



JAMES BAY LITHIUM MINE ENVIRONMENTAL IMPACT ASSESSMENT

JULY 2021 (VERSION 2)





**JAMES BAY LITHIUM MINE
ENVIRONMENTAL IMPACT ASSESSMENT
GALAXY LITHIUM (CANADA) INC.**

PROJECT NO.: 201-12362-00
DATE: JULY 2021 (VERSION 2)



Environmental Impact Assessment submitted to

Environmental and Social Impact Review Committee (COMEX)
(File No.: 3214-14-055)

And to

Canadian Environmental Assessment Agency

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Overall conditions can only be extrapolated to an undefined limited area around these testing and sampling locations. The conditions that WSP interprets to exist between testing and sampling points may differ from those that actually exist. The accuracy of any extrapolation and interpretation beyond the sampling locations will depend on natural conditions, the history of Site development and changes through construction and other activities. In addition, analysis has been carried out for the identified chemical and physical parameters only, and it should not be inferred that other chemical species or physical conditions are not present. WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.]

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This limitations statement is considered part of this report.

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TABLES OF CONCORDANCE

Tables 1 and 2 present the concordance between the information presented in the environmental impact assessment (EIA) of the James Bay Lithium Mine project of Galaxy Lithium (Canada) and the requirements set out in the documents titled Guidelines for the Preparation of an Environmental Impact Statement pursuant to the Canadian Environmental Assessment Act, 2012 of the Canadian Environmental Assessment Agency (CEAA) and Directive pour le projet de mine de lithium Baie James of the Ministère du développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC).

In addition, since the filing of the first version of the impact study (2018), the concordance (CEAA) and admissibility (MELCC) of the impact study have been obtained. Table 3 indicates the sections of the impact study where modifications have been made following the responses given to the various ministries as part of the concordance and admissibility analyzes and during the environmental analysis process since the submission of the first version of the impact study (WSP, 2018).

This version of the impact study therefore not only continues an update of the first version based on the optimization of the project design, but also brings together all the information and details submitted to the various ministries since the filing of the first version of the EIA in 2018. This document is considered up-to-date as of the date of its publication.

Table 1 Table of concordance between the sections of the CEAA guidelines and the EIA

Section of the CEAA Guidelines	Corresponding Chapter or Section of the EIA
1. INTRODUCTION AND OVERVIEW	
1.1. The proponent	1.1; 1.2; 1.6
1.2. Project overview	1.5; 4
1.3. Project location	1.4; 1.5.1; 6.1; 6.2; 6.3; 6.4; 8.5.4.1;
1.4. Regulatory framework and the role of government	2.4; 6.4.3
2. PROJECT JUSTIFICATION AND ALTERNATIVES CONSIDERED	
2.1. Purpose of the project	2.3
2.2. Alternative means of carrying out the project	3, 4.14
3. PROJECT DESCRIPTION	
3.1. Project components	4.1 à 4.12
3.2. Project activities	4.4 à 4.13
3.2.1. Site preparation and construction	4.4
3.2.2. Operation	4.5 à 4.12
3.2.3. Decommissioning and abandonment	4.13
4. PUBLIC CONSULTATION AND CONCERNS	
Public consultation and concerns Consultation et préoccupation du public	5
5. CONSULTATION WITH INDIGENOUS NATIONS AND CONCERNS RAISED	
5.1. Aboriginal nations and consultation activities	5
6. PROJECT EFFECTS ASSESSMENT	
6.1. Project setting and baseline conditions	6

Section of the CEEA Guidelines	Corresponding Chapter or Section of the EIA
6.1.1. Atmospheric, light and noise environment	6.2.10; 6.2.11; 6.2.12
6.1.2. Geology and geochemistry	6.2.2; 4.1, 4.7
6.1.3. Topography, terrestrial environments and soil	6.2.4; 6.2.5; 6.2.6; 6.2.9
6.1.4. Riparian and wetland environments	6.2.7 et 6.3.1 à 6.3.6
6.1.5. Groundwater and surface water	6.2.6; 6.2.7; 6.2.8
6.1.6. Fish and fish habitat	6.3.3; 6.2.7
6.1.7. Migratory birds and their habitats	6.3.5
6.1.8. Species at Risk	6.3; 8.5.4; 9.1.2.2
6.1.9. Indigenous peoples	2.4; 6.4; 8.6.2
6.1.10. Other changes to the environment arising as a result of a federal decision or due to changes on federal lands, in another province or outside Canada	NA
6.1.11. Human environment	6.4
6.2. Predicted changes to the physical environment	7.2
6.2.1. Changes to atmospheric, sound and light environments	7.2.5; 7.2.6; 7.2.7
6.2.2. Changes to groundwater and surface water	7.2.2; 7.2.3; 7.2.4
6.2.3. Changes to riparian, wetland and terrestrial environments	7.2.1; 7.2.2; 7.2.3
6.3. Predicted effects on valued components	7.2; 7.3; 7.4
6.3.1. Fish and fish habitat	7.2.2; 7.2.3; 7.2.4; 7.3.4
6.3.2. Migratory birds	7.3.5
6.3.3. Species at risk	7.3
6.3.4. Indigenous peoples	7.4
6.3.5. Other valued components that may be affected as a result of a federal decision or due to effects on federal lands, another province or outside Canada	NA
6.4. Mitigation measures	7.1
6.5. Significance of residual effects	7.1 to 7.5
6.6. Other effects to consider	8 et 9
6.6.1. Effects of potential accidents or malfunctions	9
6.6.2. Effects of the environment on the project	9.2.1
6.6.3. Cumulative effects assessment	8
7. SUMMARY OF ENVIRONMENTAL EFFECTS ASSESSMENT	
Summary of Environmental Effects Assessment	7.5
8. FOLLOW-UP AND MONITORING PROGRAMS	
8.1. Follow-up program	10.3; 10.4
8.2. Monitoring Program	10.2

Table 2 Table of concordance between the sections of MDDELCC directive and the EIA

Section of the MDDELCC directive		Corresponding chapter or section of the EIA
1.1	Presentation of the proponent	1.1; 1.2
1.2	Context relating to the project	1.5; 1.6; 2; 4; 6.1.1;
1.3	Purpose of the project	2.3
2.1	Location and route variants	3.1.2; 3.1.3; 3.2.5, 4.14
2.2	Technological variants	3.1.1; 3.2.1 à 3.2.4; 3.3; 3.4, 4.15
3.1	Description of the deposit and the facilities	4.1 à 4.3; 4.11
3.2	Extraction	4.5
3.3	Ore processing	4.6
3.4	Waste and tailings management	4.8
3.5	Water management	4.9
3.6	Water balance	4.9.3 à 4.9.6
3.7	Treatment and discharge of contaminated water	4.9
3.7.1	Water treatment	4.9.1 à 4.9.3; 4.10.2
3.7.2	Effluent(s)	4.9; 4.10.2
3.8	Related developments and projects	
3.8.1	Access infrastructure	4.11.2; 4.11.3
3.8.2	Lodging infrastructure	4.11.4
3.8.3	Transportation and storage of fuels or hazardous materials	4.10.4; 4.13.1; 4.13.3; 4.16.2
3.8.4	Borrow pits	4.4.3; 4.4.5; 4.8.2; 4.9.4
3.8.5	Concentrate transport	4.12
3.8.2	Energy supply	3.4; 3.5; 4.3
3.8.2	Employment and training	1.6.3; 2.3; 4.13, 6.4.3.4
4.1	Study area boundaries	6.1
4.2.1	Biophysical environment	6.2; 6.3
4.2.2	Archeological and cultural potential	6.4.9
4.2.3	Social environment	6.4
5.1	Determination and evaluation of the impacts	7
5.2	Cumulative impacts	8
6.	MITIGATION MEASURES, RESIDUAL IMPACTS AND COMPENSATORY MEASURE	
6.1	Mitigation of impacts	7.1 to 7.4
6.2	Residual impacts and compensatory measures	7.1 to 7.5; 8.6.2
7.	RISK MANAGEMENT	
7.1	Risks of technological accidents	9.3
7.2	Safety measures	9.3
7.3	Preliminary emergency response plans	9.4
8	MONITORING AND FOLLOW-UP PROGRAM	
8.1	Monitoring program	10.2
8.2	Environmental and social tracking program	10.3; 10.4

Table 3 Identification of bonifications made to the chapters of the EIA updated according to the answers submitted to the different ministries between 2019 and 2020

Section in the Impact Study	Question No.
2.0 Project context and rationale	Federal (concordance): ACÉE-52, ACÉE-53, ACÉE-54 Federal (first series): ACÉE-72 Federal (CCE) CCE-1 Provincial QC-1 QC-2 QC-3
3.0 Project Alternatives	Federal (concordance): ACÉE-55, ACÉE-56 Federal (first series): ACÉE-5
3.1.1 Deposition Methods	Provincial: QC-4, QC-5, QC-6, QC2-2
3.1.2 Location of Waste Rock and Tailings Stockpiles	Provincial: QC-7 Federal (first series): ACÉE-6, ACÉE-7 Federal (CCE): CCE-46
3.3.3 Location of Overburden Stockpiles	Federal (concordance): ACÉE-3
3.4 Power Supply at the Mine Site	Provincial QC-8, QC-10, QC-11, QC-12, QC2-3, QC2-4, QC3-1
3.5 Power Supply for Mobile Equipment	Provincial: QC-13, QC-14, QC2-5, QC3-2, QC3-3
4.0 Project Description	Provincial: QC3-4 Federal (concordance): ACÉE-4, ACÉE-6, ACÉE-7, ACÉE-51 Federal (first series): ACÉE-11,
4.4.2 Logistics	Federal (concordance): ACÉE-59 Federal (first series): ACÉE-20
4.4.3 Quarry and Borrow Pits	Provincial: QC-17, QC-18, QC2-6, QC2-7, QC2-8, QC3-5 Federal (first series): ACÉE-12, ACÉE-50 Federal (CCE): CCE-49, CCE-54
4.4.4 Laydown and Concrete Batch Plant	Federal (first series): ACÉE-13 Federal (CCE): CCE-50
4.7 Geochemical characterization	Provincial: QC-20, QC-21, QC-22, QC-23, QC-24, QC-25, QC-26, QC2-9, QC2-10, QC3-6 Federal (concordance): ACÉE-71, ACÉE-74, ACÉE-75, ACÉE-76, ACÉE-77 Federal (first series): ACÉE-51, ACÉE-52, ACÉE-53, Federal (CCE): CCE-54, CCE-55
4.8 Stockpiles	Federal (concordance): ACÉE-58 Federal (first series): ACÉE-18, ACÉE-42, ACÉE-54 Federal (CCE): CCE-56
4.8.2 Waste Rocks and Tailings	Provincial: QC-6, QC-27, QC-28, QC-29, QC-30, QC-31, QC-32, QC2-1, QC2-2, QC2-12, QC2-15, QC3-8 Federal (CCE): CCE-48

Section in the Impact Study

Question No.

4.8.3 Ore	Provincial: QC2-13 Federal (CCE): CCE-52
4.9 Water Management	Provincial: QC2-11, Qc3-10 Federal (concordance): ACÉE-60, ACÉE-61, ACÉE-62, ACÉE-63, ACÉE-64 Federal (first series): ACÉE-38, ACÉE-39, ACÉE-40, ACÉE-41, ACÉE-75 Federal (CCE): CCE-3, CCE-47, CCE-51, CCE-57, CCE-59
4.9.1 Design Parameters	Provincial: QC-33, QC-34, QC-35, QC-36, QC-45
4.9.2 Infrastructure	Provincial: QC-37, QC-38, QC-39, QC-40, QC2-16, QC3-9 Federal (first series): ACÉE-14, ACÉE-27, ACÉE-45, ACÉE-46
4.9.3 Water Balance	Provincial: QC-42, QC-43, QC-44, QC2-17,
4.9.4 During the Construction Phase	Federal (concordance): ACÉE-9, ACÉE-10, ACÉE-11 Federal (first series): ACÉE-34, ACÉE-35, ACÉE-36
4.10.1 Air Emissions	Provincial: QC-47, QC-48 Federal (first series): ACÉE-66, ACÉE-67, ACÉE-68
4.10.2 Waste Water Discharge	Provincial: QC-49, QC-50, QC-51, QC-52, QC-53, QC-54, QC-55, QC-56 Federal (first series): ACÉE-37
4.10.3 Residual Material	Provincial: QC-16 Federal (first series): ACÉE-19 Federal (CCE): CCE-61
4.10.4 Residual Hazardous Material	Provincial: QC-57, QC-58,
4.11.1 Site Buildings	Provincial: QC-59, QC-60
4.11.2 Site Access Road	Provincial: QC-61, QC-62 Federal (concordance): ACÉE-66 Federal (first series): ACÉE-16
4.11.3 Services Access Roads	Federal (first series): ACÉE-44, ACÉE-74
4.11.4 Accommodation	Provincial: QC-64
4.11.6 Fuel Storage	Provincial: QC-65, QC-66,
4.11.7 Power Line	Provincial: QC-67, QC-68, QC-69, QC2-18 Federal (first series): ACÉE-15
4.11.10 Explosives Magazine	Federal (first series): ACÉE-17, ACÉE-43
4.11.11 Optical Fiber Cable	Provincial: QC-70
4.12 Concentrate Transport to Matagami	Provincial: QC-71 Federal (first series): ACÉE-21

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4.13 Mine Restoration	Provincial: QC-72, QC-73, QC-74, QC-75, QC2-21, QC3-7, QC3-11 Federal (concordance): ACÉE-12 Federal (first series): ACÉE-32, ACÉE-55 Federal (CCE): CCE-30, CCE-31, CCE-53
4.15.1 Air Transport	Provincial: QC-76, QC2-40
4.15.3 Use of a Conveyor System	Provincial: QC-78
4.15.5 Use of the Camp at the Truck Stop	Provincial: QC-77, QC2-20
4.16.2 Sustainable Development Principles Applied to the Project	Provincial: QC-80, QC-81
5.0 Public Hearings	Federal (first series): ACÉE-94, ACÉE-95 Provincial: QC3-34
5.3.6 Consent and Validation of Minutes	Federal (concordance): ACÉE-69
5.4.1.3 2018 – 2021 Period	Provincial: QC-82, QC-83 Federal (concordance): ACÉE-67
5.7.1 Impact Benefit Agreement	Provincial: QC-84, QC-148
6.0 Description of the Receiving Environment	Federal (concordance): ACÉE-50
6.1.2 Local Study Area	Federal (first series): ACÉE-1
6.2.7 Hydrography	Federal (concordance): ACÉE-21, ACÉE-22, ACÉE-79 Federal (CCE): CCE-4A
6.2.8.1 Surface Water	Provincial: QC-89
6.2.8.2 Groundwater Quality	Provincial: QC-91
6.2.9.1 Soil	Provincial: QC-92, QC-93, QC-174, QC-175, QC2-23, QC2-24, QC3-12, QC3-13, QC3-14, QC3-15, QC3-16 Federal (concordance): ACÉE-72 Federal (first series): ACÉE-48, ACÉE-49
6.2.9.2 Sediments	Provincial: QC-95, QC2-25, QC2-26 Federal (first series): ACÉE-57
6.2.10 Air Quality	Federal (first series): ACÉE-58, ACÉE-59 Federal CCE-14
6.2.11 Ambient Noise	Federal (concordance): ACÉE-19-1, ACÉE-19-2, ACÉE-70, ACÉE-80
6.3 Biological Environment	Federal (concordance et 1ere série): ACÉE-24, ACÉE-25, ACÉE-26, ACÉE-27, ACÉE-28, ACÉE-29, ACÉE-30, ACÉE-70, ACÉE-77, ACÉE-78, ACÉE-85, ACÉE-86, ACÉE-87, ACÉE-88), Provincial: QC-90, QC-96, QC-97, QC-98, QC-99, QC-100, QC-101, QC-128, QC2-28, QC2-29, QC2-37, QC2-38, QC2-53, QC2-54, QC3-30, QC3-31 ,
6.4 Human Environment	
6.4.1 Study Area	Provincial: QC-83; QC-85, QC-86

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6.4.4.6 Development Projects	Federal (first series): ACÉE-95b
6.4.5.2 Social Environment	Federal (first series) ACÉE-116
6.4.6 Land Use	Provincial: QC-87, QC-104, QC-110 Federal (concordance): ACÉE-13, ACÉE-14-1, ACÉE-15, ACÉE-31-4, ACÉE-31-5, ACÉE-31-6, ACÉE-32, ACÉE-35, ACÉE-36 Federal (first series): ACÉE-94
6.4.6.1 Current Use of Land and Resources for Traditional Purposes	Provincial QC-85, QC-86, QC-87, QC-102, QC-103, QC2-31 Federal (concordance) ACÉE-31-1, ACÉE-31-2, ACÉE-31-3, ACÉE-31-5, ACÉE-35, ACÉE-42, ACÉE-48 Federal (first series) ACÉE-95, ACÉE-100, ACÉE-88D, ACÉE-91A, ACÉE-96, ACÉE-113
6.4.6.2 Vacations and Recreational Activities	Federal (concordance): ACÉE-36, ACÉE-48 Federal (first series): ACÉE-95
6.4.7.1 Roads	Federal (first series): ACÉE-94
6.4.7.5 Km 381 Truck Stop and Remote Landfill	Provincial: QC-41, QC-103, QC2-20
6.4.8 Landscape	Federal (concordance): ACÉE-13
6.4.9.1 Natural Heritage	Provincial: QC-105, QC-106, Federal (concordance): ACÉE-13
6.4.9.2 Archaeology	Provincial QC-107, QC-108, QC-109, QC2-32, QC2-33, QV3-17, QC3-18 Federal (concordance) ACÉE-13, ACÉE-14 Federal (first series): ACÉE-117 Federal (CCE) CCE-39
7.0 Identification and Assessment of Environmental Impacts	
7.1. Impact Assessment Method	Provincial QC-110 Federal (concordance): ACÉE-13, ACÉE-49 Federal (first series): ACÉE-3, ACÉE-4
7.1.3 Impact Assessment	Provincial: QC-110, QC-111, QC-138 Federal (concordance): ACÉE-68 Federal (first series): ACÉE-76
7.1.1.2 Environmental Components	Provincial: QC-110
7.2.1 Soils	Provincial: QC-112 Federal (first series): ACÉE-56
7.2.2 Hydrogeology	Provincial: QC-113, QC-114, QC2-14 Federal (first series): ACÉE-23, ACÉE-24, ACÉE-25, ACÉE-26, ACÉE-28, ACÉE-30 Federal (CCE): CCE-1, CCE-2

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7.2.3 Hydrological Regime	Provincial: QC-116, QC-117 Federal (first series): ACÉE-29 Federal (CCE): CCE-4
7.2.4 Water and sediments	Provincial: QC-118, Qc-119, QC-120, QC2-34, Federal (concordance): ACÉE-81 Federal (first series): ACÉE-30, ACÉE-31, ACÉE-47
7.2.5 Atmosphere	Provincial: QC-121, QC-122, QC-123, QC2-35, QC3-19, QC3-20, QC3-21 Federal (concordance): ACÉE-33, ACÉE-34 Federal (first series): ACÉE-60, ACÉE-61, ACÉE-62, ACÉE-63, ACÉE-64, ACÉE-65, ACÉE-111 Federal (CCE): CCE-15, CCE-16, CCE-21, CCE-22, CCE-23
7.2.7 Ambient Noise	Federal (CCE): CCE-19, CCE-20
7.2.8 Vibrations and Overpressure	Provincial: QC-124
7.3 Impacts on the Biological Environment	Provincial: QC-19, QC-63, QC-126, QC-127, QC-131, QC-132, QC-133, QC-134, QC-135, QC2-28, QC2-36, QC2- 39, QC3-22, QC3-23, QC3-24 Federal (concordance): ACÉE-8, ACÉE-35, ACÉE-37, ACÉE-38, ACÉE-39, ACÉE-40, ACÉE-41, ACÉE-73, ACÉE-74, ACÉE-75, ACÉE-76, ACÉE-83, ACÉE-84, ACÉE-85 Federal (first series): ACÉE-71, ACÉE-73, ACÉE-79, ACÉE-80, ACÉE-81, ACÉE-82, ACÉE-89 Federal (CCE): CCE-5, CCE-6, CCE-11, CCE-12, CCE-13, CCE-24, CCE-37, CCE-61, CCE-62
7.4 Impacts on the Social Environment	Provincial: QC2-43, QC2-44 Federal (concordance): ACÉE-16, ACÉE-17, ACÉE-18, ACÉE-48
7.4.1 Current Use of Land and Resources for Traditional Purposes	Provincial QC-87, QC-138, QC-139 Federal (concordance): ACÉE-14-2, ACÉE-32, ACÉE-35, ACÉE-42, ACÉE-43, ACÉE-44, ACÉE-45 Federal (first series) ACÉE-95, ACÉE-98, ACÉE-99, ACÉE-10, ACÉE-101, ACÉE-102, ACÉE-104, ACÉE-114, ACÉE-115, ACÉE-116 Federal (CCE): CCE-25, CCE-26, CCE-32, CCE-33, CCE-34, CCE-35, CCE-36, CCE-38

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7.4.2 Infrastructure	Provincial QC-140, QC-141, Federal (first series) ACÉE-92, ACÉE-94, ACÉE-101 Federal (CCE): CCE-27, CCE-28, CCE-29
7.4.3 Perception of the Physical and Natural Environment	Provincial QC-110, QC-136 Federal (concordance) ACÉE-15
7.4.4 Quality of Life	Provincial QC-138, QC-140, QC-142, QC-143, QC-144, QC2-41, QC2-42, QC3-25 Federal (first series) ACÉE-94, ACÉE-101, ACÉE-116 Federal (CCE): CCE-29, CCE-42, CCE-43
7.4.5 Local and Regional Economy	Provincial QC-138, QC-140, QC-145, QC-146, QC-148 Federal (first series) ACÉE-92, ACÉE-93, ACÉE-116
7.4.6 Heritage and Archaeology	Provincial QC-149, QC2-31 Federal (concordance) ACÉE-31, ACÉE-43, ACÉE-46, ACÉE-117
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ABBREVIATIONS AND ACRONYMS

ANFO	Ammonium Nitrate / Fuel Oil
ARIA	<i>Analyse, Recherche et Information sur les Accidents</i> (database)
CAPEX	Capital expenditures
CCME	Canadian Council of the Ministers of the Environment
CBHSSJB	Cree Board of Health and Social Services of James Bay
CDPNQ	<i>Centre de données sur le patrimoine naturel du Québec</i>
CEAA	<i>Canadian Environmental Assessment Act</i>
CFPBJ	Centre de formation professionnelle de la Baie-James
CHRD	Cree Human Resources Department
CMC	Community Miyupimaatisiun (health) Centre
CNG	Cree Nation Government
COMEX	Review committee
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRRNTBJ	Regional Commission on Natural Resources and the James Bay Territory
CSB	Cree School Board
CTEU-9	Water leaching test
DMS	Dense media separation
EC/ha	Equivalent-couple per hectare
EDOs	Effluent Discharge Objectives
EIA	Environmental impact assessment
EIJB	Eeyou Istchee James Bay
EIJBRG	Eeyou Istchee James Bay Regional Government
EMP	Emergency measures plan
ÉPOQ	<i>Étude des populations d'oiseaux du Québec</i>
EQA	<i>Environment Quality Act</i>
GCC	Grand Council of the Crees
GHG	Greenhouse gas
IAAC	Impact Assessment Agency of Canada
INSPQ	Institut national de santé publique du Québec
ISQ	Institut de la statistique du Québec
ISP	Cree Hunters and Trappers Income Security Program
JBNQA	James Bay and Northern Québec Agreement
LDL	Laboratory detection limit
Li ₂ O	Lithium oxide

LNG	Liquefied natural gas
LPFS	Low-pressure feed system
MABA	Static test to predict acid generation potential
MDDELCC	Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques
MELCC	Ministère de l'Environnement et de la Lutte contre les changements climatiques
MDMER	<i>Metal and Diamond Mining Effluent Regulations</i>
MEND	Mine Environment Neutral Drainage program
MERN	Ministère de l'Énergie et des Ressources naturelles
MFFP	Ministère des Forêts, de la Faune et des Parcs
MIACC	Major Industrial Accidents Council of Canada
MRNF	Ministère des Ressources naturelles et de la Faune
MTQ	Ministère des Transports du Québec
NBC	Natural background content
Non-PAG	Non-potentially acid generating
NRCan	Natural Resources Canada
NTU	Nephelometric Turbidity Units
OPEX	Operating expenditures
PAG	Potentially acid generating
RES	<i>Résurgence dans les eaux de surface</i>
SARA	<i>Species at Risk Act</i>
SDBJ	Société de développement de la Baie-James
SOPFEU	Société de protection des forêts contre le feu
SPLP	Synthetic Precipitation Leachate Procedure
TCLP	Toxicity Characteristic Leachate Procedure
TJCM	Table jamésienne de concertation minière
TOC	Total organic carbon
UGAF	Unité de gestion des animaux à fourrure
URSTM	Unité de recherche et de service en technologie minérale (UQAT)
VCs	Values components
WEDC	Wabannutao Eeyou Development Corporation
WHMIS	Workplace Hazardous Materials Information System
WNS	White-nose syndrome
WSI	Weh-Sees Indohoun
WTP	Water treatment plant

GLOSSARY

Term / Symbol	Description
Accident	Any unforeseen and sudden event that causes or is likely to cause personal injuries or damage buildings, facilities, materials, the environment or living beings.
Acid-generating potential	The acid-generating potential associated with the oxidation of tailings.
Acute toxicity	A biological test result that exceeds the standard threshold of mortality of the tested species. It measures the inherent capacity or potential of a toxic substance to cause adverse effects (mortality) in a living organism. In the present context, it refers to a mine effluent that reaches the acute lethality level.
Anthropogenic	Refers to phenomena that essentially result from man's direct or indirect intervention.
Aquifer	A geological stratum or formation that is sufficiently porous and permeable to stock a significant quantity of water while being sufficiently permeable to allow water to flow freely through it.
Aquifer potential	The capacity to provide a high and sustained flow of groundwater. This potential depends on the geometrical characteristics, hydraulic conductivity and recharge rate of the aquifers.
Auto-ignition temperature	The lowest temperature of a hot surface from which, under certain specific conditions, the ignition of a flammable substance in the form of a mix of gas or vapour with air is possible.
Background concentration	The concentration of a chemical substance that corresponds to said substance's ambient presence.
Banded gneiss	Gneiss in which dark and light decimetric horizons alternate regularly.
Basalt	A volcanic magmatic rock produced by rapidly cooled magma and characterized by the following mineralogical composition: plagioclase (50%), pyroxenes (25–40%), olivine (10–25%) and magnetite (2–3%).
Beaver pond	A body of water that is usually shallow (a few metres deep) and was created by the presence of a beaver dam.
Benthic invertebrates	Small animals that do not have a spine (such as insects and mollusks) and that live at the bottom of water bodies.
Carbon oxide equivalent (CO ₂ eq.)	A unit used to compare the radiative forcing of a GHG to carbon dioxide.
Claim	The only exploration mineral title on public land that confers on its holder the exclusive right to search for mineral substances, with the exception of surface mineral substances.
Compensatory measure	A measure, excluding the planned treatment of the mine's wastewater, aimed at compensating the residual impacts of the implementation of a project.
Concentrate	A substance of value that results from the spodumene concentration process and that contains approximately 6% of lithium oxide (Li ₂ O).
Contaminants	A solid, liquid or gaseous matter, microorganism, sound, vibration, ray, heat, odour, radiation or any combination thereof that is likely to somehow alter the quality of water or the environment.
Contaminated water	Water in which the concentration of any chemical substance exceeds its natural concentration because of mining activities (D019).
Criteria	Concentrations of a contaminant that, if they are exceeded, risk causing a complete or partial loss of the use for which they were established.

Term / Symbol	Description
Dense media separation	A density separation process that uses different material densities to apply gravity separation. This robust process is effective to separate minerals, mineralized bodies and metallic waste.
Deposit	A series of mineral layers in the ground. A mineralized zone that is large enough to justify its commercial development.
Dewatering	The action of evacuating infiltration water from a mine.
Diabase	A mafic igneous, holocrystalline rock that is equivalent to volcanic basalt or plutonic gabbro and is slightly modified by metamorphism.
Dike	A long construction designed to contain water.
Dyke (geology)	In geology, a dyke (or dike) is a tabular body of magmatic rock that has penetrated into a fracture through different layers of rock. Dykes cut through pre-existing rock vertically or quasi-vertically. A dyke can also be composed of sedimentary deposits in a pre-existing fissure.
Drainage system	A system that is used namely to intercept the mine site's drainage water and direct it to treatment units. It can also designate a system used to redirect uncontaminated runoff water to the periphery of the mine site.
Effect	The consequence of an accident: toxic concentration, thermal radiation, thermal load, overpressure.
Effect threshold	A value of toxic concentration (ppm or mg/m ³), thermal radiation (kW/m ²), thermal load ((kW/m ²) ⁴ /3*s) or overpressure (kPa) from which effects on life or health could be observed within an exposed population or structural damage could result.
Effluent Discharge Objectives	The maximum concentrations and loads of different contaminants that may be released into a receiving environment while ensuring the maintenance or retrieval of their uses.
Elevation	The vertical distance measured between a point located on the Earth's surface and a reference surface (usually the mean sea level).
Emission factor	A factor relating activity data to increased or decreased GHG levels.
Exfiltration	The movement of water from a saturated substrate through the surface of this substrate under the effect of a hydraulic gradient.
Expected detection limit	The detection limit associated with the analytical method of a given parameter specified in the list of analytical methods published by the Centre d'analyse environnementale du Québec of the Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques du Québec.
Extraction	The action of removing mineral material from excavation - open pit or underground.
Extraction capacity	The maximum quantity (in tons per day) of material that is extractable under optimal equipment conditions.
Filter press	An intermittently operating filter consisting of a series of flat vertical filtering surfaces into which the pulp to be filtered is injected under pressure. The pulp is released by separating the filter plates.
Final effluent	Mine wastewater that is no longer treated before being released at the discharge point into the receiving environment or a sewer system.
Final effluent discharge point	A point beyond which an operator no longer has control over the final effluent and can no longer improve its quality.
Flammable (or explosive) limits	When mixed with the oxygen in air, certain gasses or vapours emitted by certain liquids are flammable within the limits of a determined concentration range. Said limits are expressed in % by volume in the air with respect to the ambient temperature and atmospheric pressure. They are called: LFL: lower flammable limit (or LEL: lower explosive limit); UFL: upper flammable limit (or UEL: upper explosive limit).

Term / Symbol	Description
Flashpoint (for liquids)	The lowest temperature at which a liquid, at atmospheric pressure, emits a sufficient quantity of vapours to ignite in the presence of a flame.
Flood period	A significant increase in the water flow (and consequently the level) of a watercourse, a lake or a reservoir, most often attributable to precipitations or melting snow.
Flooded area	A terrestrial environment that has recently been affected by a rise of the water level attributable to an external activity, such as the construction of a beaver dam, without, however, having defined limits such as a beaver pond, or presenting hygrophile plants (e.g., rising waters along a lake's shores because of a beaver dam restricting its outflow).
Flow facies	The aspect of a watercourse defined by water height, flow speed and type of substrate. There are eight types of flow facies: waterfalls, cascades, rapids, rises, channels, meanders, basins and estuaries.
Fluvial deposits	Well-stratified deposits carried by a watercourse and composed of gravel, sand and—in lesser proportions—loam, clay and (occasionally) organic matter.
Forest management unit	A basic territorial unit used to manage the forest in such a way as to supply wood processing plants. It is also on the basis of this unit that potential annual sustainable yields are established.
Forest stand	A group of trees that forms a rather homogeneous whole, in terms namely of floristic composition, structure, age and spatial distribution to set is apart from neighbouring stands.
Formation (geological)	A body of rock identified by its lithologic features and stratigraphic position.
Freeboard	The vertical distance separating the embankment crest and the maximum water level in the tailings area.
Freshwater	Water drawn from the natural environment (surface water or groundwater) or from an aqueduct.
Geochemistry	The study of the chemical behaviour of the elements, in particular in rocks (magmatic, metamorphic and sedimentary) as well as in water (coastal and marine) and the atmosphere.
Geological province	A geological province is an extensive continental region that corresponds to a morphostructural set of the terrestrial globe. There are three main types of geological provinces, which are occasionally divided into subtypes: cratons, mountain ranges corresponding to zones of recent orogeny and magmatic provinces.
Geology	A science that includes the study of the parts of the Earth that can be observed directly and the development of hypotheses to reconstitute their history and explain how they fit together. The main geological disciplines are petrography, la mineralogy, la crystallography, volcanology, sedimentology, geochemistry, stratigraphy, tectonics, structure, paleontology and geomorphology.
Geomorphology	The study of the evolution of the Earth's topographic features and the causes of this evolution. This science is midway between geology and geography.
Glaciofluvial deposits	Continental sediments originating from matter ripped off by a glacier and carried by a watercourse.
Global warming potential	A factor that describes the impact of the radiative forcing of one unit of a given greenhouse gas compared to one equivalent unit of carbon dioxide for a defined period.
Gneiss	Metamorphic rock from the continental crust that contains particles of quartz, mica, plagioclase feldspar and (occasionally) alkali feldspar that are all visible to the naked eye.
Greenhouse gas	Gaseous component in the atmosphere, both natural and artificial, that absorbs and re-radiates the infrared radiation of a specific wavelength emitted by the surface of the Earth, the atmosphere and the clouds.
Greenhouse gas source	A physical unit or process that releases a GHG into the atmosphere.
Groundwater flow system	The hydrodynamic characteristics of the movement of groundwater in an aquifer over time.
Hauling road	A road taken by motor vehicles in an open-pit mine.

Term / Symbol	Description
Hazardous material	A material which, by reason of its properties, is a hazard to health or to the environment and which is explosive, gaseous, flammable, poisonous, radioactive, corrosive, oxidizing or leachable or is designated as a hazardous material, and any object classed by regulation as a hazardous material by virtue of the <i>Environment Quality Act</i> .
High water	Elevation of the water level following abundant rainfalls or melting snow or ice.
High-water mark	This line is located at the natural high-water mark, i.e., where the predominance of aquatic plants passes to a predominance of terrestrial plants or, if there are no aquatic plants, where the terrestrial plants stop towards the body of water. This mark delineates the shorelines and shores of lakes and watercourses.
Home range	The area where an animal normally lives and that enables it to satisfy its basic needs.
Hydraulic conductivity	A property of geological materials that characterizes the ease with which they allow the movement of water.
Hydraulic property	Hydraulic properties make it possible to analyze in quantitative terms the capacity of a geological formation to contain water and allow it to flow. These properties depend on the properties of the liquid, i.e., water, and the physical properties of the environment with respect to water storage and flow.
Hydrogeological conditions	A set of elements and characteristics that define the hydrology (groundwater science) and geology of a sector. It includes, among other things, the hydrostratigraphic units, granulometry and hydraulic properties of geological materials as well as groundwater levels and characteristics.
Hydrogeological property	Refer to Hydrogeological conditions.
Hydrogeological unit	A permeable and porous geological unit, delimited by one or several impermeable units, the whole of which has a structure that allows to form and feed, at least temporarily, a groundwater table within the permeable unit.
Hydrogeology	A geological discipline that studies groundwater (the underground flow of water, the search for groundwater, the evaluation of reservoirs, possible catchments and flows).
Hydrostratigraphic units	Geological units (superficial deposits or rocks) that are characterized by a distinct flow of the groundwater in consideration of their respective permeability levels.
Ignition	The state of a burning body.
<i>In situ</i>	Latin expression that means on site.
Invasive alien species	An invasive alien species is a plant, animal or microorganism (virus, bacterium or fungus) that is introduced outside of its natural range. Its establishment and spreading may constitute a threat to the environment, economy or society.
Land use	The traditional and contemporary use of resources and the full occupation of the traditional territory.
Lands in the domain of the State or public lands	Public lands in Québec.
Leaching	The dissolution of certain mineral constituents.
Leaching tests	These tests make it possible to establish the risks associated with the potential leaching of toxic substances into the groundwater table.

Term / Symbol	Description
Lithium	A soft alkaline metal that is silver-white in colour and that has the lowest molar mass and density of all metals. Its lightness and high reactivity make it particularly suitable for use in the manufacturing of batteries as well as in a variety of industrial processes. The applications of lithium are highly diverse and include the manufacturing of glass and ceramics, lubricants, polymers and pharmaceutical products, the purification of air and, recently and especially, the manufacturing of lithium ion batteries.
Lithostratigraphic	In geology, regarding lithostratigraphy, the branch of stratigraphy that analyzes the organization of strata based on lithologic criteria (composition of the sediments or rocks, including physical and chemical characteristics such as colour, mineralogical composition, harness or grain size).
Lixiviation	A technique consisting of using a solvent, namely water flowing in the soil or a substrate containing toxic products, to extract soluble products.
Low water level	The lowest recorded level of a watercourse or any other body of water.
Low-water period	The period of the year during which the flow of a watercourse reaches its lowest level (minimum flow).
Lugeon test	The Lugeon test consists of injecting pressurized water into a cavity comprised of a portion of a drilling of known dimensions and of measuring the injection rate at different pressure levels over a given period.
Marsh	A wetland that is dominated by herbaceous vegetation (emergent, grass-like or broad-leaved) growing in a mineral or organic soil. Shrubs and trees, when present, cover at least 25% of the environment's surface area. A marsh is usually connected to fluvial, riparian and lacustrine areas and its water level varies according to tides, flooding and evapotranspiration. A marsh may be flooded on a permanent, semi-permanent or temporary basis.
Maternity	A fauna breeding site.
Measurement site	The location where water samples are taken to analyze the quality of the final effluent and measure the flow and the pH. The measurement site is located immediately upstream of the final effluent discharge point.
Mine	A set of surface and underground infrastructures, with the exception of pits covered by the <i>Regulation respecting pits and quarries</i> (R.Q. c.Q-2, r.2), designed to extract mineral for economic purpose.
Mine site	A site on which unfolds or had unfolded work to explore or develop a mineral deposit, to extract or process the material. Includes, without limiting the generality of the foregoing, mines, surface infrastructures, storage areas, stockpile areas, and basins as well as adjacent cleared or disrupted sectors.
Mine water	Water, not including domestic wastewater, that is pumped from a mine excavation to keep it dry during exploration and development operations.
Mining lease	A mineral title that confers on its holder, on a given public territory, the exclusive right to mine mineral substances, except for those found on the surface. Since 1966, mining leases have replaced mining claims for new applications to operate.
Mitigation measure	A measure designed to reduce or eliminate the adverse effects of a project.
Modelling	The design of a model, i.e., a diagram representing a defined system, chosen following its intended use, followed by the development of a simulator (or an analogue, digital or other simulation model) of the system.

Term / Symbol	Description
Observation well	A well used to observe, on an episodic or regular basis, a characteristic of the groundwater that may vary: level, chemical quality, temperature, etc. More specifically, a well used to measure the hydraulic load of a water table, in general near its surface, by surveying the depth of the table, and to observe its natural or influenced variations, through periodic measurements (less rigorously than when using a piezometer).
Organic deposits	Deposits that are composed of more or less decomposed organic matter.
Organic matter	A substance of biological origin that results from the decomposition of plant debris, dejections and animal carcasses.
Outcrop	An exposure of rock or mineral deposit that can be seen on the surface, i.e., that is not covered by soil or vegetation.
Outflow	A watercourse that releases the water of a lake or pond.
Overburden	The unconsolidated natural layer of sediments that must be penetrated to reach the economic material, i.e., soil that does not contain any material of value to mining companies.
Peatland	A wetland in which the production of organic matter, regardless of the composition of the plant remains, has prevailed over its decomposition. The result is a natural accumulation of peat that constitutes organic soil. Peatland soil is either poorly or very poorly drained and the groundwater table is usually at the same depth as the soil or close to its surface. There are two main types of peatland—ombrotrophic (bogs) and minerotrophic (fens)—that are fed by different water sources. Peatland may be wooded or not (open). Wooded peatland is covered with trees that measure more than 4 m in height over 25% or more of its surface.
Permeability test	In the case of this impact study, the permeability tests conducted on site consisted of collecting a known volume of water from a well and evaluating how quickly it rises through the water table. How quickly the water rises makes it possible to establish the hydraulic conductivity of a determined horizon.
Piezometer	A tube well with a screened extremity used to measure the piezometric level at a specific point.
Piezometric high	The zone where the elevation of the water table is at its highest.
Piezometric level	The depth of the upper limit of the water table.
Pit	Refers to the excavated zone in the shape of a funnel in the open-pit mining process.
Pit wall	The sides (walls) of the pit.
Pond	A wetland with a water level of less than 2 m during the low-water season. It is characterized by the presence of floating or submerged aquatic vegetation as well as emergent vegetation covering at least 25% of the environment's surface area. Temporary ponds, often called vernal or forest pools, are shallow (< 1 m), isolated and usually fed in water by precipitations, melting or the water table. Ponds retain stagnant water in the spring for a period of approximately two months and then dry out during the summer. Given they are not inhabited by fish, they tend to favour species that are adapted to the recurrent flooddrought cycles such as salamanders and certain frog species.
Post-rehabilitation	The period that follows the end of the rehabilitation work planned to return the receiving environment to a satisfactory state for its protection.
Pumping test	Continuous pumping at a regular flow in a pumped well such as to generate a permanent flow until the water level is stable in the pumped well and the observation wells drilled around the pumped well. This test makes it possible to measure the drawdown of the water table in the observation wells during the pumping (downward flow) and once the pumping has stopped (upward flow) and, in turn, to measure the permeability coefficient.
Radius of impact	The distance measured from the source of an effect to the selected effect threshold.

Term / Symbol	Description
Receiving environment	The environment in which the project unfolds and that is likely to be affected by the completion of the project.
Recharge	The recharge corresponds to the quantity of water that enters the aquifer after infiltrating the surface and renews the groundwater.
Recirculation	Action by which mine wastewater is retrieved to be reused in equipment and processes.
Reduction	The mitigation of flood peaks due to the reduction and lag of the water volumes.
Reference state	The characteristics of an environmental component as they were before the project.
Regular monitoring	The complete environmental monitoring (weekly, three times weekly and acute toxicity) of the final effluent.
Resurgence	Refer to Resurgence water.
Retention basin	A retention structure designed to contain runoff water.
Rim	The edge of a well
Risk analysis	The use of information such as to identify the hazards and estimate the probability and seriousness of adverse effects on people or populations, the environment and property.
Scarification	An operation by which the indurated surface of a pavement (or a layer of pavement) is at once isolated from the pavement's underlying structure and reduced to blocks through ploughing using a machine such as a harrow, a rake arm or a scarifier.
Sediment	An unconsolidated deposit of detritic, chemical or organic origin formed by the grouping of small and larger particles or precipitated matter having been transported separately.
Sedimentation basin	A retention structure designed to retain water long enough for the suspended solids to settle at the bottom of the basin before the water is released.
Seismic	Which relates to earthquakes or which is prone to earthquakes.
Shoreline	The part of a lake or watercourse that extends from the high-water line to the centre of the body of water.
Sorption	The uptake and retention of a substance (the sorbed) on the surface (adsorption) as well as within (absorption, in the broader sense) another substance (the sorbent).
Special status species	Special status species are plant and animal species at risk according to the MDDELCC, i.e., those that are designated as threatened or vulnerable Québec by virtue of the <i>Act respecting threatened or vulnerable species</i> and those that are likely to be designated as such as well as plant and animal species that are at risk in Canada by virtue of the <i>Species at Risk Act</i> .
Spodumene	Spodumene is a silicate of aluminum and lithium. It is the most important mineral making up commercially mined lithium in the world.
Spodumene-bearing pegmatite	The minerals contained in lithium (spodumene, petalite, lepidolite, amblygonite) are namely associated with rocks such as rare-metal granitic pegmatites. These granitic pegmatites often constitute peraluminous instructive complexes.
Spot sample	The volume of undiluted effluent collected at a given time.
Stockpile	Land where mineral substances, topsoil, concentrates or mine tailings are accumulated.
Stratigraphy	The science that studies the succession of sedimentary deposits, generally laid out in layers (or strata). The study of the order in which layers of rock that make up the Earth's crust formed over geological times.

Term / Symbol	Description
Surface mineral substances	Peat; sand including silica sand; gravel; limestone; calcite; dolomite; common clay and argillaceous rocks used in the manufacture of clay products; all types of rocks used as dimension stone, crushed stone, silica or mineral in the making of cement; and every mineral substance that is found in its natural state as a loose deposit, except the tilth, as well as inert mine tailings, where such substances and tailings are used for construction purposes, for the manufacture of construction materials, or for the improvement of soils (<i>chapter I-1, Mining Act</i>).
Surface or superficial deposits	Unconsolidated sediments (clay, sand, gravel, stones, etc.) of various origins, natures, morphologies and thicknesses that rest on the surface of the bedrock.
Swamp	A wetland that is dominated by woody, shrub or tree vegetation (covering more than 25% of the environment's surface area) that grows in a mineral soil that is poorly or very poorly drained. A riverine swamp is seasonally flooded or characterized by a high-water table and a water flow that is high in dissolved minerals. As for an isolated swamp, it is fed by runoff water or resurgences of the water table.
Tailings	Solid or liquid substances, with the exception of the final effluent, resulting from the extraction, preparation, enrichment and separation of an economic material, including the sludge and dust resulting from the treatment or purification of mine wastewater or air emissions. Are considered as tailings the slag and sludge, including sewage sludge, released during the treatment by pyrometallurgy, hydrometallurgy or electroextraction. Are also considered as tailings the substances released during the extraction of a marketable substance from tailings and that correspond to those already defined in the first two paragraphs. Are excluded the tailings resulting from the working of a pit within the meaning of the <i>Regulation respecting pits and quarries</i> (R.Q., c.Q-2, r.2).
Tallyman	A trapper in charge of supervising other trappers and whose primary responsibility is managing animal populations within the limits of the land for which he is responsible.
Topsoil	Surface soil that is composed of a mix of organic matter as well as sand, silt and clay or a combination thereof and that is conducive to vegetation growth.
Traditional activities	Refer to Traditional practices.
Traditional practices (traditional activities)	All of the traditional hunting, fishing, gathering and general activities as well as land and resource use activities for livelihood, ritual and social purposes.
Treatment capacity	The maximum quantity of material (in tons per day) that is treatable under optimal equipment conditions.
Tributary	A watercourse that flows into a larger watercourse or into a lake (affluent).
Unconsolidated deposits	Unconsolidated matter that covers a deposit or the bedrock.
Water table	The underground water table that feeds catchment works. The water table is the first table of groundwater under the soil surface.
Watercourse	Any water mass that flows into a bed at a regular or intermittent rate, including those created or modified by human intervention as well as the St. Lawrence River and the Gulf of St. Lawrence and all seas surrounding Québec.
Watershed	A watershed is a territory, bounded by drainage divides, over which water flows to a single point called an outflow.
Wetland	Wetlands comprise all sites that are saturated with water or flooded during a sufficiently long period to exert an influence on the "soil" and "vegetation" components, to the extent they are present.
Wind erosion	Erosion caused by the wind.
Winter concentration area (or wintering area)	A forest territory of variable size that is used as shelter by a large or small group of crevids during the winter.










Term / Symbol	Description
	Explosion Hazard.
	Flammable Material.
	Oxidizing.
	Compressed Gas.
	Corrosive.
	Harmful or Fatal.
	Harmful.
	Health Hazard.
	Harmful to the Environment.



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