10.27	11.81	0.00	8	
2024-07-30					
2024-07-31					
2024-08-01					
2024-08-02					
2024-08-03					
2024-08-04					
2024-08-05					

DS-3: Stanrock ph Probe Control (ETP Operations)

Date	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2024-08-07					
2024-08-08					
2024-08-09					
2024-08-10					
2024-08-11					
2024-08-12					
2024-08-13					
2024-08-14					11.2
2024-08-15					11.0
2024-08-16					11.1
2024-08-17					
2024-08-18					
2024-08-19					11.3
2024-08-20					11.0
2024-08-21					11.0
2024-08-22					10.9
2024-08-23					10.8
2024-08-24					
2024-08-25					
2024-08-26					10.9
2024-08-27					11.1
2024-08-28	24.38	4.81	0.00	12	10.9
2024-08-29					
2024-08-30					
2024-08-31					
2024-09-01					
2024-09-02					
2024-09-03					11.3
2024-09-04					11.4
2024-09-05					
2024-09-06					
2024-09-07					
2024-09-08					
2024-09-09					
2024-09-10					
2024-09-11					
2024-09-12					
2024-09-13					
2024-09-14					
2024-09-15					
2024-09-16					
2024-09-17					
2024-09-18					
2024-09-19					
2024-09-20					
2024-09-21					
2024-09-22					
2024-09-23					
2024-09-24					
2024-09-25					
2024-09-26	3.35	0.55	0.00	2	
2024-09-27					
2024-09-28					
2024-09-29					
2024-09-30					
2024-10-01					
2024-10-02					
2024-10-03					
2024-10-04					
2024-10-05					
2024-10-06					
2024-10-07					
2024-10-08					
2024-10-09					
2024-10-10					
2024-10-11					
2024-10-12					
2024-10-13					
2024-10-14					
2024-10-15					
2024-10-16					
2024-10-17					
2024-10-18					
2024-10-19					
2024-10-20					
2024-10-21					
2024-10-22					
2024-10-23					
2024-10-24					
2024-10-25					
2024-10-26					
2024-10-27					
2024-10-28					
2024-10-29					
2024-10-30					
2024-10-31	0.00	0.00	0.00	0	
2024-11-01					
2024-11-02					
2024-11-03					
2024-11-04					11.0
2024-11-05					11.0
2024-11-06					11.0
2024-11-07					11.0
2024-11-08					11.4
2024-11-09					
2024-11-10					
2024-11-11					11.1
2024-11-12					11.0
2024-11-13					11.0
2024-11-14					
2024-11-15					
2024-11-16					
2024-11-17					
2024-11-18					
2024-11-19					
2024-11-20					10.4
2024-11-21					11.2

DS-3: Stanrock ph Probe Control (ETP Operations)

Date	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2024-11-23					
2024-11-24					
2024-11-25					
2024-11-26					
2024-11-27					
2024-11-28	54.42	16.99	0.00	13	10.8
2024-11-29					11.4
2024-11-30					
2024-12-01					
2024-12-02					
2024-12-03					
2024-12-04					
2024-12-05					10.4
2024-12-06					11.2
2024-12-07					
2024-12-08					
2024-12-09					
2024-12-10					
2024-12-11					
2024-12-12					10.9
2024-12-13					10.9
2024-12-14					
2024-12-15					
2024-12-16					
2024-12-17					10.9
2024-12-18					10.8
2024-12-19					11.0
2024-12-20					11.4
2024-12-21					
2024-12-22					
2024-12-23					10.8
2024-12-24					
2024-12-25					
2024-12-26					
2024-12-27					11.7
2024-12-28					11.1
2024-12-29					10.8
2024-12-30					11.1
2024-12-31	51.38	15.23	0.00	14	11.2
Count	12	12	12	12	365.0
High	259.33	33.61	0.00	26	12.3
Low	0.00	0.00	0.00	0	10.3
Mean	61.78	13.14	0.00	11	10.9

DS-4: Orient Lake Polishing Pond Outlet (Final Discharge)

Date	DDays day	DOC mg/L	FLOW L/s	hard mg/L	pH	SO4 mg/L	TSS mg/L	TOXCD IC25
2024-01-02			17.00		7.3		<1	
2024-01-09		2.2	13.00	311.0	7.2	270.0	<1	
2024-01-16			35.00		7.5		1	
2024-01-23			21.00		7.2		1	
2024-01-30	31		21.00		7.4		1	
2024-02-06		2.6	6.00	317.0	7.6	300.0	1	
2024-02-13			9.00		7.1		<1	
2024-02-20			13.00		7.5		<1	
2024-02-27			6.00		7.1		<1	
2024-02-28	29							
2024-03-05		2.3	254.00	327.0	6.9	270.0	<3	
2024-03-12			136.00		7.2		2	
2024-03-18			48.00		7.2		<1	
2024-03-26			71.00		8.1		2	
2024-03-28	31							
2024-04-02		2.2	54.00	244.0	7.7	200.0	3	
2024-04-09			67.00		7.1		1	
2024-04-16			105.00		7.3		1	
2024-04-23			78.00		7.4		1	
2024-04-28	30							
2024-04-30			197.00		7.5		2	
2024-05-08		1.8	67.00	250.0	7.4	230.0	2	
2024-05-14			25.00		7.3		1	
2024-05-21			9.00		7.2		1	
2024-05-28	31		5.00		7.0		1	
2024-06-04			3.00		7.2		1	
2024-06-11			3.00		7.1		1	
2024-06-18		1.7	6.00	280.0	7.0	270.0	<1	100
2024-06-25			9.00		7.1		<1	
2024-06-28	30							
2024-07-02		1.7	6.00	273.0	7.3	250.0	<1	
2024-07-10			9.00		7.2		<1	
2024-07-16			6.00		7.3		1	
2024-07-22			1.00		7.2		<1	
2024-07-29	31							
2024-07-30			3.00		7.2		1	
2024-08-06		1.3	1.00	291.0	7.0	250.0	<1	
2024-08-12			3.00		7.2		1	
2024-08-20			3.00		7.1		<1	
2024-08-27			3.00		7.5		1	
2024-08-28	31							
2024-09-03		1.3	1.00	284.0	7.1	250.0	<1	
2024-09-10		1.2	1.00	299.0	7.1	260.0	1	58
2024-09-17			1.00		7.1		<1	
2024-09-23			13.00		7.2		<1	
2024-09-28	30							
2024-10-01			3.00		7.3		<1	
2024-10-08		1.5	3.00	317.0	7.1	275.0	4	
2024-10-16			1.00		7.2		<1	
2024-10-22			6.00		7.3		<1	
2024-10-29			3.00		7.2		1	
2024-10-31	31							
2024-11-05		2.1	17.00	303.0	7.5	297.0	<1	
2024-11-12			9.00		7.2		<1	
2024-11-19			9.00		7.4		3	
2024-11-26			25.00		7.2		2	
2024-11-28	30							
2024-12-03		2.3	13.00	317.0	7.3	288.0	<1	
2024-12-10			25.00		7.4		<1	
2024-12-18			78.00		7.3		<1	
2024-12-23			25.00		7.4		2	
2024-12-30			153.00		7.1		2	
2024-12-31	31							
Count	12	13	53	13	53	13	53	2
High	31	2.6	254.00	327.0	8.1	300.0	4	100
Low	29	1.2	1.00	244.0	6.9	200.0	<1	58
Mean	31	1.9	32.06	293.3	7.3	262.3	1	79
High Criteria					8.5	128-429		
Low Criteria					6.5			
Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

DS-4: Orient Lake Polishing Pond Outlet (Final Discharge)

Date	TOXDM %	TOXRT %	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2024-01-02			0.090					
2024-01-09			0.070	0.037	0.0002	0.12	0.029	0.0106
2024-01-16			0.081					
2024-01-23			0.102					
2024-01-30			0.070					
2024-02-06			0.088	0.037	0.0002	0.12	0.036	0.0067
2024-02-13			0.069					
2024-02-20			0.065					
2024-02-27			0.079					
2024-03-05			0.114	0.036	0.0008	0.46	0.070	0.0074
2024-03-12			0.039					
2024-03-18			0.046					
2024-03-26			0.033					
2024-04-02			0.049	0.066	0.0006	0.19	0.041	0.0016
2024-04-09			0.059					
2024-04-16			0.062					
2024-04-23			0.074					
2024-04-30			0.050					
2024-05-08			0.050	0.062	0.0003	0.11	0.021	0.0031
2024-05-14			0.110					
2024-05-21			0.110					
2024-05-28			0.139					
2024-06-04			0.146					
2024-06-11			0.045					
2024-06-18	0	0	0.119	0.057	0.0001	0.04	0.027	0.0031
2024-06-25			0.261					
2024-07-02			0.154	0.049	0.0002	0.05	0.027	0.0037
2024-07-10			0.150					
2024-07-16			0.147					
2024-07-22			0.152					
2024-07-30			0.139					
2024-08-06			0.174	0.044	0.0002	0.04	0.066	0.0036
2024-08-12			0.222					
2024-08-20			0.119					
2024-08-27			0.112					
2024-09-03			0.182	0.040	0.0002	0.05	0.068	0.0063
2024-09-10	0	0	0.180	0.041	0.0002	0.05	0.072	0.0059
2024-09-17			0.135					
2024-09-23			0.215					
2024-10-01			0.154					
2024-10-08			0.145	0.039	0.0004	0.18	0.055	0.0110
2024-10-16			0.121					
2024-10-22			0.139					
2024-10-29			0.135					
2024-11-05			0.142	0.035	0.0003	0.18	0.030	0.0180
2024-11-12			0.136					
2024-11-19			0.140					
2024-11-26			0.113					
2024-12-03			0.116	0.036	0.0003	0.30	0.024	0.0130
2024-12-10			0.134					
2024-12-18			0.126					
2024-12-23			0.109					
2024-12-30			0.096					
Count	2	2	53	13	13	13	13	13
High	0	0	0.261	0.066	0.0008	0.46	0.072	0.0180
Low	0	0	0.033	0.035	0.0001	0.04	0.021	0.0016
Mean	0	0	0.115	0.044	0.0003	0.15	0.044	0.0072
High Criteria			0.469	1.000	0.0025	0.76	0.841	0.0150
Criteria Ex	0	0	0	0	0	0	0	1
Frequency	0%	0%	0%	0%	0%	0%	0%	8%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

DS-5: Stanrock Orient Creek Discharge into Moose Lake

Date	CONDF µmho/cm	FLOW L/s	Head(ft) ft	pH
2024-01-05	67.2	1.93	0.1	4.1
2024-04-02	89.0	7.41	0.2	3.7
2024-08-07		0.00	0.0	
2024-11-01	128.3	13.22	0.3	3.3
Count	3	4	4	3
High	128.3	13.22	0.3	4.1
Low	67.2	0.00	0.0	3.3
Mean	94.8	5.64	0.1	3.7
High Criteria				8.5
Low Criteria				6.5
Criteria Ex	0	0	0	3
Frequency	0%	0%	0%	100%
10x Criteria Ex	0	0	0	0
Frequency	0%	0%	0%	0%

DS-6: Stanrock Moose Lake Settling Pond Narrows, Upstream of DS-1

Date	FLOW L/s	pH
2024-01-02	16.00	7.4
2024-01-09	2.00	7.6
2024-01-16	82.00	7.1
2024-01-23	62.00	8.3
2024-01-30	62.00	7.8
2024-02-06	6.00	7.7
2024-02-13	1.00	6.9
2024-02-20	6.00	8.3
2024-02-27	1.00	7.4
2024-03-05	194.00	6.5
2024-03-12	176.00	8.4
2024-03-19	62.00	6.6
2024-03-26	56.00	8.9
2024-04-02	59.00	8.1
2024-04-09	82.00	7.9
2024-04-16	164.00	7.9
2024-04-23	103.00	7.6
2024-04-30	203.00	8.1
2024-05-07	62.00	8.5
2024-05-14	62.00	8.3
2024-05-21	6.00	8.1
2024-05-28		
2024-06-04	0.00	
2024-06-11	0.00	
2024-06-18	0.00	
2024-06-25	0.00	
2024-07-02	0.00	
2024-07-09	6.00	8.6
2024-07-16	0.00	
2024-07-23	0.00	
2024-07-30	0.00	
2024-08-06	0.00	
2024-08-13	0.00	
2024-08-20	0.00	
2024-08-27	0.00	
2024-09-03	0.00	
2024-09-10	0.00	
2024-09-17	0.00	
2024-09-23	0.00	
2024-10-01	0.00	
2024-10-08	0.00	
2024-10-15	0.00	
2024-10-22	0.00	
2024-10-29	0.00	
2024-11-05	0.00	
2024-11-12	0.00	
2024-11-19	6.00	7.5
2024-11-26	16.00	7.6
2024-12-03	6.00	7.8
2024-12-10	29.00	7.8
2024-12-17	45.00	7.4
2024-12-23	29.00	7.3
2024-12-30	203.00	7.4
Count	52	26
High	203.00	8.9
Low	0.00	6.5
Mean	34.75	7.8
High Criteria		8.5
Low Critieria		6.5
Criteria Ex	0	1
Frequency	0%	4%
10x Criteria Ex	0	0
Frequency	0%	0%

FBDST: Field Blank for D-2

Date	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L
2024-01-09	5.3	<0.2	<1	<0.005	0.000	0.0000	<0.01	<0.000
2024-02-06	5.3	<0.2	<1	<0.005	0.000	<0.0000	<0.01	0.000
2024-03-05	5.8	<0.2	1	<0.005	<0.000	<0.0000	<0.01	<0.000
2024-04-02	5.5	<0.2	1	0.005	0.001	<0.0000	<0.01	0.000
2024-05-08	6.0	<0.2	1	<0.005	0.000	<0.0000	<0.01	0.000
2024-06-18	6.0	<0.2	1	<0.005	0.000	<0.0000	<0.01	0.000
2024-07-16	5.8	<0.2	<1	<0.005	0.000	<0.0000	<0.01	0.000
2024-08-06	6.7	<0.2	1	<0.005	0.000	<0.0000	<0.01	<0.000
2024-09-03	6.4	<0.2	<1	<0.005	<0.000	<0.0000	<0.01	0.000
2024-10-01	4.5	<0.5	<1	<0.007	<0.001	<0.0001	0.04	<0.001
2024-11-05	7.2	<0.5	<1	<0.007	<0.001	<0.0001	<0.02	<0.001
2024-12-03	5.2	<0.5	<1	<0.007	<0.001	<0.0001	0.05	<0.001
Count	12	12	12	12	12	12	12	12
High	7.2	<0.5	1	<0.007	0.001	<0.0001	0.05	<0.001
Low	4.5	<0.2	<1	<0.005	<0.000	<0.0000	<0.01	<0.000
Mean	5.8	<0.3	1	0.005	0.000	0.0000	0.01	0.000

Date	U mg/L	hard mg/L
2024-01-09	0.0000	<0.1
2024-02-06	0.0000	<0.1
2024-03-05	0.0000	<0.1
2024-04-02	0.0000	<0.1
2024-05-08	0.0001	0.1
2024-06-18	0.0000	<0.1
2024-07-16	0.0001	0.3
2024-08-06	0.0000	0.3
2024-09-03	<0.0000	<0.1
2024-10-01	<0.0010	<0.1
2024-11-05	<0.0010	<0.1
2024-12-03	<0.0010	<0.1
Count	12	12
High	<0.0010	0.3
Low	<0.0000	<0.1
Mean	0.0003	0.1

FBDST2: Field Blank for DS-2

Date	pH	ACID mg/L
2024-01-03	6.0	2
2024-04-02	5.4	3
2024-07-02	5.0	2
2024-11-12	4.5	9
Count	4	4
High	6.0	9
Low	4.5	2
Mean	5.2	4

ST-1: Stanrock Downstream of Dam J

Date	CONDF µmho/cm	pH
2024-01-08	86.0	4.5
2024-04-08	35.0	4.2
2024-08-07		
2024-11-18	86.7	4.3
Count	3	3
High	86.7	4.5
Low	35.0	4.2
Mean	69.2	4.3
High Criteria	69.5	8.5
Low Critieria		6.5
Criteria Ex	0	3
Frequency	0%	100%
10x Criteria Ex	0	0
Frequency	0%	0%

ST-1A: Stanrock Seepage from Dam J at Toe of Dam

Date	CONDF µmho/cm	FLOW L/s	pH
2024-01-08		0.00	
2024-04-08	19.0	0.08	5.0
2024-08-07		0.00	
2024-11-18		0.00	
Count	1	4	1
High	19.0	0.08	5.0
Low	19.0	0.00	5.0
Mean	19.0	0.03	5.0
High Criteria	69.5		8.5
Low Critieria			6.5
Criteria Ex	0	0	1
Frequency	0%	0%	100%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

ST-3: Stanrock Downstream of Dam G

Date	CONDF µmho/cm	pH
2024-01-08	814.0	3.1
2024-04-08	416.0	3.3
2024-08-07	1450.0	3.2
2024-11-18	954.0	2.9
Count	4	4
High	1450.0	3.3
Low	416.0	2.9
Mean	908.5	3.1
High Criteria	69.5	
Low Critieria		
Criteria Ex	0	4
Frequency	0%	100%
10x Criteria Ex	0	0
Frequency	0%	0%

ST-3A: Stanrock Seepage from Dam G at Toe of Dam G

Date	CONDF µmho/cm	FLOW L/s	pH
2024-01-05	982.0	0.11	5.3
2024-04-08	761.0	0.16	4.8
2024-08-07	2569.0	0.04	3.7
2024-11-18	1192.0	0.11	4.1
Count	4	4	4
High	2569.0	0.16	5.3
Low	761.0	0.04	3.7
Mean	1376.0	0.11	4.5
High Criteria	69.5		8.5
Low Critieria			6.5
Criteria Ex	0	0	4
Frequency	0%	0%	100%
10x Criteria Ex	0	0	0
Frequency	0%	0%	0%

ST-4: Quirke Lake Delta Downstream of Dam M

Date	ACID mg/L	ALK mg/L	CONDF µmho/cm	DOC mg/L	hard mg/L	pH	SO4 mg/L	Ra Bq/L
2024-02-06	<1	9.00	79.6	4.4	41.6	7.0	28.0	0.030
2024-05-09	<2	7.00	58.0	2.8	34.7	7.3	24.0	0.015
2024-08-06	<1	8.00	92.4	3.1	32.6	7.2	26.0	0.028
2024-11-18	8	12.00	82.1	3.1	34.1	6.3	27.6	0.034
Count	4	4	4	4	4	4	4	4
High	8	12.00	92.4	4.4	41.6	7.3	28.0	0.034
Low	<1	7.00	58.0	2.8	32.6	6.3	24.0	0.015
Mean	3	9.00	78.0	3.4	35.8	7.0	26.4	0.027
High Criteria						8.5	128-429	0.469
Low Critieria						6.5		
Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

Date	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2024-02-06	0.051	0.0001	0.03	0.005	0.0012
2024-05-09	0.041	0.0000	0.02	0.005	0.0011
2024-08-06	0.040	0.0000	0.01	0.004	0.0010
2024-11-18	0.046	<0.0001	0.09	0.005	0.0010
Count	4	4	4	4	4
High	0.051	<0.0001	0.09	0.005	0.0012
Low	0.040	0.0000	0.01	0.004	0.0010
Mean	0.044	0.0001	0.04	0.005	0.0011
High Critieria	1.000	0.0005	0.76	0.841	0.0150
Criteria Ex	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%
10x Criteria Ex	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%

Summary of Final Effluent Annual Loadings for Compliance Parameters 2024

Annual loadings from the TMA final discharge were calculated using monthly monitoring results (volume and average concentration) aligning with the Metal and Diamond Mining Effluent Regulations (MDMER) loadings methodology. Weekly flows at the final discharges were used to calculate monthly discharge volumes (Litres). Monthly average concentrations were multiplied by monthly volumes to produce monthly loads and monthly loads were summed to estimate annual loadings. Annual loadings at the final discharge point were calculated for radium-226 (Million Becquerels) and TSS (kilograms per year) for each effluent treatment plant and presented in Appendix V.

Site	Final Discharge Location	Total Annual Volume (L)	Annual Radium-226 Loadings (MBq)	Annual TSS Loadings Kg/Year
2024				
Denison TMA-1	D-2	1,179,000,000	116	1871
Denison TMA-2	D-3	334,000,000	44	457
Stanrock	DS-4	999,000,000	80	1648

Denison TMA-1 (D-2) Monthly Loadings Calculations for Compliance Parameters

DENISON TMA-1 FINAL DISCHARGE (D-2) MONTHLY LOADINGS							
Month	Volume (ML)	Volume (L)	FLOW (L/s)	TSS (mg/L)	TSS (kg/Yr)	Ra-226 (Bq/L)	Ra-266 (MBq)
Jan-24	58	58000000	22	1	58	0.023	1.334
Feb-24	69	69000000	27	2	138	0.029	2.001
Mar-24	189	189000000	71	2	378	0.150	28.35
Apr-24	363	363000000	140	2	726	0.154	55.902
May-24	175	175000000	66	1	175	0.098	17.15
Jun-24	43	43000000	17	1	43	0.048	2.064
Jul-24	50	50000000	19	1	50	0.030	1.5
Aug-24	35	35000000	13	1	35	0.024	0.84
Sep-24	34	34000000	13	1	34	0.026	0.884
Oct-24	29	29000000	11	1	29	0.032	0.928
Nov-24	63	63000000	24	1	63	0.049	3.087
Dec-24	71	71000000	27	2	142	0.032	2.272
2024 Loadings		**1,179,000,000**			**1871**		**116.312**

Flow: Average monthly flow and volume (L) taken from discharge at D-2

Radium-226 and TSS: Average monthly discharge at D-2

	Entered data
	Calculated data

Denison TMA-2 (D-3) Monthly Loadings Calculations for Compliance Parameters

DENISON TMA-2 FINAL DISCHARGE (D-3) MONTHLY LOADINGS							
Month	**Volume (ML)**	**Volume (L)**	**FLOW (L/s)**	**TSS (mg/L)**	**TSS (kg/Yr)**	**Ra-226 (Bq/L)**	**Ra-226 (MBq)**
Jan-24	12	12000000	4	< 1	12	0.124	1.488
Feb-24	11	11000000	5	1	11	0.088	0.968
Mar-24	123	123000000	46	2	246	0.109	13.407
Apr-24	75	75000000	29	< 1	75	0.128	9.6
May-24	30	30000000	11	1	30	0.135	4.05
Jun-24	7	7000000	3	1	7	0.178	1.246
Jul-24	11	11000000	3	1	11	0.195	2.145
Aug-24	0	0	0	0	0	0	0
Sep-24	0	0	0	0	0	0	0
Oct-24	1	1000000	3	1	1	0.124	0.124
Nov-24	27	27000000	10	< 1	27	0.169	4.563
Dec-24	37	37000000	14	1	37	0.164	6.068
2024 Loadings		**334,000,000**			**457**		**43.659**

Flow: Average monthly flow and volume (L) taken from discharge at D-3

Radium-226 and TSS: Average monthly discharge at D-3

	Entered data
	Calculated data

Stanrock (DS-4) Monthly Loadings Calculations for Compliance Parameters

STANROCK FINAL DISCHARGE (DS-4) MONTHLY LOADINGS							
Month	**Volume (ML)**	**Volume (L)**	**FLOW (L/s)**	**TSS (mg/L)**	**TSS (kg/Yr)**	**Ra-226 (Bq/L)**	**Ra-226 (MBq)**
Jan-24	57	57000000	21	1	57	0.083	4.731
Feb-24	21	21000000	9	1	21	0.075	1.575
Mar-24	341	341000000	127	2	682	0.058	19.778
Apr-24	260	260000000	100	2	520	0.059	15.34
May-24	71	71000000	27	1	71	0.102	7.242
Jun-24	14	14000000	5	1	14	0.143	2.002
Jul-24	13	13000000	5	1	13	0.148	1.924
Aug-24	7	7000000	3	1	7	0.157	1.099
Sep-24	10	10000000	4	1	10	0.178	1.78
Oct-24	9	9000000	3	2	18	0.139	1.251
Nov-24	39	39000000	15	2	78	0.133	5.187
Dec-24	157	157000000	56	1	157	0.116	18.212
2024 Loadings		**999,000,000**			**1648**		**80.121**

Flow: Average monthly flow and volume (L) taken from discharge at DS-4

Radium-226 and TSS: Average monthly discharge at DS-4

	Entered data
	Calculated data

Denison Mines Inc Elliot Lake Division
2024 Denison Tailings Managament Area
Environmental Monitoring Results

Denison

BH91 D1A 66.14m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	360.74	6.9	780.0	<1	27.30
2021	361.01	No sample collected (no recharge)			
2022	360.80	No sample collected (no recharge)			
2023	360.00	No sample collected (no recharge)			
2024	360.17	No sample collected (no recharge)			

BH91 D1B 45.63m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	361.24	7.4	680.0	<1	0.02
2021	361.45	No sample collected (no recharge)			
2022	360.77	No sample collected (no recharge)			
2023	360.49	No sample collected (no recharge)			
2024	360.68	No sample collected (no recharge)			

BH91 D3A 47.33m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	361.78	6.6	1600.0	157	151.00
2021	362.14	6.6	1500.0	129	161.00
2022	361.63	6.6	1500.0	48	88.60
2023	361.22	7.4	1600.0	109	157.00
2024	361.38	6.5	1500.0	94	167.00

BH91 D3B 21.40m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	370.57	6.6	1600.0	207	148.00
2021	370.67	6.5	1500.0	160	145.00
2022	370.38	6.3	1400.0	185	126.00
2023	370.34	6.2	1500.0	128	146.00
2024	370.37	6.2	1500.0	154	144.00

Denison Mines Inc Elliot Lake Division
2024 Denison Tailings Managament Area
Environmental Monitoring Results

BH91 D9A 21.79m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	395.94	6.6	1600.0	178	199.00
2021	396.06	6.5	1600.0	181	202.00
2022	396.49	6.5	1400.0	147	159.00
2023	396.45	6.5	1400.0	179	170.00
2024	399.85	6.2	1300.0	138	163.00

BH91 DG4B 12.50m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	358.59	6.3	780.0	2	21.20
2021	358.64	6.6	730.0	<1	18.80
2022	358.64	6.3	700.0	<1	22.10
2023	358.63	6.6	560.0	<2	14.30
2024	358.91	6.5	550.0	<1	11.00

Denison Mines Inc Elliot Lake Division
2024 Stanrock Tailings Managament Area
Environmental Monitoring Results

BH91 SG1A 5.49 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	387.78	4.1	3200.0	2370	1050.00
2021	387.85	4.2	2800.0	1990	839.00
2022	387.67	4.4	3300.0	2410	703.00
2023	387.50	3.6	2200.0	1550	635.00
2024	387.43	4.4	2600.0	*	859.000

* Analytical error, results not reportable

BH91 SG2A 33.31 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	400.56	6.4	4500.0	2420	1320.00
2021	400.88	6.5	4500.0	2659	1540.00
2022	400.94	6.1	4500.0	2442	1220.00
2023	400.13	6.2	4600.0	2900	1390.00
2024	400.07	5.9	4600.0	*	1560.00

* Analytical error, results not reportable

BH91 SG2D 4.39 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	404.82	No sample collected (no recharge)			
2021	404.62	No sample collected (no recharge)			
2022	404.68	No sample collected (no recharge)			
2023	404.28	No sample collected (no recharge)			
2024	404.27	No sample collected (no recharge)			

BH91 SG3A 8.78 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	399.43	No sample collected (no recharge)			
2021	399.40	No sample collected (no recharge)			
2022	399.23	No sample collected (no recharge)			
2023	399.39	No sample collected (no recharge)			
2024	399.17	No sample collected (no recharge)			

Denison Mines Inc Elliot Lake Division
2024 Stanrock Tailings Managament Area
Environmental Monitoring Results

BH91 SG3B 5.85 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	399.59	No sample collected (no recharge)			
2021	399.56	No sample collected (no recharge)			
2022	399.71	No sample collected (no recharge)			
2023	399.36	No sample collected (no recharge)			
2024	399.01	No sample collected (no recharge)			

BH98 15A 7.86 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	392.24	5.9	2800.0	1170	718.00
2021	392.24	6.1	2600.0	1040	489.00
2022	392.21	5.9	2700.0	1278	656.00
2023	392.24	5.9	2300.0	1000	496.00
2024	392.24	5.7	2200.0	829	412.00

BH98 16A 5.49 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	395.68	5.7	3700.0	2050	1220.00
2021	395.90	5.8	3700.0	1960	980.00
2022	395.92	5.6	3800.0	2570	1340.00
2023	396.25	5.7	3400.0	1930	996.00
2024	395.44	5.7	3500.0	*	1090.00

* Analytical error, results not reportable

PN ST3 P3 5.94 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	404.32	5.8	3200.0	1930	979.00
2021	404.50	5.7	160.0	1960	1100.00
2022	404.40	5.6	3600.0	2090	1030.00
2023	404.04	5.2	3700.0	2540	1120.00
2024	403.77	4.3	4800.0	2140	1268.00

Denison Mines Inc Elliot Lake Division
2024 Stanrock Tailings Managament Area
Environmental Monitoring Results

PN ST3 P5 2.64 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	404.33	3.3	3400.0	2050	996.00
2021	404.42	3.4	3000.0	1770	716.00
2022	404.30	3.3	2700.0	1770	422.00
2023	404.02	3.5	2800.0	2000	746.00
2024	403.65	3.3	3100.0	insufficient volume	

PN ST3 P6 11.58 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	404.25	5.9	7100.0	4690	2670.00
2021	404.43	6.0	6200.0	4570	2550.00
2022	404.41	5.8	5800.0	4270	2470.00
2023	403.91	5.9	5700.0	5000	2230.00
2024	403.79	5.4	6400.0	4060	2440.00

PN ST3 P8 20.91 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2020	402.37	5.3	9500.0	7780	4770.00
2021	402.60	5.5	14000.0	7180	4210.00
2022	402.31	4.9	8300.0	6502	3290.00
2023	401.99	4.6	7800.0	7000	3160.00
2024	402.22	3.8	7900.0	5560	3260.00

NAUTILUS ENVIRONMENTAL
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 : 255079
Sample Number : 82817

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-06-18
Location :	Elliot Lake ON	Sampling Time :	09:25
Substance :	D-2 - 20240618	Date Received :	2024-06-19
Sampling Method :	Grab	Time Received :	09:05
Sampled By :	L. Cormier, F. Paquette	Temperature at Receipt :	27 °C
Sample Description :	Clear, yelllow.	Date Tested :	2024-06-19

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

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	9.3 days
Organism Batch :	Dm24-11	Average Brood Size :	28.8
Culture Mortality :	1.7% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per Test Level :	30
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		
Date Tested :	2024-06-18	LC50 :	6.2 g/L
Organism Batch :	Dm24-11	95% Confidence Limits :	6.0 - 6.4 g/L
Analyst(s) :	JN, GR	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.9 - 6.8 g/L

COMMENTS

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

Emma Kunert
I am approving this document
2024-06-26
14:15-04:00

Approved By :

Project Manager

Work Order : 255079
Sample Number : 82817

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.5	7.7	482	20	88	250 mg/L

0 HOURS

Date & Time : 2024-06-19 12:20
Analyst(s) : FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.5	7.7	482	20	88	250
100	B	0	0	7.5	7.7	482	20	88	250
100	C	0	0	7.5	7.7	482	20	88	250
Control	A	0	0	8.1	8.6	436	22	100	140
Control	B	0	0	8.1	8.6	436	22	100	140
Control	C	0	0	8.1	8.6	436	22	100	140

Notes:

24 HOURS

Date & Time : 2024-06-20 11:45
Analyst(s) : FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2024-06-21 12:30
Analyst(s) : GR (JW)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	7.9	8.3	484	21
100	B	0	0	7.9	8.3	483	21
100	C	0	0	7.9	8.3	483	21
Control	A	0	0	8.3	8.3	440	21
Control	B	0	0	8.3	8.3	441	21
Control	C	0	0	8.2	8.2	440	21

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2024-06-26

NAUTILUS ENVIRONMENTAL
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 : 255079
Sample Number : 82817

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-06-18
Location :	Elliot Lake ON	Sampling Time :	09:25
Substance :	D-2 - 20240618	Date Received :	2024-06-19
Sampling Method :	Grab	Time Received :	09:05
Sampled By :	L. Cormier, F. Paquette	Temperature at Receipt :	27 °C
Sample Description :	Clear, yelllow.	Date Tested :	2024-06-20

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, February 2016, and December 2023 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Mean Fork Length :	42.7 mm
Organism Batch :	T24-09	Range of Fork Lengths :	40 - 45 mm
Control Sample Size :	10	Mean Wet Weight :	0.7 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.4 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	20 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/L/min	Volume of Control :	19 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-09	LC50 :	3560 mg/L
Date Tested :	2024-06-03	95% Confidence Limits :	3263 - 3884 mg/L
Analyst(s) :	NP, FM, AJS, DT, JW	Historical Mean LC50 :	4324 mg/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	3506 - 5332 mg/L

COMMENTS

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

Approved By : Emma Kunert
I am approving this document
2024-06-26
14:29-04:00

Project Manager

Work Order : 255079
Sample Number : 82817

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.6	7.9	488	15	82
After 30 min pre-aeration :	7.6	8.4	491	15	91

0 HOURS

Date & Time 2024-06-20 9:40
Analyst(s) : NWP (PG)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.6	8.4	491	15	91
Control	0	0	8.2	9.8	721	14	100

Notes:

24 HOURS

Date & Time 2024-06-21 8:50
Analyst(s) : PG

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2024-06-22 9:00
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	16
Control	0	0	–	–	–	16

Notes:

72 HOURS

Date & Time 2024-06-23 9:05
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2024-06-24 10:15
Analyst(s) : AJS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	7.7	8.9	499	15
Control	0	0	8.3	9.3	704	15

Notes:

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

Test Data Reviewed By : JL
Date : 2024-06-25

NAUTILUS ENVIRONMENTAL
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 : 255079
Sample Number : 82818

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-06-18
Location :	Elliot Lake ON	Sampling Time :	10:30
Substance :	DS-4 - 20240618	Date Received :	2024-06-19
Sampling Method :	Grab	Time Received :	09:05
Sampled By :	L. Cormier, F. Paquette	Temperature at Receipt :	27 °C
Sample Description :	Clear, colourless.	Date Tested :	2024-06-19

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

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	9.3 days
Organism Batch :	Dm24-11	Average Brood Size :	28.8
Culture Mortality :	1.7% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per Test Level :	30
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		
Date Tested :	2024-06-18	LC50 :	6.2 g/L
Organism Batch :	Dm24-11	95% Confidence Limits :	6.0 - 6.4 g/L
Analyst(s) :	JN, GR	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.9 - 6.8 g/L

COMMENTS

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

Emma Kunert
I am approving this document
2024-06-26
14:31-04:00

Approved By : _____

Project Manager

Work Order : 255079
Sample Number : 82818

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.2	7.8	526	20	90	300 mg/L

0 HOURS

Date & Time : 2024-06-19 12:30
Analyst(s) : FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.2	7.8	526	20	90	300
100	B	0	0	7.2	7.8	526	20	90	300
100	C	0	0	7.2	7.8	526	20	90	300
Control	A	0	0	8.1	8.6	436	22	100	140
Control	B	0	0	8.1	8.6	436	22	100	140
Control	C	0	0	8.1	8.6	436	22	100	140

Notes:

24 HOURS

Date & Time : 2024-06-20 11:50
Analyst(s) : FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2024-06-21 12:45
Analyst(s) : GR (JW)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	7.6	8.3	528	22
100	B	0	0	7.6	8.3	528	22
100	C	0	0	7.7	8.4	527	22
Control	A	0	0	8.2	8.3	440	22
Control	B	0	0	8.3	8.3	440	22
Control	C	0	0	8.2	8.3	439	22

Notes:

Number immobile does not include number dead.

"–" = not measured/not required

* adjusted for temperature and barometric pressure

Test Data Reviewed By : JL
Date : 2024-06-26

NAUTILUS ENVIRONMENTAL
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 : 255079
Sample Number : 82818

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-06-18
Location :	Elliot Lake ON	Sampling Time :	10:30
Substance :	DS-4 - 20240618	Date Received :	2024-06-19
Sampling Method :	Grab	Time Received :	09:05
Sampled By :	L. Cormier, F. Paquette	Temperature at Receipt :	27 °C
Sample Description :	Clear, colourless.	Date Tested :	2024-06-20

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, February 2016, and December 2023 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Mean Fork Length :	43.0 mm
Organism Batch :	T24-09	Range of Fork Lengths :	41 - 45 mm
Control Sample Size :	10	Mean Wet Weight :	0.7 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.4 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	18 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/L/min	Volume of Control :	17 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-09	LC50 :	3560 mg/L
Date Tested :	2024-06-03	95% Confidence Limits :	3263 - 3884 mg/L
Analyst(s) :	NP, FM, AJS, DT, JW	Historical Mean LC50 :	4324 mg/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	3506 - 5332 mg/L

COMMENTS

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

Approved By : Emma Kunert
I am approving this document
2024-06-26
14:32-04:00

Project Manager

NAUTILUS ENVIRONMENTAL

TOXICITY TEST REPORT

Rainbow Trout
EPS 1/RM/13

Work Order : 255079
Sample Number : 82818

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.4	8.2	534	15	86
After 30 min pre-aeration :	7.4	8.9	536	15	93

0 HOURS

Date & Time 2024-06-20 9:15
Analyst(s) : NWP (PG)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.4	8.9	536	15	93
Control	0	0	8.2	9.8	721	14	100

Notes:

24 HOURS

Date & Time 2024-06-21 8:40
Analyst(s) : PG

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2024-06-22 9:00
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	16
Control	0	0	–	–	–	16

Notes:

72 HOURS

Date & Time 2024-06-23 9:05
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2024-06-24 8:50
Analyst(s) : AJS

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	7.5	9.1	544	15
Control	0	0	8.3	9.3	701	15

Notes:

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

Test Data Reviewed By : JL
Date : 2024-06-25

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 255079

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: 110307

Field Sampler Name (print): Laura Cormier / Fred Paquette.

Signature: Laura Cormier / Frédérie Paquette

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 06/18/24

Client: Denison Mines
1 HomeWalk, Suite 200
Elliot Lake, P5A-2A5

Phone: (705) 848-9191 x231 → Laura Cormier

Fax: (705) 848-5814

Contact: Analytical.results@denisonmines.com

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-06-18	09:25	D-2-20240618	82817	27°C	✓		✓			✓				✓*		1x20L, 3x4L **
2024-06-18	10:30	DS-4-20240618	82818	27°C	✓		✓			✓				✓*		1x20L, 3x4L **

For Lab Use Only

Received By: JW/ASK

Date: 2024-06-19

Time: 9:05

Storage Location:

Storage Temp.(°C):

Please list any special requests or instructions:

* Grab samples as per pail label.

** Bladders at 22°C 2024-06-19 JW

Standard COC rev 3 2016 09 01 TC

NAUTILUS ENVIRONMENTAL
Suite 122, 704 Mara Street
Point Edward, ON
N7V1X4
Tel. (519) 339-8787

TOXICITY TEST REPORT

Ceriodaphnia dubia
EPS 1/RM/21

Work Order : 255079
Sample Number : 82817

SAMPLE IDENTIFICATION

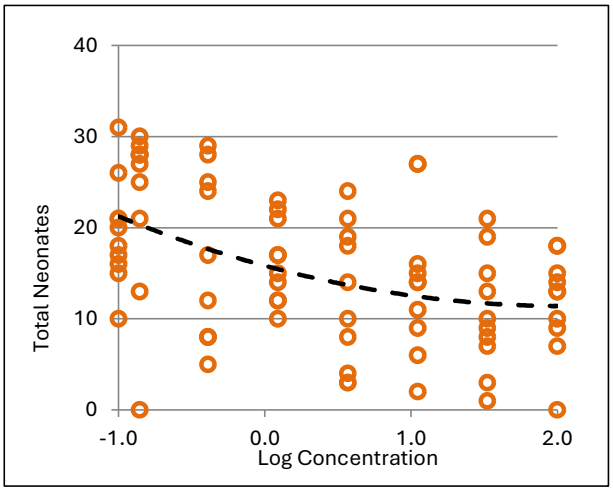
Company :	Denison Mines Inc.	Sampling Date :	2024-06-18
Location :	Elliot Lake ON	Sampling Time :	09:25
Substance :	D-2 - 20240618	Date Received :	2024-06-20
Sampling Method :	Grab	Time Received :	11:15
Sampled By :	L. Courrier, F. Paquette	Temperature at Receipt :	14 °C
Sample Description :	Clear, yelllow.	Date Tested :	2024-06-21

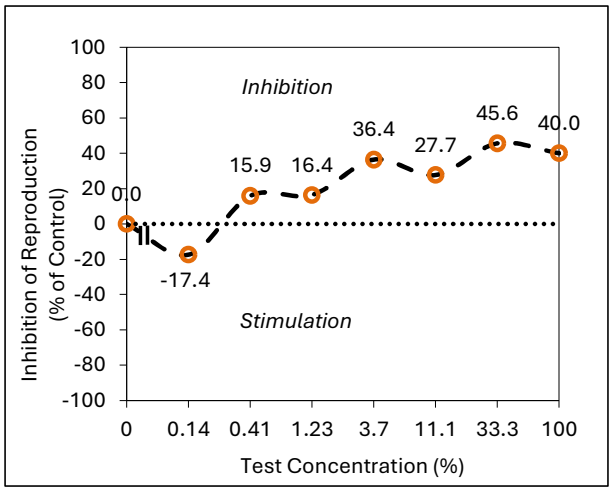
Test Method : Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia* . Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21, 2nd ed. (February 2007).

6-DAY TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Reproduction)	2.66%	0.34 - 12.2%	Non-Linear Regression (CETIS)[a]
LC50	>100%	–	–

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





COMMENTS

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

Emma Kunert
I am approving this document
2024-07-19 10:53-04:00

Approved By : _____
Project Manager

Work Order : 255079
Sample Number : 82817

TEST ORGANISM

Test Organism :	*Ceriodaphnia dubia*	Range of Age (at start of test) :	<24 h; within 12 h of one another
Organism Origin :	Single in-house mass culture	Mean Brood Organism Mortality :	5% (previous 7 days)
Test Organism Origin :	Individual in-house cultures	Brood Organism Mean Young :	22.2 (first three broods)
Ephippia in Culture :	None	Mean Young per Brood Organism :	≥8 (3rd or subsequent brood)

No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

TEST CONDITIONS

Test Type :	Static renewal	Control/Dilution Water :	CD24120 [2]
Renewal Method :	Transferred to fresh solutions	Test Volume per Replicate :	15 mL
Renewal Frequency :	≤ 24 hours	Test Vessel :	17 mL polystyrene cylinder
Sample Filtration :	None	Depth of Test Solution :	4.5 cm
Test Aeration :	None	Organisms per Replicate :	1
pH Adjustment :	None	Number of Replicates :	10
Hardness Adjustment :	None	Test Method Deviation(s) :	None

[2]Reconstituted/Dechlorinated Municipal Drinking Water, and Distilled Water (no additional chemicals)

REFERENCE TOXICANT DATA

Toxicant :	Zinc	LC50 :	0.12 mg/L
Date Tested :	2024-06-20	95% Confidence Limits :	0.09 - 0.16 mg/L
Test Duration :	6 Days	Historical Mean LC50 :	0.12 mg/L
Statistical Method :	Trimmed Spearman-Kärber	Warning Limits (± 2SD) :	0.05 - 0.26 mg/L

The reference toxicity test was performed under the same experimental conditions as those used with the test sample.

CUMULATIVE DAILY MORTALITY DATA

		Test Concentration (%)							
Date	Test Day	**Control**	**0.14**	**0.41**	**1.23**	**3.7**	**11.1**	**33.3**	**100**
2024-06-22	1	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	0	0	10
2024-06-25	4	0	0	0	0	0	0	0	10
2024-06-26	5	0	0	0	0	0	0	0	10
2024-06-27	6	10	0	0	0	0	10	0	10
Total Mortality (%) :		**10**	**0**	**0**	**0**	**0**	**10**	**0**	**10**

REFERENCES

[a] CETIS™, © 2000-2022. v2.1.4.0 x64. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

Work Order : 255079
Sample Number : 82817

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2024-06-21
Initiated By : SO
Initiation Time : 12:00
Test Completion Date : 2024-06-27

Control	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)	Analyst(s)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0	KP
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0	SO
2024-06-24	3	0	0	0	4	0	0	0	0	2	0	0.6	CS
2024-06-25	4	6	6	7	4	3	2	4	5	0	5	4.2	CS
2024-06-26	5	7	11	11	8	5	7	6	6	9	10	8	CS
2024-06-27	6	2 x 0	13	0	12	9	0	10	10	11		6.7	SO
Total		**15**	**17**	**31**	**16**	**20**	**18**	**10**	**21**	**21**	**26**	**19.5 (±5.9)**	

3.7%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	6	0	0	0	0	0.6
2024-06-25	4	4	5	2	2	3	0	0	1	3	0	2
2024-06-26	5	0	6	0	6	7	8	4	2	9	3	4.5
2024-06-27	6	0	7	8	0	9	7	10	0	12	0	5.3
Total		**4**	**18**	**10**	**8**	**19**	**21**	**14**	**3**	**24**	**3**	**12.4 (±7.9)**

0.14%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	4	4	0	4	0	6	0	1.8
2024-06-25	4	3	2	0	0	0	6	0	0	0	4	1.5
2024-06-26	5	11	8	6	11	12	10	10	0	10	9	8.7
2024-06-27	6	14	11	7	10	13	11	14	0	14	15	10.9
Total		**28**	**21**	**13**	**25**	**29**	**27**	**28**	**0**	**30**	**28**	**22.9 (±9.5)**

11.1%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	5	2	0	0	0	0	5	3	0	2	1.7
2024-06-25	4	0	0	0	0	3	4	0	0	3	0	1
2024-06-26	5	9	3	0	4	6	10	9	9	5	2	5.7
2024-06-27	6	13	4	2	11	2	0	x 13	4	6	2	5.7
Total		**27**	**9**	**2**	**15**	**11**	**14**	**27**	**16**	**14**	**6**	**14.1 (±8.1)**

0.41%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	3	0	0	0	2	0.5
2024-06-25	4	3	0	3	0	4	0	6	4	0	0	2
2024-06-26	5	9	3	6	4	4	0	11	11	8	10	6.6
2024-06-27	6	13	9	8	4	0	2	11	14	0	12	7.3
Total		**25**	**12**	**17**	**8**	**8**	**5**	**28**	**29**	**8**	**24**	**16.4 (±9.3)**

33.3%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	2	0	0	0	0	0.2
2024-06-25	4	1	3	2	3	0	0	3	3	0	0	1.5
2024-06-26	5	5	5	6	4	0	8	6	8	3	0	4.5
2024-06-27	6	3	2	11	0	3	5	4	10	5	1	4.4
Total		**9**	**10**	**19**	**7**	**3**	**15**	**13**	**21**	**8**	**1**	**10.6 (±6.5)**

1.23%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	3	0	0	2	0	0	0	0	0	5	1
2024-06-25	4	0	6	5	0	3	4	0	3	6	0	2.7
2024-06-26	5	8	0	6	10	8	5	4	5	0	8	5.4
2024-06-27	6	1	4	6	10	12	12	8	6	9	4	7.2
Total		**12**	**10**	**17**	**22**	**23**	**21**	**12**	**14**	**15**	**17**	**16.3 (±4.5)**

100%	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	2	0	0	0	0	0	0	0 x 1	0		0.3
2024-06-25	4	0	2	3	2	2	5	0	0	6	0	2
2024-06-26	5	11	7	7	8	6	3	2	0	0	7	5.1
2024-06-27	6	5	4	5	0	10	1	5	0	7	6	4.3
Total		**18**	**13**	**15**	**10**	**18**	**9**	**7**	**0**	**14**	**13**	**11.7 (±5.5)**

NOTES : •All young produced by a test organism during its fourth and subsequent broods were discarded and not included in the above counts. The presence of two or more neonates in any test chamber, during any given day of the test, constitutes a brood.

•No outlying data points were detected according to Grubbs Test (CETIS)[a].

x = test organism mortality
* = accidental test organism mortality
– =4th brood (see 'NOTES')

Test Data Reviewed By : KP
Date : 2024-07-02

Work Order : 255079
Sample Number : 82817

WATER CHEMISTRY DATA

			Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6
	Date :		2024-06-21	2024-06-22	2024-06-23	2024-06-24	2024-06-25	2024-06-26
	Sub-sample Used		1	1	1	2	2	3
Initial Chemistry (100 %)	Temperature (°C)		25	26	26	25	26	26
	Dissolved O_2 (mg/L)		8.5	9.0	9.7	9.0	9.1	8.8
	pH		7.5	7.3	7.4	7.5	7.5	7.5
	Conductivity (µmhos/cm)		555	562	560	570	574	585
	Pre-aeration Time (min)[5]		≤20	≤20	≤20	≤20	≤20	≤20
	Analyst(s)	Initial	SP	TC	TC	TC	TC	TC
		Final	MB	TC	TC	KK	TC	SP
Control	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.3	7.9	8.1	8.4	8.4	8.0
		Final	8.2	8.3	8.4	8.2	7.7	7.6
	pH	Initial	8.2	8.0	8.4	8.3	8.3	8.3
		Final	8.3	8.3	8.3	8.3	8.1	8.2
	Conductivity (µmhos/cm)	Initial	410	399	414	416	414	439
	Hardness (mg/L as $CaCO_3$)		126	–	–	–	–	–
0.14 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.5	8.1	8.3	8.3	8.0	8.0
		Final	8.4	8.6	9.0	8.4	7.7	7.7
	pH	Initial	8.3	8.3	8.4	8.3	8.4	8.3
		Final	8.4	8.4	8.4	8.4	8.2	8.2
	Conductivity (µmhos/cm)	Initial	410	406	417	418	423	434
3.7 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.6	8.5	8.6	8.4	8.0	8.1
		Final	8.3	8.3	8.4	8.4	7.6	7.7
	pH	Initial	8.3	8.4	8.5	8.3	8.4	8.2
		Final	8.3	8.4	8.3	8.3	8.1	8.2
	Cond. (µmhos/cm)	Initial	423	409	424	425	427	442
100 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.4	8.2	8.1	8.3	8.2	8.0
		Final	8.2	8.4	8.7	8.3	7.5	7.7
	pH	Initial	7.9	7.8	8.0	7.7	7.8	7.8
		Final	8.1	8.1	8.3	8.0	7.8	7.9
	Conductivity (µmhos/cm)	Initial	569	565	563	572	579	587
	Hardness (mg/L as $CaCO_3$)		246	–	–	–	–	–

"–" = not measured/not required

[5] ≤100 bubbles/minute

Test Data Reviewed By : KP
Date : 2024-07-02

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 255079

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: 110307

Field Sampler Name (print): Laura Cormier / Fred Paquette.

Signature: Laura Cormier / Frédérie Paquette

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 06/18/24

Client: Denison Mines
1 HomeWalk, Suite 200
Elliot Lake, P5A-2A5

Phone: (705) 848-9191 x231 → Laura Cormier

Fax: (705) 848-5814

Contact: Analytical.results@denisonmines.com

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-06-18	09:25	D-2-20240618	82817	27°C	✓		✓			✓				✓*		1x20L, 3x4L **
2024-06-18	10:30	DS-4-20240618	82818	27°C	✓		✓			✓				✓*		1x20L, 3x4L **

For Lab Use Only

Received By: JW/ASK

Date: 2024-06-19

Time: 9:05

Storage Location:

Storage Temp.(°C):

Please list any special requests or instructions:

* Grab samples as per pail label.

** Bladders at 22°C 2024-06-19 JW

Standard COC rev 3 2016 09 01 TC

Confirmation of sample receipt - Generated
2024-06-20 13:39

Your samples have been received at Nautilus Environmental's sample reception at Point Edward and have now been issued an unique sample ID numbers

Here are some details of your submission

Client Name :	Nautilus Guelph
Sample Number :	7940-00124100
Sample Name :	82817
Sample collection date :	2024/06/18
Sample collection time :	10:30
Sample receipt date :	2024/06/20
Sample receipt time :	11:15
Temperature upon arrival :	14 °C
Container/Volume :	3x4L

Analyses requested

Test Code	Description
CDD :	7-D C. dubia IC25

Entry of your submission is based on information contained on your Chain of Custody. If you have any questions regarding this submission, kindly contact Nautilus Environmental, Point Edward by email using carol@nautilusenvironmental.ca.

704 Mara Street, Suite 122
Point Edward, Ontario, CA
N7V 1X4, Phone 519-339-8787

NAUTILUS ENVIRONMENTAL
Suite 122, 704 Mara Street
Point Edward, ON
N7V1X4
Tel. (519) 339-8787

TOXICITY TEST REPORT

Ceriodaphnia dubia
EPS 1/RM/21

Work Order : 255079
Sample Number : 82818

SAMPLE IDENTIFICATION

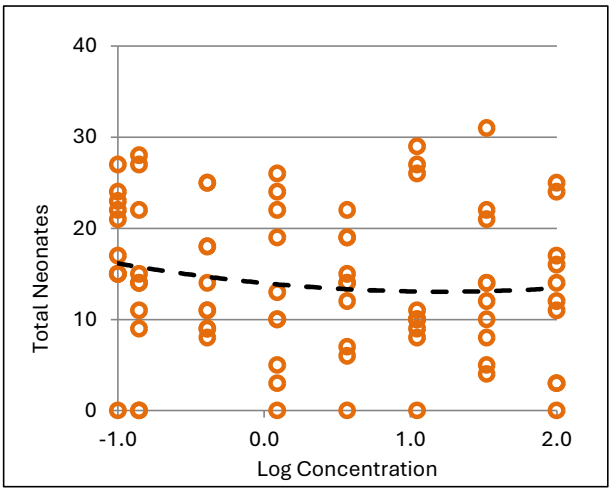
Company :	Denison Mines Inc.	Sampling Date :	2024-06-18
Location :	Elliot Lake ON	Sampling Time :	10:30
Substance :	DS-4 - 20240618	Date Received :	2024-06-20
Sampling Method :	Grab	Time Received :	11:15
Sampled By :	L. Courrier, F. Paquette	Temperature at Receipt :	14 °C
Sample Description :	Clear, colourless.	Date Tested :	2024-06-21

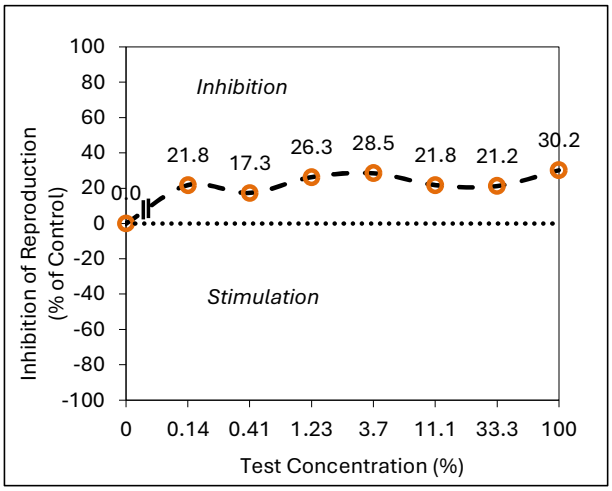
Test Method : Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia* . Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21, 2nd ed. (February 2007).

6-DAY TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Reproduction)	>100%	–	Non-Linear Regression (CETIS)[a]
LC50	>100%	–	–

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





COMMENTS

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

Emma Kunert
I am approving this document
2024-07-19
10:56-04:00

Approved By : _____

Project Manager

Work Order : 255079
Sample Number : 82818

TEST ORGANISM

Test Organism :	*Ceriodaphnia dubia*	Range of Age (at start of test) :	<24 h; within 12 h of one another
Organism Origin :	Single in-house mass culture	Mean Brood Organism Mortality :	20% (previous 7 days)
Test Organism Origin :	Individual in-house cultures	Brood Organism Mean Young :	20.1 (first three broods)
Ephippia in Culture :	None	Mean Young per Brood Organism :	≥8 (3rd or subsequent brood)

No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

TEST CONDITIONS

Test Type :	Static renewal	Control/Dilution Water :	CD2412([2]
Renewal Method :	Transferred to fresh solutions	Test Volume per Replicate :	15 mL
Renewal Frequency :	≤ 24 hours	Test Vessel :	17 mL polystyrene cylinder
Sample Filtration :	None	Depth of Test Solution :	4.5 cm
Test Aeration :	None	Organisms per Replicate :	1
pH Adjustment :	None	Number of Replicates :	10
Hardness Adjustment :	None	Test Method Deviation(s) :	None

[2]Reconstituted/Dechlorinated Municipal Drinking Water, and Distilled Water (no additional chemicals)

REFERENCE TOXICANT DATA

Toxicant :	Zinc	LC50 :	0.12 mg/L
Date Tested :	2024-06-20	95% Confidence Limits :	0.09 - 0.16 mg/L
Test Duration :	6 days	Historical Mean LC50 :	0.12 mg/L
Statistical Method :	Trimmed Spearman-Kärber	Warning Limits (± 2SD) :	0.05 - 0.26 mg/L

The reference toxicity test was performed under the same experimental conditions as those used with the test sample.

CUMULATIVE DAILY MORTALITY DATA

		Test Concentration (%)							
Date	Test Day	**Control**	**0.14**	**0.41**	**1.23**	**3.7**	**11.1**	**33.3**	**100**
2024-06-22	1	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	0	0	0
2024-06-25	4	0	0	0	10	0	0	0	0
2024-06-26	5	0	0	0	20	0	0	10	10
2024-06-27	6	10	0	0	20	10	10	10	10
Total Mortality (%) :		**10**	**0**	**0**	**20**	**10**	**10**	**10**	**10**

REFERENCES

[a] CETIS™, © 2000-2022. v2.1.4.0 x64. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

Work Order : 255079
Sample Number : 82818

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2024-06-21
Initiated By : SO
Initiation Time : 12:20
Test Completion Date : 2024-06-27

Control		Replicate										Mean Young (±SD)	Analyst(s)
	Day	1	2	3	4	5	6	7	8	9	10		
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0	SO
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0	KK
2024-06-24	3	0	0	0	0	0	0	0	0	0	0	0	CS
2024-06-25	4	4	5	6	2	4	2	3	0	4	4	3.4	KK
2024-06-26	5	11	9	10	6	8	6	9	0	9	9	7.7	KK
2024-06-27	6	0	10	11	7	11	9	9	0	2 x	9	6.8	SO
Total		**15**	**24**	**27**	**15**	**23**	**17**	**21**	**0**	**15**	**22**	**17.9 (±7.6)**	

3.7%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	0	0	0	0	0	0
2024-06-25	4	5	4	5	0	3	1	3	0	5	4	3
2024-06-26	5	9	9	0	9	2	10	6	0	8	3	5.6
2024-06-27	6	0	6	7	x 6	1	8	13	0	1	0	4.2
Total		**14**	**19**	**12**	**15**	**6**	**19**	**22**	**0**	**14**	**7**	**12.8 (±6.8)**

0.14%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	2	2	0	0	0	0	0	0	0	0.4
2024-06-25	4	0	5	4	6	0	4	3	5	4	0	3.1
2024-06-26	5	0	7	9	9	4	10	8	9	7	0	6.3
2024-06-27	6	0	0	0	13	5	13	11	0	0	0	4.2
Total		**0**	**14**	**15**	**28**	**9**	**27**	**22**	**14**	**11**	**0**	**14.0 (±9.8)**

11.1%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	4	0	0	0	0	0	0	4	0	0	0.8
2024-06-25	4	1	4	4	4	3	0	2	0	4	0	2.2
2024-06-26	5	10	4	6	6	10	0	7	10	0	5	5.8
2024-06-27	6	12	0	x 0	0	13	0	0	15	7	5	5.2
Total		**27**	**8**	**10**	**10**	**26**	**0**	**9**	**29**	**11**	**10**	**14.0 (±9.7)**

0.41%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	3	0	0	0	0	0	0	0	0	0	0.3
2024-06-25	4	0	3	4	4	6	3	3	5	6	1	3.5
2024-06-26	5	4	7	7	10	8	0	6	6	8	7	6.3
2024-06-27	6	11	8	0	11	0	6	0	0	11	0	4.7
Total		**18**	**18**	**11**	**25**	**14**	**9**	**9**	**11**	**25**	**8**	**14.8 (±6.4)**

33.3%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	0	0	0	0	0	0
2024-06-25	4	5	0	2	0	1	3	6	3	2	0	2.2
2024-06-26	5	9	x 9	1	4	9	5	11	8	0	0	5.6
2024-06-27	6	0	12	11	6	2	0	14	11	3	4	6.3
Total		**14**	**21**	**14**	**10**	**12**	**8**	**31**	**22**	**5**	**4**	**14.1 (±8.4)**

1.23%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	0	0	0	0	0	0
2024-06-25	4	3	2	0	5	3	2	5	0	2	0 x	2.2
2024-06-26	5	0	8	7	5	7	x 10	9	3	8	0	5.7
2024-06-27	6	0	0	12	3	0	12	12	2	12	0	5.3
Total		**3**	**10**	**19**	**13**	**10**	**24**	**26**	**5**	**22**	**0**	**13.2 (±9.2)**

100%		Replicate										Mean Young (±SD)
	Day	1	2	3	4	5	6	7	8	9	10	
2024-06-22	1	0	0	0	0	0	0	0	0	0	0	0
2024-06-23	2	0	0	0	0	0	0	0	0	0	0	0
2024-06-24	3	0	0	0	0	0	0	0	0	0	0	0
2024-06-25	4	3	1	6	3	4	0	2	0	3	0	2.2
2024-06-26	5	0	5	0	8	8	9	10	3	x 10	0	5.3
2024-06-27	6	0	8	11	0	13	7	0	0	11	0	5
Total		**3**	**14**	**17**	**11**	**25**	**16**	**12**	**3**	**24**	**0**	**12.5 (±8.6)**

NOTES : •All young produced by a test organism during its fourth and subsequent broods were discarded and not included in the above counts. The presence of two or more neonates in any test chamber, during any given day of the test, constitutes a brood.

•No outlying data points were detected according to Grubbs Test (CETIS)[a].

x = test organism mortality
* = accidental test organism mortality
– =4th brood (see 'NOTES')

Test Data Reviewed By : KP
Date : 2024-07-02

Work Order : 255079
Sample Number : 82818

WATER CHEMISTRY DATA

			Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6
	Date :		2024-06-21	2024-06-22	2024-06-23	2024-06-24	2024-06-25	2024-06-26
	Sub-sample Used		1	1	1	2	2	3
Initial Chemistry (100 %)	Temperature (°C)		25	26	25	24	26	26
	Dissolved O_2 (mg/L)		8.6	8.8	10.2	9.3	9.3	9.3
	pH		7.2	7.2	7.1	7.2	7.3	7.2
	Conductivity (µmhos/cm)		601	608	607	618	624	634
	Pre-aeration Time (min)[5]		≤20	≤20	≤20	≤20	≤20	≤20
	Analyst(s)	Initial	SP	TC	TC	TC	TC	TC
		Final	TC	TC	TC	KK	TC	SP
Control	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.4	7.9	8.1	8.4	8.4	8.4
		Final	8.5	8.1	7.7	7.8	7.7	7.6
	pH	Initial	8.2	8.0	8.4	8.3	8.3	8.3
		Final	8.4	8.3	8.1	8.2	8.1	8.2
	Conductivity (µmhos/cm)	Initial	410	399	414	416	414	434
	Hardness (mg/L as $CaCO_3$)		126	–	–	–	–	–
0.14 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.2	7.8	8.2	8.2	8.0	7.9
		Final	8.3	8.1	8.1	8.1	7.5	7.2
	pH	Initial	8.2	8.2	8.3	8.3	8.4	8.1
		Final	8.3	8.3	8.2	8.2	8.1	8.2
	Conductivity (µmhos/cm)	Initial	416	406	415	420	423	440
3.7 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.5	7.9	8.2	8.3	8.0	7.9
		Final	8.4	8.0	8.2	8.0	7.5	7.6
	pH	Initial	8.3	8.2	8.3	8.3	8.4	8.2
		Final	8.3	8.3	8.2	8.3	8.1	8.2
	Cond. (µmhos/cm)	Initial	419	421	426	428	427	439
100 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	25
	Dissolved O_2 (mg/L)	Initial	8.6	8.1	8.8	8.2	8.3	8.3
		Final	8.4	8.0	8.4	8.0	7.5	7.7
	pH	Initial	7.8	7.7	7.6	7.6	7.7	7.6
		Final	8.0	7.8	7.8	7.7	7.6	7.7
	Conductivity (µmhos/cm)	Initial	611	611	612	621	627	639
	Hardness (mg/L as $CaCO_3$)		74	–	–	–	–	–

"–" = not measured/not required

[5] ≤100 bubbles/minute

Test Data Reviewed By : KP
Date : 2024-07-02

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 255079

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: 110307

Field Sampler Name (print): Laura Cormier / Fred Paquette.

Signature: Laura Cormier / Frédérie Paquette

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 06/18/24

Client: Denison Mines
1 HomeWalk, Suite 200
Elliot Lake, P5A-2A5

Phone: (705) 848-9191 x231 → Laura Cormier

Fax: (705) 848-5814

Contact: Analytical.results@denisonmines.com

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-06-18	09:25	D-2-20240618	82817	27°C	✓		✓			✓				✓*		1x20L, 3x4L **
2024-06-18	10:30	DS-4-20240618	82818	27°C	✓		✓			✓				✓*		1x20L, 3x4L **

For Lab Use Only

Received By: JW/ASK

Date: 2024-06-19

Time: 9:05

Storage Location:

Storage Temp.(°C):

Please list any special requests or instructions:

* Grab samples as per pail label.

** Bladders at 22°C 2024-06-19 JW

Standard COC rev 3 2016 09 01 TC

Confirmation of sample receipt - Generated
2024-06-20 13:40

Your samples have been received at Nautilus Environmental's sample reception at Point Edward and have now been issued an unique sample ID numbers

Here are some details of your submission

Client Name :	Nautilus Guelph
Sample Number :	7940-00124101
Sample Name :	82818
Sample collection date :	2024/06/18
Sample collection time :	10:30
Sample receipt date :	2024/06/20
Sample receipt time :	11:15
Temperature upon arrival :	14 °C
Container/Volume :	3x4L

Analyses requested

Test Code	Description
CDD :	7-D C. dubia IC25

Entry of your submission is based on information contained on your Chain of Custody. If you have any questions regarding this submission, kindly contact Nautilus Environmental, Point Edward by email using carol@nautilusenvironmental.ca.

704 Mara Street, Suite 122
Point Edward, Ontario, CA
N7V 1X4, Phone 519-339-8787

NAUTILUS ENVIRONMENTAL
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 : 255855
Sample Number : 83987

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-09-10
Location :	Elliot Lake ON	Sampling Time :	10:00
Substance :	D-2-20240910	Date Received :	2024-09-11
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	F. Paquette	Temperature at Receipt :	22 °C
Sample Description :	Clear, colourless	Date Tested :	2024-09-13

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

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	7.4 days
Organism Batch :	Dm24-17	Average Brood Size :	31.6
Culture Mortality :	3.0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per Test Level :	30
Duration of Pre-Aeration :	30 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		
Date Tested :	2024-09-10	LC50 :	6.2 g/L
Organism Batch :	Dm24-17	95% Confidence Limits :	6.0 - 6.4 g/L
Analyst(s) :	GR, FM, CGR	Historical Mean LC50 :	6.3 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.9 - 6.7 g/L

COMMENTS

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

Emma Kunert
I am approving this document
2024-09-24 17:39-04:00

Approved By : _____

Project Manager

Work Order : 255855
Sample Number : 83987

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.6	8.8	571	21	103	300 mg/L

0 HOURS

Date & Time : 2024-09-13 9:30
Analyst(s) : PG/GR (JW)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.6	8.7	571	21	102	300
100	B	0	0	7.6	8.7	571	21	102	300
100	C	0	0	7.6	8.7	571	21	102	300
Control	A	0	0	8.3	8.6	458	21	100	140
Control	B	0	0	8.3	8.6	458	21	100	140
Control	C	0	0	8.3	8.6	458	21	100	140

Notes:

24 HOURS

Date & Time : 2024-09-14 8:45
Analyst(s) : FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2024-09-15 9:20
Analyst(s) : FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	7.9	8.4	574	20
100	B	0	0	7.9	8.4	575	20
100	C	0	0	8.0	8.4	572	20
Control	A	0	0	8.3	8.5	453	20
Control	B	0	0	8.3	8.4	453	20
Control	C	0	0	8.3	8.4	453	20

Notes:

Number immobile does not include number dead.

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

Test Data Reviewed By : JJ
Date : 2024-09-19

NAUTILUS ENVIRONMENTAL
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 : 255855
Sample Number : 83987

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-09-10
Location :	Elliot Lake ON	Sampling Time :	10:00
Substance :	D-2-20240910	Date Received :	2024-09-11
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	F. Paquette	Temperature at Receipt :	22 °C
Sample Description :	Clear, colourless	Date Tested :	2024-09-12

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, February 2016, and December 2023 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Mean Fork Length :	43.2 mm
Organism Batch :	T24-19	Range of Fork Lengths :	40 - 48 mm
Control Sample Size :	10	Mean Wet Weight :	0.7 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.4 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	18 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Volume of Control :	18 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-19	LC50 :	3022 mg/L
Date Tested :	2024-09-09	95% Confidence Limits :	2677 - 3412 mg/L
Analyst(s) :	NWP, FM, NM, GR, JGR	Historical Mean LC50 :	3763 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2776 - 5100 mg/L

COMMENTS

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

Emma Kunert
I am approving this document
2024-09-24 17:39-04:00

Approved By : _____
Project Manager

Work Order : 255855
Sample Number : 83987

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.7	8.8	592	15	90
After 30 min pre-aeration :	7.7	9.1	592	15	95

0 HOURS

Date & Time 2024-09-12 12:55
Analyst(s) : GR (AJS)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.7	9.1	592	15	95
Control	0	0	8.3	9.4	733	15	97

Notes:

24 HOURS

Date & Time 2024-09-13 13:25
Analyst(s) : FM (JGR)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2024-09-14 11:45
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2024-09-15 11:00
Analyst(s) : FM (JGR)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2024-09-16 12:40
Analyst(s) : NWP

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	7.3	9.1	600	15
Control	0	0	8.0	8.9	707	15

Notes:

"–" = not measured/not required

Number impaired does not include number dead.

[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2024-09-19

NAUTILUS ENVIRONMENTAL
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 : 255855
Sample Number : 83988

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-09-10
Location :	Elliot Lake ON	Sampling Time :	11:00
Substance :	DS-4-20240910	Date Received :	2024-09-11
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	F. Paquette	Temperature at Receipt :	22 °C
Sample Description :	Clear, colourless	Date Tested :	2024-09-14

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

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Species :	*Daphnia magna*	Time to First Brood :	7.4 days
Organism Batch :	Dm24-17	Average Brood Size :	30.9
Culture Mortality :	3.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms per Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms per Test Level :	30
Duration of Pre-Aeration :	30 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		
Date Tested :	2024-09-10	LC50 :	6.2 g/L
Organism Batch :	Dm24-17	95% Confidence Limits :	6.0 - 6.4 g/L
Analyst(s) :	GR, FM, CGR	Historical Mean LC50 :	6.3 g/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	5.9 - 6.7 g/L

COMMENTS

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

Emma Kunert
I am approving this document
2024-09-24 17:40-04:00

Approved By : _____

Project Manager

Work Order : 255855
Sample Number : 83988

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)*	Hardness (as $CaCO_3$)
Initial Chemistry (100%) :	7.3	9.0	588	21	106	330 mg/L

0 HOURS

Date & Time : 2024-09-14 9:15
Analyst(s) : GR (FM)/FM

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation*	Hardness
100	A	0	0	7.7	8.6	587	21	101	330
100	B	0	0	7.7	8.6	587	21	101	330
100	C	0	0	7.7	8.6	587	21	101	330
Control	A	0	0	8.3	8.6	472	21	100	140
Control	B	0	0	8.3	8.6	472	21	100	140
Control	C	0	0	8.3	8.6	472	21	100	140

Notes:

24 HOURS

Date & Time : 2024-09-15 8:15
Analyst(s) : GR (FM)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	–	0	–	–	–	20
100	B	–	0	–	–	–	20
100	C	–	0	–	–	–	20
Control	A	–	0	–	–	–	20
Control	B	–	0	–	–	–	20
Control	C	–	0	–	–	–	20

Notes:

48 HOURS

Date & Time : 2024-09-16 9:20
Analyst(s) : PG

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O_2	Conductivity	Temperature
100	A	0	0	7.9	8.5	593	21
100	B	0	0	7.9	8.4	593	21
100	C	0	0	7.9	8.4	591	21
Control	A	0	0	8.3	8.4	476	21
Control	B	0	0	8.3	8.4	475	21
Control	C	0	0	8.3	8.4	474	21

Notes:

Number immobile does not include number dead.

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

Test Data Reviewed By : JJ
Date : 2024-09-19

NAUTILUS ENVIRONMENTAL
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 : 255855
Sample Number : 83988

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2024-09-10
Location :	Elliot Lake ON	Sampling Time :	11:00
Substance :	DS-4-20240910	Date Received :	2024-09-11
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	F. Paquette	Temperature at Receipt :	22 °C
Sample Description :	Clear, colourless	Date Tested :	2024-09-12

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, February 2016, and December 2023 amendments).

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Test Organism :	*Oncorhynchus mykiss*	Mean Fork Length :	43.2 mm
Organism Batch :	T24-19	Range of Fork Lengths :	40 - 48 mm
Control Sample Size :	10	Mean Wet Weight :	0.7 g
Cumulative stock mortality rate :	0% (previous 7 days)	Organism Loading Rate :	0.4 g/L
Control organisms showing stress :	0 (at test completion)		

TEST CONDITIONS

Test Type :	Single concentration	Number of Replicates :	1
Sample pH Adjustment :	None	Organisms Per Replicate :	10
Sample Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Organisms Per Test Level :	10
Duration of Sample Pre-Aeration :	30 minutes	Volume of Sample :	18 L
Control Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Volume of Control :	18 L
Duration of Control Pre-aeration:	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride		
Organism Batch :	T24-19	LC50 :	3022 mg/L
Date Tested :	2024-09-09	95% Confidence Limits :	2677 - 3412 mg/L
Analyst(s) :	NWP, FM, NM, GR, JGR	Historical Mean LC50 :	3763 mg/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	2776 - 5100 mg/L

COMMENTS

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

Emma Kunert
I am approving this document
2024-09-24
17:41-04:00

Approved By : _____
Project Manager

Work Order : 255855
Sample Number : 83988

TEST DATA

	pH	Dissolved O_2 (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O_2 Saturation (%)[3]
Initial Water Chemistry (100%) :	7.5	9.0	611	15	92
After 30 min pre-aeration :	7.5	9.2	613	15	95

0 HOURS

Date & Time 2024-09-12 13:00
Analyst(s) : GR (AJS)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature	O_2 Saturation[3]
100%	0	0	7.5	9.2	613	15	95
Control	0	0	8.3	9.4	733	15	97

Notes:

24 HOURS

Date & Time 2024-09-13 13:25
Analyst(s) : FM (JGR)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

48 HOURS

Date & Time 2024-09-14 11:45
Analyst(s) : JGR

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

72 HOURS

Date & Time 2024-09-15 11:00
Analyst(s) : FM (JGR)

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	–	–	–	15
Control	0	0	–	–	–	15

Notes:

96 HOURS

Date & Time 2024-09-16 12:40
Analyst(s) : NWP

Concentration	Dead	Impaired	pH	Dissolved O_2	Conductivity	Temperature
100%	0	0	7.2	9.0	618	15
Control	0	0	8.0	8.9	707	15

Notes:

"–" = not measured/not required

Number impaired does not include number dead.

[3] adjusted for temperature and barometric pressure

Test Data Reviewed By : JJ

Date : 2024-09-19

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: **255855**

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: 110307

Field Sampler Name (print): FREDERIC PAQUETTE

Signature: Frédéric Paquette

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 09/10/2024

Client: Denison Mines
1 Horn Walk, Suite 200
Elliot Lake, P5A-2A5

Phone: (705) 848-9191

Fax: (705) 848-5814

Contact: analytical.results@denisonmines.com

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-09-10	10:00	D-2-20240910	83987	22°C	✓		✓			✓						1x20L, 3x4L
~~2024-09-24~~	11:00	DS-4-20240910	83988	22°C	✓		✓			✓						1x20L, 3x4L
2024-09-10 *																

For Lab Use Only

Received By: GR/NM

Date: 2024-09-17

Time: 13:00

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:
* Sample date changed to match date on sample label. NM 2024-09-17

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Ceriodaphnia dubia
EPS 1/RM/21

Work Order : 256025
Sample Number : 84285

SAMPLE IDENTIFICATION

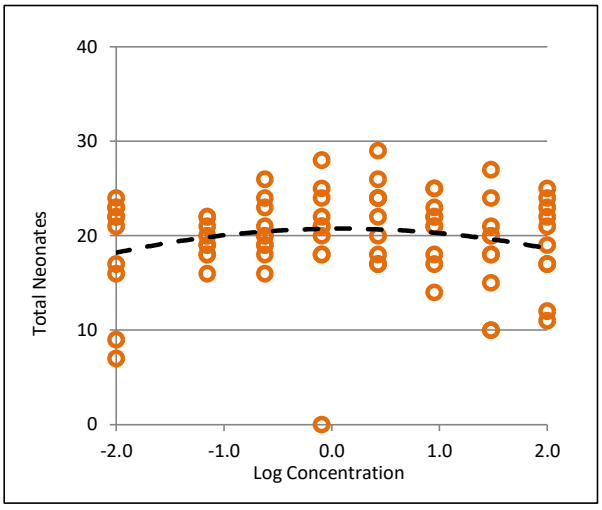
Company :	Denison Mines Inc.	Sampling Date :	2024-10-01
Location :	Elliot Lake ON	Sampling Time :	10:45
Substance :	D-2-20241001	Date Received :	2024-10-02
Sampling Method :	Grab	Time Received :	15:45
Sampled By :	L. Grant	Temperature at Receipt :	18 °C
Sample Description :	Clear, pale yellow	Date Tested :	2024-10-03

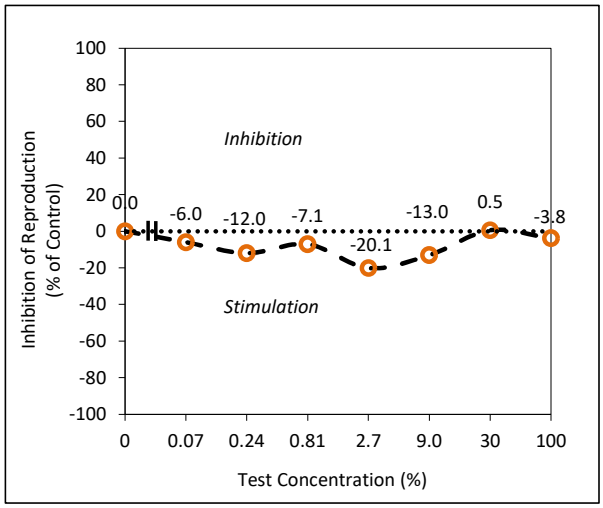
Test Method : Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia* . Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21, 2nd ed. (February 2007).

6-DAY TEST RESULTS

Effect	Value	95% Confidence Limits	Statistical Method
IC25 (Reproduction)	>100%	–	–
LC50	>100%	–	–

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





COMMENTS

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

Emma Kunert
I am approving this document
2024-11-07
14:23-05:00

Approved By : _____

Project Manager

Work Order : 256025
Sample Number : 84285

TEST ORGANISM

Test Organism :	*Ceriodaphnia dubia*	Range of Age (at start of test) :	20:50 h - 23:50 h
Organism Batch :	Cd24-10	Mean Brood Organism Mortality :	0% (previous 7 days)
Organism Origin :	Single in-house mass culture	Brood Organism Mean Young :	21.6 (first three broods)
Test Organism Origin :	Individual in-house cultures	Mean Young per Brood Organism :	13.5 (3rd or subsequent brood)
Ephippia in Culture :	None		

No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

TEST CONDITIONS

Test Type :	Static renewal	Control/Dilution Water :	Well water [2]
Renewal Method :	Transferred to fresh solutions	Test Volume per Replicate :	15 mL
Renewal Frequency :	≤ 24 hours	Test Vessel :	20 mL glass vial
Sample Filtration :	None	Depth of Test Solution :	4 cm
Test Aeration :	None	Organisms per Replicate :	1
pH Adjustment :	None	Number of Replicates :	10
Hardness Adjustment :	None	Test Method Deviation(s) :	None

[2]no additional chemicals

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Analyst(s) :	AL, EK, AS, KP
Date Tested :	2024-09-24	Test Duration :	7 days
IC25 (Reproduction) :	0.69 g/L	LC50 :	1.77 g/L
95% Confidence Limits :	0.50 - 0.90 g/L	95% Confidence Limits :	1.43 - 2.21 g/L
Statistical Method :	Non-linear Regression (CETIS)[a]	Statistical Method :	Linear Regression (MLE) (CETIS)[a]
Historical Mean IC25 :	1.01 g/L	Historical Mean LC50 :	2.05 g/L
Warning Limits (± 2SD) :	0.50 - 2.05 g/L	Warning Limits (± 2SD) :	1.39 - 3.03 g/L

The reference toxicity test was performed under the same experimental conditions as those used with the test sample.

CUMULATIVE DAILY MORTALITY DATA

		Test Concentration (%)							
Date	Test Day	**Control**	**0.07**	**0.24**	**0.81**	**2.7**	**9**	**30**	**100**
2024-10-04	1	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0
2024-10-06	3	0	0	0	10	0	0	0	0
2024-10-07	4	0	0	0	10	0	0	0	0
2024-10-08	5	0	0	0	10	0	0	0	0
2024-10-09	6	0	0	0	10	0	0	0	0
Total Mortality (%) :		**0**	**0**	**0**	**10**	**0**	**0**	**0**	**0**

REFERENCES

[a] CETIS™, © 2000-2022. v2.1.4.0 x64. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

[b]Grubbs, F.E., 1969. Procedures for detecting outlying observations in samples. *Technometrics, 11* :1-21.

NAUTILUS ENVIRONMENTAL

TOXICITY TEST REPORT

Ceriodaphnia dubia
EPS 1/RM/21

Work Order : 256025
Sample Number : 84285

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2024-10-03
Initiated By : AL (SV)
Initiation Time : 10:50
Test Completion Date : 2024-10-09

Control

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)	Analyst(s)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0	AJS (SV)
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0	SV
2024-10-06	3	4	3	0	4	4	3	4	4	2	2	3	CGR
2024-10-07	4	7	0	7	0	0	8	0	0	0	0	2.2	AL (PG)
2024-10-08	5	0	0	0	9	7	0	9	9	7	7	4.8	JGR (VBC)
2024-10-09	6	11	4	9	10	10	11	10	11	8	0	8.4	FM (SV)
Total		**22**	**7**	**16**	**23**	**21**	**22**	**23**	**24**	**17**	**9**	**18.4 (±6.1)**	

2.7%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	4	3	5	2	3	2	6	3	3	4	3.5
2024-10-07	4	8	0	0	0	0	0	0	0	0	0	0.8
2024-10-08	5	0	7	9	9	8	6	11	8	6	9	7.3
2024-10-09	6	10	7	12	9	13	9	12	13	9	11	10.5
Total		**22**	**17**	**26**	**20**	**24**	**17**	**29**	**24**	**18**	**24**	**22.1 (±4.0)**

0.07%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	3	3	1	2	4	3	2	3	2	3	2.6
2024-10-07	4	7	0	2	0	0	0	0	0	0	0	0.9
2024-10-08	5	0	8	5	6	5	7	9	9	7	8	6.4
2024-10-09	6	11	8	10	10	10	10	9	10	7	11	9.6
Total		**21**	**19**	**18**	**18**	**19**	**20**	**20**	**22**	**16**	**22**	**19.5 (±1.9)**

9%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	5	3	2	4	4	3	4	2	3	4	3.4
2024-10-07	4	6	0	0	0	0	9	8	0	0	7	3
2024-10-08	5	0	7	6	8	8	0	0	10	5	0	4.4
2024-10-09	6	12	4	10	10	10	9	13	13	9	10	10
Total		**23**	**14**	**18**	**22**	**22**	**21**	**25**	**25**	**17**	**21**	**20.8 (±3.5)**

0.24%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	3	3	2	4	3	3	3	2	2	4	2.9
2024-10-07	4	6	0	0	0	0	0	0	0	0	0	0.6
2024-10-08	5	0	6	8	9	8	8	10	8	7	9	7.3
2024-10-09	6	10	7	10	13	9	10	11	9	9	10	9.8
Total		**19**	**16**	**20**	**26**	**20**	**21**	**24**	**19**	**18**	**23**	**20.6 (±3.0)**

30%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	4	5	3	2	3	0	3	5	3	4	3.2
2024-10-07	4	0	6	0	0	4	0	6	0	0	0	1.6
2024-10-08	5	6	1	7	0	0	6	0	10	7	9	4.6
2024-10-09	6	8	8	11	8	11	9	11	12	0	11	8.9
Total		**18**	**20**	**21**	**10**	**18**	**15**	**20**	**27**	**10**	**24**	**18.3 (±5.5)**

0.81%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	3	0	x 4	3	4	4	4	4	2	3	3.1
2024-10-07	4	0	0	0	8	0	0	10	6	0	0	2.4
2024-10-08	5	6	0	9	0	7	8	0	0	8	9	4.7
2024-10-09	6	9	0	11	10	10	13	14	8	10	10	9.5
Total		**18**	**0**[3]	**24**	**21**	**21**	**25**	**28**	**18**	**20**	**22**	**19.7 (±7.6)**

100%

Day		Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-10-04	1	0	0	0	0	0	0	0	0	0	0	0
2024-10-05	2	0	0	0	0	0	0	0	0	0	0	0
2024-10-06	3	3	0	1	2	4	5	4	4	4	4	3.1
2024-10-07	4	0	0	0	0	0	0	6	0	0	0	0.6
2024-10-08	5	5	5	9	9	10	7	0	8	7	8	6.8
2024-10-09	6	9	7	7	11	11	12	11	11	0	7	8.6
Total		**17**	**12**	**17**	**22**	**25**	**24**	**21**	**23**	**11**	**19**	**19.1 (±4.8)**

NOTES : •All young produced by a test organism during its fourth and subsequent broods were discarded and not included in the above counts. The presence of two or more neonates in any test chamber, during any given day of the test, constitutes a brood.

•[3] Outlier according to Grubbs Test[b]. Outlying data points were not excluded from statistical analysis, since they could not be attributed to error.

x = test organism mortality

* = accidental test organism mortality

– = 4th brood (see 'NOTES')

Test Data Reviewed By : KP

Date : 2024-11-01

Work Order : 256025
Sample Number : 84285

WATER CHEMISTRY DATA

			Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6
	Date :		2024-10-03	2024-10-04	2024-10-05	2024-10-06	2024-10-07	2024-10-08
	Sub-sample Used		1	1	1	2	2	3
Initial Chemistry (100 %)	Temperature (°C)		25	24	24	24	24	24
	Dissolved O_2 (mg/L)		8.1	8.5	8.7	8.5	8.4	8.7
	Dissolved O_2 (% Sat.)[4]		101	107	107	106	105	108
	pH		7.7	7.6	7.7	7.7	7.6	7.5
	Conductivity (µmhos/cm)		640	636	646	644	638	636
	Pre-aeration Time (min)[5]		20	20	20	20	20	20
	Analyst(s)	Initial	DO (SV)	XD	SSF	MK (SV)	DO (PG)	DO (VBC)
		Final	AL (SV)	SV	CGR	AL (PG)	JGR (VBC)	FM (SV)
Control	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (% Sat.)[4]	Initial	100	100	100	100	100	102
	Dissolved O_2 (mg/L)	Initial	8.0	8.1	8.1	8.1	8.0	8.3
		Final	7.3	6.2	6.1	6.5	6.9	7.0
	pH	Initial	8.4	8.4	8.5	8.5	8.3	8.4
		Final	8.2	8.1	8.0	8.1	8.1	8.1
	Conductivity (µmhos/cm)	Initial	484	484	509	481	482	478
	Hardness (mg/L as $CaCO_3$)		220	–	–	–	–	–
0.07 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (mg/L)	Initial	7.9	8.0	8.1	8.1	7.9	8.1
		Final	7.2	6.2	5.9	6.4	7.1	7.1
	pH	Initial	8.4	8.3	8.5	8.4	8.3	8.4
		Final	8.2	8.1	8.0	8.1	8.2	8.2
	Conductivity (µmhos/cm)	Initial	488	481	511	481	478	477
9%	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (mg/L)	Initial	7.9	8.0	8.1	8.1	7.8	8.1
		Final	7.2	6.2	5.9	6.4	7.2	7.1
	pH	Initial	8.4	8.3	8.4	8.3	8.3	8.4
		Final	8.2	8.1	8.0	8.1	8.2	8.2
	Conductivity (µmhos/cm)	Initial	501	492	525	497	497	496
100 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (mg/L)	Initial	8.0	7.9	8.2	8.2	8.0	8.3
		Final	7.1	6.3	5.6	6.3	6.9	7.0
	pH	Initial	7.8	7.9	7.9	7.8	7.8	7.7
		Final	7.7	7.6	7.4	7.6	7.5	7.7
	Conductivity (µmhos/cm)	Initial	643	644	642	643	638	644
	Hardness (mg/L as $CaCO_3$)		290	–	–	–	–	–

"–" = not measured/not required
[4] adjusted for temperature and barometric pressure
[5] ≤100 bubbles/minute

Test Data Reviewed By : KP
Date : 2024-11-01

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: 256025

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: ~~110307~~ P.O. # to follow

Field Sampler Name (print): Laura Grant

Signature: Laura Grant

Affiliation: ~~Ops~~

Sample Storage (prior to shipping): NA

Custody Relinquished by: ~~NA~~ Laura Grant

Date/Time Shipped: October 1, 2024

Client: Denison Mines
1 Horn Walk, Suite 200
Elliot Lake, P5A-2A5

Laura Grant

Phone: ~~(705) 848-9191~~ 705-261-2033

Fax: (705) 848-5814

Contact: analytical.results@denisonmines.com

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-10-01	10:45	D-2-20241001 84285	~~84284~~	18	✓		✓			✓				✓		~~1x20L~~, 3x4L

For Lab Use Only

Received By: AJS

Date: 2024-10-02

Time: 15:45

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:

re-sample for failed control test. original sample was taken Sept. 10. Just CD needs resample.

NAUTILUS ENVIRONMENTAL
B-11 Nicholas Beaver Road
Puslinch, ON N0B 2J0
Tel. (519) 763-4412
Fax. (519) 763-4419

TOXICITY TEST REPORT

Ceriodaphnia dubia
EPS 1/RM/21

Work Order : 255855
Sample Number : 83988

SAMPLE IDENTIFICATION

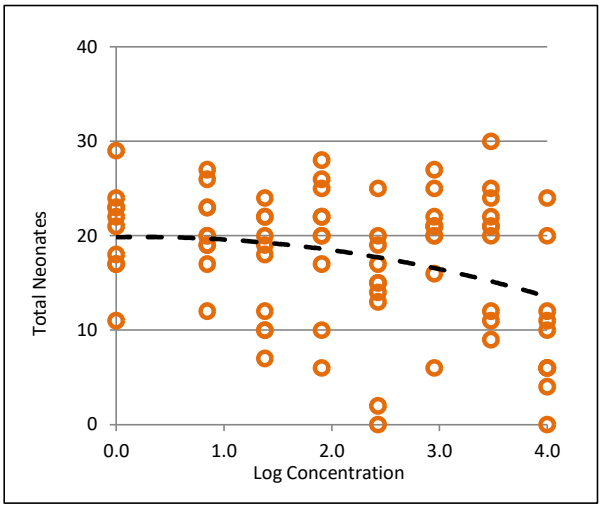
Company :	Denison Mines Inc.	Sampling Date :	2024-09-10
Location :	Elliot Lake ON	Sampling Time :	11:00
Substance :	DS-4-20240910	Date Received :	2024-09-11
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	F. Paquette	Temperature at Receipt :	22 °C
Sample Description :	Clear, colourless	Date Tested :	2024-09-12

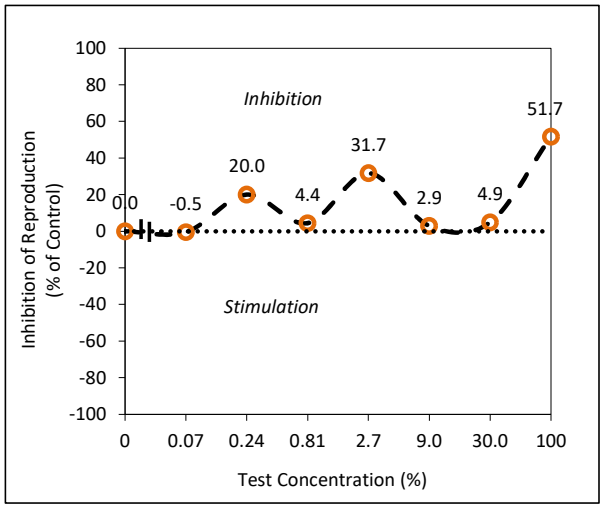
Test Method : Test of Reproduction and Survival using the Cladoceran *Ceriodaphnia dubia* . Environment Canada, Conservation and Protection. Ottawa, Ontario. Report EPS 1/RM/21, 2nd ed. (February 2007).

6-DAY TEST RESULTS

Effect	Value	95% Confidence Limits			Statistical Method
IC25 (Reproduction)	57.9%	29.7%	–	86.1%	Non-Linear Regression (CETIS)[a]
LC50	79.3%*	0.07%	–	*	Nonlinear Interpolation (Stephan)[c]

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





COMMENTS

*The usefulness of any LC50 calculated from this data set is questionable because a concentration-effect relationship has not been demonstrated over a reasonable range (e.g. <37 to >63) of percent dead. A statistically valid upper confidence limit could not be generated. At a confidence level of 95%, the binomial test shows that the LC50 is above 0.07%. An approximate LC50 of 79.3% was obtained by nonlinear interpolation.

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

Emma Kunert
I am approving this document
2024-10-17
12:31-04:00

Approved By : _____

Project Manager

Work Order : 255855
Sample Number : 83988

TEST ORGANISM

Test Organism :	*Ceriodaphnia dubia*	Range of Age (at start of test) :	07:30 h - 19:30 h
Organism Batch :	Cd24-09	Mean Brood Organism Mortality :	10% (previous 7 days)
Organism Origin :	Single in-house mass culture	Brood Organism Mean Young :	24.6 (first three broods)
Test Organism Origin :	Individual in-house cultures	Mean Young per Brood Organism :	13.1 (3rd or subsequent brood)
Ephippia in Culture :	None		

No organisms exhibiting unusual appearance, behaviour, or undergoing unusual treatment were used in the test.

TEST CONDITIONS

Test Type :	Static renewal	Control/Dilution Water :	Well water [2]
Renewal Method :	Transferred to fresh solutions	Test Volume per Replicate :	15 mL
Renewal Frequency :	≤ 24 hours	Test Vessel :	20 mL glass vial
Sample Filtration :	None	Depth of Test Solution :	4 cm
Test Aeration :	None	Organisms per Replicate :	1
pH Adjustment :	None	Number of Replicates :	10
Hardness Adjustment :	None	Test Method Deviation(s) :	None

[2]no additional chemicals

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Analyst(s) :	AL, EK, AS, KP
Date Tested :	2024-09-24	Test Duration :	7 days
IC25 (Reproduction) :	0.69 g/L	LC50 :	1.77 g/L
95% Confidence Limits :	0.50 - 0.90 g/L	95% Confidence Limits :	1.43 - 2.21 g/L
Statistical Method :	Non-linear Regression (CETIS)[a]	Statistical Method :	Linear Regression (MLE) (CETIS)[a]
Historical Mean IC25 :	1.01 g/L	Historical Mean LC50 :	2.05 g/L
Warning Limits (± 2SD) :	0.50 - 2.05 g/L	Warning Limits (± 2SD) :	1.39 - 3.03 g/L

The reference toxicity test was performed under the same experimental conditions as those used with the test sample.

CUMULATIVE DAILY MORTALITY DATA

		Test Concentration (%)							
Date	Test Day	**Control**	**0.07**	**0.24**	**0.81**	**2.7**	**9**	**30**	**100**
2024-09-13	1	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0
2024-09-15	3	0	0	0	0	0	0	0	0
2024-09-16	4	0	0	0	0	0	0	0	10
2024-09-17	5	0	0	0	0	10	0	0	50
2024-09-18	6	0	0	30	0	30	10	10	60
Total Mortality (%) :		**0**	**0**	**30**	**0**	**30**	**10**	**10**	**60**

REFERENCES

[a] CETIS™, © 2000-2022. v2.1.4.0 x64. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

[c] Stephan, C. E. 1977. Methods for calculating an LC50. pp 65-84 in : P. L. Mayer and J. L. Hamelink (eds.), Aquatic Toxicology and Hazard Evaluation. Amer. Soc. Testing and Materials, Philadelphia PA. ASTM STP 634.

Work Order : 255855
Sample Number : 83988

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2024-09-12
Initiated By : XD
Initiation Time : 13:30
Test Completion Date : 2024-09-18

Control

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)	Analyst(s)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0	AL (AS)
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0	SSF (AS)
2024-09-15	3	0	0	0	0	0	4	0	5	5	6	2	SSF (AS)
2024-09-16	4	6	4	4	2	4	0	3	7	2	0	3.2	AL (AS)
2024-09-17	5	12	7	11	6	7	8	8	0	10	9	7.8	NWP
2024-09-18	6	11	6	9	10	11	9	0	11	–	8	7.5	AL (AS)
Total		**29**	**17**	**24**	**18**	**22**	**21**	**11**	**23**	**17**	**23**	**20.5 (±4.9)**	

2.7%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	0	0	0	5	2	0	3	4	5	1.9
2024-09-16	4	4	0	6	2	0	0	4	3	0	0	1.9
2024-09-17	5	7	0	9	0	10	9	10	9	9	12 x	7.5
2024-09-18	6	9	0	0	0 x	10	8	0	–	0 x	0	2.7
Total		**20**	**0**	**15**	**2**	**25**	**19**	**14**	**15**	**13**	**17**	**14.0 (±7.7)**

0.07%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	5	0	1	0	5	0	5	6	6	2.8
2024-09-16	4	5	0	4	4	5	0	4	6	0	0	2.8
2024-09-17	5	7	11	8	9	8	11	8	0	11	11	8.4
2024-09-18	6	11	10	8	6	6	3	0	12	0	10	6.6
Total		**23**	**26**	**20**	**20**	**19**	**19**	**12**	**23**	**17**	**27**	**20.6 (±4.4)**

9%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	0	0	0	3	5	0	4	5	6	2.3
2024-09-16	4	5	6	4	4	0	0	3	6	7	0	3.5
2024-09-17	5	9	9	9	10	9	11	3	0	0	10	7
2024-09-18	6	8	10	7	7	9	11	0	10	9	0 x	7.1
Total		**22**	**25**	**20**	**21**	**21**	**27**	**6**	**20**	**21**	**16**	**19.9 (±5.7)**

0.24%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	4	0	0	0	4	0	4	3	6	2.1
2024-09-16	4	5	0	2	2	4	0	3	4	0	0	2
2024-09-17	5	7	7	8	5	8	8	9	0	7	12	7.1
2024-09-18	6	10	9	0	0	12	10	0 x	11	0 x	0 x	5.2
Total		**22**	**20**	**10**	**7**	**24**	**22**	**12**	**19**	**10**	**18**	**16.4 (±6.1)**

30%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	3	0	0	0	4	0	3	6	0	1.6
2024-09-16	4	6	0	5	3	3	0	4	0	0	0	2.1
2024-09-17	5	12	11	9	6	7	9	10	8	10	6	8.8
2024-09-18	6	12	7	7	0	10	12	8	0 x	8	6	7
Total		**30**	**21**	**21**	**9**	**20**	**25**	**22**	**11**	**24**	**12**	**19.5 (±6.8)**

0.81%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	1	0	0	5	0	0	5	5	4	2
2024-09-16	4	5	2	3	2	0	5	3	0	10	0	3
2024-09-17	5	11	9	9	0	9	11	7	7	0	9	7.2
2024-09-18	6	12	8	5	4	11	6	0	8	11	9	7.4
Total		**28**	**20**	**17**	**6**	**25**	**22**	**10**	**20**	**26**	**22**	**19.6 (±7.0)**

100%

	Day	Replicate 1	2	3	4	5	6	7	8	9	10	Mean Young (±SD)
2024-09-13	1	0	0	0	0	0	0	0	0	0	0	0
2024-09-14	2	0	0	0	0	0	0	0	0	0	0	0
2024-09-15	3	0	1	0	0	0	4	0	5	4	2	1.6
2024-09-16	4	3	0	2	2	0 x	1	1	9	0	0	1.8
2024-09-17	5	7 x	10	2 x	4	0	1 x	5	0	7	10 x	4.6
2024-09-18	6	0	9	0	0	0	0	0	10	0 x	0	1.9
Total		**10**	**20**	**4**	**6**	**0**	**6**	**6**	**24**	**11**	**12**	**9.9 (±7.3)**

NOTES : •All young produced by a test organism during its fourth and subsequent broods were discarded and not included in the above counts. The presence of two or more neonates in any test chamber, during any given day of the test, constitutes a brood.

•No outlying data points were detected according to Grubbs Test (CETIS)[a].

x = test organism mortality
* = accidental test organism mortality
– = 4th brood (see 'NOTES')

Test Data Reviewed By : KP
Date : 2024-10-11

Work Order : 255855
Sample Number : 83988

WATER CHEMISTRY DATA

			Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6
	Date :		2024-09-12	2024-09-13	2024-09-14	2024-09-15	2024-09-16	2024-09-17
	Sub-sample Used		1	1	1	2	2	3
Initial Chemistry (100 %)	Temperature (°C)		25	24	24	24	24	24
	Dissolved O_2 (mg/L)		8.0	8.5	8.4	8.7	8.6	8.9
	Dissolved O_2 (% Sat.)[4]		100	105	104	108	107	110
	pH		7.5	7.6	7.5	7.6	7.5	7.5
	Conductivity (µmhos/cm)		647	652	646	648	650	643
	Pre-aeration Time (min)[5]		0	20	20	20	20	20
	Analyst(s)	Initial Final	NWP AL (SV)	DO (SV) SSF (AS)	GR (PC) SSF (AS)	EK AL (AS)	DO (AS) NWP	NWP AL (AS)
Control	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (% Sat.)[4]	Initial	100	100	100	102	100	101
	Dissolved O_2 (mg/L)	Initial	8.0	8.1	8.0	8.3	8.1	8.1
		Final	6.7	7.1	7.4	7.2	7.3	7.3
	pH	Initial	8.4	8.5	8.5	8.5	8.5	8.4
		Final	8.1	8.2	8.2	8.3	8.2	8.2
	Conductivity (µmhos/cm)	Initial	460	442	456	472	429	476
	Hardness (mg/L as $CaCO_3$)		210	–	–	–	–	–
0.07 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (mg/L)	Initial	7.8	7.8	8.0	8.1	8.1	8.1
		Final	6.8	6.9	7.2	7.2	7.1	7.2
	pH	Initial	8.2	8.3	8.4	8.4	8.3	8.4
		Final	8.2	8.2	8.2	8.3	8.2	8.2
	Conductivity (µmhos/cm)	Initial	460	440	459	476	448	476
9 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (mg/L)	Initial	7.8	7.9	8.0	8.1	8.1	8.1
		Final	6.7	6.8	7.1	7.0	7.1	7.1
	pH	Initial	8.2	8.3	8.4	8.4	8.3	8.3
		Final	8.1	8.2	8.2	8.3	8.2	8.2
	Conductivity (µmhos/cm)	Initial	482	465	477	490	471	490
100 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	24	24	24
	Dissolved O_2 (mg/L)	Initial	7.9	7.9	7.9	8.3	8.0	8.0
		Final	6.6	6.7	7.1	7.1	7.3	7.3
	pH	Initial	7.6	7.8	7.9	7.7	7.8	7.9
		Final	7.6	7.7	7.7	7.7	7.7	7.7
	Conductivity (µmhos/cm)	Initial	650	649	648	647	649	648
	Hardness (mg/L as $CaCO_3$)		330	–	–	–	–	–

"–" = not measured/not required
[4] adjusted for temperature and barometric pressure
[5] ≤100 bubbles/minute

Test Data Reviewed By : KP
Date : 2024-10-11

CHAIN OF CUSTODY RECORD

AQUATOX

AquaTox Work Order No: **255855**

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: 110307

Field Sampler Name (print): FREDERIC PAQUETTE

Signature: Frédéric Paquette

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 09/10/2024

Client: Denison Mines
1 Horn Walk, Suite 200
Elliot Lake, P5A-2A5

Phone: (705) 848-9191

Fax: (705) 848-5814

Contact: analytical.results@denisonmines.com

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	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2024-09-10	10:00	D-2-20240910	83987	22°C	✓		✓			✓						1x20L, 3x4L
~~2024-09-24~~	11:00	DS-4-20240910	83988	22°C	✓		✓			✓						1x20L, 3x4L
2024-09-10 *																

For Lab Use Only

Received By: GR/NM

Date: 2024-09-17

Time: 13:00

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:
* Sample date changed to match date on sample label. NM 2024-09-17