

LEGEND

- CONTOUR (10 m INTERVAL)
- FLOW DIRECTION
- WATERSHED BOUNDARY
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- LANDFILL
- REHABILITATED DISTURBED AREA
- TAILINGS TO BE REMOVED TO TCA
- WASTE ROCK COVERED
- WASTE ROCK REMOVED
- WATERBODY

NOTE(S)

1. AFTER BLASTING, THE CROWN PILLAR WATERSHED WILL DRAIN INTERNALLY INTO THE UNDERGROUND MINE WORKING.

2. SPILLWAYS WILL BE EXCAVATED THROUGH THE SEWAGE LAKE DAMS AT CLOSURE LEAVING THEM FREE DRAINING.

REFERENCE(S)

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CLIENT

MANDALAY RESOURCES CORPORATION

PROJECT

LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

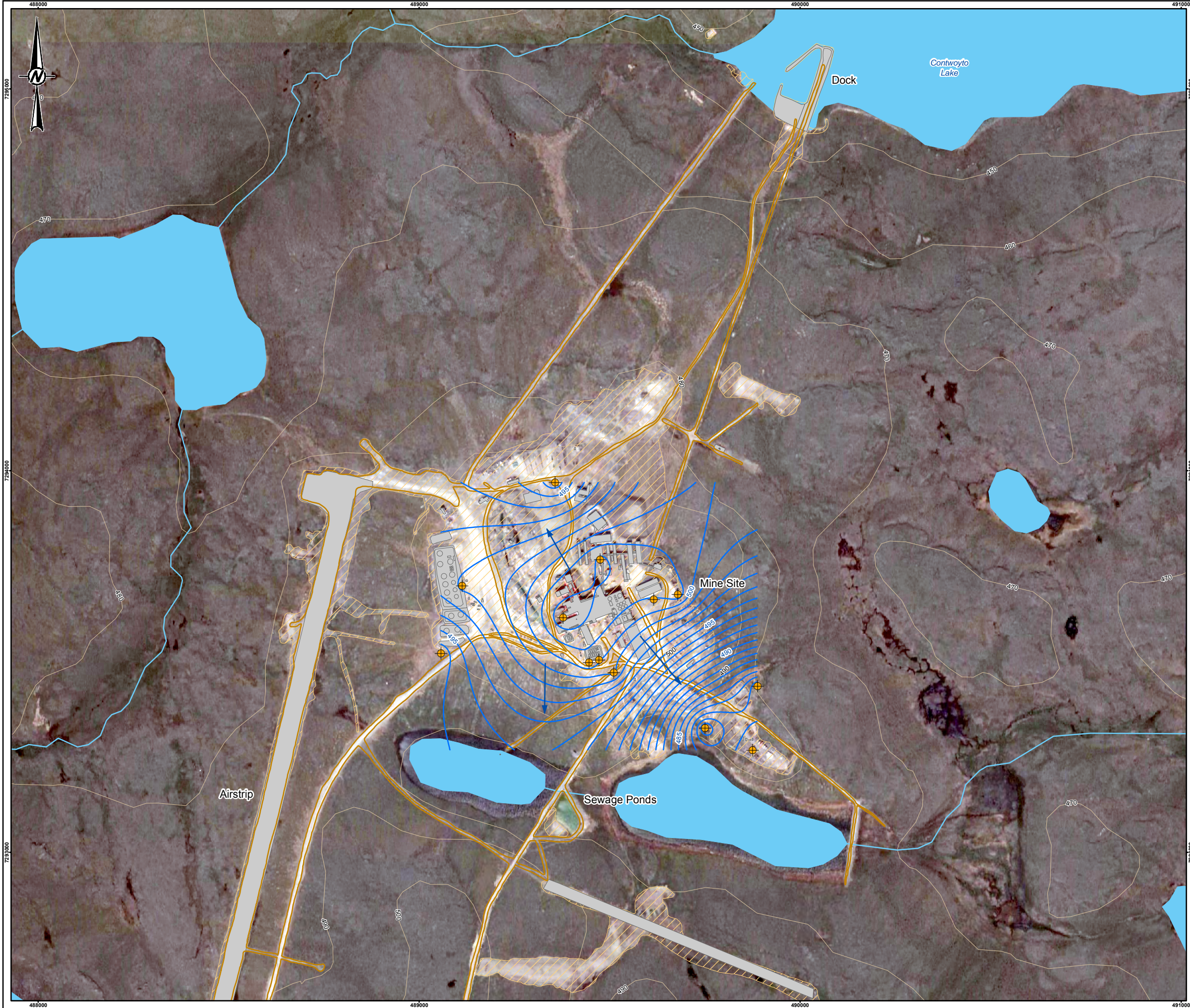
TITLE

MINE AND MILL SITE AREA – WATERSHEDS

YYYY-MM-DD	2019-10-15
DESIGNED	IM
PREPARED	JT
REVIEWED	SG
APPROVED	TMG

PROJECT NO.	CONTROL	REV.	FIGURE
19120487	5000	0	5

GOLDER



LEGEND

- MONITORING WELL
- CONTOUR
- EQUIPOTENTIAL LINE
- GROUNDWATER FLOW DIRECTION
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- DISTURBANCE FOOTPRINT
- WATERBODY

0 250 500
1:10,000 METRES

REFERENCE(S)
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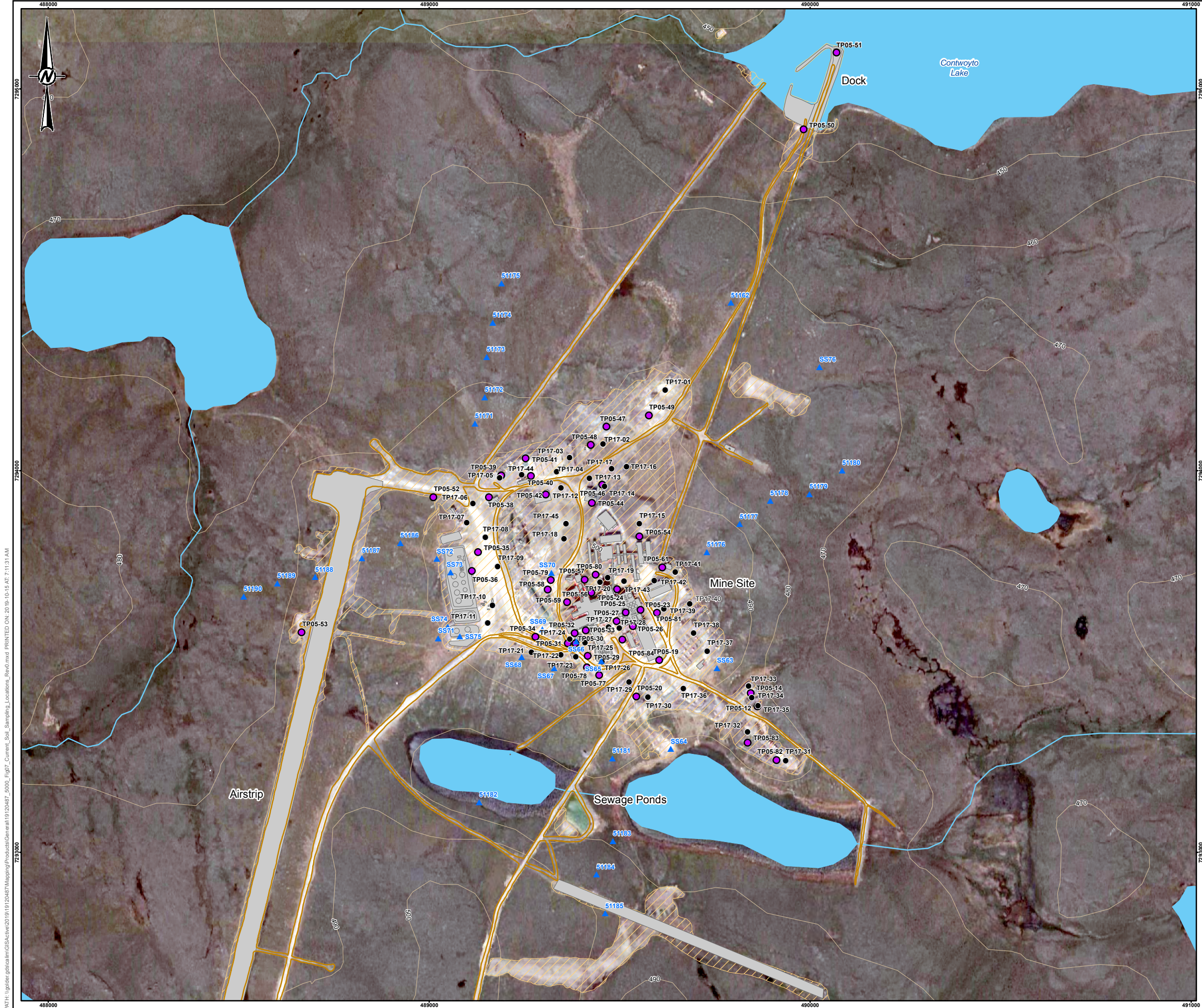
PROJECT
LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

TITLE
GROUNDWATER FLOW DIRECTION

CONSULTANT	YYYY-MM-DD	2019-10-15
	DESIGNED	DY
	PREPARED	JT
	REVIEWED	SG
	APPROVED	TMG

PROJECT NO.	CONTROL	REV.	FIGURE
19120487	5000	0	6

GOLDER



LEGEND

- 2017 TEST PIT LOCATION
- ▲ HISTORICAL SOIL SAMPLE LOCATION
- 2006 TEST PIT LOCATION
- CONTOUR
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- ▨ DISTURBANCE FOOTPRINT
- WATERBODY

REFERENCE(S)

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PROJECT


LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

TITLE

CURRENT AND HISTORICAL SOIL SAMPLE LOCATIONS

CONSULTANT	YYYY-MM-DD	2019-10-15
	DESIGNED	DY
	PREPARED	JT
	REVIEWED	SG
	APPROVED	TMG

PROJECT NO.	CONTROL	REV.	FIGURE
19120487	5000	0	7

 **GOLDER**



LEGEND

- MONITORING WELL
- CONTOUR
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- DISTURBANCE FOOTPRINT
- WATERBODY

0 250 500
1:10,000 METRES

REFERENCE(S)
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PROJECT
LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

TITLE
GROUNDWATER MONITORING WELL LOCATIONS

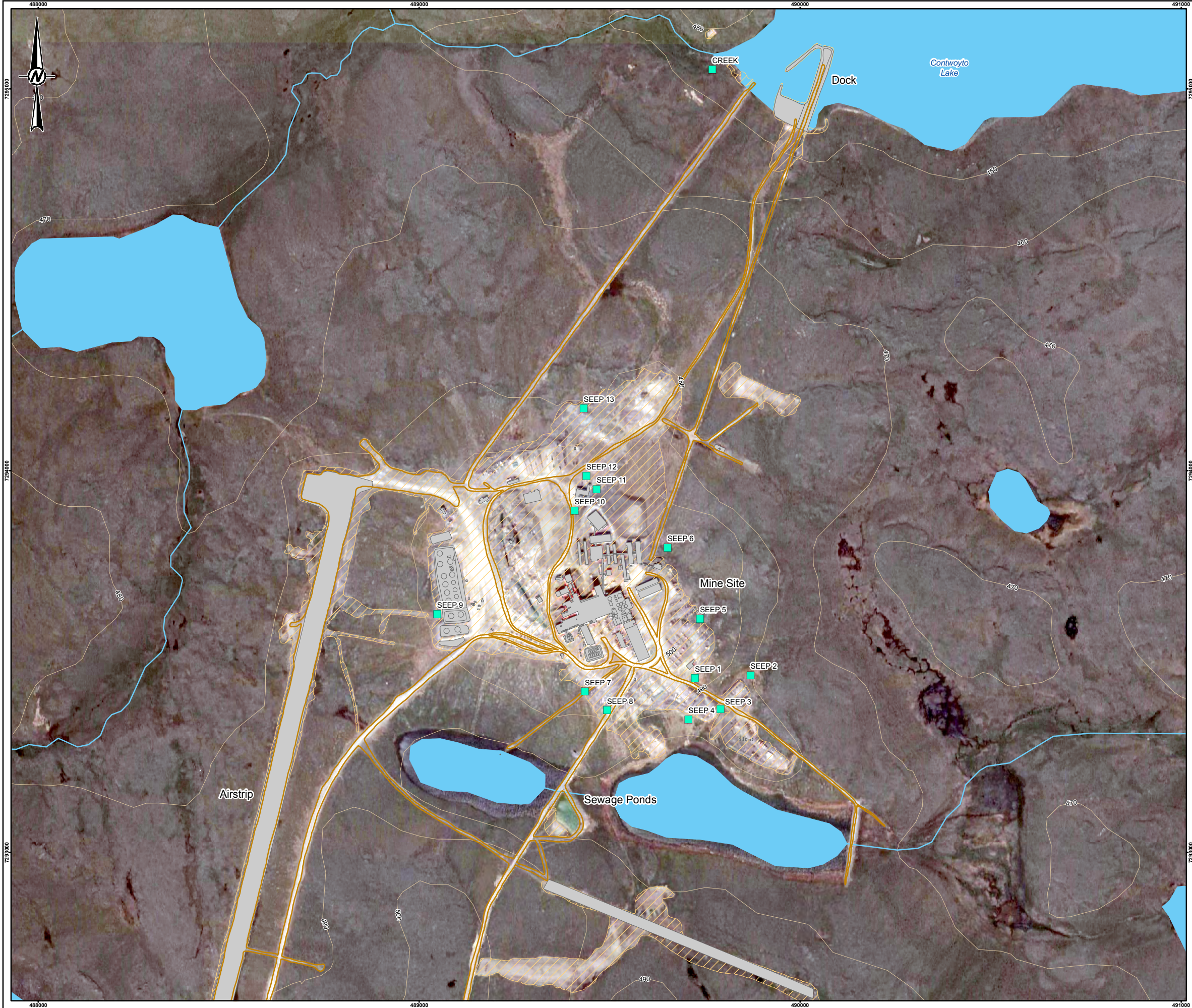
CONSULTANT	YYYY-MM-DD	2019-10-15
	DESIGNED	DY
	PREPARED	JT
	REVIEWED	SG
	APPROVED	TMG

PROJECT NO.
19120487

CONTROL
5000

REV.
0

FIGURE
8



LEGEND

- SURFACE WATER SEEP SAMPLE LOCATIONS
- CONTOUR
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- DISTURBANCE FOOTPRINT
- WATERBODY

0 250 500
1:10,000 METRES

REFERENCE(S)
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PROJECT
LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

TITLE
SEEPAGE SURFACE WATER SAMPLE LOCATIONS

CONSULTANT	YYYY-MM-DD	2019-10-15
	DESIGNED	DY
	PREPARED	JT
	REVIEWED	SG
	APPROVED	TMG

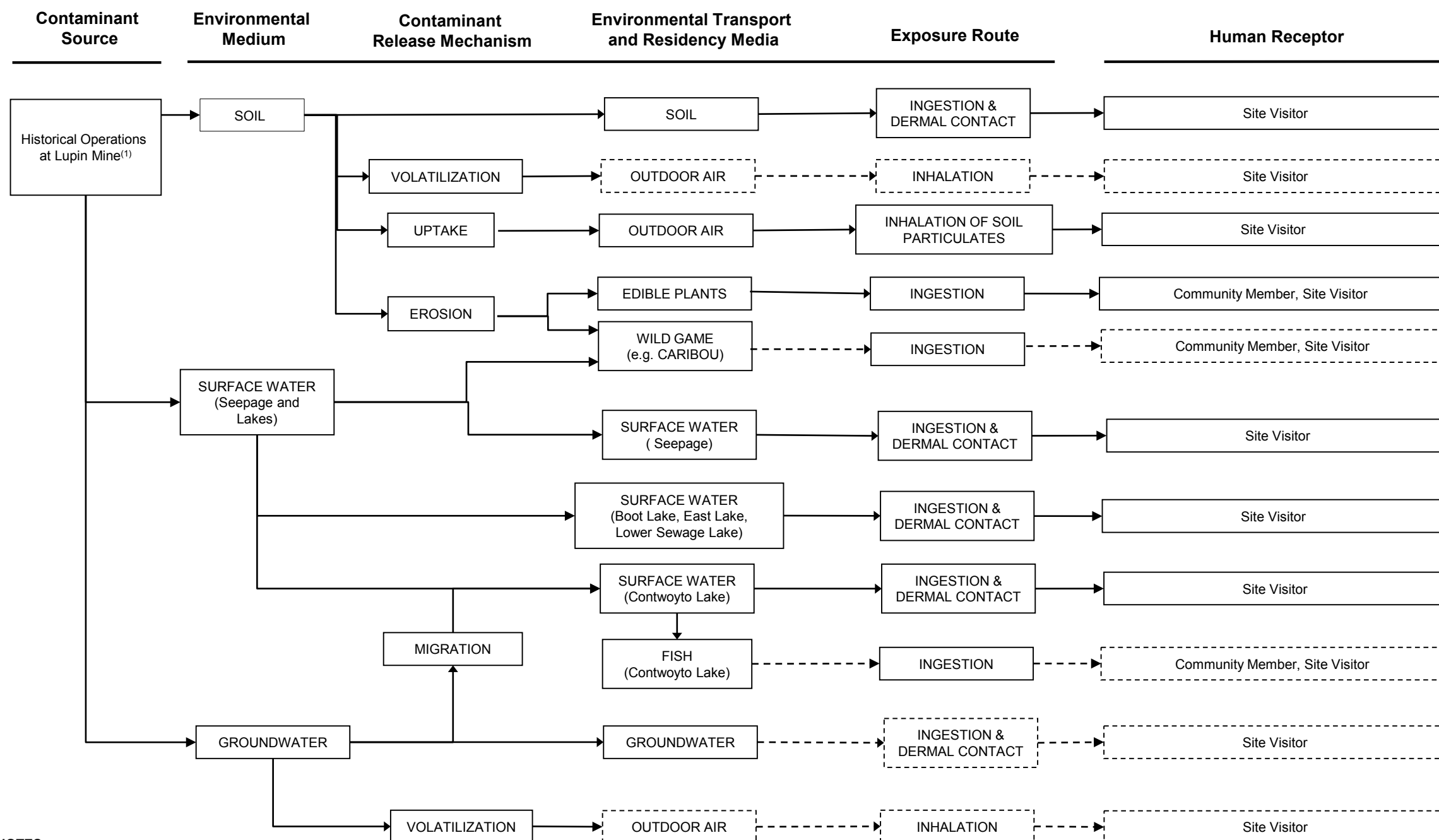
PROJECT NO.	CONTROL	REV.	FIGURE
19120487	5000	0	9

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

Conceptual Site Model for Human Receptors

FIGURE 10



NOTES:

Solid lines indicate pathways that are likely to be complete or operative.

Dotted lines indicate pathways that are likely to be incomplete or inoperative.

⁽¹⁾ For the purpose of this assessment, the "Site" is defined as the surface parcel/lease of land occupied by the mine and mill site only, along with the associated roads and water supply facilities at Contwoyto Lake. The tailings containment area is not part of this assessment.

Date: October 2019

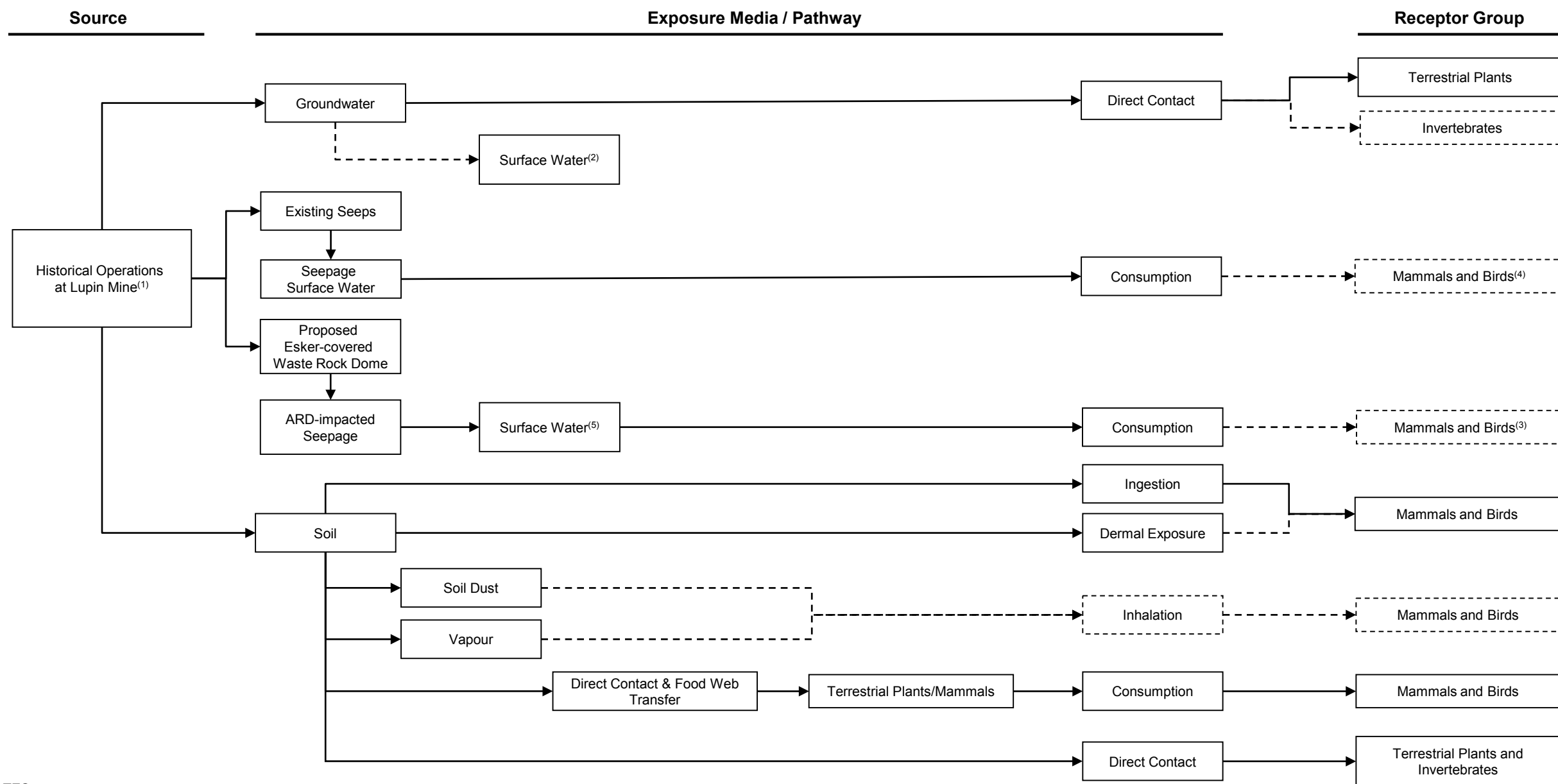
Project Number: 19120487 (5000)



GOLDER

CAD: SG

CKD: AA



NOTES:

Solid lines indicate pathways that are likely to be complete or operative.

Dotted lines indicate pathways that are likely to be incomplete or inoperative.

⁽¹⁾ For the purpose of this assessment, the "Site" is defined as the surface parcel/lease of land occupied by the mine and mill site only, along with the associated roads and water supply facilities at Contwoyto Lake. The tailings containment area is not part of this assessment.

⁽²⁾ Contwoyto Lake, Boot Lake, East Lake, Lower Sewage Lake.

⁽³⁾ No contaminants of concern were identified in lake surface water for consumption by mammals and birds.

⁽⁴⁾ No contaminants of concern were identified in seepage surface water for consumption by mammals and birds.

⁽⁵⁾ Boot Lake, East Lake and Lower Sewage Lake. Impacts to surface water quality in Contwoyto Lake are expected to be negligible.

Date: October 2019

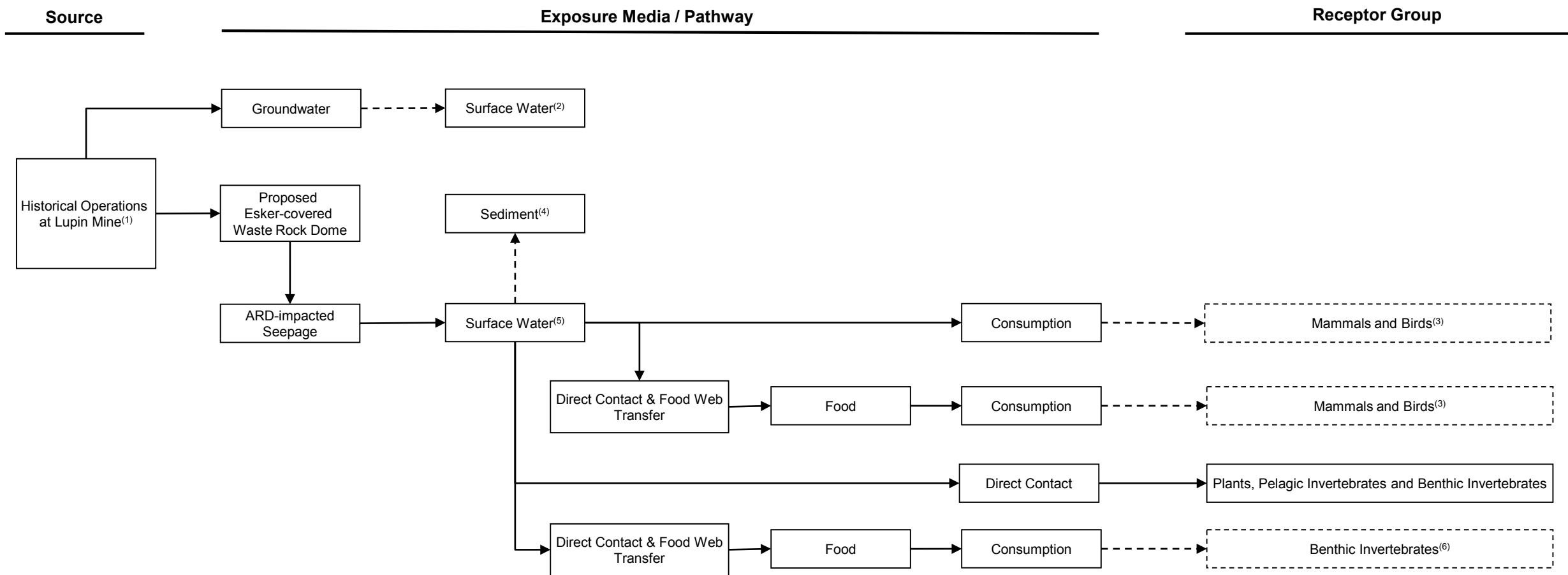
Project: 19120487 (5000)



GOLDER

CAD: SG

CKD: TMG



NOTES:

Solid lines indicate pathways that are likely to be complete or operative.

Dotted lines indicate pathways that are likely to be incomplete or inoperative.

⁽¹⁾ For the purpose of this assessment, the "Site" is defined as the surface parcel/lease of land occupied by the mine and mill site only, along with the associated roads and water supply facilities at Contwoyto Lake. The tailings containment area is not part of this assessment.

⁽²⁾ Contwoyto Lake, Boot Lake, East Lake, Lower Sewage Lake.

⁽³⁾ No contaminants of concern were identified in lake surface water for consumption by mammals and birds.

⁽⁴⁾ The focus of the assessment was on ARD-impacted seepage and potential long-term impacts to surface water quality in the receiving water bodies. Potential impacts to sediment and all associated exposure pathways and receptor groups were not considered further.

⁽⁵⁾ Boot Lake, East Lake and Lower Sewage Lake. Impacts to surface water quality in Contwoyto Lake are expected to be negligible.

⁽⁶⁾ Uptake from the water is expected to be the dominant uptake route for most of the parameters predicted in surface water. For those parameters for which uptake from the diet may be important (e.g., selenium), predicted concentrations in the lakes were not much above reference conditions and/or guidelines protective of this pathway and are not expected to drive uptake by aquatic life.

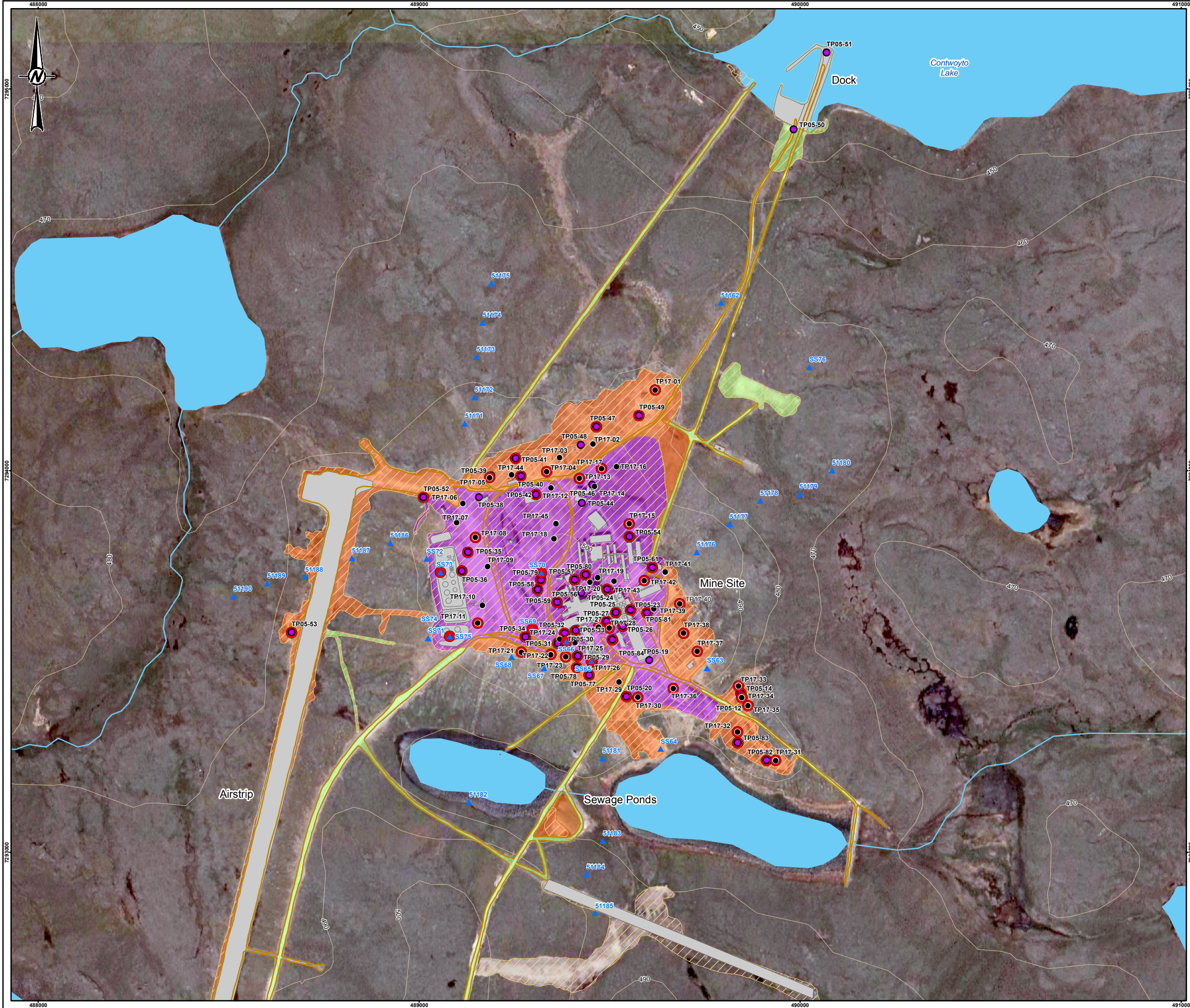
Date: October 2019

Project: 19102487



CAD: SG

CKD: TMG



LEGEND

- 2017 TEST PIT LOCATION
- ▲ HISTORICAL SOIL SAMPLE LOCATION
- 2006 TEST PIT LOCATION
- EXCEEDANCES OF SSTL FOR SOIL
- CONTOUR
- REHABILITATED DISTURBED AREA
- WASTE ROCK COVERED
- WASTE ROCK REMOVED
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- DISTURBANCE FOOTPRINT
- WATERBODY

COC	SSTL (mg/kg)
PHC F1	210
PHC F2	150
PHC F3	300
Cyanide	0.9
Arsenic	79
Lead	95
Naphthalene	0.6
pH	4.13 to 9.0

NOTE(S)

1. COC = CONTAMINANT OF CONCERN; SSTL = SITE SPECIFIC TARGET LEVEL; MG/KG = MILLIGRAM PER KILOGRAM

REFERENCE(S)

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MANDALAY RESOURCES CORPORATION

PROJECT

LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

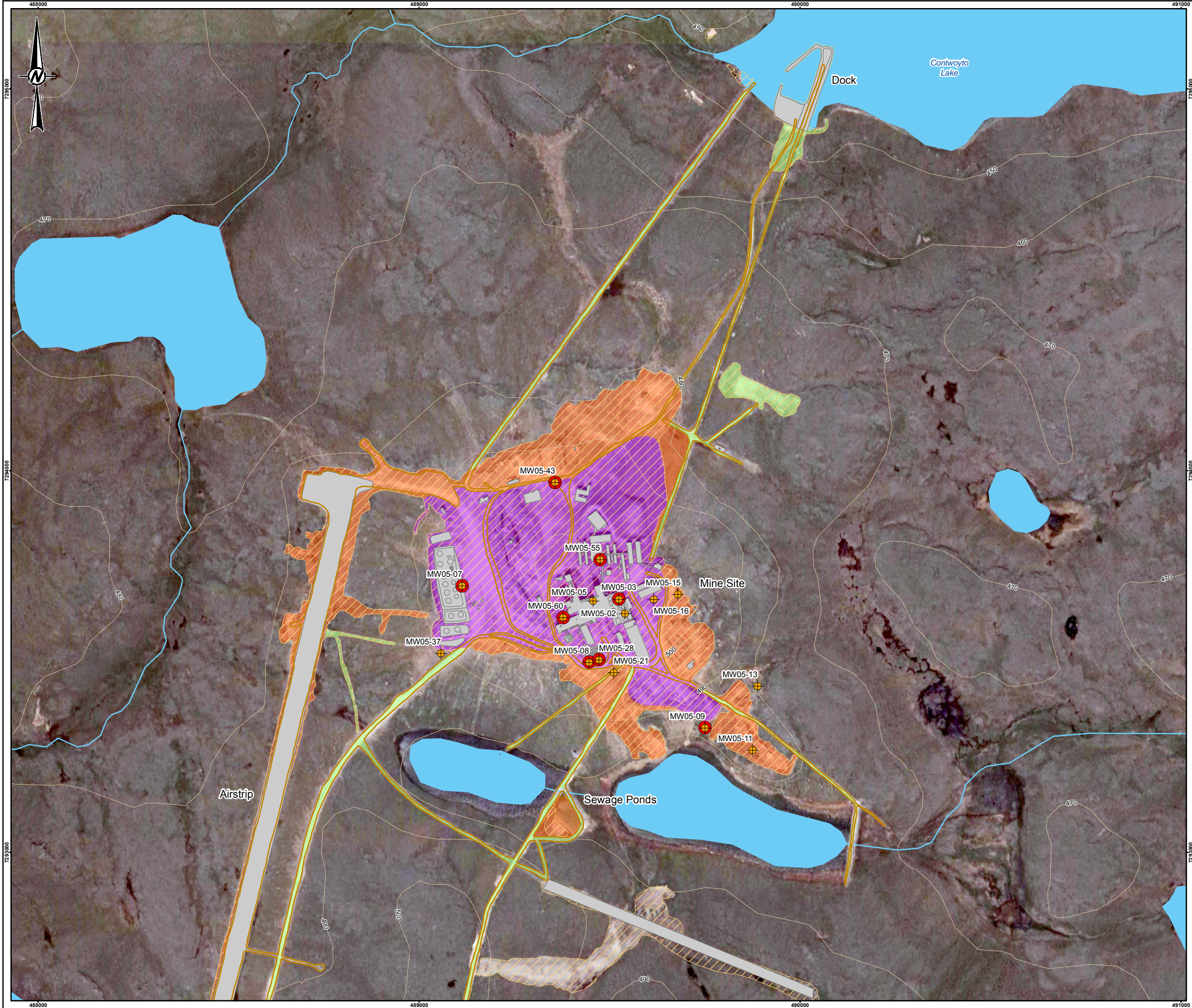
TITLE

EXCEEDANCES OF SITE SPECIFIC TARGET LEVELS FOR SOIL

CONSULTANT	YYYY-MM-DD	2019-10-15
	DESIGNED	DY
	*PREPARED	JT
	REVIEWED	SG
	APPROVED	TMG

PROJECT NO.	CONTROL	REV.	FIGURE
19120487	5000	0	13

GOLDER



LEGEND

- MONITORING WELL
- EXCEEDANCES OF SSTL FOR GROUNDWATER
- CONTOUR
- REHABILITATED DISTURBED AREA
- WASTE ROCK COVERED
- WASTE ROCK REMOVED
- WATERCOURSE
- ROAD
- INFRASTRUCTURE FOOTPRINT
- DISTURBANCE FOOTPRINT
- WATERBODY

COC	SSTL (mg/L)
PHC F2	1.8
Aluminum	0.3
Arsenic	0.001
Cobalt	0.06
Iron	10
Zinc	0.4
Sulphate	128

NOTE(S)
COC = CONTAMINANT OF CONCERN; SSTL = SITE SPECIFIC TARGET LEVEL; MG/L = MILLIGRAM PER LITRE

REFERENCE(S)
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PROJECT
LUPIN MINE CLOSURE – HUMAN HEALTH AND ECOLOGICAL RISK ASSESSMENT

TITLE
EXCEEDANCES OF SITE SPECIFIC TARGET LEVELS FOR GROUNDWATER

CONSULTANT	YYYY-MM-DD	2019-10-15
	DESIGNED	DY
	PREPARED	JT
	REVIEWED	SG
	APPROVED	TMG

PROJECT NO.
19120487

CONTROL
5000

REV.
0

FIGURE
14

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B