



***2023 OPERATING CARE & MAINTENANCE
ANNUAL REPORT
Denison Mines Inc.***

***Submitted to the
Canadian Nuclear Safety Commission***

2024



Denison Mines Inc.
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March 21, 2024

Mr. Ron Stenson, Senior Project Officer
Canadian Nuclear Safety Commission
Wastes and Decommissioning Division
280 Slater Street
PO Box 1046, Station B
Ottawa, Ontario
K1P 5S9

Dear Mr. Stenson:

RE: Denison Mines Inc. 2023 Operating Care and Maintenance Annual Report

Denison Mines Inc. is pleased to submit the Denison Mines Inc. Operating Care and Maintenance Annual Report for 2023. 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.

A handwritten signature in black ink, appearing to read 'Kevin Himbeault', written over a white background.

Kevin Himbeault

Vice President, Operations
Enclosure

Distribution

Elliot Lake Joint Review Group for Denison Mines Closed Sites

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1 ORGANIZATIONAL INFORMATION

1.1 Licencee

DENISON MINES INC.
1100-40 University Avenue
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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, 2023. All persons listed below may be contacted via the licensee address.

Table 1.1 Denison Mines Inc. Directors as of December 31, 2023

<u>Name</u>	<u>Office</u>
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, 2023. All persons listed below may be contacted via the licensee address.

Table 1.2 Denison Mines Inc. Officers as of December 31, 2023

<u>Name</u>	<u>Office</u>
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 2023 to 2028.

3 LICENCE AND MONITORING PROGRAM MODIFICATIONS

Denison Closed Mine Sites in Elliot Lake currently operate and are monitored within the scope of work outlined within a licence regulated by the Federal Canadian Nuclear Safety Commission (CNSC). Currently Denison is the licensee 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 Certificate of Approval (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 2023. A proposed amendment for C of A Denison TMA-1 remains in progress.

A State of the Environment (SOE) Report for the Serpent River Watershed is 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 will be submitted to regulators in 2024, with implementation in 2025.

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 2023, monthly safety meetings and daily line-up meetings were completed to provide Denison personnel with safety awareness and a forum to raise issues or concerns. Training for job responsibilities was tracked utilizing a training matrix to ensure comprehensive and timely

qualifications for work. A leading indicator program is in place which identifies unsafe acts and conditions in the workplace. Leading indicators are assigned actions which are tracked to completion. All field work is assessed for risk and documented through a Hazard Assessment identifying mitigations to all identified hazards.

4.1.2 Gamma Dosimetry

Denison has continued to voluntarily participate in the gamma dosimetry program. The program applies to employees whose job responsibilities require them to work in and around the licenced sites, which include the tailings management areas (TMAs). These workers do not meet the definition of Nuclear Energy Workers (NEWs) in the *Nuclear Safety and Control Act* and the *Radiation Protection Regulations* but for the purposes of the voluntary program are NEWs. The program does not apply to visitors visiting the sites or employees who do not actively work at the licenced sites.

The type of gamma dosimetry badges used are Optically Stimulated Luminescence (OSL) dosimeters, which have a wearing period of three months. Badges are issued in the first calendar month of the year and each quarter going forward. Each worker is issued a pre-labelled badge with its own unique dosimeter number that is designated for each worker. At the end of the wearing period, the dosimeters are sent to the National Dosimetry Services for Health Canada for processing. NDS will issue a radiation exposure report to Denison's designate who is thereafter responsible for reviewing the information, reporting any anomalies to workers, and maintaining company records.

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 radon fan and/or posting signage to employ longer ventilation time before ETP work begins.

The gamma and radon data are then used to calculate individual annual dose estimates for Care and Maintenance workers classified as NEWs.

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).

4.2.1.1 TMA Operational Monitoring Program (TOMP)

The TOMP was designed to track the performance of the TMAs and generate data used to make decisions for management and 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 could be used as references for water quality trends and improvement 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 licences and C of As (Sample points: D-2, D-3 and DS-4).

4.2.1.2 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.

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

The SRWMP SOE, currently produced every five years, 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, 2023 through December 31, 2023. 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 2023 SRWMP report was prepared

and submitted under a separate cover (RAL, Denison, 2024). Results are not presented in this annual report, but the report is recommended to be read in conjunction with the Denison 2023 Annual OCM report.

4.2.2 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 2023 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 (Minnow, 2019). 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.

4.2.3 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 (Minnow, 2019). Laboratory data quality assessment was provided under a separate cover in the *Serpent River Watershed Monitoring Program 2023 Annual Water Quality Report* (RAL, Denison, 2024).

4.2.4 Changes in Analytical Methods

There were no changes to analytical methods in 2023.

4.2.5 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 were provided under separate cover in the *Serpent River Watershed Monitoring Program 2023 Annual Water Quality Report* (RAL & Denison, 2024).

Monthly data validation of flagged data for 2023 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)* (Minnow, 2021). Data validation, as documented in Data Validation Procedures, ensured prompt response to upset conditions or unusual results. Appendix IV includes all 2023 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 (Minnow, 2019). 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). 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 IV.

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

		Assesment 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)
Field Parameters										
Conductivity	µmho/cm	-	0.1	0.05	-	-	20%	-	-	-
Flow	L/s	-	method	method	-	-	-	-	-	-
pH	pH units		0.1	0.01 or 0.02	-	-	20%	-	-	-
	<i>Lake</i>	6.5								
	<i>Wetland/stream</i>	5.3								
Laboratory Parameters										
Acidity	mg/L	-	1.0	-	2	2	20%	10%	-	20%
Barium	mg/L	1.0	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%
	<i>Lake</i>	0.76	0.02							
	<i>Wetland/stream</i>	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%	20%	20%	-
Sulphate ³	mg/L	128-309	0.1	-	0.2	0.2	20%	10%	20%	20%
TSS	mg/L	-	1	-	2	-	20%	10%	-	20%
Uranium	mg/L	0.0150	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 SWRMP, SAMP and TOMP (Minnow 2021) . Parameters are hardness dependent.

5 RESULTS AND DISCUSSION

5.1 Health and Safety

5.1.1 Health and Safety Injury Statistics

In 2023, health and safety related training and education continued to be an integral part of monthly safety meetings and daily line-ups for care and maintenance workers working at the Denison Closed Mines Operations in Elliot Lake. All care and maintenance workers 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 at the Denison Closed Mines Operations in Elliot Lake were current. There was one medical aid and no lost time accidents reported in 2023 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 2023.

Table 5.1.1 Health & Safety Injury Statistics

Category	2023		2022		2021	
	Number	Frequency	Number	Frequency	Number	Frequency
Medical Aid	1	5.04	1	4.92	0	0.0
Lost Time	0	0.0	0	0.0	0	0.0
Total	1	5.04	1	4.92	0	0.0
Person-Hours Worked - Denison Employees	39484		40682		30015	

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

5.1.2 Gamma Dosimetry

Gamma is not 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 2023. 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 2023

Quarter	Radon (WL)
1	0.0006
2	0.0018
3	0.0035
4	0.0024

Table 5.1.3.2 Denison LWL ETP Radon Progeny Monitoring Results 2023

Quarter	Radon (WL)
1	0.0332
2	0.0083
3	0.0131
4	0.0029

Table 5.1.3.3 Stanrock ETP Radon Progeny Monitoring Results 2023

Quarter	Radon (WL)
1	0.0105
2	0.0166
3	0.0055
4	0.0043

5.2 Water Quality Monitoring Program

The objective of the annual 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 Environmental Inc., 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 three field blank DQO exceedances in 2023 (Table 5.2.1). Parameters with field blank exceedances included acidity (1), total radium-226 (1), and iron (1). The total radium-226 exceedance was very low with the sample measuring 0.013 Bq/L compared to the DQO Criteria of 0.01 Bq/L. The iron sample result was 0.05 mg/L compared to the DQO of 0.04 mg/L and the acidity sample was 3.0 mg/L, exceeding the DQO of 2 mg/L. The 2023 DQO exceedances were few and very 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.

There were 27 out of 125 field precision exceedance results which did not meet DQOs in 2023 (Table 5.2.1).

The TSS field precision DQO of 20% was exceeded in 4 out of 12 samples, with a maximum result of 67%. The exceedances were indicative of the lack of precision at low TSS concentrations, ranging between <1 mg/L and 2 mg/L (Appendix III), and did not influence performance monitoring data integrity.

The radium-226 field precision DQO of 20% was exceeded in 7 out of 12 samples with a maximum result of 100% 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, barium, cobalt, uranium and manganese field precision exceeded the DQO of 20%; 3 in 12 samples for iron and barium, 5 in 12 samples for cobalt, one in 12 samples for uranium and 4 of 12 samples for manganese. Precision exceedances for cobalt were at values near the detection limit and uncertainty at these levels is high. Cobalt, iron and manganese precision variance was very high in the June samples with duplicate concentrations being more similar to blank values. It is likely that there was a bottle labelling or sampling issue in June. 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, sulphate, uranium, barium, and iron (Table 5.2.1).

Table 5.2.1 2023 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	3	13	13	13	13	13	13	13	13	13
Average	6.3	2.3	<1	0.3	0.2	0.006	0.0003	0.002	0.0002	0.02	0.001
Max	8.5	3.0	<1	0.5	0.2	0.013	0.0005	0.005	0.0005	0.05	0.002
Min	5.1	2.0	<1	0.1	0.1	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	1	0	0	0	1	0	0	0	1	0
Field Duplicate Statistics											
Count	14	3	12	12	12	12	12	12	12	12	12
Average	0%	5%	22%	3%	2%	32%	4%	14%	23%	14%	24%
Max	1%	9%	67%	13%	9%	100%	23%	57%	86%	80%	87%
Min	0%	0%	0%	0%	0%	7%	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	4	0	0	7	1	3	5	3	4

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 Denison TMA-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 were not expected to meet benchmarks. Detailed water quality results are provided in Appendix IV.

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, pH, and cobalt levels were consistent over the past five years, where pH remained near neutral to slightly alkaline. 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 are slightly higher than the past four years but remain below the surface water quality benchmark (0.0150 mg/L). Sulphate concentrations have been declining as predicted in the 1995 Environmental Impact Statement (DML 1995) with the values generally stable over the past 4 years. Annual average radium-226 levels remained stable and elevated compared to the 50-year post-decommissioning predictions, (i.e., predictions for the year 2050; DML 1995). The current barium chloride treatment for radium-226 removal remains adequate with increased dosage and has maintained radium-226 control downstream in the final discharge at D-2 (Table 5.2.1.1b). Denison continues to work with external consultants to refine the understanding of radium-226 in the TMA and downstream and is examining potential for improved treatment efficiencies.

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

PARAMETER UNITS	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
2019	69.61	<1	123	7.7	70.7	1.847	0.049	<0.0005	0.13	0.022	0.0125
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
<i>Annual Summary Statistics</i>											
Average	44.78	<1	109.1	7.6	56.2	1.680	0.078	<0.0005	0.09	0.023	0.0098
Maximum	81.45	<1	123.0	7.7	70.7	1.847	0.101	<0.0005	0.13	0.030	0.0125
Minimum	19.13	<1	98.5	7.4	43.0	1.511	0.049	<0.0005	0.06	0.012	0.0075

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

The final point of control at 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). In addition, with the exception of uranium, all parameters remained below the SRWMP benchmarks (4.2.2) and cobalt remained close to the TDL. Annual average barium concentrations increased in 2023 and are similar to 2020

concentrations. The higher barium concentrations can be attributed to the increased barium chloride addition rates required for radium-226 removal upstream in the D-1 influent (Table 5.3.1.2.1). The 2023 barium chloride annual consumption was 8659 kilograms (kg) compared to 3958 kg used in 2022 (Table 5.3.1.2.1). Uranium concentrations are elevated compared to influent concentrations due to contribution from dam seepage but are generally stable and are not increasing at further downstream locations (e.g., SRWMP). 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 IV.

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
2019	70.89	236.1	7.2	179.2	1	0.152	0.338	0.0006	0.22	0.201	0.0325
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
<i>Annual Summary Statistics</i>											
Average	57.27	241.8	7.2	173.1	1	0.132	0.358	0.0005	0.31	0.166	0.0303
Maximum	81.69	260.8	7.2	200.3	1	0.163	0.481	0.0006	0.42	0.201	0.0326
Minimum	39.19	214.8	7.2	151.3	1	0.109	0.272	0.0004	0.22	0.142	0.0264

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 2023 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 2023, no mortality was observed in the acute lethality tests and *Ceriodaphnia dubia* IC₂₅ reproduction results were >100% effluent for both tests (Appendix V).

In 2023, 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 2023 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.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
May	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
June	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
July	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Aug.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	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.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
YTD	52	0 of 52	0 of 12	0 of 52	0 of 12	0 of 52	0 of 12

¹Limits established in the Licence UMDL-MINEMILL-DENISON.01/ndf 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 five years, and all remained below SRWMP benchmarks (Table 5.2.1.2a and Table 4.2.2). Radium-226 concentrations increased between 2019 and 2022 but decreased in 2023 and are similar to 2019 concentrations. The 2023 annual radium-226 concentration in the influent (D-22) is 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 2019 to 2021 values but are still within historical ranges and are well below the 50 and 100 years post decommissioning porewater concentration predictions (1600 mg/L sulphate) made in the 1995 EA (Denison 1995). Iron and manganese annual concentrations appear elevated and are highly influenced by seasonal spikes generally observed in July during warm, dry weather and low water levels but also in October of 2023 when conditions were again dry and warm. Other individual iron and manganese concentrations over the last five years remained below the wetland SRWMP benchmark criteria of 2.49 mg/L (iron) and 0.841 mg/L (manganese). Detailed results for 2023 are provided in Appendix IV of this report and previous results are provided in their respective Annual OCM Reports (Denison, 2018-2021).

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
2019	6.7	59.3	0.250	0.029	0.0006	2.54	0.374	0.0008
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
<i>Annual Summary Statistics</i>								
Average	6.7	84.2	0.391	0.049	0.0009	6.08	0.890	0.0014
Maximum	6.8	129.0	0.689	0.067	0.0012	7.68	1.265	0.0019
Minimum	6.7	40.5	0.250	0.029	0.0006	2.54	0.374	0.0008

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 had increased from 2019 to 2021, with a decrease in

average concentration in 2022 and 2023, and continues to remain well below discharge criteria. Sulphate concentrations had been decreasing since 2019, with a small increase in the average concentration in 2022 and holding stable in 2023 (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. Annual average barium concentrations have followed the same trend over the last five years and can be attributed to the increased barium chloride addition rates 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 Denison Lower Williams Lake (DML 1995, Denison 2023).

Uranium concentrations at D-3 have remained stable and are below levels considered to be toxic to aquatic biota (0.0150 mg/L) (CCME, 2020). 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
2019	11.62	90.3	7.1	53.9	1	0.137	0.321	0.0005	0.21	0.040	0.0038
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
<i>Annual Summary Statistics</i>											
Average	7.99	105.4	7.1	64.1	1	0.158	0.353	0.0005	0.18	0.037	0.0048
Maximum	11.62	133.6	7.1	85.0	1	0.221	0.391	0.0005	0.25	0.047	0.0076
Minimum	4.72	83.5	7.0	45.3	1	0.103	0.316	<0.0005	0.11	0.019	0.0029

In 2023, 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 2023 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.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
May	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
June	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
July	0	Zero Discharge					
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.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
YTD	35	0 of 35	0 of 9	0 of 35	0 of 9	0 of 35	0 of 9

¹Limits 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. Radium-226 has decreased slightly over the past four years, with the lowest annual average of the past five years measured in 2023 (Table 5.2.1.3a). Annual averages of radium-226 continue to remain below SRWMP benchmarks and final effluent discharge limits (Table 5.2.1.3a). Influent continues to meet radium-226 effluent discharge limits. Flows at DS-2 continue to be low due to lower precipitation in the area. Detailed results for 2023 are provided in Appendix IV of this report and previous results are provided in their respective Annual OCM Reports (Denison, 2019-2022).

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
2019	64.14	197	2.8	490.0	0.267	0.016	0.0647	33.35	1.305	0.0241
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
<i>Annual Summary Statistics</i>										
Average	44.22	176	2.9	467.2	0.248	0.019	0.0549	28.35	1.316	0.0152
Maximum	65.76	197	3.1	490.0	0.273	0.027	0.0647	33.35	1.438	0.0241
Minimum	27.36	160	2.8	437.5	0.194	0.016	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 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
2019	42.06	294.7	7.2	251.7	1	0.083	0.060	0.0005	0.14	0.045	0.0046
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
<i>Annual Summary Statistics</i>											
Average	31.93	283.0	7.1	239.2	1	0.101	0.063	0.0005	0.12	0.042	0.0058
Maximum	43.42	311.5	7.2	260.8	1	0.128	0.077	0.0006	0.14	0.047	0.0093
Minimum	20.42	245.7	7.0	222.5	1	0.083	0.050	< 0.0004	0.09	0.032	0.0038

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 2023, 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 June rainbow trout acute lethality tests resulted in 0% mortality. There was 10% mortality recorded in the September rainbow trout test, and the results indicate that the effluent is not acutely toxic (Appendix IV). The June and September IC₂₅ *Ceriodaphnia dubia* reproduction test results were 57% and 40% effluent, respectively, indicating some potential sub-lethal issues with reproduction. No lethality was observed in either test and reproduction inhibition was never greater than 30% and 50%. All parameter concentrations in the sample effluent were within typical values for DS-4 and controls at the laboratory were satisfactory indicating a valid test. Sublethal toxicity at DS-4 will continue to be monitored in 2024. In 2023, 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 2023 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.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
May	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	0 of 1
June	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
July	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
Aug.	5	0 of 5	0 of 1	0 of 5	0 of 1	0 of 5	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.	4	0 of 4	0 of 1	0 of 4	0 of 1	0 of 4	0 of 1
YTD	52	0 of 52	0 of 12	0 of 52	0 of 12	0 of 52	0 of 12

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

5.2.1.3.1 Unnamed Pond adjacent to Stanrock Mine Site

Denison has been periodically monitoring an unnamed pond, located adjacent to the Stanrock former mine area. The pond is a small (0.59 ha), shallow (maximum depth: 2 m), waterbody located to the east of the Stanrock TMA and approximately 50 m west from the shore of Quirke Lake. The pond was first discovered by a member of the public in 2015 due to its unique colouration.

Following its discovery, Denison completed periodic surface water sampling, the results of which showed that the pond had depressed pH and elevated levels of some metals (e.g., Al, Co, Fe). As discussed in a previously submitted report (Minnow 2022), the results of monitoring indicate that the pond is likely influenced by TMA affected groundwater which is elevated in sulphate metals as well as inputs from surface seeps. Additional 2023 monitoring results have been provided in Appendix VI. Concentrations of Al, Co, Mn and Fe remain elevated, and pH is depressed and stable. In 2023, the pond level was considerably lower compared to the level in 2021, likely due to drier weather conditions.

Denison is currently in discussions with regulators to determine a path forward for management of this pond and/or any discharge from the pond. Surface water and groundwater monitoring plans are also being evaluated for the area.

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 IV. The 2023 groundwater field blank and field precision data summary is presented in Table 5.2.2.

The field precision DQO of 20% for pH, sulphate and iron was not exceeded in 2023 (Table 5.2.2). The field precision criteria of 20% for acidity was slightly exceeded once in 2023 at 23%. Acidity concentrations were consistent with typical values and therefore did not affect interpretation of groundwater quality results. The annual average field precision for acidity was below the DQO at 15% (Table 5.2.2).

The iron field blank DQO criteria of 0.04 mg/L was exceeded in 1 of 3 samples at 0.08 mg/L. However, the iron concentration at this location, 98-15A, is much higher (>1000 mg/L) and therefore this does not impact interpretation of groundwater quality results at this location. The sulphate field blank DQO was equalled 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 needed, and implemented before the 2024 sampling campaign.

Table 5.2.2 2023 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	6.2	0.2	4.3	0.04
	Min	5.5	0.2	4	0.01
	Max	6.6	0.2	5	0.08
Field Blank Exceedances					
	DQO Criteria ¹	-	0.2	2	0.04
	# Exceedances	0	3	3	1
Field Precision Statistics					
	Count	3	3	3	3
	Average	1%	6%	15%	3%
	Min	0%	2%	0%	0%
	Max	2%	4%	23%	13%
Field Precision Exceedances					
	DQO Criteria ¹	20%	20%	20%	20%
	# Exceedances	0	0	1	0

¹Field 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 2023 (Appendix IV). Samples were not able to be collected at these stations in 2019, 2021 and 2022, therefore, the lack of sample collection in 2023 is not unexpected. Alternative methods to sample this location will be investigated in 2024.

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 saw an increase in pH from the historically stable 6.6 to 7.4, and remains neutral. 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. 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 IV).

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 IV). Iron concentrations continue to be low compared to other wells. Sulphate concentrations increased in 2020 but has been slowly declining, with a more marked drop between 2022 and 2023, 700mg/L to 560mg/L, respectively (Appendix IV).

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 (Appendix IV). Sulphate concentrations are similar to other GW stations and have been stable over the past five years. Iron concentrations saw a slight decline in 2022 and 2023 compared to the three years prior (Appendix IV).

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 IV). Iron concentrations have been decreasing steadily over the past five years. Acidity, pH and sulphate values are all lower in 2023 compared to the last four years (Appendix IV)

Dam B groundwater quality also has a low pH and elevated sulphate, acidity and iron concentrations (Appendix IV). Iron, acidity, and sulphate concentrations are relatively stable with a slight decrease for all in 2023.

Groundwater quality monitored downstream of Dam C at BH98 15A indicates depressed pH with consistently high acidity, sulphate and iron, (Appendix IV). Acidity, sulphate and iron were all slightly lower in 2023 compared to the previous four years.

5.2.3 Porewater Quality

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 3.2 to 3.5, with high acidity, sulphate, and iron concentrations in all wells (Appendix IV). 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 with the exception of 2019 due to no recharge in the well. Porewater quality results obtained at this station were consistent over the last five years, with elevated concentrations of iron, acidity and sulphate; acidity saw a slight increase in 2023. This is very similar to all other monitoring stations at Stanrock (Appendix IV).

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 inspections and preventative maintenance were performed at the Denison TMA-1 as required. Any equipment that was able to be repaired either on-site or sent out was done so, and anything that was damaged or worn beyond repair was replaced with a new unit. All maintenance was completed to ensure continued efficiency and safe operations on site. Furthermore, 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.

Additional maintenance activities for Denison TMA-1 site completed in 2023 are as follows:

- The beaver deceiver at the D-6 inlet at Little Cinder Lake was removed and rebuilt. Fencing was repaired at the Denison Mine Road site access.
- The propane tank at the TMA1 ETP was replaced and commissioned.
- All culverts on site were inspected.
- A new automated external defibrillator was installed at the TMA-1 ETP.
- Trees were removed at the toe of Dam 18.
- All access locks to site were replaced with a different keyed lock.
- Beaver debris removed at locations around site.
- ETP intake screens were cleared of debris as needed.
- Herbicide was applied as needed.
- Annual shaft cap inspections took place around the site.
- Shaft cap at #2 shaft had a crack in the concrete repaired.

5.3.1.2 ETP Operations

The ETP located at the Denison TMA-1 spillway (D-1) operated for 130 days in 2023 (Table 5.3.1.2.1). The ETP treated approximately 759,000,000 L of water, with a monthly average daily plant flow of 68 L/s. A total of 8659 kg of barium chloride was used for radium-226 removal, more than the approximately 4000 kg used in 2022. The addition of barium chloride at higher dose rates has controlled the concentration of radium-226 in the final discharge at D-2. Sodium hydroxide (NaOH) was not utilized for pH neutralization in 2023 because the TMA-1 influent is already neutral to slightly alkaline, ranging from 7.0 to 8.3 and therefore does impact pH downstream at the final discharge at D-2 (Table 5.3.1.2.1). An

estimated 1,482,000,000 L was discharged from the final point of control at the Stollery Lake Settling Pond Outlet (D-2). Although the plant only operated for 130 days, discharge at D-2 occurred for 365 days in 2023 (Table 5.3.1.2.1). Annual monthly average daily discharge flow was 47 L/s.

5.3.1.2.1 Operating Summary

In 2023, the TMA-1 ETP operated consistently for 130 days from January to May when it was shut down on May 26. The ETP did not resume operation for the remainder of the year. Siphons were used to draw from the TMA to ensure the pond level remained below spillway elevation as well as to maintain a controlled release of water from TMA-1. Lower than normal precipitation in 2023 resulted in the low number of operational days for the ETP.

Table 5.3.1.2.1 2023 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. 2023	Y.T.D. 2022
PLANT OPERATIONS														
Operating Days	15	28	31	31	25	0	0	0	0	0	0	0	130	111
Maximum Daily Plant Flow (L/s D-1)	27	80	76	79	83	0	0	0	0	0	0	0	83	89
Minimum Daily Plant Flow (L/s @ D-1)	24	26	46	73	70	0	0	0	0	0	0	0	0	0
Monthly Average Daily Plant Flow (L/s @ D-1)	26	63	74	76	80	0	0	0	0	0	0	0	68	63
Total Volume Treated (ML)	34	151	197	204	173	0	0	0	0	0	0	0	759	603
Barium Chloride Consumption														
total kg/month	231	991	2553	2664	2220	0	0	0	0	0	0	0	8659	3958
monthly average mg/litre	6.87	6.54	12.97	13.06	12.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.41	6.56
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	28	31	30	31	30	31	31	30	31	30	31	365	365
Maximum Daily Discharge Flow (L/s D-2)	57	97	91	321	153	17	17	13	13	17	29	21	321	104
Minimum Daily Discharge Flow (L/s D-2)	21	63	72	94	27	13	4	9	7	10	17	21	4	4
Monthly Average Daily Discharge Flow (L/s D-2)	36	81	82	176	88	15	12	12	11	13	22	21	47	40
Total Volume Discharged (ML)	96	197	221	455	235	39	31	31	28	35	57	56	1482	1248

5.3.2 Denison Lower Williams Lake and TMA-2

5.3.2.1 TMA Maintenance

Routine inspections, preventative maintenance and herbicide application were performed at Denison TMA-2 and the Lower Williams Lake site, as required. Any equipment that was able to be repaired either on-site or sent out was done so, and anything that was damaged or worn beyond repair was replaced with a new unit. All maintenance was completed to ensure continued efficiency and safe operations on site. Furthermore, proper calibrations of monitoring equipment were conducted on a consistent basis and recorded accordingly. The dam safety inspection noted in Section 5.3.1.1 included inspection of dams and berms at TMA-2 and Lower Williams Lake.

Additional maintenance activities included the following:

- Tree clearing around the ETP to ensure additional buffer for forest fire protection in June when forest fires were active in the area.
- Removal of beaver activity debris at the outlet of Lower Williams Lake.
- All access locks to site were replaced with a different keyed lock.
- A new propane tank was installed and commissioned.
- All culverts on site were inspected.

5.3.2.2 Summary of ETP Operations

The ETP located at the Denison Lower Williams Lake station (D-22) operated for 312 days in 2023 (Table 5.3.2.2.1). The ETP treated approximately 224,000,000 L of water, with a monthly average daily plant flow of 8 L/s. The total amount of barium chloride that was used for radium-226 removal was 2024 kg, similar to 2022 usage. Although annual radium-226 concentrations had indicated a gradually increasing trend between 2019 and 2022 concentrations are still well below discharge limits at D-3 (Table 5.2.1.2.b). Influent (D-22) radium-226 concentrations in 2023 were below discharge criteria (0.37 Bq/L monthly mean). An estimated 218,000,000 L was discharged from the final point of control (D-3) and took place over 251 days of 2023. Annual monthly average daily discharge flow was 10 L/s (Table 5.3.2.2.1).

5.3.2.2.1 Operating Summary

In 2023, the Denison Lower Williams Lake ETP operated every month with the exception of August. Periodic operation of the ETP was a result of warmer and drier than normal conditions in 2023. 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 2023 influent concentrations also below the discharge criteria. Neutralization treatment has not been required at this site since 2002.

Table 5.3.2.2.1 2023 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. 2023	Y.T.D. 2022
PLANT OPERATIONS														
Operating Days	31	28	31	30	31	30	17	0	22	31	30	31	312	365
Maximum Daily Plant Flow (L/s @ D-3)	14	9	11	79	14	6	0	0	0	5	21	14	79	47
Minimum Daily Plant Flow (L/s @ D-3)	6	1	2	12	1	1	0	0	0	1	5	4	0	0
Monthly Average Daily Plant Flow (L/s @ D-3)	9	4	5	39	6	3	0	0	0	3	10	8	8	6
Total Volume Treated (ML)	24	8	13	102	15	6	0	0	0	8	25	21	224	201
Barium Chloride Consumption														
total kg/month	206	186	206	200	206	200	113	0	143	157	201	206	2024	2437
monthly average mg/litre	8.74	21.97	15.38	1.97	13.38	30.86	0.00	0.00	0.00	19.48	7.94	9.64	9	12
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	28	31	30	31	30	0	0	0	9	30	31	251	261
Maximum Discharge Flow (L/s @ D-3)	14	9	11	79	14	6	0	0	0	5	21	14	79	47
Minimum Discharge Flow (L/s @ D-3)	6	1	2	12	1	1	0	0	0	1	5	4	0	0
Monthly Average Discharge Flow (L/s @ D-3)	9	4	5	39	6	3	0	0	0	3	10	8	10	9
Total Volume Discharged (ML)	24	8	13	102	15	6	0	0	0	2	25	21	218	194

5.3.3 Stanrock TMA

5.3.3.1 TMA Maintenance

Routine inspections and preventative maintenance were performed at the Denison Stanrock TMA site as required. Any equipment that was able to be repaired either on-site or sent out was done so, and anything that was damaged or worn beyond repair was replaced with a new unit. All maintenance was completed to ensure continued efficiency and safe operations on site. Furthermore, 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 site; the resulting report will be submitted under separate cover.

Additional maintenance to the Denison Stanrock TMA completed in 2023 are as follows:

- Failed dump valve actuator for pumps #3 and #4 line at Dam G was replaced.
- Electric lime addition valve in the plant was replaced.
- Pneumatic lime addition pinch valve had its rubber liner replaced.
- Dam G pump #3 and Dam M pump #2 failed and were replaced.
- Cable was pulled from the ETP to a new junction box that will house a pH probe and transmitter downstream of the ETP bypass spillway.
- A new automated external defibrillator was installed at the Stanrock ETP.
- Communication issues were repaired at Dam G to restore remote control of the pumps.
- The valve was replaced on the Beaver Lake Syphon.
- A syphon was built and installed in October at the headpond over the spillway to optimize water management to the ETP.
- All access locks to site were replaced with a different keyed lock.
- Drive belts were replaced on the lime circulating pumps.
- Air pump to sample DS-2 was replaced with an electric pump.
- Herbicide was applied as required.
- Brushing was completed as required.
- Shaft cap at the service raise had a crack in the concrete that was repaired.
- All site culverts were inspected.
- Two culverts were installed for Dam C seepage and the road was raised to accommodate the new culverts.

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 107 days, with an average monthly daily plant flow of 111 L/s. Throughout 2023, an estimated 1,024,000,000 L of water were treated with barium chloride for radium-226 removal and lime addition for neutralization. In 2023, 912 kg of barium chloride and 106.58 dry tonnes of lime were used at the Stanrock ETP. In total, 981,000,000 L were discharged from the final point of control (DS-4), over a total of 365 days. Monthly average daily discharge flow at DS-4 was 31 L/s for 2023 (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 4 to 25 days, operating in eight months of the reporting year. Most of the operating days were during November, late 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). High water levels throughout the spring can sometimes cause overflow of the holding pond spillway (at ETP) and of Beaver Lake into the Moose Lake Settling Pond. To help neutralize the acidity at the spillway, pH set point is increased enough to account for the added volume. For water entering the Moose Lake Settling Pond from Beaver Lake, caustic soda is dispensed into Orient Creek. This practice was not required in 2023, and no amount of caustic soda was added to Orient Creek.

Table 5.3.3.2.1 2023 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. 2023	Y.T.D. 2022
PLANT OPERATIONS														
Operating Days	13	14	12	25	15	0	0	0	0	4	16	8	107	95
Maximum Daily Plant Flow (L/s @ DS-2)	119	130	120	157	135	0	0	0	0	120	132	122	157	159
Minimum Daily Plant Flow (L/s @ DS-2)	89	89	88	91	70	0	0	0	0	112	66	92	0	0
Monthly Average Daily Plant Flow (L/s @ DS-2)	105	106	106	126	106	0	0	0	0	116	106	105	111	105
Total Volume Treated (ML)	118	128	110	271	138	0	0	0	0	40	147	72	1024	859
Barium Chloride Consumption														
total kg/month	79	93	72	280	170	0	0	0	0	39	120	60	912	854
monthly average mg/litre	0.67	0.73	0.65	1.03	1.23	0.00	0.00	0.00	0.00	0.98	0.82	0.82	0.89	0.99
Lime Consumption														
total dry tonnes/month	9.33	11.79	11.34	27.47	15.45	0.00	0.00	0.00	0.00	5.81	17.30	8.09	106.58	86.32
monthly average g/litre	0.08	0.09	0.10	0.10	0.11	0.00	0.00	0.00	0.00	0.15	0.12	0.11	0.10	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	9.33	11.79	11.34	27.47	15.45	0.00	0.00	0.00	0.00	5.81	17.30	8.09	106.58	106.1
EFFLUENT														
Discharge Days	31	28	31	30	31	30	31	31	30	31	30	31	365	365
Maximum Daily Discharge Flow (L/s @ DS-4)	47	78	41	323	211	6	3	3	3	6	58	21	323	172
Minimum Daily Discharge Flow (L/s @ DS-4)	13	13	13	51	6	3	1	1	3	3	13	13	1	3
Monthly Average Daily Discharge Flow (L/s @ DS-4)	24	38	28	154	66	5	2	2	3	4	34	18	31	23
Total Volume Discharged (ML)	64	93	74	399	177	12	5	5	8	10	88	48	981	737

6 REFERENCES

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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: <ul style="list-style-type: none"> • monitoring substances reduced to mine indicator parameters (barium, cobalt, DOC, iron, manganese, radium-226, selenium, silver, sulphate and uranium); • addition of two lake 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.
	In Basin Monitoring Program, Cycle 3 Study Design	2009		TOMP and SAMP: <ul style="list-style-type: none"> • removal of silver, selenium based on performance and removal of conductivity based on redundancy with sulphate; and

Cycle 3	Serpent River Watershed Monitoring Program: Cycle 3 Study Design	2009	2005 to 2009	<ul style="list-style-type: none"> • DOC, hardness and flow added at selected stations. SRWMP: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • improved approach to trend analysis of surface water quality using the non-parametric seasonal Kendall test. SRWMP: <ul style="list-style-type: none"> • 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 Inc.
Denison
SAMPLE LOCATION MAP

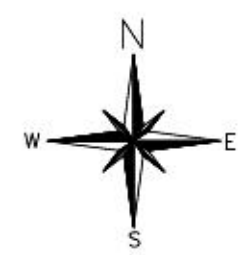
Rev. 2011-00
File 3.2.1
March 2011

Legend

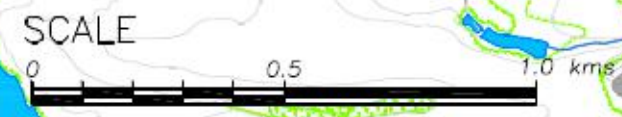
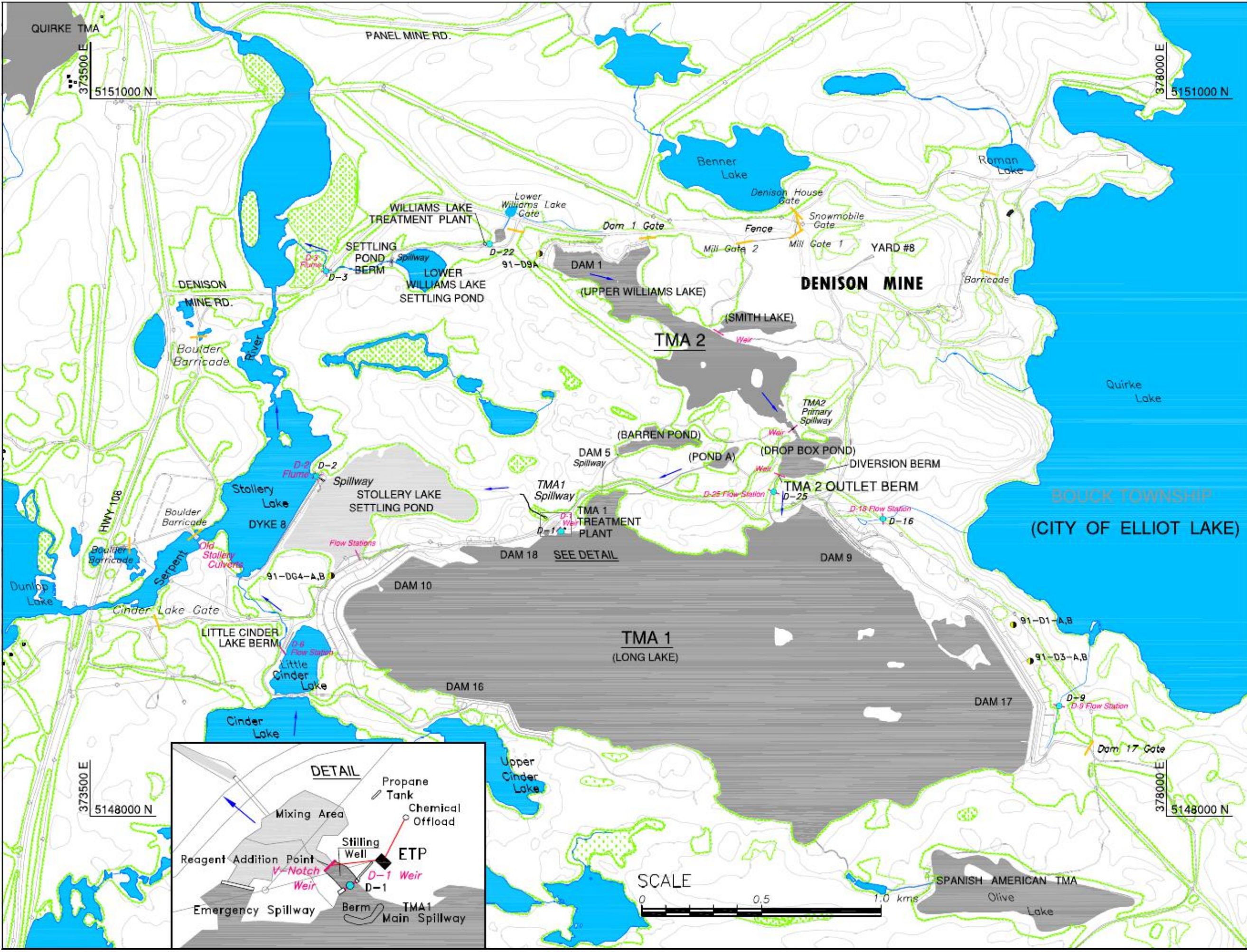
- water covered tailings.
- settling ponds.
- surface water sample location.
- groundwater sample location.
- flow direction.
- roads or trails.
- power line.
- flow station or weir.
- pipeline.
- gate.
- wetlands.

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.

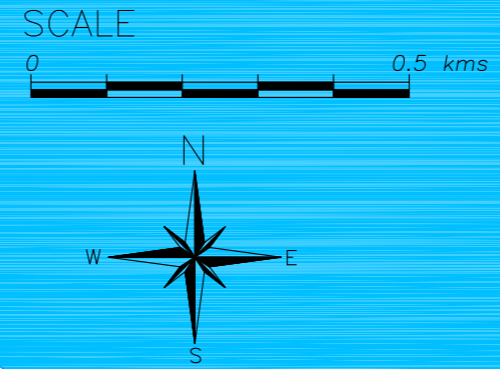


Issued on: _____
Issued by: _____
Denison Responsible Authority



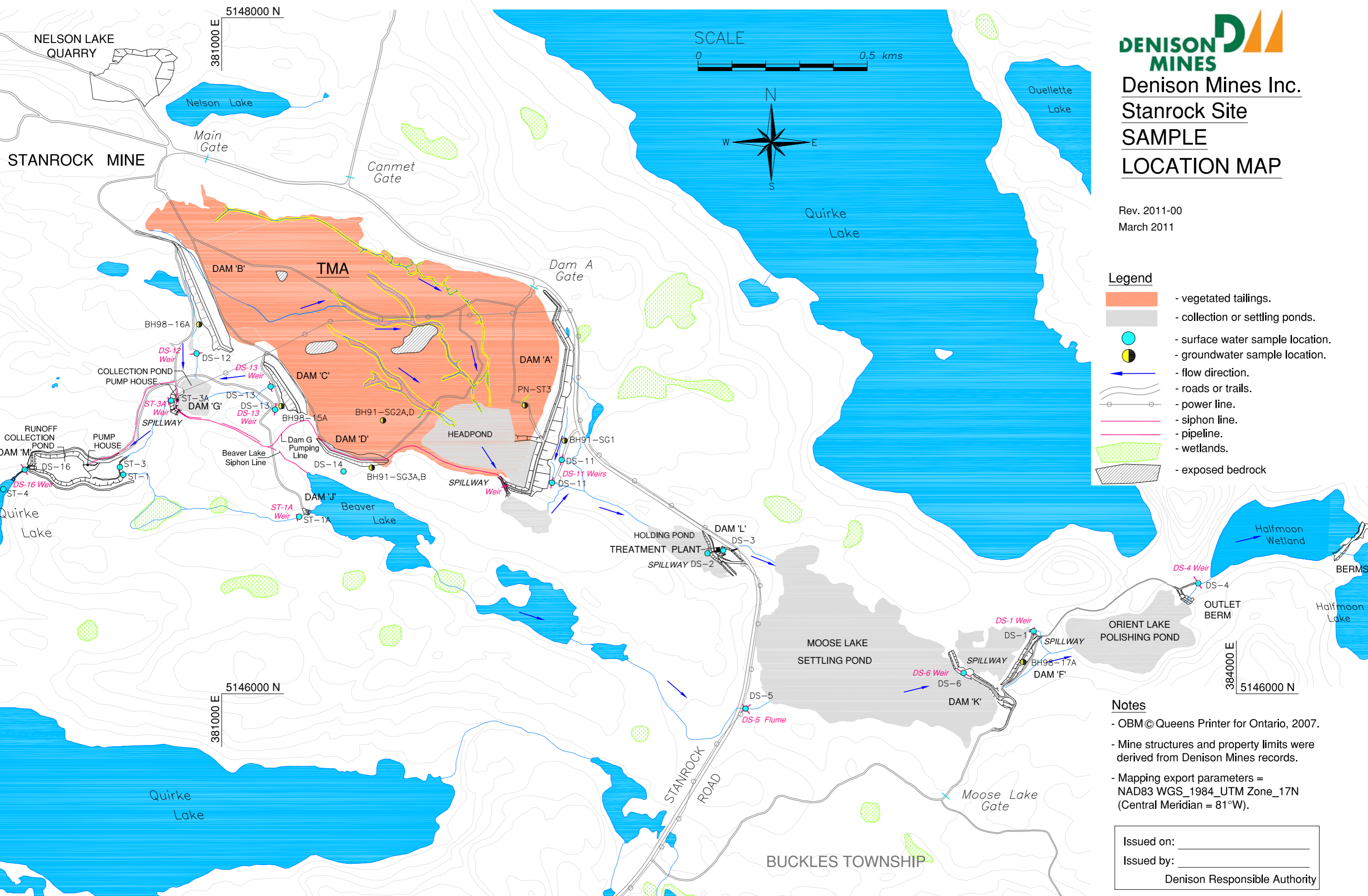
Denison Mines Inc.
Stanrock Site
SAMPLE
LOCATION MAP

Rev. 2011-00
 March 2011



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

**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		
DS-2	U	2023-01-10	0	0.0276	0.0322 mg/L	Result is above the high flag limit, but consistent with previous values in the last four years.		
ST-1	pH	2023-01-17	3.9	4.4	5.4	Result is above the high flag limit, but consistent with previous values in the last four years.		
ST-3	pH	2023-01-17	3.0	3.6	2.9	Result is slightly below the flow flag limit, but consistent with previous values in the last two years.		
D-2	Ba	2023-04-20	0	0.8836	1.41 mg/L	Results are above the high flag limits, but consistent with operational adjustments made upstream in the influent (D-1) to mitigate increasing radium concentrations in the final discharge (D-2). These values are internal requirements as the regulatory monthly requirement was collected on April 11.		
		2023-04-25	0	0.8836	2.12 mg/L			
	FLOW	2023-04-18	0	158.41	321 L/s			
	2023-04-20	0	158.41	250 L/s				
D-2	FLOW	2023-04-25	0	158.41	175 L/s	Results are above the high limit, but consistent with increased seasonal flows during spring freshet.		
		D-3	FLOW	2023-04-11	0	33.624	39 L/s	Results are above the high limit, but consistent with increased seasonal flows during spring freshet.
				2023-04-18	0	33.624	79 L/s	

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
DS-1	FLOW	2023-04-18	0	232.26	253 L/s	Result is above the high limit, but consistent with increased seasonal flows during spring freshet.
DS-16	FLOW	2023-04-11	0	2.2949	5.8 L/s	Results are above the high limit, but consistent with increased seasonal flows during spring freshet.
		2023-04-18	0	2.2949	5 L/s	
DS-2	U	2023-04-11	0	0.0338	0.0405 mg/L	Result is an 11-year high. The result could not be repeated as there was insufficient volume to run another analysis.
DS-4	FLOW	2023-04-18	0	141.07	323 L/s	Result is above the high limit, but consistent with increased seasonal flows during spring freshet.
DS-6	FLOW	2023-04-18	0	310.57	390 L/s	Result is above the high limit, but consistent with increased seasonal flows during spring freshet.
D-16	FLOW	2023-05-09	0	1.6402	3 L/s	Results are above the high limit, but consistent with increased seasonal flows during spring freshet.
D-25	Fe	2023-05-09	0.0701	0.2059	0.47 mg/L	The result is above the high flag limit and may be a result of low water levels in TMA-2 due to dry conditions. No downstream increase in iron is noted. Continue to monitor.

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
D-3	Ba	2023-05-09	0.1038	0.4919	0.595 mg/L	Result is above the high flag limit but similar to historical concentrations at this time of year.
	Fe	2023-05-09	0	0.106	0.131 mg/L	Result higher than flag but within historical range of data.
	hard	2023-05-09	66.174	187.25	64.8 mg/L	Result slightly lower than low flag. Will continue to monitor. June measurement is higher.
DS-1	FLOW	2023-05-02	0	149.57	212 L/s	Results are above the high limit, but consistent with increased seasonal flows during spring freshet.
		2023-05-05	0	149.57	166 L/s	
DS-11	pH	2023-05-24	5.9274	7.2544	5.7	pH slightly lower than flag criteria, but within historical data range.
DS-16	CONDF	2023-05-02	16.804	70.781	239.9 µmho/cm	Result is unexpected and was a data entry error. Error in data entry was corrected. June conductivity measurement was within the normal range.
DS-4	Co	2023-05-09	0.0005	0.0005	0.0009 mg/L	Higher than flag criteria, but MDL has changed to be lower than reportable criteria. Result is acceptable.
	Fe	2023-05-09	0.0211	0.1531	0.155 mg/L	Result is only slightly above high flag and acceptable.
DS-4	FLOW	2023-05-02	0	175.33	211 L/s	Results are above the high limit, but consistent with increased seasonal flows during spring freshet.

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
FBDST	Ra	2023-05-09	0.0013	0.0109	0.013 Bq/L	Result is slightly above high flag criteria but only slightly above the data quality objective of 0.01 Bq/L. No further action taken.
BSDST	hard	2023-06-27	118.19	446.92	< 0.05 mg/L	Results are below the low flag limits. It appears the metals bottle was mislabeled and should have been marked FBDST. Repeats have been requested for both the blank and and blind metals.
	U	2023-06-27	0.0023	0.0697	< 0.0005 mg/L	
D-2	Mn	2023-06-27	0.053	0.262	0.029 mg/L	Result is below the low flag criteria but acceptable.
D-3	Fe	2023-06-13	0	0.11	0.18 mg/L	Results are slightly above the high flag limits, but still consistent with previous values in the last two years.
	Mn	2023-06-13	0	0.033	0.044 mg/L	
	hard	2023-06-13	75	186.6	70.1 mg/L	Results are slightly below the low flag limits, but still consistent with previous values in the last two years.
	SO4	2023-06-13	34.5	143.9	30 mg/L	
FBDST	Ba	2023-06-27	0.005	0.005	0.348 mg/L	Results are above the flag limits. It appears the metals bottle was mislabeled and should have been marked BSDST. Repeats have been requested for both the blank and and blind metals.
	U	2023-06-27	0.0002	0.0008	0.00401 mg/L	

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
BSDST	Co	2023-07-18	0.0002	0.0007	< 0.00017 mg/L	Result is below low flag but consistent with historical measurements. MDL is lower than data quality objective.
D-2	Co	2023-07-18	0.0004	0.0007	< 0.00026 mg/L	Result is below low flag but consistent with historical measurements. MDL is lower than data quality objective.
FBDST	Ba	2023-07-18	0.0032	0.0067	< 0.00008 mg/L	Result is below low flag and consistent with field blank data. MDL is lower than data quality objective.
	Co	2023-07-18	0.0003	0.0007	< 4E-06 mg/L	
	U	2023-07-18	0.0001	0.0009	< 5E-06 mg/L	
D-25	pH	2023-08-08	6.8275	8.0322	6.8	pH is slightly below low flag but accepted.
DS-12	pH	2023-08-15	1.9473	5.7818	5.8	pH is above the high value flag and is an improvement in quality. Accept and continue to monitor.
BSDST	Mn	2023-09-12	0	0.2449	0.282 mg/L	Result is slightly above the high flag value, but not inconsistent with parent sample (D-2).
D-2	Co	2023-09-12	0.0004	0.0006	0.00022 mg/L	Result is below the low result flag but consistent with historical values. MDL is lower than reporting quality objective.
DS-4	TOXRT	2023-09-12	0	0	10 %	Result of 10% mortality is valid as the control had 0% mortality. The result of 10% mortality is low and below requirement, would be acceptable as a control and no additional testing is required.

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
FBDST	Ba	2023-09-12	0.0032	0.0067	0.00011 mg/L	Result is below the low result flag and consistent with field blank water quality.
	Co	2023-09-12	0.0003	0.0007	< 4E-06 mg/L	
	U	2023-09-12	0.0001	0.0009	6.8E-05 mg/L	
BSDST	Co	2023-10-10	0.0002	0.0007	0.00021 mg/L	Result is below the low result flag but consistent with historical values. MDL is now lower than data quality objective.
D-16	U	2023-10-10	0.0005	0.0005	0.00015 mg/L	Result is below the low result flag but consistent with historical values. MDL is now lower than data quality objective.
D-2	SO4	2023-10-10	0	354.03	460 mg/L	Result is above the high flag and a reassay was requested with the laboratory. The reassay result (270 mg/L) is consistent with historical values. The original result was removed from the database.
D-22	SO4	2023-10-11	0	278.5	310 mg/L	Result is above the high flag and was confirmed by the reassay. Original result is accepted.
D-3	Co	2023-10-24	0.0005	0.0005	0.00016 mg/L	Result is below the low result flag but consistent with historical values. MDL is now lower than data quality objective.

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
DS-4	Ra	2023-10-31	0	0.2048	0.255 Bq/L	Result is above the high flag value and a reassay was requested. Result of reassay (0.077 Bq/L) was similar to historic results and was accepted .
	TSS	2023-10-05	0.0609	2.2468	3 mg/L	Result slightly above high flag value. Will continue to monitor. Next result was within expected range. No action required.
		2023-10-31	0.0609	2.2468	76 mg/L	This result exceeds the high flag and is higher than historical. The result was suspect as the sample was noted to be clear in appearance. Repeat analysis on the sample was requested but the laboratory misplaced most of the remaining sample, but did confirm that the sample was clear and that the result of 76 mg/L was not valid and has been removed from the reportable data. The next weekly TSS sample result was low and as expected for this location. The laboratory has issued a nonconformance report.
FBDST	Ba	2023-10-10	0.0024	0.0073	0.00016 mg/L	Result is below the low result flag but consistent with field blank expected values. MDL is now lower than historically reported data quality objective.
	Co	2023-10-10	0.0002	0.0007	8E-06 mg/L	
	U	2023-10-10	0.0001	0.0009	2E-06 mg/L	
D-25	ACID	2023-11-29	1	1 <	2 mg/L	Value is above the high flag limit but consistent with historical values.
D-3	Co	2023-11-08	0.0005	0.0005	5.8E-05 mg/L	Value is outside the high low flag limit but low and consistent with previous data.

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
D-3	U	2023-11-08	0	0.0098	0.0164 mg/L	Result is above the high flag limit, but consistent with previous values in the last year.
DS-3	pH	2023-11-07	10.427	11.232	3.44	Value is below the low flag limit as ETP lime addition line was plugged resulting in the ETP shut down.
		2023-11-08	10.427	11.232	12.2	Value is above the high flag limit due to overtreatment with lime to treat bypass water as per ETP operation manual. Values are within historical values. Downstream pH values were not affected.
		2023-11-13	10.427	11.232	11.3	
DS-4	pH	2023-11-29	6.6871	7.6653	7.78	Value is slightly above the high flag limit but within discharge criteria and historical values.
FBDST	Ba	2023-11-08	0.0014	0.0081	0.00114 mg/L	Value is below the low flag and the data quality objective and consistent with field blank water quality. The MDL is now lower than the data quality objective. No further action needed.
	Co	2023-11-08	0.0001	0.0008 <	4E-06 mg/L	
D-1	Co	2023-12-19	0.0005	0.0005	0.00011 mg/L	Result is below the low result flag but consistent with historical values. MDL is now lower than data quality objective.
D-3	Co	2023-12-05	0.0005	0.0005	3.5E-05 mg/L	Result is below the low result flag but consistent with historical values. MDL is now lower than data quality objective.
	pH	2023-12-12	6.5854	7.6552	7.72	pH is slightly above high flag but well within discharge limit.

Denison Mines Inc.
SAMP/TOMP Flagged Data



Location	Analyte	Date	Low	Hi	Result	Comment
D-3	U	2023-12-05	0	0.0103	0.0154 mg/L	Result is above high flag but within historical data range.
FBDST	Ba	2023-12-05	0.0013	0.0081	0.00015 mg/L	Result is below the low result flag but consistent with field blank expected values. MDL is now lower than historically reported data quality objective.
	Co	2023-12-05	0.0001	0.0008	< 4E-06 mg/L	

SAMP and TOMP DATA QUALITY REPORTING
Field Blank 2023
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Registry: RC8.5.4-02

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	Date	pH	Acid mg/L	TSS mg/L	Hardness mg/L as CaCO3	Uranium mg/L	Sulphate mg/L	Radium Bq/L	Barium mg/L	Cobalt mg/L	Iron mg/L	Manganese mg/L
Blank Criteria												
	SAMP ¹	-	-	-	1.0	0.001	0.2	0.01	0.01	0.001	0.04	0.004
	TOMP ¹	-	2	2	-	0.001	0.2	0.01	0.01	0.001	0.04	0.004
FBDST	2023.01	6.3		< 1	< 0.5	< 0.0005	< 0.1	< 0.005	< 0.005	< 0.0005	< 0.02	< 0.002
FBDST2	2023.01	6.0	2.0									
FBDST	2023.02	6.0		< 1	< 0.5	< 0.0005	< 0.1	0.010	< 0.005	< 0.0005	< 0.02	< 0.002
FBDST	2023.03	6.0		< 1	< 0.5	< 0.0005	0.1	< 0.005	< 0.005	< 0.0005	0.05	< 0.002
FBDST	2023.04	5.9		< 1	< 0.5	< 0.0005	< 0.2	< 0.005	< 0.005	< 0.0005	< 0.02	< 0.002
FBDST2	2023.04	5.9	2.0									
FBDST	2023.05	6.0		< 1	< 0.5	< 0.0005	< 0.1	0.013	< 0.005	< 0.0005	< 0.02	< 0.002
FBDST	2023.06	6.1		< 1	< 0.1	< 0.0000	< 0.2	< 0.005	< 0.000	< 0.0000	< 0.01	< 0.000
FBDST	2023.07	5.9		< 1	< 0.1	< 0.0000	< 0.2	< 0.005	< 0.000	< 0.0000	< 0.01	< 0.000
FBDST	2023.08	6.9		< 1	< 0.5	< 0.0005	< 0.2	< 0.005	< 0.005	< 0.0005	< 0.02	< 0.002
FBDST	2023.09	6.2		< 1	0.2	0.0001	< 0.2	< 0.005	0.000	< 0.0000	< 0.01	0.000
FBDST2	2023.09	6.2		< 1	0.2	0.0001	< 0.2	< 0.005	0.000	< 0.0000	< 0.01	0.000
FBDST	2023.10	7.2		< 1	< 0.1	0.0000	< 0.2	< 0.005	0.000	0.0000	< 0.01	0.000
FBDST	2023.11	6.9		< 1	0.1	0.0001	< 0.2	< 0.005	0.001	< 0.0000	< 0.01	0.000
FBDST2	2023.11	5.1	3.0									
FBDST	2023.12	8.5		< 1	0.2	0.0001	< 0.2	< 0.005	0.000	< 0.0000	< 0.01	0.000
Count		16	3	13	13	13	13	13	13	13	13	13
# Exceedances		0	1	0	0	0	0	1	0	0	1	0
Average		6.3	2.3	< 1	0.3	0.0003	0.2	0.006	0.002	0.0002	0.02	0.001
Max		8.5	3.0	< 1	0.5	0.0005	0.2	0.013	0.005	0.0005	0.05	0.002
Min		5.1	2.0	< 1	0.1	0.0000	0.1	0.005	0.000	0.0000	0.01	0.000

¹ SAMP and TOMP field blank criteria taken from Table 2.11 State of The Environment Report (SOE) (Minnow, 2011)

Bold Indicates an exceedance of the Blank Criteria

SAMP and TOMP DATA QUALITY REPORTING
Field Precision 2023
Revision 2007-01



Registry: RF8.5.4-02

Location	Date	pH	Acidity mg/L	TSS mg/L	Hardness mg/L	Sulphate mg/L	Radium (total) Bq/L	Uranium mg/L	Barium mg/L	Cobalt mg/L	Iron mg/L	Manganese mg/L
D-2	2023.01	7.2		1.0	316.0	260.0	0.022	0.0460	0.063	< 0.0005	0.39	0.166
BSDST		7.2		< 1.0	316.0	260.0	0.031	0.0472	0.060	< 0.0005	0.39	0.152
variance		0%		0%	0%	0%	34%	3%	5%	0%	0%	9%
D-2	2023.02	7.1		2.0	219.0	150.0	0.288	0.0257	0.489	0.0005	0.67	0.144
BSDST		7.1		1.0	215.0	150.0	0.264	0.0251	0.483	< 0.0005	0.66	0.144
variance		0%		67%	2%	0%	9%	2%	1%	0%	2%	0%
D-2	2023.03	7.2		1.0	184.0	120.0	0.307	0.0190	0.781	< 0.0005	0.59	0.120
BSDST		7.2		1.0	188.0	110.0	0.218	0.0190	0.799	< 0.0005	0.58	0.119
variance		0%		0%	2%	9%	34%	0%	2%	0%	2%	1%
D-2	2023.04	7.1		2.0	183.0	97.0	0.288	0.0149	0.850	< 0.0005	0.53	0.103
BSDST		7.1		1.0	177.0	98.0	0.350	0.0151	0.837	< 0.0005	0.52	0.102
variance		0%		67%	3%	1%	19%	1%	2%	0%	2%	1%
D-2	2023.05	7.3		1.0	205.0	150.0	0.113	0.0204	0.882	< 0.0005	0.47	0.124
BSDST		7.3		1.0	203.0	150.0	0.125	0.0209	0.821	< 0.0005	0.44	0.123
variance		0%		0%	1%	0%	10%	2%	7%	0%	7%	1%
D-2	2023.06	7.1		< 1.0	243.0	180.0	0.041	0.0258	0.215	< 0.0005	0.03	0.029
BSDST		7.1		1.0	276.0	180.0	0.046	0.0325	0.300	< 0.0002	0.07	0.018
variance		0%		0%	13%	0%	11%	23%	33%	86%	80%	47%
D-2	2023.07	7.2		1.0	276.0	200.0	0.036	0.0300	0.227	< 0.0003	0.17	0.115
BSDST		7.2		1.0	271.0	190.0	0.060	0.0291	0.219	< 0.0002	0.15	0.076
variance		0%		0%	2%	5%	50%	3%	4%	40%	13%	41%
D-2	2023.08	7.0		1.0	293.0	220.0	0.015	0.0346	0.215	< 0.0004	0.23	0.176
BSDST		7.0		< 1.0	300.0	220.0	< 0.005	0.0343	0.160	< 0.0005	0.18	0.069
variance		0%		0%	2%	0%	100%	1%	29%	22%	24%	87%
D-2	2023.09	7.2		2.0	326.0	250.0	0.020	0.0389	0.119	0.0002	0.38	0.121
BSDST		7.2		1.0	319.0	250.0	0.031	0.0379	0.214	0.0005	0.47	0.282
variance		0%		67%	2%	0%	43%	3%	57%	86%	21%	80%

SAMP and TOMP DATA QUALITY REPORTING
Field Precision 2023
Revision 2007-01



Registry: RF8.5.4-02

Location	Date	pH	Acidity mg/L	TSS mg/L	Hardness mg/L	Sulphate mg/L	Radium (total) Bq/L	Uranium mg/L	Barium mg/L	Cobalt mg/L	Iron mg/L	Manganese mg/L
D-2	2023.10			1.0	332.0	270.0	0.031	0.0434	0.111	0.0003	0.28	0.163
BSDST		7.5		1.0	329.0	250.0	0.038	0.0429	0.096	0.0002	0.26	0.136
variance				0%	1%	8%	20%	1%	14%	40%	7%	18%
D-2	2023.11	7.1		1.0	350.0	300.0	0.058	0.0438	0.083	0.0004	0.35	0.200
BSDST		7.2		1.0	347.0	300.0	0.037	0.0447	0.089	0.0004	0.34	0.201
variance		1%		0%	1%	0%	44%	2%	7%	0%	3%	0%
D-2	2023.12	7.6		2.0	371.0	300.0	0.026	0.0497	0.067	0.0004	0.42	0.196
BSDST		7.6		1.0	357.0	320.0	0.028	0.0477	0.065	0.0004	0.41	0.192
variance		0%		67%	4%	6%	7%	4%	3%	0%	2%	2%
DS-2	2023.01	2.6	178.0									
BSDST		2.6	163.0									
variance		0%	9%									
DS-2	2023.04	3.0	188.0									
BSDST		3.0	178.0									
variance		0%	5%									
DS-2	2023.11	2.8	165.0									
BSDST		2.8	165.0									
variance		0%	0%									
Count		14	3	12	12	12	12	12	12	12	12	12
Average		0%	5%	22%	3%	2%	32%	4%	14%	23%	14%	24%
Max		1%	9%	67%	13%	9%	100%	23%	57%	86%	80%	87%
Min		0%	0%	0%	0%	0%	7%	0%	1%	0%	0%	0%
Criteria ¹		20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
# Exceedances		0	0	4	0	0	7	1	3	5	3	4

¹ SAMP parameter 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 Program (TOMP) Design (Minnow, 2002b)

SAMP and TOMP DATA QUALITY REPORTING
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Date		Acidity mg/L as CaCO ₃	Sulphate mg/L	pHF	Iron mg/L
Blank Criteria	TOMP ¹	2	0.1		0.04
2023.08	FBD-GW2	4.0	< 0.2	5.5	0.08
2023.08	FBD-GW4	5.0	< 0.2	6.6	< 0.02
2023.09	FBD-GW3	4.0	< 0.2	6.3	< 0.01
Count		3	3	3	3
# Exceedances		3	0	0	1
Average		4.3	< 0.2	6.2	0.04
Max		5	< 0.2	6.6	0.08
Min		4	< 0.2	5.5	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

SAMP and TOMP DATA QUALITY REPORTING
Groundwater Field Precision
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Registry: RF8.5.4-02

Location	Date	pHF	Sulphate mg/L	Acidity mg/L	Iron mg/L
98-15A	2023.08	5.9	2300.0	1000.0	496.00
BSD-GW2		5.9	2300.0	641.0	475.00
variance		0%	0%	44%	4%
BH91 DG4B	2023.09	6.6	560.0	< 2.0	14.30
BSD-GW3		6.6	680.0	< 2.0	14.40
variance		0%	19%	0%	1%
BH91 SG2A	2023.08	6.2	4600.0	2900.0	1390.00
BSD-GW4		6.1	4600.0	2890.0	1440.00
variance		2%	0%	0%	4%
Count		3	3	3	3
Average		1%	6%	15%	3%
Min		0%	2%	0%	0%
Max		2%	4%	23%	13%
Criteria1		20%	20%	20%	20%
# Exceedances		0	0	1	0

¹ Field criteria taken from Table 6.2 of the Cycle 5 Study Design for SRWMP, SAMP and TOMP (Minnow, 2010).
Bold Indicates an exceedance of the Blank Criteria

APPENDIX IV
Water Quality Results

2023 Performance Monitoring Results

Detailed Results for 2023

BSDST: Blind Sample for D-2

Date	FLOW L/s	hard mg/L	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L
2023-01-10	25.00	316.0	7.2	260.0	<1	0.031	0.060	<0.0005
2023-02-14	63.00	215.0	7.1	150.0	1	0.264	0.483	<0.0005
2023-03-21	87.00	188.0	7.2	110.0	1	0.218	0.799	<0.0005
2023-04-11	122.00	177.0	7.1	98.0	1	0.350	0.837	<0.0005
2023-05-09	39.00	203.0	7.3	150.0	1	0.125	0.821	<0.0005
2023-06-27	13.00	276.0	7.1	190.0	1	0.046	0.300	<0.0002
2023-07-18	12.00	271.0	7.2	190.0	1	0.060	0.219	<0.0002
2023-08-08	13.00	300.0	7.0	220.0	<1	<0.005	0.160	<0.0005
2023-09-12	7.00	319.0	7.2	250.0	1	0.031	0.214	0.0005
2023-10-10	10.00	329.0	7.5	250.0	1	0.038	0.096	0.0002
2023-11-08	21.00	347.0	7.2	300.0	1	0.037	0.089	0.0004
2023-12-05	21.00	357.0	7.6	320.0	1	0.028	0.065	0.0004

Count	12	12	12	12	12	12	12	12
High	122.00	357.0	7.6	320.0	1	0.350	0.837	0.0005
Low	7.00	177.0	7.0	98.0	<1	<0.005	0.060	<0.0002
Mean	36.08	274.8	7.2	207.3	1	0.102	0.345	0.0004

High Limit			8.5	128-429	10	0.469	1.000	0.0025
Low Limit			6.5					
Lim Ex	0	0	0	0	0	0	0	2
Frequency	0%	0%	0%	0%	0%	0%	0%	17%
10x Lim 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
2023-01-10	0.39	0.152	0.0472
2023-02-14	0.66	0.144	0.0251
2023-03-21	0.58	0.119	0.0190
2023-04-11	0.52	0.102	0.0151
2023-05-09	0.44	0.123	0.0209
2023-06-27	<0.21	0.086	0.0325
2023-07-18	0.15	0.076	0.0291
2023-08-08	0.18	0.069	0.0343
2023-09-12	0.47	0.282	0.0379
2023-10-10	0.26	0.136	0.0429
2023-11-08	0.34	0.201	0.0447
2023-12-05	0.41	0.192	0.0477

Count	12	12	12
High	0.66	0.282	0.0477
Low	0.15	0.069	0.0151
Mean	0.38	0.140	0.0330

High Limit	0.76	0.841	0.0150
Lim Ex	0	0	0
Frequency	0%	0%	0%
10x Lim Ex	0	0	0
Frequency	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

BSDST2: Blind Sample for DS-2

Date	ACID mg/L	pH
2023-01-10	163	2.6
2023-04-11	178	3.0
2023-09-26		
2023-11-08	165	2.8
Count	3	4
High	178	3.0
Low	163	2.6
Mean	169	2.8
Lim Ex	0	0
Frequency	0%	0%
10x Lim Ex	0	0
Frequency	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-01-01				0.00				
2023-01-02				0.00				
2023-01-03			386.91	0.00				
2023-01-04				0.00				
2023-01-05				0.00				
2023-01-06				0.00				
2023-01-07				0.00				
2023-01-08				0.00				
2023-01-09				0.00				
2023-01-10			386.94	0.00				7.2
2023-01-11				0.00				
2023-01-12				0.00				
2023-01-13				0.00				
2023-01-14				0.00				
2023-01-15				0.00				
2023-01-16				0.00				
2023-01-17			386.94	24.00				
2023-01-18				27.00				
2023-01-19				26.00				
2023-01-20				26.00				
2023-01-21				26.00				
2023-01-22				26.00				
2023-01-23			386.96	26.00				
2023-01-23					121.0			7.1
2023-01-24				26.00				
2023-01-25				26.00				
2023-01-26				26.00				
2023-01-27				26.00				
2023-01-28				26.00				
2023-01-29				26.00				
2023-01-30				26.00				
2023-01-30		231.00				0.00	15	
2023-01-31			386.96	26.00				
2023-01-31					126.0			7.0
2023-02-01				26.00				
2023-02-02				47.00				
2023-02-03				48.00				
2023-02-04				48.00				
2023-02-05				48.00				
2023-02-06				48.00				
2023-02-07			386.95	47.00				
2023-02-07					119.0			7.0
2023-02-08				48.00				
2023-02-09				48.00				
2023-02-10				48.00				
2023-02-11				48.00				
2023-02-12				48.00				
2023-02-13				48.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl ₂ T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-02-14	<1		386.95	80.00	117.0			7.1
2023-02-15				80.00				
2023-02-16				77.00				
2023-02-17				77.00				
2023-02-18				77.00				
2023-02-19				77.00				
2023-02-20				77.00				
2023-02-21			386.95	76.00				
2023-02-21					129.0			7.2
2023-02-22				76.00				
2023-02-23				76.00				
2023-02-24				76.00				
2023-02-25				76.00				
2023-02-26				76.00				
2023-02-27				76.00				
2023-02-28		991.00				0.00	28	
2023-02-28			386.94	76.00				
2023-03-01				76.00				
2023-03-02				76.00				
2023-03-03				46.00				
2023-03-04				76.00				
2023-03-05				76.00				
2023-03-06				76.00				
2023-03-07			386.91	75.00				
2023-03-08				75.00				
2023-03-09				75.00				
2023-03-10				75.00				
2023-03-11				74.00				
2023-03-12				74.00				
2023-03-13				73.00				
2023-03-14			386.89	74.00				
2023-03-15				74.00				
2023-03-16				74.00				
2023-03-17				75.00				
2023-03-18				75.00				
2023-03-19				75.00				
2023-03-20				75.00				
2023-03-21			386.88	73.00				7.1
2023-03-22				74.00				
2023-03-23				74.00				
2023-03-24				74.00				
2023-03-25				74.00				
2023-03-26				74.00				
2023-03-27				74.00				
2023-03-28		2553.00				0.00	31	
2023-03-28			386.87	74.00				
2023-03-29				74.00				
2023-03-30				72.00				
2023-03-31				73.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-04-01				73.00				
2023-04-02				73.00				
2023-04-03				74.00				
2023-04-04			386.89	74.00				
2023-04-05				75.00				
2023-04-06				74.00				
2023-04-07				74.00				
2023-04-08				74.00				
2023-04-09				74.00				
2023-04-10				74.00				
2023-04-11	<1		386.91	74.00	128.0			7.1
2023-04-12				74.00				
2023-04-13				76.00				
2023-04-14				76.00				
2023-04-15				78.00				
2023-04-16				78.00				
2023-04-17				78.00				
2023-04-18			387.03	78.00				
2023-04-19				77.00				
2023-04-20				78.00				
2023-04-21				78.00				
2023-04-22				78.00				
2023-04-23				78.00				
2023-04-24				77.00				
2023-04-25			387.05	78.00				
2023-04-26				78.00				
2023-04-27				77.00				
2023-04-28				77.00				
2023-04-28		2664.00				0.00	31	
2023-04-29				78.00				
2023-04-30				79.00				
2023-05-01				80.00				
2023-05-02			387.09	80.00				
2023-05-03				78.00				
2023-05-04				81.00				
2023-05-05				82.00				
2023-05-06				80.00				
2023-05-07				80.00				
2023-05-08				83.00				
2023-05-09			387.08	83.00				7.8
2023-05-10				81.00				
2023-05-11				83.00				
2023-05-12				82.00				
2023-05-13				82.00				
2023-05-14				82.00				
2023-05-15				82.00				
2023-05-16			387.03	82.00				
2023-05-17				81.00				
2023-05-18				80.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-05-19				80.00				
2023-05-20				70.00				
2023-05-21				78.00				
2023-05-22				78.00				
2023-05-23			386.98	80.00				
2023-05-24				79.00				
2023-05-25				78.00				
2023-05-26				0.00				
2023-05-27				0.00				
2023-05-28				0.00				
2023-05-28		2220.00				0.00	25	
2023-05-29				0.00				
2023-05-30			386.94	0.00				
2023-05-31				0.00				
2023-06-01				0.00				
2023-06-02				0.00				
2023-06-03				0.00				
2023-06-04				0.00				
2023-06-05				0.00				
2023-06-06			386.92	0.00				
2023-06-07				0.00				
2023-06-08				0.00				
2023-06-09				0.00				
2023-06-10				0.00				
2023-06-11				0.00				
2023-06-12				0.00				
2023-06-13			386.90	0.00				7.7
2023-06-14				0.00				
2023-06-15				0.00				
2023-06-16				0.00				
2023-06-17				0.00				
2023-06-18				0.00				
2023-06-19				0.00				
2023-06-20			386.90	0.00				
2023-06-21				0.00				
2023-06-22				0.00				
2023-06-23				0.00				
2023-06-24				0.00				
2023-06-25				0.00				
2023-06-26				0.00				
2023-06-27			386.89	0.00				
2023-06-28				0.00				
2023-06-28		0.00				0.00	0	
2023-06-29				0.00				
2023-06-30				0.00				
2023-07-01				0.00				
2023-07-02				0.00				
2023-07-03				0.00				
2023-07-04			386.86	0.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-07-05				0.00				
2023-07-06				0.00				
2023-07-07				0.00				
2023-07-08				0.00				
2023-07-09				0.00				
2023-07-10				0.00				
2023-07-11	<1		386.84	0.00	94.2			8.3
2023-07-12				0.00				
2023-07-13				0.00				
2023-07-14				0.00				
2023-07-15				0.00				
2023-07-16				0.00				
2023-07-17				0.00				
2023-07-18			386.82	0.00				
2023-07-19				0.00				
2023-07-20				0.00				
2023-07-21				0.00				
2023-07-22				0.00				
2023-07-23				0.00				
2023-07-24				0.00				
2023-07-25			386.80	0.00				
2023-07-26				0.00				
2023-07-27				0.00				
2023-07-28				0.00				
2023-07-28		0.00				0.00	0	
2023-07-29				0.00				
2023-07-30				0.00				
2023-07-31				0.00				
2023-08-01			386.77	0.00				
2023-08-02				0.00				
2023-08-03				0.00				
2023-08-04				0.00				
2023-08-05				0.00				
2023-08-06				0.00				
2023-08-07				0.00				
2023-08-08			386.75	0.00				7.7
2023-08-09				0.00				
2023-08-10				0.00				
2023-08-11				0.00				
2023-08-12				0.00				
2023-08-13				0.00				
2023-08-14				0.00				
2023-08-15			386.74	0.00				
2023-08-16				0.00				
2023-08-17				0.00				
2023-08-18				0.00				
2023-08-19				0.00				
2023-08-20				0.00				
2023-08-21				0.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-08-22			386.74	0.00				
2023-08-23				0.00				
2023-08-24				0.00				
2023-08-25				0.00				
2023-08-26				0.00				
2023-08-27				0.00				
2023-08-28		0.00				0.00	0	
2023-08-28			386.73	0.00				
2023-08-29				0.00				
2023-08-30				0.00				
2023-08-31				0.00				
2023-09-01				0.00				
2023-09-02				0.00				
2023-09-03				0.00				
2023-09-04				0.00				
2023-09-05			386.72	0.00				
2023-09-06				0.00				
2023-09-07				0.00				
2023-09-08				0.00				
2023-09-09				0.00				
2023-09-10				0.00				
2023-09-11				0.00				
2023-09-12			386.73	0.00				
2023-09-13				0.00				
2023-09-14				0.00				
2023-09-15				0.00				
2023-09-16				0.00				
2023-09-17				0.00				
2023-09-18				0.00				
2023-09-19			386.71	0.00				
2023-09-20				0.00				
2023-09-21				0.00				
2023-09-22				0.00				
2023-09-23				0.00				
2023-09-24				0.00				
2023-09-25				0.00				
2023-09-26			386.69	0.00				
2023-09-27				0.00				
2023-09-28				0.00				
2023-09-28		0.00				0.00	0	
2023-09-29				0.00				
2023-09-30				0.00				
2023-10-01				0.00				
2023-10-02				0.00				
2023-10-03			0.50	0.00				
2023-10-04				0.00				
2023-10-05				0.00				
2023-10-06				0.00				
2023-10-07				0.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-10-08				0.00				
2023-10-09				0.00				
2023-10-10			386.68	0.00				
2023-10-11				0.00				
2023-10-12				0.00				
2023-10-13				0.00				
2023-10-14				0.00				
2023-10-15				0.00				
2023-10-16				0.00				
2023-10-17			386.67	0.00				
2023-10-18				0.00				
2023-10-19				0.00				
2023-10-20				0.00				
2023-10-21				0.00				
2023-10-22				0.00				
2023-10-23				0.00				
2023-10-24			386.68	0.00				
2023-10-25				0.00				
2023-10-26				0.00				
2023-10-27				0.00				
2023-10-28				0.00				
2023-10-29				0.00				
2023-10-30				0.00				
2023-10-31			386.73	0.00				
2023-11-01				0.00				
2023-11-01		0.00				0.00	0	
2023-11-02				0.00				
2023-11-03				0.00				
2023-11-04				0.00				
2023-11-05				0.00				
2023-11-06				0.00				
2023-11-07			386.78	0.00				
2023-11-08				0.00				
2023-11-09				0.00				
2023-11-10				0.00				
2023-11-11				0.00				
2023-11-12				0.00				
2023-11-13				0.00				
2023-11-14			386.80	0.00				
2023-11-15				0.00				
2023-11-16				0.00				
2023-11-17				0.00				
2023-11-18				0.00				
2023-11-19				0.00				
2023-11-20				0.00				
2023-11-21			386.81	0.00				
2023-11-22				0.00				
2023-11-23				0.00				
2023-11-24				0.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl2T kg/month	ELEV m	FLOW L/s	hard mg/L	NaOHT kg/month	ODays day	pH
2023-11-25				0.00				
2023-11-26				0.00				
2023-11-27				0.00				
2023-11-28		0.00				0.00	0	
2023-11-28			386.82	0.00				
2023-11-29				0.00				
2023-11-30				0.00				
2023-12-01				0.00				
2023-12-02				0.00				
2023-12-03				0.00				
2023-12-04				0.00				
2023-12-05			386.82	0.00				7.8
2023-12-06				0.00				
2023-12-07				0.00				
2023-12-08				0.00				
2023-12-09				0.00				
2023-12-10				0.00				
2023-12-11				0.00				
2023-12-12			386.84	0.00				
2023-12-13				0.00				
2023-12-14				0.00				
2023-12-15				0.00				
2023-12-16				0.00				
2023-12-17				0.00				
2023-12-18				0.00				
2023-12-19	<1		386.85	0.00	94.5			7.5
2023-12-20				0.00				
2023-12-21				0.00				
2023-12-22				0.00				
2023-12-23				0.00				
2023-12-24				0.00				
2023-12-25				0.00				
2023-12-26				0.00				
2023-12-27			386.85	0.00				
2023-12-28				0.00				
2023-12-28		0.00				0.00	0	
2023-12-29				0.00				
2023-12-30				0.00				
2023-12-31				0.00				
Count	4	12	52	365	8	12	12	16
High	<1	2664.00	387.09	83.00	129.0	0.00	31	8.3
Low	<1	0.00	0.50	0.00	94.2	0.00	0	7.0
Mean	<1	721.58	379.43	23.86	116.1	0.00	11	7.4
High Limit								8.5
Low Limit								6.5
Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Lim Ex	0	0	0	0	0	0	0	0

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2023-01-10	59.0		1.590					
2023-01-23	58.0	1	2.080	0.089	<0.0005	0.03	0.005	0.0121
2023-01-31	59.0	<1	2.080	0.085	<0.0005	0.02	0.004	0.0117
2023-02-07	62.0	<1	2.030	0.080	<0.0005	0.02	0.003	0.0107
2023-02-14	56.0		2.180	0.075	<0.0005	0.09	0.009	0.0114
2023-02-14		1						
2023-02-21	61.0	1	1.560	0.092	<0.0005	0.05	0.009	0.0135
2023-03-21	78.0		2.300					
2023-04-11	60.0		1.620	0.074	<0.0005	0.11	0.023	0.0139
2023-05-09	51.0		1.480					
2023-06-13	65.0		1.430					
2023-07-11	53.0		1.580	0.082	<0.0005	0.12	0.037	0.0101
2023-08-08	54.0		1.580					
2023-10-24	58.0		1.100					
2023-12-05	67.0		1.620					
2023-12-19	28.0		1.940	0.079	0.0001	0.04	0.008	0.0096
Count	15	5	15	8	8	8	8	8
High	78.0	1	2.300	0.092	<0.0005	0.12	0.037	0.0139
Low	28.0	<1	1.100	0.074	0.0001	0.02	0.003	0.0096
Mean	57.9	1	1.745	0.082	0.0005	0.06	0.012	0.0116
High Limit	128-429	10	0.469	1.000	0.0025	0.76	0.841	0.0150
Low Limit								
Lim Ex	0	0	15	0	0	0	0	0
Frequency	0%	0%	100%	0%	0%	0%	0%	0%
10x Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

D-16: Denison TMA-1 Dam 9 Seepage

Date	FLOW L/s	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L
2023-01-10	0.67	227.0	6.2	210.0	0.013	0.024	0.0010	0.71
2023-05-09	3.00	150.0	6.1	130.0	0.008	0.021	<0.0005	0.12
2023-07-11	0.25	297.0	6.4	230.0	0.024	0.031	0.0034	5.31
2023-10-10	3.10	328.0	6.6	280.0	0.033	0.038	0.0012	7.12
Count	4	4	4	4	4	4	4	4
High	3.10	328.0	6.6	280.0	0.033	0.038	0.0034	7.12
Low	0.25	150.0	6.1	130.0	0.008	0.021	<0.0005	0.12
Mean	1.75	250.5	6.3	212.5	0.020	0.028	0.0015	3.32
High Limit			8.5	128-429	0.469	1.000	0.0025	0.76
Low Limit			6.5					
Lim Ex	0	0	3	0	0	0	1	2
Frequency	0%	0%	75%	0%	0%	0%	25%	50%
10x Lim 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						
2023-01-10	0.566	<0.0005						
2023-05-09	0.229	<0.0005						
2023-07-11	4.810	<0.0005						
2023-10-10	2.580	0.0002						
Count	4	4						
High	4.810	<0.0005						
Low	0.229	0.0002						
Mean	2.046	0.0004						
High Limit	0.841	0.0150						
Lim Ex	2	0						
Frequency	50%	0%						
10x Lim Ex	0	0						
Frequency	0%	0%						

2023 Performance Monitoring Results

Detailed Results for 2023

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 %
2023-01-03		21.00		7.2		<1		
2023-01-10		25.00	316.0	7.2	260.0	1		
2023-01-17		27.00		7.3		1		
2023-01-23		57.00		7.1		1		
2023-01-28	31							
2023-01-31		49.00	255.0	7.1	210.0	2		
2023-02-07		81.00	242.0	7.0	200.0	1		
2023-02-14		63.00	219.0	7.1	150.0	2		
2023-02-21		84.00	199.0	7.2	150.0	2		
2023-02-28		97.00		7.2		2		
2023-02-28	28							
2023-03-07		81.00		7.2		2		
2023-03-14		72.00		7.6	120.0	3		
2023-03-16		84.00		7.7	110.0	1		
2023-03-21		87.00	184.0	7.2	120.0	1		
2023-03-23		91.00		7.2	120.0	2		
2023-03-28	31	87.00		7.3		2		
2023-03-30		75.00	178.0	7.2	100.0	1		
2023-04-04		94.00		7.3	99.0	2		
2023-04-06		115.00		6.6	120.0	3		
2023-04-11		122.00	183.0	7.1	97.0	2		
2023-04-13		153.00		7.2	96.0	1		
2023-04-18		321.00		7.1	74.0	1		
2023-04-20		250.00		7.1	54.0	2		
2023-04-25		175.00		7.0	64.0	1		
2023-04-28	30							
2023-05-02		153.00		7.1	120.0	2		
2023-05-09		64.00	205.0	7.3	150.0	1		
2023-05-16		101.00		7.6	130.0	2		
2023-05-23		94.00		7.5	140.0	2		
2023-05-30		27.00		7.2		1		
2023-06-06		17.00		7.0		2		
2023-06-13		17.00		7.3	160.0	2		
2023-06-20		13.00		7.2	160.0	2		
2023-06-27							100	0
2023-06-27		13.00	243.0	7.1	180.0	<1		
2023-06-28	30							
2023-07-04		17.00		7.1	200.0	2		
2023-07-11		4.00		7.2	200.0	1		
2023-07-18		12.00	276.0	7.2	200.0	1		
2023-07-24		13.00		7.1	220.0	<1		
2023-07-28	31							
2023-08-01		13.00		7.2	220.0	2		
2023-08-08		13.00	293.0	7.0	220.0	1		
2023-08-15		11.00		7.1	230.0	1		
2023-08-22		9.00		7.1	240.0	<1		
2023-08-28		12.00		7.3	240.0	1		
2023-08-28	31	12.00						

2023 Performance Monitoring Results

Detailed Results for 2023

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

	DDays day	FLOW L/s	hard mg/L	pH	SO4 mg/L	TSS mg/L	TOXCD IC25	TOXDM %
2023-09-05		12.00		7.3	240.0	1		
2023-09-12		7.00	326.0	7.2	250.0	2		
2023-09-12								100 0
2023-09-19		13.00		7.4		1		
2023-09-26		9.00		7.2		1		
2023-09-28	30	13.00		7.4				
2023-10-05		13.00		7.2		1		
2023-10-10		0.00	332.0		270.0	1		
2023-10-17		13.00		7.3		2		
2023-10-24		10.00		7.5		1		
2023-10-28	31							
2023-10-31		17.00		7.3		3		
2023-11-08		21.00	350.0	7.1	300.0	1		
2023-11-14		29.00		7.6		<1		
2023-11-21		17.00		7.6		<1		
2023-11-29		21.00		7.7		1		
2023-11-29	30							
2023-12-05		21.00	371.0	7.6	300.0	2		
2023-12-12		21.00		7.5		<1		
2023-12-19		21.00		7.3		1		
2023-12-27		21.00		7.4		1		
2023-12-28	31							
Count	11	60	16	59	38	58	2	2
High	31	321.00	371.0	7.7	300.0	3	100	0
Low	28	0.00	178.0	6.6	54.0	<1	100	0
Mean	30	53.42	260.8	7.2	171.4	1	100	0
High Limit				8.5	128-429	10		
Low Limit				6.5				
Lim Ex	0	0	0	0	5	0	0	0
Frequency	0%	0%	0%	0%	13%	0%	0%	0%
10x Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	TOXRT %	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2023-01-03		0.042	0.059				
2023-01-10		0.022	0.063	<0.0005	0.39	0.166	0.0460
2023-01-17		0.037	0.056				
2023-01-23		0.057	0.120				
2023-01-31		0.126	0.292	<0.0005	0.53	0.155	0.0331
2023-02-07		0.208	0.373	0.0006	0.70	0.174	0.0319
2023-02-14		0.288	0.489	0.0005	0.67	0.144	0.0257
2023-02-21		0.256	0.663	0.0005	0.63	0.149	0.0242
2023-02-28		0.373	0.716				
2023-03-07		0.337	0.806				
2023-03-14		0.265	0.881				
2023-03-16		0.230	0.745				
2023-03-21		0.307	0.781	<0.0005	0.59	0.120	0.0190
2023-03-23		0.241	0.814				
2023-03-28		0.179	0.838				
2023-03-30		0.215	0.802				
2023-04-04		0.187	0.744				
2023-04-06		0.201	0.782				
2023-04-11		0.288	0.850	<0.0005	0.53	0.103	0.0149
2023-04-13		0.191	0.821				
2023-04-18		0.172	0.815				
2023-04-20		0.316					
2023-04-20			1.410				
2023-04-25		0.282	2.120				
2023-05-02		0.125	1.030				
2023-05-09		0.113	0.882	<0.0005	0.47	0.124	0.0204
2023-05-16		0.116	0.654				
2023-05-23		0.105	0.607				
2023-05-30		0.075	0.398				
2023-06-06		0.047	0.405				
2023-06-13		0.053	0.396				
2023-06-20		0.037	0.271				
2023-06-27	0						
2023-06-27		0.041	0.215	<0.0005	0.03	0.029	0.0258
2023-07-04		0.035	0.271				
2023-07-11		0.029	0.213				
2023-07-18		0.036	0.227	<0.0003	0.17	0.115	0.0300
2023-07-24		0.033	0.203				
2023-08-01		0.030	0.183				
2023-08-08		0.015	0.215	<0.0004	0.23	0.176	0.0346
2023-08-15		0.026	0.143				
2023-08-22		0.024	0.152				
2023-08-28		0.018	0.133				
2023-09-05		0.015	0.168				
2023-09-12		0.020	0.119	0.0002	0.38	0.121	0.0389
2023-09-12	0						
2023-09-19		0.021	0.102				
2023-09-26		0.026	0.107				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	TOXRT %	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2023-10-05		0.023	0.093				
2023-10-10		0.031	0.111	0.0003	0.28	0.163	0.0434
2023-10-17		0.027	0.083				
2023-10-24		0.019	0.086				
2023-10-31			0.085				
2023-11-08		0.058	0.083	0.0004	0.35	0.200	0.0438
2023-11-14		0.046	0.090				
2023-11-21		0.038	0.074				
2023-11-29		0.033	0.069				
2023-12-05		0.026	0.067	0.0004	0.42	0.196	0.0497
2023-12-12		0.027	0.060				
2023-12-19		0.020	0.059				
2023-12-27		0.035	0.057				
Count	2	58	58	15	15	15	15
High	0	0.373	2.120	0.0006	0.70	0.200	0.0497
Low	0	0.015	0.056	0.0002	0.03	0.029	0.0149
Mean	0	0.109	0.416	0.0004	0.42	0.142	0.0321
High Limit		0.469	1.000	0.0025	0.76	0.841	0.0150
Lim Ex		0	2	0	0	0	14
Frequency	0%	0%	3%	0%	0%	0%	93%
10x Lim Ex	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	ACID mg/L	BaCl2T kg/month	hard mg/L	ODays day	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-01-03					6.6			
2023-01-10	<1		83.0		6.3	61.0	0.034	0.025
2023-01-17					6.8			
2023-01-23					6.5			
2023-01-28		206.00		31				
2023-01-31					6.7			
2023-02-07					6.7			
2023-02-14					6.5		0.105	
2023-02-21					6.8			
2023-02-28		186.00		28				
2023-02-28					6.6			
2023-03-07					6.6			
2023-03-14					7.2			
2023-03-21					6.7		0.079	
2023-03-28		206.00		31				
2023-03-28					6.5			
2023-04-04					6.6			
2023-04-11	<1		38.1		6.9	19.0	0.015	0.013
2023-04-18					6.9			
2023-04-25					6.9			
2023-04-28		200.00		30				
2023-05-02					6.8			
2023-05-09					6.7		0.052	
2023-05-16					6.7			
2023-05-23					6.8			
2023-05-28		206.00		31				
2023-05-30					6.5			
2023-06-06					6.5			
2023-06-13					6.9		0.197	
2023-06-20					6.7			
2023-06-27					6.7			
2023-06-28		200.00		30				
2023-07-04					6.6			
2023-07-11	<1		265.0		6.5	110.0	1.090	0.066
2023-07-18								
2023-07-25					7.0			
2023-07-28		113.00		17				
2023-08-01								
2023-08-08								
2023-08-15								
2023-08-22								
2023-08-28		0.00		0				
2023-08-28								
2023-09-05								
2023-09-12					6.7		0.373	
2023-09-19								
2023-09-28		143.19		22				
2023-09-28					6.7			

2023 Performance Monitoring Results

Detailed Results for 2023

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

	ACID mg/L	BaCl ₂ T kg/month	hard mg/L	ODays day	pH	SO ₄ mg/L	Ra Bq/L	Ba mg/L
2023-10-05					6.5			
2023-10-11	<1		403.0		7.0	310.0	0.734	0.078
2023-10-18					6.9			
2023-10-24					6.5			
2023-10-28		156.51		31				
2023-10-31					7.1			
2023-11-08					6.9		0.016	
2023-11-14					6.6			
2023-11-21					6.6			
2023-11-28		200.68		30				
2023-11-28					6.5			
2023-12-05					6.9		0.192	
2023-12-12					6.7			
2023-12-19					7.0			
2023-12-27					6.6			
2023-12-28		206.46		31				
Count	4	12	4	12	52	4	11	4
High	<1	206.46	403.0	31	7.2	310.0	1.090	0.078
Low	<1	0.00	38.1	0	6.3	19.0	0.015	0.013
Mean	<1	168.65	197.3	26	6.7	125.0	0.262	0.046
High Limit					8.5	128-429	0.469	1.000
Low Limit					6.5			
Lim Ex	0	0	0	0	0	2	2	0
Frequency	0%	0%	0%	0%	0%	50%	18%	0%
10x Lim 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				
2023-01-10	0.0008	0.40	0.339	<0.0005				
2023-04-11	0.0004	0.35	0.108	0.0002				
2023-07-11	0.0021	14.30	2.820	0.0053				
2023-10-11	0.0014	7.89	1.350	0.0013				
Count	4	4	4	4				
High	0.0021	14.30	2.820	0.0053				
Low	0.0004	0.35	0.108	0.0002				
Mean	0.0012	5.74	1.154	0.0018				
High Limit	0.0025	2.49	0.841	0.0150				
Lim Ex	0	2	2	0				
Frequency	0%	50%	50%	0%				
10x Lim Ex	0	0	0	0				
Frequency	0%	0%	0%	0%				

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	ACID mg/L	pH	SO4 mg/L	Ra Bq/L	Fe mg/L
2023-01-10		7.1			
2023-02-15		7.6			
2023-03-21		7.4			
2023-04-11		7.2			
2023-05-09	<1	7.5	74.0	0.650	0.47
2023-06-13		7.5			
2023-07-11		6.9			
2023-08-08		6.8			
2023-09-19		7.0			
2023-10-31	<1	7.1	110.0	0.245	0.65
2023-11-14		7.7			
2023-11-29	<2	7.9	98.0	0.224	0.12
2023-12-05		7.6			
Count	3	13	3	3	3
High	<2	7.9	110.0	0.650	0.65
Low	<1	6.8	74.0	0.224	0.12
Mean	<1	7.3	94.0	0.373	0.41
High Limit		8.5	128-429	0.469	0.76
Low Limit		6.5			
Lim Ex		0	0	1	0
Frequency	0%	0%	0%	33%	0%
10x Lim Ex	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	DDays day	FLOW L/s	hard mg/L	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L
2023-01-03		14.00		7.2		1	0.097	
2023-01-10		11.00	129.0	6.7	89.0	<1	0.046	0.244
2023-01-17		7.00		7.2		<1	0.111	
2023-01-23		6.00		6.8		1	0.120	
2023-01-28	31							
2023-01-31		6.00		6.8		<1	0.104	
2023-02-07		1.00		7.0		<1	0.111	
2023-02-14		2.00	136.0	7.0	120.0	<1	0.118	0.200
2023-02-21		2.00		7.1		2	0.106	
2023-02-28		9.00		7.2		1	0.080	
2023-02-28	28							
2023-03-07		2.00		7.0		<1	0.081	
2023-03-14		5.00	145.0	7.4	120.0	<1	0.122	0.233
2023-03-21		2.00		7.1		<1	0.122	
2023-03-27	31							
2023-03-28		11.00		7.2		<1	0.073	
2023-04-04		12.00		7.2		<1	0.051	
2023-04-11		39.00	92.6	7.1	61.0	1	0.097	0.414
2023-04-18		79.00		7.2		1	0.122	
2023-04-25		27.00		7.1		1	0.089	
2023-04-28	30							
2023-05-02				7.2		1	0.128	
2023-05-09		14.00	64.8	7.1	41.0	<1	0.136	0.595
2023-05-16		5.00		7.3		1	0.109	
2023-05-23		3.00		7.3		1	0.123	
2023-05-28	31							
2023-05-30		1.00		6.9		1	0.182	
2023-06-06		1.00		7.0		<1	0.114	
2023-06-13		1.00	70.1	7.2	30.0	1	0.104	0.213
2023-06-20		2.00		7.3		2	0.194	
2023-06-27		6.00		6.9		1	0.145	
2023-06-28	30							
2023-07-04		0.00						
2023-07-11		0.00						
2023-07-18		0.00						
2023-07-25								
2023-07-28	0							
2023-08-01		0.00						
2023-08-08		0.00						
2023-08-15		0.00						
2023-08-22		0.00						
2023-08-28		0.00						
2023-08-28	0							
2023-09-05		0.00						
2023-09-12		0.00						
2023-09-19		0.00						
2023-09-26		0.00						
2023-09-28	0							

2023 Performance Monitoring Results

Detailed Results for 2023

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

	DDays day	FLOW L/s	hard mg/L	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L
2023-10-05		0.00						
2023-10-10		0.00						
2023-10-17		0.00						
2023-10-24		1.00	121.0	7.2	58.0	<1	0.034	0.330
2023-10-28	9							
2023-10-31		5.00		7.2		1		
2023-11-08		21.00	157.0	7.0	97.0	1	0.098	0.349
2023-11-14		8.00		7.0		<1	0.034	
2023-11-21		5.00		7.3		<1	0.090	
2023-11-28		5.00		7.5		1	0.106	
2023-11-28	30							
2023-12-05		4.00	150.0	7.5	100.0	<1	0.097	0.269
2023-12-12		14.00		7.7		1	0.080	
2023-12-19		7.00		7.0		<1	0.098	
2023-12-27		7.00		7.4		1	0.078	
2023-12-28	31							
Count	12	52	9	52	9	37	37	9
High	31	79.00	157.0	7.7	120.0	2	0.194	0.595
Low	0	0.00	64.8	6.7	30.0	<1	0.034	0.200
Mean	21	6.90	118.4	7.1	79.6	1	0.103	0.316
High Limit				8.5	128-429	10	0.469	1.000
Low Limit				6.5				
Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Lim 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				
2023-01-10	<0.0005	0.07	0.004	0.0055				
2023-02-14	<0.0005	0.03	0.002	0.0060				
2023-03-14	<0.0005	0.05	0.002	0.0043				
2023-04-11	<0.0005	0.36	0.070	0.0019				
2023-05-09	<0.0005	0.13	0.010	0.0014				
2023-06-13	<0.0005	0.18	0.044	0.0021				
2023-10-24	0.0002	0.04	0.028	0.0033				
2023-11-08	0.0001	0.08	0.005	0.0164				
2023-12-05	0.0000	0.02	0.002	0.0154				
Count	9	9	9	9				
High	0.0002	0.36	0.070	0.0164				
Low	<0.00005	0.02	0.002	0.0014				
Mean	0.0004	0.11	0.019	0.0063				
High Limit	0.0025	0.76	0.841	0.0150				
Lim Ex	0	0	0	2				
Frequency	0%	0%	0%	22%				
10x Lim Ex	0	0	0	0				
Frequency	0%	0%	0%	0%				

2023 Performance Monitoring Results

Detailed Results for 2023

D-9: Denison TMA-1 Dam 9 Seepage

Date	FLOW L/s	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L
2023-01-10	2.80	643.0	6.7	550.0	<0.005	0.018	0.0023	0.84
2023-05-09	5.00	472.0	6.9	360.0	0.007	0.019	0.0010	0.31
2023-07-11	1.25	808.0	6.8	740.0	0.008	0.019	0.0023	0.52
2023-10-10	2.00	778.0	7.3	690.0	0.007	0.022	0.0022	0.56
Count	4	4	4	4	4	4	4	4
High	5.00	808.0	7.3	740.0	0.008	0.022	0.0023	0.84
Low	1.25	472.0	6.7	360.0	<0.005	0.018	0.0010	0.31
Mean	2.76	675.3	6.9	585.0	0.007	0.020	0.0019	0.56
High Limit			8.5	128-429	0.469	1.000	0.0025	0.76
Low Limit			6.5					
Lim Ex	0	0	0	3	0	0	0	1
Frequency	0%	0%	0%	75%	0%	0%	0%	25%
10x Lim 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						
2023-01-10	1.610	0.0328						
2023-05-09	0.784	0.0177						
2023-07-11	1.930	0.0391						
2023-10-10	1.800	0.0318						
Count	4	4						
High	1.930	0.0391						
Low	0.784	0.0177						
Mean	1.531	0.0304						
High Limit	0.841	0.0150						
Lim Ex	3	4						
Frequency	75%	100%						
10x Lim Ex	0	0						
Frequency	0%	0%						

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	FLOW L/s	pH	Ra Bq/L
2023-01-03	81.00	7.0	
2023-01-10	16.00	7.0	0.011
2023-01-11			
2023-01-17	16.00	7.2	
2023-01-19			
2023-01-23	21.00	7.1	
2023-01-24			
2023-01-30			
2023-01-31	11.00	6.8	
2023-02-07	16.00	7.0	
2023-02-14	11.00	7.0	
2023-02-21	90.00	7.0	
2023-02-22			
2023-02-23			
2023-02-24			
2023-02-27			
2023-02-28	81.00	7.2	
2023-03-02			
2023-03-07	66.00	6.9	
2023-03-08			
2023-03-09			
2023-03-13	7.00	7.1	
2023-03-15			
2023-03-16			
2023-03-21	44.00	7.1	
2023-03-22			
2023-03-24			
2023-03-27			
2023-03-28	26.00	7.0	
2023-03-30			
2023-04-03			
2023-04-04	51.00	7.2	
2023-04-10			
2023-04-11	169.00	7.1	0.030
2023-04-13			
2023-04-14			
2023-04-17		7.1	
2023-04-18	253.00	7.1	
2023-04-21	212.00	7.3	
2023-04-25	169.00	7.7	
2023-04-27	107.00	7.0	
2023-04-28	44.00	7.3	
2023-05-02	212.00	8.5	
2023-05-05	166.00	8.6	
2023-05-08	90.00	8.1	
2023-05-09	107.00	8.2	
2023-05-15	7.00	7.6	
2023-05-16	4.00	7.6	

2023 Performance Monitoring Results

Detailed Results for 2023

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

	FLOW L/s	pH	Ra Bq/L
2023-05-22			
2023-05-23	11.00	7.5	
2023-05-24	16.00	7.6	
2023-05-26	44.00	7.5	
2023-05-30	7.00	7.1	
2023-06-02			
2023-06-06	7.00	7.1	
2023-06-12			
2023-06-13	11.00	7.4	
2023-06-20	4.00	7.2	
2023-06-21			
2023-06-26	7.00	7.9	
2023-06-27	7.00	7.8	
2023-06-28			
2023-07-04	7.00	7.3	
2023-07-06			
2023-07-07			
2023-07-11	7.00	7.9	0.017
2023-07-12			
2023-07-18	5.00	7.8	
2023-07-24	5.00	7.3	
2023-07-31	1.00	7.4	
2023-08-01	1.00		
2023-08-02	1.00		
2023-08-07			
2023-08-08	1.00	7.4	
2023-08-10			
2023-08-14			
2023-08-15	4.00	7.2	
2023-08-17			
2023-08-18			
2023-08-21			
2023-08-22	7.00	7.4	
2023-08-23			
2023-08-24			
2023-08-25			
2023-08-28	7.00	7.3	
2023-08-29			
2023-08-31			
2023-09-01			
2023-09-04			
2023-09-05	7.00	7.7	
2023-09-06	11.00	7.4	
2023-09-07	7.00	7.7	
2023-09-08	4.00	7.5	
2023-09-11	7.00	7.3	
2023-09-12	11.00	7.3	
2023-09-13	4.00	7.7	
2023-09-14	4.00	7.4	

2023 Performance Monitoring Results

Detailed Results for 2023

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

	FLOW L/s	pH	Ra Bq/L
2023-09-15	4.00	7.6	
2023-09-18	8.00	7.5	
2023-09-19	7.00	7.8	
2023-09-20	7.00	7.9	
2023-09-21	7.00	7.7	
2023-09-22	7.00	7.7	
2023-09-25	7.00	7.5	
2023-09-26	7.00	7.7	
2023-09-27	7.00	7.5	
2023-09-28	7.00	7.6	
2023-09-29	7.00	7.4	
2023-10-02	11.00	7.5	
2023-10-03			
2023-10-04			
2023-10-05	11.00	7.3	
2023-10-06	11.00	7.3	
2023-10-10	7.00	7.5	
2023-10-11	7.00	7.5	0.013
2023-10-12	7.00	7.4	
2023-10-13	7.00	7.5	
2023-10-16	7.00	7.9	
2023-10-17	4.00	7.4	
2023-10-18	7.00	7.6	
2023-10-19	7.00	7.6	
2023-10-20	11.00	7.6	
2023-10-23	7.00	7.2	
2023-10-24	7.00	7.3	
2023-10-25	11.00	7.3	
2023-10-26	11.00	7.3	
2023-10-27	16.00	7.0	
2023-10-30	7.00	7.3	
2023-10-31	7.00	7.3	
2023-11-01	7.00	7.2	
2023-11-02	7.00	7.4	
2023-11-03	7.00	7.4	
2023-11-06	21.00	7.7	
2023-11-07	7.00	7.1	
2023-11-08	7.00	7.1	
2023-11-09	11.00	7.2	
2023-11-10	11.00	7.6	
2023-11-13	11.00	7.4	
2023-11-14	7.00	7.2	
2023-11-15	26.00	7.6	
2023-11-16	26.00	7.6	
2023-11-17	73.00	7.2	
2023-11-20	16.00	7.6	
2023-11-21	32.00	7.5	
2023-11-22	26.00	7.5	
2023-11-23	21.00	7.4	

2023 Performance Monitoring Results

Detailed Results for 2023

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

	FLOW L/s	pH	Ra Bq/L
2023-11-24	11.00	7.3	
2023-11-27	26.00	7.5	
2023-11-28	58.00	7.7	
2023-11-29	51.00	7.5	
2023-11-30	26.00	7.7	
2023-12-01	58.00	7.5	
2023-12-04	16.00	7.5	
2023-12-05	11.00	7.7	
2023-12-06	11.00	7.6	
2023-12-07	58.00	7.7	
2023-12-08	44.00	7.5	
2023-12-11	21.00	7.7	
2023-12-12	16.00	7.6	
2023-12-13	16.00	7.6	
2023-12-14	11.00	7.6	
2023-12-15	11.00	7.6	
2023-12-18	21.00	7.3	
2023-12-19	16.00	6.8	
2023-12-20	11.00	7.1	
2023-12-21	16.00	7.4	
2023-12-22	26.00	7.0	
2023-12-27	16.00	7.0	
2023-12-28	11.00	7.1	
2023-12-29	58.00	7.5	
Count	125	170	4
High	253.00	8.6	0.030
Low	1.00	6.8	0.011
Mean	27.73	7.4	0.018
High Limit		8.5	0.469
Low Limit		6.5	
Lim Ex	0	0	0
Frequency	0%	0%	0%
10x Lim Ex	0	0	0
Frequency	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

DS-11: Stanrock Seepage of Dam A

Date	CONDF µmho/cm	FLOW L/s	pH
2023-01-17	323.1	0.30	6.8
2023-05-24	524.0	0.33	5.7
2023-08-15	606.0	0.26	6.5
2023-10-11	478.0	0.69	6.4
Count	4	4	4
High	606.0	0.69	6.8
Low	323.1	0.26	5.7
Mean	482.8	0.39	6.3
High Limit	69.5		8.5
Low Limit			6.5
Lim Ex	4	0	2
Frequency	100%	0%	50%
10x Lim Ex	0	0	0
Frequency	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

DS-12: Stanrock Seepage from Dam B

Date	CONDF µmho/cm	FLOW L/s	pH
2023-01-17	357.2	0.67	3.9
2023-05-24	732.0	0.28	3.3
2023-08-15	788.0	0.03	5.8
2023-10-11	478.0	0.11	6.0
Count	4	4	4
High	788.0	0.67	6.0
Low	357.2	0.03	3.3
Mean	588.8	0.27	4.7
High Limit	69.5		8.5
Low Limit			6.5
Lim Ex	4	0	4
Frequency	100%	0%	100%
10x Lim Ex	2	0	0
Frequency	50%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

DS-13: Stanrock Seepage from Dam C

Date	CONDF µmho/cm	FLOW L/s	pH
2023-01-17	426.2	0.04	6.9
2023-05-24	742.0	0.04	6.3
2023-08-15	1108.0	0.02	6.5
2023-10-11	604.0	0.04	6.5
Count	4	4	4
High	1108.0	0.04	6.9
Low	426.2	0.02	6.3
Mean	720.0	0.04	6.6
High Limit	69.5		8.5
Low Limit			6.5
Lim Ex	4	0	1
Frequency	100%	0%	25%
10x Lim Ex	2	0	0
Frequency	50%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	COND µmho/cm	DOC mg/L	FLOW L/s	hard mg/L	pH	SO4 mg/L	Ra Bq/L
2023-01-03			0.00				
2023-01-10			0.00				
2023-01-17			0.00				
2023-01-23			0.00				
2023-01-31			0.00				
2023-02-07			0.00				
2023-02-14			0.00				
2023-02-21			0.00				
2023-02-28			0.00				
2023-03-07			0.00				
2023-03-14			0.00				
2023-03-21			0.00				
2023-03-28			0.00				
2023-04-04			0.00				
2023-04-11	36.5	3.0	5.80	16.8	6.7	9.1	0.007
2023-04-18	30.2		5.00		6.9		
2023-04-25	44.0		1.30		7.0		
2023-05-02	35.6		3.00		7.0		
2023-05-09	48.9		0.70		7.0		
2023-05-16			0.00				
2023-05-23			0.00				
2023-05-30			0.00				
2023-06-06			0.00				
2023-06-13			0.00				
2023-06-20			0.00				
2023-06-27			0.00				
2023-07-04			0.00				
2023-07-11			0.00				
2023-07-18			0.00				
2023-07-24			0.00				
2023-08-01							
2023-08-08			0.00				
2023-08-15			0.00				
2023-08-22			0.00				
2023-08-28			0.00				
2023-09-05			0.00				
2023-09-12			0.00				
2023-09-19			0.00				
2023-09-26			0.00				
2023-10-05			0.00				
2023-10-10			0.00				
2023-10-17			0.00				
2023-10-24			0.00				
2023-10-31			0.00				
2023-11-07			0.00				
2023-11-14			0.00				
2023-11-21			0.00				
2023-11-28			0.00				

2023 Performance Monitoring Results

Detailed Results for 2023

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

	COND μmho/cm	DOC mg/L	FLOW L/s	hard mg/L	pH	SO4 mg/L	Ra Bq/L
2023-12-05			0.00				
2023-12-12			0.00				
2023-12-19			0.00				
2023-12-27			0.00				
Count	5	1	52	1	5	1	1
High	48.9	3.0	5.80	16.8	7.0	9.1	0.007
Low	30.2	3.0	0.00	16.8	6.7	9.1	0.007
Mean	39.04	3.0	0.31	16.8	6.9	9.1	0.007
High Limit	69.5				8.5	128-429	0.469
Lim Ex	1	0	0	0	0	0	0
Frequency	20%	0%	0%	0%	0%	0%	0%
10x Lim Ex	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%
Date	Ba	Co	Fe	Mn	U		
	mg/L	mg/L	mg/L	mg/L	mg/L		
2023-04-11	0.006	<0.0005	0.04	0.006	<0.0005		
Count	1	1	1	1	1		
High	0.006	<0.0005	0.04	0.006	<0.0005		
Low	0.006	<0.0005	0.04	0.006	<0.0005		
Mean	0.006	<0.0005	0.04	0.006	<0.0005		
High Limit	1.000	0.00025	0.76	0.841	0.0150		
Lim Ex	0	0	0	0	0		
Frequency	0%	0%	0%	0%	0%		
10x Lim Ex	0	0	0	0	0		
Frequency	0%	0%	0%	0%	0%		

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

Date	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-01-01		96.00						
2023-01-02		105.00						
2023-01-03		89.00	1.4100					
2023-01-04		0.00	0.9800					
2023-01-05		119.00	0.7200					
2023-01-06		95.00	1.2400					
2023-01-07		0.00						
2023-01-08		0.00						
2023-01-09		0.00	0.9200					
2023-01-10	178	118.00	0.7400	328.0	2.6	530.0	0.160	0.033
2023-01-11		94.00	1.2600					
2023-01-12		0.00	1.1200					
2023-01-13		106.00	1.1100					
2023-01-14		0.00						
2023-01-15		0.00						
2023-01-16		0.00	0.8800					
2023-01-17		117.00	0.7600					
2023-01-18		100.00	1.1900					
2023-01-19		0.00	1.0000					
2023-01-20		113.00	1.0000					
2023-01-21		0.00						
2023-01-22		0.00	1.0000					
2023-01-23		118.00	0.7100					
2023-01-24		93.00	1.3100					
2023-01-25		0.00	1.1000					
2023-01-26		0.00	0.9600					
2023-01-27		105.00	0.8800					
2023-01-28		0.00	1.0000					
2023-01-29		0.00	0.9000					
2023-01-30		0.00	0.8800					
2023-01-31		0.00	0.8200					
2023-02-01		120.00	0.6700					
2023-02-02		94.00	1.3200					
2023-02-03		0.00	1.1000					
2023-02-04		0.00						
2023-02-05		0.00						
2023-02-06		0.00	0.8300					
2023-02-07		116.00	0.7400					
2023-02-08		90.00	1.3500					
2023-02-09		0.00	1.1600					
2023-02-10		0.00	1.0700					
2023-02-11		0.00						
2023-02-12		0.00						
2023-02-13		0.00	0.9700					
2023-02-14		112.00	0.8600		2.9		0.196	
2023-02-15		91.00	1.3800					
2023-02-16		0.00	0.8700					
2023-02-17		126.00	0.5700					

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-02-18		106.00	1.0000					
2023-02-19		0.00	0.7500					
2023-02-20		130.00	0.4700					
2023-02-21		105.00	1.0600					
2023-02-22		93.00	0.8300					
2023-02-23		89.00	1.3900					
2023-02-24		0.00	1.1400					
2023-02-25		0.00						
2023-02-26		0.00						
2023-02-27		114.00	0.8200					
2023-02-28		93.00	1.3600					
2023-03-01		0.00	1.0900					
2023-03-02		0.00	0.9100					
2023-03-03		116.00	1.0000					
2023-03-04		0.00						
2023-03-05		0.00						
2023-03-06		119.00	0.7400					
2023-03-07		93.00	1.3200					
2023-03-08		0.00	1.1000					
2023-03-09		0.00	0.9500					
2023-03-10		0.00	0.8600					
2023-03-11		0.00						
2023-03-12		0.00						
2023-03-13		120.00	0.7100					
2023-03-14		89.00	1.3800					
2023-03-15		0.00	1.1700					
2023-03-16		0.00	1.0200					
2023-03-17		0.00	0.8900					
2023-03-18		0.00	0.7400					
2023-03-19		120.00	0.6800					
2023-03-20		100.00	1.2400					
2023-03-21		0.00	0.9900					
2023-03-22		0.00	0.8900					
2023-03-23		0.00	0.7900		2.8		0.155	
2023-03-24		88.00	1.4100					
2023-03-25		0.00	1.2500					
2023-03-26		0.00	1.0600					
2023-03-27		0.00	0.8700					
2023-03-28		120.00	0.7200					
2023-03-29		93.00	1.3800					
2023-03-30		0.00	1.1000					
2023-03-31		113.00	1.0500					
2023-04-01		0.00	0.8500					
2023-04-02		120.00	0.6600					
2023-04-03		96.00	1.2700					
2023-04-04		0.00	1.0000					
2023-04-05		120.00	0.7100					
2023-04-06		106.00						
2023-04-07		91.00	1.3700					

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

Date	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-04-08		0.00						
2023-04-09		121.00	0.7400					
2023-04-10		105.00						
2023-04-11	188	110.00		243.0	3.0	430.0	0.160	0.028
2023-04-12		129.00						
2023-04-13		154.00	0.0000					
2023-04-14		157.00	0.0000					
2023-04-15		156.00						
2023-04-16		156.00						
2023-04-17		156.00						
2023-04-18		154.00						
2023-04-19		145.00						
2023-04-20		138.00						
2023-04-21		135.00						
2023-04-22		127.00						
2023-04-23		119.00						
2023-04-24		108.00						
2023-04-25		100.00	1.3200					
2023-04-26		116.00	0.9800					
2023-04-27		97.00	1.3700					
2023-04-28		0.00	1.0100					
2023-04-29			135.0000					
2023-04-30			107.0000					
2023-05-01		113.00						
2023-05-02		127.00						
2023-05-03		135.00						
2023-05-04		123.00						
2023-05-05		111.00						
2023-05-06								
2023-05-07								
2023-05-08		78.00						
2023-05-09		70.00	1.9300		2.9		0.195	
2023-05-10		0.00	1.6800					
2023-05-11		0.00	1.4500					
2023-05-12		0.00	1.2500					
2023-05-13		0.00	1.1000					
2023-05-14		0.00	0.9700					
2023-05-15		0.00	0.8700					
2023-05-16		0.00	0.7200					
2023-05-17		135.00						
2023-05-18		112.00						
2023-05-19		90.00	1.6100					
2023-05-20		0.00						
2023-05-21		0.00						
2023-05-22		0.00						
2023-05-23		0.00	1.0800					
2023-05-24		116.00	0.9700					
2023-05-25		98.00						
2023-05-26		75.00	1.8200					

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

Date	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-05-27		0.00						
2023-05-28		0.00						
2023-05-29		0.00	1.5600					
2023-05-30		0.00	1.5400					
2023-05-31		0.00						
2023-06-01		0.00	1.5200					
2023-06-02		0.00	1.5300					
2023-06-03		0.00						
2023-06-04		0.00						
2023-06-05		0.00	1.5300					
2023-06-06		0.00	1.5400					
2023-06-07		0.00	1.5400					
2023-06-08		0.00	1.5500					
2023-06-09		0.00	1.5500					
2023-06-10		0.00	1.5500					
2023-06-11		0.00	1.5500					
2023-06-12		0.00	1.5500					
2023-06-13		0.00	1.5200					
2023-06-14		0.00	1.5200					
2023-06-15		0.00						
2023-06-16		0.00	1.4800					
2023-06-17		0.00	1.4800					
2023-06-18		0.00	1.4800					
2023-06-19		0.00	1.4800					
2023-06-20		0.00	1.4800					
2023-06-21		0.00	1.0000					
2023-06-22		0.00	0.0000					
2023-06-23		0.00	1.4800					
2023-06-24		0.00	1.4800					
2023-06-25		0.00	1.4800					
2023-06-26		0.00	1.4800					
2023-06-27		0.00	1.4700					
2023-06-28		0.00	1.4800					
2023-06-29		0.00	1.4800					
2023-06-30		0.00	1.4800					
2023-07-01		0.00						
2023-07-02		0.00						
2023-07-03		0.00						
2023-07-04		0.00	1.4800					
2023-07-05		0.00	1.4800					
2023-07-06		0.00	1.4500					
2023-07-07		0.00	1.4500					
2023-07-08		0.00	1.4500					
2023-07-09		0.00	1.4500					
2023-07-10		0.00	1.4500					
2023-07-11		0.00	1.4500					
2023-07-12		0.00						
2023-07-13		0.00	1.4800					
2023-07-14		0.00						

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-07-15		0.00	1.4400					
2023-07-16		0.00	1.4400					
2023-07-17		0.00	1.4400					
2023-07-18		0.00	1.4400					
2023-07-19		0.00	1.4400					
2023-07-20		0.00	1.4400					
2023-07-21		0.00						
2023-07-22		0.00						
2023-07-23		0.00						
2023-07-24		0.00	1.4400					
2023-07-25		0.00	1.4400					
2023-07-26		0.00	1.4400					
2023-07-27		0.00	1.4400					
2023-07-28		0.00	1.4300					
2023-07-29		0.00						
2023-07-30		0.00						
2023-07-31		0.00	1.4500					
2023-08-01		0.00	1.4500					
2023-08-02		0.00	1.4500					
2023-08-03		0.00	1.4500					
2023-08-04		0.00	1.4500					
2023-08-05		0.00						
2023-08-06		0.00						
2023-08-07		0.00						
2023-08-08		0.00	1.4400					
2023-08-09		0.00	1.4400					
2023-08-10		0.00						
2023-08-11		0.00	1.4300					
2023-08-12		0.00						
2023-08-13		0.00						
2023-08-14		0.00						
2023-08-15		0.00	1.4100					
2023-08-16		0.00	1.4100					
2023-08-17		0.00						
2023-08-18		0.00	1.4100					
2023-08-19		0.00	1.4100					
2023-08-20		0.00	1.4100					
2023-08-21		0.00	1.4000					
2023-08-22		0.00	1.4200					
2023-08-23		0.00	1.3700					
2023-08-24		0.00	1.3700					
2023-08-25		0.00	1.4100					
2023-08-26		0.00						
2023-08-27		0.00						
2023-08-28		0.00	1.4100					
2023-08-29		0.00						
2023-08-30		0.00	1.4300					
2023-08-31		0.00						
2023-09-01		0.00						

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2:Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-09-02		0.00						
2023-09-03		0.00						
2023-09-04		0.00	1.3500					
2023-09-05		0.00	1.3800					
2023-09-06		0.00	1.3700					
2023-09-07		0.00	1.3600					
2023-09-08		0.00	1.3600					
2023-09-09		0.00	1.3500					
2023-09-10		0.00	1.3500					
2023-09-11		0.00	1.3500					
2023-09-12		0.00	1.3500					
2023-09-12		0.00	1.3500					
2023-09-13		0.00	1.3500					
2023-09-14		0.00	1.3400					
2023-09-15		0.00	1.3500					
2023-09-16		0.00	1.3400					
2023-09-17		0.00	1.3400					
2023-09-18		0.00	1.3300					
2023-09-20		0.00	1.3400					
2023-09-21		0.00	1.3500					
2023-09-22		0.00	1.3400					
2023-09-23		0.00	1.3500					
2023-09-24		0.00	1.3400					
2023-09-25		0.00	1.3500					
2023-09-26		0.00	1.3500					
2023-09-27		0.00	1.3500					
2023-09-28		0.00	1.3600					
2023-09-29		0.00	1.3500					
2023-09-30		0.00	1.3600					
2023-10-01		0.00	1.3500					
2023-10-02		0.00	1.3400					
2023-10-03		0.00	1.3500					
2023-10-04		0.00	1.3400					
2023-10-05		0.00	1.3200					
2023-10-06		0.00	1.3100					
2023-10-07		0.00	1.2900					
2023-10-08		0.00	1.2900					
2023-10-09		0.00	1.2700					
2023-10-11		0.00	1.2600					
2023-10-12		0.00	1.2600					
2023-10-13		0.00	1.2500					
2023-10-14		0.00	1.2500					
2023-10-15		0.00	1.2500					
2023-10-16		0.00	1.2500					
2023-10-17		0.00	1.2500					
2023-10-18		0.00	1.2400					
2023-10-19		0.00	1.2400					
2023-10-20		0.00	1.2000					
2023-10-21		0.00	1.1700					

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-10-22		0.00	1.1600					
2023-10-23		0.00	1.1600					
2023-10-24		0.00	1.1700					
2023-10-25		0.00	1.1200					
2023-10-26		0.00	1.0900					
2023-10-27		120.00						
2023-10-28		115.00						
2023-10-29		0.00	1.0200					
2023-10-30		112.00						
2023-10-31					2.8		0.389	
2023-11-01		66.00	1.8300					
2023-11-02		0.00	1.6300					
2023-11-03		0.00	1.3900					
2023-11-04		0.00	1.1800					
2023-11-05		0.00	1.0600					
2023-11-06		0.00	0.9400					
2023-11-07		115.00	0.8800					
2023-11-08	165	122.00	0.6000	294.0	2.8	490.0	0.062	0.019
2023-11-09		99.30						
2023-11-10		83.00	1.5400					
2023-11-11		0.00	1.1100					
2023-11-12		0.00	1.1100					
2023-11-13		127.00	0.5700					
2023-11-14		112.00	1.9200					
2023-11-15		97.00	1.9700					
2023-11-16		105.90	1.1100					
2023-11-17		88.00	1.5200					
2023-11-18		0.00	1.2900					
2023-11-19		0.00	1.0400					
2023-11-20		117.00	0.8400					
2023-11-21		93.00	1.4200					
2023-11-22		0.00	1.2200					
2023-11-23		0.00	1.0100					
2023-11-24		117.00	0.8300					
2023-11-25		0.00	0.8000					
2023-11-26		0.00	0.6200					
2023-11-27		132.00	0.4700					
2023-11-28		105.00	1.1600					
2023-11-29		0.00	0.9800					
2023-11-30		118.00	0.8100					
2023-12-01		98.00	1.3800					
2023-12-02		0.00	1.2000					
2023-12-03		0.00	1.0400					
2023-12-04		0.00	0.9000					
2023-12-05		0.00	0.7800					
2023-12-06		122.00	0.7000		2.5		0.233	
2023-12-07		92.00	2.0000					
2023-12-08		0.00	1.4700					
2023-12-09		0.00	1.4200					

2023 Performance Monitoring Results

Detailed Results for 2023

DS-2: Stanrock ETP Influent

	ACID mg/L	FLOW L/s	Freeboard(m) m	hard mg/L	pH	SO4 mg/L	Ra Bq/L	Ba mg/L
2023-12-10		0.00	1.3500					
2023-12-11		0.00	1.2900					
2023-12-12		0.00	1.2300					
2023-12-13		0.00	1.1900					
2023-12-14		0.00	1.1700					
2023-12-15		0.00	1.1500					
2023-12-16		0.00	1.1300					
2023-12-17		0.00	1.1100					
2023-12-18		0.00	1.0600					
2023-12-19		0.00	0.9700					
2023-12-20		118.00	0.7700					
2023-12-21		93.60	1.4000					
2023-12-22		99.00	1.3000					
2023-12-23		0.00	1.2500					
2023-12-24		0.00	1.1900					
2023-12-25		0.00	1.1400					
2023-12-26		0.00	1.0900					
2023-12-27		0.00	0.9700					
2023-12-28		118.00	0.7800					
2023-12-29		96.00	1.3400					
2023-12-30		0.00	1.2000					
2023-12-31		0.00	1.1000					

Count	3	364	357	3	11	3	9	3
High	188	157.00	135.0000	328.0	3.0	530.0	0.389	0.033
Low	165	0.00	0.0000	243.0	2.5	430.0	0.062	0.019
Mean	177	31.75	2.0510	288.3	2.8	483.3	0.194	0.027

High Limit					8.5	128-429	0.469	1.000
Lim Ex		0	0	0	11	3	0	0
Frequency	0%	0%	0%	0%	100%	100%	0%	0%
10x Lim 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
2023-01-10	0.0648	25.50	1.760	0.0322
2023-04-11	0.0748	39.00	0.944	0.0405
2023-11-08	0.0538	21.50	1.610	0.0149

Count	3	3	3	3
High	0.0748	39.00	1.760	0.0405
Low	0.0538	21.50	0.944	0.0149
Mean	0.0645	28.67	1.438	0.0292

High Limit	0.0025	0.76	0.841	0.0150
Lim Ex	3	3	3	2
Frequency	100%	100%	100%	67%
10x Lim Ex	3	3	0	0
Frequency	100%	100%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-01-01	8.42					10.8
2023-01-02	5.04					10.8
2023-01-03	5.00					10.8
2023-01-04	0.00					
2023-01-05	8.42					10.7
2023-01-06	2.98					10.8
2023-01-07	0.00					
2023-01-08	0.00					
2023-01-09	0.00					
2023-01-10	8.33					10.8
2023-01-11	6.43					10.8
2023-01-12	0.00					
2023-01-13	3.10					10.8
2023-01-14	0.00					
2023-01-15	0.00					
2023-01-16	0.00					
2023-01-17	7.22					10.8
2023-01-18	4.90					10.8
2023-01-19	0.00					
2023-01-20	3.56					10.8
2023-01-21	0.00					
2023-01-22	0.00					
2023-01-23	7.68					10.9
2023-01-24	4.95					10.8
2023-01-25	0.00					
2023-01-26	0.00					
2023-01-27	3.01					10.8
2023-01-27		79.00	9.30	0.00	13	
2023-01-28	0.00					
2023-01-29	0.00					
2023-01-30	0.00					
2023-01-31	0.00					
2023-02-01	8.42					10.8
2023-02-02	5.32					10.8
2023-02-03	0.00					
2023-02-04	0.00					
2023-02-05	0.00					
2023-02-06	0.00					
2023-02-07	8.33					10.8
2023-02-08	6.06					10.8
2023-02-09	0.00					
2023-02-10	0.00					
2023-02-11	0.00					
2023-02-12	0.00					
2023-02-13	0.00					
2023-02-14	7.77					10.8
2023-02-15	4.95					10.8
2023-02-16	0.00					

2023 Performance Monitoring Results

Detailed Results for 2023

DS-3 Stanrock pH Probe Control (ETP Operations)

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-02-17	6.38					10.8
2023-02-18	6.01					10.8
2023-02-19	0.00					
2023-02-20	8.42					10.8
2023-02-21	6.66					10.8
2023-02-22	6.01					10.8
2023-02-23	7.08					10.8
2023-02-24	0.00					
2023-02-25	0.00					
2023-02-26	0.00					
2023-02-27	6.85					10.9
2023-02-28	4.86					10.8
2023-02-28		93.00	11.80	0.00	14	
2023-03-01	0.00					
2023-03-02	0.00					
2023-03-03	2.36					10.8
2023-03-04	0.00					
2023-03-05	0.00					
2023-03-06	8.42					10.9
2023-03-07	4.90					10.7
2023-03-08	0.00					
2023-03-09	0.00					
2023-03-10	0.00					
2023-03-11	0.00					
2023-03-12	0.00					
2023-03-13	8.51					10.9
2023-03-14	5.90					10.9
2023-03-15	0.00					
2023-03-16	0.00					
2023-03-17	0.00					
2023-03-18	0.00					
2023-03-19	7.35					10.9
2023-03-20	5.00					10.8
2023-03-21	0.00					
2023-03-22	0.00					
2023-03-23	7.68					10.8
2023-03-24	4.90					11.1
2023-03-25	0.00					
2023-03-26	0.00					
2023-03-27	0.00					
2023-03-28	8.33					10.9
2023-03-28		72.00	11.30	0.00	12	
2023-03-29	5.32					10.5
2023-03-30	0.00					
2023-03-31	3.01					10.9
2023-04-01	0.00					
2023-04-02	7.12					10.9
2023-04-03	5.27					11.0
2023-04-04	0.00					

2023 Performance Monitoring Results

Detailed Results for 2023

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

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-04-05	5.64					10.7
2023-04-06	10.92					10.8
2023-04-07	5.00					10.8
2023-04-08	0.00					
2023-04-09	5.09					10.8
2023-04-10	13.32					10.7
2023-04-11	13.32					10.9
2023-04-12	13.32					10.8
2023-04-13	13.32					11.3
2023-04-14	13.32					11.3
2023-04-15	13.32					10.8
2023-04-16	13.32					10.8
2023-04-17	13.32					10.2
2023-04-18	13.32					10.8
2023-04-19	13.32					10.8
2023-04-20	13.32					10.9
2023-04-21	13.32					11.0
2023-04-22	13.32					
2023-04-23	13.32					
2023-04-24	13.32					11.0
2023-04-25	5.13					10.9
2023-04-26	6.85					10.8
2023-04-27	7.77					11.0
2023-04-28	0.00					
2023-04-28		280.00	27.50	0.00	25	
2023-04-29	8.42					
2023-04-30	13.32					
2023-05-01	13.32					10.9
2023-05-02	13.32					11.0
2023-05-03	13.32					10.7
2023-05-04	13.32					10.9
2023-05-05	13.32					10.8
2023-05-06	13.32					
2023-05-07	13.32					
2023-05-08	13.32					10.7
2023-05-09	5.50					10.7
2023-05-10	0.00					
2023-05-11	0.00					
2023-05-12	0.00					
2023-05-13	0.00					
2023-05-14	0.00					
2023-05-15	0.00					
2023-05-16	0.00					
2023-05-17	13.32					10.8
2023-05-18	13.32					10.8
2023-05-19	5.64					10.8
2023-05-20	0.00					
2023-05-21	0.00					
2023-05-22	0.00					

2023 Performance Monitoring Results

Detailed Results for 2023

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

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-05-23	0.00					
2023-05-24	6.24					10.8
2023-05-25	13.32					10.8
2023-05-26	6.38					10.8
2023-05-27	0.00					
2023-05-28	0.00					
2023-05-28		170.00	15.50	0.00	15	
2023-05-29	0.00					
2023-05-30	0.00					
2023-05-31	0.00					
2023-06-01	0.00					
2023-06-02	0.00					
2023-06-03	0.00					
2023-06-04	0.00					
2023-06-05	0.00					
2023-06-06	0.00					
2023-06-07	0.00					
2023-06-08	0.00					
2023-06-09	0.00					
2023-06-10	0.00					
2023-06-11	0.00					
2023-06-12	0.00					
2023-06-13	0.00					
2023-06-14	0.00					
2023-06-15	0.00					
2023-06-16	0.00					
2023-06-17	0.00					
2023-06-18	0.00					
2023-06-19	0.00					
2023-06-20	0.00					
2023-06-21	0.00					
2023-06-22	0.00					
2023-06-23	0.00					
2023-06-24	0.00					
2023-06-25	0.00					
2023-06-26	0.00					
2023-06-27	0.00					
2023-06-28	0.00					
2023-06-28		0.00	0.00	0.00	0	
2023-06-29	0.00					
2023-06-30	0.00					
2023-07-01	0.00					
2023-07-02	0.00					
2023-07-03	0.00					
2023-07-04	0.00					
2023-07-05	0.00					
2023-07-06	0.00					
2023-07-07	0.00					
2023-07-08	0.00					

2023 Performance Monitoring Results

Detailed Results for 2023

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

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-07-09	0.00					
2023-07-10	0.00					
2023-07-11	0.00					
2023-07-12	0.00					
2023-07-13	0.00					
2023-07-14	0.00					
2023-07-15	0.00					
2023-07-16	0.00					
2023-07-17	0.00					
2023-07-18	0.00					
2023-07-19	0.00					
2023-07-20	0.00					
2023-07-21	0.00					
2023-07-22	0.00					
2023-07-23	0.00					
2023-07-24	0.00					
2023-07-25	0.00					
2023-07-26	0.00					
2023-07-27	0.00					
2023-07-28	0.00					
2023-07-28		0.00	0.00	0.00	0	
2023-07-29	0.00					
2023-07-30	0.00					
2023-07-31	0.00					
2023-08-01	0.00					
2023-08-02	0.00					
2023-08-03	0.00					
2023-08-04	0.00					
2023-08-05	0.00					
2023-08-06	0.00					
2023-08-07	0.00					
2023-08-08	0.00					
2023-08-09	0.00					
2023-08-10	0.00					
2023-08-11	0.00					
2023-08-12	0.00					
2023-08-13	0.00					
2023-08-14	0.00					
2023-08-15	0.00					
2023-08-16	0.00					
2023-08-17	0.00					
2023-08-18	0.00					
2023-08-19	0.00					
2023-08-20	0.00					
2023-08-21	0.00					
2023-08-22	0.00					
2023-08-23	0.00					
2023-08-24	0.00					
2023-08-25	0.00					

2023 Performance Monitoring Results

Detailed Results for 2023

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

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-08-26	0.00					
2023-08-27	0.00					
2023-08-28	0.00					
2023-08-28		0.00	0.00	0.00	0	
2023-08-29	0.00					
2023-08-30	0.00					
2023-08-31	0.00					
2023-09-01	0.00					
2023-09-02	0.00					
2023-09-03	0.00					
2023-09-04	0.00					
2023-09-05	0.00					
2023-09-06	0.00					
2023-09-07	0.00					
2023-09-08	0.00					
2023-09-09	0.00					
2023-09-10	0.00					
2023-09-11	0.00					
2023-09-12	0.00					
2023-09-13	0.00					
2023-09-14	0.00					
2023-09-15	0.00					
2023-09-16	0.00					
2023-09-17	0.00					
2023-09-18	0.00					
2023-09-19	0.00					
2023-09-20	0.00					
2023-09-21	0.00					
2023-09-22	0.00					
2023-09-23	0.00					
2023-09-24	0.00					
2023-09-25	0.00					
2023-09-26	0.00					
2023-09-27	0.00					
2023-09-28	0.00					
2023-09-28		0.00	0.00	0.00	0	
2023-09-29	0.00					
2023-09-30	0.00					
2023-10-01	0.00					
2023-10-02	0.00					
2023-10-03	0.00					
2023-10-04	0.00					
2023-10-05	0.00					
2023-10-06	0.00					
2023-10-07	0.00					
2023-10-08	0.00					
2023-10-09	0.00					
2023-10-10	0.00					
2023-10-11	0.00					

2023 Performance Monitoring Results

Detailed Results for 2023

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

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-10-12	0.00					
2023-10-13	0.00					
2023-10-14	0.00					
2023-10-15	0.00					
2023-10-16	0.00					
2023-10-17	0.00					
2023-10-18	0.00					
2023-10-19	0.00					
2023-10-20	0.00					
2023-10-21	0.00					
2023-10-22	0.00					
2023-10-23	0.00					
2023-10-24	0.00					
2023-10-25	0.00					
2023-10-26	0.00					
2023-10-27	8.33					
2023-10-28	4.14					10.8
2023-10-28		39.11	5.81	0.00	4	
2023-10-29	0.00					
2023-10-30	13.32					10.9
2023-10-31	13.32					10.9
2023-11-01	6.11					10.5
2023-11-02	0.00					
2023-11-03	0.00					
2023-11-04	0.00					
2023-11-05	0.00					
2023-11-06	0.00					
2023-11-07	5.41					3.4
2023-11-08	8.35					12.2
2023-11-09	6.66					10.7
2023-11-10	5.27					11.0
2023-11-11	0.00					
2023-11-12	0.00					
2023-11-13	8.28					11.3
2023-11-14	13.32					10.9
2023-11-15	7.93					10.8
2023-11-16	8.42					10.9
2023-11-17	7.96					10.9
2023-11-18	0.00					
2023-11-19	0.00					
2023-11-20	8.16					10.8
2023-11-21	8.34					10.5
2023-11-22	0.00					
2023-11-23	0.00					
2023-11-24	2.87					11.0
2023-11-25	0.00					
2023-11-26	0.00					
2023-11-27	8.14					11.1
2023-11-28	8.26					10.5

2023 Performance Monitoring Results

Detailed Results for 2023

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

	BaCl2D kg/day	BaCl2T kg/month	CaOT tonnes/mth.	NaOHT kg/month	ODays day	pH
2023-11-29	0.00					
2023-11-30	6.19					10.8
2023-11-30		119.67	17.30	0.00	16	
2023-12-01	8.24					11.0
2023-12-02	0.00					
2023-12-03	0.00					
2023-12-04	0.00					
2023-12-05	0.00					
2023-12-06	7.60					10.5
2023-12-07	8.60					11.0
2023-12-08	0.00					
2023-12-09	0.00					
2023-12-10	0.00					
2023-12-11	0.00					
2023-12-12	0.00					
2023-12-13	0.00					
2023-12-14	0.00					
2023-12-15	0.00					
2023-12-16	0.00					
2023-12-17	0.00					
2023-12-18	0.00					
2023-12-19	0.00					
2023-12-20	8.44					10.9
2023-12-21	7.59					11.1
2023-12-22	2.88					11.2
2023-12-23	0.00					
2023-12-24	0.00					
2023-12-25	0.00					
2023-12-26	0.00					
2023-12-27	0.00					
2023-12-28	8.23					11.6
2023-12-28		59.63	8.09	0.00	8	
2023-12-29	8.05					10.3
2023-12-30	0.00					
2023-12-31	0.00					
Count	365	12	12	12	12	362
High	13.32	280.00	27.50	0.00	25	12.2
Low	0.00	0.00	0.00	0.00	0	3.4
Mean	2.50	76.03	8.88	0.00	9	10.8
High Limit						8.5
Low Limit						6.5
Lim Ex	0	0	0	0	0	1
Frequency	0%	0%	0%	0%	0%	0.003%
10x Lim Ex	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

DS-4: Stanrock 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
2023-01-03			47.00		7.1		<1	
2023-01-10		2.1	17.00	312.0	7.0	270.0	1	
2023-01-17			13.00		7.2		<1	
2023-01-23			17.00		7.1		<1	
2023-01-28	31							
2023-01-31			25.00		6.8		1	
2023-02-07			21.00		7.0		1	
2023-02-14		1.9	13.00	322.0	7.0	270.0	1	
2023-02-21			78.00		7.1		<1	
2023-02-28			41.00		7.3		<1	
2023-02-28	28							
2023-03-07			35.00		7.1		2	
2023-03-13			13.00		7.0		1	
2023-03-21		2.2	41.00	340.0	7.1	300.0	1	
2023-03-28			21.00		7.5		<1	
2023-03-28	31							
2023-04-04			51.00		7.2		1	
2023-04-11		2.0	136.00	373.0	7.1	300.0	<1	
2023-04-18			323.00		7.1		2	
2023-04-25			105.00		7.1		2	
2023-04-28	30							
2023-05-02			211.00		7.3		2	
2023-05-09		1.8	91.00	185.0	7.5	160.0	1	
2023-05-16			9.00		7.3		<1	
2023-05-23			13.00		7.2		1	
2023-05-28	31							
2023-05-30			6.00		7.0		1	
2023-06-06			3.00		6.9		1	
2023-06-13			6.00		7.2		<1	
2023-06-20			3.00		6.8		1	
2023-06-27		1.5	6.00	288.0	7.3	240.0	1	
2023-06-27								57
2023-06-28	30							
2023-07-04			3.00		7.2		<1	
2023-07-11		1.3	3.00	285.0	7.3	240.0	1	
2023-07-18			1.00		7.2		<1	
2023-07-24			1.00		7.3		<1	
2023-07-28	31							
2023-07-31			1.00		7.3		1	
2023-08-08		1.5	1.00	311.0	7.4	260.0	<1	
2023-08-15			3.00		7.0		1	
2023-08-22			3.00		7.1		<1	
2023-08-28			1.00		7.2		2	
2023-08-28	31							
2023-09-05			3.00		7.2		<1	
2023-09-12		1.5	3.00	328.0	7.1	270.0	1	
2023-09-12								40
2023-09-19			3.00		7.2		1	

2023 Performance Monitoring Results

Detailed Results for 2023

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

	DDays day	DOC mg/L	FLOW L/s	hard mg/L	pH	SO4 mg/L	TSS mg/L	TOXCD IC25
2023-09-26			3.00		7.1		1	
2023-09-28	30							
2023-10-05			6.00		7.0		3	
2023-10-10		1.7	3.00	320.0	7.4	250.0	1	
2023-10-17			3.00		7.3		1	
2023-10-24			3.00		7.5		<1	
2023-10-28	31							
2023-10-31			3.00		7.2			
2023-11-07		2.8	30.00	340.0	7.5	270.0	1	
2023-11-14			13.00		7.5		1	
2023-11-21			35.00		7.1		1	
2023-11-29			58.00		7.8		1	
2023-11-29	30							
2023-12-05		2.3	13.00	334.0	7.6	300.0	1	
2023-12-12			21.00		7.7		2	
2023-12-19			21.00		7.3		<1	
2023-12-27			17.00		7.4		1	
2023-12-28	31							
Count	12	12	52	12	52	12	51	2
High	31	2.8	323.00	373.0	7.8	300.0	3	57
Low	28	1.3	1.00	185.0	6.8	160.0	<1	40
Mean	30	1.9	30.77	311.5	7.2	260.8	1	48
High Limit					8.5	128-429	10	
Low Limit					6.5			
Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

DS-4: Stanrock 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
2023-01-03			0.089					
2023-01-10			0.093	0.037	<0.0005	0.11	0.029	0.0134
2023-01-17			0.125					
2023-01-23			0.074					
2023-01-31			0.053					
2023-02-07			0.144					
2023-02-14			0.114	0.029	<0.0005	0.12	0.039	0.0080
2023-02-21			0.062					
2023-02-28			0.044					
2023-03-07			0.041					
2023-03-13			0.066					
2023-03-21			0.056	0.034	<0.0005	0.15	0.058	0.0050
2023-03-28			0.049					
2023-04-04			0.073					
2023-04-11			0.060	0.036	0.0009	0.40	0.097	0.0057
2023-04-18			0.060					
2023-04-25			0.087					
2023-05-02			0.044					
2023-05-09			0.052	0.113	0.0009	0.16	0.032	0.0014
2023-05-16			0.075					
2023-05-23			0.067					
2023-05-30			0.103					
2023-06-06			0.112					
2023-06-13			0.091					
2023-06-20			0.099					
2023-06-27			0.111	0.063	<0.0005	0.07	0.038	0.0045
2023-06-27	0	0						
2023-07-04			0.102					
2023-07-11			0.136	0.059	<0.0005	0.07	0.060	0.0045
2023-07-18			0.110					
2023-07-24			0.104					
2023-07-31			0.109					
2023-08-08			0.121	0.055	<0.0002	0.06	0.057	0.0069
2023-08-15			0.083					
2023-08-22			0.111					
2023-08-28			0.121					
2023-09-05			0.121					
2023-09-12			0.139	0.051	0.0002	0.08	0.063	0.0106
2023-09-12	0	10						
2023-09-19			0.106					
2023-09-26			0.119					
2023-10-05			0.138					
2023-10-10			0.123	0.044	0.0002	0.07	0.050	0.0143
2023-10-17			0.105					
2023-10-24			0.087					
2023-10-31			0.077					
2023-11-07			0.110	0.043	0.0002	0.07	0.018	0.0196
2023-11-14			0.102					

2023 Performance Monitoring Results

Detailed Results for 2023

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

	TOXDM %	TOXRT %	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L	Mn mg/L	U mg/L
2023-11-21			0.101					
2023-11-29			0.119					
2023-12-05			0.098	0.041	0.0002	0.10	0.022	0.0176
2023-12-12			0.090					
2023-12-19			0.098					
2023-12-27			0.105					
Count	2	2	52	12	12	12	12	12
High	0	10	0.144	0.113	0.0009	0.40	0.097	0.0196
Low	0	0	0.041	0.029	0.0002	0.06	0.018	0.0014
Mean	0	5	0.094	0.050	0.0004	0.12	0.047	0.0093
High Limit	50	50	0.469	1.000	0.0025	0.76	0.841	0.0150
Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%
10x Lim Ex	0	0	0	0	0	0	0	0
Frequency	0%	0%	0%	0%	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

DS-5: Stanrock Orient Creek Discharge into Moose Lake

Date	COND μmho/cm	FLOW L/s	Head(ft) ft	pH
2023-01-17	132.8	<1.00		4.1
2023-05-24	119.0	1.82	0.1	4.0
2023-08-15		0.00		
2023-11-16	79.4	6.85	0.2	3.7
Count	3	4	2	3
High	132.8	6.85	0.2	4.1
Low	79.4	0.00	0.1	3.7
Mean	110.4	2.42	0.1	3.9
High Limit	69.5			8.5
Low Limit				6.5
Lim Ex	3	0	0	3
Frequency	100%	0%	0%	100%
10x Lim Ex	0	0	0	0
Frequency	0%	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	FLOW L/s	pH
2023-01-03	103.00	7.0
2023-01-10	6.00	6.9
2023-01-11		
2023-01-17	6.00	7.1
2023-01-19		
2023-01-23	6.00	7.0
2023-01-24		
2023-01-30		
2023-01-31	<1.00	6.8
2023-02-07		7.1
2023-02-14		7.0
2023-02-21	126.00	7.0
2023-02-22		
2023-02-23		
2023-02-24		
2023-02-27		
2023-02-28	103.00	7.4
2023-03-02		
2023-03-07	82.00	7.0
2023-03-08		
2023-03-09		
2023-03-13	0.00	
2023-03-15		
2023-03-16		
2023-03-21	29.00	7.3
2023-03-22		
2023-03-24		
2023-03-27		
2023-03-28	6.00	6.8
2023-03-30		
2023-04-03		
2023-04-04	45.00	7.5
2023-04-10		
2023-04-11	232.00	7.2
2023-04-13		
2023-04-14		
2023-04-17		7.0
2023-04-18	390.00	7.1
2023-04-21	103.00	7.0
2023-04-25	176.00	7.8
2023-04-27	151.00	7.0
2023-04-28	126.00	8.5
2023-05-02	151.00	8.7
2023-05-05	126.00	9.0
2023-05-08	176.00	8.1
2023-05-09	126.00	8.8
2023-05-15	16.00	7.9
2023-05-16	0.00	8.0

2023 Performance Monitoring Results

Detailed Results for 2023

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

	FLOW L/s	pH
2023-05-22		
2023-05-23	29.00	7.5
2023-05-24	16.00	7.9
2023-05-26	62.00	7.9
2023-05-30	0.00	
2023-06-02		
2023-06-06	0.00	
2023-06-12		
2023-06-13	0.00	
2023-06-20	0.00	
2023-06-21	0.00	
2023-06-26	0.00	
2023-06-27	0.00	
2023-06-28	0.00	
2023-07-04	0.00	
2023-07-06	0.00	
2023-07-07	0.00	
2023-07-11	0.00	
2023-07-12		
2023-07-18	0.00	
2023-07-24	0.00	
2023-07-31	0.00	
2023-08-01	0.00	
2023-08-02	0.00	
2023-08-07		
2023-08-08	0.00	
2023-08-10		
2023-08-14		
2023-08-15	0.00	
2023-08-17		
2023-08-18		
2023-08-21	0.00	
2023-08-22	0.00	
2023-08-23		
2023-08-24		
2023-08-25		
2023-08-28	0.00	
2023-08-29		
2023-08-31	0.00	
2023-09-01	0.00	
2023-09-04		
2023-09-05	0.00	
2023-09-06	0.00	
2023-09-07	0.00	
2023-09-08	0.00	
2023-09-11	0.00	
2023-09-12	0.00	
2023-09-13	0.00	
2023-09-14	0.00	

2023 Performance Monitoring Results

Detailed Results for 2023

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

	FLOW L/s	pH
2023-09-19	0.00	
2023-09-20	0.00	
2023-09-21	0.00	
2023-09-22	0.00	
2023-09-25	0.00	
2023-09-26	0.00	
2023-09-27	0.00	
2023-09-28	0.00	
2023-09-29	0.00	
2023-10-02	0.00	
2023-10-03	0.00	
2023-10-04	0.00	
2023-10-05	0.00	
2023-10-06	0.00	
2023-10-09	0.00	
2023-10-10	0.00	
2023-10-11	0.00	
2023-10-12	0.00	
2023-10-13	0.00	
2023-10-16	0.00	
2023-10-17	0.00	
2023-10-18	0.00	
2023-10-19	0.00	
2023-10-20	0.00	
2023-10-23	0.00	
2023-10-24	0.00	
2023-10-25	0.00	
2023-10-26	0.00	
2023-10-27	0.00	
2023-10-30	0.00	
2023-10-31	0.00	
2023-11-01	0.00	
2023-11-02	0.00	
2023-11-03	0.00	
2023-11-06	0.00	
2023-11-07	0.00	
2023-11-08	0.00	
2023-11-09	0.00	
2023-11-10	0.00	
2023-11-13	0.00	
2023-11-14	4.00	8.2
2023-11-15	62.00	8.5
2023-11-16	45.00	8.5
2023-11-17	103.00	8.5
2023-11-20	16.00	8.5
2023-11-21	82.00	8.5
2023-11-22	45.00	8.3
2023-11-23	29.00	8.4
2023-11-24	16.00	8.5

2023 Performance Monitoring Results

Detailed Results for 2023

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

	FLOW L/s	pH
2023-11-27	16.00	8.3
2023-11-28	82.00	8.4
2023-11-29	45.00	8.4
2023-11-30	16.00	8.2
2023-12-01	82.00	8.3
2023-12-04	6.00	8.3
2023-12-05	6.00	8.1
2023-12-06	6.00	8.2
2023-12-07	82.00	8.3
2023-12-08	16.00	8.3
2023-12-11	16.00	8.3
2023-12-12	16.00	8.2
2023-12-13	16.00	8.2
2023-12-14	6.00	8.1
2023-12-15	6.00	8.0
2023-12-18	16.00	7.8
2023-12-19	16.00	7.6
2023-12-20	6.00	7.8
2023-12-21	176.00	7.7
2023-12-22	126.00	8.5
2023-12-27	16.00	7.9
2023-12-28	29.00	7.9
2023-12-29	82.00	7.7
Count	131	169
High	390.00	9.0
Low	0.00	6.8
Mean	28.08	7.9
High Limit		8.5
Low Limit		6.5
Lim Ex	0	3
Frequency	0%	1.8%
10x Lim Ex	0	0
Frequency	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

FBDST: Field Blank for D-2

Date	hard mg/L	pH	SO4 mg/L	TSS mg/L	Ra Bq/L	Ba mg/L	Co mg/L	Fe mg/L
2023-01-10	<0.5	6.3	<0.1	<1	<0.005	<0.005	<0.0005	<0.02
2023-02-14	<0.5	6.0	<0.1	<1	0.010	<0.005	<0.0005	<0.02
2023-03-21	<0.5	6.0	0.1	<1	<0.005	<0.005	<0.0005	0.05
2023-04-11	<0.5	5.9	<0.2	<1	<0.005	<0.005	<0.0005	<0.02
2023-05-09	<0.5	6.0	<0.1	<1	0.013	<0.005	<0.0005	<0.02
2023-06-27	<0.1	6.1	<0.2	<1	<0.005	<0.000	<0.0000	<0.01
2023-07-18	<0.1	5.9	<0.2	<1	<0.005	<0.000	<0.0000	<0.01
2023-08-08	<0.5	6.9	<0.2	<1	<0.005	<0.005	<0.0005	<0.02
2023-09-12	0.2	6.2	<0.2	1	<0.005	0.000	<0.0000	<0.01
2023-10-10	<0.1	7.2	<0.2	1	<0.005	0.000	0.0000	<0.01
2023-11-08	0.1	6.9	<0.2	<1	<0.005	0.001	<0.0000	<0.01
2023-12-05	0.2	8.5	<0.2	<1	<0.005	0.000	<0.0000	<0.01

Count	12	12	12	12	12	12	12	12
High	<0.5	8.5	<0.2	1	0.013	<0.005	<0.0005	0.05
Low	<0.1	5.9	<0.1	<1	<0.005	<0.000	<0.0000	<0.01
Mean	0.3	6.5	0.2	1	0.006	0.003	0.0003	0.02

High Limit	8.5		128-429	10	0.469	1.000	0.0025	0.76
Low Limit	6.5							
Lim Ex	0	8	0	0	0	0	0	0
Frequency	0%	66%	0%	0%	0%	0%	0%	0%
10x Lim 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
2023-01-10	<0.002	<0.0005
2023-02-14	<0.002	<0.0005
2023-03-21	<0.002	<0.0005
2023-04-11	<0.002	<0.0005
2023-05-09	<0.002	<0.0005
2023-06-27	<0.000	<0.0000
2023-07-18	<0.000	<0.0000
2023-08-08	<0.002	<0.0005
2023-09-12	0.000	0.0001
2023-10-10	0.000	0.0000
2023-11-08	0.000	0.0001
2023-12-05	0.000	0.0001

Count	12	12
High	<0.002	<0.0005
Low	<0.000	0.0000
Mean	0.001	0.0003

High Limit	0.841	0.0150
Lim Ex	0	0
Frequency	0%	0%
10x Lim Ex	0	0
Frequency	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

FBDST2: Field Blank for DS-2

Date	ACID mg/L	pH
2023-01-10	2	6.0
2023-04-11	2	5.9
2023-09-26		
2023-11-08	3	5.1
Count	3	4
High	3	6.0
Low	2	5.1
Mean	2	5.7
Lim Ex	1	0
Frequency	33.3%	0%
10x Lim Ex	0	0
Frequency	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

ST-1: Stanrock Downstream of Dam G

Date	CONDf µmho/cm	pH
2023-01-17	89.6	5.4
2023-05-24	165.0	3.8
2023-08-15		
2023-11-02	133.0	4.2
Count	4	4
High	165.0	5.4
Low	89.6	3.8
Mean	129.2	4.5
High Limit		69.5 8.5
Low Limit		6.5
Lim Ex	3	3
Frequency	100%	100%
10x Lim Ex	0	0
Frequency	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

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

Date	CONDF μmho/cm	FLOW L/s	pH
2023-01-17		0.00	
2023-05-24		0.00	
2023-08-15		0.00	
2023-11-02		0.00	
Count	4	4	4
High		0.00	
Low		0.00	
Mean		0.00	
High Limit	69.5		8.5
Low Limit			6.5
Lim Ex	0	0	0
Frequency	0%	0%	0%
10x Lim Ex	0	0	0
Frequency	0%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

ST-3: Stanrock Downstream of Dam G

Date	COND μmho/cm	pH
2023-01-17	704.0	2.9
2023-05-24	820.0	3.2
2023-08-15		
2023-11-02	1254.0	3.1
Count	4	4
High	1254.0	3.2
Low	704.0	2.9
Mean	926.0	3.1
High Limit		69.5 8.5
Low Limit		6.5
Lim Ex	3	3
Frequency	100%	100%
10x Lim Ex	3	0
Frequency	100%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

ST-3A: Stanrock Dam G Toe of Dam G

Date	CONDF µmho/cm	FLOW L/s	pH
2023-01-17	841.0	0.08	5.5
2023-05-24	1513.0	0.08	4.0
2023-08-15		0.00	
2023-10-11	1858.0	0.06	4.5
Count	3	4	3
High	1858.0	0.08	5.5
Low	841.0	0.00	4.0
Mean	1404.0	0.05	4.7
High Limit	69.5		8.5
Low Limit			6.5
Lim Ex	3	0	3
Frequency	100%	0%	100%
10x Lim Ex	3	0	0
Frequency	100%	0%	0%

2023 Performance Monitoring Results

Detailed Results for 2023

ST-4: Quirke Lake Delta Downstream of Dam M

Date	ACID mg/L	ALK mg/L	COND µmho/cm	DOC mg/L	hard mg/L	pH	SO4 mg/L	Ra Bq/L
2023-02-21	<1	11.00	49.0	2.8	31.0	6.7	23.0	0.051
2023-05-09	<1	6.00	51.6	2.6	23.8	6.6	21.0	0.020
2023-08-08	<1	8.00	88.3	3.1	35.7	7.6	25.0	0.018
2023-11-07	<1	7.00	57.8	3.4	35.7	6.7	26.0	0.050
Count	4	4	4	4	4	4	4	4
High	<1	11.00	88.3	3.4	35.7	7.6	26.0	0.051
Low	<1	6.00	49.0	2.6	23.8	6.6	21.0	0.018
Mean	<1	8.00	61.7	3.0	31.6	6.9	23.8	0.035
High Limit			69.5			8.5	128-429	0.469
Low Limit						6.5		
Lim Ex	0	0	1	0	0	0	0	0
Frequency	0%	0%	25%	0%	0%	0%	0%	0%
10x Lim 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			
2023-02-21	0.044	<0.0005	0.09	0.016	0.0008			
2023-05-09	0.030	<0.0005	0.03	0.006	0.0008			
2023-08-08	0.045	0.0000	0.02	0.005	0.0011			
2023-11-07	0.043	0.0007	0.11	0.022	0.0009			
Count	4	4	4	4	4			
High	0.045	0.0007	0.11	0.022	0.0011			
Low	0.030	0.0000	0.02	0.005	0.0008			
Mean	0.040	0.0004	0.06	0.012	0.0009			
High Limit	1.000	0.0025	0.76	0.841	0.0150			
Lim Ex	0	0	0	0	0			
Frequency	0%	0%	0%	0%	0%			
10x Lim Ex	0	0	0	0	0			
Frequency	0%	0%	0%	0%	0%			

Summary of Final Effluent Annual Loadings for Compliance Parameters 2023

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). 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 IV.

Site	Final Discharge Location	Total Annual Volume (L)	Annual Radium-226 Loadings (MBq)	Annual TSS Loadings Kg/Year
2023				
Denison TMA-1	D-2	1,481,000,000	257	2663
Denison TMA-2	D-3	216,000,000	20	216
Stanrock	DS-4	983,000,000	76	1392

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-23	96	96000000	36	1	96	0.057	5.472
Feb-23	197	197000000	81	2	394	0.281	55.357
Mar-23	221	221000000	82	2	442	0.253	55.913
Apr-23	455	455000000	176	2	910	0.234	106.47
May-23	235	235000000	88	2	470	0.107	25.145
Jun-23	39	39000000	15	2	78	0.045	1.755
Jul-23	31	31000000	12	1	31	0.033	1.023
Aug-23	31	31000000	12	1	31	0.023	0.713
Sep-23	28	28000000	11	1	28	0.021	0.588
Oct-23	35	35000000	13	2	70	0.025	0.875
Nov-23	57	57000000	22	1	57	0.033	1.881
Dec-23	56	56000000	21	1	56	0.027	1.512
2023 Loadings		1,481,000,000			2663		256.704

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-23	24	24000000	9	1	24	0.096	2.304
Feb-23	8	8000000	4	1	8	0.104	0.832
Mar-23	13	13000000	5	1	13	0.1	1.3
Apr-23	102	102000000	39	1	102	0.09	9.18
May-23	15	15000000	6	1	15	0.136	2.04
Jun-23	6	6000000	3	1	6	0.139	0.834
Jul-23	0	0	0	0	0	0	0
Aug-23	0	0	0	0	0	0	0
Sep-23	0	0	0	0	0	0	0
Oct-23	2	2000000	2	1	2	0.034	0.068
Nov-23	25	25000000	25	1	25	0.082	2.05
Dec-22	21	21000000	21	1	21	0.088	1.848
2023 Loadings		216,000,000			216		20.456

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-23	64	64000000	24	1	64	0.087	5.568
Feb-23	93	93000000	38	1	93	0.091	8.463
Mar-23	74	74000000	28	1	74	0.053	3.922
Apr-23	399	399000000	154	2	798	0.07	27.93
May-23	177	177000000	66	1	177	0.068	12.036
Jun-23	12	12000000	5	1	12	0.103	1.236
Jul-23	5	5000000	2	1	5	0.112	0.56
Aug-23	5	5000000	2	1	5	0.109	0.545
Sep-23	8	8000000	3	1	8	0.121	0.968
Oct-23	10	10000000	4	2	20	0.106	1.06
Nov-23	88	88000000	34	1	88	0.108	9.504
Dec-22	48	48000000	18	1	48	0.098	4.704
2023 Loadings		983,000,000			1392		76.496


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

Surface Water Quality Monitoring at the Stanrock Unnamed Pond, Station DSP, 2015 to 2023

Station	Month	Conductivity	Hardness	pH	Sulphate	Aluminum	Cobalt	Iron	Manganese	Uranium	Zinc
		(µc/cm)	(mg/L as CaCO ₃)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
PWQO		-	-	6.5 - 8.5	-	0.075	0.0009	0.3	-	0.005	0.02
CCME WQG (Long Term)		-	-	6.5 - 9.0	-	0.1	-	0.3	0.21	0.0015	variable
DSP	Jun-2015	520	204	3.7	250	-	0.0478	0.52	4.81	0.0001	na
	Jul-2015	584	240	3.7	260	5.31	0.0588	0.40	5.26	0.0002	0.0260
	Sep-2015	505	-	3.8	290	4.92	0.0512	0.31	5.29	<0.0005	na
	Dec-2015	43	19	4.3	24	0.79	0.0068	0.32	0.409	<0.0005	na
	Mar-2016	289	166	4.2	190	3.27	0.0329	0.75	3.40	<0.0005	na
	Jun-2016	594	259	3.8	290	5.94	0.0528	0.43	4.89	<0.0005	na
	Sep-2016	601	285	3.7	350	5.44	0.0531	0.34	5.67	<0.0005	na
	Jun-2017	562	256	3.8	280	6.48	0.0539	0.47	5.58	<0.0005	na
	Sep-2017	96.1	248	3.7	280	5.88	0.0550	0.60	4.91	<0.0005	na
	Jun-2018	584	253	3.5	280	4.32	0.0487	2.63	5.13	<0.0005	na
	Sep-2018	560	265	3.8	320	6.30	0.0520	0.26	5.14	<0.0005	na
Jul-2021	618	230	3.49	287	6.30	0.0477	0.76	4.34	0.0002	0.00035	
Jul-2023	795	310	3.49	370	7.99	0.0589	1.18	5.78	0.0006	0.035	

 Parameter was greater than the lesser of the PWQO (Provincial Water Quality Objective or Interim Provincial Water Quality Objective; OMOEE 1994) or CCME (Canadian Council of Ministers for the Environment) long term (WQGL) Water Quality Guidelines for the Protection of Aquatic Life (CCME 2021).

Note: "-" indicates that data is not available. Hardness based guidelines assumed a concentration of 20 mg/L as CaCO₃. Guidelines based on pH assumed a pH level of 6.5. Where other concentrations were required to calculate guideline values, the most conservative value possible was chosen.

na-not available

Denison Mines Inc. Elliot Lake Division
2023 Denison Tailings Management Area
Environmental Monitoring Results

BH91 D1A 218.00 ft

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	360.41	No sample collected (no recharge)			
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)			

BH91 D1B 149.20 ft

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	360.96	No sample collected (no recharge)			
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)			

BH91 D3A 159.00 ft

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	361.37	No sample collected (no recharge)			
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

BH91 D3B 69.00 ft

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	370.26	6.6	1400.0	228	140.00
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

**Denison Mines Inc. Elliot Lake Division
2023 Denison Tailings Management Area
Environmental Monitoring Results**

BH91 D9A 72.20 ft

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	396.12	6.5	1500.0	196	201.00
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

BH91 DG4B 35.80 ft

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	358.52	6.2	670.0	<1	13.80
2020	358.59	6.3	780.0	2	21.200
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

Denison Mines Inc. Elliot Lake Division
2023 Stanrock Tailings Management Area
Environmental Monitoring Results

BH91 SG1A 5.49 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	387.81	4.1	2900.0	2270	1270.00
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	3.5	2200.0	1550	635.00

BH91 SG2A 33.31 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	400.54	No sample collected (no recharge)			
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

BH91 SG2D 4.39 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	404.76	No sample collected (no recharge)			
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)			

BH91 SG3A 8.78 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	399.34	No sample collected (no recharge)			
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)			

Denison Mines Inc. Elliot Lake Division
2023 Stanrock Tailings Management Area
Environmental Monitoring Results

BH91 SG3B 5.85 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	399.13	No sample collected (no recharge)			
2020	399.16	No sample collected (no recharge)			
2021	399.20	No sample collected (no recharge)			
2022	399.19	No sample collected (no recharge)			
2023	399.00	No sample collected (no recharge)			

BH98 15A 7.86 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	392.24	6.0	2400.0	1130	504.00
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

BH98 16A 5.49 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	395.56	5.8	3500.0	2190	1300.00
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

PN ST3 P3 5.94 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	404.29	5.6	2800.0	1610	887.00
2020	404.32	5.8	3200.0	1930	979.00
2021	404.50	5.7	160.0	1960	1100.00
2022	404.40	5.5	3600.0	2090	1030.00
2023	404.04	5.2	3700.0	2540	1120.00

**Denison Mines Inc. Elliot Lake Division
2023 Stanrock Tailings Management Area
Environmental Monitoring Results**

PN ST3 P5 2.64 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	404.30	3.2	3000.0	2130	1070.00
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

PN ST3 P6 11.58 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	404.14	5.9	5400.0	4430	2580.00
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

PN ST3 P8 20.91 m

Year	Elevation (m)	Field pH	Sulphate (mg/L)	Acidity (mg/L)	Iron (mg/L)
2019	402.29	5.6	9300.0	8210	4730.00
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

Work Order : 251980
 Sample Number : 78373

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-06-27
Location :	Elliot Lake ON	Sampling Time :	11:05
Substance :	D-2	Date Received :	2023-06-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	CBC	Temperature at Receipt :	20 °C
Sample Description :	Clear, colourless.	Date Tested :	2023-06-28

 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	3.3 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Species :	<i>Daphnia magna</i>	Time to First Brood :	8 days
Organism Batch :	Dm23-11	Average Brood Size :	26.8
Culture Mortality :	1.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / Test Level :	30
Duration of Pre-Aeration :	0 minutes	Organism Loading Rate :	15.0 mL/organism
Test Aeration :	None	Impaired Control Organisms :	3.3%
Hardness Adjustment :	None	Test Method Deviation(s) :	None


REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride		
Date Tested :	2023-06-20	LC50 :	6.0 g/L
Organism Batch :	Dm23-11	95% Confidence Limits :	5.5 - 6.3 g/L
Analyst(s) :	SSF, JW	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Linear Regression (MLE)	Warning Limits ($\pm 2SD$) :	5.8 - 7.4 g/L

COMMENTS

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

Approved By :


 Martina Rendas
 I am approving
 this document
 2023-07-05
 15:19-04:00

Project Manager

Work Order : 251980
 Sample Number : 78373

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Chemistry (100%) :	7.8	8.1	473	20	94	250 mg/L

0 HOURS

 Date & Time : 2023-06-28 14:00
 Analyst(s) : SSF (JCS)/JCS

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	7.8	8.1	473	20	94	250
100	B	0	0	7.8	8.1	473	20	94	250
100	C	0	0	7.8	8.1	473	20	94	250
Control	A	0	0	8.4	8.4	449	20	98	140
Control	B	0	0	8.4	8.4	449	20	98	140
Control	C	0	0	8.4	8.4	449	20	98	140

Notes:

24 HOURS

 Date & Time : 2023-06-29 14:00
 Analyst(s) : CFM (SV)

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 : 2023-06-30 14:00
 Analyst(s) : SSF (JGR)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.0	8.2	472	20
100	B	0	0	8.0	8.2	473	20
100	C	0	0	8.0	8.3	475	20
Control	A	0	0	8.3	8.3	454	20
Control	B	1	0	8.3	8.3	454	20
Control	C	0	0	8.3	8.3	458	20

Notes:

Number immobile does not include number dead.

"-" = not measured/not required

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2023-07-04

Work Order : 251980
 Sample Number : 78373

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-06-27
Location :	Elliot Lake ON	Sampling Time :	11:05
Substance :	D-2	Date Received :	2023-06-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	CBC	Temperature at Receipt :	20 °C
Sample Description :	Clear, colourless.	Date Tested :	2023-06-28

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

96-HOUR TEST RESULTS

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 :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	31.9 mm (±3.6)
Organism Batch :	T23-12	Range of Fork Lengths :	30 - 35 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.3 g (±0.1)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.2 - 0.3 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.1 g/L

TEST CONDITIONS

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

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	LC50 :	3285 mg/L
Organism Batch :	T23-12	95% Confidence Limits :	2781 - 3657 mg/L
Date Tested :	2023-06-09	Historical Mean LC50 :	3882 mg/L
Analyst(s) :	KR, NM, LL	Warning Limits (± 2SD) :	2956 - 5099 mg/L
Statistical Method :	Linear Regression (MLE)		

COMMENTS

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



 Martina Rendas
 I am approving this
 document
 2023-07-05
 15:33-04:00

Approved By : _____

Project Manager

Work Order : 251980

Sample Number : 78373

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.6	8.2	501	16	88
After 30 min pre-aeration :	7.6	8.6	499	16	93

0 HOURS

Date & Time	2023-06-28	14:30					
Analyst(s) :	KR (JGR)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.6	8.6	499	16	93
Control	0	0	8.0	9.4	711	16	100

Notes:

24 HOURS

Date & Time	2023-06-29	14:30					
Analyst(s) :	LL						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	15	
Control	0	0	-	-	-	15	

Notes:

48 HOURS

Date & Time	2023-06-30	14:30					
Analyst(s) :	KR (SV)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	15	
Control	0	0	-	-	-	15	

Notes:

72 HOURS

Date & Time	2023-07-01	14:30					
Analyst(s) :	KP						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	15	
Control	0	0	-	-	-	15	

Notes:

96 HOURS

Date & Time	2023-07-02	14:30					
Analyst(s) :	KP						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	7.9	9.4	508	15	
Control	0	0	8.4	9.5	652	15	

Notes:

"-" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

 Test Data Reviewed By : FS

 Date : 2023-07-05

Work Order : 251980
 Sample Number : 78374

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-06-27
Location :	Elliot Lake ON	Sampling Time :	09:40
Substance :	DS-4	Date Received :	2023-06-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	CBC	Temperature at Receipt :	20 °C
Sample Description :	Clear, colourless.	Date Tested :	2023-06-28

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	3.3 %
	Mean Mortality	0.0 %

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

TEST ORGANISM

Species :	<i>Daphnia magna</i>	Time to First Brood :	8 days
Organism Batch :	Dm23-11	Average Brood Size :	26.8
Culture Mortality :	1.3% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / 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 :	2023-06-20	LC50 :	6.0 g/L
Organism Batch :	Dm23-11	95% Confidence Limits :	5.5 - 6.3 g/L
Analyst(s) :	SSF, JW	Historical Mean LC50 :	6.5 g/L
Statistical Method :	Linear Regression (MLE)	Warning Limits (± 2SD) :	5.8 - 7.4 g/L

COMMENTS

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



Martina Rendas
 I am approving
 this document
 2023-07-05
 15:34-04:00

Approved By : _____

Project Manager

Work Order : 251980
 Sample Number : 78374

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	8.0	498	20	94	280 mg/L

0 HOURS

 Date & Time : 2023-06-28 13:55
 Analyst(s) : SSF (JCS)/JCS

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	7.3	8.0	498	20	94	280
100	B	0	0	7.3	8.0	498	20	94	280
100	C	0	0	7.3	8.0	498	20	94	280
Control	A	0	0	8.4	8.4	449	20	98	140
Control	B	0	0	8.4	8.4	449	20	98	140
Control	C	0	0	8.4	8.4	449	20	98	140

Notes:

24 HOURS

 Date & Time : 2023-06-29 13:55
 Analyst(s) : CFM (SV)

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 : 2023-06-30 13:55
 Analyst(s) : SSF (JGR)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	7.7	8.3	503	20
100	B	0	1	7.8	8.3	506	20
100	C	0	0	7.8	8.3	506	20
Control	A	0	0	8.3	8.2	452	20
Control	B	0	0	8.3	8.3	454	20
Control	C	0	0	8.3	8.3	456	20

Notes:

Number immobile does not include number dead.

"-" = not measured/not required

* adjusted for temperature and barometric pressure

 Test Data Reviewed By : JL

 Date : 2023-07-04

Work Order : 251980

Sample Number : 78374

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-06-27
Location :	Elliot Lake ON	Sampling Time :	09:40
Substance :	DS-4	Date Received :	2023-06-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	CBC	Temperature at Receipt :	20 °C
Sample Description :	Clear, colourless.	Date Tested :	2023-06-28

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

96-HOUR TEST RESULTS

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 :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	33.8 mm (±5.2)
Organism Batch :	T23-12	Range of Fork Lengths :	29 - 37 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.3 g (±0.1)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.2 - 0.4 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.2 g/L

TEST CONDITIONS

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

REFERENCE TOXICANT DATA

Toxicant :	Potassium Chloride	LC50 :	3285 mg/L
Organism Batch :	T23-12	95% Confidence Limits :	2781 - 3657 mg/L
Date Tested :	2023-06-09	Historical Mean LC50 :	3882 mg/L
Analyst(s) :	KR, NM, LL	Warning Limits (± 2SD) :	2956 - 5099 mg/L
Statistical Method :	Linear Regression (MLE)		

COMMENTS

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

Approved By : _____



 Martina Rendas
 I am approving this
 document
 2023-07-05
 15:35-04:00

Project Manager

Work Order : 251980

Sample Number : 78374

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.4	8.3	539	16	90
After 30 min pre-aeration :	7.5	8.8	539	16	94

0 HOURS

Date & Time	2023-06-28	14:30					
Analyst(s) :	KR (JGR)						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.5	8.8	539	16	94
Control	0	0	8.0	9.4	711	16	100

Notes:

24 HOURS

Date & Time	2023-06-29	14:30				
Analyst(s) :	LL					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	-	-	-	15
Control	0	0	-	-	-	15

Notes:

48 HOURS

Date & Time	2023-06-30	14:30				
Analyst(s) :	KR (SV)					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	-	-	-	15
Control	0	0	-	-	-	15

Notes:

72 HOURS

Date & Time	2023-07-01	14:30				
Analyst(s) :	KP					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	-	-	-	15
Control	0	0	-	-	-	15

Notes:

96 HOURS

Date & Time	2023-07-02	14:30				
Analyst(s) :	KP					
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature
100%	0	0	7.8	9.5	542	15
Control	0	0	8.3	9.4	657	15

Notes:

"-" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

 Test Data Reviewed By : FS

 Date : 2023-07-05

CHAIN OF CUSTODY RECORD



AquaTox Work Order No

251980

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): CBC

Signature: *[Signature]*

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 06-27-23 14:00

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

Phone: (705) 848-9191

Fax: (705) 848-5814

Contact:

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	Corodaphnia 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.)
2023-06-27	1105	D-2	70373	20°C	✓		✓			✓						1x20L, 3x4L
2023-06-27	0940	DS-4	70374	20°C	✓		✓			✓						1x20L, 3x4L

For Lab Use Only

Received By: KR / CL

Date: 2023-06-28

Time: 11:50

Storage Location:

Storage Temp.(°C):

Please list any special requests or instructions:

Work Order : 251980

Sample Number : 78373

SAMPLE IDENTIFICATION

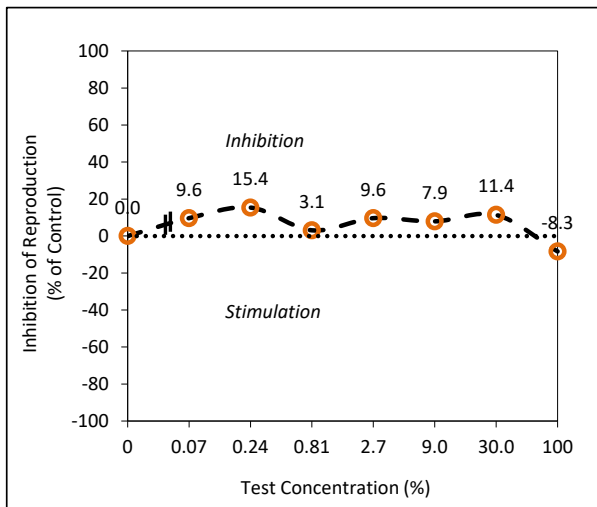
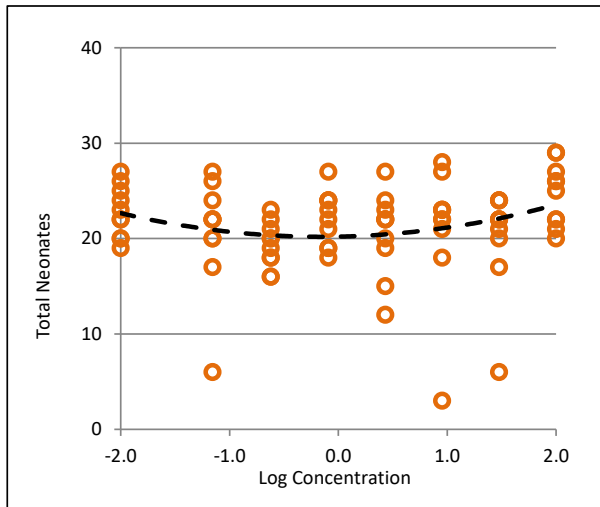
Company :	Denison Mines Inc.	Sampling Date :	2023-06-27
Location :	Elliot Lake ON	Sampling Time :	11:05
Substance :	D-2	Date Received :	2023-06-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	CBC	Temperature at Receipt :	20 °C
Sample Description :	Clear, colourless.	Date Tested :	2023-06-29

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.



Martina Rendas
 I am approving this document
 2023-07-27
 14:42-04:00

Approved By :

Project Manager

Work Order : 251980

Sample Number : 78373

TEST ORGANISM

Test Organism :	<i>Ceriodaphnia dubia</i>	Range of Age (at start of test) :	21:45 h - 23:45 h
Organism Batch :	Cd23-06	Mean Brood Organism Mortality :	0% (previous 7 days)
Organism Origin :	Single in-house mass culture	Average Total Neonates :	23.0 (first three broods)
Test Organism Origin :	Individual in-house cultures	Average Neonates :	14.6 (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

²no additional chemicals

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Analyst(s) :	PC, DT, CFM, CN, SF, KP
Date Tested :	2023-06-20	Test Duration :	6 days
IC25 (Reproduction) :	1.46 g/L	LC50 :	1.88 g/L
95% Confidence Limits :	1.13 - 1.74 g/L	95% Confidence Limits :	1.57 - 2.26 g/L
Statistical Method :	Linear Interpolation (CETIS) ^a	Statistical Method :	Spearman-Kärber (CETIS) ^a
Historical Mean IC25 :	1.08 g/L	Historical Mean LC50 :	2.03 g/L
Warning Limits (± 2SD) :	0.56 - 2.10 g/L	Warning Limits (± 2SD) :	1.06 - 3.89 g/L

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

CUMULATIVE DAILY MORTALITY DATA

Date	Test Day	Test Concentration (%)							
		Control	0.07	0.24	0.81	2.7	9	30	100
2023-06-30	1	0	0	0	0	0	0	0	0
2023-07-01	2	0	0	0	0	0	0	0	0
2023-07-02	3	0	0	0	0	0	0	0	0
2023-07-03	4	0	0	0	0	0	0	0	0
2023-07-04	5	0	0	0	0	0	0	0	0
2023-07-05	6	0	0	0	0	0	0	10	0
Total Mortality (%) :		0	0	0	0	0	0	10	0

REFERENCES

^a CETIS™, © 2000-2022. V.2.1.4.0. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

^bGrubbs, F.E., 1969. Procedures for detecting outlying observations in samples. *Technometrics*, 11:1-21.

Work Order : 251980

Sample Number : 78373

WATER CHEMISTRY DATA

			Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6
			2023-06-29	2023-06-30	2023-07-01	2023-07-02	2023-07-03	2023-07-04
Initial Chemistry (100 %)	Date :							
	Sub-sample Used		1	1	1	2	2	3
	Temperature (°C)		25	25	25	25	25	25
	Dissolved O ₂ (mg/L)		7.5	7.1	7.9	7.8	7.9	8.0
	Dissolved O ₂ (% Sat.) ⁴		97	92	101	100	101	102
	pH		7.6	7.7	7.7	7.8	7.8	7.7
	Conductivity (µmhos/cm)		531	548	528	529	529	536
	Pre-aeration Time (min) ⁵		0	0	20	0	20	20
Analyst(s)	Initial	LL (VBC)	PG	DT (CGR)	DT (CGR)	JJ (CGR)	CFM (VBC)	
	Final	DT	CGR	DT (CGR)	CGR	PG	CFM (PC)	
Control	Temperature (°C)	Initial	25	25	25	25	25	25
		Final	24	26	25	25	25	25
	Dissolved O ₂ (% Sat.) ⁴	Initial	99	100	99	100	101	97
		Initial	7.8	7.7	7.7	7.8	7.9	7.6
	pH	Initial	8.3	8.3	8.3	8.3	8.3	8.4
		Final	8.1	8.1	8.2	8.2	8.1	8.1
	Conductivity (µmhos/cm)	Initial	457	444	438	448	441	438
	0.07 %	Temperature (°C)	Initial	25	25	25	25	25
Final			24	26	25	25	25	25
Dissolved O ₂ (mg/L)		Initial	7.3	7.8	7.6	7.4	7.3	7.6
		Final	6.0	6.5	6.8	6.6	6.6	6.9
pH		Initial	8.2	8.3	8.3	8.2	8.3	8.3
		Final	8.1	8.1	8.2	8.2	8.1	8.1
Conductivity (µmhos/cm)		Initial	459	446	439	448	443	439
9 %		Temperature (°C)	Initial	25	25	25	25	25
	Final		24	26	25	25	25	25
	Dissolved O ₂ (mg/L)	Initial	7.5	7.8	7.7	7.6	7.5	7.6
		Final	6.2	6.5	6.7	6.5	6.5	6.9
	pH	Initial	8.2	8.3	8.3	8.3	8.3	8.3
		Final	8.1	8.1	8.1	8.1	8.1	8.1
	Conductivity (µmhos/cm)	Initial	465	454	450	460	453	448
	100 %	Temperature (°C)	Initial	25	25	25	25	25
Final			24	26	25	25	25	25
Dissolved O ₂ (mg/L)		Initial	7.5	7.6	7.8	7.7	7.5	7.7
		Final	6.3	6.6	6.8	6.6	6.4	7.0
pH		Initial	7.7	7.8	7.8	7.8	7.9	7.9
		Final	7.7	7.8	7.8	7.8	7.6	7.7
Conductivity (µmhos/cm)		Initial	531	529	530	528	530	533
Hardness (mg/L as CaCO ₃)			250	-	-	-	-	-

"- " = not measured/not required

⁴ adjusted for temperature and barometric pressure

⁵ ≤100 bubbles/minute

 Test Data Reviewed By : SF

 Date : 2023-07-20

Work Order : 251980

Sample Number : 78374

SAMPLE IDENTIFICATION

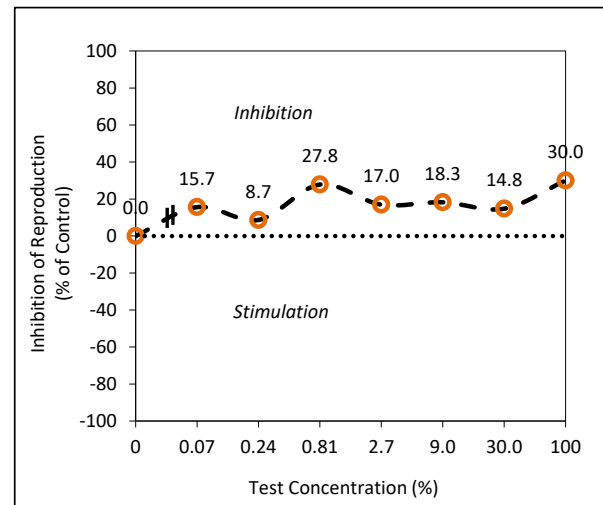
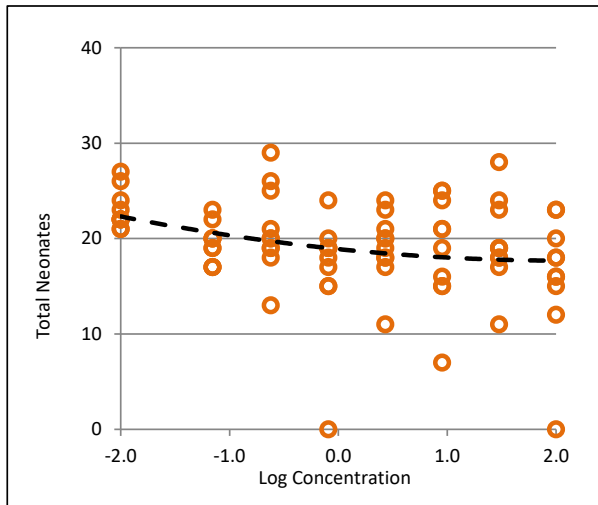
Company :	Denison Mines Inc.	Sampling Date :	2023-06-27
Location :	Elliot Lake ON	Sampling Time :	09:40
Substance :	DS-4	Date Received :	2023-06-28
Sampling Method :	Grab	Time Received :	11:50
Sampled By :	CBC	Temperature at Receipt :	20 °C
Sample Description :	Clear, colourless.	Date Tested :	2023-06-29

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)	56.5%	0.62 – 89.8	Linear Interpolation (Toxstat) ^d
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.
- Statistical analysis for the IC25 (Reproduction) endpoint could not be conducted using Non-Linear Regression, because a suitable model could not be identified. Therefore, test results were calculated using Linear Interpolation (Toxstat)^d.



Martina Rendas
 I am approving this document
 2023-07-27
 14:41-04:00

Approved By : _____

Project Manager

Work Order : 251980
 Sample Number : 78374

TEST ORGANISM

Test Organism :	<i>Ceriodaphnia dubia</i>	Range of Age (at start of test) :	21:55 h - 23:55 h
Organism Batch :	Cd23-06	Mean Brood Organism Mortality :	0% (previous 7 days)
Organism Origin :	Single in-house mass culture	Average Total Neonates :	23.5 (first three broods)
Test Organism Origin :	Individual in-house cultures	Average Neonates :	15.1 (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

²no additional chemicals

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Analyst(s) :	PC, DT, CFM, CN, SF, KP
Date Tested :	2023-06-20	Test Duration :	6 days
IC25 (Reproduction) :	1.46 g/L	LC50 :	1.88 g/L
95% Confidence Limits :	1.13 - 1.74 g/L	95% Confidence Limits :	1.57 - 2.26 g/L
Statistical Method :	Linear Interpolation (CETIS) ^a	Statistical Method :	Spearman-Kärber (CETIS) ^a
Historical Mean IC25 :	1.08 g/L	Historical Mean LC50 :	2.03 g/L
Warning Limits (± 2SD) :	0.56 - 2.10 g/L	Warning Limits (± 2SD) :	1.06 - 3.89 g/L

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

CUMULATIVE DAILY MORTALITY DATA

Date	Test Day	Test Concentration (%)							
		Control	0.07	0.24	0.81	2.7	9	30	100
2023-06-30	1	0	0	0	0	0	0	0	0
2023-07-01	2	0	0	0	0	0	0	0	0
2023-07-02	3	0	0	0	0	0	0	0	0
2023-07-03	4	0	0	0	0	0	0	0	0
2023-07-04	5	0	0	0	0	0	0	0	0
2023-07-05	6	0	0	0	10	0	0	0	0
Total Mortality (%) :		0	0	0	10	0	0	0	0

REFERENCES
^a CETIS™, © 2000-2022. V.2.1.4.0. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

^d West, Inc. and D. Gulley. 1996. Toxstat Release 3.5. Western Ecosystems Technology. Cheyenne, WY, U.S.A.

Work Order : 251980

Sample Number : 78374

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2023-06-29
Initiated By : CGR
Initiation Time : 15:55
Test Completion Date : 2023-07-05

Control													Analyst(s)	2.7%																			
Day	1	2	3	4	Replicate					10	Mean Young (±SD)	Day		1	2	3	4	Replicate					10	Mean Young (±SD)									
2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0	0	LL (PC)	2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0	0	CGR	2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023-07-02	3	4	5	6	4	5	6	5	5	6	5	5.1	CGR	2023-07-02	3	3	6	2	4	2	4	2	4	2	4	2	5	3.4					
2023-07-03	4	0	8	0	0	0	9	9	8	10	8	5.2	JJ (CGR)	2023-07-03	4	8	9	0	0	0	8	7	0	6	9	4.7							
2023-07-04	5	8	0	7	8	7	0	0	0	0	0	3	PG	2023-07-04	5	0	0	7	7	4	0	0	8	0	0	2.6							
2023-07-05	6	9	9	10	10	10	11	8	11	11	8	9.7	CFM (PC)	2023-07-05	6	9	9	8	7	5	9	9	8	11	9	8.4							
Total		21	22	23	22	22	26	22	24	27	21	23.0 (±2.1)		Total		20	24	17	18	11	21	18	20	19	23	19.1 (±3.6)							

0.07%													Analyst(s)	9%																			
Day	1	2	3	4	Replicate					10	Mean Young (±SD)	Day		1	2	3	4	Replicate					10	Mean Young (±SD)									
2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0		2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0		2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023-07-02	3	4	5	4	4	4	5	5	3	4	5	4.3		2023-07-02	3	1	4	1	3	4	5	5	4	6	4	3.7							
2023-07-03	4	0	0	0	0	0	3	0	4	4	0	1.1		2023-07-03	4	0	7	0	0	8	0	0	9	8	4	3.6							
2023-07-04	5	8	7	7	8	4	0	8	1	0	8	5.1		2023-07-04	5	0	0	6	5	0	12	7	0	0	0	3							
2023-07-05	6	10	8	8	8	9	9	7	11	9	10	8.9		2023-07-05	6	6	10	8	7	7	7	9	12	11	8	8.5							
Total		22	20	19	20	17	17	20	19	17	23	19.4 (±2.1)		Total		7	21	15	15	19	24	21	25	25	16	18.8 (±5.7)							

0.24%													Analyst(s)	30%																		
Day	1	2	3	4	Replicate					10	Mean Young (±SD)	Day		1	2	3	4	Replicate					10	Mean Young (±SD)								
2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0		2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0		2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023-07-02	3	1	5	4	4	4	5	4	5	6	5	4.3		2023-07-02	3	4	4	4	5	4	3	4	4	5	4	4.1						
2023-07-03	4	0	5	0	0	0	8	0	10	10	8	4.1		2023-07-03	4	5	7	0	0	0	8	7	10	6	9	5.2						
2023-07-04	5	5	0	7	7	6	0	7	0	0	1	3.3		2023-07-04	5	0	0	5	5	6	0	0	0	0	0	1.6						
2023-07-05	6	7	10	7	8	9	8	9	14	10	11	9.3		2023-07-05	6	10	8	2	8	7	8	7	14	12	11	8.7						
Total		13	20	18	19	19	21	20	29	26	25	21.0 (±4.6)		Total		19	19	11	18	17	19	18	28	23	24	19.6 (±4.6)						

0.81%													Analyst(s)	100%																		
Day	1	2	3	4	Replicate					10	Mean Young (±SD)	Day		1	2	3	4	Replicate					10	Mean Young (±SD)								
2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0		2023-06-30	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0		2023-07-01	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2023-07-02	3	3	5	0	3	2	4	4	3	4	5	3.3		2023-07-02	3	0	0	0	3	5	6	3	6	5	4	3.2						
2023-07-03	4	0	8	0	0	5	6	5	0	9	7	4		2023-07-03	4	5	0	4	0	0	6	0	7	6	6	3.4						
2023-07-04	5	8	0	0	5	0	0	0	8	0	0	2.1		2023-07-04	5	0	0	1	6	5	0	5	0	0	0	1.7						
2023-07-05	6	8	6	0	x 10	8	7	6	8	11	8	7.2		2023-07-05	6	11	0	10	7	8	6	4	10	12	10	7.8						
Total		19	19	0 ³	18	15	17	15	19	24	20	16.6 (±6.4)		Total		16	0 ³	15	16	18	18	12	23	23	20	16.1 (±6.6)						

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.

•³ Outlier according to Grubbs Test (CETIS)³. 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 : SF

Date : 2023-07-20

Work Order : 251980

Sample Number : 78374

WATER CHEMISTRY DATA

		Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6	
Date :		2023-06-29	2023-06-30	2023-07-01	2023-07-02	2023-07-03	2023-07-04	
Initial Chemistry (100 %)	Sub-sample Used	1	1	1	2	2	3	
	Temperature (°C)	25	25	25	25	25	25	
	Dissolved O ₂ (mg/L)	7.4	8.1	7.9	7.6	7.8	8.0	
	Dissolved O ₂ (% Sat.) ⁴	95	105	102	98	100	102	
	pH	7.4	7.5	7.6	7.5	7.5	7.5	
	Conductivity (µmhos/cm)	565	576	565	568	565	568	
	Pre-aeration Time (min) ⁵	0	20	20	0	0	20	
	Analyst(s)	Initial Final	LL (VBC) LL	NM (VBC) CGR	DT(CGR) CGR	DT (CGR) CGR	JJ (CGR) PG	CFM (VBC) CFM (PC)
Control	Temperature (°C)	Initial	25	25	25	25	25	25
		Final	24	25	25	25	25	25
	Dissolved O ₂ (% Sat.) ⁴	Initial	99	100	99	100	101	97
		Initial	7.8	7.7	7.7	7.8	7.9	7.6
	pH	Initial	8.3	8.3	8.3	8.3	8.3	8.4
		Final	8.1	8.2	8.2	8.2	8.1	8.1
	Conductivity (µmhos/cm)	Initial	457	444	438	448	441	438
	0.07 %	Temperature (°C)	Initial	25	25	25	25	25
Final			24	25	25	25	25	25
Dissolved O ₂ (mg/L)		Initial	7.6	7.8	7.7	7.6	7.6	7.8
		Final	6.5	6.8	6.9	6.6	6.7	6.8
pH		Initial	8.2	8.3	8.3	8.3	8.2	8.3
		Final	8.1	8.2	8.2	8.2	8.1	8.1
Conductivity (µmhos/cm)		Initial	458	450	444	447	437	437
9 %		Temperature (°C)	Initial	25	25	25	25	25
	Final		24	25	25	25	25	25
	Dissolved O ₂ (mg/L)	Initial	7.7	7.8	7.7	7.7	7.6	7.8
		Final	6.3	6.8	6.8	6.6	6.7	6.7
	pH	Initial	8.2	8.3	8.3	8.3	8.2	8.3
		Final	8.1	8.1	8.1	8.2	8.1	8.1
	Conductivity (µmhos/cm)	Initial	469	462	455	464	457	464
	100 %	Temperature (°C)	Initial	25	25	25	25	25
Final			24	25	25	25	25	25
Dissolved O ₂ (mg/L)		Initial	7.6	7.7	7.8	7.7	7.7	7.9
		Final	6.3	6.9	6.9	6.7	6.8	6.9
pH		Initial	7.5	7.5	7.6	7.6	7.7	7.7
		Final	7.5	7.6	7.6	7.6	7.6	7.5
Conductivity (µmhos/cm)		Initial	569	569	567	565	567	569
Hardness (mg/L as CaCO ₃)			280	-	-	-	-	-

"-" = not measured/not required

⁴ adjusted for temperature and barometric pressure

⁵ ≤100 bubbles/minute

 Test Data Reviewed By : SF

 Date : 2023-07-20

CHAIN OF CUSTODY RECORD



AquaTox Work Order No
251920

P.O. Number: 110307
 Field Sampler Name (print): CBC
 Signature: [Signature]
 Affiliation: Ops
 Sample Storage (prior to shipping): NA
 Custody Relinquished by: NA
 Date/Time Shipped: 06-27-23 14:00

Client: **Denison Mines**
 1 Horn Walk, Suite 200
 Elliot Lake, PSA-2A5
 Phone: (705) 848-9191
 Fax: (705) 848-5814
 Contact:

Shipping Address: AquaTox Testing & Consulting Inc.
 B-11 Nicholas Beaver Road
 Puslinch, Ontario Canada N0B 2J0
 Voice: (519) 763-4412 Fax: (519) 763-4419

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	Corrodaphnia dubia Survival & Reproduction	Lemna minor Growth	Pseudokirchneriella subcapitata Growth	Other (please specify below)	Grab Composite	# of Containers and Volume (e.g. 2 x 1L, 3 x 10L, etc.)
2023-06-27	1105	D-2	70873	20°C	✓		✓			✓					1x20L, 3x4L
2023-06-27	0940	DS-4	70874	20°C	✓		✓			✓					1x20L, 3x4L

For Lab Use Only
 Received By: KR / CL
 Date: 2023-06-28
 Time: 11:50
 Storage Location:
 Storage Temp.(°C)

Please list any special requests or instructions:

Work Order : 252650
 Sample Number : 79331

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-09-12
Location :	Elliot Lake ON	Sampling Time :	10:05
Substance :	DS-4	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	C. Chopee	Temperature at Receipt :	19 °C
Sample Description :	Clear, colourless	Date Tested :	2023-09-14

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 :	<i>Daphnia magna</i>	Time to First Brood :	10.4 days
Organism Batch :	Dm23-17	Average Brood Size :	39.1
Culture Mortality :	0% (previous 7 days)		

TEST CONDITIONS


Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / 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 :	2023-09-12	LC50 :	6.3 g/L
Organism Batch :	Dm23-17	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	PG, NP	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.6 - 7.4 g/L

COMMENTS

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


 Martina Rendas
 I am approving
 this document
 2023-09-26
 14:44-04:00

Approved By : _____
 Project Manager

Work Order : 252650
 Sample Number : 79331

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	8.7	574	20	100	320 mg/L

0 HOURS

Date & Time : 2023-09-14 12:00
 Analyst(s) : NM/MEP (JW)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	7.5	8.7	574	20	100	320
100	B	0	0	7.5	8.7	574	20	100	320
100	C	0	0	7.5	8.7	574	20	100	320
Control	A	0	0	8.3	8.7	441	20	100	140
Control	B	0	0	8.3	8.7	441	20	100	140
Control	C	0	0	8.3	8.7	441	20	100	140

Notes:

24 HOURS

Date & Time : 2023-09-15 12:00
 Analyst(s) : MEP (NM)

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 : 2023-09-16 12:00
 Analyst(s) : JGR

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	7.9	8.4	588	20
100	B	0	0	7.9	8.3	585	20
100	C	0	0	7.9	8.4	585	20
Control	A	0	0	8.3	8.4	447	20
Control	B	0	0	8.3	8.4	447	20
Control	C	0	0	8.3	8.4	444	20

Notes:

Number immobile does not include number dead.

"-" = not measured/not required

* adjusted for temperature and barometric pressure

Work Order : 252650

Sample Number : 79331

SAMPLE IDENTIFICATION

Company :	Dension Mines Inc.	Sampling Date :	2023-09-12
Location :	Elliot Lake ON	Sampling Time :	10:05
Substance :	DS-4	Date Received :	2023-09-14
Sampling Method :	Grab	Time Received :	12:40
Sampled By :	C. Chopee	Temperature at Receipt :	17.0 °C
Sample Description :	Clear, colourless	Date Tested :	2023-09-15

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

96-HOUR TEST RESULTS

Substance	Effect	Value
Control	Mean Impairment	0.0 %
	Mean Mortality	0.0 %
100%	Mean Impairment	0.0 %
	Mean Mortality	10.0 %

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

TEST ORGANISM

Test Organism :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	39.4 mm (±6.7)
Organism Batch :	LF160823	Range of Fork Lengths :	35 - 44 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.7 g (±0.3)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.4 - 0.9 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 0.26 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	60 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Zinc	LC50 :	0.41 mg/L
Organism Batch :	LF160823	95% Confidence Limits :	0.31 - 0.54 mg/L
Date Tested :	2023-09-07	Historical Mean LC50 :	0.31 mg/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	0.13 - 0.77 mg/L

COMMENTS

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



Martina Rendas
I am approving this document
2023-09-26 14:45:04:00

Approved By : _____

Project Manager

Work Order : 252650

Sample Number : 79331

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.4	10.5	658	14	103
After 30 min pre-aeration :	7.4	10.5	655	14	103

0 HOURS

Date & Time	2023-09-15	17:10					
Analyst(s) :	KF/CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.4	10.2	655	14	100
Control	0	0	7.9	10.0	228	14	100

Notes:

24 HOURS

Date & Time	2023-09-16	17:10					
Analyst(s) :	CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	-	
Control	0	0	-	-	-	-	

Notes:

48 HOURS

Date & Time	2023-09-17	17:10					
Analyst(s) :	CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	-	
Control	0	0	-	-	-	-	

Notes:

72 HOURS

Date & Time	2023-09-18	17:10					
Analyst(s) :	CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	-	
Control	0	0	-	-	-	-	

Notes:

96 HOURS

Date & Time	2023-09-19	17:10					
Analyst(s) :	KF/CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	1	0	7.6	9.7	-	14	
Control	0	0	8.0	9.8	-	14	

Notes:

"-" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

 Test Data Reviewed By : SF

 Date : 2023-09-22

Work Order : 252650
 Sample Number : 79332

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-09-12
Location :	Elliot Lake ON	Sampling Time :	11:00
Substance :	D-2	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	C. Chopee	Temperature at Receipt :	19 °C
Sample Description :	Cloudy, yellow	Date Tested :	2023-09-16

 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 :	<i>Daphnia magna</i>	Time to First Brood :	10.4 days
Organism Batch :	Dm23-17	Average Brood Size :	37.4
Culture Mortality :	1.0% (previous 7 days)		

TEST CONDITIONS

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Organisms / Replicate :	10
Pre-aeration Rate :	~30 mL/min/L	Organisms / 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 :	2023-09-12	LC50 :	6.3 g/L
Organism Batch :	Dm23-17	95% Confidence Limits :	5.8 - 6.8 g/L
Analyst(s) :	PG, NP	Historical Mean LC50 :	6.4 g/L
Statistical Method :	Binomial	Warning Limits (± 2SD) :	5.6 - 7.4 g/L

COMMENTS

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


 Martina Rendas
 I am approving
 this document
 2023-09-26
 14:46-04:00

Approved By : _____

Project Manager

Work Order : 252650
 Sample Number : 79332

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%)*	Hardness (as CaCO ₃)
Initial Chemistry (100%) :	7.7	8.5	583	21	100	310 mg/L

0 HOURS

 Date & Time : 2023-09-16 14:20
 Analyst(s) : PG

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation*	Hardness
100	A	0	0	7.7	8.5	583	21	100	310
100	B	0	0	7.7	8.5	583	21	100	310
100	C	0	0	7.7	8.5	583	21	100	310
Control	A	0	0	8.3	8.6	437	20	100	150
Control	B	0	0	8.3	8.6	437	20	100	150
Control	C	0	0	8.3	8.6	437	20	100	150

Notes:

24 HOURS

 Date & Time : 2023-09-17 14:20
 Analyst(s) : PG

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 : 2023-09-18 14:20
 Analyst(s) : SSF (JJ)

Concentration (%)	Replicate	Dead	Immobile	pH	Dissolved O ₂	Conductivity	Temperature
100	A	0	0	8.0	8.3	592	20
100	B	0	0	8.0	8.3	597	20
100	C	0	0	8.0	8.3	605	20
Control	A	0	0	8.4	8.3	451	20
Control	B	0	0	8.4	8.3	451	20
Control	C	0	0	8.4	8.3	458	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 : 2023-09-22

Work Order : 252650

Sample Number : 79332

SAMPLE IDENTIFICATION

Company :	Denison Mines Inc.	Sampling Date :	2023-09-12
Location :	Elliot Lake ON	Sampling Time :	11:00
Substance :	D-2	Date Received :	2023-09-14
Sampling Method :	Grab	Time Received :	12:40
Sampled By :	C. Chopee	Temperature at Receipt :	16.2 °C
Sample Description :	Cloudy, yellow	Date Tested :	2023-09-15

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

96-HOUR TEST RESULTS

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 :	<i>Oncorhynchus mykiss</i>	Average Fork Length (± 2 SD) :	40.3 mm (±10.3)
Organism Batch :	LF160823	Range of Fork Lengths :	33 - 49 mm
Control Sample Size :	10	Average Wet Weight (± 2 SD) :	0.6 g (±0.5)
Cumulative stock tank mortality rate :	0% (previous 7 days)	Range of Wet Weights :	0.3 - 1.1 g
Control organisms showing stress :	0 (at test completion)	Organism Loading Rate :	0.3 g/L

TEST CONDITIONS

Sample Treatment :	None	Volume Tested (L) :	20
pH Adjustment :	None	Number of Replicates :	1
Test Aeration :	Yes	Organisms Per Replicate :	10
Pre-aeration/Aeration Rate :	6.5 ± 0.26 mL/min/L	Organisms Per Test Level :	10
Duration of Pre-Aeration :	30 minutes	Test Method Deviation(s) :	None

REFERENCE TOXICANT DATA

Toxicant :	Zinc	LC50 :	0.41 mg/L
Organism Batch :	LF160823	95% Confidence Limits :	0.31 - 0.54 mg/L
Date Tested :	2023-09-07	Historical Mean LC50 :	0.31 mg/L
Statistical Method :	Spearman-Kärber	Warning Limits (± 2SD) :	0.13 - 0.77 mg/L

COMMENTS

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

Approved By :



Martina Rendas
I am approving
this document
2023-09-26
14:47-04:00

Project Manager

Work Order : 252650

Sample Number : 79332

TEST DATA

	pH	Dissolved O ₂ (mg/L)	Conductivity (µmhos/cm)	Temperature (°C)	O ₂ Saturation (%) ³
Initial Water Chemistry (100%) :	7.5	10.0	659	14	98
After 30 min pre-aeration :	7.7	10.0	658	14	98

0 HOURS

Date & Time	2023-09-15	16:40					
Analyst(s) :	KF/CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	O ₂ Saturation ³
100%	0	0	7.7	10.0	658	14	98
Control	0	0	7.9	10.0	228	14	100

Notes:

24 HOURS

Date & Time	2023-09-16	16:40					
Analyst(s) :	CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	-	
Control	0	0	-	-	-	-	

Notes:

48 HOURS

Date & Time	2023-09-17	16:40					
Analyst(s) :	CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	-	
Control	0	0	-	-	-	-	

Notes:

72 HOURS

Date & Time	2023-09-18	16:40					
Analyst(s) :	CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	-	-	-	-	
Control	0	0	-	-	-	-	

Notes:

96 HOURS

Date & Time	2023-09-19	16:40					
Analyst(s) :	KF/CD						
Concentration	Dead	Impaired	pH	Dissolved O ₂	Conductivity	Temperature	
100%	0	0	7.6	9.3	-	14	
Control	0	0	8.0	9.8	-	14	

Notes:

"-" = not measured/not required

Number impaired does not include number dead.

³ adjusted for temperature and barometric pressure

 Test Data Reviewed By : SF

 Date : 2023-09-22

CHAIN OF CUSTODY RECORD



AquaTox Work Order No:
252650

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 (652) +

Field Sampler Name (print): Cynthia Chapee

Signature: *CME*

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 2023/09/12 2pm

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

Phone: (705) 848-9191

Fax: (705) 848-5814

Contact:

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	Lemma minor Growth	Pseudokirchneriella subcapitata Growth	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-09-12	10:05	D3-4	79331	19°C	✓		✓			✓				✓		1x20L, 3x4L
2023-09-12	11:00	D-2	79332	19°C	✓		✓			✓				✓		"

For Lab Use Only

Received By: *NM/AJS*

Date: 2023-09-13

Time: 13:00

Storage Location: _____

Storage Temp. (°C) _____

Please list any special requests or instructions:

Work Order : 252650

Sample Number : 79332

SAMPLE IDENTIFICATION

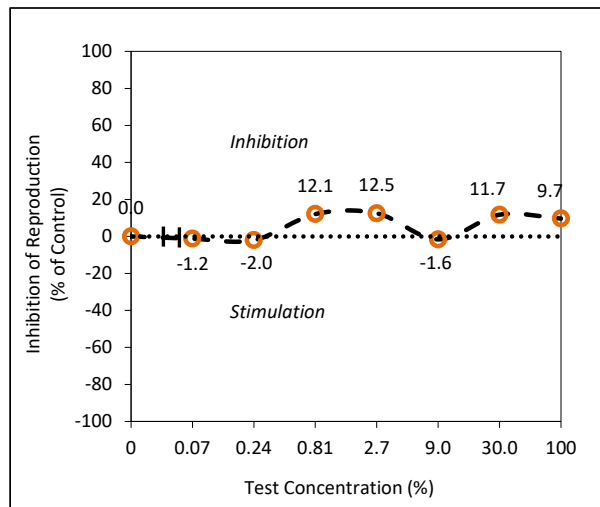
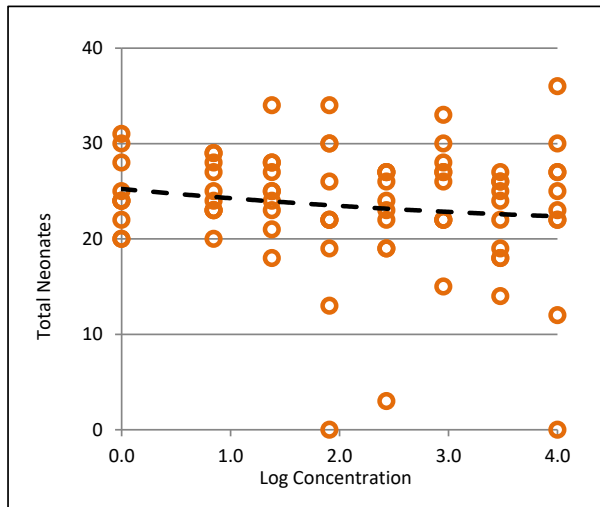
Company :	Denison Mines Inc.	Sampling Date :	2023-09-12
Location :	Elliot Lake ON	Sampling Time :	11:00
Substance :	D-2	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	C. Chopee	Temperature at Receipt :	19 °C
Sample Description :	Cloudy, yellow	Date Tested :	2023-09-14

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.

Martina Rendas
 I am approving
 this document
 2023-10-03
 10:50-04:00

Approved By : _____
 Project Manager

Work Order : 252650
 Sample Number : 79332

TEST ORGANISM

Test Organism :	<i>Ceriodaphnia dubia</i>	Range of Age (at start of test) :	08:55 h - 20:55 h
Organism Batch :	Cd23-09	Mean Brood Organism Mortality :	0% (previous 7 days)
Organism Origin :	Single in-house mass culture	Average Total Neonates :	24.6 (first three broods)
Test Organism Origin :	Individual in-house cultures	Average Neonates :	12.4 (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

²no additional chemicals

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Analyst(s) :	NM, YA, SV
Date Tested :	2023-09-13	Test Duration :	6 days
IC25 (Reproduction) :	0.56 g/L	LC50 :	1.99 g/L
95% Confidence Limits :	0.41 - 0.72 g/L	95% Confidence Limits :	1.69 - 2.35 g/L
Statistical Method :	Non-Linear Regression ¹ (CETIS) ^a	Statistical Method :	Spearman-Kärber (CETIS) ^a
Historical Mean IC25 :	1.10 g/L	Historical Mean LC50 :	2.05 g/L
Warning Limits (± 2SD) :	0.56 - 2.18 g/L	Warning Limits (± 2SD) :	1.08 - 3.91 g/L

¹Poisson Weighting (CETIS)^a applied

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

CUMULATIVE DAILY MORTALITY DATA

Date	Test Day	Test Concentration (%)							
		Control	0.07	0.24	0.81	2.7	9	30	100
2023-09-15	1	0	0	0	0	0	0	0	10
2023-09-16	2	0	0	0	10	0	0	0	10
2023-09-17	3	0	0	0	10	0	0	0	10
2023-09-18	4	0	0	0	10	0	0	0	10
2023-09-19	5	0	0	0	10	0	0	10	10
2023-09-20	6	0	0	0	10	0	0	10	10
Total Mortality (%) :		0	0	0	10	0	0	10	10

REFERENCES

^a CETIS™, © 2000-2022. V.2.1.4.0. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

^bGrubbs, F.E., 1969. Procedures for detecting outlying observations in samples. *Technometrics*, 11 :1-21.

Work Order : 252650
Sample Number : 79332

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2023-09-14
Initiated By : YA (PC)
Initiation Time : 14:55
Test Completion Date : 2023-09-20

Control	Day	Replicate										Mean Young (±SD)	Analyst(s)	
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	YA (PC)
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	XD
2023-09-17	3	0	0	0	0	0	0	4	0	0	0	0	0.4	XD
2023-09-18	4	5	5	6	5	4	4	0	3	5	4	4.1	YA (PC)	
2023-09-19	5	9	10	8	10	11	9	12	8	9	8	9.4	YA (AS)	
2023-09-20	6	10	15	6	9	9	12	15	9	14	10	10.9	NWP (PC)	
Total		24	30	20	24	24	25	31	20	28	22	24.8 (±3.8)		

2.7%	Day	Replicate										Mean Young (±SD)	
		1	2	3	4	5	6	7	8	9	10		
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	0	0	2	0	0	0.2
2023-09-18	4	4	5	0	4	6	5	0	2	6	5	3.7	
2023-09-19	5	7	10	0	7	10	9	8	7	11	8	7.7	
2023-09-20	6	8	12	3	12	11	12	12	10	10	11	10.1	
Total		19	27	3³	23	27	26	22	19	27	24	21.7 (±7.3)	

0.07%	Day	Replicate										Mean Young (±SD)
		1	2	3	4	5	6	7	8	9	10	
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0
2023-09-18	4	5	3	4	3	2	5	2	3	3	5	3.5
2023-09-19	5	9	7	10	8	9	10	9	8	9	8	8.7
2023-09-20	6	13	13	15	14	12	9	12	9	16	16	12.9
Total		27	23	29	25	23	24	23	20	28	29	25.1 (±3.0)

9%	Day	Replicate										Mean Young (±SD)
		1	2	3	4	5	6	7	8	9	10	
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0
2023-09-18	4	2	5	5	5	6	3	0	4	5	4	3.9
2023-09-19	5	6	10	11	8	10	9	9	9	13	8	9.3
2023-09-20	6	7	13	14	9	11	14	13	14	15	10	12
Total		15	28	30	22	27	26	22	27	33	22	25.2 (±5.1)

0.24%	Day	Replicate										Mean Young (±SD)
		1	2	3	4	5	6	7	8	9	10	
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	3	0	0	0	0.3
2023-09-18	4	5	6	3	5	4	3	0	5	3	4	3.8
2023-09-19	5	9	12	7	9	9	7	8	10	9	10	9
2023-09-20	6	14	16	8	11	11	11	14	12	11	14	12.2
Total		28	34	18	25	24	21	25	27	23	28	25.3 (±4.4)

30%	Day	Replicate										Mean Young (±SD)
		1	2	3	4	5	6	7	8	9	10	
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0
2023-09-18	4	0	5	3	4	4	4	5	4	5	4	3.8
2023-09-19	5	6	13 x	7	10	8	9	6	8	7	8	8.2
2023-09-20	6	8	0	8	12	13	14	8	10	14	12	9.9
Total		14	18	18	26	25	27	19	22	26	24	21.9 (±4.4)

0.81%	Day	Replicate										Mean Young (±SD)
		1	2	3	4	5	6	7	8	9	10	
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0
2023-09-16	2	0	x	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	3	0	0	0	0.3
2023-09-18	4	0	7	4	4	5	3	0	3	6	4	3.6
2023-09-19	5	0	13	7	8	8	9	10	9	9	9	8.2
2023-09-20	6	0	14	11	10	0	7	17	10	15	13	9.7
Total		0³	34	22	22	13	19	30	22	30	26	21.8 (±9.8)

100%	Day	Replicate										Mean Young (±SD)
		1	2	3	4	5	6	7	8	9	10	
2023-09-15	1	0	0	0	0	0	0	0	0	x	0	0
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0
2023-09-18	4	5	5	0	4	7	5	0	3	4	4	3.7
2023-09-19	5	10	12	4	10	11	10	0	7	7	9	8
2023-09-20	6	12	19	8	9	12	10	0	12	11	14	10.7
Total		27	36	12	23	30	25	0³	22	22	27	22.4 (±10.0)

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 (CETIS)^a. 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 : FS

Date : 2023-09-28

Work Order : 252650

Sample Number : 79332

WATER CHEMISTRY DATA

		Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6	
Date :		2023-09-14	2023-09-15	2023-09-16	2023-09-17	2023-09-18	2023-09-19	
Initial Chemistry (100 %)	Sub-sample Used	1	1	1	2	2	3	
	Temperature (°C)	25	25	24	24	25	24	
	Dissolved O ₂ (mg/L)	7.8	8.5	8.3	8.4	8.3	8.3	
	Dissolved O ₂ (% Sat.) ⁴	100	106	104	106	105	105	
	pH	7.6	7.7	7.6	7.7	7.7	7.7	
	Conductivity (µmhos/cm)	622	631	630	636	652	651	
	Pre-aeration Time (min) ⁵	0	20	20	20	20	20	
	Analyst(s)	Initial Final	TBK (PC) YA (SV)	TBK (SV) XD	NWP (PG) XD	NWP (PG) YA (PC)	TBK (PC) YA (AS)	TBK (AS) NWP (PC)
Control	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	25	24	24
	Dissolved O ₂ (% Sat.) ⁴	Initial	102	101	102	99	101	98
	Dissolved O ₂ (mg/L)	Initial	8.3	8.2	8.2	7.9	8.0	7.7
		Final	7.2	7.1	7.0	7.1	7.0	7.2
	pH	Initial	8.4	8.3	8.3	8.3	8.3	8.3
		Final	8.1	8.1	8.1	8.1	8.1	8.0
	Conductivity (µmhos/cm)	Initial	435	434	443	441	466	461
0.07 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	25	24	24
	Dissolved O ₂ (mg/L)	Initial	6.7	7.9	7.8	7.9	7.6	7.4
		Final	7.2	7.1	6.9	7.1	7.0	7.3
	pH	Initial	7.9	8.2	8.2	8.3	8.2	8.2
		Final	8.1	8.1	8.1	8.1	8.1	8.1
	Conductivity (µmhos/cm)	Initial	441	440	446	466	473	468
	9 %	Temperature (°C)	Initial	24	24	24	24	24
		Final	24	24	24	25	24	24
Dissolved O ₂ (mg/L)		Initial	6.8	8.0	7.9	7.9	7.7	7.5
		Final	7.2	7.1	6.9	7.1	7.0	7.4
pH		Initial	8.0	8.2	8.2	8.3	8.2	8.3
		Final	8.1	8.1	8.1	8.2	8.1	8.1
Conductivity (µmhos/cm)		Initial	457	455	465	490	489	483
100 %		Temperature (°C)	Initial	24	24	24	24	24
		Final	24	24	24	25	24	24
	Dissolved O ₂ (mg/L)	Initial	7.5	8.1	8.0	8.1	7.9	7.6
		Final	7.2	7.2	6.8	7.1	7.0	7.5
	pH	Initial	7.8	7.8	7.8	7.8	7.7	7.9
		Final	7.8	7.8	7.8	7.7	7.7	7.8
	Conductivity (µmhos/cm)	Initial	636	636	634	651	654	652
	Hardness (mg/L as CaCO ₃)		310	-	-	-	-	-

"-" = not measured/not required

⁴ adjusted for temperature and barometric pressure

⁵ ≤100 bubbles/minute

 Test Data Reviewed By : FS

 Date : 2023-09-28

CHAIN OF CUSTODY RECORD



AquaTox Work Order No:
252650

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 (652) +

Field Sampler Name (print): Cynthia Chapee

Signature: *CME*

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 2023/09/12 2pm

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

Phone: (705) 848-9191

Fax: (705) 848-5814

Contact:

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	Lemma minor Growth	Pseudokirchneriella subcapitata Growth	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-09-12	10:05	DS-4	79331	19°C	✓		✓			✓				✓		1x20L, 3x4L
2023-09-12	11:00	D-2	79332	19°C	✓		✓			✓				✓		"

For Lab Use Only

Received By: *NM/AJS*

Date: 2023-09-13

Time: 13:00

Storage Location: _____

Storage Temp. (°C): _____

Please list any special requests or instructions:

Work Order : 252650
 Sample Number : 79331

SAMPLE IDENTIFICATION

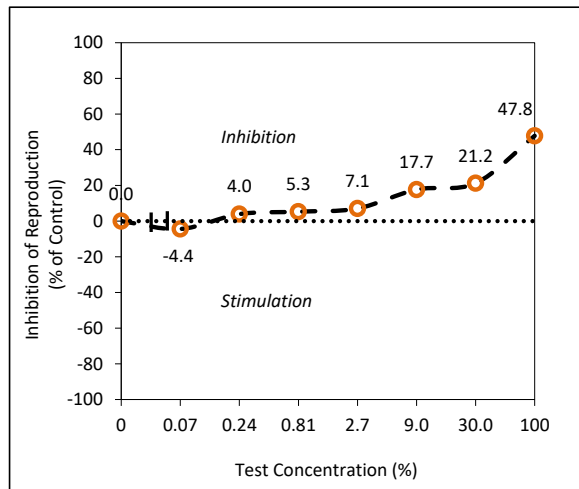
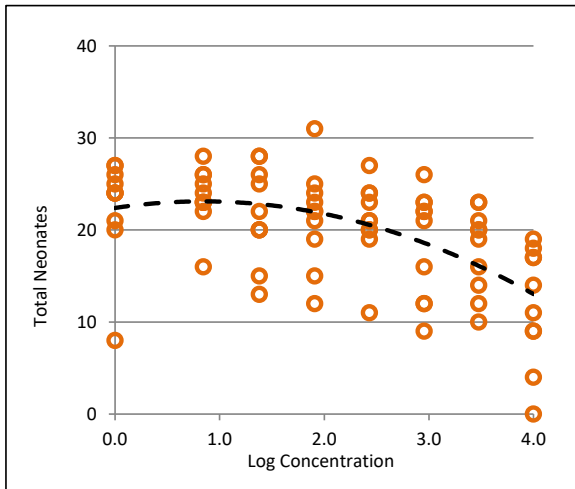
Company :	Denison Mines Inc.	Sampling Date :	2023-09-12
Location :	Elliot Lake ON	Sampling Time :	10:05
Substance :	DS-4	Date Received :	2023-09-13
Sampling Method :	Grab	Time Received :	13:00
Sampled By :	C. Chopee	Temperature at Receipt :	19 °C
Sample Description :	Clear, colourless	Date Tested :	2023-09-14

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)	39.9%	5.27 – 63.2%	Linear Interpolation (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.
- Statistical analysis for the IC25 (Reproduction) endpoint could not be conducted using Non-Linear Regression, because a suitable model could not be identified. Therefore, test results were calculated using Linear Interpolation (CETIS)^a. In test concentrations where hormesis was observed (0.07%, data was replaced with control values for the purposes of statistical analysis, as recommended by Environment Canada (2005).



Martina Rendas
 I am approving this document
 2023-10-03 10:59:04:00

Approved By : _____

Project Manager

Work Order : 252650
 Sample Number : 79331

TEST ORGANISM

Test Organism :	<i>Ceriodaphnia dubia</i>	Range of Age (at start of test) :	09:00 h - 21:00 h
Organism Batch :	Cd23-09	Mean Brood Organism Mortality :	5% (previous 7 days)
Organism Origin :	Single in-house mass culture	Average Total Neonates :	25.7 (first three broods)
Test Organism Origin :	Individual in-house cultures	Average Neonates :	12.9 (3rd or subsequent brood)
Ehippia 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

²no additional chemicals

REFERENCE TOXICANT DATA

Toxicant :	Sodium Chloride	Analyst(s) :	NM, YA, SV
Date Tested :	2023-09-13	Test Duration :	6 days
IC25 (Reproduction) :	0.56 g/L	LC50 :	1.99 g/L
95% Confidence Limits :	0.41 - 0.72 g/L	95% Confidence Limits :	1.69 - 2.35 g/L
Statistical Method :	Non-Linear Regression ⁴ (CETIS) ^a	Statistical Method :	Spearman-Kärber (CETIS) ^a
Historical Mean IC25 :	1.10 g/L	Historical Mean LC50 :	2.05 g/L
Warning Limits (± 2SD) :	0.56 - 2.18 g/L	Warning Limits (± 2SD) :	1.08 - 3.91 g/L

⁴Poisson Weighting (CETIS)^a applied

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

CUMULATIVE DAILY MORTALITY DATA

Date	Test Day	Test Concentration (%)							
		Control	0.07	0.24	0.81	2.7	9	30	100
2023-09-15	1	0	0	0	0	0	0	0	0
2023-09-16	2	0	0	0	0	0	0	0	0
2023-09-17	3	0	0	0	0	0	0	0	0
2023-09-18	4	0	0	0	0	0	0	0	10
2023-09-19	5	0	0	0	0	0	0	0	10
2023-09-20	6	0	0	0	0	0	0	0	10
Total Mortality (%) :		0	0	0	0	0	0	0	10

REFERENCES

^a CETIS™, © 2000-2022. V.2.1.4.0. Comprehensive Environmental Toxicity Information System. Tidepool Scientific Software, LLC, McKinleyville, CA 95519 [Program on disk and printed User's Guide].

^bGrubbs, F.E., 1969. Procedures for detecting outlying observations in samples. *Technometrics*, 11:1-21.

Environment Canada, 2005. Guidance Document on Statistical Methods for Environmental Toxicity Tests. Environmental Protection Series, Ottawa, Ont., Rept. EPS 1/RM/46.

Work Order : 252650

Sample Number : 79331

SURVIVAL AND REPRODUCTION

Test Initiation Date : 2023-09-14

Initiated By : DT (PC)

Initiation Time : 15:00

Test Completion Date : 2023-09-20

Control	Day	Replicate										Mean Young (±SD)	Analyst(s)	
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	YA (SV)
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	CL
2023-09-17	3	0	2	0	0	0	0	0	0	0	0	0	0.2	CL
2023-09-18	4	5	0	4	5	5	4	4	5	2	6	4	4	YA (PC)
2023-09-19	5	10	8	10	9	7	6	9	7	6	8	8	8	YA (AS)
2023-09-20	6	12	10	13	12	13	11	11	12	0	10	10.4	10.4	PG
Total		27	20	27	26	25	21	24	24	8 ³	24	22.6 (±5.6)		

2.7%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	4	0	0	0	0	0	0	0	0	0	0.4	
2023-09-18	4	4	0	6	3	4	4	5	6	0	0	3.2	3.2	
2023-09-19	5	8	7	9	8	7	7	8	7	4	10	7.5	7.5	
2023-09-20	6	9	8	12	12	9	9	11	11	7	11	9.9	9.9	
Total		21	19	27	23	20	20	24	24	11 ³	21	21.0 (±4.3)		

0.07%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	4	0	0	0	0	0	0	0	0	0.4	0.4	
2023-09-18	4	5	0	3	6	4	5	4	6	2	5	4	4	
2023-09-19	5	8	7	9	10	9	10	8	7	7	8	8.3	8.3	
2023-09-20	6	12	11	11	12	13	11	11	11	7	10	10.9	10.9	
Total		25	22	23	28	26	26	23	24	16 ³	23	23.6 (±3.2)		

9%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-18	4	2	4	4	2	4	1	0	4	0	1	2.2	2.2	
2023-09-19	5	9	8	9	5	9	5	3	9	5	8	7	7	
2023-09-20	6	11	11	13	5	8	10	6	10	7	13	9.4	9.4	
Total		22	23	26	12	21	16	9	23	12	22	18.6 (±5.9)		

0.24%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	4	0	0	0	0	0	0	0	0	0.4	0.4	
2023-09-18	4	3	0	2	6	4	3	4	2	2	4	3	3	
2023-09-19	5	9	8	5	9	10	7	10	5	5	8	7.6	7.6	
2023-09-20	6	10	8	13	13	12	10	14	8	6	13	10.7	10.7	
Total		22	20	20	28	26	20	28	15	13	25	21.7 (±5.1)		

30%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-18	4	3	2	6	4	5	3	0	4	1	3	3.1	3.1	
2023-09-19	5	7	7	9	6	8	7	5	8	5	8	7	7	
2023-09-20	6	0	7	5	10	10	11	9	11	6	8	7.7	7.7	
Total		10	16	20	20	23	21	14	23	12	19	17.8 (±4.6)		

0.81%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-18	4	5	5	4	6	2	5	5	6	1	4	4.3	4.3	
2023-09-19	5	7	8	8	10	7	5	8	6	6	8	7.3	7.3	
2023-09-20	6	0	11	13	15	13	9	10	9	8	10	9.8	9.8	
Total		12	24	25	31	22	19	23	21	15	22	21.4 (±5.3)		

100%	Day	Replicate										Mean Young (±SD)		
		1	2	3	4	5	6	7	8	9	10			
2023-09-15	1	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-16	2	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-17	3	0	0	0	0	0	0	0	0	0	0	0	0	
2023-09-18	4	0	0	x	0	2	1	3	2	2	1	0	1.1	
2023-09-19	5	3	0	4	7	6	7	6	6	0	1	4	4	
2023-09-20	6	8	0	5	9	7	7	11	9	8	3	6.7	6.7	
Total		11	0	9	18	14	17	19	17	9	4	11.8 (±6.4)		

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 : FS

Date : 2023-09-28

Work Order : 252650

Sample Number : 79331

WATER CHEMISTRY DATA

		Day 0 - 1	Day 1 - 2	Day 2 - 3	Day 3 - 4	Day 4 - 5	Day 5 - 6	Day 6 - 7
Date :		2023-09-14	2023-09-15	2023-09-16	2023-09-17	2023-09-18	2023-09-19	2023-09-20
Initial Chemistry (100 %)	Sub-sample Used	1	1	1	2	2	3	3
	Temperature (°C)	25	25	25	24	25	24	25
	Dissolved O ₂ (mg/L)	7.8	8.5	8.7	8.5	8.4	8.2	8.4
	Dissolved O ₂ (% Sat.) ⁴	100	106	110	107	107	104	106
	pH	7.6	7.6	7.5	7.6	7.5	7.6	7.5
	Conductivity (µmhos/cm)	621	620	621	624	640	653	637
	Pre-aeration Time (min) ⁵	0	20	20	20	20	20	20
	Analyst(s)	Initial Final	TBK (PC) YA (SV)	TBK (SV) CL	NWP (PG) CL	NWP (PG) YA (PC)	TBK (PC) YA (AS)	TBK (AS) PG
Control	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	25	24	25
	Dissolved O ₂ (% Sat.) ⁴	Initial	102	101	102	99	101	98
	Dissolved O ₂ (mg/L)	Initial	8.3	8.2	8.2	7.9	8.0	7.7
		Final	7.1	7.1	7.2	7.2	7.1	7.3
	pH	Initial	8.4	8.3	8.3	8.3	8.3	8.3
	Final	8.1	8.1	8.2	8.1	8.1	8.2	
Conductivity (µmhos/cm)	Initial	435	434	443	441	466	461	
0.07 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	25	24	25
	Dissolved O ₂ (mg/L)	Initial	7.2	7.7	7.8	7.9	7.5	7.0
		Final	7.0	7.2	7.1	7.3	7.0	7.6
	pH	Initial	8.1	8.2	8.2	8.3	8.1	8.1
		Final	8.1	8.1	8.2	8.2	8.1	8.2
Conductivity (µmhos/cm)	Initial	440	441	434	467	472	470	
9 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	25	24	25
	Dissolved O ₂ (mg/L)	Initial	7.3	7.8	7.8	7.9	7.6	7.2
		Final	6.9	7.2	7.0	7.3	7.0	7.6
	pH	Initial	8.0	8.2	8.2	8.3	8.2	8.2
		Final	8.1	8.1	8.1	8.1	8.1	8.2
Conductivity (µmhos/cm)	Initial	455	459	464	489	488	484	
100 %	Temperature (°C)	Initial	24	24	24	24	24	24
		Final	24	24	24	25	24	25
	Dissolved O ₂ (mg/L)	Initial	7.7	8.0	8.1	8.0	7.9	7.6
		Final	7.0	7.2	7.0	7.3	7.1	7.7
	pH	Initial	7.7	7.6	7.7	7.7	7.7	7.8
		Final	7.6	7.6	7.7	7.7	7.7	7.8
Conductivity (µmhos/cm)	Initial	622	623	621	641	643	654	
Hardness (mg/L as CaCO ₃)		320	-	-	-	-	-	

"-" = not measured/not required

⁴ adjusted for temperature and barometric pressure

⁵ ≤100 bubbles/minute

Test Data Reviewed By : FS

Date : 2023-09-28

CHAIN OF CUSTODY RECORD



AquaTox Work Order No:
252650

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 (652) +

Field Sampler Name (print): Cynthia Chapee

Signature: *CME*

Affiliation: Ops

Sample Storage (prior to shipping): NA

Custody Relinquished by: NA

Date/Time Shipped: 2023/09/12 2pm

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

Phone: (705) 848-9191

Fax: (705) 848-5814

Contact:

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	Lemma minor Growth	Pseudokirchneriella subcapitata Growth	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2023-09-12	10:05	D3-4	79331	19°C	✓		✓			✓				✓		1x20L, 3x4L
2023-09-12	11:00	D-2	79332	19°C	✓		✓			✓				✓		"

For Lab Use Only

Received By: *NM/AJS*

Date: 2023-09-13

Time: 13:00

Storage Location: _____

Storage Temp. (°C) _____

Please list any special requests or instructions:
