NI 43-101 TECHNICAL REPORT

ON THE

SILICON RIDGE PRELIMINARY ECONOMIC ASSESSMENT

QUEBEC – CANADA

Prepared for
ROGUE RESOURCES INC.
Prepared by

Yves A. Buro, P.Eng., Senior Geologist
Schadrac Ibrango, P.Geo., Ph.D., MBA Lead Geology & Hydrogeology
Ewald Pengel, P.Eng., Senior Process Engineer
Daniel Gagnon, P.Eng., VP Mining and Geology
Michel L. Bilodeau, P.Eng. M.Sc. (App.), Ph.D., Economic Analyst
Mary Jean Buchanan, P.Eng., M.Env., Senior Project Manager
Met-Chem, a division of DRA Americas

Marc Arpin, P.Geo., M.Sc., M.Env., Director-Sustaining Capital Works**, SNC-Lavalin**

Effective Date: September 14, 2016
Issue Date: October 26, 2016

Project Number: 2015-041

IMPORTANT NOTICE

This Report was prepared as a National Instrument 43-101 Technical Report for Rogue Resources Inc. ("**Rogue**") by Met-Chem, a division of DRA Americas Inc. ("**Met-Chem**"). The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in Met-Chem's services, based on: i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this Report. This Report can be filed as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101, Standards of Disclosure for Mineral Projects. Except for the purposes legislated under Canadian securities laws, any other uses of this Report by any third party are at that party's sole risk.

DATE AND SIGNATURE PAGE – CERTIFICATES

Effective Date: September 14, 2016

Issue Date: October 26, 2016

MET-CHEM A MEMBER OF THE DRA GROUP

DRA

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26th, 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Yves A. Buro, P.Eng, do hereby certify that:

1) I am a Senior Geologist presently with Met-Chem, a division of DRA Americas, with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate of University of Geneva, Switzerland, with the equivalent of a B.Sc. and a M.Sc. in Geology obtained in 1976;

3) I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (Reg. 42279);

4) I have worked as a geologist continuously since graduation from University in 1976. I have gained direct experience on deposits similar to the Silicon Ridge Project, as exploration geologist in Europe and in South America;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of the report entitled "**NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada**" dated October 26th 2016 under Met-Chem Consultation Company as geologist. I have participated, and I am responsible for sections 4, 5, 6, 7, 8, 9, 10, 11,12, 23 and part of section 1, 25 and 26;

7) I have visited the site on August 18, 2015 and completed a personal inspection of the Property, as one of the QPs, between the days of November 18 and 20, 2015;

8) I have not had prior involvement with Rogue Resources Inc. and its Silicon Ridge Project and property that is the subject of the Technical Report;

9) I state that, as the date of the certificate, to the best of my qualified knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

MET-CHEM A MEMBER OF THE DRA GROUP

DRA

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26th day of October 2016.

Yves A. Buro, P.Eng.
Senior Geologist
Met-Chem, a division of DRA Americas

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26, 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Schadrac Ibrango, P.Geo., Ph.D., MBA. do hereby certify that:

1) I am lead geologist and hydrogeologist with Met-Chem, a division of DRA Americas, with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate of University of Ouagadougou (Burkina-Faso) with a Master Degree in Geology obtained in 1998, a Ph.D. in Engineering of Darmstadt Unversity of Technology (Germany) obtained in 2005 and a Master in Business Administration (MBA) of UQAM (Canada) obtained in 2016;

3) I am a member in good standing of the Ordre des Géologues du Québec (#1102) and of the Professional Engineers and Geoscientists Newfoundland and Labrador (#07633);

4) I have practiced my profession continuously since 1998. I have gained direct experience on projects similar to Silicon Ridge Project, as geologist in Canada;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of the report entitled "**NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada**" dated October 26, 2016 under Met-Chem as lead geologist. I have participated, and I am responsible for section 14 and parts of section 1, 25 and 26;

7) I have not visited the site;

8) I have not had prior involvement with Rogue Resources Inc. and its Silicon Ridge Project and property that is the subject of the Technical Report;

9) I state that, as of the date of the certificate, to the best of my qualified knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26 day of October 2016.

GÉOLOGUE / GEOLOGIST
SCHADRAC IBRANGO
1102
QUÉBEC

____

Schadrac Ibrango, P.Geo., Ph.D., MBA.
Lead Geology and Hydrogeology
Met-Chem, a division of DRA Americas

MET-CHEM A MEMBER OF THE DRA GROUP DRA

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26, 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Ewald Pengel, P. Eng., do hereby certify that:

1) I am a Senior Process Engineer with Met-Chem, a division of DRA Americas, with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate from Queen's University, Kingston, Ontario with a B. Sc. in Metallurgical Engineering in 1982 and the University of Pittsburgh, Pittsburgh, Pennsylvania (USA) with a M. Sc. in Mining Engineering in 1985;

3) I am a registered member of Professional Engineers Ontario (90520297) and I am a member of the Canadian Institute of Mining, Metallurgy and Petroleum;

4) I have worked for 29 years in the mineral industry since graduation;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of the report entitled "**NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** "dated October 26, 2016, under Met-Chem Consultation Company as senior process engineer. I have participated, and I am responsible for Section 13, Section 17 and parts of Sections 1 and 21;

7) I have not visited the site, I did visit the laboratory facilities where the test work was conducted and witnessed testing;

8) I have not had prior involvement with Rogue Resources Inc. and its Silicon Ridge Project and property that is the subject of the Technical Report;

9) I state that, as the date of the certificate, to the best of my qualified knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

MET-CHEM A MEMBER OF THE DRA GROUP

DRA

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26 day of October 2016.

LICENSED PROFESSIONAL ENGINEER
E. A. PENGEL
90520297
PROVINCE OF ONTARIO

Ewald Pengel, P.Eng.
Senior Process Engineer
Met-Chem, a division of DRA Americas

MET-CHEM A MEMBER OF THE DRA GROUP

DRA

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Daniel M. Gagnon, P. Eng., do hereby certify that:

1) I am a VP Mining and Geology with Met-Chem, a division of DRA Americas, with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate from "*École Polytechnique de Montréal*" with B. Eng. in Mining Engineering in 1995;

3) I am a registered member of "*Ordre des Ingénieurs du Québec*" (118521);

4) I have worked as a Mining Engineer continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of the report entitled " **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** " dated October 26 2016 and am responsible for Sections 15 and 16 and part of Sections 1, 21 and 26;

7) I have visited the site on July 6th 2016;

8) I have not had prior involvement with Rogue Resources Inc. and its Silicon Ridge Project and property that is the subject of the Technical Report;

9) I state that, as the date of the certificate, to the best of my qualified knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26th day of October 2016.

Daniel M. Gagnon, P. Eng.
Senior VP Mining and Geology
Met-Chem, a division of DRA Americas

Michel L. Bilodeau, P.Eng., M.Sc.(App.), Ph.D.
Independent Consultant
22 Labrador Street
Kirkland, QC, H9J 3W8
Telephone: 514-426-4210
Email: Michel.L.Bilodeau@McGill.CA

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26th, 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Michel L. Bilodeau, P.Eng. M.Sc.(App.), Ph.D., do hereby certify that:

1) I am a retired (June 2009) Associate Professor from the Department of Mining and Materials Engineering of McGill University, 3450 University St., Montréal, QC, Canada H3A 2A7, and have continued teaching on a contract basis the mineral economics course of the mining engineering program at McGill in the Winter terms of 2010, 2011 and 2012;

2) I am a graduate of École Polytechnique de Montréal with a B.Eng. in Geological Engineering (1970), and of McGill University with a M.Sc.(App.) in mineral exploration (1972) and a Ph.D. in mineral economics (1978);

3) I am a member in good standing of the "Ordre des ingénieurs du Québec" (23799);

4) While employed at McGill (1975-2009), I have taught continuously in the areas of engineering economy, mineral economics and mining project feasibility studies in the mining engineering program dispensed by the University, and have carried out in the capacity of independent consultant several assignments related to the economic/financial analysis of mining projects; after retiring from McGill, I have continued my activities in the capacity of independent consultant up until the present;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience in the mineral industry that includes teaching for more than 30 years and consulting activities over the past 25 years, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of the report titled "**NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada**" dated October 26th, 2016, as an Economic/Financial Analyst Consultant. I am responsible for Section 22;

7) I have not visited the site;

8) I have not had prior involvement with Rogue Resources and its Silicon Ridge Project and property that is the subject of the Technical Report besides the present Technical Report;

9) I state that, as of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26th day of October 2016.

Michel L. Bilodeau, P.Eng., M.Sc.(App.), Ph.D.
Economic/Financial Analyst
Consultant for Met-Chem, a division of DRA Americas

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26th, 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Mary Jean Buchanan, Eng., M.Env. do hereby certify that:

1) I am a Senior Project Manager and Senior Environmental Engineer with Met-Chem, a division of DRA Americas, with an office at suite 300, 555 René-Lévesque Blvd. West, Montréal, Canada;

2) I am a graduate of Université du Québec à Chicoutimi with B.Eng. in Geological Engineering in 1983 and of the Université de Sherbrooke with a M.Env. (Master degree in Environment) in 1997;

3) I am a member in good standing of the "Ordre des Ingénieurs du Québec" (38671);

4) I have practiced my profession for the mining industry continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience that includes 30 years in consulting practice related to resource estimates, mine engineering and environmental assessment, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have supervised and participated in the preparation of the report entitled " **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** " dated October 26th, 2016 and am responsible for Sections 2, 3, 18, 19, 24, 25, 27 and parts of 1, 21 and 26;

7) I have not visited the site;

8) I have not had prior involvement with Rogue Resources Inc. and its Silicon Ridge Project and property that is the subject of the Technical Report;

9) I state that, as the date of the certificate, to the best of my qualified knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26th day of October 2016.

Mary Jean Buchanan, P.Eng., M.Env.
Senior Project Manager
Met-Chem, a division of DRA Americas

CERTIFICATE OF AUTHOR

To Accompany the Report titled **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** which is effective as of September 14th, 2016 and issued on October 26, 2016 (the "Technical Report") prepared for Rogue Resources Inc. (the "Corporation").

I, Marc Arpin, P.Geo., M.Sc., M.Env. do hereby certify that:

1) I am a Senior Mine Geologist and Mining Environment professional with SNC-Lavalin, with an office at 1140 de Maisonneuve Blvd. West, Montréal, Canada, H3A1M8;

2) I am a graduate of Université de Montréal with B.Sc. and M.Sc. in Geology in 1981 and 1985 respectively and of the Université de Sherbrooke with a M.Env. (Master degree in Environment) in 2005;

3) I am a member in good standing of the "Ordre des Géologues du Québec" (594);

4) I have practiced my profession for the mining industry continuously since my graduation from university;

5) I have read the definition of "qualified person" set out in National Instrument 43-101 (NI 43-101) and certify that by reason of my education, affiliation with a professional association (as defined by NI 43-101) and past relevant work experience that includes more than 30 years in mining operations and consulting practice related to mining, mine closure and environmental assessment, I fulfill the requirements to be a "qualified person" for the purposes of NI 43-101;

6) I have participated in the preparation of the report entitled " **NI 43-101 Technical Report on the Silicon Ridge Preliminary Economic Assessment, Québec-Canada** " dated October 26, 2016 and am responsible for Section 20;

7) I have not visited the site;

8) I have not had prior involvement with Rogue Resources Inc. and its Silicon Ridge Project and property that is the subject of the Technical Report;

9) I state that, at the date of the certificate, to the best of my qualified knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading;

10) I have no personal knowledge, as of the date of this certificate, of any material fact or material change which is not reflected in this Technical Report;

11) I am independent of the issuer as defined in section 1.5 of NI 43-101;

12) I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form;

This 26th day of October 2016.

GÉOLOGUE / GEOLOGIST
MARC ARPIN
#594
QUÉBEC

____
Marc Arpin, P.Geo., M.Sc., M.Env.
Director – Sustaining Capital Works - Montreal
Mining & Metallurgy
SNC-Lavalin

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abbreviation	Description
$	Dollar Sign
$/m²	Dollar per Square Metre
$/m³	Dollar per Cubic Metre
$/t	Dollar per Metric Tonne
%	Percent Sign
% w/w	Percent Solid by Weight
¢/kWh	Cent per Kilowatt hour
°	Degree
°C	Degree Celsius
2D	Two Dimensions
3D	Three Dimensions
AC	Authorization Certificate
AI	Abrasion Index
AMSL	Above Mean Sea Level
ASL	Above Sea Level
A-T	After-Tax
az	Azimuth
bank	Bank Cubic Metre (Volume of material in situ)
BAPE	*Bureau d'Audience Publique sur l'Environnement*
BFA	Bench Face Angle
BQ	Drill Core Size (3.65 cm diameter)
BSG	Bulk Specify Gravity
BTU	British Thermal Unit
BWI	Bond Ball Mill Work Index

Abbreviation	Description
CAD	Canadian Dollar
CAPEX	Capital Expenditures
CDC	*Claim désigné sur carte*
Ce	Cesium
CEAA	Canadian Environmental Assessment Agency
CEE	Canadian Exploration Expenses
CEPA	Canadian Environmental Protection Act
cfm	Cubic Feet per Minute
CFR	Cost and Freight
CIF	Cost Insurance and Freight
CIL	Carbon in Leach
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CIP	Carbon in Pulp
Cl	Clay
CL	Concentrate Leach
cm	Centimetre
CofA	Certificate of Authorization
COG	Cut Off Grade
COV	Coefficient of Variation
CRM	Certified Reference Materials
CWI	Crusher Work Index
d	Day
d/w	Days per Week
d/y	Days per Year

Abbreviation	Description
D2	Second Generation of Deformation
D3	Third Generation of Deformation
D4	Fourth Generation of Deformation
dB	Decibel
dBA	Decibel with an A Filter
DDH	Diamond Drill Hole
deg	Angular Degree
DFO	Department of Fisheries and Oceans
DGPS	Differential Global Positioning System
DMS	Dense Media Separator
DWI	Drop Weight Index
DWT	Drop Weight Test
DXF	Drawing Interchange Format
E	East
EA	Environmental Assessment
EBS	Environmental Baseline Study
EHS	Environment Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EOH	End of Hole
EP	Environmental Permit
EPCM	Engineering, Procurement and Construction Management
EQA	Environmental Quality Act
ER	Electrical Room

Abbreviation	Description
ESBS	Environmental and Social Baseline Study
ESIA	Environmental and Social Impact Assessment
FDS	Fused Disconnect Switch
Fe	Iron
FOB	Free on Board
ft	Feet
FVNR	Full Voltage Non Reversible
g	Grams
G&A	General and Administration
g/l	Grams per Litre
g/t	Grams per Tonne
gal	Gallons
GEMS	Global Earth-System Monitoring Using Space
GESTIM	*Gestion des Titres Miniers*
GPS	Global Positioning System
GQ	Government of Quebec
Gr	Granular
GCW	Gross Combined Weight
GOH	Gross Operating Hours
H	Horizontal
h	Hour
h/d	Hours per Day
h/y	Hour per Year
H_2	Hydrogen

Abbreviation	Description
ha	Hectare
HDPE	High Density PolyEthylene
HF	Hydrofluoric Acid
HFO	Heavy Fuel Oil
HG	High Grade
HL	Heavy Liquid
hp	Horse Power
HQ	Drill Core Size (6.4 cm Diameter)
HVAC	Heating Ventilation and Air Conditioning
I/O	Input / Output
ICP-AES	Inductively Coupled Plasma – Atomic Emission Spectroscopy
ICP-MS	Inductively Coupled Plasma – Mass Spectroscopy
ICP-OES	Inductively Coupled Plasma – Optical Emission Spectroscopy
ID	Identification
IDW	Inverse Distance Method
IDW2	Inverse Distance Squared Method
In	Inches
IRA	Inter-Ramp Angle
IRR	Internal Rate of Return
KE	Kriging Efficiency
kg	Kilogram
kg/l	Kilogram per Litre
Kg/t	Kilogram per Metric Tonne
kl	Kilolitre
km	Kilometre

Abbreviation	Description
km/h	Kilometre per Hour
kPa	Kilopascal
KSR	Kriging Slope Regression
kt	Kilotonne
kV	Kilovolt
kVA	Kilovolt Ampere
kW	Kilowatt
kWh	Kilowatt-hour
kWh/t	Kilowatt-hour per Metric Tonne
Hz	Hertz
L	Line
l	Litre
l/h	Litre per hour
lbs	Pounds
LECO	Laboratory Equipment Corporation
LFO	Light Fuel Oil
LG	Low Grade
LG-3D	Lerchs-Grossman – 3D Algorithm
LIMS	Laboratory Information Management System
LOI	Loss On Ignition
LOM	Life Of Mine
LV	Low Voltage
m	Metre
m/h	Metre per Hour
m/s	Metre per Second
m^2	Square Metre

Abbreviation	Description
m^3	Cubic Metre
m^3/d	Cubic Metre per Day
m^3/h	Cubic Metre per Hour
m^3/y	Cubic Metre per Year
mA	MilliAmpère
Mm^3	Million Cubic Metres
MCC	Motor Control Center
MDDELCC	*Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques du Québec*
MD&A	Management Discussion and Analysis
MFFP	*Ministère des Forêts, de la Faune et des Parcs du Québec*
mg/l	Milligram per Litre
MIBK	Methyl Isobutyl Ketone
min	Minute
min/h	Minute per Hour
Min/shift	Minute per Shift
ml	Millilitre
ML	Metal Leaching
mm	Millimetre
mm/d	Millimetre per Day
Mm^3	Million Cubic Metres
MMER	Metal Mining Effluent Regulation
MMU	Mobile Manufacturing Units
MOU	Memorandum of Understanding
MRC	Municipalité Régionale de Comté
MERN	*Ministère de l'Énergie et des Ressources Naturelles*
Mt	Million Metric Tonnes

Abbreviation	Description
Mt/y	Millions of Metric Tonnes per year
MV	Medium Voltage
MVA	Mega Volt-Ampere
MW	Megawatts
MWh/d	Megawatt Hour per Day
My	Million Years
N	North
Nb	Number
NE	Northeast
NGR	Neutral Grounding Resistor
NI	National Instrument
Nm^3/h	Normal Cubic Metre per Hour
NPV	Net Present Value
NQ	Drill Core Size (4.8 cm diameter)
NSR	Net Smelter Return
NTP	Normal Temperature and Pressure
NTS	National Topographic System
NW	North West
O/F	Overflow
OB	Overburden
OGQ	*Ordre des Géologues du Québec*
OK	Ordinary Kriging
OPEX	Operating Expenditures
oz	Ounce (troy)
oz/t	Ounce per Short Ton

Abbreviation	Description
P&ID	Piping and Instrumentation Diagram
PEA	Preliminary Economic Assessment
PF	Power Factor
PFS	Pre-Feasibility Study
PGGS	Permit for Geological and Geophysical Survey
ph	Phase (electrical)
pH	Potential Hydrogen
PIR	Primary Impurity Removal
PLC	Programmable Logic Controllers
PP	Preproduction
ppb	Part per Billion
ppm	Part per Million
PQ	Drill Core Size (8.5 cm diameter)
psi	Pounds per Square Inch
P-T	Pre-Tax
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance/Quality Control
QKNA	Quantitative Kriging Neighbourhood Analysis
QP	Qualified Person
RCM	Regional County Municipality
RCMS	Remote Control and Monitoring System
RER	Rare Earth Magnetic Separator
RMR	Rock Mass Rating

Abbreviation	Description
ROM	Run of Mine
rpm	Revolutions per Minute
RQD	Rock Quality Designation
RWI	Bond Rod Mill Work Index
S	South
S	Sulfur
S/R	Stripping Ratio
SAG	Semi-Autogenous Grinding
scfm	Standard Cubic Feet per Minute
SCIM	Squirrel Cage Induction Motors
SE	South East
sec	Second
SEDAR	System for Electronic Document Analysis and Retrieval
Set/y/unit	Set per Year per Unit
SG	Specific Gravity
SIR	Secondary Impurity Removal
SMC	SAG Mill Comminution
SNRC	Système National de Référence Cartographique
SolFe	Sulfate Ferrous
SPI	SAG Power Index
SPLP	Synthetic Precipitation Leaching Procedure
SPT	Standard Penetration Tests
SW	South West
SW	Switchgear
t	Metric Tonne

Abbreviation	Description
t/d	Metric Tonne per Day
t/h	Metric Tonne per Hour
t/h/m	Metric Tonne per Hour per Metre
t/h/m²	Metric Tonne per Hour per Square Metre
t/m	Metric Tonne per Month
t/m²	Metric Tonne per Square Metre
t/m³	Metric Tonne per Cubic Metre
t/y	Metric Tonne per Year
Ta	Tantalum
TCLP	Toxicity Characteristic Leaching Procedure
TIN	Triangulated Irregular Network
ton	Short Ton
tonne	Metric Tonne
TOR	Terms of Reference
TSS	Total Suspended Solids
U	Uranium
U/F	Under Flow
ULC	Underwriters Laboratories of Canada
USA	United Stated of America
USD	United States Dollar
USGPM	Us Gallons per Minute
UTM	Universal Transverse Mercator
V	Vertical
V	Volt
VAC	Ventilation and Air Conditioning
VFD	Variable Frequency Drive

Abbreviation	Description
VLF	Very Low Frequency
W	Watt
W	West
WHIMS	Wet High Intensity Magnetic Separation
WHO	World Health Organization
WRA	Whole Rock Analysis Method
WSD	World Steel Dynamics
wt	Wet Metric Tonne
X	X Coordinate (E-W)
XRD	X-Ray Diffraction
XRF	X-Ray Fluorescence
y	Year
Y	Y coordinate (N-S)
Z	Z coordinate (depth or elevation)
ZEC	*Zone d'Exploitation Controlée*
Zr	Zirconium

1.0 SUMMARY

1.1 Introduction

Rogue is a Canadian mining company with a diverse portfolio of properties but is currently focused on its 100%-owned Silicon Ridge Project. The Property is located about 42 km north of the City of Baie-Saint-Paul, on the north shore of the Saint Lawrence River, in the Province of Quebec.

This NI 43-101 Technical Report (Report) on the Silicon Ridge Project has been prepared at the request of Rogue to present the Preliminary Economic Assessment (PEA) major findings. The PEA is based on the Mineral Resources (effective date June 7th, 2016) as issued by Met-Chem in the July 20th, 2016 Technical Report.

The effective date of the Technical Report on the PEA of the Silicon Ridge Project is September 14th 2016 and the report was completed October 26th, 2016.

A PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Met-Chem was requested by Rogue to provide a PEA Study for the exploitation of the Silicon Ridge quartzite deposit. Met-Chem was to provide leadership for the mining, process design, infrastructure, the compilation of capital and operating cost estimates at a confidence level of ± 35%, economic analysis and report preparation integrating metallurgical testing and environment considerations for which information was provided by other consultants. The PEA Report is intended to demonstrate the potential viability of the Project at a mining rate of 200,000 tonnes per year, processing rate of 190,000 tonnes per year and a production rate of about 160,000 tonnes per year of silica concentrate in order to justify proceeding with other phases of project development.

Preliminary process flowsheets were developed from a recent metallurgical testing program performed by Dorfner-ANZAPLAN GmBH (“ANZAPLAN”). The capital cost and the operating cost estimates have been developed for a 190,000 tonnes per year processing circuit.

1.2 Property Description and Location

The Property is located about 42 km north of the City of Baie-Saint-Paul, on the north shore of the Saint Lawrence River, Province of Quebec The Property is comprised of eight (8) contiguous map-designated mineral claims (“CDC”) that form a rectangular block covering a total area of 462.6 ha. All the claims are currently in good standing and Rogue Resources Inc. is the 100% recorded owner.

The Property is accessible from Baie-Saint-Paul via national highways and well-maintained forestry roads.

The Property is subject to a 2% Net Smelter Return ("NSR") royalty to a vendor, which may be purchased, as well as a royalty of $0.08 per metric tonne of extracted economic material to the Huron-Wendat Nation Council.

1.3 History

The discovery of a quartzite occurrence in 1946 triggered exploration work in the general Property area. Documented modern exploration efforts in the region started in 1965, with Leeds Metals Company completing a drilling program. The discovery of new quartzite occurrences by the Quebec Mine Ministry and disclosure of mineral resource estimates in a series of deposits, from 1969 to 1974, brought renewed attention to the area. Silicium Québec and Sitec Quartz Inc., as well as GEX Silicium Limited and SOQUEM started mining in 1976. New exploration work targeted the region after J. Rondot delineated another ten quartzite occurrences of potential deposit size in 1984.

Rogue started the first modern and integrated exploration programs on the Silicon Ridge Property in September 2014. No resources estimate and no prior quartzite production had been completed on the Property.

1.4 Geological Setting and Mineralization

The Property area is located in the high-grade metamorphic terranes of the Grenville Province of the Canadian Shield. At least four ductile and one brittle deformation events have affected the area.

The quartzite units and paragneiss form an anticline with a NE trending, steeply NW dipping axial plane (overturned fold) and a syncline to the SE, the axis of which passes along the north shore of lac de la Grosse Femelle . The "G" and "H" units represent the same unit duplicated by fold repetition, with about 250 m of intervening quartz-biotite-garnet gneiss. Charnokitic gneiss lies at the northern and southern contacts of the "G" and "H" units.

The Property hosts several map-scale units of high purity quartzite. The width of the "G" quartzite unit varies along strike, but reaches a maximum of 260 m, with an average of 150 m.

The quartzite on the Property is generally coarse-grained, massive, locally fractured. It may contain traces of biotite, muscovite, hematite, magnetite, ilmenite, fuschite, rutile commonly associated with coloured quartzite. Clusters of sillimanite with pyrite were occasionally observed.

The quartzite exhibits internal zones distinguished by their colour or by shear zones that represent fairly continuous bands within the deposit.

1.5 Deposit Types

The quartzite on the Property is of the metamorphic type, of probable sedimentary origin, and occurs as large-amplitude folds formed in response to multiple episodes of folding. The controlling factors for the formation of the quartzite and for the presence of internal sub-units and structures are lithological (sediment precursor) and structural (recrystallisation and formation of folds).

1.6 Exploration

Initial exploration work by Rogue began in September 2014 by mapping and sampling the quartzite units. This was followed by an airborne helicopter Magnetics and VLF survey to map out the quartzite units and define the contacts with the paragneiss. The next steps consisted in line cutting, mapping and trenching. These exploration programs culminated in the selection of the most promising units ("G" and "H") to be tested by drilling to gather sufficient data to prepare a Technical Report on an initial NI 43-101 compliant resource estimate, and eventually a PEA study. Field and core quartzite samples were submitted to chemical analysis and testing.

1.7 Drilling

A drill program for a total of 11,822.30 m of core in 71 holes was completed between August 8, 2015 and December 16, 2015 over the "G" and 'H" quartzite units. Six holes (PQ and NQ core diameters) were drilled for technical evaluation by ANZAPLAN. No prior holes had been drilled before the Rogue drilling program.

Two holes were drilled on most of the sections and the trenches in the "G" and "H" units. The southwestern portion of the "G" unit was drilled on sections 50 m apart. The northeastern portion of the "G" unit and the entire "H" unit were drilled along sections 100 m apart. The holes were drilled by Orbit Garant, with an office in Val-d'Or, Quebec. Core was generally recovered at a rate of 95% or better.

All the collars were surveyed with a DGPS and the downhole deviation was measured using a Flexit instrument and the core was oriented.

1.8 Sample Preparation, Analysis and Security

Core logging included measurements of basic geotechnical parameters, core recovery, RQD, followed by description of lithological and structural features. Slightly more than 4,600 samples of a nominal length of 2 m were collected, in addition to the QC samples inserted to monitor the laboratory performance. The core from the "H" quartzite unit was split with a hydraulic splitter whereas the "G" quartzite samples were cut with a diamond blade saw.

The QA-QC protocol adhered to by Rogue included insertion of about 8% of Certified Reference Material (CRM), Blank and Duplicate samples into the sample stream.

The samples were sent to ALS Chemex in Val-d'Or, for preparation and to ALS in Vancouver for analysis. Rogue requested ALS to apply pulverizing procedures specifically designed to avoid contamination of the samples by using non-ferrous (tungsten carbide) disks/rings and bowl mills.

All the samples were submitted for whole rock analysis by lithium borate fusion technique coupled with XRF (package of 24 elements). LOI was also determined, as well as total

Carbon and total Sulphur by LECO furnace. The trace elements were analyzed on selected drill holes by ICP-MS method after Four Acid digestion. Specific gravity was determined by ALS on every tenth sample by the bottle pycnometer method.

1.9 Data Verification

Yves A. Buro, P.Eng., Senior Geologist, Met-Chem, visited the site on August 18, 2015 and completed a QP personal inspection between November 18 and 20, 2015 and independently selected 30 samples for check analysis. The check samples consisted of coarse rejects from the original samples.

Met-Chem examined the QA-QC system applied by Rogue and completed some verification of the results obtained by the QC samples inserted by Rogue into the project samples. Some dispersion is observable in the analyses of silica and of the quality elements, as a result from their concentrations being close to the detection limits. However, Met-Chem believes that the reliability of the analytical results is acceptable and sufficiently high to be used in a resource estimate. In addition, the tests conducted by ANZAPLAN have shown that processing can significantly reduce the content of deleterious elements to achieve grades fit for generating various silicon products.

1.10 Mineral Processing and Metallurgical Testing

ANZAPLAN was engaged in October 2015 to provide the first evaluation of the potential of the Silicon Ridge property quartzite in different high value applications.

In October 2015, Dr. Reiner Haus, MD of ANZAPLAN, visited the Silicon Ridge property accompanied by Rogue's former Senior Vice President, Mr. E. Canova, Géo (OGQ403). Based on that visit, a pre-sample of quartzite totaling approximately 250 kilograms was selected. The material was delivered to ANZAPLAN's Laboratory facilities in Hirschau, Germany for preliminary chemical composition analysis. Based upon these results, ANZAPLAN was commissioned to complete the "Evaluation of a Quartzite Deposit in Canada for the Identification of Potential Applications".

Rogue provided ANZAPLAN with three PQ diamond drill cores (GF15-53, GF15-60 and GF15-62) and three corresponding NQ diamond drill cores (GF15-39, GF15-42 and GF15-46) in December 2015 and January 2016. The PQ drill cores were subjected to processing tests targeting the evaluation of the suitability of the quartzite for silicon and high value applications. The NQ drill cores were subjected to chemical analysis.

Five samples from each PQ drill core were defined for the processing tests based on the chemical analysis of the twinned NQ drill cores, the core logging as completed by Rogue and visual inspection of the PQ drill core samples. The purpose of the test work was to identify areas suitable to produce quartzite products for silicon and ferrosilicon production.

Silicon production generally utilizes quartzite in particle sizes ranging from 20 to 120 mm. Based on the limited size of the PQ drill cores, a fraction of 20 – 80 mm was used for the processing tests. Each of the 15 quartzite samples were crushed using a jaw crusher and screened into fractions of <20 mm, 20 – 40 mm and 40 – 80 mm. Product fractions of 20 – 40 mm and 40 – 80 mm were washed and screened prior to sensor based sorting.

Results from processing tests of drill core GF15-53 indicated that 16.2 wt% of the entire drill core is suitable for ferrosilicon production. A total of 20 to 22 wt% of the samples are in the < 20 mm fraction and will serve as feed material for high value applications.

Results from processing tests of drill core GF15-60 indicated that 34.6 wt% of the entire drill core is suitable for ferrosilicon production. A total of 20 to 25 wt% of the samples are in the < 20 mm fraction and will serve as feed material for high value applications.

Results from processing tests of drill core GF15-62 indicated that 34.7 wt% of the entire drill core is suitable for ferrosilicon production. A total of 21 to 23 wt% of the samples are in the < 20 mm fraction and will serve as feed material for high value applications.

The less than 20 mm fines and the optical sorting rejects will be stockpiled for potential further processing for high value applications.

1.11 Mineral Resource Estimates Statement

Rogue completed the first ever drilling campaign into the “G” and ‘H” quartzite units on the Silicon Ridge property between August 8, 2015 and December 16, 2015. Met-Chem was mandated by Rogue to carry out a resource estimate of the Silicon Ridge mineralization with the intent to use the information for the preparation of a NI 43-101 compliant PEA.

The drill holes database contained 74 drill holes and 25 trenches representing the exploration work performed basically in 2015. The resource interpolation was performed using the Inverse Distance Weighted (“IDW”) at a power of two (“IDW2”).

The resource estimate was performed by Schadrac Ibrango, P.Geo., Ph.D. a QP for Met-Chem. The effective date of this resource estimate is June 7, 2016.

The mineral resource classification follows the guidelines adopted by the CIM through the NI 43-101. The mineral resources are constrained by a Lerch-Grossman (LG) optimized pit shell using MineSight software. The LG pit shell was defined using the following constraints; 50 degree pit slope, a 85 m offset that includes 75 m offset from from lakes and wetlands and 10 m buffer zone for pit road access, products sale prices of $200/t and $100/t for respectively high value and ferrosilicon, processing costs of $45.84/t and $16.84/t of feed for respectively high value and ferrosilicon, a mining cost of $6.73/t and a G&A cost of $2/t.

Table 1-1 provides a summary of the pit-constrained resources for the three deposits.

Table 1-1 Silicon Ridge – Summary of the Pit Constrained Mineral Resources Estimate (Cut-Off: ≥ 98.1% SiO_2, ≤ 0.8% Al_2O_3, ≤ 0.075% TiO_2, ≤ 0.24% Fe_2O_3).

ALL ZONES					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	3.2	98.61	0.061	0.556	0.101
Indicated	6.5	98.60	0.062	0.564	0.122
Measured + Indicated	**9.7**	**98.60**	**0.062**	**0.561**	**0.115**
Inferred	**4.6**	**98.64**	**0.062**	**0.532**	**0.131**

SOUTH WEST ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	2.4	98.60	0.061	0.560	0.101
Indicated	3.9	98.60	0.062	0.576	0.109
Measured + Indicated	**6.3**	**98.60**	**0.061**	**0.570**	**0.106**
Inferred	**2.5**	**98.70**	**0.061**	**0.544**	**0.096**

NORTH EAST ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	0.8	98.66	0.063	0.544	0.102
Indicated	1.4	98.63	0.066	0.556	0.123
Measured + Indicated	**2.2**	**98.64**	**0.065**	**0.552**	**0.116**
Inferred	**0.5**	**98.56**	**0.069**	**0.641**	**0.136**

CENTRE NORTH ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	0.001	98.31	0.047	0.589	0.150
Indicated	1.2	98.56	0.061	0.535	0.163
Measured + Indicated	**1.2**	**98.56**	**0.061**	**0.535**	**0.163**
Inferred	**1.6**	**98.56**	**0.060**	**0.479**	**0.183**

Notes:

1) CIM definitions (May 10, 2014) were followed for classification of Mineral Resources.
2) Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3.
3) Density of 2.65 g/cm^3.
4) Metric tonnes.
5) Numbers may not add due to rounding.
6) Effective date of the resource estimate is June 7, 2016.
7) 50 degree slope;
8) Offset of 85 m from lakes and wetlands;

9) Product sales price of $200/t and $100/t for high value and ferrosilicon, respectively;
10) Processing cost of $16.84/t and $45.84/t of feed for high value and ferrosilicon, respectively;
11) Mining cost of $6.73/t and a G&A cost of $2/t.

(*All pricing and costing will be refined for the PEA.*)

The reader is cautioned that Mineral Resources that are not Mineral Reserves have no demonstrated economic viability. The estimate of Mineral Resources may be materially affected by mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and government factors (the "Modifying Factors").

1.12 Mineral Reserve Estimate

No mineral reserve estimates can be produced based on a PEA.

1.13 Mining Methods

Met-Chem evaluated the potential for a quarry operation at Silicon Ridge to feed the processing plant with 190,000 tonnes per year of silica mineralization. The Mineral Resources used for the PEA are based on the July 20, 2016 "NI 43-101 Technical Report on the Silicon Ridge Mineral Resources" completed by Met-Chem. Since this study is at a PEA level, NI 43-101 guidelines allow inferred mineral resources to be used in the optimization and mine plan.

The mining method selected for the Project is a conventional truck and shovel, drill and blast quarry operation. Vegetation, topsoil and overburden will be stripped and stockpiled for future reclamation use. The mineralized material and waste rock will be mined with 5 m high benches, drilled, blasted and loaded into rigid frame haul trucks with hydraulic excavators. Based on client recommendations, contract mining was used as a basis for the PEA study, Met-Chem was provided with a budgetary pricing from several contractors in the region.

The seasonal quarry operation is based on the contractor operating five (5) days per week, twelve (12) hours per day, six (6) months of the year during the warmer seasons. Overburden removal may take place during the winter to take advantage of the frozen ground conditions. Since the process plant is designed to operate year round, the contractor will provide a mineralized crushed material stockpile to maintain the run of mine feed to the plant, weekends and when the mine is shutdown during the six (6) month period.

Two pits were designed for the Silicon Ridge project in order to target 20 years of production at 200,000 tonnes of blasted resource per year. Southwest pit is approximately 650 m long and 180 m wide at surface with a maximum pit depth from surface of approximately 105 m. The total surface area of the pit is roughly 100,000 m^2. Centre North pit is approximately 420 m long and 180 m wide at surface with a maximum pit depth from surface of approximately 60 m. The total surface area of the pit is roughly 60,000 m^2.

The proportion of inferred mineral resources contained within the 20 year pit design is 20%.

The Silicon Ridge open pit resources for the 20-year pit design are summarized in Table 1-2.

Table 1-2 – Silicon Ridge Open Pit resources (20 yr pit design)

Pit	ROM	Al_2O_3	Fe_2O_3		SiO_2	TiO_2	Waste	OB
	(Mt)	(%)	(%)		(%)	(%)	(Mt)	(Mt)
SW	2.65	0.55	0.100		98.61	0.0606	6.0	1.04
CN	1.35	0.52	0.169		98.55	0.0601	2.4	0.30
TOTAL	**4.00**	**0.54**	**0.123**		**98.59**	**0.0604**	**8.4**	**1.34**

1.14 Recovery Methods

The silica products will be recovered by optical sorting process. The crushing will be performed by a contractor. The processing circuit feed will be crushed material to minus 120 mm (top size).

The processing area consists of optical sorting and dewatering. The processing circuit feed is 190,000 dry tonnes per year of crushed run-of-mine material (–120 mm). The processing circuit produces four (4) streams:

- trucked –120 mm +20 mm material;
- bagged –20 mm +7 mm material;
- trucked –20 mm +7 mm material;
- fines storage of –7 mm material.

The processing circuit will operate 24 hours per day, seven (7) days per week, 52 weeks per year, at an operating percentage of 83.3%. The processing circuit capacity has been established at an average rate of 520 dry tonnes per day or at a nominal throughput rate of 26 dry tonnes of crushed run-of-mine material per hour (see Table 1-3).

Table 1-3 – Design Criteria

Processing Circuit Capacity		
Parameter	**Units**	**Value**
Nominal crushed −120 mm processing rate	dry tonnes per year	190,000
Design crushed −120 mm processing rate	dry tonnes per year	310,000
Processing circuit operating time	percentage	83.3
Nominal processing rate	dry tonnes per hour	26
Design processing rate	dry tonnes per hour	42.5
Recovery of		
−120 mm +20 mm final trucked product	percentage	59.1
−20 mm +7 mm final bagged product	percentage	5.5
−20 mm +7 mm trucked product	percentage	18.1

1.15 Infrastructure

Infrastructure, buildings, other facilities and services that are required to complement the processing of the Silicon Ridge quartzite and to produce silica concentrate, have been added to complete the investment cost of the project.

The Silicon Ridge Project is located about 13.4 km from a 25 kV Hydro-Quebec power line that is providing electrical power to Sitec. The Project power requirement is estimated at 1 MW and shall be provided by diesel generator on site for the first three (3) years of the life of the quarry. Provision has been made in Year 3 of the life of the quarry to extend the 25kV power line to site and add a step-down transformer in order to provide 600V to the site.

Silicon Ridge is located approximately 13.4 km from Highway 381. Provision has been made to upgrade part of the existing gravel access road and the last part of the road that reaches the site along an existing access route.

In addition to site roads, water services, provisions have been made for ancillary buildings and facilities such as a modular prefabricated administration/gatehouse building.

No provision for camp site accommodation is required for the Project. The quarry is located about 55 km from Saint-Urbain, 70 km from Baie-Saint-Paul and 100 km from Chicoutimi and it is expected that employees will travel from these location to site where a parking area will be available.

1.16 Market Studies and Contracts

After preliminary metallurgical studies were prepared by Dorfner-ANZAPLAN GmBH in Q1 2016 and initial product applications were identified, Roskill Consulting Group (Roskill) was engaged by Rogue in Q2 2016 to provide a report identifying the potential customer base by product. Understanding of the market and pricing is also based on Roskill's multi-client report, "*Silicon and Ferrosilicon: Global Industry Markets and Outlook for 2014*".

In summary, the Silicon Ridge material metallurgically qualifies for application into Glass, Ceramics, Silicon Metal, various Fillers (including countertops) and Building Materials. For the purposes of base pricing in this study, the focus has been on selling silica for the production of Silicon Metal, in addition to some Fillers. The section focuses on Silicon Metal, (specifically chemical grade silicon ("silicon") and ferrosilicon) and are summarized based on the market studies completed by Rogue's consultants.

No contract or offtake agreements were signed to date with potential client (s).

1.16.1 Supply

Quartzite is the usual form of silica and is the basic raw material from which both silicon metal and ferrosilicon are produced.

Quartzite is brittle and is relatively easy to blast and crush. Silicon metal producers prefer quartzite lumps that exceed 2.54 cm in diameter with a minimum softening point of 1,700 C° and that do not decrepitate below 950 °C.

The rock should contain 98.5% SiO_2 and less than 1.5% Fe_2O_3 + Al_2O_3, 0.2% CaO, 0.2% MgO and 0.2% LOI.

Metallurgical-grade and chemical grade silicon metal typically have a minimum silicon content of 98.5% SiO_2. The reduction process for silicon metal is slagless and is why normal ash content coals cannot be used to produce silicon metal.

Quartzite prices reflect local transport distance rather than global market conditions. Import and export of quartzite is mostly focused on high purity grades used in the production of silicon metal and some specialty ferrosilicon grades.

Spain and Egypt are two countries that export significant volumes of high-grade quartz for silicon metal production.

1.16.2 Demand

Silicon Metal has three (3) main end-users: aluminum alloys, silicones and polysilicon/solar. About 90% of Ferrosilicon is consumed in iron and steel production with 10% in manufacture of primary magnesium. Silicon metal consumption was 47% aluminum, 36% silicones and 15% polysilicon with average growth rates of 4.2% per year predicted in 2014 from a base of 2.25Mt in 2013. Polysilicon is predicted to be the fastest growing end use for silicon metal.

China is dominant silicon metal producer representing 61% of the global total and 75% of global capacity. China exported 49% of its silicon metal production.

Dow Corning is one of the world's largest producers of silicon metal and the world's biggest manufacturer of silicone products. It operates several silicon metal plants in the USA, Brazil and Canada.

Potential end users are the following:

- Quebec Silicon Limited Partnership (Dow and GSM Joint Venture), Becancour, Quebec;
- Global Specialty Minerals (GSM);
- Dow Corning;
- Elkem Chicoutimi, Quebec;
- CC Metals & Alloys Inc.

Generally speaking, ferrosilicon is 3 times the volume of production of silicon metal annually. Globally, Ferroglobe PLC (merge between GSM and Grupo Ferroatlantica) was the world's largest silicon metal producer. The BlueStar (Elkem) and Dow Corning are jointly the second largest silicon metal producers by capacity. BlueStar is majority owned by the Chinese Government but most of its silicon metal capacity is located at its Elkem plants in Norway. All of Canada's silicon metal production is produced at Becancour.

In addition, according to public sources, Iceland is becoming a major importer of silica, to feed its growing domestic silicon and ferrosilicon production. Elkem's Akranes ferrosilicon plant in Iceland is the second largest in the world, with 130 ktpy, United Silicon HF is developing a plant in Iceland to produce 22 ktpy silicon metal, with rampup potential to quadruple the production rate. Thorsil is building a silicon metal plant with the potential for 110 ktpy, Silicor Material is planning a silicon metal plant with the potential for 16 ktpy and PCC plans one to produce 32 ktpy of silicon metal.

Ferroglobe has presented that a tonne of silicon metal requires 2.8 tonnes of silica in the manufacturing process.

1.16.3 Price

Silica is not an openly traded commodity. Prices are negotiated between end users and producers for annual and some long term contracts. Prices do vary according to different parameters such as purity, size and impurities.

Based on this information and understanding of the market, a price was developed by Met-Chem with Rogue Resources for the economic analysis. This price, based on a mix of ferrosilicon grade product and other fillers, was established at CAN$88.80 per tonne.

1.17 Environmental Studies, Permitting and Social or Community Impact

At the start of the project in 2014, guidance was given by Service GFE (GFE) in a report presented in November 5, 2014, Rapport Sectoriel – Milieu Naturel et Humain, by

Christine Beaumier, biol.. WSP Group plc (WSP) in 2015 provided guidance on several matters pertaining to the environmental obligations related to the development of a mining operation on the Silica Ridge deposits.

SNC-Lavalin, on May 12, 2016, was granted the mandate to carry out the baseline study towards the CofA Request for a Quarry Operation. In order to comply with the MFFP and MDDELCC requirements and to avoid or reduce the impact of the project, biological surveys were completed.

This assessment of the potential environmental and social issues is based on preliminary infrastructure location that was provided to SNC-Lavalin for the biological surveys. A new environmental and social assessment will be completed throughout the design and engineering process as infrastructure location is being finalized and confirmed.

The project is located within a habitat that is conferred legal status by the *Regulation respecting Wildlife Habitats*. In June 2016 Rogue Resources took steps towards securing the required authorizations which, if granted, will require certain mitigation measures being implemented. These mitigation measures include restriction periods for certain activities. Rogue Resources is working proactively with the relevant authorities and is ready to apply the required mitigation measures.

Considering the presence of special status bat species in the study area, specific mitigation measures for these species could be required by the authorities concerned. The same applies to the potential habitats of special status voles. Regarding the Bicknell's Thrush, the MFFP could recommend full protection zones in the areas classified as optimal habitat while specific mitigation measures may be required inside or nearby habitats considered as sub-optimal.

According to Article 14 of the *Regulation respecting pits and quarries*, the operating site of any new quarry must be located at a minimum horizontal distance of 75 m from any swamp. A complementary inventory may be required depending on the Mines Site Layout to be completed throughout the design and engineering process.

Although bog-type wetlands are not covered by Article 14 of the *Regulation respecting pits and quarries,* encroachment on bog-type wetlands or their destruction is subject to an Authorization Certificate (AC) application, as provided for in Article 22 of the EQA. It is likely the MDDELCC will require compensation for bog losses caused by the project.

According to the *Regulation respecting pits and quarries*, the operating site of any new quarry must be located at a minimum horizontal distance of 75 m from any permanent stream or lake. Similarly, the operation of a quarry in a permanent stream or a lake is prohibited. Furthermore, a 15 m strip must be maintained for intermittent streams, as provided for in the *Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains*. Encroachment on these or destruction thereof is subject to an AC application as provided for by Article 22 of the EQA. The analysis of available data shows that there are several permanent and intermittent watercourses straddling the current Mine Site

Layout or located nearby. However, the status of some watercourses will be reviewed with the authorities because it might not be defined as a watercourse within the meaning of the law.

The watercourses where fish was observed are also considered as fish habitats, i.e. a habitat subject to legal protection under the *Regulation respecting wildlife habitats*. To this end, if needed for intermittent watercourses, Rogue Resources would have to apply for authorization to implement its project in these legally protected habitats as per Article 128.7 of the *Act respecting the conservation and development of wildlife*.

In terms of the potential social effects, as mentioned above, Rogue Resources inc. has interacted with the various local stakeholders since the start of the project: the Municipalities of Saint-Urbain, of Baie-Saint-Paul, and of Les Éboulement; the MRC of Charlevoix; the ZEC des Martres and the Huron-Wendat Nation Council. Stakeholders were kept informed on the project and the work development. In particular, the ZEC des Martres was kept informed of all exploration activities and the Company took the necessary measures to ensure the ZEC des Martres access roads were kept in a reasonable condition and provided grading of the roads when required.

It is foreseen that the social issues that will be raised by the implementation of the project will concern recreational and land use activities, and the preservation of the biophysical environmental. These take place throughout the year, with peaks during hunting and fishing seasons. The potential interactions between the project and such activities will likely be raised by stakeholders at the local and regional levels in the course of the consultation process.

In addition, it may be required to verify the archaeological potential on the project site. Given the remoteness of the site, it is likely that the archaeological potential will be low.

This area is also characterised by high unemployment rates (when compared to the nearby urban are of Quebec City) and by seasonal fluctuations in employment (Schéma d'aménagement, MRC Charlevoix, 2012). It is thus likely that the implementation of this project in the area will raise expectations in terms of employment and opportunities for contracts for local enterprises. Already, throughout the exploration program local employment in the region was created as well as hiring local contractors for line cutting, outcrop stripping, cutting timber on drill pads, drill pad site preparation with an excavator, and restoration of drill sites. Purchasing locally in Saint-Urbain and Baie-Saint-Paul was highly encouraged and accommodations in the region were used during an eight month period in 2015.

Two main alternatives are under consideration for the access road to the project site. The southern alternative is preferred since it avoids the main road of ZEC des Martres. The impact assessment for this access road will be carried out after completion of the biological surveys for this project area and the results of the public consultation.

There are no environmental liabilities to be reported (WSP, 2016)[1].

1.18 Capital and Operating Costs

1.18.1 Capital Costs

The capital cost estimate of Rogue's Silicon Ridge Project for silica concentrate production at a processing rate of 190,000 tonnes per year is based on Met-Chem's standard methods applicable for a Preliminary Economic Assessment study to achieve the accuracy level of ± 35%. It is to be noted that an overall reduction of about 20% was applied to equipment costs on the basis of validated availability of said equipment on the pre-owned market. However, all factorized values are calculated on the basis of new equipment.

The capital cost estimate includes the material, equipment, labour and freight required for the mine pre-development, processing facilities, fines storage and management, as well as infrastructure and services necessary to support the operation. Mine services and facilities as well as mine equipment are accounted for as operating costs since the operation of the quarry is based on mining contractors fees. The initial capital cost for the scope of work is estimated as $13,110,000 including $8,740,000 for direct costs, $1,748,000 for indirect costs and $2,622,000 for contingency. The total life of mine capital cost is estimated at $17,475,000 of which $13,110,000 is initial capital and $4,365,000 is sustaining capital. The sustaining capital cost includes $3,631,000 to cover for the installation of the 25kV power line in Year 3 and related substation as well as $734,000 for closure and rehabilitation of the site in Year 20.

The capital cost is summarized Table 1-4.

[1] Section 20 prepared by WSP in report NI 43-101 – Technical Report on the Silicon Ridge Mineral Resources, June 7, 2016.

Table 1-4 – Summary of the Investment Capital Costs Estimate

Item Description	Initial Capital Total Rounded (CAN$)	Sustaining Capital Total Rounded (CAN$)
Direct Cost		
Quarry		
Pre-Development	344,000	
Quarry Total	**344,000**	
Process		
Processing Circuit	6,064,000	
Process Total	**6,064,000**	
Infrastructure Site and Power		
Industrial Site Preparation, Drainage and Site Roads	270,000	
Access Road	564,000	
Ancillary Buildings and Facilities	257,500	
Power, Substation and Distribution	659,000	3,631,000
Infrastructure Site and Power Total	**1,751,000**	
Service Vehicles		
Plant Service Vehicles	581,000	
Plant Service Vehicles Total	**581,000**	
Total Direct Cost	**8,740,000**	
Indirect Costs	1,748,000	
Contingency	2,622,000	
Closure and Rehabilitation		734,000
Total Capital Cost	**13,110,000**	**4,365,000**

1.18.2 Operating Costs

Operating costs have been developed for Mining, Processing and Site Services and Administration for the Project.

The sources of information used to develop the operating costs include in-house databases and outside sources particularly for materials, services and consumables. All amounts are in Canadian dollars (CAD).

The life of mine average operating cost estimate, given as dollar per tonne of feed to the concentrator amounts to $ 37.84 and is summarised in Table 1-5.

Table 1-5 – Summary of Life of Mine (LOM) Average Operating Cost Estimate

Area	LOM Average Operating Cost ($/feed tonne)
Mining	22.11
Processing	11.36
Administration, Infrastructure & Technical Services	4.37
Total Average Operating Costs	**37.84**

Table 1-6 presents the estimated personnel requirements for the Project. This workforce is comprised of staff as well as hourly employees. The administration employees will work on a 5 days per week basis. The hourly workforce at the plant will provide 24 hour per day coverage, 7 days per week, and will work on a 2 weeks on, 2 weeks off rotation.

Quarry operations are based on a six (6) month duration and are conducted by a mining contractor. No employee requirement is shown for the quarry.

Table 1-6 – Total Personnel Requirement

Area	Number
Processing	13
Management, Administration & Technical Services	3
Total Manpower	16

1.19 Economic Analysis

1.19.1 Economic Results

The economic/financial assessment of the Silicon Ridge Project of Rogue Resources Inc. is based on Q3-2016 price projections and cost estimates in Canadian currency. No provision was made for the effects of inflation. The evaluation was carried out on a 100 %-equity basis. Current Canadian tax regulations were applied to assess the corporate tax liabilities while the recently adopted regulations in Quebec (originally proposed as Bill 55, December 2013) were applied to assess the mining tax liabilities.

The financial indicators under base case conditions are given in Table 1-7.

Table 1-7 – Base Case Financial Results

Base Case Financial Results	Unit	Value
Pre-Tax (P-T) NPV @ 10 %	M CAD	36.5
After-Tax (A-T) NPV @ 10 %	M CAD	23.8
P-T IRR	%	40.2
A-T IRR	%	33.9
P-T Payback Period	years	2.6
A-T Payback Period	years	3.1

A sensitivity analysis reveals that the Project's viability will not be significantly vulnerable to variations in capital and operating costs, within the margins of error associated with PEA estimates. However, the Project's viability remains more vulnerable to the larger uncertainty in future market prices.

1.19.2 Important Caution Regarding the Economic Analysis

The economic analysis contained in this report is preliminary in nature. It incorporates inferred mineral resources that are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. It should not be considered a prefeasibility or feasibility study. There can be no certainty that the estimates contained in this report will be realized. In addition, mineral resources that are not mineral reserves do not have demonstrated economic viability.

The results of the economic analysis are forward-looking information that is subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

1.20 Interpretation and Conclusions

Core handling and data capture were done in a professional manner and in accordance with the industry best practice guidelines.

Based on discussions with Rogue personnel and observations during the site visits of August and November 2015, Met-Chem concluded that the drill program was well planned, the geology descriptions and the sampling are well done. Three drill holes were drilled down dip cutting across the quartzites at shallow angles and this was due to topographic constraints and drill collars were positioned in such a manner as to obtain a most southwesterly quartzite intersection. Additionally one drill hole was drilled down dip and vertically into the middle of the southwest quartzite and another drill hole was drilled down dip and vertically into the middle of the northeast zone, both verifying the down dip extension of the quartzite. Met-Chem agrees with the correlations of the mineralized zones between holes and between sections. The quartzite exposed and sampled in the trenches located on drill sections provided excellent control on the attitude and quality of the quartzite.

Although the performance of the QC samples has not been outstanding because of the concentrations of elements approaching the detection limits, Met-Chem believes that, globally, the analytical results used in the resource estimation reflects the quality of the quartzite, as regarding the silica and impurities contents. It is important to note that the possible risk associated with this slight variability is mitigated by the process that has been shown by ANZAPLAN to achieve significant reduction of the content of impurities in the mineralized material.

This Technical Report presents the results of Met-Chem's estimation of the in pit mineral resource within the "G" and "H" quartzite units on the Silicon Ridge Property. The DTM from a photogrammetric survey was used for the resources and the pit design. The resource estimate follows the guidelines of NI 43-101 (2011) and of the CIM Standard on Mineral Resources and Reserves (2014).

Met-Chem believes the data used in the resource estimate for the ‘G” and “H” units is sufficiently reliable and complete to serve in a resources estimate that adequately reflects the geological and grade continuity of the quartzite units within the boundaries of the block model.

A seasonal quarry operation based on contractors operating five (5) days per week, twelve (12) hours per day, six (6) months of the year during the warmer seasons was considered for the Project. The contractor would be responsible to provide crushed mineralized material (-120 mm) to the plant or to the crushed material stockpiles when the quarry is not operating. The mine production schedule was developed based on a 20 years pit shell. This schedule includes a pre-production phase of one (1) year which is required for overburden stripping, road construction and pit development. During this period, 120,000 tonnes of overburden will be mined.

Further study of the overburden depth over the proposed quarry will be carried out to confirm the pre-production overburden stripping requirements and subsequent length of the pre-production phase.

The processing plant has a nominal capacity to process 190,000 tonnes per year of run of mine to produce approximately 160,000 tonnes per year of silica concentrate, with the potential to process up to a design capacity of 310,000 tonnes per year. A suitable process flowsheet includes scrubbing, mineral sorting, regrind and rejects thickening.

In addition to quarrying and processing, infrastructure and services have been added to complete the investment cost of the project.

The total life of mine capital cost, at an accuracy level of ± 35%, is estimated at $17,475,000 of which $13,110,000 is initial capital and $4,365,000 is sustaining capital. The sustaining capital cost includes $3,631,000 to cover for the installation of the 25kV power line in Year 3 and related substation (no government or utility subsidies were assumed) as well as $734,000 for closure and rehabilitation of the site in Year 20. Future detailed mine plan will assess potential for continuous rehabilitation throughout the quarry's life.

The life of mine average operating cost estimate is evaluated at $37.84 per tonne of feed. Mine closure and rehabilitation cost have been estimated at $734,000.

The economic analysis of the project has demonstrated the potential viability of the project with recommendations to proceed to next level of Feasibility studies. At an average sale price of silica product of $88.80/tonne (FOB Silicon Ridge), the financial results indicate a pre-tax Net Present Values (NPV) of $ 36.5 M at a discount rate of 10%. The pre-tax Internal Rate of Return is 40.2% with a payback period of 2.6 years. The after-tax Net Present Values are $ 23.8 M at a discount rate of 10%. The after-tax Internal Rate of Return is 33.9% and the payback period is 3.1 years.

1.21 Recommendations

Considering the positive results of the PEA, Met-Chem recommends that the project continues to the next phase of development with a Feasibility Study. Met-Chem recommends a series of additional studies and tests to advance to the next phase and minimize risks. The main recommendations include:

- Complete overburden depth survey over proposed SW Pit location and estimate volume of overburden to be stockpiled during quarrying operation;
- Update Project Schedule with information provided by overburden depth survey;
- Complete market analysis of potential end users and further contacts with clients;
- In order to develop and firm up a construction budget estimate based on some pre-owned equipment, efforts should be made in identifying the suppliers and securing the equipment;
- Add diamond drill holes in the portions of the deposit hosting the Inferred Resources, to improve grades estimates, upgrade the related blocks and firm up the resources in the higher categories. Based on the 20 years pit shell Met-Chem has determined that the additional drilling will consist in seven (7) short drill holes totalizing 700 m and three (3) trenches totalizing 150 m
- In future drilling programs:
  - Only use commercial certified reference materials;
  - Standardize and simplify the rock codes for easier handling and plotting; a large number of combinations of quartzite code with various qualifiers was found in the master database.
- Perform a series of in situ density determination by the immersion method on quartzite samples for which an S.G. was measured by pycnometry and

calculate a regression between the immersion and the existing pycnometer results. It is expected that 100 tests will be sufficient to define the correlation between the two datasets. The objective of this work is to allow a quantification of the effect of the secondary porosity (permeability) in order to provide a better estimate of tonnes;

- Perform in situ density determination on about 50 waste samples, for future economic study and mine planning purposes;
- Perform rock mechanics as well as hydrogeological studies to further confirm rock slopes, rock permeability, ground and underground water flows and water balance in order to validate the open pit mining technical parameters.
- Evaluate the requirements of condemnation drilling for the Silicon Ridge Project mine site and infrastructure location (waste rocks disposal area, industrial site, fines storage area, etc.);
- Carry out soil geotechnics fieldwork and testing in order to provide foundations design parameters and determination of mechanical properties beneath infrastructure.

The estimated cost for the next study phase is provided in Table 1-8.

Table 1-8 – Next Phase Estimated Costs

Activity	Estimated Costs (CAD)
Pit Slope and Geotechnical Work	75,000
Advance Study Work / FS	400,000
TOTAL	475,000

2.0 INTRODUCTION

Rogue is a Canadian mining company with a diverse portfolio of properties but is currently focused on its 100%-owned Silicon Ridge Project. The Property is located about 42 km north of the City of Baie-Saint-Paul, on the north shore of the Saint Lawrence River, in the Province of Quebec.

The services of Met-Chem were retained by Rogue to produce first the mineral resources estimate and then to complete a PEA of the Silicon Ridge Project.

The Technical Report that presented the results of the estimation of the mineral resource within the "G" and "H" quartzite units on the Silicon Ridge Property prepared by Met-Chem was issued July 20, 2016.

This NI 43-101 Technical Report (Report) on the Silicon Ridge Project has been prepared at the request of Rogue to present the PEA major findings. The PEA is based on the Mineral Resources (effective date June 7th, 2016) as issued by Met-Chem in the July 20th, 2016 Technical Report.

The PEA report was prepared by Met-Chem with economic results completed on September 14th 2016.

The effective date of the Technical Report on the PEA of the Silicon Ridge Project is September 14th 2016 and the report was completed October 26, 2016.

A PEA is preliminary in nature and includes Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. There is no certainty that the conclusions reached in the PEA will be realized. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

2.1 Terms of Reference - Scope of Study

Met-Chem was requested by Rogue to provide a PEA Study for the exploitation of the Silicon Ridge quartzite deposit. Met-Chem was to provide leadership for the mining, process design, infrastructure, the compilation of capital and operating cost estimates at a confidence level of ± 35%, economic analysis and report preparation integrating metallurgical testing and environment considerations for which information was provided by other consultants.

Preliminary process flowsheets were developed from a recent metallurgical testing program performed by ANZAPLAN. The capital cost and the operating cost estimates have been developed for a 190,000 tonnes per year processing circuit.

The PEA Report is intended to demonstrate the potential viability of the Project at a production rate of about 160,000 tonnes per year of silica concentrate in order to justify proceeding with other phases of project development.

2.2 Source of Information

The Qualified Persons have relied on information provided by Rogue and on expert opinions pertaining to mineral tenure, surface rights, royalties, environmental considerations and agreements with local communities.

The status of the claims was verified on the government system for management of claims (GESTIM) available on the website of the Quebec "Ministère de l'Énergie et des Ressources Naturelles" (MRN).

Information related to geology and exploration was sourced from files published, or provided by, Rogue and from a previous Technical Report by Geologica Groupe-Conseil Inc. of Val-d'Or, Quebec. Information on environmental matters derives from work by WSP and by SNC-Lavalin. This Technical Report is also based on site visits by a qualified person and on discussions with Rogue's personnel.

The selection of the cutoff grade for this resource estimate is supported by the results from metallurgical testing conducted by ANZAPLAN in Germany. An industrial minerals specialist, ANZAPLAN has extensive experience in the mining industry and background in silica projects. Other reference sources are as noted throughout this Report.

Each qualified person has reviewed the available technical information and determined it to be adequate for the purposes of this report.

2.3 Site Visit

Yves A. Buro, P.Eng., Senior Geologist, Met-Chem, visited the site on August 18, 2015 and completed a personal inspection of the Property, as one of the QPs, between the days of November 18 and 20, 2015. During the QP visit, several trenches and outcrops were visited, as well as the two active drill rigs and most of the drill sites. Selected drill core was examined, the database, core logging and sampling activities, QA/QC procedures and geological interpretation were reviewed and discussed with the geologists. Independent check samples were collected by the QP.

Daniel Gagnon, P.Eng., VP Mining and Geology, Met-Chem, visited the site on July 6th, 2016 accompanied by Rogue's former Senior Vice President, Mr. E. Canova, Géo (OGQ-403) and Rogue's Technical Advisor, Mr. P. Davis, P.Geo (OGQ-357).

The QPs consider the site visit as current personal inspection, as defined under Section 6.2 of NI 43-101CP, on the basis that the material work completed on the Property was reviewed and that no new material scientific or technical information has been accumulated about the Property since that personal inspection. The QP has taken the necessary steps to verify independently that there has been no material work done on the property since his last site visit.

2.4 Contributing Authors and Qualified Persons

Table 2-1 provides a list of qualified persons and their respective sections of responsibility. The certificates for people listed as Qualified Persons can be found at the beginning of the Report under Date and Signature – Certificates.

Table 2-1 Qualified Persons and their Respective Sections of Responsibilities

Section	Title of Section	Qualified Persons
1.0	Summary	MJ Buchanan and related QPs
2.0	Introduction	MJ Buchanan and related QPs
3.0	Reliance on Other Experts	MJ Buchanan and related QPs
4.0	Property Description and Location	Yves Buro, Met-Chem
5.0	Accessibility, Climate, Local Resources, Infrastructure And Physiography	Yves Buro, Met-Chem
6.0	History	Yves Buro, Met-Chem
7.0	Geological Setting and Mineralization	Yves Buro, Met-Chem
8.0	Deposit Types	Yves Buro, Met-Chem
9.0	Exploration	Yves Buro, Met-Chem
10.0	Drilling	Yves Buro, Met-Chem
11.0	Sample Preparation, Analyses and Security	Yves Buro, Met-Chem
12.0	Data Verification	Yves Buro, Met-Chem
13.0	Mineral Processing and Metallurgical Testing	Ewald Pengel, Met-Chem
14.0	Mineral Resource Estimates	Schadrac Ibrango, Met-Chem
15.0	Mineral Reserve Estimates	Left blank for PEA study
16.0	Mining Methods	Daniel Gagnon, Met-Chem
17.0	Recovery Methods	Ewald Pengel, Met-Chem
18.0	Project Infrastructure	MJ Buchanan, Met-Chem
19.0	Market Studies and Contracts	MJ Buchanan, Met-Chem
20.0	Environmental Studies, Permitting and Social or Community Impact	Marc Arpin, SNC-Lavalin
21.0	Capital and Operating Costs	MJ Buchanan, Met-Chem
22.0	Economic Analysis	Michel L. Bilodeau,Met-Chem
23.0	Adjacent Properties	Yves Buro, Met-Chem
24.0	Other Relevant Data and Information	MJ Buchanan, Met-Chem

Section	Title of Section	Qualified Persons
25.0	Interpretation and Conclusions	MJ Buchanan, Met-Chem
26.0	Recommendations	MJ Buchanan, Met-Chem
27.0	References	MJ Buchanan, Met-Chem

Capital and Operating Cost estimates as well as Conclusions and Recommendations were provided by those involved in relevant areas of the Study.

3.0 RELIANCE ON OTHER EXPERTS

The Qualified Persons ("QP's") involved in this report are responsible for the sections identified in the certificates of the Qualified Persons. The Qualified Persons have relied on expert opinions pertaining to mineral tenure, surface rights, royalties, environmental considerations and agreements with local communities.

The status of the claims was verified on the government system for management of claims (GESTIM) available on the website of the Quebec "Ministère de l'Énergie et des Ressources Naturelles" (MERN).

The information, conclusions, opinions, and estimates contained herein are based on:

- Information available to Met-Chem at the time of the preparation of this Report with an effective date of September 14th, 2016;
- Assumptions, conditions and qualifications as set forth in this Report; and
- Data, reports, and opinions supplied by Rogue and other third party sources.

The Reports supplied and forming the basis of this Technical Report are listed in Section 27.

Met-Chem believes that information supplied to be reliable but does not guarantee the accuracy of conclusions, opinions, or estimates that rely on third party sources for information that is outside the area of technical expertise of Met-Chem. As such, responsibilities for the various components of the Summary, Conclusions and Recommendations are dependent on the associated sections of the Report from which those components were developed.

Met-Chem relied on the following reports and opinions for information that is outside the area of technical expertise of Met-Chem:

- Metallurgical testing: Dorfner ANZAPLAN.
- Information relative to environmental studies, permitting and social or community impact was provided by SNC Lavalin;
- Information relative to pit slope parameters was provided by Journeaux Assoc., Division of Lab Journeaux Inc;
- Information on Silica Pricing provided by Rogue with the support of the Roskill report.

4.0 PROPERTY DESCRIPTION AND LOCATION

4.1 Property Location

The Property is located about 42 km north of the City of Baie-Saint-Paul, on the north shore of the Saint Lawrence River, Province of Quebec, approximately 95 km northeast of Quebec City (Figure 4-1).

The Property is located within the area covered by National Topographic System (NTS) map sheet 21M/15. The centre of the Property is approximately at Universal Transverse Mercator ("UTM") coordinates 381350 mE, 5294350 mN, North American Datum NAD83, Grid Zone 19N.

4.2 Property Description and Ownership

The Property is comprised of eight (8) contiguous map-designated mineral claims ("CDC" claims) that form a rectangular block covering a total area of 462.6 ha (Table 4-1 and Figure 4-2). All the claims are currently active and Rogue Resources Inc. is the 100% recorded owner. The claims are in good standing and have an expiry date of April 21, 2018. All the claims are affected by a restriction related to a Wildlife Habitat protection.

The status of the claims was verified on June 6, 2016, using GESTIM, the government system for management of claims, available on the website of the Quebec "Ministère de l'Énergie et des Ressources Naturelles" (MERN) (Table 4-1).

The amount of required work to keep the claims in good standing was reduced by 35% for a period of two years starting in December 2015, whereas the renewal fees were increased by 8 % on January 1, 2016 and will be increased by another 8 % on January 1, 2017.

Table 4-1 Silicon Ridge Property, List of Claims, Status, Work and Fees

Claim No	Area	Required Work ($)	Excess Work (Credit; $)	Required Fees ($)	Expiry Date	Restriction
2402787	57.83	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402788	57.83	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402789	57.83	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402790	57.83	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402791	57.82	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402792	57.82	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402793	57.82	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
2402794	57.82	780.00	1,114.00	59.67	2018-04-21	Wildlife Habitat
Total	**462.60**	**6,240.00**	8,912.00	477.36		

Figure 4-1 Property General Location

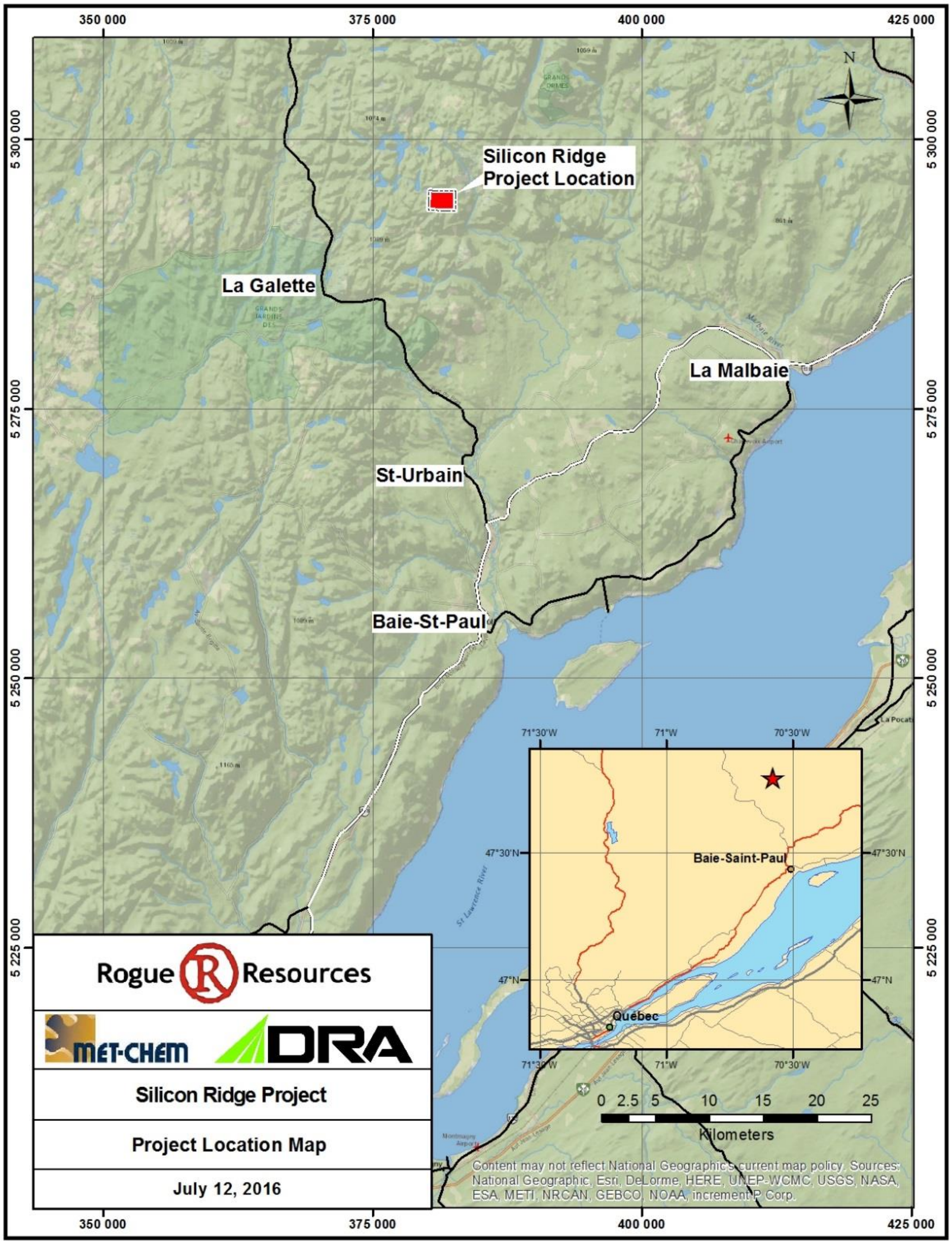
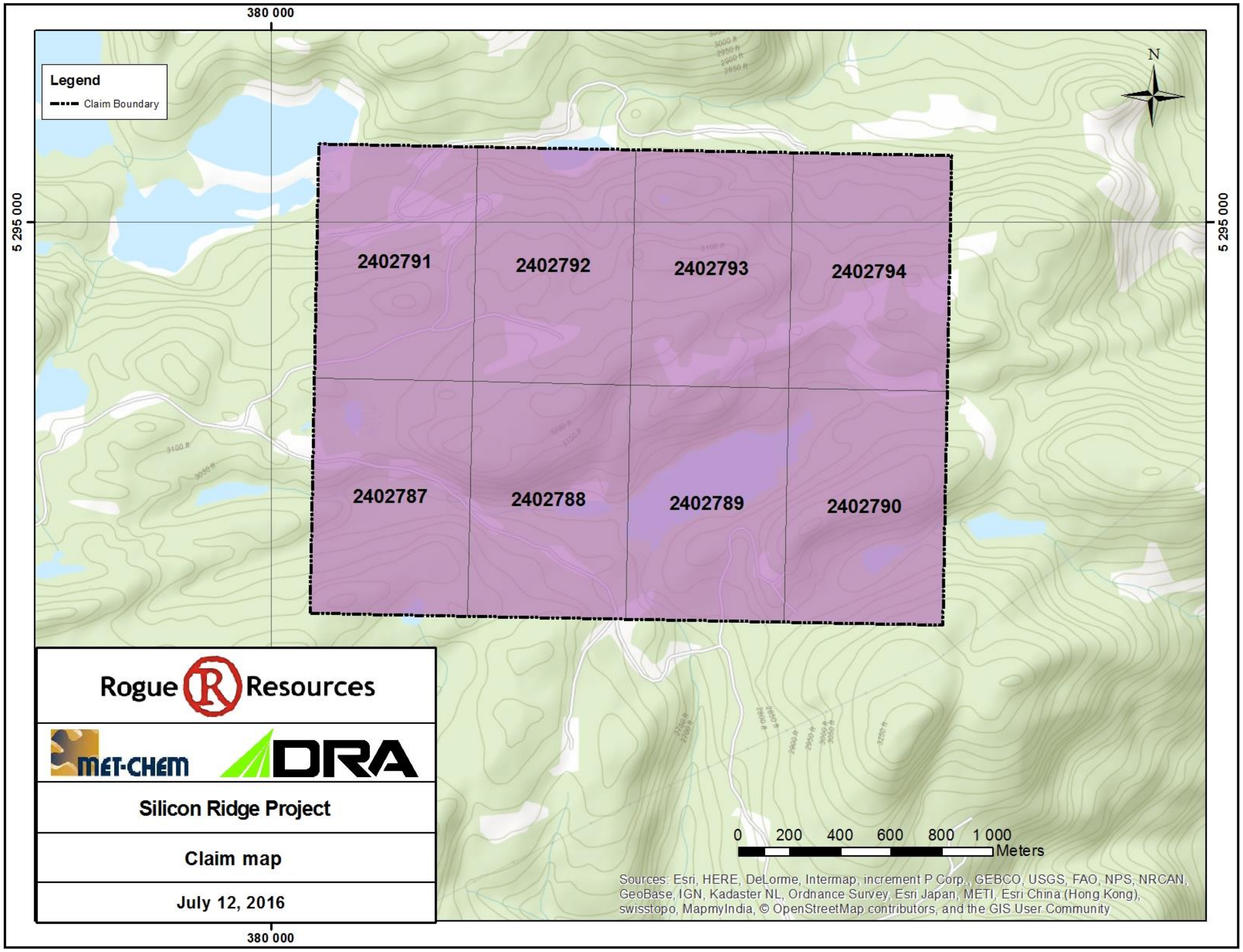


Figure 4-2 Property Location and Claims Map



The Property has not been legally surveyed but map-staked claims are defined on the basis of UTM coordinates and consequently the Property boundaries are deemed to be accurate.

4.3 Mineral Tenure in Quebec

Map designation is now the main means of acquiring a claim in Quebec. Once the Notice of Staking is approved, the claims are registered with the Registrar of the Quebec MERN. Within surveyed territory, the outline of a claim is the same as that of a land lot, or part of.

The claims have a validity of two years and can be renewed indefinitely for two-year periods, provided the renewal fees are paid and the required exploration work ("Assessment Work") is completed, under certain conditions.

Excess assessment work on one claim may be applied to the renewal of other contiguous claims held by the same owner within a radius of 4.5 km from the centre of the claim from which the credits will be used.

The claims give the owner exclusive rights to explore for any mineral substances in the public domain, with a few exceptions like:

- Hydrocarbons;
- Loose deposits such as sand, gravel and clay;
- Land that is also subject to an exploration or mining right for surface mineral substances.

Access to the claims is granted to carry out exploration work. However, the claim holder cannot enter land granted for non-mining purposes or land leased for mining surface mineral substances without permission from the current holder of these rights.

The claim holder may not erect or maintain any construction on lands of the domain of the State without first obtaining authorization from the Minister of Mines, except if the construction is located on the parcel of land subject to the claim and is a construction of a type defined by a ministerial order.

The information in this section is only a summary description of the mining rights and the reader seeking full and official definitions on titles or rights and obligations of the claim holders should refer to the website of the MERN of Quebec.

4.4 Underlying Agreements and Royalties, Encumbrances

Pursuant to an option agreement dated August 15, 2014, Rogue (the Company) acquired an option to earn a 100% interest in the Property for a payment of 8.5 million shares. The Property is subject to a 2% Net Smelter Return ("NSR") royalty, of which one-half (1%) may be purchased for $500,000 and the remaining one-half (1%) may be purchased for a further $1,000,000 (MD&A, July 31, 2015).

The Company also entered into an MOU dated April 10, 2015 with the Huron-Wendat Nation Council in respect of the Project (MD&A, July 31, 2015). The agreement stipulates, among other obligations, that the Company will pay a royalty of $0.08 per metric tonne of extracted economic material upon commencing commercial production of quartzite.

Extensive community consultations have been carried out by Rogue management with various community groups in the region, including the Municipal Regional Offices of Saint-Urbain, Baie-Saint-Paul, the regional county municipalities ("MRC") of Charlevoix and the administrators of the "Zones d'exploitation contrôlée des Martres" ("ZEC", Controlled Harvesting Zone). (MD&A, July 31, 2015).

The Property is located within the "ZEC des Martres" located in public land areas of Quebec. ZECs were set up in 1978 by the Government of Quebec to take over from private hunting, fishing and trapping clubs, in order to provide timely access to recreational activities to the general public.

All the claims are registered at the MERN with an encumbrance related to the conservation of Wildlife Habitat (Restriction 16862). It seems that this will essentially consist of a restriction on exploration work during certain periods of the year, such as during the migration of caribou.

It is important to note that the Sitec silica mine that is located in the same restricted area, 4 km to the southwest from Rogue's Property, has been in operation for the past fifty years. In addition, the Property is located in a region that has been logged in recent years, resulting in a number of forestry roads facilitating access to different sectors of the Property.

4.5 Environmental Liabilities

WSP Group plc (WSP) provided initial guidance on all matters pertaining to the environmental obligations related to the development of a mining operation on the Silicon Ridge deposit.

The environmental characterization work carried out by WSP included:

- Identification of environmental issues:
  - Special status wildlife (Woodland caribou);
  - Wetlands and watercourses;
  - Surficial deposits and borrow pits;
  - Special-status flora and fauna species.
- Characterization of surface water and watercourses with high fish habitat potential:
  - Sampling and analysis of water quality in Lac de la Grosse Femelle;

- Physical characterization of watercourses (substrate, type of flow, fish habitat);
- Description of present fish communities.

The environmental obligations with regard to the Quebec Environment Department, the Québec's Environment Quality Act or the Canadian Environmental Assessment Act are addressed by WSP.

Further guidance was also presented by Service GFE (GFE) in a report presented in November 5, 2014 (Rapport Sectoriel – Milieu Naturel et Humain, by Christine Beaumier, biol.), for the project area.

On May 12th, 2016, SNC Lavalin was granted the mandate to carry out the baseline environmental study towards the CofA Request for a Quarry Operation. The field work and reports are to be completed by November 2016 and the submission of the CofA form in December 2016.

Full descriptions regarding the environmental matters are provided under Section 20.0 of the present report.

4.6 Permits that must be acquired

Permits to conduct exploration work, including drilling, were obtained by Rogue. However, starting a mining operation on the Property will require either a "Mining Lease" (BM) or a "Lease to Mine Surface Mineral Substances" (BEX)**.**

It is expected that the Project will require a number of approvals, permits and authorizations throughout all the stages of development and prior to initiation of mining.

4.7 Other significant factors and Risks

The Property is located within the Charlevoix Seismic Zone, one of the most seismically active regions in eastern Canada. A total of 187 micro-earthquakes were recorded over the past twelve months (June 16, 2015 to June 11, 2016), ten (10) of which were felt, although of low magnitudes ranging from 1.3 to 3.8 (Source: Natural Resources Canada, Earthquakes Canada). Despite these repetitive earthquakes, no surface rupture has ever been reported in historical accounts or in scientific reports. In addition to damaging buildings in areas where soft soils amplify ground motions, high-magnitude earthquakes may trigger landslides.

Met-Chem is not aware of any risks or other encumbrances, environmental liabilities or other significant factors and risks that may affect access, title or the right or ability to perform work on the Property. Met-Chem has not verified the validity of titles or rights on the property except for the information for the claims available on GESTIM. Met-Chem relies on information provided by Rogue on these matters.

5.0 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Accessibility

The Property is accessible from Baie-Saint-Paul by driving north along Route 138 to Saint-Urbain, and along Route 381 to “Accueil Barley”, the entrance point to the “ZEC des Martres”. This entrance is located off Route 381, at Distance Marker Km 43, some 52.8 km north from Baie-Saint-Paul. From this point, the property can be reached by driving about 17 km eastward following forestry roads. The main gravel roads are maintained in good condition and are easily passable with a pickup truck or heavy equipment.

The Property can also be accessed via the road to the Sitec quartzite mine and forestry roads and trails, some of uncertain drivable condition.

5.2 Topography, Elevation and Vegetation

Rugged topography makes up most of the Property, dominated by northeast trending ridges and deeply incised river valleys. Elevations within the Property vary from about 870 to 990 m above mean sea level.

Vegetation is represented by balsam fir, white birch, yellow birch, as well as conifer regrowth in forested areas.

5.3 Population, Transportation

The Property is situated within a vast territory that is exploited mainly for forestry and recreational outdoor activities. The region has no permanent population and chiefly includes lands belonging to the State, such the “Réserve Faunique des Laurentides”, the “Parc National des Grands-Jardins” and the “ZEC des Martres”.

Saint-Urbain, with a population of 1,456 (as at July 1, 2014; Source: “Institut de la statistique du Québec”) is the closest town from the Property. Baie-Saint-Paul, located 14.5 km to the south of Saint-Urbain, has a population of 7,331 (as at July 1, 2014) and is the largest urban centre in the region of the Property.

The Property is within a region serviced from Quebec City by provincial highways following the entire north shore of the Saint Lawrence River or connecting it to the City of Saguenay.

5.4 Climate

The Property is situated in a zone of a sub-humid, temperate continental climate with cold winters and warm, humid summers. Annual daily average temperature stands at 4ºC and total annual precipitations amount to 737 mm of rain and 2,565 mm of snow (Table 5-1). Rogue’s field personnel have noticed that the temperature seems to be systematically lower in the Property area than at the Baie-Saint-Paul weather station by about 5º C.

Micro-climates characterized by significant temperature variations may prevail locally, owing to the proximity of the St. Lawrence River and the general rugged topography.

A year-round mining operation at the Property would probably be possible, except for the hunting season that stretches from September to mid-October and during the period of caribou migration. Although winter days can be cold and snow accumulation significant, the highways in the area are open year round and Canadian miners are experienced at operating mines under even harsher climatic conditions than the ones prevailing in the Project area. However, a mining operation extracting quartzite on the Property may be seasonal and thus would not be significantly affected by the harsh winter conditions.

Table 5-1 Baie-Saint-Paul; Average Monthly Climate Data & Extremes (1981 to 2010 Source: Environment Canada)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall, Monthly Average (mm)	13.3	16.1	40.2	77.2	97.9	93.8	87.4	83.4	79.5	77.4	59.6	11.2
Snowfall Monthly Average (cm)	60.7	48.7	40.7	14.3	0.1	0.0	0.0	0.0	0.0	1.7	26.2	64.0
Rainfall, Extreme Daily (mm)	49.5	72.6	90.0	65.0	91.8	63.4	80.4	69.0	92.4	62.2	55.0	41.9
Snowfall, Extreme Daily (cm)	49.8	65.8	37.0	33.0	12.7	0.0	0.0	0.0	0.0	7.8	37.4	58.4
Temperature, Daily Maximum (°C)	-6.7	-4.2	0.6	7.7	15.7	21.1	23.8	22.7	17.5	10.9	3.5	-2.9
Temperature, Daily Minimum (°C)	-17.9	-15.7	-9.6	-1.5	4.5	9.9	12.7	11.8	7.4	1.9	-4.2	-12.3
Prevailing Wind Direction (AZ°) (*)	315	315	315	337	292	337	0	292	337	90	315	292

((*) Source: Windfinder.com)

5.5 Surface Rights, Power, Water, Personnel

The imprint of a quartzite mining operation would be relatively small compared to the size of the Property. It appears that sufficient space is available within the Property limits to accommodate the soil and waste dumps, as well as the necessary infrastructure. The construction of a large, complex process plant on the Property is not envisaged.

The closest major power line is located 5.4 km east-southeast of the southeast corner of the Property. However, in February 2015, the Government of Québec announced that, as part of its 2013-2020 Climate Change Action Plan, it will be providing Sitec Quartz Inc., with over $2 million in financial assistance to build a 31 km hydro power line that will connect to the Hydro-Quebec power grid. This funding is significant for the Project as it will bring hydroelectric power to within 4 km of the Project. The opportunity to connect with the Hydro-Quebec grid, should production be initiated on the Project, will be economically beneficial to the Project (MD&A, July 31, 2015). As of July 5th, 2016, the power line has been completed to the Sitec Quartz Inc site and is presently being commissioned (personal communication).

Water is available from Lac de la Grosse Femelle located in the central sector of the claim group.

Personnel for a mining operation can be found in nearby towns (Saint-Urbain, Baie-Saint-Paul, Clermont, La Malbaie, Saint-Hilarion) and among First Nation members, but part of the hired labour will likely be sourced from other cities in Quebec due to requirement for skilled professionals.

6.0 HISTORY

6.1 Ownership

Globex Mining Enterprises Inc. staked the claims making up the Property in April 2014 and transferred them to a third party, Fiducie Ananke, in June 2014. The claims were transferred from Ananke to Rogue in April 2015. Globex received shares of Rogue and retains a NSR royalty. Rogue is currently the 100% registered owner of the Property.

6.2 Mineral Exploration Work

The Property and surrounding region became a target for prospecting and reconnaissance exploration following the discovery of a quartzite occurrence in 1946, two km east of Lac de la Galette, approximately 10 km southwest of the Property.

Documented modern exploration efforts in the region started in 1965, with Leeds Metals Company completing a drilling program on a quartzite occurrence and a resource estimate.

New quartzite occurrences with potential economic significance discovered by Jehan Rondot, for the Quebec Mine Ministry, from 1969 to 1972, in the Lac des Martres area brought renewed attention from different prospectors.

In 1974, J. Rondot estimated a significant resource tonnage in a series of deposits, which attracted SKW (currently Silicium Québec SEC) and Baskatong Quartz Inc. (currently Sitec Quartz Inc.) who started mining in 1976.

GEX Silicium Limited (1976) mined a deposit from a small quarry for one year, and SOQUEM started a short-lived quartzite operation in 1975 and carried out sporadic exploration in the region between 1979 and 1995.

Further work by J. Rondot until 1984 delineated another ten quartzite occurrences of potential deposit sizes. Following this period, several companies and prospectors have completed exploration work in this area, among others, prospector Tremblay in 1999.

Additional details on exploration in the region of the Property, and a detailed list of reports filed with GESTIM, can be found in the NI 43-101 Technical Report on the Lac De la Grosse Femelle Silica Property, by Geologica Groupe-Conseil Inc., dated November 19, 2014 (Geologica, 2014).

6.3 Resources, Production

Prior to the Company's 2016 resource estimate, no resources estimate has ever been completed for the quartzite on the Property and the Property has not seen any prior quartzite production. The same quartzite formations that are found on the Property extend along strike onto the Sitec mine 4 km to the SW.

7.0 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Introduction

In addition to the geological information in this chapter, detailed descriptions can be found in the previously SEDAR filed Technical Report prepared by Geologica (2014), and in the M.Sc. thesis by G. Tremblay (1989).

7.2 Regional Geology

The Property is located in the high-grade metamorphic terranes of the Grenville Province of the Canadian Shield. The region is underlain by meta-sedimentary and meta-volcanic rocks occurring as discontinuous units in a zone predominantly occupied by charnockitic and anorthositic intrusive bodies. The paragneiss-quartzite sequences hosting the quartzite on the Property belong to the Galette Formation, which is a sub-unit of the Groupe des Martres (Rondot, 1979) within the Tadoussac Complex. The paragneiss sequence is intensely folded and has undergone upper amphibolite to granulite grade metamorphism.

Part of the region is covered by glacial till.

7.3 Local Geology

The paragneiss are arranged in a regional synformal fold wrapped around the northern boundary of the St. Urbain anorthositic intrusion. Rocks of charnockitic composition occupy the core of the fold and border the sequence to the west and the north.

At least four ductile deformation events, overprinted by late deformation in the brittle regime, have been recognized to have affected the paragneiss sequence.

The ductile tectonic events have generated large-scale NW-SE isoclinal folds, subsequent open folds, a NE-SW trending synformal fold, a syncline around the St. Urbain anorthosite and S-type folds encountered in several quartzite units. Part of the boudinage that is observable at the mesoscopic scale may derive from one or more of these tectonic events.

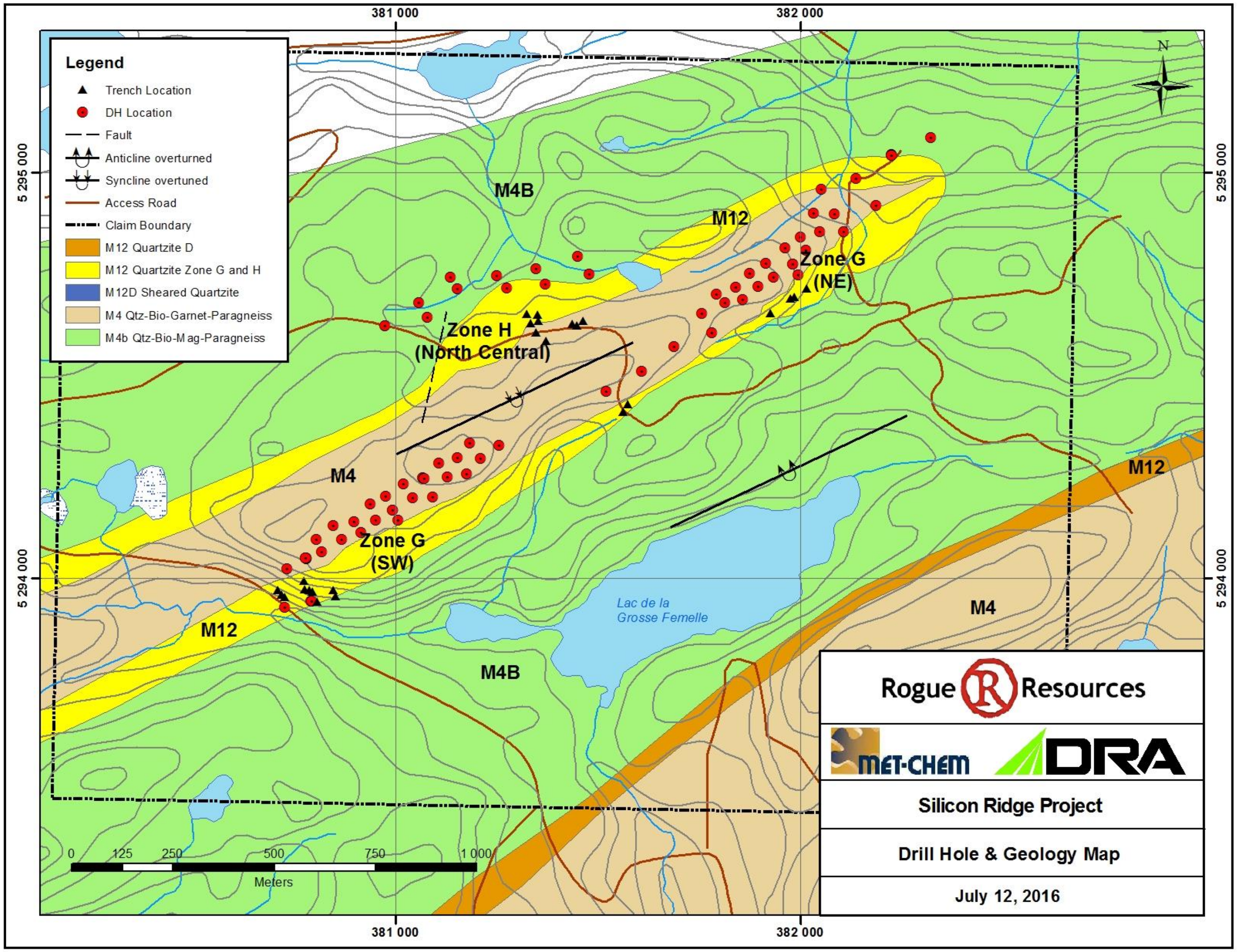
Brittle deformation is responsible for the penetrative fractures and the offsets along N and NE fault offsets affecting the quartzite. The re-distribution of impurities in the quartzite units has also been interpreted to be partly in response to the brittle deformation event.

7.4 Property Geology

7.4.1 Geology, Structure

The “G” and “H” quartzite and paragneiss form an anticline with a NE trending, steeply NW dipping axial plane (overturned fold) and a syncline to the SE, the axis of which passes immediately along the north shore of Lac de la Grosse Femelle (Figure 7-1).

Figure 7-1 Drill Holes and Geology



The "G" and "H" units represent the same unit duplicated by fold repetition, with intervening quartz-biotite-garnet gneiss. Charnokitic gneiss lies at the northern and southern contacts of the "G" and "H" units. The following sequence is typically found in the 'G" unit, from hangingwall to footwall:

- Quartz-feldspar-biotite-garnet paragneiss (non magnetic);
- Contact zone: paragneiss with intercalated quartzite intervals;
- Pure white quartzite, with local pink, buff and grey-green fractured sections;
- Fault zone that appears to follow the axial plane of the fold;
- White-pink-grey quartzite with local red coloring by oxidation;
- Charnokitic Gneiss (weakly magnetic).

7.4.2 Mineralization

The Property hosts several map-scale units that correspond to high purity quartzite. However, Rogue selected two units ("G" and "H") as the best drilling targets for further development. The "G" unit extends along a NE direction through the central point of the Property, whereas the "H" unit is about 250 m to the NW, in the northern sector of the Property (Figure 7-1). The width of the "G" quartzite unit varies along strike, but reaches a maximum of 260 m, with an average of 150 m.

The quartzite on the Property is generally coarse-grained, massive, locally fractured. It may contain traces of biotite, muscovite, hematite, magnetite, ilmenite, fuschite, rutile commonly associated with coloured quartzite. Clusters of sillimanite with pyrite were occasionally observed.

The different impurities cause the changes of colour in the quartzite. In the case of iron, fine hematite or magnetite crystals impart a pervasive pink or red colour to the quartzite, whereas iron staining (surface coating) is observed along fractures and fractured contact zones that promote water circulation.

The quartzite exhibits internal zones distinguished by their colour or by sheared zones that represent fairly continuous bands within the deposit. These bands of different tenors in impurities have been interpreted to have responded to different controlling factors:

- Lithological: precursor's original composition (protolith);
- Structural, indicated by:
  - The fact that these bands are folded like the quartzite unit, rather than cutting across (synthetic folds with respect to the geometry of the large-scale fold in the quartzite unit);
  - Observed remobilization of mobile elements during the metamorphic events;
  - Evidence of late migration of iron along the fracture network.

Two thin sections were examined under the polarizing microscope by ANZAPLAN and the following features were described in a short memorandum. The quartzite is formed of isometric or elongate quartz crystals that reach a size of more than 1 cm. The complex regional geological/structural history has been recorded by the quartzite, as evidenced by features such as dynamic recrystallisation and internal crystal deformation observed in these two thin sections. Films of hematite of about 50µm occur along grain boundaries and are interpreted to indicate primary sedimentary layering. In addition, the roundness of the zircons suggests a sedimentary precursor. The presence of muscovite flakes (occasionally altered), sillimanite in prismatic habitus (occasionally altered to clay) and common rutile needles observed in core specimen was confirmed by the study of the two thin sections. Rare fluid inclusions of a size of less than 20 µm were detected along healed fractures.

Analyses of white quartzite in the "G" Quartzite unit have in the past indicated low contents of impurities (Table 7-1). More recently, samples collected by Geologica returned similar values (Table 7-1).

Table 7-1 "G" Quartzite, Historical Samples

Oxides	**Content (%)**		
SiO_2	99.52	98.72	97.6 to 99.5
Fe_2O_3	0.39	0.43	0.28 to 0.69
Al_2O_3	0.46	0.70	0.07 to 0.21
TiO_2	0.04	0.06	0.02 to 0.13
Source:	***Tremblay et al., 1999***		***Geologica, 2014***

These analytical results are within the preliminary cutoff set for ferro-silicon production from the silica, which is 0.8% Al_2O_3, 0.24% Fe_2O_3 and 0.075% TiO_2, and are consistent with the results from sampling along the trenches and from the drill core collected by Rogue.

8.0 DEPOSIT TYPES

The classification of the silica deposits includes the following types:

- Unconsolidated silica sands;
- Orthoquartzite ("quartzitic sandstone");
- Quartzite (metamorphic, recrystallized);
- Massive quartz (hydrothermal – lode; segregations within intrusive bodies or pegmatite).

Silica deposits are widespread throughout the world and most of the production derives from silica sands. The Cape Flattery silica mine in Queensland, Australia, is the largest in the world and provides two million tonnes of silica sand each year.

Canada's main producers of silica are in Québec (44 quartzite deposits listed by MERN), Ontario and Alberta. Silica is also produced in Saskatchewan, British Columbia, Nova Scotia and in Newfoundland and Labrador.

The quartzite on the Property is of the metamorphic type, of probable sedimentary origin, and occurs as large-amplitude folds formed in response to multiple episodes of folding. The exploration model used by Rogue for the deposits on the Property primarily relies on field mapping, the positive topography resulting from the erosion-resistant quartzite, and the lack of magnetic susceptibility of the quartzite, in contrast with the geophysical signature of the magnetic paragneiss in the footwall of the "G" unit and in the hangingwall of the "H" unit.

A general indication of the quality of the quartzite is provided by visual inspection in hand specimens of the colour imparted by the type and content of impurities.

9.0 EXPLORATION

9.1.1 Exploration Summary

Initial exploration work by Rogue on the Project began in September 2014 for the prime purposes of mapping and sampling the quartzite units for a NI 43-101 Technical Report on the Lac la Grosse Femelle Silica Property (November 2014, Geologica). This was followed by an airborne helicopter Magnetics and VLF survey in December 2014 to map out and define the quartzites and magnetic paragneisses. The next steps consisted in line cutting 22.12 km of grid lines oriented 330° and lines spaced at 200 m, followed by mapping the quartzites and collecting quartzite samples for chemical analysis and testing, determining the overall quartzite unit size along the strike and dip, trenching and drilling. The exploration programs were designed by Rogue to gather sufficient data to prepare a Technical Report on an initial NI 43-101 compliant resource estimate, and eventually a PEA study.

A summary of the exploration work conducted by Rogue is provided in Table 9-1.

Table 9-1 Summary of Exploration Work on the Property

Rogue Resources	2014	Rogue Resources Inc., 2014 NI 43-101 Technical Report On The Lac De La Grosse Femelle Silica Property, Charlevoix Regional County Municipality, Quebec, Canada, Geologica Groupe-Conseil; November 19, 2014.
		Airborne Heli-Mag survey flown over the Property and a large swath of land to the North and the East by Geophysics GPR International Inc., Longueuil, Quebec; (316.5 line-km of MAG, of which approximately 50.0 km over the Property area) along NW-SE lines at 100-m spacing. Flown December 2014 and June 2015.
		Technical Report on the Lac de la Grosse Femelle Silica Property, Quebec, Canada; Report Prepared for Folkstone Capital Corp., by Mario Justino, M.Sc., P.Geo., May 30, 2014
	2015	• Line-cutting (22.12 km); • Outcrop stripping 446.7 m by 2 m wide; • Channel sampling (“G” and “H” units, 295 samples); • Mapping (22.12 km on grid lines and road mapping); • Airborne VLF survey (287.4 line km); • Geological-structural Evaluation, Exploration Consultant Dr. Trygve Hoy
		Drilling program (“G” quartzite unit), started mid-Aug.,

		second drill rig testing the "H" unit and infill on "G" unit from mid-Sep.
		Topographic survey: Heliborne LiDAR survey (Digital Terrane Model, DTM)
		Helicopter-borne EM-VLF geophysical survey by Geophysics GPR International Inc., Longueuil, Quebec; (287.4 line-km along NW-SE lines at 100-m spacing), using the transmitting station in Cutler, Maine
		Processing and Interpretation of a Helicopter Borne Magnetic Survey, January 2015, by consulting geophysicist J. Simard, P. Geol./Geoph.
		Re-processing and modeling (inversion) of MAG and EM-VLF survey data by consulting geophysicist J. Simard, P. Geol./Geoph.
		ANZAPLAN visit to project. Viewed trenches, core visit with Rogue, collected 2 samples (100 kg) for preliminary testing
		Drill core from two PQ and corresponding NQ holes sent to ANZAPLAN for testing
	2016	Core from one additional PQ and twin NQ hole shipped to ANZAPLAN to carry out the additional testwork
		ANZAPLAN, Evaluation of a Quartzite Deposit in Canada for the Identification of Potential Application; Report
		Bulk Sample collection 1.6 tonnes of "G" quartzite at Trench 7 – L5W, Bulk Sample Testing & Analysis by ANZAPLAN and flow sheet design.
		NI 43-101 Technical Report on the Silicon Ridge Mineral Resources Quebec, Canada; Prepared for Rogue Resources Inc. by Met-Chem, a division of DRA Americas; July 20, 2016

9.1.2 Trenching, Sampling

The quartzite and gneiss were exposed and sampled in a total of fourteen (14) trenches excavated over the "G" and "H" units between June 2, 2015 and July 11, 2015. The trenches are generally on the steep slopes of the ridges and actually consist of stripped outcrops.

Continuous channel sampling was carried out using diamond blade rock saws. A total of 295 samples were collected, which amounts to a cumulative total of 510.5 m.

The trenches were surveyed by Corriveau J. L. and Assoc. of Val-d'Or, Quebec.

10.0 DRILLING

A drill program for a total of 11,822.30 m of core in 71 holes was completed between August 8, 2015 and December 16, 2015 into the “G” and ‘H” quartzite units. No prior holes had been drilled into the quartzite deposits of the Silicon Ridge Project before the 2015 Rogue’s drilling program.

Six holes (PQ and NQ core diameters) were drilled for technical evaluation by ANZAPLAN. PQ Holes GF15-53, GF15-60 and GF15-62 were drilled and shipped as whole core as part of the metallurgical testing program and NQ drill holes GF15-39, GF15-42 and GF15-46 respectively were drilled as twin holes and shipped as quartered core to ANZAPLAN for analysis.

The majority of the holes were drilled at an angle of -45º, with a few at steeper angles ranging from -50° to -90°, toward the SE (AZ 150º). The first three holes had to be drilled toward the NW (AZ 330º) because of the restricted access to suitable drilling platforms. The depths of the holes ranged from 12 m to 261 m.

Two holes were drilled on most of the sections and the location of the six trenches in the “G” unit had been selected to fall on, or close to, drilled sections.

The southwestern portion of the “G” unit was drilled on sections 50 m apart, between 5+50W and 1+00E. The northeastern portion of the “G” unit was drilled along sections 100 m apart between 4+00E and 7+00E, and at a spacing of 50 m between 7+00E and 11+00E. Drilling was extended on three sections 100 m apart to 14+00E, which indicated that the quartzite unit terminates by a fold between 13+00E and 14+00E (Figure 7-1). The “H” unit was drilled on sections 100 m distant, between 0+00E and 5+00E.

The holes were drilled by Orbit Garant, with an office in Val-d’Or, Quebec. Diamond drilling commissioned by Rogue started with one drill rig scheduled to drill 5,000 m and was completed with two rigs equipped to retrieve NQ (47.6 mm) diameter core when the initial program was expanded. The additional drilling was carried out, in part, due to ANZAPLAN’s request for NQ and PQ drill core, and following a management’s decision to conduct infill drilling originally planned for 2016.

All the collars were surveyed with a DGPS and the downhole deviation was measured using a Flexit instrument. The core was oriented using a tool that cuts a groove in the surface of the core, which was done systematically at every sixth run (every 18 m).

Core recovery was generally very high, with the majority of the intervals at 100% recovery and 94% of the core recovered at a rate of 95% or better.

A total of 4,619 samples representing about 6,300 m of core were sampled, in addition to the duplicate, standard and blank materials inserted as QC samples to monitor the laboratory performance. The nominal samples length was 2 m, but ranged from 0.5 m to 3.0 m in order to honour the lithological contacts and the significant changes in the quality of the quartzite. Only in certain cases were samples stretched to 3.0 m lengths between drill depth markings where the core recovery was poor.

The drill program was designed to define the geometry, width, depth extension and quality of the portion of the quartzite located primarily above the floor of the valley. Drilling has confirmed the strike length of the "G" quartzite unit at 1,950 m and the "H" quartzite unit at 500 m, both of which remain open at depth and along the strike extensions.

Met-Chem believes that the drill program was successful in defining the quartzite units in sufficient detail to support the present resource estimation. The DGPS survey of all the hole collars and the use of a Flexit instrument to measure the hole deviation provide accurate location of the holes in the deposits. No drilling, sampling, or recovery factors that could materially impact the accuracy and reliability of the results were observed by Met-Chem in this drill program.

11.0 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Core Handling

At the drill site, the driller placed the core into wooden boxes and covered them with sheets of protecting wrapping foam to keep pieces from shifting, before closing the boxes with a lid secured with baling wire. The core boxes were then transported to the core handling facilities at Les Éboulements.

Once at Rogue's facilities, the core stubs were fitted together so as to leave no space between them and the location of the depth marker blocks in the core boxes were verified and turned upside so the marking is visible. The core was then measured and the depths were marked with a crayon.

A digital photographic record of the entire core in wet condition was taken, in groups of four boxes, each picture including a card indicating the hole ID, box numbers, and the interval contained in these boxes.

11.2 Core Logging and Sampling

The core boxes for entire holes were laid out on the ground and the contacts of the main units were located by a senior geologist, followed by a peer review, and recorded in a rough log. This data was used by the logging geologists who broke down the main units into sub-units and sample intervals.

Logging started with a geologist concentrating on measurements of geotechnical parameters: core recovery, RQD, as well as fractures systems, joints, faults, contacts and bedding. A core orienter tool made up of a scribe knife shoe at the base of the core barrel that cuts a groove in the surface of the core as it enters the mouth of the barrel was used at every sixth run (every 18 m). This reference line etched on the core allowed the geologist to measure both the Alpha and Beta angles (dip and strike, respectively) of the planar features. Rogue did not use dedicated software to log the core but designed different tables in an Excel spreadsheet.

The hole deviation path was measured at every second core run (6 m) using a Reflex instrument. In addition to the hole azimuth and plunge, the probe measured the temperature, the gravity field, the total magnetic field strength and its components. The data from both core orientation and down-hole survey were monitored by the QP geologist acting as project manager.

Other geologists record in detail the lithology of the units and sub-units and their main characteristics such as grain size, colour (5 classes (G1 to G5), from pure white to grey, to green, green-red), minerals present, angles of bedding, contacts, veins, as a general description. Fault zones and veins or dykes were entered as sub-units into the Geology 2 table.

Rock types were assigned codes from the Quebec Ministry of Energy and Mines to ensure consistent core logging and sampling.

11.3 Database Construction

The data for each drill hole was entered into separate Tables in an individual Excel spreadsheet, and transferred into a Master Excel Database for the Project. Table 11-1 presents the Tables and the information that populates them. All the Tables are connected by a key consisting of the *Hole ID* and the *From* and *To* fields.

Table 11-1 Information Contained in the Master Database

Excel Tables	Information
Header	Hole collar XYZ coordinates, Azimuth, Length of hole
Survey	Depth, Azimuth, Plunge, Temperature, Gravity, Magnetic Susceptibility
Geology 1	Lithology, Colour, Grain Size, Structure (Foliation, Fractures, Faults, Bedding), Veins, Alteration, Minerals
Geology 2	Sub-units described in the same fashion as the main units
Assays	Sample Interval and ID, General Description, Weight, XRF analyses, Total Oxides, LOI, C, S, S.G.
ICP	Analyses of trace elements by acid digestion and ICP (package of 48 elements)
Geotechnical	Core Recovery; RQD; different sets of Fractures and Joints (Alpha and Beta angles), Faults, Banding, Contacts

11.4 Sampling, QA-QC System, Chain of Custody

The samples intervals were selected by the logging geologists, essentially on the basis of visual assessment of the quality of the quartzite. The samples respect the significant changes in quality and the sub-unit intervals and cannot straddle the contacts of the main geological units.

The samples have a nominal length of 2.0 m, which is the statistical mode. The sample lengths range from 0.5 m to 2.0 m and this interval includes 99.3% of the samples. The sample limits are marked with a red crayon and with a laboratory sample tag stapled in the box at the end of the intervals. The sample booklets supplied by ALS Chemex contain tags with unique sequential numbers identified by a code bar.

A line was marked lengthwise on the core by the geologists for the operator of the core saw or splitter, to ensure that the pieces of core sent to the laboratory mirror the second half saved for future reference.

The core from the "H" quartzite unit was split with a hydraulic splitter and the "G" quartzite samples were sawn with a diamond blade saw. One half of the core was retained in the core box for future reference and audit and the second half was placed with the laboratory tag into polyethylene bags. Each piece of core was carefully washed after sawing, in order to avoid sample-to-sample contamination. The sample bags were placed into rice bags for shipment to the laboratory.

The QA-QC protocol adhered to by Rogue included insertion of Certified Reference Material (CRM), Blank and Duplicate samples into the sample stream.

The CRM consists of ISO 9001 Certified fine quartz powder from Opta Minerals Inc. (Opta), marketed under the trade name of Barco Silica Sand and principally used in foundry applications. The declared values are listed in Table 11-2. Opta is a processor and distributor of industrial minerals with headquarters in Waterdown, Ontario, but maintains an international presence.

Table 11-2 Technical Specifications of the Fine Silica Sand by Opta Minerals Inc.

Oxide	Declared Values (%)
SiO_2	99.70
Al_2O_3	0.14
Fe_2O_3	0.016
K_2O	0.04
Na_2O	< 0.01
MgO	< 0.01
CaO	< 0.01

White decorative stone having the composition of a dolomitic limestone was sourced from a hardware store and used as blank material.

The duplicate samples were prepared by Rogue's geologists by cutting in two the half core used for analytical purposes. These pairs of quarter-core samples introduce a volume variance, as compared to the half core making up the other samples. However, this variance is not expected to be very significant since the samples are generally 2 m long, which still provide a fair amount of weight for quarter core samples.

Two of the three QC samples types were selected by the geologists to be inserted into every batch of 25 samples. The geologist alternated the type of QC samples used in each batch, which brings the total of eight (8) QC samples for every 100 samples.

Individual sample batches were sent to the laboratory for each hole, in order to minimize sample mix-ups.

Rogue maintained chain of custody from the drill site to shipment by its own selected carrier to the laboratories in Val-d'Or. Permanent presence from Rogue geologists at the core processing facilities ensured security of the core and the samples.

Met-Chem has no reason to believe that any tampering of the samples may have taken place at any time along the way followed by the samples.

11.5 Sample Preparation and Analyses

The first samples were sent to SGS and to Corem in Quebec City for sample preparation and chemical analysis. Eventually, the samples were sent to ALS Chemex in Val-d'Or for preparation and to ALS in Vancouver for analysis. All the original samples sent to SGS and COREM were subsequently re-analyzed by ALS.

At ALS in Val-d'Or, the samples were identified and logged (Code: LOG-22) into the laboratory information management system (LIMS) by scanning the bar code on the sample tag placed in the sample bags. The weight of the samples as received was recorded (Code: WEI-21) and the samples were air-dried overnight, or in an oven at a maximum of 120ºC, if required. The entire samples were crushed to better than 70% passing 2 mm (Code: CRU-31). A riffle splitter was used to extract a 20-g sub-sample (Code: SPL-21) to be pulverized to at least 85% passing -75µm. Rogue requested ALS to apply pulverizing procedures specifically designed to avoid contamination of the samples by using non-ferrous (tungsten carbide) disks/rings and bowl mills (Code: PUL-33). The pulp samples were then sent to ALS Vancouver to be analyzed.

All the samples were submitted for whole rock analysis by lithium borate fusion technique, coupled with XRF (package of 24 elements, Code: ME-XRF26). The XRF whole rock analysis included the following elements reported as oxides or elements: Al_2O_3, As, Ba, CaO, Cl, Co, Cr_2O_3, Cu, Fe_2O_3, K_2O, MgO, Mn, Na_2O, Ni, Pb, P_2O_5, S, SiO_2, Sn, Sr, TiO_2, V_2O_5, Zn, Zr and Total percentage. In addition, LOI was calculated by weighing a prepared sample after being placed into an oven at 1000°C for one hour (Code: OA-GRA05x). Total Carbon (Code: C-IR07) and total Sulphur (Code: S-IR08) were analyzed by LECO furnace and ferrous iron (FeO) was determined by titration (Code: Fe-VOL05).

The trace elements were analyzed by ALS' supertrace method with Four Acid digestion followed by ICP-MS method (48 Element Package, Code: ME-MS61L). ICP-MS analysis was performed on selected drill holes.

Specific gravity was determined by ALS on every tenth sample by the bottle pycnometer method using methanol as a solvent (Code: OA-GRA08b).

Selected samples were used for mineralogical and petrographic studies for determination of metallurgical parameters.

All three laboratories used by Rogue for analysis of the samples from the core and the trenches, COREM, SGS and ALS, are fully certified and accredited to the highest standards of the industry and are independent of Rogue. All the samples from the drill program and those collected in the trenches that were used in the present resource estimation had been analyzed by ALS, with disregard of the analytical results from Corem or SGS.

ALS applies strict Quality Management System procedures at the stages of sample preparation and analysis, and all the activities are run under the LIMS system. QC testing of crushing and pulverizing efficiency is conducted on random samples. The routine analysis of certified reference materials, blank and duplicate samples is an integral part of the internal QA system, as well as periodical calibration of the instruments. Independent inter-laboratory proficiency testing fits into the overall quality assurance plan.

It is the opinion of the Qualified Person that the sample preparation, security and analytical procedures used in the Rogue drilling program are appropriate for use in a mineral resource estimate.

11.6 Core and Sample Storage

The core boxes are stacked in racks at the facilities used by Rogue in Les Éboulements. The core was moved to a secure area after the drilling program was complete and moved to Saint-Urbain, Hwy 381.

Each core box is identified by an aluminum tags stapled at the end of the box indicating the drill hole ID, box number and start and end depth (m) of the core it contains.

The rejects and pulps are presently kept at ALS Chemex laboratory facilities in Val-d’Or and Vancouver. These rejects and pulps will later be returned from the laboratory and saved at the Rogue facilities in Saint-Urbain.

11.7 Conclusion

The core handling, logging and sampling protocol for the 2015 drilling program was established under the supervision of Mr. E. Canova, Géo. (OGQ-403). Mr. Canova is non-independent of Rogue but is a QP for the purposes of NI 43-101.

The logging and sampling data were validated by peer review of the logging activities and data entry, visual inspection of the data entered into the database by two senior geologists and while importing the data, notably the laboratory results, into Gemcom software. Met-Chem found few errors in the database during the field visit and in the final master database sent to Met-Chem by Rogue.

Met-Chem believes that the use of dedicated logging software would have added another layer of validation at the stage of the data entry.

Very detailed information in terms of core description and analytical work was collected by the geologists. The oriented core and the results from the down-hole survey of the holes greatly improved the quality of the data collected by allowing measurements of strike and dip of the planar features.

In conclusion, it is the opinion of the Met-Chem's Qualified Person that the sample handling, logging and sampling followed high industry standards and were completed by competent geologists and under constant supervision from senior geologists. Met-Chem does not see any reason to believe that the results of the drilling program are not of a quality providing a sufficient level of confidence for use in a resources estimate.

Met-Chem believes that the sample preparation and analytical procedures used in the Rogue drilling program are appropriate. The analysis by XRF and ICP of a long list of elements and oxides provides ample information on the quality of the quartzite.

12.0 DATA VERIFICATION

12.1 QP Visit by Met-Chem

12.1.1 Field Visit

Yves A. Buro, P.Eng., Senior Geologist, Met-Chem, visited the site on August 18, 2015 and completed a QP site visit between November 18 and 20, 2015. During both visits, Y. Buro was accompanied by Mr. E. Canova, Géo. (OGQ-403), Rogue's former Senior Vice President. Two drill rigs were active on the Property at the time of the QP visit and a team of geologists was busy supervising the drilling activities and carrying out core logging and sampling.

During the QP site visit, a series of stripped outcrops and trenches where the quartzite units and the gneiss are exposed were examined. Most drill sites in the "G" and "H" zones were visited, as well as the two drill rigs active on the Property.

The collar location of a dozen drill holes was picked up with a hand-held GPS instrument by Met-Chem and a few readings at the extremities of a few trenches were also taken. Field procedures applied to sampling the trenches and positioning the drill rigs was discussed with the field geologist.

The core from selected holes was examined by Met-Chem, with Mr. E. Canova, Géo. (OGQ-403), and with the geologists logging and sampling the core. The core handling, logging and sampling procedures were observed at the facilities in Les Éboulements, Quebec, and discussed with the geologists. The geology and structure of the deposit, the QA-QC protocol, database construction were also discussed with the geologists.

The geology and sampling descriptions and measurements on the drill core reviewed were compared against drill logs and sampling records. A review of the database constructed for each drill hole and of the master database was also performed by Met-Chem.

Met-Chem did not find any errors in the description and location of the contacts of the lithological units and sample intervals that had been selected while logging and sampling the core. The GPS measurements of the drill hole collars and the trenches corresponded with the entries into the database and the plot on the maps and were well within the accuracy of a hand-held GPS device.

Met-Chem noted during the field visit that the core was handled with care, core logging and sampling was completed by competent geologists, using peer review by QP geologists. Detailed information on geology and on the main geotechnical parameters was recorded from the core. All the work was found by Met-Chem to have been conducted along best practices in the industry. The use of dedicated logging software may have added another validation of the data capture, yet Met-Chem believes the peer review and constant supervision by Rogue's QP geologists resulted in the construction of a reliable database.

12.1.2 Independent Check Samples

Met-Chem independently selected 30 samples for check analysis after the QP site visit (Table 12-1). The samples represent a fair geographical distribution within the eastern and western portions of the "G" deposit and in the "H" deposit, strike- and depth-wise. The distribution of the silica content in the selected samples approximates the distribution of all the quartzite assays in the drill hole database.

The check samples consisted of coarse rejects from the original samples. Met-Chem requested the ALS laboratory in Val-d'Or to prepare the samples and send the pulps to Met-Chem. Met-Chem inserted five (5) QC samples into the sample sequence that consisted of one Blank and two Certified Reference materials provided by Rogue, as well as of two Duplicate samples. The Duplicate samples were generated from two splits of coarse rejects. The entire sequence of samples was re-numbered by Met-Chem to be submitted as blind samples to the ALS laboratory for analysis.

The major oxides were analyzed using the XRF technique. LOI and Sum of oxides were determined, as well as sulphur by Leco furnace. All the samples were also analyzed by ICP-MS, and two samples were submitted to S.G. determination using the bottle pycnometer method. The same sample preparation, suite of elements and analytical methods as routinely used for the Rogue samples were requested from the ALS laboratory.

The analytical results and the basic statistical parameters for the original and the samples selected by the QP are presented in Table 12-1. The results from the QC samples inserted into the QP samples are described in Table 12-2.

The plot of Al_2O_3, Fe_2O_3 and TiO_2 on scatter diagrams, as well as the statistical parameters, show a fair degree of correlation and no bias between the individual pairs of original-duplicate samples (Figure 12-1, Figure 12-2 and Figure 12-3 and Table 12-1). However, the reproducibility of SiO_2 is not as high (Figure 12-4).

The correlation between the original and duplicate samples cannot be expected to be extremely high, considering that the analyses for these metals is close to the lower detection limit, while the silica values are close to the higher detection limit. The degradation of accuracy while approaching the detection limits of the analytical methods is well-documented.

However, the QP duplicate samples selected by Met-Chem reproduced the original analytical results sufficiently closely to be acceptable, based on the criteria used by Met-Chem to check the Rogue geologists' duplicate samples, as discussed in the following sections. The same trends are observable in the QP duplicate samples as in the duplicate samples that were part of the QP system applied by Rogue. In addition, the average grade of the original and of the duplicate samples is identical, or close to, even though it was calculated on a limited number of samples.

Table 12-1 QP Samples – List of Analytical Results for the QP Samples

Sample_ID		Al_2O_3 (%)		Fe_2O_3 (%)		TiO_2 (%)		SiO_2 (%)	
ORIG	DUP	ORIG	DUP	ORIG	DUP	ORIG	DUP	ORIG	DUP
R651010	S382710	1.20	1.21	0.05	0.19	0.10	0.11	97.90	97.56
R651037	S382711	3.39	3.62	0.88	1.00	0.25	0.26	93.02	92.80
R651511	S382713	0.60	0.60	0.30	0.27	0.07	0.08	98.00	98.68
R651512	S382714	0.50	0.46	0.05	0.07	0.05	0.05	98.20	98.43
R651550	S382715	1.70	1.82	0.20	0.27	0.12	0.12	96.80	96.82
R651634	S382716	0.30	0.38	0.05	0.04	0.05	0.06	98.60	99.33
R651677	S382717	2.00	1.92	0.20	0.21	0.13	0.12	95.60	96.55
R651755	S382718	0.58	0.59	0.08	0.06	0.05	0.05	98.55	98.80
R651756	S382719	0.51	0.48	0.13	0.12	0.05	0.06	98.29	98.59
S278008	S382720	0.67	0.63	0.13	0.11	0.07	0.05	98.03	98.29
S278049	S382722	0.53	0.53	0.05	0.06	0.05	0.05	98.93	99.55
S278287	S382723	0.49	0.61	0.48	0.59	0.08	0.09	99.07	98.17
S278532	S382724	2.44	2.18	0.30	0.27	0.14	0.14	96.12	96.43
S278533	S382725	1.09	0.94	0.20	0.15	0.12	0.11	97.76	98.53
S278698	S382727	0.53	0.46	0.09	0.04	0.06	0.05	98.34	99.42
S278776	S382728	0.23	0.22	0.05	0.03	0.05	0.04	99.98	99.54
S278819	S382730	1.24	1.23	0.16	0.16	0.09	0.10	97.85	97.35
S282282	S382731	0.64	0.69	0.07	0.10	0.06	0.06	99.48	98.30
S282791	S382732	0.38	0.38	0.10	0.07	0.06	0.06	99.38	98.91
S282792	S382733	0.58	0.58	0.07	0.04	0.06	0.06	98.46	98.65
S282826	S382735	1.25	1.48	0.16	0.21	0.07	0.09	97.38	97.82
S282984	S382736	0.57	0.54	0.32	0.29	0.07	0.07	98.52	98.20
S382587	S382737	0.78	0.70	0.71	0.71	0.04	0.04	97.29	98.23
S382633	S382738	1.16	1.22	0.27	0.31	0.09	0.09	96.92	97.52
S383079	S382739	1.02	1.04	0.19	0.14	0.06	0.09	98.77	97.86
S383312	S382740	0.19	0.23	0.09	0.07	0.05	0.05	99.04	99.40
S383350	S382741	0.75	0.76	0.10	0.09	0.06	0.06	99.21	98.56
S383801	S382742	0.95	0.90	0.09	0.09	0.06	0.05	98.97	98.35
S383802	S382743	1.52	1.30	0.13	0.11	0.10	0.09	97.36	97.76
S383814	S382744	0.48	0.44	0.17	0.17	0.06	0.06	99.17	98.84
Correl'n Coefficient		0.989		0.977		0.973		0.897	
Average		0.94	0.94	0.20	0.20	0.08	0.08	98.03	98.11
Maximum		3.39	3.62	0.88	1.00	0.25	0.26	99.98	99.55
Minimum		0.19	0.22	0.05	0.03	0.04	0.04	93.02	92.80

Although no statistical conclusion can be derived from the small number of QC samples, the duplicate samples display high correlation with the corresponding original and the blank and standard materials performed very well.

Table 12-2 QP Samples – List of Analytical Results for the QC Samples

Sample_Type	Sample_ID	Al_2O_3 (%)	Fe_2O_3 (%)	TiO_2 (%)	SiO_2 (%)
Original	**S382720**	0.63	0.11	0.05	98.29
Duplicate of previous	**S382721**	0.65	0.12	0.05	98.42
Original	**S382728**	0.22	0.03	0.04	99.54
Duplicate of previous	**S382729**	0.23	0.04	0.04	99.28
Blank	**S382726**	0.23	0.13	0.02	8.87
Blank Average (n=140)	**Dolomite**	0.28	0.15	0.01	8.70
Standard	**S382734**	0.11	0.03	0.01	99.74
Standard	**S382712**	0.11	0.03	0.01	99.05
Declared Value	**Barco Silica Sand**	0.14	0.16	n/a	99.70

Figure 12-1 QP Check Samples, Al_2O_3 Analyses of Original and Duplicate Samples

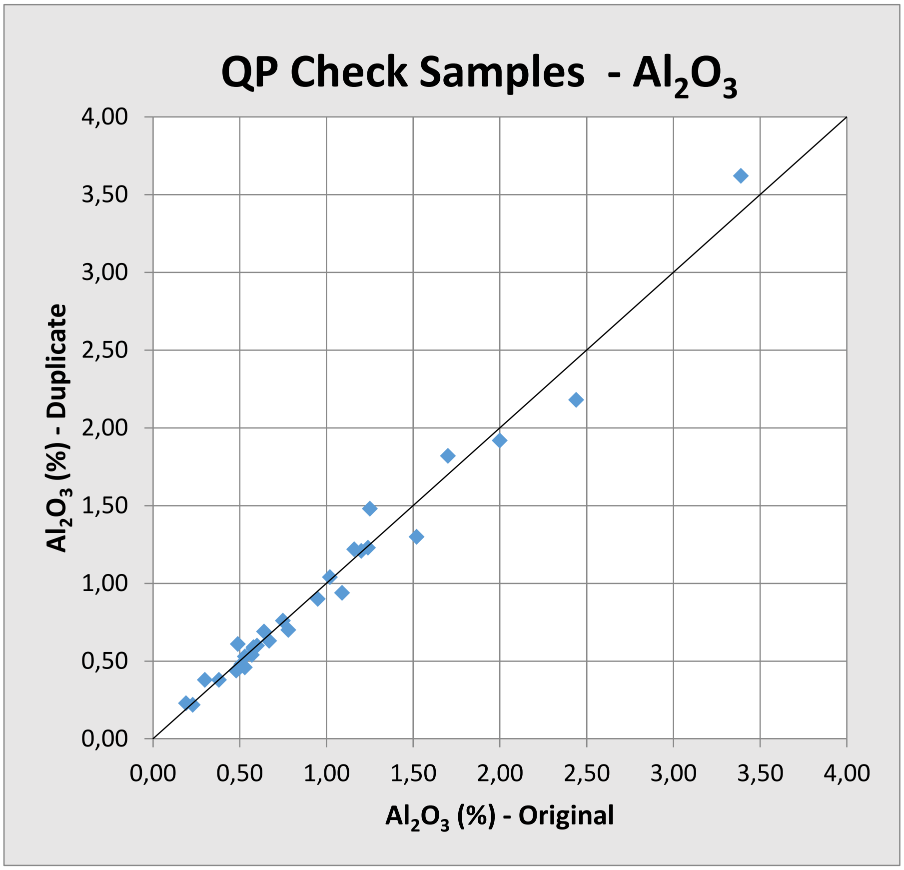


Figure 12-2 QP Check Samples, Fe_2O_3 Analyses of Original and Duplicate Samples

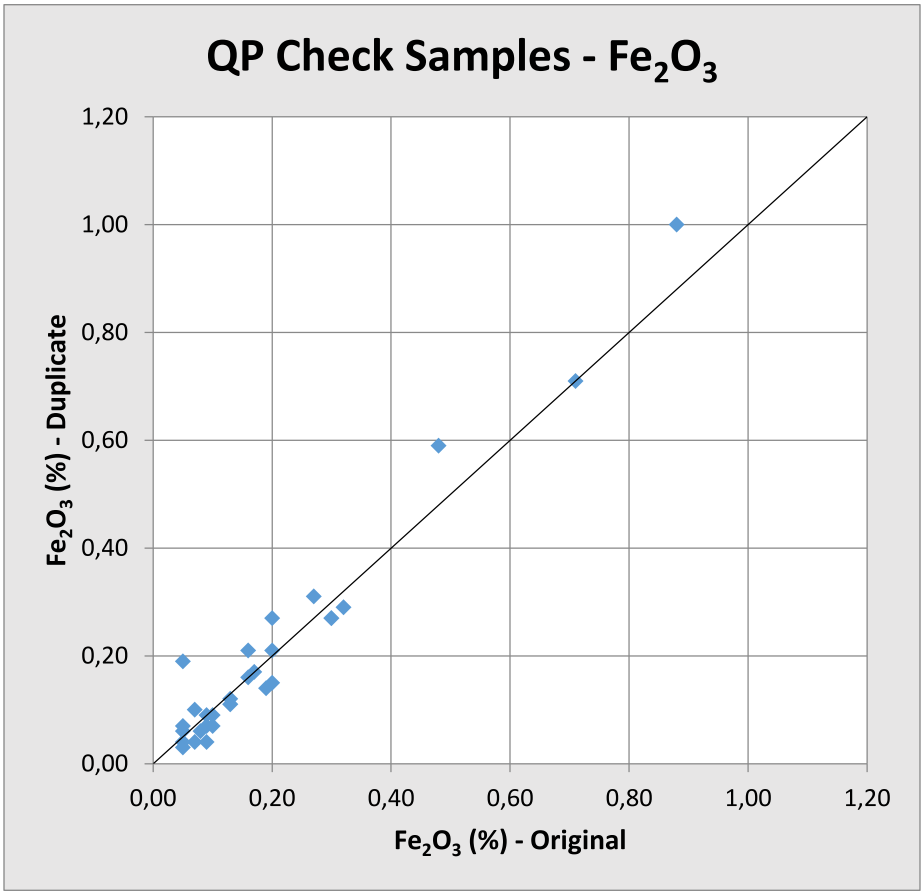


Figure 12-3 QP Check Samples, TiO_2 Analyses of Original and Duplicate Samples

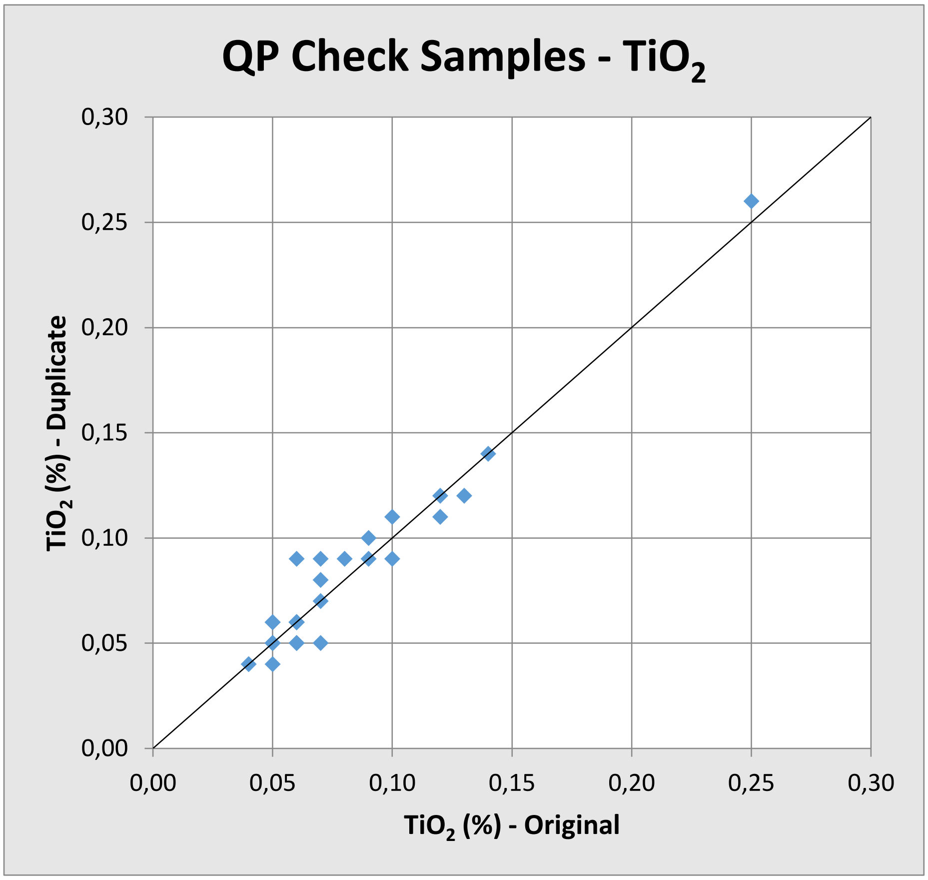
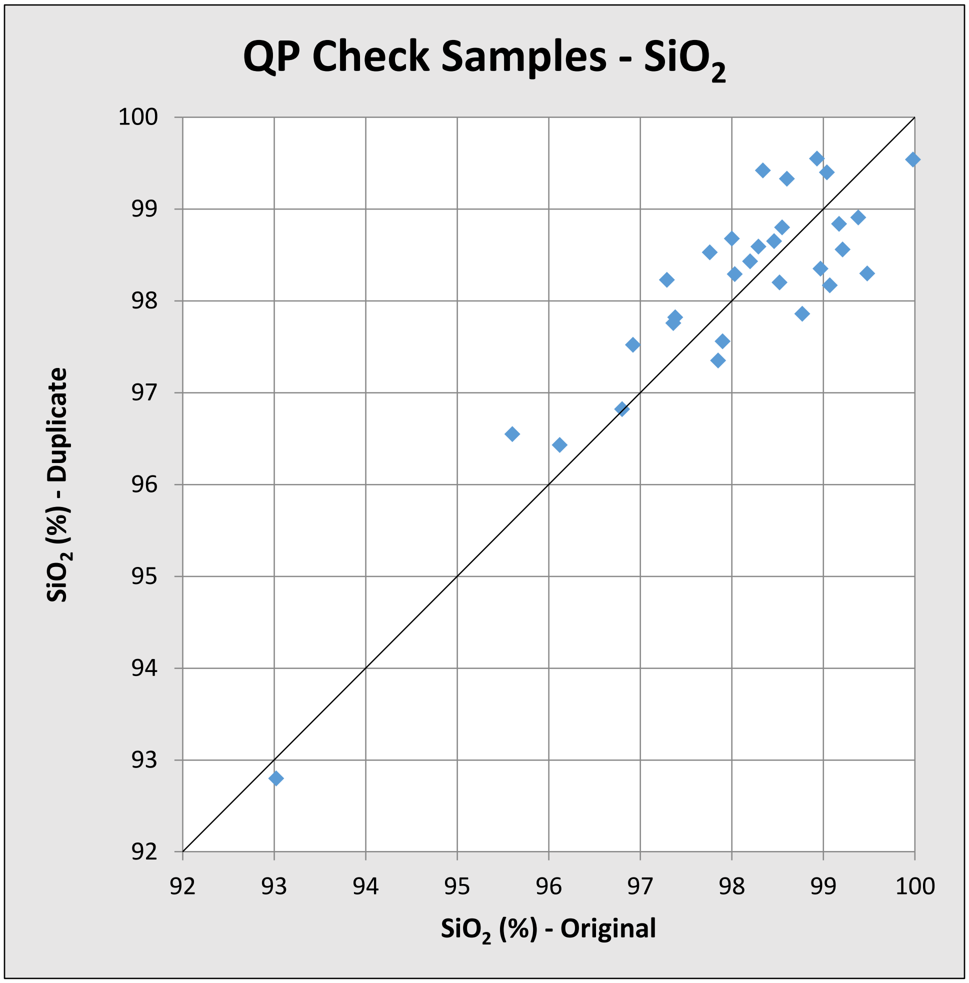


Figure 12-4 QP Check Samples, SiO_2 Analyses of Original and Duplicate Samples



12.1.3 Database Validation by Met-Chem

The data from the drill program and from the trenches were transmitted by Rogue to Met-Chem in Excel spreadsheet format. Rogue checked the data before sending them and Met-Chem did additional verifications of the master database using visual examination, formulas in Excel sheets and MineSight.

Few errors were found in the database and were corrected with the help of Mr. E. Canova. The main problem Met-Chem found with the database was in the use of combinations of several rock codes for the main lithological units, which cannot be handled by mining software. Met-Chem modified the coding system to be compatible with mining software. The final version of the database was ready on April 16, 2016 after all the errors detected by Met-Chem had been corrected.

Met-Chem believes that, in view of the verifications done by several geologists from Rogue and by Met-Chem, the database is free from major errors that may significantly impact the outcome of the resource estimate.

12.1.4 Verifications of the QA-QC Implemented by Rogue

a) General

Met-Chem examined the QA-QC system applied by Rogue and completed some verification of the results obtained by the QC samples inserted by Rogue into the sample stream.

b) Blank Samples

White decorative stone was sourced from a hardware store and used as QC blank samples. This material is not certified and the analytical data is not provided by the manufacturer. The following range of values was obtained from the multiple analyses of this material with the project samples (Table 12-3). These values indicate that this rock has the composition of a dolomitic limestone.

Table 12-3 Blank Material – Analytical Results

Oxide	Minimum	Maximum	Average
CaO	44.70	51.20	49.11
MgO	2.08	4.40	2.77
SiO_2	6.20	12.90	8.70
n=	140	140	140

A total of 140 results of XRF analyses of the Blanks were found in the database and the values indicate that no sample mix-up with a quartzite or a gneiss sample occurred (Table 12-3). Likewise, no sample mis-sequencing was detected in the ICP analyses of the Blanks.

However, a distinct change is visible on a line plot in the CaO % by XRF at samples 1 to 27 in the time sequence, relative to the subsequent samples (Figure 12-5) and three sills (moving averages) were detected in the Na_2O analyses. This pattern may be explained by lack of homogeneity of the decorative stone. No such change of variability with time occurred in the analyses of silica (Figure 12-6) or of the other elements, including LOI%.

Figure 12-5 Analysis of CaO by XRF for the Blank Material

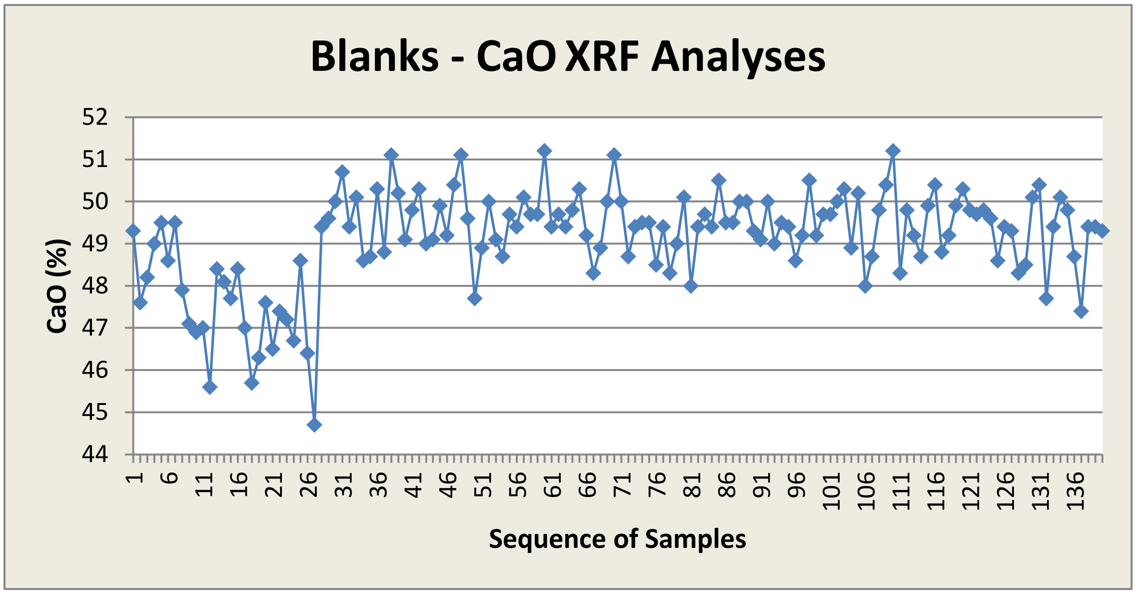
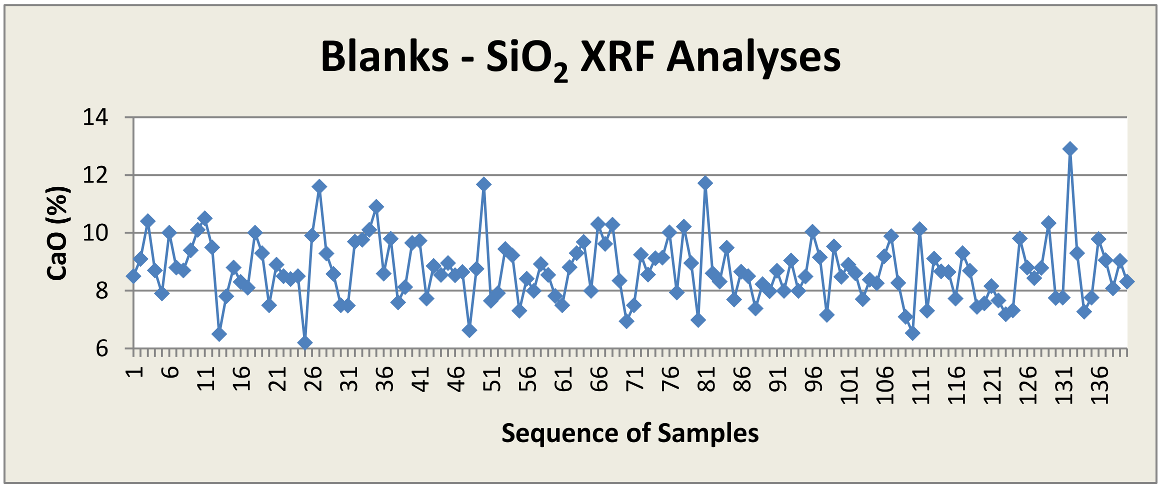


Figure 12-6 Analysis of SiO_2 by XRF for the Blank Material



c) Certified Reference Material

A "Fine Silica Blank" was sourced by Rogue from Analytical Solutions Ltd. (ASL), Mulmur, Ontario, to serve as Certified Reference Material (Standard). The Blank is marketed by the manufacturer, Opta Minerals (Opta), under the name of "Barco Silica sand" and it is generally used for foundry applications. Optra provides the element concentrations (Table 12-4) but neither specifies the analytical method(s) used to determine these elements nor supplies the confidence intervals (95% confidence limits). ASL has tested the silica sand for gold and has generally sold this material as blank material for gold projects. Thus, the Opta sand is certified for gold but it is not for the purpose of the Project.

Table 12-4 Technical Specifications of the Fine Silica Sand by Opta Minerals Inc.

Oxide	Declared Values (%)
SiO_2	99.70
Al_2O_3	0.14
Fe_2O_3	0.016
K_2O	0.04
Na_2O	< 0.01
MgO	< 0.01
CaO	< 0.01

A total of 136 occurrences of XRF analyses of the Standard were found in the database. The majority of the results for Al_2O_3, Fe_2O_3, TiO_2 and SiO_2 fall within the mean and two standard deviations, which is acceptable (Figure 12-7, Figure 12-8, Figure 12-9 and Figure 12-10). An episode of lower variability of the results for silica is apparent in the XRF analyses of the first 34 samples in the time sequence (Figure 12-10). The same pattern emerges from the ICP analyses, as illustrated by the Fe results (Figure 12-11). This can be attributed to lack of homogeneity of the Silica sand.

The results for all the above elements are systematically biased, relative to the declared value of the silica sand. The negative bias for silica and alumina, as well as the positive bias for iron are clearly visible in the line diagrams of Figure 12-7, Figure 12-8, Figure 12-9 and Figure 12-10.

The concentration of values for the four main oxides investigated within the limits of two (2) standard deviations from the mean is acceptable and attests to the good performance of the silica sand as a standard, in terms of precision. However, no conclusion can be drawn from the systematic bias as regards the accuracy of the analyses since the material is not certified.

Figure 12-7 Analysis of Alumina by XRF for the Reference Material

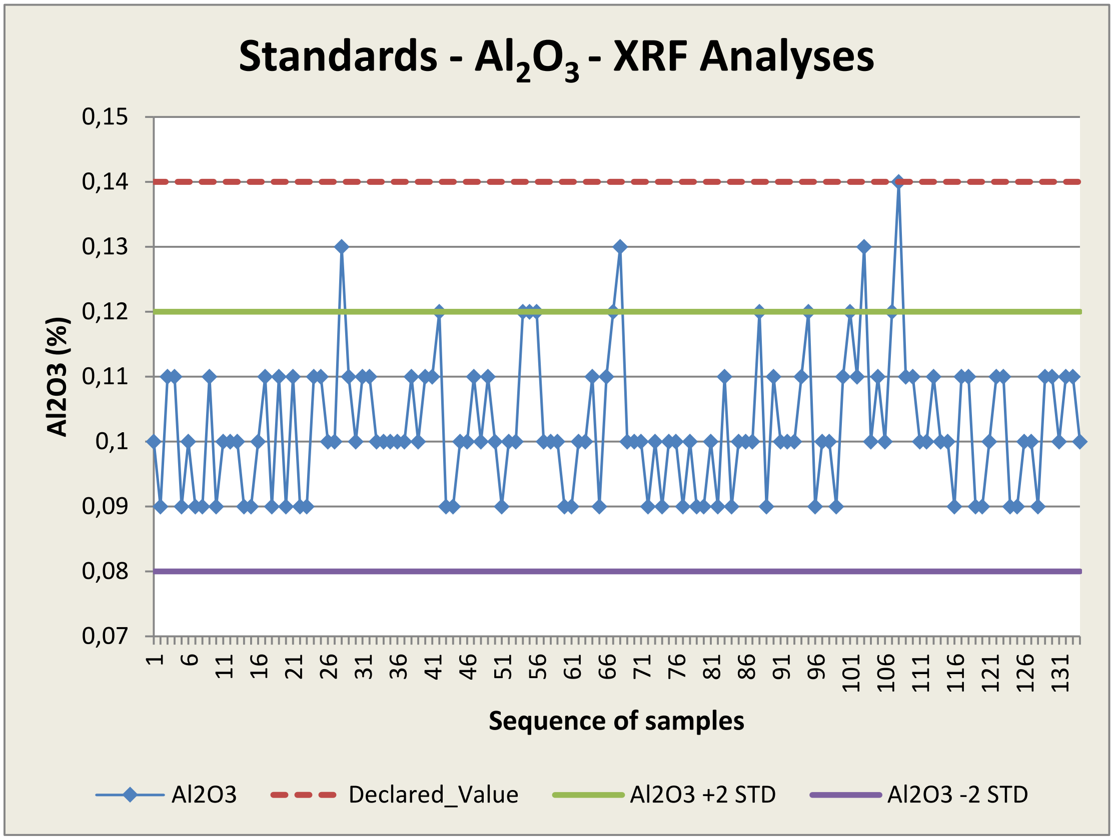


Figure 12-8 Analysis of Iron by XRF for the Reference Material

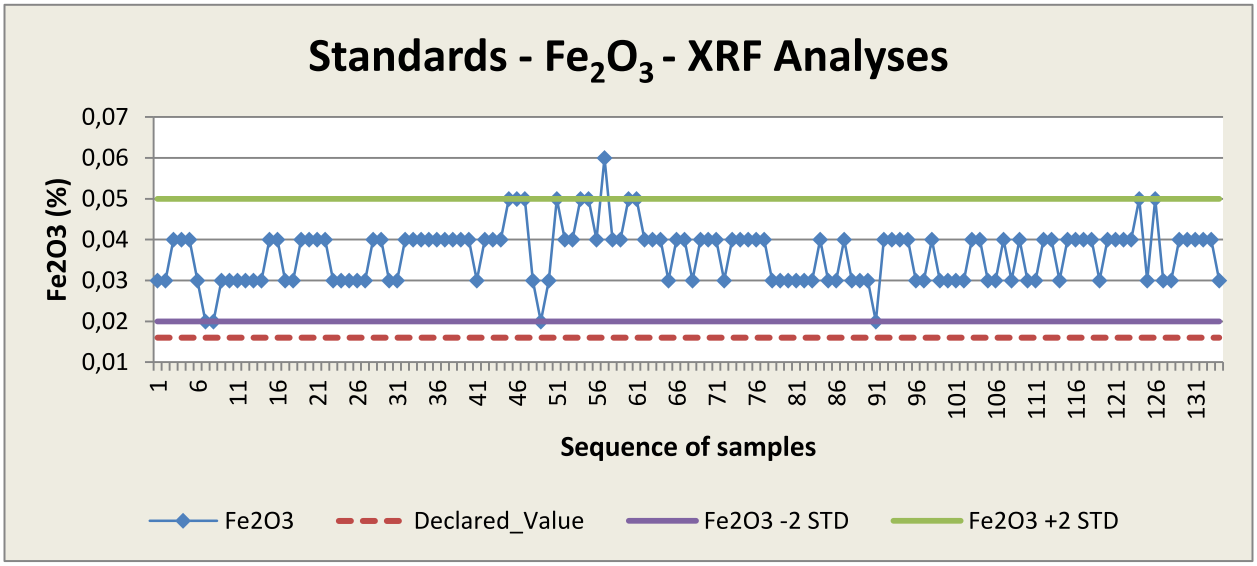


Figure 12-9 Analysis of Titania by ICP for the Reference Material

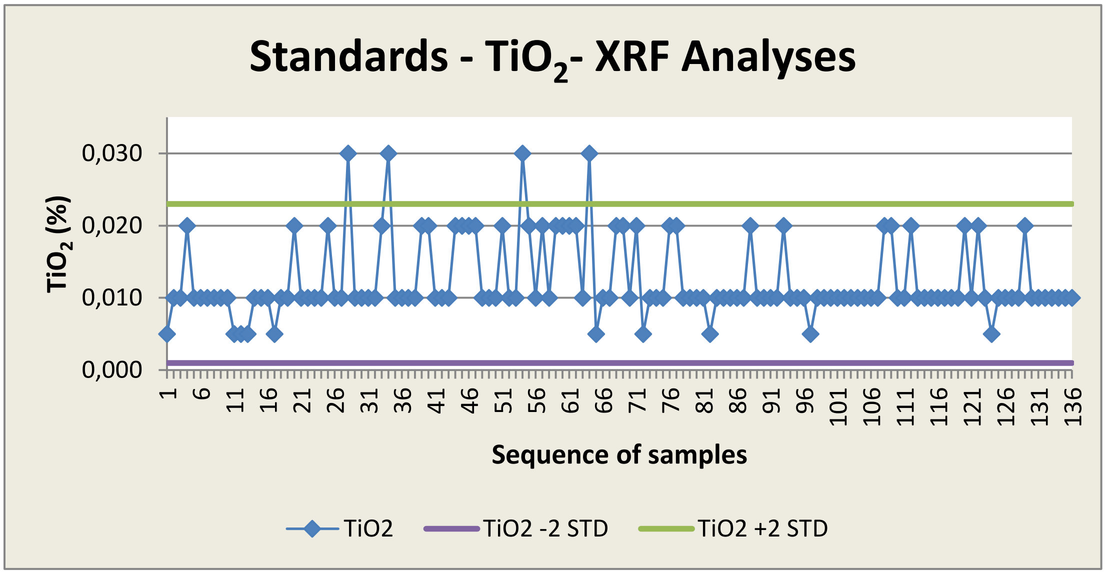


Figure 12-10 Analysis of Silica by XRF for the Reference Material

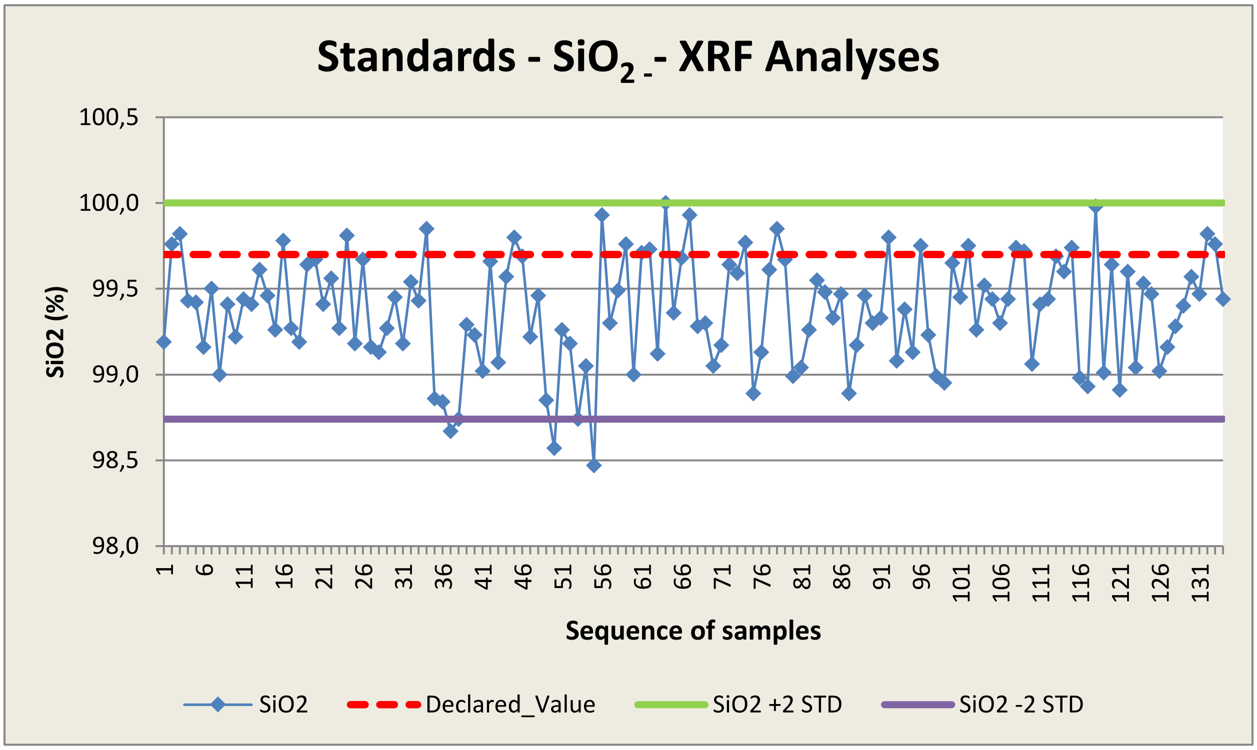
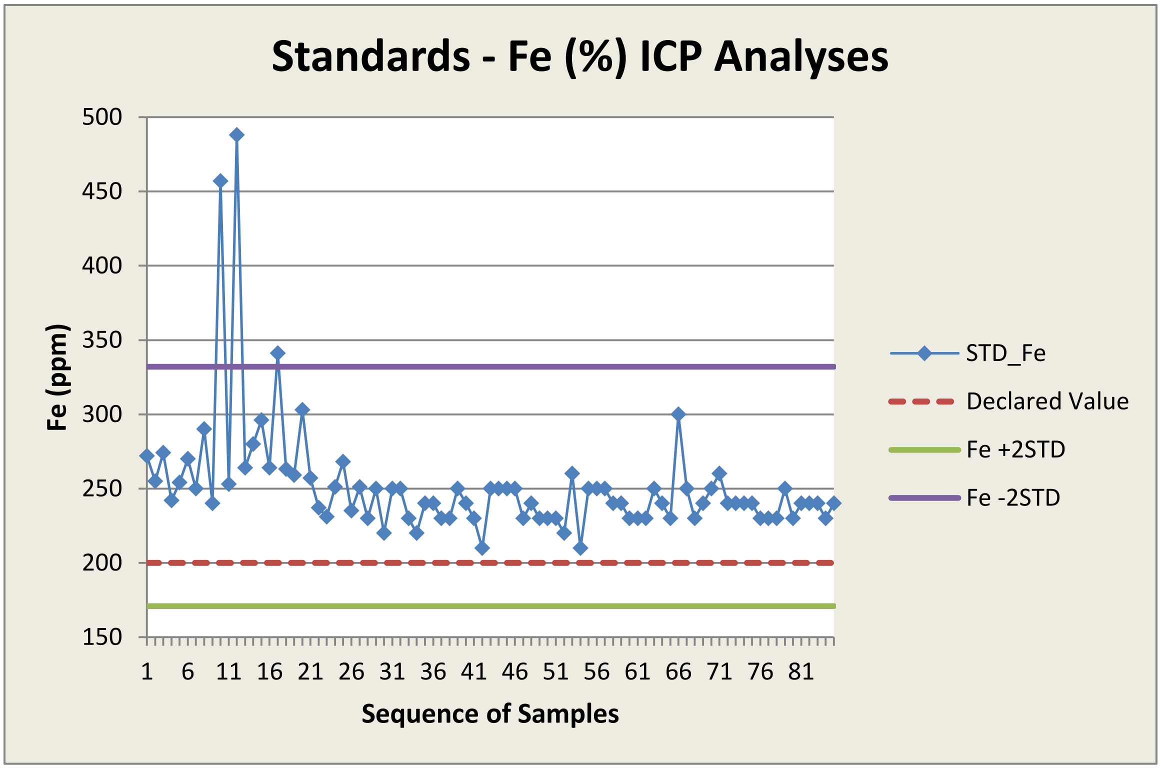


Figure 12-11 Analysis of Iron by ICP for the Reference Material



d) Duplicate Samples – Rogue Samples

Rogue used quarter-core samples to generate the duplicate samples in their QA/QC system. The relative percent difference is generally used to evaluate the precision from duplicate measurements. Met-Chem believes that this criterion cannot be applied to the Silicon Ridge samples as the relative differences are generally very low for the silica analyses and very high for the alumina, iron and titania values. This is due to the relative homogeneity of the quartzite and the consistently high silica and low metal contents that are close to the upper and lower detection limits of the analytical methods. In this case, the analytical precision can better be assessed by examining the difference between the pairs of original and duplicate samples.

The scatter plot and histogram of the XRF analyses of the individual original-duplicate sample pairs for silica show a relatively significant dispersion (Figure 12-12 and Figure 12-13) of the differences in the consecutive pairs on both sides of the mode that is around 0% difference. The differences in the silica content in the pairs range from -0.93% to +1.23%, except for three occurrences, which is fairly high considering the narrow range of values left by the high-level of silica (≥98.1%) required for the production of ferro-silicon.

Only 68.2% of the differences in the silica content between the pairs of samples range from -0.5% to +0.5%, which is not an outstanding performance (Table 12-5). This variability can be explained by the values being close to the high detection limit of the XRF method. The quantile-quantile plot shows a slight high bias in the duplicate samples, relative to the original samples, a trend that is yet unexplained. However, the average silica content for the 151 original samples is 97.69% and 97.88% for the duplicate samples. Alumina, iron and titania in original and duplicate samples are well correlated (Table 12-5).

The ICP analyses of the Duplicate samples show a high degree of correlation for alumina and iron in the respective pairs, whereas a higher dispersion is visible in titania. A higher correlation is expected from the ICP analyses as the pulps are used, rather than the quarter core submitted to XRF analysis. The average for the original and for the duplicate samples is very close (Table 12-6).

Met-Chem believes that even though some dispersion inherent in the analytical method was observed, the reliability of the analytical results is acceptable and sufficiently high to be used in a resource estimate. In addition, the tests conducted by ANZAPLAN have shown that processing can significantly reduce the content of deleterious elements to achieve grades fit for generating various silicon products. Consequently, part of the variability of the analyses can be accommodated by processing of the run-of-mine material in a mining operation.

Figure 12-12 Duplicate Samples – SiO_2 XRF Analyses

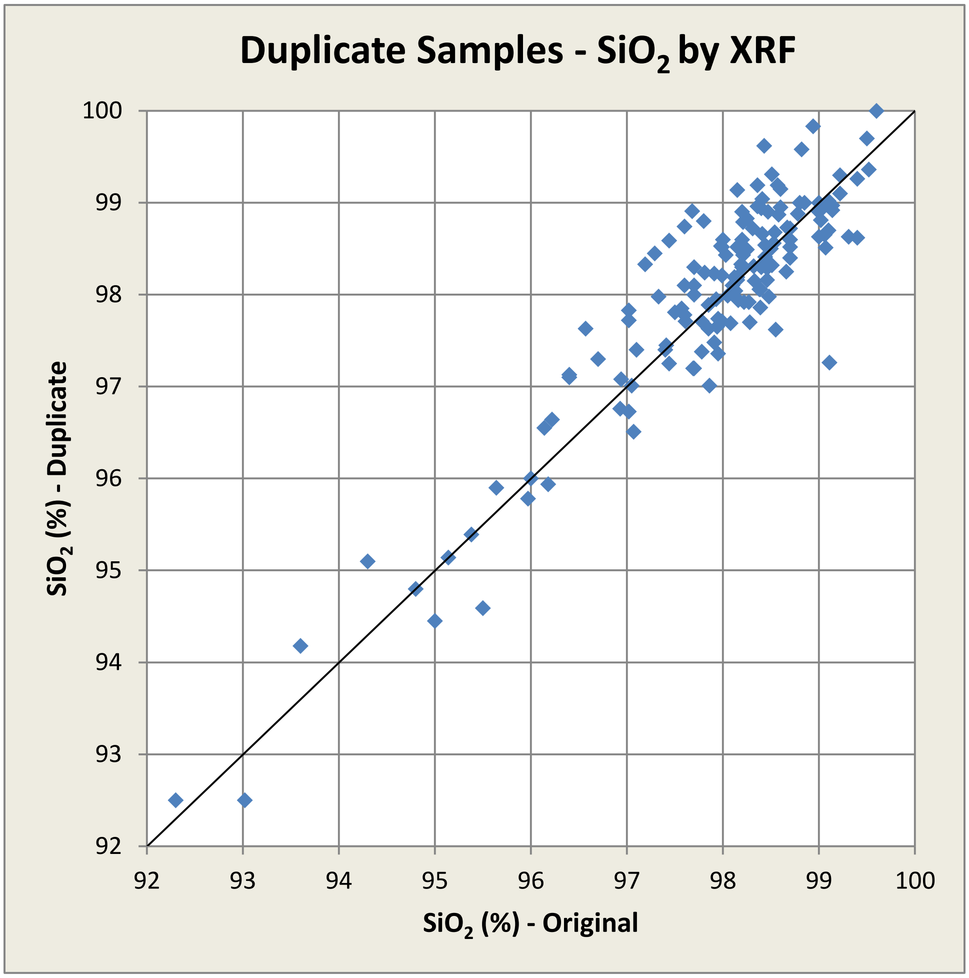


Figure 12-13 Duplicate Samples – Differences in Individual Original-Duplicate Pairs (SiO_2, XRF Analyses)

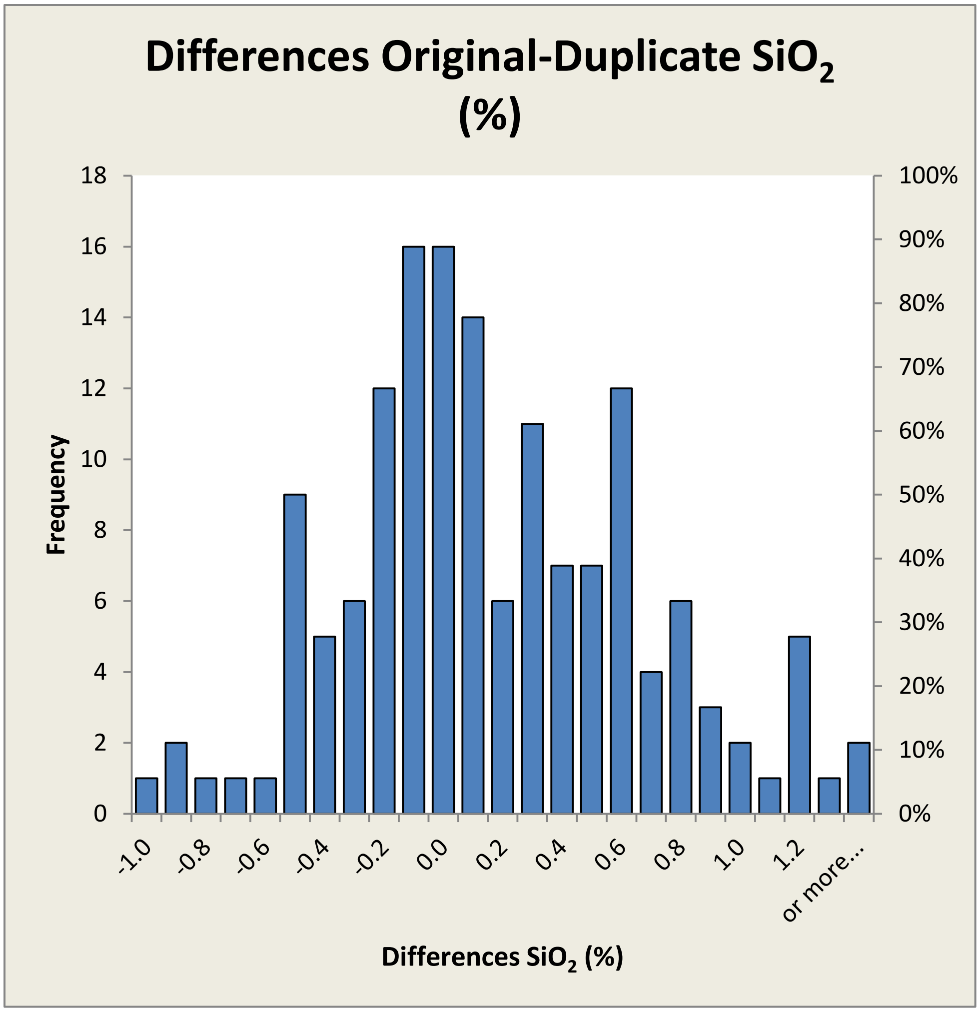


Table 12-5 Duplicate Samples – Description of the Differences in the Original-Duplicate Pairs (XRF Analyses)

Element	Differences Original-Duplicate Samples; Selected Range			Average all Samples (%)	
	From (%)	To (%)	Percent Within	Original	Duplicate
Al_2O_3	-0.20	+0.20	89.4	1.060	0.962
Fe_2O_3	-0.05	+0.05	85.6	0.365	0.351
TiO_2	-0.02	+0.02	86.1	0.116	0.109
SiO_2	-0.50	+0.50	68.2	97.69	97.88

Table 12-6 Duplicate Samples – Average of the ICP Analyses in Individual Original-Duplicate Pairs

Element	Average (%)	
	Original Sample	Duplicate Sample
Al_2O_3	0.381	0.381
Fe_2O_3	0.152	0.142
TiO_2	1.751	1.744
N=	57	57

e) Duplicate Samples – Re-Analysis of Pulp or Rejects

The rejects and pulps from a few batches for which some anomalous values had been observed by Rogue were re-analyzed. The results from these samples (111 samples) were examined by Met-Chem to see whether re-analysis on “non-blind” (“Lab-aware”) samples submitted to the laboratory would show a different variability from the “blind” duplicate samples submitted by Rogue. These analytical results would also provide some insight into the volume variance effect between the different types of samples being re-analyzed: quarter core, coarse rejects or pulp samples.

The variability between the analytical results for silica from the pairs of original and duplicate samples appears to be similar to the variability observed in the blind samples (Figure 12-14). The fact that the variability observed in the results from the pulps is lower than in the rejects re-analyses is consistent with the generally higher homogeneity attained by the finer pulp material (Figure 12-15).

Figure 12-14 Duplicate Sample Re-Analysis of Rejects – Silica (%)

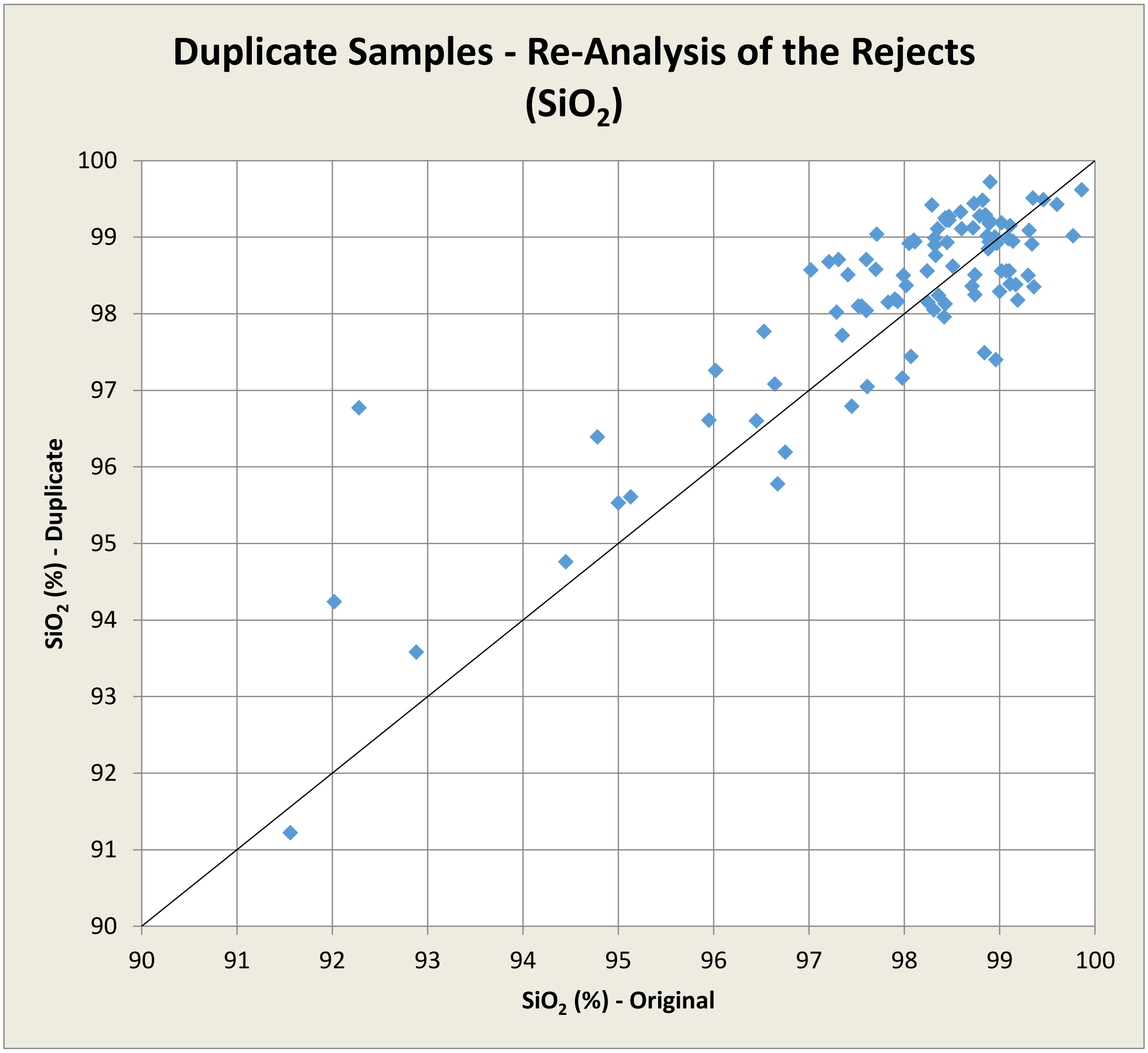
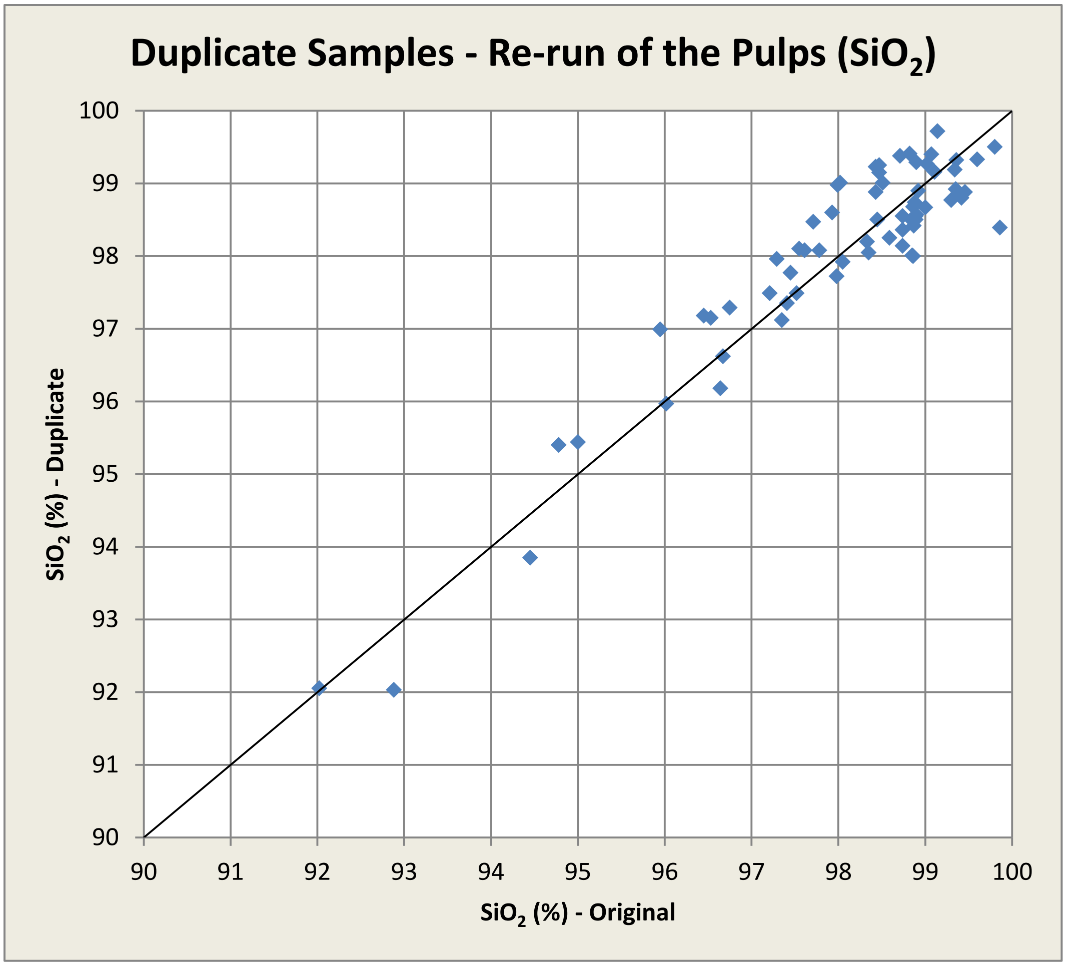


Figure 12-15 Duplicate Samples Re-Analysis of Pulps - Silica (%)



f) Specific Gravity

A total of 467 specific gravity (S.G.) determinations were performed by ALS on quartzite samples using the bottle pycnometer method with a methanol solvent (Code OA-GRA08b). The S.G. results range from 2.470 to 3.100, with about 74% of them falling within 2.620 and 2.680. The average of all the values is 2.65, which corresponds to the density of quartz. As was expected, no correlation is visible between S.G. and the silica, iron, alumina or titania contents.

The pycnometer method is prone to generate values somewhat higher than the immersion method. Density determinations by water immersion provide the equivalent of an "in situ" measurement, commonly referred to as "bulk density" or "in situ density". This method takes into account the porosity of the rock and is the preferred measurement to be used in a resource estimate.

If Rogue proceeds with a Pre-Feasibility or a Feasibility study, Met-Chem recommends submitting a series of samples that have a pycnometer test to the immersion method to check whether differences may exist between the results from the two methods. If so, a sufficient number of tests have to be performed to calculate a regression formula in order to correct the original S.G. results. In addition, density determinations have to be completed both on quartzite and gneiss samples (waste material) for future economic study and mine planning purposes.

g) Conclusion

Rogue has applied a strict QA/QC protocol starting from the field work to the database construction submitted to Met-Chem.

Surveying all the trenches and drill hole collars, as well as tracking the deviation path of the holes was completed to ensure reliable location of the rock units, samples and structures in the deposit. The entire core was oriented, which allowed measurements of the alpha and beta angles.

The logging and sampling activities were supervised or completed by senior geologists who used ample peer review of data validation. The use of standards, blanks and duplicates inserted into the sample stream was adequate to monitor the laboratory performance.

Met-Chem believes the entire drilling and trenching programs were completed according to high industry standards and Met-Chem has all reasons to believe that the results produced by these programs are sufficiently reliable and complete to serve as the basis of the preparation of a resource estimate.

13.0 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Introduction

Dorfner ANZAPLAN was engaged in October 2015 to serve as a consulting and engineering partner for complete project advancement, beginning with providing the first evaluation of the potential of the Silicon Ridge property quartzite in different high value applications. ANZAPLAN is a full service specialist in high-value industrial and strategic minerals offering international customers a complete one-stop shopping solution across all phases of the economic evaluation and development of industrial, specialty and strategic minerals projects such as quartzite processing for silicon application or high purity quartz.

In October 2015, Dr. Reiner Haus, MD of Dorfner ANZAPLAN, visited the Silicon Ridge property accompanied by Rogue's former Senior Vice President and Qualified Person, Mr. E. Canova, Geo (OGQ-403). Based on that visit, a pre-sample of quartzite totaling approximately 250 kilograms was selected. The material was delivered to ANZAPLAN's Laboratory facilities in Hirschau, Germany for preliminary chemical composition analysis. Based upon these results, ANZAPLAN was commissioned to complete the "Evaluation of a Quartzite Deposit in Canada for the Identification of Potential Applications".

Rogue provided ANZAPLAN with three PQ diamond drill cores (GF15-53, GF15-60 and GF15-62) and three corresponding NQ diamond drill cores (GF15-39, GF15-42 and GF15-46) in December 2015 and January 2016. The PQ drill cores were subjected to processing tests targeting the evaluation of the suitability of the quartzite for silicon and high value applications. The NQ drill cores were subjected to chemical analysis.

13.2 Mineralogical and Chemical Analyses

During mineralogical investigations, inclusions of hematite, ilmenite, muscovite, sillimanite, zircon and rutile were identified in the quartzite.

Selected samples were characterized by X-ray diffraction (XRD) analyses and the crystalline phases were identified.

The chemical composition of the main elements was analyzed by X-ray fluorescence spectroscopy (XRF). The loss on ignition at a temperature of 1,025 °C was also analyzed.

The trace element analyses were completed by applying analytical techniques for the detection of impurities in quartz developed systematically by ANZAPLAN and led to the introduction of special quartz digestion methods. Raw quartz lump samples are prepared via a contamination free, optimized procedure, specifically applicable for high purity quartz. Chemical analysis was carried out by using inductively coupled plasma spectrometry.

13.3 Sample Definition

Three pairs of drill cores were received, each containing a whole PQ drill core (85 mm diameter) and a quarter of an NQ drill core (47.6 mm diameter). The pairing of the drill cores is listed in Table 13-1.

Table 13-1 PQ and NQ Drill Core Pairs

Section	PQ Drill Core	NQ Drill Core
100W	GF15-53	GF15-39
450W	GF15-60	GF15-42
950E	GF15-62	GF15-46

Five samples from each PQ drill core were defined for the processing tests based on the chemical analysis of the twinned NQ drill cores, the core logging as completed by Rogue and visual inspection of the PQ drill core samples. The purpose of the test work was to identify areas suitable to produce quartzite products for silicon and ferrosilicon production. The samples are defined Table 13-2 for each of the PQ drill cores.

Table 13-2 Definition of samples for processing tests for silicon application

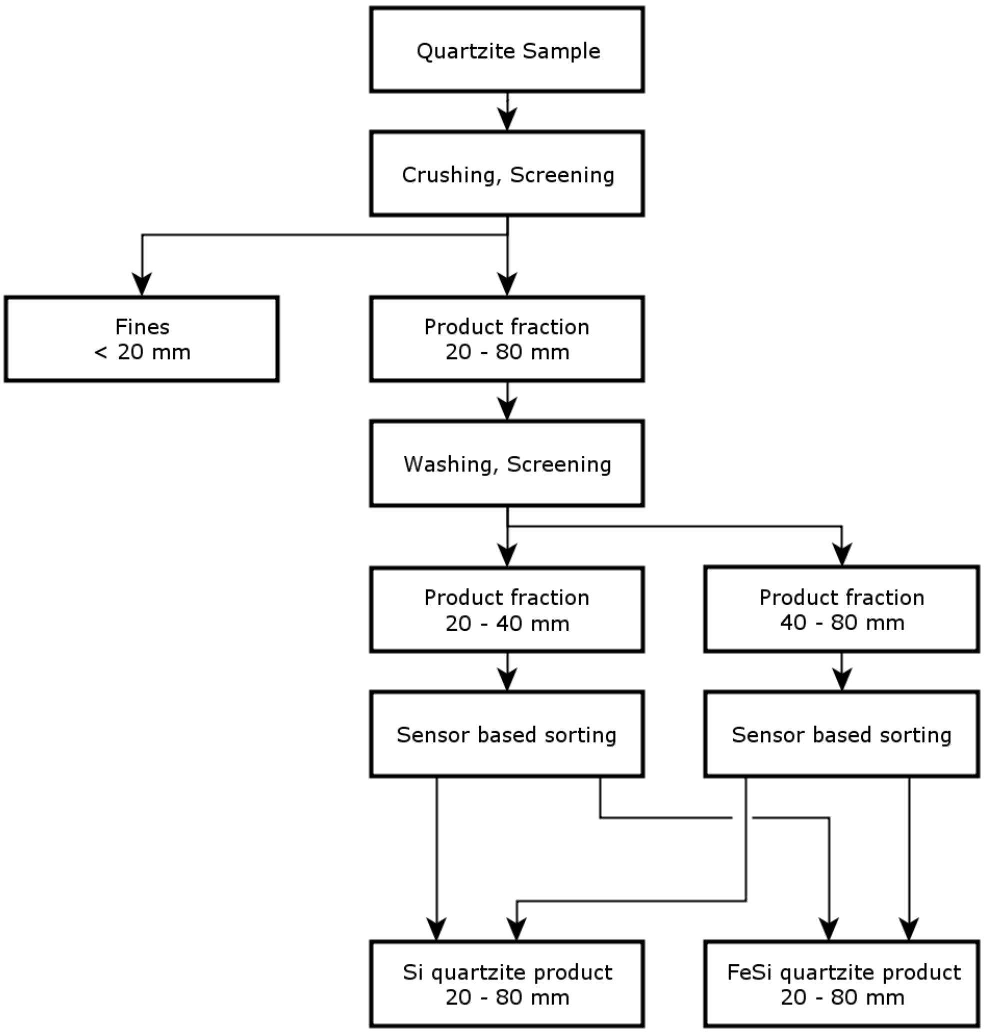
Sample ID	Drill Interval (m)	Description
Drill core GF15-53		
Sample 1	78.6 – 99.2	Above shear zone
Sample 2	99.2 – 111.7	
Sample 3	111.7 – 135	
Sample 4	135 – 156.8	Shear zone
Sample 5	156.8 – 186.2	Below shear zone
Drill core GF15-60		
Sample 1	38.3 – 66	Above shear zone
Sample 2	66 – 80	
Sample 3	80 – 97	
Sample 4	98 – 118	Shear zone
Sample 5	118 – 138	Below shear zone
Drill core GF15-62		
Sample 1	35.4 – 55.7	Above metagabbro
Sample 2	55.7 – 66.7	
Sample 3	66.7 – 83.7	
Sample 4	83.7 – 93.2	
Sample 5	105.8 – 116.8	Below metagabbro

13.4 Processing results for silicon / ferrosilicon application

Silicon production generally utilizes quartzite in particle sizes ranging from 20 to 120 mm. Based on the limited size of the PQ drill cores, a fraction of 20 – 80 mm was used for the processing tests as summarized in the following flow sheet (Figure 13-1).

Each of the 15 quartzite samples were crushed using a jaw crusher and screened into fractions of <20 mm, 20 – 40 mm and 40 – 80 mm. Product fractions of 20 – 40 mm and 40 – 80 mm were washed and screened prior to sensor based sorting.

Figure 13-1 Flow Sheet for silicon / ferrosilicon application



Automated optical sorting sorts the quartzite into different qualities based on differences in colour. The chemical compositions after optical sorting show the selectivity of optical sorting to iron oxide, alumina, titania in both, the 20 – 40 mm and 40 – 80 mm fraction. Compared to the typical values for iron oxide in quartz products for metallurgical grade silicon (MG-silicon) and ferrosilicon, low iron oxide contents are achievable, suitable for both applications. For alumina and titania grades in the typical range for ferrosilicon production were achieved, however, the levels are still elevated compared to typical quartz feedstock materials used for MG-silicon production. These typical values are not strict thresholds and producers rather indicate typical ranges of materials used which does not exclude the use of materials which are not exactly in the given ranges.

The applicability of different sensors to reduce the titania and alumina contents were evaluated and consisted of X-ray transmission (XRT), Near-infrared (NIR) and Electromagnetic (EM) sensor technologies. Sensor screening tests confirmed that some of the samples can be sorted using NIR, however, optical sensor sorting provided better results.

Results from processing tests of drill core GF15-53 indicated that 16.2 wt% of the entire drill core is suitable for ferrosilicon production. A total of 20 to 22 wt% of the samples are in the < 20 mm fraction and will serve as feed material for high value applications.

Results from processing tests of drill core GF15-60 indicated that 34.6 wt% of the entire drill core is suitable for ferrosilicon production. A total of 20 to 25 wt% of the samples are in the < 20 mm fraction and will serve as feed material for high value applications.

Results from processing tests of drill core GF15-62 indicated that 34.7 wt% of the entire drill core is suitable for ferrosilicon production. A total of 21 to 23 wt% of the samples are in the < 20 mm fraction and will serve as feed material for high value applications.

The less than 20 mm fines and the optical sorting rejects will be stockpiled for potential further processing for high value applications.

14.0 MINERAL RESOURCE ESTIMATES

14.1 Mineral Resource Estimates Statement

Rogue completed the first ever drilling campaign into the "G" and 'H" quartzite units on the Silicon Ridge property between August 8, 2015 and December 16, 2015. Met-Chem was mandated by Rogue to carry out a resource estimate of the Silicon Ridge mineralization with the intent to use the information for the preparation of a NI 43-101 compliant PEA.

The exploration database used contained 71 drill holes and 3 holes (GF15-35, GF15-35A and GF15-51) repeated due to drill casings breaking, and 25 trenches representing the exploration work performed in 2015. The geological interpretation was performed by the geological team of Rogue. Met-Chem has constructed the 3D geological solids used for the estimate. Variogram parameters were defined and used to define search ellipses that were used during the resource interpolation. The resource interpolation was performed using the Inverse Distance Weighted ("IDW") at a power of two ("IDW2").

The resource estimate was performed by Schadrac Ibrango, P.Geo., Ph.D. a QP for Met-Chem. The effective date of this resource estimate is June 7, 2016.

The mineral resource classification follows the guidelines adopted by the CIM through the NI 43-101. A summary of the CIM Definition Standards for Mineral Resource classification is provided in Section 14.2. In addition the criteria used by Met-Chem for classifying the estimated resource are based on the quality of the data set and the certainty of continuity of the geology and grades. The mineral resources are constrained by a Lerch-Grossman (LG) optimized pit shell using MineSight software. The LG pit shell was defined using the following constraints; 50 degree pit slope, a 85 m offset includes 75 m offset from lakes and wetlands and 10 m buffer zone for pit road access, products sale prices of \$200/t and \$100/t for respectively high value and ferrosilicon, processing costs of \$45.84/t and \$16.84/t of feed for respectively high value and ferrosilicon, a mining cost of \$6.73/t and a G&A cost of \$2/t.

Table 14-1 provides a summary of the pit-constrained resources for the three deposits.

Table 14-1 Silicon Ridge – Summary of the Pit Constrained Mineral Resources Estimate (Cut-Off: ≥ 98.1% SiO_2, ≤ 0.8% Al_2O_3, ≤ 0.075% TiO_2, ≤ 0.24% Fe_2O_3).

ALL ZONES					
	Tonnes (Mt)	SiO_2 (%)	TiO_2 (%)	Al_2O_3 (%)	Fe_2O_3 (%)
Measured	3.2	98.61	0.061	0.556	0.101
Indicated	6.5	98.60	0.062	0.564	0.122
Measured + Indicated	**9.7**	**98.60**	**0.062**	**0.561**	**0.115**
Inferred	4.6	98.64	0.062	0.532	0.131

SOUTH WEST ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	2.4	98.60	0.061	0.560	0.101
Indicated	3.9	98.60	0.062	0.576	0.109
Measured + Indicated	**6.3**	**98.60**	**0.061**	**0.570**	**0.106**
Inferred	**2.5**	**98.70**	**0.061**	**0.544**	**0.096**

NORTH EAST ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	0.8	98.66	0.063	0.544	0.102
Indicated	1.4	98.63	0.066	0.556	0.123
Measured + Indicated	**2.2**	**98.64**	**0.065**	**0.552**	**0.116**
Inferred	**0.5**	**98.56**	**0.069**	**0.641**	**0.136**

CENTRE NORTH ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	0.001	98.31	0.047	0.589	0.150
Indicated	1.2	98.56	0.061	0.535	0.163
Measured + Indicated	**1.2**	**98.56**	**0.061**	**0.535**	**0.163**
Inferred	**1.6**	**98.56**	**0.060**	**0.479**	**0.183**

The reader is cautioned that Mineral Resources that are not Mineral Reserves have no demonstrated economic viability. The estimate of Mineral Resources may be materially affected by mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and government factors (the “Modifying Factors”).

14.2 Definitions

According to the latest version of the CIM Standards/NI 43-101 that was adopted by CIM Council on May 10, 2014:

> A Mineral Resource is a concentration or occurrence of solid material of economic interest in or on the Earth’s crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade or quality, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling.

Material of economic interest refers to diamonds, natural solid inorganic material, or natural solid fossilized organic material including base and precious metals, coal, and industrial minerals.

An **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation.

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

A **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation.

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource.

It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

An **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling.

Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve.

It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

14.3 Mineral Resource Estimation Procedures

The estimation of the Silicon Ridge Mineral Resource includes the following procedures:

- Validation of the drill hole database received from Rogue;
- Importation of the database into MineSight® v. 11;
- Basic calculations to assess the statistical parameters of different quality elements and decision on the compositing length;
- Construction of the 3D primarly quartzite geological solids using the drill sections with the interpreted geology provided by Rogue;
- Selection of the cut-offs for SiO_2, TiO_2, Al_2O_3, Fe_2O_3 to be applied for modelling quartzite solids portions that are relevant to the final products;
- Exclusion of non relevant parts and regeneration of quartzite solids that meet the selected SiO_2, TiO_2, Al_2O_3 and Fe_2O_3 cut-offs;
- Compositing to standardize the support length for grade interpolation;
- Geostatistical analysis of percentages of SiO_2 and Al_2O_3, constrained within the mineralised solids of the quartzite unit to assess the spatial continuity of the mineralization and determine the search ellipse parameters;
- Selection of the block size in accordance with the drilling spacing and the selected mining equipments;
- Generation of a block model;
- Interpolation of the SiO_2, TiO_2, Al_2O_3, Fe_2O_3 content for all blocks constrained within the mineralized solids;
- Validation of the resource estimate;
- Classification of the resource according to CIM/NI 43-101 standards
- Mineral Resource Statement.

14.4 Drill Hole Database and Data Verification

14.4.1 Drill Hole Database

The drill holes database used in this mineral resource estimate was supplied to Met-Chem in Excel format. The entire database consisted of 74 collars information related to diamond drill holes, 71 drill holes were completed, 3 drill holes were abandoned, due to casing breaking, and 25 trenches records. Three (3) drill holes, namely GF15-35, GF15-35A and GF15-51, were abandoned at a depth of only 12 m to 15 m without having reached the quartzite due to technical difficulties. Three (3) large holes (PQ diameter), namely GF15-53, GF15-60 and GF15-62 were drilled as twin holes to provide core for metallurgical tests. The whole core from these holes was shipped to ANZAPLAN as part of the metallurgical test program.

Seventy (70) drill holes have intercepted the quartzite formation. In addition to the drill holes, 25 trenches (stripped outcrops) were cleared and sampled on the property. These trenches were also used for the geological modelling and the mineral resource estimates. Table 14-2 and Table 14-3 provide a summary of diamond drilling and trenching performed on the Silicon Ridge Property.

Table 14-2 Summary of Diamond Drilling on the Silicon Ridge Property

Quartzite Unit	Sections	Numbers of Holes	Cumulative Length (m)
G - South West Sector	5+50 W to 1+00E	33	5 690.50
G-North East Sector	0+50E to 14+00E	30	4 298.80
H - Centre North	0+00 to 5+00E	11	1 833.00
TOTAL		**74**	**11 822.30**

Table 14-3 Summary of Trenching on the Silicon Ridge Property

Quartzite Unit	Sections	Numbers of Trenches	Cumulative Length (m)
G - South West Sector	5+50 W to 1+00E	10	282.80
G-North East Sector	0+50E to 14+00E	6	111.10
H - Centre North	0+00 to 5+00E	9	116.60
TOTAL		**25**	**510.50**

Table 14-4 provides a summary of samples assayed during the drilling and trenching campaign.

Table 14-4 Summary of Exploration work

Source of information	Assays Samples	
	Number	Cumulative Length (m)
Drill Holes	4 740	6 476.60
Trenches	293	501.70
TOTAL	**5 033**	**6 978.30**

The data from all the exploration drill holes and from the trenches was used for the geological modelling. The lithology of all holes were used to perform the sectional geological interpretation and later for the construction of the different geological and grades envelopes. The assays data from holes and trenches that are located within the modelled geological solids were all used for grade interpolation. Only the analytical results from the XRF method were used for compositing and grade interpolation. The data from the elements analyzed by ICP were not used in the mineral resource estimates.

14.4.2 Data Verification

Met-Chem performed the following validation steps, as part of data verification, once the drill hole database was received:

- Checking for location and elevation discrepancies and unusual values;
- Checking for minimum and maximum values for each quality element to ensure that the range of the all values fall within acceptable limits;
- Checking for inconsistencies in the lithological units and for overlaps in the lithology and assays intervals;
- Checking for gaps in the lithological code intervals;
- Checking for duplicate intervals/samples

This first validation step was performed before importing the data into MineSight®. A further validation process was completed when importing the data into Torque, a SQL based database manager linked with MineSight®. Another validation step consisted of comparing the assay results entries in the database, for selected holes, with the assay results as displayed in original laboratory certificates. Some errors were found and corrected according to following discussions during the different progress meetings.

The fields contained in the drill hole database are summarized in Table 14-5.

Table 14-5 Fields contained in the Drill Hole Database

Collar Fields	Hole-ID, Location_X, Location_Y, Location_Z, Length (m)
Survey Fields	Hole-ID, Depth (m), Azimuth (°), Dip (°)
Litho Fields	Hole-ID, From (m), To (m), Litho, LCODE, GCODE
Assays Fields	Hole-ID, From (m), To (m), Length (m), Al_2O_3%, BaO%, CaO%, Cr_2O_3%, Fe_2O_3%, K_2O%, MgO%, MnO%, Na_2O%, P_2O_5%, SO_3%, SiO_2%, TiO_2%, TOTAL%, S.G. (on selected samples)

Table 14-6 Descriptive Statistics of Quality Elements in the Entire Database

	Arith. Average	Weighted Average	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	1.19	1.13	0.77	0.36	1.67	1.41	24.33	0.11	24.44	5 033
BaO	0.01	0.01	0.01	0.01	0.01	1.56	0.31	0.01	0.31	5 030
CaO	0.04	0.04	0.01	0.01	0.34	9.18	9.77	0.01	9.77	5 033
Cr_2O_3	0.01	0.01	0.01	0.01	0.00	0.56	0.09	0.01	0.09	5 033
Fe_2O_3	0.37	0.34	0.13	0.06	1.40	3.82	22.70	0.01	22.70	5 033
K_2O	0.13	0.13	0.06	0.04	0.29	2.18	4.10	0.01	4.10	5 033
MgO	0.077	0.072	0.010	0.005	0.460	5.985	9.125	0.005	9.130	5 033
MnO	0.007	0.006	0.005	0.005	0.018	2.735	0.645	0.005	0.650	5 033
Na_2O	0.014	0.015	0.010	0.005	0.075	5.149	2.645	0.005	2.650	5 033
P_2O_5	0.014	0.013	0.005	0.005	0.075	5.391	1.825	0.005	1.830	5 033
SO_3	0.023	0.022	0.005	0.005	0.105	4.542	3.445	0.005	3.450	5 030
SiO_2	97.36	97.48	98.16	97.99	4.36	0.04	61.47	38.53	100.00	5 033
SrO	0.005	0.005	0.005	0.005	0.002	0.422	0.075	0.005	0.080	5 030
TiO_2	0.119	0.112	0.080	0.060	0.278	2.338	6.060	0.020	6.080	5 033
Total	99.55	99.56	99.58	100.10	2.46	0.02	102.44	0.21	102.65	5 033
S.G.	2.65	2.65	2.65	2.65	0.04	0.02	0.61	2.47	3.08	461

14.4.3 Geological Modelling Procedures

Rogue interpreted the geology of the three deposits on vertical drill sections that were transmitted to Met-Chem. After minor adjustments on the contacts and modifications on the lithology codes, Met-Chem generated the 3D geological solids, using the traditional sectional interpretation on 2D prior the generation of 3D envelopes by linking the different 2D polylines.

The geological model is based on a single quartzite envelope for the North East and Centre North zones. However, the main shear zone transecting the quartzite unit in the SW deposit was excluded during the interpretation process, in view of its continuity and its grades exceeding the set cutoffs.

After the primary quartzite solids were built for each part of the mineralization (NE, SW and Centre North) Met-Chem used cutoffs set and supplied by ANZAPLAN, and based on the results of the metallurgical testing, to develop a domaining approach to better guide the mineral resource interpolation. This was done in order to constrain high grades and low grades domains and avoid interactions of composites selection during grades interpolation. The domaining process, based on the different Al_2O_3%, Fe_2O_3%, TiO_2% and SiO_2% cut-offs has allowed to further isolate secondary shear or fracture zones of lower quality silica parallel to the main shear zone visually identified in the South West part of the quartzite mineralization.

Rogue provided a topographic surface generated by a LiDAR survey over the property. Where necessary, Met-Chem adjusted the collar elevations of drill holes onto this surface to guide the construction of the final solids representing the quartzite iron formation and to ensure that the mineral resource estimate stayed below these surfaces. Figure 14-1 and Figure 14-2 show 3D plan views of the quartzite solids (with cut-offs and without cut-offs).

The global tonnage of the quartzite modelled, all zones together and without application of any cut-off grade, is 77.4 Million tonnes. Parts of that quartzite material that does not satisfy the criteria for its use for high value or ferrosilicon may be used for other ends such as gravel, common glasses, etc.

14.5 Statistical Analysis and Compositing

The geological solids were used to constrain the assays of holes used for the resources interpolation. Basic descriptive statistics were calculated on the resulting raw data in order to get a better understanding of statistical parameters and take necessary action before moving forward into the next steps of a resource estimate. In Table 14-7, Table 14-8 and Table 14-9 statistics were calculated only on the assays constrained within the different geological solids built respectively for the SW, NE and Centre North zone. No cut-offs were applied at this stage to generate the solids used to constrain the assays used.

Figure 14-1 Plan view of the main quartzite units (without cut-offs applied)

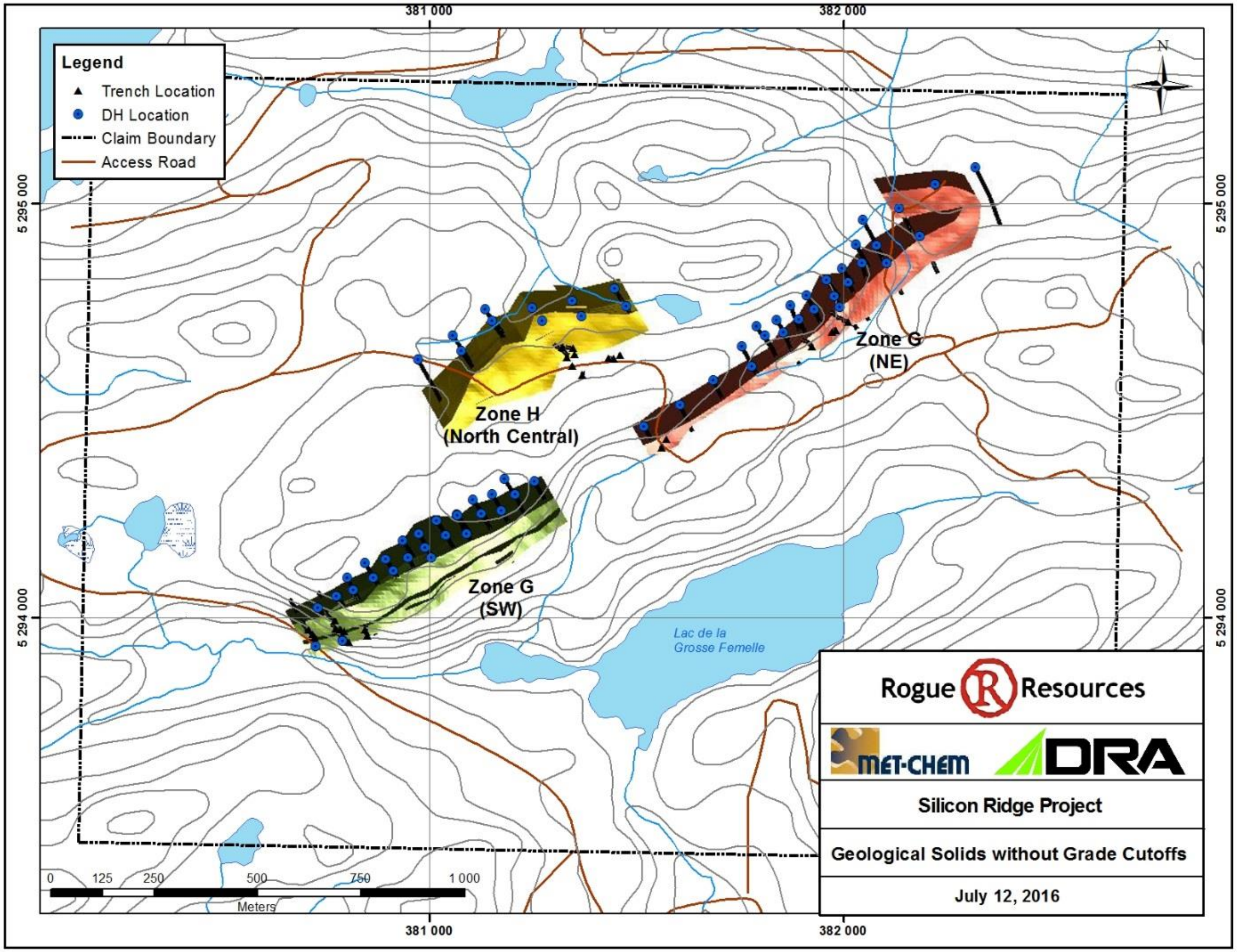


Figure 14-2 Plan view of the main quartzite units (with cut-offs applied)

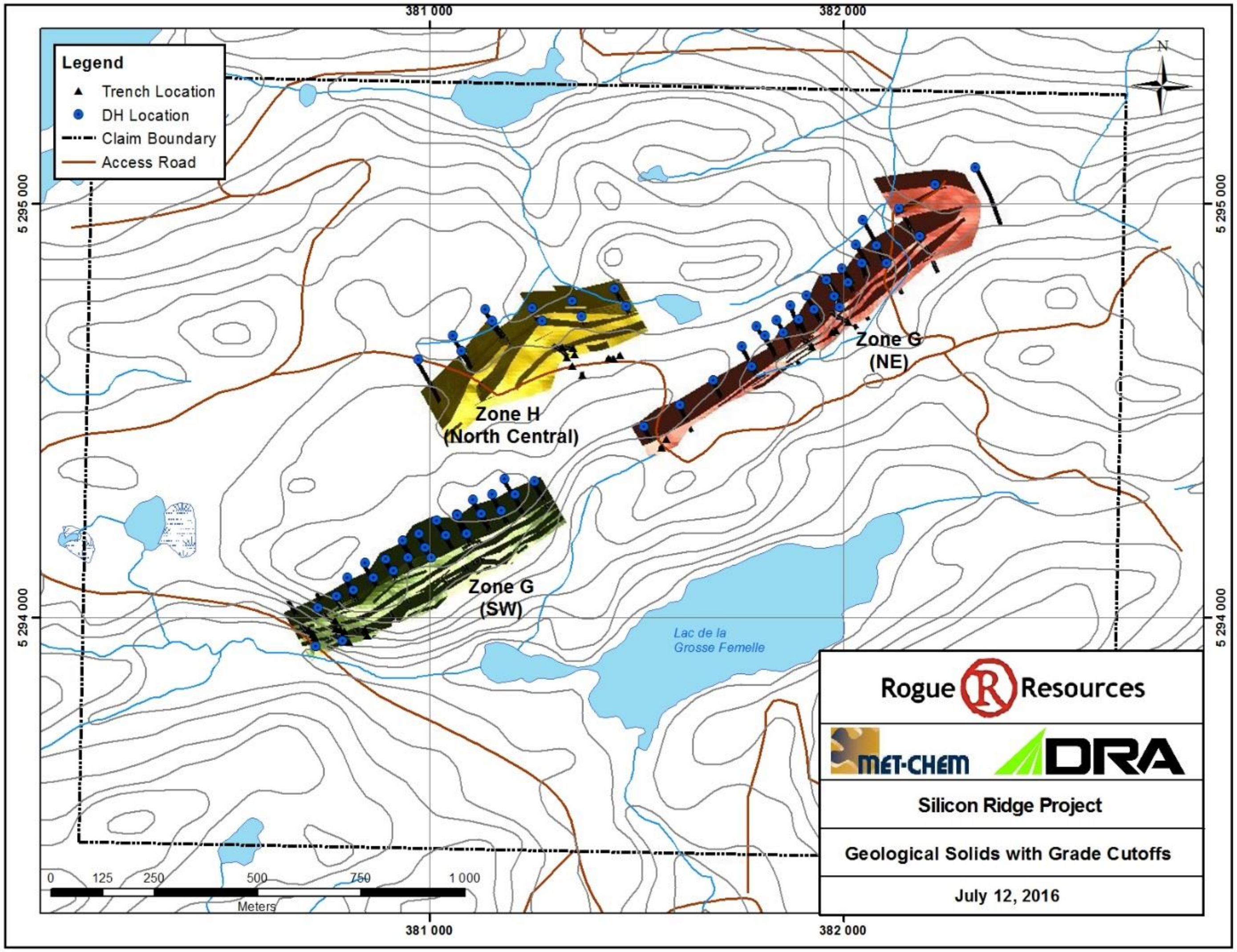


Table 14-7 Assays descriptive statistics for the South West Zone (No cut-offs applied)

Descriptive Statistics for the South West Zone (No Cut-offs)										
	Arith. Av.	Weighted Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.87	0.82	0.70	0.64	0.97	1.11	17.57	0.13	17.70	2 285
BaO	0.01	0.01	0.01	0.01	0.01	1.14	0.20	0.01	0.20	2 285
CaO	0.01	0.01	0.01	0.01	0.05	3.47	1.66	0.01	1.66	2 285
Cr_2O_3	0.01	0.01	0.01	0.01	0.00	0.50	0.09	0.01	0.09	2 285
Fe_2O_3	0.20	0.17	0.10	0.06	0.66	3.31	16.31	0.01	16.31	2 285
K_2O	0.07	0.07	0.05	0.04	0.16	2.16	3.75	0.01	3.75	2 285
MgO	0.024	0.019	0.005	0.005	0.175	7.349	6.135	0.005	6.140	2 285
MnO	0.005	0.005	0.005	0.005	0.004	0.751	0.115	0.005	0.120	2 285
Na_2O	0.008	0.008	0.005	0.005	0.008	0.960	0.225	0.005	0.230	2 285
P_2O_5	0.008	0.008	0.005	0.005	0.028	3.338	1.185	0.005	1.190	2 285
SO_3	0.013	0.012	0.005	0.005	0.065	5.036	1.955	0.005	1.960	2 285
SiO_2	98.03	98.15	98.35	97.99	2.19	0.02	48.83	51.17	100.00	2 285
SrO	0.005	0.005	0.005	0.005	0.000	0.099	0.005	0.005	0.010	2 285
TiO_2	0.087	0.081	0.070	0.050	0.116	1.331	3.680	0.020	3.700	2 285

Table 14-8 Assays descriptive Statistics for the North East Zone (No cut-offs applied)

Descriptive Statistics for the North East Zone (No Cut-offs)										
	Arith. Av.	Weighted Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.96	0.91	0.68	0.34	1.46	1.52	17.81	0.11	17.92	1 174
BaO	0.01	0.01	0.005	0.005	0.01	1.54	0.195	0.005	0.2	1 174
CaO	0.05	0.06	0.005	0.005	0.46	8.64	9.765	0.005	9.77	1 174
Cr_2O_3	0.01	0.01	0.005	0.005	0.00	0.42	0.025	0.005	0.03	1 174
Fe_2O_3	0.32	0.30	0.11	0.06	1.39	4.31	19.99	0.02	20.01	1 174
K_2O	0.09	0.09	0.05	0.03	0.23	2.48	3.285	0.005	3.29	1 174
MgO	0.06	0.05	0.01	0.005	0.36	6.44	9.125	0.005	9.13	1 174
MnO	0.01	0.01	0.005	0.005	0.01	1.92	0.275	0.005	0.28	1 174
Na_2O	0.02	0.02	0.01	0.005	0.11	6.90	2.645	0.005	2.65	1 174
P_2O_5	0.02	0.02	0.005	0.005	0.11	5.76	1.825	0.005	1.83	1 174
SO_3	0.01	0.01	0.005	0.005	0.11	7.44	3.445	0.005	3.45	1 174
SiO_2	97.73	97.81	98.35	98.51	4.26	0.04	59.49	40.51	100	1 174
SrO	0.01	0.01	0.005	0.005	0.00	0.57	0.075	0.005	0.08	1 174
TiO_2	0.11	0.11	0.07	0.06	0.25	2.26	3.94	0.03	3.97	1 174

Table 14-9 Assays descriptive Statistics for the Centre North Zone (No cut-offs applied)

Descriptive Statistics for the Centre North Zone (No Cut-offs)										
	Arith. Av.	Weighted Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	1.06	1.04	0.66	0.33	1.90	1.79	24.29	0.15	24.44	595
BaO	0.01	0.01	0.005	0.005	0.02	2.27	0.305	0.005	0.31	592
CaO	0.04	0.04	0.005	0.005	0.28	7.62	4.655	0.005	4.66	595
Cr_2O_3	0.01	0.01	0.005	0.005	0.01	0.71	0.065	0.005	0.07	595
Fe_2O_3	0.37	0.36	0.16	0.12	1.10	2.96	12.25	0.01	12.26	595
K_2O	0.12	0.12	0.05	0.04	0.32	2.69	3.455	0.005	3.46	595
MgO	0.11	0.12	0.02	0.005	0.67	5.92	8.975	0.005	8.98	595
MnO	0.01	0.01	0.005	0.005	0.03	4.04	0.645	0.005	0.65	595
Na_2O	0.01	0.01	0.005	0.005	0.03	2.78	0.495	0.005	0.5	595
P_2O_5	0.01	0.01	0.005	0.005	0.02	2.52	0.375	0.005	0.38	595
SO_3	0.02	0.02	0.005	0.005	0.08	3.74	1.735	0.005	1.74	592
SiO_2	97.55	97.58	98.31	98.46	4.30	0.04	52.86	47.14	100	595
SrO	0.01	0.01	0.005	0.005	0.00	0.38	0.025	0.005	0.03	592
TiO_2	0.11	0.10	0.07	0.05	0.18	1.67	2.42	0.02	2.44	595

ANZAPLAN was asked to perform metallurgical tests on core originating from three twin holes (GF15-53, GF15-60 and GF15-62) with the objective to determine suitable material that can be used for ferrosilicon. The results of these metallurgical tests have identified suitable cut-offs that should be applied in parallel for the ferrosilicon production. The cut-offs were set for SiO_2%, Fe_2O_3%, TiO_2% and Al_2O_3%. Those cut-offs were used to refine the geological modelling by defining grades domains that will be used to constrain the composites section during the mineral resource calculation. The domaining approach was successful and has allowed identification of secondary shear zones or fracture zones that are oriented in the strike direction and are parallel to the primary main shear zone identified in the South West sector. The resulting domain solids according to the cut-offs applied were used to constrain the assays and regenerate new descriptive statistics that are presented in Table 14-10, Table 14-11 and Table 14-12.

Table 14-10 Assays descriptive Statistics for the South West Zone (cut-offs applied)

Descriptive Statistics for the South West Zone; Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3									
	Arith. Av.	Weighted Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.75	0.69	0.53	0.35	1.00	1.32	17.57	0.13	17.7	1335
BaO	0.01	0.01	0.005	0.005	0.01	1.13	0.195	0.005	0.2	1335
CaO	0.01	0.01	0.005	0.005	0.03	2.27	0.575	0.005	0.58	1335
Cr_2O_3	0.01	0.01	0.005	0.005	0.00	0.38	0.035	0.005	0.04	1335
Fe_2O_3	0.17	0.14	0.08	0.03	0.67	3.91	16.305	0.005	16.31	1335
K_2O	0.06	0.06	0.04	0.03	0.14	2.13	3.715	0.005	3.72	1335
MgO	0.02	0.02	0.005	0.005	0.13	6.15	3.685	0.005	3.69	1335
MnO	0.01	0.01	0.005	0.005	0.00	0.72	0.115	0.005	0.12	1335
Na_2O	0.01	0.01	0.005	0.005	0.01	0.80	0.125	0.005	0.13	1335
P_2O_5	0.01	0.01	0.005	0.005	0.01	1.63	0.175	0.005	0.18	1335
SO_3	0.01	0.01	0.005	0.005	0.06	4.33	1.215	0.005	1.22	1335
SiO_2	98.25	98.37	98.58	98.74	2.15	0.02	47.59	52.41	100	1335
SrO	0.01	0.01	0.005	0.005	0.00	0.08	0.005	0.005	0.01	1335
TiO_2	0.08	0.07	0.06	0.05	0.13	1.65	3.68	0.02	3.7	1335

Table 14-11 Assays descriptive Statistics for the North East Zone (cut-offs applied)

Descriptive Statistics for the North East Zone; Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3									
	Arith. Av.	Weighted Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.78	0.73	0.54	0.34	1.08	1.38	14.74	0.13	14.87	720
BaO	0.01	0.01	0.005	0.005	0.01	1.05	0.145	0.005	0.15	720
CaO	0.03	0.03	0.005	0.005	0.30	8.67	7.535	0.005	7.54	720
Cr_2O_3	0.01	0.01	0.005	0.005	0.00	0.43	0.025	0.005	0.03	720
Fe_2O_3	0.25	0.22	0.1	0.06	1.10	4.44	19.99	0.02	20.01	720
K_2O	0.07	0.07	0.04	0.03	0.14	1.96	2.415	0.005	2.42	720
MgO	0.05	0.04	0.01	0.005	0.40	8.14	9.125	0.005	9.13	720
MnO	0.01	0.01	0.005	0.005	0.01	2.05	0.275	0.005	0.28	720
Na_2O	0.01	0.01	0.01	0.005	0.03	2.61	0.705	0.005	0.71	720
P_2O_5	0.01	0.01	0.005	0.005	0.07	4.52	0.915	0.005	0.92	720
SO_3	0.01	0.01	0.005	0.005	0.03	3.55	0.755	0.005	0.76	720
SiO_2	98.09	98.22	98.5	98.31	3.33	0.03	59.49	40.51	100	720
SrO	0.01	0.01	0.005	0.005	0.00	0.16	0.015	0.005	0.02	720
TiO_2	0.09	0.09	0.07	0.06	0.20	2.14	3.94	0.03	3.97	720

Table 14-12 Assays descriptive Statistics for the Centre North Zone (cut-offs applied)

Descriptive Statistics for the Centre North Zone; Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3										
	Arith. Av.	Weighted Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.89	0.88	0.53	0.33	1.94	2.17	24.29	0.15	24.44	343
BaO	0.01	0.01	0.005	0.005	0.02	2.44	0.305	0.005	0.31	341
CaO	0.03	0.04	0.005	0.005	0.24	8.03	4.345	0.005	4.35	343
Cr_2O_3	0.01	0.01	0.005	0.005	0.01	0.72	0.065	0.005	0.07	343
Fe_2O_3	0.30	0.29	0.15	0.12	0.83	2.77	12.07	0.02	12.09	343
K_2O	0.10	0.10	0.05	0.03	0.24	2.42	2.85	0.01	2.86	343
MgO	0.06	0.08	0.02	0.005	0.38	6.31	6.935	0.005	6.94	343
MnO	0.01	0.01	0.005	0.005	0.04	4.61	0.645	0.005	0.65	343
Na_2O	0.01	0.01	0.005	0.005	0.02	1.91	0.225	0.005	0.23	343
P_2O_5	0.01	0.01	0.005	0.005	0.01	1.30	0.105	0.005	0.11	343
SO_3	0.01	0.01	0.005	0.005	0.02	1.92	0.185	0.005	0.19	341
SiO_2	97.92	97.92	98.48	98.88	3.53	0.04	39.96	59.97	99.93	343
SrO	0.01	0.01	0.005	0.005	0.00	0.30	0.025	0.005	0.03	341
TiO_2	0.09	0.09	0.06	0.05	0.17	1.86	2.42	0.02	2.44	343

The sample length histogram of all assays falling within the quartzite was generated to visualise the sample length frequency in order to determine the suitable length to be used to composite all assays into a uniform length prior the resource interpolation. The length of the samples ranges from 0.2 (samples were normally greater than 0.5 m) to 3.0 m with 2.0 m being the statistical mode. Figure 14-3 shows the sampling length histogram of assays constrained within the quartzite unit. Met-Chem elected to use the statistical mode, which allows most of the assays to remain unmodified after compositing, as compositing length to uniform the assays and avoid bias introduced by too short or too long assays. The statistical mode (2 m) of sampling length also represents a multiple of the selected bench height which is 4 m.

The regular downhole compositing approach was used to composite assays restricted to each quartzite solid. All composites shorter than 0.6 m were discarded in order to avoid bias introduced by short intervals. Table 14-13, Table 14-14 and Table 14-15 provide descriptive statistics for the composites data for each mineralized solid. Figure 14-3, Figure 14-4, Figure 14-5, Figure 14-6 and Figure 14-7 present the composite length histogram as well as the composites histograms for SiO_2%, Al_2O_3%, TiO_2% and Fe_2O_3% for the South West Zone which represents the main mineralized zone according to the cut-offs used for the constraining.

Figure 14-3 Sampling length histogram of assays within the quartzite unit

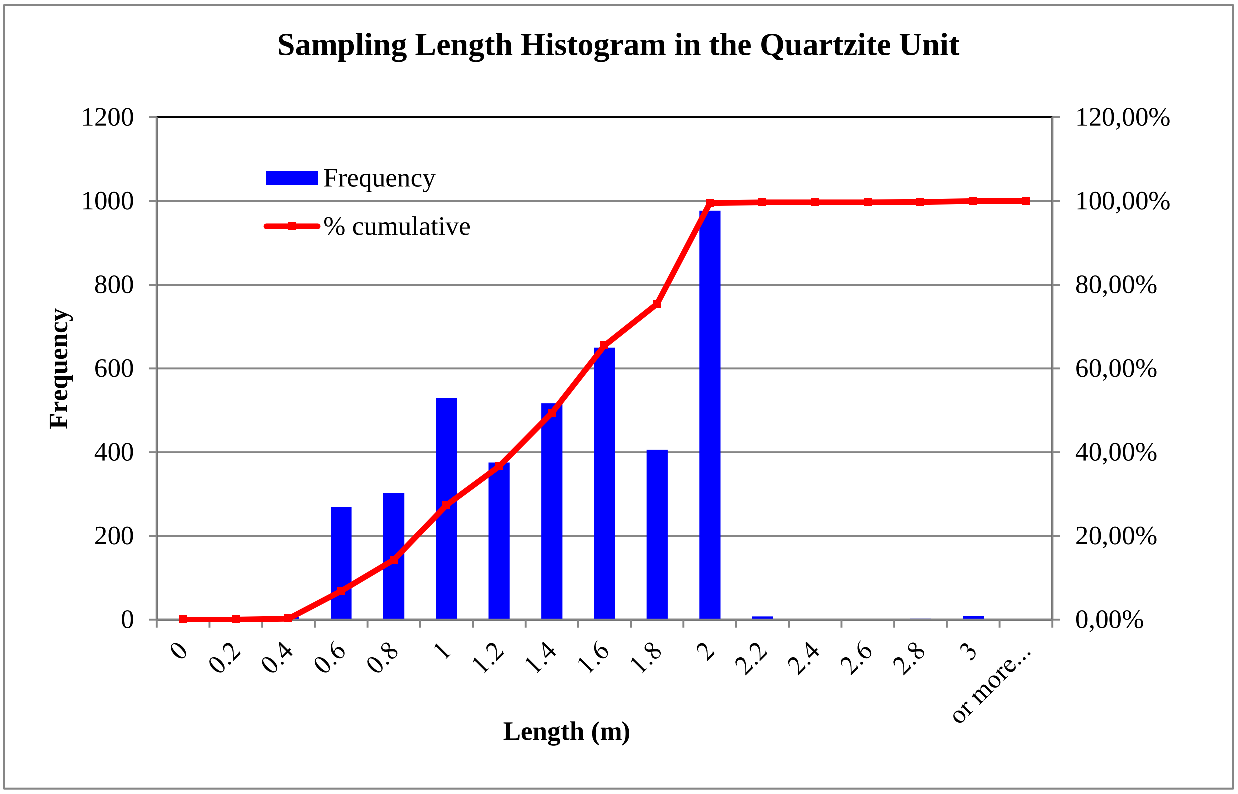


Table 14-13 Composites statistics within the cut-offs solid for the South West Zone

Composites statistics for the South West Zone; Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3										
	Arith. Av.	Weigt. Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.71	0.69	0.56	0.40	0.77	1.07	9.99	0.16	10.15	946
BaO	0.01	0.01	0.01	0.01	0.01	0.85	0.10	0.01	0.10	946
CaO	0.01	0.01	0.01	0.01	0.02	1.72	0.31	0.01	0.31	946
Cr_2O_3	0.01	0.01	0.01	0.01	0.00	0.31	0.02	0.01	0.03	946
Fe_2O_3	0.16	0.15	0.08	0.03	0.48	3.01	10.92	0.01	10.92	946
K_2O	0.06	0.06	0.05	0.03	0.10	1.59	1.85	0.01	1.86	946
MgO	0.02	0.02	0.01	0.01	0.09	4.33	1.82	0.01	1.83	946
MnO	0.01	0.01	0.01	0.01	0.00	0.55	0.08	0.01	0.08	946
Na_2O	0.01	0.01	0.01	0.01	0.01	0.69	0.10	0.01	0.11	946
P_2O_5	0.01	0.01	0.01	0.01	0.01	1.20	0.11	0.01	0.11	946
SO_3	0.01	0.01	0.01	0.01	0.05	3.52	0.67	0.01	0.67	946
SiO_2	98.32	98.37	98.57	98.52	1.59	0.02	24.31	75.54	99.85	946
SrO	0.01	0.01	0.01	0.01	0.00	0.07	0.01	0.01	0.01	946
TiO_2	0.07	0.07	0.06	0.05	0.09	1.16	1.86	0.02	1.88	946

Table 14-14 Composites statistics within the cut-off solids for the North East Zone

Composites statistics for the North East Zone; Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3										
	Arith. Av.	Weigt. Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.72	0.73	0.58	0.38	0.62	0.86	5.55	0.16	5.71	502
BaO	0.01	0.01	0.01	0.01	0.00	0.62	0.04	0.01	0.05	502
CaO	0.03	0.03	0.01	0.01	0.17	5.47	2.54	0.01	2.55	502
Cr_2O_3	0.01	0.01	0.01	0.01	0.00	0.37	0.02	0.01	0.03	502
Fe_2O_3	0.22	0.22	0.11	0.07	0.61	2.81	6.70	0.02	6.72	502
K_2O	0.07	0.07	0.05	0.03	0.09	1.26	0.75	0.01	0.76	502
MgO	0.04	0.04	0.01	0.01	0.22	5.07	3.06	0.01	3.06	502
MnO	0.01	0.01	0.01	0.01	0.01	1.13	0.09	0.01	0.10	502
Na_2O	0.01	0.01	0.01	0.01	0.02	1.58	0.25	0.01	0.25	502
P_2O_5	0.01	0.01	0.01	0.01	0.05	3.69	0.76	0.01	0.76	502
SO_3	0.01	0.01	0.01	0.01	0.02	2.33	0.25	0.01	0.25	502
SiO_2	98.23	98.22	98.55	98.56	1.83	0.02	21.22	78.62	99.84	502
SrO	0.01	0.01	0.01	0.01	0.00	0.13	0.01	0.01	0.01	502
TiO_2	0.09	0.09	0.07	0.06	0.11	1.26	1.56	0.03	1.59	502

Table 14-15 Composites statistics within the cut-offs solid for the Centre North Zone

Composites statistics for the Centre North Zone; Cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3										
	Arith. Av.	Weig. Av.	Median	Mode	St. Dev.	COV	Range	Minimum	Maximum	Samples Count
Al_2O_3	0.90	0.88	0.55	0.51	1.74	1.93	21.32	0.15	21.47	266
BaO	0.01	0.01	0.01	0.01	0.02	2.08	0.20	0.01	0.21	265
CaO	0.04	0.04	0.01	0.01	0.29	7.13	4.02	0.01	4.02	266
Cr_2O_3	0.01	0.01	0.01	0.01	0.00	0.63	0.06	0.01	0.07	266
Fe_2O_3	0.33	0.29	0.16	0.12	0.94	2.89	12.04	0.05	12.09	266
K_2O	0.10	0.10	0.06	0.03	0.24	2.31	2.64	0.01	2.65	266
MgO	0.08	0.08	0.02	0.01	0.47	5.87	6.42	0.01	6.42	266
MnO	0.01	0.01	0.01	0.01	0.04	4.70	0.65	0.01	0.65	266
Na_2O	0.01	0.01	0.01	0.01	0.02	1.84	0.21	0.01	0.21	266
P_2O_5	0.01	0.01	0.01	0.01	0.01	1.25	0.11	0.01	0.11	266
SO_3	0.01	0.01	0.01	0.01	0.02	1.73	0.18	0.01	0.18	265
SiO_2	97.84	97.92	98.47	98.73	3.64	0.04	36.91	62.90	99.81	266
SrO	0.01	0.01	0.01	0.01	0.00	0.34	0.02	0.01	0.03	265
TiO_2	0.09	0.09	0.06	0.05	0.18	1.88	2.41	0.03	2.44	266

Figure 14-4 Composites histogram on SiO_2% for the South West Zone

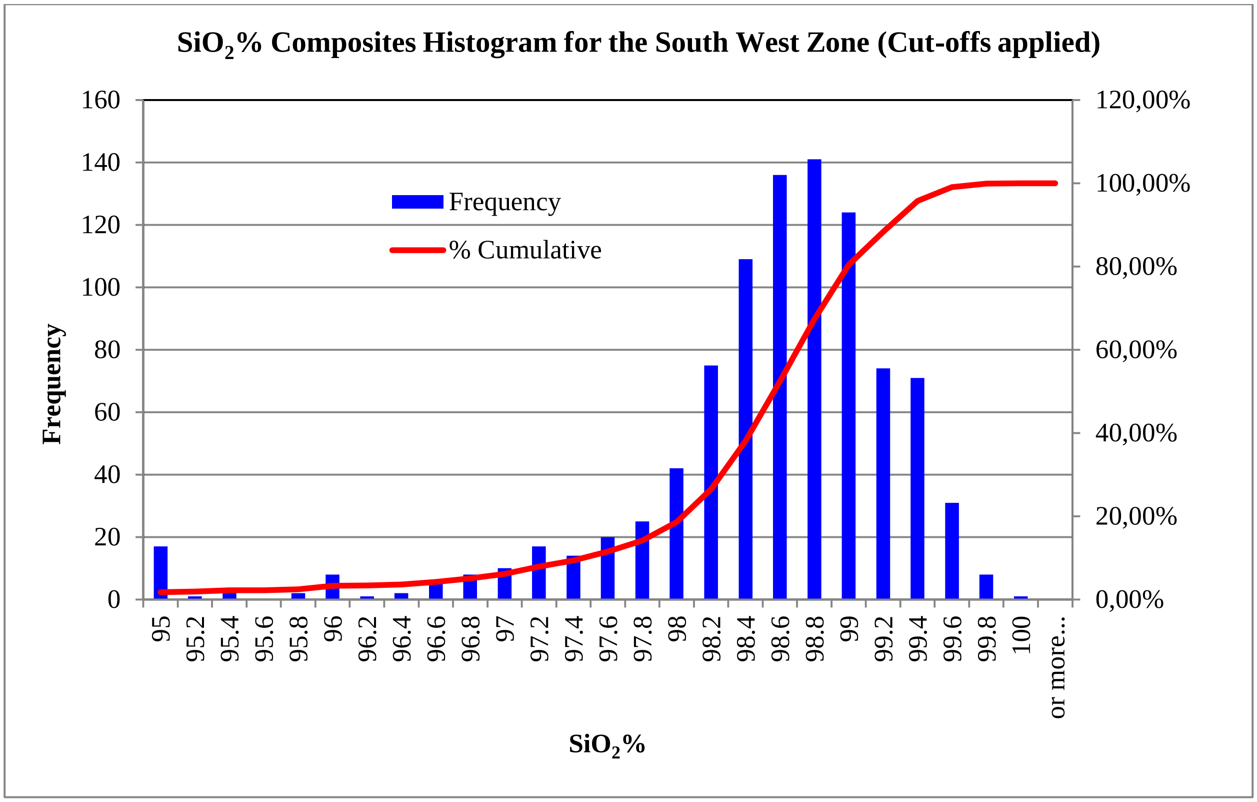


Figure 14-5 Composites histogram on Al_2O_3% for the South West Zone

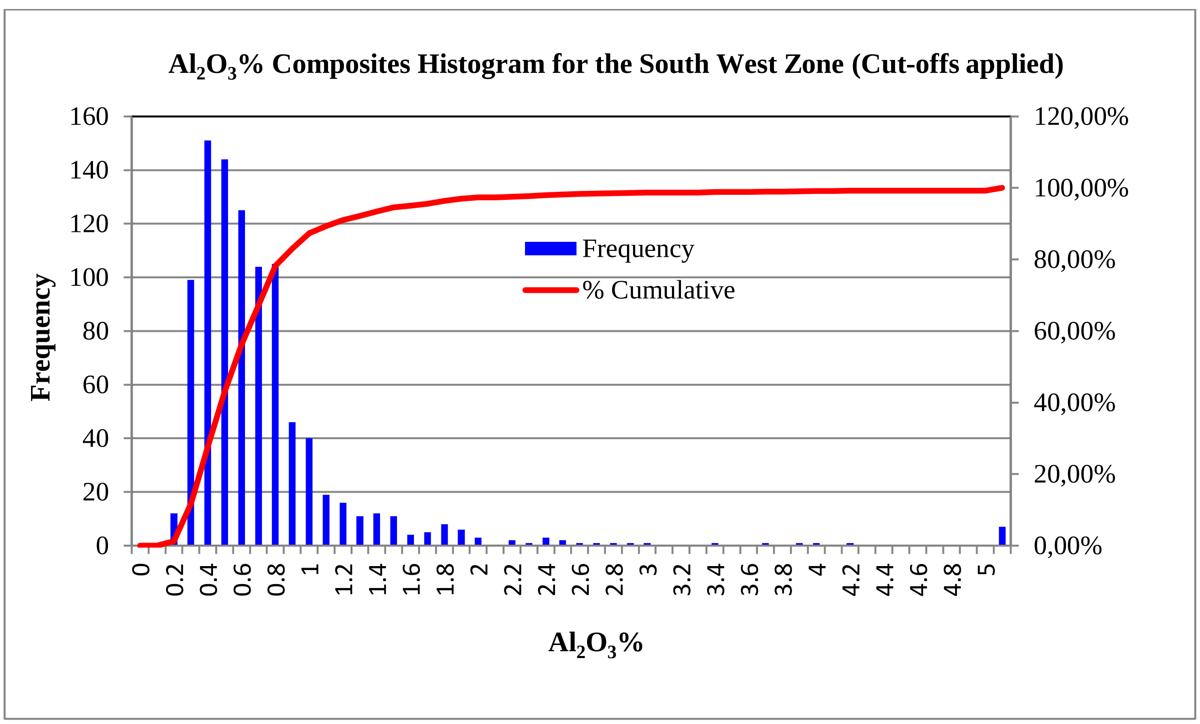


Figure 14-6 Composites histogram on TiO_2% for the South West Zone

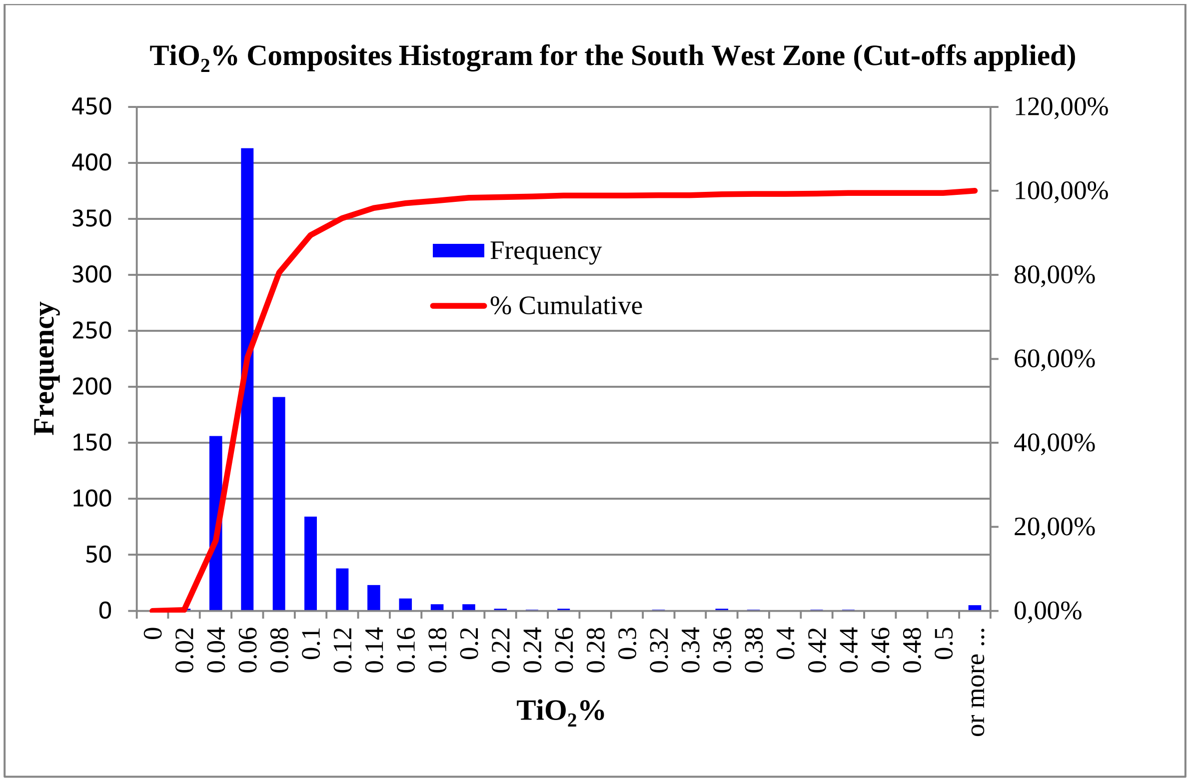
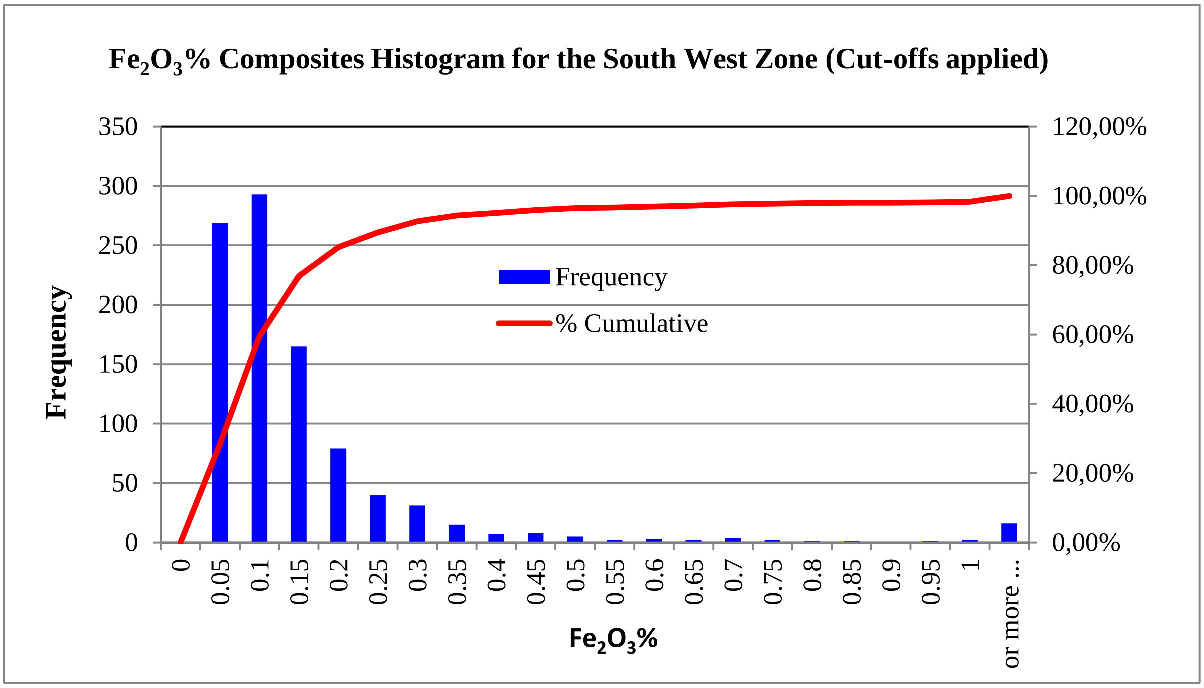


Figure 14-7 Composites histogram on Fe_2O_3% for the South West Zone



14.6 Variogram Modelling

Variograms were generated for the south west zone (for both mineralized grade solids), which is the main mineralized zone, in order to analyze the spatial continuity of the mineralization and determine the suitable parameters to guide the grades interpolation. The composites data set was used to that end and the quality elements used are SiO_2% and Al_2O_3%. The module MineSight® Data Analyst – 3.30-02 was used to model all variograms.

The variograms modelling process starts first with the generation of a set of combination of variograms covering the whole 360° horizontally with varying steps of 15° and a window of 7.5° and also covering the whole 90° vertically with varying steps of 10° and a window of 5°. The resulting combination set of multiples variograms are then analyzed to identify the different axis of continuity both in the strike and dip directions. Once the different axes of continuity are identified directional variograms are then generated for the selected quality elements in directions corresponding to the major axis (axis of better continuity), the semi-major axis (perpendicular to the major axis) and in the minor axis (in principle perpendicular to the major and the semi-major axis). In the present case the longer axis of continuity was found in the strike direction for both SiO_2% and Al_2O_3% with a range of 110 m for SiO_2% and a range of 125 m for Al_2O_3%.

However the best variogram structure was obtained with SiO_2% as shown in Figure 14-8. For SiO_2% the dip direction was found at an azimuth of 240° and a dip of -60° with a less defined variogram structure in comparison with the strike structure. The corresponding range is 115 m as shown in Figure 14-9. Generally the combined downhole variogram is considered as an alternative to define the third structure of the search ellipse. Considering the presence of different shear zones in the mineralization and the definition of different cut-offs solids Met-Chem elected to just consider the maximum thickness of each modeled solid as its third constraining parameter to guide the composites selection during the resources interpolation.

The variograms parameters defined by the geostatistical analysis in addition to others considerations served as basis for the definition of the search parameters. The fact that some drill holes drilled into the quartzite formation were down dip holes was also taken into account.

Figure 14-8 Variogram in the strike direction for SiO_2% in the South West Zone

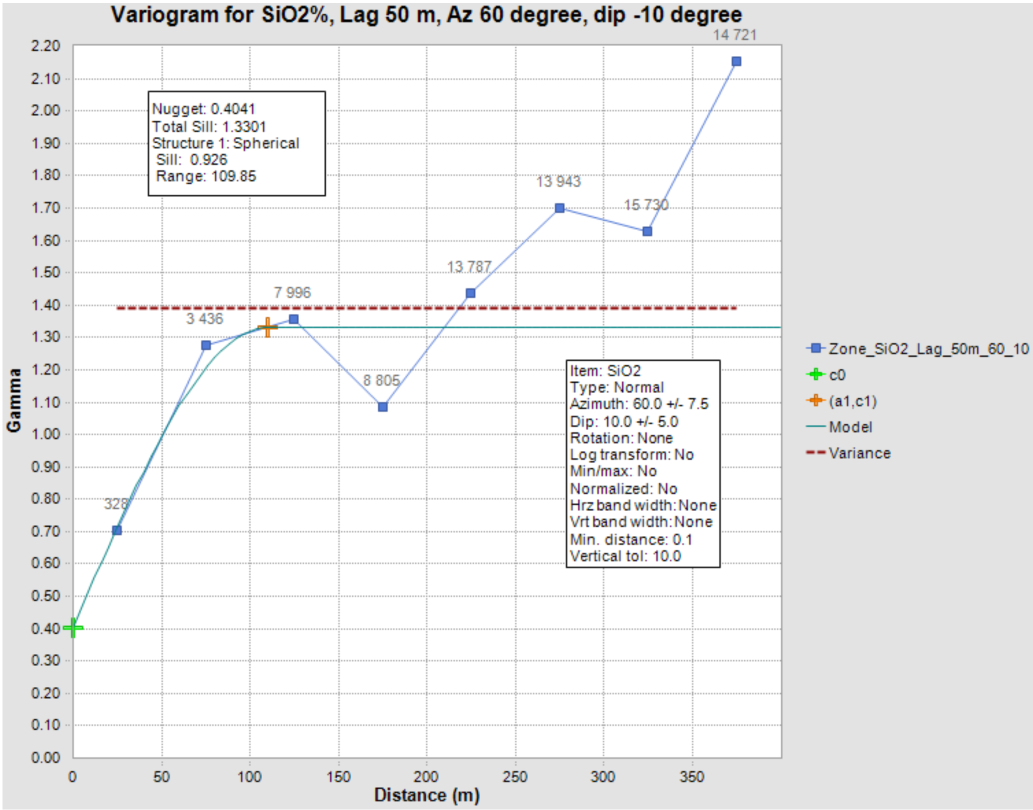
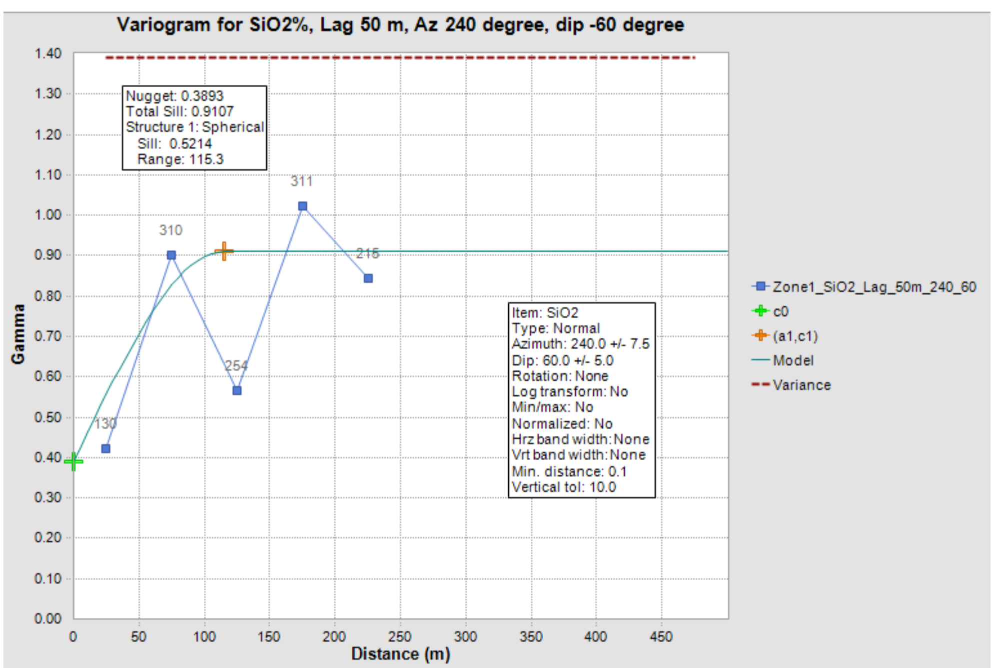


Figure 14-9 Variogram in the dip direction for SiO_2% in the South West Zone



14.7 Specific Gravity

For the current mineral resource estimate, Met-Chem used the average from 467 results of Specific Gravity (S.G.) measurements systematically performed on every tenth sample pulps using the pycnometer method (gas and bottle pycnometers). No correlation was found between the silica or alumina content and S.G. The average specific gravity used to convert volumes into tonnes for all interpolated blocks is 2.65. Further density measurements basically based on the immersion approach should be performed during the Pre-Feasibility and/or Feasibility stage of the project development. Densities determined simultaneously with pycnometer and immersion approach will allow the quantification the effect of the secondary porosity.

14.8 Block Model Setup/Parameters

A block model was created using MineSight® software package to generate a grid of regular blocks for estimating tonnes and grades. A unique block model was created for the South West, Centre North and North East units. In the present resource estimate, Met-Chem considered a block size of 15 m × 5 m × 4 m respectively in the X, Y and Z directions.

An industry standard is to consider block size in the range of one half (½) to one fourth (¼) of the average drilling spacing. Even for estimates not based on geostatistical methods such as the Inverse Distance Method ("IDW"), too small a block size would lead to estimates that do not reflect the confidence provided by the drilling spacing.

The average spacing between the drill sections is 50 m in the core of the SW and NE deposits and 100 m along the extremity of the NE deposits and on the Centre North deposit. Two or three holes were drilled along each section and the trenches are located on or near the drill sections.

For the X and Y directions, Met-Chem decided to consider a size of 15 m × 5 m, which corresponds to one third of the average drill spacing. A height of 4 m was considered in the Z direction, as it is a multiple of the composite length and of the projected bench height. A rotated model was used in order to align the orientation of blocks with the strike of the mineralization. The specific parameters used for the block modelling are summarised in Table 14-16.

Table 14-16 Silicon Ridge – Blocks Model Parameters

Direction	Minimum (UTM)	Maximum (UTM)	Block Size	Number of Blocks	Model Origin (UTM)
Easting (X)	379 075	383 606	15	200	380 575
Northing (Y)	5 293 300	5 297 648	5	300	5 293 300
Elevation (Z)	630	1 210	4	145	0
Rotation	Rot1= 330°, Rot2 = 0°, Rot3 = 0°, Invert Z axis: No				

14.9 Structural Domains for Interpolation

Except for the aforementioned grade domaining according to the grades cut-offs supplied by ANZAPLAN, no additional domaining was applied to break down the quartzite units into different structural domains. This is due to the fact that the quartzite unit has a steady uniform dip and that a single ellipse will allow to adequately code all blocks during the resource interpolation.

14.10 Resource Interpolation

The resources of the Silicon Ridge deposit were estimated using the Inverse Distance Squared Method ("IDW2") which, in its basis formulation, belongs to the non-geostatistical estimation methods. However, the search ellipse anisotropy was taken into account, which makes the estimation methodology closer to the kriging method. In kriging estimation, the estimate of a block is a linear combination of all surrounding composites that are selected. In this linear combination, the weight of each composite is a function of its distance to the block centre and the quality of the variogram, range and nugget effect, in the related direction.

In the IDW2, the weighting factor is a function of the distance from the block centre to the composites where closer composites have more weight. The consideration of the ellipse anisotropy attributes more weight on composites situated in the better axis of continuity. Met-Chem is of the opinion that the IDW2 methods give estimates similar to geostatistical methods in the case of continuous sedimentary rocks such as a quartzite deposit.

Three (3) interpolation passes were used in the estimation. Considering the compositing length, the fact that three holes (GF15-1 (section line 5+50W), and GF15-2, GF15-3 (section line 5+00W)) drilled on the property were drilled down dip cutting across the quartzite unit at shallow angles and this was due to extreme topographic constraints and drill collars were positioned in such a manner as to obtain the most southwesterly extension of the G quartzite. A fourth drill hole was drilled down dip in the middle of the southwest zone and was drilled vertically across the G quartzite verifying the quality of the quartzite (GF15-66 (section line 2+00W)). Additionally a fifth drill hole was drilled down dip in the centre of the northeast zone and was drilled vertically across the G quartzite verifying the quality of the quartzite (GF15-64 (section line 9+50E)). Met-Chem elected to consider half of the range defined by the variograms analysis for the first pass. The used range is 50 m in the strike and dip directions and 30 in the minor axis. For the second pass the search ellipse was relaxed by a factor of 1.5 and the composites requirement reduced. For the third pass the search ellipse was widely relaxed in order to ascertain that all the blocks within each mineralized solid will be captured and coded. The interpolation parameters are summarized in Table 14-17.

Table 14-17 Interpolation Parameters

Items	Description		
Grade Interpolation Method	IDW2		
Compositing	By fixed length of 2 m, discarding composites < 0.6 m		
High Values Capping	SiO_2 values > 100% were reduced to 100%, other elements were reduced to their limit of detection		
Ellipse Orientation	Az: 60°, Dip: 65°		
Interpolation Pass	**Pass 1**	**Pass 2**	**Pass 3**
Min. Number of Composites/Block	18	12	3
Max. Number of Composites/Block	30	30	9
Max. Number of Composites/Hole	6	6	3
Ellipse Size on the Major Axis (Strike)	50	75	200
Ellipse Size on the Semi-Major Axis (Dip)	50	75	200
Ellipse Size on the Minor Axis	30	50	100

14.11 Resource Validation

Table 14-18, Table 14-19 and Table 14-20 show, respectively for the South West, North East and Centre North Zones, comparative statistics between the main different quality elements for assays, composites and interpolated blocks. This is done to ensure that assays and blocks statistics are reproduced well during the ressource interpolation and no bias was introduced. Those statistics are calculated for blocks constrained within solids built according to the different cut-offs used. The assays and composites statistics reproduce well in blocks for the South West zone where the major portion of blocks were coded during the first and second passes. However it is observed a slight bias for the North East and Centre North zone where an important portion of blocks were coded during the third pass where the search ellipse was extremely relaxed to allow all the blocks to be informed.

Table 14-18 Comparison for Assays, Composites and Blocks on the South West Zone

South West Zone				
	SiO_2%	Al_2O_3%	TiO_2%	Fe_2O_3%
Assays	98.25	0.75	0.08	0.17
Composites	98.32	0.71	0.07	0.16
Blocks	98.34	0.72	0.07	0.16

Table 14-19 Comparison for Assays, Composites and Blocks on the North East Zone

North East Zone				
	SiO_2%	Al_2O_3%	TiO_2%	Fe_2O_3%
Assays	98.09	0.78	0.09	0.25
Composites	98.23	0.72	0.09	0.22
Blocks	97.87	0.88	0.10	0.30

Table 14-20 Comparison for Assays, Composites and Blocks on the Centre North Zone

Centre North Zone				
	SiO_2%	Al_2O_3%	TiO_2%	Fe_2O_3%
Assays	97.92	0.89	0.09	0.30
Composites	97.84	0.9	0.09	0.33
Blocks	97.41	1.05	0.12	0.49

In addition to the statistics comparison between the Assays, the Composites and the estimated Blocks, Met-Chem has also validated the resource estimates by visual comparison where estimated blocks were compared with composite and raw assay grades on section, plan and 3D views. The correlation was adequate, basically for blocks estimated during the first two passes, and no major discrepancies were found. Blocks interpolated were well constrained within each mineralized solid. The search ellipse was also well oriented, blocks grades pattern follows the directions of best continuity, namely the strike and dip direction.

14.12 Resource Classification

Mineral Resource classification is based on certainty of geology and grades and this is, in most cases, related to the drilling density. Areas more densely drilled are usually better known and understood than areas with sparser drilling which could be considered to have a lower confidence level. However, in some rare cases, even a tight drilling may not allow having certainty on grades continuity. This is particularly the case of deposits showing high variability on grades and high nugget effect. The quartzite unit of the Silicon Ridge deposits exhibits a strong geological continuity. Equivalent quartzite units have been traced into adjacent properties and are mined by Sitec to the SW of Rogue's property. Met-Chem has considered the following factors for the resource classification of the Silicon Ridge deposit:

- Geology and grade continuity defined by relatively tight drilling pattern of 50 m and 100 m between the sections, with two or more holes per section; this information is complemented by ample outcrops and channel samples collected along drill section;

- Full QA/QC program using peer review by QPs of the logging and sampling activities and monitoring of the laboratory performance with insertion of Standards, Blank and Duplicate samples into the sample stream;
- Simple geometry of the deposits affected by large-scale folds with no evidence of second-order folds or major fault offsets;
- Cutoff grades defined by preliminary metallurgical tests.

Taking all of these factors into account, Met-Chem found it to be appropriate to classify all blocks estimated during the first pass as Measured Mineral Resources. The blocks estimated during the second pass where the search ellipse was slightly relaxed and the composites requirements also relaxed are classified as Indicated Mineral Resources. The blocks estimated during the third pass are classified as Inferred Mineral Resources. The large size of the ellipse used to define the Inferred resources resulted in relying on some relatively remote and sparse analytical data in the grade interpolation. Although the geological continuity of the mineralization is well established, this significantly affected the degree of confidence in the definition of the Inferred resources.

A plan view of the classified Mineral Resources is provided in Figure 14-10 while Figure 14-11 shows a typical vertical cross section with classified blocks.

Figure 14-10 Plan view of classified Mineral Resources

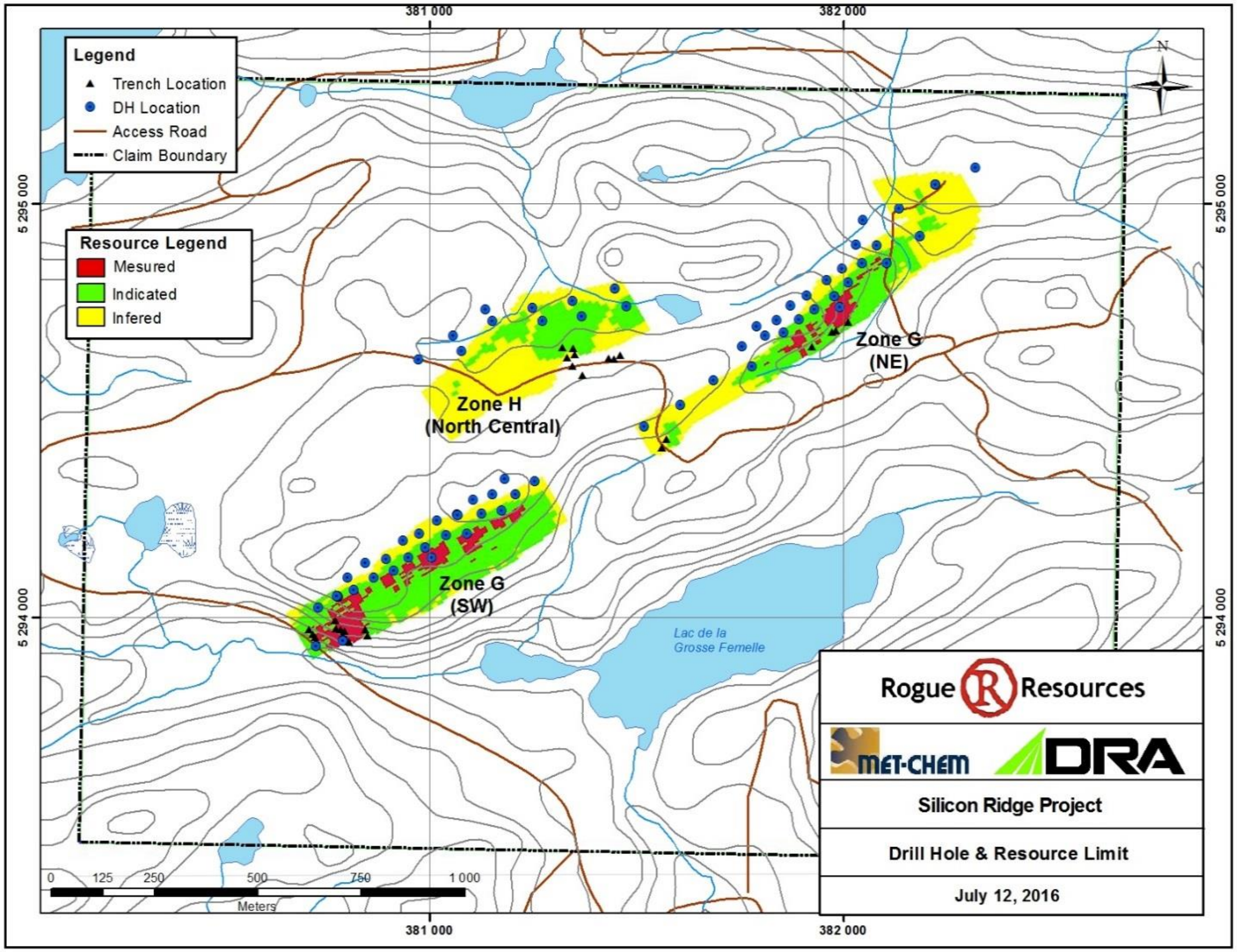
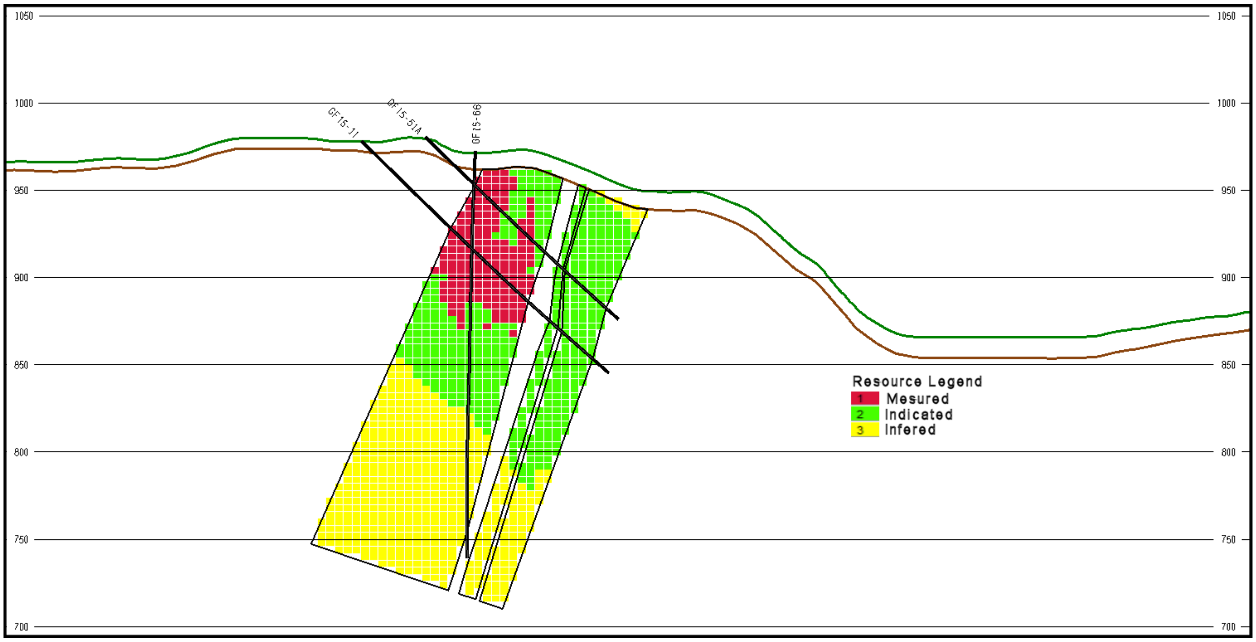


Figure 14-11 Typical vertical cross section with classified blocks



14.13 Mineral Resource Statement

Mineral Resources are stated using multiple cut-offs applied simultaneously as follows: ≥ 98.1% SiO_2, ≤ 0.8% Al_2O_3, ≤ 0.075% TiO_2, ≤ 0.24% Fe_2O_3. These cut-offs are related to the results from metallurgical tests conducted by ANZAPLAN.

In addition to the quality cut-offs from ANZAPLAN, the mineral resources were also constrained by an optimized pit shells to meet the requirement of reasonable prospect of economic extraction stated in the CIM guidelines for resources estimation. An additional constraint was added to the deposit by limiting the optimized pits with a 75 m buffer from streams, wetlands and lakes surrounding the deposit (so as not to disturb these areas) and a 10 m buffer zone for pit road access.

The optimized pit shells were carried out using the Lersch Grossman (LG) method in MineSight software by applying the economic parameters presented in Table 14-21 below to create a pit shell with an overall slope of 50 degrees.

Table 14-21 Optimized pit Economic Parameters (Canadian Dollars)

ITEM	UNITS	VALUE	
		FeSi Grade	High Value
Mining Cost	$	6.73	6.73
Processing Cost	$	16.84	45.84
General and Administration Cost	$	2.00	2.00
Product Sales Price	$	100.00	200.00

The Mineral Resource Estimate for all the zones forming the Silicon Ridge Project contains 9.7 Mt of Measured and Indicated Mineral Resources at an average grade of 98.60 % SiO_2, 0.062 % TiO_2, 0.561 % Al_2O_3 and 0.115 % Fe_2O_3 and 4.6 Mt of Inferred Mineral Resources at an average grade of 98.64 % SiO_2, 0.062 % TiO_2, 0.532 % Al_2O_3 and 0.131 % Fe_2O_3 (using cut-off grades of 98.1% SiO_2, 0.8% Al_2O_3, 0.075% TiO_2 and 0.24% Fe_2O_3).

The mineral resource estimate is summarized in Table 14-22 for all zones and separately for the South West Zone, the North East Zone and for the Centre North Zone.

Table 14-22 Silicon Ridge – Summary of the Pit Constrained Mineral Resources Estimate (Cut-Off: ≥ 98.1% SiO_2, ≤ 0.8% Al_2O_3, ≤ 0.075% TiO_2, ≤ 0.24% Fe_2O_3)

ALL ZONES					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	3.2	98.61	0.061	0.556	0.101
Indicated	6.5	98.60	0.062	0.564	0.122
Measured + Indicated	**9.7**	**98.60**	**0.062**	**0.561**	**0.115**
Inferred	4.6	98.64	0.062	0.532	0.131

SOUTH WEST ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	2.4	98.60	0.061	0.560	0.101
Indicated	3.9	98.60	0.062	0.576	0.109
Measured + Indicated	**6.3**	**98.60**	**0.061**	**0.570**	**0.106**
Inferred	**2.5**	**98.70**	**0.061**	**0.544**	**0.096**

NORTH EAST ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	0.8	98.66	0.063	0.544	0.102
Indicated	1.4	98.63	0.066	0.556	0.123
Measured + Indicated	**2.2**	**98.64**	**0.065**	**0.552**	**0.116**
Inferred	**0.5**	**98.56**	**0.069**	**0.641**	**0.136**

CENTRE NORTH ZONE					
	Tonnes (Mt)	**SiO_2 (%)**	**TiO_2 (%)**	**Al_2O_3 (%)**	**Fe_2O_3 (%)**
Measured	0.001	98.31	0.047	0.589	0.150

Indicated	1.2	98.56	0.061	0.535	0.163
Measured + Indicated	**1.2**	**98.56**	**0.061**	**0.535**	**0.163**
Inferred	**1.6**	**98.56**	**0.060**	**0.479**	**0.183**

The reader is cautioned that Mineral Resources that are not Mineral Reserves have no demonstrated economic viability. The estimate of Mineral Resources may be materially affected by mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and government factors (the "Modifying Factors").

15.0 MINERAL RESERVE ESTIMATES

Since this report is a PEA report, no Mineral Reserves have been estimated for the Silicon Ridge Project as per NI 43-101 regulations.

16.0 MINING METHODS

The mining methods and In-pit Mineral Resource estimate for the Silicon Ridge deposit were prepared by Daniel Gagnon, Eng., Senior Vice President Mining Geology Met-Chem as Qualified Person. All work related to the mine design for the PEA was done using Minesight® Version 11.00-2. Minesight® is a commercially available software that has been used by Met-Chem for over 30 years.

16.1.1 Topographic Surface

The mine design for the PEA Study was carried out using a topographic surface that originated from a Laser Imaging Detection and Ranging Survey (LIDAR). The topographic surface was supplied to Met-Chem as 1 m elevation contours.

16.1.2 Resource Block Model

The mine design for the PEA Study is based on the 3-dimensional geological block model that was prepared by Met-Chem and presented in Section 14. Each block in the model is 15 m wide, 5 m long and 4 m high. The model is subject to rotation at an angle of 330°.

Each block in the model contains Al_2O_3, SiO_2, TiO_2 and Fe_2O_3 grades, the resource classification (Measured, Indicated and Inferred) and a material classification (Mineral resources, Low grade, Waste and Overburden). Using the DDH collars an overburden surface was created by Met-Chem and used to differentiate the non-mineralized material as either overburden or waste rock.

16.1.3 Material Properties

The material properties for the different rock types are outlined below. These properties are important in estimating the mineral resources as well as the dump and stockpile design capacities.

Density

As was discussed in Section 14 of this report, the in-situ dry density of the mineralized material is 2.65 t/m^3. Met-Chem used a density of 2.65 t/m^3 for the low grade and waste rock. A density of 2.1 t/m^3 was used for the overburden.

Swell Factor

The swell factor reflects the increase in volume of material from its in-situ state to after it is blasted and loaded into the haul trucks. A swell factor of 25% was used for the PEA Study, which is a typical value used for open pit hard rock mines.

Moisture Content

The moisture content reflects the amount of water that is present within the rock formation. It affects the estimation of haul truck requirements and must be considered during the payload calculations. The moisture content is also an important factor for the process water balance.

Since the mineral resources are estimated using the dry density, they are not affected by the moisture content value. A moisture content of 3% was used for the PEA Study. This value is typical for similar projects in the region.

16.2 Open Pit Optimization

The first step in estimating pit constrained mineral resources is to carry out a pit optimization analysis. The pit optimization analysis uses economic criteria to determine to what extent the deposit can be mined profitably.

The pit optimization analysis was done using the MS-Economic Planner module of MineSight® Version 8.5. The optimizer uses the 3D Lerchs-Grossmann algorithm to determine the economic pit limits based on input of mining and processing costs and revenue per block. Furthermore the optimization is limited to a proximity of 85 m from lakes/wetlands and 600 m meters from nearby campsites. In order to comply with NI 43-101 guidelines regarding the Standards of Disclosure for Mineral Projects, blocks classified in the Measured, Indicated and Inferred categories are allowed to drive the pit optimizer for a PEA study.

Table 16-1 presents the parameters that were used for the pit optimization analysis. All figures are in Canadian Dollars. The cost and operating parameters that were used are preliminary estimates for developing the economic pit and should not be confused with the operating costs subsequently developed for the PEA Study and presented in Section 21.

The pit optimization analysis considered a 5% loss of mineral resource at the mine, this quantity is accounted for as waste material.

Using the cost and operating parameters, a series of 13 pit shells were generated by varying the selling price (revenue factor) from 76.14 to 35.00 $/t. Figure 16-1 shows a typical section through the deposit with several of the pit shells.

The Net Present Value (NPV) of each shell was calculated assuming an average selling price of $76.14/t of product, a discount rate of 10% and an annual mining of 200,000 tonnes of mineral resources. Figure 16-2 presents the results in a graphical format.

The pit optimization analysis shows PIT09 (Revenue Factor - 0.68) as the pit shell with the best NPV option. This pit shell contains 5.65 Mt of Measured, Indicated and Inferred Mineral Resources at a strip ratio of 1.8 to 1. Mining additional resources with an open pit beyond the limits of this pit shell increases the strip ratio but does provide much of an increase in NPV.

The pit optimization analysis is constrained within the limits of the In-pit resources shell visible in Figure 16-1 and previously described in Section 14 of this report.

Table 16-1– Pit Optimization Parameters

Item	Value	Units
Mining Cost (Overburden)	2.48	$/t (mined)
Mining Cost (Waste)	5.34	$/t (mined)
Mining Cost (ROM)	9.34	$/t (mined)
Processing Cost	16.84	$/t (milled)
Administration Cost	2.00	$/t (milled)
Average product Sales Price	76.14	$/t (product)
Average Mill Recovery [1]	86.5	%
Mining Rate	200,000	t/yr
Pit Slope [2]	50 and 55	degree

[1] Weight Recovery per block is a function of Al_2O_3 grade based on ANZAPLAN test work on drill core

[2] A pit slope of 50° was used on hanging wall side of the deposit. A pit slope of 55° was used on the footwall side of the deposit. Based on recommendations from Journeaux Assoc.

Figure 16-1 – Pit Optimization Shells

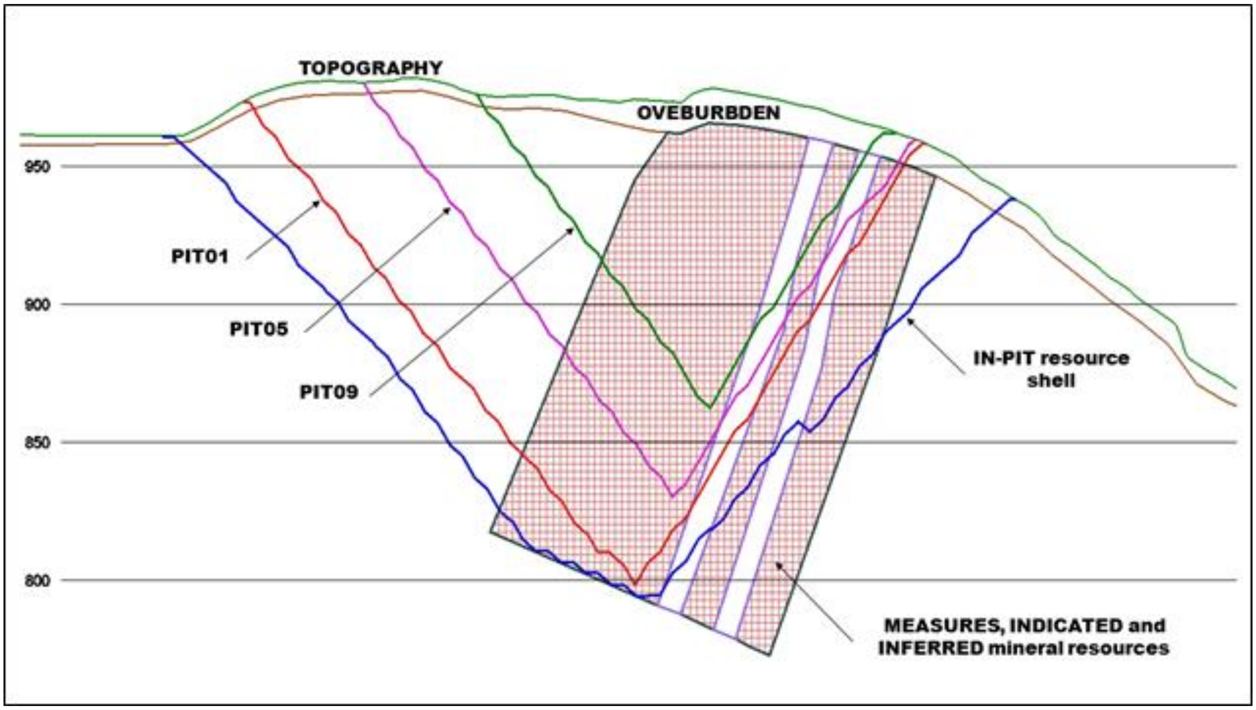


Figure 16-2 – Pit Optimization Results

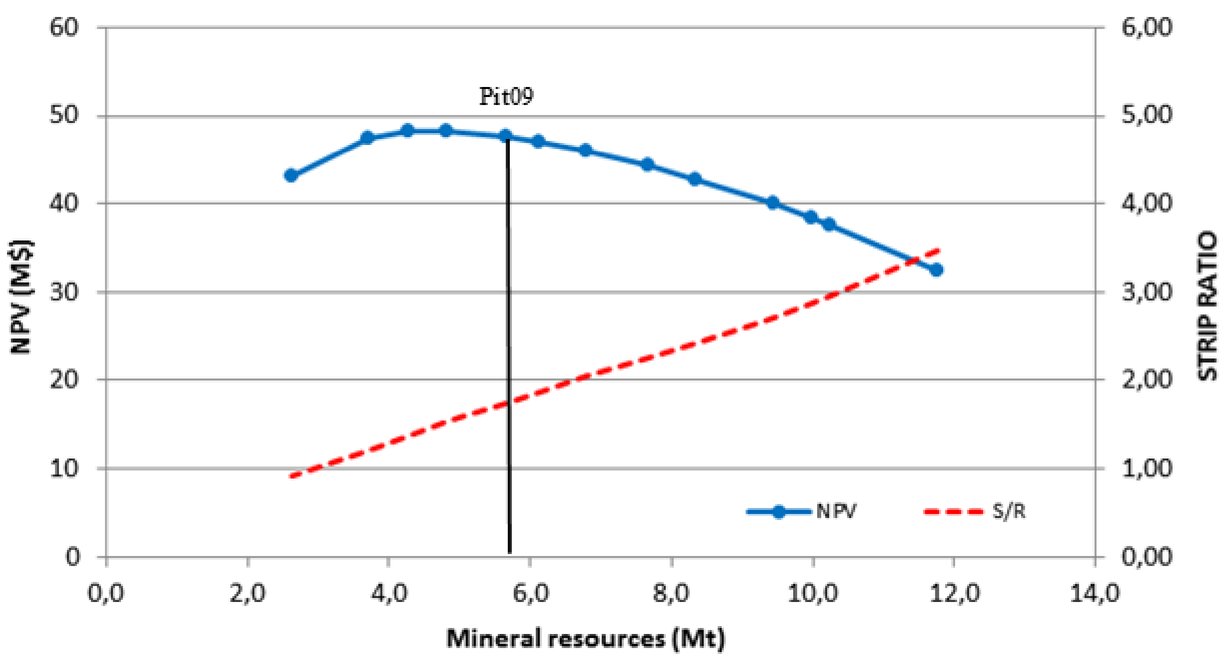
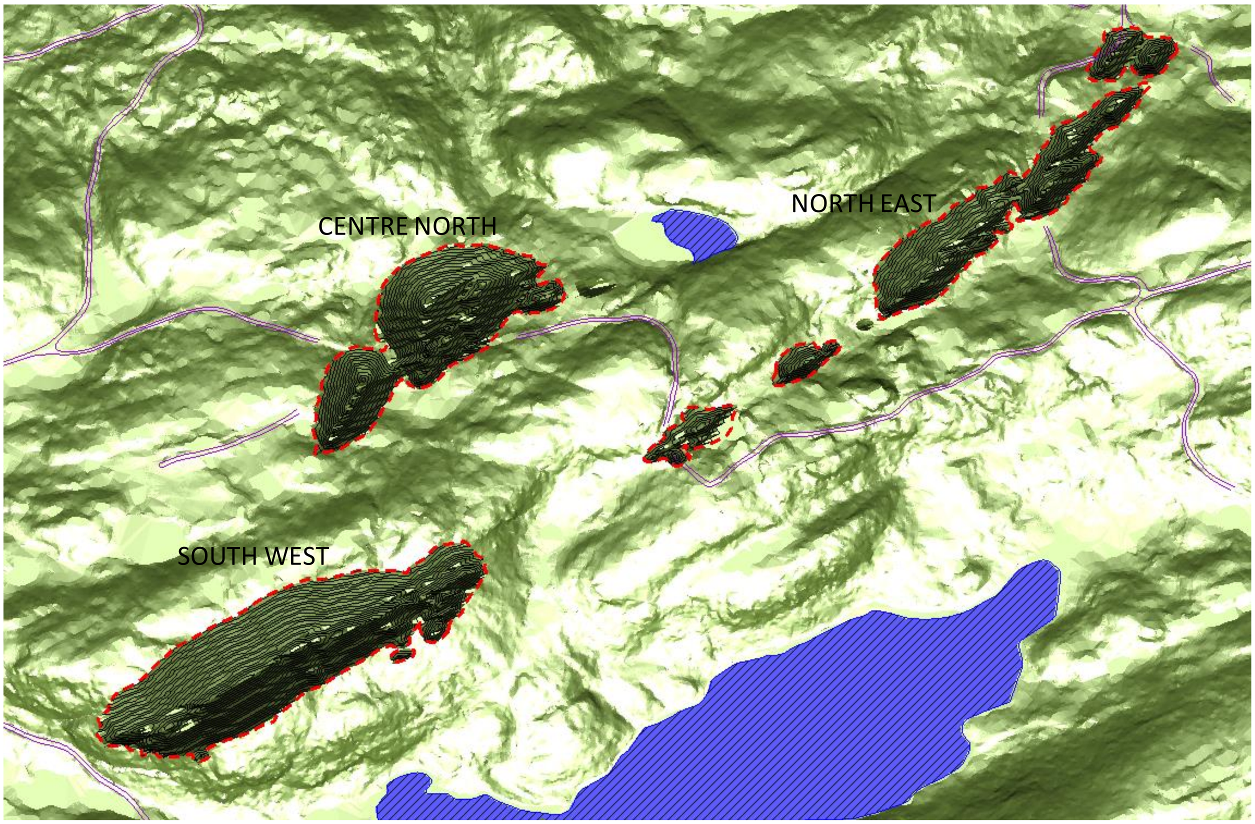


Figure 16-3 displays Pit09 in isometric view. As can be seen, the Silicon Ridge Project is comprised of three distinct mining locations South West (SW), Centre North (CN) and North East (NE).

Figure 16-3 – Isometric View (Pit09)



16.3 Pit Optimization (20 year pit)

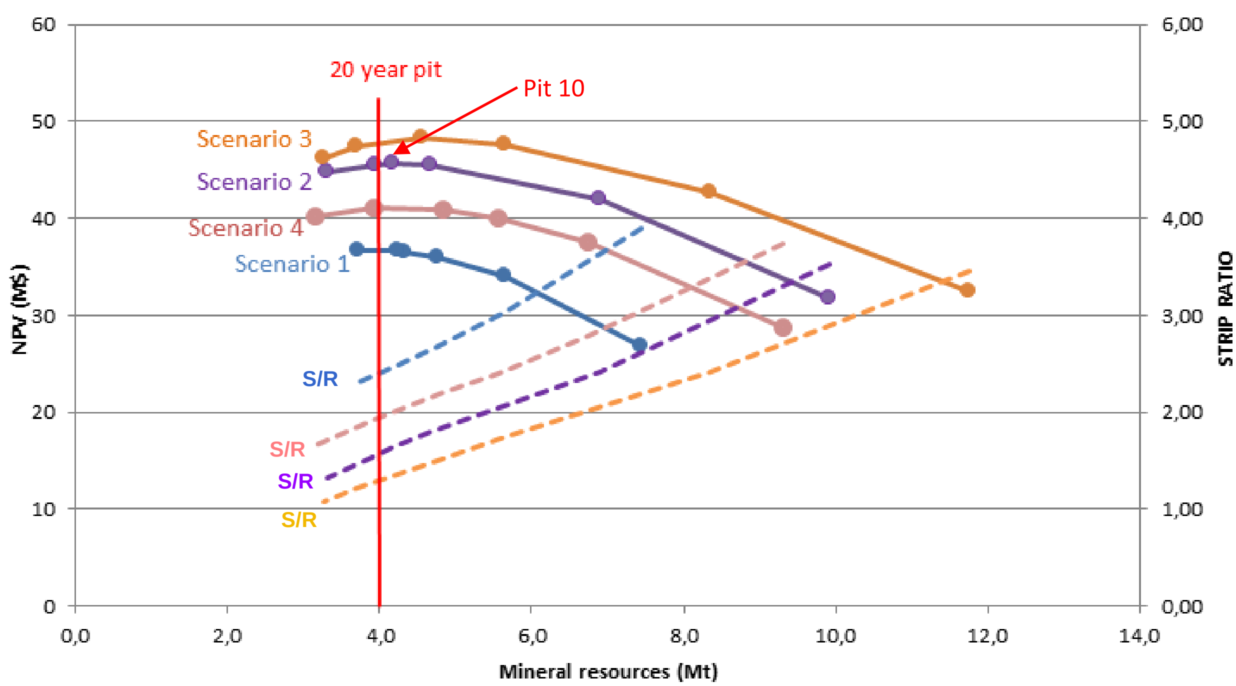
Similar to the pit optimization method previously explained, multiple pit scenarios were analyzed in order to determine the best location(s) to establish an optimal 20 year pit shell which was used as the basis for pit design and mine planning. The different scenarios analyzed are listed as follows:

- Scenario 1 – Mining South West (SW)
- Scenario 2 – Mining South West (SW) and Centre North (CN)
- Scenario 3 – Mining South West (SW), Centre North (CN) and North East (NE)
- Scenario 4 – Mining South West (SW) and North East (NE)

Using the cost and operating parameters in Table 16-1, a series of 6 pit shells were generated for each of the Scenarios listed above (24 pit shells total). In order to identify and compare a 20 year pit for each scenario, the selling price (revenue factor) was varied for each scenario. Figure 16-4 presents the results in a graphical format.

By comparing the four (4) scenarios, it is clear that the option which maximizes NPV is Scenario 3, however the optimization analysis does not take into consideration the capital cost associated with developing a new pit and the costs associated with a long haul from the North East location. As a result Scenario 2 (mining SW and CN) more specifically, PIT10 was chosen as the optimal solution as it shows a 20 year pit with high NPV and minimizes potential costs associated with the need to develop the North East location. This pit shell contains 4.16 Mt of Measured, Indicated and Inferred Mineral Resources at a strip ratio of 1.6 to 1.

Figure 16-4 – Pit Optimization Results (Scenarios)



16.4 Open Pit Design

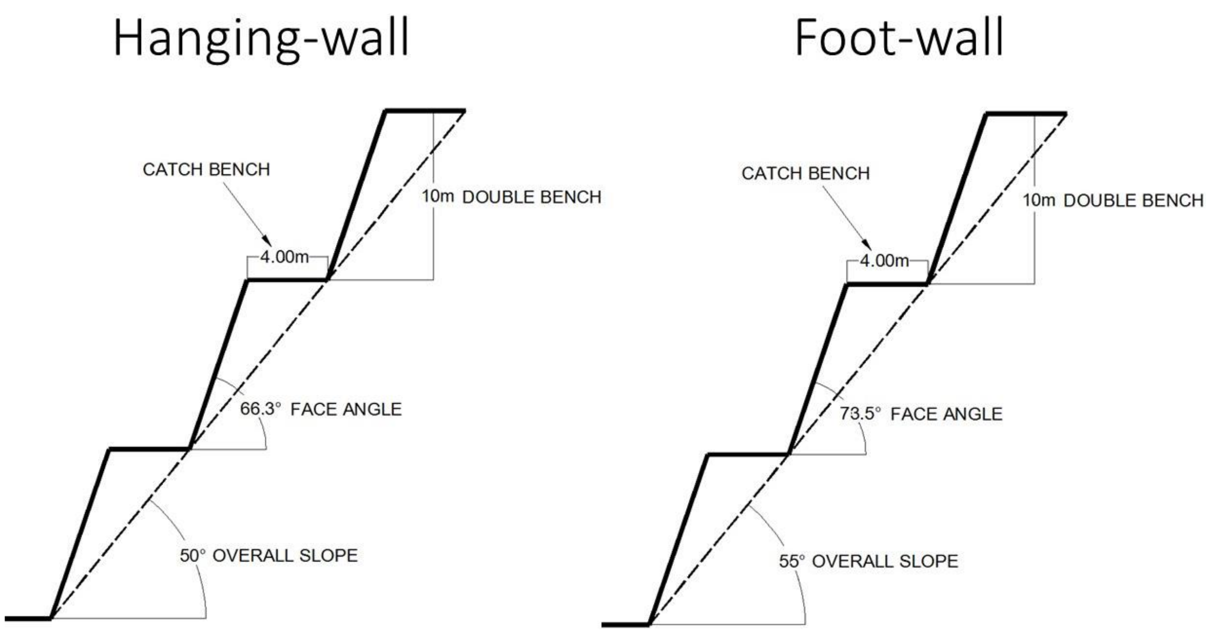
The next step in the mineral resource estimation process is to design an operational pit that will form basis of the production plan. This pit design uses the pit shell as a guideline and includes smoothing the pit wall, adding ramps to access the pit bottom and ensuring that the pit can be mined using the initially selected equipment. The following section provides the parameters that were used for the open pit design and presents the results.

16.4.1 Geotechnical Pit Slope Parameters

The geotechnical pit slope parameters were provided by Journeaux Assoc. who conducted a preliminary desktop review of the drill core log information provided by Rogue Resources.

Based on Journeaux's preliminary review of the southwest (SW) zone, on the hanging-wall side of the deposit, a face slope angle of 66.3° with an overall pit slope of 50° is recommended. On the footwall side of the deposit, a face slope of 73.5° with an overall pit slope 55° is recommended. This is considering 5 m bench heights and a 4 m wide catch bench per two (2) benches. The pit wall configuration considered for this study is presented in Figure 16-5.

Figure 16-5 – Pit Wall Configuration

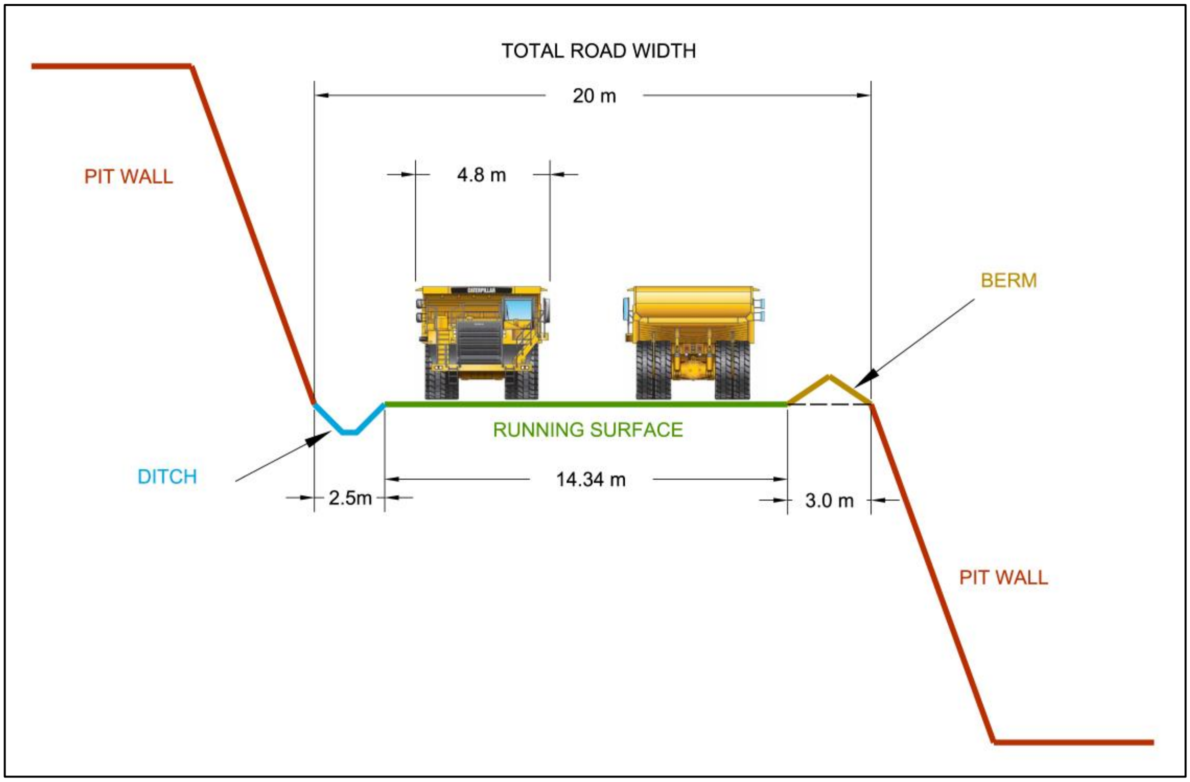


16.4.2 Haul Road Design

The ramps and haul roads were designed with an overall width of 20 m. For double lane traffic, industry practice indicates the running surface width to be a minimum of three (3) times the width of the largest truck. The overall width of a 36.5-tonne rigid frame haul truck is 4.8 m which results in a running surface of 14 m. The allowance for berms and ditches increases the overall haul road width to 20 m.

A maximum ramp grade of 10% was used. This grade is acceptable for a 36.5-tonne rigid frame haul truck. Figure 16-6 presents a typical section of the in-pit ramp design.

Figure 16-6 – Ramp Design



16.4.3 Mine Dilution and Mining Recovery

In every mining operation, it is impossible to perfectly separate the mineralization and waste as a result of the large scale of the mining equipment and the use of drilling and blasting equipment. In order to account for this, Met-Chem assumed a mining recovery of 95%, in other words, 5% of the mineralized material is considered waste since this deposit is clearly defined given the visual contrast between waste zones and zones containing mineral resources.

The loss in tonnage associated with a 95% mining recovery was removed from the yearly production and was added to the low grade waste material category.

16.4.4 Minimum Mining Width

A minimum mining width of 15 m was considered for the open pit design. This is based on a 9 m turning radius for a 36.5-tonne haul truck plus several meters on each side for safety.

16.4.5 Open Pit Design Results

Two pits were designed for the Silicon Ridge project in order to target 20 years of production at 200,000 tonnes of blasted resource per year. Southwest pit is approximately 650 m long and 180 m wide at surface with a maximum pit depth from surface of approximately 105 m. The total surface area of the pit is roughly 100,000 m^2. Centre North pit is approximately 420 m long and 180 m wide at surface with a maximum pit depth from surface of approximately 60 m.

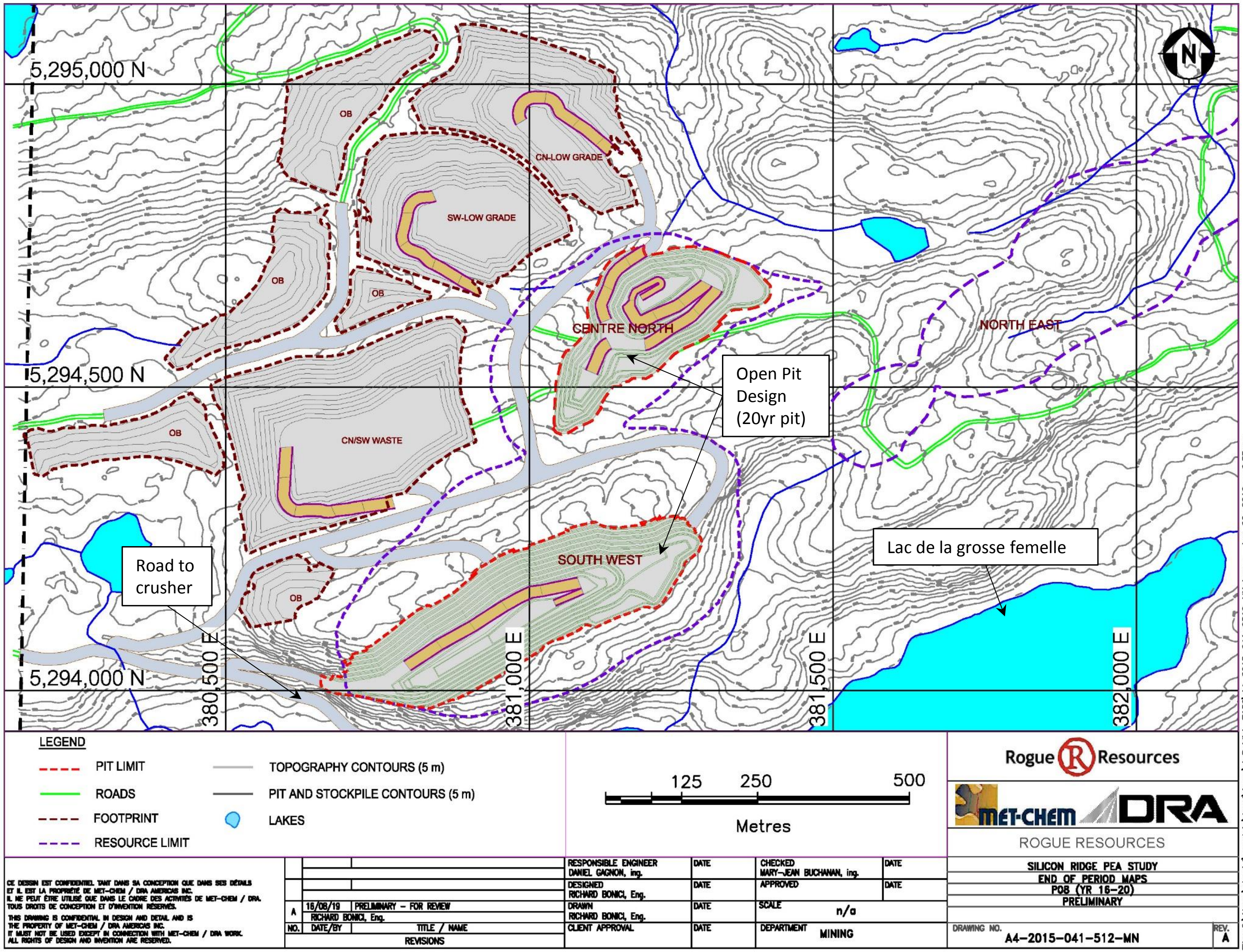
The total surface area of the pit is roughly 60,000 m^2. The proportion of inferred mineral resources contained within the 20 year pit design is 20%.

Figure 16-7 presents the open pit design for the Silicon Ridge project while Table 16-2 summaries the results.

Table 16-2 – Silicon Ridge Open Pit resources (20 yr pit design)

Pit	ROM	Al_2O_3	Fe_2O_3	SiO_2	TiO_2	Waste	OB
	(Mt)	(%)	(%)	(%)	(%)	(Mt)	(Mt)
SW	2.65	0.55	0.100	98.61	0.0606	6.0	1.04
CN	1.35	0.52	0.169	98.55	0.0601	2.4	0.30
TOTAL	**4.00**	**0.54**	**0.123**	**98.59**	**0.0604**	**8.4**	**1.34**

Figure 16-7 – Mine Site General Layout



16.4.6 Mining Methods

The mining method selected for the Project is a conventional drill and blast, truck and shovel quarry operation. Vegetation, topsoil and overburden will be stripped and stockpiled for future reclamation use. The mineralized material and waste rock will be mined with 5 m high benches, drilled, blasted and loaded into rigid frame haul trucks with hydraulic excavators.

16.4.7 Contract Mining

Based on client request, contract mining was used as a basis for the PEA study, Met-Chem was provided with budgetary pricing from several contractors in the region.

16.4.8 Waste Rock and Overburden Stockpile

Overburden stockpiles have been designed on the north side of the property, within current permitted boundary limits for the project. As a results, overburden stockpiles were designed with an overall slope of 18.4° (2.5 H:1V), have a total capacity of 0.8 Mm^3, a footprint area of 100,000 m^2. Material that is placed in this stockpile will be used for future reclamation. Waste rock piles were designed with an overall slope of 26.6° (2H:1V), has a capacity of 4.0 Mm^3, a footprint area of approx. 210,000 m^2. The waste rock pile will be built in 5 m high lifts and will have a safety berm of 20 m for every 3 lifts.

16.5 Mine Planning

This mine plan forms the basis of the economic cashflow mine capital and operating cost estimate presented in Section 22. The mine plan was established annually for the first five (5) years of production, followed by three (3), five (5) year periods for the remaining 15 years.

16.5.1 Mine Planning Parameters

<u>Work Schedule</u>

Since the mining rate of 200,000 tonnes per year is quite small and the harshness of the winter months is difficult for operations, Met-Chem has considered a seasonal quarry operation. The contractor will operate five (5) days per week, twelve (12) hours per day, six (6) months of the year during the warmer seasons. Overburden removal may take place during the winter to take advantage of the frozen ground conditions. Since the processing circuit is designed to operate year round, a mineralized material stockpile is required to maintain the run of mine feed to the plant, weekends and when the mine is shutdown during the six (6) month period.

The design of the processing circuit includes a crushed material storage bin with a 3-hour capacity to store crushed mineralized material. During the weekend and the five (5) month shutdown period, the re-handling of crushed material will be done with a front end wheel loader.

16.5.2 Mine Production Schedule

Table 16-3 presents the mine production schedule that was developed for the 20-year life of the quarry. This schedule includes a pre-production phase of one (1) year for overburden stripping, road construction and pit development. During this period, 120,000 tonnes of overburden will be mined. Further study of the overburden depth over the proposed quarry will be carried out to confirm the pre-production overburden stripping requirements and subsequent length of the pre-production phase.

The annual mining rate during the 20-year period is constant at 200 kt. Figure 16-10 presents a chart showing the tonnages mined each year. The tonnages shown are annualized for the five (5) year periods. Figure 16-8 and Figure 16-9 show the pit, waste pile and overburden stockpile advances as of Year 5 and 15 respectively.

More detailed mine plan will eventually be developed to assess continuous rehabilitation throughout the quarry's life in order to anticipate the final size of overburden stockpiles.

Table 16-3 – Mine Production Schedule

Description	Units	PRE PROD	Year 01	Year 02	Year 03	Year 04	Year 05	Year 06-10	Year 11-15	Year 16-20	Total
PRODUCTS	kt	0.0	164.1	163.9	163.4	165.6	165.3	825.7	814.9	825.0	3,287.9317
ROM (minus losses)	kt	0.0	190.0	190.0	190.0	190.0	190.0	950.0	950.0	950.0	3,800.0
ROM	kt	0.0	200.0	200.0	200.0	200.0	200.0	1,000.0	1,000.0	1,000.0	4,000.0
AL2O3	%	0.00	0.56	0.56	0.57	0.54	0.55	0.53	0.55	0.52	0.54
FE2O3	%	0.000	0.152	0.147	0.143	0.164	0.177	0.129	0.113	0.093	0.123
SIO2	%	0.0	98.5	98.5	98.5	98.5	98.5	98.6	98.6	98.7	98.6
TIO2	%	0.000	0.061	0.060	0.061	0.060	0.061	0.060	0.060	0.061	0.060
Weight recovery	%	0.0	86.4	86.3	86.0	87.1	87.0	86.9	85.8	86.8	86.5
Total Waste	kt	120	558	555	626	643	667	3,304	2,276	1,021	9,770
Overburden	kt	120	231	169	228	211	151	230	0	0	1,340
	m3	*57*	*110*	*81*	*108*	*101*	*72*	*109*	*0*	*0*	638
Waste Rock	kt	0	87	119	115	187	234	1,947	1,311	190	4,189
Low grade	kt	0	240	267	283	245	283	1,127	965	831	4,241
Target ROM (Mining rate)	kt	0	200.0	200.0	200.0	200.0	200.0	1,000.0	1,000.0	1,000.0	4,000
Total Material Moved	kt	120	758	755	826	843	867	4,304	3,276	2,021	13,770
Stripping Ratio		n/a	2.9	2.9	3.3	3.4	3.5	3.5	2.4	1.1	2.6

Figure 16-8 – End of Year 05

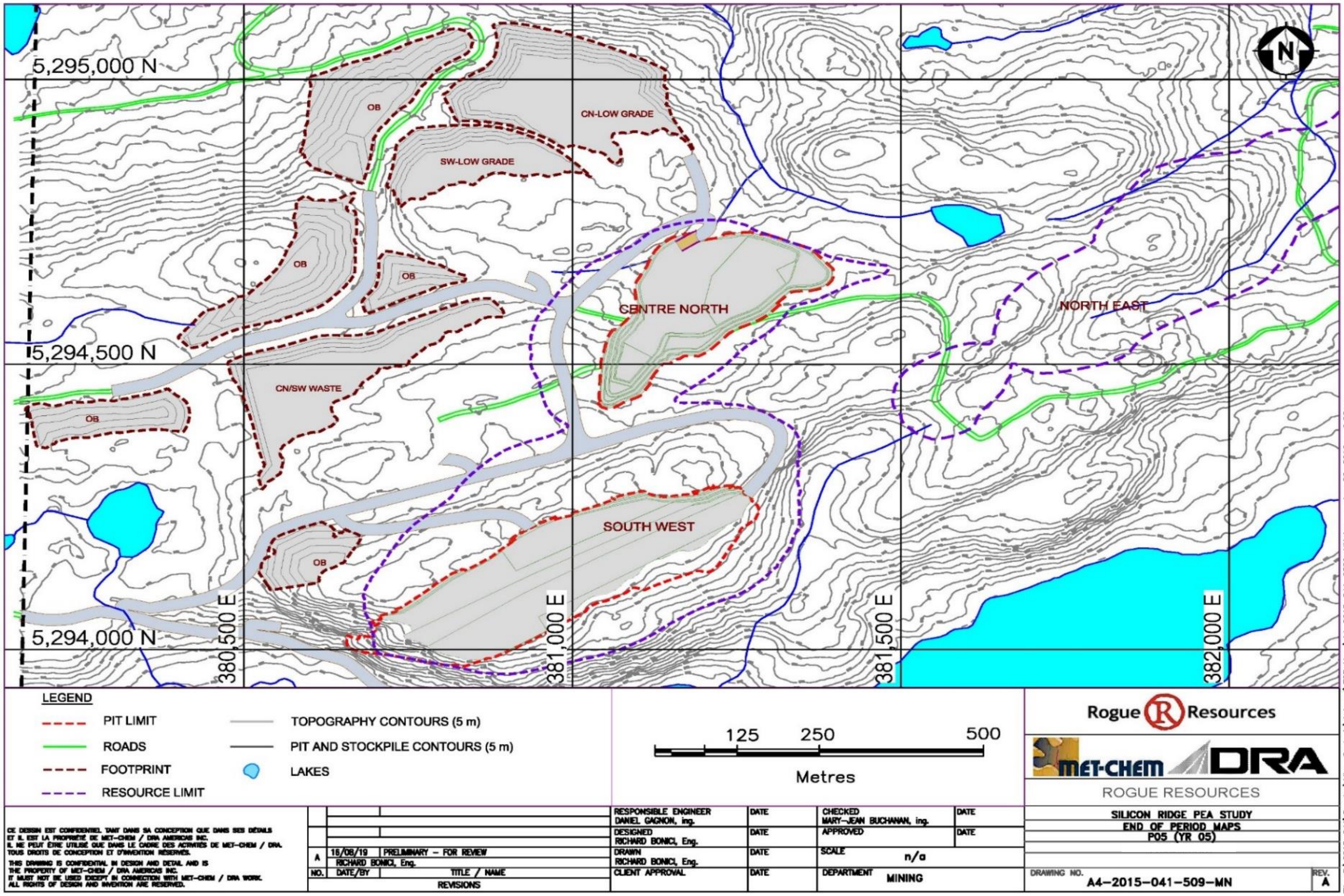


Figure 16-9 – End of Year 15

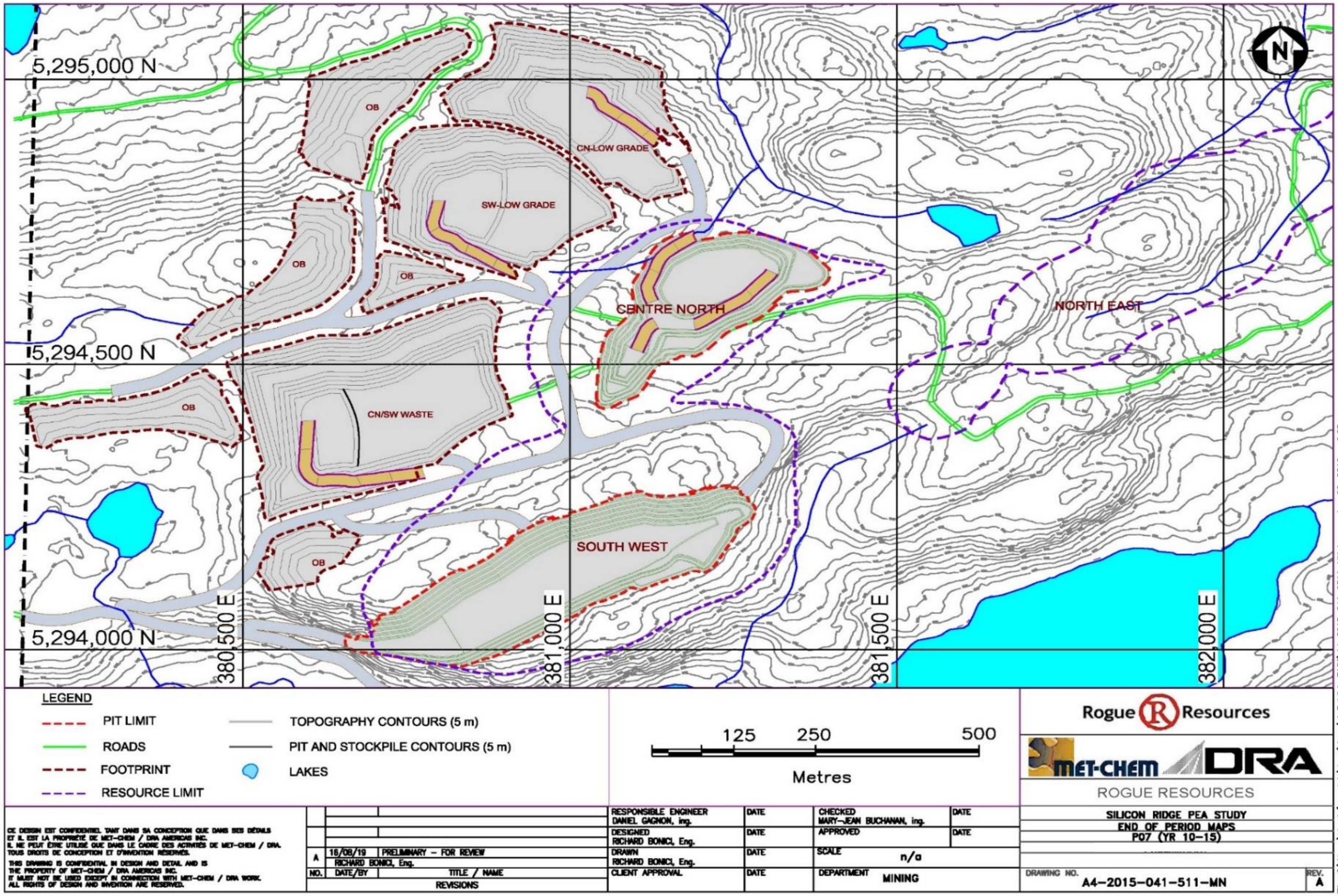
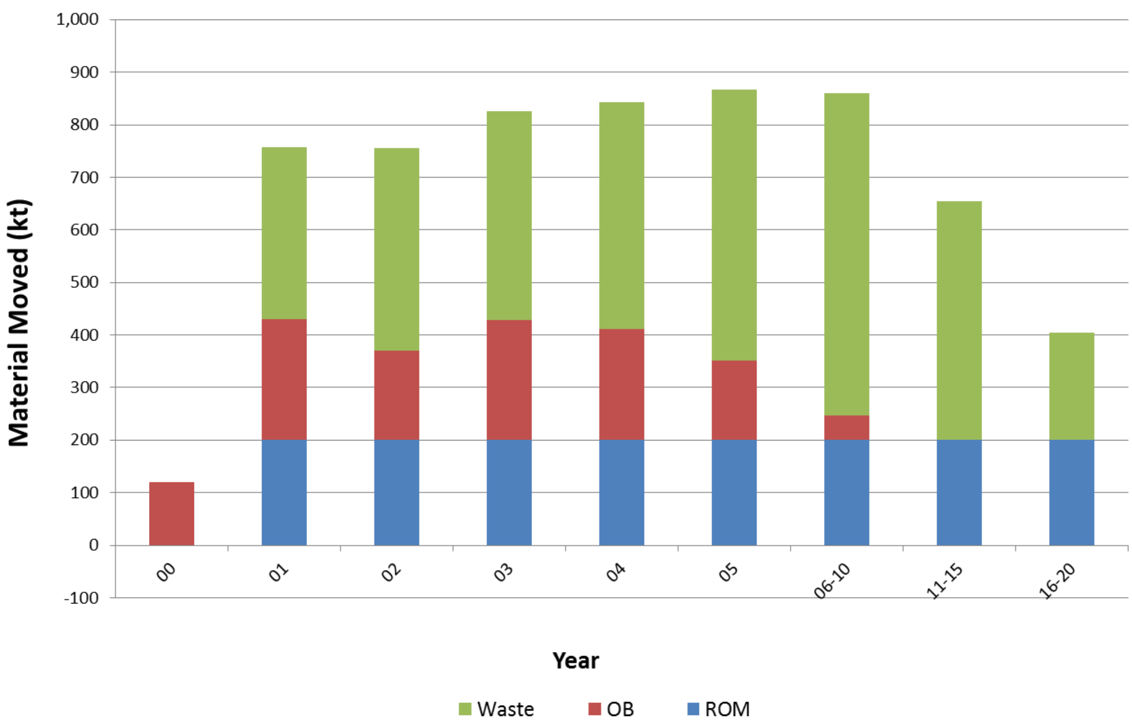


Figure 16-10 – Mine Production Schedule



17.0 RECOVERY METHODS

The silica products will be recovered by an optical sorting process. The crushing will be performed by a contractor. The processing circuit feed will be crushed material to minus 120 mm (top size).

17.1 Process Plant

The processing area consists of optical sorting and dewatering. The processing circuit feed is 190,000 dry tonnes per year of crushed run-of-mine material (–120 mm). The processing circuit produces four (4) streams:

- trucked –120 mm +20 mm material;
- bagged –20 mm +7 mm material;
- trucked –20 mm +7 mm material;
- fines storage of –7 mm material.

17.1.1 Design Criteria

All throughput rates are based on the process plant feed of 190,000 dry tonnes per year. The recoveries are based on test work results, carried out as part of preliminary metallurgical test work for flow sheet development.

The processing circuit will operate 24 hours per day, seven (7) days per week, 52 weeks per year, at an operating percentage of 83.3%. The processing circuit capacity has been established at an average rate of 520 dry tonnes per day or at a nominal throughput rate of 26 dry tonnes of crushed run-of-mine material per hour.

The equipment have been sized to meet the parameters in Table 17-1 as well as the mass balance and the water balance that were prepared to meet the optical sorter accepted product specification in Table 17-2.

Table 17-1 – Design Criteria

Processing Circuit Capacity		
Parameter	**Units**	**Value**
Nominal crushed −120 mm processing rate	dry tonnes per year	190,000
Design crushed −120 mm processing rate	dry tonnes per year	310,000
Processing Circuit operating time	percentage	83.3
Nominal processing rate	dry tonnes per hour	26
Design processing rate	dry tonnes per hour	42.5
Recovery of		
−120 mm +20 mm final trucked product	percentage	59.1
−20 mm +7 mm final bagged product	percentage	5.5
−20 mm +7 mm trucked product	percentage	18.1

Table 17-2 – Optical Sorter Product Specification

Optical Sorter Accepted Product Specification		
Parameter	**Units**	**Value**
Silica (SiO_2)	percentage	minimum 98.7
Iron oxide (Fe_2O_3)	percentage	maximum 0.3
Aluminum oxide (Al_2O_3)	percentage	maximum 0.6
Titanium oxide (TiO_2)	percentage	maximum 0.05

17.1.2 Mass Balance and Water Balance

The process plant mass balance has been calculated based on the flow sheet developed and the design criteria previously discussed. Table 17-3 below shows a summary of the mass balance in terms of throughput rate in “wet” tonnes per hour.

The throughput and flows are nominal rates in t/h and m^3/h.

Table 17-3 – Process Mass Balance

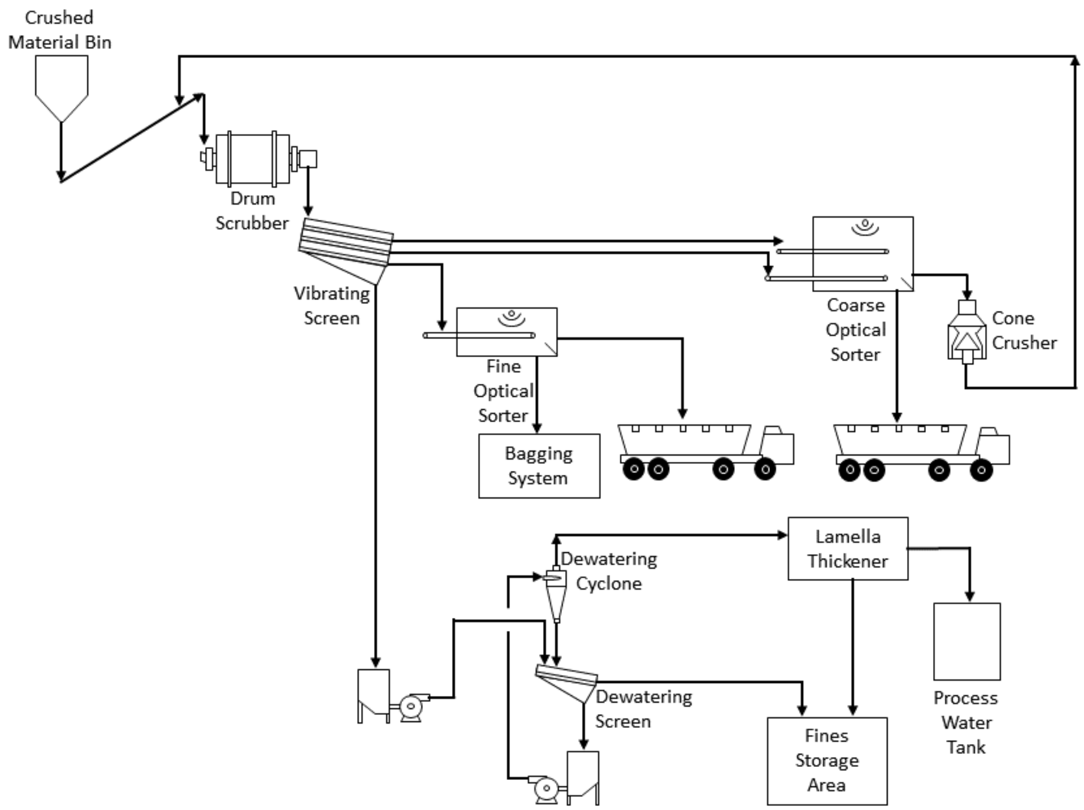
Streams Entering the Processing Circuit				Streams Exiting the Processing Circuit			
Streams	**Dry Solids (t/h)**	**Water (m^3/h)**	**Total Mass (t/h)**	**Streams**	**Dry Solids (t/h)**	**Water (m^3/h)**	**Total Mass (t/h)**
−120 mm crushed feed	26.0	0.5	26.5	−120 mm +20 mm final trucked product	15.4	1.7	17.1
Make-up water	-	2.9	2.9	−20 mm +7 mm final bagged product	1.4	0.2	1.6
				−20 mm +7 mm trucked product	4.7	0.5	5.2
				−7 mm to fines storage area	4.5	1.0	5.5
Total Entering	26.0	3.4	29.4	Total Exiting	26.0	3.4	29.4

17.2 Simplified Flow Sheet and Process Description

A simplified flow sheet of the process is presented in Figure 17-1 and summarizes the different steps of the processing plant.

This simplified flow sheet is included to follow the process description.

Figure 17-1 – Processing Circuit Simplified Flow Sheet



17.2.1 Primary Crushing

The run-of-mine (ROM) is crushed by a contractor. Crushing is not part of the Processing Circuit. The contractor is responsible to provide –120 mm material to the Processing circuit.

17.2.2 Optical Sorting

The crushed material will be loaded by a loader or dumped by the mine trucks into a bin. The material discharging from the bin falls onto a feed conveyor, which discharges the crushed material into a rotary drum scrubber. The crushed material will have a top size of 120 mm.

The rotary drum scrubber will discharge by gravity to a triple-deck vibrating screen to split the material into four (4) size fractions:

- Very coarse: –120 mm +50 mm;
- Coarse: –50 mm +20 mm;
- Fine: –20 mm +7 mm;
- Very fine: –7 mm.

The two coarsest size fractions, –120 mm +50 mm and –50 mm +20 mm, are optically sorted by industrial processing sorting equipment designed to sort these two size fractions.

The accepted material (product meeting the specification) discharges onto a conveyor that will feed a surge bin. From the surge bin, the product is discharged into trucks for final delivery.

The material rejected by the optical sorter is directed to a cone crusher for secondary crushing. The closed side setting (CSS) on the crusher is 30 mm. The crushed material is conveyed upstream to the rotary drum scrubber.

The –20 mm +7 mm size fraction is also optically sorted. The material is sorted by industrial processing sorting equipment designed to sort this fine size fraction.

The accepted material (product meeting the specification) discharges onto a conveyor that will feed a bagging system. The final product will be bagged into bulk bags for final delivery. The bagging system will have 1 tonne bag packaging unit. All bags will be weighed.

The material rejected from the fine optical sorter is conveyed to a surge bin. From the surge bin, the product is discharged into trucks for final delivery.

The triple deck vibrating screen undersize (–7 mm size fraction) discharges into a pump box from which it is pumped to the dewatering circuit.

17.2.3 Dewatering Circuit

Dilute –7 mm material from the triple deck vibrating screen is pumped to a dewatering screen in closed loop with a dewatering cyclone. The screen undersize discharges to a pump box prior to being pumped to the dewatering cyclone. The underflow from the cyclone discharges on the dewatering screen.

The screen oversize consisting of mainly –7 mm +0.3 mm material is conveyed to the fines storage area.

The cyclone overflow consisting of –0.3 mm material is fed to a lamella thickener to which flocculant is added to help settling of very fine particles.

The thickened underflow pulp from the lamella thickener is pumped to the fines storage area. The thickener overflow is directed to the process water tank.

17.3 Utilities

17.3.1 Processing Circuit Water Services

The water consumption is based on processing circuit plant average water consumption per day.

i) Make-up Water

The wells will be the main water source for make-up water for the processing circuit. Make-up water flow rate to the processing circuit will be 57 m^3/d.

ii) Process Water

There are two (2) sources contributing to the process water: thickener overflow and make-up water from the wells. The total process water is approximately 788 m^3/d, of which 731 m^3/d is thickener overflow and the remainder 57 m^3/d comes from the wells.

17.3.2 Processing Circuit Compressed Air

Air systems will support the air requirement for the process plant. Compressed air will be required mainly for plant air, instrument air and optical sorters.

17.4 Plant Layout

The processing circuit is located between the coarse material stockpiles and the fines storage area. The processing circuit is installed in a light structure building, approximately 35 m long by 28 m wide.

The scrubber feed conveyor is inclined at an angle of 15° to reach from the discharge of the crushed material bin to the rotary drum scrubber.

The processing circuit building is conventional and is divided into two (2) main areas:

- optical sorting area;
- dewatering area.

The main building is rectangular shaped.

There will be no laboratory in the processing circuit.

18.0 PROJECT INFRASTRUCTURE

This section summarizes infrastructure, buildings, other facilities and services that are required to complement the processing of the Silicon Ridge quartzite and to produce silica concentrate.

All topographic information for the location of infrastructure was provided by Rogue with a LiDAR survey over the property and 1 m contours were used. It is to be noted that the LiDAR survey covers most of the property except for a 100 m wide area at the southern edge of the property.

There have been no geotechnical investigations for surface infrastructure performed to date. It is understood that appropriate field geotechnical investigations will be required for subsequent phases of the project. Illustrations of main access to site as well as an overall general site layout are provided on Figure 18-1 and Figure 18-2 with Drawing A1-2015-041-0001-L. The processing plant and industrial site is located in the South-West corner of the property. Mineralization will be quarried and transported to the site during a period of six months. The mining contractor will either crush and load the hopper for immediate processing or crush and prepare stockpiles of material to feed the processing plant during the remaining months of the year.

All off-road equipment traffic will be limited to the North of the industrial complex to eliminate intersections between off-highway equipment and highway trucks. Highway trucks will reach the property from the South.

General layouts of the processing plant were developed for the project.

18.1 Main Access Road

Main access to the Silicon Ridge property is from the paved all-weather Highway 381 from Baie-Saint-Paul (Quebec). The main-haul gravel logging road is reachable from the main access to the Sitec quartzite property. The Silicon Ridge is located approximately 13.4 km from Highway 381 (see Figure 18-1).

Provision has been made to upgrade part of the existing gravel access road and the last part of the road that reaches the site along an existing access route.

18.2 Power

Silicon Ridge Project is located about 13.4 km from a 25 kV Hydro-Quebec power line that is providing electrical power to Sitec.

The Project power requirement is estimated at 1 MW and shall be provided by diesel generator on site for the first three (3) years of the life of the quarry. Provision has been made in Year 3 of the life of the quarry to extend the 25kV power line to site and add a step-down transformer in order to provide 600V to the site.

Figure 18-1 Silicon Ridge Project Main Access Road

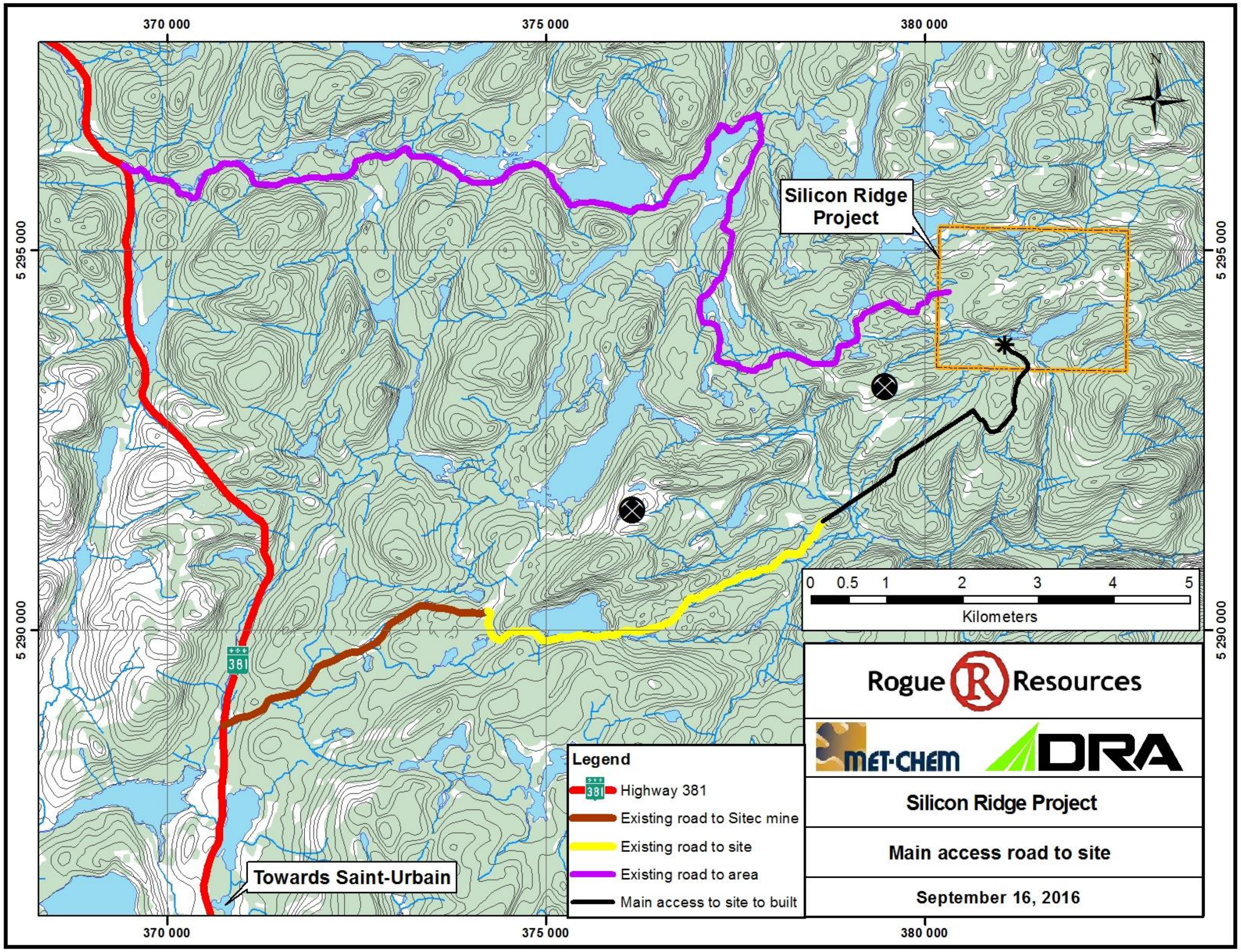
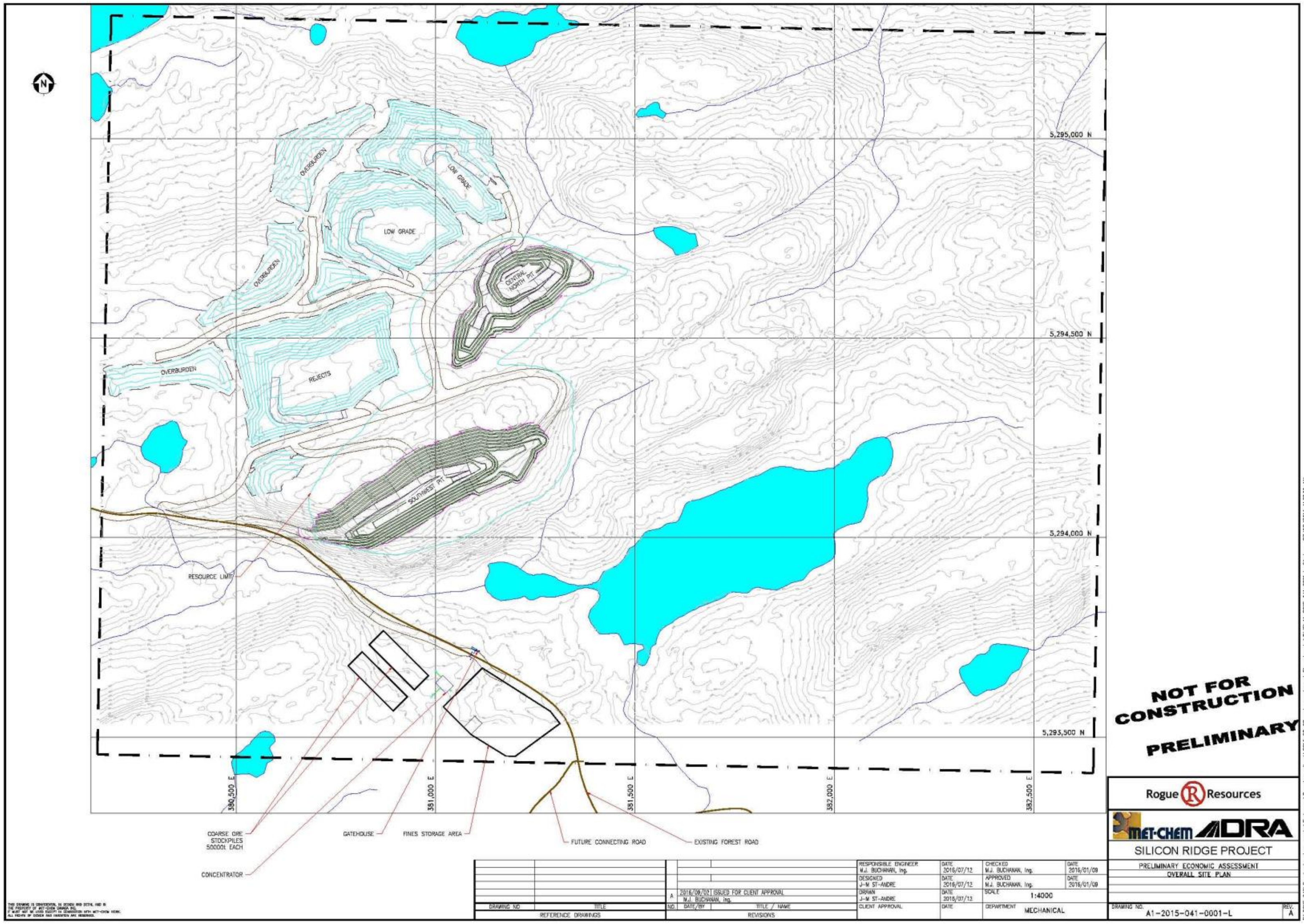


Figure 18-2 Silicon Ridge Project General Site Layout



18.3 Camp Site Accommodations

No provision for camp site accommodation is required for the Project. The quarry is located about 55 km from Saint-Urbain, 70 km from Baie-Saint-Paul and 100 km from Chicoutimi and it is expected that employees will travel from these location to site where a parking area will be available.

18.4 Site Roads

Site and service roads will be 10 m wide, except for the mine haul roads. They will take advantage of existing forest road network whenever possible. One site road will be required to provide access to the fresh water pumping station which is located south west of Lac de la Grosse Femelle.

18.5 Fines Storage Area

One stream of material, the -7 mm fraction, will need to be stored on site since no outcome of this material have been determined as of now. It is expected that in the future further treatment may be put in place in order to find a market for this material. In the meantime a storage area has been identified to hold the 20-year production. The area illustrated on Figure 18-2 includes a settling pond and drainage.

18.6 Buildings

In addition to the processing circuit building which will house, besides the processing equipment, the equipment auxiliaries, the site will also include a modular prefabricated administration building located at the entrance of the site which will also serve as a gatehouse.

18.6.1 Offices

Provision has been made for a modular prefabricated office/gatehouse building at the entrance of the site. The single level 21 m x 5 m modular prefabricated building will accommodate one large area for visitors and it will have a first aid station.

18.6.2 Mine Equipment Maintenance

The mining contractor will be responsible of the maintenance of the equipment. Considering the small fleet that will be required and the quarrying operation will be restricted to the summer months it is expected that site maintenance will be limited and required infrastructure (maintenance garage) will be provided by the contractor.

18.6.3 Cold Warehouse

A few containers will be used to provide temporary storage of product big bags or mechanical equipment parts.

18.7 Site Power and Communication

The power requirement of the Silicon Ridge Project was developed based on a preliminary power demand. Power will be supplied by one (1) Diesel Generator (DG) unit1. It will be 1000 kWe PF=0.8 / 600V and installed in its own walk-in shelter.

Provision to connect an emergency rented generator in case of major failure of a diesel generator will need to be included.

The total power demand is estimated at 0.893 MW with 0.506 MW for the process. The remaining 0.387 MW are necessary to cover requirements for electric rooms, lighting & heating for processing circuit and related buildings.

Distribution lines to office/gatehouse building, fuelling station and fresh water pumping station will be required. It is assumed that diesel pumps will be used for the quarry dewatering.

No additional emergency diesel generator is provided in this design. Provisions were also made to include a connection to the Main LV Switchgear to connect a mobile Emergency Diesel Generator (600V) that can be rented from outside in case of emergency.

18.8 Site Services

Provision has been made in the project for a fresh water intake system (water well) to be installed near the Lac de la Grosse Femelle for the plant fresh water and fire protection water tank. A potable water treatment will be required and bottled water is expected to be provided for drinking purposes. Domestic sewage treatment will be based on a septic system.

Fuel storage will be required for the diesel generator. It is estimated that one (1) double walled horizontal tank with a capacity of 45,000 litres will be required for weekly storage.

Allowances for plant mobile equipment such as a pick-up truck, a loader with attachments, one 12 wheel dump truck and 2 fork lifts is included.

19.0 MARKET STUDIES AND CONTRACTS

After preliminary metallurgical studies were prepared by Dorfner-ANZAPLAN GmBH in Q1 2016 and initial product applications were identified, Roskill Consulting Group (Roskill) was engaged by Rogue in Q2 2016 to provide a report identifying the potential customer base by product. Understanding of the market and pricing is also based on Roskill's multi-client report, "*Silicon and Ferrosilicon: Global Industry Markets and Outlook for 2014*".

In summary, the Silicon Ridge material metallurgically qualifies for application into Glass, Ceramics, Silicon Metal, various Fillers (including countertops) and Building Materials. For the purposes of base pricing in this study, the focus has been on selling silica for the production of Silicon Metal, in addition to some Fillers. (see Section 19.3)

The following sections focus on Silicon Metal, (specifically chemical grade silicon ("silicon") and ferrosilicon) and are distilled by Met-Chem from the market studies completed by the Rogue's consultants.

No contract or offtake agreements were signed to date with potential client(s).

19.1 Supply

Quartzite is the usual form of silica and is the basic raw material from which both silicon metal and ferrosilicon are produced.

The approximate specifications of quartzite used for silicon metal and ferrosilicon manufacture are shown in Table 19-1.

Table 19-1 Specifications of quartz for silicon metal and ferrosilicon production (%)

	Silicon	Ferrosilicon
SiO_2	98.0 min	96.0 min
Al_2O_3	1.0 max	0.4 max
$Fe_2O_3 + Al_2O_3$	1.5 max	0.5 max
CaO	0.2 max	…
MgO	0.2 max	…
P_2O_5	nil	0.1 max
As_2O_3	nil	…

SOURCE: Roskill, USBM Mineral Facts and Problems [2]

[2] Roskill Information Services Ltd., Silicon and Ferrosilicon: Global Industry Markets and Outlook, Fourteenth Edition, 2014

Quartzite is brittle and is relatively easy to blast and crush. Silicon metal producers prefer quartzite lumps that exceed 2.54 cm in diameter with a minimum softening point of 1,700 C° and that do not decrepitate below 950 °C.

The rock should contain 98.5% SiO_2 and less than 1.5% Fe_2O_3 + Al_2O_3, 0.2% CaO, 0.2% MgO and 0.2% LOI.

If chemical grade silicon metal is being produced, the silica feed should have high reactivity and very low alumina.

Ferrosilicon producers can accommodate smaller lumps of silica rock ranging from 0.32 cm to 10.16 cm in diameter, and a lower SiO_2 content

Ferrosilicon manufacture requires quartzite with more than 96% SiO_2 and less than 0.2% Fe_2O_3 and the Al_2O_3 content affects the consumption of electricity during smelting.

Metallurgical-grade and chemical grade silicon metal typically have a minimum silicon content of 98.5% SiO_2.

The reduction process for silicon metal is slagless and is why normal ash content coals cannot be used to produce silicon metal.

The silicon metal industry has been developing production of ultra-pure silicon metal, for direct use in solar cells as an alternative to polysilicon, but the process does not appear to have taken off with several producers cancelling their solar-grade silicon projects as the process involves intensive slag treatment and acid leaching to remove impurities and yield a product with minimum purity of 99.9% Si.

Ferrosilicon is manufactured the same way as silicon metal with the addition of iron.

The purity of silica is less critical when producing ferrosilicon where oxides of aluminium, calcium and magnesium can be tolerated up to 2 parts per thousand but there are stringent limits on the levels of arsenic, sulphur and phosphorus.

Ferrosilicon is a slagless process.

Based upon the average % cost of quartzite in the ex-plant costs the average price of the raw quartzite would be US$142.25/t for silicon metal grade silica and US$59.50 for ferrosilicon grade silica.

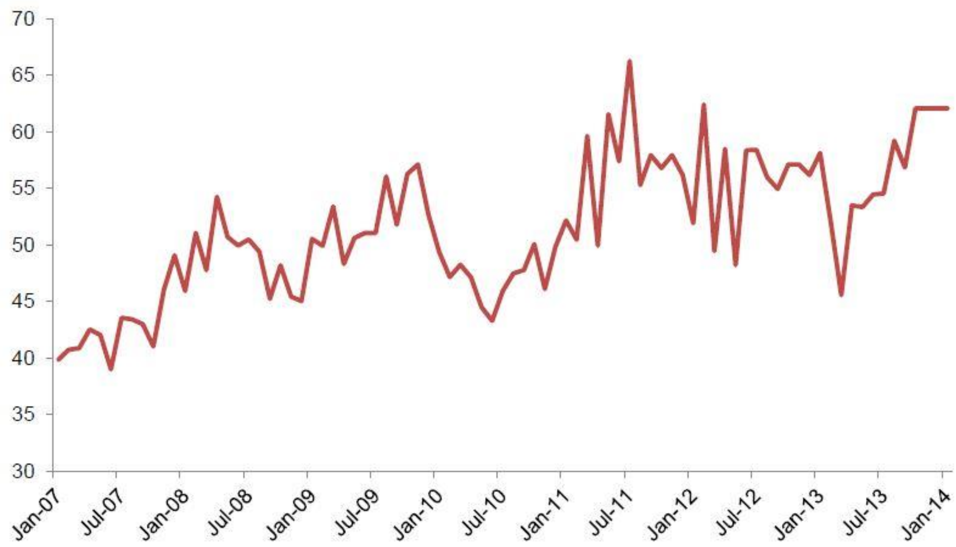
Quartzite prices reflect local transport distance rather than global market conditions.

Import and export of quartzite is mostly focused on high purity grades used in the production of silicon metal and some specialty ferrosilicon grades.

Spain and Egypt are two countries that export significant volumes of high-grade quartz for silicon metal production.

Figure 19-1 charts the monthly freight on board (FOB) export price for Spanish quartz as published by Eurostat.

Figure 19-1 Spanish quartz export prices, monthly, 2007 to 2014 (US$/t)

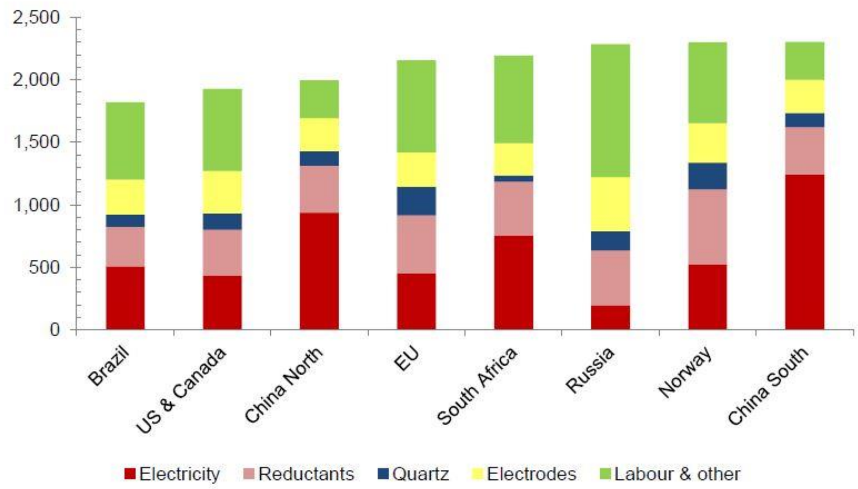


SOURCE: Roskill, Eurostat [3]

Figure 19-2 represents a graph of the ex-plant costs by region for Silicon Metal that appears to indicate that the production costs are somewhat lower in US and Canada, however the percentage that quartz contributes to the costs are slightly higher. Figure 19-3 gives the regional ex-plant costs for ferrosilicon.

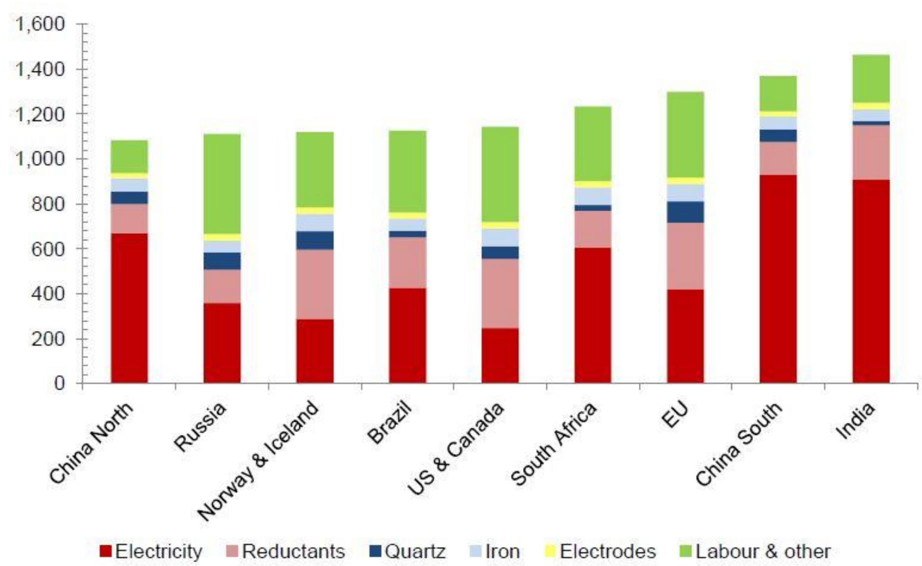
[3] Roskill Information Services Ltd., Silicon and Ferrosilicon: Global Industry Markets and Outlook, Fourteenth Edition, 2014

Figure 19-2 Silicon metal ex-plant cash costs by region and component, 2014



SOURCE: Roskill [1]

Figure 19-3 Ferrosilicon ex-plant cash costs by region and component, 2014



SOURCE: Roskill[4]

[4] Roskill Information Services Ltd., Silicon and Ferrosilicon: Global Industry Markets and Outlook, Fourteenth Edition, 2014

19.2 Demand

Silicon Metal has three (3) main end-users: aluminum alloys, silicones and polysilicon/solar. About 90% of Ferrosilicon is consumed in iron and steel production with 10% in manufacture of primary magnesium. Silicon metal consumption was 47% aluminum, 36% silicones and 15% polysilicon with average growth rates of 4.2% per year predicted in 2014 from a base of 2.25Mt in 2013. Polysilicon is predicted to be the fastest growing end use for silicon metal.

China is dominant silicon metal producer representing 61% of the global total and 75% of global capacity. China exported 49% of its silicon metal production.

Dow Corning is one of the world's largest producers of silicon metal and the world's biggest manufacturer of silicone products. It operates several silicon metal plants in the USA, Brazil and Canada.

Silicon metal prices in USA and European Union are much higher than Chinese spot because of import tariffs on Chinese silicon.

Ferrosilicon is projected to increase at 3.0% per year in 2014 with 8.08Mt production in 2013.

Electrical steel contains 3% silicon and stainless steel contains 1% silicon.

Carbon steel contains 0.29% silicon and represents 46% of ferrosilicon consumption.

China is the world's largest ferrosilicon producer representing 73% of world production.

China exports between 10 and 15% of ferrosilicon production. The 2013 utilization rate was estimated at 56% for China and 70% for non-Chinese production. The ferrosilicon industry is much less consolidated than silicon metal business with only 30% of production from top 20 companies.

Most ferrosilicon producers prefer quartzite as vein quartz is more brittle and gives rise to excessive fines during handling.

Silicon has the following commercial properties:

- It imparts high fluidity and low shrinkage to Al alloys;
- It acts as deoxidiser in steel;
- It acts as reducing agent in steel;
- It improves tensile strength, yield point and hardness in steel;
- It imparts electrical characteristics to steel;
- It turns carbon to graphite in cast iron production;
- It acts as reducing agent for primary magnesium;
- And it acts as precursor of silicones and polycrystalline silicon.

Silicon metal used for semiconductors and photovoltaic solar cells are processed through numerous intermediate steps by specialised processors who are mostly not involved in the production of silicon metal. Ferrosilicon is a grey, chemically stable material produced in powder, granule or lump form.

Ferrosilicon containing 72% to 80% Si melts between 1290 °C and 1340 °C. It is the most widely used vehicle for the addition of silicon to iron and steel.

Ferrosilicon is 3 times the volume of production of silicon metal annually.

19.2.1 Potential End Users

- Quebec Silicon Limited Partnership (Dow and GSM Joint Venture) - Becancour, Quebec

  The partnership was formed in August 2010 between Dow Corning (49%) and Timminco (51%). Timminco went bankrupt in 2012 and Globe Specialty Metals Inc ("GSM") bought 51% interest. Becancour consists of 3 furnaces with capacity of 47k tpy silicon and 5k tpy ferrosilicon. Most production is shipped to the USA and Europe. Quartz is obtained from a leased mine at Sitec (4 km west of the Silicon Ridge Project) and under long term contract from Newfoundland. Timminco had been developing the production of solar grade silicon at Becancour and the assets were sold to Spain's Grupo Ferroatlantica.

- Global Specialty Minerals

  It is a large US producer of silicon metal with around 75% of production. Globe is integrated into upstream raw materials to a greater extent than any major silicon metal producer. It produces its own high-grade quartzite through its subsidiary Alabama Sand & Gravel. *[In 2015 GSM and Grupo Ferroatlantica merged to form Ferroglobe PLC.]*

- Dow Corning

  It is the largest producer of silicones and therefore the world's largest consumer of silicon metal. Over the last 13 years Dow Corning has pursued a policy of upstream integration into silicon metal production which has seen the company make numerous acquisitions in the silicon metal industry.

- Elkem Chicoutimi, Quebec

  The plant consists of a single 30MVA furnace with a capacity of 30k tpy of ferrosilicon. It was purchased by China National BlueStar (Group) Co. Ltd. ("BlueStar") in 2011. Historically it produced standard 75% ferrosilicon for Canadian Steel Industry. Over the past 10 years it had switched to producing ferrosilicon magnesium and inoculants for foundry sector that are mainly exported to the USA.

- CC Metals & Alloys Inc

  It is usually the largest producer in the USA and it was acquired by the Optima Group in 2011, and then became part of Georgian American Alloys. Optima and Georgian American Alloys are controlled by the owners of Ukraine's Privat Group. It is located in Calvert City, Kentucky, and consists of 3 furnaces and has a capacity of around 90k tpy of ferrosilicon.

Generally speaking, ferrosilicon is 3 times the volume of production of silicon metal annually. Globally, Ferroglobe PLC was the world's largest silicon metal producer. The BlueStar and Dow Corning are jointly the second largest silicon metal producers by capacity. BlueStar is majority owned by the Chinese Government but most of its silicon metal capacity is located at its Elkem plants in Norway. All of Canada's silicon metal production is produced at Becancour.

In addition, according to public sources, Iceland is becoming a major importer of silica, to feed its growing domestic silicon and ferrosilicon production. Elkem's Akranes ferrosilicon plant in Iceland is the second largest in the world, with 130 ktpy, United Silicon HF is developing a plant in Iceland to produce 22 ktpy silicon metal, with rampup potential to quadruple the production rate. Thorsil is building a silicon metal plant with the potential for 110 ktpy, Silicor Material is planning a silicon metal plant with the potential for 16 ktpy and PCC plans one to produce 32 ktpy of silicon metal.

Ferroglobe has presented that a tonne of silicon metal requires 2.8 tonnes of silica in the manufacturing process.

19.3 Price

Silica is not an openly traded commodity. Prices are negotiated between end users and producers for annual and some long term contracts. Prices do vary according to different parameters such as purity, size and impurities.

Based on this information and understanding of the market, a price was developed by Met-Chem with Rogue Resources for the economic analysis. This price, based on a mix of ferrosilicon grade product and other fillers, was established at CAN$88.80 per tonne.

20.0 ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1 Environmental Studies

At the start of the project in 2014, guidance was given by Service GFE (GFE) in a report presented in November 5, 2014, Rapport Sectoriel – Milieu Naturel et Humain, by Christine Beaumier, biol.. The report described and presented a list of concerns for the project area and that would be covered in a baseline study: the physiography of the region, the vegetation, the humid sectors, the fauna – the reptiles and amphibians, the bird species, the fish species, and the caribou, and the human and social aspects for the area. The area was described as being used mainly for forestry, recreational purposes and mining of silica in the vicinity of the project area.

In 2015, additional work was carried out by WSP and this work includes the following work activities:

- Identification of environmental issues related to the development of a silica deposit:
    - Woodland caribou;
    - Fish with special status and its habitat;
    - Wetlands and watercourses;
    - Birds with special status and its habitat;
    - Land use for fishing and hunting activities.
- Characterization of surface water and watercourses with high fish habitat potential for the silica mining project:
    - Sampling and analysis of water quality in Lac de la Grosse Femelle at 4 stations;
    - Physical characterization of watercourses (substrate, type of flow, fish habitat, etc.);
    - Description of present fish communities from available information (desk top study);
    - Installation of a weather station at the project site;
    - Measurement of the water table level in diamond drill boreholes.

SNC-Lavalin, on May 12, 2016, was granted the mandate to carry out the baseline study towards the CofA Request for a Quarry Operation. In order to comply with the MFFP and MDDELCC requirements and to avoid or reduce the impact of the project, the following biological surveys were completed:

- Bird surveys:
    - Bird of prey;
    - Barrow's Goldeneye;

- Bicknell's Thrush.

- Fish and fish habitat survey;
- Vegetation and wetlands;
- Potential habitats of voles with special status.

Each of the surveys have been undertaken following acceptance by the MFFP or MDDELCC of the survey protocols. The field survey reports are to be completed in November 2016. The summary of the results of these field surveys is provided in section 20.3.

Since the project is located within a caribou habitat that is conferred legal status of protection (*caribou range south of the 52nd parallel*) by the Regulation respecting Wildlife Habitat, the MFFP requires the filling of an application form (*request for authorization as provided for Article 128.7 of the Act respecting the conservation and development of wildlife*). The preliminary application form has been submitted to the MFFP in June 2016 and an initial meeting with the MFFP was held on 22 June 2016. Discussion with the MFFP will continue throughout the design and engineering process.

20.2 Environmental Assessment and Review Process

In response to written and verbal requests sent by WSP regarding the Silicon Ridge Project's legal obligations, the Ministère du Développement durable, de l'Environnement et de la Lutte contre les Changements climatiques (Quebec Environment Department) provided written confirmation on December 21, 2015 that the project was not subject to the regulation on environmental impact assessment and review. However, the project does require a certificate of authorization under section 22 of Québec's Environment Quality Act. Thus, a more basic environmental impact study must be conducted, being the equivalent of a brief impact assessment whose analysis will be entrusted to the local MDDELCC office (Direction régionale de la Capitale Nationale).

With regard to the Canadian Environmental Assessment Act (CEEA, 2012), based on the available information and communications between WSP and the CEA Agency, the project is not subject to the federal environmental assessment procedure stipulated in the Regulations Designating Physical Activities under CEAA.

Rogue has interacted with the various local groups since the start of the project; Municipality of Saint-Urbain, Baie-Saint-Paul, Les Éboulement, the MRC of Charlevoix, the Huron-Wendat Nation Council and the ZEC des Martres. Stakeholders were kept informed on the project and the work development. Throughout the exploration program local employment in the region was created as well as hiring local contractors for line cutting, outcrop stripping, cutting timber on drill pads, drill pad site preparation with an excavator, and re-management of drill sites. Purchasing locally in Saint-Urbain and Baie-Saint-Paul was highly encouraged and accommodations in the region were used during an eight month period in 2015.

Key environmental authorization will come from the MFFP *(request for authorization as provided for Article 128.7 of the Act respecting the conservation and development of wildlife*) since the project is located in a caribou habitat that is conferred legal status of protection.

Following the MFFP approval, an authorization request must be presented to the MERN to obtain a lease for the project. The type of lease to be obtained, lease to mine surface mineral substances (BEX) versus mining lease, depends on the product's anticipated usage (construction versus industrial). To this end, the characteristics regarding the quality of the deposit as well as other factors used to determine the product's usage shall initially be submitted to the MERN. According to the current project description, it is understood that the lease to mine surface mineral substances (BEX) will be required from the MERN. The duration of this process approval should take approximately four (4) months. Concurrently, Rogue Resources will undertake a public consultation with the local authorities (MRC Charlevoix), aboriginal groups and main stakeholders (ZEC des Martres, Chambers of Commerce, etc.).

Once the BEX has been issued by the MERN, Rogue will complete the application form for a quarry site to be submitted to MDDELCC. The duration of this process should take approximately 75 working days but is dependent on the questions posed by the MDDELCC which could extend the time period. However, this process may be undertaken in parallel with the MERN process.

20.3 Vegetation and Wildlife Baselines Studies

20.3.1 Baseline Study Areas

The study area corresponds to the eight (8) contiguous map-designated mineral claims ("CDC" claims) and covers an area of approximately 4.6 km^2 (Figure 20-1). It is entirely located in the *ZEC des Martres*. It should be noted that the Mine Site Layout was modified between the submission of the fauna and flora inventory protocols to the MFFP and the MDDELCC and the drafting of this report. The Mine Site layouts were updated as part of the PEA process and the layouts used during the surveys had smaller impacted areas than the infrastructure presented in Figures 16-7, 16-8, 16-9 and 18-2.

The survey area considered for the inventory of bird of prey nests includes the study area and a 1-km buffer zone surrounding it. The survey area is limited to the study area for the Barrow's Goldeneye and bats. The survey area for the Bicknell's Thrush, potential habitats of voles with special status, wetlands, special status plants, water stream characterization and the fish inventory is limited to the Mine Site Layout available at the time of the surveys (see Figure 20-1).

20.3.2 Physical Environment

The project area, ranges between 870 and 990 m of elevation, straddles the watersheds of *rivière Malbaie and rivière du Gouffre*. Its surficial deposits consist mainly of glacial deposits less than 1 m thick while the presence of organic deposits is limited. The *lac de* *la Grosse Femelle* is the largest water body in the study area, but several other small lakes are also present. The smaller water bodies include: *Gros-Bec; lac du Gaie Bleu; lac du Moineau; lac Bicknell;* and the *Premier lac du mont de Foin*. Several small permanent and intermittent watercourses are also present in the study area. The majority of these watercourses drain into the *rivière du Gouffre*.

20.3.3 Welands and Special Status Plants

SNC-Lavalin conducted wetland characterization activities and a search for special status plant species from August 16 to 23, 2016. The wetlands present in the study area were delineated by photo-interpretation before being validated or corrected after the fieldwork. Areas within the Mine Site Layout that may have wetlands that are invisible by photo-interpretation were also surveyed. The inventory protocol was approved by the MDDELCC.

In total of 21 wetlands were identified and three classes of wetland were observed in the area: shrub swamps, shrub bogs and wooded bogs. Wetlands occupy a total surface area of 9.23 ha, which breaks down as follows: 4.36 ha of shrub swamps, 3.63 ha of wooded bogs and 1.23 ha of shrub bogs. Other wetlands may be present in the non-surveyed sections of the Mine Site Layout shown in Figures 16-7, 16-8, 16-9 and 18-2 of the report.

No forest habitat that could potentially harbor threatened, vulnerable or likely to be designated as threatened or vulnerable plant species was identified and no such species was observed during the inventory. In fact, no occurrence of threatened, vulnerable plant species or species likely to be so designated was reported in the study area or nearby following the request for information filed with to the Quebec Natural Heritage Data Center (CDPNQ).

20.3.4 Birds of Prey

A helicopter survey was conducted by SNC-Lavalin in the study area, above potential habitats identified beforehand by means of mapping and geomatics tools. The purpose of this survey was to establish the presence of the nesting sites of three species: the Bald Eagle, the Peregrine Falcon (*Anatum* subspecies) and the Golden Eagle. Flight lines, including all potential habitats, were flown over on June 3, 2016 in accordance with an MFFP-approved protocol.

Based on field observations, the nesting habitat potential for the three species is low. In fact, no nesting site was noted and no specimen was observed.

20.3.5 Barrow’s Goldeneye

The areas likely to host breeding habitats that are suitable for the Barrow’s Goldeneye were identified by means of geomatics tools and by targeting head of lakes located at a minimum elevation of 500 m and covering a surface area of 0.2 to 15 ha. Flyover surveys were conducted by SNC-Lavalin on June 3, 2016 in accordance with an MFFP-approved protocol. No specimen of this species was observed during the flyover.

20.3.6 Bicknell's Thrush

Field visits were conducted by SNC-Lavalin in two separate phases that were associated respectively with the inventory of the Bicknell's Thrush (June 14 to 17, 2016) and the characterization of its habitat (July 27, 2016). The habitat characterization phase was subject to the identification of specimen in the field, during the first phase. The field work (survey and habitat characterization) and the method used to determine the habitat category were conducted in accordance with an established protocol and were approved by the MFFP.

The specimen survey consisted in visiting 13 pre-determined stations, located in the preferred habitat of the species during its active periods. Bicknell's Thrush specimens were heard at 3 of the 13 stations visited, which confirmed the presence of the species in study area during the nesting period. Other areas frequented by the Bicknell's Thrush could be present in non-surveyed sections of the current Mine Site Layout.

The vegetation of these three stations was subsequently characterized with a view to categorizing the type of habitat based on the preferences of the species. One of three stations had combinations of habitat features with optimal suitability for the species. However, in most of the plots characterized the habitat is considered sub-optimal. A mapping of habitat types, covering the entire study area, will be conducted in order to extrapolate data from the characterization activity together with ecoforestry data, as requested by the MFFP. These analyzes are currently in progress.

20.3.7 Fish and Watercourses

Information about fish fauna and watercourses was obtained as a result of field work conducted by SNC-Lavalin in the study area from August 15 to 23, 2016 and other field work carried out in 2015 by WSP. The watercourses potentially affected by the project were surveyed in order to characterize the fish habitat and also confirm the presence of fish specimens. In total, six watercourses and their tributaries were covered by the survey. The presence of fish was verified by means of electrofishing. The inventory protocol was pre-approved by the MFFP.

This characterization method was used to validate the presence of watercourses, their general location as well as their status (intermittent or permanent). As for the fishing activities, they made it possible to establish the presence of a single fish species, the Brook Trout. Therefore, no special status fish species was observed in the surveyed watercourses.

20.3.8 Caribou

The Woodland Caribou from the Charlevoix population (hereinafter referred to as Charlevoix Woodland Caribou) is present in the study area. The Woodland Caribou is designated as "vulnerable" in Quebec under the *Act respecting threatened or vulnerable species*. A recovery plan for the Woodland Caribou in Quebec, covering the 2013-2023 period, was published in 2013. In Canada, the boreal caribou population is listed as a "threatened" species in Schedule 1 of the *Species at risk Act*. A federal recovery program was published in 2012. The study area is located in the Charlevoix range (QC2) associated with the Charlevoix Woodland Caribou. According to the Federal Recovery Strategy published in 2012, the caribou habitat disruption rate in the Charlevoix range was estimated at 80%.

A forest management plan in the area frequented by the Charlevoix Woodland Caribou was published in 2006 and a new version is being prepared. The plan aims to reconcile the survival of the caribou with economic development in an operational forest management plan. Special development arrangements apply and include, among others, the maintenance of a minimum proportion of 50 year old stands and older (minimum area of 65%) and softwood stands 80 years old and older (minimum area of 43%). The study area is located within an area that is intensively used by caribou (caribou forest block), called "*bloc lac des Martres*". The blocks are used annually by caribou for calving and rutting and during the summer and winter. The management plan applies to the legally recognized portion of the wildlife habitat that is part of the public domain. In fact, the study area is located in a *caribou range south of the 52nd parallel*, which is a legal habitat under the *Regulation respecting Wildlife Habitats*.

20.3.9 Bats

The information related to the presence of bats was obtained following field work carried out in the study area from June 22 to July 3, 2016 by bat specialist, François Fabianek. The presence and nocturnal activity of bats in the area were characterized through a fixed acoustic inventory involving four listening stations located near water bodies and wetlands. In addition, efforts were made to identity signs of bat maternity by visually checking rocky slopes for recent deposits of bat guano. These checks were conducted three times, i.e. on June 22 and 28 and on July 3, 2016. The inventory protocol was pre-approved by the MFFP.

The inventory confirms, with certainty and in a specific way, the presence of two bat species already listed in the *Capitale Nationale* area. The Hoary Bat (a species that is likely to be designated threatened or vulnerable in Quebec) was the most active, followed by the Little Brown Bat (a species mentioned in the federal list of endangered species and in Schedule 1 of the *Species at Risk Act*). Adding to these are passages of *Myotis* bats, the Big Brown Bat/Silver-haired Bat complex and bats with unidentified genus and species. The activity index was relatively low. Night temperatures recorded at altitudes of more than 870 m may have contributed to such low activity figures. The visual inspection of outcrops yielded no results suggesting the presence of bat maternity in the areas visited.

20.3.10 Potential Habitats of Special Status Voles

The study area straddles the range of two mammal species that are likely to be designated threatened or vulnerable in Quebec, i.e. the Rock Vole and the Southern Bog Lemming. Some field works were carried out on July 19 and 20, 2016 by SNC-Lavalin in order to establish the presence of potential habitats of these two species in the project area. The inventory protocol was pre-approved by the MFFP.

The field works carried out led to the conclusion that there are potential habitats for these species in the study area and that some of the habitats overlap with the Mine Site Layout. Various other species of voles, mice and shrews are likely to frequent the study area, but do not have protected status.

20.3.11 Other Mammals

The numerous moose tracks observed suggest that this is a common species in the study area. The North American Porcupine, the North American Beaver, and the Red Squirrel were also observed in the various inventories conducted by SNC-Lavalin in 2016. The other species of medium- and large-size mammals likely to frequent the study area include the Gray Wolf, the Coyote, the Red Fox, the Snowshoe Hare, the Black Bear, the American Marten, the Woodchuck, the American Mink and the River Otter. None of these species has protected status.

20.3.12 Amphibians and Reptiles

Considering the location of the study area and its high altitude, no special status amphibian or reptile is probably present there. Therefore, no specific inventory for these two groups of species was conducted. However, some species of amphibians were observed there during other surveys conducted by SNC-Lavalin in 2016. These include the Northern Two-lined Salamander, the Eastern Newt, the Mink Frog, the Wood Frog and the American Toad. Other species of amphibians likely to frequent the study area are the Blue-spotted Salamander, the Yellow-spotted Salamander, the Spring Peeper, the Leopard Frog and the Green Frog. The only reptile species likely to be present in the study area is the Common Gartersnake.

20.4 Socio-economic Setting and Consultation Process

20.4.1 Socio-economic Context

The project site is located in remote area, north of St-Urbain, in Charlevoix, region, and adjacent to the Côte-Nord region. The project site is located in the MRC de Charlevoix, and the closest municipality is St-Urbain, a small town with approximately 1475 people (Statistique Canada 2011). The area is characterized by a low population density, yet it attracts important numbers of tourists and outdoors enthusiast on a yearly basis, including for fishing and hunting and for several other types of recreational activities (*Schéma d'aménagement, Municipalité Régionale de Comté (MRC) Charlevoix*, *2012*). Indeed, this area is home to ecological reserves, outfitting zones, and Provincial parks, and the project site itself is located within the *Zone d'Exploitation Controlée* (ZEC) *des Martres*. The *ZEC des Martres* is part of Québec's hunting zone #27 and fishing zone #27. In addition, several campgrounds are located outside the project site (more than 1 km), along the ZEC's main access road.

The most important industries in this area are health and social services, retail, manufactures, and lodging catering. The exploitation of natural resources, including forestry and agriculture, account for 7.7%[5] of the economic activity at the local level (Schéma d'aménagement, MRC Charlevoix, 2012).

20.4.2 Consultation Process

Several stakeholders were contacted in the context of the silica project development to both provide information on the project and obtain the comments of the participants.

Consultation were held by Rogue Resources with local groups and stakeholders including the Municipality of Saint-Urbain, Baie-Saint-Paul, Les Eboulement, the MRC of Charlevoix, the Huron-Wendat Nation Council and the ZEC des Martres. In addition to formal meetings, many other informal discussions took place since 2014 with some the stakeholders mentioned above. It should be noted that a MOU has been signed with the Huron-Wendat Nation in April 10th of 2015.

A communication and consultation plan will be established for the purpose of the subsequent project phases. Stakeholders will be informed of the project's advancement and will be encouraged to provide their comments. The Innu population of Mashteusiatsh and Essipit will be notified of the project and be invited to take part in the consultation process. The Huron-Wendat Nation, with whom a MOU was signed, will also be informed and consulted for this project.

20.5 Current and potential environmental and social issues that may affect extraction of mineral resources

This assessment of the potential environmental and social issues is based on the infrastructure location (Figure 20-1) provided to SNC-Lavalin for the biological surveys. A new environmental and social assessment will be completed throughout the design and engineering process.

As mentioned in Section 20.3.8 (caribou), the project is located within a habitat that is conferred legal status by the *Regulation respecting Wildlife Habitats*. To this end, Rogue Resources must file a request for authorization to implement its project in this legally protected habitat, as provided for in Article 128.7 of the *Act respecting the conservation and development of wildlife*. The cumulative effects of other anthropogenic disturbances taking place in the project area will also be taken into account by the competent authorities when approving or rejecting activities in the legal caribou habitat. In June 2016 Rogue Resources took steps towards securing the required authorizations which, if granted, will require certain mitigation measures being implemented. These mitigation measures include restriction periods for certain activities. Rogue Resources is working proactively with the relevant authorities and is ready to apply the required mitigation measures.

[5] According to 2006 data, extracted from the Schema d'aménagement, MRC Charlevoix, 2012.

Considering the presence of special status bat species in the study area, specific mitigation measures for these species could be required by the authorities concerned. The same applies to the potential habitats of special status voles. Regarding the Bicknell's Thrush, the MFFP could recommends full protection zones in the areas classified as optimal habitat while specific mitigation measures may be required inside or nearby habitats considered as sub-optimal. Specific requirements for all of these species will be known after the submission of all required documents to the MFFP for analysis.

According to Article 14 of the *Regulation respecting pits and quarries*, the operating site of any new quarry must be located at a minimum horizontal distance of 75 m from any swamp. Similarly, the operation of a quarry in a swamp is prohibited. Part of the current Mine Site Layout was surveyed in 2016 and there was no swamp straddling the three deposit zones that were considered at the time. However, some swamps were present in the study area as well as within a distance of 75 m from the South West Zone. A complementary inventory may be required depending on the Mines Site Layout to be completed throughout the design and engineering process.

Although bog-type wetlands are not covered by Article 14 of the *Regulation respecting pits and quarries*, encroachment on bog-type wetlands or their destruction is subject to an Authorization Certificate (AC) application, as provided for in Article 22 of the EQA. There are peatlands straddling the South West Zone and the Central North Zone. Other bogs are present in the surveyed area. A complementary inventory may be required depending on the Mines Site Layout completed throughout the design and engineering process. It is likely the MDDELCC will require compensation for bog losses caused by the project.

According to the *Regulation respecting pits and quarries*, the operating site of any new quarry must be located at a minimum horizontal distance of 75 m from any permanent stream or lake. Similarly, the operation of a quarry in a permanent stream or a lake is prohibited. Furthermore, a 15 m strip must be maintained for intermittent streams, as provided for in the *Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains*. Encroachment on these or destruction thereof is subject to an AC application as provided for by Article 22 of the EQA. The analysis of available data shows that there are several permanent and intermittent watercourses straddling the current Mine Site Layout or located nearby. For example, a permanent watercourse is located about 75 m from the South West Zone. Similarly, a permanent watercourse is located about 75 m from the North Central Zone while an intermittent stream straddles this area. However, the status of this intermittent watercourse will be reviewed with the authorities because it might not be defined as a watercourse within the meaning of the law.

The watercourses where the Brook Trout was observed are also considered as fish habitats, i.e. a habitat subject to legal protection under the *Regulation respecting wildlife habitats*. To this end, if needed, Rogue Resources would have to apply for authorization to implement its project in these legally protected habitats as per Article 128.7 of the *Act respecting the conservation and development of wildlife*.

In terms of the potential social effects, as mentioned above, Rogue Resources inc. has interacted with the various local stakeholders since the start of the project: the Municipalities of Saint-Urbain, of Baie-Saint-Paul, and of Les Éboulement; the MRC of Charlevoix; the ZEC des Martres and the Huron-Wendat Nation Council. Stakeholders were kept informed on the project and the work development. In particular, the ZEC des Martres was kept informed of all exploration activities and the Company took the necessary measures to ensure the ZEC des Martres access roads were kept in a reasonable condition and provided grading of the roads when required.

It is foreseen that the social issues that will be raised by the implementation of the project will concern recreational and land use activities, and the preservation of the biophysical environmental. These take place throughout the year, with peaks during hunting and fishing seasons. The potential interactions between the project and such activities will likely be raised by stakeholders at the local and regional levels in the course of the consultation process.

In addition, it may be required to verify the archaeological potential on the project site. Given the remoteness of the site, it is likely that the archaeological potential will be low.

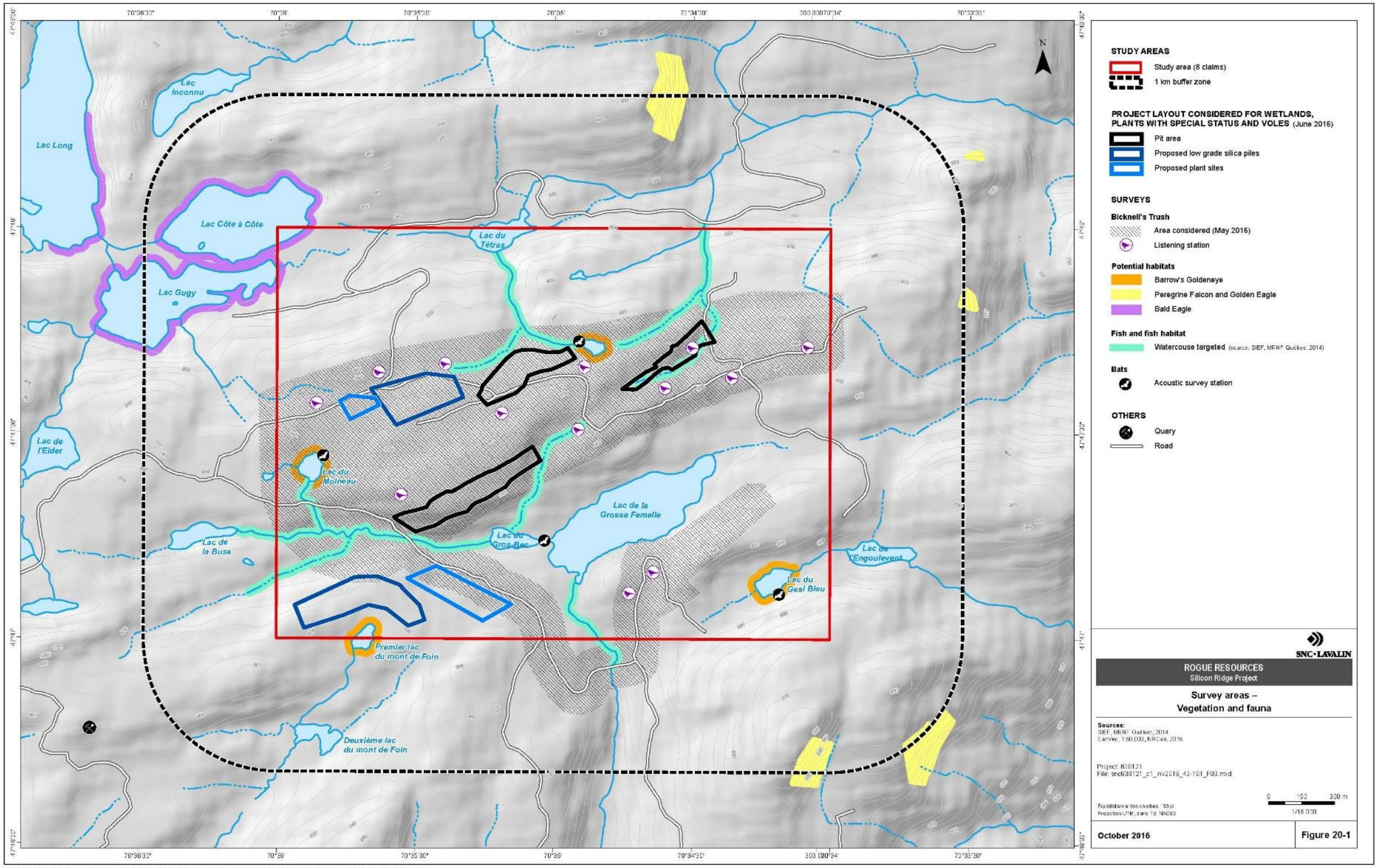
This area is also characterised by high unemployment rates (when compared to the nearby urban are of Quebec City) and by seasonal fluctuations in employment (Schéma d'aménagement, MRC Charlevoix, 2012). It is thus likely that the implementation of this project in the area will raise expectations in terms of employment and opportunities for contracts for local enterprises. Already, throughout the exploration program local employment in the region was created as well as hiring local contractors for line cutting, outcrop stripping, cutting timber on drill pads, drill pad site preparation with an excavator, and restoration of drill sites. Purchasing locally in Saint-Urbain and Baie-Saint-Paul was highly encouraged and accommodations in the region were used during an eight month period in 2015.

Two main alternatives are under consideration for the access road to the project site (see Figure 18-1). The southern alternative is preferred since it avoids the main road of ZEC des Martres. The impact assessment for this access road will be carried out after completion of the biological surveys for this project area and the results of the public consultation.

There are no environmental liabilities to be reported (WSP, 2016)[6].

[6] Section 20 prepared by WSP in report NI 43-101 – Technical Report on the Silicon Ridge Mineral Resources, June 7, 2016.

Figure 20-1 Silicon Ridge Project Location



21.0 CAPITAL AND OPERATING COSTS

21.1 Capital Cost

This capital cost estimate covers the Project for a plant with an annual capacity of 190,000 tonnes of feed material. Location of the facilities is in a greenfield area located about 42 km North of Baie Saint-Paul in the Province of Québec, Canada. The site is accessible by all-weather Highway 381 and existing forest roads. A 3.6 km road will be established to complete access to site along an existing access route.

The capital cost estimate includes the material, equipment, labour and freight required for the mine pre-development, processing facilities, fines storage and management, as well as infrastructure and services necessary to support the operation. Mine services and facilities as well as mine equipment are accounted for as operating costs since the operation of the quarry is based on mining contractors fees.

The estimate is based on Met-Chem's standard methods applicable for a PEA study to achieve the accuracy level of ± 35%. It is to be noted that an overall reduction of about 20% was applied to equipment costs on the basis of validated availability of said equipment on the pre-owned market. However, all factorized values are calculated on the basis of new equipment.

21.1.1 Summary of the Estimate

All amounts are expressed in Canadian dollars (CAD) unless otherwise noted.

The initial capital cost for the scope of work is estimated as $13,110,000 including $8,740,000 for direct costs, $1,748,000 for indirect costs and $2,622,000 for contingency.

The total life of mine capital cost is estimated at $17,475,000 of which $13,110,000 is initial capital and $4,365,000 is sustaining capital. The sustaining capital cost includes $3,631,000 to cover for the installation of the 25kV power line in Year 3 and related substation (no government or utility subsidies were assumed) as well as $734,000 for closure and rehabilitation of the site in Year 20. More detailed mine plan will be developed in subsequent phases of the project to assess continuous rehabilitation throughout the quarry's life in order to anticipate more detailed sustaining rehabilitation cash flow.

The capital cost is summarized in Table 21-1.

Table 21-1 – Summary of the Investment Capital Costs Estimate

Item Description	Initial Capital Total Rounded (CAN$)	Sustaining Capital Total Rounded (CAN$)
Direct Cost		
Quarry		
Pre-Development	344,000	
Quarry Total	**344,000**	
Process		
Processing Circuit	6,064,000	
Process Total	**6,064,000**	
Infrastructure Site and Power		
Industrial Site Preparation, Drainage and Site Roads	270,000	
Access Road	564,000	
Ancillary Buildings and Facilities	257,500	
Power, Substation and Distribution	659,000	3,631,000
Infrastructure Site and Power Total	**1,751,000**	
Service Vehicles		
Plant Service Vehicles	581,000	
Plant Service Vehicles Total	**581,000**	
Total Direct Cost	**8,740,000**	
Indirect Costs	1,748,000	
Contingency	2,622,000	
Closure and Rehabilitation		734,000
Total Capital Cost	**13,110,000**	**4,365,000**

21.1.2 Basis of Estimate – General

a) Base Date, Currency, Escalation

The base date for the cost estimate is the third quarter 2016. The estimate is expressed in CAD dollars. The exchange rate used is $1.00 USD/$0.76 CAD when quotations were received in US dollars and 1 EURO/$ 0.68 CAD when quotations were received in euros. No allowance for currency fluctuation is included.

b) Labour

The installation costs were estimated by factor.

c) Basis of Estimate – Mining

The estimate is based on contract mining for the excavation of the overburden and the waste rock material and the excavation of the mineralization, the transportation to the crusher area at the plant where the contract mining company is responsible to provide the plant with -120 mm crushed material to the plant or to stockpile the material in prevision for the months of the year when the quarry will not be operating.

The mine development costs were estimated using the unit rates developed based on the local mining contractor quotes and the quantities for the pre-development of the open pit mine were taken from the mine schedule for the project.

The haul road construction cost was estimated based on mining contractor quotes unit rates.

Mine services and facilities are supplied by the mining contractor during the quarry operating months (6).

d) Basis of Estimate – Processing Areas

The process building is limited to the processing circuit. The process building can accommodate a change area for the employees. No laboratory is required on site.

Preliminary layouts were prepared in order to determine the size of the building. The estimation was based on a light structure-type from recent similar projects. Site preparation and ancillary buildings are included in the infrastructure section below.

The process mechanical equipment list was derived from the flow sheets and equipment sizing was based on the design criteria. Approximately 70% of the process equipment value is based on single source budget proposals obtained from qualified suppliers for major equipment. The remaining equipment was estimated from recent in-house databases of similar projects. From the original quotes based on new equipment, an evaluation of availability of potential pre-owned equipment was made. A factor of about 80% was obtained and used in the capital estimate by comparing new equipment costs with pre-owned equipment available on the market.

Freight was established at 7% of the equipment value. Equipment installation, piping, electrical and automation were estimated by factor based on recent similar projects.

Buildings services and supplies for the process were estimated by factors based on recent similar projects.

e) Basis of Estimate – Processing Circuit Infrastructure and Services

Site preparation requirements are based on area. The costs were estimated based on recent similar projects.

Site roads are required from existing main road to the processing circuit and to the fresh water well. The lengths of site roads were derived from layouts. Also, improvement work is required on the main access road. Estimations for roads were based on unit prices from the local, bidding contractors.

No specific warehousing facility is provided for concentrate bags. The bags will be stored in storage containers.

No permanent camp facility is required for this project and it is estimated that during construction only small local teams will be required.

Preliminary requirements for office and gatehouse were established including services as well as equipment, supplies and furniture. The cost was estimated based on scaled estimate from recent similar projects.

No requirement for mine vehicles maintenance building is expected for this project since quarrying will be limited to six (6) months a year and maintenance costs is included in the mining contractor fee.

The industrial site general services including fuel storage and fuel distribution facilities, fresh water supply from a water well located West of Lac de la Grosse Femelle and also sanitary and waste management. These costs are included into process building services and supplies.

f) Basis of Estimate – Power and Communication

Preliminary requirements were established for electrical power based on preliminary power demand. Process equipment as well as services and general power needs were considered. Power supply includes one (1) diesel generator for the first three (3) years of operation with sustaining capital provision made in the third (3) year for the connection / installation of the 25 kV powerline and appropriate stepdown to bring power to the site. Allowances for power distribution are included.

Estimation was based on recent similar projects and considers that the diesel generator will be purchased pre-owned. No provision was made for communication or to include a main tower.

h) Basis of Estimate - Service Vehicles and Equipment

Preliminary requirements were established for service vehicles and equipment and the costs were estimated based on pre-owned equipment from recent similar projects and in-house database.

Service vehicles include a pick-up truck, a loader with attachments, one 12 wheel dump truck and 2 fork lifts. Maintenance of the main access road will be sub-contracted.

i) Basis of Estimate – Indirect Costs

The provisions for indirect costs and contingency were established by factors.

Taxes and duties, escalation and interests incurred during construction are excluded from the capital cost. Working capital is also excluded from the capital costs but provision for 3 months of operation cost is considered in the economic analysis.

The provision for contingency was established in consideration of the engineering development level, the available technical information required for design and the estimation methods of the project.

j) Closure Costs

Provisions are made for closure and rehabilitation costs in the sustaining capital in Year 20. It is assumed that the equipment and facilities salvage value will cover rehabilitation costs related to dismantling of process building and infrastructure. For rehabilitation of the waste rock and overburden stockpiles, as well as the industrial complex area, quantities were derived from the layouts and estimation was based on unit rates from recent similar projects. The amount established and used in the economic analysis totals $734,000. More detailed mine plan will be developed in subsequent phases of the project to assess continuous rehabilitation throughout the quarry's life in order to anticipate more detailed yearly disbursement.

21.2 Operating Costs

This section provides information on the estimated operating costs of the Project and covers Mining, Processing, Site Services and Administration.

The sources of information used to develop the operating costs include actual quotes from local contractors, in-house databases and outside sources particularly for materials, services and consumables. All amounts are in Canadian dollars (CAD), unless specified otherwise.

21.2.1 Summary Operating Costs

The life of mine average operating cost estimate, given as dollar per tonne of feed to the processing circuit, is summarised in Table 21-2.

Table 21-2 – Summary of Life of Mine (LOM) Average Operating Cost Estimate

Area	LOM Average Operating Cost ($/feed tonne)
Mining	22.11
Processing	11.36
Administration, Infrastructure & Technical Services	4.37
Total Average Operating Costs	**37.84**

21.2.2 Summary of Personnel Requirements

Table 21-3 presents the estimated personnel requirements for the Project. This workforce is comprised of staff as well as hourly employees. The administration employees will work on a 5 days per week basis. The hourly workforce at the plant will provide 24 hour per day coverage, 7 days per week, and will work on a 2 weeks on, 2 weeks off rotation.

Quarry operations are based on a six (6) month duration and are conducted by a mining contractor. No employee requirement is shown for the quarry.

Table 21-3 – Total Personnel Requirement

Area	Number
Processing	13
Management, Administration & Technical Services	3
Total Manpower	**16**

Total annual costs for the above manpower including base salary, bonus and fringe benefits have been estimated at $ 1.4 M.

The above manpower costs are detailed in the following sections.

21.2.3 Mining Operating Costs

The mine operating cost was estimated based on budgetary pricing from local contract mining companies.

Table 21-4 presents the LOM average unit rates that were applied to the tonnages for each period of the mine plan to arrive at the total LOM operating costs for the quarry operations. These rates include the supply of explosives, equipment maintenance, surveying services as well as the delivery of -120 mm crushed mineralization to the plant.

Table 21-4 – Summary of Estimated Life of Mine Operating Costs by Type of Material

Type of material	LOM Cost ($)	$/tonne mined	$/tonne sold	Total (%)
Overburden	3,487,727	2.86	1.06	4
Waste material	45,021,855	5.34	13.69	54
Crushed mineralization	35,492,000	9.34	10.79	42
Total	**84,001,582**	**6.25**[7]	**25.55**[8]	**100**

21.2.4 Processing

For a typical year at nominal processing rate, the operating costs for the processing circuit are summarized in Table 21-5. This table shows the costs for the first years of operation. The breakdown is shown for the components: labour cost, electrical power cost, reagent and consumables consumption, material handling and spare parts and miscellaneous. These costs were derived from supplier information, Met-Chem's database or factored from similar operations. The total operating costs were estimated to be $ 2,560,500 per year or $ 13.48 per tonne of feed processed for the first years of operation while the electricity is being generated on-site by generators.

[7] Average $ per tonne mined
[8] Total $ per tonne sold

Table 21-5 – Summary of Average Annual Process Plant Operating Costs for the first 3 years

Description	Total Annual Cost ($/year)	Unit Cost ($/feed tonne)	% of Total Costs
Processing Circuit Manpower	1,110,200	5.84	43.4%
Electrical Power	730,700	3.85	28.5%
Reagent Consumption	100	0.00	0.0%
Consumables Consumption	256,300	1.35	10.0%
Material Handling	417,000	2.19	16.3%
Spare Parts and Miscellaneous	46,200	0.24	1.8%
Total	**2,560,500**	**13.48**	**100.0%**
$1 corresponds to 1 Canadian Dollar (CAD). Based on processing circuit throughput of 190,000 tonnes per year (on a dry basis). Power cost is 18.9¢/kWh generated on-site by generators.			

After the first years of operation, the electricity will come from Hydro-Québec by being connected on their grid. The power cost will be lower than the first years of operation. The operating costs for the processing circuit are summarized in Table 21-6 and were estimated to be $ 2,100,400 per year or $ 11.05 per tonne of feed processed.

Table 21-6 – Summary of Average Annual Process Plant Operating Costs after Year 3

Description	Total Annual Cost ($/year)	Unit Cost ($/feed tonne)	% of Total Costs
Processing Circuit Manpower	1 110 200	5.84	52.9%
Electrical Power	270 600	1.42	12.9%
Reagent Consumption	100	0.00	0.0%
Consumables Consumption	256 300	1.35	12.2%
Material Handling	417 000	2.19	19.8%
Spare Parts and Miscellaneous	46 200	0.24	2.2%
Total	**2 100 400**	**11.05**	**100.0%**
$1 corresponds to 1 Canadian Dollar (CAD). Based on processing circuit throughput of 190 000 tonnes per year (on a dry basis). Power cost is 7¢/kWh connected on the grid of Hydro-Québec.			

The personnel requirement for the processing circuit consists of 13 employees, of which all are shift employees and there are not any office positions in the process group. These employees are required for the proper operation of the processing circuit, including operations and maintenance. The labour rates and burdens were based on the rates for similar job classifications in the northern Quebec. The total estimate is $ 1,110,200 per year, which equates to $ 5.84 per tonne of feed processed.

Total electrical power costs were calculated using the total load of the processing circuit operation. The total power consumption of the processing circuit was estimated to 3,866 MWh per year. For the first 3 years of operation, the electrical power cost is estimated at $ 0.189 / kWh from on-site generated electricity by generators, and the total estimate electrical power cost is $ 730,700 per year or $ 3.85 per tonne of feed processed. After Year 3, the electricity power cost is estimated at $ 0.07 / kWh by being connected on the grid of Hydro-Québec. The total estimate electrical power cost is $ 270,600 per year or $ 1.42 per tonne of feed processed.

The total processing circuit reagent operating costs were estimated at $ 100 per year. The reagent quantity (flocculant) was estimated. The reagent cost was obtained from a supplier.

Total consumables include processing circuit equipment wear parts and 1-tonne bags for product bagging. The total cost was estimated at $ 256,300 per year or $ 1.35 per tonne of feed processed, and was obtained from manufacturer or estimated from equipment capital cost.

Mobile equipment will be used for material handling near or in the processing circuit facility, including a wheel loader and a fork lift. The associated operating cost was estimated based on the required equipment operating hours and the fuel oil consumption for these pieces of equipment. The total material handling cost is estimated at $ 417,000 per year or $ 2.19 per tonne of feed processed.

Maintenance spare parts and miscellaneous cost was estimated at 1.5 % of total equipment capital cost, which equal to $ 46,200 per year.

21.2.5 Plant Administration and Technical Services Costs

This section regroups the manpower costs for Management and site services as well as costs related to material and technical services and power for heating. The operating cost summary, for a typical year, is given in Table 21-7. No requirement for room and board or catering is included for this project since it is expected that employees will be living in the nearby towns.

Table 21-7 – Summary of Annual Plant Administration and Services Costs

Description	Total Annual Cost ($)	$/tonne of feed
General Administration Manpower	315,000	1.66
Administration – Material & Services	288,150	1.51
Infrastructure, Heating & miscellaneous	228,005	1.20
Total	**831,155**	**4.37**

22.0 ECONOMIC ANALYSIS

The following includes results of a PEA study that uses mineral resources that are not mineral reserves and therefore have not demonstrated economic viability.

Therefore, the following economic analysis is limited to the potential viability of the Project and will serve as a decision tool to proceed or not with additional field work and studies on the Project.

The economic/financial assessment of the Silicon Ridge Project of Rogue Resources Inc. is based on Q3-2016 price projections and cost estimates in Canadian currency. No provision was made for the effects of inflation. The evaluation was carried out on a 100 %-equity basis. Current Canadian tax regulations were applied to assess the corporate tax liabilities while the recently adopted regulations in Quebec (originally proposed as Bill 55, December 2013) were applied to assess the mining tax liabilities.

The financial indicators under base case conditions are given in Table 22-1.

Table 22-1 – Base Case Financial Results

Base Case Financial Results	Unit	Value
Pre-Tax (P-T) NPV @ 10 %	M CAD	36.5
After-Tax (A-T) NPV @ 10 %	M CAD	23.8
P-T IRR	%	40.2
A-T IRR	%	33.9
P-T Payback Period	years	2.6
A-T Payback Period	years	3.1

A sensitivity analysis reveals that the Project's viability will not be significantly vulnerable to variations in capital and operating costs, within the margins of error associated with PEA estimates. However, the Project's viability remains more vulnerable to the larger uncertainty in future market prices.

22.1 Assumptions

22.1.1 Macro-Economic Assumptions

The main macro-economic assumptions used in the base case are given in Table 22-2. The price forecast for the silicon product is a size-purity-dependent average provided by Rogue Resources. Details on the derivation of this average price forecast are given in Section 19 of this Report. The sensitivity analysis examines a range of prices 30 % above and below this base case forecast.

Table 22-2 – Macro-Economic Assumptions

Item	Unit	Base Case Value
Average Silica Product Price (FOB Silicon Ridge)	CAD/tonne	88.80
Discount Rate	% per year	10
Discount Rate Variants	% per year	8 and 12

According to the definition of "Mineral Resource" in Subsection 248(1) of the Income Tax Act, paragraph (d) 3. state that a quartzite deposit, which is the subject of this Report, is a mineral resource. Thus, the current Canadian tax system applicable to Mineral Resource Income was used to assess the Project's annual tax liabilities. These consist of federal and provincial corporate taxes as well as provincial mining taxes. The federal and provincial corporate tax rates currently applicable over the Project's operating life are 15.0 % and 11.5 % (decreasing by 0.1 % per year from 11.9 % in 2016 to 11.5 % in 2020) of taxable income, respectively. The marginal tax rates applicable under the recently adopted mining tax regulations in Quebec (originally proposed as Bill 55, December 2013) are 16 %, 22 % and 28 % of taxable income and depend on the profit margin. As a beneficiation plant is required at the mine site, a processing allowance rate of 10 % was assumed.

The assessment was carried out on a 100 %-equity basis. Apart from the base case discount rate of 10.0 %, two (2) variants of 8.0 and 12.0 % were used to determine the Net Present Value of the Project. These discount rates represent possible costs of equity capital.

22.1.2 Royalty Agreements

This Project incorporates two royalty agreements. The first is equivalent to an "NSR" agreement. This agreement calls for annual payments of 2% of FOB sales. The second agreement calls for annual payments of $0.08 per tonne of product sold.

22.1.3 Technical Assumptions

The main technical assumptions used in the base case are given in Table 22-3.

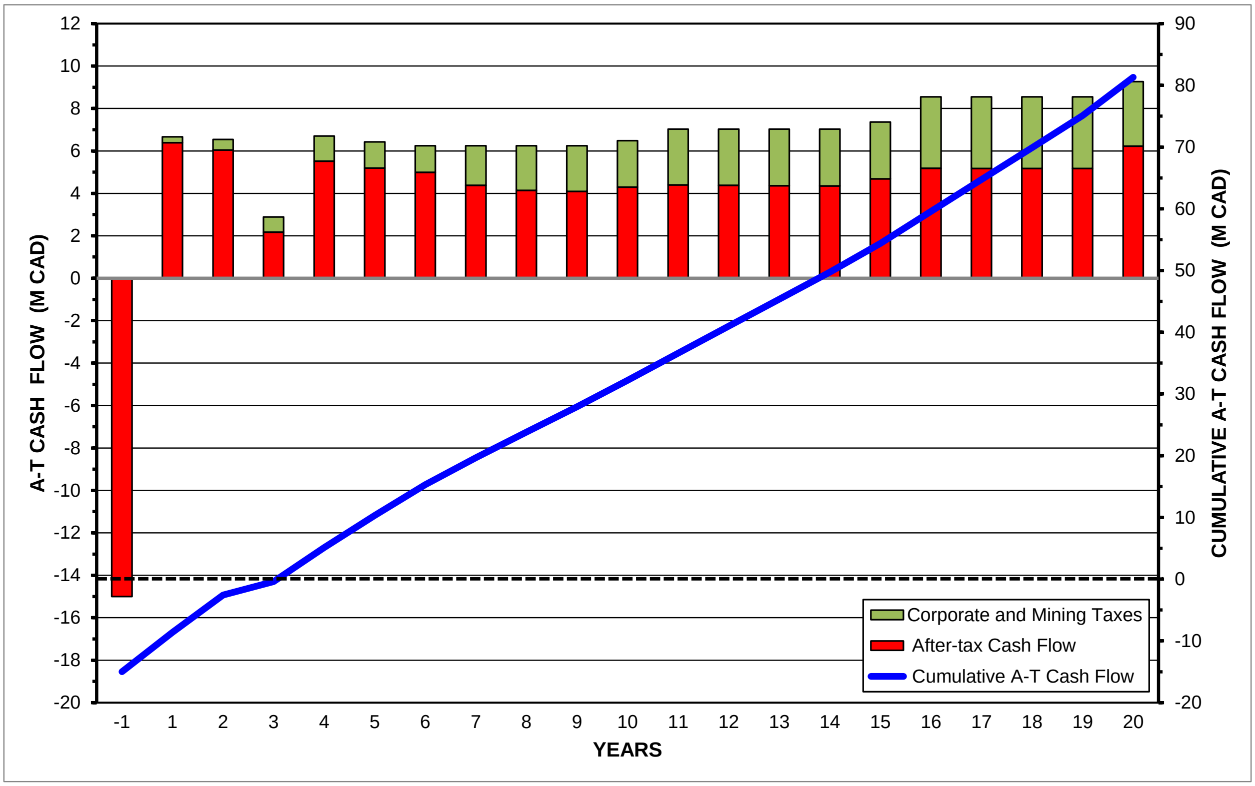
Table 22-3 – Technical Assumptions

Item	Unit	Base Case Value
Open Pit Resource Mined	tonnes	4,000,000
Average Grade	% SiO_2	98.6
Mining Rate	tonnes/year	200,000
Average Stripping Ratio	w : o	2.57:1
Mine Life	years	20
Average Process Recovery	%	86.5
Average Silica Product Grade	% SiO_2	98.7
Average Silica Product Production Rate	tonnes/year	164,400
Average Mining Costs	$/tonne processed	22.11
Average Processing Costs	$/tonne processed	11.36
Average General and Administration Costs	$/tonne processed	4.37
Average Total Costs (excludes royalty)	$/tonne processed	37.84
Average Total Costs (excludes royalty)	$/tonne product	43.73

22.2 Financial Model and Results

Figure 22-1illustrates the after-tax cash flow and cumulative cash flow profiles of the Project for base case conditions. Note that the total height of a particular bar (i.e., after-tax cash flow plus corporate and mining taxes) represents in fact the before-tax cash flow. The intersection of the after-tax cumulative cash flow curve with the horizontal dashed line represents the payback period.

Figure 22-1 – After-tax Cash Flow and Cumulative Cash Flow Profiles



A summary of the evaluation results is given in Table 22-4 and Table 22-5 gives the cash flow statement, both for base case conditions.

The summary and cash flow statement indicate that the total pre-production (initial) capital costs were evaluated at $ 13.1 M. The sustaining capital requirement (power line and substation construction in production year 3) was evaluated at $ 3.6 M. Mine closure costs were estimated at an additional $ 0.7 M.

The cash flow statement shows a capital cost breakdown by area. Working capital requirements were estimated at three (3) months of total annual operating costs, excluding royalty payments. Since operating costs vary annually over the mine life, additional amounts of working capital are injected or withdrawn as required.

The total revenue derived from the sale of the silica products was as estimated at $ 292.0 M ($ 88.80/tonne sold). The total operating costs, including royalty payments, were estimated at $ 149.8 M, or on average, $ 39.44 /tonne processed.

The financial results indicate a pre-tax Net Present Value ("**NPV**") of $ 36.5 M at a discount rate of 10.0 %. The pre-tax Internal Rate of Return ("**IRR**") is 40.2 % and the payback period is 2.6 years.

The after-tax NPV is $ 23.8 M at a discount rate of 10.0 %. The after-tax IRR is 33.9 % and the payback period is 3.1 years.

Table 22-4 – Project Evaluation Summary – Base Case

Item	Unit	Value
Total Revenue	M CAD	292.0
Total Operating Costs (includes royalty payments)	M CAD	149.9
Initial Capital Costs (excludes Working Capital)	M CAD	13.1
Sustaining Capital Costs	M CAD	3.6
Mine Closure Costs	M CAD	0.7
Total Pre-tax Cash Flow	M CAD	124.6
Pre-tax NPV @ 8 %	M CAD	45.8
Pre-tax NPV @ 10 %	M CAD	36.5
Pre-tax NPV @ 12 %	M CAD	29.4
Pre-tax IRR	%	40.2
Pre-tax Payback Period	Years	2.6
Total After-tax Cash Flow	M CAD	81.3
After-tax NPV @ 8 %	M CAD	29.9
After-tax NPV @ 10 %	M CAD	23.8
After-tax NPV @ 12 %	M CAD	18.9
After-tax IRR	%	33.9
After-tax Payback Period	Years	3.1

Table 22-5 – Cash Flow Statement – Base Case

			2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	
Year			-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
ROM (t)			0	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	200 000	**4 000 000**
Grade (%)				98,50	98,51	98,51	98,51	98,51	98,59	98,59	98,59	98,59	98,59	98,58	98,58	98,58	98,58	98,58	98,67	98,67	98,67	98,67	98,67	**98,59**
Waste (t)			120 158	557 838	555 217	625 765	643 430	667 344	659 970	659 970	659 970	659 970	659 970	456 005	456 005	456 005	456 005	456 005	204 215	204 215	204 215	204 215	204 215	**9 770 702**
Total Material Mined (t)			120 158	757 838	755 217	825 765	843 430	867 344	859 970	859 970	859 970	859 970	859 970	656 005	656 005	656 005	656 005	656 005	404 215	404 215	404 215	404 215	404 215	**13 770 702**
Stripping Ratio (w : o)				2,936	2,922	3,294	3,386	3,512	3,474	3,474	3,474	3,474	3,474	2,400	2,400	2,400	2,400	2,400	1,075	1,075	1,075	1,075	1,075	**2,571**
Mineralisation to Process Plant (t)	Mining Losses (%)	5,0%		190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	190 000	**3 800 000**
	Process Recovery (%)			86,37%	86,26%	86,02%	87,13%	87,02%	86,91%	86,91%	86,91%	86,91%	86,91%	85,78%	85,78%	85,78%	85,78%	85,78%	86,85%	86,85%	86,85%	86,85%	86,85%	86,52%
Total Product Sold (t)				164 107	163 888	163 433	165 553	165 341	165 138	165 138	165 138	165 138	165 138	162 976	162 976	162 976	162 976	162 976	165 008	165 008	165 008	165 008	165 008	**3 287 932**
Total Sales ($)	Average Price – FOB Mine (CAD/t)	88,80		14 572 736	14 553 210	14 512 827	14 701 145	14 682 259	14 664 277	14 664 277	14 664 277	14 664 277	14 664 277	14 472 230	14 472 230	14 472 230	14 472 230	14 472 230	14 652 725	14 652 725	14 652 725	14 652 725	14 652 725	**291 968 331**
Total Revenue ($)	Base Case			14 572 736	14 553 210	14 512 827	14 701 145	14 682 259	14 664 277	14 664 277	14 664 277	14 664 277	14 664 277	14 472 230	14 472 230	14 472 230	14 472 230	14 472 230	14 652 725	14 652 725	14 652 725	14 652 725	14 652 725	291 968 331
Total Revenue ($)	Indexed for Sensitivity			**14 572 736**	**14 553 210**	**14 512 827**	**14 701 145**	**14 682 259**	**14 664 277**	**14 664 277**	**14 664 277**	**14 664 277**	**14 664 277**	**14 472 230**	**14 472 230**	**14 472 230**	**14 472 230**	**14 472 230**	**14 652 725**	**14 652 725**	**14 652 725**	**14 652 725**	**14 652 725**	**291 968 331**
Mining Costs ($)	$/year (see LOM Schedule)			4 181 287	4 319 384	4 551 583	4 686 021	4 963 878	5 186 964	5 186 964	5 186 964	5 186 964	5 186 964	4 207 816	4 207 816	4 207 816	4 207 816	4 207 816	2 865 106	2 865 106	2 865 106	2 865 106	2 865 106	84 001 582
Processing Costs ($)	$/t product	11,05		2 560 500	2 560 500	2 330 450	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	2 100 400	43 158 250
G&A Costs ($)	$/t year	831 155		831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	831 155	16 623 107
Royalty Payments ($)	i) % FOB Mine Sales	2,0%																						
	ii) $/t product sold	0,08		304 583	304 175	303 331	307 267	306 872	306 497	306 497	306 497	306 497	306 497	302 483	302 483	302 483	302 483	302 483	306 255	306 255	306 255	306 255	306 255	6 102 401
Total Operating Costs ($)	Base Case			7 877 525	8 015 215	8 016 520	7 924 844	8 202 306	8 425 016	8 425 016	8 425 016	8 425 016	8 425 016	7 441 854	7 441 854	7 441 854	7 441 854	7 441 854	6 102 916	6 102 916	6 102 916	6 102 916	6 102 916	149 885 340
Total Operating Costs ($)	Indexed for Sensitivity			**7 877 525**	**8 015 215**	**8 016 520**	**7 924 844**	**8 202 306**	**8 425 016**	**8 425 016**	**8 425 016**	**8 425 016**	**8 425 016**	**7 441 854**	**7 441 854**	**7 441 854**	**7 441 854**	**7 441 854**	**6 102 916**	**6 102 916**	**6 102 916**	**6 102 916**	**6 102 916**	**149 885 340**
Operating Profit ($)				**6 695 210**	**6 537 996**	**6 496 307**	**6 776 301**	**6 479 953**	**6 239 261**	**6 239 261**	**6 239 261**	**6 239 261**	**6 239 261**	**7 030 375**	**7 030 375**	**7 030 375**	**7 030 375**	**7 030 375**	**8 549 808**	**8 549 808**	**8 549 808**	**8 549 808**	**8 549 808**	**142 082 991**
Mine Pre-production Capital Expenditure ($)																								
MINE DEVELOPMENT – Pre-stripping			515 478																					515 478
MINE EQUIPMENT			0																					0
CRUSHING			0																					0
PROCESS PLANT			9 096 177																					9 096 177
TAILINGS AND WASTE MANAGEMENT			0																					0
INFRASTRUCTURE			3 498 091																					3 498 091
Total	Base Case		13 109 746																					13 109 746
Total	Indexed for Sensitivity		13 109 746																					13 109 746
Residual Value ($)	Crushing & Process Plant	0,0%																						0
Working Capital ($)	Months of Annual Operating Costs	3,00	1 893 236	34 524	537	-23 903	69 464	55 771	0	0	0	0	-244 787	0	0	0	0	-335 678	0	0	0	0	-1 449 165	0
Sustaining Capital Expenditure ($)																								
General				0	0	3 630 800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 630 800
Total Sustaining Capital Expenditure	Base Case			0	0	3 630 800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 630 800
Total Sustaining Capital Expenditure	Indexed for Sensitivity			0	0	3 630 800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3 630 800
Total Capital Expenditure ($)			**15 002 982**	**34 524**	**537**	**3 606 897**	**69 464**	**55 771**	**0**	**0**	**0**	**0**	**-244 787**	**0**	**0**	**0**	**0**	**-335 678**	**0**	**0**	**0**	**0**	**-1 449 165**	**16 740 546**
Closure Costs ($)			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**733 943**	**733 943**
Federal Corporate Income Tax			0	0	0	0	0	0	0	547 476	745 829	762 128	771 140	857 380	863 601	868 279	871 797	874 442	1 047 756	1 049 173	1 050 241	1 051 047	972 388	12 332 677
Provincial Corporate Income Tax			0	0	0	267 070	567 460	563 659	559 387	574 223	585 543	594 168	598 304	662 433	665 776	668 338	670 297	671 793	804 285	805 094	805 714	806 187	745 777	11 615 508
Quebec Mining Tax			0	275 504	498 504	449 784	617 704	663 897	691 429	735 002	765 503	786 853	822 896	1 110 199	1 121 387	1 129 219	1 134 701	1 138 539	1 518 480	1 520 873	1 522 549	1 523 721	1 319 038	19 345 780
Total Corporate Income and Mining Taxes ($)			**0**	**275 504**	**498 504**	**716 854**	**1 185 164**	**1 227 555**	**1 250 816**	**1 856 702**	**2 096 875**	**2 143 149**	**2 192 340**	**2 630 012**	**2 650 764**	**2 665 836**	**2 676 795**	**2 684 773**	**3 370 520**	**3 375 140**	**3 378 504**	**3 380 955**	**3 037 203**	**43 293 965**
BEFORE-TAX CASH FLOW			**-15 002 982**	**6 660 686**	**6 537 458**	**2 889 410**	**6 706 837**	**6 424 182**	**6 239 261**	**6 239 261**	**6 239 261**	**6 239 261**	**6 484 048**	**7 030 375**	**7 030 375**	**7 030 375**	**7 030 375**	**7 366 053**	**8 549 808**	**8 549 808**	**8 549 808**	**8 549 808**	**9 265 031**	**124 608 502**
Cumulative B-T CF			-15 002 982	-8 342 296	-1 804 837	1 084 573	7 791 410	14 215 591	20 454 852	26 694 113	32 933 374	39 172 635	45 656 683	52 687 059	59 717 434	66 747 809	73 778 185	81 144 238	89 694 046	98 243 855	106 793 663	115 343 471	124 608 502	
Payback period work area			1,00	1,00	1,00	0,62	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	0,00	0,00	0,00	
AFTER-TAX CASH FLOW			**-15 002 982**	**6 385 182**	**6 038 954**	**2 172 556**	**5 521 673**	**5 196 627**	**4 988 445**	**4 382 559**	**4 142 386**	**4 096 112**	**4 291 708**	**4 400 363**	**4 379 611**	**4 364 539**	**4 353 580**	**4 681 279**	**5 179 288**	**5 174 668**	**5 171 305**	**5 168 853**	**6 227 827**	**81 314 536**
Cumulative A-T CF			-15 002 982	-8 617 799	-2 578 845	-406 289	5 115 384	10 312 011	15 300 456	19 683 015	23 825 401	27 921 514	32 213 222	36 613 585	40 993 196	45 357 736	49 711 316	54 392 595	59 571 883	64 746 551	69 917 856	75 086 709	81 314 536	
Payback period work area			1,00	1,00	1,00	1,00	0,07	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	0,00	0,00	

FINANCIAL INDICATORS				
Pre Tax				
Payback Period (years)			**2,6**	
Total Cash Flow ($)			**124 608 502**	
Net Present Value ($)	Discount Rate	8,0%	**45 791 792**	
Net Present Value ($)	Discount Rate	10,0%	**36 542 153**	
Net Present Value ($)	Discount Rate	12,0%	**29 363 133**	
Internal Rate of Return			**40,2%**	
After Tax				Effective Tax Rates
Payback Period (years)			**3,1**	
Total CashFlow ($)			**81 314 536**	34,7%
Net Present Value ($)	Discount Rate	8,0%	**29 916 564**	34,7%
Net Present Value ($)	Discount Rate	10,0%	**23 757 305**	35,0%
Net Present Value ($)	Discount Rate	12,0%	**18 937 866**	35,5%
Internal Rate of Return			**33,9%**	

22.3 Sensitivity Analysis

A sensitivity analysis was carried out, with the base case described above as a starting point, to assess the impact of changes in total pre-production capital expenditure ("**CAPEX**"), operating costs ("**OPEX**") and product price ("**PRICE**") on the Project's NPV @ 10.0 % and IRR. Each variable was examined one-at-a-time. An interval of ±30 % with increments of 10.0 % was used for the three (3) variables.

The before-tax results of the sensitivity analysis, as shown in Figure 22-2 and Figure 22-3, indicate that, within the limits of accuracy of the cost estimates in this Study, the Project's before-tax viability does not seem significantly vulnerable to the under-estimation of capital and operating costs, taken one at-a-time. As seen in Figure 22-2, the NPV is more sensitive to variations in Opex than Capex, as shown by the steeper slope of the Opex curve. As expected, the NPV is most sensitive to variations in price. The NPV becomes marginal at the lower limit of the price interval examined.

The sensitivity of the Project's economic indicators to the USD/CAD exchange rate has not been explicitly determined. However, it can be stated that this sensitivity is just as important as that of the product price, because the exchange rate and the product price are both factors used in the determination of revenue. It is to be noted that the sensitivity of the Project to the USD/CAD exchange rate is inverse of that of the product price, i.e., as the exchange rate increases towards parity, the Project's profitability is reduced.

Figure 22-2 – Pre-tax NPV10 %: Sensitivity to Capital Expenditure, Operating Cost and Price

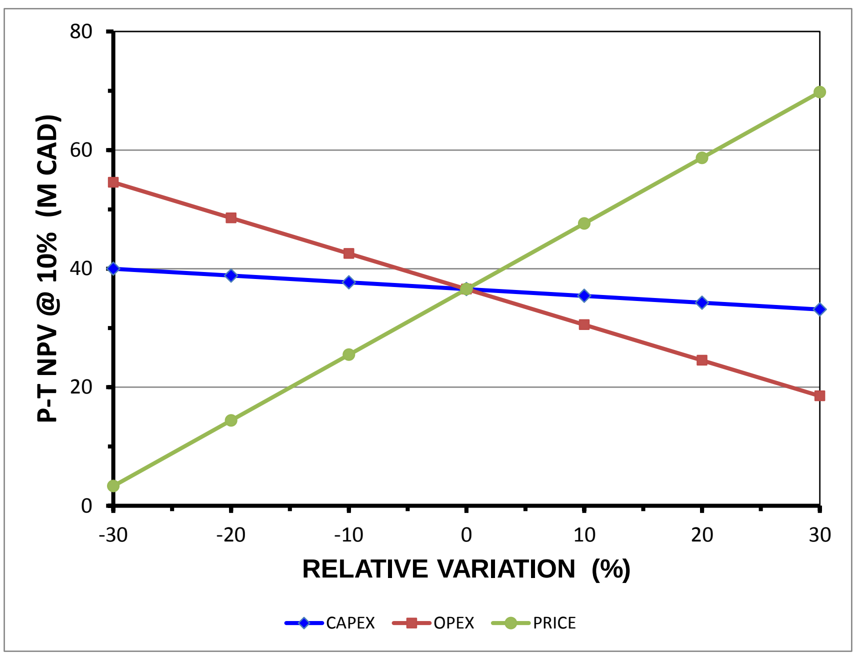
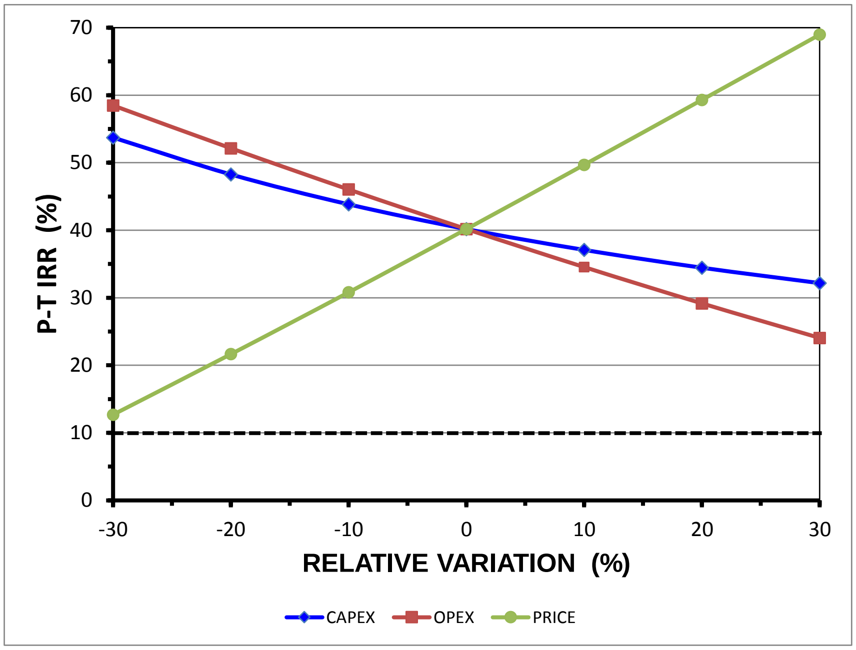


Figure 22-3, showing variations in internal rate of return, provides the same conclusions. The horizontal dashed line represents the base case discount rate of 10%.

Figure 22-3 – Pre-tax IRR: Sensitivity to Capital Expenditure, Operating Cost and Price



The same conclusions can be made from the after-tax results of the sensitivity analysis as shown in Figure 22-4 and Figure 22-5.

Figure 22-4 indicates that the Project's after-tax viability is mostly vulnerable to a price forecast reduction, while being less affected by the under-estimation of capital and operating costs. The NPV becomes marginal at the lower limit of the price interval examined. Break-even conditions (i.e., a net present value of zero) are obtained at an average selling price of about $61 per tonne of silica product (variation of -31 % from base case price).

Figure 22-4 – After-tax NPV10 %: Sensitivity to Capital Expenditure, Operating Cost and Price

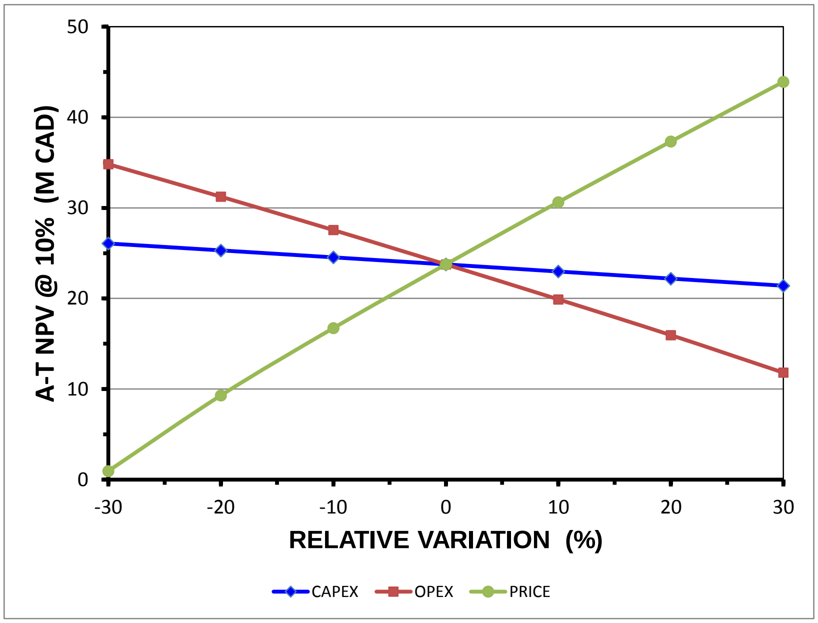
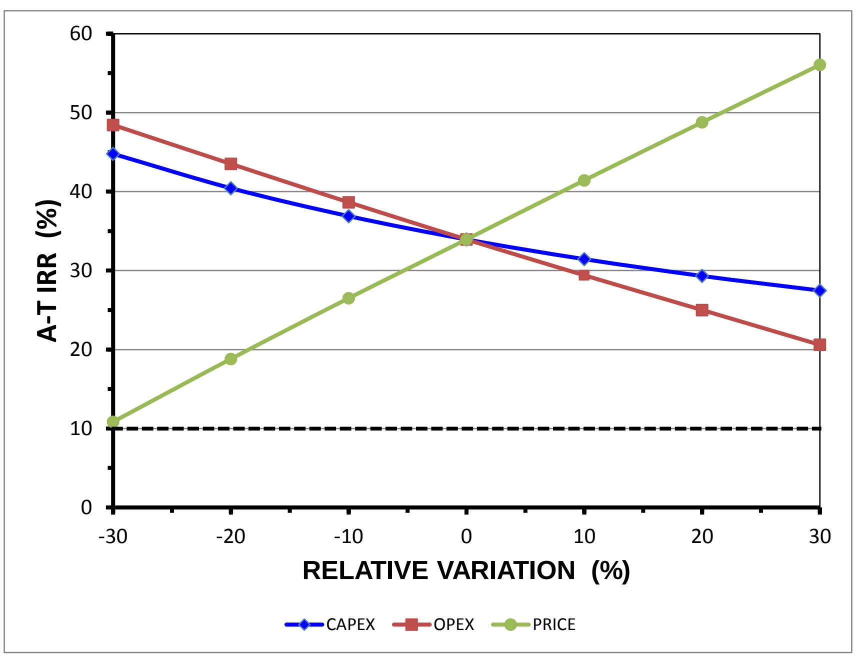


Figure 22-5, showing variations in internal rate of return, provides the same conclusions.

Figure 22-5 – After-tax IRR: Sensitivity to Capital Expenditure, Operating Cost and Price



22.4 Important Caution Regarding the Economic Analysis

The economic analysis contained in this report is preliminary in nature. It incorporates inferred mineral resources that are considered too geologically speculative to have the economic considerations applied to them that would enable them to be categorized as mineral reserves. It should not be considered a prefeasibility or feasibility study. There can be no certainty that the estimates contained in this report will be realized. In addition, mineral resources that are not mineral reserves do not have demonstrated economic viability.

23.0 ADJACENT PROPERTIES

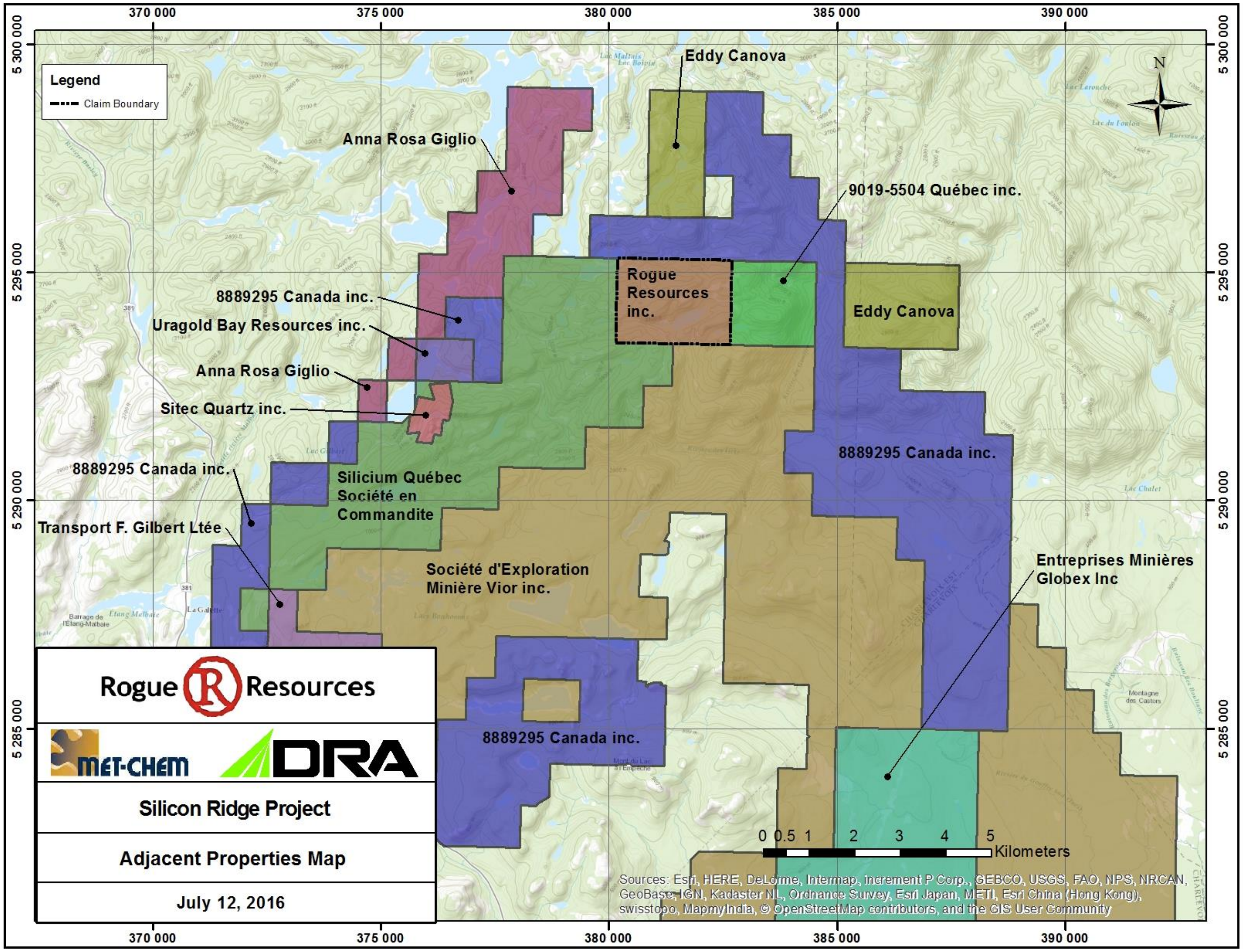
The Property is surrounded by claims on all sides (Figure 23-1) and the claims having a common side with the Property are registered under the names of:

- 9019-5504 Québec inc., (Holdings company incorporated in 1995) on the east;
- Société d'exploration Minière Vior inc. on the south (eastern claims);
- Sitec Quartz Inc. on the south (western claims) and the west;
- 888295 Canada Inc. on the north (incorporated in the Province of Ontario in 2014).

The reader is advised that the information provided in this Section is publicly disclosed, derived from an Internet search and is mostly drawn from the Registry of Ministère des Ressources Naturelles (GESTIM) and various published maps and reports.

The Qualified Person has not attempted to verify the data and results. The presence of quartzite units in adjacent properties is not necessarily indicative of the mineralization on the Property that is subject of the present Technical Report.

Figure 23-1 Map of Adjacent Mineral Properties



24.0 OTHER RELEVANT DATA AND INFORMATION

24.1 Project Implementation Schedule

A preliminary project implementation schedule was prepared to illustrate the main engineering, procurement and construction activities that are required for the project. The information contained in this schedule is derived from information taken from supplier's quotes or in-house database. The schedule presents the total duration of the project considering the advance study work required to develop a «Basic Engineering» construction cost budget in time for a 2017 construction schedule.

According to the preliminary permitting schedule, it is assumed that a decision on the Certificate of Authorization as per the Québec's Environment Quality Act could be expected end of Q1-2017.

Long lead delivery process equipment and manufacturing capacity for specific type of equipment such as mineral sorting equipment, drum scrubber, screens were considered in the preparation of the implementation schedule (see Table 24-1).

Emphasis should be made on:

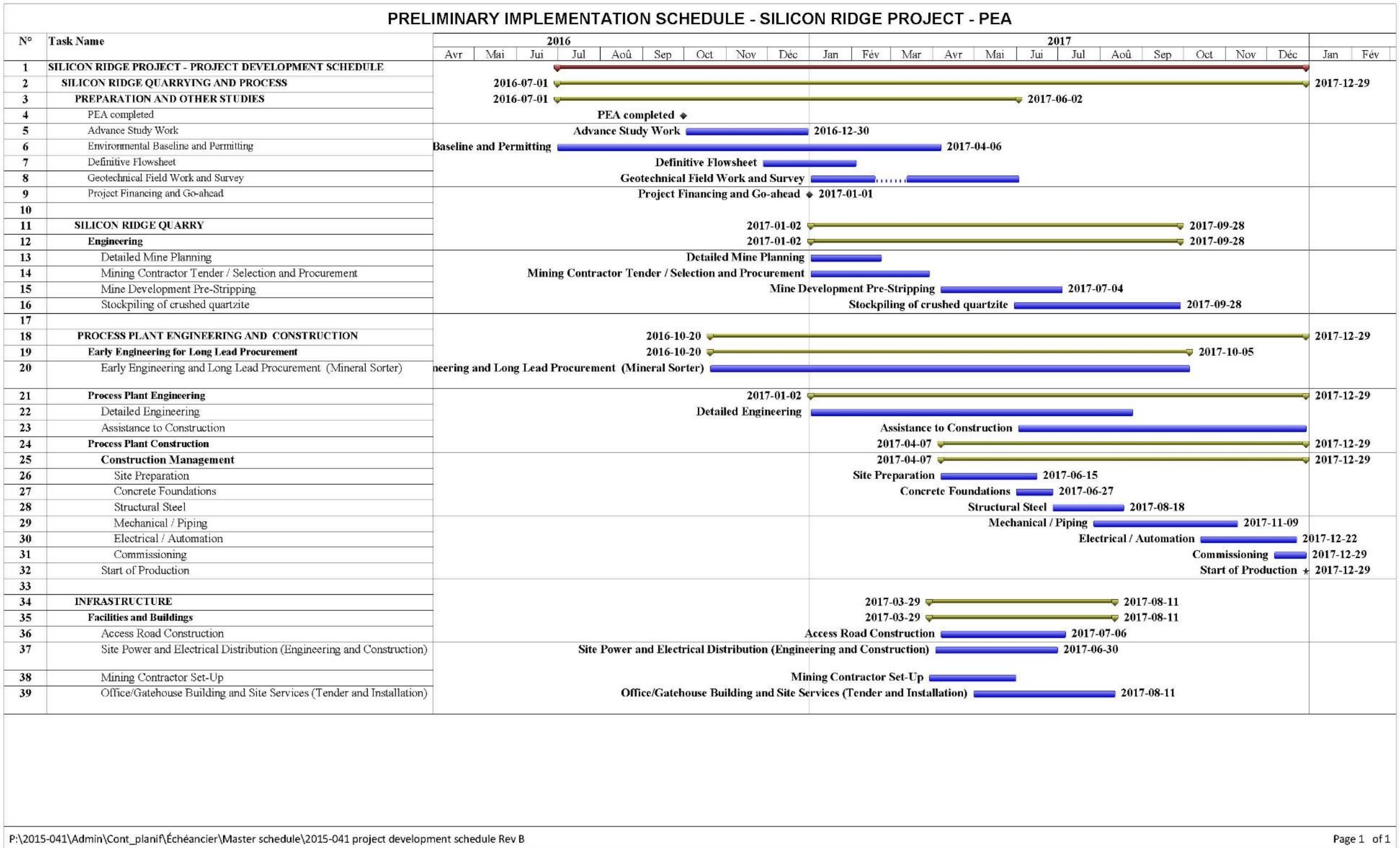
- Timely reception of environmental permitting;
- Advanced procurement of long lead process equipment;
- Infrastructure and site preparation engineering to satisfy the pre-stripping and construction phases.

Table 24-1 – Process Equipment Lead Delivery Time

Equipment	Lead Delivery time (weeks)
Optical Sorters	32
Thickener	20
Drum Scrubber	14
Triple Deck Screen	14
Bagging System	12

The preliminary project implementation schedule presented in Figure 24-1 has been prepared for the project with the information available to date.

Figure 24-1 Preliminary Project Implementation Schedule



25.0 INTERPRETATION AND CONCLUSIONS

25.1 Geology

In 2014, Rogue initiated the first modern and integrated exploration programs on its Silicon Ridge Property in Quebec. Mapping, trenching and sampling of the quartzite units, followed by an airborne Magnetic-VLF survey allowed to delineate the quartzite units with their internal sub-units and to define the contacts with the paragneiss. The exploration results lead Rogue to select the “G” and “H” units as the most promising to be tested by diamond drilling.

The drill holes into the “G” unit are largely on 50 m spacing and are 100 m distant over the “H” unit, with two or more holes per section. The drill hole collars and the hole deviation were surveyed, as well as the trench location.

Several holes, including large-diameter holes, were drilled to collect material for metallurgical tests. The field and core quartzite samples were used for chemical analysis and metallurgical testing.

All core was logged and sampled in a single drill program, which generated a homogeneous data set. Ample details were collected by the geologists, including photographic records of the core, detailed structural and preliminary geotechnical measurements made possible since the entire core was oriented.

The database has been validated at different stages and Met-Chem found the final version to be free from major or systematic errors that would significantly affect the resource estimate.

Whole rock analysis by XRF on all samples and trace elements by ICP on selected holes provided complete data on the quality of the quartzite. Specific gravity measurements were also performed by the laboratory.

The very high silica content and the very low levels of impurities in the quartzite are close to the high and low detection limits of the analytical method, in a range outside of the linearity (concentration versus assay measurement) of the analytical procedure.

The QA-QC system enforced by Rogue included Blank, Standard and Duplicate samples inserted in sufficient frequency. The relatively low variability of the analyses of the Standard, in view of the values close to the detection limits, is an indication of acceptable precision. However, the systematic bias observed in the results shows that the use of non-certified standards can only detect the more noticeable problems (sample swaps, large discrepancies) but cannot be used to monitor accuracy of the laboratory.

No spurious values were noted in the assay results from the blank samples, which indicates no mis-sequencing of the samples.

A generally good correlation exists between the original and second assays of the paired duplicate samples, and the same pattern was observed in the check samples independently collected by Met-Chem.

Although Rogue does not systematically use a secondary laboratory, a significant number of project or control samples that returned unexpected results were re-analyzed. As expected, a lower variability was observed in the re-analysis of pulp sample pairs, as compared to the coarse rejects duplicates, which is one example that attests to the good performance of the laboratory.

While constructing the 3D geological solids, the main shear zone in the SW portion of the "G" unit was manually left out of the quartzite domains using solid boundaries. Fairly continuous and parallel secondary shears were later isolated by applying the cut-offs on the geological model. These steps were followed in order to prevent smearing between domains containing quartzite that meet all the cut-offs and domains that do not. Finally, the blocks were constrained by the cutoffs to delineate the resources within the 3D solids.

The cut-off grades for the crucial quality elements used for the resources estimate were selected on the basis of the preliminary metallurgical tests completed by ANZAPLAN, an expert in industrial minerals, with a strong background in silica projects.

The Inverse Distance Weighting Squared method was selected for grade interpolation. Although this is a non-geostatistical method, directional variograms were generated and used to determine the search ellipsoid parameters that would allow for possible anisotropy in the deposits.

The resources categories were defined on the basis of reliability and adequacy of the data set and of the geological interpretation of the quartzite units, as well as on the continuity of the structure and grades within the deposits, the latter supported by variography study. The modelling and resource estimates completed by Met-Chem rely on the results from 71 diamond drill holes and from surface channel samples.

The mineral resource is contained in quartzite units arranged as large-scale anticlines and synclines and show good continuity defined by mapping and drilling. The resource estimate includes three (3) zones referred to as the South West, North East ("G" unit) and Centre North ("H" unit) zones. The mineral resource estimate includes a pit constrained measured and indicated resource of 9.7 million tonnes grading 98.60% SiO_2 and an inferred resource of 4.6 Mt grading 98.64% SiO_2.

Core handling and data capture were done in a professional manner and in accordance with the industry best practice guidelines.

Based on discussions with Rogue personnel and observations during the site visits of August and November 2015, Met-Chem concluded that the drill program was well planned, the geology descriptions and the sampling are well done. Three drill holes were drilled down dip cutting across the quartzites at shallow angles and this was due to topographic constraints and drill collars were positioned in such a manner as to obtain a most southwesterly quartzite intersection. Additionally one drill hole was drilled down dip and vertically into the middle of the southwest quartzite and another drill hole was drilled down dip and vertically into the middle of the northeast zone, both verifying the down dip extension of the quartzite. Met-Chem agrees with the correlations of the mineralized zones between holes and between sections. The quartzite exposed and sampled in the trenches located on drill sections provided excellent control on the attitude and quality of the quartzite.

Although the performance of the QC samples has not been outstanding because of the concentrations of elements approaching the detection limits, Met-Chem believes that, globally, the analytical results used in the resource estimation reflects the quality of the quartzite, as regarding the silica and impurities contents. It is important to note that the possible risk associated with this slight variability is mitigated by the process that has been shown by ANZAPLAN to achieve significant reduction of the content of impurities in the mineralized material.

This Technical Report presents the results of Met-Chem's estimation of the in pit mineral resource within the "G" and "H" quartzite units on the Silicon Ridge Property. The DTM from a photogrammetric survey was used for the resources and the pit design. The resource estimate follows the guidelines of NI 43-101 (2011) and of the CIM Standard on Mineral Resources and Reserves (2014).

Met-Chem believes the data used in the resource estimate for the ‘G” and “H” units is sufficiently reliable and complete to serve in a resources estimate that adequately reflects the geological and grade continuity of the quartzite units within the boundaries of the block model.

25.2 PEA

A seasonal quarry operation based on contractors operating five (5) days per week, twelve (12) hours per day, six (6) months of the year during the warmer seasons was considered for the Project. The contractor would be responsible to provide crushed mineralized material (-120 mm) to the plant or to the crushed material stockpiles when the quarry is not operating. The mine production schedule was developed based on a 20 years pit shell. This schedule includes a pre-production phase of one (1) year which is required for overburden stripping, road construction and pit development. During this period, 120,000 tonnes of overburden will be mined. Further study of the overburden depth over the proposed quarry will be carried out to confirm the pre-production overburden stripping requirements and subsequent length of the pre-production phase.

The processing plant has a nominal capacity to process 190,000 tonnes per year of run of mine to produce approximately 160,000 tonnes per year of silica concentrate, with the potential to process up to a design capacity of 310,000 tonnes per year. A suitable process flowsheet includes scrubbing, mineral sorting, regrind and rejects thickening.

In addition to quarrying and processing, infrastructure and services have been added to complete the investment cost of the project.

The total life of mine capital cost, at an accuracy level of ± 35%, is estimated at $17,475,000 of which $13,110,000 is initial capital and $4,365,000 is sustaining capital. The sustaining capital cost includes $3,631,000 to cover for the installation of the 25kV power line in Year 3 and related substation (no government or utility subsidies were assumed) as well as $734,000 for closure and rehabilitation of the site in Year 20. Future detailed mine plan will assess potential for continuous rehabilitation throughout the quarry’s life.

The life of mine average operating cost estimate is evaluated at $37.84 per tonne of feed. Mine closure and rehabilitation cost have been estimated at $734,000.

The economic analysis of the project has demonstrated the potential viability of the project with recommendations to proceed to next level of Feasibility studies. At an average sale price of silica product of $88.80/tonne (FOB Silicon Ridge), the financial results indicate a pre-tax Net Present Values (NPV) of $ 36.5 M at a discount rate of 10%. The pre-tax Internal Rate of Return is 40.2% with a payback period of 2.6 years. The after-tax Net Present Values are $ 23.8 M at a discount rate of 10%. The after-tax Internal Rate of Return is 33.9% and the payback period is 3.1 years.

26.0 RECOMMENDATIONS

Considering the positive results of the PEA, Met-Chem recommends that the project continues to the next phase of development with a Feasibility Study. Met-Chem recommends a series of additional studies and tests to advance to the next phase and minimize risks. The main recommendations include:

- Complete overburden depth survey over proposed SW Pit location and estimate volume of overburden to be stockpiled during quarrying operation;
- Update Project Schedule with information provided by overburden depth survey;
- Complete market analysis of potential end users and further contacts with clients;
- In order to develop and firm up a construction budget estimate based on some pre-owned equipment, efforts should be made in identifying the suppliers and securing the equipment;
- Add diamond drill holes in the portions of the deposit hosting the Inferred Resources, to improve grades estimates, upgrade the related blocks and firm up the resources in the higher categories. Based on the 20 years pit shell Met-Chem has determined that the additional drilling will consist in seven (7) short drill holes totalizing 700 m and three (3) trenches totalizing 150 m
- In future drilling programs:
  - Only use commercial certified reference materials;
  - Standardize and simplify the rock codes for easier handling and plotting; a large number of combinations of quartzite code with various qualifiers was found in the master database.
- Perform a series of in situ density determination by the immersion method on quartzite samples for which an S.G. was measured by pycnometry and calculate a regression between the immersion and the existing pycnometer results. It is expected that 100 tests will be sufficient to define the correlation between the two datasets. The objective of this work is to allow a quantification of the effect of the secondary porosity (permeability) in order to provide a better estimate of tonnes;
- Perform in situ density determination on about 50 waste samples, for future economic study and mine planning purposes;
- Perform rock mechanics as well as hydrogeological studies to further confirm rock slopes, rock permeability, ground and underground water flows and water balance in order to validate the open pit mining technical parameters.

- Evaluate the requirements of condemnation drilling for the Silicon Ridge Project mine site and infrastructure location (waste rocks disposal area, industrial site, fines storage area, etc.);
- Carry out soil geotechnics fieldwork and testing in order to provide foundations design parameters and determination of mechanical properties beneath infrastructure.

The estimated cost for the next study phase is provided in Table 26-1.

Table 26-1 – Next Phase Estimated Costs

Activity	Estimated Costs (CAN$)
Pit Slope and Geotechnical Work	75,000
Advance Study Work / FS	400,000
TOTAL	475,000

27.0 REFERENCES

ANZAPLAN; Untitled; Subject: Microscopic Pre-Investigation of Two Thin sections of Quartzite under the Polarizing Microscope; undated.

Geologica Groupe-Conseil Inc.; NI 43-101 Technical Report on the Lac De la Grosse Femelle Silica Property, November 19, 2014.

Guy Tremblay; Étude des Déformations du Metaquartzite de la Galette, du Comté Charlevoix, Université du Québec à Chicoutimi; Mémoire Présenté a l'université du Quebec à Chicoutimi Comme Exigence Partielle de la Maîtrise en Sciences de la Terre; Mai 1984.

Met-Chem a division of DRA Americas, NI 43-101 – Technical Report on the Silicon Ridge Mineral Resources, June 7, 2016.

Roskill Consulting Group Ltd., Rogue Resources Potential Customers for Rogue Resources silica, June 2016.

Roskill Information Services Ltd., Silicon and Ferrosilicon: Global Industry Markets and Outlook, Fourteenth Edition, 2014.

WSP. 2016. Charlevoix Silica Project - Caractérisation de l’eau de surface et des cours d’eau à fort potentiel d’habitat du poisson dans le cadre du projet d’exploitation d’un gisement de silice. Rapport de WSP à Rogue Ressources Inc. 17 pages et annexes.

WSP. 2015. Charlevoix Silica Project – Identification of Environmental Issues related to the Development of a Silica Deposit. WSP report for Rogue Resources. 17 p. and appendices.