Lupin Mines Incorporated

(a subsidiary of Elgin Mining Inc.)

January 31, 2016

Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

To whom it may concern,

RE: 2015 Annual Geotechnical Inspection – Lupin Mine Tailings Containment Area, Nunavut
Lupin Mine, Nunavut, License Number 2AM-LUP1520

Please accept this cover letter with plan and timelines to implement the engineer's recommendations. The 2015 Lupin Geotechnical Inspection Report, completed by SRK Consulting, to fulfil part E, item 6 (i) of our water licence was submitted to the Nunavut Water Board in 2015.

SRK makes the following general recommendations:

1. Keep the water in Cell 5 as low as operable,
2. Keep the water in Pond 2 below the riprap armouring along the toe of Dams M and K,
3. In consultation with the Engineer-of-Record (EOR) initiate an emergency construction of a toe buttress at Dam M as priority, then Dam K,
4. Initiate a consultation with the EOR on a detailed investigation for the potential failure mode(s) in Dams M and K,
5. Monitoring and repair the animal burrow activities in Dam K,
6. Monitoring and repair the erosion in Dam L, and
7. Monitoring and surveillance the physical conditions and stability for Dam N.

LMI should carry out inspections during summer season where practical to include the following:

- Monitoring of seepage flowrates at Dam 2,
- Monitoring of any potential seepage from Dam 4,
- Recording the water levels in Ponds 1 and 2 and Cells 3 and 5,
- General surface erosion and anomalies on dams,
- Monitoring of ground animal burrow activities ,
- Observe the physical condition of Dam N, and;
- Monitoring of tension cracks in Dam M and Dam K.
- Observations and findings from site inspections should be included in the annual inspection records.

The water in Cell 5 has been lowered during the 2015 season as recommended.

The water in Pond 2 is currently below the riprap armouring along the toe of Dams M and K as recommended.

During the 2016 season LMI will consultant with the Engineer-of-Record (EOR) to initiate an emergency construction of a toe buttress at Dam M as priority, then Dam K; and initiate a consultation with the EOR on a detailed investigation for the potential failure mode(s) in Dams M and K.

During the 2016 season LMI will monitor Dam K to track the animal burrow activities; monitor and repair the erosion in Dam L; and monitor and surveillance the physical conditions and stability for Dam N.

LMI will carry out inspections during the 2016 season, where practical, to include the following:

- Monitoring of seepage flowrates at Dam 2,
- Monitoring of any potential seepage from Dam 4,
- Recording the water levels in Ponds 1 and 2 and Cells 3 and 5,
- General surface erosion and anomalies on dams,
- Monitoring of ground animal burrow activities ,
- Observe the physical condition of Dam N, and;
- Monitoring of tension cracks in Dam M and Dam K.
- Observations and findings from site inspections should be included in the annual inspection records.

There are no issues requiring immediate attention identified in the report. The erosional issues identified in the report will be addressed in the 2016 summer season.

If you have any questions regarding the above, please do not hesitate to contact me.

Sincerely,

Lupin Mines Incorporated.

"Karyn Lewis"

Karyn Lewis

2015 Annual Geotechnical Inspection – Lupin Mine Tailings Containment Area, Nunavut

Prepared for

Lupin Mines Incorporated

Prepared by

SRK Consulting (Canada) Inc.
1CL008.002
October 2015

2015 Annual Geotechnical Inspection – Lupin Mine Tailings Containment Area, Nunavut

October 2015

Prepared for

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Project No: 1CL008.002

File Name: Lupin_1CL008 002_2015 Annual Inspection Report_AT_PMH_20151009_FNL.docx

srk consulting

Table of Contents

List of Figures

List of Tables

Appendicies

1 Introduction

The Lupin Mine site is currently under care and maintenance status and at the time of the inspection was operating under expired Nunavut Water Licence 2AM-LUP0914 (NWB 2009) by Lupin Mines Incorporated (LMI), a wholly-owned indirect subsidiary of Elgin Mining Inc. On October 5, 2015 the Minister of the Aboriginal Affairs and Northern affairs approved the renewed and amended Type A water licence, 2AM_LUP1520.

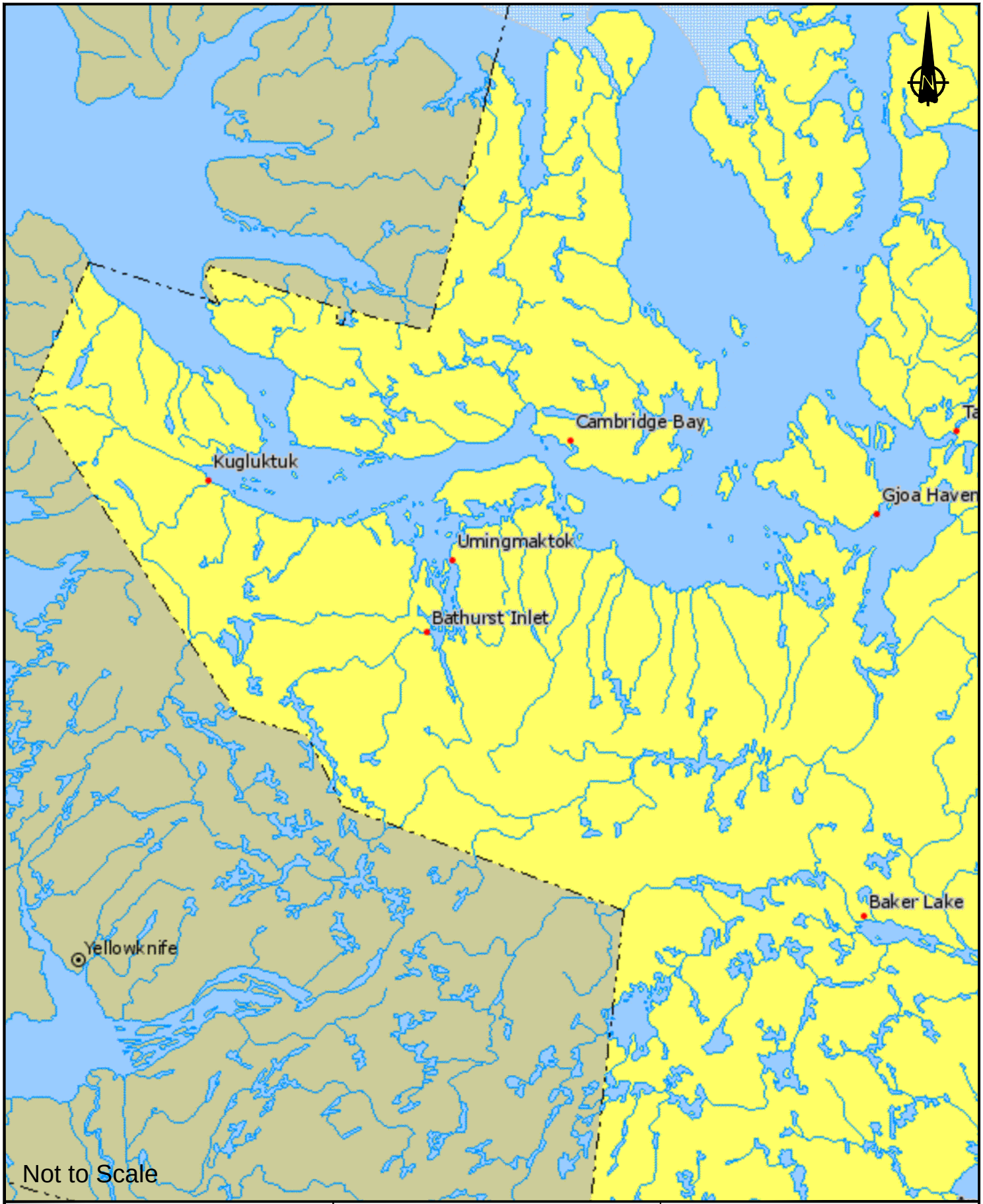
The mine is located on the west shore of Contwoyto Lake, approximately 285 km southeast of Kugluktuk, Nunavut and 400 km northeast of Yellowknife (Figure 1-1). As a part of the Water Licence requirement, an annual geotechnical inspection is required for the tailings containment area (TCA) perimeter dams, TCA Covers, including an assessment of any seepage from the TCA (NWB 2009). In fulfillment of the regulatory requirements, LMI has retained SRK Consulting (Canada) Inc. to conduct the 2015 geotechnical site inspection. Part E Item 6 of expired water licence (NWB 2009) applies to the inspection and stipulates the following:

"*Clause E.6. The TCA shall be constructed, operated and maintained to engineering standards such that:*

a. A freeboard limit of 1.0 m shall be maintain at all times or as recommended by a Geotechnical Engineer and as approved by the Nunavut Water Board (the Board) in writing;
b. Seepage from the TCA is minimized;
c. Any seepage that occurs is collected and returned immediately to the TCA;
d. Erosion of constructed facilities is addressed immediately;
e. The solids fraction of the mill Tailings shall be permanently contained within the TCA or underground as Backfill;
f. Weekly inspections of the dam(s), Tailings line(s), and catchment basin(s) shall be carried out and records of these inspections shall be kept for review upon the request of an Inspector, or as otherwise approved by the Board. More frequent inspections shall be performed at the request of an Inspector; and
g. *An inspection of the TCA shall be carried out annually during ice free, open water conditions by a Geotechnical Engineer. The Engineer's report shall be submitted to the Board within sixty (60) days following the inspection and shall include a covering letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations*."

This report summarizes SRK's observations of the TCA's condition and our recommendations. Previous annual inspections and closure planning reports on record, available to the author included:

- Inspections from 2012-2014 by SRK Consulting,
- Inspections from 2009-2011 by TBT Engineering Consulting Group,
- Inspections from 1997, 2000-2008 by BGC Engineering and Golder Associates,
- TCA closure design reports by Holubec Consulting and Klohn-Crippen and
- The 2004 Dam Safety Review of the perimeter tailings dams performed by Golder Associates.



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Lupin Mine Inc.

LUPIN MINE

Location Plan

SRK JOB NO.: 1CL008.000

FILE NAME: Lupin-SiteFacil-utm-12_ATedits_RevD_09092017.dwg

Lupin Mine Incorporated

DATE:	APPROVED:	FIGURE:
Sept 2015	AT	1.1

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2 Site Conditions

2.1 History of the Lupin TCA

A brief summary of the development history of the TCA is listed in Table 2-1. A detailed history of the Tailings Containment Area (TCA) is provided in the closure plan prepared by Holubec Consulting Inc. in 2005 (Holubec 2005).

Table 2-1: Lupin Mine TCA Development Historical Summary

Year	Comment
1960	Ore deposit discovered by Canadian Nickel Company Ltd.
1980	Property purchased by Echo Bay Mines Ltd.
1981	TCA developed by the construction of Dam 1A and Dam 2.
1982	Mining operations commenced in October and tailings slurry discharged from the northern edge of the TCA into future Cell 5. Dam 3 constructed.
1985	Tailings management strategy revised and tailings deposited within cells. Excess water from the cells is directed into two ponds in series within the TCA prior to discharge. Internal Dam 3C and Dam J constructed.
1988	Covering of tailings in parts of Cell 1 with gravelly sand commenced.
1990	Internal Dam K constructed and Cell 4 provides an additional clarification pond.
1992	Perimeter Dam 4, Dam 5 and Dam 6 and internal Dam L and Dam M constructed.
1995	Reminder of Cell 1 and parts of Cell 2 were covered.
1997	Internal Dam N constructed.
1998	Production stopped and site placed on care and maintenance in January.
2000	Production resumed in April. Dam M raised.
2002	Echo Bay Mines Ltd., TVX Gold and Kinross Gold Corp. merged and Kinross assumed control of operations.
2003	Site placed on care and maintenance in August. Parts of Cell 3 were covered.
2004	Production resumed between March and December. Reminder of Cell 2 was covered. Parts of Cell 3 were covered.
2005	Closure of operation announced in February and site placed on care and maintenance. Parts of Cell 3 and 5 were covered. The small cell formed by Dam N was covered.
2006	Ownership is purchased by LMI, a subsidiary of Wolfden Resources.
2007	Wolfden Resources acquired by Zinifex Ltd.
2008	Zinifex Ltd. merged with Oxiana Ltd. to form OZ Minerals Ltd.
2009	Canadian assets of OZ Minerals sold to China Minmetals Ltd. MMG Resources Inc., a wholly owned subsidiary of Minerals and Metals Group Ltd., was the Canadian operating company set up after that transaction to hold the Lupin Mine.
2011	Ownership of LMI purchased by Elgin Mining Inc. in July.
2014	Elgin Mining Inc. acquired by Mandalay Resources Corp.

About 84% of the tailings areas are covered with at least 1 m of sand/gravel (Holubec 2006). The property has remained in care and maintenance since 2005 and no tailings has been produced since then, nor has the remaining exposed tailings been covered.

2.2 Site Infrastructures

Because of its isolated location, the mine site was constructed to be totally self-sufficient, with all (then) operations and (now) maintenance personnel housed on site. The only year-round access to the site is via aircraft. Historically, the mine was annually resupplied in bulk via a 570 km ice-road from Tibbitt Lake during February and March.

The Lupin Mine site (Figure 2-1) consists of two major areas: an industrial complex and the TCA. The industrial complex consists of the administration buildings, mill, maintenance shops, fuel tank farms, camp buildings, and the airstrip (Figure 2-2). The 2015 waste management facilities geotechnical inspection focused on facilities at the industrial complex and is reported separately.

The 2015 TCA geotechnical inspection focused on the terms stipulated by the expired water licence 2AM-LUP0914 (NWB 2009). The TCA is located approximately 6 km south of the industrial complex, and is divided into two main components: five solid retention cells and two settling ponds in series (Figure 2-3). The TCA is characterized by six main perimeter dams and nine internal dams for cell separation. The perimeter dams consist of Dams 1A, 1B, 1C, and Dams 2 to 6. The dams range in height from 1-8 m. The nine internal dams consist of Dams 3C, 3D and 3E, and Dams J thru N. Internal dams range from 5.7-11.2 m in height. All dams are constructed from esker sands and gravels, with the perimeter dam including a liner for seepage control. All perimeter dams are frozen core structures founded on permafrost.

The care and maintenance procedures for water management at the TCA have runoff flowing from Cell 3 to Cell 4, where solids settle out prior to the water flowing to Pond 1. It is assumed water flows from Cell 4 to Pond 1, via a gated culvert and trench. Water in Pond 1 is then transferred by siphon to Pond 2 for clarification and settling and, if needed, treatment, prior to discharge to the environment. Water in Cell 5 is siphoned to Pond 1 as needed for water management. Prior to discharge by siphon from Pond 2 to the environment the quality of water is tested for pH, metals and toxicity to rainbow trout and *Daphnia* species.

2.3 Dam Classifications

According to the Canadian Dam Association (CDA) guideline (Table 2-2), the perimeter Dams 1A, 1B, 1C, and Dams 2 to 6 are classified as “Significant” as there is no population at risk, no significant loss or deterioration of fish or wildlife habitat in the immediate impact areas and no losses to recreational facilities, workplace or transportation routes. The nine internal Dams 3C, 3D and 3E and Dams J thru N are classified as “Low” as no loss of life and external environmental losses are expected (Golder 2004).

Table 2-2: Dam Classifications as per CDA (2007, Revised 2013)

Dam Class	Population at Risk[1]	Incremental losses		
		Loss of Life[2]	Environmental and Cultural Values	Infrastructure and Economics
Low	None	0	Minimal short-term loss No long-term loss	Low economic losses; area contains limited infrastructure or services
Significant	Temporary only	Unspecified	No significant loss or deterioration of fish or wildlife habitat Loss of marginal habitat only Restoration or compensation in kind highly possible	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes
High	Permanent	10 or fewer	Significant loss or deterioration of *important* fish or wildlife habitat Restoration or compensation in kind highly possible	High economic losses affection infrastructure, public transportation, and commercial facilities
Very high	Permanent	100 or fewer	Significant loss or deterioration of *critical* fish or wildlife habitat Restoration or compensation in kind possible but impractical	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities for dangerous substances)
Extreme	Permanent	More than 100	Major loss of *critical* fish or wildlife habitat Restoration or compensation in kind impossible	Extreme losses affecting critical infrastructure or services (e.g., hospital, major industrial complex, major storage facilities for dangerous substances)

[1] Definitions for population at risk:

None—There is no identifiable population at risk, so there is no possibility of loss of life other than through unforeseeable misadventure.

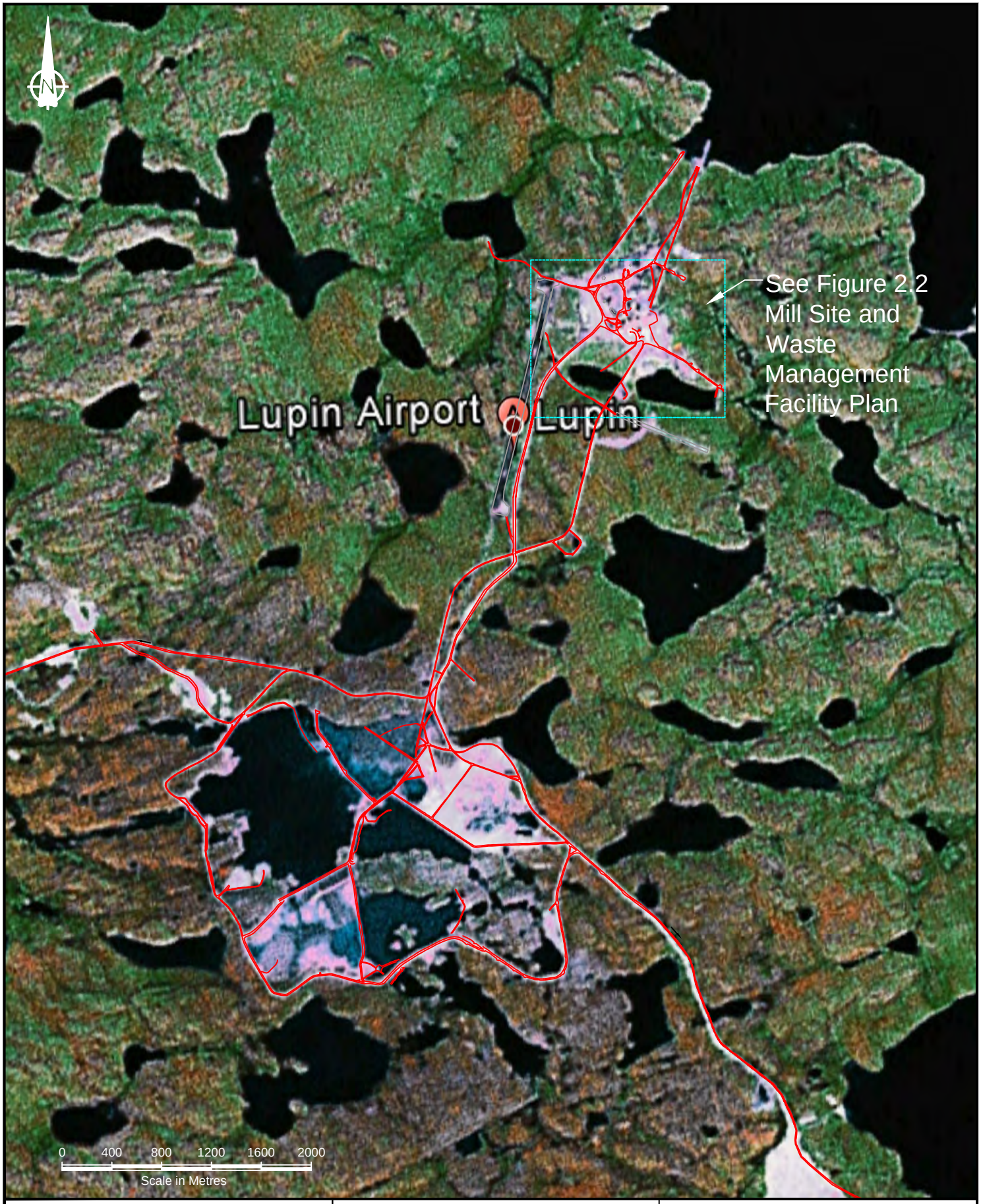
Temporary—People are only temporarily in the dam-breach inundation zone (e.g., seasonal cottage use, passing through on transportation routes, participating in recreational activities).

Permanent—The population at risk is ordinarily located in the dam-breach inundation zone (e.g., as permanent residents); three consequence classes (high, very high, extreme) are proposed to allow for more detailed estimates of potential loss of life (to assist in decision-making if the appropriate analysis is carried out).

[2] Implications for loss of life:

Unspecified – The appropriate level of safety required at a dam where people are temporarily at risk depends on the number of people, the exposure time, the nature of their activity, and other conditions. A higher class could be appropriate, depending on the requirements. However, the design flood requirement, for example, might not be higher if the temporary population is not likely to be present during the flood season.

The classifications of these dams do not require an Emergency Preparedness Plan (EPP) or a dam break inundation study.



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Lupin Mine Inc.

LUPIN MINE

General Site Plan

SRK JOB NO.: 1CL008.000

FILE NAME: Lupin-SiteFacil-utm-12_ATedits_RevD_09092017.dwg

Lupin Mine Incorporated

DATE:	APPROVED:	FIGURE:
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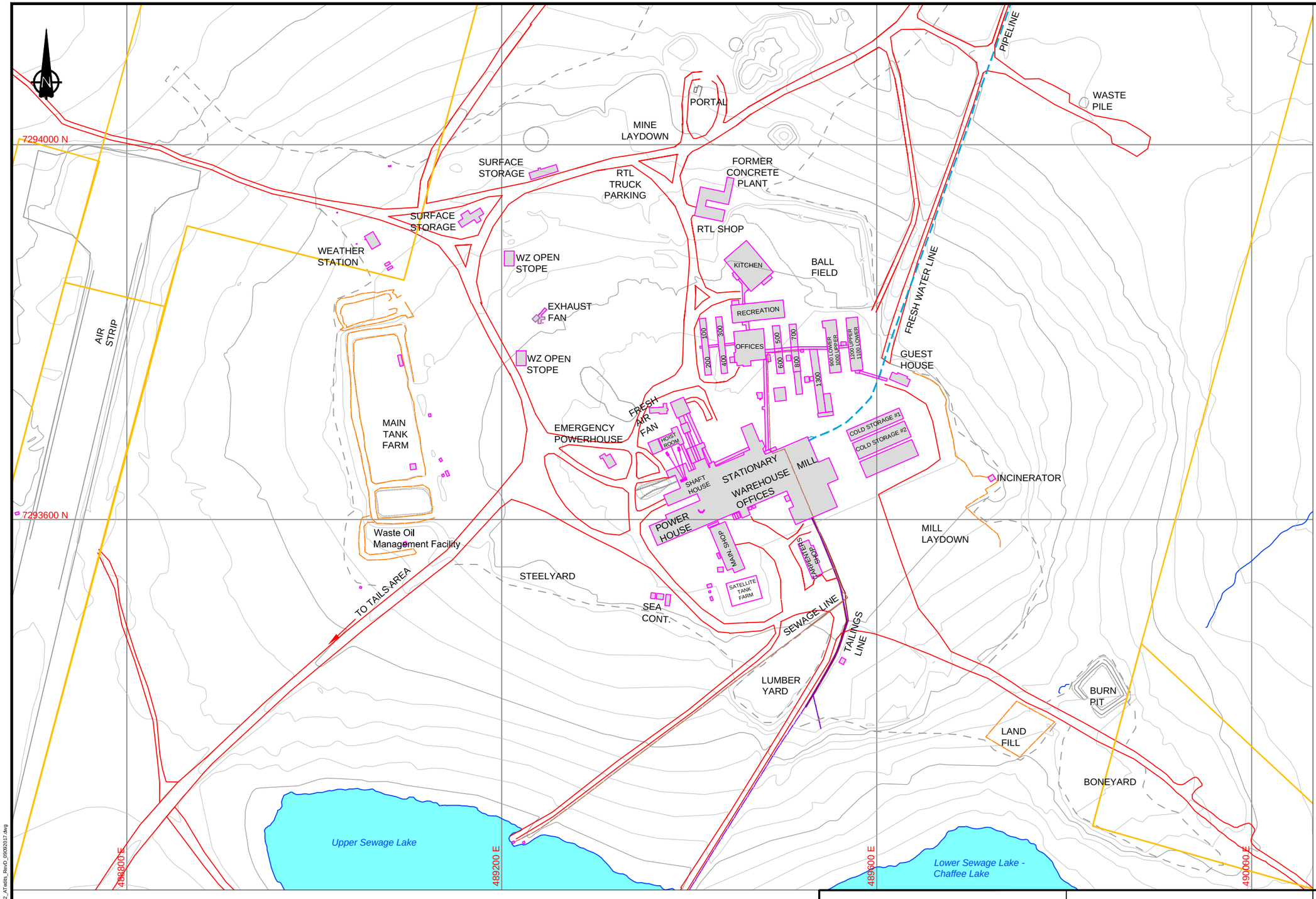

LEGEND

- Lake Pond
- Tank Farm Berm Outline
- Building
- Water Pipeline (8 in Diam) (Not in Use)
- Tailings Line Route (Not in Use)
- Sewage Pipeline (6 in Diam) (Not in Use)
- Lake Shore, Drainage
- Contour 1 m
- Contour 5 m
- Roads
- Site Features Miscellaneous
- Cleared Area
- Berm Area
- Slope Toe
- Slope Top
- Culvert
- Fence

NOTES

1. Topographic information and facilities outline provided by Lupin Mine Inc. on August 13, 2012.

0 40 80 120 160 200

Scale in Metres

Coordinate System: Nad_1983_UTM_Zone_12N
NTS Map Sheets 076E11 and 076E14

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SRK JOB NO.: 1CL008.000

FILE NAME: Lupin-SiteFacil-utm-12_ATedits_RevD_09092017.dwg

Lupin Mine Inc.

Lupin Mine Incorporated

LUPIN MINE

Mill Site and Support Facility Plan

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September 2015		2.2

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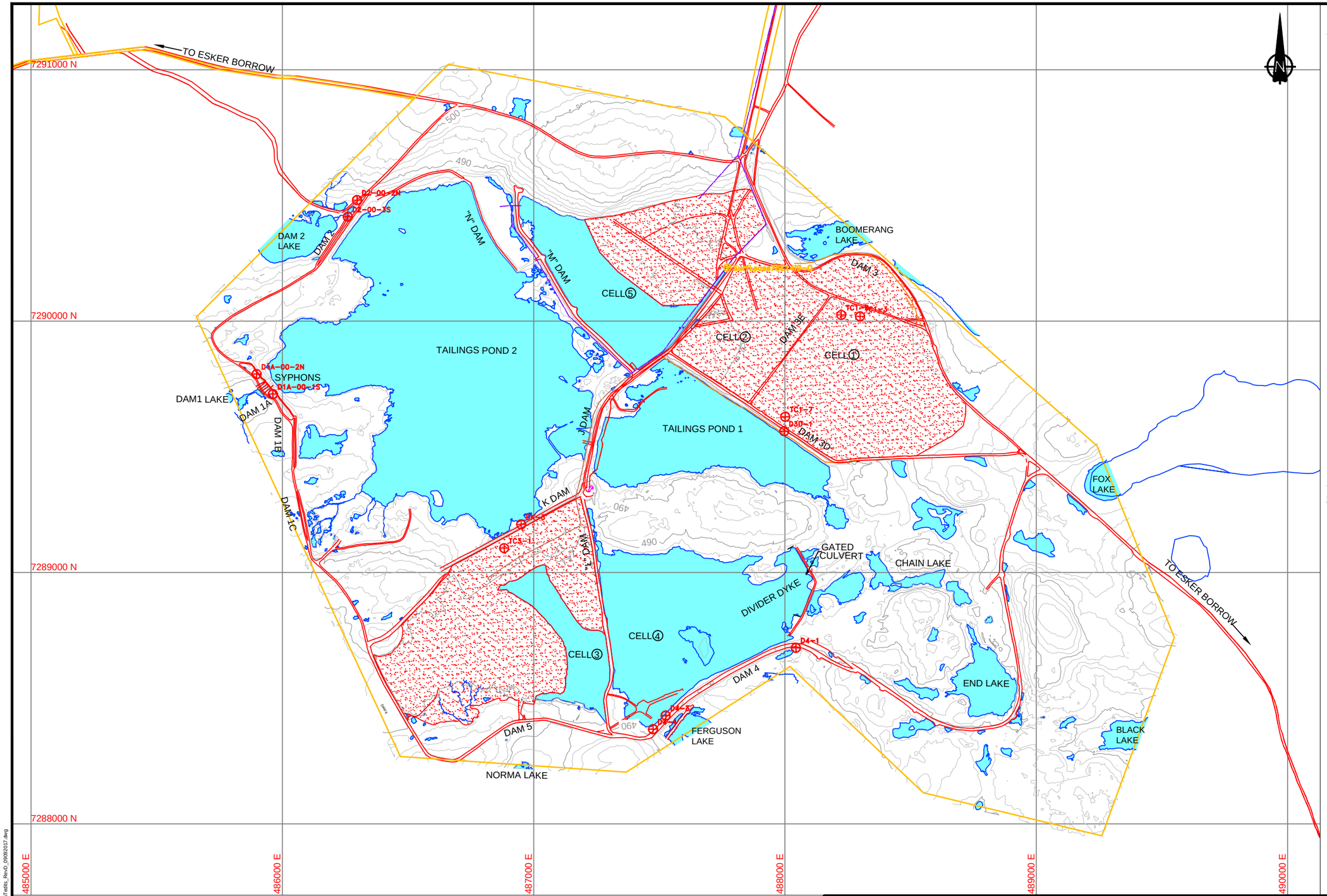

LEGEND

- Water Body
- Granular Tailings Cover
- Lease Boundary
- Lake Shore, Drainage
- Tailings Line Route (Not in Use)
- Contour 1 m
- Contour 5 m
- Roads
- Berm Area
- Thermistor
- Cells

NOTES

1. Topographic information and facilities outline provided by Lupin Mine Inc. on August 13, 2012.

0 100 200 300 400 500

Scale in Metres

Coordinate System: Nad_1983_UTM_Zone_12N
NTS Map Sheets 076E11 and 076E14

srk consulting

SRK JOB NO.: —

FILE NAME: Lupin–SiteFacil–utm–12_ATedits_RevD_09092017.dwg

Lupin Mine Inc.

Lupin Mine Incorporated

LUPIN MINE

Tailings Containment Area

DATE:	APPROVED:	FIGURE:
September 2015		2.3

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2.4 Climate

Climate conditions were recorded at the Lupin manned weather station until October 2006. An automated weather station known as Lupin (MAPS) (CWIJ) in Weather Underground database, or Lupin CS Climate ID 230N002 in Environment Canada database, has recorded data intermittently at the site. Reviewing the data from the end of October 2006 to the present, the station has reported an arctic climate with a mean annual temperature of -9.8°C. Winter is considered to last from October to May and summer is considered to last from June to September. The average summer daily temperature is 7.6°C and the average winter daily temperature is -19.2°C. There are persistent winds at an annual mean of 17.4 km/h and gusts up to 95.0 km/h. Measured site precipitation is reported at an annual mean of around 405 mm. The data does not breakdown the precipitation into rain and snow (WU 2015).

2.5 Site Geology

The Lupin gold deposit is situated in an Archean metaturbidite sequence of the Contwoyto Formation, part of the Yellowknife Supergroup of supracrustal metasedimentary and metavolcanic rocks of the Slave Geologic Province. The rocks have been subjected to both regional and contact metamorphism and to several phases of deformation and intrusion.

The Contwoyto Lake area lies within the Upland unit of the Kazan physiographic region of the Canadian Shield. The area was glaciated during the Pleistocene Epoch. Isostatic rebound after ice melt resulted in emergent landforms, and during this process all parts of the land were washed by runoff and lakes. The easily erodible glaciolacustrine sediment, till and glacio-fluvial sand and gravels were subsequently reworked by melts and runoff. This has resulted in the present day outcrops with thin soil veneers, abandoned beaches and esker formations (Kinross 2005).

Tailings are primarily composed of the gangue minerals amphibole and quartz, which account for over 80% of the volume. Pyrrhotite and arsenopyrite make up an additional 17% (Klohn-Crippen 1995). The tailings have been shown through various studies to be capable of generating acid upon oxidation (Kinross 2005).

2.6 Permafrost and Dam Geotechnical Conditions

The area is completely within Canada's cold continuous permafrost region. The active layer is observed to be somewhat variable between the depths of 1.3-3.1 m based on available data. There has been long-term discontinuous monitoring of the permafrost conditions in dams at the Lupin TCA since 1995. The recordings are made by thermistors installed in various dam and cover locations. While a number of thermistors are defunct and others have suffered physical damages, there are sufficient operating thermistors that are read regularly during inspections. They continue to show the presence of permafrost through the dams and foundations. While there are some fluctuations in recorded ground temperature readings, the 2015 reading are within the record limits.

3 TCA Inspection

3.1 General

Mr Alvin Tong, PEng, a Senior Consultant with SRK, conducted the geotechnical inspection on 5th and 19th August, 2015. After a general overview of the site from the air, the detailed site inspection was carried out using ground transportation with frequent stops for thorough visual inspections. Mr Patrick Downey and Ms. Karyn Lewis, LMI representatives, accompanied SRK on the inspection on 19 August 2015.

Weather conditions during the inspection were cool and sunny with periods of high winds. A detailed photographic log of the inspection is included in Appendix A.

Generally, the inspection revealed the perimeter dams are in good condition with the exception of the erosion damage on Dam 3, which was repaired this season after the inspection. Tension cracks were observed on the crests of the internal Dam K and M. Minor erosion was observed on all the inspected dams. Dam N was submerged at the time of inspection.

The Divider Dyke is located east of Cell 4 and southeast of Pond 1. This structure was not included as part of the annual inspection as it was not designed or intended to contain tailings.

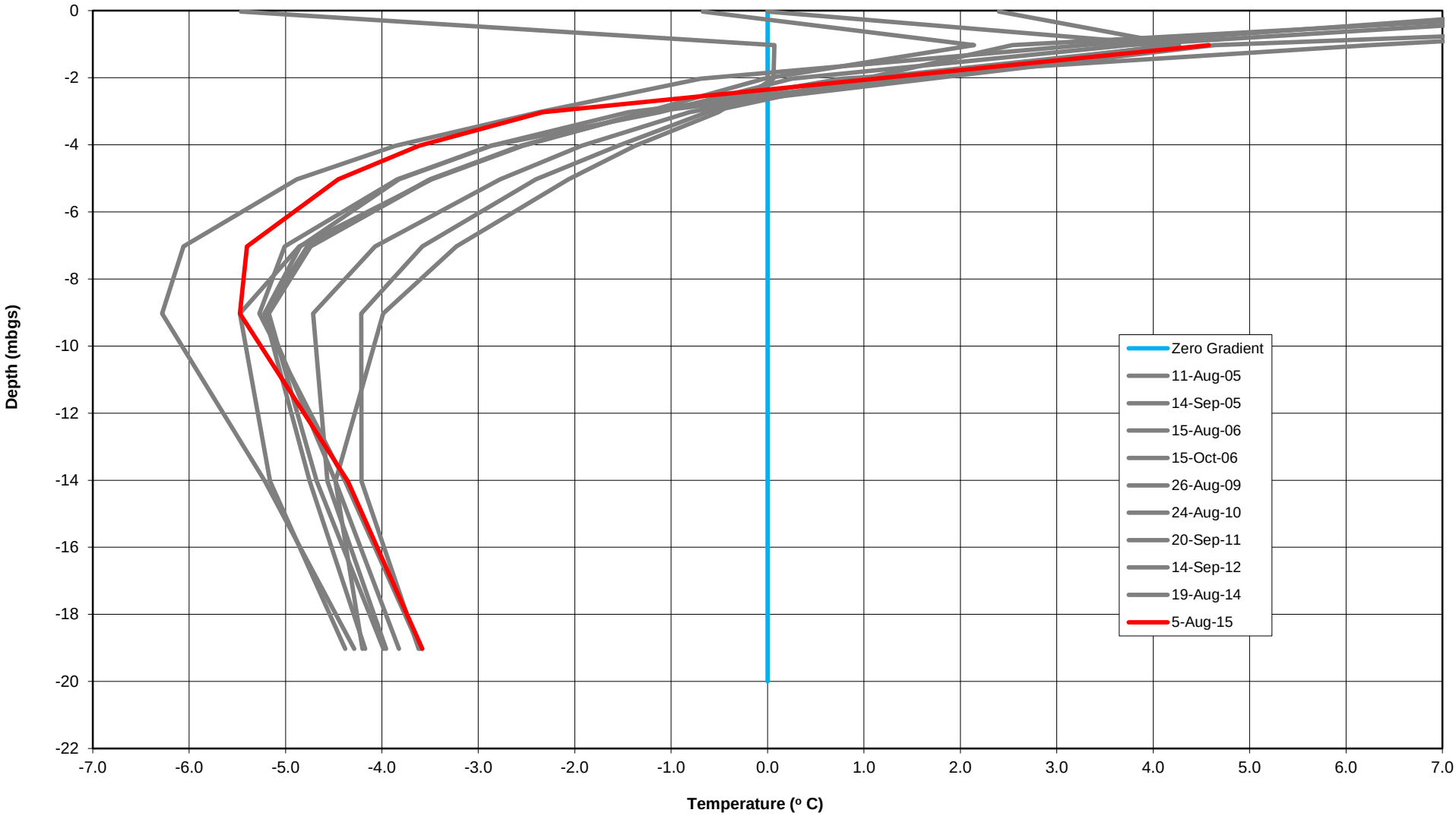
Since our inspection, LMI has siphoned Cell 5 to lowest point possible allowed by the siphon pipes. LMI provided photographs showing the results of the siphon operation. At the time of writing this report LMI was currently discharging from Pond 2 to lower the water level.

3.2 Thermistors

Figure 2-3 presents the locations of five functioning TCA thermistors that were installed between 1995 and 2004. In addition to the thermistor strings shown, there are a number of historical thermistor installations that are no longer functional. Furthermore, only thermistor data recorded after production and deposition of tailings ended in 2005 are presented in this document, as this data best reflects the current care and maintenance status. To provide a point of reference, selected data from August to October are shown for comparison.

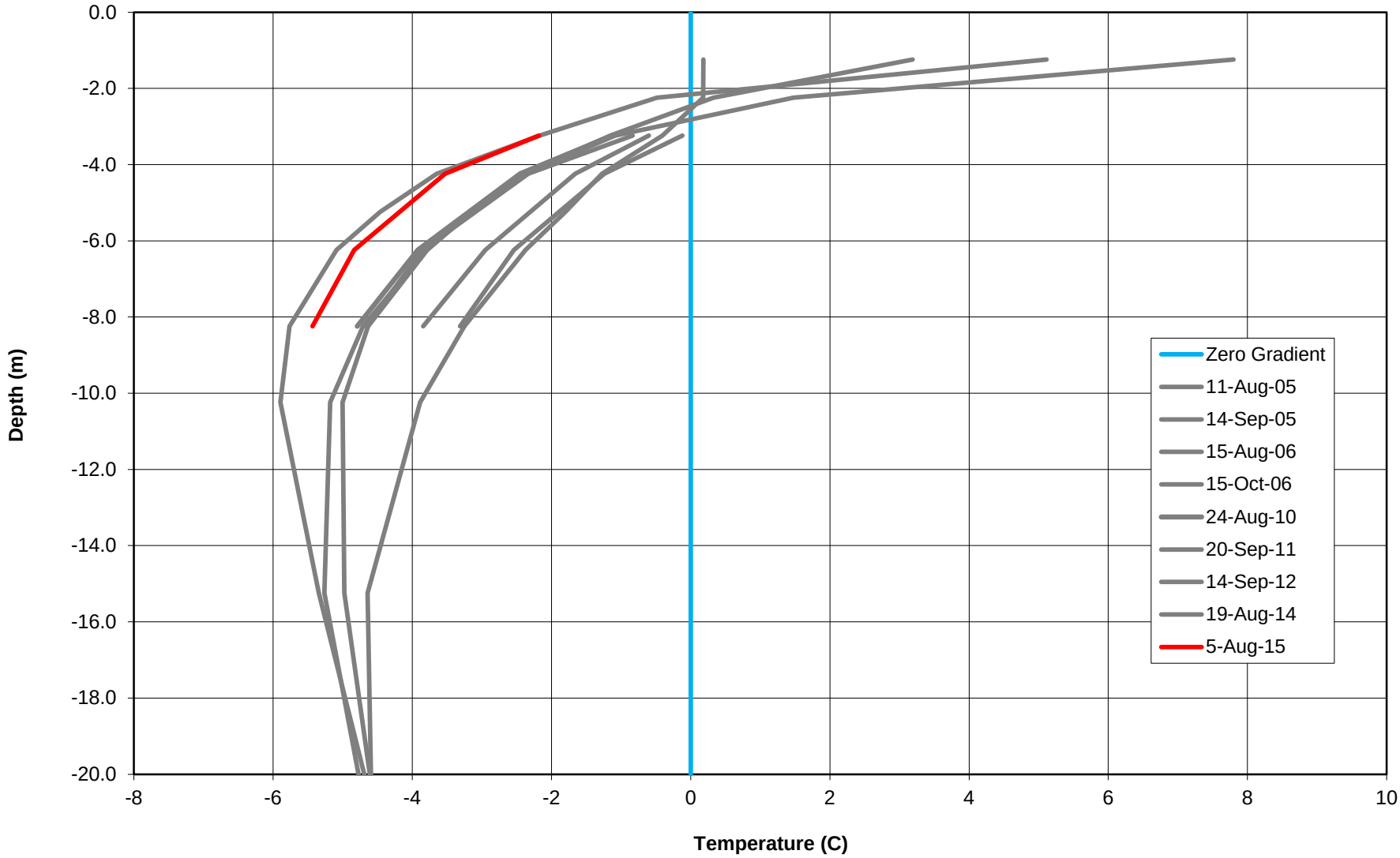
In the TCA, all five of the thermistors are less than 20 m deep. Based on the data between 2005 and 2015, taking into account annual climatic variations, the 2015 readings are within the historical variations. The largest historical variation in the given data set of 4°C occurs in Dam 3D, at approximately 4 m below the dam crest. This variation occurs below -1°C; and the 0°C gradient occurs at approximately 3 m below the surface. This concurs with the regional active zone based on in-house information and national research (Penner 1983). These records indicate the frozen cores in the majority of the dams are within the seasonal limits and visual physical inspection support the conclusion that permafrost is not degrading in most of the structures. Figure 3-1 to Figure 3-7 show the thermistor data read during summer periods from 2005-2015.

Thermistor D1A-00-01 - Installed November 9, 2000
(Vertical Thermistor installed on the crest of Dam 1A, south of Syphons)



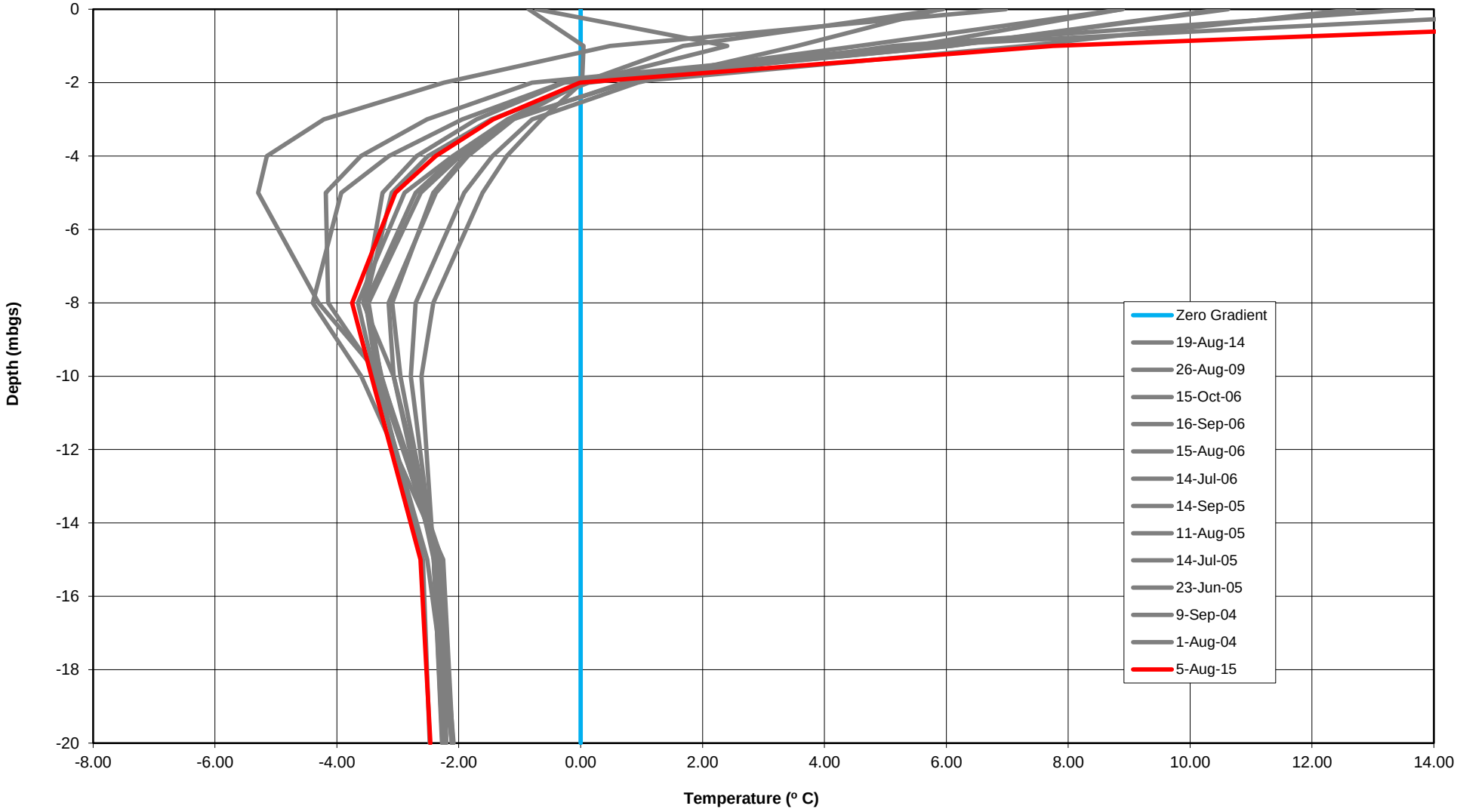
srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading D1A-00-01
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-1**

Thermistor D2-00-2 n- Installed November 8, 2000
(Vertical Termistor Installed on the crest of Dam 2, at the north end)



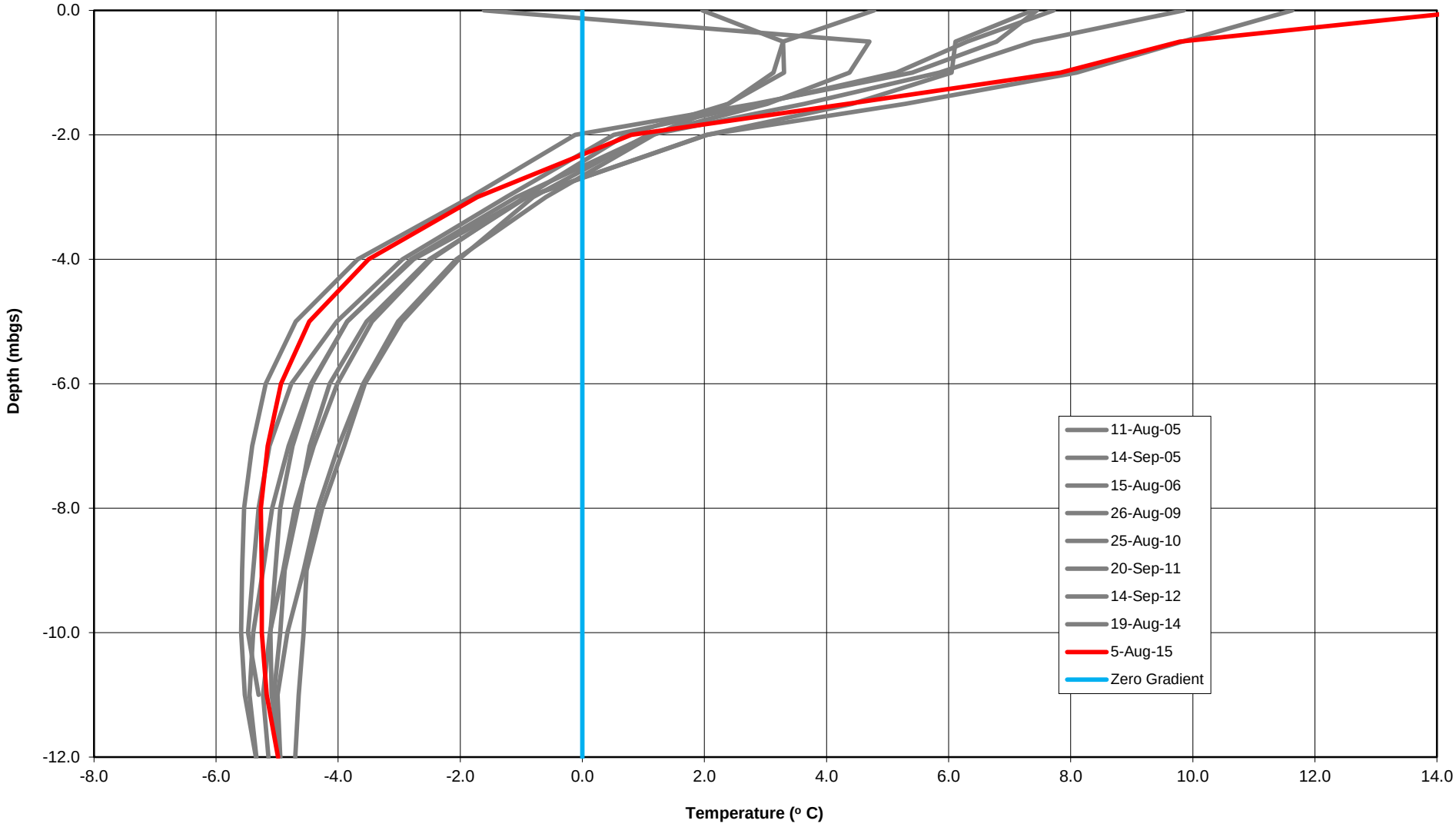
srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading D2-00-02
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-2**

Thermistor D3D-1 - Installed June 13, 2004
(Vertical Thermistor installed on the crest of Dam 3, near middle)



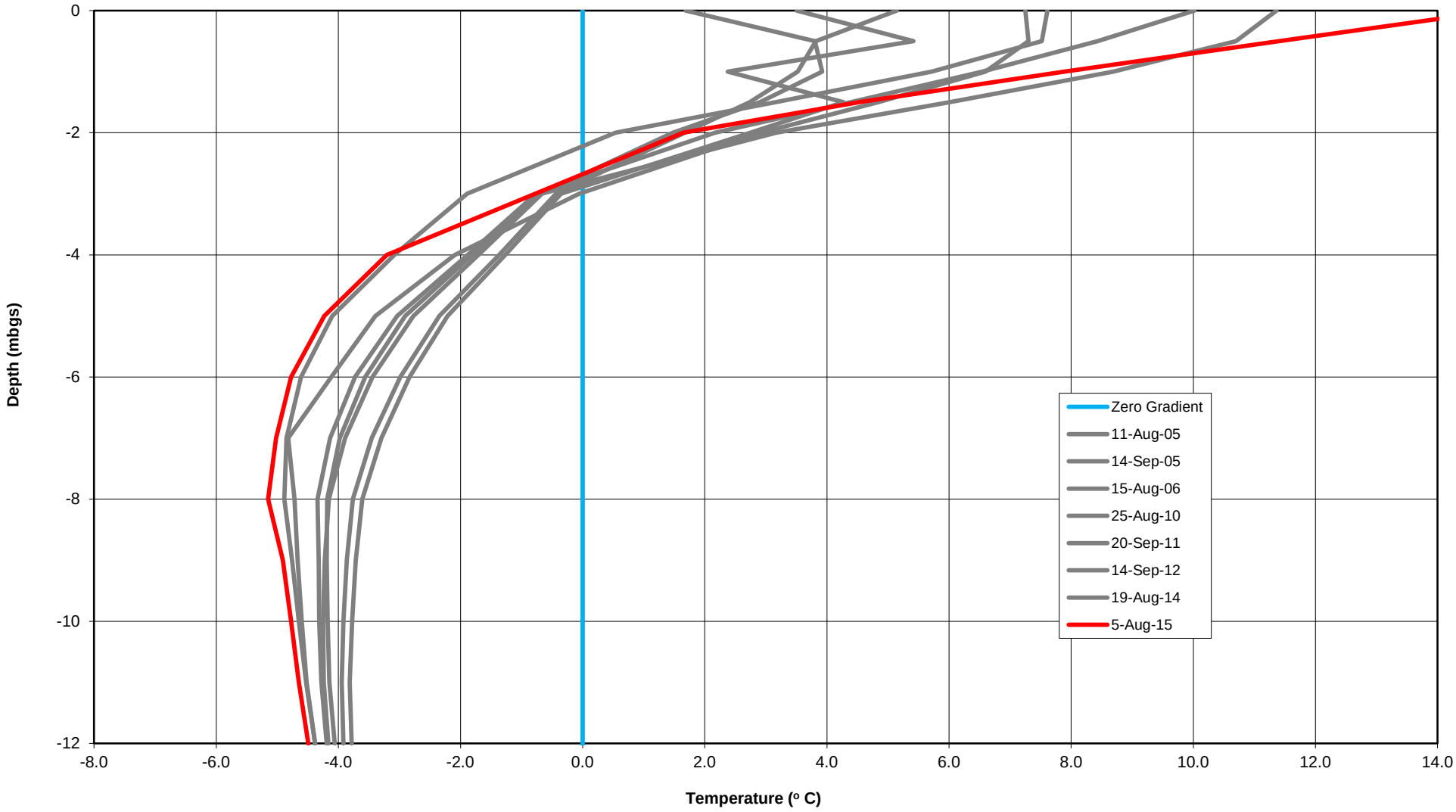
srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading D3D-1
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-3**

Thermistor D4-1 - Installed October 24, 1995
(Vertical Thermistor installed on the crest of Dam 4, Far East End)



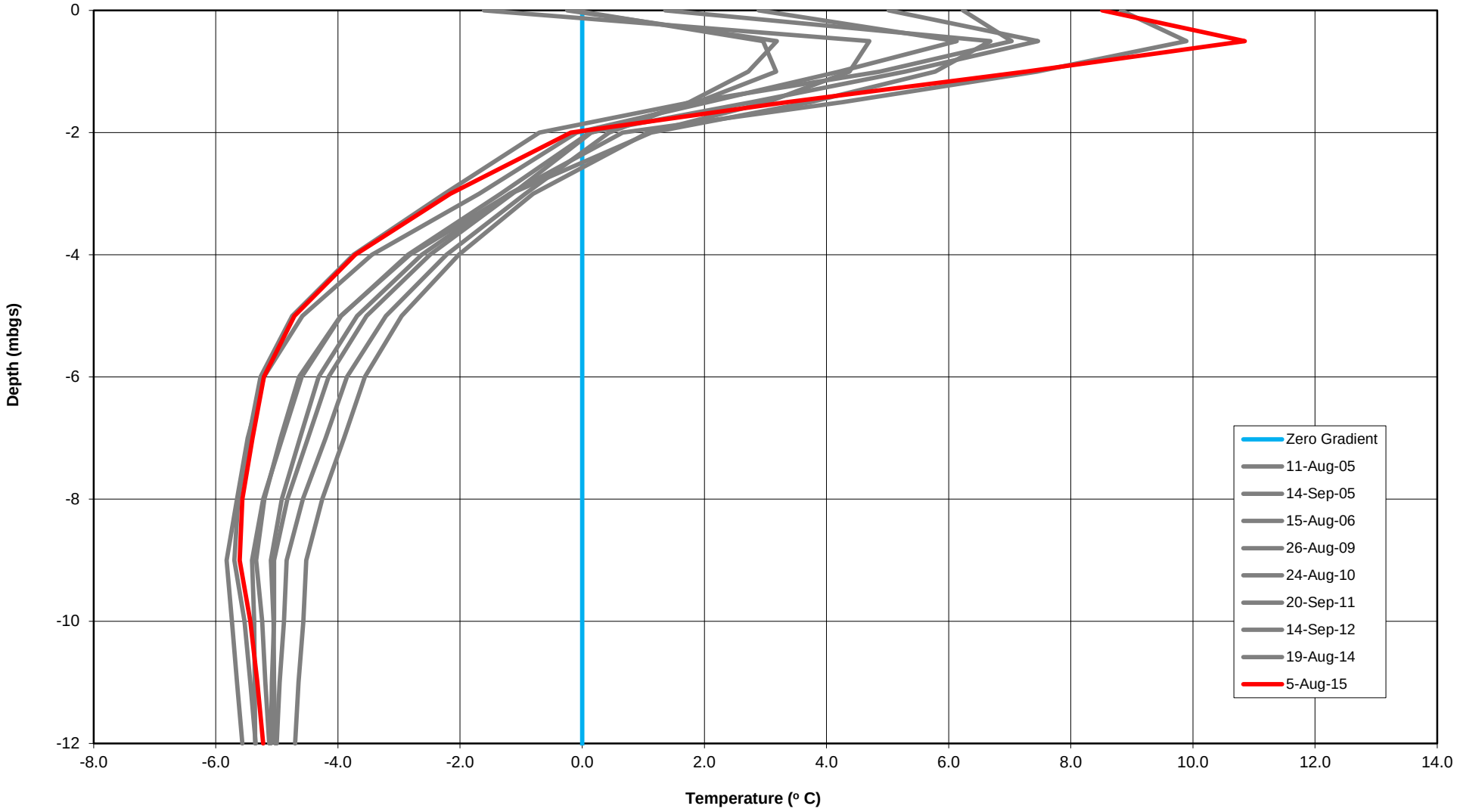
srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading D4-1
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-4**

Thermistor D4-3 - Installed October 25, 1995
(Vertical Thermistor installed on the crest of Dam 4, West End, Just East of TD4-4)



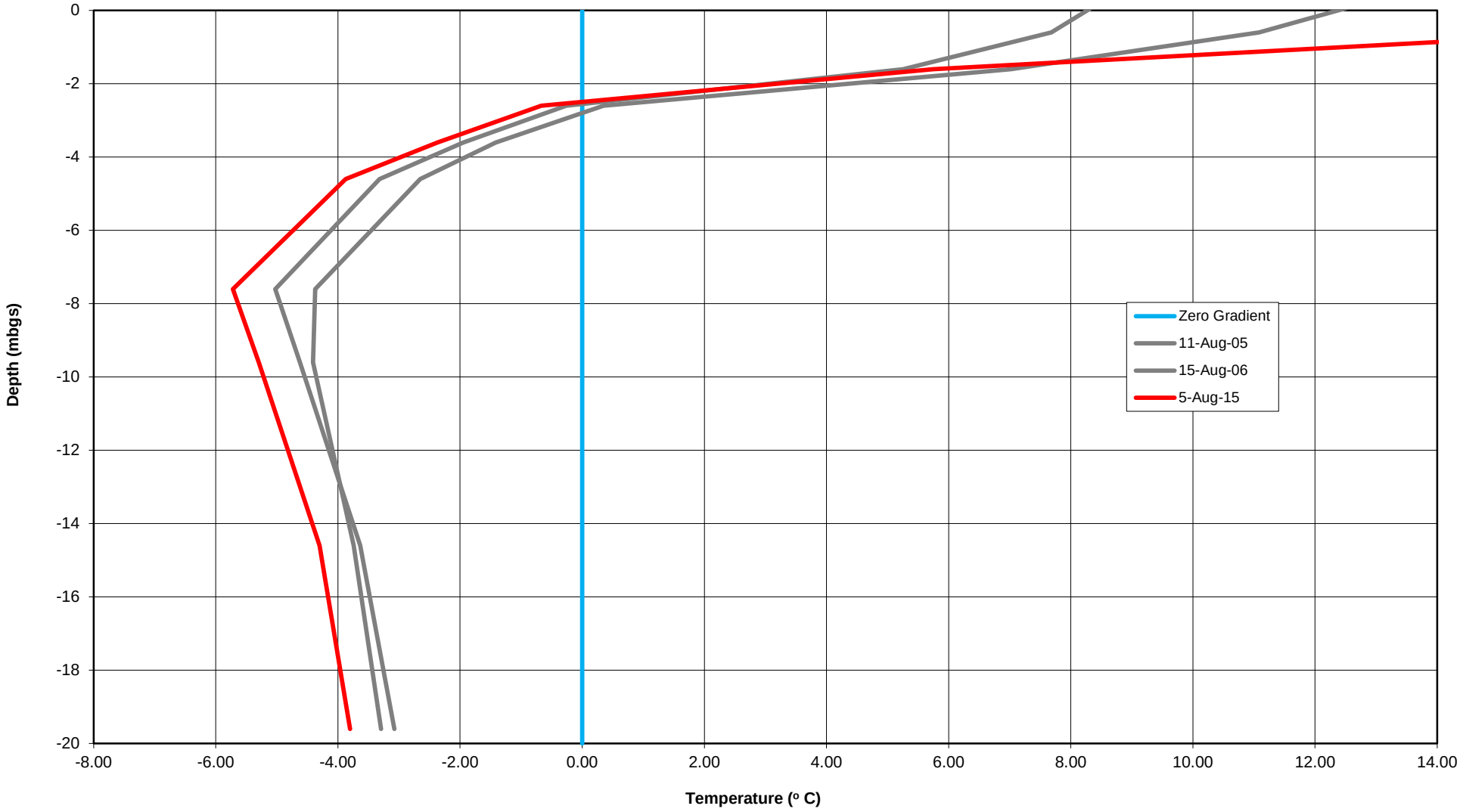
srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading D4-3
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-5**

Thermistor D4-4
(Vertical Thermistor installed on Dam 4)



srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading D4-4
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-6**

Thermistor DK-3 - Installed June 14, 2004
(Vertical Thermistor installed on the crest of Dam K, near middle)



srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection on Perimeter Dams
		Thermistor Reading DK-3
Job No: 1CL008.001 Filename: Lupin Annual Inspection_Figure 3.1_3.5.pptx	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **3-7**

3.3 TCA Perimeter Dams

The perimeter dams are generally in good condition in terms of stability and performance. There are minor erosion issues which are typically associated with sand and gravel construction material. While most of the erosion is minor, the repair work on the downstream face of Dam 1A should be completed in 2016. The rest of the dams should be monitored and repaired as required to prevent any continuous erosion that could worsen and impair the dam's structural integrity.

The previous annual inspection found seepage in the western buttress toe of Dam 4 into Ferguson Lake and the northern buttress toe of Dam 2 into a pond created by a cofferdam adjacent to Dam 2 Lake. Seepage at Dam 4 has not been observed since the 2011 inspection. Seepage at the toe of Dam 2 was observed in 2015, at similar flowrates since 2012. In 2015, this seepage was contained by the cofferdam downstream of north abutment and pumped back into Pond 2 when it pooled.

The storm ditch built within the top 2 m of Dam 3 has suffered some erosion damages from the 2014 freshet. It is believed that ponding in sections of the ditch is the main cause of the erosion damage. Because of the poor grading, the closure cover runoff water pooled, froze, and created an ice dam; which in turn forced the freshet water to overtop the ditch, over a small portion of Dam 3. Repair was completed on the damaged area in 2015 by constructing an armored channel along the alignment of the erosion, to let the drainage bypass the ponding section.

The observed freeboard on the perimeter dams ranges from approximately 1.5-2 m depending on the individual perimeter dam elevations. The observed freeboards are in compliance with the 1.0 m minimum stipulated by the water license for all the perimeter dams. LMI is currently treating and discharging water hence the freeboard on the perimeter dams is expected to increase.

3.4 Internal Dams

All of the internal dams have experienced typical erosion associated with dams constructed from esker sand material. Dam 3D is in good condition. Dam J, Dam K, and Dam M require some repair and maintenance and the condition of Dam N cannot be determined until water levels in Pond 2 are lowered.

During the 2012 inspection, an erosion breach was observed at the south end of Dam L. The erosion damage was repaired this year. The Dam L slope facing Cell 3 is observed to have considerable erosion near the toe.

Dam J has erosion on both sides of the dam.

Dam K has historically experienced erosion (undercutting) at the toe of the slope due to wave action on the adjacent water in Pond 2. Minor tension cracks and a few erosion gullies were observed in the dam crest. Recent observations made by an SRK engineer during an inspection on October 7 indicate that there is in fact riprap armoring along the northern toe of Dam K. This riprap armoring was submerged during previous inspections and was only exposed recently as Pond 2 was lowered. Animal burrows were observed in the eroded gullies. It is unknown what type of animal made these burrows.

Eight significant tension cracks were observed on Dam M. Visual comparison between 2012 and 2015 photographs showed the existing cracks are widening and lengthening. Potentially, the failed portions of the dam could breach and allow the supernatant water and tailings to flow from Cell 5 into Pond 2. Because of the severity of the cracks and potential breach, LMI was advised that all vehicle traffic should avoid this section for safety reasons. A risk assessment was completed by SRK in 2012 to evaluate the potential impact on water quality and the environment in the event of a breach. The results of the assessment indicated that there would be minimal impact to the environment due to the presence of the perimeter dam containment (SRK 2012b). However, a breach in Dam M would be a concern for worker safety, site infrastructure access, future operations, and ongoing care and maintenance activities. Section 4.1 provides recommendations to address the potential risks in the event of a full breach.

The water level in Pond 2 was higher than levels previously observed by SRK at the time of the site visits, just prior to discharge. Dam N was almost submerged. This made the dam surface difficult to travel on due to the fully saturated material. The difficulties in gaining access and the high water coverage on the dam made it difficult to carry out a proper inspection.

Previously, Dam 3D, Dam L and Dam N were not included in the annual inspections. Under pre-2014 CDA guidelines they were not considered as dams due to the absence of water ponded upstream of them. However under the updated CDA technical bulletin issued in 2014, a structure impounding liquefiable contaminants, such as unfrozen tailings, is considered a dam. Due to this update, Dam 3D, Dam L and Dam N should be included in future annual inspections until the tailings behind these dams are confirmed to be non-liquefiable. Thermistor readings from 2014 and 2015 in the structure of Dam 3D indicate the zero degree gradient is 2 m below surface. While it is likely that tailings behind the dam are also frozen 2 m below the cover surface, there are insufficient data to determine the exact depth of the zero degree gradient. If all the tailings impounded behind Dam 3D, L and N are found to be frozen, which would render them non liquefiable, the dams could be reclassified as embankments.

The observed freeboard during SRK's inspection of the internal dams varies up to 5 m.

4 Recommendations

Table 4-1 summarizes observations and recommendations from the inspections performed in 2014 and 2015. Highlighted recommendations are deemed critical and LMI should complete the work as high priorities.

Table 4-1: Inspection Observations and Recommendations

Inspection Item	2015 Inspection			2014 Inspection	
	Estimated Freeboard (m)	Observations	Recommendations	Observations	Recommendations
Perimeter Dams					
Dam 1A	>2 m	Minor erosion on slopes with some deep erosion gullies.	Repair deep erosion gullies.	Minor erosion on series and some deep erosion gullies.	Repair deep erosion gullies.

Inspection Item	2015 Inspection			2014 Inspection	
	Estimated Freeboard (m)	Observations	Recommendations	Observations	Recommendations
Dam 1B	~2 m	Minor surface erosions.	Surface maintenance e.g. grading and backfilling.	Minor surface erosions.	Consider surface maintenance.
Dam 1C	1.8 m	Minor surface erosions. No cracks observed.	Surface maintenance e.g. grading and backfilling.	Minor surface erosions. No cracks observed.	Consider surface maintenance.
Dam 2	~2 m	Minor surface erosion. Estimated seepage at the northern buttress is less than 0.1 L/min. Collection pond was emptied in 2015.	Monitor the seepage and water level in collection pond to pump the collected seepage back into Pond 2 as necessary.	Minor surface erosion. Estimated seepage at the northern buttress is less than 0.1 L/min. Collection pond is nearly full.	Consider surface maintenance. Monitor the water level in collection pond to pump the collected seepage back into Pond 2.
Dam 3	N/A (no water is impounded by this dam)	Erosion has once again damaged the dam crest due to the poor storm ditch grading. Mitigation included converting the erosion gully into an armored storm ditch to provide proper drainage.	Repairs were completed on the eroded section by LMI after the inspection. Monitoring should be carried out to check that the new ditch is performing as intended.	Minor surface erosion. Despite repairs to the storm ditch, it does not yet have a free-draining grade.	Repairs were completed on the eroded section after the inspection by LMI. Consider to re-grade ditch to minimize ponding and monitor during freshet to prevent ice blockages.
Dam 4	~2 m	Surface erosion with a number of erosion gullies. Exposed geogrid observed near the eastern downstream toe of the dam.	Repair the deep erosion gullies, re grade surface and backfill and depressions monitor the exposed geogrid for further erosion and potential water seepage.	Surface erosion with a number of deep erosion gullies. Exposed geogrid or similar synthetic reinforcements observed near the eastern downstream toe of the dam.	Repair the deep erosion gullies and maintain the surface. Monitor the exposed geogrid for further erosion and potential water seepage.
Dam 5	N/A (no water is impounded by this dam)	Minor surface erosions.	Surface maintenance e.g. backfilling and regrading.	Minor surface erosions.	Consider surface maintenance.
Dam 6	1.5 m	Surface erosion with some gullies.	Repair the deep erosion gullies, backfill depressions and regrade	Surface erosion with some gullies. No seepage or ponding.	Repair the deep erosion gullies and maintain surface.
Internal Dams[(1)]					
Dam 3D	~5 m	Minor surface and crest erosions.	Surface maintenance. e.g. backfilling and regrading Optionally, it is recommended to complete an evaluation on the depth of frozen tailings to de-classify this facility as a dam (see Section 3.4)		

Inspection Item	2015 Inspection			2014 Inspection	
	Estimated Freeboard (m)	Observations	Recommendations	Observations	Recommendations
Dam J	0.4 m (Pond 1), 1.5 m (Pond 2)	Reduced crest width due to erosion and placement of siphon pipes. Toe erosion likely due to wave action from Pond 1 and 2. Free board is around 0.2 m.	Repair eroded section and siphon pipes base. Rebuild crest width where possible. Place riprap along the dam face on both sides to protect against further erosion.	Reduced crest width due to erosion and placement of siphon pipes. Toe erosion likely due to wave action from Pond 1 and 2. Free board is around 0.3 m.	Repair eroded section and siphon pipes base. Rebuild crest width where possible. Place riprap along the dam face on both site to protect against further erosion.
Dam K	~4 m	Downstream crest erosion and undercutting at toe from Pond 2 wave action. Animal burrows are noted.	Surface maintenance. e.g. backfilling and regrading Recommend placing riprap near the toe for erosion protection. Monitor the animal burrows activity in the dam and consult an animal specialist for mitigative measures if burrow activities increase. Note See section 4.1 for further recommendations	Minor downstream slope surface erosion and some undercutting at toe; appears to be fine grained material, from Pond 2 wave action.	Consider surface maintenance. Consider placing riprap near the toe for erosion protection.
Dam L	0.5 m (Cell 5), 2 m (Cell 4)	Erosion of the dam face in Cell 3 and reduced crest width. Repair was done on the erosion damage from 2012.	Recommend placing riprap at the eroded areas for protection.	Minor slope surface erosions and some undercutting at toe. Breach at southern section of dam near buttress. No seepage observed	Consider surface maintenance. Consider placing riprap at the eroded areas for protection. Repair the breach with compacted well-graded esker material. Monitor and manage water in Cell 3 to prevent freshet overflow.
Dam M	0.8[(2)] m (Cell 5), 4 m (Pond 2)	Slope surface erosion. Tension cracks observed to be widening and lengthening prepared to previous year. Cracks are up to 30 m long and deeper than 30 cm.	Set up barricades on dam to prevent non-authorized personnel traffic. LMI should contact the engineer-of-record to identify proper mitigation repairs. Reference section 4.1 for detailed mitigation measures.	Slope surface erosion. New major tension cracks observed over 150 m section along the southwest facing slopes. Cracks are up to 10 m long and deeper than 30 cm.	Set up barricades on dam to prevent non-authorized personnel traffic. Consider construction of a buttress for stabilization. Reference section 4.1 for detailed mitigation measures.
Dam N	0 m	Nearly submerged at the time of visit. Water is noted to pond in the western abutment.	Monitoring of the dam is recommended once the Pond 2 water level is lowered to allow observations.		

Note [1]: Dam 3C and 3E are considered closed as they have been intergraded with the tailings granular cover with no difference in elevation and risk of failure.

Note [2]: the freeboard is estimated from the photograph provided by LMI after the siphoning.

4.1 Mitigation for Tension Cracks on Dam M

Based on a visual inspection of the tension cracks in Dam M, possible causes could include pore water pressure from Cell 5, foundation “creep” (movement between the active layer and permafrost), or undercut erosion of toe material. It is recommended that LMI consults with the engineer-of-record to better understand the mechanism behind the tension cracks and appropriate repairs. This could involve an investigation program to determine the exact mode(s) of failure before designing the appropriate remedial measures.

In the short term, all non-authorized personnel should avoid this dam for safety reasons. SRK further recommends that a monitoring program be established to determine the rate of failure and development of new cracks. The program should include pairs of monitoring monuments placed perpendicular to the cracks: one at each end, and one in the middle of the failing sections, each with a matching monitor on the stable section of the crest. Authorized personnel should measure and record the level and distance between each set of monuments on daily bases during the summer season. Results should be compiled and reviewed each year.

The risk assessment and water quality review (SRK 2012b) provided a summary of potential impact in the event of these cracks resulting in a full breach of Dam M. The assessment concluded that a breach of Dam M would not significantly impact the water quality in Pond 2 and would not prevent discharging of the treated water in Pond 2 to the receiving environment. Thus, the risks associated with a dam breach are mainly related to physical stability, health and safety, future operation of Cell 5 and accessibility for traffic around site.

To mitigate some of the stability risks, SRK recommends that LMI keep the water levels in Cell 5 and Pond 2 as low as possible to reduce potential for dam instability. It is recommended that LMI monitor Cell 5 water level and keep it as low as operable until the dam is deemed stable. Recent observations provided by SRK staff show that there is riprap armouring along the toe of Dam M and K. These armoured toes were submerged during previous inspections and were only exposed recently due to the lowering of Pond 2. It is recommended that LMI to keep the water in Pond 2 below this armored toe to minimize erosion damage and reduce stress on the dam.

To further maintain the stability of both Dams M and K, SRK recommends that as an emergency response, a toe buttress be constructed along the toe (Pond 2 side) of both dams as soon as practical. The buttress should be constructed of compacted, well-graded esker material, and placed with a downstream slope of 2H:1V (horizontal to vertical) and extend up to half the height to the existing dam crest. The buttress should have a minimum crest width of 3m and extend a minimum of 5 m beyond the failing sections at each end and armored with riprap at the Pond 2 water level. In addition to the construction of the buttress, SRK recommends that a more detailed investigation be undertaken in consultation with the Engineer-of-Record to further understand the mode of failure.

4.2 General Recommendations

The majority of the perimeter dams were generally found to be performing well and stable. SRK recommends that the observed erosion on Dams 1A, 3, 4, 6, J and N be monitored and repaired as required to reduce the risk of instability. LMI should consult with the engineer-of-record to regarding the current course of action to repair Dams M and K.

Monitoring is recommended at Dam K to track the animal burrow activities. While it is unlikely that the ground animal would be able to penetrate the frozen core, periodic monitoring of the burrows in the summer season is recommended to check on any increase in numbers. An animal specialist should be consulted to identify and remove the animal if significant animal activities are observed or large concentrations of burrows are found within a short distance, e.g., 10 burrows in 30 m distance based on engineering judgment.

As water levels in Pond 2 lower during discharge, Dam N monitoring is recommended by site personnel at the direction of a qualified person and the surveillance data should be communicated to the qualified person for review.

Additional evaluation is recommended to determine the depth of frozen tailings in Cell 1 and 2. This would help determine if Dam 3D can be considered a closed embankment rather than a dam under the 2014 CDA technical bulletin. Similar evaluation should be considered for the content of Dam N containment.

Periodic monitoring in the summer season of the side slopes of Dam L is recommended to determine the maintenance priority in order to minimize the impact of future erosion.

Of the repairs and maintenance recommended in Section 4.1, the following repairs should be prioritized as follows:

1. Keep the water in Cell 5 as low as operable,
2. Keep the water in Pond 2 below the riprap armouring along the toe of Dams M and K,
3. In consultation with the Engineer-of-Record (EOR) initiate an emergency construction of a toe buttress at Dam M as priority, then Dam K,
4. Initiate a consultation with the EOR on a detailed investigation for the potential failure mode(s) in Dams M and K,
5. Monitoring and repair the animal burrow activities in Dam K,
6. Monitoring and repair the erosion in Dam L, and
7. Monitoring and surveillance the physical conditions and stability for Dam N.

LMI should carry out inspections during summer season where practical to include the following:

- Monitoring of seepage flowrates at Dam 2,
- Monitoring of any potential seepage from Dam 4,
- Recording the water levels in Ponds 1 and 2 and Cells 3 and 5,
- General surface erosion and anomalies on dams,

- Monitoring of ground animal burrow activities ,
- Observe the physical condition of Dam N, and;
- Monitoring of tension cracks in Dam M and Dam K.

Observations and findings from site inspections should be included in the annual inspection records.

LMI has commissioned a dam safety review in 2015 as recommended in the Canadian Dam Association guideline. LMI should discuss the findings in that report with the engineer-of-record.

This report "*2015 Annual Geotechnical Inspection of Lupin Mine Tailings Containment Area, Nunavut*" has been prepared by SRK Consulting (Canada) Inc.

Prepared by

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Senior Consultant

Reviewed by

Peter Healey, PEng

Project Reviewer

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Appendix A: Photo Log

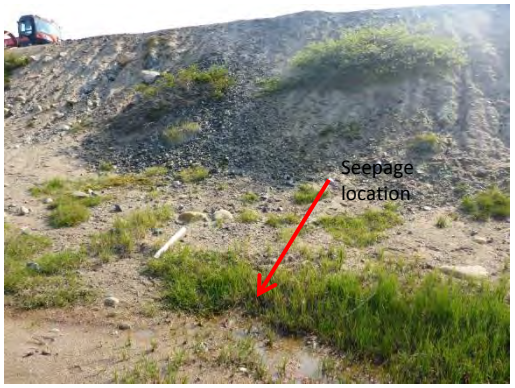

Photo 1: Seepage in the north abutment of Dam 2 and surface erosion

Photo 2: Looking south at the seepage collection ponds at toe of Dam 2.

Photo 3: Looking southwest on Dam 2 near the northern abutment.

Photo 4: Looking south at Dam 1A upstream face.

Photo 5: Downstream surface erosion of Dam 1A

Photo 6: Looking north from the southern abutment of Dam 1A

srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection Lupin Tailings Mine
		Appendix A: Photo Log
Job No: 1CL008.002 Filename:Appendix_A_Photo_Log_1CL008_002_JN_2014	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: 1

Photo 7: Looking south at the upstream face of Dam 1B

Photo 8: Look south at the downstream face of Dam 1B

Photo 9: Looking north at the downstream face of Dam 1B

Photo 10: Looking south at the upstream face of Dam 1C

Photo 11: Looking south at the centerline of Dam 1C

Photo 12: Looking south at the downstream face of Dam 1C

Photo 13: Looking south at the downstream face of Dam 6 near the northern abutment

Photo 14: Close up look at one of the large erosion gully in Dam 6.

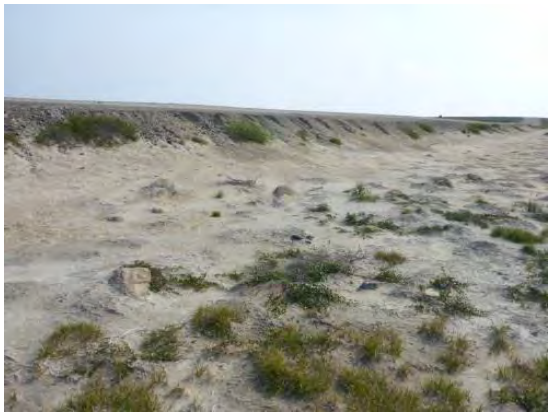

Photo 15: Looking north at the downstream face of Dam 6 from the southern abutment

Photo 16: Looking east from at the upstream face of Dam 5, near the west abutment.

Photo 17: Looking east from at the center line of Dam 5.

Photo 18: View of the downstream face at the south abutment of Dam 5

srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection Lupin Tailings Mine
		Appendix A: Photo Log
Job No: 1CL008.002 Filename:Appendix_A_Photo_Log_1CL008_002_JN_2014	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: 3

Photo 19: Looking east at the upstream face of Dam 4 near the east abutment.

Photo 20: Looking west at the thermistor and downstream face of Dam 4 at near the west abutment.

Photo 21: Close up of erosion gully in Dam 4, the burrow from ground animal.

Photo 22: looking northwest at the storm ditch and erosion damage on crest of Dam 3.

Photo 23: Looking east at the storm channel on Dam 3.

Photo 24: Looking north at the repair work completed over the eroded gully in Dam 3, including geotextile and riprap armoring.

srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection Lupin Tailings Mine
		Appendix A: Photo Log
Job No: 1CL008.002 Filename:Appendix_A_Photo_Log_1CL008_002_JN_2014	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **4**

Photo 25: Looking west at the crest and top part of the downstream face of Dam 3D

Photo 26: Looking at the lower part of the downstream face of Dam 3D.

Photo 27: Looking northeast at the downstream face of Dam 3D.

Photo 28: Looking northwest at original tension cracks on Dam M, with Dam N and Pond 2 to the left.

Photo 29: Close up view of the original tension cracks on Dam M.

Photo 30: Looking northwest on Dam M at the over steepen slope directly downstream of the cracks, with Dam N and Pond 2 to the left.

Photo 31: Close up view of Dam M at the new tension cracks observed in 2014, through the centerline of the dam, near the eastern abutment to Dam J.

Photo 32: Close up eastern view of Dam M at the new tension cracks observed in 2014, in face of the dam toward Pond 1.

Photo 33: Close up western view of Dam M the new tension cracks observed in 2014, in face of the dam toward Pond 1, upwards of 0.3m wide and 0.5m deep.

Photo 34: Looking east at the upstream face of Dam M and dewatered Cell 5, near the western abutment.

Photo 35: Looking west at the upstream face of Dam M and dewatered Cell 5, near the middle of the dam.

Photo 36: Looking northeast of at the Dam M facing toward pond 2. Note the failure surfaces at the toe.

Photo 37: Looking south on Dam J with Pond 2 at the right.

Photo 38: Looking North on Dam J crest with Pond 1 at the right.

Photo 39: Looking south on Dam J with Pond 1 at the left.

Photo 40: Looking south at Dam K facing pond 2. Note the under cut from at the toe of the dam.

Photo 41: Close up view of erosion gully in Dam K facing pond 2.

Photo 42: Looking west at Dam K with pond 2 at the left at the eastern abutment.

Photo 43: Looking south at the crest of Dam L with Cell 4 at the left.

Photo 44: Looking north at the crest and dam face with Cell 4 to the right.

Photo 45: Aerial view of Dam N. Note the near submergence due to the high water level in Pond 2 during the time of visit.

Photo 46: Picture taken on October 6th at Dam M showing the armored toe that was previously submerged in Pond 2.

Photo 47: Picture taken on October 6th at Dam L showing the armored toe that was previously submerged in Pond 2.

Lupin Mines Incorporated
(a subsidiary of Mandalay Resources)

January 31, 2016

Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

To whom it may concern,

RE: 2014 Sewage Pond Dams Geotechnical Inspection, 2014, Addendum Memo 2014 Fuel Tank Farm Inspection, and 2015 Waste Management Facility Geotechnical Inspection – Lupin Mine (LMI), Nunavut, License Number 2AM-LUP1520

Please accept this cover letter with plan and timelines to implement the engineer's recommendations in regards to the following reports, completed by SRK Consulting. The following reports have already been submitted to the Nunavut Water Board:

- 2014 - 2014 Sewage Pond Dams Geotechnical Inspection and Addendum Memo 2014 Fuel Tank Farm Inspection

- 2015 - 2015 Waste Management Facilities Geotechnical Inspection

SRK noted in the 2015 Waste Management Facilities Geotechnical Inspection that they completed geotechnical inspections at the sewage pond dams, fuel tank farm containment systems and at the tailings containment area (TCA) in 2014. The inspections at the sewage pond dams and fuel containment are direct actions taken as per request from the July 2014 Water Licence Inspection Form. The inspection at the TCA was done as part of the annual requirement as per the Clause E.6 of the Water Licence agreement. Subsequently, the Inspector's Water Licence Inspection Form provided on July 14, 2015, section 3.3 of the document under Action Required (AANDC 2015) states that:

"Geotechnical inspection of Waste Containment Areas – report to be received by Inspector by October 31, 2015."

Clarification from the Inspector in 2015 indicated that the subject area is the waste oil management facility (WOMF) that is located immediately south of the main tank farm. This area was not understood to be a "water management structure", because it is not intended to hold water, hence it was not inspected in 2014. A geotechnical inspection was completed in 2015 as per requested in the July 2015 Water Licence Inspection Form.

<u>2014 Sewage Pond Dams Geotechnical Inspection and followup 2015 Geotechnical Memo</u>

SRK states that the facilities are in good geotechnical condition and makes the following maintenance and repair recommendations:

Periodical inspection should be carried out on the buried culvert to monitor its condition and seepage rate as culvert is heavily corroded and partially filled with sand and gravel

Maintenance and monitoring are recommended to ensure the condition of the dam does not further degrade. LMI should consider backfilling the eroded upstream section of the dam with compacted granular material with the face armored with riprap.

LMI should monitor the condition of the tension cracks to determine their rate of movement. If the monitoring results indicate the cracks are lengthening or widening, LMI should consider constructing a 2 m wide buttress with a 2H:1V slope to half the height of the dam with compacted granular material, downstream of failed section of dam.

During the inspection, DMS was in the process of siphoning the Lower Sewage Lake to lower the water level. The activity log provided on September 22nd, 2014 indicated that the water level has been lowered by 0.36 m since the inspection, measured at the low area of the dam. A supporting note from George Friesen on October 9, 2014 confirmed that the current freeboard is 0.96 m as the pond is frozen for the winter. This lowering of the water level reduces the risk of overtopping.

SRK recommended that the operational freeboard of the lower pond be no less than 0.5 m at all times. Furthermore, SRK also recommended in order to achieve this minimum freeboard of 0.5 m at the time of future freshets that prior to the onset of winter, the pond level be lowered to provide a 0.8 m freeboard.

During the 2015 season SRK also provided a memo in regards to the 2015 Geotechnical Inspection advising the inspector of the following:

SRK engineer, Alvin Tong, has completed a geotechnical inspection of the Lupin Mine on 2 August, 2015. This inspection indicated that repairs have been completed in the lower dam, according to the recommendations provided in the geotechnical report (SRK 2014). It was noted during the inspection that LMI had set up syphons to drop the water level on the lower sewage pond. A technical memorandum was issued on 6 August, 2015 (SRK 2015), to confirm the "Measures to be Taken". Action item 2a) in the 22 July, 2015 Inspector's Directive has been substantially completed with minor finishing work scheduled to be completed before the end of 2015's field season.

Mr. Tong completed an additional geotechnical inspection in 19 August, 2015. It was noted in this inspection that the lower sewage pond had been lowered to provide 1.4 m of freeboard before syphoning was completed on 19 August, 2015. The upper sewage dam was noted to have 1.1 m of freeboard. The dams met the minimum freeboard to allow operation. LMI has provided photographs on 2 September, 2015 indicating all finishing work on both dams are completed.

<u>Addendum Memo 2014 Fuel Tank Farm Inspection</u>

SRK stated that the facilities are in geotechnically stable condition and SRK made the following maintenance and repair recommendations:

Prior to adding new fuel in the tank farms, it is recommended that any noted damage to the liner to be repaired to ensure containment and the sand overliner be replaced over the exposed liner to provide for long-term protection. In addition to repairs on visually identified liner damages, general earthwork maintenance repairs should be carried out on the erosion gullies in downstream slopes of the containment berms.

LMI will ensure prior to adding new fuel to the tank farms that they will completed as recommended by SRK.

2015 Waste Management Facilities Geotechnical Inspection

The report summarized SRK's observation of the sewage pond dams and waste oil management area.

SRK stated that the facilities are in stable condition with no geotechnical concerns.

The reports stated that both the sewage dams were repaired according to the 2014 recommendations. The current condition of the Upper Sewage Dam is in good geotechnical condition after the 2015 repairs. Periodic inspections are recommended on the buried culvert to monitor its condition and seepage rate. It appears that this culvert controls the upper lake level. If the seepage stops or further reduces, then the lake level could increase as a result. If the culvert is found to be fully collapsed or blocked and the seepage stops, then it would be recommended that the siphon pipes be reinstalled to transfer water to the lower lake. The upper pond levels is recommended to have minimum 1 m freeboard prior to operations and winterization.

The Lower Sewage Dam is in good geotechnical condition after the 2015 repairs. Visual checks are recommended in the upstream face when practicable during summer seasons for potential major erosion. Repairs should be considered if major erosion damages are found. The lower pond level is recommended to have a minimum 1 m freeboard prior to operations and winterization.

The waste oil management facility is in good geotechnical conditions. Visual checks should be done in the downstream face of the facility for erosion and within the facility for any exposed liner. Monitoring should also be done during freshet to ensure the runoff is contained within the berm and ditches.

There are no issues requiring immediate attention identified in the reports. Visual checks and pond levels as identified in the report will be addressed in the 2016 season.

If you have any questions regarding the above, please do not hesitate to contact me.

Sincerely,

Lupin Mines Incorporated.

"Karyn Lewis"

Karyn Lewis

2015 Waste Management Facilities Geotechnical Inspection

Prepared for

Lupin Mines Incorporated

Prepared by

SRK Consulting (Canada) Inc.
1CL008.002
October 2015

2015 Waste Management Facilities Geotechnical Inspection

October 2015

Prepared for

Lupin Mines Incorporated
201 – 750 West Pender Street
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Canada

Project No: 1CL008.002

File Name:
Lupin_1CL008.002_2015WasteManagementFacilitiesGeotechnicalInspection_20151001_FNL_AT.docx

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Table of Contents

List of Figures

List of Tables

Appendices

1 Introduction

The Lupin Mine site is currently under care and maintenance status, and operating under Nunavut Water Licence 2AM-LUP0914 (NWB 2009) by Lupin Mines Incorporated (LMI), a wholly-owned indirect subsidiary of Elgin Mining Inc. Elgin acquired LMI from MMG Resources Inc. in July 2011. The mine is located on the western shore of Contwoyto Lake, approximately 285 km southeast of Kugluktuk, Nunavut and 400 km northeast of Yellowknife (Figure 1.1). As part of the Inspector's Water Licence Inspection Form provided on July 15, 2014, section 3.4 of the document under Action Required (AANDC 2014), states that:

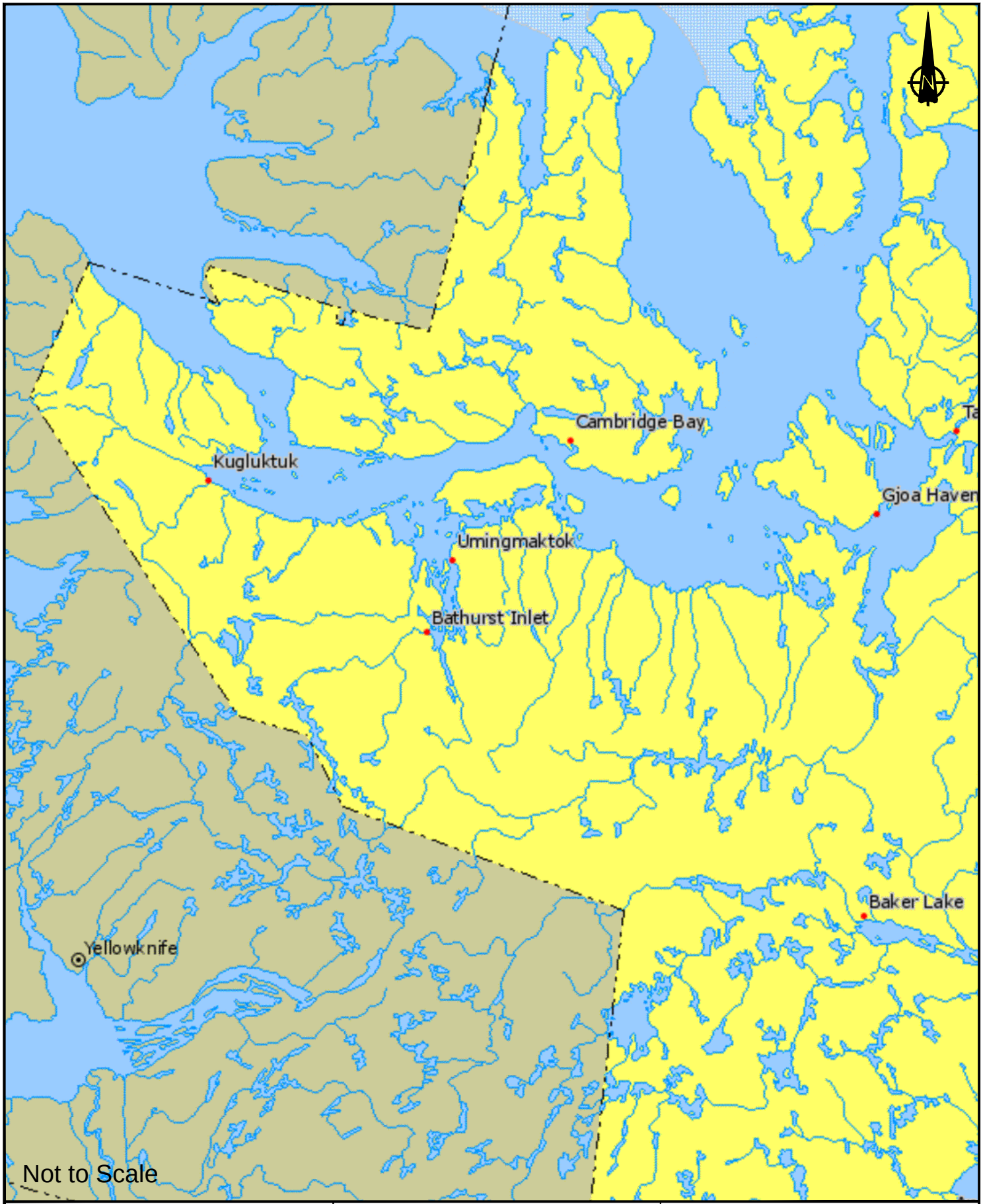
"A geotechnical inspection is to be conducted on all engineered water management structures, including but not limited to: Main and Satellite Tank Farms, Upper and Lower Sewage Lagoon, and waste management areas. The engineer's report is to be submitted to the NWB and to the Inspector by October 31, 2014, accompanied by a plan and timelines to implement the engineer's recommendations."

SRK completed geotechnical inspections at the sewage pond dams, fuel tank farm containment systems and at the tailings containment area (TCA) in 2014. The inspections at the sewage pond dams and fuel containment are direct actions taken as per request from the July 2014 Water Licence Inspection Form. The inspection at the TCA was done as part of the annual requirement as per the Clause E.6 of the Water Licence agreement. Subsequently, the Inspector's Water Licence Inspection Form provided on July 14, 2015, section 3.3 of the document under Action Required (AANDC 2015) states that:

"Geotechnical inspection of Waste Containment Areas – report to be received by Inspector by October 31, 2015."

Clarification from the Inspector in 2015 indicated that the subject area is the waste oil management facility (WOMF) that is located immediately south of the main tank farm. This area was not understood to be a "water management structure", because it is not intended to hold water, hence it was not inspected in 2014. A geotechnical inspection was completed in 2015 as per requested in the July 2015 Water Licence Inspection Form.

This report summarizes SRK's observation of the sewage pond dams and waste oil management area.



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Lupin Mine Inc.

LUPIN MINE

Location Plan

SRK JOB NO.: 1CL008.000

FILE NAME: Lupin-SiteFacil-utm-12_ATedits_Revc_09092015.dwg

Lupin Mine Incorporated

DATE:	APPROVED:	FIGURE:
Sept 2015	AT	1.1

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2 Site Conditions

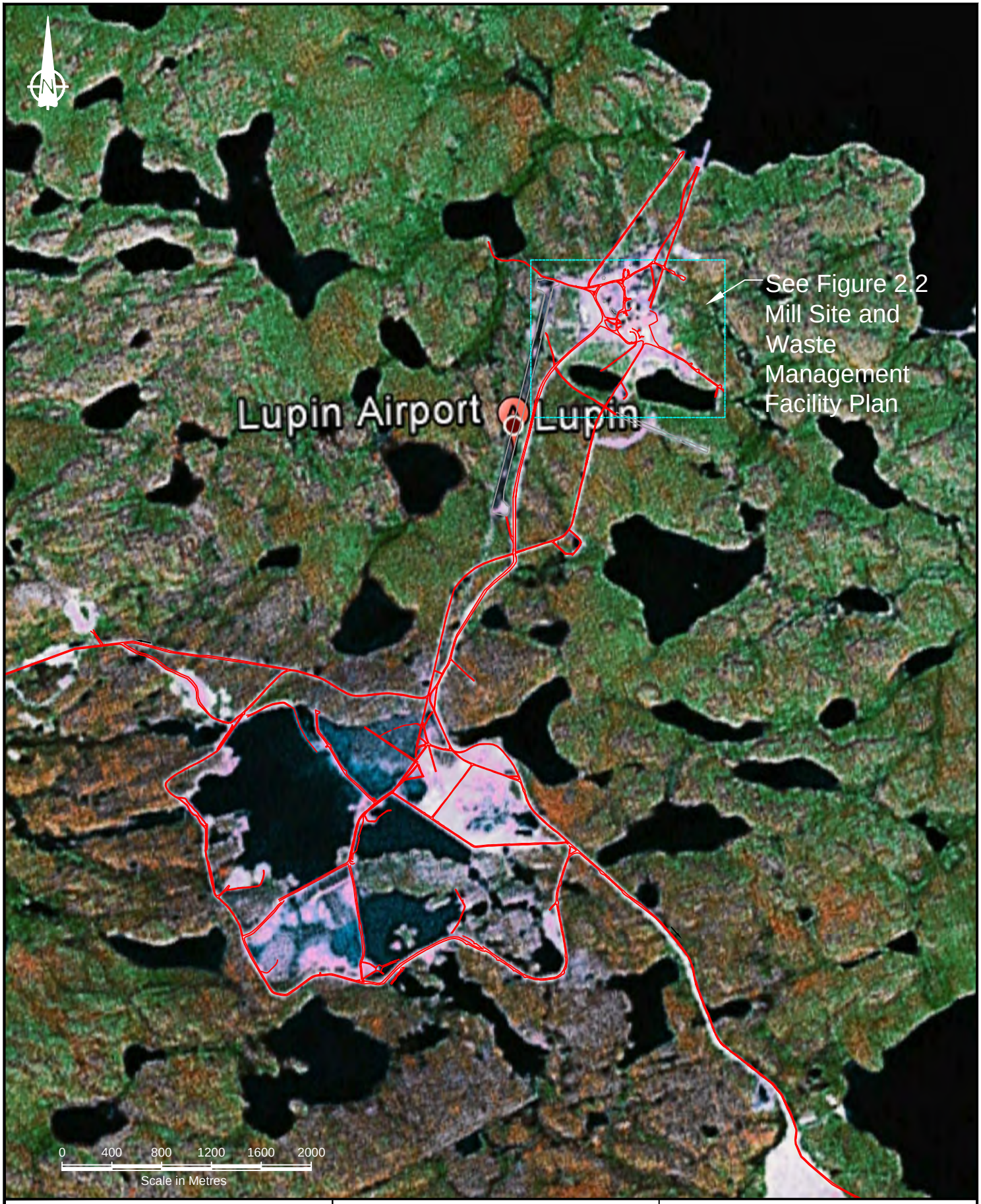
2.1 Sewage Management Facility

The Lupin Mine consists of a mill facility, camps, airstrip and tailings containment area (Figure 2.1). The sewage management facility consists of two lagoon lakes located south of the mill facility (Figure 2.2). The sewage lagoon lakes system was constructed in a natural valley which generally drains from a northwest to southeast direction. The system consists of two lakes, created by Upper and Lower Sewage Dams. The dams are generally aligned in a north to south direction, and observed to be constructed from compacted esker sand and gravel estimated to be 3-4 m high. The Upper Sewage Dam is around 60 m in length and the crest supports the now decommissioned tailings pipeline which discharged tailings to the tailings containment area (TCA) from the mill. A small containment (tailings dump pond #1) is built downstream in the southern section of the upper sewage dam, using it as a buttress. The height of this small containment varies between 3-4 m. The Lower Sewage Dam is around 80 m in length.

The general sewage management requires raw sewage to be hauled and discharged into the western shore of the Upper Sewage Lake. Water from the Upper Sewage Lake was siphoned to the Lower Sewage Lake periodically during mine operation, or as needed during the care and maintenance period. The water in the Lower Sewage Lake will be tested and discharged into the environment through the siphon over the dam as needed.

2.2 Waste Oil Management Facility

The waste oil management facility (WOMF) consist of a single containment berm system located immediately south of the main tank farm. The facility is a flat area constructed from sand and gravel material and surrounded by 0.5 m high berms and a 0.3 m deep ditch to the west and south. LMI informed SRK that a liner system exists underneath the sand and gravel. Used oil containers and drums are transported by fork lifts into the facility for storage. The facility is not designed or intended for long term water storage, but it can support the freshet and seasonal precipitations.



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Lupin Mine Inc.

LUPIN MINE

General Site Plan

SRK JOB NO.: 1CL008.000

FILE NAME: Lupin-SiteFacil-utm-12_ATedits_Revc_09092015.dwg

Lupin Mine Incorporated

DATE:	APPROVED:	FIGURE:
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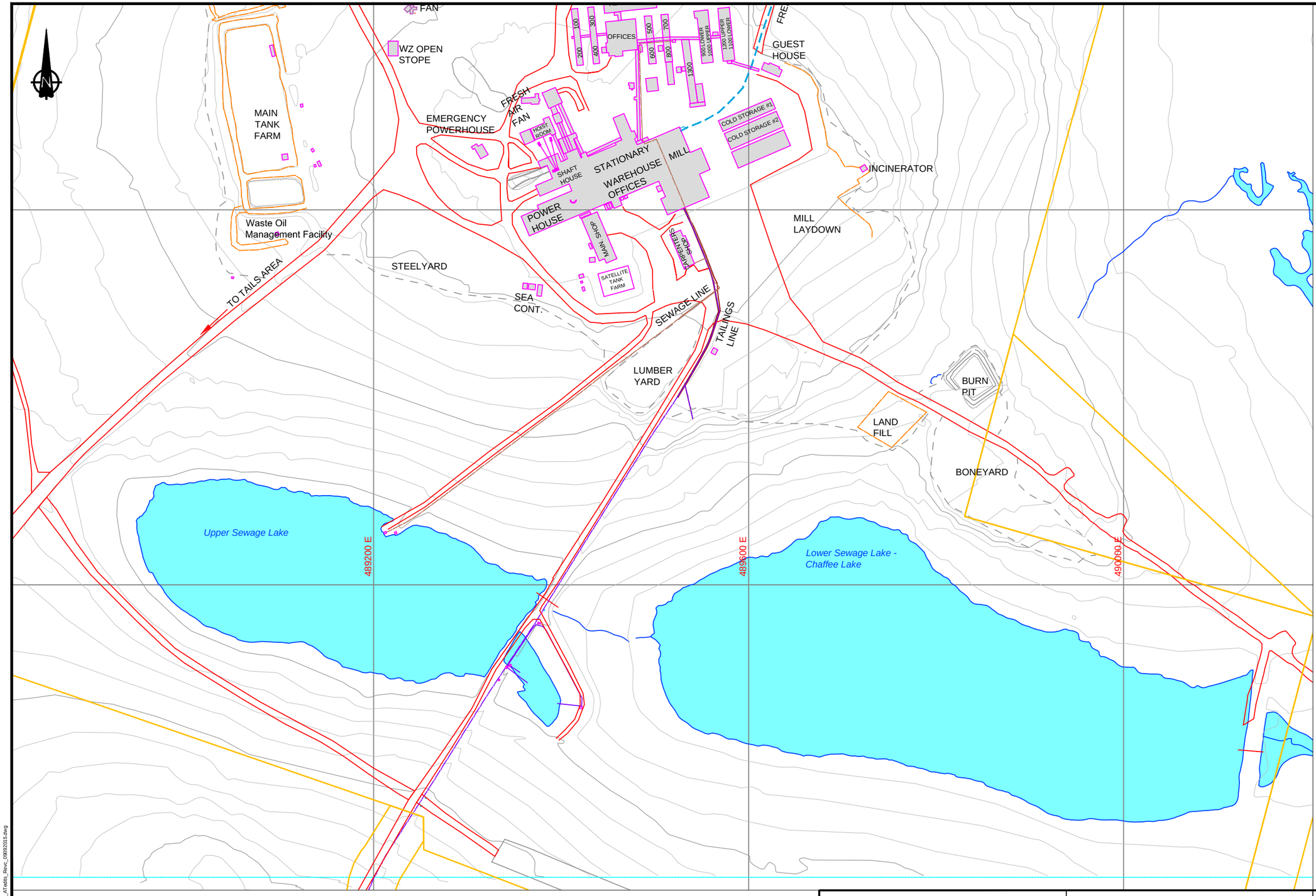

LEGEND

- Lake Pond
- Tank Farm Berm Outline
- Building
- Water Pipeline (8 in Diam) (Not in Use)
- Tailings Line Route (Not in Use)
- Sewage Pipeline (6 in Diam) (Not in Use)
- Lake Shore, Drainage
- Contour 1 m
- Contour 5 m
- Roads
- Site Features Miscellaneous
- Cleared Area
- Berm Area
- Slope Toe
- Slope Top
- Culvert
- Fence

NOTES

1. Topographic information and facilities outline provided by Lupin Mine Inc. on August 13, 2012.

0 40 80 120 160 200

Scale in Metres

Coordinate System: Nad_1983_UTM_Zone_12N
NTS Map Sheets 076E11 and 076E14

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SRK JOB NO.: 1CL008.000

FILE NAME: Lupin-SiteFacil-utm-12_ATedits_Revc_09092015.dwg

Lupin Mine Inc.

Lupin Mine Incorporated

LUPIN MINE

Waste Management Structures

DATE:	APPROVED:	FIGURE:
Sept 2015	AT	2.2

2.3 Dam Classifications

According to the Canadian Dam Association guidelines (Table 2-1), the sewage dams are classified as Low where no loss of life is expected and has a minimal short-term impact to the environment and cultural values. The classification of the dams do not require an Emergency Preparedness Plan (EPP) or a dam break inundation study.

Table 2-1: Dam Classifications as per CDA (2007, Revised 2013)

Dam Class	Population at Risk[1]	Incremental losses		
		Loss of Life[2]	Environmental and Cultural Values	Infrastructure and Economics
Low	None	0	Minimal short-term loss No long-term loss	Low economic losses; area contains limited infrastructure or services
Significant	Temporary only	Unspecified	No significant loss or deterioration of fish or wildlife habitat Loss of marginal habitat only Restoration or compensation in kind highly possible	Losses to recreational facilities, seasonal workplaces, and infrequently used transportation routes
High	Permanent	10 or fewer	Significant loss or deterioration of *important* fish or wildlife habitat Restoration or compensation in kind highly possible	High economic losses affection infrastructure, public transportation, and commercial facilities
Very high	Permanent	100 or fewer	Significant loss or deterioration of *critical* fish or wildlife habitat Restoration or compensation in kind possible but impractical	Very high economic losses affecting important infrastructure or services (e.g., highway, industrial facility, storage facilities for dangerous substances)
Extreme	Permanent	More than 100	Major loss of *critical* fish or wildlife habitat Restoration or compensation in kind impossible	Extreme losses affecting critical infrastructure or services (e.g., hospital, major industrial complex, major storage facilities for dangerous substances)

[1] Definitions for population at risk:

None—There is no identifiable population at risk, so there is no possibility of loss of life other than through unforeseeable misadventure.

Temporary—People are only temporarily in the dam-breach inundation zone (e.g., seasonal cottage use, passing through on transportation routes, participating in recreational activities).

Permanent—The population at risk is ordinarily located in the dam-breach inundation zone (e.g., as permanent residents); three consequence classes (high, very high, extreme) are proposed to allow for more detailed estimates of potential loss of life (to assist in decision-making if the appropriate analysis is carried out).

[2] Implications for loss of life:

Unspecified – The appropriate level of safety required at a dam where people are temporarily at risk depends on the number of people, the exposure time, the nature of their activity, and other conditions. A higher class could be appropriate, depending on the requirements. However, the design flood requirement, for example, might not be higher if the temporary population is not likely to be present during the flood season.

2.4 Climate

Climate conditions were recorded at the Lupin manned weather station until October 2006. An automated weather station known as Lupin (MAPS) (CWIJ) has recorded data intermittently at the site. Reviewing the data from the end of October 2006 to the present, the station has reported an arctic climate with a mean annual temperature of -9.8°C. Winter is considered to last from October to May and summer is considered to last from June to September. The summer daily temperature averages at 6.8°C, and winter daily temperature averages at -18.5°C. There are persistent winds at an annual mean velocity of 18.0 km/h and gusts up to 95 km/h. Measured site precipitation is reported at an annual mean of around 388 mm. The data does not breakdown the precipitation into rain and snow (WU 2012).

2.5 Site Geology

The Lupin gold deposit is situated in an Archean metaturbidite sequence of the Contwoyto Formation, part of the Yellowknife Supergroup of supracrustal metasedimentary and metavolcanic rocks of the Slave Geologic Province. The rocks have been subjected to both regional and contact metamorphism and to several phases of deformation and intrusion.

The Contwoyto Lake area lies within the Upland unit of the Kazan physiographic region of the Canadian Shield. The area was glaciated during the Pleistocene Epoch. Isostatic rebound after ice melt resulted in emergent landforms, and during this process all parts of the land were washed by runoff and lakes. The easily erodible glaciolacustrine sediment, till and glacio-fluvial sand and gravels were subsequently reworked by melts and runoff. This has resulted in the present day outcrops with thin soil veneers, abandoned beaches and esker formations (Kinross 2005).

3 Sewage Dams Inspection

3.1 General

Mr Alvin Tong, PEng, a Senior Consultant with SRK, conducted two geotechnical inspections on August 4th and on August 19th 2015. After an initial aerial overview of the site, the detailed site visual inspection was done. Mr. Patrick Downing of LMI was present during the August 19th inspection for comment and discussion after the inspection. Discovery Mining Service (DMS) was on site to carryout maintenance work around site, including siphoning the water in the ponds and maintenance earthwork on the dams.

Weather conditions during the inspection were mild and overcast with periods of light rain. A detailed photographic log of the inspection is included in Appendix A.

3.2 Upper Sewage Dam

The dam is in good condition with no geotechnical concerns. Previous damages and deficiencies noted from the 2015 inspection report (AANDC 2015) had been repaired. The crest of the dam was repaired, widened and leveled with new backfill material. Tailings dump pond #1 has been

sufficiently dewatered and has no stability concerns. Geotextile and riprap was placed on the upstream face of the dam as repair. Seepage was observed discharging from the old 200 m long culvert at a rate estimated to be about 0.5 L/min. The condition of the culvert made it very difficult to accurately measure the flow. The freeboard is observed to be approximately 1.8 m.

3.3 Lower Sewage Dam

The dam is in stable condition with no geotechnical concerns. Maintenance work has been completed on the dam. The erosion on the upstream face was repaired with the installation of geotextile and riprap. The crest and the south abutment have been backfilled with additional material to provide a levelled elevation. All the deficiencies noted in the AANDC's 2014 inspection have been addressed. The freeboard is observed to be approximately 1.3 m.

4 Waste Oil Management Facility Inspection

The facility is a stable condition with no geotechnical concern. Minor ponding water was observed in the lowest point of the ditch and in one high traffic area. The berm and collection ditch are in stable condition. The downstream slopes of the facility are observed to be in stable condition without any evidence of erosion and instability. No exposed liner was observed within the facility.

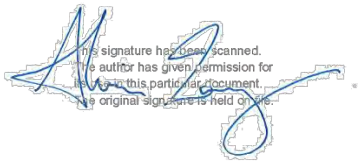
5 Recommendations

Both the sewage dams were repaired according to the 2014 recommendations. The current condition of the Upper Sewage Dam is in good geotechnical condition after the 2015 repairs. Periodic inspections are recommended on the buried culvert to monitor its condition and seepage rate. It appears that this culvert controls the upper lake level. If the seepage stops or further reduces, then the lake level could increase as a result. If the culvert is found to be fully collapsed or blocked and the seepage stops, then it would be recommended that the siphon pipes be reinstalled to transfer water to the lower lake. The upper pond levels is recommended to have minimum 1 m freeboard prior to operations and winterization.

The Lower Sewage Dam is in good geotechnical condition after the 2015 repairs. Visual checks are recommended in the upstream face when practicable during summer seasons for potential major erosion. Repairs should be considered if major erosion damages are found. The lower pond level is recommended to have a minimum 1 m freeboard prior to operations and winterization.

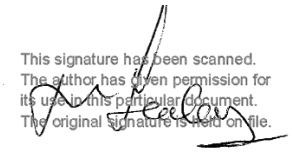
The waste oil management facility is in good geotechnical conditions. Visual checks should be done in the downstream face of the facility for erosion and within the facility for any exposed liner. Monitoring should also be done during freshet to ensure the runoff is contained within the berm and ditches.

This report, 2015 Waste Management Facility Geotechnical Inspection, was prepared by



Alvin Tong, PEng
Senior Consultant

and reviewed by



Peter Healey, PEng
Principal Consultant

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

6 References

[AANDC] Aboriginal Affairs and Northern Development Canada, 2014. Water Licence Inspection Form, issued to LMI on July 15, 2014.

[AANDC] Aboriginal Affairs and Northern Development Canada, 2015. Water Licence Inspection Form, issued to LMI on July 14, 2015.

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Appendix A – Photograph Log

Photo 1: Looking north from the Lower Sewage Dam south abutment on the repaired crest and upstream face.

Photo 2: Looking south at the Lower Sewage Dam southern abutment on the additional fill placed to raise the elevation.

Photo 3: Look south from the Lower Sewage Dam North abutment on the repaired upstream slope and crest. Note the 1.3 meter freeboard available at the time of the photo.

Photo 4: Looking south from the Upper Sewage Dam north abutment on the repaired crest with additional fill placement.

Photo 5: Looking at repaired upstream face and crest of the Upper Sewage Dam. Note the 1.8 meter freeboard available at the time of the photo.

srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection Lupin Tailings Mine
		Waste Management Structures Inspection
Job No: 1CL008.002 Filename:Appendix_A_Photo_Log_1CL008_002_JN_20141006	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **A.1**

Photo 6: Looking east from the back of the WOMF.

Photo 7: Looking west from the from of the front WOMF at the ditch.

Photo 8: Looking south at the back of the WOMF and the ditch.

Photo 9: Looking west at the WOMF and the downstream slope.

srk consulting	**Lupin Mines Incorporated**	2015 Annual Geotechnical Inspection Lupin Tailings Mine **Waste Management Structures Inspection**
Job No: 1CL008.002 Filename:Appendix_A_Photo_Log_1CL008_002_JN_20141006	Lupin Mine	Date: Sept 2015 / Approved: AT / Figure: **A.2**

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Memo

To:	Karyn Lewis, Elgin Mining Incorporated	**Client:**	Lupin Mines Incorporated
From:	Andrea Bowie, Arlene Laudrum	**Project No:**	1CL008.000
Cc:	Eric Ketilson, SRK	**Date:**	December 31, 2015
Subject:	Results of the 2015 Lupin Mine Windblown Tails Survey at Dam 6		

1 Introduction

Concern that windblown tails were being deposited outside the tailings containment area (TCA) was expressed by Aboriginal Affairs and Northern Development Canada (now referred to as Indigenous and Northern Affairs Canada) (INAC) during the Technical Review of the Lupin Mine water licence renewal application. INAC requested that Lupin Mines Incorporated (LMI) develop a formal plan and schedule to address monitoring, cleanup and control of windblown tails. LMI responded on October 10, 2014 by committing to complete a soil sampling program in 2015 at Dam 6 of the Lupin Mine Tailings Containment Area (TCA).

The presence of arsenic in surficial sediment samples had been documented at the toe of Dam 6. A soil sample collected by INAC on July 6, 2012 from the west side of Dam 6, outside the containment area, returned an arsenic concentration of 162 mg/kg. INAC suggested that the result supported their hypothesis that windblown tails were being actively deposited outside of the TCA.

Dam 6 is a perimeter closure dam for Cell 3, located on the southwest side of the TCA (Figure 1). It was constructed in 1992 (Holubec 2005). Tails were deposited in Cell 3 between 1990 and 2005 (Tansey, 2006). The tails in Cell 3 are covered with 1.0 m or more esker material except for an 86,000 m^2 area of uncovered saturated tails situated more than 750 m from Dam 6. The cover on Cell 3 was placed between 2003 and 2005.

2 Sample Collection

The 2015 sampling program at Dam 6 included the physical and chemical characterization of soil samples collected in a 25 m grid pattern at the downstream base of the dam. The plan to assess the presence of windblown tailings was provided to INAC and the Nunavut Water Board (NWB) in a memo on October 29, 2014 (SRK 2014).

All samples collected to assess the presence of windblown tails were gathered over a three day period from August 14 to 16, 2015. The sampling area was established 5 m off the toe of the dam and the grid consisted of 13 columns and 3 rows spaced 25 m apart. Samples were collected to

characterize the dust on the surface of the soil by utilizing a brush and dustpan. No samples were collected from the southwest corner of the sample grid, as no surficial material was observed in the elevated area. The southwest corner of the sample grid is a ridge covered by vegetation. Initially, every other sample from the first row was submitted for grain size and metal analysis. The sample results were compared to the proposed arsenic concentration management trigger limit of 179 mg/kg (Morrow 2006). If any sample had an exceedance of the management limit the adjacent samples were then submitted for analysis.

Samples were also collected from the crest of Dam 6 on the road, from the esker material covering the tails in the TCA 5 m to the east side of Dam 6 and from the exposed tailings in Cell 3 for comparative purposes. Due to the nature of wetted tails, the sample from Cell 3 was collected with a clean spade up to 10 cm below surface.

In addition, soil samples were collected from shallow pits on August 22, 2015 to twin samples being collected by INAC. Three pits were excavated to the west of Dam 6 and one pit was excavated in the exposed tails on Cell 3. A surface sample and subsurface sample were collected in each pit. The surface soil sample consisted of material collected between 2.5 and 10 cm below surface while the subsurface sample was collected from material between 15 and 25 cm below surface. The samples were collected with a clean spade.

3 Results

The analytical soil sample results are compared to the generic Canadian Council of Ministers of the Environment (CCME) Residential Land Use (RL) and the Industrial Land Use (IL) criteria as well as the proposed site specific arsenic concentration management trigger limit of 179 mg/kg (Morrow 2006) in Table 1.

Maps highlighting the arsenic concentrations in the surficial and subsoil material are presented as Figure 2 and Figure 3, respectively. Samples LUP15059, LUP15061 and LUP15063 shown on Figure 2 were not collected from the dust on surface, they were instead collected between 2.5 and 10 cm below surface. No surficial soil samples could be collected from the southwest ridge (LUP15036, LUP15038 and LUP15039) as no surficial material was observed.

Three rounds of samples were submitted to ALS Environmental, after which the decision not to submit further samples was made as the results were conclusive of elevated arsenic concentrations. The arsenic concentrations in the dust recovered from the surface of the soil ranged from 84.2 to 2,550 mg/kg, with the highest concentrations of arsenic being found in the third (outside) row farthest from the dam. Arsenic was the only element to exceed the CCME guidelines in the dust. The subsoil samples revealed elevated arsenic concentrations from 176 to 2,410 mg/kg (samples LUP15060, LUP150062, LUP150064) beneath a surface layer of sand that had arsenic concentrations that ranged from 47 to 103 mg/kg (samples LUP15059, LUP15061 and LUP15063).

Samples collected from the crest of Dam 6 on the road returned arsenic concentrations that ranged from 21 to 112 mg/kg. The arsenic concentrations in the capped tails esker material on the TCA ranged from 8 to 13 mg/kg. The exposed tails in Cell 3 exhibited arsenic concentrations that ranged from 6,200 to 8,410 mg/kg.

Sieve analysis of the samples was conducted to assess the likelihood of windblown materials being present outside of the TCA. The results revealed that the tailings has a fine texture with less than 20% of the material being more than 75 µm in grain size. The surficial material collected outside of the TCA has a coarse texture with 75 to 97% greater than 75 µm. The subsoil samples were a finer texture material with 45 to 50% greater than 75 µm.

Quality assurance and control measures associated with the collection and analysis of the solids samples included the analysis of blind duplicate samples. The complete listing of laboratory quality control samples and their relative percent difference (RPD) are shown in Table 2. These monitor a combination of the precision of the laboratory analyses, sample preparation errors and genuine short scale variations in soil geochemistry. Results that are either below the detection limit for one or both sample pairs, or below the practical quantitation limit (PQL) have RPD's identified as not applicable.

Five sample pairs were evaluated. Two of the sample pairs had RPD values greater than 25% for two elements of the elements analysed. These data suggest the material sampled was homogeneous and the results will not affect the conclusions or recommendations.

4 Conclusions

The results do not show that windblown tails are currently being deposited outside of the facility as a result of the exposed saturated tails in Cell 3. The size analysis shows that the material analyzed is coarse to fine grain sands. This grain size of material is not indicative of windblown material. The results indicate that the potential for windblown deposition of tailings outside of the TCA has been controlled by the placement of the esker sand cover. The absence of surficial material on elevated areas at the downstream toe of Dam 6 further supports this conclusion.

The arsenic concentrations and grain size of the subsoil samples suggest the historical deposition of tailings occurred in the vicinity of Dam 6. A sand cover is in place over the tails downgradient of the toe of Dam 6. A review of Lupin Mine spill reports and available operating records did not reveal a spill or overtopping of tailings at Dam 6. Nor was documentation found that discussed capping tails on the downstream toe of Dam 6. It is possible that the deposition of tails in this area predates the construction of Dam 6.

The Ecological Risk Assessment for the Lupin Mine Tailings Containment Area (Golder 2004) showed that the risks from sand-covered tailings are acceptable, both for humans and wildlife. The study did not assess areas outside of the TCA.

5 Recommendations

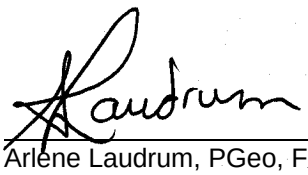
An extension of the 10 cm thick soil cover at the downstream toe of Dam 6 is recommended, based on available site data. Additional soil sampling from shallow pits is required to determine the lateral extent of the cover required. The soil samples should be collected from topographic lows west of the surficial sample grid.

When the final closure plan is being developed for the site, SRK recommends that a human health and ecological risk assessment be conducted for the Lupin Mine site to determine site specific soil quality management trigger limits for contaminants of environmental concern, including arsenic. Minimal sample collection would be involved in order to assess the toxicity of arsenic through speciation identification and to appraise the mobility of arsenic to the surrounding environment through leaching tests. The study would be informed by the results of the environmental effects monitoring programs undertaken at the Lupin Mine. Based on the risk assessment results, the risk remediation strategy for dealing with soil and sediment in excess of the management trigger limits can be developed (i.e. cover [minimum depth of cover required], excavate and relocate, do not disturb).

SRK Consulting (Canada) Inc.

Andrea Bowie, PEng
Consultant

and reviewed by



Arlene Laudrum, PGeo, FGC
Principal Consultant

Enclosures:
Tables
Figures

6 References

Golder 2004. Ecological Risk Assessment for the Lupin Mine Tailings Containment Area. Prepared by Golder Associates Ltd for Kinross Gold Corporation. December 2004.

Holubec 2005. Lupin Operation Closure Plan For Tailings Containment Area. Prepared by I. Holubec Consulting Inc. for Kinross Gold Corporation. Dated January 2005.

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Morrow 2006. Phase 1 and 2 Environmental site Assessment, Lupin Mine Site, Nunavut Territory. Prepared by Morrow Environmental Consultants Inc., a member of the SNC-Lavalin Group for Kinross Gold Corp. Dated January 11, 2006.

SRK 2014. Arsenic concentration in sample of windblown material collected by AANDC in 2012 does not exceed background levels. Prepared by SRK Consulting (Canada) Inc. for Lupin Mines Incorporated. Dated October 29, 2014.

Tansey 2006. Tails Cells Depositional History.xls. Lupin Mine operational records. File dated March 1, 2006.

Lupin Mine Site

Table 1: 2015 Windblown Tails Data

Client Sample ID	CCME Recreational Land Use (RL) Criteria (mg/kg)	CCME Industrial Land Use (IL) Criteria (mg/kg)	Site Specific Background Concentration (mg/kg)	Units	LUP15001	LUP15004	LUP15007	LUP15010	LUP15013	LUP15016	LUP15056 duplicate of LUP15016	LUP15022	LUP15028	LUP15031	LUP15034	LUP15037
Date Sampled					15-Aug-2015	14-Aug-2015	15-Aug-2015	14-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015
Location					Downstream Toe of Dam 6, Row 1											
ALS Sample ID	**Exceedance Format**	**Exceedance Format**	***Exceedance Format***		L1700420-1	L1661981-1	L1697540-2	L1661981-2	L1697540-5	L1661981-3	L1661981-21	L1661981-4	L1661981-5	L1697540-7	L1661981-6	L1697540-10
Parameter					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
% Particles > 75um (Coarse/Fine)																
% Sand				%			91.6		95.6					95.6		94.8
% Silt				%			5		3.2					2.6		4.6
% Clay				%			3.4		1.2					1.8		<1.0
General Texture Class				-		Coarse	Sand	Coarse	Sand	Coarse	Coarse	Coarse	Coarse	Sand	Coarse	Sand
% >75um				%		92.4		93.7		96.9	96.5	96	97.2		99	
Metals in Soil by CRC ICPMS																
Aluminum (Al)				mg/kg		5200		4080		4970	4920	4840	4860		4960	
Antimony (Sb)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic (As)	12	12	179	mg/kg	***310***	**127**	**112**	**142**	**105**	**109**	**114**	**116**	**103**	**86**	***947***	***245***
Barium (Ba)				mg/kg	34.1	28	29.9	24	27.4	31.7	27.7	31.7	25.4	23.3	26	30.8
Beryllium (Be)	4	8		mg/kg	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	0.1	<0.10	0.11	<0.10	0.1	<0.10
Bismuth (Bi)				mg/kg		<0.20		<0.20		0.32	<0.20	<0.20	<0.20		<0.20	
Boron (B)				mg/kg		<5.0		<5.0		<5.0	<5.0	<5.0	<5.0		<5.0	
Cadmium (Cd)	10	22		mg/kg	<0.020	0.034	<0.020	<0.020	<0.020	<0.020	<0.020	0.03	0.03	0.022	<0.020	0.02
Calcium (Ca)				mg/kg		4990		2410		676	841	1000	2480		917	
Chromium (Cr)	64	87		mg/kg	18.8	20.2	17.7	16.5	16.8	24.6	17.9	17.1	18	17.4	17.2	15.3
Cobalt (Co)	50	300		mg/kg	2.94	5.59	3.31	4.07	3.45	2.88	2.88	3.43	4.01	4.16	3.36	5.24
Copper (Cu)	63	91		mg/kg	11.2	29.4	7.14	7.9	7.54	14.6	10.9	9.25	9.34	7.82	9.25	8.12
Iron (Fe)				mg/kg		9360		8550		9930	9540	10600	10700		10600	
Lead (Pb)	140	600		mg/kg	4.64	2.46	2.94	3.08	2.7	2.42	2.85	2.3	1.87	2.15	3.24	3.29
Lithium (Li)				mg/kg		17.7		11.6		15.3	14.9	15.1	16.2		14.7	
Magnesium (Mg)				mg/kg		3500		2730		3430	3150	3200	3330		3360	
Manganese (Mn)				mg/kg		91.7		78.4		69.6	69.4	82.9	92.6		74.7	
Mercury (Hg)				mg/kg	<0.0050		<0.0050		<0.0050					<0.0050		<0.0050
Molybdenum (Mo)	10	40		mg/kg	0.22	0.24	0.19	0.22	0.29	0.24	0.28	0.23	0.23	0.22	0.36	0.39
Nickel (Ni)	45	89		mg/kg	9.38	15.6	9.24	10.4	9.83	11.5	9.04	8.7	10.4	11.3	9.6	12.6
Phosphorus (P)				mg/kg		218		204		215	225	265	207		259	
Potassium (K)				mg/kg		1440		1430		1610	1460	1700	1660		1300	
Selenium (Se)	1	2.9		mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Silver (Ag)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium (Na)				mg/kg		86		110		84	86	79	109		<50	
Strontium (Sr)				mg/kg		14.4		11.7		7.56	7.99	7.24	9.84		4.72	
Thallium (Tl)				mg/kg	0.082	0.087	0.075	0.068	0.08	0.081	0.082	0.077	0.08	0.067	0.069	0.069
Tin (Sn)	50	300		mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium (Ti)				mg/kg		298		215		253	274	252	260		214	
Uranium (U)				mg/kg	0.441	0.373	0.296	0.266	0.344	0.335	0.404	0.37	0.334	0.347	0.403	0.335
Vanadium (V)	130	130		mg/kg	15.5	15.9	14.3	12.4	14.8	14.2	14.6	14	14.9	13.9	13.9	12.5
Zinc (Zn)	200	360		mg/kg	14.6	18.5	13.5	14.3	14.2	17.5	14.2	16.6	17.3	17	15.9	13.4
Zirconium (Zr)				mg/kg		1.6		1.3		1.4	1.6	1.5	1.3		1.4	

Lupin Mine Site

Table 1: 2015 Windblown Tails Data

Client Sample ID	CCME Recreational Land Use (RL) Criteria (mg/kg)	CCME Industrial Land Use (IL) Criteria (mg/kg)	Site Specific Background Concentration (mg/kg)	Units	LUP15002	LUP15005	LUP15066 duplicate of LUP15005	LUP15008	LUP15011	LUP15014	LUP15017	LUP15029	LUP15032	LUP15067 duplicate of LUP15032	LUP15035
Date Sampled					15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015
Location					Downstream Toe of Dam 6, Row 2										
ALS Sample ID	**Exceedance Format**	**Exceedance Format**	***Exceedance Format***		L1700420-2	L1697540-1	L1697540-11	L1697540-3	L1697540-4	L1697540-6	L1700420-8	L1700420-10	L1697540-8	L1697540-12	L1697540-9
Parameter					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
% Particles > 75um (Coarse/Fine)															
% Sand				%	75.6	93	93.6	90.6	93.6	92.6		94.6	94.6	96.8	99
% Silt				%	17.4	5.6	6	6.4	4	4		1	1.6	2.8	0.43
% Clay				%	7.0	1.4	<1.0	3	2.4	3.4		4.4	3.8	<1.0	0.54
General Texture Class				-	Sandy loam	Sand	Sand	Sand	Sand	Sand		Sand	Sand	Sand	Sand
% >75um				%											
Metals in Soil by CRC ICPMS															
Aluminum (Al)				mg/kg											
Antimony (Sb)	20	40		mg/kg	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic (As)	12	12	179	mg/kg	***1530***	***191***	**141**	***447***	***370***	***393***	**136**	***682***	***219***	***223***	***402***
Barium (Ba)				mg/kg	40.7	32.8	28.7	27.8	31.1	30	30.2	36.1	31	30.3	36
Beryllium (Be)	4	8		mg/kg	<0.10	0.11	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	0.1	0.11	<0.10
Bismuth (Bi)				mg/kg											
Boron (B)				mg/kg											
Cadmium (Cd)	10	22		mg/kg	0.02	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Calcium (Ca)				mg/kg											
Chromium (Cr)	64	87		mg/kg	16.6	18.6	16.9	15.8	14.7	15.1	17	16.5	20	20.4	17.4
Cobalt (Co)	50	300		mg/kg	1.99	2.92	2.86	2.83	2.54	2.46	2.56	2.6	3.19	3.24	2.85
Copper (Cu)	63	91		mg/kg	11	10	10.3	7.33	8.43	8.19	7.83	7.78	8.69	9.27	8.67
Iron (Fe)				mg/kg											
Lead (Pb)	140	600		mg/kg	24.9	6.35	4.88	7.79	5.29	5.31	2.92	8.06	4.19	4.77	5.58
Lithium (Li)				mg/kg											
Magnesium (Mg)				mg/kg											
Manganese (Mn)				mg/kg											
Mercury (Hg)				mg/kg	0.03	<0.0050	<0.0050	0.0053	0.0086	0.0076	<0.0050	0.012	0.0053	0.0051	0.0078
Molybdenum (Mo)	10	40		mg/kg	0.38	0.27	0.22	0.23	0.2	0.18	0.19	0.36	0.22	0.28	0.2
Nickel (Ni)	45	89		mg/kg	7.46	9.65	8.82	8.8	8.23	7.76	8.31	8.68	11	11.1	9.77
Phosphorus (P)				mg/kg											
Potassium (K)				mg/kg											
Selenium (Se)	1	2.9		mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Silver (Ag)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium (Na)				mg/kg											
Strontium (Sr)				mg/kg											
Thallium (Tl)				mg/kg	0.067	0.07	0.066	0.062	0.064	0.058	0.06	0.06	0.073	0.06	0.066
Tin (Sn)	50	300		mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium (Ti)				mg/kg											
Uranium (U)				mg/kg	0.502	0.415	0.364	0.281	0.392	0.415	0.314	0.378	0.437	0.382	0.358
Vanadium (V)	130	130		mg/kg	14.3	14.7	13.1	12.2	12.5	12.6	15.1	14.1	16	15.7	13.6
Zinc (Zn)	200	360		mg/kg	13	14.3	13.7	13.1	12.9	11.9	13	13	15.5	16	13.9
Zirconium (Zr)				mg/kg											

Lupin Mine Site

Table 1: 2015 Windblown Tails Data

Client Sample ID	CCME Recreational Land Use (RL) Criteria (mg/kg)	CCME Industrial Land Use (IL) Criteria (mg/kg)	Site Specific Background Concentration (mg/kg)	Units	LUP15003	LUP15006	LUP15009	LUP15012	LUP15068 duplicate of LUP15012	LUP15015	LUP15018	LUP15030	LUP15033	LUP15059-DAM6 SURFMAT	LUP15061-DAM6 SURFMAT	LUP15063-DAM6 SURFMAT
Date Sampled					15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	22-Aug-2015	22-Aug-2015	22-Aug-2015
Location					Downstream Toe of Dam 6, Row 3									Surface soil at downstream toe of Dam 6		
ALS Sample ID	**Exceedance Format**	**Exceedance Format**	***Exceedance Format***		L1700420-3	L1700420-4	L1700420-5	L1700420-6	L1700420-13	L1700420-7	L1700420-9	L1700420-11	L1700420-12	L1662622-3	L1662622-5	L1662622-7
Parameter					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
% Particles > 75um (Coarse/Fine)																
% Sand				%	75.4	82.6	92					83.2				
% Silt				%	19.9	11.8	3.4					8.0				
% Clay				%	4.66	5.6	4.6					8.8				
General Texture Class				-	Loamy sand	Loamy sand	Sand					Loamy sand		Coarse	Coarse	Coarse
% >75um				%										96	94.1	92.7
Metals in Soil by CRC ICPMS																
Aluminum (Al)				mg/kg										5600	4850	4610
Antimony (Sb)	20	40		mg/kg	0.23	0.1	<0.10	<0.10	<0.10	<0.10	0.14	0.18	<0.10	<0.10	<0.10	<0.10
Arsenic (As)	12	12	179	mg/kg	***2550***	***1690***	***1070***	***218***	***266***	**84.2**	***2080***	***2450***	***350***	**47.3**	**103**	**96.5**
Barium (Ba)				mg/kg	48.5	40.7	40.8	38.5	33.5	30.8	42.3	48.3	39.5	30.2	30.9	28.6
Beryllium (Be)	4	8		mg/kg	0.21	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	<0.10	0.11	<0.10	<0.10
Bismuth (Bi)				mg/kg										<0.20	<0.20	<0.20
Boron (B)				mg/kg										<5.0	<5.0	<5.0
Cadmium (Cd)	10	22		mg/kg	0.13	0.041	0.022	<0.020	<0.020	<0.020	<0.020	<0.020	0.023	<0.020	<0.020	<0.020
Calcium (Ca)				mg/kg										880	1010	885
Chromium (Cr)	64	87		mg/kg	16.5	13.9	16.5	21.5	18.4	18.2	17.3	18.9	19.6	21.8	19	17.8
Cobalt (Co)	50	300		mg/kg	31.4	11.4	2.94	3.1	2.95	2.74	2.38	2.57	3.46	3.82	2.82	2.6
Copper (Cu)	63	91		mg/kg	25.9	13.3	13.7	6.76	8.24	6.72	9.09	12.8	13.5	12.7	8.34	7.6
Iron (Fe)				mg/kg										11300	11000	9710
Lead (Pb)	140	600		mg/kg	34.2	24.9	19.4	3.29	3.49	2.38	17	22.3	8.88	3.04	3.49	3.68
Lithium (Li)				mg/kg										17.6	13.6	12.4
Magnesium (Mg)				mg/kg										3680	2910	2710
Manganese (Mn)				mg/kg										88.4	75.7	68
Mercury (Hg)				mg/kg	0.027	0.022	0.024	<0.0050	0.0058	<0.0050	0.018	0.026	0.025			
Molybdenum (Mo)	10	40		mg/kg	0.49	0.45	0.36	0.44	0.21	0.19	0.35	0.5	0.35	0.31	0.53	0.17
Nickel (Ni)	45	89		mg/kg	35.5	14.1	10.2	10.5	8.57	8.55	8.34	9.19	11.6	11.9	9.06	8.72
Phosphorus (P)				mg/kg										241	213	245
Potassium (K)				mg/kg										1680	1610	1500
Selenium (Se)	1	2.9		mg/kg	0.27	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Silver (Ag)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium (Na)				mg/kg										92	203	121
Strontium (Sr)				mg/kg										5.69	9.53	7.34
Thallium (Tl)				mg/kg	0.09	0.074	0.074	0.069	0.068	0.06	0.08	0.07	0.068	0.102	0.087	0.082
Tin (Sn)	50	300		mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium (Ti)				mg/kg										324	330	303
Uranium (U)				mg/kg	0.421	0.37	0.457	0.35	0.343	0.325	0.3	0.454	0.49	0.472	0.392	0.372
Vanadium (V)	130	130		mg/kg	12.7	11.6	13.4	17.5	15.8	14	14.2	16.4	14.6	18	16.4	14.9
Zinc (Zn)	200	360		mg/kg	35.1	17	14.5	15.9	14.1	12.6	12.8	13.8	15.2	19.3	15	13.1
Zirconium (Zr)				mg/kg										2.4	1.8	2.2

Lupin Mine Site

Table 1: 2015 Windblown Tails Data

Client Sample ID	CCME Recreational Land Use (RL) Criteria (mg/kg)	CCME Industrial Land Use (IL) Criteria (mg/kg)	Site Specific Background Concentration (mg/kg)	Units	LUP15043	LUP15045	LUP15047	LUP15055 duplicate of LUP15047	LUP15049	LUP15051	LUP15053	LUP15044	LUP15046	LUP15048	LUP15050
Date Sampled					15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015	15-Aug-2015
Location					Crest of Dam 6							Soil cover on Cell 3 upstream of Dam 6			
ALS Sample ID	**Exceedance Format**	**Exceedance Format**	***Exceedance Format***		L1661981-7	L1661981-9	L1661981-11	L1661981-20	L1661981-13	L1661981-15	L1661981-17	L1661981-8	L1661981-10	L1661981-12	L1661981-14
Parameter					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
% Particles > 75um (Coarse/Fine)															
% Sand				%											
% Silt				%											
% Clay				%											
General Texture Class				-	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse	Coarse
% >75um				%	87	82.7	85.2	86.9	85.8	92.1	91.1	92	84.8	89.2	88.1
Metals in Soil by CRC ICPMS															
Aluminum (Al)				mg/kg	5770	6300	5900	6100	6730	5530	5370	5780	5090	5050	4790
Antimony (Sb)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Arsenic (As)	12	12	179	mg/kg	**112**	**77.2**	**62.4**	**65.8**	**98.8**	**20.5**	**49.9**	**12.8**	8	**12.4**	**12**
Barium (Ba)				mg/kg	36.9	39.2	34.6	37.6	41.4	36.3	31.8	35.9	29.9	31	28.3
Beryllium (Be)	4	8		mg/kg	0.12	0.13	0.12	0.13	0.16	0.12	0.13	0.12	0.22	0.18	0.22
Bismuth (Bi)				mg/kg	0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron (B)				mg/kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium (Cd)	10	22		mg/kg	0.024	0.027	0.033	0.036	0.033	0.024	0.029	0.028	0.31	0.24	0.34
Calcium (Ca)				mg/kg	937	1290	1580	1680	1540	989	1280	1250	8380	8860	8190
Chromium (Cr)	64	87		mg/kg	24.3	28.9	24.6	25.4	27.5	22.4	21	25	20.8	19.8	18.5
Cobalt (Co)	50	300		mg/kg	3.34	4.22	5.53	6.44	6.13	3.64	3.98	4.25	**53.3**	47.8	**70**
Copper (Cu)	63	91		mg/kg	11.6	12.6	14.4	15.5	17.3	10.8	13.9	13.9	**68.5**	39.9	**66.1**
Iron (Fe)				mg/kg	10500	11500	10900	10800	12200	9380	9480	10300	8500	8270	8030
Lead (Pb)	140	600		mg/kg	2.67	2.39	2.19	2.13	1.98	1.23	1.53	1.81	1.16	1.04	1.08
Lithium (Li)				mg/kg	16.3	16.3	17.9	19.4	18.7	18	17	17	25.2	23.3	27.1
Magnesium (Mg)				mg/kg	3450	3950	3780	3940	4140	3520	3360	3690	5230	5150	5460
Manganese (Mn)				mg/kg	80.9	87.6	92.5	96.5	103	82.2	83.4	84.8	395	368	438
Mercury (Hg)				mg/kg											
Molybdenum (Mo)	10	40		mg/kg	0.24	0.38	0.32	0.28	0.29	0.33	0.3	0.2	0.17	0.17	0.21
Nickel (Ni)	45	89		mg/kg	11.6	15.3	17.5	21	18.6	12.1	13.3	13.8	**154**	**135**	**184**
Phosphorus (P)				mg/kg	313	337	318	279	286	228	249	311	339	198	244
Potassium (K)				mg/kg	1790	1950	2020	2180	2520	1820	1670	2160	4120	3120	5000
Selenium (Se)	1	2.9		mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Silver (Ag)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium (Na)				mg/kg	66	104	86	99	92	<50	74	56	345	357	436
Strontium (Sr)				mg/kg	4.48	4.7	5.58	6.32	6.62	3.84	5.76	4.32	23.2	26.2	27.7
Thallium (Tl)				mg/kg	0.094	0.089	0.099	0.102	0.118	0.099	0.086	0.1	0.16	0.143	0.173
Tin (Sn)	50	300		mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Titanium (Ti)				mg/kg	334	334	314	362	378	302	292	391	290	260	256
Uranium (U)				mg/kg	0.719	0.683	0.675	0.615	0.649	0.474	0.552	0.819	1.43	0.931	1.56
Vanadium (V)	130	130		mg/kg	18.7	20.7	18.9	19.4	23.2	17.6	15.7	20.9	16.3	14.4	14.3
Zinc (Zn)	200	360		mg/kg	16.6	19	19.7	21.1	22	17.7	18	17.7	56.6	49.1	67.3
Zirconium (Zr)				mg/kg	2.2	2.4	2	2.2	1.7	1.4	1.9	2.2	1.9	1.6	1.6

Lupin Mine Site

Table 1: 2015 Windblown Tails Data

Client Sample ID	CCME Recreational Land Use (RL) Criteria (mg/kg)	CCME Industrial Land Use (IL) Criteria (mg/kg)	Site Specific Background Concentration (mg/kg)	Units	LUP15052	LUP15054	LUP15060-DAM6 DEEPMAT	LUP15062-DAM6 DEEPMAT	LUP15064-DAM6 DEEPMAT	LUP15041	LUP15057-CELL3 TAIL	LUP15058-CELL3 DUP
Date Sampled					15-Aug-2015	15-Aug-2015	22-Aug-2015	22-Aug-2015	22-Aug-2015	16-Aug-2015	22-Aug-2015	22-Aug-2015
Location					Soil cover on Cell 3 upstream of Dam 6		Subsoil at downstream toe of Dam 6			Cell 3 Tails		
ALS Sample ID	**Exceedance Format**	**Exceedance Format**	***Exceedance Format***		L1661981-16	L1661981-18	L1662622-4	L1662622-6	L1662622-8	L1661981-19	L1662622-1	L1662622-2
Parameter					Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
% Particles > 75um (Coarse/Fine)												
% Sand				%								
% Silt				%								
% Clay				%								
General Texture Class				-	Coarse	Coarse	Coarse	Fine	Fine	Fine	Fine	Fine
% >75um				%	82.5	95.8	50.4	45.7	46.5	14.6	13.2	19.5
Metals in Soil by CRC ICPMS												
Aluminum (Al)				mg/kg	6270	6350	6480	3930	4130	21300	18300	18100
Antimony (Sb)	20	40		mg/kg	<0.10	<0.10	0.17	<0.10	<0.10	0.4	0.43	0.41
Arsenic (As)	12	12	179	mg/kg	10	9	***2410***	**176**	***830***	***8410***	***6200***	***6750***
Barium (Ba)				mg/kg	34.5	24.5	42.9	19	22.1	115	113	117
Beryllium (Be)	4	8		mg/kg	0.55	0.11	0.14	<0.10	<0.10	0.45	0.5	0.44
Bismuth (Bi)				mg/kg	<0.20	<0.20	0.34	<0.20	<0.20	0.82	0.99	1
Boron (B)				mg/kg	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Cadmium (Cd)	10	22		mg/kg	0.79	0.036	0.022	<0.020	<0.020	0.16	0.1	0.088
Calcium (Ca)				mg/kg	13500	1730	1860	1380	1560	9870	9380	9110
Chromium (Cr)	64	87		mg/kg	22.3	24.2	21.8	14.8	15.3	53.5	45.9	46.4
Cobalt (Co)	50	300		mg/kg	**190**	5.02	3.17	2.53	2.34	11.4	6.01	6.35
Copper (Cu)	63	91		mg/kg	**188**	16.8	14.6	7.56	8.34	**91.8**	**82.8**	**66**
Iron (Fe)				mg/kg	9060	10500	23200	8280	12400	91900	84800	86500
Lead (Pb)	140	600		mg/kg	1.14	1.27	50.7	3.68	12.6	**229**	**217**	**256**
Lithium (Li)				mg/kg	54.2	17.4	13.6	8.9	9.2	36.3	29.9	29.4
Magnesium (Mg)				mg/kg	9680	4280	3220	2090	2200	7590	6580	6520
Manganese (Mn)				mg/kg	1020	95.3	79.8	65.5	62.5	131	137	136
Mercury (Hg)				mg/kg								
Molybdenum (Mo)	10	40		mg/kg	0.33	0.27	0.61	0.21	0.29	2.1	2.1	2.1
Nickel (Ni)	45	89		mg/kg	**493**	16.7	11.4	8.73	8.06	32.7	19.1	22.1
Phosphorus (P)				mg/kg	263	208	450	415	487	785	794	804
Potassium (K)				mg/kg	6720	1760	1580	640	760	3140	2980	3030
Selenium (Se)	1	2.9		mg/kg	<0.20	<0.20	0.21	<0.20	<0.20	**1**	0.87	0.89
Silver (Ag)	20	40		mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	0.14	0.13	0.12
Sodium (Na)				mg/kg	913	65	206	87	105	315	515	458
Strontium (Sr)				mg/kg	52.8	7.29	24.3	6.34	10.6	60.4	93.4	79.1
Thallium (Tl)				mg/kg	0.212	0.106	0.093	<0.050	0.05	0.177	0.185	0.195
Tin (Sn)	50	300		mg/kg	<2.0	<2.0	<2.0	<2.0	<2.0	2.4	3.1	3
Titanium (Ti)				mg/kg	345	219	330	315	271	526	466	472
Uranium (U)				mg/kg	3.05	0.408	0.683	0.756	0.777	1.18	1.01	0.777
Vanadium (V)	130	130		mg/kg	18.9	16.2	19.2	13.4	15.1	36.9	33.2	33.9
Zinc (Zn)	200	360		mg/kg	178	20.7	16.4	11.6	11	71.2	76.9	74.9
Zirconium (Zr)				mg/kg	2.4	1.1	1.1	1.4	1.4	3.7	4.4	4.1

Lupin Mine Site
Table 2: 2015 Windblown Tails Data Quality Control

Client Sample ID	MRL	PQL	Units	LUP15016	LUP15056	LUP15016 & LUP15056 - Duplicate Comparison	LUP15047	LUP15055	LUP15047 & LUP15055 - Duplicate Comparison	LUP15005	LUP15066	LUP15005 & LUP15066 - Duplicate Comparison	LUP15032	LUP15067	LUP15032 & LUP15067 - Duplicate Comparison	LUP15012	LUP15068	LUP15012 & LUP15068 - Duplicate Comparison
Date Sampled				15-Aug-2015	15-Aug-2015		15-Aug-2015	15-Aug-2015		15-Aug-2015	15-Aug-2015		15-Aug-2015	15-Aug-2015		15-Aug-2015	15-Aug-2015	
ALS Sample ID				L1661981-3	L1661981-21		L1661981-11	L1661981-20		L1697540-1	L1697540-11		L1697540-8	L1697540-12		L1700420-6	L1700420-13	
Parameter				Soil	Soil	RPD	Soil	Soil	RPD	Soil	Soil	RPD	Soil	Soil	RPD	Soil	Soil	RPD
Aluminum (Al)	50	250.0	mg/kg	4970	4920	1%	5900	6100	-3%									na
Antimony (Sb)	0.1	0.5	mg/kg	<0.10	<0.10	na	<0.10	<0.10	na	<0.10	<0.10	na	<0.10	<0.10	na	<0.10	<0.10	na
Arsenic (As)	0.1	0.5	mg/kg	109	114	-4%	62	66	-5%	191	141	**30%**	219	223	-2%	218	266	-20%
Barium (Ba)	0.5	2.5	mg/kg	31.7	27.7	13%	34.6	37.6	-8%	32.8	28.7	13%	31.0	30.3	2%	38.5	33.5	14%
Beryllium (Be)	0.1	0.5	mg/kg	<0.10	0.10	na	0.12	0.13	na	0.11	0.10	na	0.10	0.11	na	<0.10	<0.10	na
Bismuth (Bi)	0.2	1.0	mg/kg	0.32	<0.20	na	<0.20	<0.20	na									
Boron (B)	5	25.0	mg/kg	<5.0	<5.0	na	<5.0	<5.0	na									
Cadmium (Cd)	0.02	0.1	mg/kg	<0.020	<0.020	na	0.033	0.036	na	<0.020	<0.020	na	<0.020	<0.020	na	<0.020	<0.020	na
Calcium (Ca)	50	250.0	mg/kg	676	841	-22%	1580	1680	-6%									
Chromium (Cr)	0.5	2.5	mg/kg	24.6	17.9	**32%**	24.6	25.4	-3%	18.6	16.9	10%	20.0	20.4	-2%	21.5	18.4	16%
Cobalt (Co)	0.1	0.5	mg/kg	2.88	2.88	0%	5.53	6.44	-15%	2.92	2.86	2%	3.19	3.24	-2%	3.10	2.95	5%
Copper (Cu)	0.5	2.5	mg/kg	14.6	10.9	**29%**	14.4	15.5	-7%	10.0	10.3	-3%	8.69	9.27	-6%	6.76	8.24	-20%
Iron (Fe)	50	250.0	mg/kg	9930	9540	4%	10900	10800	1%									
Lead (Pb)	0.5	2.5	mg/kg	2.42	2.85	na	2.19	2	na	6.35	4.88	**26%**	4.19	4.77	-13%	3.29	3.49	-6%
Lithium (Li)	2	10.0	mg/kg	15.3	14.9	3%	17.9	19.4	-8%									
Magnesium (Mg)	20	100.0	mg/kg	3430	3150	9%	3780	3940	-4%									
Manganese (Mn)	1	5.0	mg/kg	69.6	69.4	0%	92.5	96.5	-4%									
Mercury (Hg)	0.01	0.0	mg/kg							<0.0050	<0.0050	na	0.0053	0.0051	na	<0.0050	0.0058	na
Molybdenum (Mo	0.1	0.5	mg/kg	0.24	0.28	na	0.32	0.28	na	0.27	0.22	na	0.22	0.28	na	0.44	0.21	na
Nickel (Ni)	0.5	2.5	mg/kg	11.5	9.0	24%	17.5	21.0	-18%	9.65	8.82	9%	11.0	11.1	-1%	10.5	8.57	20%
Phosphorus (P)	50	250.0	mg/kg	215	225	na	318	279	13%									
Potassium (K)	100	500.0	mg/kg	1610	1460	10%	2020	2180	-8%									
Selenium (Se)	0.2	1.0	mg/kg	<0.20	<0.20	na	<0.20	<0.20	na	<0.20	<0.20	na	<0.20	<0.20	na	<0.20	<0.20	na
Silver (Ag)	0.1	0.5	mg/kg	<0.10	<0.10	na	<0.10	<0.10	na	<0.10	<0.10	na	<0.10	<0.10	na	<0.10	<0.10	na
Sodium (Na)	50	250.0	mg/kg	84.0	86.0	na	86.0	99.0	na									
Strontium (Sr)	0.5	2.5	mg/kg	7.56	7.99	-6%	5.58	6.32	-12%									
Thallium (Tl)	0.05	0.3	mg/kg	0.081	0.082	na	0.099	0.102	na	0.070	0.066	na	0.073	0.060	na	0.069	0.068	na
Tin (Sn)	2	10.0	mg/kg	<2.0	<2.0	na	<2.0	<2.0	na	<2.0	<2.0	na	<2.0	<2.0	na	<2.0	<2.0	na
Titanium (Ti)	1	5.0	mg/kg	253	274	-8%	314	362	-14%									
Uranium (U)	0.05	0.3	mg/kg	0.335	0.404	-19%	0.675	0.615	9%	0.415	0.364	13%	0.437	0.382	13%	0.350	0.343	2%
Vanadium (V)	0.2	1.0	mg/kg	14.2	14.6	-3%	18.9	19.4	-3%	14.7	13.1	12%	16.0	15.7	2%	17.5	15.8	10%
Zinc (Zn)	2	10.0	mg/kg	17.5	14.2	21%	19.7	21.1	-7%	14.3	13.7	4%	15.5	16.0	-3%	15.9	14.1	12%
Zirconium (Zr)	1	5.0	mg/kg	1.4	1.6	na	2.0	2.2	na									

Bold RPD value is greater than or equal to +/- 25% and the concentrations of both samples are greater than the PQL.

Notes:

na *RPD value is not applicable because one or both results are less than the PQL.*
RPD *Relative Percent Difference = (Difference/Average)*100.*
PQL *Practical Quantitation Limit = 5 * Method Reporting Limit (MRL)*
MRL *Method Reporting Limit*

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NOTES:
Image produced by Photosat Information Ltd. 2012
Image data: Aug. 21, 2012

Coordinate System: NAD 1983 UTM Zone 12N

0 0.5 1 Kilometers

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Job No: 1CL008.003

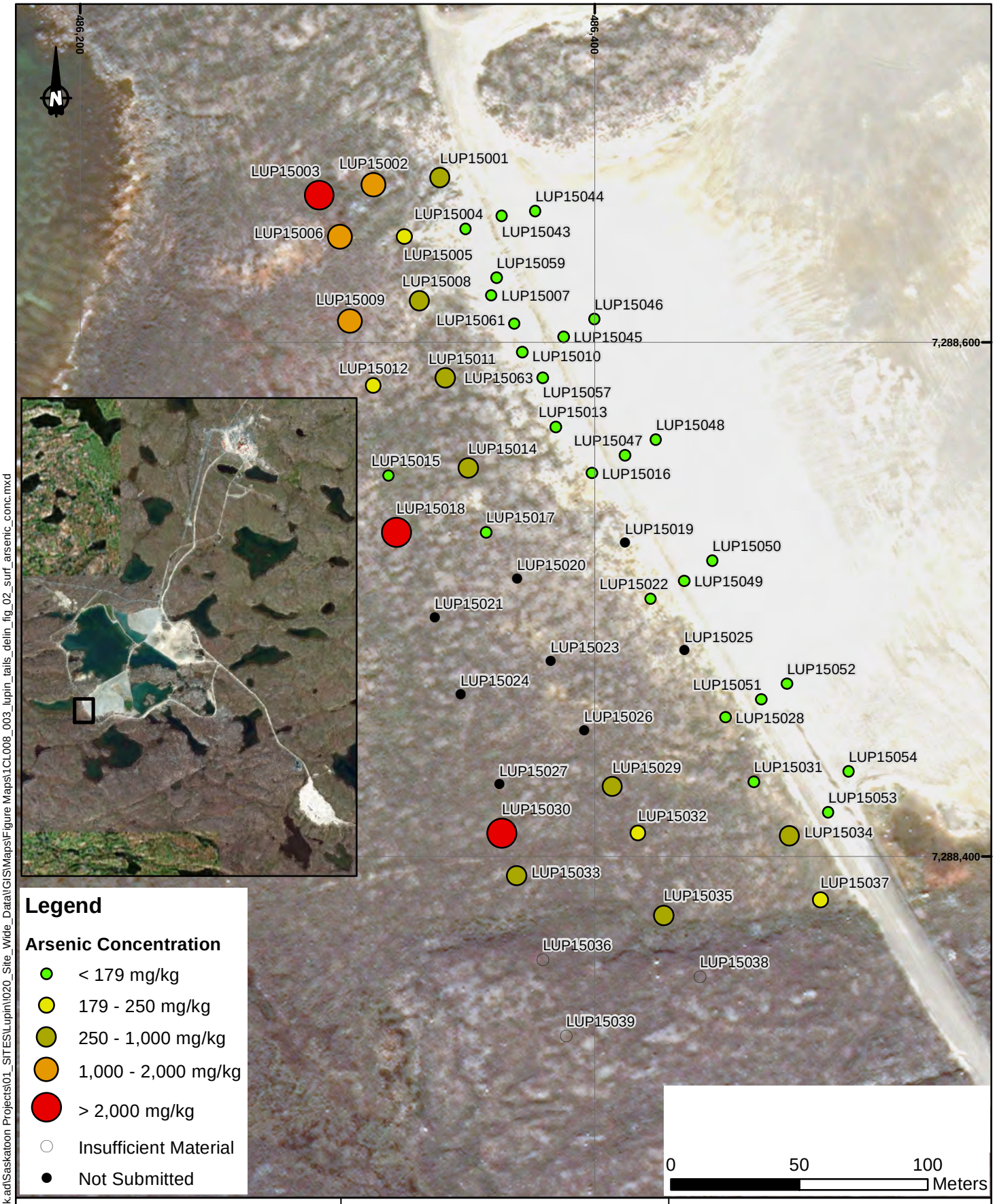
Filename: 1CL008_003_lupin_tails_delin_fig_01_tailings_area

LUPIN MINES INC.

WIND BLOW TAILINGS DELINEATION

TAILINGS CONTAINMENT AREA

Date:	Approved:	Figure:
DEC 2015		1



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LUPIN MINES INC.

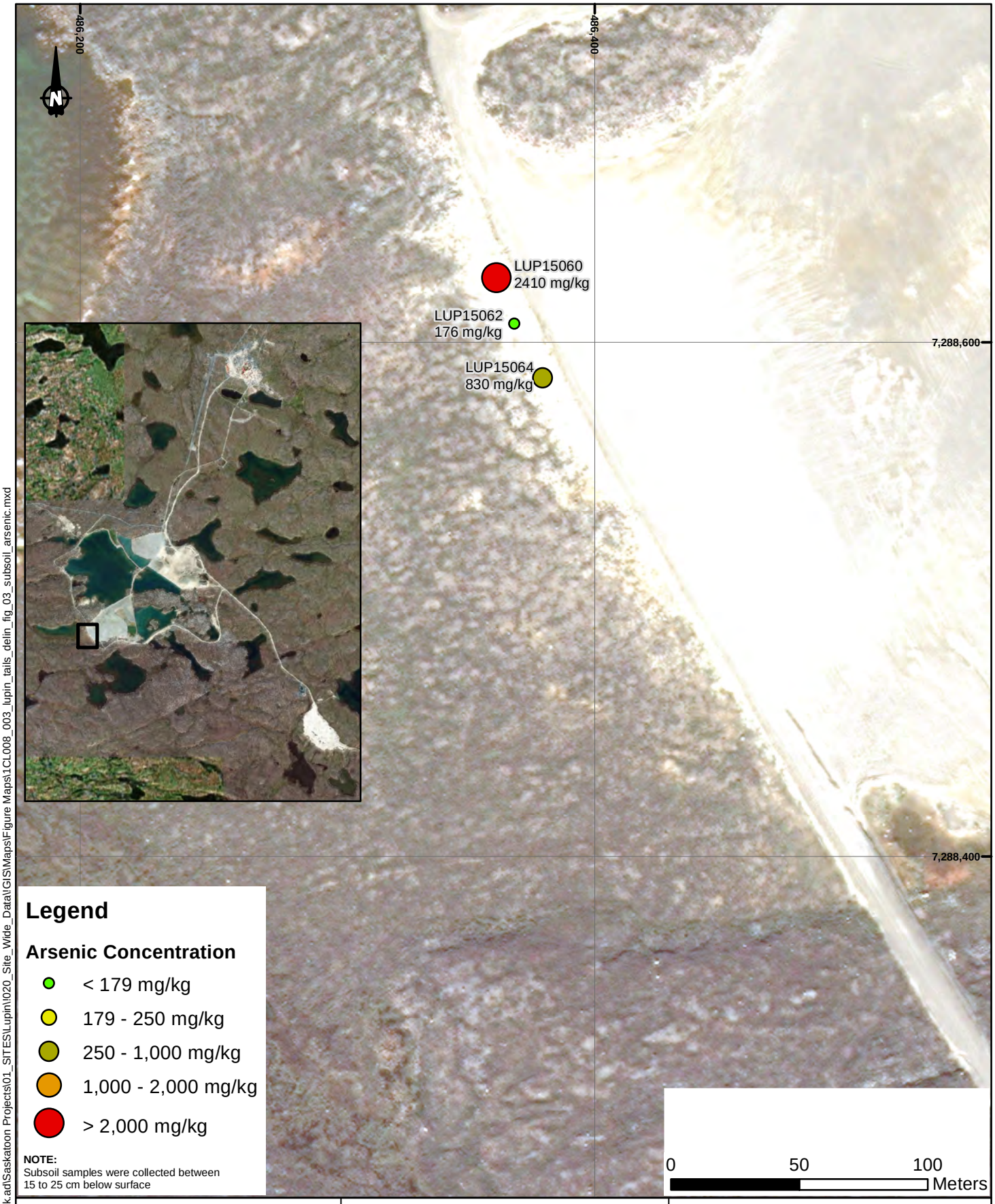
WIND BLOW TAILINGS DELINEATION

SURFICIAL ARSENIC CONCENTRATIONS

Job No: 1CL008.003

Filename: 1CL008_003_lupin_tails_delin_fig_02_surf_arsenic_conc

Date:	Approved:	Figure:
DEC 2015		2



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WIND BLOW TAILINGS DELINEATION

SUBSOIL ARSENIC CONCENTRATIONS

Job No: 1CL008.003

Filename: 1CL008_003_lupin_tails_delin_fig_03_subsoil_arsenic

Date:	Approved:	Figure:
DEC 2015		3