IMERYS

**Mine and Resource Planning**

Imerys Performance Minerals Americas

October 12, 2021

Arizona State Mine Inspector
1700 West Washington Street
STE 403
Phoenix, AZ
85007

Dear Inspector,

Please find enclosed for your review Imerys' detailed amendment to its existing reclamation plan for the Superior Perlite Mine located in Superior, AZ. Imerys has chosen to structure the amendment around the existing reclamation plan with changes to the narrative highlighted in yellow. The amendment includes fully updated figures and reclamation cost estimate.

Please contact me if you have any questions.

Sincerely,

Todd Whitacre

Todd Whitacre
Lands and Reclamation Manager - West Hub
Imerys Performance Minerals Americas

CC Digital: Amanda Lothner
Reclamation Specialist
Arizona State Mine Inspector

Enclosures: Three (3) copies of Imerys' Amendment
Check #600075330

Imerys Filtration Minerals, Inc. 150 East Main, Suite 320 Fernley, NV 89408 – USA
Tel: 541 429-2076 – Fax: 775 835-6550 – www.imerys.com

| COMPANY | VOUCHER NUMBER | INVOICE NUMBER | PURCHASE ORDER | INVOICE DATE | AMOUNT | DISCOUNT | NET AMOUNT |
|---|---|---|---|---|---|---|---|
| 8306 | BasWarVD_01316 | R11-3-209 Fees | | 9/1/2021 | 1,565.00 | 0.00 | 1,565.00 |

| Vendor | | Check number | Check Date | Amount |
|---|---|---|---|---|
| | State of Arizona | | | |
| 70208 | Mine Inspector<br>1700 W. Washington St., Suite 400<br>Phoenix, AZ 85007-2805 | 600075330 | 9/29/2021 | 1,565.00 |

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Imerys Filtration Minerals, Inc.
P.O. Box 519
Lompoc, CA 93436

Void after 180 days

DATE
9/29/2021

NET AMOUNT
**$***1,565.00**

PAY

*** One Thousand Five Hundred Sixty Five and 00/100 US Dollars

TO THE ORDER OF

**State of Arizona**
Mine Inspector
1700 W. Washington St., Suite 400
Phoenix, AZ 85007-2805

HEAT SENSITIVE RUB AREA TO VERIFY

Authorized Signature

THIS CHECK CONTAINS MULTIPLE SECURITY FEATURES – SEE BACK FOR DETAILS

⑈600075330⑈ ⑆061100790⑆ 8800610696⑈

ORIGIN ID:NFLA (775) 404-6271
TODD WHITACRE - MINE PLANNING
IMERYS FILTRATION MINERALS, INC.
150 E MAIN ST, STE 320

FERNLEY, NV 89408
UNITED STATES US

SHIP DATE: 12OCT21
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BILL SENDER

TO **ATTN: AMANDA LOTHNER**
**ARIZONA STATE MINE INSPECTOR**
**1700 W WASHINGTON ST**
**SUITE 403**
**PHOENIX AZ 85007**

(602) 542-5971 REF: 2021 RECLAMATION PLAN AMENDMEN
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# 2021 Amendment to
# Approved Reclamation Plan (2008)

**Superior Perlite Mine**
**Imerys Perlite USA, Inc.**
**Superior, AZ**

**October 1, 2021**

## ADMINISTRATIVE COMPLETENESS CHECKLIST

| Arizona Revised Statutes (A.R.S.) Arizona Administrative Code (A.A.C.) REFERENCE | PLAN REQUIREMENTS | LOCATION WITHIN AMENDMENT | COMPLETENESS | | |
|---|---|---|---|---|---|
| | | *(Applicant Completes)* | YES | NO | N/A |
| ARS 27-1271.B.1<br>AAC R11-3-201-B | Owner/Operator Information | Section 2.1 | | | |
| ARS 27-1271.B.2<br>AAC R11-3-201-A.2 | Responsible Party Documentation | Section 2.1.3 | | | |
| ARS 27-1271.B.3 | Description of Current Operation | Section 2.3 | | | |
| ARS 27-1271-B.4<br>AAC R11-3-501-A and R11-3-503 | Postaggregate Mining Use | Section 2.4 | | | |
| ARS 27-1271-B.9.b<br>AAC R11-3-602 | Postaggregate Mining Re-grading and Erosion Control | Section 2.5 | | | |
| ARS 27-1271.B.9.a<br>AAC R11-3-601 | Postaggregate Mining Plan for Structures and Equipment | Section 2.6 | | | |
| ARS 27-1271-B.7<br>AAC R11-3-603 | Postaggregate Mining Road Reclamation | Section 2.7 | | | |
| ARS 27-1271.B.9c<br>AAC R11-3-Article 7 | Soil Conservation and Revegetation | Section 2.8 | | | |
| ARS 27-1271-B.10 | Conceptual Schedule for Disturbance and Reclamation | Section 2.9 | | | |
| ARS 27-1271-B.11<br>AAC R11-3-802 | Estimated Reclamation Costs | Section 2.11, Appendix B | | | |
| ARS 27-1233<br>AAC R11-3-209 | Fees | Section 3.0 | | | |
| ARS 27-1291 and 27-1292<br>AAC R11-3-Article 8 | Financial Assurance Mechanism | Section 4.0 | | | |
| ARS 27-1271-B.6<br>AAC R11-3-501-B.8 | Vicinity Map | Figure 1 | | | |
| ARS 27-1271-B.6<br>AAC R11-3-501-B.8 | Existing Site Conditions | Figure 2 | | | |
| ARS 27-1271-B.6<br>AAC R11-3-501-B.1 | Postaggregate Mining Contours | Figure 3 | | | |
| ARS 27-1271-B.6<br>AAC R11-3-501-B.1,7 | Postaggregate Reclamation Plan | Figure 4 | | | |

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APPENDIX

# Executive Summary -

# Amendment to Approved ASMI Reclamation Plan

Imerys Perlite USA, Inc. mines and processes perlite at its Superior, AZ facility.

Imerys has the opportunity to supply perlite ore for a new product segment. To that end, Imerys wishes to conduct exploration drilling and ultimately mining operations in the area to the south of the existing mining area in Superior, AZ. Historic drilling in the area suggests the presence of suitable ore resources, but exploration drilling will be required to prove the quantity and nature. Until the drilling is completed and analyzed, the pit design and extent presented in this Amendment are largely conceptual. Ultimately, the pit may be smaller and shallower than indicated in this Amendment.

The target product segment relies on large size processed perlite particles. As such, there is a potentially high waste rate made up of undersize material. Some of the proposed disturbance in this Amendment is to accommodate this waste.

The ore body to be mined is overlain with overburden, but until the exploration drilling is completed, the thickness and volume is unknown. Like the plant waste above, some of the proposed disturbance is to accommodate overburden.

The overburden and out of specification waste material may afford Imerys the opportunity to backfill areas of the pits that were formerly to be left open. Assumed waste rate and overburden volumes were used to prepare the conceptual post mining contours indicated in this Amendment. Actual final topography may vary.

Mining style in the proposed areas will be performed in exactly the same manner as described in the approved Reclamation Plan for the existing mining operations.

Reclamation in the proposed areas will be performed in exactly the same manner as described in the approved Reclamation Plan for the existing mining operations.

The proposed new disturbance areas will absorb approximately 18.5 acres of Pre 1997 mining disturbance previously not subject to reclamation, but will now benefit from full reclamation.

Capacity and processing differences would necessitate the construction of a second processing line at the processing area. This would include an additional crushing plant, as well as an additional drying and sizing plant. All construction would occur within the existing disturbance footprint.

# 1.0 INTRODUCTION

This Reclamation Plan Amendment is written for the Superior Perlite Mine operated by Imerys Perlite USA, Inc. located in Superior, Arizona. Notice of the proposed change was provided to the Arizona State Mine Inspector per A.R.S. R11-3-207, on September 9, 2021. The Inspector determined that Imerys' proposed change was substantial, triggering the submission of this Reclamation Plan Amendment.

# 2.0 RECLAMATION PLAN NARRATIVE

## 2.1 OWNER/OPERATOR INFORMATION

### 2.1.1 Owner /Operator of Operation

| | |
|---|---|
| Owner | Imerys Perlite USA, Inc. |
| Name(s) of Regulatory Contact(s) | Tom Hawk, Plant & Mine Manager |
| Address | 45156 North Silver King Rd. Superior, AZ 85173 |
| Fax | (520) 689-2362 |
| Business Phone | (805) 737-1264 |
| Cell Phone | (805) 291-3565 |

### 2.1.2 Company

| | |
|---|---|
| Name | Imerys Perlite USA, Inc. |
| Address | 100 Mansell Court East, STE 300<br>Roswell, GA 30076 |

**Contact**

| | |
|---|---|
| Name(s) | Tom Hawk, Plant & Mine Manager |
| Address | 45156 North Silver King Rd. Superior, AZ 85173 |
| Fax | (520) 689-2362 |
| Business Phone | (805) 737-1264 |
| Cell Phone | (805) 291-3565 |
| Email Address | tom.hawk@imerys.com |

**Applicant**

| | |
|---|---|
| Name(s) | Imerys Perlite USA, Inc. |
| Address | 45156 North Silver King Rd. Superior, AZ 85173 |
| Fax | (520) 689-2362 |
| Business Phone | (520) 689-5723 |

**Permit Technical Consultant**

| | |
|---|---|
| Name(s) | Todd Whitacre, Lands & Reclamation Manager |
| Address | 150 East Main, Ste 320 Fernley, NV 89408 |
| Fax | (775) 835-6550 |
| Business Phone | (775) 575-2536 ext 2,3 |
| Cell Phone | (541) 429-2076 |
| Email Address | todd.whitacre@imerys.com |

**Landowner**

| | |
|---|---|
| Name of Landowner(s) | Imerys Perlite USA, Inc. |
| Parcels | Comprised mostly of 105-14007008 & 11, in Pinal County |
| Address | 45156 North Silver King Rd.Superior, AZ 85173 |
| Fax | (520) 689-2362 |
| Business Phone | (520) 689-5723 |

### 2.1.3 Responsible Party

Company, owner or operator assumes responsibility for the reclamation of surface disturbances that are attributable to the aggregate mining unit consistent with Arizona Revised Statues (A.R.S. Chapter 6) §. 27-1201 et.seq., and any promulgated rules in A.C.C. Title 11, Chapter 3.

All areas that have been disturbed at the site will be reclaimed to a safe and stable condition, before and directly after mine operation conclude, and will maintain Financial Assurance as needed per A.R.S. §. 27-1291 & 1292, to carry out the required reclamation as hereby stated per A.R.S. §. 27-1271 (B)(2), and this plan.

Reclamation annual reports will be submitted each year, within 60 days after the Final Plan approval date ("Anniversary Date"), in accordance with A.R.S. §. 27-1277, and any rules pertaining to the Annual reporting requirements.

| Jim Murberger | General Manager |
|---|---|
| (Corporate Officer) | (Title) |
| (Signature) | 3-16-2016 (Date) |

## 2.2 CERTIFICATE OF DISCLOSURE

The certificate of disclosure required by A.R.S. 27-1205 will be prepared by Imerys.

## 2.3 CURRENT OPERATIONS

### 2.3.1 Description of Current Operations

The Site location is shown on Figure 1. Features of the Site include:

- Multiple patented claims encompassing approximately 417 acres.
- Located southwest of Superior, Arizona on Silver King Mine Road. The mining area is located south of Highway 60. The processing area is north of Highway 60.
- Perlite mining operation with a processing plant area.
- Plant reject dumps and material stockpiles are present on the processing plant area, with an average slope at the angle of repose of approximately 1.5 horizontal to 1 vertical (1.5H:1V)

- Current access is provided by Highway 60, turn south onto Silver King Road to access the mine; turn north to access the processing area.
- Current mining area located on patented mining claims.
- Current processing area located on patented and unpatented millsite claims.

Figure 2 shows existing site conditions. The eastern and western portions of the mining area naturally slope inwards towards the center of the Site in which storm water drains into a series of lower mining areas, and then further north towards Queen Creek.

Elevations on the Site range from approximately 2,785 feet above mean sea level (amsl) to approximately 2,512 feet amsl.

Equipment, structures, and facilities on the Site are utilized for perlite mining, crushing and screening, and equipment fueling. Details of the processing area are as follows:

- Processing plant is approximately 20 acres.
- Located north of Highway 60, north of the mining area.
- Processing area has one reject dump.
- Equipment and facilities for perlite processing include:
  - One crushing plant;
  - An additional crushing plant would be constructed adjacent to the existing one, within the existing disturbance footprint;
  - One drying and sizing plant;
  - An additional drying and sizing plant would be constructed adjacent to the existing one, within the existing disturbance footprint;
  - One maintenance shop;
  - One portable scale and scale house;
  - One mobile office;
  - Two block wall building structures; and
  - Aboveground storage tanks (ASTs) for fuel.
- Utilities on the Site include:
  - Local utilities provide electricity with transformers and line power;
  - One 100-foot well;
  - A rail spur;

- Sanitary facilities provided by municipal water and two septic systems; and
- Solid waste in portable bins provided by contract waste removal services.

Details of the current mining area are as follows:

- Perlite material is being extracted using blasting and excavating techniques from above the groundwater level.
- The material is loaded into haul trucks and taken north to the processing plant where it is crushed, dried, and sized.
- There were previously three areas of mining disturbance located within the planned disturbance footprint. Proposed new disturbance of approximately 65.5 acres will join the three areas into two large, continuous mining areas, separated only by the Forgotten Wedge unpatented claim.
- Located on the Site are "Inactive Aggregate Mining Units" as defined by A.R.S. 27-1201.09. These areas are not required to be included in the reclamation effort because mining activities ceased before April 1, 1997 as defined by A.R.S. 27-1224. There are approximately 29 acres included in the inactive aggregate mining units. The proposed new disturbance will absorb some of the "Inactive Aggregate Mining Units," thereby ensuring reclamation of these disturbed areas not previously subject to the reclamation effort (see Figure 3).
- The groundwater level information was taken from a local well approximately 1.5 miles away. Depth of water is reported at approximately 2,425 feet amsl (Arizona Department of Water Resources [ADWR] Ground Water Site Inventory Database, June, 2005).

### 2.3.2 Current Permits, Licenses, and Approvals

Operations will comply with applicable air, storm water, and hazardous/regulated materials management regulations. The facility will have the following permits:

- A Pinal County General Air Quality Permit Authority to Operate (ATO) for a crushing plant;
- A Storm Water Pollution Prevention Plan (SWPPP); and
- A Spill Prevention, Control, and Countermeasures (SPCC) Plan.

Although these permits/plans indirectly regulate operations at the Site, they do not have the authority to control or limit the depth of mining at the Site.

### 2.3.3 Description of Future Disturbance

All mining and reclamation activities on the Site are planned to occur within the planned disturbance footprint (Figure 3). The planned future operations will include:

- Setbacks from the property boundary will vary. All disturbances will be inside the property boundary.
- Pit slopes of the mining areas will be mined to a slope of approximately 2H:1V.
- Previously there were three areas of disturbance; the East Pit, South Pit, and West Pit. Proposed new disturbance of approximately 64.8 acres will join the three areas into two large, continuous mining areas, separated only by the Forgotten Wedge unpatented claim. Previous excavation disturbance was estimated at approximately 55.7 acres. This includes the perlite mining area and the processing area. Total disturbance, including proposed new disturbance, will be approximately 120.5 acres.
- All of the northern proposed disturbance and a small portion of the southern proposed disturbance will be used for storage and disposal of overburden and plant waste. These dumps will be graded to a 3H:1V slope.
- One section of the area formerly known as the East Pit is anticipated to have a final pit floor under the reported groundwater level of 2,425 feet amsl. All other pit floors are anticipated to be above the groundwater level.
- The maximum final depth for material mining will vary for each of the three pits, the lowest elevation pit bottom is anticipated to be at an elevation of approximately 2,400 feet amsl.

## 2.4 POSTAGGREGATE MINING USE

### 2.4.1 Description of Total Future Disturbance

The postaggregate mining use is designated for naturalized open space with areas of backfill. No part of the reclaimed site will be designated as grazing, fish/wildlife habitat, forestry, or recreation.

### 2.4.2 Surrounding Area Land Use

The Site is located in a mineralized area with predominantly undeveloped desert located in the vicinity of Superior, Arizona. Surrounding land uses generally consist of:

- Vacant/undeveloped mountain/desert lands to the south, west, and east; and
- Highway 60 to the north with the processing plant located north across Highway 60.
- The Resolution Copper Mine located to the north and west.

The planned postaggregate mining use as naturalized open space is consistent with surrounding land uses.

## 2.5 POSTAGGREGATE MINING RE-GRADING AND EROSION CONTROL

### 2.5.1 Description of Final Topography

The final topography for the mining areas that will be reclaimed (Figure 4) will include pit walls with bench heights of 20 feet, rock face angles at approximately 63.5 degrees, and 30-foot horizontal benches. The resultant average overall slope will be 2H:1V for the pit walls.

Excavation in the East Pit will lower the highest pit elevation, approximately 2,653 feet amsl, by 253 feet bringing the pit floor to a planned depth of approximately 2,400 feet amsl. The South Pit excavation will lower the highest pit elevation, approximately 2,782 feet amsl, by 207 feet bringing the pit floor to a planned depth of approximately 2,575 feet amsl. The West Pit excavation will lower the highest pit elevation, approximately 2,660 feet amsl, by 80 feet bringing the pit floor to a planned depth of approximately 2,580 feet amsl.

The setbacks along the property will vary due to proximity to areas of Pre-1997 mining activity, the various property positions, and the location of the mining areas.

Areas on site designated "Inactive Aggregate Mining Units" are not required to be included in the reclamation effort because mining activities ceased before April 1, 1997 as defined by
A.R.S. 27-1224.

Processing plant material stockpiles will be depleted and removed by the end of mining operations. The reject waste dump located at the processing area will be regraded to slopes of 2H:1V or flatter.

### 2.5.2 Slope Stability Evaluation

Acceptable static and pseudostatic factors of safety were estimated for the proposed pit

wall overall slope grade of 2H:1V. The factors of safety for static and seismic conditions were greater than 1.5 in both cases. The complete slope stability evaluation is detailed in Appendix A.

It should be noted that the slope stability analyses only considered potential deep seated failure planes. Near surface or localized failures and deformation were not addressed in the stability analyses. The slopes may be susceptible to localized surface slumping and should be periodically inspected as part of the post-closure monitoring plan.

### 2.5.3 Erosion Control Plan

Storm water drainage controls will be established as part of the SWPPP. Specific erosion control measures include:

- Collection of storm water in the pits.
- Rip-rap used to line drainage points where erosion control is required. The location and size of rip-rap lined areas is not indicated on a Site map; however, the cost is included in Appendix B to show the appropriate financial assurance.
- Earthen berms used to prevent outfalls and prevent storm water from flowing off site.
- The SWPPP will be followed in addition to site-specific best management practices.

## 2.6 POSTAGGREGATE MINING PLAN FOR STRUCTURES AND EQUIPMENT

### 2.6.1 Structures to be Removed

The mining areas will have no permanent structures. Temporary structures currently on the processing site or planned to be on site include:

- Crushing and screening plants (2);
- Drying and sizing plants (2);
- Maintenance building;
- ASTs for fuel;
- Portable scale and scale house;
- Mobile office; and
- Two block wall building structures.

### 2.6.2 Unreclaimed Structures

There will be no structures left on the mine site or the processing area.

### 2.6.3 Utilities, Facilities, Wells, and Improvements to be Reclaimed

Utilities to be reclaimed on the processing site include:

- Two septic systems;
- One transformer;
- A rail spur;
- One 100-foot well; and
- 700 feet of power line.

These items will be dismantled and removed as part of the reclamation efforts. The facilities with concrete pads and/or concrete secondary containment will be removed and the concrete structures will be broken up and buried on site.

### 2.6.4 Access Restriction/Public Safety

Final mining slopes will be mined to 2H:1V or flatter to provide an acceptable factor of safety against deep seated failure. Signs will be installed and maintained to identify any potential hazards.

### 2.6.5 Disposition of Hazardous and Regulated Materials

Harborlite carefully manages all regulated materials at the Site in accordance with site-specific operational procedures, environmental permits, and applicable environmental regulations. These procedures, permits, and regulations are designed to prevent the accidental release of regulated substances and create well-defined notification and remedial obligations for Harborlite should an accidental release occur.

In accordance with Harborlite policies and procedures, all regulated materials such as fuels, lubricants, batteries, and chemicals used in conjunction with fueling, production, and maintenance activities will be removed from the Site prior to closure. These substances will be safely transferred to other active facilities, returned to the manufacturer or supplier as unused product, or recycled or disposed of in accordance with applicable state and federal regulations. Appropriate documentation will be maintained by Harborlite personnel to document the disposition of these materials.

## 2.7 POSTAGGREGATE MINING ROAD RECLAMATION

### 2.7.1 Road Description

The Site contains approximately 18,450 feet of unpaved roads that may be compacted

during use. Access roads leading to other properties and mining claims or roads within inactive mining units will not be reclaimed. Facility roads specific to the mining and processing areas will be reclaimed.

These unpaved roads include:

- Approximately 10,250 feet of haul roads; and
- Approximately 8,200 feet of access roads.

The 10,250 feet of haul roads will be reclaimed. All haul roads will be reclaimed by scarifying and reseeding by broadcast seed methods. Roads located on pit floors and slopes will be incorporated into the final reclaimed topography. Culverts, if any, will be removed and drainage patterns restored to match reclaimed topography. Compacted road beds will be ripped/scarified to match surface drainage patterns of surrounding reclaimed land.

### 2.7.2 Reclaimed Road Erosion Control Plan

The reclamation of compacted road surfaces will eliminate the concentrated and erosive flow patterns associated with typical road runoff. The uneven and loosened surfaces created by scarifying and ripping will facilitate infiltration and generate relatively non-erosive sheet flow under heavy precipitation events.

## 2.8 SOIL CONSERVATION AND REVEGETATION

### 2.8.1 Topsoil Conservation Plan

In the mining area, most portions of the mining sites were disturbed by historical mining activities. The terrain and excavation techniques make recovery of topsoil difficult, no topsoil is anticipated to be recovered in the future. Therefore, no topsoil will be available for reclamation purposes. Any topsoil recovered will be placed in berms around the mining areas and allowed to naturally revegetate.

Most of the processing area has been disturbed by historical activity. No topsoil is anticipated to be recovered in the future. Therefore, no topsoil will be available for reclamation purposes in the processing areas.

### 2.8.2 Revegetation Plan

Soil placement will not occur at the mining areas or processing areas. A native seed mixture suitable for the Superior, Arizona area will be used in the planned revegetation of the Site. The native seed mixture should be successful at the Site over time because the naturally occurring geologic materials are sufficiently fine-grained to provide a suitable growth medium for vegetation. Active revegetation in the mining area is planned only for the pit floors above the water elevation of 2,425 feet amsl, approximately

8 acres. Active revegetation in the process area is approximately 20 acres, for a total of 28 acres of active revegetation. The revegetation technique planned will be broadcast seeding.

Grasses, shrubs, and forbs suitable for the Lower Colorado River/Sonoran Scrub environment will be used in the planned revegetation. To promote revegetation success, the planting will occur between September 15 and November 30. A seed mixture of at least two grasses, two forbs, and two shrubs will be selected from the table of seeds listed in Appendix C. Mulching, fertilizing, or supplemental irrigation will not be required to successfully revegetate the Site.

Care and maintenance of the reclamation effort will involve annual inspections of the Site (for 3 years maximum) to monitor slope movement, erosion, and vegetation growth. Annual inspection reports will be published on the anniversary date of site closure until the Site is released by the ASMI.

## 2.9 CONCEPTUAL SCHEDULE FOR DISTURBANCE AND RECLAMATION

The conceptual schedule includes:

- Mining operations are anticipated to continue through at least 2048;
- Reclamation activities will be concurrent with mining activities as conditions allow;
- If concurrent reclamation is not feasible, areas will be reclaimed after mining operations cease. Postaggregate mining reclamation activities will begin within 12 months of the cessation of mining activities and is anticipated to be completed within 12 months; and
- Reclamation will be deemed complete once the reclaimed surfaces have been regraded to a safe and stable condition, access restriction measures are in place, and the ASMI verifies that the responsible party has fulfilled the requirements of the approved reclamation plan.

## 2.10 PROBABLE FUTURE CONDITIONS

The profitable operation of a mine is based on a variety of factors including the amount and quality of geologic resources available for extraction, site-specific hydrogeologic conditions, permitting constraints, economic factors affecting the cost of extraction and processing, and market conditions which influence the supply and demand for these materials or finished products containing these materials. Changes to any of these factors

can have significant impacts to mine profitability and can thus require operators to modify mining, processing, or operational methods or expand or temporarily cease operations.

Further, the means and methods described in this Plan to operate a mining facility and implement reclamation are based on the application of currently-available technologies and practices. These technologies and practices are constantly evolving and the operations described in this Plan may be modified if the currently-specified means and methods become out-dated, obsolete, cost ineffective, or impracticable.

Consequently, factors affecting profitable operation or means and methods are likely to change due to unanticipated or unknown future conditions. Therefore, the operator of the facility described in this Plan reserves the right to adapt their operations or plans to these changing, unanticipated, or unknown future conditions to the extent that these operational changes do not cause substantial non-compliance with existing permits or authorizations.

## 2.11 ESTIMATED RECLAMATION COSTS

The unit costs developed for this Reclamation Plan are based primarily on two key cost estimating databases (RS Means Facilities Construction Cost Data – 2004, RACER Cost Estimating software version 8.1.2), along with estimated productivity for material movement based primarily on the Caterpillar Handbook (edition 31).

Material volumes and surface areas have been calculated using the topographic base maps provided. Material volumes were calculated using Digital Terrain Model (DTM) surfaces for cuts and fills. Surface areas were defined by plan projection of outlined areas.

Administrative costs were based on Arizona Rock Products Association (ARPA) recommendations.

Units and equipment selection from 2008 application used for new calculations. Costs inflated via 2021 ENR Cost Index. Index applied only to Demo, Structures, Revegetation, and Misc. Actual, current contractor costs used for Regrading and Scarifying. .

The estimated costs developed for this Reclamation Plan include:

- Earthwork and re-grading;
- Demolition and removal of structures and improvements;
- Road reclamation;
- Care and maintenance;
- General construction;
- Cost adjustment; and
- Administrative costs.

A summary of the estimated reclamation costs is listed in Table 1 at the end of this section. The sources and calculation of the estimated reclamation costs are detailed in Appendix B.

### 2.11.1 Pit Walls Re-grading and Revegetation Cost

The slopes of the mining area will be mined to an overall 2H:1V slope. The pit floors above the water elevation will be revegetated using broadcast seeding. The area being revegetated will be approximately 8 acres.

This cost estimate is based on the worst case estimate of no concurrent reclamation.

The total estimated cost for this category is $71,646

### 2.11.2 Stockpile, Dumps, and Fines Area Cost

Material stockpiles will be depleted by the end of operations. One waste dump pile encompassing approximately 1 acre, located at the processing plant, will be re-graded to a slope of 2H:1V. This final slope will be stable for the material. The processing area will be revegetated using broadcast seeding. The total area revegetated in the processing area will be approximately 20 acres.

The total estimated cost for this category is $27,325.

### 2.11.3 Structure Demolition Cost

The reclamation activities detailed in this category includes:

- Removal of a scale house;
- Removal of buildings on site;
- Removal of power line and electrical transformer;
- Breakup and burial of concrete pads (approximately 18,675 square feet).

The total estimated cost for this category is $280,124.

### 2.11.4 Road Reclamation Cost

There is an estimated 10,250 feet of facility roads that will be reclaimed.

The cost of ripping/scarifying and re-seeding the roads is estimated at $5,859.

### 2.11.5 Care and Maintenance Cost

Care and maintenance for the reclamation effort at this operation consists of:

- An annual inspection of the Site;
- Preparation of the required annual report describing the site conditions; and
- Trash removal.

Three annual inspections are estimated to be needed before the Site is released.

The cost of care and maintenance is estimated at $11,066.

### 2.11.6 Construction Cost

Construction efforts for reclamation are expected to consist of:

- Install access restriction signs along the site perimeter;
- Install rip-rap erosion lining.

The cost of construction is estimated at $20,989.

### 2.11.7 Plant Removal Cost

The estimated reclamation costs detailed in this section include the dismantling, loading onto transport, and removal of the following equipment:

- Removal of approximately 500 feet of rail spur;
- One portable crushing and screening plant; and
- One drying and sizing plant.

The cost of plant removal is estimated at $213,798.

### 2.11.8 Cost Adjustment

A price index factor was included to adjust from 2004 pricing to estimated May 2008 pricing on operating and material costs. The index factor supplied is the Consumer Price Index for the period 2004 through May 2008.

CPI = 1.0942

The basis for adjustment is 2004 = 1.0000. The factor indicates that prices (on average) have increased 9.42 percent since 2004. The Consumer Price Index adjustment is not applied to the Administrative costs because it is a fixed percentage of the operating and material costs.

Cost adjustments (ENR Index) applied to appropriate estimate entries within the Reclamation Cost Estimate calculations.

The cost adjustment is estimated at N/A.

### 2.11.9 Administrative Cost

The estimated administrative cost includes:

- Contingency;
- Mobilization/demobilization;
- Indirect costs;
- Contractor profit; and
- Contract administrative costs.

The total estimated administrative cost is $170,824.

### 2.11.10 Total Reclamation Cost

The total estimated reclamation cost for this reclamation plan is estimated at $801,631.

**TABLE 1. ESTIMATED RECLAMATION COST SUMMARY**

| SECTION | RECLAMATION ITEM | COST |
|---|---|---|
| 2.11.1 | Pit Walls Re-grading and Revegetation | $71,646 |
| 2.11.2 | Stockpile, Dumps, and Fines Area | $27,325 |
| 2.11.3 | Structure Demolition | $280,124 |
| 2.11.4 | Road Reclamation | $5,859 |
| 2.11.5 | Care and Maintenance | $11,066 |
| 2.11.6 | Construction | $20,989 |
| 2.11.7 | Plant Removal | $213,798 |
| 2.11.8 | Cost Adjustment | N/A |
| 2.11.9 | Administration | $170,824 |
| 2.11.10 | **Total Reclamation Cost** | **$801,631** |

# 3.0 FEES

The Reclamation Plan Amendment fee is $1565.00 for an existing aggregate mining unit. A check covering this fee was submitted with this Amendment.

## 4.0 FINANCIAL ASSURANCE

Reclamation Bond will be the Financial Assurance Mechanism used to cover the estimated reclamation cost. Imerys will provide the Inspector with a rider to the existing bond to cover the additional reclamation costs associated with this Amendment.

## 5.0 REFERENCES

Arizona Administrative Code, Title 11 – Mines, Chapter 3. State Mine Inspector Aggregate Mined Land Reclamation, Articles 1-8.

Arizona Department of Water Resources, Ground Water Site Inventory Database, June, 2005.

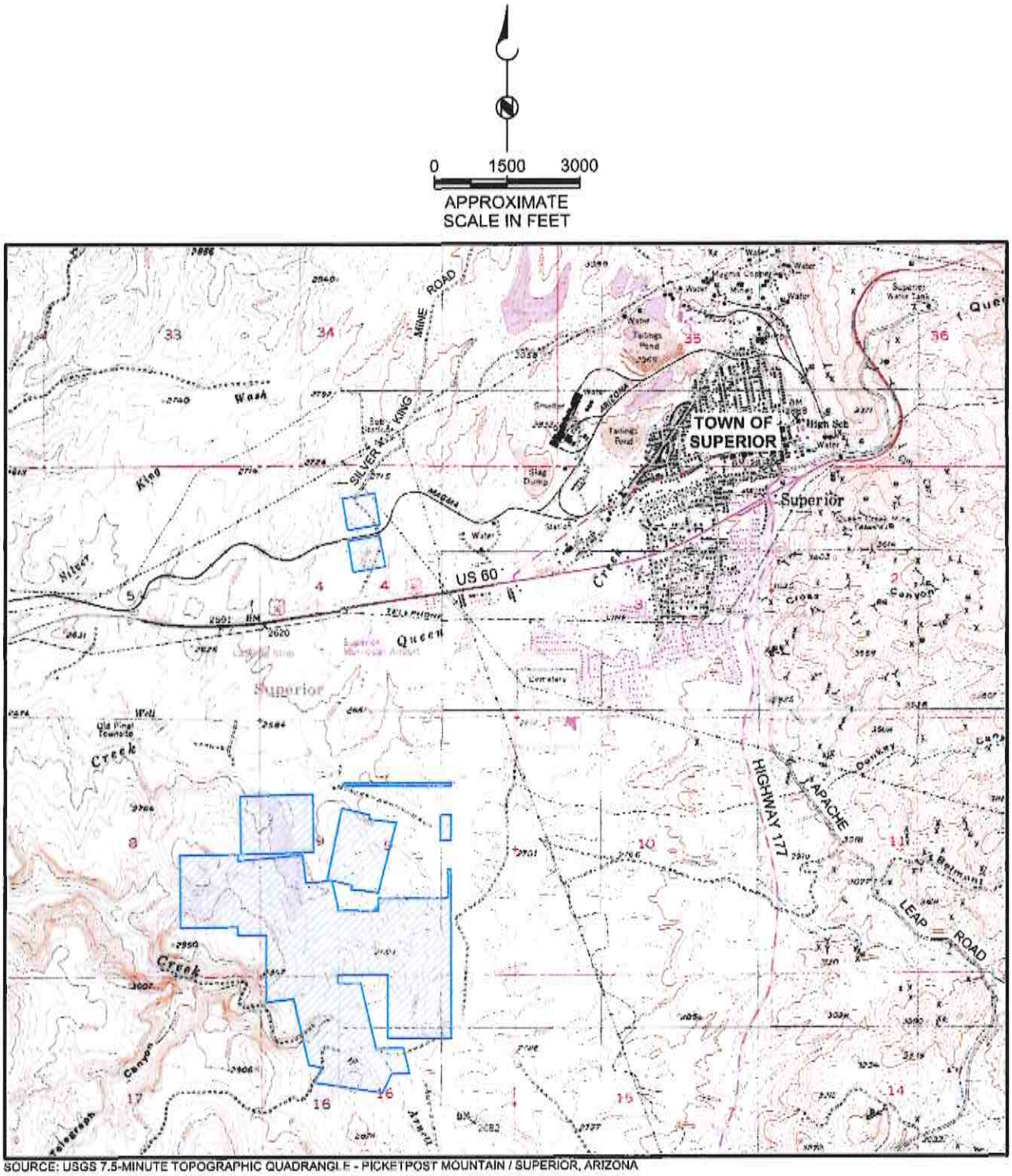
Arizona Revised Statutes, Title 27 – Minerals, Oil and Gas, Aggregate Mined Land Reclamation, Articles 1-6.

Arizona State Mine Inspector Division of Mined Land Reclamation, January, 1997, *Mined Land Reclamation Statutes and Rules*.

Caterpillar Performance Handbook, Edition 31, Caterpillar Inc., October, 2000.

RACER Cost Estimating software v. 8.1.2., 2006.

RS Means, *Facilities Construction Cost Data, 2004*, 19th Annual Edition, Reed Construction Data, 2003.




SOURCE: USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE - PICKETPOST MOUNTAIN / SUPERIOR, ARIZONA

IMERYS OWNED SURFACE
AND MINERAL RIGHTS

Figure 1
**Vicinity Map**
**IMERYS PERLITE USA, INC.**
**SUPERIOR PERLITE MINE**
**SUPERIOR, AZ**

# APPENDIX A

# SLOPE STABILITY ANALYSIS

TECHNICAL MEMORANDUM

Registered Professional Engineer CERTIFICATE 26290 JON C. BRUTON Date Signed 6/6/08 ARIZONA U.S.A.

Expires

June 6, 2008

15-135132.100

TO: Michael Houseman, Chief Geologist, Harborlite

Corporation FROM: Jon C. Bruton, P.E., Chief Geotechnical

Engineer

SUBJECT: Slope Stability Evaluation, Harborlite Corp. Operation

This report presents the results of a slope stability evaluation for the Harborlite Corp. - Superior Perlite Mine. The evaluation was performed in support of preparation of an Aggregate Mined Reclamation Plan for Harborlite's facility located at 45156 Silver King Mine Road in Superior, Arizona.

Three pits are proposed with the deepest one having a depth of approximately 240 feet. The floor elevation in the pit with the highest cut slope will be at approximately 2,400 above mean sea level (amsl). The crest of the highest cut slope will be at approximately 2,640 feet amsl. Groundwater is located at about 2,425 feet amsl. The proposed cut slopes will consist of 20-foot high faces with 30-foot wide benches. The slope between benches will be at an angle of approximately 63.5 degrees. Drilling and blasting is performed to conduct mining.

## MATERIAL PROPERTIES

Material being mined on the site is Perlite. Perlite is naturally occurring siliceous volcanic rock. The engineering properties of Tuff were applied in the slope stability evaluation. Strength parameters for Tuff were estimated based on empirical relationships presented in Peck, Hanson, Thomburn (1974). The strength of Tuff may reach approximately 500,000 pounds per square foot (psf). A conservative strength of 20,000 psf was applied in the slope stability evaluation.

## METHODS OF ANALYSES

Slope stability analyses of the proposed reclaimed slopes were performed using a computer program to evaluate the overall factor of safety of the property against deep seated slope instability. Static and seismic (pseudostatic) slope stability evaluations were conducted. Analyses were performed using the computer program Slide Version 5.0 developed by Rocscience. Figure 1 shows an example printout from the computer program Slide Version 5.0.

Figure 2 shows a simplified diagram of soil shear resistance and gravitational forces tending to produce land sliding. Bishop's method of analysis was selected. A circular slip surface is assumed and the earth mass within the surface is divided into small vertical slices. The basic assumption of the limit equilibrium approach is that Coulomb's failure criterion is satisfied along the assumed failure surface.

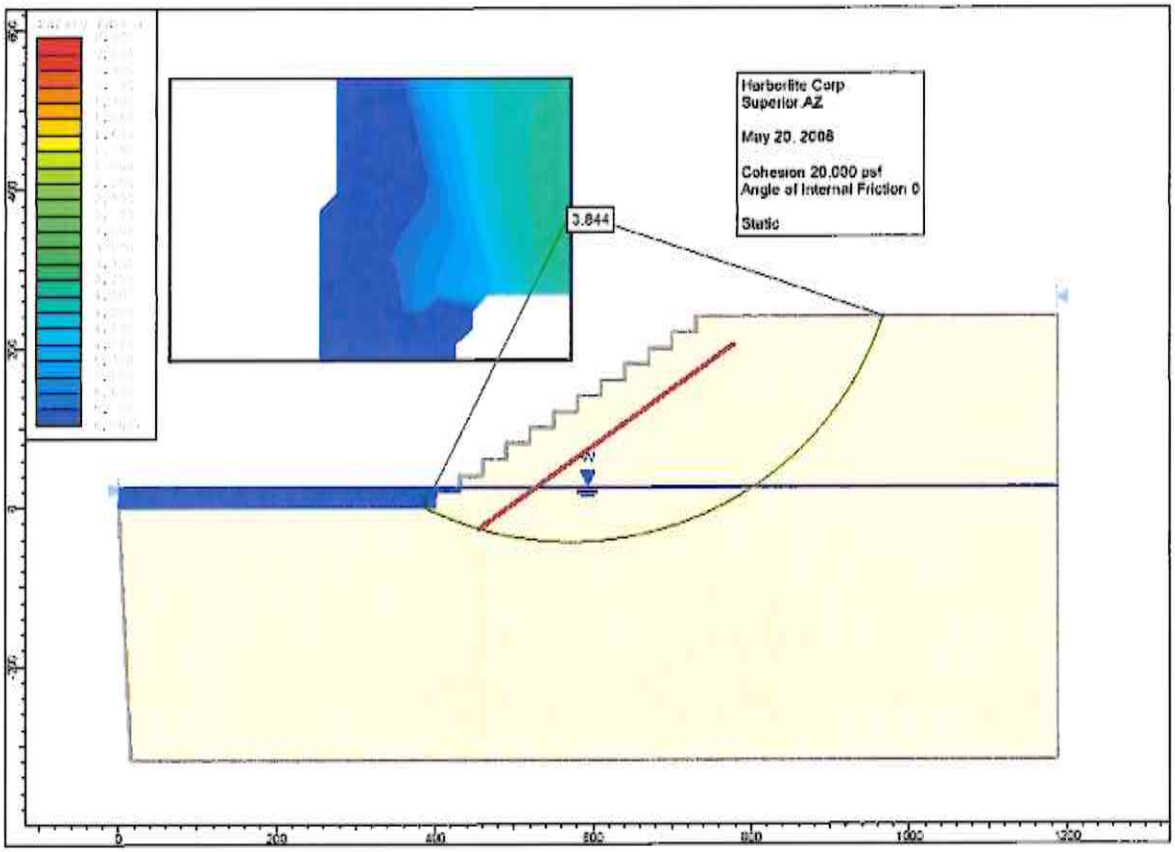



**Figure 1. Example output from slope stability analysis computer program**

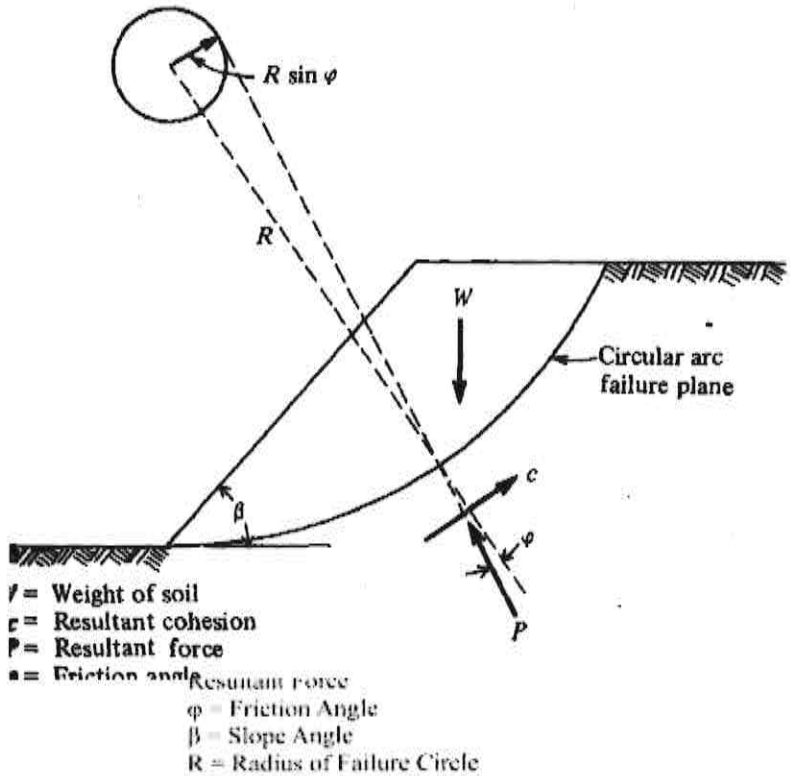



**Figure 2 – Simplified Diagram of Slope Forces**

In general terms, the calculated factor of safety is the ratio of available soil shear resistance to the gravitational forces tending to produce landsliding. When the soil strength is equal to the slide producing forces, a factor of safety of 1.0 would exist and the slope would be on the verge of movement. Uncertainties are associated with the assumed subsurface conditions, soil strength, groundwater levels, and location of the most critical failure surface. To provide a margin of safety against these uncertainties, a factor of safety of 1.3 for static (non-seismic) conditions and 1.1 for seismic conditions is accepted engineering practice.

The stability of slopes under seismic loading was evaluated using the pseudostatic method. In a pseudostatic analysis horizontal vertical static forces are applied to the slope to simulate the forces created by an earthquake. The horizontal force is applied by the computer program using the weight of the slice being analyzed, multiplied by the horizontal seismic coefficient. The horizontal seismic coefficient was taken as one-half of the peak horizontal ground acceleration (PHGA), as is common practice when conducting analyses of overall slope stability. The vertical seismic coefficient was assigned a value equal to one-half of the horizontal seismic coefficient. The seismic coefficients are dimensionless factors.

A PHGA with a 10 percent probability of exceedance in 50 years of 0.06g was selected. The PHGA was determined from using a database available through the United States Geological Survey (USGS, 2006). Accordingly, a horizontal seismic coefficient of 0.03 and a vertical seismic coefficient of 0.015 were applied in the pseudostatic slope stability analyses.

## FINDINGS

The computer program calculated over 1,000 possible failure surfaces and related factors of safety for each scenario. Possible slip surfaces were reviewed and engineering judgment was applied to select representative deep seated failure surfaces. Potential slip surfaces and factors of safety for the final slopes are shown on Figures 3 through 10.

Factors of safety for static and seismic conditions exceeded 1.5 for the proposed final reclaimed slope configuration. It should be noted that the slope stability analyses considered potential deep seated failure planes. Near surface failures and deformation were not addressed in the stability analyses. The slope face could be susceptible to slumping due to saturation of near surface soil and erosion.

Even though our analyses of the site with reclaimed slopes indicated a low risk level for deep seated failure, conditions beyond property boundaries and below the existing bottom of the pit could directly affect the stability of the subject site. It should be noted that there is always an inherent risk of slope instability. Consequently we are unable to provide a guarantee regarding slope stability and cannot accept liability for any possible failures.

## DESIGN EXPLORATIONS AND ANALYSES

The analyses and findings presented in this letter report were prepared to support preparation of the site reclamation plan. Prior to initiating final site reclamation, detailed subsurface explorations, laboratory testing to determine the engineering properties of the soil, and engineering analyses should be performed. Recommendations for excavations and fill placement should be prepared and included as part of the construction documents for final site reclamation.

## USE OF THIS REPORT

This report was prepared for the exclusive use of the owner for specific application to the preparation of a reclamation plan. The data and letter report should not be construed as a warranty of subsurface conditions. In developing our findings regarding slope stability, reasonable care and engineering judgment were exercised.

Within the limitations of scope, schedule, and budget, the analyses and findings presented in this letter report were prepared in accordance with generally accepted professional geotechnical engineering principles and practice in this area at the time this report was prepared. We make no other warranty, either express or implied. These conclusions and recommendations were based on our understanding of the site as described in this letter report and the assumed subsurface conditions.

**References:**

Peck, R.B. Hanson, W.E. and Thornburn, T.H., 1974. Foundation Engineering, John Wiley & Sons, New York, NY, pgs 13, 310.

Rocscience. 2006. Slide Version 5.0. Toronto, Canada.

U.S. Geological Survey (USGS), 2006. Earthquake Search, http://eqint.cr.usgs.gov/eq-men/html/lookup-2002-interp-06.html, Earthquake Center, Earthquake Hazards Program.

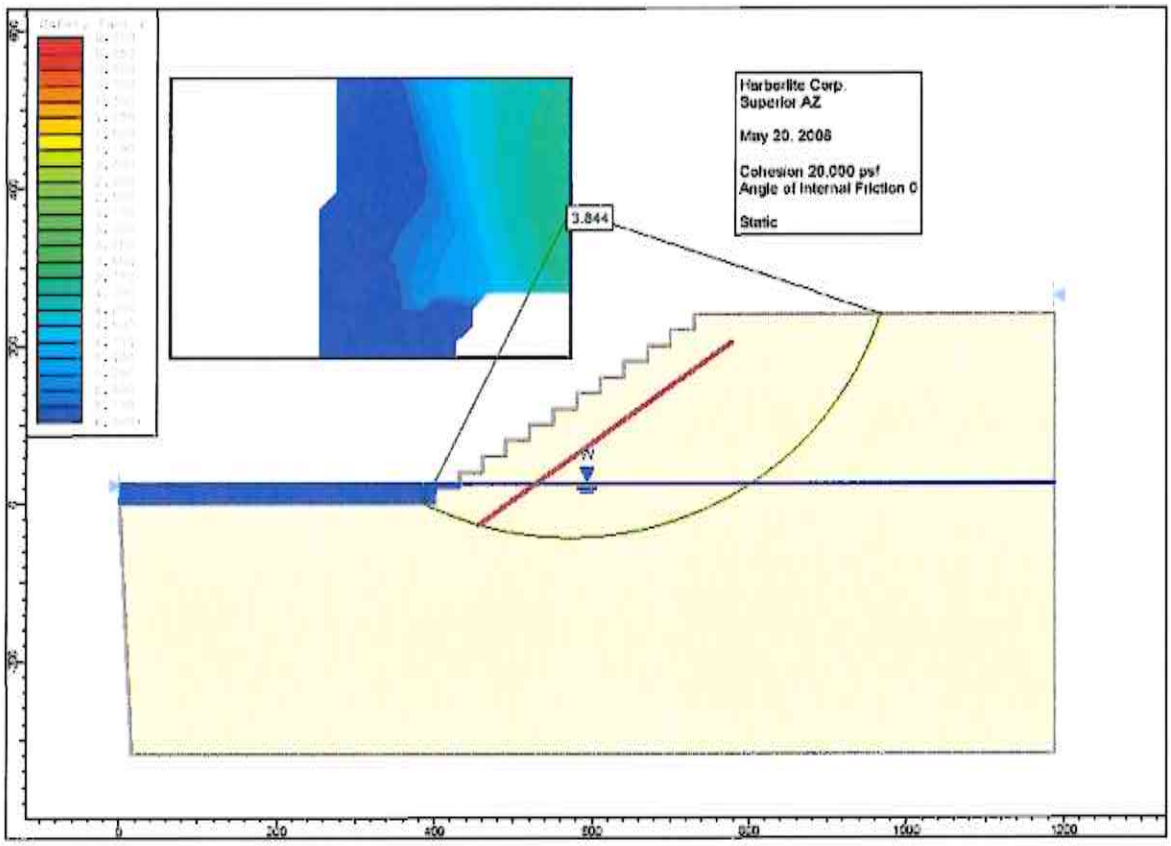

Harbelite Corp.
Superior AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
Static
3.844
0
200
400
600
800
1000
1200

**Figure 3**

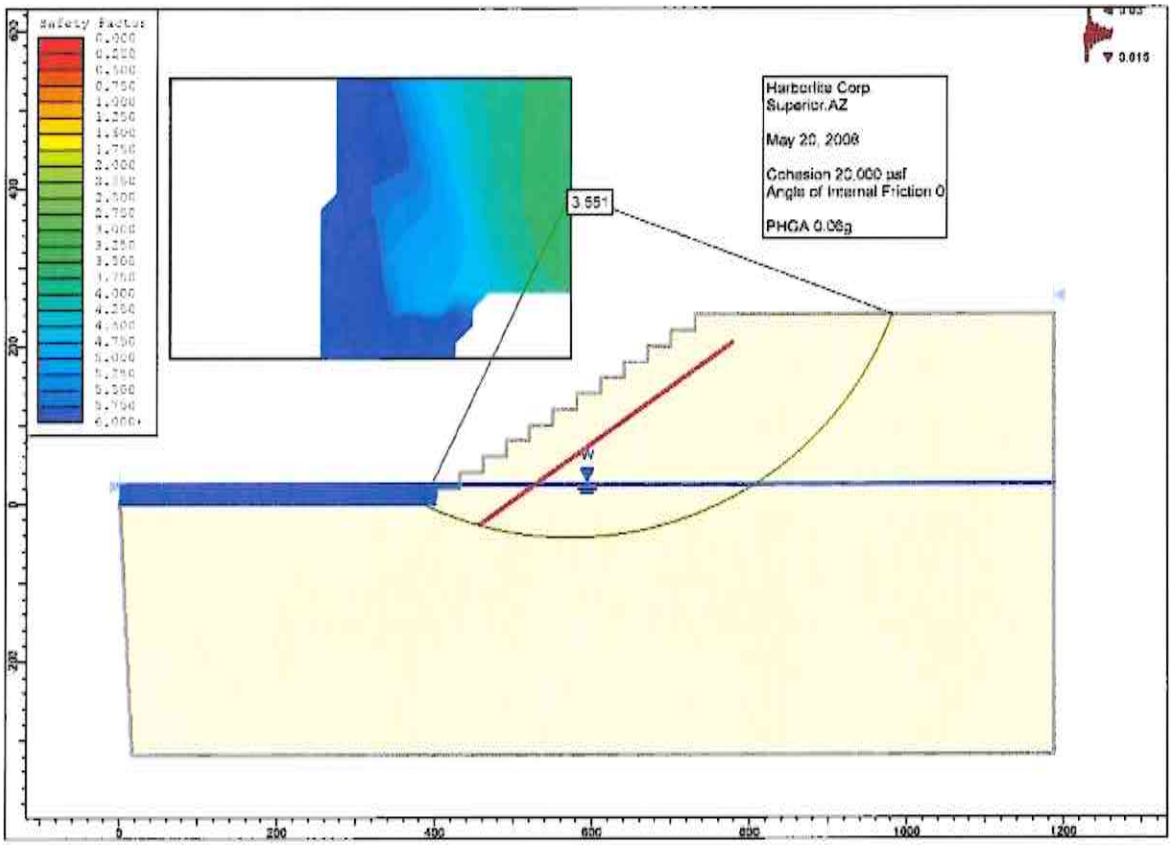

Safety Factor
3.551
Harbolite Corp
Superior,AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
PHGA 0.06g
W
0
200
400
600
800
1000
1200

**Figure 4**

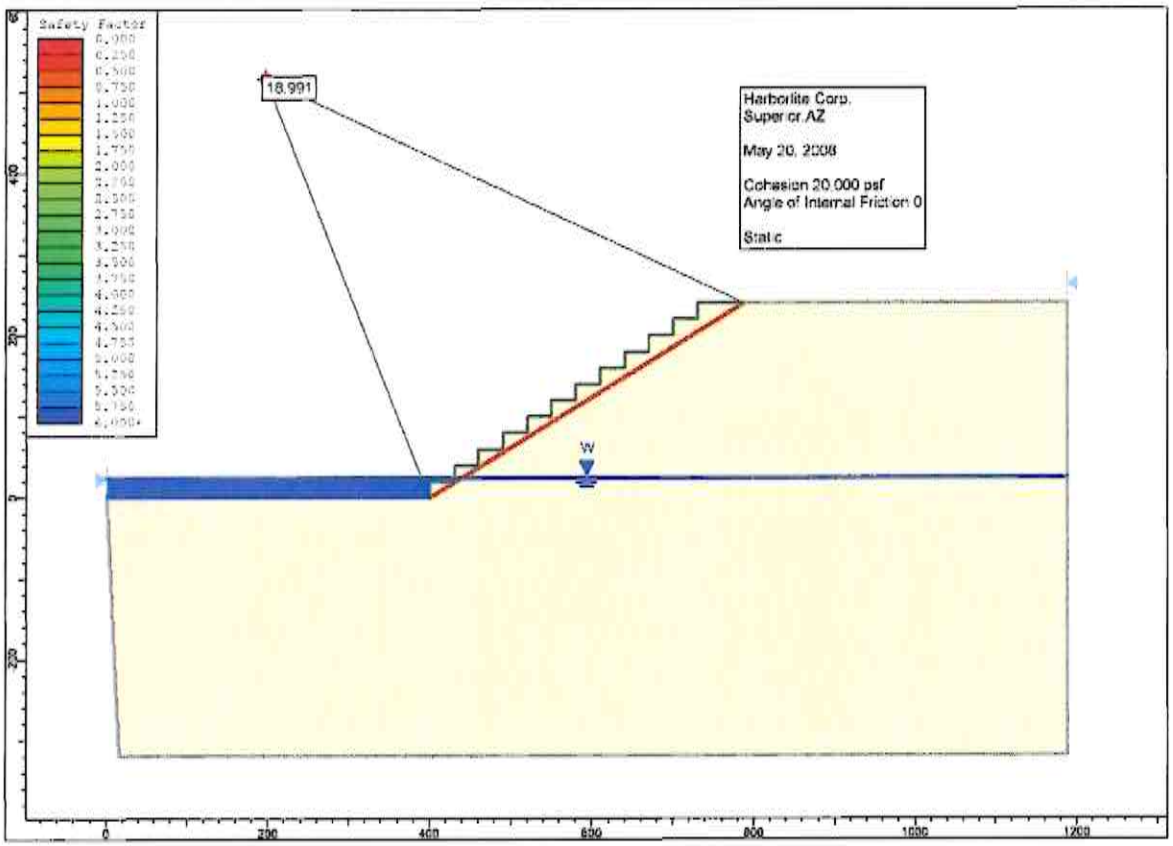

Safety Factor
18.991
Harborlite Corp.
Superior AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
Static
W
0
200
400
600
800
1000
1200

**Figure 5**

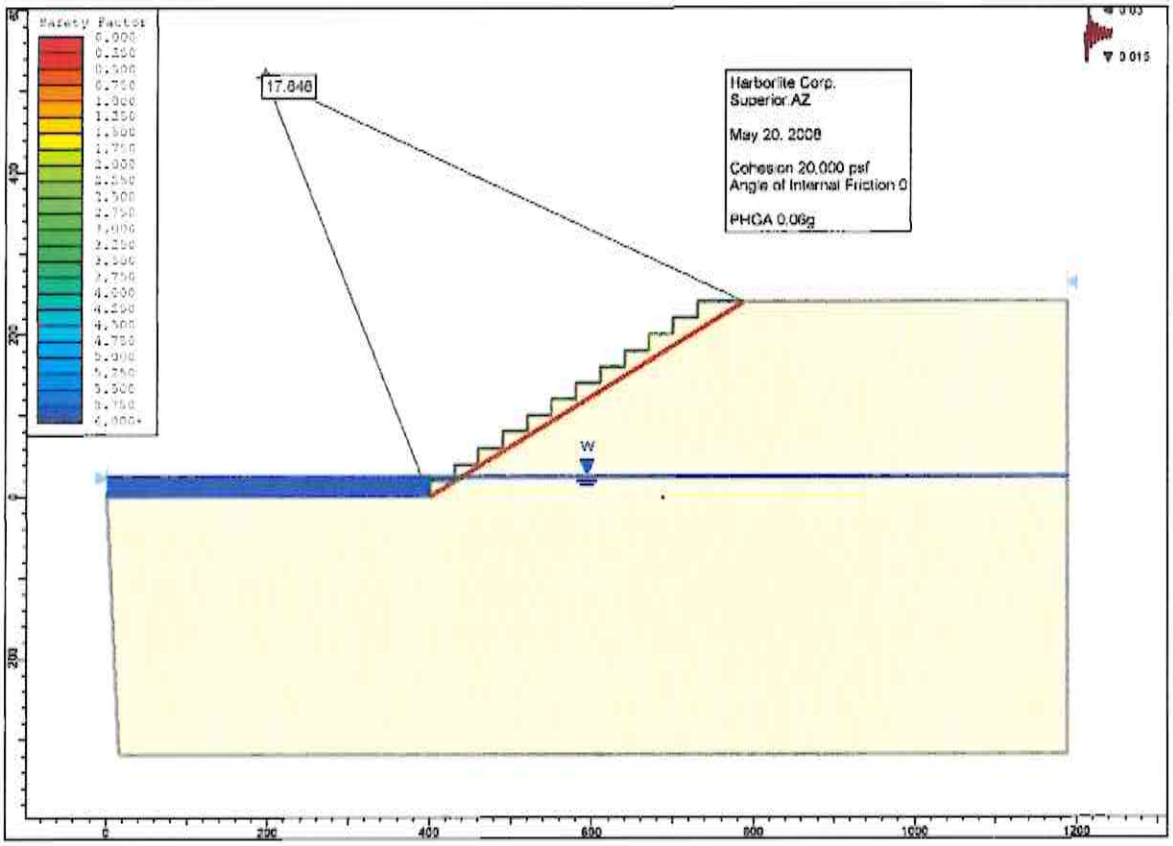

Safety Factor
17.648
Harborlite Corp.
Superior AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
PHGA 0.06g
W
0
200
400
600
800
1000
1200

**Figure 6**

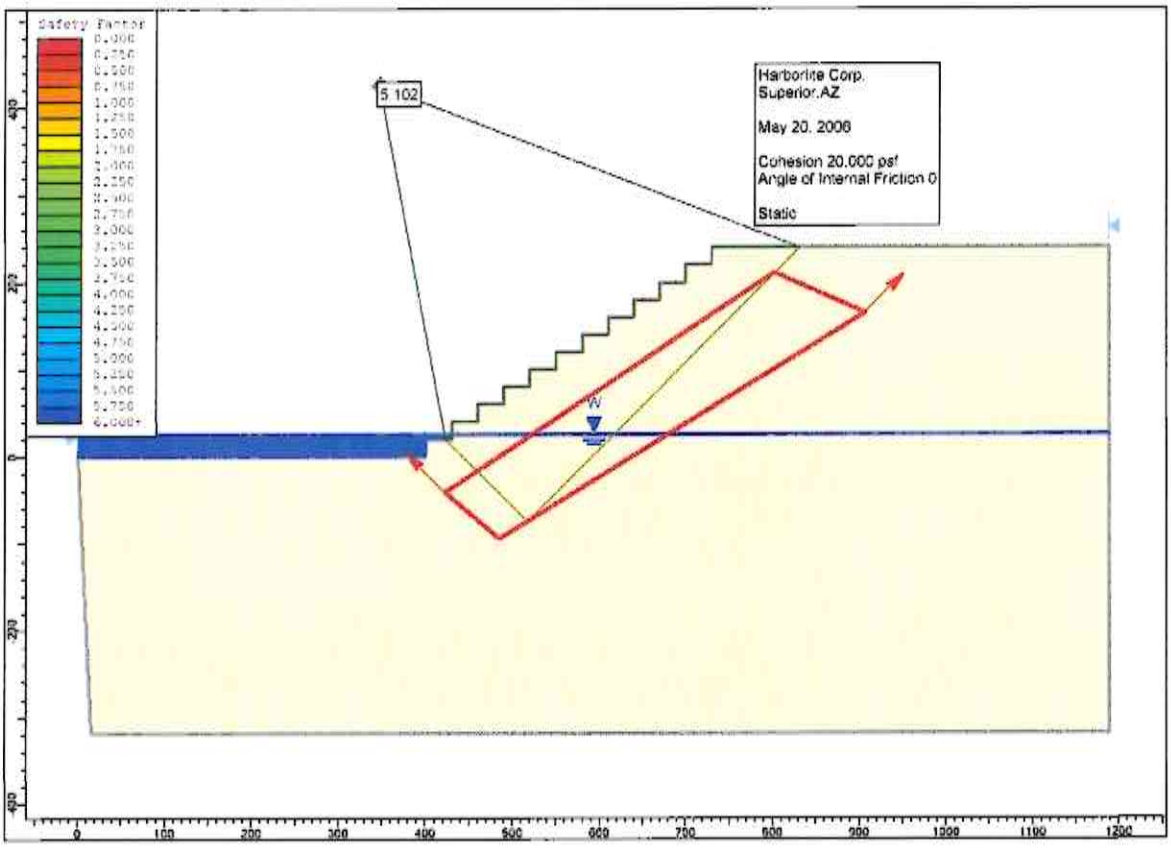

Safety Factor
5.102
Harborlite Corp.
Superior,AZ
May 20, 2006
Cohesion 20,000 psf
Angle of Internal Friction 0
Static
W

**Figure 7**

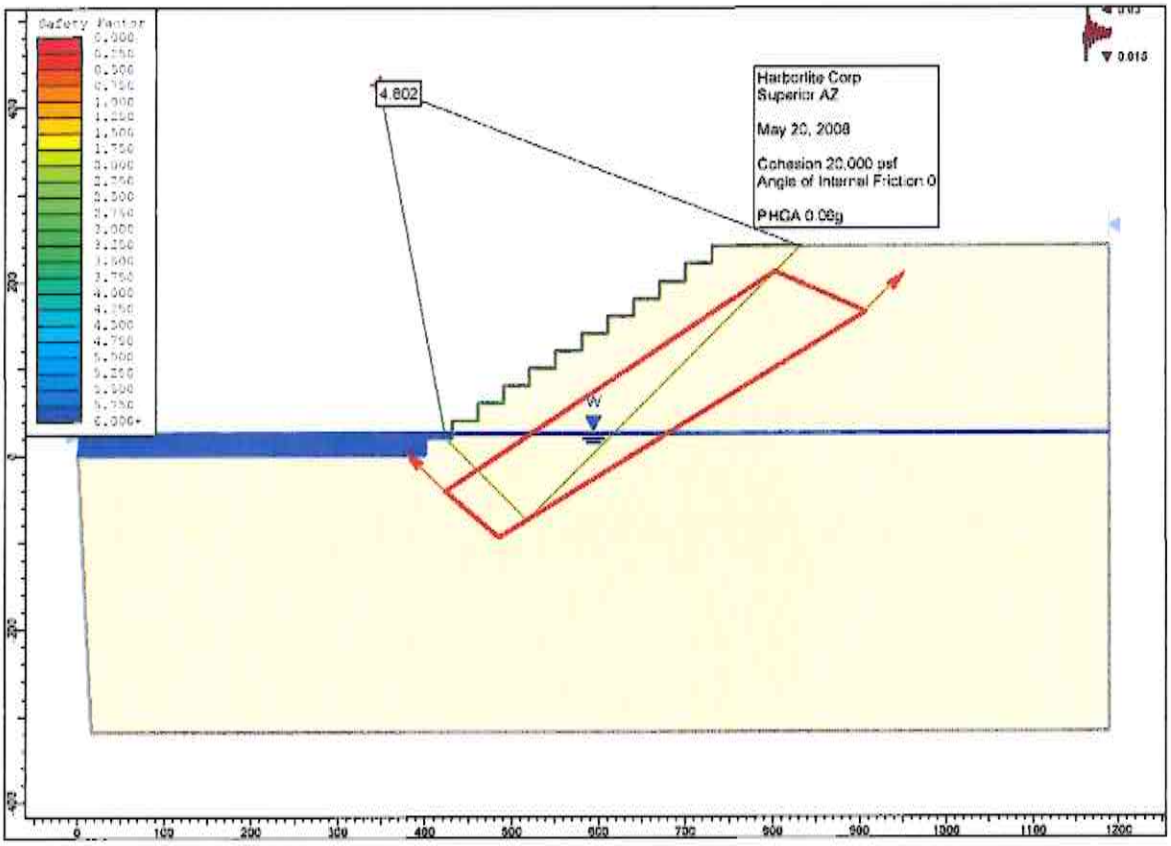

Safety Factor
4.802
Harborlite Corp
Superior AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
PHGA 0.09g
W
0.015

**Figure 8**

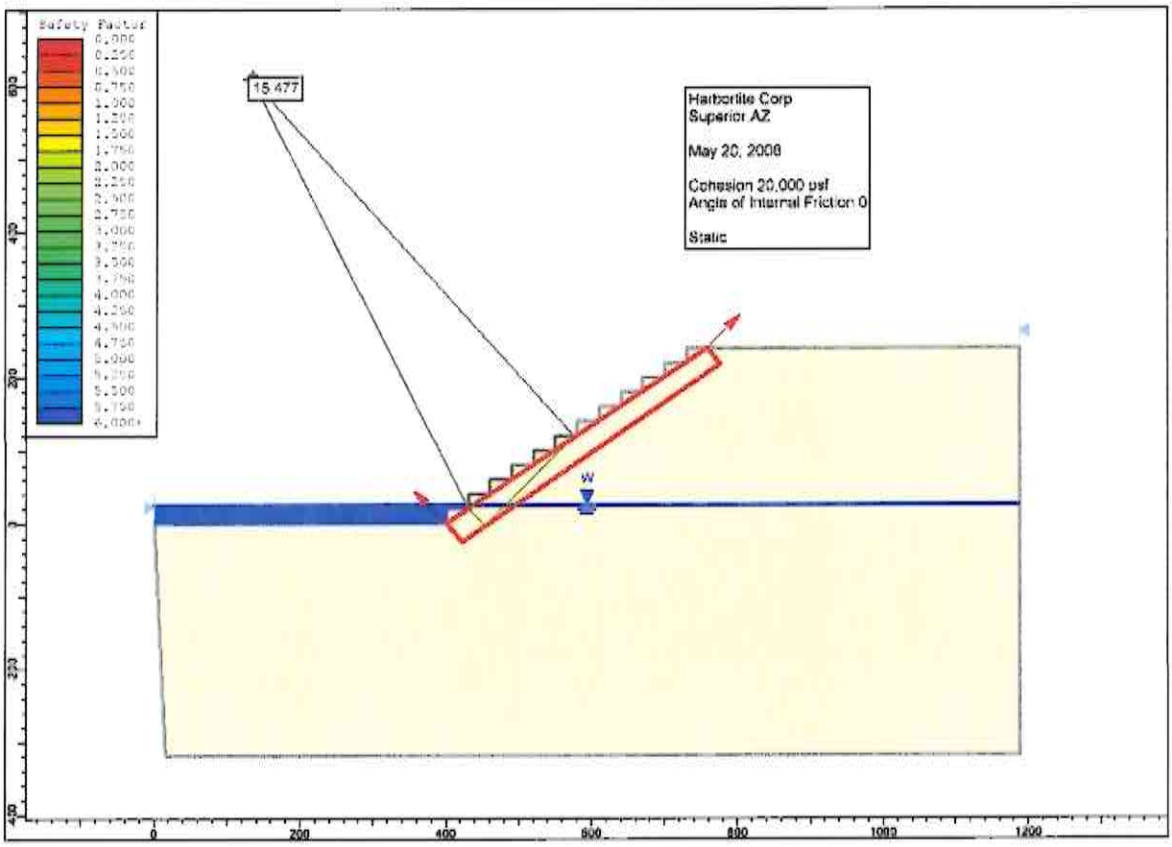

Safety Factor
15.477
Harborlite Corp
Superior AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
Static
W
0
200
400
600
800
1000
1200

**Figure 9**

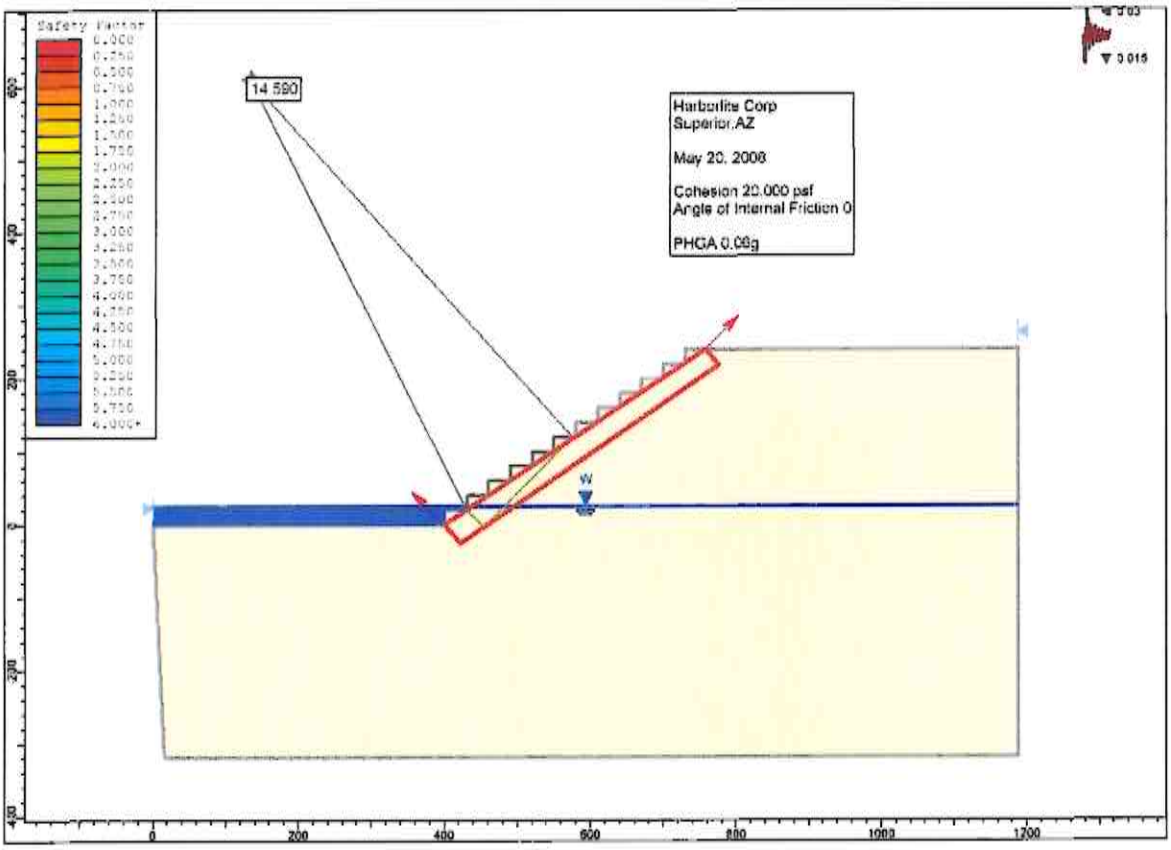

Safety Factor
14.590
Harbolite Corp
Superior,AZ
May 20, 2008
Cohesion 20,000 psf
Angle of Internal Friction 0
PHGA 0.06g
W
0
200
400
600
800
1000
1200

**Figure 10**

# APPENDIX B
# RECLAMATION COST ESTIMATE

# Reclamation Cost Estimate

Superior Permit Amendment RCE

Reclamation Cost Estimate — Superior Mine

***Superior Permit Amendment*** — 10/09/21

Applicant Imerys Perlite USA, Inc.

Contact:
Tom Hawk
805-689-1264

| | |
|---|---|
| Permit Number: | |
| Number of Acres: | 417 |
| Type of Operation: | Existing/Surface/Perlite |
| Location: | Superior, Az |
| Prepared by: | Clay Diemert |
| **Total Liablity:** | **$801,631** |

## Reclamation Cost Estimate
Reclamation Costs

**Remove buildings, sheds, equipment, tanks, fuel, and foundations**

**Total Cost: $493,922**

**Regrading**

**Total Cost: $50,967**

**Scarifying**

**Total Cost: $18,111**

**Revegetation**

**Total Cost: $35,752**

**Other**

**Total Cost: $32,055**

**Admin**

**Total Cost: $170,824**

**Total Cost: $801,631**

IMERYS
TRANSFORM TO PERFORM

**Reclamation Cost Estimate**
Building Demolition

Superior Mine
Worksheet #2
10/9/2021
CED

**Removal of Processing Plants (2)***

| Item | Description | Units | Total Cost |
|---|---|---|---|
| 1 | 80 ton Crane (Hr) | 70 | $15,108 |
| 2 | 120 Ton Crane (Hr) | 28 | $11,391 |
| 3 | Mechanical Labor (Hr) | 533 | $25,018 |
| 4 | Loading/Unloading Labor (Hr) | 110 | $3,948 |
| 5 | Light Transportation (Trips) | 7 | $8,498 |
| 6 | Heavy Transportation (Trips) | 8 | $14,283 |
| | | **Estimated Total Cost for Plant Removal =** | **$156,494** |

**Removal of Crushing and Screening Plant (2)****

| Item | Description | Units | Total Cost |
|---|---|---|---|
| 1 | 80 ton Crane (Hr) | 23 | $5,036 |
| 2 | 120 Ton Crane (Hr) | 9 | $3,797 |
| 3 | Mechanical Labor (Hr) | 178 | $8,339 |
| 4 | Loading/Unloading Labor (Hr) | 37 | $1,316 |
| 5 | Light Transportation (Trips) | 2 | $2,833 |
| 6 | Heavy Transportation (Trips) | 3 | $4,761 |
| | | **Estimated Total Cost for Plant Removal =** | **$52,165** |

**Removal of Rail Spur (Per Mile)***

| Item | Description | Units | Total Cost |
|---|---|---|---|
| 1 | 80 ton Crane (Hr) | 50 | $10,792 |
| 2 | 120 Ton Crane (Hr) | 14 | $5,696 |
| 3 | Mechanical Labor (Hr) | 266 | $12,485 |
| 4 | Loading/Unloading Labor (Hr) | 70 | $2,513 |
| 5 | Light Transportation (Trips) | 7 | $8,498 |
| 6 | Heavy Transportation (Trips) | 8 | $14,283 |
| | | Estimated Total Cost for Spur Removal (Per Linear Mile) = | $54,267 |
| | | Per Linear Foot = | $10.28 |
| | | Units: | 500 |
| | | **Estimated Total Cost for Spur Removal =** | **$5,139** |

| | |
|---|---|
| **Total Demolition =** | **$213,798** |

*Units and equipment selection from Brown and Caldwell Reclamation report 6/6/2008
**Crushing/Screening = to Sizing/Drying plant in B&C Report. Updated to be 1/3 of Drying/Sizing.
Costs updated 2021 via ENR Cost Index

Superior Mine
Worksheet #3
10/9/2021
CED

## Reclamation Cost Estimate
Structures

| Item | Description | Rate | Units | Cost |
|---|---|---|---|---|
| 1 | Demo/Remove - Metal Buildings (Sq.Ft) | $4.33 | 10,500 | $45,442 |
| 2 | Demo/Remove - Secondary Containment (Sq.Ft.) | $9.68 | 0 | $0 |
| 3 | Demo/Remove - Concrete Buildings (Sq.Ft.) | $22.65 | 925 | $20,954 |
| 4 | Powerline Removal - Single Pole Utility (Linear Mile) | $14,283 | 0.13 | $1,857 |
| 5 | Transformer Removal (Each) | $7,142 | 1 | $7,142 |
| 6 | Septic Tank Removal | $1,428 | 2 | $2,857 |
| 7 | Demo - Chain Link Fencing (Linear Ft.) | $4.96 | 3,275 | $16,232 |
| 8 | Demo - Barb Wire Fencing (Linear Ft) | $2.77 | 0 | $0 |
| 9 | Removal - 15" Culvert (Linear Ft.) | $14.70 | 0 | $0 |
| 10 | Well Removal (Ft Depth) | $47.92 | 100 | $4,792 |
| 11 | Demo - Concrete Roads and Pads (Sq.Ft.) | $9.68 | 18,675 | $180,849 |
| | | **Total Structures:** | **33,478** | **$280,124** |

*Units and equipment selection from Brown and Caldwell Reclamation report 6/6/2008
Costs updated 2021 via ENR Cost Index

Superior Mine
Worksheet #4
10/9/2021
CED

## Reclamation Cost Estimate
Regrading

| Item | Description | | Equipment | vol (cy) | Hrs | Total Cost |
|---|---|---|---|---|---|---|
| 1 | Fines Dumps | 3:1 Slope | D9N | 6,000 | 4.3 | $1,352 |
| 2 | South Dump | 3:1 Slope | D9N | 64,000 | 45.8 | $14,420 |
| 3 | In Pit Dump | 3:1 Slope | D9N | 56,000 | 40.1 | $12,617 |
| 4 | West Area 1 | 3:1 Slope | D9N | 32,000 | 41.2 | $12,978 |
| 5 | backfill road | 3:1 Slope | D9N | 507 | 0.7 | $206 |
| 6 | Sediment Basin | 3:1 Slope | D9N | 12,972 | 29.8 | $9,395 |
| | | | **Total Regrading/Sloping:** | **171,480** | **162** | **$50,967** |

Dumps resloped.
Areas with uneven surfaces, berms and piles regraded.

Superior Mine
Worksheet #5
10/9/2021
CED

## Reclamation Cost Estimate
Scarifying

| Item | Description | Equipment | sqft | Hrs | Total Cost |
|---|---|---|---|---|---|
| 1 | Pit Floors | 140H | 1,243,660 | 60 | $8,872 |
| 2 | Roads | 140H | 345,241 | 17 | $2,463 |
| 3 | Processing Area | 140H | 871,193 | 42 | $6,215 |
| 4 | Sediment Basin | 140H | 78,695 | 4 | $561 |
| | | **Total Scarifying:** | **2,538,789** | **122** | **$18,111** |

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**Reclamation Cost Estimate**
Revegetation

Superior Mine
Worksheet #6
10/9/2021
CED

| Item | Description | sqft | acres | Total Cost |
|---|---|---|---|---|
| 1 | Fines Dumps | 46,529 | 1.07 | $458 |
| 2 | Backfill Road | 21,127 | 0.49 | $208 |
| 3 | South Dump | 454,944 | 10.44 | $4,475 |
| 4 | In Pit Dump | 195,929 | 4.50 | $1,927 |
| 5 | West of Main Pit | 377,087 | 8.66 | $3,709 |
| 6 | Roads | 345,241 | 7.93 | $3,396 |
| 7 | Pit Floors | 1,243,660 | 28.55 | $12,234 |
| 8 | Sediment Basin | 78,695 | 1.81 | $774 |
| 9 | Processing Area | 871,193 | 20.00 | $8,570 |
| | **Total Mulch & Fertilization:** | **3,634,404** | **83** | **$35,752** |

**Total Revegetation: $35,752**

IMERYS

# Reclamation Cost Estimate
## Miscellaneous Costs

Superior Mine
Worksheet #7
10/9/2021
CED

| Item | Description | Rate | Units | Cost |
|---|---|---|---|---|
| 1 | Site Monitoring and Reporting (Annual) | $2,857 | 3 | $8,570 |
| 2 | Trash Removal | $86 | 16 | $1,371 |
| 3 | Construction - Chain Link Fencing (Linear Ft.) | $13 | 0 | $0 |
| 4 | Install Rip Rap Erosion Lining (Sq.Ft.) | $77 | 250 | $19,282 |
| 5 | Install Access Rrestriction Sign | $95 | 18 | $1,707 |
| 6 | Weed Survey | $1,125 | 1 | $1,125 |
| | | | **Total Miscellaneous:** | **$32,055** |

*Units and equipment selection from Brown and Caldwell Reclamation report 6/6/2008
Costs updated 2021 via ENR Cost Index

Superior Mine
Worksheet #8
10/9/2021
CED

# Reclamation Cost Estimate
## Administrative Costs

| Item | Description | % | Cost |
|---|---|---|---|
| 1 | Contingency | 10% | $63,081 |
| 2 | General Mob-Demob | 4% | $21,039 |
| 3 | Indirect Costs | 2% | $12,616 |
| 4 | Contractor Profit | 10% | $49,392 |
| 5 | Contract Administration | 5% | $24,696 |
| | | **Total Miscellaneous:** | **$170,824** |

Contractor Profit only on Demo and Structures.
General Mob-Demob only on Demo, Structures and Other.

IMERYS

# Reclamation Cost Estimate
## Dozer Productivity

Superior Mine
Worksheet #9
10/9/2021
CED

**D9N Regrading to 3H:1V Slope**

| | | | |
|---|---|---|---|
| | | **D9N Dozer Resloping** | |
| | Optimum Production (CY/Hr) | 1,250 | 100 ft push |
| Push Factors | Operator Experience | 0.875 | |
| | Type of Material | 1.2 | loose stkp |
| | Grade of Push | 1.8 | |
| | Weight Correction | 0.71 | 1.62 T/CY |
| | 50 min/hr | 0.83 | |
| | Average Production (CY/Hr) | 1,398 | |
| | Average Daily Production (CY) | 11,183 | 8 Hr work day |

**D9N Regrading piles, berms, etc.**

| | | | |
|---|---|---|---|
| | | **D9N Dozer Regrading** | |
| | Optimum Production (CY/Hr) | 1,250 | 100 ft push |
| Push Factors | Operator Experience | 0.875 | |
| | Type of Material | 1.2 | loose stkp |
| | Grade of Push | 1 | |
| | Weight Correction | 0.71 | 1.62 T/CY |
| | 50 min/hr | 0.83 | |
| | Average Production (CY/Hr) | 777 | |
| | Average Daily Production (CY) | 6,213 | 8 Hr work day |

**D9N Regrading Sediment Basin**

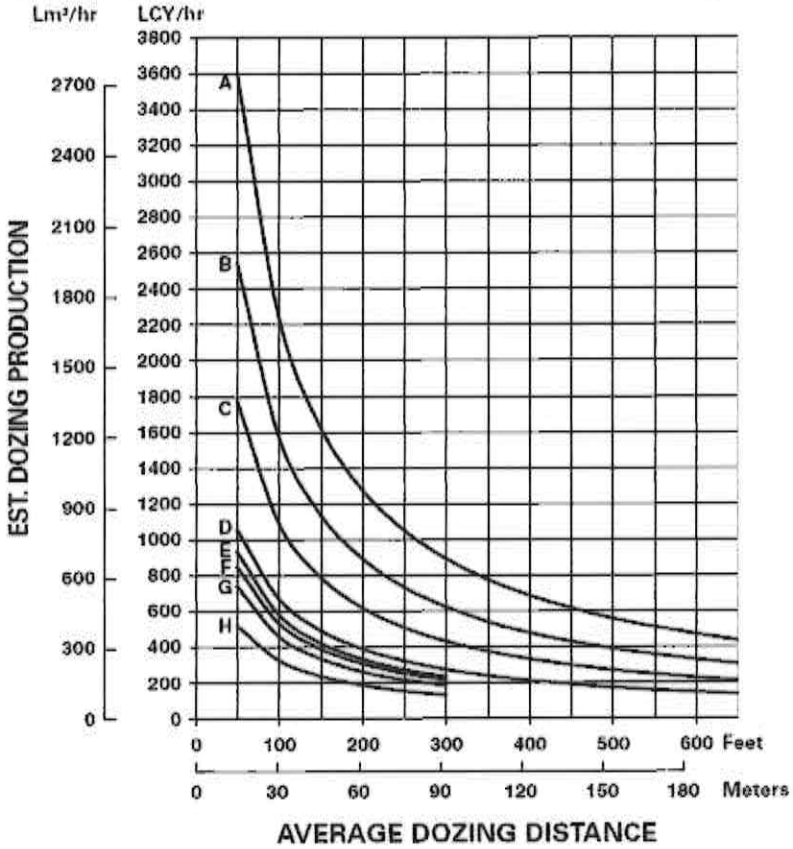
| | | | |
|---|---|---|---|
| | | **D9N Dozer Resloping** | |
| | Optimum Production (CY/Hr) | 700 | 75 |
| Push Factors | Operator Experience | 0.875 | |
| | Type of Material | 1.2 | loose stkp |
| | Grade of Push | 1 | Flat |
| | Weight Correction | 0.71 | 1.62 T/CY |
| | 50 min/hr | 0.83 | |
| | Average Production (CY/Hr) | 435 | |
| | Average Daily Production (CY) | 3,479 | 8 Hr work day |

Cat Performance Handbook v.31

# Reclamation Cost Estimate
## Dozer Productivity

**Bulldozers** | Estimating Production Off-the-Job
• SU-Blades

ESTIMATED DOZING PRODUCTION • Semi-Universal Blades • D6N through D11T




KEY
A – D11T
B – D10T
C – D9T
D – D8T
E – D7E
F – D7R Series 2
G – D6T
H – D6N

NOTE: This chart is based on numerous field studies made under varying job conditions. Refer to correction factors following these charts.

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Cat Performance Handbook v.31

**140H Scarifying Roads and Pit Floors**

| | **140H Grader Scarifying** |
|---|---|
| Ripper Beam (ft) | 8.6 |
| Max first gear with std tires (mph) | 2.2 |
| Feet per mile | 5,280 |
| Half Speed in ft/hr | 5,808 |
| Double pass factor | 0.5 |
| Effective speed in ft/hr | 2,904 |
| | |
| Optimum area/hour (Sq.Ft./Hr) | 24,974 |
| 50 min/Hr | 0.83 |
| **Average area/hour (ft2/Hr)** | **20,812** |
| **Average area Daily (Sq.Ft.)** | **166,496** |

## PRODUCTION

The motor grader is used in a variety of applications in a variety of industries. Therefore, there are many ways to measure its operating capacity, or production. One method expresses a motor grader's production in relation to the area covered by the moldboard.

**Formula:**

$$A = S \times (L_e - L_o) \times 1000 \times E \quad \text{(Metric)}$$
$$A = S \times (L_e - L_o) \times 5280 \times E \quad \text{(English)}$$

where A: Hourly operating area ($m^2/h$ or $ft^2/h$)
S: Operating speed (km/h or mph)
$L_e$: Effective blade length (m or ft)
$L_o$: Width of overlap (m or ft)
E: Job efficiency

**Operating Speeds:**

Typical operating speeds by application

| | | |
|---|---|---|
| Finish Grading: | 0-4 km/h | (0-2.5 mph) |
| Heavy Blading: | 0-9 km/h | (0-6 mph) |
| Ditch Repair: | 0-5 km/h | (0-3 mph) |
| Ripping: | 0-5 km/h | (0-3 mph) |
| Road Maintenance: | 5-16 km/h | (3-9.5 mph) |
| Haul Road Maintenance: | 5-16 km/h | (3-9.5 mph) |
| Snow Plowing: | 7-21 km/h | (4-13 mph) |
| Snow Winging: | 15-28 km/h | (9-17 mph) |

**Effective Blade Length:**

Since the moldboard is usually angled when moving material, an effective blade length must be computed to account for this angle. This is the actual width of material swept by the moldboard.

Cat Performance Handbook v.31

IMERYS

# Reclamation Cost Estimate
Costs

Superior Mine
Worksheet #11
10/9/2021
CED

| Equipment | Description | 2008 Rate ($/HR) | 2016 Rate ($/HR) | 2021 Rate ($/HR) | |
|---|---|---|---|---|---|
| Grader | 140H | | $132 | $148.47 | $/Hr |
| Dozer | D9N | | $280 | $314.94 | $/Hr |
| Excavator | Cat 330 | | $164 | $184.46 | $/Hr |
| Loader | 988F | | $217 | $244.08 | $/Hr |
| Truck | Super 14 | | $90 | $101.23 | $/Hr |
| Pickup | Pickup | | $13 | $14.62 | $/Hr |
| Water | Water | | $80 | $89.98 | $/Hr |
| Crane | 80 Ton Crane | $139 | $192 | $215.84 | $/Hr |
| Crane | 120 Ton Crane | $262 | $362 | $406.83 | $/Hr |

| Labor | | | | |
|---|---|---|---|---|
| Mechanical labor | $34.00 | $41.73 | $46.94 | $/Hr |
| Laborer | $26.00 | $31.91 | $35.89 | $/Hr |

| Misc. | 2008 Rate | 2017 Rate | 2021 Rate | |
|---|---|---|---|---|
| Demolition/Removal Metal Building and foundation | $3.03 | $3.85 | $4.33 | $/Sq.Ft. |
| Demo/Removal Block Building and foundation | $15.86 | $20.14 | $22.65 | $/Sq.Ft. |
| Demo/Removal - Concrete Pads/roads 12" | $6.78 | $8.61 | $9.68 | $/Sq.Ft. |
| Demo/Removal Chainlink Fencing | $3.47 | $4.41 | $4.96 | $/Sq.Ft. |
| Site Monitoring and Reporting (Anuual) | $2,000 | $2,540 | $2,856.64 | $/year |
| Removal of Single Pole Powerline | $10,000 | $12,699 | $14,283.2 | $/Mile |
| Removal of electical Transformers | $5,000 | $6,349 | $7,141.59 | Each |
| Well removal - 6" casing, Auger drill rig | $33.55 | $42.60 | $47.92 | $/ft |
| Construction of chain link fence | $9.21 | $11.70 | $13.15 | $/ft |
| Installation of access restriction/public safety signs | $66.40 | $84.32 | $94.84 | $/sign |
| Demo - Barb Wire Fencing (Linear Ft.) | $1.94 | $2.46 | $2.77 | $/ft |
| Removal - 15" Culvert (Linear Ft.) | $10.29 | $13.07 | $14.70 | $/ft |
| Septi Tank Removal | $1,000 | $1,270 | $1,428.32 | Each |
| Trash Removal | $60.00 | $76.19 | $85.70 | $/Ton |
| Transport and Unloading, Heavy | $1,250 | $1,587 | $1,785.40 | $/load |
| Transport and Unloading, Light | $850 | $1,079 | $1,214.07 | $/load |
| Broadcast Seeding | | | | |
| w/Straw mulch, fertilizer, desert scrub seed mixture | $607 | $771 | $866.99 | $/acre |
| w/o mulch and fertilizer | $300 | $381 | $428.50 | $/acre |
| Hydroseed | | | | |
| w/mulch and desert scrub type seed mixture | $1,175 | $1,492 | $1,678 | $/acre |
| Install Rip Rap Erosion Lining (Sq.Yd.) | $54.00 | $68.57 | $77.13 | $/yd |

2008 Rates obtained from Brown and Caldwell Reclamation Report were updated via ENR Cost Index.
Mining Equipment Rates obtained from current Dalmolin invoice. Operator included

Superior Mine
Worksheet #12
10/9/2021
CED

## Reclamation Cost Estimate
ENR Cost Index

2016 Avg: 10338
Jan-21 11628

**Index: 1.125**

| | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 |
|---|---|---|---|---|---|---|---|---|
| JAN | 11206 | 11392 | 11628 | | | | | |
| FEB | 11213 | 11396 | | | | | | |
| MAR | 11228 | 11397 | | | | | | |
| APR | 11228 | 11412 | | | | | | |
| MAY | 11230 | 11418 | | | | | | |
| JUN | 11268 | 11436 | | | | | | |
| JUL | 11293 | 11439 | | | | | | |
| AUG | 11311 | 11455 | | | | | | |
| SEP | 11311 | 11499 | | | | | | |
| OCT | 11326 | 11539 | | | | | | |
| NOV | 11381 | 11579 | | | | | | |
| DEC | 11381 | 11626 | | | | | | |
| AVG. | 11281 | 11466 | | | | | | |

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|
| JAN | 8938 | 9176 | 9437 | 9664 | 9972 | 10132 | 10542 | 10878 |
| FEB | 8998 | 9198 | 9453 | 9681 | 9962 | 10181 | 10559 | 10889 |
| MAR | 9011 | 9268 | 9456 | 9702 | 9972 | 10242 | 10667 | 10959 |
| APR | 9027 | 9273 | 9484 | 9750 | 9992 | 10279 | 10678 | 10971 |
| MAY | 9035 | 9290 | 9516 | 9796 | 9975 | 10315 | 10692 | 11013 |
| JUN | 9053 | 9291 | 9542 | 9800 | 10039 | 10337 | 10703 | 11069 |
| JUL | 9080 | 9324 | 9552 | 9835 | 10037 | 10379 | 10789 | 11116 |
| AUG | 9088 | 9351 | 9545 | 9846 | 10039 | 10385 | 10826 | 11124 |
| SEP | 9116 | 9341 | 9552 | 9870 | 10065 | 10403 | 10823 | 11170 |
| OCT | 9147 | 9376 | 9689 | 9886 | 10128 | 10434 | 10817 | 11183 |
| NOV | 9173 | 9398 | 9666 | 9912 | 10092 | 10442 | 10870 | 11184 |
| DEC | 9172 | 9412 | 9668 | 9936 | 10152 | 10530 | 10873 | 11186 |
| AVG. | 9070 | 9308 | 9547 | 9806 | 10035 | 10338 | 10737 | 11062 |

Index was only applied to Demo, Structures, Revegetation and Misc.
Not applied to Regrading or Scarifying due to known current costs.

# 2020 DalMolin Equipment & Man Power Rates

## DalMolin Owned Equipment Hourly Rates

| Description | Equipment # | Quantity | Unit | Hourly | Daily |
|---|---|---|---|---|---|
| D3 Dozer CAT | D-10 | 1 | Each | $75.00 | |
| D4 Dozer CAT | D-70 D-80 | 1 | Each | $92.00 | |
| D5 Dozer CAT | | 1 | Each | $110.00 | |
| D7H Dozer CAT | D-20 D-30 | 1 | Each | $143.00 | |
| D7R Dozer CAT | D-90 | 1 | Each | $168.00 | |
| D8 Dozer CAT | D-40 D-95 | 1 | Each | $194.00 | |
| D9N Dozer CAT | D-50 | 1 | Each | $280.00 | |
| 936 Loader / Forks / CAT | L-20 | 1 | Each | $84.00 | |
| 950 Loader CAT | L-30 L-40 | 1 | Each | $108.00 | |
| 966 Loader / Forks / CAT | L-60 | 1 | Each | $135.00 | |
| 980 Loader CAT | L-80 L-90 | 1 | Each | $160.00 | |
| 988 Loader CAT | L-10 | 1 | Each | $217.00 | |
| 416 Backhoe CAT | BH-20 | 1 | Each | $65.00 | |
| 420 Backhoe CAT | BH-30 | 1 | Each | $70.00 | |
| 420D Backhoe w/ Hammer CAT | | 1 | Each | $140.00 | |
| 426 Backhoe CAT | BH-10 | 1 | Each | $70.00 | |
| John Deere Skip Loader w/ Gannon | | 1 | Each | $80.00 | |
| 140 H Blade CAT | B-30 | 1 | Each | $132.00 | |
| 140 G Blade CAT | B-10 | 1 | Each | $120.00 | |
| 120 G Blade CAT | | 1 | Each | $84.00 | |
| 16 G Blade CAT | | 1 | Each | $198.00 | |
| *Walk Behind Compactor | | 1 | Each | | $100.00 |
| CS-323C Smooth Drum Roller CAT | C-20 | 1 | Each | $80.00 | |
| CB -563 Sheep Foot Roller CAT | | 1 | Each | $98.00 | |
| Ingersoll Rand Double Drum Roller | DD-24 | 1 | Each | $65.00 | |
| 815B Sheepsfoot Compactor w/ Blade | C-10 | 1 | Each | $114.00 | |
| Mini Excavator Bobcat | | 1 | Each | $78.00 | |
| 301 Excavator CAT | TH-45 | 1 | Each | $72.00 | |
| 301 Excavator w/ Hammer CAT | TH-35 | 1 | Each | $144.00 | |
| 303 Excavator CAT | | 1 | Each | $78.00 | |
| 308 Excavator CAT | TH-30 | 1 | Each | $84.00 | |
| 308 Excavator w/ Hammer CAT | TH-30 | 1 | Each | $168.00 | |
| 312 Excavator CAT | TH-60 | 1 | Each | $96.00 | |
| 314 Excavator CAT | | 1 | Each | $97.00 | |
| 314 Excavator w/Hammer CAT | | 1 | Each | $194.00 | |
| 315 Excavator CAT | | 1 | Each | $97.00 | |
| 320 Excavator CAT | TH-25 TH-70 | 1 | Each | $115.00 | |
| 320 Excavator w/ Hammer CAT | TH-25 TH-70 | 1 | Each | $197.00 | |
| 321 Excavator CAT | | 1 | Each | $115.00 | |
| 322L Excavator CAT | TH-10 | 1 | Each | $125.00 | |
| 322L Excavator w/ Hammer CAT | TH-10 | 1 | Each | $210.00 | |
| 325L Excavator Bucket or Grapple CAT | TH-20 TH-40 | 1 | Each | $131.00 | |
| 325L Excavator w/ Hammer CAT | TH-20 TH-40 | 1 | Each | $262.00 | |
| 330 Excavator CAT | TH-35 TH-80 | 1 | Each | $169.00 | |
| 330 Excavator w/ Hammer CAT | TH-35 TH-80 | 1 | Each | $250.00 | |
| 330 Excavator w/ Rock Crusher CAT | TH-35 TH-80 | 1 | Each | $250.00 | |
| 345 Excavator CAT | | 1 | Each | $199.00 | |
| 345 Excavator w/ Hammer CAT | | 1 | Each | $287.00 | |
| 365 Excavator CAT | TH-90 | 1 | Each | $298.00 | |
| 225 Excavator Komatsu | TH-15 | 1 | Each | $131.00 | |
| 225 Excavator w/ Hammer Komatsu | TH-15 | 1 | Each | $262.00 | |
| 735 Articulating Truck CAT | AT-10, 20, 30, 40, 50 | 1 | Each | $155.00 | |
| 769 C/D 35-40 Ton Rock Truck CAT | RT-454, 474, 484 | 1 | Each | $155.00 | |
| 773B 50 Ton Rock Truck CAT | RT-494 | 1 | Each | $165.00 | |

| Description | Equipment # | Quantity | Unit | Hourly | Daily |
|---|---|---|---|---|---|
| 6000 lb. Reach Fork Sky Track | RF-10 | 1 | Each | $98.00 | |
| 10,000 lb.Reach Fork | | 1 | Each | $116.00 | |
| 226B Skid Steer Loader CAT | | 1 | Each | $70.00 | |
| 226B Skid Steer Loader w/ Hammer CAT | | 1 | Each | $140.00 | |
| 226B Skid Steer Loader w/ Auger CAT | | 1 | Each | $100.00 | |
| 242B Skid Steer Loader CAT | SL-30 | 1 | Each | $70.00 | |
| 242B Skid Steer Loader w/ Hammer CAT | SL-30 | 1 | Each | $140.00 | |
| 242B Skid Steer Loader w/ Auger CAT | SL-30 | 1 | Each | $100.00 | |
| 257 Tracked Skid Steer CAT | | 1 | Each | $79.00 | |
| 259B Tracked Skid Steer CAT | | 1 | Each | $79.00 | |
| 259B Tracked Skid Steer w/ Hammer CAT | SL-50 | 1 | Each | $158.00 | |
| 259B Tracked Skid Steer w/ Auger CAT | SL-50 | 1 | Each | $100.00 | |
| 277 Tracked Skid Steer CAT | SL-40 | 1 | Each | $86.00 | |
| Power Grid 2 Deck Screen | PS-10 PS-20 | 1 | Each | $80.00 | |
| 14 Ton Truck Mounted National Crane | T-20 T-35 | 1 | Each | $90.00 | |
| 17 Ton Truck Mounted Terex Crane | T-56 | 1 | Each | $109.00 | |
| Truck Tractor & Lowboy Trailer 50 or 35 Ton | | 1 | Each | $109.00 | |
| Tractor w/ Belly Dump Trailer | | 1 | Each | $92.00 | |
| Tractor w/ End Dump Trailer | | 1 | Each | $92.00 | |
| Tractor w/ 40' Flatbed | | 1 | Each | $90.00 | |
| Super 14 Dump Truck | | 1 | Each | $90.00 | |
| 10 Wheel Dump Truck | | 1 | Each | $65.00 | |
| 10 Wheel Dump Truck w/25 ton Pennel Hitch Trailer | | 1 | Each | $80.00 | |
| 8 Yard Singel Axe Dump Truck | T-7 | 1 | Each | $60.00 | |
| Flat Bed Truck 24, 16, 12 | T-21 T-59 | 1 | Each | $68.00 | |
| 2000 Gallon Water Truck | | 1 | Each | $70.00 | |
| 4000 Gallon Water Truck | | 1 | Each | $85.00 | |
| 500 Gallon Water Truck w/ Pump | | 1 | Each | | $137.00 |
| Weld Truck w/ Welder | | 1 | Each | $72.00 | |
| Service/Fuel Truck w/ Operator | | 1 | Each | $73.00 | |
| Mechanics Truck w/ Mechanic | | 1 | Each | $77.00 | |
| * Pick Up Truck | | 1 | Each | $13.00 | |
| * Pick Up Truck w/ Tools | | 1 | Each | $20.00 | |
| Pick Up w/ Foreman | | 1 | Each | $58.00 | |
| * Pick Up w/20' Trailer (no chrge for truck) | | 1 | Each | | $164.00 |
| Pick Up w/45' Trailer(no chrge for truck or driver) | | 1 | Each | $70.00 | hr minimum |
| * Tool Trailer | | 1 | Each | | $225.00 |
| * Small Tools and Machinery - Chainsaw | | 1 | Each | | $27.00 |
| * Wood Chipper (without operator) | | 1 | Each | $56.00 | |
| * 90lb Breaker (without operator) | | 1 | Each | | $45.00 |
| * Jumping Jack Compactor (without operator) | | 1 | Each | $15.00 | |
| Plate Compactor | | 1 | Each | | $65.00 |
| Cement Mixer | | 1 | Each | | $75.00 |
| 185 CFM Air Compressor | | 1 | Each | | $125.00 |
| Pressure Washer | | 1 | Each | | $200.00 |
| Welding Machine 300 Amp | | 1 | Each | | $120.00 |
| Welding Machine 500 Amp | | 1 | Each | | $135.00 |
| 480 Volt Generator | | 1 | Each | | $310.00 |
| 6500 Watt Generator | | 1 | Each | | $79.00 |
| 3" Trash Pump | | 1 | Each | | $79.00 |
| 2" Trash Pump | | 1 | Each | | $69.00 |
| 3" x 4" Rain for Rent Pump | | 1 | Each | | $300.00 |
| Light Plant | | 1 | Each | | $100.00 |
| Concrete Pump Mayco 15500 | | 1 | Each | | $1,000.00 |

*** Labor not included in this equipment rate, see below for labor**

| Fusing Machines | Equipment # | Quantity | Unit | Hourly | Daily |
|---|---|---|---|---|---|
| * 1"- 3" HDPE Fusing Machine | | 1 | Each | | $130.00 |
| * 4"- 8" HDPE Fusing Machine | | 1 | Each | | $250.00 |
| * 6"- 18" HDPE Fusing Machine | | 1 | Each | | $350.00 |
| * 18" - 36" HDPE Fusing Machine | | 1 | Each | | $649.00 |
| * Data Logger (Upon Request) | | 1 | Each | | $100.00 |

**- Fusing Machine Rates do not include Pipefitter to operate the machine.**

**Please Note: Equipment Rates are operated, maintained and include OH & P, but no taxes.**

- **Eqiupment Rates do not include mobilization/demobilization fees.**
- **It may be necessary for DalMolin Excavating to assess a fuel surcharge if fuel costs exceed the calculated cost for the operation of the equipment.**
- **Rental for any equipment not available from DalMolin will be rental cost plus 10%.**
- **Fuel consumption (by the gallon) will be charged on all rental equipment.**
- **Tire wear will be charged at cost plus 10% on rental equipment that has a tire wear charge.**
- **Consumables, materials, and subs will be cost plus 10%.**

**DalMolin Man Power Hourly Rates**

| Description | | Quantity | Unit of Measure | Straight | Overtime |
|---|---|---|---|---|---|
| Machinest w/Pickup and Tools | | 1 | Hour | $88.00 | $132.00 |
| Sr. Project Manager | | 1 | Hour | $60.00 | $90.00 |
| Project Manager | | 1 | Hour | $57.00 | $85.50 |
| Env. Health & Safety Director | | 1 | Hour | $54.00 | $81.00 |
| Project Superintendent | | 1 | Hour | $53.00 | $79.50 |
| Project Engineer | | 1 | Hour | $48.00 | $72.00 |
| Field Superintendent | | 1 | Hour | $45.00 | $67.50 |
| Env. Health & Safety Coordinator | | 1 | Hour | $38.00 | $57.00 |
| Foreman | | 1 | Hour | $45.00 | $67.50 |
| Welder | | 1 | Hour | $42.00 | $63.00 |
| Pipefitter | | 1 | Hour | $42.00 | $63.00 |
| Heavy Equipment Operator | | 1 | Hour | $35.00 | $52.50 |
| Grade Checker | | 1 | Hour | $35.00 | $52.50 |
| Mechanic | | 1 | Hour | $40.00 | $60.00 |
| Carpenter/Finisher | | 1 | Hour | $35.00 | $52.50 |
| Machinest Helper | | 1 | Hour | $42.00 | $63.00 |
| Oiler | | 1 | Hour | $32.00 | $48.00 |
| Truck Driver | | 1 | Hour | $30.00 | $45.00 |
| Laborer | | 1 | Hour | $27.00 | $40.50 |

**Labor rates are based on a 40 hour work week, 4 days/10 hours day. Overtime applies to Labor Only.**

# APPENDIX C
# SEED MIX TABLE

Appendix C
Reclamation Plan
Imerys Perlite USA, Inc.

**SEED MIX**

| Botanical Name | Common Name | Grass/Scrub/Forb | PLS Rate (Pounds Per Acre) |
|---|---|---|---|
| **LOWER COLORADO RIVER SONORAN DESERT SCRUB** | | | |
| Abronia villosa | Sand Verbena | Forb | 0.5 |
| Argemone platyceras | Prickly Poppy | Forb | 2 |
| Aristida purpurea | Purple Threeawn | Grass | 3 |
| Baileya multiradiata | Desert Marigold | Forb | 1.5 |
| Bouteloua aristidoides | Needle Grama | Grass | 1 |
| Bouteloua rothrockii | Rothrock's Grama | Grass | 0.5 |
| Castilleja exerta ssp. exerta | Purple Owl's Clover | Forb | 0.25 |
| Encelia farinosa | Brittlebush | Shrub | 1 |
| Eschscholtzia mexicana | Mexican Poppy | Forb | 3 |
| Kallstroemia grandiflora | Arizona Poppy | Forb | 0.5 |
| Larrea tridentata | Creosote Bush | Shrub | 0.5 |
| Lupinus sparsiflorus | Desert Lupine | Forb | 2 |
| Phacelia crenulata | Arizona Desert Bluebell | Forb | 0.5 |
| Salvia Columbariae | Desert Chia | Forb | 0.5 |
| Sphaeralcea ambigua | Desert Globemallow | Shrub | 1.5 |
| Sporobolus contractus | Spike Dropseed | Grass | 0.5 |
| Sporobolus cryptandrus | Sand Dropseed | Grass | 0.5 |