NOTICE OF INTENT TO COMMENCE LARGE MINING OPERATIONS & MODIFICATION OF PLAN OF OPERATIONS

LISBON VALLEY COPPER MINE

M/037/0088
UTU-72499

Lisbon Valley Mining Company, LLC
920 South County Road 313
La Sal, UT 84530

Prepared For:
Bureau of Land Management (BLM)
82 Dogwood Ave
Moab, UT 84532

Utah Division of Oil Gas and Mining (DOGM)
PO Box 145801
1594 W North Temple #1210
Salt Lake City, UT 84116

Prepared By:

Lisbon Valley Mining Company, LLC
920 South County Road 313
La Sal, UT 84530
[P] 435-686-9950

JULY 2020
REVISED OCTOBER 2022

Introduction Table – Key Factors & List of Commitments

Estimated mine life = 16 years

HLP = 212 acres

committed to re-grading slopes steeper than 2.5H:1V as needed.

Average height not to exceed 75' unless approved by the Division, with supporting draindown model

Maximum height of 100' of stacked material

2020 current average height = 57'

Waste Dump A = 129 acres

committed to re-grading slopes steeper than 2.5H:1V 2021

Waste Dump B = 135 acres

committed to regrading/reclaiming 2020/2021

Waste Dump C = 157 acres

committed to drainage installation 2021

GTO Pit = 35 acres

Centennial Pit = 174 acres

Will at any time have a total void space of 275,000 cy that would need to be backfilled above 6,200'.

The onsite Class IVb landfill will be monitored to ensure that post-mining capacity will remain for the use of the landfill for disposal of all demolished structures, equipment, etc. during final closure activities. Estimated Cubic yardage of demolition debris to be disposed of in the onsite landfill is 20,000 cubic yards.

The Company provides the Division with the following commitments:

1. The onsite landfill will be monitored to ensure that post-mining capacity of 20,000 cubic yards will remain for use during demolition and disposal of onsite facilities;
2. Perform concurrent reclamation activities as areas of the mine are no longer active. Specifically:
    1. Waste Dump C will be reclaimed including the drainage patterns as discussed between the Division and LVMC at site and represented on Map 4;
    2. Waste Dump B will be reclaimed including the drainage patterns as discussed between the Division and LVMC at site and represented on Map 4;
    3. Waste Dump A will be constructed with slopes being concurrently graded to 2.5H:1V as the dump continues to be heightened as represented on Map 5 & Map 6;
    4. Preliminary reclamation stormwater drawings will be updated and dump earthwork reclamation completed after the acquisition of final engineering designs, based on the design storm.

3. Install berms around the entire pit perimeters to minimize entry;
4. Perform recirculation of all heap effluent back onto the leach pad in the event of any shut down or temporary/permanent closure until forced evaporation can be implemented;
5. Initiate water quality sampling of PLS and RAFF by a certified third party laboratory on a frequency deemed adequate by the Division and DWQ;
6. Initiate Humidity Cell Testing by a certified third party laboratory of heap leach ore material in order to estimate the long-term effluent chemistry and neutralization potential of the existing heaped material.
7. Provide heap leach effluent analytical results for acidity and metals.
8. Calculate the potential flow rates that could be seen during a 100-year 24-hour storm event in the proposed drainage re-route to the south of the Sentinel Pit, as represented on Map 4.
9. Provide engineering design of an adequately sized drainage channel, with adequate berming to ensure runoff does not flow toward the Sentinel Pit, or pool near the Pit walls.
10. Maintain a maximum recirculation rate not to exceed 13,600 gpm from the process ponds to the leach pad, and an average recirculation rate of around 11,500 gpm during active processing.
11. Perform soil suitability analyses on soil/alluvium as a possible borrow source for use in a water-balance cover in the area of the previously proposed Stage 4 area of the leach pad. Soil suitability analyses will follow the guidelines of the Colorado Landfill Closure document, Area 1, which appears to be of similar physiography as the LVCM.
12. Waste Dump A will be constructed in such a way that the landfill can be encapsulated by waste on all sides, consistent with the requirements of the Utah Division of Waste Management and Radiation Control.
13. Until the Surety is updated, the maximum average height of the leach pad will not exceed 50 feet. On the northeast and southwest ends of the pad, the associated maximum heights will be 75 ft and 25 ft, respectively. Additional permitting and approved reclamation surety will be required before this number is exceeded.
14. The maximum volume of total heap system process fluid associated with this average height is 258,700,000 gallons. Additional permitting and approved reclamation surety will be required before this number is exceeded.
15. The Centennial Pit will not be expanded in any way that would encroach upon the existing gas line or power lines. Prior to expansion, the Company will work with the owners of the gas line and County to ensure that a re-route plan is acceptable and approved by all parties.
16. The Sentinel West Pit will be backfilled to an elevation of at least 6,240 ft amsl with non-acid generating waste rock. Any potentially acid generating waste placed in the Sentinel Pit above the 6,240 ft elevation will be encapsulated per the Company's existing Waste Rock Management Plan.
17. The Sentinel West Backfill (heaped above original topography) will be constructed with a 2.5H:1V slope, with erosion control benches installed every 100' vertical lift, to ensure long-term drainage control is maintained.

3809.401 Plan of Operations Checklist

Operator Information Requirements - 3809.401(b)(1)

❑ Name, address, phone, taxpayer identification number – *See Section R647-4-104*

❑ BLM serial number of involved unpatented claims – *See Section R647-4-104*

❑ Point of contact for corporations – *See Section R647-4-104*

❑ 30-day notification required for any change in operator – *See General Information*

Description of Operations Elements - 3809.401(b)(2)

❑ Maps showing all activity and facility locations – *See Appendix C*

❑ Preliminary designs and operating plans – *See Appendix C*

❑ Water management plans – *See R647-4-106.8 & R647-4-109.1*

❑ Rock characterization and handling plans – *See R647-4-106.9 & R647-4-109.5*

❑ Quality assurance plans – *See R647-4-109.5*

❑ Spill contingency plans – *See R647-4-109.5*

❑ Schedule of operations from start through closure – *See R647-4-102*

❑ Plans for access, power, water, or support services – *See R647-4-106.2*

Reclamation Plan Requirements - 3809.401(b)(3)

❑ Drill-hole plugging plans – *See R647-4-108*

❑ Regrading and reshaping plans – *See R647-4-110.2*

❑ Mine reclamation, with pit backfilling information – *See R647-4-110*

❑ Riparian mitigation plans – *Not applicable*

❑ Plans for wildlife habitat rehabilitation – *See R647-4-110.5*

❑ Topsoil handling plans – *See R647-4-110.5*

❑ Revegetation plans – *See R647-4-110.5*

❑ Plans to isolate and control toxic or deleterious material – *See R647-4-110.4*

❑ Plans to remove/stabilize buildings, structures, and facilities – *See R647-4-110.3*

❑ Provisions for post-closure management – *See R647-4-110.3*

Monitoring Plan Requirements - 3809.401(b)(4)

❑ Description of resources subject to monitoring plans – *See R647-4-109.5*

❑ Type and location of monitoring devices – *See R647-4-109.5 & Appendix C*

❑ Sampling parameters and frequency – *See R647-4-109.5*

❑ Analytical methods – *See R647-4-109.5*

❑ Reporting procedures – *See R647-4-109.5*

❑ Procedures for responding to adverse monitoring results – *See R647-4-109.5*

❑ Reliance on other Federal or State monitoring plans – *See R647-4-109.5*

Interim Management Plan - 3809.401(b)(5)

❑ Measures to stabilize excavations and workings – *See Appendix P*

❑ Measures to isolate or control toxic or deleterious materials – *See Appendix P*

❑ Plan for storage or removal of: equipment, supplies, structures – *See Appendix P & Appendix N*

❑ Measures to maintain the area in a safe and clean condition – *See Appendix P*

❑ Plans for monitoring site conditions during non-operation – *See Appendix P*

❑ Schedule of anticipated non-operation – *See Appendix P*

❑ Provisions to notify BLM of changes in non-operation period – *See Appendix P*

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Appendices

R647-4-101 Filing Requirements and Review Procedures

Lisbon Valley Mining Company, LLC (Company) intends to operate an open-pit copper mine (Lisbon Valley Copper Mine (LVCM)), and a heap leach facility located approximately 18 miles southeast of La Sal, Utah, in San Juan County. The Company will produce cathode copper using a solvent extraction electrowinning process (SX-EW).

The Company has reviewed and understands section 101 of R-646-4.

R647-4-102 Duration of the Notice of Intention

The Company understands that this NOI including any subsequently approved amendments or revisions remains in effect for the life of the mine. The Company considers the life of the mine to be the end of mining and processing activities. The estimated life of the mine is 16 years.

R647-4-103 Notice of Intention to Commence Large Mining Operations

The Company has prepared this Notice of Intent (NOI) in accordance with R647-4-103 of the Utah Administrative Code. The NOI addresses the following requirements:

- R647-4-104 Operator(s), Surface and Mineral Owner(s)
- R647-4-105 Maps, Drawings and Photographs
- R647-4-106 Operation Plan
- R647-4-108 Hole Plugging Requirements
- R647-4-109 Impact Assessment
- R647-4-110 Reclamation Plan
- R647-4-112 Variance

R647-4-104 Operator(s), Surface and Mineral Owner(s)

104.1 Operator Information

Company Information

Lisbon Valley Mining Company, LLC
PO Box 400
Moab, UT 84532
Phone: 435-686-9950
Fax: 435-686-2223
Website: www.lisbonmine.net

Mine Information

Lisbon Valley Copper Mine (LVCM)
920 South Country Road 313
La Sal, UT 84532

Registered Utah Agent

Ken Garnett
11 Edgewater Drive
Old Greenwich, CT 06870
Phone: 203-249-4125
ken.garnett@gmail.com

Delegation of Authority

Ken Garnett
11 Edgewater Drive
Old Greenwich, CT 06870
Phone: 203-249-4125
ken.garnett@gmail.com

104.2 Surface & Mineral Landowners

Surface Landowners:

- Lisbon Valley Mining Company, LLC
  PO Box 400
  Moab, UT 84532
  435-686-9950

- Bureau of Land Management (BLM)
  Moab District Office, 82 East Dogwood
  Moab, UT 84532
  435-259-2100

- State of Utah, School and Institutional Trust Lands Administration (SITLA)
  675 East 500 South, Suite 500
  Salt Lake City, UT 84102
  801-538-5100

Mineral Owners:

- Lisbon Valley Mining Company, LLC
  PO Box 400
  Moab, UT 84532
  435-686-9950

- Bureau of Land Management (BLM)
  Moab District Office, 82 East Dogwood
  Moab, UT 84532
  435-259-2100

- State of Utah, School and Institutional Trust Lands Administration (SITLA)
  675 East 500 South, Suite 500
  Salt Lake City, UT 84102
  801-538-5100

- Steve & Mary Lou Kosanke (or next of kin)
  PO Box 116
  Bluff, Utah 84512

- Lisbon Copper Ltd.
  C/O Burton Kunkel (or next of kin)
  980 S Main St
  Willard, UT 84340

- Tintic Uranium
  ℅ Ronny Cutshall
  1309 S Penn St
  Salt Lake City, UT 84105

- JF and Joyce Costanza (or next of kin)
  3221 Rimrock Rd
  Moab, UT 84535

- Boyd C Brinton
  677 Holiday Drive
  Brigham City, UT 84302

- Suzanne Brinton Strong, ℅ Greg Strong
  3737 Melinda Ln
  Millcreek, UT 84109

- Marva K Loebe
  2 Lakeshore Dr.
  Salem, SC 29676

- Carole L Steel (or next of kin)
  3311 Creekridge County Rd

Randleman, NC 27317

104.3 Claim & Permit Information

Federal mining claim number(s), lease number(s), or permit number(s) & State mining claim number(s), lease number(s), or permit number(s):

Ownership	Contract type	Identification	Description
State DOGM	Permit	M/037/0088	Large Mining Operations Permit
Federal BLM	BLM File	UTU72499	BLM File Number
State SITLA	Lease	ML 17661	Section 36 30S / 25E
State SITLA	Lease	ML 20569	Section 36 30S / 25E
State SITLA	Lease	ML 53127	Section 32 30S / 26E
BLM	Unpatented Claims	Multiple	See Appendix A

Table 1

BLM unpatented claims are located in Appendix A.

R647-4-105 Maps, Drawings & Photographs

105.1 - Topographic base map, boundaries, pre-act disturbance

Refer to Map 1 in Appendix C

105.2 - Surface facilities map

Refer to Map 2 in Appendix C

105.3 – Drawings or Cross Sections (slopes, roads, pads, etc,)

Refer to Figures 1-6 in Appendix C

105.4 – Photographs

Refer to Appendix B

R647-4-106 Operation Plan

The operator shall provide a narrative description referencing maps or drawings as necessary, of the proposed operations including:

106.1 - Minerals mined

LVCM is a copper mine; while other metals are incidentally mined, they are not in significant enough quantities to be economic or pose a risk.

106.2 - Type of operations conducted, mining method, processing etc.

Open pit mining has been performed within the active mine plan boundary as approved in the 1997 ROD since 2005. Since 2005, four open pits were mined (Map 1):

Sentinel East (now completely backfilled and covered by Waste Dump C)

Sentinel West (mined out to an ultimate post-mining pit floor elevation of 6,220 ft amsl, but remaining open for use as a source of riprap material for drainage installation on dumps and other areas within the active mine plan boundary. Once riprap material has been removed, the Sentinel West pit will be backfilled and waste dump tied into Waste Dump C) (Figure 13, Map 2)

Centennial Pit (still considered active, and proposed for continued mining with an ultimate pit floor elevation of 6,166 ft amsl; which will be backfilled up to 6,200 ft amsl for post-mining reclamation) (Map 2)

GTO Pit (still considered active, and proposed for continued mining with an ultimate pit floor elevation of 6,102 ft amsl) (Map 2)

The Company intends to operate a traditional open-pit copper mine with a heap leach pad, solvent extraction, and electrowinning processing plant. The final product is a 99.99% pure copper cathode with many commercial uses.

Mining Operation

<u>Open Pit Mining</u>

The Company will remove rock from the active mine area by drilling and blasting. The pits will develop in phases. Mining may extend into the next phase before the current phase is complete, to maximize safety and meet production needs. All haul roads are within the project boundary.

Ore is drilled and then blasted to an acceptable fragmentation from 20' deep benches. The ore is then loaded and transported to the heap leach pad using conventional front end loaders and haul trucks. Waste rock is handled in accordance with the Waste Rock Management Plan found in Appendix D. Waste rock is hauled to Waste Dump A or to the Centennial Pit backfill using the same methods and equipment.

A small landfill is located on Waste Dump A and is approved for use by the Utah Division of Waste Management and Radiation Control. The landfill is designated as a Class IVb under Permit #1902, and is regulated by UAC R315-301 through 320. The maximum footprint of the landfill is less than five acres, is located completely on SITLA land, and will be contained completely within the existing footprint of Waste Dump A. A copy of the Approved Permit Application and Class IVb Solid Waste Permit is included in Appendix D as part of the Waste Rock Management Plan.

The Company contracts drilling and blasting. The drilling contractors use a fleet of conventional 6.75 linch rotary drills. The blasting contractor uses an ammonium nitrate/fuel oil (AN/FO) explosive. Blast hole depth is 20' and spaced 15-20'.

Haul roads average 80' in width with maximum 10 degree ramps. Refer to Map 2 in Appendix C.

Summary of Mine Plan Amendments

The LVCM initiated open-pit mining operations in 2005 following an approved NOI for Large Mining Operations. Not including the 2020 NOI Re-submittal there are seven mine plan amendments authorized between 2007 and 2016. The amendments are listed below and tabulated as a function of cumulative changes and disturbance trade accounting in Table 2. It should be noted that Table 2 only shows mine plan amendments as it relates to leach pad, open pit and waste dump disturbances. Process areas and pond disturbance is reflected in Table 6.

	Mining Volumes Cubic Yard (CY)		Disturbance (acres)			
	Ore	Waste	Pits	Dumps	Leach Pad	Total Mine
Proposed Action	32.8M	65M	231	394	266	891
2007 Amended Plan	28.7M	64.8M	255	376	266	897
Centennial Expansion						
ILS Pond						
2010 Approved Amendment	28.7M	64.8M	255	373	266	894
Backfill Sentinel East Pit						
2011 Approved Amendment	28.7M	64.8M	254	371	266	891
Expand Dump C Reduce Dump B						
Haul Road from GTO Pit						
2012 Approved Amendment	28.7M	64.8M	254	442	266	962
Expand Dump B						
2015 Approved Amendment	28.7M	64.8M	254	442	266	962
Beds 14 & 15 Centennial Pit Backfill						
2015 Approved Amendment	28.7M	64.8M	254	442	266	962
Additional Backfill Materials						
2016 NOI Amendments						
Pit expansions, gas line relocation, Leach Pad Powerline, Leach Pad Acid Tanks, GTO Drainage, B-Dump Expansion, PW-13	33.6M	109.3M	360	447	266	1073

2020 NOI Mine Plan						
Minor expansion of Centennial Pit, continued mining in GTO, elevated haul road on leach pad, Removal of Phase IV of the heap	33.6M	109.3M	282	423	212	917
2022 NOI Mine Plan						
Backfill of the Sentinel Pit with Centennial Waste	33.6M	109.3M	244	469.4	212	925.4
Acreage Difference Between 2020 NOI and 2022 NOI	**0**	**0**	**-38**	**46.4**	**0**	**8.4**

Table 2

Cumulative Changes to Mine Plan 2007 - 2016

1) Centennial/ILS/Stage IV Revision - 2007[1]
2) Sentinel East Pit Backfilling - 2009[2]
3) Dump C Expansion/Dump B Reduction - 2011[3]
4) Haul Road from GTO Pit - 2011a[4]
5) B Dump Expansion - 2013[5]
6) Phase II B Dump Expansion - 2013a[6]

The reason for the decrease in proposed disturbance for the pits and dumps is due to optimized pit planning and ability to dispose of more mined waste during pit backfilling. The decrease in proposed disturbance

[1] LVMC 2007 Summary of Proposed Mine Plan Amendments. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 19 Feb 2007.

[2] LVMC 2009 Proposed Mine Plan Amendment. Sentinel East Backfilling. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 24 April 2009.

[3] LVMC 2010 Proposed Mine Plan Amendment. Dump C Expansion/Dump B Reduction. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 29 Oct 2010.

[4] LVMC 2010a Proposed Design Revision for Mine Plan Amendment. Haul Road from GTO Pit. Lisbon Valley Mining Company LLC, 920 South County Road 313, La Sal, Utah 84530. 14 Dec 2010.

[5] LVMC 2013 Proposed Mine Plan Amendment - B Dump Expansion Lisbon Valley Mining Company LLC, 920 South County Road 313La Sal, Utah 84530, DOGM Permit M/037/088 5 July 2010.

[6] LVMC 2013a Revision 1 - Proposed Mine Plan Amendment - B Dump Expansion Phase II - Lisbon Valley Mining Company LLC, 920 South County Road 313 La Sal, Utah 84530, DOGM Permit M/037/088.

for the leach pad is due to the optimized design of the elevated haul road on the south portion of the pad, as well as better understanding of fluid control.

The Company's mine fleet is detailed below in Table 3.

Type of Equipment	Use
40 ton haul trucks	Mining and general construction
50 ton haul trucks	Mining
100 ton haul trucks	Mining
Excavators	Mining and general site maintenance
Loaders & backhoes	Mining and general site maintenance
Dozers	Mining and general site maintenance
Fork Lifts	General site maintenance
Skid steers	General site maintenance
Fuel trucks, lube trucks, maintenance vehicles	General site maintenance
Light vehicles	General site maintenance & supervision

Table 3

A detailed list of all facilities, tanks, and related fixed equipment can be found in Appendix N, and in Appendix C, Map 2.

Waste Rock Management Plan

The Company manages waste rock per the Waste Rock Management Plan approved February 12, 2014. The Waste Rock Management Plan which includes a detailed discussion of waste rock characteristics is attached as Appendix D.

Refer to Map 1 in Appendix C for Waste dump locations. Waste dump capacities are detailed in Table 4.

Dump	Proposed Final Acres	Remaining capacity (MM tons)	LOM Volume (MM tons)
A	129	31	35
B	137	0	20
C	157	0	40
Totals	423	31	95

Table 4

Waste dump A is designed to cover 129 acres and receive 31MM tons of waste to an elevation of 6880' above mean sea level (AMSL). Waste Dump B has been completed, with a total acreage of 137 acres. This waste dump is scheduled for reclamation in 2020-2021. Waste Dump C has been completed, with a total acreage of 157 acres. This waste dump underwent concurrent reclamation between 2012 and 2016. Installation of drainage controls is scheduled to take place in 2021. Refer to Figures 4, 5, 6 in Appendix C.

The Company has identified beds 3-10 as Uncertain if they would produce acid through acid-base accounting testing. These waste beds are encapsulated within Likely Acid Neutralizing waste within the waste dumps or within authorized backfill areas of the Centennial Pit. To date, the Company has placed approximately 56,000 tons of 3-10 waste material in the Centennial pit (see Waste Rock Management Plan), all of which was placed above the elevation of 6,200 ft amsl. Maps illustrating the encapsulation are located within the annual data updates to the Waste Rock Management Plan attached as Appendix D. Further detail regarding waste rock characteristics including Acid Base Accounting results and Meteoric Water Mobility Testing are located within the Waste Rock Management Plan and the annual data updates attached as Appendix D.

The Centennial Pit will be backfilled during the mining process. The pit will be backfilled to cover the pre-mine groundwater elevation of 6190' AMSL. Further details regarding Centennial Pit Backfilling are provided in Section 106.9.1.

The Sentinel West Pit will be backfilled during the mining process. The pit will be backfilled to an elevation of 6,240' AMSL. Further details regarding Sentinel Pit Backfilling are provided in Section 106.9.1.

The Company commits to following the stipulations of the existing Environmental Assessment for the treatment of waste material as it relates to pit backfilling and waste dump placement. Specifically, this relates to the placement of beds 3-10 above the level of 6,200' amsl in the Centennial Pit, and its encapsulation in waste dumps with 40 feet of waste with an NPR three times the acid generation potential.

The Company further commits to following the stipulations of the existing Environmental Assessment for the backfilling of the Sentinel Pit.

Heap Leach and Ponds Operations

The leach pad is designed to contain up to 33MM tons of ore and to route solution to the ponds via gravity drainage. As of 2020, 25MM tons of ore has been placed on the leach pad, with a total footprint of approximately 192 acres. The remaining ore to be placed is 8MM tons. The remaining ore to be placed will be placed on the existing 192-acre leach pad footprint, which has been optimized to include the elevated haul road design portion. Details on the elevated haul road are found in Appendix C of the GWDPA, Map 6. The elevated haul road would increase the lined and proposed stacking area of the leach pad by 20 acres. This would give a total post-mining leach pad footprint of 212 acres, and a total capacity of 8MM tons.

Initially, on stacking of the first lift, material was crushed to minus 2" and 'agglomerated' prior to placement on retreats 1-2. However, the nature of the material was such that the crushing and agglomeration led to increased clays and decreased the total leachability of the ore. The remaining leach pad was stacked as run of mine material. The plan for future ore placement is to crush oversize material to less than 6" prior to placement. Fines generated during the crushing may be stockpiled separately for potential tentative use as 'sand' material during the construction of the ET cells.

The leach pad has a perimeter berm and is graded to follow the natural topography of the valley. The leach pad's drainage follows accordingly in a northern and easterly direction with the solution ponds located at the northeast corner. Refer to Map 1, Map 2, Map 4, the Company's SWPPP, and Map 5 in Appendix C. Also refer to Figure 11 in Appendix C. The solution collection ditch is constructed along the north edge of the pad and drains by gravity to the solution ponds.

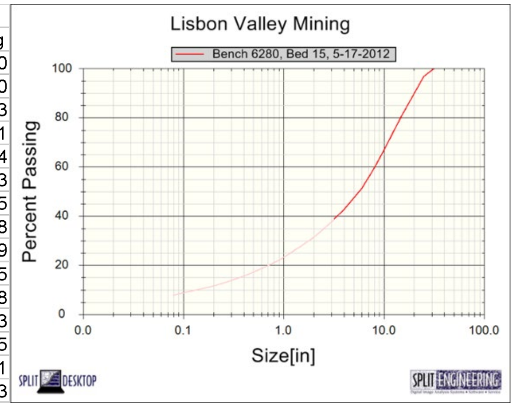
The ore stacked on the leach pad is in multiple lifts ranging from 10- 36' in vertical height. The first lift is offset from the edge of the leach pad a minimum of 10' to provide a buffer zone between the toe of the lift and the edge of the lined leach pad. Subsequent lifts are set back, with the intention of creating terraces that allow for an overall operational slope of 2.5H:1V. The terraces will be filled in by pushing the leached material to create a final continuous slope of 2.5H:1V for final reclamation. Reference section 110.2.5 Dumps, Heap Leach Pads, Solution and Storm water Ponds for additional details on leach pad reclamation. Some areas of the heap leach pad are in the process of being re-graded to an operational slope of 2.5H:1V. Therefore, as of the date of this submission, there may be areas of the existing heap leach pad that have current operational slopes steeper than 2.5H:1V. The Company commits to re-working these steeper slopes to ensure a feasible reclamation slope angle of 2.5H:1V or shallower as the leach pad continues to be constructed. The operational slope angles take into account the ability to push, especially to the north, to fill in the existing pipe ditch, without having to add additional liner beyond the current lined area. The top of the heap is kept relatively flat in order to ensure consistent and homogeneous spread of effluent for an enhanced leaching process.

As stated above, construction of the leach pad initially included placement of minus 2" crushed rock for retreats 1-2. In recent years the operation halted crushing and the existing upper lifts consist of run-of-mine material. Average size distribution of the run-of-mine material ranges from 2' to minus 1/4". Starting in late 2018, ore has been crushed to minus 6" prior to placement on the heap leach pad. Due to the variation in ore sizes, especially with the lower-most lifts, constant monitoring of the lower lifts are performed by the in-house surveyor and operations personnel.

Split Engineering is employed to gain a better understanding of the ore's size fractions. Photos of the dig face are taken with scaling balls (as seen below) and those photos are analyzed for size fractions using computer engineering software.

The data produced is graphed showing the curve of the size fractions.

	Bench 6280, Bed 15, 5-17-2012	IMG_0002	IMG_0003	IMG_0001
Size[in]	% Passing	% Passing	% Passing	% Passing
50	100	100	100	100
25	96.85	97.32	94.03	100
15	80.63	76.24	70.93	99.83
10	66.64	58.7	56.92	90.81
8	59.32	50.46	51.78	81.84
6	51.24	41.86	46.45	70.73
4	42.58	33.26	40.17	58.75
2	31.57	21.85	32.14	44.28
1	23.33	14.34	25.5	32.89
0.75	20.61	12.03	23.15	29.05
0.5	17.31	9.39	20.2	24.38
0.38	15.31	7.87	18.34	21.53
0.25	12.89	6.14	15.99	18.05
0.19	11.4	5.14	14.5	15.91
0.08	7.96	3.01	10.84	10.93



Retreats are oriented north/south and are approximately 220' wide. The leach pad is built on naturally sloping terrain, with the southwestern corner of the leach pad being the natural topographic high point for the leach pad, and the northeast corner being the natural topographic low point for the leach pad. During construction, the pad is built in lifts to ensure the top of the pad is relatively flat to ensure consistency in leach solution application and infiltration. Because of this, the north portion of the pad will always be stacked higher than the south portion of the pad. The anticipated final heap elevation of the pad once all remaining 8MM tons of ore is stacked will be 6,526 ft amsl. This final elevation, when measured from the natural topography of the southwest corner, gives an overall stacked thickness of approximately 30 feet. The final elevation when measured from the natural topography of the north edge, however, gives an overall stacked thickness of approximately 100 feet.

The proposed stacking plan would fill in the existing 'bowl' located in the central portion of the leach pad, effectively bringing the eastern half of the leach pad to a relatively flat plane. Once the eastern half of the leach pad is relatively flat, and the elevated haul road has expanded the leach pad southward, all remaining ore will be placed on the western half of the leach pad, which is currently at an average height of 30'. The western half of the leach pad will have a final post-mining elevation of slightly higher than the eastern half. This stacking plan will ensure post-mining drainage is toward the process and 100-yr ponds.

The heap leach pad liner system is comprised of 1' of compacted low permeability soil overlain by 80-mil thick high-density polyethylene (HDPE) or linear low-density polyethylene (LLDPE) plastic. The plastic sheets are welded together to form a continuous impermeable synthetic liner.

A grid of solution collection pipes spaced approximately 20 to 30' apart is installed over the synthetic liner to enhance drainage and reduce head pressures over the liner. The pipes are designed to control the hydraulic head up to about 1'.

Copper stacked on the leach pad is leached from the ore using a sulfuric acid solution in concentrations ranging from 2 to 200 grams/liter (g/L) acid, which typically have a pH of about 1.4. The barren acid solution is termed raffinate (RAFF). RAFF is applied to the ore using conventional drip lines at an application rate ranging from 0.001-0.004 gallons per minute per square ft (GPM/ft^2). The resultant liquor is composed largely of copper sulfate and is termed intermediate leachate solution (ILS). The ILS is contained in an artificially lined pond. To build copper concentration within the solution ILS is recirculated back onto the ore. Once the recirculated liquor reaches an acceptable copper concentration, the liquor is termed pregnant leachate solution (PLS). The PLS is contained in an artificially lined PLS pond then pumped to the solvent extraction/electro winning (SX/EW) facility.

The Company will use four ponds for processing; pre-RAFF, RAFF, ILS, and PLS. The Company maintains two ponds for storm water management; storm water and an emergency overflow.

The heap leach pad and process ponds construction drawings (Stages 1-3 + elevated haul road) is compiled in a series of drawings. Refer to Figures 8, 9 and 10 located in Appendix C.

Upon closure, the spent ore from the heap leach processing will be left in place on the heap leach pad. The reclamation process for the heap leach pad includes draining the leach pad down, pushing slopes down,3' of crushed rock, and 12" of growth media applied and subsequent re-vegetation.

Solvent Extraction and Electrowinning

The PLS is pumped from the PLS pond to the Solvent Extraction facility. The solvent extraction facility uses a large mixing tank to stir the PLS and oil based copper extraction fluid termed organic. When the two solutions are mixed the PLS releases its copper to the organic, the resulting solutions are RAFF and loaded organic. The RAFF is routed back to a RAFF pond to be returned to the leach pad circuit to continue extracting copper. The loaded organic is routed to another large mixing tank. This mixing tank stirs the loaded organic with a lean electrolyte. When the two solutions are mixed the loaded organic releases its copper to the lean electrolyte and the resulting solutions are organic and rich electrolyte. The organic solution is returned to the PLS mixing tank for copper extraction. The rich electrolyte is routed to the electrowinning facility. The electrowinning facility circulates the rich electrolyte through tanks with stainless steel cathodes and lead anodes. An electrical current is applied across the cathodes and anodes. The resulting products from this process are high grade cathode copper plates and lean electrolyte. During the plating process the lead anodes oxidize and produce a byproduct called lead flake at approximately a rate of .5% of cathode production. A film called "crud" can form and float on the top of the cells. This is due to very fine silt mixing with the organic, electrolyte and forming an emulsion. Crud is produced at a very low rate, however, large precipitation events can temporarily increase the production rate. The lean electrolyte is returned to the loaded organic mixer to extract copper. The lead flake is extracted from the bottoms of the tanks, loaded into barrels and shipped to a recycler. Crud is extracted through a filtering process, loaded into trucks and deposited on the leach pad for further beneficiation. The copper cathode plates are weighed, banded and prepped for shipment to the customer.

The effluent flow to the heap leach pad averaged 11,500 gpm from 2016-2020. The maximum effluent flow that was sent to the leach pad was 13,600 gpm, which occurred during the months of February and April. The lowest effluent flow that was sent to the leach pad was 7,400 gpm, which occurred during the months of December and January. These are the planned rates for further operations of the leach pad and effluent.

Use and Occupancy

The Company's occupancy of federal land is incident to mining, mineral processing and cathode copper production. The equipment required for this project include heap leach pad, process ponds, solvent extraction, and electrowinning facilities which are constantly supervised for safe and efficient operation. The processing facilities are fenced and gated restricting access to the site for the protection of public safety, employee safety, immobile processing equipment, and valuable copper cathodes.

The Company's operations do not limit access to adjacent public lands. Existing roads provide access to adjacent public lands. The Little Valley Road is immediately north of the site travels east and west. The Lisbon Valley Road (also known as Country Road 313) passes through the site and travels north and south.

Island Mesa Road is immediately to the southeast and travels east and west. East Lisbon Valley Road is a turn off Island Mesa Road immediately south of the mine site traveling northwest and southeast.

Section 110.3 address's the reclamation of surface facilities.

Concurrent Reclamation

The Company will conduct concurrent reclamation as stipulated by R647-107.6. Reclamation is discussed in detail in Section 110.

106.3 - Estimated acreages disturbed, reclaimed, annually

The current disturbance, as of June 2020, is 1,066 acres. The current disturbance is detailed in Table 5. Disturbance related to the open pits, waste dumps, and leach pad anticipated in this Notice is detailed in Table 6. The Company commits to completing partial reclamation concurrent with operations, as stipulated by R647-107.6.

Facility	2020 Disturbance Acreages			Totals
Land Ownership	**BLM**	**SITLA**	**Fee (Private)**	
Centennial Pit	113	71	0	184
Sentinel West Pit	38	0	0	38
GTO Pit	0	50	10	60
Waste Dump C	157	0	0	157
Waste Dump B	0	137	0	137
Waste Dump A	41	36	0	77
Leach Pad	32	0	160	192
Process Ponds-PLS, ILS, RAFF, Storm Water & Emergency Overflow	0	0	36	36
Process Area Facilities - SX/EW, Truck Shop, Maintenance Shop, Lab, Admin	61	0	0	61
Freshwater Ponds & Laydown Areas	0	0	30	30
Haul Roads	19	24	23	66
Reclamation Stockpiles	4	11	13	28
Total Project Related Disturbance	465	329	272	1066

Table 5
LVCM Site Current Surface Disturbance

Facility	Estimated 2022 Disturbance Acreage			Totals
Land Ownership	**BLM**	**SITLA**	**Fee (Private)**	
Centennial Pit	113	71	0	184
Sentinel West Pit (backfilled)	46.4	0	0	46.4
GTO Pit	0	50	10	60
Waste Dump C	157	0	0	157
Waste Dump B	0	137	0	137
Waste Dump A	89	40	0	129
Leach Pad	32	0	180	212
Process Ponds-PLS, ILS, RAFF, Storm Water & Emergency Overflow	0	0	36	36
Process Area Facilities - SX/EW, Truck Shop, Maintenance Shop, Lab, Admin	61	0	0	61
Freshwater Ponds & Laydown Areas	0	0	30	30
Haul Roads	19	24	23	66
Reclamation Stockpiles	4	11	13	28
Total Project Related Disturbance	521.4	333	292	1146.4

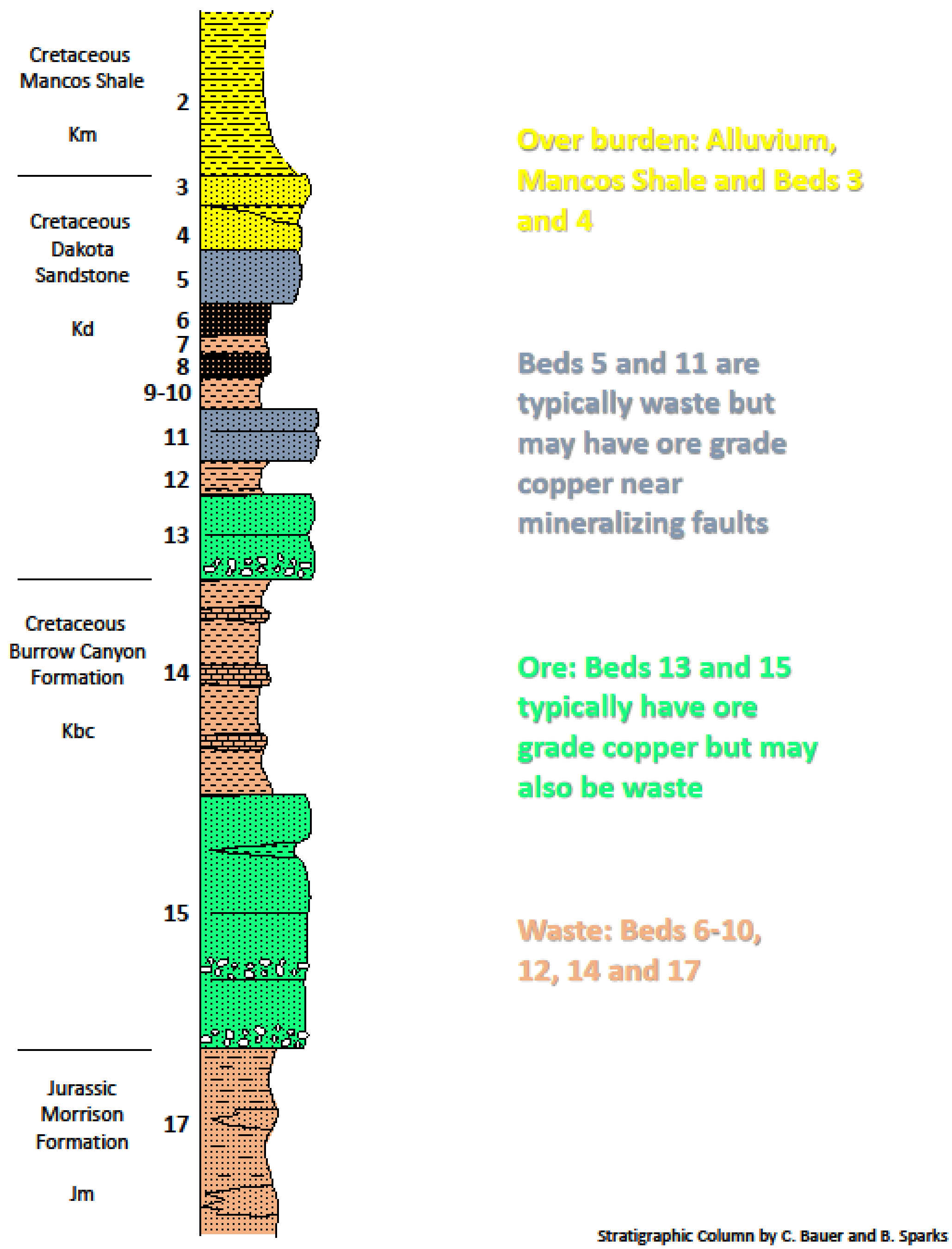
Table 6
LVMC Estimated Site Proposed Surface Disturbance

Included in the disturbance are a number of support facilities such as the SX/EW building, truck shop, admin building, lab, etc. A complete list of all facilities listed on site is seen on Map 2, Appendix C and in Appendix N.

106.4 - Nature of materials mined, waste and estimated tonnages

The Company breaks the stratigraphy of Lisbon Valley into 17 distinct beds for engineering and environmental management. This breakdown is shown in the Strat Column on page 23.

Rock Type 1 is Quaternary Alluvium and is wasted. Rock Type 2 is Mancos Shale and is either stockpiled for final mine reclamation or wasted. Rock Type 3 (Beds 3-5) is upper Dakota Sandstone. This interval can carry some nominal copper grade. Rock Type 4 (Beds 6-8) comprises a carbonaceous facies of the Dakota Formation. It contains little copper and is considered Uncertain; therefore, Rock Type 4 is encapsulated near the center of waste dumps. Rock Type 5 (Beds 9-10) comprises a shaley facies of the Dakota. This material contains too much shale for heap leaching and is considered Uncertain; therefore, Rock Type 5 is encapsulated near the center of waste dumps. Rock Type 6 (Beds 11-13) is comprised of Lower Dakota sandstones and can carry copper grade. Rock Type 7 (Beds 14-15) is comprised of the Burro Canyon Formation. Bed 14 is highly calcic and wasted. Bed 15 is the primary ore host in Lisbon Valley. Geochemical testing for beds 14 and 15 are conducted separately. Rock Type 8 is comprised of variegated shales of the Jurassic Morrison Formation. This material is wasted. The material in the footwall of the Lisbon Valley Fault is mined and wasted. This material is comprised of Jurassic Entrada, Navajo, Kayenta, and Wingate formations. Acid Based Accounting testing results indicate the Jurassic footwall material is Likely Acid Neutralizing.



Strat Column
LVCM Formation, Lithology, and Bed Number

Refer to Figures 1, 2, & 3, Map 3 in Appendix C for additional detail on stratigraphy and geology.

Waste rock is defined as material that contains <0.12% copper, >20% fines, and/or excessive calcium carbonate resulting in > 85lbs/ton acid consumption.

Waste rock includes the overburden and interburden. Overburden includes Quaternary Alluvium and Cretaceous Mancos Shale. Interburden includes barren sandstones and shales within deposits Dakota/Burro Canyon and Jurassic Morrison shales below the deposits.

As per the Waste Rock Management Plan located in Appendix D, waste rock monitoring and testing is conducted on an on-going basis. This testing demonstrates that the bulk of all waste rock (Beds 1-4, 9-17 and Jurassic footwall) are Likely Acid Neutralizing. Table 7 below breaks out bed numbers into rock type categories, provides descriptions and characterizes each according to the tested acid neutralization potential. The table portrays the overall acid neutralizing characteristics of waste rock at LVCM.

The MWMP testing is used as supplementing data to support the ABA data and waste rock characterization determinations. The MWMP results corroborate the ABA results in that rock types 3-5's pH results either become slightly more acidic or become slightly more basic and there is a wider range of metals detected through the MWMP analysis when compared to the other rock types. The other rock types (2, 6, 7 & 8) pH's become significantly more basic and 2 or fewer metals are detected through the MWMP analysis.

Refer to the Waste Rock Management Plan for the current Meteoric Water Mobility and ABA data. As seen in the Waste Rock Management Plan and tables in Appendix D of this document, the purpose of the designation of certain rock types as 'Uncertain' and therefore encapsulated is because of the results of the ABA and MWMP analyses. The mobile metals within rock types 3, 4, and 5 exceed the Utah ground water quality standards and LVCM's background statistics (GWDP 2015) Rock types 1, 2, 6-8, and J did not exceed the background statistics for the LVCM aquifers.

Centennial is the largest deposit, and will be mined in 3 phases. These include Penny, North Centennial, and South Pit. The average strip ratio is approximately 3.6:1 waste to ore. The average yearly mining production is 6MM cubic yards (cu yds). Therefore, the average annual waste rock production is about 4.5MM cu yds of waste rock and 1.5MM cu yds of ore. Pits, Phases, Strip Ratio and Cu Detail, are located in Table 8. Table 9 provides estimated annual tonnages of ore and waste materials to be mined.

Lithology	Bed #	Rock Type	Description	Categorization
Quaternary Alluvium	1	1	Unconsolidated sand, silt; and clay.	No Data
Mancos Shale Formation	2	2	Black fissile shale with trace amounts of gypsum. The upper 20-30 feet is usually weathered to a brownish olive-green color.	Likely Acid Neutralizing

Lithology	Bed #	Rock Type	Description	Categorization
Upper Dakota Sandstone	3, 4, 5	3	**Bed 3:** Except in a small area to the north of the Centennial Pit, Bed 3 is a fine to medium-grained buff sandstone, which is sometimes separated from Bed 4 by a black shale lithologically similar to the Mancos Shale. Usually Beds 3, 4, and 5 are identical and inseparable, forming a 45-60-foot-thick well sorted, buff sandstone bed. In all locales Bed 3 is barren of ore. Beds 4 & 5: Fine to medium-grained buff sandstone, sometimes with minor gray shale and carbonaceous material, but usually rather pure. The thickness is usually 35-40 feet. In some areas there is good ore (in excess of 15%) at the base of Bed 5. In outcrop Bed 5 shows a rectangular jointing pattern with a spacing of about 5 feet.	Uncertain
Dakota Sandstone, coaly beds	6, 7, 8	4	**Bed 6:** This bed is usually a coal bed, but may grade to a carbonaceous shale or even to a carbonaceous sandstone. It usually does not have very much copper, but can be quite rich (1% copper) along the contact with Bed 5. Thickness is 5-20 feet, usually about 12 feet. **Bed 7:** Usually a light gray shale, similar lithologically to Bed 9 with a thickness of usually about 10 feet. Rarely, however, it is a fine-grained buff sandstone or a fine-grained gray sandstone. **Bed 8:** Bed 8 is lithologically indistinguishable from Bed 6, except that it is usually a poorer grade coal. It may be either shaly or sandy, but is usually a slightly shaly coal about 6-8 feet thick. Large pyrite balls are not infrequent.	Uncertain
Dakota Sandstone, shaley beds	9, 10	5	**Beds 9 & 10:** Usually indistinguishable. They are usually a light gray shale towards the top, becoming darker towards Bed 11. The contact between 10 and 11 is sometimes gradational but where present, beds 9 and 10 are usually about 35 feet thick.	Uncertain
Lower Dakota Sandstone	11, 12, 13	6	**Bed 11:** Fine to medium-grained sandstone that is either buff or white. Bed 11 is white about half the time and buff half the time. Where buff in color, it frequently has 1-20% black shale. When white, the rock can be indistinguishable from 13. Thickness is 2-35 feet and quite variable. There is frequently ore in Bed 11, especially towards the Lisbon Valley Fault, and the copper tends to be present in the white variety. **Bed 12:** This bed is a faintly green shale to very fine-grained sandstone. This bed can always be identified by its green color. When Beds 11 and 13 hold ore, so does Bed 12, but it will not, in general, produce copper. It is, however, frequently pyritic. Thickness is 5-20 feet, but usually 10 feet. **Bed 13:** Medium grained white or deep buff sandstone. It can be distinguished from 11 in that it is coarser and more of an orange color when buff, and coarser when white. It almost always has higher copper assays, too. It can be distinguished from Bed 15 in that it is much softer; the rock itself is probably quite loosely cemented, whereas bed 15 grades into a quartzite. Thickness ranges from 20-50 feet and is usually about 30-35 feet.	
Burro Canyon Formation	14, 15	7	**Bed 14:** Usually about 100 feet thick but varies from 70-120 feet. Lithologically, it is composed of red shales, green shales, limestones, massive chert beds, and conglomerates.	Likely Acid Neutralizing

Lithology	Bed #	Rock Type	Description	Categorization
			Bed 15: Usually a fine-grained white sandstone frequently medium-grained and occasionally coarse-grained (especially near the base), which is usually very pure (i.e., no feldspars, no magnetite, no chert only well-sorted, well-rounded quartz grains). In thickness, it is usually about 120 feet, although this is variable. Three shale members have been identified: two are green, and one is red. Bed 15 is the most important copper ore-bearing bed in the area. Lithologically, Bed 15 is fine-grained for the first 20 to 30 feet and this zone frequently has copper ore in the 0.4% to 0.9% range. Below 30 feet, Bed 15 becomes medium-grained and usually darker in color (due to chalcocite) and this zone frequently has ore in the 0.8% to 2.0% range and this lasts down to about 45 feet. Below 45 feet Bed 15 becomes fine-grained again, picks up some black chert, and is almost invariably barren of ore.	
Morrison Formation	17	8	**Bed 17:** The Morrison may be recognized at the base of Bed 15 by: 1) more than 10 feet of red shale; 2) reddish colored sandstones; 3) complete absence of copper; 4) no known green shale in the Morrison in this area. Until now, the Brushy Basin Member has been thought to be a red shale, but more detailed study indicates that there can be a fair amount of sandstone in the Morrison. Sandstone outcrops in the Morrison are indistinguishable from some of the Dakota Sandstone or Burro Canyon Formation beds (usually looks like Bed 15). This means that in places the contact between Bed 15 and the Morrison Formation may be ambiguous.	Likely Acid Neutralizing
Jurassic Footwall	N/A	J	Jurassic strata represent continuing deposition in continental environments. Massive sandstones were deposited in eolian conditions, while interbedded sandstone, shale, and siltstone formed in fluvial conditions. Local freshwater limestones were deposited in lacustrine settings.	Likely Acid Neutralizing

Table 7
LVCM Waste Rock Characteristics

Centennial		Sentinel West (1)		Sentinel East (2)		GTO	
Ore ktons	Waste ktons	Ore ktons	West ktons	Ore ktons	West ktons	Ore ktons	West ktons
17,133.80	54,530.60	6,528.90	3,724.80	1,009.40	1,613.80	586.5	5,456.30

Table 8.a = past mining of LVCM pits, dumps

(1) Sentinel West is considered mined out. This pit will be left open for use as a borrow pit for riprap material during the installation of drainages during concurrent and final reclamation. Once suitable riprap material has been removed, this pit will be backfilled with Centennial Waste. While the pit remains inactive, however, access will be blocked by berms.
(2) Sentinel East has been mined out and is completely backfilled by the Waste Dump C (Map 1).

Pit Design	Ore Tons	Copper Grade (%Cu total)	Contained Copper, lbs	Waste Tons	Strip Ratio (waste/ore)
Penny South Slough	1,211,157	0.36%	8,726,774	3,153,671	2.6
N Centennial 2.20	1,689,286	0.39%	13,056,362	5,652,071	3.3
N Centennial 3.00	1,973,559	0.33%	12,841,132	7,332,271	3.7
South Pit 3.00	2,020,096	0.39%	15,589,364	13,416,631	6.6
Total Centennial	6,894,098	0.36%	50,213,632	29,554,644	4.3
GTO Phase 2 3.00	1,278,718	0.65%	16,484,466	10,799,523	8.4
Total	8,172,816	0.41%	66,698,098	40,354,167	4.9

Table 8.b
Proposed Future Mining of LVCM Pits, Phases, Strip Ratio and Cu Detail

Estimated Annual Ore and Waste Tonnages						
Phases	Year1	Year2	Year3	Year4	Year5	Year6
Centennial Penny ore ktons	1,211					
Centennial Penny waste ktons	3,154					
Centennial N ore ktons	49	1,432	208			
Centennial N waste ktons	1,976	3,602	74			
GTO Phase 2 ore ktons		27	1,252			
GTO Phase 2 waste ktons		5,150	5,649			
Centennial N ore ktons			10	1,964		
Centennial N waste ktons			3,013	4,320		
Centennial S ore ktons				1	1,533	486
Centennial S waste ktons				3,932	8,687	798

Table 9
Estimated Annual Ore and Waste Tonnages
(anticipated to re-start mining in 2021)

Beds	Year1 tons	Year2 tons	Year3 tons	Year4 tons	Year5 tons
1	0	61,435	61,435	0	0
2	53,584	2,276,913	2,931,217	1,140,729	486,425
(3-5)	91,462	569,879	1,392,010	1,580,161	758,030
(6-8)	93,761	394,964	820,254	627,618	202,328
(9-10)	972,801	282,317	717,055	562,124	127,386
11	281,949	282,317	717,055	562,124	127,386
12	413,864	118,285	396,952	359,251	80,584
13	165,770	184,910	358,217	252,878	79,570
14	80,219	577,320	2,389,108	2,564,126	752,338

Beds	Year1 tons	Year2 tons	Year3 tons	Year4 tons	Year5 tons
15	129,205	263,043	572,968	765,444	455,518
17	129,205	19,237	335,589	542,749	226,397
J	1,182,879	1,151,821	1,185,303	533,661	500,179
Totals	**3,594,699**	**6,182,441**	**11,877,163**	**9,490,865**	**3,796,141**

Table 10
Estimated Annual Tonnages of Annual Waste Material by Bed number

The Class IVb landfill located on Waste Dump A will contain waste materials approved for disposal. The waste materials will be gathered onsite as the waste types are generated. The waste types will be stored separately by type in trash receptacles suitable for each waste type. The receptacles will be hauled to the landfill location monthly, where they will be emptied in 4-6 foot lifts, followed by 24 inches of covering using local waste rock from the Waste Dump A. The waste rock will be placed over the top of the waste materials to stabilize the surface and prevent wind-scattering of the debris. Covering will occur the same day the waste receptacles are emptied. The rock will help hold the waste materials in place and stabilize the surface for the next vertical lift.

The total proposed capacity of the landfill is 57,000 CY. Of that, 75% will be landfilled material, and 25% will be inert rock encapsulation material. The landfill will be used intermittently during ongoing operations, however the bulk of the capacity will be used at the end of mine life during reclamation and disposal of onsite facilities. The landfill will have, at any time during the life of operations, an excess capacity of 20,000 cubic yards that will be used solely for the disposal of onsite facilities during final reclamation. See Appendix D and N for landfill capacity as it relates to facility demolition and disposal.

106.5 - Existing soil types, location, amount

Topsoil resources (growth media) were evaluated and inventoried during baseline data gathering activities in 1994 and during operations from 2006 to the present, see Baseline Soils Report in Appendix L. Growth media stockpiles are strategically and opportunistically located throughout the project area for final reclamation. Salvage of the A & B horizons of soil was projected to provide 1,887,394 cubic yards of growth media. To date, approximately 1.72 million cubic yards of topsoil has been salvaged during initial clearing and grubbing within the active mine areas, at an average depth of 8-10 inches (topsoil from the recent GTO expansion salvaged topsoil to an average depth of 6'). Of that, approximately 1.22 million cubic yards of salvaged topsoil is currently located in stockpiles around the project as seen in Map 5. This 1.22 million cubic yards represents the amount of topsoil available for use in final reclamation of the site. Any topsoil quantities that may have been inadvertently affected by waste dump construction is not accounted for in this 1.22 million cubic yards. An estimated 150K cubic yards was used during the reclamation of Waste Dump C. Table 11 summarizes the amount of topsoil located in existing soil piles. Salvageable growth media is generally stockpiled away from active mining areas, revegetated, and sloped to minimize erosion. Growth media will be stockpiled in the pits, wherever possible, to minimize additional surface disturbance. Growth media stockpiles will constitute up to 68 acres of impact throughout the project area.

In 2012 the Company contracted with Mindy Wheeler of WP Resources to review activities and success of reclamation activities and propose ongoing reclamation guidelines. LVCM's waste rock rapidly breaks down to a sandy soil. Laboratory analysis concluded that both the waste rock soil and growth media required similar amendments to promote optimal native plant growth conditions and they have similar exchangeable sodium characteristics. The Reclamation Guidelines with the laboratory results are attached as Appendix G. While the waste rock soil may have similar chemical characteristics as growth media, the waste rock within the LVCM does not degrade at a rate sufficient to create enough necessary fines to act as 'soil.' Therefore, the guidelines for seed mix and use of waste rock is for consideration only. Refer to Map 5 located in Appendix C.

106.6 - Plan for protecting & re-depositing soils

The Company's plan to protect existing soils is first to remove soils before mining activities start. Soil salvage depths have varied and will vary depending upon the terrain and depth of soil present for salvage. For example, in hilly areas where the soil layer is very thin, soil will be salvaged where practicable. In valley areas, such as near the GTO pit, soil will be salvaged at least 1' in depth Additional topsoil will be salvaged to a depth ranging from 1' to 3' depending upon the suitability of the alluvium for use as growth media, and if additional suitable soil materials (including alluvium) are available at depths deeper than 1', then all suitable soil materials will be salvaged until the existing soil deficiency is erased, in order to facilitate the planned final reclamation. The second step is to stockpile the soils in an area that will not be disturbed, in a way/shape that reduces erosion, and apply BLM & DOGM approved seed mix to the surface (see section 110.5.4 for seed mix details). These efforts should reduce erosion and weed growth.

As of January 2015, LVCM had stockpiled the growth media required to reclaim 2015 surface disturbance at the site (waste dumps & leach pad). Table 11 details the growth media stockpile quantities and source location. Refer to Map 5 located in Appendix C. As of 2022, the total accessible stockpiled growth media has changed from what was reported in 2015. The cause of the change in accessible stockpiled growth media was from the recent GTO expansion, in which viable topsoil was salvageable to a depth of approx. 6'. The only other additional disturbances that have occurred at site between 2015 and 2022 were the installation of two small manmade water retention ponds. During construction, topsoil was stockpiled in the H stockpile (Map 5, Appendix C). Additional topsoil will be salvaged as disturbance related to ongoing operations continues.

Topsoil Piles	Topsoil Quantities (CY)	Source
A	73200	Leachpad, ponds, facilities (shops and admin, plant)
B	294,200	Leachpad, ponds, facilities (shops and admin, plant)
C	236,600	Centennial pit, facilities
D	138,400	A dump
E	269,300	B dump
F	15,400	A dump, GTO pit
G	25,200	A dump (to be salvaged)
H	165,493	GTO, Water Pond 1 and 2, A dump
Totals	**1,217,793**	

Table 11
LVCM Growth Media Source Locations

Location of existing topsoil stockpiles and their volumes, as well as possible borrow pits, can be found on Map 5, Appendix C.

106.7 - Existing vegetation - species and amount

Lisbon Valley is relatively typical of this region of the Colorado Plateau in that the valleys are covered in sagebrush and the hillsides are dominated by pinyon-juniper woodlands. The vegetation inventory is detailed in the FEIS February 1997 and the baseline flora and fauna data was detailed in a 1994 report by Woodward-Clyde attached as Appendix F. WP Resources 2012 Reclamation Guidelines report addressed vegetative communities and cover levels attached as Appendix G. Color photographs were taken for Section 105.4 in September of 2016, and are included in Appendix B showing the current vegetative communities and cover levels around the mine site.

There is no riparian habitat within the project boundary.

Updated vegetation and wildlife information has been gathered from the US Fish & Wildlife Service Information, Planning and Consultation System, as well as from the Utah Division of Wildlife Resources. The updated reports for the LVCM are located in Appendix F. According to the IPaC, there are no critical habitats within the LVCM.

106.8 - Depth to groundwater, extent of overburden, geology

The geologic setting of the project is consistent with Southeastern Utah. Lisbon Valley is located near the center of the Paradox Basin, an asymmetric sedimentary basin of Pennsylvanian to Cretaceous age. The structure and stratigraphy of the basin are dominated by the thick evaporite deposits of the Pennsylvanian Paradox Formation (Paradox). During the Pennsylvanian, the Paradox subsided along a series of northwest trending faults forming a restricted seaway bounded on the northeast by the Uncompaghre Uplift and on the west by the Kaibab Uplift and the Emery High. The seaway accumulated locally thick deposits of evaporates including salt. Plastic deformation of the salt caused by the weight of the overlying sediments caused the salt to flow along pre-existing basement structures where accumulations were thickest. The salt flow formed a series of elongate northwest trending diapirs following the dominant structural fabric of the basin. Anticline structures developed over the diapirs between Middle Pennsylvanian and Late Triassic time. The structures were further deformed during Jurassic, Late Cretaceous, and Early Tertiary by folding, faulting and renewed salt movement.

The initial, most active, period of salt structure growth started in the Late Pennsylvanian to Permian and continued for about 75 MM years until the Middle to Late Triassic. This salt uplift influenced sedimentation of the Permian to Triassic rocks. Sediments were deposited as thin layers, or not at all, over the rising salt diapirs, and as thick layers in adjacent subsiding areas. Near the margins of the salt diapirs, the sedimentary rocks are commonly brecciated, upturned, and display numerous local unconformities. The unconformities developed as the sediments were tilted as the salt rose planed off by erosion and then covered by younger sediment. Each unconformity registers a time when subsurface faults were active and the salt moved. After a tectonic pause in the Early Jurassic some of the salt diapirs grew again in the Middle Jurassic. Later Jurassic to Cretaceous sediments were deposited above the salt anticlines with little thickness variations. During the Late Cretaceous to Early Tertiary Laramide orogeny, a series of gentle anticlines and synclines were formed. Many of these young anticlines, including Lisbon Valley, were developed as upward extensions of pre-existing salt anticlines. The younger set of anticlines is sub-parallel to the older structures, but not necessarily coincident. Diapiric salt movement was rejuvenated at this time and continues to the present. The surface of some of the breached anticlines is a residual rubble of gypsum and siltstone developed from Paradox Formation from which the salt has been leached. Present examples include the Moab, Paradox, and Sinbad anticlines.

In Lisbon Valley, the anticline structure is unbreached and the evaporite sequence remains covered by folded and faulted younger rocks reflecting the anticlinal structure created by the still-rising salt. The Lisbon Valley anticline structure is about 15 miles long and is faulted along its longitudinal axis by the Lisbon Valley Fault. The fault strikes N40°W and dips 50°-85° northeast. Its vertical displacement exceeds 3,800' and juxtaposes Cretaceous formations against Permian. At the ends of the Lisbon Valley Fault the structure tends to horsetail into a number of smaller branching fault strands.

Sedimentary stratigraphy within copper deposits includes Quaternary Alluvium, Mancos Shale, Dakota Sandstone, Burrow Canyon Formation and The Brushy Basin Member of the Morrison Formation, with Lower Jurassic and Permian formations in the footwall of the Lisbon Valley Fault. LVMC breaks the stratigraphy within the deposits into 17 distinct beds for engineering, production and environmental management. Quaternary alluvium is identified as Bed 1 and is comprised of light brown to red sand, silt and gravel, and stream and flood deposited alluvium. The Cretaceous Mancos Shale is identified as Bed 2. The Mancos shale is a black, dark gray to brownish olive-green, thinly laminated to thin bedded marine shale with occasional limy fossil beds. The Cretaceous Dakota Sandstone has is identified as Beds 3-13. Bed 3 is a buff to white, fine to medium grained sandstone. Bed 4 is a buff to gray, medium grained sandstone to silty sandstone with minor interbedded gray shale. Bed 5 is a buff colored fine to medium grained sandstone. Bed 6 is a coal bed of variable thickness usually averaging 12' and can grade into carbonaceous shale. Bed 7 is a light to dark gray silty shale. Bed 8 is a poor grade coal bed, usually silty or shaly and typically contains pyrite. Beds 9-10 are usually indistinguishable light to dark gray silty or shaly, fine to medium grained sandstone. Bed 11 is a white to buff colored fine to medium grained sandstone and can contain up to 20% black shale or organics. Bed 12 is a pale green to gray shale. Bed 13 is a white to buff colored medium grained, poorly cemented sandstone and matrix supported chert pebble conglomerate, with minor pale green to gray shale beds and lenses. The Cretaceous Burro Canyon Formation is identified as beds 14-16. Bed 14 is a red to light gray variegated siltstone and shale. Bed 14 can grade into buff or gray limestone and sometimes contains massive chert beds. Bed 15 is a buff to gray to white, fine to medium grained and rarely coarse-grained sandstone and matrix supported chert pebble conglomerate. Bed 15 can contain pale green to gray shale beds and lenses. Bed 16 is similar to Bed 15 but with poor cementation and is usually indistinguishable from Bed 15. The Jurassic Brushy Basin Member of the Morrison Formation is identified as Bed 17. Bed 17 is a maroon to red to brown variegated siltstone, mudstone and calcareous sandstone.

Copper deposits in the Lisbon Valley occur near faults in collapsed blocks of Dakota and Burro Canyon Formations over a former anticline structure. The Lisbon Valley Fault is the most prominent fault and runs parallel to a series of en-echelon faults that extend across the width of Lisbon Valley and strike parallel to the NW/SE anticlinal axis.

Lisbon Valley mineralization is characterized by low-temperature, finely disseminated copper minerals in permeable sandstones of the Cretaceous Dakota and Burro Canyon Formations. Warm, chlorine-rich brines released from the Paradox Formation moved upward through the Lisbon Valley Fault system and stripped loosely bound copper from the red-bed Cutler and Chinle Formations. When the upward-moving mineralizing fluids encountered the impermeable Mancos shale, they spread laterally into the permeable intervals of Dakota and Burro Canyon sandstones. It is here that the fluids prepared the host rock and subsequently precipitated copper under acceptable redox conditions.

The Centennial deposit lies immediately northeast, and adjacent to the Lisbon Valley Fault. Mineralization is concentrated in the lower Burro Canyon formation but also occurs in all sandstone beds in the Dakota Sandstone. Two anticline collapse faults tilt bedding to the southwest (see Appendix C, Figure 1: Geologic Cross Section of the Centennial Deposit). The Centennial Deposit is approximately 4,000’ long and 1,500’ wide.

The GTO deposit lies immediately northeast and adjacent to an offset splay of the Lisbon Valley fault. In the GTO deposit, mineralization is concentrated in the lower Dakota Sandstone with mineralization in the Burro Canyon Formation as well. An anticline collapse fault tilts bedding to the east, away from the Lisbon Valley splay fault (see Appendix C, Figure 2: Geologic Cross Section of the GTO Deposit). The GTO deposit is approximately 2,800’ long and 750’ wide.

The Sentinel deposit is situated on the east side of Lisbon Valley along an antithetic, valley-bounding fault. The deposit is comprised predominantly of oxide ores near the surface and chalcocite ore at depth in the Burro Canyon Formation. The Burro Canyon lies exposed on the east side of the valley and where the Dakota is largely eroded away, leaving Burro Canyon as the remaining host. The deposit plunges steeply into a graben structure on its SW side (see Appendix C, Figure 3: Geologic Cross Section of the Sentinel Deposit.). The Sentinel deposit is approximately 1500’ long and 800’ wide.

Groundwater occurs beneath the project site as four vertically and laterally discontinuous units and is structurally controlled. These include valley fill, Mancos Shale perched units, the Burro Canyon (BC) Aquifer, and Navajo (N) Aquifer. Groundwater ranges from 60’ below ground surface (bgs) in the valley fill and Mancos Shale, to 300’ bgs in the BC Aquifer and 800’ bgs to 1000’ bgs in the N Aquifer. Groundwater information is detailed in Sections 3.2.3 and 4.2 of the February 1997 FEIS. Additionally, LVMC monitors groundwater and heap leach facilities in accordance with Utah Groundwater Discharge Permit UGW 370005 included in Appendix H. LVMC reports quarterly groundwater sampling results to the BLM and DOGM.

Detailed information regarding Centennial Pit backfilling should reference: Arcadis’s Updated Centennial Pit Backfill Evaluation March 2014, Whetstone’s Method and Results for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock March 2014, Whetstone’s Method and Results for 2015 Geochemical Testing of Lisbon Valley Mine Waste Rock January 2016, BLM’s Decision Record Environmental Assessment DOI-BLM-UT-Y010_2014-0018EA, and BLM’s Determination of NEPA Adequacy DOI-BLM-UT-Y010-2016-0158-DNA.

Pit dewatering is required for all three of LVMC’s open pits. The Centennial Pit will be dewatered until mining activities are completed below 6190’ AMSL. The GTO Pit is dewatered by LVMC’s Production Well 12 (PW-12). LVMC utilizes PW-12’s water for copper production needs. LVMC maintains water rights for process water. Water Rights #’s 05-2593 (F69971). The Sentinel West Pit will be backfilled above the original contour, therefore eliminating any potential risk of pit pooling.

Overburden material is comprised of soil, alluvium, and Cretaceous Mancos Shale. Rock Characterization is discussed in detail in sections 106.2, 106.4 and the Waste Rock Management Plan had additional detailed information attached as Appendix D.

106.9 - Location & size of ore, waste, tailings, ponds

Ore is stored and processed on the Leach pad. The leach pad is designed to stockpile 33MM tons of ore. A discussion of the heap leach pad, its features and function, are in section 106.2. Refer to Maps 2 in Appendix C. At the end of the mine life the ore on the heap leach pad will become spent ore and should be considered similar to tailings. Details regarding the reclamation of the heap leach pad are covered in the reclamation plan section 110. The current waste dump design includes three waste dumps, only one of which is active. The dump to the north of the Centennial Pit (Waste Dump C) is considered complete and has undergone reclamation and revegetation efforts, although complete reclamation is anticipated to be completed in 2020-2021. The dump west of the GTO pit (Waste Dump A) is designed to receive 31MM tons and cover 129 acres. This is the only active dump within the LVCM. The dump to the north of the GTO Pit (Waste Dump B) is considered complete and will undergo reclamation and revegetation in 2020-2021. All dumps are designed with a maximum 2.5H:1V slope. A small section of Waste Dump C's west-facing slope was constructed with angle-of-repose slopes. However, this slope appears to be stable and pushing the slope down to 2.5H:1V will occur during 2021.

The Centennial Pit will be backfilled with waste Beds 2 through 17 as mining is conducted. Backfilling of the Centennial Pit was approved after a comprehensive NEPA evaluation, see *Centennial Pit Partial Backfilling Revision 3*, submitted March 2015, and the later-approved 2016 Plan for Centennial Backfill Expansion. The specific objective was to assess the potential impacts to groundwater refilling into Centennial Pit and coming in contact with this material after mining is complete. Arcadis's Updated Centennial Pit Backfill Evaluation March 2014 report calculated averaged beds 14 & 15 NNP of 187.2 tons $CaCO_3$/kt calculated from the 1997 FEIS, operational cauterization (2005 through 2013) and the 2014 column testing program. This NNP value differs from the Waste Rock Management Plan NNP value as the Waste Rock Management Plan is updated annually and is calculated from operational (2005 through current) data. The Centennial Pit Backfilling Evaluation March 2014 was based on extensive testing, including the following.

- Acid-base accounting (ABA)
- Static water leach testing using single and multiple extraction modified meteoric water mobility procedure (MWMP) and Synthetic Precipitation Leaching Procedure (SPLP) testing.
- Kinetic column testing following the procedures specified in the Final Work Plan for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock.[7]
- Solid phase elemental analysis by inductively coupled plasma atomic emission spectroscopy and mass spectrometry (ICP-AES and ICP-MS);
- Mineralogy by transmitted light thin-section microscopy and Rietveld x-ray diffraction (XRD).

Further, the testing indicates that backfilling these waste beds will meet Utah Groundwater Quality Standards or improve background levels as regulated by the Utah Division of Environmental Quality (UDEQ). Written authorization for backfilling in the context of this testing is provided by BLM[8], UDEQ,[9] and DOGM[10].

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[7] Whetstone 2014. Workplan for Additional Geochemical Testing of Waste Rock Jan 2014

[8] BLM 2015. Finding of No Significant Impact EA----

[9] UDEQ 2015. Groundwater Discharge Permit ------

[10] Utah Division of Oil, Gas & Mining 2015. Review of Amended Notice of Intent to Commence Large Mining Operations and Updated Centennial Pit Backfill Proposal, Lisbon Valley Mining Company LLC, Lisbon Valley Mine, M/037/0088, San Juan County, UT.

Due to the phased approach for mining within the Centennial Pit, approximately 14 million tons of waste rock from Centennial Pit will need to be stockpiled outside of the pit. The Company evaluated expanding the B dump and A dump as options, however both options would increase overall surface disturbance as well as require modifications to the plans to install drainages. Furthermore, as the B Dump is currently undergoing active reclamation, re-disturbance of the B Dump would not be considered best management practice. The Company then evaluated the Sentinel West Pit as a proposed location for backfilling. The material to be used to backfill the Sentinel West Pit will be sourced from the Centennial Pit, and thus will be the same material that was evaluated during the previous Plan Modifications. Backfilling of the Sentinel West Pit will be done in conformance with the approved backfilling plan for Centennial. No changes in the backfilling plan is proposed, other than the location (Sentinel West vs. Centennial). Therefore, backfilling the Sentinel West Pit would be considered best management practice for the storage of the 14 million tons of waste material coming from the Centennial Pit.

Backfill Plan

The backfilling plan calls for backfilling of the Centennial Pit to a minimum elevation of 6,200' or until all backfilling opportunities are exhausted (Page 1, paragraph 4; BLM 2015 Decision Record EA). As the initial purpose was to protect the Burro Canyon from undue and unnecessary degradation, the elevation of 6,200' was chosen, as it is 10' above the pre-mining water level of the BC aquifer. The Centennial pit will be backfilled using a mixture of Beds 2 through 17. Beds 2, 11, 12, 13, 14, 15 and 17 will be backfilled below the 6200' elevation and the mixture will be a minimum 75% to 100% Bed 2, 12, 14, 17 and 0% to 25% beds 11, 13, 15. Mixed waste from Beds 2 through 17 will be backfilled above 6200'. The current mine plan is phased in such a way that there will never be a void space larger than 275,000 cubic yards below the 6,200' of the Centennial Pit. The reason for this is due to the last phase of mining having a final floor level above 6,200', and all waste encountered during the pushback to receive the last phase of ore will be deposited in the existing mined-out portion of the pit floor.

The Sentinel West Pit backfill Plan will have the following features:

- The Sentinel West Pit will initially be backfilled to an elevation of at least 6,240' amsl.
- Beds 2, 11, 12, 13, 14, 15, and 17 will be backfilled below the 6240' elevation and the mixture will be a minimum 75% to 100% Bed 2, 12, 14, 17 and 0% to 25% beds 11, 13, 15.
- Mixed waste from Beds 2 through 17 will be backfilled above 6240'.
- Waste material backfilled above the pre-mining contour will be blended with the west-facing angle-of-repose slope of the C Dump.
- Waste material placed above the pre-mining contour will be operationally graded to 2.5H:1V.
- Erosion control features will be operationally installed into the outer slopes of the Sentinel West Backfill.
- Erosion control features will be operationally installed a minimum of every 100 vertical feet of slope height to allow for proper control of surface water runoff.

Backfill Quality Assurance

The Company analyzes all the blast holes, surveys and demarks ore/waste boundaries, and creates detailed geologic maps of all pits as part of its grade control process.[11] This process provides the quality assurance (QA) necessary to discretely identify ore, waste, Bed number, and Rock Type. The same process will be

[11] LVMC 2008 Ore Grade Control Quality Assurance Plan. Aug 2008

used to identify waste for backfilling. The backfill is not anticipated to settle more than 2’ based on analogous waste dump surveys and heap leach surveys conducted by LVMC.

Water Storage/Treatment Ponds

The Company stores groundwater in one 240,000 gallon above ground storage tank (AST) and three retention ponds with total storage capacity of 19M gallons. The locations are shown in Maps 2 Surface Facilities Map 1 & 2. These ponds are designed to be less than 20 acre-feet with berms less than 10 feet tall, so the ponds will not classify as dams.

The solution ponds are designed to separately store four solutions, including PLS (pregnant leachate solution), 2007 ILS (intermediate leachate solution), Raffinate (barren solution), and storm water. Solution ponds are covered under the updated GWDPA. Refer to Map 1, Map 2, Map 4, the Company’s SWPPP, Map 5 and Figures 8, 9 & 10 located in Appendix C. Table 12 shows solution capacity per pond.

Pond Name	Cubic Feet	Gallons	Acre-feet
PLS Pond	1,288,238	9,636,691	29.57
ILS Pond (below weir/outlet)	997,012	7,458,170	22.89
Raff Pond	969,585	7,253,002	22.26
Stormwater Pond	743,036	5,558,295	17.06
Emergency 10-yr 24-hr overflow Pond (“100-yr Pond”)	1,840,311	13,766,480	42.25
TOTAL PROCESS STORAGE	5,838,182	43,672,638	134
Haul Road Retention Pond	791,919	5,923,966	18.18
GTO Pond 1	871,198	6,517,014	20
GTO Pond 2	871,198	6,517,014	20
TOTAL FRESH WATER STORAGE	2,534,315	18,957,994	58

Table 12: Pond Capacities

Ephemeral Stream Channels

Ephemeral stream channels will be permanently diverted around open pits as stipulated in the 1997 BLM Record of Decision. Impacts to groundwater, surface water and wildlife have been reviewed and documented in the 1997 EIS.

106.10 - Amounts of Material extracted or moved

The types of material to be extracted and/or moved within the LVCM include:

Copper-bearing ore (Tables 8.a, 8.b, 9)

Barren waste rock (Tables 8.a, 8.b, 10)

Topsoil (Table 11)

Tables 8.a, 8.b, 9, and 10 outline the amounts and types of material extracted or moved. Table 11 details the total amounts of topsoil that has been or will be stockpiled and/or readily available for use during final reclamation.

R647-4-108 - Hole Plugging Requirements

The Company will properly plug drill holes as soon as practical and shall not leave them unplugged for more than 30 days without approval of the Division.

The Company's surface plugging of drill holes shall be accomplished by setting a nonmetallic perma-plug at a minimum of 5'below the surface, or returning the cuttings to the hole and tamping the returned cuttings to within 5' of ground level. The hole above the perma-plug or tamped cuttings will be filled with a cement plug. If, the cemented casing is to be left in place a concrete surface plug is not required, provided that a permanent cap is secured on top of the casing.

Drill holes that encounter water, oil, gas or other potential migratory substances and are $2^{1}/_{2}$" or greater in surface diameter shall be plugged in the subsurface to prevent the migration of fluid from one stratum to another. If water is encountered plugging shall be accomplished as outlined below.

Holes that encounter significant amounts of non-artesian water shall be plugged by placing a 50'cement plug immediately above and below the aquifer(s) or filling from the bottom up (through the drill stem) with a high-grade bentonite/water slurry mixture. The slurry shall have a Marsh funnel viscosity of at least 50 seconds per quart before the adding of any cuttings.

The Centennial Pit Backfill proposal included a monitoring well near the pit for regular water quality testing. The Company has identified the existing well SLV3 as the ground water monitoring point. The Centennial pit may expand to the south and consume SLV3. At this point, the Company will identify another suitable replacement ground water monitoring point. SLV3's UTM NAD83 Zone 12 coordinates are 4,223,407N 664,080E.

R647-4-109 - Impact Assessment

109.1 - Impacts to surface & groundwater systems

Surface Water Protection

Surface water is protected during active mining and processing by use of culverts, manmade and natural stormwater catchments, and manmade and natural drainages (Map 1a). To the extent possible, stormwater is diverted around the active mine area using existing natural drainage channels and culverts. Where stormwater falls within the active mine area, the stormwater is diverted to onsite manmade and natural catchments where it is either used in beneficiation or allowed to infiltrate or evaporate. Potential impacts associated with long-term surface and ground water hydrology and erosion control will be mitigated during reclamation activities as discussed in more detail in Section 110 below.

The Company maintains a Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Utah Pollutant Discharge Elimination System (UPDES) Permit UTR 000737 and UPDES General Multi-Sector General Permit (MSGP). The MSGP authorizes storm water discharges related to Industrial Activities, Group 3, Sector G (Metal Mining). The LVCM is considered an "Active Metal Mining Facility" (AMA) under the MSGP, and subject to Pollution Prevention Plan Requirements. The SWPPP and the Utah Pollutant Discharge Elimination System permit is attached as Appendix M.

The SWPPP describes pollution prevention and control practices designed to minimize the contact of storm water with "significant materials", and thereby avoiding impacts, or otherwise manage water after such contact, so there is no discharge. [12]

The SWPPP authorizes the diversion of surface water around the active mining area (AMA). Activities in the AMA the following:

- Road Construction
- Drilling and blasting
- Open-pit excavation
- Ore and waste rock hauling and stockpiling
- Heap Leaching
- Solvent Extraction-Electro Winning (SX-EW)
- Vehicle maintenance and parking

The Company avoids impacts to surface water systems through implementation of best management practices (BMP) in accordance with the SWPPP. BMP are developed to minimize the potential for non-point source pollution to surface waters.

BMPs include both structural and non-structural controls. Structural controls include:

- Diversion
- Retention
- Erosion and Sediment Control
- Stabilization
- Energy Dissipation

Structural control methods are implemented to site conditions, and modified as site conditions change with on-going mine development. These include:

- Diverting runoff away from roads and other denuded areas by using berms, ditches, and other functionally equivalent diversions.
- Preparation of road drainages and outlets by removing fugitive outfalls and consolidating runoff into designed outfall structures that are capable of managing the expected runoff volume.
- Reducing runoff velocities by using energy dissipation devices and minimizing grade. Refer to Map 4 located in Appendix C.
- Trapping sediment on-site in sediment ponds, sumps, and other functionally equivalent structural controls.
- Capturing runoff, when practical, to eliminate the potential for storm water discharges.

Diversion channels and retention ponds comprise the primary structural controls at LVCM. The Company maintains three primary manmade retention ponds. Refer to Map 2 located in Appendix C. The upper retention pond is located southeast of the leach pad and functions to retain a large portion of surface water runoff from the highest flowing sub basins located on the rim rock south of the leach pad. The lower

[12] EPA defines "Significant materials" to include, but are not limited to: raw materials; fuels; solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101(14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag and sludge that have the potential to be released with storm water discharges.

retention ponds are located east of the GTO Pit and situated on low-permeability Mancos shale. Many of the existing and operational storm water control features will be left in place and expanded upon for post-reclamation hydrologic controls. Such features that will be expanded include drainage diversion channels and catchments. The post-mining control features will also include the permanent diversion of runoff from Dump C and north of the mine area to re-connect with the existing ephemeral Little Valley drainage. This diversion will be designed and installed south of the Sentinel West Pit to allow for unencumbered surface water flow around the Sentinel West Pit and other disturbances. Refer to Map 4 located in Appendix C.

Non-structural controls include maintenance, spill prevention & response, inspections, training, and record keeping. These controls are detailed in the SWPPP. Culverts are located around the project area in order to ensure storm water is diverted to the designated receiving areas.

Groundwater Protection

Groundwater ranges from 60 feet below in valley fill and Mancos shale units to about 1,000 feet below surface. Groundwater occurs in four low-yield, poor-quality aquifers below the site. These include valley fill, Mancos, Burro Canyon (BC) and Navajo (N) aquifers. The valley-fill aquifer exceeds state ground water quality standards for gross alpha and gross beta levels. Secondary standards are exceeded for dissolved manganese and TDS. The Mancos aquifer exceeds primary standards for sulfate, TDS, gross alpha, and gross beta.

Both the valley fill and Mancos shale aquifers are low-yield perched aquifers, and are hydrologically discontinuous from the deeper BC aquifer, as well as from other areas regionally by function of outcropping. Moreover, the Mancos shale is very low permeability by geologic definition which adds to its poor use as an aquifer. Both the valley fill and Mancos shale aquifers have been locally dewatered by mining and beneficiation activities. The Mancos shale geologic unit outcrops locally, which isolates the LVCM from potentially impacting the aquifer on a regional basis. As the Mancos shale outcrops, it not only drains the Mancos aquifer, but also eliminates the potential continuation of the valley fill aquifer, which occurs in the alluvium overlying the Mancos shale unit. Valley fill aquifers are limited by their occurrences as alluvial deposits. While the word 'aquifer' is used here to describe the Mancos, this unit is highly impermeable, and within the Lisbon Valley Project area and Lower Lisbon Valley (LLV), does not contain sufficient saturation to truly classify as an aquifer by the definition provided by the US Geological Survey (USGS, 2020). The valley fill is a perched aquifer, only receiving recharge from precipitation and surface run-on. Therefore, the use of the word 'aquifer' to describe the valley fill should also be considered a loose interpretation only.

The BC aquifer was classified as Class III by the State of Utah (UDEQ, 1998) because it naturally exceeds Utah Ground Water Quality Standards (R317-6-2) for uranium, gross alpha, and gross beta particle activity. Arsenic, cadmium, aluminum, and iron also commonly exceed Utah groundwater quality standards. Gross alpha and gross beta particle activity commonly exceed Utah groundwater quality standards in the N-aquifer. Some background water quality samples from the N-aquifer have also contained concentrations of arsenic, aluminum, iron, sulfate, and TDS that exceed Utah groundwater quality standards. Overall though, the N-aquifer would be designated as a Class II aquifer by Utah Ground Water Classes (R317-6-3) based on the baseline water quality and ongoing water quality monitoring within the Project area.

The Company monitors groundwater and facilities in accordance with Ground Water Quality Discharge Permit (GWDP) UGW370005 in compliance with the provisions of the Utah Water Pollution Control Act. The GWDP is in the process of being updated to reflect the re-start of operations. The GWDPA, as written, assumes all ground water monitoring controls as already approved in the existing GWDP. The existing GWDP describes how potential impacts to groundwater are minimized by the design and construction of process facilities that under normal operating conditions will not discharge.

In December 2018, Whetstone Associates provided the Company with a 20-year summary report of the water quality monitoring data that had been collected by Whetstone from water wells throughout the Project Area from a period ranging from 1998 through to 2018. (Appendix F of the GWDPA). As part of the summary report, Whetstone performed an evaluation of the ground water flow direction and the communications (or lack thereof) between the aquifers that exist within the Project Area.

According to the report, there is a large unsaturated zone that exists between the BC and N aquifers. Moreover, both the BC and N aquifers are highly segmented, with faults generally acting as barriers to flow across faults. Of note, active mining has been performed within the Lisbon Valley Active Mine Area, with open pits being deepened yearly. Over the twenty-year monitoring event, there has been no indication of communication between the BC and N aquifers, as would have resulted in change in water quality and overall water chemistry of the distinct aquifers. The 2018 Whetstone report in the GWDPA indicates that water quality impacts the N-aquifer as a result of mining in Lisbon Valley have not been detected to date, and that because local impacts to the Burro Canyon and N-aquifer are negligible or not expected, measurable regional impacts to the N-aquifer and Dolores River system are not expected.

Moreover, there is no indication of dewatering of the N aquifer which was a question posed in the 1997 ROD as it relates to the Dolores River system. Therefore, the Company maintains high confidence that the empirical results of the 20-year monitoring support that no impacts to surface or ground water has or will occur as mining continues.

The results of the 20-year monitoring are available as annual submissions to the DWQ in accordance with the Company's GWDP. The GDWP provides background water quality, groundwater protection levels, Best Available Technology (BAT), and monitoring requirements. Implementation and maintenance of BAT protects groundwater and surface water from potential contaminant sources, including solution ponds, leach pad, SX/EW plant, waste dumps, and processing facilities. These facilities are constructed with clay composite/synthetic liners, maintained, and monitored in accordance with the BAT standards. Above ground storage tanks (AST) and other reagent storage are contained with synthetic liners or otherwise contained in concrete. BAT monitoring includes:

a. Leak Detection under Leach Pad and Ponds
b. Pad Settlement
c. Solution Water Balance to Maintain Storm Water Capacity in Ponds
d. Heap Slope Stability
e. Diversion Ditch Erosion
f. Waste Rock Chemistry (Acid/Base)
g. Sediment in Retention Ponds and Diversions
h. Spill Containment

A copy of the GWDP included in Appendix H and BAT Monitoring Plan is included in Appendix K. The updated GWDPA is also included in Appendix H.

As stated above, the facilities, including the process ponds, are constructed with underlying clay layers, and are also constructed within an area underlain by limestone and Mancos shale. The combination of the manmade installed controls and geologic controls further enhance the protection of water resources. To date, there have been no indication through the continued ground water monitoring of impacts to ground water quality as a result of the ongoing operations.

Pit pools are simulated to accumulate in the GTO and Sentinel West pit at or near the pre-mining groundwater elevation. The pit pool simulation data will not change as seen in the updated GWDPA. The Centennial Pit is approved to backfill above the pre-mining groundwater level, therefore, there is no pit pool expected.

Pit pools in the GTO and Sentinel Pits are authorized by the existing GWDP and anticipated to concentrate some chemical constituents, metals, and TDS. Chemical constituents include: sulfate, chloride, sodium, and calcium. Metals include: aluminum, arsenic, selenium, molybdenum, manganese, iron, uranium, and zinc.

During the permitting process and as part of the 1997 Environmental Impact Statement process the potential for the development of pit lakes for the Centennial, Sentinel and GTO pits were studied. The existing GWDP describes the two hydrogeologic models used to predict potential post mining pit lake scenarios. The first model was based on the classical hydrologic flow in the horizontal direction and the second model was based on a vertical flow model. Field testing suggests that the vertical model most appropriately represents groundwater flow (drilling and testing of paired shallow and deep monitoring wells MW96-7A and MW96-7B [Adrian Brown Consultants 1996b]) and a vertical spreadsheet model was developed for each of the proposed pits. The vertical model was a numerical implementation of the following concept:

> In this system, flow is predominantly vertical. Infiltration moves to the upper saturated zones, where it is essentially perched. Most of the infiltration seeps vertically to the underlying materials, which ultimately drain to the deep basin sediments, which in turn drain to the [Delores] river. Little groundwater flow takes place laterally in the shallow saturated zone [Burro Canyon aquifer], due to its segmentation (Adrian Brown Consultants, 1996c).

Additional detail regarding pit pools is found in the Whetstone Associates 2008 Annual Update and 2018 Hydrogeologic Update of the Lisbon Valley Hydrogeologic System Evaluation. The reports provide a detailed summary of the previous numerical ground water modeling and predicted pit pools and water quality.

A separate Centennial Pit Backfilling pit pool model and water quality predictions were developed in support of the backfill permitting process in 2014. The Sentinel and GTO pits were not included in this model.

Anticipated impacts to water quality due to the Centennial Pit backfilling are discussed in Section 106.9; the Company has simulated and evaluated potential effects on post-mine groundwater quality resulting from backfilling the Centennial Pit. The discussion of model parameters references the Lisbon Valley Mine Updated Centennial Pit Backfill Evaluation (Arcadis March 2014).

A more recent Hydrogeologic Evaluation was performed by Whetstone in 2018, and summarizes the previous reports as well as provides updated evaluations based on optimized pit designs. This Evaluation is part of the Company's GWDPA packet, and can be found in Appendix H of this NOI.

The earlier performed simulations are documented in Arcadis's *Lisbon Valley Mine Updated Centennial Pit Backfill Evaluation* of March 2014, Whetstone's *Method and Results for Additional Geochemical Testing of Lisbon Valley Mine Waste Rock* of March 2014, and Whetstone's *Method and Results for 2015 Geochemical Testing of Lisbon Valley Mine Waste Rock* of January 2016. The BLM's Backfill review and approval documentation are included in Appendix J. [13] Reference the Centennial Pit Backfilling documentation for current pit pool and water quality predictions related to the Centennial pit as described below.

- Backfilling will prevent the accumulation of a pit pool, along with the associated evapo-concentration of salts. A pit pool, and the associated increases of total dissolved solids, is simulated to degrade the N-Aquifer under worst-case conditions. A pit pool is currently approved through Federal and State agencies.
- Backfilling will prevent formation of any acidic condition, due to the acid-neutralizing characteristics of the backfill materials.
- Backfilling will protect, and ostensibly improve, post-mine groundwater quality. Uranium concentrations in the backfill are predicted to be lower than the pre-mining uranium concentrations in groundwater. The raw unadjusted dissolved uranium concentrations ranged from 0.1376 to 0.1979 mg/L in the Bed 15 column leachates and from 0.0063 to 0.0125 mg/L in the Bed 15 column leachates. These values are lower than the average concentration of 0.341 mg/L in background well MW2A and substantially lower than the maximum value of 0.456 mg/L. These facts are documented extensively in the record.
- The kinetic column testing suggests that the interaction of backfilled waste rock and rebounding groundwater will result in lower uranium concentration in groundwater than what was there historically.
- The water quality in the backfilled pit is also expected to be significantly better quality than in a pit lake subject to concentration through evaporation.
- The Burro Canyon aquifer is a perched, laterally discontinuous, aquifer with Class III limited use groundwater that naturally exceeds drinking water quality standards. Protection limits for uranium in this aquifer are set in such a manner that no increase in concentrations is allowed. The results of kinetic column testing on proposed backfill material indicates that water quality in the column leaches has lower uranium concentrations than in the pre-mining groundwater.
- Water quality outside of the Centennial Pit is generally of better quality, but remains Class II. DWQ's understanding of the data submitted thus far indicates minimal offsite migration will occur due to the compartmentalization and limited extent of both the local perched aquifer and the deeper "regional" aquifer.
- Modeling and kinetic column testing indicates that water quality will improve relative to the pre-mining baseline. Furthermore, a pit lake and the associated TDS increase will not occur.

Based on the above, UDEQ approved LVCM's backfilling proposal in a letter to the BLM. [14]

The anticipated impacts to the BC aquifer due to the dewatering of pits and extraction of groundwater for mineral processing include a reduction of the availability of groundwater in the immediate project area (Adrian Brown Consultants 1996a) and the development of pit pools in the GTO and Sentential pits.

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[13] Lisbon Valley Mining Co 2015. Centennial Pit Partial Backfilling Revision 3 March 11, 2015

[14] **Utah Department of Environmental Quality 2014. Evaluation of Lisbon Valley Mining Company's Proposal to Backfill the Centennial Pit. 22 August 2014**

The shallow aquifer (BC-aquifer) will slowly recharge in the years following mining. Groundwater elevations, in the vicinity of the open pits, will never regain pre-mining elevations due to the annual evaporation of recharge water through the exposed pit walls and open pits. Potential impacts are tempered by the following: 1) the shallow aquifer (BC) is currently not used for any beneficial purposes either within the active mine area, the mined area of the fault-isolated and compartmentalized BC aquifer, or within a two mile radius, and 2) the water naturally exceeds the State of Utah drinking water quality standards for arsenic, uranium, TDS, radionuclides, and other parameters. Potential uses of the water are limited at present and would be similarly limited in the future. The backfilling of the Centennial pit will allow for the water level in the compartmentalized BC aquifer to recover in the immediate area. The backfill material is not expected to generate problematic groundwater chemistry. (BLM Centennial Pit Backfilling Mine Plan Modification for the Lisbon Valley Mine, San Juan County, Utah 2015)

The deeper aquifer (N-aquifer) will only be impacted by groundwater extraction as this aquifer is well below the host material being mined. This aquifer will slowly recharge in the years following mining, however, initially less water will be available to move downgradient of the project site northeast toward the Dolores River. It is possible that flows in the Dolores River could be affected, however, the percentage of total flow in the Dolores River contributed by the deep aquifer in the Lisbon Valley area is very small and would likely be undetectable. (BLM FEIS 1997)

Water Rights Use and Water Quantity Protection

The Company maintains the only active water rights within the active mine area. An inventory of active water rights in the LVCM was used to identify the location and status of water rights points of diversion within a 2-mile radius of the LVCM. The inventory was based on water rights records on file with the UDWR (UDWR 2020).

According to the findings, the Company is the only user of water within the LVCM, with a total annual allowable usage of 2,664.56 acre-feet. The Company maintains detailed records of the amount of water used annually for the mining and processing of copper ores. The Company recirculates water through the process circuit as much as feasible to reduce the overall water consumption however due to the arid environment, makeup water is required practically year-round.

Impacts to water rights outside of the LVCM are unlikely based upon the compartmentalized nature of the ground water in the district. This assumption is further supported by the continued water level monitoring, which commenced in 1994 and has been ongoing since. The ground water level monitoring has tracked the trend of the valley fill, BC, and N aquifers. The Valley Fill Aquifer has exhibited a general trend of decreased levels since monitoring commenced. Of interest in this data is the downward trend was noted to start well before mining in the area became active. This may indicate that the valley fill aquifer is more susceptible to precipitation and to other withdrawals than activities associated with the permittee's copper mining.

The Burro Canyon Aquifer has exhibited a general upward trend in water level since monitoring commenced in 1994. While some production wells have a clear localized effect on ground water levels, that effect is short-lived while the wells are pumping, and tend to have a quick recovery back to static. Moreover, the localized drawdowns of the production wells do not appear to have any translational effects on surrounding wells and thus the aquifer in general.

While the production wells have a clear localized drawdown effect on the Navajo aquifer, the aquifer as monitored for the entire LVCM and LLV has exhibited insignificant change in ground water level within the larger Lisbon Valley and Lower Lisbon Valley areas. In fact, in most monitoring wells, the ground water level of the Navajo aquifer has exhibited a small rise since monitoring commenced.

The Company provides summaries of cumulative water well drawdown annually to the DWQ in their annual Hydrogeologic Update (2018 Whetstone Hydrogeologic Report; 2019 Annual Hydrogeologic Report; Appendix D & H).

Actions to Mitigate Impacts to Surface and Ground Water

Surface Water

Surface water impacts will be mitigated during active mining by ensuring culverts are maintained and cleared of debris. Natural drainage channels surrounding the mine area will be kept in place, and not impounded or otherwise impacted by mining. Where impacted, the Company will work with the appropriate agencies to design and install re-routes to ensure surface water flow is continued unencumbered. Surface water that falls within the active mine area will be diverted to onsite holding ponds or manmade catchment areas to ensure no outfalls occur. Map 1a, Appendix C shows the proposed surface water controls during mining activities.

Post mining surface water controls are found in Map 4, Appendix C, and discussed in more detail in Section 110 below. Included in the post mining surface water controls are installation of drainages on all waste dumps and around the pits, to reconnect with existing natural ephemeral drainage channels. Most of the culverts located within the active mining area will be removed upon reclamation of the access roads. Some culverts may remain if needed for appropriate conveyance of runoff to the designated drainage routes. Maps 4 and 5 of Appendix C depict the proposed culverts to be left in place post-reclamation.

Process Solution

Process solution will be controlled during active mining by keeping the process ponds in good working condition, as well as the heap leach drainages and pipes. Critical spares of all major pumps will be kept onsite and will be regularly maintained to ensure their availability in the case of a pump failure. Other controls will include ensuring the 100-yr storm pond remains empty for use as its intended purpose during large 100-year 24-hour storm events.

Post-mining control of effluent draindown will be monitored and controlled by the installation of Evapotranspiration (ET) cells (Section 110.4; Appendix I). The effluent will be characterized by initiating quarterly and/or annual (as deemed appropriate by the Division and DWQ) compliance monitoring water quality sampling of the effluent contained within the PLS and RAFF ponds. The effluent will be analyzed for the same constituents as specified in the Company's GWDP. Anticipated long-term draindown water quality will be characterized by the implementation of humidity cell testing of existing stacked ore and fresh ore, as it is mined. The humidity cell testing will be run for a minimum of 20 weeks in order to approximate the potential remaining acid neutralizing capabilities of the ore would be upon completion of mining and leaching. These humidity cell tests will be performed for a range of ore material and already-stacked leached ore material to provide a relatively representative dataset of the leach pad in its entirety.

Ground Water

Ground water impacts will be mitigated during active mining by ensuring the process ponds, leach pad drainage ditches, pipes, and overall process facilities are kept in good working condition to ensure no release to the ground water occurs. Quarterly monitoring of the production and monitor wells will continue to track analytes in the ground water. The Company has a SWPPP and SPCC that provides guidelines for the protection of surface and ground water within the Project. Other ground water protection will include the concurrent backfilling of the Centennial pit with Beds 11-14 below the level of 6,190' amsl as mining progresses in other areas of the pit.

Post-mining ground water impacts will be mitigated by completing the backfilling of the Centennial Pit to an elevation of at least 6,200' amsl, and by implementation of the controls stated for Surface Water and Process Solution. Design and construction of the heap cover to minimize infiltration, as well as construction of evaporation cells, will help minimize any impacts to groundwater.

Post-mining ground water resources in regard to potential long-term recharge are discussed above.

109.2 - Impacts to threatened & endangered wildlife/habitat

Wildlife inventories were evaluated in the February 1997 FEIS. The presence of wildlife in the Lisbon Valley area was characterized as "limited" due to the lack of potential food and water sources. There are six mammals that are listed as sensitive, which may occur within the project area according to the UDWR and USFWS online searches.

These include:

- Gunnison's Prairie Dog
- Burrowing Owl
- Grey Wolf
- Black-footed Ferret
- Lewis's Woodpecker
- Gunnison Sage-grouse

The Flora and Fauna Baseline Data by Woodward-Clyde in June of 1994 is located in Appendix F. Updated reports from USFWS and UDWR are also included in Appendix F.

There are no endangered species on or around the Project boundaries (IPaC report, Appendix F).

Pit lakes are expected to form in both the Sentinel West and GTO pits. Pit lakes will have neutral to mildly alkali pH, and evapo-concentrate to relatively high TDS and elevated cadmium, selenium, and uranium concentrations. (Whetstone Associates, Annual Update of the Lisbon Valley Hydrogeologic System Evaluation, September 2009). Potential positive impacts include an available water source for wildlife in an arid location and potential negative impacts could occur to avian fauna from landing in pit lakes. Monitoring of pit lakes will be conducted for 5 years post-mining and the Company will propose and implement corrective action if post-mining mortalities occur.

109.3 - Impacts on existing soils resources

Mining operations will be conducted in accordance with R647-4-107.3 Erosion Control. The Company's compliance with R647-4-107.3 helps minimize the loss of soil resources due to erosion. Erosion is the only anticipated impact on existing soils due to mining operations.

Soil resources are detailed in the February 1997 FEIS, the Baseline Soils Report by Woodward-Clyde in August of 1994 located in Appendix L, and the Reclamation Guidelines by WP Resources in October 2012 located in Appendix G. Soils are generally poor quality; however sufficient volumes are available for full reclamation of the active mining areas (minus pits). The LVCM has stockpiled soil and the Company has surveyed the volumes for final reclamation. Stockpiled soils will be placed away from active mining activity and seeded to minimize soil loss due to erosion. Refer to Map 5 located in Appendix C.

Salvageable growth medium (soil and vegetation) will continue to be grubbed from disturbed areas and stockpiled in the locations described in Section 106.5

109.4 - Slope stability, erosion control, air quality, safety

The Company manages the stability of three types of slopes on site; pit walls, waste dump, and leach pad slopes. Pit walls are designed to specifications of contracted geotechnical studies (Kenneth C. KO & Associates 1989, Call and Nicholas Inc. 1996, 2014). The Company practices ground control protocols to achieve final wall configurations in four steps: Presplitting, Trim Shooting, Wall scaling with dozer or backhoe and visual inspection. In case of mining in loose and weak rock formations such as shale that presplitting doesn't result in stable wall, larger benches and lower wall angles are implemented. Pit wall stability is monitored using high accuracy prism and reflectorless Total Station surveys. Pit walls are visually inspected by all trained personnel and supervisors for cracks and signs of unsafe wall movements in active areas.

Pits

The rock at the Lisbon Valley Mine consists of massive sandstones, interbedded with shales and clays of varying thicknesses and consistencies. During mining all active high walls in the pits will be maintained at 20 or 40'high walls on an 18'batter with maximum 25'benches. The overall slope of these benched high walls will be 1H:1V or less. The unconsolidated alluvium on top of the lithic formation will be stripped to beyond the crest of the ultimate pit limits and used to supplement reclamation on waste dumps and other areas as needed. High wall inspections are completed on a daily basis by mine supervisory personnel, as well as MSHA inspectors twice annually. Berms will be constructed above the final pit walls to enhance public safety and to keep storm water runoff entering the pit.

The Centennial Pit will be backfilled to at least 6,200 ft amsl, which is 10 feet above the predicted post-mining ground water table. Pit lakes are anticipated to form in the GTO pit after mining has ceased. Pit lake modelling predicts lake water to have neutral to mildly alkali pH and will evapo-concentrate sulfate and carbonate ions, eventually reaching TDS concentrations as high as 6,000 mg/L and will develop elevated concentrations of cadmium, selenium, and uranium. Due to high evaporation, water from the Burro Canyon aquifer will flow one-way into the pit lakes, minimizing contamination of the aquifer. The pit lakes are underlain by approximately 1000 ft of low permeability shale, siltstone and silty sandstone (Morrison and Summerville formations). Minor leakage of pit lake water is expected to infiltrate faults and fractures, but pit lake water is expected to remain in pit lakes and not reach the Navajo Aquifer. The Sentinel West pit lake is seasonally intermittent and does not reach the high concentrations of TDS or metals. That said, the

Sentinel West Pit is planned for backfilling, thus eliminating any potential pit pooling from occurring. See *2018007 Annual Update of the Lisbon Valley Hydrogeologic System Evaluation*. Long-term monitoring of pit lakes for impacts to wildlife will be conducted and no other mitigation measures are planned beyond monitoring and/or backfilling per the prescribed method discussed in Section 106.9.

The Sentinel West Pit will be backfilled above the pre-mining topography. This will eliminate any risk for pit pooling, as discussed above.

Pit walls all have floor-to-crest angles of less than 45 degrees. This angle is deemed adequate for long-term stability by rule. The Company modifies their mine plan to ensure pit walls are shallower than 45 degrees depending upon geologic conditions encountered during mining.

The leach pad is designed and intended to be built with operational slopes of 2.5H:1V constructed in terraces and a reclaimed continuous slope of 2.5H:1V, as recommended by a geotechnical survey performed by Golder Associates Inc, in 2006. As stated previously, some areas of the already-existing leach pad has operational slopes greater than 2.5H:1V. These slopes will be re-worked as needed during the continued construction of the leach pad. Leach pad slope stability is monitored using high accuracy prism and reflectorless Total Station surveys and visually by all trained personnel and supervisors for cracking and signs of instability.

Waste dumps

The waste rock is comprised of the same sandstones, shales, and clays. It is reduced by blasting to an approximate 24” minus gradation. The waste is end-dumped on waste dumps and pushed with dozers as needed to a maximum slope of 2.5H:1V. LVMC will use slope breaks, ripping parallel to the slope, and roughed surfaces to enhance slope stability. Waste rock will be seeded to further increase stability during mine operation.

Waste dump A and any waste dump to be built, have concurrent reclamation during construction. By building short lifts and sloping benches during operation, the slopes are at reclaimed angle when each lift is constructed.

Waste dumps B and C are sloped to 2.5H:1V except for a few slopes to be reclaimed. Dump A is designed to be sloped at 2.5H:1V with concurring reclamation as it is being built and slope faces become inactive. The slopes of the waste dumps are visually monitored for instability. The Sentinel West Backfill will also be constructed with outer slopes concurrently reclaimed to 2.5H:1V.

Erosion

The Company manages erosion from two main sources: wind and storm water. It is anticipated that the wind will blow dust from disturbed surfaces around and off the site. It is also anticipated that storm water will move sediment during rain events. Erosion control methods will be employed to help minimize erosion, as needed, while stable revegetation establishes following final regrading of the heap and dumps. Such methods may include the placement of straw waddles, re-ripping of areas along contour, regrading of significant rills, and otherwise reducing the length of continuous or uninterrupted slopes. See Map 4 in Appendix C for illustrative examples of the employment of these methods.

Storm water erosion

Storm water is managed in accordance with UPDES permit and the Storm Water Pollution Prevention Plan, attached as Appendix M. Storm water is diverted through the mine site to both reduce erosion and minimize storm water's interaction with chemicals and process water. Sediment traps and erosion control structures including, but not limited to, rock check dams and berms will be installed as necessary and or by condition of permits. Sediment traps may be expanded into larger basins to mitigate flooding in response to rainfall events. Refer to Map 4 located in Appendix C.

Storm water erosion control will be provided by surface water diversions, sediment traps in conjunction to the aforementioned slope breaks, roughened surfaces, and maximum slopes.

The Company is aware that the Division typically requires stormwater designs to be approved prior to installation of the proposed engineered drainages. The Company has generated high-resolution surface contour maps for the LVCM, particularly the waste dumps and the Sentinel West area. From these surface contour maps, drainage delineation modeling was performed based on a 100-year 24-hour storm event and taking into account upland watersheds, where applicable. The modeling and accompanying flow capacity reports were used to generate adequate drainage designs for the waste dumps and large diversion to the south of the Sentinel West pit. Of high import, a diversion drainage has been designed to transport all intercepting water from the Waste Dump C and upland watershed along the toe of the Waste Dump C, and around and to the south of the Sentinel West Pit, to eventually reconnect with the natural Little Valley drainage. This and other drainage designs have been engineered and approved by the Division (see Division letter dated May 5, 2022). The Company intends to commence construction of the drainages and perform final reclamation of the C Dump in 2022/2023. After successful completion of the C Dump reclamation, the Company will then move to final reclamation of the B Dump. The reason for expediency for the engineering and installation of this drainage in particular is because the current drainage system has been deemed inadequate for proper surface water transport. All drainages that will be installed at the LVCM have been engineered to maintain stability for post-mining hydrology controls. Once the Sentinel West Backfill is complete, and the C Dump angle-of-repose slope tied into the Backfill plan, final installation of long-term drainages will be performed using the same criteria as applied to C Dump and B Dump.

Presently, surface water is diverted around the Centennial Pit by means of an ephemeral drainage that flows parallel to the Lisbon Valley Highway. This drainage intercepts all surface water runoff from the north, including Waste Dump C, by means of diversions and culverts. Until the final drainage has been installed, this existing ephemeral drainage will continue to be the primary mechanism for transport of surface water to the eventual reconnection with the natural Little Valley drainage. Once the design has been completed, however, the culverts that exist underneath the Lisbon Valley Highway directly south of the Waste Dump C will be blocked and the surface water flow re-routed to stay north of the Lisbon Valley Highway.

Wind based erosion

Wind based erosion will be managed in accordance with the air quality permit, attached as Appendix E. Wind erosion is managed by reclaiming disturbed areas, seeding growth media stockpiles, seeding waste dumps, and utilizing a water truck to keep mobile equipment dust to a minimum.

Emissions

The Company manages two emissions impacting air quality: tail pipe emissions from equipment, both mobile and stationary, and fugitive dust. The Company maintains an Air Quality Permit administered by the Utah Department of Environmental Quality attached as Appendix E.

Tail Pipe Emissions

LVMC complies with an air quality permit administered by the Utah Department of Environmental Quality, attached as Appendix E. All equipment used on the site is maintained according to a preventative maintenance schedule promoting optimal operation and minimal emissions.

Fugitive Dust

LVMC complies with the fugitive dust control plan and air quality permit administered by the Utah Department of Environmental Quality, attached as Appendix E. Dust is controlled by operation of water trucks and associated sprays. Opacity is monitored by visual observation.

Public Health and Safety

The Company manages multiple potential impacts to public health and safety including fugitive dust, water quality, site access, and hazardous materials.

Public Health and Safety are a primary concern of the Company. The Company manages fugitive dust, as discussed in both the Erosion Control and Air Quality sections, by way of monitoring dust and reclaiming disturbed areas and the watering of roadways. The Company manages water quality in accordance with the state issued Groundwater Discharge Permit as discussed in section 109.1.2. The Company controls access to the site by way of fencing, berms, signage, 24hr/365day on site personnel and video surveillance. The Company manages hazardous materials by following permit conditions, MSHA, and EPA rules and regulations. The Company has HAZMAT trained personnel and only utilizes certified logistics companies. The pits will be bermed off to enhance public safety and to keep run off from surrounding areas from entering the pit directly.

109.5 - Actions to mitigate any impacts

Mitigation is discussed in sections 109.1 through 109.4, and is supported by reclamation plans in section 110.

R647-4-110 - Reclamation Plan

110.1 Current Land Use and Post – Mining Land Use

The current land use in Lisbon Valley is mining, rangeland and wildlife habitat. Post-mining land use will be rangeland, recreation, and wildlife habitat.

110.2 Reclamation of Roads, Highwalls, Slopes, Leach Pads, Dumps, Etc.

Roads, and other Ancillary Facilities

All surfaces, haul roads, and roads not deemed essential by DOGM or the BLM will be reclaimed. Reclamation will include ripping/re-grading, followed by topsoil placement, unless approved otherwise by the Division, and re-seeding. The ripping and/or re-grading of the haul roads and adjacent slopes (if applicable) will be performed to match surrounding terrain and surface conditions.

Highwalls

Highwalls in the Sentinel and GTO pits are mined to a general slope angle of 1.2H:1V. Highwalls in the Centennial pit are mined to a general slope angle of 1H:1V. Pit highwalls will remain at the mined slope of

1H:1V, or less. The Centennial mine plan includes a layback on the south portion of the pit, which would put the post-mining highwall on the footwall side of a localized normal fault. This will add to the overall post-mining stability of the pit walls.

Centennial Pit

The Centennial pit will be partially backfilled so that no area of the pit is lower than the 6,200' amsl level as discussed in section 106.9. The mining sequence for the Centennial lends itself for ongoing backfilling so that upon completion of all mining activities, very little if any area of the pit will remain below the level of 6,200' amsl. Access to the pit will be blocked by placing berms and fences around the entire pit perimeter. Pit walls and benches will be allowed to fill with rubble. Haul roads, which access the bottom of the pit, and pit floors will be ripped and seeded. If excess topsoil exists after reclamation of the dumps, facilities, and heap leach pad, pit floors and access roads will also be topsoiled. Non-acid generating waste rock will be placed on post-mining pit bench surfaces below the outcrops of formations determined to be potentially acid generating.

GTO Pit

The GTO pit will not be backfilled in the current mine plan and a pit pool is expected to develop. Access to the pit will be blocked by placing rock berms and fences around the entire pit perimeter. Pit walls and benches will be allowed to fill with rubble. Haul roads, which access the bottom of the pit, and pit floors will be ripped and seeded. If excess topsoil exists after reclamation of the dumps, facilities, and heap leach pad, pit floors and access roads will also be topsoiled.. Non-acid generating waste rock will be placed on post-mining pit bench surfaces below the outcrops of formations determined to be acid generating. The GTO pit is not a candidate for backfilling for multiple reasons including: the copper resource is not completely mined out and backfilling would preclude future development of remaining resource, deposit geometry does make pits that are conducive to backfilling, and the volume of waste rock required to backfill the GTO pit is not available in the mine plan.

Sentinel West Pit

The Sentinel East Pit has been completely backfilled and is being actively reclaimed as part of the C Dump reclamation. The Sentinel West pit will also be backfilled, with backfilling going above the pre-mining contour, and tying into the existing angle-of-repose west slope of the C Dump. Remaining pit walls and benches will be allowed to fill with rubble.

For all pits, access will be restricted by installing berms around the entire perimeter and along all access points. Pit bottoms will be re-topsoiled and re-seeded where the pit bottoms are above the ground water elevation and where excess topsoil exists. In the absence of excess topsoil, pit bottoms and access ramps will be ripped, scarified and reseeded.

Drainages

Drainages will be reclaimed and rebuilt at the end of the mine life to maintain drainage continuity and minimize erosion. Sediment traps and erosion control structures, including rock check dams, may be expanded as necessary based on drainage monitoring in accordance with the SWPPP. Refer to Map 4 located in Appendix C and Appendix M. During construction of the roads and process areas, culverts were installed throughout the active mine boundary. These culverts will remain in place as part of the post-reclamation drainage control process if deemed necessary by the Division; otherwise they will be removed. Culverts identified for post-mining use are seen in Map 4 and Map 5 of Appendix C.

Drainage channels will be constructed as stated above for the waste dumps and heap leach pad reclamation. Other drainages will be constructed to ensure stormwater runoff does not accumulate near pit walls, where seepage could create a potential highwall failure.

The section of surface water drainage that runs along the southern edge of the Sentinel West pit will be re-designed and re-constructed farther to the south to ensure that water does not accumulate near the pit walls. Details on this design and the progress can be found in Section 109 of this NOI. This drainage will connect the Waste Dump C drainage channels and the north leach pad drainage channels to the existing Little Valley ephemeral drainage. While the culverts directly south of the Waste Dump C will be blocked and/or removed by the installation of the engineered 100-year 24-hour drainage with San Juan County concurrence, other culverts will remain. In particular, the culverts will remain that are already installed by San Juan County that connect the to-be engineered Waste Dump C and Sentinel West drainage with the drainage running parallel to the north end of the leach pad and the to-be reconnected drainage running north from the southeastern corner of the leach pad (Map 4, Map 5). Information on the size of these culverts is being gathered to ensure that the re-designed section will meet flow requirements for a 100-yr 24-hr storm event for all intersecting surface water sources.

Waste Dumps

The Company's waste dumps are completed with breaks in slopes, roughened slopes and maximum slope angle 2.5H:1V. Surface water is or will be diverted around the dumps where possible. Dump tops will be sloped to drain away from dump crests. The overall waste dump slope lengths will be broken up by catchment benches as needed to prevent terminal velocity of rainwater runoff to occur. For Waste Dump C, up-gradient riprapped channels will be installed to capture most of the intercepting waters. A riprapped drainage design for the Waste Dump C has been engineered in 2021, and the Company commits to installing the drainage and associated catchments in the upcoming year. The water that does fall will continue to follow the set course, with the modification of the drainage channels per Map 5. Maximum continuous slope lengths are identified on Map 5. Continuous slope lengths will be kept under 100 vertical feet over a distance of 250 horizontal feet in order to reduce flow velocity. Situationally, drainage channels will be located on reclaimed haul roads and terraces as needed. Drainages will be installed as seen on Map 4.

Based on past experiences at site, a reclaimed, re-topsoiled slope angle of 2.5H:1V appears to be suitable for long term hydrologic stability as long as slope lengths are not continuous with no catch benches or other breaks for no more than 100 vertical feet over a distance of 250 horizontal feet. Beyond this, rilling has been seen to form, such as at the C dump. It is because of the past experiences that these conditions will now be in place for final reclamation of the site.

The Company will concurrently regrade and/or reclaim dumps as they are completed. This will include grading to a final contour that maximizes conformance with existing topography. Waste Dump A and the Sentinel West Backfill will be regraded concurrently with its construction, but final reclamation involving topsoil placement will not occur until the waste dump in its entirety has been completed. Roughened surfaces will be created by ripping along contour to approximately 1.5' in depth after topsoil placement has occurred. Rilled areas will be backfilled and repaired as necessary during the mine life. During final reclamation of the waste dumps, any additional rilling created by surface water runoff will be repaired as necessary prior to final topsoil placement.

Final surface reclamation will include the placement of 12” of growth media, seeding and revegetation. The exception to this is those areas of the Waste Dump C that have revegetated to a level where disturbance to place topsoil would not be considered Best Management Practice. In this case, Waste Dump C will remain with the existing vegetated areas, and only those areas approved by the Division for re-disturbance will be re-graded, topsoiled, and re-seeded.

The landfill located on Waste Dump A will be reclaimed as follows (Permit #1902):

When the operational life of the landfill facility has ended, final capping will be accomplished using acid neutralizing waste rock from the surrounding Waste Dump ‘A’. The final cover will be no less than 24” in thickness. Following the final capping, topsoil will be spread to a depth of no less than 12” on top of the capped landfill. The topsoil will be taken from the topsoil stockpile located north of Waste Dump A.

Topsoil placement will likely occur in fall of the reclamation year. This will be done to allow for re-seeding of the area in late fall, which is the preferred re-seeding season. The seed mixture to be used will be approved by DOGM, BLM, and SITLA. If, during the subsequent years following final seeding, excessive rilling is seen to occur, rilled areas will continue to be backfilled and repaired as necessary to comply with the reclamation standards of R647-4-111.

Seeding in all areas of the active mine plan boundary will be performed using either aerial seeding, broadcast seeding, or other methods that have been proved to have viability within the LVCM.

Heap Leach Pad

NOTE: all data contained herein and in referenced Appendices is based on a Tentative Plan for Permanent Closure (TPPC) that was engineered in 2021. A final heap closure plan will be engineered prior to reclamation and in coordination with the Company, the Division, and DWQ. In any event, recirculation of heap fluids will continue until heap closure activities commence. Information gathered during the draindown that occurred between March and June 2020, as well as laboratory tests on the ore types existing within the leach pad, have been evaluated and incorporated into the 2021 TPPC. This TPPC was provided to the Division and summarized in the Company’s 2021 Annual Report on file with the Division.

Reclamation of the Heap Leach Pad will follow the guidelines set forth in the original 1997 Record of Decision for the Lisbon Valley Copper Project, and, consistent with the ROD, will be updated to reflect current known Best Available Control Technology (BACT), including that information contained within the TPPC. The updates as known currently include the draindown of effluent, re-grading the pad slopes to a final 2.5H1V or shallower, capping the entire surface with 3’ of inert waste and/or a mixture of waste and alluvium, and applying a final cover of 12” of topsoil to all slopes and top. Long-term draindown evaporation cells will be constructed in the ILS, PLS, RAFF, and Stormwater Ponds, and the 100-yr emergency pond will be left at least temporarily unreclaimed for post-closure sediment control.

Data gathered from the humidity cell testing (HCT) and/or other analytical method deemed appropriate by DWQ and the Division has, and will continue to provide the Company with adequate data to project the long-term neutralization potential of the leached ore. Based upon the initial results seen within the first year of re-commencement of mining operations, a post-mining effluent neutralization plan may not be necessary, as pH was seen to steadily increase, while acidity quickly dropped off in the first few weeks of the HCT. The results of the HCT are summarized in the 2021 Annual Report on file with the Division.

To ensure long-term stability and reduced overall draindown, the leach pad surface will be crowned and/or graded outward to minimize infiltration. Map 5 details the post-reclamation grading plan for the leach pad. As seen in Map 5, the leach pad will consist of a series of crowned terraces that will drain outward to designated drainage channels and eventually report to the designated stormwater catchment areas. The channels will be riprapped on the slopes to minimize erosion.

The primary solution ditch runs along the north perimeter of the leach pad. This ditch will be at least partially filled with coarse, durable, and permeable material for the purpose of maintaining conveyance of subsurface draindown that is not intercepted by the piping system, and if appropriate, may be generated from dozed material from the sloping of the leach pad. During this process, the piping and solution monitoring ports (cans) will be protected for post-mining monitoring and effluent transport during ongoing draindown. The stormwater riprap channels that exit the leach pad on the north will be separated from the underlying draindown channels either by a combination of filter fabric, a clay layer, HDPE, and/or some other mechanism.

The proposed stormwater drainage paralleling the south of the leach pad will also be installed in such a manner as to ensure isolation of the heap effluent from stormwater runoff. The design information contained in this NOI text and accompanying appendices is still preliminary in nature, and further refinement will be made in collaboration with the Division and DWQ.

Details on the stages and timing for leach pad draindown and final reclamation are found in Appendix I. As stated previously in this Notice, an updated GWDPA is being provided to the DWQ. Therefore, any previous assumptions for the closure and post-closure of the LVCM, especially as it pertains to the heap leach pad, is superseded with this Notice and associated GWDPA.

As with the waste dumps, the final reclaimed leach pad will be designed so that continuous slope lengths will be kept under 100 vertical feet over a distance of 250 horizontal feet in order to reduce flow velocity. As the maximum vertical height from natural topography of the leach pad is not anticipated to be greater than 76 vertical feet, the slopes should remain well under the 100 vertical foot limit.

Solution and Storm water ponds

The solution and stormwater ponds (PLS, ILS, RAFF, and Stormwater Pond) will be converted into post-closure evaporation cells. Detailed information on the design and proposed construction of the evaporation cells is found in Appendix I.

The 100-yr pond will be left unreclaimed for post-mining emergency storm water controls while the draindown of the leachpad is ongoing. Once draindown has reached a stable condition and the heap leach pad surface has been reclaimed and deemed stable, the 100-yr pond will be reclaimed by folding in the HDPE liner and pushing material to create a more natural-looking stormwater collection area. The reclaimed pond area may be designed to ensure stable connectivity continues between the reclaimed leach pad stormwater channel and natural channels, and also possibly as overflow catchment for the ET cells. This reclaimed pond would continue to act as a stormwater catchment in the event of a major storm event. The pond would be reclaimed in such a manner that it would allow for infiltration and evaporation of stormwater during a specific design storm event, while excess stormwater during larger events would report to a weir connected to the natural drainage to the north of this pond (Map 4). This concept is preliminary in nature and further refinement and design will be performed in conjunction with DWQ and the Division. The reclaimed pond will have a sound hydrologic design which will be presented to the Division and DWQ at least one year prior to site closure by the Company. This pond will most likely have a beneficial long-term post-mining use for the continued diversion of stormwater from the leach pad to the natural Little Valley drainage.

The three manmade water storage ponds (haul road pond and two GTO ponds) will be reclaimed by pushing material back into the ponds. As no HDPE or other liner material was used in the construction of these ponds, no further reclamation treatments are proposed. Upon regrading the ponds, the areas will be re-seeded.

The onsite wetlands located north of the Truck Shop will be reclaimed by folding the liner inward and backfilling the area with material bermed during the original construction of the wetlands.

Drill Holes

Any exploration and development drill holes will be abandoned in accordance with R647-4-108. Any remaining production and monitoring wells will be abandoned by a Utah state licensed contractor in accordance with R655-4-14.

110.3 Surface Facilities to be Left

The solution ponds and stormwater pond (PLS, ILS, RAFF, Stormwater Pond) will be converted to long-term evaporation cells. The purpose of leaving the evaporation cells is to ensure any effluent and/or sediment that may continue to drain from the pad is captured and contained for evaporation and catchment purposes. Detailed designs of a post-closure long-term monitoring plan would be submitted to the Division during the first year of closure activities. Because the ponds will be the last facilities to be reclaimed, and because it is anticipated that the heap leach pad will continue to drain, post-reclamation, the first few years of closure activities, draindown fluid sampling, and flow monitoring will help provide the Division and the Company with sufficient data to finalize designs and implement any required post-closure long-term monitoring and evaporation plan. The Company has updated the Leach Pad Drain Down plan and post-mining reclamation of the heap leach pad with the data learned during the periods of March 2020 and June 2020. During this period, the Company experienced a reclamation scenario. Detailed information on the draindown, evaporation, pump rates, pH, and other factors were recorded daily. This information has allowed the Company to partially simulate the closure and post-closure monitoring of the heap leach pad. This information and the closure simulation data is found in Appendix I.

Other than the existing ponds and facilities mentioned above, all surface facilities will be removed or demolished. Surface facilities will include the SX/EW, AST's, Truck Shop, Maintenance Shop, Laboratory, and Administration Office. No chemical or electrical hazards will remain after closure. All buildings and other facilities will be dismantled and removed from the site or buried onsite in a permitted landfill. Refer to Map 5 in Appendix C. Foundations will either be removed and buried elsewhere on the site or buried in place with at least two feet of cover. Facility areas will be contoured to create a natural appearance and to minimize erosion.

A UDEQ pre-demolition inspection to identify and quantify any asbestos-containing materials per R307-801 and all universal hazardous wastes will then be quantified, removed, and disposed of properly before demolition as per R315-16.

Post-Closure Management of Fences, Berms, Signs and Treatment Systems

Fences, berms, signs and treatment systems will be monitored and maintained as needed during the post closure 5-year water quality monitoring.

110.4 Treatment, Location, and Disposition of Deleterious Materials

The Company has multiple deleterious materials onsite including: waste rock beds 3-10, reagents, fuels, oils, acid, lead fake, and spent ore. The Waste Rock Management Plan in Appendix D includes "as-built" plan views of waste dumps with encapsulated material identified. The Site Facilities Map in Appendix C includes the locations of reagents, fuels, oils, acid, lead flake and spent ore. The Company recycles the lead flake on a quarterly or as-needed basis. The Company receives spot price income for the sale of the lead flake to Doe Run. In regard to solvents, upon closure all remaining solvents will be removed from site.

Waste Rock Selective Handling

Acid generating and uncertain waste rock that is not economically backfilled into the Centennial pit and Sentinel West Pit will be isolated during standard mining operations within the waste dumps and effectively neutralized by encapsulation inside waste rock with a NPR three times the acid generation potential. Encapsulation thickness will include 40' of buffer material on all surrounding portions of the acid generating and uncertain waste rock. Waste dump surfaces will be sloped to 2.5H:1V and revegetated to stabilize the slopes and minimize erosion. The proportion of neutralizing waste relative to waste with acid generation potential provides the Company with a high level of confidence that waste dumps will remain pH-neutral for perpetuity. This discussion is expanded in the Annual Waste Rock Monitoring Report. The Waste Rock Management Plan in Appendix D includes "as-built" plan views of waste dumps with encapsulated material identified.

Reagents, Fuels, Oils, and Acid

A listing of reagents, fuels, oils, and acid used by the Company is provided within Table 14. All reagents, fuels, oils are contained in tanks. Acid is contained in tanks and the leach circuit. All tanks are contained in secondary containment. Refer to Map 2 Appendix C.

Upon closure, the SX/EW circuits will be isolated. All acid and acidic/copper-laden (non-hydrocarbon) solvents will be drained into the solution ponds for recycling onto the heap leach pad as part of the closure plan. All hydrocarbons and organic solvents (including used oil, diesel, unleaded gasoline, etc.) will be isolated in their respective tanks and stored until removed by a certified hydrocarbon recycling company.

Process Tanks
SX Acid Tank
Loaded Organic Tank (North)
Loaded Organic Tank (South)
Electrolyte Recirculation
Filter Feed Tank
SX Drain Tank
Disep Electrolyte Filter
Crud Cone Tank
Crud Org Recycle tank

Crud Pre Coat Tank
E-1 Extractor Settler
E-2 Extractor Settler
S-1 Stripper Settler
E-1 Primary Mix Tank
E-1 Aux Mix Tank
E-2 Primary Mix Tank
E-1 Aux Mix Tank
S-1 Mixer Tank
Hot Water Tank
Organic Skimmer Tank
Acid cure tank (4)
RO permeate Tank
SX Diesel Tank
SX Diesel Tank
SX Filter (3)
Plant water Tank
Truckshop Tanks
Diesel
Unleaded
Used Oil (4)
Used Coolant

Table 14
Reagent, Fuel, Oil and Acid Tank List

Spent Ore

The Company mines ore and sends it to the leach pad. Once the ore is placed on the leach pad, it will stay there. After all of the economic mineral is extracted the ore will be considered spent ore. The spent ore will stay in its original location on the leach pad after the final drain down. The slopes of the leach pad will be pushed down to a 2.5H:1V slope. The leach pad will undergo reclamation as detailed in Appendix I. Refer to Map 5 located in Appendix C for reclamation and topsoil placement practices. Because the spent ore may be considered deleterious in nature, final reclamation of the leach pad will include capping with 3' of inert rock and/or a mixture of inert rock and alluvium as detailed in Section 110.5 below.

Process Solution

The Company has developed a Process Fluid Management Plan and Closure Plan for the handling of process solutions both during operations and during closure and post-closure activities. These Plans are found in Appendix I. Long-term process solution chemistry will be estimated by the employment of water quality tests on PLS and RAFF solution, as well as water quality tests on the Humidity cell drained solution during the first week and every fourth week subsequently. Based upon the data gathered by the Company within the first year of re-commencement of operations, the process fluid management plan will be modified.

Upon closure of the operations, the Company will continue to recirculate process solution onto the leach pad while closure activities and forced evaporation methods are employed. Historic process solution has fluctuated between 20,000 and 35,000 ppm tds based on a pH between 1.4 and 2. High TDS is anticipated for long-term draindown. It is uncertain at this time what the heap effluent chemistry and flow will be during long-term draindown. It is the goal of the Company to estimate the effluent chemistry through the employment of HCT as stated above. That said, based upon column tests that have been performed from 2016 to 2019, as well as the HCT performed in 2021, it is anticipated that the heaped ore will have a high level of remaining acid neutralizing potential (Appendix N). The projected amount of acid neutralizing potential of the heaped ore will be defined during the remainder of the life-of-mine through the employment of numerous HCT evaluations. To ensure draindown effluent does not follow existing flow paths with less neutralization potential, ripping of the heap surface will likely be needed during forced evaporation and/or prior to final capping, depending on effluent pH. Heap closure will maintain the current drainage regime. The underlying liner slope promotes water flow to the northeast and into the existing process ponds. Any solution from the south slope of the heap will be conveyed toward the east side of the pad and from there north to the process ponds. Solution ditches along the entire perimeter of the leach pad will be maintained during draindown activities. The ditches will be utilized during final reclamation as well by preferentially filling the ditches with competent rock potentially sourced from Sentinel West Pit as the heap is re-graded for final reclamation. The concept is to create a french drain prior to final capping. This is conceptual in nature and will be refined in coordination with DWQ and the Division. Existing ponds and solution ditches will be repaired and protected as needed to ensure long-term fluid management is maintained.

To ensure process solution quantities are reduced as quickly and efficiently as possible, the Company will implement enforced evaporation techniques that may include enhanced evaporation nozzles installed on existing heap leach piping such as BETE © or large blowers such as Slimline ©. The process solution will be evaporated on the leach pad surface and process ponds and will be evaporated until remaining draindown solution can be managed by the ET cells (Appendix I, HLDE, Appendix N).

The PLS, ILS, RAFF and Stormwater Pond will be converted into ET cells by first placing 3' of sand, possibly sourced from crusher reject material in the bottom of the dried and double lined ponds. This layer will protect the HDPE from the rock layer. Next, 8' of inert and durable rock will be placed in the cells on top of the 3' cushion layer. The rock will act as a permeable layer with large void space for fluid storage. The rock layer will be capped with 1' of sand that will act as a capillary layer between the rock and the capping growth media. Finally, the ET cells will be capped with 2' of growth media. While the purpose of the ET cells is to allow for enhanced fluid dispersal through transpiration, the elevated TDS of the process solution may not support plant growth. Sturdier plants and other methods of final capping will continue to be evaluated as the results from the humidity cell tests provide a more adequate representation of the post-closure draindown solution chemistry. It should be noted that the designs for the ET cells are conceptual and will be further refined and engineered in coordination with DWQ and the Division.

The draindown rates and duration have been modeled by Newfields Engineering using site-specific information. These rates are summarized in the 2021 Annual Report, and detailed further in the Newfields Engineering Report for the TPPC of the leach pad. The full Newfields Report and parameters used is found in Appendix I and Appendix N.

As seen in more detail in Appendix I, the draindown and long-term monitoring of heap effluent has been modeled as follows:

1. *March '25 – August '25: decreases from +10,000 gpm to approx. 1,100 gpm;*
2. *August '25 – March '26: decreases to approx. 250 gpm;*
3. *March '26 – August '26: increase to max. 400 gpm, with overall average closer to 300 gpm;*

4. *August '26 – March '27: decrease to approx. 175 gpm, at which time the semi-passive monitoring kicks in.*
5. *March '27 – August '27: decrease to approx. 150 gpm.*
6. *August '27 – March '28: decrease to approx. 90 gpm.*
7. *March '28 – August '28: decrease to approx. 65 gpm.*
8. *August '28 – March '29: decrease to approx. 50 gpm.*
9. *March '29 – August '29: decrease to approx. 45 gpm.*
10. *August '29 – March '30: decrease to approx. 35 gpm.*
11. *March '30 – August '30: decrease to approx. 30 gpm.*
12. *August '30 – March '31: decrease to approx. 28 gpm, at which point the water will be re-routed to French drain systems.*

The long term heap effluent will be managed by the ET cells, and, based on site-specific modeling parameters and outputs, is estimated to be less than 30 gpm after 5 years. This is estimated to be managed by the ET cells with remote-sensor evaporation fountains. This draindown rate will continue to decrease gradually until a static state is reached. The final ET cell designs will accommodate the typical steady state flow rate.

Process Fluid Characteristics

The Company has used HCT studies and other analyses to model the potential long-term characteristics of the process fluid as draindown continues through the heaped ore. The general characteristics might be estimated based upon data that is known presently by the Company. Such data includes:

1. 24-week Humidity Cell Test of numerous leach pad ore samples taken spatially and vertically distributed within the existing leach pad
2. 2-year study of acid consumption and neutralization potential of LVCM ore
3. 10 years of MWMP data on LVCM rock types from GTO, Centennial, Sentinel East, and Sentinel West
4. 20+ years of ground water quality data for the valley fill, BC, and N aquifers in the LVCM
5. Laboratory analysis of PLS and ILS

The Company will continue to perform HCT, MWMP, and other studies on the ore and effluent.

In order to estimate the potential long-term characteristics of the process effluent, it is first important to understand the basic rock type and its chemical makeup that is contained within the heap leach pad. The primary ore host within the LVCM, as described in Section 106.4, is Bed 15. Bed 15 is composed of the Burro Canyon formation, which, as summarized from the Company's extensive exploration hole database, is a fine-grained to medium-grained white sandstone and which is usually quite pure in form.

The Company has kept detailed records of the ore host encountered at the LVCM as mining was performed starting in 2006. Moreover, the Company has collected quarterly samples of the different beds that were mined and sent them off for MWMP. As detailed in the Company's Waste Rock Management Plan, the purpose of performing the MWMP is to provide proper characterization and handling of mined rock to limit its potential to generate acid or liberate other constituents, primarily metals, into the environment. The results of the MWMP provide an indication of what, if any, constituents may release from the rock as a function of time.

From the Company's MWMP dataset, Bed 15 results were extracted. The results of the Bed 15 MWMP indicates that calcium stays relatively high, having a MWMP result of 18.84 mg/L, and all other elements were well below the limit for the site's background groundwater quality (Appendix D). Therefore, from the standpoint of native rock, Bed 15 ore is quite inert and is expected, on its own, to have no long-term acid generation potential or metal mobility potential. This is further supported by the 2014 Whetstone report referenced in Section 106 pertaining to the waste rock management plan.

The process of extracting the copper from the ore uses sulfuric acid. This acid, when extracting copper, reduces the overall pH of the saturated portions of the leach pad in order to liberate the copper from the rock. This acidification could cause other constituents to mobilize beyond what was seen in the MWMP results. The question, therefore, is how long the acidic solution will stay acidic once draidown occurs and no additional acid is applied to the leach pad.

During a period between 2016 and 2018, the Company performed a two-year test of the average acid application rate and consumption of the LVCM ore. The results of this two-year study, as summarized in the Internal Memo contained in Appendix I, shows that even at total saturation of the leach pad, which, by the very nature of leach pads, never reaches 100% saturation of the actual rock (unlike in other types of extractive processes such as vat leaching and agitated leaching), the ore itself maintains significant acid neutralization potential. And while these extrapolated numbers are modeled and theoretical, the model shows a complete re-neutralization of the process effluent to be reached within 300 days of cessation of application of fresh acid.

These findings are further supported by the 24-week HCT that was performed in 2021. The results of this test are summarized in the 2021 Annual Report, and show an overall rise in pH, with a dramatic decrease in acidity. The decrease in acidity correlates with the precipitation of metals out of solution, and a decrease in TDS within the effluent.

As stated above, the modeled time for draindown and monitored evaporation is estimated at 5 years from initial shutdown of the plant, after which all remaining solution will be captured by the ET cells. Therefore, it is predicted that the effluent will increase in pH during this period as a function of reduced amount of solution and remaining acid neutralizing potential of the ore itself. What that final pH will be is still uncertain, and will be modeled in more detail through further laboratory testing. However, based upon the two-year test, and the 24-week HCT, the pH will rise, and while the final pH is uncertain, the rise of pH will inevitably cause metals to precipitate out of solution. This precipitated metal will be contained within the heap leach pad and the process ponds, and will be encapsulated by the reclamation of the leach pad itself. Long term evaporation of draindown will result in precipitated sludge and metals in the evaporation cells.

To provide a basis for what metals may be contained in the solution prior to a pH rise, the Company has performed a one-time analytical test of the PLS and ILS. This one-time test is not necessarily representative of either ongoing effluent characteristics or proposed draindown solution characteristics, and a more robust database will be compiled by the Company. However, this one-time test at the very least provides a baseline for what metals are present and in solution at a low pH. The complete results and third party laboratory certificates of the one-time analytical test are also contained in Appendix I. The chemicals found to be present in the PLS and ILS solution at a pH ranging from 1-2 includes:

Station Name	Units	PLS	ILS
Field Sample ID		LVMC PLS	LVMC ILS

Lab Sample ID		L94515-01	L94547-01
Sample Date		41038	41043
Major Ions + Indicator Parameters			
Alkalinity (as $CaCO_3$)	mg/l	<2	<2
Bicarbonate (as $CaCO_3$)	mg/l	<2	<2
Carbonate (as $CaCO_3$)	mg/l	<2	<2
Hydroxide (as $CaCO_3$)	mg/l	<2	<2
Hardness (as $CaCO_3$)	mg/l	nm	nm
Calcium, dissolved	mg/l	389	373
Magnesium, dissolved	mg/l	1530	1440
Potassium, dissolved	mg/l	153	146
Sodium, dissolved	mg/l	171	166
Chloride	mg/l	14	14
Fluoride	mg/l	nm	nm
Silica	mg/l	nm	nm
Sulfate	mg/l	17000	18000
Total Dissolved Solids	mg/l	nm	nm
Total Suspended Solids	mg/l	nm	nm
pH, Lab	s.u.	nm	nm
E.C., Lab	µS/cm	nm	nm
Nutrients			
Phosphorus, total as P	mg/l	46.2	49.4
Nitrate as N, dissolved	mg/l	nm	nm
Nitrite as N, dissolved	mg/l	nm	nm
Nitrate/Nitrite as N, dissolved	mg/l	3.54	2.81
Nitrogen, ammonia	mg/l	8.7	6.2
Metals			
Aluminum, dissolved	mg/l	580	566
Antimony, dissolved	mg/l	nm	nm
Arsenic, dissolved	mg/l	nm	nm
Barium, dissolved	mg/l	<0.06	<0.06
Beryllium, dissolved	mg/l	nm	nm
Cadmium, dissolved	mg/l	31.9	32.7
Chromium, dissolved	mg/l	0.29	0.261
Copper, dissolved	mg/l	nm	nm
Iron, dissolved	mg/l	912	928
Lead, dissolved	mg/l	0.65	0.634
Manganese, dissolved	mg/l	396	374
Mercury, dissolved	mg/l	<0.0002	<0.0002
Molybdenum, dissolved	mg/l	nm	nm
Nickel, dissolved	mg/l	3.8	3.6
Selenium, dissolved	mg/l	0.097	0.086

Silver, dissolved	mg/l	<0.001	0.0006
Thallium, dissolved	mg/l	nm	nm
Uranium, total	mg/l	3.17	3.22
Vanadium, dissolved	mg/l	3	3
Zinc, dissolved	mg/l	nm	nm

(nm = not measured)

These ranges of dissolved metals are typical of a copper solution at a low pH. Of interest, neither the PLS nor ILS exceed the UDWQ allowable limits for any measured metal other than cadmium. Other metals not measured could potentially exceed these limits. As the pH of a system rises, significant amounts of cadmium and other soluble metals will precipitate out ofsolution. Moreover, as the solution is recycled through the leach pad during draindown and forced evaporation, a layer of precipitate will naturally form on the surface of the leach pad, reducing the permeability and potentially acting as a complex to bind the metals from continued dissolution. This supposition is theoretical however may prove efficacious as further laboratory testing is performed. Therefore, for the interim, it may be assumed that the process effluent will neutralize to some greater or lesser degree during the 18 month draindown.

110.5 Re-vegetation Planting Program and Topsoil Re-distribution

Grading and Stabilization Procedures

Grading and stabilization procedures are described throughout this section.

Top Soil Material Replacement

Growth media will be spread over the waste dumps, leach pad, and, where additional topsoil exists, along haul roads and pit floors. Growth media will be spread using loaders, haul trucks, bulldozers, and graders. Growth media will be spread to a depth of 12" unless otherwise delineated within this Notice and Map 5, Appendix C. Marked lathe will be used to assist equipment operators in maintaining 12" of depth. Pit highwalls will not be covered with growth media.

Stockpiled soil located below the Dump B slopes will be removed prior to completion of slope grading to ensure its availability for reclamation.

If additional volume of topsoil is necessary, a borrow area southeast of the GTO pit (Borrow 2 on Map 5h) could be a possible source of topsoil. Estimated volumes of additional toposil to be borrowed from Borrow 2 is in excess of 160,000 CY. Reclamation of the borrow pit would include grading and re-seeding. Another location of additional topsoil would be a borrow pit located directly west of the leach pad. This area was tested for soil depth in 2021 during the Newfield TPPC study, and has indicated salvage depths ranging from 2' to +15'. The Leach pad borrow area (Borrow 2 on Map 5h) is being reserved for capping material during final closure of the Leach pad, along with the Clay pile and elevated haul road.

LVMC Growth Media Requirements				
Area	Acres	Sq ft	Cu ft soil	Cu yd
Leach Pad	212	9,234,720	9,234,720	342,027
Process Ponds	36	1,568,160	1,568,160	58,080
Process Area	61	2,657,160	2,657,160	98,413
C Dump	63	2,744,280	2,744,280	101,640
B Dump	132	5,749,920	5,749,920	212,960

Clay pile	7	304,920	304,920	11,293
A Dump	129	5,619,240	5,619,240	208,120
Haul Roads	66	2,874,960	2,874,960	106,480
Open Pit Haul Roads	14	609,840	609,840	22,587
GTO-Dump	7	304,920	304,920	11,293
Centennial Pit Backfilled Surface	25	1,089,000	1,089,000	40,333
Sentinel West Backfill	67	2,896,740	2,896,740	107,287
Totals	**819**	**35,653,860**	**35,653,860**	**1,320,513**
2022 Surveyed Soil			32,880,411	1,217,793
Additional Soil Collection Necessary			2,773,449	102,720
*Additional Soil Available GTO Borrow Area **			*4,320,000*	*160,000*
TOTAL SOIL FOR RECLAMATION			**37,200,411**	**1,320,513**

Table 15

As stated in the preceding sections, pit walls will not be topsoiled during final reclamation. Access roads, haul roads, pit roads, and pit floors will also not be re-topsoiled unless adequate topsoil exists after reclamation and topsoiling has been performed on dumps, leach pad surface, facilities area, and ET cells.

Seed Bed Preparation

Growth media will be spread in the same way for all of the reclamation across the site. Waste dumps may have additional roughening to the surface, ripping parallel to slopes and track packing perpendicular to slopes. The leach pad will have a cap of 3' of inert waste and/or alluvium (or a mixture of the two, depending upon availability and requirements from DWQ and the Division) which will reduce the infiltration rate of any surface water, and will have light ripping on the surface and parallel to slopes. Rilled areas will be backfilled and repaired as necessary until the reclamation treatment standards of 111 relating to revegetation, erosion, and stability have been achieved.

Final surface reclamation will include the placement of 12" of growth media, seeding and revegetation to a minimum of 70% of the baseline vegetation cover.

Seed Mixture

Table 16 provides an updated seed mix that was provided by the Division. This seed mix must be approved by the BLM prior to use in final reclamation on federal lands. For reclamation located on private and SITLA lands, this seed mix will be used.

Common Name	Lb/Acre	% of mix
Indian Ricegrass	2.2	6%
Blue Grama	0.8	12%
Sideoats grama	1.55	6%
Chrested Wheatgrass	3.5	18%
Thickspike wheatgrass	3.2	10%
Annual Sunflower	1	1%

Gooseberry-leaf globemallow	0.1	1%
Yarrow	0.1	6%
Palmer penstemon	0.8	10%
Yellow sweetclover	2.2	12%
Alfalfa	2	8%
Fourwing saltbrush	1	1%
Winterfat	0.25	1%
Mountain big sage	0.1	3%
Shadscale	1	1%
Nevada Ephedra	2	1%
Low rabbitbbitbrush	0.25	4%
Total	22.05	100%

Table 16

Seeding Method

The seeding method will vary and include broadcasting, drill seeding, and aerial seeding with the objective to meet the reclamation standard of 70% of the baseline vegetation cover.

Fertilization

No fertilizers will be used.

Timing of Seeding

Seeding will be conducted in the fall up and until snow begins to accumulate.

110.6 Commitment statement

The Company is committed to successful reclamation of the mine site with a minimum of 70% of the baseline vegetation cover. Concurrent reclamation, permit compliance, and surety demonstrate this commitment.

R647-4-111 Reclamation Practices

During reclamation activities the Company will conform to the practices listed under R647 section 111 unless the Division grants a variance in writing.

R647-4-112 Variance

The Company is not requesting a variance from R647 at this time.

R647-4-113 Surety

The Company is actively engaged with the Division for the formulation of an up-to-date reclamation cost estimate. This RCE will be used by the Company and will be adjusted accordingly as new technology and information becomes known.

R647-4-114 Failure to Reclaim

The Company understands the implications if they fail to reclaim.