Arizona Mined Land Reclamation Plan

Rosemont Copper World Project

August 2021

(original June 7, 2021, updated June 21, 2021, updated August 26, 2021)

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Appendix A Reclamation Cost Estimates

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Table 1 presents the requirements of the A.R.S. Title 27, Chapter 5, § R27-901 et seq., a description of the requirements, and the section within this Mined Land Reclamation Plan (MLRP) where these requirements are addressed.

Table 1 Mined Land Reclamation Plan Requirements

A.R.S. Section	Requirement	Section in Plan
R27-905	Certificate of Disclosure	1.2
R27-971, B.1.	Names, addresses of owner or operator and regulatory contact	1.1
R27-971, B.2.	Statement that owner or operator assumes responsibility for reclamation of surface disturbances	2
R27-971, B.3.	Current ownership and use of land in mining unit	3
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R27-971, B.6.	Existing topography	6 and Figure 4
R27-971, B.6.	Proposed final topography	6 and Figure 5
R27-971, B.7.	Narrative description of roads	7
R27-971, B.8.	Acreage affected by each type of surface disturbance and map of mining unit area showing each surface disturbance	8 and Table 2
R27-971, B.9.	Proposed reclamation measures to achieve the post-mining use	9
R27-971, B.9a.	Measures to restrict public access to pits, adits, shafts, and other surface features	9.1
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R27-971, B.9c	Measures to address revegetation, conservation and care and maintenance or revegetated areas	9.3
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Section 1
Introduction

1.1 Name, Address of Owner or Operator and Regulatory Contact - § R27-971, B.1

Applicant

Rosemont Copper Company
5255 East Williams Circle, Suite 1065
Tucson, Arizona 85711
(520) 495-3500

Owner/Operator

Rosemont Copper Company
5255 East Williams Circle, Suite 1065
Tucson, Arizona 85711
(520) 495-3500

Regulatory Contact

Mr. David Krizek
Environmental Manager
5255 East Williams Circle, Suite 1065
Tucson, Arizona 85711
(520) 495-3527

1.2 Certificate of Disclosure of Violations - § R27-905

Rosemont Copper Company is not subject to the Certification of Disclosure requirements of A.R.S. Title 27, Chapter 5, § R27-905 because the Rosemont Copper Company is neither:

1. A person who is engaged in an activity subject to regulation under this chapter and who has been convicted of a felony involving laws related to mined land reclamation within the five-year period immediately preceding execution of the certificate.

2. A person who is engaged in an activity subject to regulation under this chapter and who is or has been subject in any civil proceeding to an injunction, decree, judgment or permanent order of any state or federal court within the five-year period immediately preceding the execution of the certificate that involved a violation of laws of that jurisdiction relating to mined land reclamation.

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Section 2

Regulatory Responsibility Statement - § R27-971, B.2

Rosemont Copper Company assumes responsibility for reclamation of surface disturbances that are attributable to the Rosemont Copper World Project (Project) consistent with Mining Unit Reclamation Plan elements identified in Arizona Revised Statutes §§ 27-901-997 and Arizona Administrative Code R11-2-201 through R11-2-822.

Name: Mr. Andre Lauzon

Signature:

Title: Vice President, Arizona Business Unit, Hudbay Minerals

Date: August 26, 2021

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Section 3

Current Land Ownership and Use of Land - § R27-971, B.3

The core of the Rosemont Copper Company land holdings in the general area of Rosemont's Copper World Project consists of 141 patented lode claims that total an area of 2,004 acres. Additionally, there are also 1,426 acres of fee (private) land in the general Project area. The area covered by the patented claims and fee lands in the general Project area therefore totals approximately 3,430 acres (see attached Figures 1 and 2).

Rosemont has additional land holdings that are distal from the main Project area for infrastructure purposes such as well fields, a pump station, and electric power distribution. These lands compromise an additional 73 acres (see attached Figures 1 and 2).

All private/patented land described above are held by Rosemont Copper Company, a subsidiary of Hudbay Minerals, Inc. (Hudbay).

Current land use reflects a mixture of mining activities, ranching, wildlife habitat, and limited recreational use. Access to most of the patented land is restricted to the public via gated roads.

The Rosemont property is also part of the existing Rosemont Ranch, a ranching facility with over 30,000 acres of grazing lands and leases.

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Section 4

Proposed Post-Mining Use of Land - § R27-971, B.4

The post-mining land use for the areas covered in this MLRP will include on-going ranching and wildlife habitat. Much of the top surfaces of the post-mining reclaimed facilities will be ideal for grazing once vegetation is established. Public access restrictions to Rosemont's property is anticipated to remain in place post-mining.

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Section 5

Description of the Mining Unit and Proposed Surface Disturbance Created - § R27-971, B.5

In general, Rosemont's Copper World Project will include the following facilities:

- Open pit mines
- Waste Rock Storage Area
- Tailings Storage Facilities (TSF)
- Processing facilities including an MIA (Mine Infrastructure Area)
- Ancillary facilities such as offices, warehouses, and storage yards
- Utilities (water and power)
- Haul Roads and miscellaneous plant site/service roads

The locations of these facilities are shown on Figures 2 and 3. Note: The plant and service roads are not shown on these figures.

The main mine facilities will be located in Township 18 South and Range 15 East within the following sections (see Exhibit 1):

- T18S R15E, Sections 10, 13, 14, 15, 22, 23, and 24

The power and water utilities are located in a long linear corridor shown on Figure 2 within the following sections (Note: Township and range are only shown on Figure 2):

- T18S R15E, Sections 7, 17, 18, 20,21
- T18S, R14E, Sections 1, 2, 12
- T17E, R14E, Sections 17. 18, 19, 20, 29, 32, 33, 34, 35

Right-of-Ways (ROWs) have been established through State land with the Arizona State Land Department (ASLD) for these power and water utilities. Additionally, a license agreement has been established with the Town of Sahuarita (TOS) related to water utilities.

The production wells are located on private Rosemont land within the following sections and on the following parcels:

- Sanrita South: T17S, R14E, Section 29 (parcel 303-54-005B)
- Sanrita West: T17S, R14E, Section 17 (parcel 303-60-1410)

The Sanrita South parcel will so have a switchyard and is the start of the electrical transmission line through State land to the Rosemont Copper World Project property.

Open Pit Mine

The mine will consist of two open pit areas, Peach-Elgin and Copper World, for a total of approximately 99 million short tons of material mined; 61 million short tons from Peach-Elgin and 38 million short tons from Copper World.

The Peach-Elgin pit(s) will be constructed with 50-foot benches and a bottom bench starting at an elevation of 4,680 feet above mean sea level (ft amsl). The final pit, although not conical, will measure approximately 1,200 feet (ft) in diameter and will have a total depth of 780 ft. The pit slope angles will be 45 degrees.

The Copper World pit will be constructed with 50-foot benches and a bottom bench starting at an elevation of 5,180 ft amsl. The pit slope angles for this deposit will be 45 degrees. The Copper World final pit is not conical but will measure approximately 1,100 ft in diameter and will have a total depth of 730 ft.

Mining operations will use typical large-scale equipment including mining shovels, haul trucks, and rotary blast hole drills.

Waste Rock Storage Area

Waste rock material from both deposits, Peach-Elgin and Copper World, as well as overburden will be placed between the two deposits, east of the Peach-Elgin deposits. The total waste is 64 million short tons; 41 million short tons from Peach-Elgin and 23 million short tons from Copper World. The loading plan suggest 100 ft lifts with a maximum of 3 lifts.

The Waste Rock Storage Area configuration is approximately 300 ft in height, 3,000 ft in length and 2,000 ft in width.

Tailings Storage Facilities

Three tailings storage facilities have been identified as TSF-1, TSF-2, and TSF-3. Each tailings facility is a conventional impoundment and each will have a raised embankment.

TSF 1 is the smallest impoundment with a final length of about 4,000 ft and located in the south part of the property. The volume required is approximately 14 million cubic yards (Myd3).

TSF 2 is second largest of the impoundments. This impoundment is located south of TSF-3 and north of TSF 1 on the west side of the property. The volume required is approximately 19 Myd3.

TSF 3 is the largest of the impoundments. This impoundment is located at the northern part of the property. The volume required is approximately 45 Myd3.

Processing and Ancillary facilities

Processing facilities area is a conventional copper-molybdenum concentrator. The process involves crushing, grinding, flotation, molybdenum separation, concentrate dewatering and tailings dewatering.

The primary crusher is located south of the Peach-Elgin pit area and is in the Mine Infrastructure Area (MIA). This area also has the maintenance shop, fuel station, and vehicle wash station. The MIA will also have an office, a change house and the main warehouse.

Material from the primary crusher is conveyed to a stockpile where material is drawn off the stockpile using feeders. These feeders feed the milling circuit.

The milling process includes the typical SAG-Ball Mill-Pebble Crushing circuit located west of the crusher. The flotation is a rougher and cleaner froth flotation. A copper-molybdenum separation step generates the final copper and molybdenum concentrate products. The copper cleaner concentrate is fed to a copper-molybdenum thickener and the tailings is fed to a 2nd copper cleaner flotation cell circuit.

The thickened copper-molybdenum concentrate is fed to a molybdenum rougher conditioning tank and molybdenum rougher/scavenger flotation cell circuit. Molybdenum concentrate product from the final cleaner stage of the separation circuit, and copper concentrate from the molybdenum rougher tails, are thickened and press filtered.

The copper concentrate is loaded onto trucks and/or stockpiled, while the molybdenum concentrate is dried and loaded into drums.

Flotation tailings from the copper rougher and copper cleaner scavenger circuits are thickened and pumped to the TSFs.

Reagents are stored, mixed and distributed from a central reagents area. The frother, collector, and depressant are pumped from the reagents area to head tanks in the flotation section.

Reject tailings from the milling process will be pumped as slurry and conveyed to the tailings facilities in 24-inch (or less) diameter pipelines. The pipeline from the plant site to TSF-2 will be underground and will be constructed to avoid surface disturbance to BLM land (see Figure 3).

Utilities

The utilities associated with the Project include a freshwater pipeline (including well fields and pump stations), a utility maintenance road, and a high voltage transmission line. These will be located within a utility corridor and terminate near the flotation plant.

The high voltage transmission line will terminate at a substation in the flotation plant area and will provide distribution power to the site.

The fresh water distribution system (FWDS) waterline begins at a pump station on Rosemont's Sanrita South property and terminates into a second pump station on Rosemont's property located south/southwest of the flotation plant. Distribution water will then be taken from the pump station into a freshwater tank and distributed as needed to site facilities.

Production water wells are located on Rosemont's Sanrita South and Sanrita West properties. Well water distribution piping from both well fields feeds water to Pump Station No. 1 at Sanrita South.

The high voltage transmission line is within a right-of-way (ROW) on State land and the fresh water distribution lines (includes well water distribution) are also with in the State land ROW or are within a ROW in the Town of Sahuarita (TOS). Costs associated with the removal of facilities and reclamation of disturbances within these ROWs are included in this MLRP.

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Section 6

Existing and Proposed Final Topography § R27-971, b.6

Rosemont owns property located in the northern portion of the Santa Rita Mountains in the Basin and Range physiologic province of the southwestern United States (Figure 1). The province is characterized by high mountain ranges adjacent to alluvial filled basins. The Basin and Range province has been further divided into the Mexican Highlands and Sonoran Desert subprovinces. The Santa Rita Mountains form the boundary between the Mexican Highlands of southeastern Arizona and the Sonoran Desert sub-province to the west.

Rosemont's property occupies relatively flat to mountainous topography in the northeastern and northwestern flanks of the Santa Rita Mountains. The Santa Rita Mountains separate the Cienega Basin to the east from the Santa Cruz Basin to the west. General property elevations range from about 3,800 feet amsl to over 6,300 feet amsl. The facility elevations associated with the Copper World Project range from about 3,800 feet amsl to about 4,950 feet amsl.

The Project will, where possible, place materials in their final configuration throughout the life of the Project. As outer facility slopes are constructed during the life of mine, the slopes will be constructed at final reclamation angles and covered in non-erosive waste rock so that regrading of these slopes will not be required at Project closure. Existing topography is shown on Figure 4. Proposed final topography is shown on Figure 5. Slope details are provided in Section 9.0

Vegetation

The Copper World Project area covers three main vegetation communities. This includes the Desert (Scrub) Grasslands Community, the Desert and Semi-Desert Grasslands Community, and the Oak, Juniper, Pinyon Community. Additionally, the utilities are mainly within the Mixed Palo Verde-Cacti Community along the utility corridor.

Existing vegetation along most of the utility corridor tends to be sparse, with species of cholla (*Cylindropuntia spp.*), prickly pear (*Opuntia spp.*), and other cacti being common at lower elevations. Saguaro (*Carnegiea gigantea*) are present but not common. Invasive (introduced or non-native) plants occur in varying densityalong the utility corridor and include Lehmann lovegrass (*Eragrostis lehmanniana*), Buffelgrass (*Pennisetum ciliare*) and snakeweed (*Gutierrezia spp.*).

As the elevation increases in the Project area, vegetation density also increases and transitions into semi-desert grassland that supports abundant catclaw acacia and mimosa (*Acacia greggii* and *Mimosa aculeaticarpa*), ocotillo (*Fouquieria splendens*), and yucca (*Yucca spp.*). Tree species are mostly limited to littleleaf palo verde (*Parkinsonia microphyllum*) and low-stature velvet mesquite (*Prosopis velutina*), both of which are more abundant along the xeric desert washes. The mesquite trees do not get very large because they are only supported by occasional rainfall.

The grassland communities gradually transition into the encinal oak community near the crest of the Santa Rita Mountains east of the Copper World pit area. Multiple species of oak (e.g., *Quercus emoryi*), juniper (*Juniperus spp.*) and other woody shrubs typical of the encinal oak

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community (e.g., *Vauquelinia californica)* can be found in these higher elevation areas, with denser concentrations occurring along drainages and on northern exposures.

Section 7

Narrative Description of Proposed Roads § R27-971, B.7

An access road will be located to the west of the flotation plant connecting to Santa Rita Road to the Project area. This access road is considered a primary access to the plant site. The main access road will consist of two 14-foot-wide travel lanes.

A utility maintenance road will be built along the utility corridor in the State land ROW and will be used to access the waterline and powerline as needed. This road can be accessed from Santa Rita Road.

In plant roads will run along the north side of the flotation plant area to the MIA area. There will also be a delivery route on the south side of the flotation plant that runs to the MIA area.

Mine haul roads will be constructed around the north, west and east edges of the planned waste rock storage area. Temporary haul roads will be constructed internal to the ultimate pit limits as necessary to provide access to working faces in the open pit. Haul roads will also access the primary crusher facility and TSF-1.

Haul roads will generally be 114-feet wide, inclusive of safety berms, and will support the traffic of 250- to 360-ton off-highway mine haulage trucks. In-plant roads will generally measure 24-feet wide.

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Section 8

Acreage Affected by Each Type of Surface Disturbance with Map § R27-971, B.8

The land position of the Project is sufficient to allow mining of the open pits, processing of ore, storage of tailings, storage of waste rock, and operation of milling and flotation equipment. The Project encompasses the approximate area presented in Table 2.

Table 2 depicts the acreages that will be disturbed at the mine site. A total of 1,292 acres of land will be disturbed. There will be approximately 169 acres of unreclaimed portions of the open pits leaving a total of 1,123 acres to be reclaimed.

Table 2 Disturbance Acreages

Affected Area	Disturbed Acres
Open Pits	169
Waste Rock Storage Area	149
Tailings Storage Facilities	756
Access and Haul Roads and Utility Corridors	87
Crushing, Processing and Support Facilities	64
Yards	34
Stormwater Controls	33
Total Disturbance	1,292

A portion of the Copper World Project area (TSF-2 and TSF-3) contains an area where the federally listed endangered Pima pineapple cactus has been identified. These areas will either be avoided or transplanting of the cactus will occur on other portions of Rosemont's private land. The Sonoran desert tortoise may also be encountered with in these same areas and is a candidate for listing as threatened or endangered. Pre-disturbance surveys will be conducted and tortoises relocated per approved protocols. With the exception of the TSF-2 and TSF-3, the remainder of the Project lies within jaguar critical habitat. No jaguars have been detected in the Santa Rita Mountains since 2015.

Additionally, historic mine openings located within facility footprints would be surveyed for bat species prior to land disturbance and bat exclusion activities would be implemented at appropriate openings to minimize impacts to bats. Both the translocation of plants and the exclusion of bats from historic mine openings would follow established protocols.

No fish habitats will be affected.

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Section 9

Proposed Reclamation Measures to Achieve Post Mining Land Use § R27-971, B.9

9.1 Measures that will be taken to Restrict Public Access to the Project § R27-971, B.9a

In order for the Rosemont operations to run safely and efficiently, it is important that the site be secure. Theft, vandalism, protestors and illegal activity could potentially have a negative effect on worker safety, the environment, and on operating efficiency. Therefore, Rosemont will be responsible for controlling access to the site with fencing, security patrols, and by limiting locations for officially entering and exiting the property.

A fence will be built to encompass all of the primary mining and processing operations and facilities, including portions of the utility corridor. Fencing will provide a zone restricted from public access and will also provide locations for environmental compliance monitoring. Signage on the fence will state that entrance into the Rosemont Copper World Project area is prohibited. A gatehouse will be located at the entrance to the plant site where the primary access road intersects the fence.

Fencing for post-closure safety will be coordinated with applicable agencies including the Mine Safety and Health Administration (MSHA) and the Arizona State Mine Inspector (ASMI). It will be the responsibility of Rosemont to install and maintain any of these safety measures. The fence(s) may be removed at some time in the post-closure period after considering grazing and safety needs. It is assumed that post-closure reclamation monitoring and maintenance will occur for a period of five years.

In addition to protecting the site from potential vandalism or theft, it is also important to protect the public from interfacing with mine operations and to prevent potential injury. Hazards of a typical mining operation include, but are not limited to, the following: traumatic injury or death from large equipment, entanglement in machinery, driving over steep embankments, slipping or falling on uneven ground or slippery surfaces, encountering high-voltage electricity, blasting with potential for flyrock, exposure to chemicals or reagents while not wearing proper personal protective equipment, and exposure to loud noises while not wearing hearing protection. Employees working at the site are required to receive specific training in accordance with MSHA covers various aspects of site safety, whereas recreationists will likely have no training and may not recognize the hazards. Therefore, it is imperative to control access and to enforce trespassing rules. The same fencing, patrols and signage discussed above will serve to warn recreationists and others in the area of potential dangers. In addition, employees will be trained to be aware of trespassers in the course of their normal duties and report any suspicious activity.

The facilities will be designed to minimize the need for visitors or vendors to drive or walk into hazardous areas. Supply route drivers will receive site orientation training and will be familiarized with their specific loading/unloading locations and procedures.

9.2 Measures that will be taken to Address Erosion Control and Stability § R27-971, B.9b

During operations, erosion control will be addressed by waste rock stabilization of slopes and operational control of stormwater. Post-mining reclamation will include a coarse waste rock cover, and vegetated soil cover in addition to stormwater controls. Geotechnical design will be ongoing during the mine planning process to confirm waste rock and tailings outer slopes and pit slopes are stable.

Foundation conditions underneath waste rock outer slopes will initially be inspected for the presence of unsuitable materials. These materials will be removed and placed to the interior of the waste rock storage area. The same approach will be applied to the tailings storage facilities. Facilities are designed to be at or above recommended safety factors as provided in the Arizona Mining BADCT Guidance Manual (ADEQ 2004).

Waste rock will generally be placed to achieve an approximate overall slope of 2.2:1. The overall outer slopes of the tailings storage facilities will be about 2.6:1V. Bench widths and heights will vary to achieve the overall slope configurations. Inner bench slopes will be 1.5:1. Final slope configurations will be achieved as part of operations.

Operational Stormwater Controls

During the operational phase, the open pits and plant areas will be designed as a closed system with all precipitation and local runoff collected. Stormwater collected within the pits will be routed to evaporation areas within the pit or routed/pumped to process water storage areas. Other stormwater that contacts other process areas or materials will also be used in the process. As practicable, non-contact stormwater will be routed offsite through sediment control structures.

The surface of the tailings areas will be sloped so that precipitation that falls on top of the active area will remain on top and be pumped to the process water circuit. This will also apply to runoff from the tailings slopes prior to placement of a waste rock cover. Temporary stormwater ditches will initially be constructed upstream of the tailings facility to divert non-contact stormwater offsite and away from the facility.

During the initial years, surface water runoff generated in the waste rock storage area will be managed by using internal stormwater controls and/or by allowing stormwater runoff to infiltrate back into the waste rock pile. Runoff from waste rock outer slopes will be contained within smaller basins or stormwater ponds located along the toe.

Diversion channels and other appropriate best management practices will be implemented as needed to direct stormwater and control erosion. Sediment control structures will be installed to reduce the total suspended solids load to downgradient drainages. Sediment structures (ponds) will be located and sized based on topography, available space, and the anticipated sediment generating capacity of the contributing basin. These unlined ponds will typically be sized to be no more than 6 feet deep. These structures constructed out of inert rockfill. The ponds will be temporary structures that will collect stormwater flows, settle velocities so that the heavier wash load falls out, and allow water to slowly seep through the rockfill.

Rosemont plans to contain any water from the tailings area on-site along with other stormwater that would be considered process water. Stormwater runoff from the waste rock storage area,

outer slopes of the covered tailings facilities, and office/administrative building areas may be discharged under an applicable stormwater permit. However, as general practice, Rosemont will contain most of the stormwater that falls directly within the Project footprint. This stormwater may be recycled into the process circuit or allowed to evaporate/infiltrate or be used for dust control.

The top surface of the tailings will be exposed to precipitation only during operations. All tailings will be covered with waste rock (or local borrow) and vegetated at closure.

Stormwater from above the open pits will be diverted around the pits as practicable. As noted, stormwater that falls within the pit and associated disturbed areas during operations will be contained on-site and used for mining and processing purposes or evaporated. Post-closure, any stormwater that enters the pit will be retained.

As practicable, stormwater runoff from the waste rock storage area will be diverted offsite through sediment control structures.

Pre- and Post-Mining Temporary Sediment and Erosion Controls

Temporary erosion and sediment controls will be installed to reduce sediment loading in stormwater during the pre-mining construction of the ancillary facilities and pre-stripping of the waste rock and tailings storage areas, etc. Stormwater controls would also follow the Stormwater Pollution Prevention Plan (SWPPP) developed for the Project. Temporary best management practices will be also installed to control erosion and sediment during demolition and reclamation activities.

Reclamation shall result in stable conditions with regard to erosion and seismic activity. Topographic contour grading will be conducted as needed to establish suitable reclaimed facilities. Permanent piles of mining materials shall not restrict surface drainages or contribute to excessive erosion. Drainage channels will be established as needed.

At the end of mine life, all operational facilities not required for closure applications will be removed, the areas regraded, capped with growth media (as needed), and seeded. Some sediment ponds may be left in place or new basins established to control the sediment load to downgradient drainages.

Measures taken to Preserve and Conserve Soil

Suitable cover soil materials may be salvaged used as cover during reclamation. Waste rock stored at the waste rock facility will also be used during reclamation for non-erosive rock cover and as vegetative cover. At reclamation, soil and waste rock areas suitable for vegetation will be seeded.

9.3 Measures to Address Revegetation, Conservation, and the Care and Monitoring of Revegetated Areas § R27-971, B.9c

The goal of the Project revegetation program is to meet state of Arizona requirements by establishing native, diverse and productive plant communities capable of stabilizing the soil against wind and water erosion and supporting the post-mining land uses of ranching and

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wildlife habitat. Much of the reclaimed landscape will be suitable for grazing once vegetation is established.

Based on the Arizona Department of Transportation Final Stabilization Standards, Rosemont is proposing that the vegetation cover required for final stabilization to be complete is 70% of the existing native vegetation coverage that is representative of the local area. This would be applicable to the top areas of reclaimed waste rock and tailings facilities and the reclaimed plant site area. Slopes are generally planned with a coarse waste rock cover to resist erosion.

9.4 Measures That Will Be Taken to Encourage Fish and Wildlife Post-Mining Land Use and Their Compatibility with Fish and Wildlife Habitat on Adjacent Lands § R27-971, B.9d

Wildlife habitat is a defined post-mining land use. Rosemont is planning reclamation of the facility to establish wildlife habitat. Species selected for use in the seed mix(s) must be native and common to the Project area and support wildlife habitat and commercially available. Additionally, areas disturbed by the Project will generally be fenced to exclude the public. As noted, ranching will also be continued on the land post-mining. Therefore, selected species will also be chosen that are supportive of grazing.

Section 10

A Proposed Schedule for Reclamation Measures § R27-971, B.10

Figures 4 and 5 show existing and proposed topography for the site facilities. The Project includes a total of 1,292 acres of disturbed area. Mining is currently expected to be completed in less than 10 years. Limited site preparation work in anticipated beginning in September 2021.

Post-mining reclamation will commence immediately upon mining cessation. Reclamation activities are anticipated to be completed within a 12-month period followed by 5 years of site monitoring and maintenance. A total of 1,123 acres of disturbance will be reclaimed (169 acres of pit area will not be reclaimed).

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Section 11

Estimated Costs to Perform Each of the Proposed Reclamation Measures § R27-971, B.11

Reclamation cost estimates were performed using the Standard Reclamation Cost Estimator (SRCE) spreadsheets (SRCE 2021). Descriptions of cost estimating assumptions, reclamation activities and quantities, and resulting costs are provided in Appendix A. A cost summary is provided in Table 3 below.

Table 3 Reclamation Cost Summary

Cost Element	Labor	Equipment	Material	Total
Earthwork/Recontouring	$2,203,000	$4,623,000	$352,000	$7,178,000
Revegetation/Stabilization	$135,000	$48,000	$380,000	$563,000
Waste Disposal	-	-	-	$50,000
Structure, Equipment, and Facility Removal	$3,730,000	$1,135,000	$86,000	$4,951,000
Monitoring	$139,000	$22,000	$44,000	$205,000
Construction Management and Support	$832,000	$750,000	$20,000	$1,602,000
Indirect Costs				$5,151,000
Total				$19,700,000

The average reclamation cost per acre for the total reclaimed area of 1,123 acres is just under $5,900. Total bonding cost for the same acreage is just over $17,500 per acre.

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Section 12

References

ADEQ, 2004. Arizona Mining BADCT Guidance Manual. Publication # TB 04-01.

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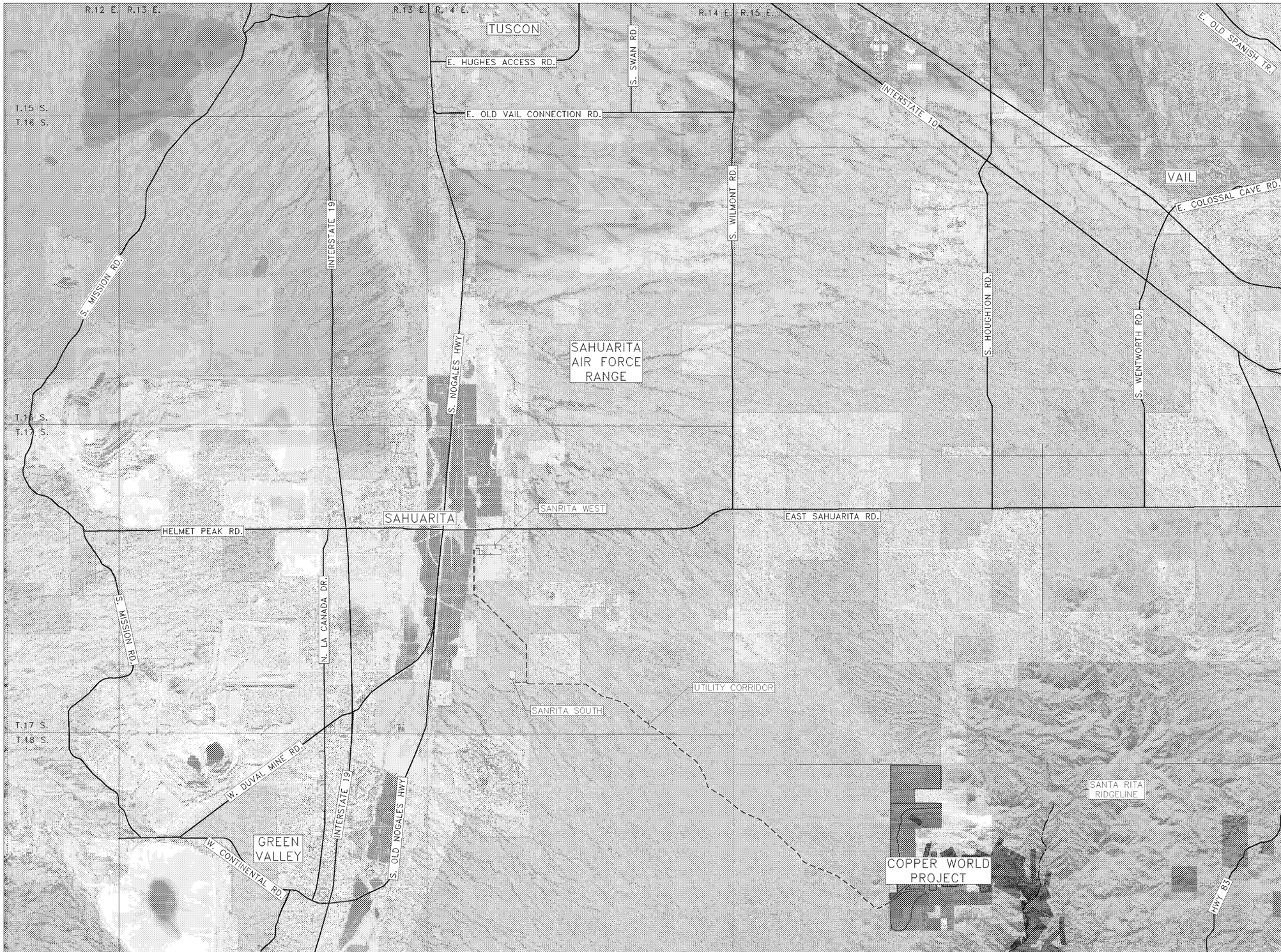
Figures



LEGEND

- EXISTING ROADWAY
- TOWNSHIP LINE
- SANTA RITA RIDGELINE
- WATERLINE
- POWER LINE
- GENERAL FACILITY FOOTPRINT
- PIT OUTLINE
- ROSEMONT PATENTED LANDS
- ROSEMONT FEE LANDS
- PRIVATE LAND (NO COLOR)
- BLM
- USFS
- STATE
- INDIAN LANDS

N

SCALE

5000' 0 5000' 10000'

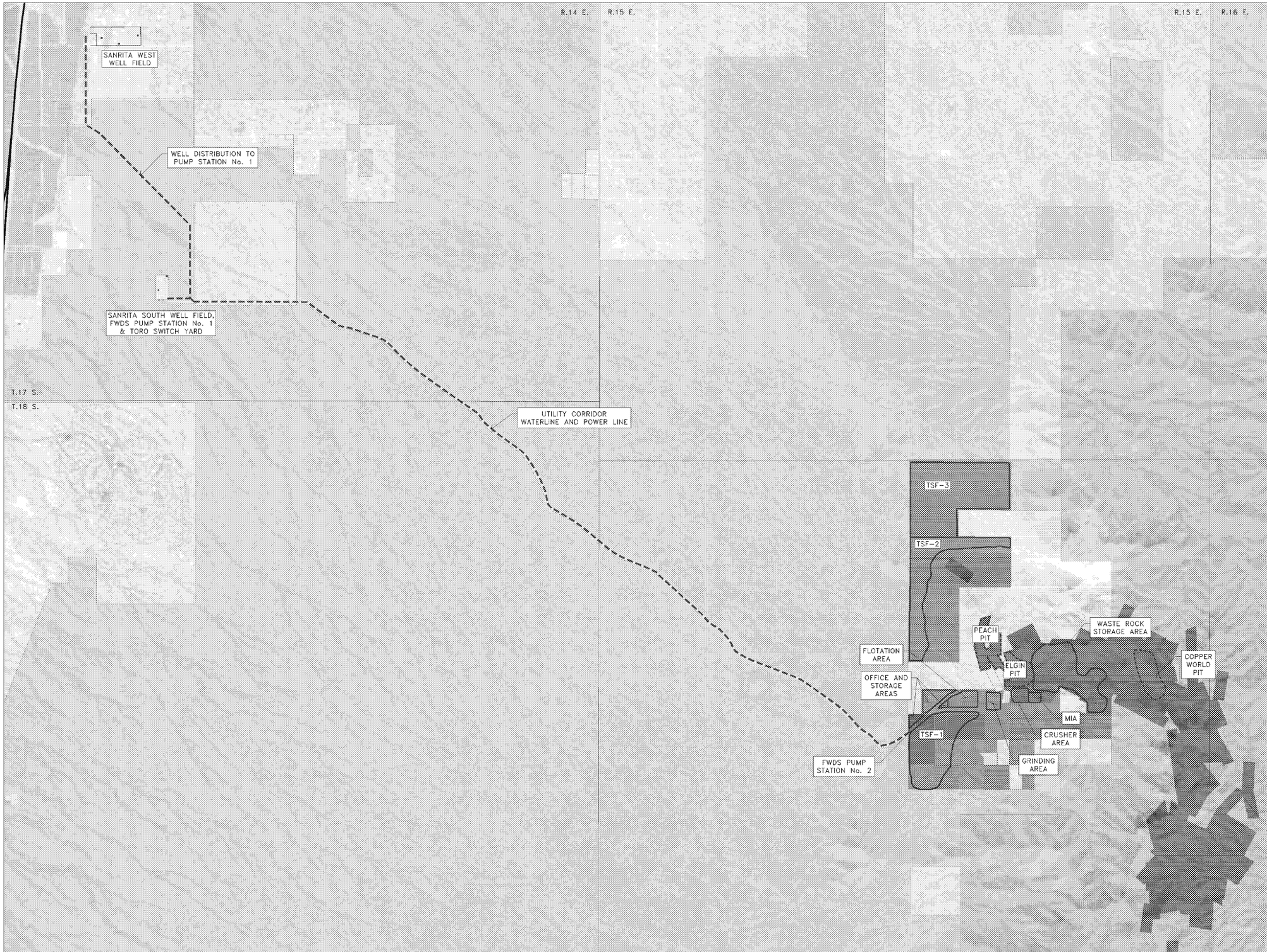
CONTOUR INTERVAL = 10'

PROJECT:
MINED LAND RECLAMATION PLAN

COUNTY: PIMA	STATE: ARIZONA
	DATE: JUNE 2021

FIGURE 1 VICINITY MAP

HUDBAY



LEGEND

- TOWNSHIP LINE
- WATERLINE
- POWER LINE
- GENERAL FACILITY FOOTPRINT
- PIT OUTLINE
- ROSEMONT PATENTED LANDS
- ROSEMONT FEE LANDS
- PRIVATE LAND (NO COLOR)
- BLM
- USFS
- STATE

N

SCALE

2500' 0 2500' 5000'

PROJECT: **MINED LAND RECLAMATION PLAN**	
COUNTY: PIMA	STATE: ARIZONA
	DATE: JUNE 2021
FIGURE 2 UTILITY CORRIDOR	
HUDBAY	

LEGEND

- TOWNSHIP LINE
- WATERLINE
- POWER LINE
- GENERAL FACILITY FOOTPRINT
- PIT OUTLINE
- HAUL ROAD
- EXISTING ROAD
- BURIED TAILINGS LINE
- ROSEMONT PATENTED LANDS
- ROSEMONT FEE LANDS
- PRIVATE LAND (NO COLOR)
- BLM
- USFS
- STATE

N

SCALE

1000' 0 1000' 2000'

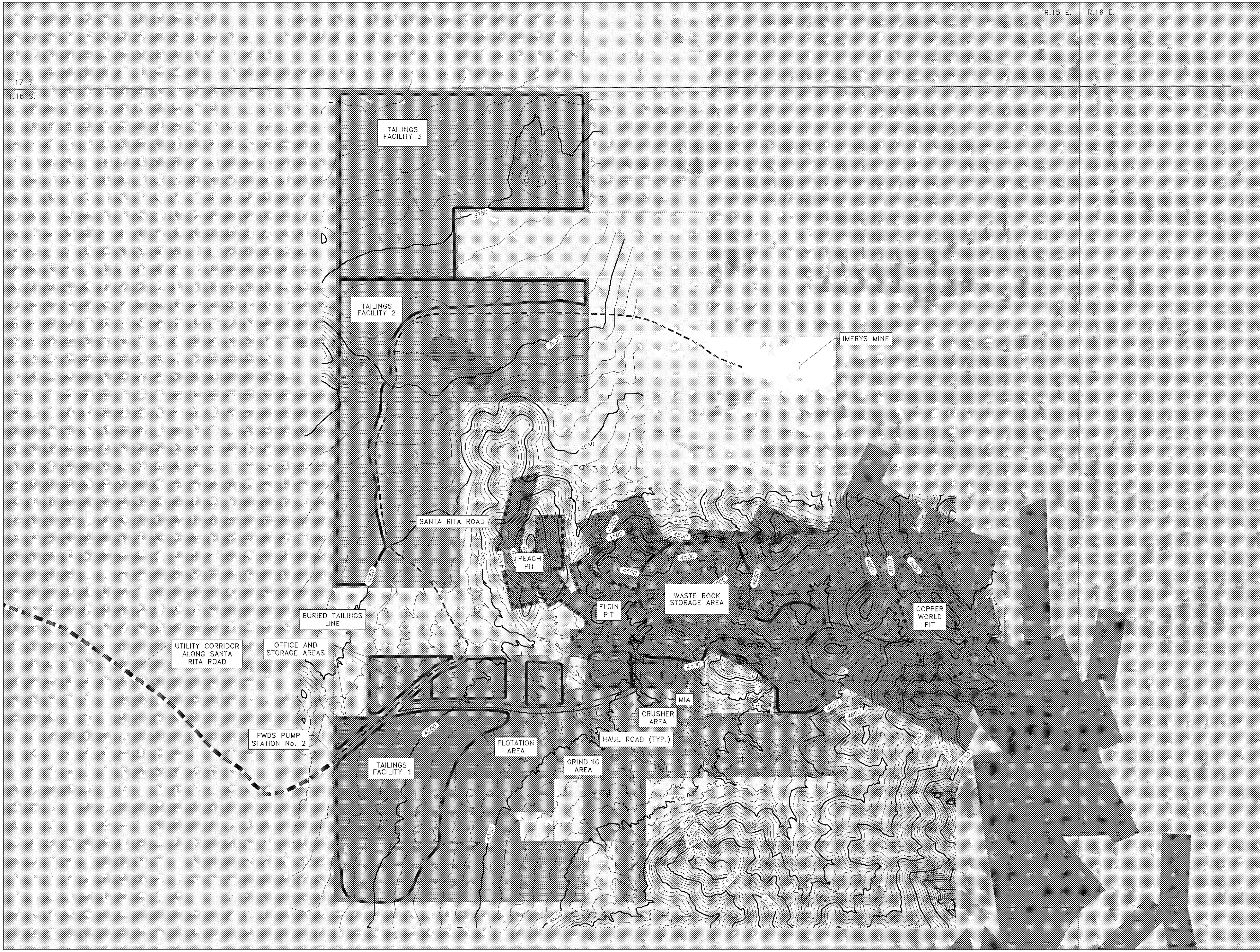
CONTOUR INTERVAL = 10'

PROJECT:
MINED LAND RECLAMATION PLAN

COUNTY: PIMA	STATE: ARIZONA
	DATE: JUNE 2021

FIGURE 3
PROPOSED PROJECT FACILITIES

HUDBAY



LEGEND

- CONTOURS
- TOWNSHIP LINE
- WATERLINE
- POWER LINE
- GENERAL FACILITY FOOTPRINT
- PIT OUTLINE
- HAUL ROAD
- EXISTING ROAD
- BURIED TAILINGS LINE
- ROSEMONT PATENTED LANDS
- ROSEMONT FEE LANDS
- PRIVATE LAND (NO COLOR)
- BLM
- USFS
- STATE

N

SCALE

1000' 0 1000' 2000'

CONTOUR INTERVAL = 30'

PROJECT:
MINED LAND RECLAMATION PLAN

COUNTY: PIMA	STATE: ARIZONA
	DATE: JUNE 2021

FIGURE 4 EXISTING TOPOGRAPHY

HUDBAY

ED_013507_00000769-00040

LEGEND

- CONTOURS
- TOWNSHIP LINE
- WATERLINE
- POWER LINE
- GENERAL FACILITY FOOTPRINT
- PIT OUTLINE
- HAUL ROAD
- EXISTING ROAD
- BURIED TAILINGS LINE
- ROSEMONT PATENTED LANDS
- ROSEMONT FEE LANDS
- PRIVATE LAND (NO COLOR)
- BLM
- USFS
- STATE

N

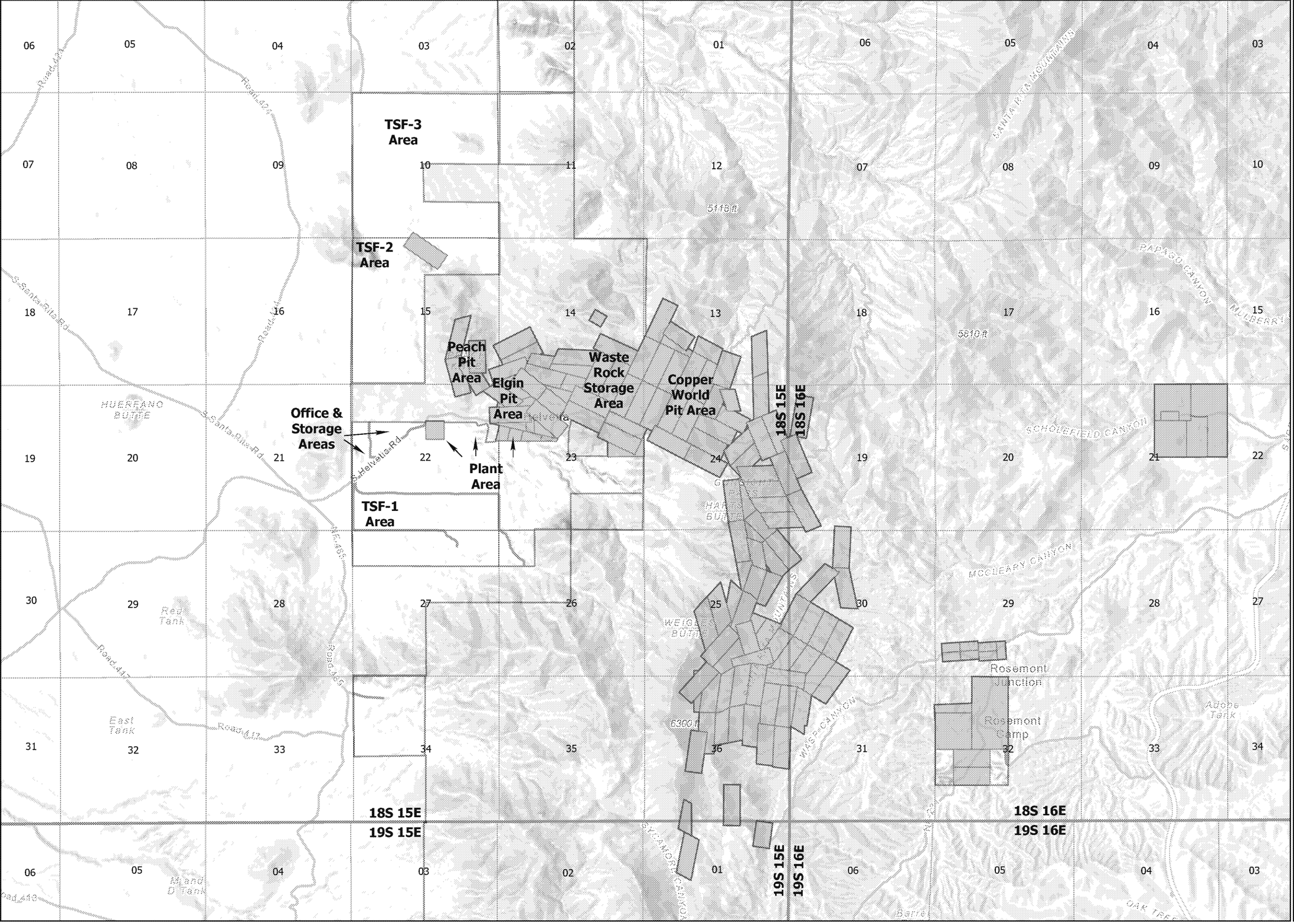
SCALE

1000' 0 1000' 2000'

CONTOUR INTERVAL = 30'

PROJECT: **MINED LAND RECLAMATION PLAN**	
COUNTY: PIMA	STATE: ARIZONA
	DATE: JUNE 2021
FIGURE 5 PROPOSED TOPOGRAPHY	
HUDBAY	

Exhibits



Legend

- Rosemont Patented Claims
- AZ BLM Surface Management (BLM 2019, WRI Modified 2021)
- Bureau of Land Management (BLM)
- Private Land (No Color)
- State Trust Land
- US Forest Service (USFS)

1:40,000

0.5 0.25 0 0.5

Miles

Project: Rosemont Copper Company	
Source: ArcGIS Map Service Server	
County: Pima	State: Arizona
PRJ: NAD83 UTM 12 Meters	Date: 6/21/2021

Exhibit 1. Rosemont Copper World Project.

HUDBAY

Appendix A

Reclamation Cost Estimates

CDM Smith

Memorandum

Rosemont Copper World Mined Land Reclamation Plan June 2021
Reclamation Cost Basis

This document outlines the reclamation process and assumptions behind developing reclamation costs for the Rosemont Copper World Project (Project) in Pima County, Arizona as part of the Mined Land Reclamation Plan submitted to the Arizona State Mine Inspector (ASMI). Reclamation costs were estimated using the Standard Reclamation Cost Estimator (SRCE) software from the Nevada Division of Environmental Protection (https://ndep.nv.gov/land/mining/reclamation/reclamation-cost-estimator) developed as a collaborative effort between the Nevada Department of Environmental Protection, Bureau of Mining Regulation and Reclamation, U.S. Department of Interior, Bureau of Land Management, and Nevada Mining Association. The SRCE utilizes standardized reclamation calculation methods, productivity data and procedures, and user-inputted data to create a cost-estimate for mine closure and reclamation activities.

The information below summarizes each applicable reclamation component for the Project at closure and the SRCE model assumptions used to calculate the reclamation costs. It was assumed that large or medium sized equipment would be used for all activities. It was also assumed that waste rock would be used for reclamation as non-erosive rock cover or as seeded cover material, with a few exceptions noted below.

Cost-Data

Cost-Data was imported from the SRCE database as a User-Generated Data file using the Southern Nevada cost basis with minor adjustments made for Pima County, AZ. The Southern Nevada database costs are related to the Las Vegas, Nevada area (Clark County, Nevada) which are considered similar to costs in the Tucson, Arizona area (Pima County, Arizona) where the Rosemont Copper World Project is located. Labor rates and indirect costs are based on Davis-Bacon rate schedules for equipment operators and laborers. Project management and technical labor are based on RS Means 2020 labor rates. Materials costs, equipment operating rates, fuel usage, and equipment maintenance costs are based on regional vendor quotes, RS Means 2020, and CAT Handbook. Details for pricing are provided within the cost summary sheets attached.

Waste Rock Dumps

One waste rock facility (waste rock storage area) is proposed for the Project. The waste rock storage area (WRSA) would be configured with a sloped western side and relatively flat top. The final reclaimed western slope would encompass approximately 28 acres and the flat top would cover approximately 121 acres. Total reclaimed footprint is estimated at 149 acres. It was assumed that the sloped western side would be built during mining at an approximate overall slope of 2.2:1 with non-erosive rock cover and would require no regrading or seeding during final reclamation. The top of the WRSA would require minor regrading to provide proper drainage post-closure. It is assumed that a volume equal to 1 foot over 1/3 of the area of the WRSA would be graded. The flat top area would be scarified and seeded after mine closure.

Heap Leach

The Project does not currently include any heap leach facilities.

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Tailings

The Project would include three Tailings Storage Facilities (TSF) of varying sizes. All three would have sloped embankments, final embankment height of approximately 200 feet. TSF-1 reclaimed embankment is estimated to cover approximately 18 acres and the flat top is estimated at 164 acres. TSF-2 reclaimed embankment is estimated to cover approximately 71 acres and the flat top is estimated at 120 acres. TSF-3 reclaimed embankment is estimated to cover approximately 40 acres and the flat top is estimated at 344 acres. For the SRCE it was assumed that the sloped west sides of all three tailing facilities would be built at an overall approximate slope of 2.6:1 and would be reclaimed with approximately 2 feet of non-erosive rock cover and would require no regrading or seeding during final reclamation. The flat tops of all three tailings facilities will be covered with a 1-foot layer of growth media, scarified, and seeded during final reclamation. Costs assume suitable growth media is hauled from the WRSA to the three tailings sites. Cover may alternatively be taken from materials salvaged from facility footprints and locally stockpiled. The higher cost of these two options was assumed herein.

It was assumed that the flat tops of the tailing's facilities would require minor regrading to provide proper drainage post-closure. It is assumed that a volume equal to 1 foot over 1/3 of the area of each tailings facility would be graded.

Roads

Within the Rosemont Copper World Project area there are haul roads and access roads that will require reclamation work. The reclamation process was slightly different for each type of road and is further explained below.

Haul Roads

There are approximately 2 miles of on-site haul roads with an average width of 114-feet. These will be reclaimed to a width of 20-feet to allow for future monitoring and maintenance access. For reclamation, approximately 94-feet of the haul road width will be regraded and seeded. The cover soil will be salvaged from the cut/fill material placed adjacent to the haul roads during construction. It is assumed that the haul roads each have a 6-foot safety berm on one side of the road. Culverts are also dispersed throughout the haul roads, the reclamation process for those is explained in the Misc. Costs section.

Utility Corridor Access Road

The utility corridor contains an approximate 12.5-mile access road with an average width of 30-feet. It was assumed that there were no safety berms on this road, and that the entire width would be reclaimed at mine closure. The utility corridor access road will be regraded and seeded for reclamation. It was assumed that cover soil would be salvaged from available regraded road materials.

Within the utility corridor there are 12.5 miles of water pipeline for the fresh water delivery to the mine. For convenience, the reclamation of the pipeline corridor was included in the SRCE road costs module. Pipeline removal is included under the Misc. Costs. After pipeline removal the corridor area would re-graded and seeded. It was assumed that cover soil would be material salvaged during the installation and removal of the pipeline.

Pits

At closure, pit access will be restricted by fencing (see Misc. Costs). Therefore, no safety berms are included.

Quarries and Borrow Pits

The Project does not currently include any quarries or borrow pits.

Underground Openings

The Project does not currently include any underground openings.

Haul Material

The Project does not currently include any additional haul material.

Foundations & Buildings

The total square footage of buildings was supplied by Rosemont at 165,864 square feet. Structures include two Flotation Buildings, a Crusher Building, a Grinder Building, a Molybdenum Plant, a Moly Filtration and Concrete Loadout Building, a Copper/Moly Load Out Building, and various mine-support facilities. The dimensions in the SRCE are estimates and include a 30-foot Eve Height, 12-inch slab thickness, 12-inch foundation wall thickness and 6-foot foundation wall height.

For reclamation, the concrete foundations will be broken and buried in place, with 4-feet of cover placed on top. Cover, including growth media, will be obtained from materials immediately adjacent to the area. The building areas will then be graded using soil from original construction grading and all disturbed areas will be seeded.

Other Demo & Equip Removal

Demolition of two pump stations, which is part of the fresh water delivery system, was included in the calculations. Demolition cost was estimated at $100,000 for each pump station.

Sediment & Drainage Control

For stormwater control and sediment control at closure, an estimate based on similarly sized projects was used for the total length of diversion ditches and amount of sediment ponds.

Diversion Ditches

For stormwater diversion, the site contains an estimated 56,000-feet of diversion ditches. Of this total, it was assumed that 11,200-feet would require riprap armoring. Calculations included riprap on the bottom and sides of these ditches. A depth of 3-feet, bottom width of 6-feet, and side slope of 2:1 was used for calculations. For reclamation, it was assumed that these ditches would be seeded within the channel.

Sediment Ponds

It was assumed that there would be up to six sediment ponds placed throughout the Project. Each pond is estimated to be 100-feet by 300-feet and have a depth of 6-feet. The calculations used assumed that all excavated material would be used to build a berm around the sediment ponds. It was also assumed that no liners would be installed in the ponds. For reclamation, these areas will be reclaimed and seeded.

Process Ponds, Landfills, Yards

No process ponds, or landfills, are included for closure reclamation. Process ponds could be included in the Project but reclamation of these will be covered under the Arizona Aquifer Protection Permit Program. Yards associated with office and storage areas total 34 acres and would be reclaimed by regrading and covering with 12-inches of growth that is assumed to be located adjacent to the yards. The area would be scarified and seeded.

Waste Disposal

Most solid waste during closure will be removed from the site as part of the building demolition costs. Additional (miscellaneous) solid waste removal is estimated to be 1,000 cubic yards. It is assumed that solid waste dumpsters would be rented over the estimated 12-month reclamation period.

Well Abandonment

Wells included in the cost-estimate include 8 dewatering wells. Dewatering wells are assumed to be 12-inches in diameter and 500 feet in depth. The reclamation cost-estimate assumes that the holes would be grouted and capped at surface with neat cement. Monitoring wells were assumed to remain as part of the ADEQ Aquifer Protection Permit Program. Production water wells were assumed to be capped but not abandoned.

Misc. Costs

Miscellaneous costs included fence installation around the pits to restrict access, culvert and buried pipe removal, and power line and substation removal.

Fence Installation

Fencing to surround the Peach/Elgin Pit area measures an estimated 21,445-feet in total length and the Copper World Pit fence is estimated at 8,854-feet in total length. Both fences were assumed to be constructed of 5-stranded barbed wire. Fences will be installed in lieu of berms around the pits. These fences will be left in place for safety.

Culvert and Buried Pipe Removal/Abandonment

The removal of the 12.5-mile-long freshwater delivery system pipeline within the utility corridor is included in this portion of the estimate. The pipeline length is estimated at 66,000-feet and is assumed to be 24-inches in diameter. This portion of the SRCE is only relevant for the removal of this pipeline. The reclamation costs for this area are calculated in the previous section for Roads.

Removal of the culverts underneath the Haul Roads and Access Roads were also included in this section. It was assumed there were 10 culverts per mile of haul road, each 140-feet in length and 24-inches in diameter. In order to preserve a 20-foot access road along these haul roads for future maintenance activities, it was assumed that a 40-foot length segment would be left in place at each culvert location. The removal of culverts associated with the former plant site roads were assumed to consist of 10 culverts, each 60-feet in length and 24-inches in diameter. Reclamation of these plant site roads was included in the general area grading.

It was assumed that no culverts were installed along the 12.5-mile length of the utility access road.

The approximate 1,700-foot-long buried tailings slurry pipeline between the mill and TSF-2 is assumed to be 24-inches in diameter and will be closed in place by filling with cement grout.

Power Line and Switchyard/Substation Removal

For reclamation of the site, 9.1-miles of powerline will be removed as well as one switchyard and one substation. It was assumed the powerline was single pole construction. Reclamation of disturbed areas associated with removal of the powerline were assumed coincident and part of the water line removal cost.

Reclamation Maintenance and Monitoring

For reclamation maintenance, it was assumed that 10% of the total revegetation area would need to be reseeded per year. It was also assumed that 10% of the graded and reclaimed area would need erosion maintenance per year. Maintenance was assumed to occur for 5 years.

For reclamation monitoring, it is assumed that field visits to evaluate site conditions would be required 4 times per year for 5 years. One Field Geologist/Engineer and one Range Scientist are assumed to visit the site for 2, 8-hour days, each quarter during the year. Costs also include an additional 4 hours of work quarterly for the Field Geologist/Engineer to prepare field reports, and 4 hours of work quarterly for the Range Scientist to prepare reports. Travel costs were estimated using 4 hours one-way for each trip to the site and 1 truck per trip.

No soil or water sampling is included in the cost estimate. It is assumed that sampling of this nature would occur under the Aquifer Protection Permit Program.

Construction Management and Road Maintenance

It was assumed that reclamation could be completed in 12 months of full-time work. Construction management costs include two supervisors working full time (8 hours per day) for the duration of the reclamation period (12 months). Costs include transportation (pickup truck), one temporary on-site office rental, and a temporary toilet.

For construction management during the 5-year Monitoring and Maintenance period, one part-time (12 hours per quarter) supervisor was assumed. A temporary toilet is assumed to be needed at the site for the duration of the 5-year monitoring period.

During active reclamation, costs include using one large water truck and one large grader for road maintenance and dust control for the duration of the 12-month period. For Monitoring and Maintenance, it was assumed that road maintenance by one medium sized grader would be required yearly (12 hours per year) for 5 years and no water truck.

Water Fees were assumed to be $19,879 assuming on-site water would be available for the duration of the reclamation work. This cost is based on an ADWR removal fee of $3.00 per acre-foot of pumping out of the AMA, an estimated 81 acre-feet of usage during the reclamation period, and about $243.00 per acre-foot for pumping costs.

Enter Data Below in Green and Blue Spaces

STANDARDIZED RECLAMATION COST ESTIMATOR

Version 1.4.1
Build 017b (Revised 16 May 2019)
Approved for use in Nevada, August 1, 2012

COST DATA FILE INFORMATION

File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm

Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm

Cost Data Date: June 3, 2021

Cost Data Basis: User Data Data Cost Units: Imperial

Author/Source: CDM Smith

PROJECT INFORMATION

Property/Mine Name: Rosemont Copper World Project Property Code:

Project Name: Rosemont Copper World Mined Land Reclamation Plan

Date of Submittal: June 7, 2021 Average Altitude: 4300 ft.

Select One: ☐ Notice or Sm Exploration Plan ☐ Lg Exploration Plan ☒ Mine Operation

Select One: ☐ Private Land ☒ Public or Public/Private

Cost Estimate Type: Surety

Cost Basis Category: Southern Nevada - Adjusted for Arizona

Cost Basis Description: **Clark, Esmeralda, Lincoln and Nye counties - adjusted for Pima County, AZ**

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ıe: Rosemont Copper World Mined Land Reclamation Plan
Project Date: June 7, 2021
er World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Reclamation Plan

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Description

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Closure Cost Estimate
Cost Summary
Project Name: Rosemont Copper World Mined Land Reclamation Plan
Project Date: June 7, 2021
Model Version: Version 1.4.1
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Data Cost File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Basis: Southern Nevada - Adjusted for Arizona

A. Earthwork/Recontouring	Labor (1)	Equipment (2)	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$4,158	$17,171	$0	$21,329
Well Abandonment	$42,348	$78,145	$7,084	$127,577
Pits	$0	$0	N/A	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings	$0	$0	$0	$0
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$8,560	$35,351	$0	$43,911
Landfills	$0	$0	$0	$0
Tailings	$1,487,405	$4,140,052	$0	$5,627,457
Foundation & Buildings Areas	$53,816	$127,014	$0	$180,830
Yards, Etc.	$28,036	$75,259	$0	$103,295
Drainage & Sediment Control	$578,180	$149,746	$345,233	$1,073,159
Generic Material Hauling	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal	**$2,202,503**	**$4,622,738**	**$352,317**	**$7,177,558**
Mob/Demob if included in Other User sheet	$0	$0	$0	$0
Mob/Demob				$0
Subtotal "A"	**$2,202,503**	**$4,622,738**	**$352,317**	**$7,177,558**

B. Revegetation/Stabilization	Labor (1)	Equipment (2)	Materials	Total
Exploration	$0	$0	$0	$0
Exploration Roads & Drill Pads	$0	$0	$0	$0
Roads	$12,231	$4,371	$34,360	$50,962
Well Abandonment				N/A
Pits	$0	$0	$0	$0
Quarries & Borrow Areas	$0	$0	$0	$0
Underground Openings				N/A
Process Ponds	$0	$0	$0	$0
Heaps	$0	$0	$0	$0
Waste Rock Dumps	$16,940	$6,050	$47,583	$70,573
Landfills	$0	$0	$0	$0
Tailings	$87,920	$31,400	$246,961	$366,281
Foundation & Buildings Areas	$8,960	$3,200	$25,171	$37,331
Yards, Etc.	$4,760	$1,700	$13,371	$19,831
Drainage & Sediment Control	$4,424	$1,580	$12,429	$18,433
Generic Material Hauling	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "B"	**$135,235**	**$48,301**	**$379,875**	**$563,411**

C. Detoxification/Water Treatment/Disposal of Wastes**	Labor (1)	Equipment (2)	Materials	Total
Process Ponds/Sludge				$0
Heaps				$0
Dumps (Waste & Landfill)				$0
Tailings				$0
Surplus Water Disposal				$0
Monitoring				$0
Miscellaneous				$0
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$50,235
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "C"	**$0**	**$0**	**$0**	**$50,235**

D. Structure, Equipment and Facility Removal, and Misc.	Labor (1)	Equipment (2)	Materials	Total
Foundation & Buildings Areas	$2,067,999	$728,403	$0	$2,796,402
Other Demolition	$160,000	$130,000	$60,000	$350,000
Equipment Removal	$0	$0	$0	$0
Fence Removal	$0	$0		$0
Fence Installation	$94,836	$15,755	$25,754	$136,345
Culvert Removal	$922,530	$260,820	N/A	$1,183,350
Pipe Removal	$0	$0	N/A	$0
Powerline Removal	$425,916			$425,916
Transformer Removal	$58,997			$58,997
Rip-rap, rock lining, gabions	$0	$0	$0	$0

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Closure Cost Estimate
Cost Summary
Project Name: Rosemont Copper World Mined Land Reclamation Plan
Project Date: June 7, 2021
Model Version: Version 1.4.1
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm

Other Misc. Costs	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "D"	**$3,730,278**	**$1,134,978**	**$85,754**	**$4,951,010**
E. Monitoring	**Labor (1)**	**Equipment (2)**	**Materials**	**Total**
Reclamation Monitoring and Maintenance	$139,046	$22,030	$44,146	$205,222
Ground and Surface Water Monitoring	$0	$0	$0	$0
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Subtotal "E"	**$139,046**	**$22,030**	**$44,146**	**$205,222**
F. Construction Management & Support	**Labor**	**Equipment (2)**	**Materials**	**Total**
Construction Management	$551,656	$104,612	N/A	$656,268
Construction Support	$0	$42,684	$0	$42,684
Road Maintenance	$279,844	$602,721	$19,879	$902,444
Other User Costs (from Other User sheet)	$0	$0	$0	$0
Other**				$0
Subtotal "F"	**$831,500**	**$750,017**	**$19,879**	**$1,601,396**
Subtotal Operational & Maintenance Costs	**Labor (1)**	**Equipment (2)**	**Materials (3)**	**Total**
Subtotal A through F	**$7,038,562**	**$6,578,064**	**$881,971**	**$14,548,832**

** Other Operator supplied costs - additional documentation required.

Indirect Costs			**Include?**	**Total**
1. Engineering, Design and Construction (ED&C) Plan (7)				$872,930
2. Contingency (8)				$872,930
3. Insurance (9)	$105,578			$105,578
4. Performance Bond (10)				$436,465
5. Contractor Profit (11)				$1,454,883
6. Contract Administration (12)				$1,163,907
7. Government Indirect Cost (13)				$244,420
Subtotal Add-On Costs				**$5,151,113**
Total Indirect Costs as % of Direct Cost				35%
GRAND TOTAL				**$19,699,945**

Administrative Cost Rates (%)					
	Cost Ranges for Indirect Cost Percentages				
	<=	<=	<=	>	
1. Engineering, Design and Construction (ED&C) Plan (7)	$1,000,000	$25,000,000		$25,000,000	Small Plan
Variable Rate	8%	6%		4%	0%
	<=	<=	<=	>	
2. Contingency (8)	$500,000	$5,000,000	$50,000,000	$50,000,000	Small Plan
Variable Rate	10%	8%	6%	4%	0%
3. Insurance (9)	1.5%	of labor costs			
4. Bond (10)	3.0%	of the O&M costs if O&M costs are >$100,000			
5. Contractor Profit (11)	10%	of the O&M costs			
	<=	<=	<=	>	
6. Contract Administration (12)	$1,000,000	$25,000,000		$25,000,000	
Variable Rate	10%	8%		6%	
Government Indirect Cost (13)	21%	of contract administration			

RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES

NOTE :

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading,
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced,
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid,
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a

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RECLAMATION COST ESTIMATION SUMMARY SHEET FOOTNOTES (Full Text)

NOTE :

1. Federal construction contracts require Davis-Bacon wage rates for contracts over $2,000. Wage rate estimates may include base pay, payroll loading, overhead and profit. To avoid double counting of any of the identified administrative costs the operator must itemize the components of their labor cost estimates or provide BLM with a signed statement, under penalty of USC 1001, that identifies what specific administrative costs are included in the quoted hourly rate.
2. The reclamation cost estimate must include the estimated plugging cost of at least one drill hole for each active drill rig in the project area. Where the submitted Notice or approved Plan of Operations calls for drill holes to be plugged, but doesn't specifically require the drill holes be plugged before the drill rig has been moved from the drill pad, the reclamation cost estimate must include the plugging cost for those drill holes. For all drill holes and wells scheduled to be left open, the estimated plugging cost must be included in the reclamation cost estimate. Where the approved Plan of Operations proposes immediate mining through an area where the drilling is to occur, and the cost of the post-mining reclamation is included in the reclamation cost estimate, the cost estimate does not need to include the plugging costs for those drill holes.
3. Miscellaneous items should be itemized on accompanying worksheets.
4. Fluid management should be calculated only when mineral processing activities are involved. Fluid management represents the costs of maintaining proper fluid management to prevent overflow of solution ponds through premature cessation or abandonment of operations. Calculate a minimum six month direct cost estimate which includes power, supplies, equipment, labor and maintenance.
5. Handling of hazardous materials includes the cost of decontaminating, neutralizing, disposing, treating and/or isolating all hazardous materials used, produced, or stored on the site.
6. Any mitigation measures required in the Plan of Operations must be included in the reclamation cost estimate. Mitigation may include measures to avoid, minimize, rectify and reduce or eliminate the impact, or compensate for the impact.
7. Engineering, design and construction (ED&C) plans are often necessary to provide details on the reclamation needed to contract for the required work. To estimate the cost to develop an ED&C plan use 4-8% of the O&M cost. Calculate the ED&C cost as a percentage of the O&M cost as follows: up to and including $1 million, use 8%; over $1 million to $25 million, use 6%; and over $25 million, use 4%. Inclusion of a line item for the development of an ED&C plan may not be necessary for small operations, such as notice-level exploration. With small, uncomplicated reclamation efforts contracting may be able to proceed without developing an ED&C plan. [ED&C is automatically eliminated if "Notice" is selected on the Property Information Sheet]
8. A contingency cost is included in the reclamation cost estimation to cover unforeseen cost elements. Calculate the contingency cost as a percentage of the O&M cost as follows: up to and including $500,000, use 10%; over $500,000 to $5 million, use 8%; over $5 million to $50 million, use 6%; and greater than $50 million, use 4%. As with the ED&C cost, inclusion of a contingency cost may not be necessary for small operations, such as notice-level exploration.
9. Insurance premiums are calculated at 1.5% of the total labor costs. Enter the premium amount if liability insurance is not included in the itemized unit costs.
10. Federal construction contracts exceeding $100,000 require both a performance and a payment bond (Miller Act, 40 USC 270et seq.). Each bond premium is figured at 1.5% of the O&M cost. Enter the sum of both premium costs on this line.
11. For Federal construction contracts, use 10% of estimated O&M cost for the contractor's profit.
12. To estimate the contract administration cost, use 6 to 10% of the operational and maintenance (O&M) cost. Calculate the contract administration cost as a percentage of the O&M cost as follows: up to and including $1 million, use 10%; over $1 million to $25 million, use 8%; and greater than $25 million use 6%.
13. Government indirect cost rate is 21% of the contract administration costs

Closure Cost Estimate
Reclamation Quantities

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Data Cost File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Reclamation Quantity Summary

												Unit Costs					
	Description	Total Regrade or Haul Volume cy	Total Regrade or Haul Cost $	Total Cover Volume cy	Cover Placement Cost $	Total Growth Media Volume cy	Growth Media Placement Cost $	Total Surface Area acres	Total Scarify Cost $	Total Revetation Cost $	TOTALS $	Regrade Unit Cost $/CY	Material Haul or Backfill Unit Cost $/CY	Cover Unit Cost $/CY	Growth Media Unit Cost $/CY	Scarify Unit Cost $/CY	Area Unit Cost $/acre
1	Waste Rock Dumps	77,440	$ 10,455		$ -		$ -	148.94	$ 33,456	$ 70,573	$ 114,484	$0.14	N/A			$224.63	$768.66
2	Tailings Impoundments	337,724	$ 393,518	1,428,413	$ 5,069,173		$ -	756.69	$ 164,766	$ 366,281	$ 5,993,738	$1.17	N/A	$3.55		$217.75	$7,921.00
3	Heap Leach Pads		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
5	Open Pits		$ -							$ -	$ -		N/A				
4	Quarries & Borrow Pits		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
6	Roads	32,622	$ 21,329				$ -	87.37	$ -	$ 50,962	$ 72,291	$0.65	N/A			$0.00	$827.41
7	Landfills		$ -		$ -		$ -		$ -	$ -	$ -		N/A				
8	Buildings			24,706	$ 35,590	103,255	$ 145,240	64	$ -	$ 37,331	$ 218,161		N/A	$1.44	$1.41	$0.00	$3,408.77
9	Yards	10,000	$ 17,145	54,853	$ 76,950		$ -	34	$ 9,200	$ 19,831	$ 123,126	$1.71	N/A	$1.40		$270.59	$3,621.35
10	Ponds		$ -				$ -			$ -	$ -	N/A					
11	Exploration Roads		$ -				$ -		$ -	$ -	$ -		N/A				
12	Exploration Trenches		$ -							$ -	$ -		N/A				
13	Diversion Ditches		$ 27,995					25		$ 14,581	$ 42,576		N/A				$1,703.04
14	Sediment Ponds	29,598	$ 15,054	10,650			$ 10,968	6.6	$ 2,514	$ 3,852	$ 32,388	$0.51	$0.71			$380.91	$4,907.27
15	Generic Haulage/Backfill		$ -		$ -		$ -		$ -	$ -	$ -	N/A					
16	Adit/Decline Backfilling1		$ -								$ -	N/A					
17	Shaft Backfilling		$ -								$ -	N/A					
	TOTALS	487,384	$ 485,496	1,518,622	$ 5,181,713	103,255	$ 156,208	1,122.60	$ 209,936	$ 563,411	$ 6,596,764						
	Average Costs	per CY	$1.00	per CY	$3.41	per CY	$1.51	per acre	$187.01	$2.68	$5,876	per acre					

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Closure Cost Estimate
Waste Rock Dumps

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Waste Rock Dumps - Cost Summary	Labor	Equipment	Materials	Totals
Grading Costs	$2,038	$8,417	N/A	$10,455
Cover Placement Cost	$0	$0	N/A	$0
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$6,522	$26,934	N/A	$33,456
Subtotal Earthworks	**$8,560**	**$35,351**	**$0**	**$43,911**
Revegetation Cost	$16,940	$6,050	$47,583	$70,573
TOTALS	**$25,500**	**$41,401**	**$47,583**	**$114,484**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Waste Rock Dumps - User Input — You must fill in ALL green cells in this section for each dump, lift or dump category

	Facility Description			Physical - MANDATORY									Cover				Growth Media			
	Description (required)	ID Code	Type	Underlying Ground Slope % Grade	Ungraded Slope _H:1V	Final Slope _H:1V	Final Top Slope % Grade	Lift (dump) Height ft	Mid-Bench Length ft	Average Flat Area Long Dimension (ripping distance) ft	Final (Regraded) Dump Footprint acres	Regrade Volume (1) (if calculated elsewhere) cy	Cover Thickness Slopes in	Cover Thickness Flat Areas in	Distance from Cover Borrow ft	Slope from Dump to Cover Borrow % grade	Slope Growth Media Thickness in	Flat Area Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Dump to Stockpile % grade
1	WRF		Waste Rock Dump	0.0	1.5	1.5	1.0	300	2,250	500	144.00	77440	0.0	0.0			0.0	0.0	0	0.0

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)

Reclamation only occuring on Flat Top, Underlying Ground slope set to 0, acres adjusted
Growth Media removed, area will be covered with waste rock and seeded, no scarifying

Waste Rock Dumps - User Input (cont.) — You must fill in ALL green cells and relevant blue cells in this section for each dump, lift or dump category

		Grading				Cover		Growth Media		Revegetation								
	Description (required)	Regrading Material Condition (select)	Regrading Material Type (select)	Regrading Equipment Fleet (select)	Slot/Side-by-Side (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Seed Mix Slopes (select)	Seed Mix Flat Areas (select)	Mulch Slopes (select)	Mulch Flat Areas (select)	Fertilizer Slopes (select)	Fertilizer Flat Areas (select)	Slope Scarify/ Rip? (select)	Flat Area Scarify/ Rip? (select)	Scarify/ Ripping Fleet (select)
1	WRF	1	LS - broken	Large	Yes				Large Truck	None	Mix 4	None	None	None	None	No	Yes	Large Dozer

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

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Closure Cost Estimate
Waste Rock Dumps

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Waste Rock Dumps - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$2,038	$8,417	N/A	$10,455
Cover Placement Cost	$0	$0	N/A	$0
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$6,522	$26,934	N/A	$33,456
Subtotal Earthworks	**$8,560**	**$35,351**	**$0**	**$43,911**
Revegetation Cost	$16,940	$6,050	$47,583	$70,573
TOTALS	**$25,500**	**$41,401**	**$47,583**	**$114,484**

Waste Rock Dumps - Calculations

Regrading Volume Calculation

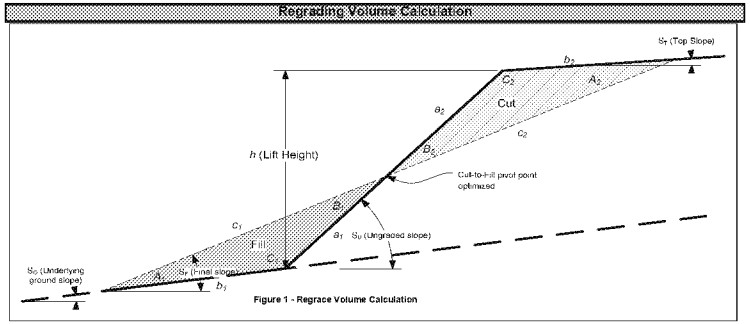

Figure 1 - Regrace Volume Calculation

Regrading Push Distance Calculation

dozing distance: based on 2/3 final cut slope + 2/3 final fill slope (minimum = 50 ft)

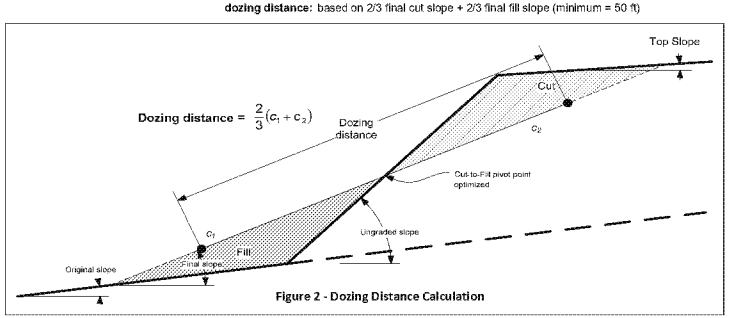

Figure 2 - Dozing Distance Calculation

Final Slope Area and Footprint Area Calculations

Final slope length = $c_1 + c_2$
Final slope area = Final slope length x Mid-bench Length
Final lift height (h_{final}) = (c_1 + c_2) x sin(Final slope)
Final slope width (d) = (c_1 + c_2) x cos(Final slope)
Final slope footprint = Final slope width x Mid-bench Length
Final flat area = Final footprint – Final slope footprint

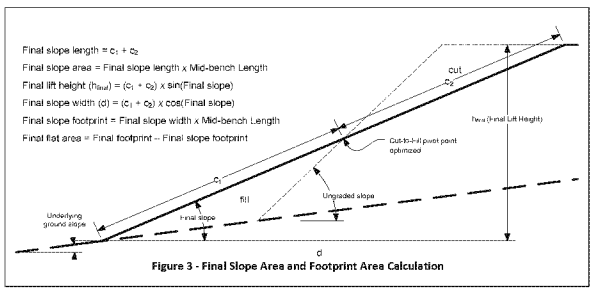

Figure 3 - Final Slope Area and Footprint Area Calculation

Ripping/Scarifying Calculations

Minimum 1 hr ripping/scarifying time per dump

Slopes:
Number of passes = Final slope length ÷ Grader width
Travel distance = Number of passes x Mid-bench length
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)
Minimum 1 hr

Flat Areas:
Flat area width = Final flat area ÷ Average long dimensions
Number of passes = Flat area width ÷ Grader width
Travel distance = Number of passes x Average long dimensions
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)

Revegetation: Minimum 1 acre revegetation crew time per area

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Closure Cost Estimate
Waste Rock Dumps

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Waste Rock Dumps - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$2,038	$8,417	N/A	$10,455
Cover Placement Cost	$0	$0	N/A	$0
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$6,522	$26,934	N/A	$33,456
Subtotal Earthworks	**$8,560**	**$35,351**	**$0**	**$43,911**
Revegetation Cost	$16,940	$6,050	$47,583	$70,573
TOTALS	**$25,500**	**$41,401**	**$47,583**	**$114,484**

Waste Rock Dumps - Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83) x (Slot/Side-by-Side) x (Altitude Deration)

	Description (required)	Regrading Volume cy	Dozing Distance (see above) ft	Regrading Fleet	Uncorrected Dozer Productivity cy/hr	Grade Correction	Dozing Material	Density Correction	Side-by-Side or Slot Dozing	Total Hourly Productivity cy/hr	Total Dozer Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	WRF	77,440	50	D10R	2,934	1.5	1.0	0.88	1.2	3,086	25	$2,038	$8,417	$10,455
		77,440									25	**$2,038**	**$8,417**	**$10,455**

Waste Rock Dumps - Cover and Growth Media Costs

		Cover (lower layer)								Growth Media Placement							
	Description (required)	Cover Volume cy	Cover Replacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Cover Labor Cost $	Cover Equipment Cost $	Total Cover Cost $	Growth Media Volume cy	Growth Media Replacement Fleet	Fleet Productivity BCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	WRF	0			Cover Material	Cover Materia	$0	$0	$0	0					$0	$0	$0
							$0	**$0**	**$0**						**$0**	**$0**	**$0**

Waste Rock Dumps - Scarifying/Revegetation Costs

	Description (required)	Slope Area acres	Flat Area acres	Total Surface Area acres	Final Slope Length ft	Flat Area Long Dimension ft	Ripping/ Scarifying Fleet	Slope Scarifying/ Ripping Hours hrs	Flat Area Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	WRF	27.94	121.00	148.94	541	500	D10R		80	$6,522	$26,934	$33,456	$16,940	$6,050	$47,583	$70,573
		27.94	121.00	148.94					80	**$6,522**	**$26,934**	**$33,456**	**$16,940**	**$6,050**	**$47,583**	**$70,573**

Notes: 1) Minimum total ripping hours = 1 (i.e. if total ripping hrs (slope + flat) < 1, then one hour of fleet time is assumed, regardless of acres shown in in scarifying table.)
2) Assumes 50min/hr equipment availability

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Closure Cost Estimate
Tailings

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Tailings - Cost Summary	Labor	Equipment	Materials	Totals
Embankment Regrading Cost	$0	$0	N/A	$0
Tailings Surface Grading Cost	$76,711	$316,807	N/A	$393,518
Cover Placement Cost	$1,378,576	$3,690,597	N/A	$5,069,173
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$32,118	$132,648	N/A	$164,766
Subtotal Earthworks	**$1,487,405**	**$4,140,052**	**$0**	**$5,627,457**
Revegetation Cost	$87,920	$31,400	$246,961	$366,281
TOTALS	**$1,575,325**	**$4,171,452**	**$246,961**	**$5,993,738**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Tailings - User Input — You must fill in ALL green cells and relevant blue cells in this section for each tailings impoundment

	Facility Description		Physical - MANDATORY								Cover				Growth Media			
	Description (required)	ID Code	Underlying Ground Slope % Grade	Ungraded Slope _H:1V	Final (Regraded) Embankment Slope _H:1V	Final Embankment Height ft	Final Tailings Surface Area acres	Mid-Embankment or Ripping Length ft	Embankment Regrade Volume (if calculated elsewhere) cy	Surface Regrade Volume (calculated elsewhere) cy	Embankment Cover Thickness in	Tailings Surface Cover Thickness in	Distance from Cover Borrow ft	Slope from Tailings to Borrow % grade	Embankment Growth Media Thickness in	Tailings Surface Growth Media Thickness in	Distance from Growth Material Stockpile ft	Slope from Tailings to Stockpile % grade
1	TSF - 1		9.1	2.5	2.5	200	164.00	1,450		88,196	24.0	12.0	11,000	5.0	0.0	0.0	0	0.0
2	TSF - 2		8.5	2.5	2.5	200	120.00	5,750		64,533	24.0	12.0	15,000	5.0	0.0	0.0	0	0.0
3	TSF - 3		5.9	2.5	2.5	200	344.00	3,200		184,996	24.0	12.0	21,000	5.0	0.0	0.0	0	0.0

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)

Assumes cover material hauled from WRF or from immediately adjacent to TSF facilities
Assumes embankment constructed at final slope so no regrading required.
Assumes minor regrading of tailings surface (1 foot depth over 1/3 of tailings area) for drainage

Tailings - User Input (cont.) — You must fill in ALL green cells and relevant blue cells in this section for each tailings impoundment

		Grading				Cover		Growth Media		Revegetation								
	Description (required)	Regrading Material Condition (select)	Embankment Material Type (select)	Regrading Equipment Fleet (select)	Slot/Side-by-Side (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Seed Mix Embankment Slope (select)	Seed Mix Tailings Surface (select)	Mulch Embankment Slopes (select)	Mulch Tailings Surface (select)	Fertilizer Embankment Slopes (select)	Fertilizer Tailing Surface (select)	Embankment Slope Scarify/ Rip? (select)	Tailings Surface Scarify/ Rip? (select)	Scarifying/ Ripping Fleet (select)
1	TSF - 1			Large		LS - broken	Large Truck			None	Mix 4	None	None	None	None	No	Yes	Large Dozer
2	TSF - 2			Large		LS - broken	Large Truck			None	Mix 4	None	None	None	None	No	Yes	Large Dozer
3	TSF - 3			Large		LS - broken	Large Truck			None	Mix 4	None	None	None	None	No	Yes	Large Dozer

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

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Closure Cost Estimate
Tailings

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
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Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Tailings - Cost Summary

	Labor	Equipment	Materials	Totals
Embankment Regrading Cost	$0	$0	N/A	$0
Tailings Surface Grading Cost	$76,711	$316,807	N/A	$393,518
Cover Placement Cost	$1,378,576	$3,690,597	N/A	$5,069,173
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$32,118	$132,648	N/A	$164,766
Subtotal Earthworks	**$1,487,405**	**$4,140,052**	**$0**	**$5,627,457**
Revegetation Cost	$87,920	$31,400	$246,961	$366,281
TOTALS	**$1,575,325**	**$4,171,452**	**$246,961**	**$5,993,738**

Tailings - Calculations

Surface Area Calculations

Top Surface Area provided by user

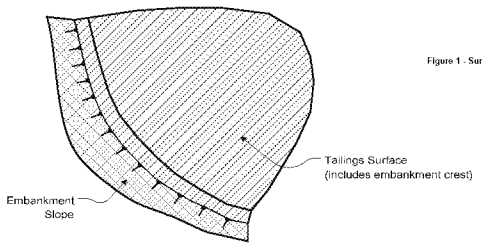

Figure 1 - Surface Areas

Final Slope Area and Footprint Area Calculations

$$\text{Overall slope length (c)} = \frac{\text{Embankment height}}{\cos(\text{Overall slope angle}}$$

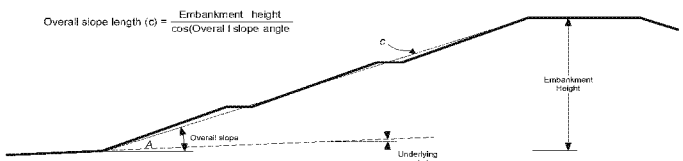

Figure 2 - Final Slope Area and Footprint Area Calculation

Grading Calculations

Grading assumed on impoundment surface only, not embankment
Average push distance assumed to be 2/3 of the 600 feet maximum from Catepillar Handbook or 400 feet
Material assumed to be loose stockile (1.2 productivity factor)
Dozing density correction based on dry sand = 2300/2400 = 0.96
Slope assumed to be 0 to 5% (1.0 productivity factor)

Ripping/Scarifying/Revegetation Calculation

Minimum 1 hr ripping/scarifying per area
Minimum 1 acre revegetation crew time per area

Regrading Volume Calculation

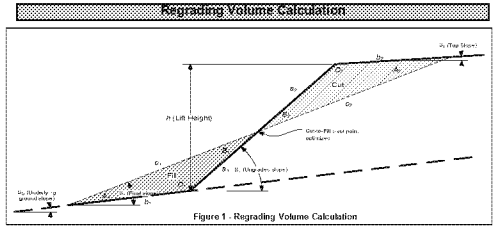

Figure 1 - Regrading Volume Calculation

Regrading Push Distance Calculation

$$\text{Dozing distance} = \frac{2}{3}(C_1 + C_2)$$

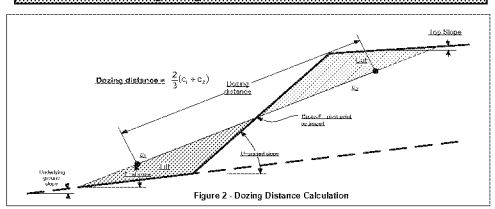

Figure 2 - Dozing Distance Calculation

Tailings - Embankment Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83) x (Slot/Side-by-Side) x (Altitude Deration)

	Description (required)	Regrading Volume cy	Dozing Distance (see above) ft	Regrading Fleet	Uncorrected Dozer Productivity cy/hr	Grade Correction	Dozing Material Condition	Density Correction	Side-by-Side or Slot Dozing	Total Hourly Productivity cy/hr	Total Dozer Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**TSF - 1**	0		D10R								$0	$0	$0
2	**TSF - 2**	0		D10R								$0	$0	$0
3	**TSF - 3**	0		D10R								$0	$0	$0
												$0	**$0**	**$0**

Tailings - Surface Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83) x (Slot/Side-by-Side) x (Altitude Deration)

	Description (required)	Regrading Volume cy	Dozing Distance (see above) ft	Regrading Fleet	Uncorrected Dozer Productivity cy/hr	Grade Correction	Density Correction	Dozing Material	Side-by-Side or Slot Dozing	Total Hourly Productivity cy/hr	Total Dozer Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**TSF - 1**	88,196	400	D10R	501	1.00	0.96	1.20	1.00	359	246	$20,054	$82,821	$102,875
2	**TSF - 2**	64,533	400	D10R	501	1.00	0.96	1.20	1.00	359	180	$14,674	$60,601	$75,275
3	**TSF - 3**	184,996	400	D10R	501	1.00	0.96	1.20	1.00	359	515	$41,983	$173,385	$215,368
		337,724									941	**$76,711**	**$316,807**	**$393,518**

Tailings - Cover and Growth Media Costs

Cover Placement	Growth Media Placement

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Closure Cost Estimate
Tailings

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Tailings - Cost Summary

	Labor	Equipment	Materials	Totals
Embankment Regrading Cost	$0	$0	N/A	$0
Tailings Surface Grading Cost	$76,711	$316,807	N/A	$393,518
Cover Placement Cost	$1,378,576	$3,690,597	N/A	$5,069,173
Topsoil Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$32,118	$132,648	N/A	$164,766
Subtotal Earthworks	**$1,487,405**	**$4,140,052**	**$0**	**$5,627,457**
Revegetation Cost	$87,920	$31,400	$246,961	$366,281
TOTALS	**$1,575,325**	**$4,171,452**	**$246,961**	**$5,993,738**

	Description (required)	Cover Volume cy	Cover Placement Fleet	Cover Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Placement Cost $	Growth Media Volume cy	Growth Media Placement Fleet	Growth Media Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**TSF - 1**	322,473	769D/988G/D7R	779	7	414	$245,899	$645,679	$891,578	0					$0	$0	$0
2	**TSF - 2**	423,177	769D/988G/D7R	807	9	524	$375,729	$1,002,522	$1,378,251	0					$0	$0	$0
3	**TSF - 3**	682,763	769D/988G/D7R	758	11	901	$756,948	$2,042,396	$2,799,344	0					$0	$0	$0
		1,428,413				1,839	**$1,378,576**	**$3,690,597**	**$5,069,173**						**$0**	**$0**	**$0**

Tailings - Scarifying/Revegetation Costs

	Description (required)	Embankment Slope Area acres	Tailings Surface Area acres	Total Surface Area acres	Final Slope Length ft	Ripping/ Scarifying Fleet	Slope Scarifying/ Ripping Hours hrs	Flat Area Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Cost $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Cost $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**TSF - 1**	17.94	164.00	181.94	539	D10R		86	$7,744	$31,984	$39,728	$22,960	$8,200	$64,493	$95,653
2	**TSF - 2**	71.15	120.00	191.15	539	D10R		62	$8,070	$33,330	$41,400	$16,800	$6,000	$47,190	$69,990
3	**TSF - 3**	39.60	344.00	383.60	539	D10R		179	$16,304	$67,334	$83,638	$48,160	$17,200	$135,278	$200,638
		128.69	628.00	756.69				327	**$32,118**	**$132,648**	**$164,766**	**$87,920**	**$31,400**	**$246,961**	**$366,281**

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Closure Cost Estimate
Roads

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Roads - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$4,158	$17,171	N/A	$21,329
Cover Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$4,158**	**$17,171**		**$21,329**
Revegetation Cost	$12,231	$4,371	$34,360	$50,962
TOTALS	**$16,389**	**$21,542**	**$34,360**	**$72,291**

Color Code Key

User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Maximum slope grade allowed for dozer: 20 % (max 40%)

Roads - User Input — You must fill in ALL green cells and relevant blue cells in this section for each road

	Facility Description			Physical (1) - MANDATORY						User Overrides		Growth Media		
	Description (required)	ID Code	Type	Underlying Ground Slope % grade	Ungraded Slope _H:1V	Cut Slope degrees	Road Width ft	Road Length ft	Slope Replacement Percent %	Regrade Volume (if calculated elsewhere) cy	Disturbed Area (if calculated elsewhere) acres	Growth Media Thickness in	Haul Distance from Growth Media Stockpile ft	Slope from Road to Stockpile % grade
1	WRF-Peach/Elgin		Haul Road	10.0	1.0	70.0	94.0	3,015	20%			0.0		
2	Pit-Crusher (Around Flotation)		Haul Road	10.0	1.0	70.0	94.0	4,729	20%			0.0		
3	Copper World-PE		Haul Road	10.0	1.0	70.0	94.0	2,756	20%			0.0		
4	Utility Corridor Access Road		Access Road	5.0	1.0	70.0	30.0	66,000	20%			0.0		
5	Utility Corridor - Pipe corridor		Access Road	5.0	1.0	70.0	10.0	66,000	20%			0.0		

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)
3. Because the work required for building roads with a dozer is similar to that required to regrade a road with a dozer, this sheet could be used to provide a rough estimate of road construction costs if a dozer is selected as the grading fleet.

Assumes graded road material vegetated in place without need for growth media

Roads - User Input (cont.)

		Haul Road Safety Berms				
	Description (required)	Berm Length ft	Berm Height ft	Berm Base Width ft	Berm Sideslope Angle _H:1V	Number of Berms (2) (1 or 2 sides)
1	WRF-Peach/Elgin	3,015.0	6.0	12.0	1.0	1
2	Pit-Crusher (Around Flotation)	8,527.0	6.0	12.0	1.0	1
3	Copper World-PE	2,756.0	6.0	12.0	1.0	1
4	Utility Corridor Access Road	0.0	0.0	0.0	0.0	
5	Utility Corridor - Pipe corridor	0.0	0.0	0.0	0.0	

(2) Enter 1 if berm on only one side of road, 2 if both sides of road are bermed.

Roads - User Input (cont.) — You must fill in ALL green cells and relevant blue cells in this section for each road

		Grading				Growth Media			Revegetation				
	Description (required)	Regrading Material Condition (select)	Regrading Material Type (select)	Regrading Equipment Fleet (select)	No. of Excavators if grade >30% (select)	Growth Media Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarifying/ Ripping? (select)	Ripping Fleet (select)
1	WRF-Peach/Elgin	1	Alluvium	Lg Dozer		Alluvium	Large Truck		Mix 4	None	None	No	
2	Pit-Crusher (Around Flotation)	1	Alluvium	Lg Dozer		Alluvium	Large Truck		Mix 4	None	None	No	
3	Copper World-PE	1	Alluvium	Lg Dozer		Alluvium	Large Truck		Mix 4	None	None	No	
4	Utility Corridor Access Road	1	Alluvium	Lg Dozer					Mix 4	None	None	No	
5	Utility Corridor - Pipe corridor	1	Alluvium	Lg Dozer					Mix 4	None	None	No	

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table
2. If original slope >30% only excavators are allowed.

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Closure Cost Estimate
Roads

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Roads - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$4,158	$17,171	N/A	$21,329
Cover Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$4,158**	**$17,171**		**$21,329**
Revegetation Cost	$12,231	$4,371	$34,360	$50,962
TOTALS	**$16,389**	**$21,542**	**$34,360**	**$72,291**

Roads - Calculations

Regrading Volume and Footprint Volume

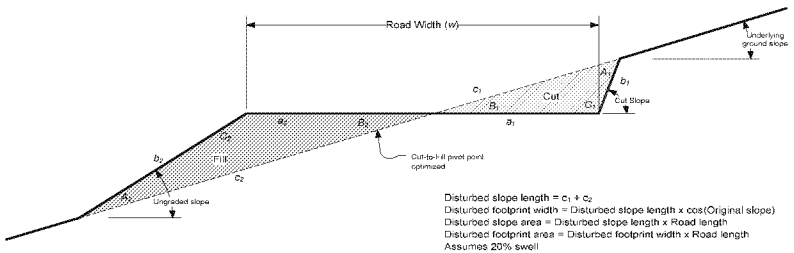


Figure 1 - Regrading Volume Calculation

Will not allow dozer for slopes greater than 30%
For dozer regrading push distance = road width
Assumes dozer push is uphill
Assumes minimum push distance of 100 ft

Ripping/Scarifying Calculations

Minimum 1 hr ripping/scarifying time per area
Number of passes = Final slope length ÷ Grader width
Travel distance = Number of passes x Road length
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)
For dozer regrading assumes push distance = 3 x road width

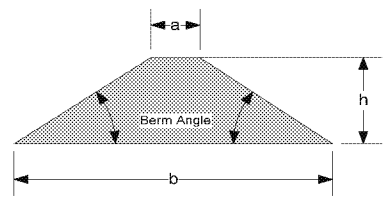
Revegetation Calculations

Minimum of 1 acre crew time per area

Safety Berm Volume Calculation

Cross Sectional Area = $\frac{(a+b)}{2} h$

Berm Volume = Berm Length x Cross Sectional Area x No. Sides



Total berm volume doubled if both sides of road are bermed.
If length of berm on each side of road is different, input total length of both berms and input 1 for number of sides

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Closure Cost Estimate
Roads

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Roads - Cost Summary

	Labor	Equipment	Materials	Totals
Grading Costs	$4,158	$17,171	N/A	$21,329
Cover Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$4,158**	**$17,171**		**$21,329**
Revegetation Cost	$12,231	$4,371	$34,360	$50,962
TOTALS	**$16,389**	**$21,542**	**$34,360**	**$72,291**

Roads - Regrading Costs

	Description (required)	Regrading Volume cy	Recontouring Fleet	Fleet Productivity cy/hr	Total Fleet Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**WRF-Peach/Elgin**	6,919	D10R	627	11	$897	$3,703	$4,600
2	**Pit-Crusher (Around Flotation)**	15,916	D10R	627	25	$2,038	$8,417	$10,455
3	**Copper World-PE**	6,325	D10R	627	10	$815	$3,367	$4,182
4	**Utility Corridor Access Road**	3,117	D10R	716	4	$326	$1,347	$1,673
5	**Utility Corridor - Pipe corridor**	345	D10R	716	1	$82	$337	$419
		32,622			51	**$4,158**	**$17,171**	**$21,329**

Roads - Growth Media Costs

	Description (required)	Growth Media Volume cy	Growth Media Replacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**WRF-Peach/Elgin**						$0	$0	$0
2	**Pit-Crusher (Around Flotation)**						$0	$0	$0
3	**Copper World-PE**						$0	$0	$0
4	**Utility Corridor Access Road**						$0	$0	$0
5	**Utility Corridor - Pipe corridor**						$0	$0	$0
							$0	**$0**	**$0**

Roads - Scarifying/Revegetation Costs

	Description (required)	Total Surface Area acres	Final Slope Length ft	Ripping/ Scarifying Fleet	Ripping Hours hrs	Ripping Labor Costs $	Ripping Equipment Cost $	Total Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**WRF-Peach/Elgin**	7.03	102.0			$0	$0	$0	$984	$352	$2,765	$4,101
2	**Pit-Crusher (Around Flotation)**	11.03	102.0			$0	$0	$0	$1,544	$552	$4,338	$6,434
3	**Copper World-PE**	6.43	102.0			$0	$0	$0	$900	$322	$2,529	$3,751
4	**Utility Corridor Access Road**	47.17	31.0			$0	$0	$0	$6,604	$2,359	$18,550	$27,513
5	**Utility Corridor - Pipe corridor**	15.71	10.0			$0	$0	$0	$2,199	$786	$6,178	$9,163
		87.37				**$0**	**$0**	**$0**	**$12,231**	**$4,371**	**$34,360**	**$50,962**

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Closure Cost Estimate
Foundations & Buildings

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Buildings & Foundation Demolition Cost Summary	Labor	Equipment	Materials	Totals
Building Demolition Cost	$1,000,560	$600,336	N/A	$1,600,896
Wall Demolition Cost	$1,057,212	$92,167	N/A	$1,149,379
Slab Demolition	$10,227	$35,900	N/A	$46,127
Subtotal Demolition	**$2,067,999**	**$728,403**	**$0**	**$2,796,402**
Cover Placement Cost	$10,592	$24,998	N/A	$35,590
Growth Media Placement Cost	$43,224	$102,016	N/A	$145,240
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$53,816**	**$127,014**	**$0**	**$180,830**
Revegetation Cost	$8,960	$3,200	$25,171	$37,331
TOTALS	**$2,130,775**	**$858,617**	**$25,171**	**$3,014,563**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Minimum thickness of cover over unbroken slab: 6 ft

Buildings & Foundation - User Input — You must fill in ALL green cells and relevant blue cells in this section for each building or facility

	Facility Description			Physical - MANDATORY								Foundation Cover (1)			Growth Media (1) (entire footprint)		
	Description (required)	ID Code	Type	Length ft	Width ft	Eve Height ft	Slab Thickness in	Foundation Wall Thickness in	Foundation Wall Height ft	Average Flat Area Long Dimension (ripping distance) ft	Building Area Footprint (including surrounding facilities) acres	Foundation Cover Thickness in	Distance from Foundation Cover Borrow Area ft	Slope from Facility to Borrow Area % grade	Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Facility to Stockpile % grade
1	**Flotation Building A**		Process - Plant & Buildings	170	100	30	12	12	6	170	15.00	48	500	5.0	12	500	5.0
2	**Flotation Building B**		Process - Plant & Buildings	170	100	30	12	12	6	170	11.00	48	500	5.0	12	500	5.0
3	**Grinder Building**		Process - Crushing & Screenin	200	140	30	12	12	6	200	15.00	48	500	5.0	12	500	5.0
4	**Crusher Building**		Process - Crushing & Screenin	100	50	30	12	12	6	100	15.00	48	500	5.0	12	500	5.0
5	**Buildings General**		Site Facilities - Buildings	240	205	30	12	12	6	240	2.00	48	500	5.0	12	500	5.0
6	**Moly Filtration and Concrete Loadout Building**		Process - Plant & Buildings	100	130	30	12	12	6	130	2.00	48	500	5.0	12	500	5.0
7	**Copper/Moly Load Out Building**		Process - Plant & Buildings	180	120	30	12	12	6	180	2.00	48	500	5.0	12	500	5.0
8	**Molybdenum Plant**		Process - Plant & Buildings	114	140	30	12	12	6	140	2.00	48	500	5.0	12	500	5.0

Notes:
1. Foundation cover only calculated to cover slab. Growth media estimated over entire footprint area
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)

Buildings & Foundation - User Input (cont.) — You must fill in ALL green cells and relevant blue cells in this section for each building or facility

		Construction Materials		Slab Demolition		Foundation Cover			Growth Media			Revegetation				
	Description (required)	Building Type (select)	Foundation Wall Type (select)	Slab Demo Method (select)	Slab Breaking Equipment Fleet (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarify/ Rip? (select)	Ripping Fleet (select)
1	**Flotation Building A**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
2	**Flotation Building B**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
3	**Grinder Building**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
4	**Crusher Building**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
5	**Buildings General**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
6	**Moly Filtration and Concrete Loadout Building**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
7	**Copper/Moly Load Out Building**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	
8	**Molybdenum Plant**	Lg. steel	Conc 12 in (300 mm) thick	Break & bury	Lg Excavator	LS - broken	Large Truck		Alluvium	Large Truck		Mix 4	None	None	No	

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

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Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Buildings & Foundation Demolition Cost Summary

	Labor	Equipment	Materials	Totals
Building Demolition Cost	$1,000,560	$600,336	N/A	$1,600,896
Wall Demolition Cost	$1,057,212	$92,167	N/A	$1,149,379
Slab Demolition	$10,227	$35,900	N/A	$46,127
Subtotal Demolition	**$2,067,999**	**$728,403**	**$0**	**$2,796,402**
Cover Placement Cost	$10,592	$24,998	N/A	$35,590
Growth Media Placement Cost	$43,224	$102,016	N/A	$145,240
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$53,816**	**$127,014**	**$0**	**$180,830**
Revegetation Cost	$8,960	$3,200	$25,171	$37,331
TOTALS	**$2,130,775**	**$858,617**	**$25,171**	**$3,014,563**

Buildings & Foundation - Calculations

Building Volume Calculations

Using Means Heavy Construction Cost Data (2004) calculates cubic feet from building dimensions
Estimage slab thickness and wall thickness if not known
Assumes that all concrete slabs are reinforced
Productivity for crew from Means Heavy Construction Cost Data (2004) adjusted for supervision
(addressed in Misc. Costs) and Davis-Bacon Wage Rates
Demolition costs do not include hauling or disposing if debris - Use Waste Disposal module

Slab Demolition Calculations

Minimum 1 hr excavator time for slab demolition

Cover Volume Calculation

Foundation area x cover thickness
If "Bury in Place" is selected as slab demolition method, cover thickness is adjusted such that
total cover (cover + growth media) equals value entered in "Minimum thickness of cover over unbroken slab" cell above

Ripping/Scarifying Calculations

Flat area width = Final flat area ÷ Average long dimensions
Number of passes = Flat area width ÷ Grader width
Travel distance = Number of passes x Average long dimensions
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)

Revegetation

Minimum 1 acre revegetation crew time per area

Building & Foundation Demolition Costs

Uses RS Means Heavy Construction Cost Data for building and wall demolition cost calculations. Uses CAT Handbook for slab breaking production

								Building Demolition			Wall Demolition			Slab Demolition			Total Costs		
	Description (required)	Building Footprint (slab area) sqft	Building Volume cu ft	Wall Length ft	Wall Area sq ft	Slab Demolition Fleet	Slab Volume cy	Total Labor Cost $	Total Equipment Cost $	Total Building Demolition Cost $	Total Labor Cost $	Total Equipment Cost $	Total Wall Demolition Cost $	Total Labor Cost $	Total Equipment Cost $	Total Slab Breaking Cost $	Total Labor Cost $	Total Equipment Cost $	Total Demolition Costs $
1	**Flotation Building A**	17,000	510,000	540	3,240	385BL	630	$102,000	$61,200	$163,200	$126,360	$11,016	$137,376	$1,046	$3,670	$4,716	$229,406	$75,886	$305,292
2	**Flotation Building B**	17,000	510,000	540	3,240	385BL	630	$102,000	$61,200	$163,200	$126,360	$11,016	$137,376	$1,046	$3,670	$4,716	$229,406	$75,886	$305,292
3	**Grinder Building**	28,000	840,000	680	4,080	385BL	1,037	$168,000	$100,800	$268,800	$159,120	$13,872	$172,992	$1,715	$6,022	$7,737	$328,835	$120,694	$449,529
4	**Crusher Building**	5,000	150,000	300	1,800	385BL	185	$30,000	$18,000	$48,000	$70,200	$6,120	$76,320	$310	$1,090	$1,400	$100,510	$25,210	$125,720
5	**Buildings General**	49,200	1,476,000	890	5,340	385BL	1,822	$295,200	$177,120	$472,320	$208,260	$18,156	$226,416	$3,006	$10,552	$13,558	$506,466	$205,828	$712,294
6	**Moly Filtration and Concrete Loadout Building**	13,000	390,000	460	2,760	385BL	481	$78,000	$46,800	$124,800	$107,640	$9,384	$117,024	$801	$2,810	$3,611	$186,441	$58,994	$245,435
7	**Copper/Moly Load Out Building**	21,600	648,000	600	3,600	385BL	800	$129,600	$77,760	$207,360	$140,400	$12,240	$152,640	$1,323	$4,645	$5,968	$271,323	$94,645	$365,968
8	**Molybdenum Plant**	15,960	478,800	508	3,048	385BL	591	$95,760	$57,456	$153,216	$118,872	$10,363	$129,235	$980	$3,441	$4,421	$215,612	$71,260	$286,872
			5,002,800				6,176	**$1,000,560**	**$600,336**	**$1,600,896**	**$1,057,212**	**$92,167**	**$1,149,379**	**$10,227**	**$35,900**	**$46,127**	**$2,067,999**	**$728,403**	**$2,796,402**

Building & Foundation - Foundation Cover and Growth Media Costs

		Foundation Cover								Growth Media								Total Cover & Growth Media Costs		
	Description (required)	Cover Volume cy	Cover Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Cost $	Growth Media Volume cy	Growth Media Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $	Total Labor Cost $	Total Equipment Cost $	Total Costs $
1	**Flotation Building A**	2,519	769D/988G/D7R	684	2	4	$1,145	$2,702	$3,847	24,200	769D/988G/D7R	684	2	35	$10,019	$23,646	$33,665	$11,164	$26,348	$37,512
2	**Flotation Building B**	2,519	769D/988G/D7R	684	2	4	$1,145	$2,702	$3,847	17,747	769D/988G/D7R	684	2	26	$7,443	$17,566	$25,009	$8,588	$20,268	$28,856
3	**Grinder Building**	4,148	769D/988G/D7R	684	2	6	$1,718	$4,054	$5,772	24,200	769D/988G/D7R	684	2	35	$10,019	$23,646	$33,665	$11,737	$27,700	$39,437
4	**Crusher Building**	741	769D/988G/D7R	684	2	1	$286	$676	$962	24,200	769D/988G/D7R	684	2	35	$10,019	$23,646	$33,665	$10,305	$24,322	$34,627
5	**Buildings General**	7,289	769D/988G/D7R	684	2	11	$3,149	$7,432	$10,581	3,227	769D/988G/D7R	684	2	5	$1,431	$3,378	$4,809	$4,580	$10,810	$15,390
6	**Moly Filtration and Concrete Loadout Building**	1,926	769D/988G/D7R	684	2	3	$859	$2,027	$2,886	3,227	769D/988G/D7R	684	2	5	$1,431	$3,378	$4,809	$2,290	$5,405	$7,695
7	**Copper/Moly Load Out Building**	3,200	769D/988G/D7R	684	2	5	$1,431	$3,378	$4,809	3,227	769D/988G/D7R	684	2	5	$1,431	$3,378	$4,809	$2,862	$6,756	$9,618
8	**Molybdenum Plant**	2,364	769D/988G/D7R	684	2	3	$859	$2,027	$2,886	3,227	769D/988G/D7R	684	2	5	$1,431	$3,378	$4,809	$2,290	$5,405	$7,695
		24,706				37	**$10,592**	**$24,998**	**$35,590**	103,255				151	**$43,224**	**$102,016**	**$145,240**	**$53,816**	**$127,014**	**$180,830**

Building & Foundation - Scarifying/Revegetation Costs

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Buildings & Foundation Demolition Cost Summary	Labor	Equipment	Materials	Totals
Building Demolition Cost	$1,000,560	$600,336	N/A	$1,600,896
Wall Demolition Cost	$1,057,212	$92,167	N/A	$1,149,379
Slab Demolition	$10,227	$35,900	N/A	$46,127
Subtotal Demolition	**$2,067,999**	**$728,403**	**$0**	**$2,796,402**
Cover Placement Cost	$10,592	$24,998	N/A	$35,590
Growth Media Placement Cost	$43,224	$102,016	N/A	$145,240
Ripping/Scarifying Cost	$0	$0	N/A	$0
Subtotal Earthworks	**$53,816**	**$127,014**	**$0**	**$180,830**
Revegetation Cost	$8,960	$3,200	$25,171	$37,331
TOTALS	**$2,130,775**	**$858,617**	**$25,171**	**$3,014,563**

					Scarifying/Ripping			Revegetation				Total Scarify & Revegation Costs			
	Description (required)	Flat Area acres	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $	Total Labor Cost $	Total Equipment Cost $	Total Material Cost $	Total Costs $
1	**Flotation Building A**	15.00			$0	$0	$0	$2,100	$750	$5,899	$8,749	$2,100	$750	$5,899	$8,749
2	**Flotation Building B**	11.00			$0	$0	$0	$1,540	$550	$4,326	$6,416	$1,540	$550	$4,326	$6,416
3	**Grinder Building**	15.00			$0	$0	$0	$2,100	$750	$5,899	$8,749	$2,100	$750	$5,899	$8,749
4	**Crusher Building**	15.00			$0	$0	$0	$2,100	$750	$5,899	$8,749	$2,100	$750	$5,899	$8,749
5	**Buildings General**	2.00			$0	$0	$0	$280	$100	$787	$1,167	$280	$100	$787	$1,167
6	**Moly Filtration and Concrete Loadout Building**	2.00			$0	$0	$0	$280	$100	$787	$1,167	$280	$100	$787	$1,167
7	**Copper/Moly Load Out Building**	2.00			$0	$0	$0	$280	$100	$787	$1,167	$280	$100	$787	$1,167
8	**Molybdenum Plant**	2.00			$0	$0	$0	$280	$100	$787	$1,167	$280	$100	$787	$1,167
		64.00			**$0**	**$0**	**$0**	**$8,960**	**$3,200**	**$25,171**	**$37,331**	**$8,960**	**$3,200**	**$25,171**	**$37,331**

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Closure Cost Estimate
Other Demo & Equip Removal

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Other Demolition and Equipment Removal - Cost Summary	Labor	Equipment	Materials	Totals
Other Demolition	$160,000	$130,000	$60,000	$350,000
Equipment Removal	$0	$0	$0	$0
TOTALS	**$160,000**	**$130,000**	**$60,000**	**$350,000**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Other Demolition

	Facility Description								
	Description (required)	ID Code	Type	Quantity	Units	Labor Unit Cost $	Equipment Unit Cost $	Material Unit Cost $	Total Cost $
1	**Removal of FWDS Pump Station #1 and #2**		Site Facilities - Buildings	2	EA	**$55,000.00**	**$40,000.00**	**$5,000.00**	$200,000
2	**Abandon Tailings Pipeline In Place**		Site Facilities - Structures	1	LS	**$50,000.00**	**$50,000.00**	**$50,000.00**	$150,000
						$160,000	**$130,000**	**$60,000**	**$350,000**

Notes: **1. 24-inch diameter tailings pipeline under BLM property (~1700 linear feet) abandoned in place and filled with grout**

Equipment & Material Removal

	Facility Description								
	Description (required)	ID Code	Type	Quantity	Units	Labor Unit Cost ($)	Equipment Unit Cost ($)	Material Unit Cost ($)	Total Cost ($)
						$0	**$0**	**$0**	

Notes:

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Drainage Control - Cost Summary

	Labor	Equipment	Materials	Totals
Diversion Ditch Construction	$7,858	$20,137	N/A	$27,995
Diversion Ditch Liner	$0	$0	$0	$0
Diversion Ditch Rip-Rap	$563,962	$107,433	$345,233	$1,016,628
Sed Pond Construct/Regrade	$2,934	$12,120	N/A	$15,054
Liner Installation	$0	$0	$0	$0
Sed Pond Cover	$2,934	$8,034	N/A	$10,968
Ripping/Scarifying Cost	$492	$2,022	N/A	$2,514
Subtotal Earthworks	**$578,180**	**$149,746**	**$345,233**	**$1,073,159**
Diversion Ditch Revegetation	$3,500	$1,250	$9,831	$14,581
Sediment Pond Revegetation	$924	$330	$2,598	$3,852
Subtotal Revegetation	**$4,424**	**$1,580**	**$12,429**	**$18,433**
TOTALS	**$582,604**	**$151,326**	**$357,662**	**$1,091,592**

Color Code Key

User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Diversion Ditches - User Input

			Diversions Ditches							Revegetation			Liner and Rip-Rap Installation			
	Description (required)	ID Code	Diversion Length ft	Diversion Depth ft	Ditch Bottom Width ft	Ditch Sideslope Angle _H:1V	Excavate Volume (if calculated elsewhere) cy	Excavating Material Condition (select)	Excavating Equipment Fleet (select)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Liner Area S.Y.	Liner Type (select)	Rip-Rap Area S.Y.	Rip-Rap Type (select type)
1	Stormwater Ditch - no riprap		44800	3.0	6.0	2.0		1	Large	Mix 4	None	None	0		0	
2	Stormwater Ditch - rip rap lined		11200	3.0	6.0	2.0		1	Large	Mix 4	None	None	0		24,142	Gabions, 12 in (30

Notes:
Riprap assumes bottom and sides of ditch covered

Sediment/Evaporation Pond Construction/Removal - User Input

			Sediment Ponds								Growth Media		
	Description (required)	ID Code	Pond Width ft	Pond/Berm Length ft	Berm Height ft	Crest Width ft	Sideslope Angle _H:1V	Final Area (if calculated elsewhere) acres	Regrade Volume (if calculated elsewhere) cy	Cover Volume (if calculated elsewhere) cy	Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Pond to Borrow % grade
1	Retention Pond 1		100	300	10.0	17.0	2.0				12	500	5.0
2	Retention Pond 2		100	300	10.0	17.0	2.0				12	500	5.0
3	Retention Pond 3		100	300	10.0	17.0	2.0				12	500	5.0
4	Retention Pond 4		100	300	10.0	17.0	2.0				12	500	5.0
5	Retention Pond 5		100	300	10.0	17.0	2.0				12	500	5.0
6	Retention Pond 6		100	300	10.0	17.0	2.0				12	500	5.0

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivity Sheet)
3. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table
Berm dimensions assume all material removed for pond is used for berm construction

Sediment/Evaporation Pond Construction/Removal - User Input (cont.)

		Sediment Ponds				Growth Media			Revegetation			Ripping/Scarifying	
	Description (required)	Excavating Material Condition (select)	Material Type (select)	Excavating Equipment Fleet (select)	Liner Type (select)	Growth Media Material Type (select)	Growth Media Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarify/ Rip? (select)	Scarify/ Ripping Fleet (select)
1	Retention Pond 1	1	Alluvium	Large		Alluvium	Scraper Dozer		Mix 4	None	None	Yes	Large Dozer
2	Retention Pond 2	1	Alluvium	Large		Alluvium	Scraper Dozer		Mix 4	None	None	Yes	Large Dozer
3	Retention Pond 3	1	Alluvium	Large		Alluvium	Scraper Dozer		Mix 4	None	None	Yes	Large Dozer
4	Retention Pond 4	1	Alluvium	Large		Alluvium	Scraper Dozer		Mix 4	None	None	Yes	Large Dozer
5	Retention Pond 5	1	Alluvium	Large		Alluvium	Scraper Dozer		Mix 4	None	None	Yes	Large Dozer
6	Retention Pond 6	1	Alluvium	Large		Alluvium	Scraper Dozer		Mix 4	None	None	Yes	Large Dozer

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

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Diversion Ditch Liner	$0	$0	$0	$0
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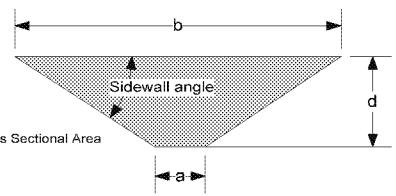
TOTALS	**$582,604**	**$151,326**	**$357,662**	**$1,091,592**

Drainage Control - Calculations

Diversion Ditch Volume Calculation



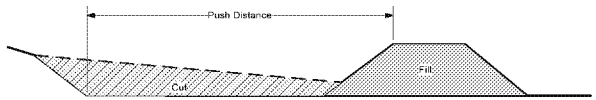
Cross Sectional Area = $\frac{(a+b)}{2}\ d$

Ditch Volume = Ditch Length x Cross Sectional Area

Figure 1 - Ditch Volume Calculation

1) Assume 20% swell for excavations
2) Assumes heavy duty trenching bucket is used

Sediment/Evaporation Pond Construction Calculation



Cut = Fill
Push distance = pond width up to 2/3 max push distance (400 ft)

Figure 2 - Sediment Ponds

1) Assume balanced cut-to-fill for berm construction
2) Include cost for liner, if required.
3) Include line items for removal, if necessary.
4) Assume 20% swell for excavations
5) Minimum 1 hr ripping/scarifying per area
6) Minimum 1 acre revegetation crew time per area

Diversion Ditches - Excavation Costs

	Description (required)	Diversion Ditch Volume LCY	Diversion Ditch Equipment	Corrected Excavator Productivity LCY/hr	Total Hours	Diversion Ditch Labor Cost $	Diversion Ditch Equipment Cost $	Total Diversion Ditch Cost $	Liner Installation: Total Labor Cost $	Liner Installation: Total Equipment Cost $	Liner Installation: Total Material Cost $	Liner Installation: Total Liner Cost $	Rip-Rap Installation: Labor Cost $	Rip-Rap Installation: Equipment Cost $	Rip-Rap Installation: Material Cost $	Rip-Rap Installation: Total Cost $
1	**Stormwater Ditch - no riprap**	71,680	385BL	935	77	$6,303	$16,152	$22,455	$0	$0	$0	$0	$0	$0	$0	$0
2	**Stormwater Ditch - rip rap lined**	17,920	385BL	935	19	$1,555	$3,985	$5,540	$0	$0	$0	$0	$563,962	$107,433	$345,233	$1,016,628
		89,600			96	**$7,858**	**$20,137**	**$27,995**	**$0**	**$0**	**$0**	**$0**	**$563,962**	**$107,433**	**$345,233**	**$1,016,628**

Notes: LCM assumes 20% swell from ditch volume

Diversion Ditches - Revegetation Costs

	Description (required)	Surface Area acres	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revegetation Material Cost $	Total Revegetation Cost $
1	**Stormwater Ditch - no riprap**	20.00	$2,800	$1,000	$7,865	$11,665
2	**Stormwater Ditch - rip rap lined**	5.00	$700	$250	$1,966	$2,916
		25.00	**$3,500**	**$1,250**	**$9,831**	**$14,581**

Sediment/Evaporation Ponds - Construction/Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83)

	Description (required)	Regrading Volume cy	Sed/Evap Pond Equipment	Dozing Distance (see above) ft	Uncorrected Dozer Productivity LCY/hr	Grade Correction	Density Correction	Excavating Material	Corrected Productivity LCY/hr	Total Dozer Hours hr	Earthwork: Total Labor Cost $	Earthwork: Total Equipment Cost $	Earthwork: Total Constr/ Regrading Cost $	Liner: Total Labor Cost $	Liner: Total Equipment Cost $	Liner: Total Material Cost $	Liner: Total Liner Cost $
1	**Retention Pond 1**	4,933	D10R	100	1,627	1.00	0.79	1.00	800	6	$489	$2,020	$2,509	$0	$0	$0	$0
2	**Retention Pond 2**	4,933	D10R	100	1,627	1.00	0.79	1.00	800	6	$489	$2,020	$2,509	$0	$0	$0	$0
3	**Retention Pond 3**	4,933	D10R	100	1,627	1.00	0.79	1.00	800	6	$489	$2,020	$2,509	$0	$0	$0	$0
4	**Retention Pond 4**	4,933	D10R	100	1,627	1.00	0.79	1.00	800	6	$489	$2,020	$2,509	$0	$0	$0	$0
5	**Retention Pond 5**	4,933	D10R	100	1,627	1.00	0.79	1.00	800	6	$489	$2,020	$2,509	$0	$0	$0	$0
6	**Retention Pond 6**	4,933	D10R	100	1,627	1.00	0.79	1.00	800	6	$489	$2,020	$2,509	$0	$0	$0	$0
		29,598								36	**$2,934**	**$12,120**	**$15,054**	**$0**	**$0**	**$0**	**$0**

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ED_013507_00000769-00072

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Drainage Control - Cost Summary

	Labor	Equipment	Materials	Totals
Diversion Ditch Construction	$7,858	$20,137	N/A	$27,995
Diversion Ditch Liner	$0	$0	$0	$0
Diversion Ditch Rip-Rap	$563,962	$107,433	$345,233	$1,016,628
Sed Pond Construct/Regrade	$2,934	$12,120	N/A	$15,054
Liner Installation	$0	$0	$0	$0
Sed Pond Cover	$2,934	$8,034	N/A	$10,968
Ripping/Scarifying Cost	$492	$2,022	N/A	$2,514
Subtotal Earthworks	**$578,180**	**$149,746**	**$345,233**	**$1,073,159**
Diversion Ditch Revegetation	$3,500	$1,250	$9,831	$14,581
Sediment Pond Revegetation	$924	$330	$2,598	$3,852
Subtotal Revegetation	**$4,424**	**$1,580**	**$12,429**	**$18,433**
TOTALS	**$582,604**	**$151,326**	**$357,662**	**$1,091,592**

Sediment/Evaporation Ponds - Growth Media Costs

	Description (required)	Growth Media Volume cy	Growth Media Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Placement Cost $
		Growth Media							
1	**Retention Pond 1**	1,775	631G/D10R/D7R	802	1	2	$489	$1,339	$1,828
2	**Retention Pond 2**	1,775		802	1	2	$489	$1,339	$1,828
3	**Retention Pond 3**	1,775		802	1	2	$489	$1,339	$1,828
4	**Retention Pond 4**	1,775	631G/D10R/D7R	802	1	2	$489	$1,339	$1,828
5	**Retention Pond 5**	1,775	631G/D10R/D7R	802	1	2	$489	$1,339	$1,828
6	**Retention Pond 6**	1,775	631G/D10R/D7R	802	1	2	$489	$1,339	$1,828
		10,650				12	**$2,934**	**$8,034**	**$10,968**

Sediment/Evaporation Ponds - Revegetation Costs

	Description (required)	Surface Area acres	Long Ripping Distance ft	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**Retention Pond 1**	1.10	300	D10R	1	$82	$337	$419	$154	$55	$433	$642
2	**Retention Pond 2**	1.10	300	D10R	1	$82	$337	$419	$154	$55	$433	$642
3	**Retention Pond 3**	1.10	300	D10R	1	$82	$337	$419	$154	$55	$433	$642
4	**Retention Pond 4**	1.10	300	D10R	1	$82	$337	$419	$154	$55	$433	$642
5	**Retention Pond 5**	1.10	300	D10R	1	$82	$337	$419	$154	$55	$433	$642
6	**Retention Pond 6**	1.10	300	D10R	1	$82	$337	$419	$154	$55	$433	$642
		6.60			6	**$492**	**$2,022**	**$2,514**	**$924**	**$330**	**$2,598**	**$3,852**

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ED_013507_00000769-00073

Closure Cost Estimate
Yards, Etc.

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Yards, Etc. - Cost Summary

	Labor	Equipment	Materials	Totals
Regrading Cost	$3,342	$13,803	N/A	$17,145
Cover Placement Cost	$22,901	$54,049	N/A	$76,950
Growth Media Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$1,793	$7,407	N/A	$9,200
Subtotal Earthworks	**$28,036**	**$75,259**		**$103,295**
Revegetation Cost	$4,760	$1,700	$13,371	$19,831
TOTALS	**$32,796**	**$76,959**	**$13,371**	**$123,126**

Color Code Key

User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Yards, Etc. - User Input — You must fill in ALL green cells and relevant blue cells in this section for each building or facility

	Facility Description			Physical			Cover			Growth Media		
	Description (required)	ID Code	Type	Area acres	Average Flat Area Long Dimension (ripping distance) ft	Regrade Volume (calculated elsewhere) cy	Cover Thickness in	Distance from Cover Borrow Area ft	Slope from Facility to Borrow Area % grade	Growth Media Thickness in	Distance from Growth Media Stockpile ft	Slope from Facility to Stockpile % grade
1	**Office and Storage Area Yards**		Yard	34.00	1,000	10,000	12	500	5.0			

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)
3. Assume cover material available adacent to office and storage area yards
4. Includes regrade volume of 10,000 CY

Yards, Etc. - User Input (cont.) — You must fill in ALL green cells and relevant blue cells in this section for each building or facility

		Grading			Cover			Growth Media			Revegetation				
	Description (required)	Regrading Material Condition (select)	Regrading Material Type (select)	Regrading Equipment Fleet (select)	Cover Material Type (select)	Cover Placement Equipment Fleet (select)	Maximum Fleet Size (user override)	Growth Media Material Type (select)	Growth Media Equipment Fleet (select)	Maximum Fleet Size (user override)	Seed Mix (select)	Mulch (select)	Fertilizer (select)	Scarify/ Rip? (select)	Ripping Fleet (select)
1	**Office and Storage Area Yards**	1	Alluvium	Large	Alluvium	Large Truck					Mix 4	None	None	Yes	Large Dozer

Notes:
1. Material Types are used for density correction based on material densities in Caterpillar Performance Handbook material density table

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Closure Cost Estimate
Yards, Etc.

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Yards, Etc. - Cost Summary

	Labor	Equipment	Materials	Totals
Regrading Cost	$3,342	$13,803	N/A	$17,145
Cover Placement Cost	$22,901	$54,049	N/A	$76,950
Growth Media Placement Cost	$0	$0	N/A	$0
Ripping/Scarifying Cost	$1,793	$7,407	N/A	$9,200
Subtotal Earthworks	**$28,036**	**$75,259**		**$103,295**
Revegetation Cost	$4,760	$1,700	$13,371	$19,831
TOTALS	**$32,796**	**$76,959**	**$13,371**	**$123,126**

Yards, Etc. - Calculations

Grading Calculations

Average push distance assumed to be 2/3 of the 600 feet maximum from Catepillar Handbook or 400 feet
Material assumed to be loose stockile (1.2 productivity factor)
Slope assumed to be 0 to 5% (1.0 productivity factor)

Cover Volume Calculation

Yard area x cover thickness

Ripping/Scarifying Calculations

Flat area width = Final flat area ÷ Average long dimensions
Number of passes = Flat area width ÷ Grader width
Travel distance = Number of passes x Average long dimensions
Total hours = (Travel distance ÷ Grader productivity) + (Number of passes x Grader maneuver time)
Minimum 1 hr ripping/scarifying per area

Revegetation

Minimum 1 acre revegetation crew time per area

Yards, Etc. - Regrading Costs

Productivity = Dozer Productivity x Grade Correction x Density Correction x Operator (0.75) x Material x Visibility x Job Efficiency (0.83) x (Slot/Side-by-Side)

	Description (required)	Regrading Volume cy	Dozing Distance (see above) ft	Regrading Fleet	Uncorrected Dozer Productivity cy/hr	Grade Correction	Dozing Material	Density Correction	Total Hourly Productivity cy/hr	Total Dozer Hours hr	Total Labor Cost $	Total Equipment Cost $	Total Regrading Cost $
1	**Office and Storage Area Yards**	10,000	400	D10R	501	1.0	1.0	0.79	246	41	$3,342	$13,803	$17,145
		10,000								41	**$3,342**	**$13,803**	**$17,145**

Yards, Etc. - Cover and Growth Media Costs

		Cover								Growth Media							
	Description (required)	Cover Volume cy	Topsoil Repacement Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Cover Cost $	Growth Media Volume cy	Growth Media Fleet	Fleet Productivity LCY/hr	Number of Trucks/ Scrapers	Total Fleet Hours	Total Labor Cost $	Total Equipment Cost $	Total Growth Media Cost $
1	**Office and Storage Area Yards**	54,853	769D/988G/D7R	684	2	80	$22,901	$54,049	$76,950						$0	$0	$0
		54,853				80	**$22,901**	**$54,049**	**$76,950**						**$0**	**$0**	**$0**

Yards, Etc. - Scarifying/Revegetation Costs

	Description (required)	Surface Area acres	Area Long Dimension ft	Ripping/ Scarifying Fleet	Scarifying/ Ripping Hours hrs	Scarifying/ Ripping Labor Costs $	Scarifying/ Ripping Equipment Cost $	Total Scarifying/ Ripping Costs $	Revegetation Labor Cost $	Revegetation Equipment Cost $	Revgetation Material Cost $	Total Revegetation Cost $
1	**Office and Storage Area Yards**	34.00	1,000	D10R	22	$1,793	$7,407	$9,200	$4,760	$1,700	$13,371	$19,831
		34.00			22	**$1,793**	**$7,407**	**$9,200**	**$4,760**	**$1,700**	**$13,371**	**$19,831**

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Closure Cost Estimate
Waste Disposal

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Waste Disposal - Cost Summary

	Labor	Equipment	Fees	Totals
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$50,235
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
TOTALS	**$0**	**$0**	**$0**	**$50,235**

Color Code Key

User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Waste Disposal - User Input - Solid Waste

						Landfill (Bulk) Disposal			Dumpster
	Description (required)	ID Code	Waste Type (select)	Disposal Method (select)	Quantity cy	Distance to Landfill ft	Slope to Landfill % grade	Number of Trucks (user override)	Months Dumpster Rental months
1	**Solid Waste Removal**		**Waste Mgmt & Disposal**	**Dumpster**	**1,000**				**12**

Notes:
1. All Physical parameters must be input even if manual overrides for volume or area are used.
2. If Slope from facility to borrow source is >20, downhill travel time may be underestimated due to limitation of uphill travel time curves and downhill speed tables from CAT Handbook (see Productivty Sheet)

Waste Disposal - User Input - Hazardous Materials

	Description (required)	ID Code	Waste Type (select)	Container Type (select)	Vacuum Truck Size (select)	Liquid Quantity gallons	Soild Quantity cy	One Way Travel Distance to Disposal Site mi	One Way Travel Time to Disposal Site hr

Notes:
1. Use Other Demo & Equip Removal Sheet for tank removal

Waste Disposal - User Input - Hydrocarbon Contaminated Soils

	Description (required)	ID Code	Waste Type (select)	Disposal Method (select)	Quantity cy	Travel Distance to Offsite Disposal mi

Notes:
1. Use Yards or Landfills Sheets for bioremediation facility reclamation

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Closure Cost Estimate
Waste Disposal

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Waste Disposal - Cost Summary

	Labor	Equipment	Fees	Totals
Solid Waste - On Site	$0	$0	N/A	$0
Solid Waste - Off Site				$50,235
Hazardous Materials				$0
Hydrocarbon Contaminated Soils	$0	$0	$0	$0
TOTALS	$0	$0	$0	$50,235

Waste Disposal - Assumptions & Calculations

Solid Waste Disposal

Off site disposal assumes use of average rolloff dumpster [30 cy (m3), 10 ton (tonne)]
On site disposal assumes use of small loader/truck fleet for haulage
Average density for on site disposal = 2,600 lb/cy (1,540 kg/m3)
For on site disposal only 1 truck is required unless total truck hours > 8, only 2 trucks unless total truck hours are > 16

Hazardous Materials Disposal

Assumes all hazardous materials are known
Enter EITHER solid or liquid quantity each line.
If container type = 55 gallon (200 liter) drum then solid waste hauling costs apply
Average density for solids assumed to be 2,600 lb/cy (1,540 kg/m3)
Vacuum truck sizes: small = 2,200 gal (~8,300 litres), large = 5,000 gal (~19,000 litres)
Vacuum truck on site for 4 hours for each load

Hydrocarbon Contaminated Soils Disposal

Assumes all hazardous materials are known
On site disposal assumes biopad treatment
Exavation productivity =45 cy./hr (35 m3/hr) (Means Heavy Construction, 2006: 02315-424-0360)

Waste Disposal - Solid Waste Disposal

	Description (required)	Waste Volume cy	Number of Off Site Dumpster Loads	Landfill Fleet Equipment	Landfill Fleet Productivity LCY/hr	Number of Trucks	Total Fleet Hours	Total Dumpster Cost $	Total Labor Cost $	Total Equipment Cost $	Total Waste Disposal Cost $
1	**Solid Waste Removal**	1,000	34					$50,235	$0	$0	$0
		1,000						$50,235	$0	$0	$0

Waste Disposal - Hazardous Materials Disposal

	Description (required)	Liquid Waste Volume gallons	Solid Waste Volume cy	Number of Truck Loads	Tons of Waste Tons	Pick-up Fees $	Transport Fees $	Disposal Fees $	Total Hazardous Material Cost $
						$0	$0	$0	$0

Waste Disposal - Hydrocarbon Contaminated Soils

	Description (required)	Quantity cy	Disposal Equipment Fleet	Total Fleet Hours	Treatment Cost $	Transport Fees $	Disposal Fees $	Total Labor Cost $	Total Equipment Cost $	Total Waste Disposal Cost $
					$0	$0	$0	$0	$0	$0

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Closure Cost Estimate
Well Abandonment

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Well Abandonment	Labor	Equipment	Materials	Totals
Production, Dewatering, Infiltration Wells	$42,348	$78,145	$7,084	$127,577
Monitoring Wells	$0	$0	$0	$0
TOTALS	**$42,348**	**$78,145**	**$7,084**	**$127,577**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Well seal thickness: 20 ft
Minimum seal above groundwater table: 50 ft

Production, Dewatering and Infiltration Well Closure

	Description (required)	ID Code	Number of Holes	Casing Diam in	Average Depth(1) ft bgs	Depth to First Water ft bgs	Original Static Water Level ft bgs	Top of Slotted Casing(2) ft bgs	Blank Casing Below Top of Screen(2) ft	Type of Pump (if any) (select)	Depth to Pump ft bgs	Hole Plug Method (select)	Casing Volume per ft cf	Perforation Length(3,4) ft	Grout Volume per Hole(4,5) cy	Cement Volume per Hole(6) cy	Inert Media Volume per Hole(7) cy	Pump Removal Labor Cost $	Pump Removal Equip Cost $	Perf Labor Cost $	Perf Equip Cost(8) $	Grout + Cement Labor Cost(9) $	Grout + Cement Equip Cost(9) $	Grout + Cement Material Cost $	Inert Media Labor Cost(10) $	Inert Media Equip Cost(9) $	Total Cost $
1	**Dewatering wells**		**8**	**12.0**	**500**	**200**	**200**	**300**	**100**	**Submersil**	**300**	**Grout + Ba**	0.790	250	20.50	0.60	2.90	$18,360	$45,264	$11,999	$19,398	$11,052	$13,261	$7,084	$937	$222	$127,577
																		$18,360	**$45,264**	**$11,999**	**$19,398**	**$11,052**	**$13,261**	**$7,084**	**$937**	**$222**	**$127,577**

(1) For previously abandoned holes enter "0" for depth
(2) Wells abandoned per Nevada Administrative Code (NAC 534.420). Hole grouted and perforated from bottom to 50 feet (15.24m) above the top of the screen, or first water encountered or original static water level, depending on vertical hydraulic gradient and well construction parameters. Inert media (cuttings or alluvium) used from top of grout to top seal.
(3) Perforation length = amount of blank casing below first water (for confined aquifers) or predicted recovered water table (unconfined aquifers) + 50 feet (15.24m) of blank casing above water table
(4) Assumes 50' (15.24m) sanitary seal at top of hole. Therefore, perforation and grouting only required to bottom of sanitary seal.
(5) Assumes 100% loss to formation for grout (abandonite) for screened and perforated sections.
(6) Assumes 20' (6m) top seal of cement in casing only. See note 4.
(7) Inert material is cuttings or alluvium sourced locally.
(8) Includes perforation tool wear cost/ft of perforation (see Productivty Sheet).
(9) See Productivity Sheet for hourly production. Minimum 1 hr per hole + fixed hours per hole for move and setup. If no perforation required, use standard drill rig.
(10) See Productivity Sheet for hourly production. Minimum 1 hr per hole.

Notes:

Monitoring Well Closure

	Description (required)	ID Code	Number of Holes	Casing Diam in	Average Depth ft bgs	Top of Screen(1) ft bgs	Hole Plug Method (select)	Casing Volume per ft ft3	Grout Volume/ Well(2,3) cy	Cement Volume per Hole(4) cy	Inert Backfill Volume per Hole(5) cy	Total Grouting Hours/ Hole hr	Total Inert Media Hours/ Hole hr	Grout + Cement Labor Cost(6) $	Grout + Cement Equip Cost(6) $	Grout + Cement Material Cost $	Inert Material Labor Cost(7) $	Inert Material Equip Cost(7) $	Total Cost $
1							**none**							$0	$0	$0	$0	$0	$0
														$0	**$0**	**$0**	**$0**	**$0**	**$0**

Wells abandoned per NAC 534.420 with bentonite grout placed to 50 feet above the top of the screen (see note 1).
(1) Assumes top of screen is at or above the static water level (in unconfined aquifers) or the depth of first water encountered (in confined aquifers).
(2) Assumes 25% loss to formation for grouting
(3) Grouting only required to 50' (15.24m) above the top of screen because monitor wells are constructed with a seal in the annular space.
(4) Assumes top 20' (6m) plugged with cement.
(5) Assumes hole plugged with inert material (cuttings or alluvium) above grout up to cement surface plug.
(6) See Productivity Sheet for hourly production. Minimum 1 hr per hole + fixed hours per hole for move and setup (see Productivty Sheet).
(7) See Productivity Sheet for hourly production. Minimum 1 hr per hole.

Notes:
All monitoring wells remain in place for long term monitoring under APP permit

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Cost Data: User Data
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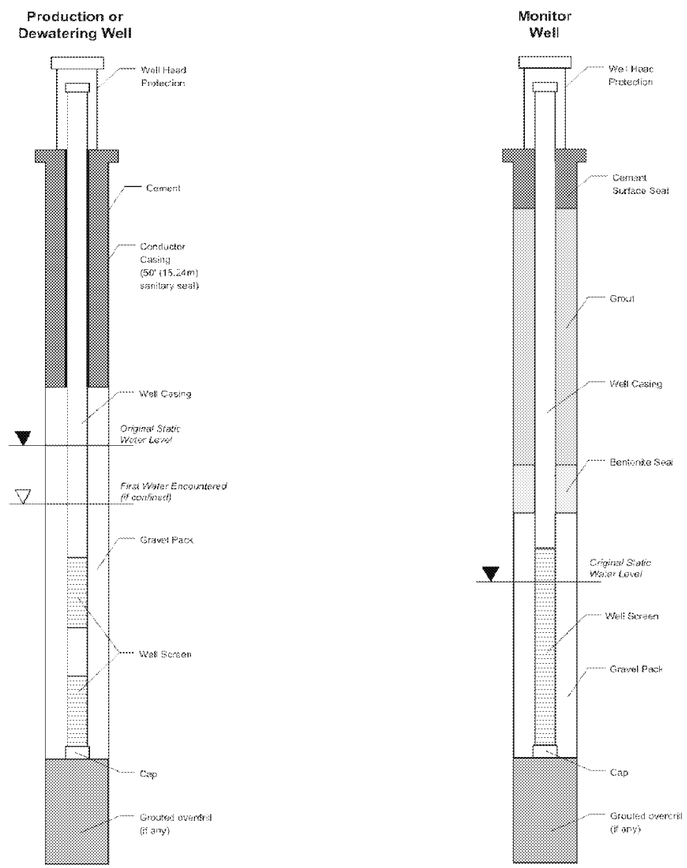
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Well Abandonment

	Labor	Equipment	Materials	Totals
Production, Dewatering, Infiltration Wells	$42,348	$78,145	$7,084	$127,577
Monitoring Wells	$0	$0	$0	$0
TOTALS	**$42,348**	**$78,145**	**$7,084**	**$127,577**

Well Construction



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Closure Cost Estimate
Misc. Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Miscellaneous Cost Summary

	Labor	Equipment	Materials	Totals
Fence Removal	$0	$0	N/A	$0
Fence Installation	$94,836	$15,755	$25,754	$136,345
Culvert & Buried Pipe Removal	$922,530	$260,820	N/A	$1,183,350
Surface Pipe Removal	$0	$0	N/A	$0
Power Lines	$425,916	N/A	N/A	$425,916
Substations/Transformers	$58,997	N/A	N/A	$58,997
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Costs	$0	$0	$0	$0
TOTALS	$1,502,279	$276,575	$25,754	$1,804,608

Color Code Key

User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

Fence Removal — You must fill in ALL green and blue cells

	Description (required)	ID Code	Length ft	Type (select type)	Labor Cost $	Equipment Cost $	Total Cost $
					$0	$0	$0

Notes:

Fence Installation — You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Length ft	Input: Type (select type)	Labor Cost $	Equipment Cost $	Material Cost ($)	Total Cost $
1	Peach/Elgin Pit Fence		21445	Barbed 5-strand	$67,123	$11,151	$18,228	$96,502
2	Copper World Pit		8854	Barbed 5-strand	$27,713	$4,604	$7,526	$39,843
					$94,836	$15,755	$25,754	$136,345

Notes:

Culvert & Buried Pipe Removal — You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Length ft	Input: Type (select type)	Input: Location (select)	Labor Cost $	Equipment Cost $	Total Cost $
1	Water Pipes through utility corridor		66000	24 in (600 mm) Di	Off site	$882,420	$249,480	$1,131,900
2	Haul Road Culverts		3000	24 in (600 mm) Di	On site	$40,110	$11,340	$51,450
						$922,530	$260,820	$1,183,350

Notes: Haul road culverts assume 40' of pipe left in place to maintain road for maintenance access
Access road culverts assume 4 per mile for 12.5 miles averaging 40 feet in length each

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Closure Cost Estimate
Misc. Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Miscellaneous Cost Summary

	Labor	Equipment	Materials	Totals
Fence Removal	$0	$0	N/A	$0
Fence Installation	$94,836	$15,755	$25,754	$136,345
Culvert & Buried Pipe Removal	$922,530	$260,820	N/A	$1,183,350
Surface Pipe Removal	$0	$0	N/A	$0
Power Lines	$425,916	N/A	N/A	$425,916
Substations/Transformers	$58,997	N/A	N/A	$58,997
Rip-rap, rock lining, gabions	$0	$0	$0	$0
Other Costs	$0	$0	$0	$0
TOTALS	$1,502,279	$276,575	$25,754	$1,804,608

Surface Pipe Removal — You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Length ft	Input: Type (select type)	Input: Location (select)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Total Cost $
						$0	$0	$0

Notes:

Power Line and Substation Removal — You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Power Line Length miles	Input: Power Line Type (select)	Input: Number of Substations #	Input: Location (select)	Costs: Power Line Removal $	Costs: Substation Removal $	Costs: Total Cost $	Cost Breakdown: Labor Cost $	Cost Breakdown: Equipment Cost $
1	Powerline through utility corridor		9.1	Single Pole	1	Off-site	$425,916	$58,997	$484,913	$96,983	$387,930
							$425,916	$58,997	$484,913	$96,983	$387,930

Notes: If substation owned by operator, use Other Demo & Equipment Removal sheet
User may need to add line items in Foundations & Buildings for substation slab demolition and fence removal
Labor/Equipment costs assume approximately 80% of cost are equipment and 20% are labor related costs

Rip-Rap & Rock Lining — You must fill in ALL green and blue cells

	Description (required)	ID Code	Input: Area S.Y.	Input: Type (select type)	Costs: Labor Cost $	Costs: Equipment Cost $	Costs: Material Cost $	Costs: Total Cost $
					$0	$0	$0	$0

Notes:

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Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
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Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Reclamation Monitoring & Maintenance - Cost Summary

	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	$15,716	$5,613	$44,146	$65,475
Erosion Maintenance	$3,898	$11,694	N/A	$15,592
Reclamation Monitoring	$119,432	$4,723	N/A	$124,155
Subtotal Reclamation Monitoring	**$139,046**	**$22,030**	**$44,146**	**$205,222**
Water Quality Monitoring	$0	$0	$0	$0
TOTAL MONITORING	**$139,046**	**$22,030**	**$44,146**	**$205,222**

Reclamation Maintenance

Description	Total Revegetation Surface Area (1,2) acres	% Area Requiring Reseeding	Seed Mix (select)	Area Requiring Reseeding acres	Seed $/acres	Labor $/acres	Equipment $/acres	Totals $
Revegetation Maintenance	1,123	**10%**	**Mix 4**	112.3	$393.25	$140.00	$50.00	
Labor								$15,716
Equipment								$5,613
Materials								$44,146
Cost/Acre								$583
							Subtotal	**$65,475**

Notes: 1) Surface area is NOT the same as footprint disturbance area typically used for permitting purposes.

	Total Volume Growth Media cy	% Volume Requiring Maintenance	Average Growth Media Placement Cost $/CY	Volume Requiring Replacement cy		Labor (assume: 25%) $/acres	Equipment (assume: 75%) $/acres	Total $
Erosion Maintenance	103,255	**10%**	$1.51	10,326		$3,898.00	$11,694.00	$15,592

Notes:

Reclamation Monitoring

Description	Hrs/Day	Days/Year	Number of Years	Rate $/hr		
Field Work						
Field Geologist/Engineer	8	8	5	$156.79		$50,173
Range Scientist	8	8	5	$141.79		$45,373
Reporting						
Field Geologist/Engineer	4	4	5	$156.79		$12,543
Range Scientist	4	4	5	$141.79		$11,343
					Subtotal	**$119,432**
Travel						
	Hrs/Trip hr	Trips/Year	Years	Truck Cost $/hr		
Travel	4	8	5	$29.52		$4,723
					Subtotal	**$4,723**
					Total Reclamation Monitoring	**$124,155**

Notes: **Monitoring assumes 1 Field Geologist/Engineer and 1 Range scientist per trip, 4 trips per year, 2 days each trip**
Travel data assumes 1 trucks per trip, half day for travel each way, 4 trips per year

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Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Reclamation Monitoring & Maintenance - Cost Summary

	Labor	Equipment	Lab & Materials	Totals
Revegetation Maintenance	$15,716	$5,613	$44,146	$65,475
Erosion Maintenance	$3,898	$11,694	N/A	$15,592
Reclamation Monitoring	$119,432	$4,723	N/A	$124,155
Subtotal Reclamation Monitoring	**$139,046**	**$22,030**	**$44,146**	**$205,222**
Water Quality Monitoring	$0	$0	$0	$0
TOTAL MONITORING	**$139,046**	**$22,030**	**$44,146**	**$205,222**

Water and Rock Sample Analysis

Description	Samples #	Events/Year	No. Years	First Sample Year closure year (1-100)	No. of Samplers	Days/Event	Hrs/Day	Analysis Cost $/sample	Supplies $/sample	Lab Cost $	Material Cost $	Equipment Cost $	Labor Cost $	Cost $	Comments
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
														$0	
										$0.00	$0.00	$0.00	$0.00		
													Subtotal Sampling Costs	**$0**	

Notes: Sampling labor cost = No. Samplers x Years x Events/year x Days/event x Hour/Day x Labor Rate
Sampling equipment costs include 1 pickup truck for every two samplers

Ground & Surface Water Monitoring

Pump Costs

Description	No. of units		Years		Cost $
Pump (purchased)		Replacement period (yrs)			$0
				Subtotal Field Work	**$0**

Notes: Replacement period = frequency of pump replacement

Reporting

Description	Hrs/Event	Rate $/hr	Cost $
Field Geologist/Engineer			
		Subtotal Reporting	

Notes: **All sampling and reporting performed under APP permit**

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Closure Cost Estimate
Constr. Mgmt

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Construction Management & Road Maintenance - Cost Summary	Labor	Equipment	Materials	Totals
Construction Management	$551,656	$104,612	N/A	$656,268
Construction Support		$42,684		$42,684
Road Maintenance	$279,844	$602,721	$19,879	$902,444
TOTAL CONSTRUCTION MANAGEMENT	**$831,500**	**$750,017**	**$19,879**	**$1,601,396**

Construction Management

Construction Management Staff

Description	Duration mo.	Hours/ Month hr.	Number of Supervisors	Supervisor Rate $/hr	Labor Cost $	Equipment Cost(1) $	Totals $
Active Reclamation	12	160	2	$135.21	$519,206	$98,458	$617,664
Monitoring & Maintenance	60	4	1	$135.21	$32,450	$6,154	$38,604
				Total Staff	**$551,656**	**$104,612**	**$656,268**

Construction Management Support

Description	Duration mo.	Number of Units		Rental Rate $/mo	Generator Cost $/mo	Equipment Cost(1) $	Totals $
Temporary Office Rental	12	1		$198	$2,288	$29,832	$29,832
Temporary Toilets	60	1		$214		$12,852	$12,852
					Total Support	**$42,684**	**$42,684**

Notes: Office rental assumes only 1 generator required for every 4 trailers

Total Construction Management **$698,952**

Road Maintenance

Description	Fleet Size (select)	Number	Duration mo.	Hours/ Month hr.	Labor Cost $	Equipment Cost $	Totals $
Active Reclamation							
Water Truck	Large	1	12	160	$118,157	$219,398	$337,555
Grader	Large	1	12	160	$156,787	$375,264	$532,051
Monitoring & Maintenance							
Water Truck					$0	$0	$0
Grader	Medium	1	60	1	$4,900	$8,059	$12,959
Description	**Gallons/ Day**	**Days/ Month**	**Duration mo.**	**Cost/ Gallon $**			**Totals $**
Water Fees							
Water Fees	100000	22	12	0.00			$19,879
				Total Project Maintenance	**$279,844**	**$602,721**	**$902,444**

Notes: 1) Supervisor equipment = pickup truck
Final reclamation assumed completed in 12 months
Periodic (once per year) road maintenance for 5 years
Water cost assumes $3/AF supply well cost plus $243/AF pumping cost = $0.000753/gal

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Closure Cost Estimate
Labor Rates

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

ZONE ADJUSTMENTS

Cost Basis/Project Region	Southern Nevada - Adjusted for Arizona		Clark, Esmeralda, Lincoln and Nye counties - adjusted for Pima County, AZ
Power Equipment Operators	**20-40 miles**	$0.00	
Truck Drivers	**30-50 miles**	$0.00	
Laborers	**30-50 miles**	$0.00	

INDIRECT COSTS

Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	7.60%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	0.00%

HOURLY LABOR RATE TABLE

EQUIPMENT TYPE (1) OR JOB DESCRIPTION	Labor Group	Base Rate ($/hr)	Zone Adjustment ($/hr)	Hourly Wage ($/hr)	Fringe ($/hr)	Retirement/ Medicare ($/hr)	Unemployment Insurance ($/hr)	Workman's Compensation ($/hr)	Other Indirect Costs ($/hr)	Total ($/hr)
Equipment Operators ($/hr) (2)										
Bulldozers										
D6R	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
D6R w/ Winch					$24.70					
D7R	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
D8R	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
D9R	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
D10R	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
D11R	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
Wheeled Dozers										
824G					$24.70					
834G					$24.70					
844					$24.70					
854G					$24.70					
Motor Graders										
120H	Group 10	$48.17	$0.00	$48.17	$24.70	$1.45	$3.69	$3.66	$0.00	$81.66
14G/H	Group 10	$48.17	$0.00	$48.17	$24.70	$1.45	$3.69	$3.66	$0.00	$81.66
16G/H	Group 10	$48.17	$0.00	$48.17	$24.70	$1.45	$3.69	$3.66	$0.00	$81.66
24M					$24.70					
Track Excavators										
312C	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
320C	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
325C	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
330C	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
345B	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
365BL					$24.70					
385BL	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
Scrapers										
631G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
637G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
Wheeled Loaders										
924G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
928G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
950G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
966G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
972G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
980G	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
988G	Group 10	$48.17	$0.00	$48.17	$24.70	$1.45	$3.69	$3.66	$0.00	$81.66
990					$24.70					
992G	Group 10	$48.17	$0.00	$48.17	$24.70	$1.45	$3.69	$3.66	$0.00	$81.66
994D					$24.70					
L2350					$24.70					
Shovels										
PC2000					$24.70					
PC3000					$24.70					
PC4000					$24.70					
PC5500					$24.70					
PC8000					$24.70					
Hydraulic Hammers										
H-120 (fits 325)										
H-160 (fits 345)										
H-180 (fits 365/385)										
Demolition Shears										
S340 (fits 322/325/330)										
S365 (fits 330/345)										
S390 (fits 365/385)										
Demolition Grapples										
G315 (fits 322/325)										
G320 (fits 325/330)										
G330 (fits 345/365)										

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Closure Cost Estimate
Labor Rates

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

ZONE ADJUSTMENTS			
Cost Basis/Project Region	**Southern Nevada - Adjusted for Arizona**	Clark, Esmeralda, Lincoln and Nye counties - adjusted for Pima County, AZ	
Power Equipment Operators	**20-40 miles**	$0.00	
Truck Drivers	**30-50 miles**	$0.00	
Laborers	**30-50 miles**	$0.00	

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	7.60%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	0.00%

HOURLY LABOR RATE TABLE

Other Equipment										
420D 4WD Backhoe	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
428D 4WD Backhoe	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
CS533E Vibratory Roller	Group 12A	$48.34	$0.00	$48.34	$24.70	$1.45	$3.70	$3.67	$0.00	$81.86
CS633E Vibratory Roller					$24.70					
CP533E Sheepsfoot Compactor					$24.70					
CP633E Sheepsfoot Compactor					$24.70					
Light Truck - 1.5 Ton					$24.70					
Supervisor's Truck					$24.70					
Flatbed Truck					$24.70					
Air Compressor + tools	Group 1	$44.99	$0.00	$44.99	$24.70	$1.35	$3.44	$3.42	$0.00	$77.90
Welding Equipment	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
Heavy Duty Drill Rig	Group 1	$44.99	$0.00	$44.99	$24.70	$1.35	$3.44	$3.42	$0.00	$77.90
Pump (plugging) Drill Rig	Group 1	$44.99	$0.00	$44.99	$24.70	$1.35	$3.44	$3.42	$0.00	$77.90
Concrete Pump					$24.70					
Gas Engine Vibrator	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
Generator 5KW					$24.70					
HDEP Welder (pipe or liner)					$24.70					
5 Ton Crane	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
20 Ton Crane	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
50 Ton Crane	Group 8A	$48.05	$0.00	$48.05	$24.70	$1.44	$3.68	$3.65	$0.00	$81.52
120 Ton Crane					$24.70					

NOTES:

(1) Equipment Type:	Catepillar model or equivalent, LeTourneau
(2) Equipment Operator Source:	0-B NV2020012 07/03/2020
(3) Zone Basis:	From Las Vegas City Hall

Truck Drivers ($/hr) (4)										
725	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
730	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
735	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
740	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
769D	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
773E					$26.72					
777D	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
785C					$26.72					
793C					$26.72					
797B					$26.72					
613E (5,000 gal) Water Wagon		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
621E (8,000 gal) Water Wagon		$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54
777D Water Truck					$26.72					
785C Water Truck					$26.72					
Dump Truck (10-12 yd3)	Dump Truck Driver	$29.45	$0.00	$29.45	$26.72	$0.88	$2.25	$2.24	$0.00	$61.54

NOTES:

(4) Truck Driver Source:	0-B NV2020012 07/03/2020
(5) Zone Basis:	From Las Vegas City Hall

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Closure Cost Estimate
Labor Rates

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

ZONE ADJUSTMENTS		
Cost Basis/Project Region	**Southern Nevada - Adjusted for Arizona**	Clark, Esmeralda, Lincoln and Nye counties - adjusted for Pima County, AZ
Power Equipment Operators	**20-40 miles**	$0.00
Truck Drivers	**30-50 miles**	$0.00
Laborers	**30-50 miles**	$0.00

INDIRECT COSTS	
Unemployment (%)	3.00%
Retirement/SS/Medicare (%)	7.65%
Workman's Compensation (%)	7.60%
Other Indirects	
State Payroll Tax (13),(15),(17),(1	
Total Other Indirects	**0.00%**

HOURLY LABOR RATE TABLE

Laborers ($/hr) (6,7)										
General Laborer	Group 1	$27.65	$0.00	$27.65	$26.79	$0.83	$2.12	$2.10	$0.00	$59.49
Skilled Laborer	Group 2	$27.86	$0.00	$27.86	$26.79	$0.84	$2.13	$2.12	$0.00	$59.73
Driller's Helper	Group 2	$27.86	$0.00	$27.86	$26.79	$0.84	$2.13	$2.12	$0.00	$59.73
Rodmen (reinforcing concrete)	Group 2	$27.86	$0.00	$27.86	$26.79	$0.84	$2.13	$2.12	$0.00	$59.73
Cement finisher	Group 2	$27.86	$0.00	$27.86	$26.79	$0.84	$2.13	$2.12	$0.00	$59.73
Carpenter		$46.15	$0.00	$46.15	$16.81	$1.38	$3.53	$3.51	$0.00	$71.38

NOTES:

(6) Laborer Source:	D-B LABO0872-015 7/1/2019
(7) Carpenter Source:	D-B CARP1977-003 7/1/2019
(8) Zone Basis:	From Las Vegas City Hall

Project Management and Technical Labor ($/hr) (9)										
Project Manager		$91.69		$91.69	$26.79	$2.75	$7.01	$6.97	$0.00	$135.21
Foreman		$84.94		$84.94	$26.79	$2.55	$6.50	$6.46	$0.00	$127.23
Field Geologist/Engineer		$109.94		$109.94	$26.79	$3.30	$8.41	$8.36	$0.00	$156.79
Field Tech/Sampler		$76.11		$76.11	$26.79	$2.28	$5.82	$5.78	$0.00	$116.79
Range Scientist		$97.25		$97.25	$26.79	$2.92	$7.44	$7.39	$0.00	$141.79
Senior Planning Engineer					$26.79					
Project Engineer					$26.79					
Mechanic/Fitter					$26.79					
					$26.79					
					$26.79					
					$26.79					
					$26.79					

NOTES:

(9) Project Manager:	RS Means 2020 Q2 (01 31 1320)
(9) Foreman Source:	RS Means 2020 Q2 (01 31 1320)
(9) Techical Labor Source:	Wood plc 2020
Other Labor Source:	
Other Labor Source:	
†Additional User Markups	
(These are added by the user to the	
base rate to account for site-specific	
conditions or corporate requirements)	

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Closure Cost Estimate
Equipment Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Monthly Rental Basis: 160 hrs month

EQUIPMENT RENTAL RATE TABLE				
EQUIPMENT TYPE (1)	Monthly Owner/Rental Rate	Equipment Hourly Rate	Fuel/Lube/ Wear	Total Rate
Bulldozers				
D6R	$10,605.00	$66.28	$29.37	$95.65
D6R w/ Winch			$16.56	$16.56
D7R	$11,575.00	$72.34	$32.69	$105.03
D8R	$22,030.00	$137.69	$43.96	$181.65
D9R	$29,580.00	$184.88	$62.60	$247.48
D10R	$41,000.00	$256.25	$80.42	$336.67
D11R	$64,000.00	$400.00	$117.20	$517.20
Wheeled Dozers				
824G			$28.49	$28.49
834G			$33.39	$33.39
844			$39.75	$39.75
854G			$50.35	$50.35
Motor Graders				
120H	$9,790.00	$61.19	$31.65	$92.83
14G/H	$14,075.00	$87.97	$46.36	$134.32
16G/H	$22,000.00	$137.50	$57.95	$195.45
24M			$41.08	$41.08
Track Excavators				
312C	$5,380.00	$33.63	$13.37	$47.00
320C	$6,070.00	$37.94	$22.29	$60.22
325C	$8,490.00	$53.06	$28.04	$81.10
330C	$11,015.00	$68.84	$33.96	$102.80
345B	$14,565.00	$91.03	$42.36	$133.39
365BL			$34.98	$34.98
385BL	$22,950.00	$143.44	$66.33	$209.76
Scrapers				
631G	$25,295.00	$158.09	$69.83	$227.93
637G	$35,000.00	$218.75	$100.33	$319.08
Wheeled Loaders				
924G	$4,850.00	$30.31	$20.88	$51.19
928G	$5,300.00	$33.13	$23.63	$56.75
950G	$7,750.00	$48.44	$29.30	$77.73
966G	$11,115.00	$69.47	$38.65	$108.12
972G	$14,075.00	$87.97	$43.56	$131.52
980G	$14,075.00	$87.97	$49.28	$137.25
988G	$23,460.00	$146.63	$70.36	$216.98
990			$45.05	$45.05
992G	$63,000.00	$393.75	$132.34	$526.09
994D			$95.40	$95.40
L2350			$174.90	$174.90
Shovels				
PC2000			$98.05	$98.05
PC3000			$132.50	$132.50
PC4000			$185.50	$185.50
PC5500			$315.35	$315.35
PC8000			$394.85	$394.85
Hydraulic Hammers				
H-120 (fits 325)	$5,810.00	$36.31	$5.62	$41.93
H-160 (fits 345)	$12,240.00	$76.50	$10.98	$87.48
H-180 (fits 365/385)	$16,520.00	$103.25	$13.01	$116.26
Demolition Shears				
S340 (fits 322/325/330)				$0.00
S365 (fits 330/345)				$0.00
S390 (fits 365/385)				$0.00
Demolition Grapples				

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Closure Cost Estimate
Equipment Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
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G315 (fits 322/325)				$0.00
G320 (fits 325/330)				$0.00
G330 (fits 345/365)				$0.00
Other Equipment				
420D 4WD Backhoe	$2,700.00	$16.88	$16.64	$33.52
428D 4WD Backhoe	$3,450.00	$21.56	$16.51	$38.08
CS533E Vibratory Roller	$8,140.00	$50.88	$9.94	$60.81
CS633E Vibratory Roller			$12.59	$12.59
CP533E Sheepsfoot Compactor			$9.94	$9.94
CP633E Sheepsfoot Compactor			$12.59	$12.59
Light Truck - 1.5 Ton	$4,044.00	$25.28	$4.25	$29.52
Supervisor's Truck	$3,634.00	$22.71	$2.92	$25.64
Flatbed Truck	$4,044.00	$25.28	$13.97	$39.24
Air Compressor + tools	$5,749.00	$35.93	$2.65	$38.58
Welding Equipment	$3,036.00	$18.98	$5.30	$24.28
Heavy Duty Drill Rig	$32,802.00	$205.01	$31.80	$236.81
Pump (plugging) Drill Rig	$32,802.00	$205.01	$26.50	$231.51
Concrete Pump	$8,470.00	$52.94	$26.50	$79.44
Gas Engine Vibrator	$554.00	$3.46	$2.65	$6.11
Generator 5KW	$1,652.00	$10.33	$3.98	$14.30
HDEP Welder (pipe or liner)	$8,778.00	$54.86	$5.30	$60.16
5 Ton Crane	$7,779.00	$48.62	$7.95	$56.57
20 Ton Crane	$11,924.00	$74.53	$10.60	$85.13
50 Ton Crane	$11,924.00	$74.53	$12.46	$86.98
120 Ton Crane			$13.78	$13.78
Trucks				
725	$15,300.00	$95.63	$38.68	$134.30
730	$15,300.00	$95.63	$40.00	$135.63
735	$15,300.00	$95.63	$54.27	$149.90
740	$15,300.00	$95.63	$55.49	$151.11
769D	$21,650.00	$135.31	$41.49	$176.80
773E	$34,025.00	$212.66	$55.14	$267.80
777D	$55,700.00	$348.13	$78.68	$426.81
785C			$64.26	$64.26
793C			$110.64	$110.64
797B			$155.69	$155.69
613E (5,000 gal) Water Wagon	$6,630.00	$41.44	$24.84	$66.28
621E (8,000 gal) Water Wagon	$11,220.00	$70.13	$44.15	$114.27
777D Water Truck			$44.39	$44.39
785C Water Truck			$64.26	$64.26
Dump Truck (10-12 yd^3)	$11,814.00	$73.84	$14.81	$88.65

NOTES:

(1) Power Equipment Source:	
(2) Power Equipment Type:	Catepillar model or equivalent, LeTourneau loader, Komatsu shovels
(3) Drilling Equipment Source:	RS Means Heavy Construction (2020 Q2)
(4) Other Equipment Source:	RS Means Heavy Construction (2020 Q2)
(5) Drill rig includes support (pipe) truck	

FUEL, LUBE AND WEAR CALCULATIONS

EQUIPMENT TYPE	PM Cost Per Hour (1)	Under carriage or Tires (2)	G.E.T Consumption (3)	Fuel Use Rate gal/hr (4)	Cost@ 2.65/gal	Total Hourly Equipment Cost
Bulldozers						
D6R	$7.63		$5.18	6.25	$16.56	$29.37
D6R w/ Winch				6.25	$16.56	$16.56
D7R	$7.63		$5.18	7.50	$19.88	$32.69
D8R	$8.05		$10.07	9.75	$25.84	$43.96
D9R	$9.18		$15.66	14.25	$37.76	$62.60
D10R	$10.80		$21.92	18.00	$47.70	$80.42
D11R	$14.71		$32.26	26.50	$70.23	$117.20
Wheeled Dozers						
824G		$0.00		10.75	$28.49	$28.49
834G		$0.00		12.60	$33.39	$33.39
844		$0.00		15.00	$39.75	$39.75
854G		$0.00		19.00	$50.35	$50.35

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Closure Cost Estimate
Equipment Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm

Motor Graders						
120H	$4.64	$5.63	$10.78	4.00	$10.60	$31.65
14G/H	$5.78	$8.43	$15.58	6.25	$16.56	$46.36
16G/H	$6.04	$10.75	$21.28	7.50	$19.88	$57.95
24M				15.50	$41.08	$41.08
Track Excavators						
312C	$4.36		$4.03	1.88	$4.98	$13.37
320C	$4.65		$4.65	4.90	$12.99	$22.29
325C	$4.68		$5.87	6.60	$17.49	$28.04
330C	$5.77		$6.46	8.20	$21.73	$33.96
345B	$7.66		$6.61	10.60	$28.09	$42.36
365BL				13.20	$34.98	$34.98
385BL	$6.42		$13.53	17.50	$46.38	$66.33
Scrapers						
631G	$7.74	$13.86	$8.48	15.00	$39.75	$69.83
637G	$12.87	$13.86	$10.66	23.75	$62.94	$100.33
Wheeled Loaders						
924G	$3.53	$5.59	$4.47	2.75	$7.29	$20.88
928G	$4.14	$5.59	$4.62	3.50	$9.28	$23.63
950G	$5.15	$4.95	$8.60	4.00	$10.60	$29.30
966G	$5.37	$7.25	$10.79	5.75	$15.24	$38.65
972G	$6.07	$7.25	$13.67	6.25	$16.56	$43.56
980G	$6.07	$9.67	$13.67	7.50	$19.88	$49.28
988G	$11.37	$12.27	$14.65	12.10	$32.07	$70.36
990				17.00	$45.05	$45.05
992G	$12.59	$25.17	$33.63	23.00	$60.95	$132.34
994D				36.00	$95.40	$95.40
L2350				66.00	$174.90	$174.90
Shovels						
PC2000				37.00	$98.05	$98.05
PC3000				50.00	$132.50	$132.50
PC4000				70.00	$185.50	$185.50
PC5500				119.00	$315.35	$315.35
PC8000				149.00	$394.85	$394.85
Hydraulic Hammers						
H-120 (fits 325)	N/A		$5.62			$5.62
H-160 (fits 345)	N/A		$10.98			$10.98
H-180 (fits 365/385)	N/A		$13.01			$13.01
Demolition Shears						
S340 (fits 322/325/330)	N/A					$0.00
S365 (fits 330/345)	N/A					$0.00
S390 (fits 365/385)	N/A					$0.00
Demolition Grapples						
G315 (fits 322/325)	N/A					$0.00
G320 (fits 325/330)	N/A					$0.00
G330 (fits 345/365)	N/A					$0.00
Other Equipment						
420D 4WD Backhoe	$4.29	$0.81	$3.59	3.00	$7.95	$16.64
428D 4WD Backhoe	$4.06	$0.81	$3.69	3.00	$7.95	$16.51
CS533E Vibratory Roller				3.75	$9.94	$9.94
CS633E Vibratory Roller				4.75	$12.59	$12.59
CP533E Sheepsfoot Compactor				3.75	$9.94	$9.94
CP633E Sheepsfoot Compactor				4.75	$12.59	$12.59
Light Truck - 1.5 Ton		$0.27		1.50	$3.98	$4.25
Supervisor's Truck		$0.27		1.00	$2.65	$2.92
Flatbed Truck		$1.51		4.70	$12.46	$13.97
Air Compressor + tools			N/A	1.00	$2.65	$2.65
Welding Equipment			N/A	2.00	$5.30	$5.30
Heavy Duty Drill Rig				12.00	$31.80	$31.80
Pump (plugging) Drill Rig				10.00	$26.50	$26.50
Concrete Pump			N/A	10.00	$26.50	$26.50
Gas Engine Vibrator			N/A	1.00	$2.65	$2.65
Generator 5KW			N/A	1.50	$3.98	$3.98
HDEP Welder (pipe or liner)			N/A	2.00	$5.30	$5.30
5 Ton Crane				3.00	$7.95	$7.95
20 Ton Crane				4.00	$10.60	$10.60
50 Ton Crane				4.70	$12.46	$12.46
120 Ton Crane				5.20	$13.78	$13.78

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Closure Cost Estimate
Equipment Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
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Trucks						
725	$8.53	$14.47	$3.22	4.70	$12.46	$38.68
730	$8.53	$14.47	$3.22	5.20	$13.78	$40.00
735	$8.53	$23.04	$3.22	7.35	$19.48	$54.27
740	$8.53	$24.26	$3.22	7.35	$19.48	$55.49
769D	$6.32	$7.05	$3.60	9.25	$24.51	$41.49
773E	$7.82	$12.14	$4.04	11.75	$31.14	$55.14
777D	$11.19	$18.59	$4.51	16.75	$44.39	$78.68
785C				24.25	$64.26	$64.26
793C				41.75	$110.64	$110.64
797B				58.75	$155.69	$155.69
613E (5,000 gal) Water Wagon	$5.12	$3.82		6.00	$15.90	$24.84
621E (8,000 gal) Water Wagon	$7.24	$8.42		10.75	$28.49	$44.15
777D Water Truck				16.75	$44.39	$44.39
785C Water Truck				24.25	$64.26	$64.26
Dump Truck (10-12 yd3) (5)	N/A	$1.03	N/A	5.20	$13.78	$14.81

Notes:

(1) PM Source:	Cashman Equipment Company (July 2020) unless noted
(2) Undercarriage Source:	Purecell Tire Quote: June 2020
(3) G.E.T. Source:	Cashman Equipment Company (July 2020) unless noted
(4) Fuel Use Source:	Caterpillar Handbook, Edition 35, Ch. 20; or estimated average for smaller vehicles
(5) Dump Truck Oper. Cost Source:	Means Heavy Construction (2008)

TIRE COST TABLES

Equipment	Tire Size	# of Tires Per Piece of Equipment	Cost Per Tire	Tire Cost (1)(2)	Life Expectency Hours (Low/Zone A) (3)	Tire Cost per Hour
Bulldozers						
D6R			N/A			
D6R w/ Winch			N/A			
D7R			N/A			
D8R			N/A			
D9R			N/A			
D10R			N/A			
D11R			N/A			
Wheeled Dozers						
824G	29.5R25	4		$0.00	3,500	$0.00
834G	35/65-R33	4		$0.00	3,500	$0.00
844	45/65-R39	4		$0.00	3,500	$0.00
854G	45/65-R45	4		$0.00	3,500	$0.00
Motor Graders						
120H	13PR24	6	$3,282.50	$19,695.00	3,500	$5.63
14G/H	20.5R25	6	$4,919.50	$29,517.00	3,500	$8.43
16G/H	23.5R25	6	$6,272.90	$37,637.40	3,500	$10.75
24M	23.5R25	6		$0.00	3,500	
Track Excavators						
312C			N/A			
320C			N/A			
325C			N/A			
330C			N/A			
345B			N/A			
365BL			N/A			
385BL			N/A			
Scrapers						
631G	37.25R35	4	$13,862.80	$55,451.20	4,000	$13.86
637G	37.25R35	4	$13,862.80	$55,451.20	4,000	$13.86
Wheeled Loaders						
924G	17.5R25	4	$6,292.00	$25,168.00	4,500	$5.59
928G	17.5R25	4	$6,292.00	$25,168.00	4,500	$5.59
950G	26.5R25	4	$5,565.40	$22,261.60	4,500	$4.95
966G	26.5R25	4	$8,160.20	$32,640.80	4,500	$7.25
972G	26.5R25	4	$8,160.20	$32,640.80	4,500	$7.25
980G	29.5R25	4	$10,873.40	$43,493.60	4,500	$9.67
988G	35/65-33	4	$13,808.70	$55,234.80	4,500	$12.27
990	41.25/70-39	4		$0.00	4,500	
992G	45/65R45	4	$28,316.00	$113,264.00	4,500	$25.17
994D	55/85R57	4		$0.00	4,500	
L2350	55/85R57	4		$0.00	4,500	

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Closure Cost Estimate
Equipment Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
Date of Submittal: June 7, 2021
File Name: ROSEMONT Copper World MLRP_06032021_SRCE_Version_1_4_1_017b_NV_2020.xlsm
Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm

Shovels						
PC2000			N/A			
PC3000			N/A			
PC4000			N/A			
PC5500			N/A			
PC8000			N/A			
Hydraulic Hammers						
H-120 (fits 325)			N/A			
H-160 (fits 345)			N/A			
H-180 (fits 365/385)			N/A			
Demolition Shears						
S340 (fits 322/325/330)			N/A			
S365 (fits 330/345)			N/A			
S390 (fits 365/385)			N/A			
Demolition Grapples						
G315 (fits 322/325)			N/A			
G320 (fits 325/330)			N/A			
G330 (fits 345/365)			N/A			
Other Equipment						
420D 4WD Backhoe	340/80R18-19.5LR24	2	$1,221.10	$2,442.20	3,000	$0.81
428D 4WD Backhoe	340/80R18-16.9R28	2	$1,221.10	$2,442.20	3,000	$0.81
CS533E Vibratory Roller			N/A			
CS633E Vibratory Roller			N/A			
CP533E Sheepsfoot Compactor			N/A			
CP633E Sheepsfoot Compactor			N/A			
Light Truck - 1.5 Ton		4	206.2	$824.80	3,000	$0.27
Supervisor's Truck		4	206.2	$824.80	3,000	$0.27
Flatbed Truck		22	206.2	$4,536.40	3,000	$1.51
Air Compressor + tools			N/A			
Welding Equipment			N/A			
Heavy Duty Drill Rig		4		$0.00	3,000	
Pump (plugging) Drill Rig		4		$0.00	3,000	
Concrete Pump			N/A			
Gas Engine Vibrator			N/A			
Generator 5KW			N/A			
HDEP Welder (pipe or liner)			N/A			
5 Ton Crane		4		$0.00	3,000	
20 Ton Crane		4		$0.00	3,000	
50 Ton Crane		6		$0.00	3,000	
120 Ton Crane		6		$0.00	3,000	
Trucks						
725	23.5R25	6	$4,824.30	$28,945.80	2,000	$14.47
730	23.5R25	6	$4,824.30	$28,945.80	2,000	$14.47
735	26.5R25	6	$7,681.00	$46,086.00	2,000	$23.04
740	29.5R25	6	$8,086.20	$48,517.20	2,000	$24.26
769D	18.00R33	6	$7,054.80	$42,328.80	6,000	$7.05
773E	24.00R35	6	$10,119.20	$60,715.20	5,000	$12.14
777D	27.00R49	6	$15,494.70	$92,968.20	5,000	$18.59
785C	33.00R51	6		$0.00	4,000	
793C	40.00R57	6		$0.00	4,000	
797B	40.00R57	6		$0.00	4,000	
613E (5,000 gal) Water Wagon	23.5R25	6	$3,818.10	$22,908.60	6,000	$3.82
621E (8,000 gal) Water Wagon	33.25R29	6	$11,223.35	$67,340.10	8,000	$8.42
777D Water Truck	27.00R49	6		$0.00	5,000	
785C Water Truck	33.00R51	6		$0.00	4,000	
Dump Truck (10-12 yd3)		10	$619.90	$6,199.00	6,000	$1.03

Notes:

(1) Unit Cost Basis:	Cost per set
(2) Cost Basis:	Total cost for all required tires
(3) Tire Cost Source:	Purecell Tire Quote: June 2020
(4) Tire Wear Source:	Caterpillar Handbook, Edition 35; CH 20

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Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Color Code Key	
User Input - Direct Input	**Direct Input**
User Input - Pull Down List	**Pull Down Selection**
Program Constant (can override)	**Alternate Input**
Program Calculated Value	**Locked Cell - Formula or Reference**

Revegetation Materials

Seed Mixes

Seed Mix	Description		Cost/Acre
None			
Mix 1	Basins		$302.90
Mix 2	Low Hills		$332.75
Mix 3	Uplands		$353.00
Mix 4	Riparian or Custom		$393.25
User Mix 1			
User Mix 2			
User Mix 3			
User Mix 4			
	Cost/lb	**lbs/Acre**	**Cost/Acre**
User Mix 5 (from Seed Mix sheet)	$0.00	$17.42	$0.00

Notes:

Mulch

Item	Cost/lb	lbs/Acre	Cost/Acre
None			
Straw Mulch	$0.17		
Hydro Mulch	$0.25		
Timber Mulch			

Notes: Granite Seed $500 per ton in 50lb bag Wood (hydro) mulch (June 2020)

Amendments

Item	Cost/lb	lbs/Acre	Cost/Acre
None			
Organic Matter	$0.70		$0.00
Treated Sludge			
Chemical	$0.59		$0.00

Notes: Western Nevada Supply $29.34 per 50lb bag 15-15-15 (June 2020)

Revegetation Method

Slopes

Disturbance Type	Seed Application Method	Labor Cost/Acre	Equipment Cost/Acre	Total Cost/Acre
Waste Rock Dumps	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Heap Leach	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Tailings	**Hand Broadcast**	$140.00	$50.00	$190.00
Quarries & Borrow Pits	**Mechanical Broadcast**	$140.00	$50.00	$190.00

Flat Areas and Undifferentiated

Disturbance Type	Seed Application Method	Labor Cost/Acre	Equipment Cost/Acre	Total Cost/Acre
Exploration Trenches	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Exploration Roads	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Waste Rock Dumps	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Heap Leach	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Tailings	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Quarries & Borrow Pits	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Roads	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Pits	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Haul Material	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Foundations & Buildings	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Sediment & Drainge Control	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Process Ponds	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Landfills	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Yards, Etc.	**Mechanical Broadcast**	$140.00	$50.00	$190.00
Revegetation Maintenance	**Mechanical Broadcast**	$140.00	$50.00	$190.00

Well Abandonment Materials

Description	Cost/50lb bag	Units	Cost/unit*
Cement	$7.87	cy	$36.05
Grout (Low Grade Bentonite)	$8.85	cy	$42.14
Inert Material/Cuttings		cy	
		cy	
		cy	

(1) Jentech Drilling Supply Quote (June 2020) Type I - II Cement at $14.24 per 94lb bag
(2) Jentech Drilling Supply (June 2020) 3/8 in. Chunk Bentonite Hole Plug at $8.85 per 50 lb. bag (5.75 cf/bag at 43 gallons slurry and 12.1% solids)+ 10% for bentonite chips added.

* Assumes 1 bag mixes with water to make 0.21 y3 or 0.16 m3 of grout/cement slurry

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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety **Cost Basis: Southern Nevada - Adjusted for Arizona**

Monitoring Costs

Description	Units	Cost/unit
Monitor Well Pump	ea.	$2,766.41
Sampling Supplies	ea.	$6.51
Water Analysis (Profile I) (1)	ea.	$411.00
Leach Test (MWMP) w/ analysis	ea.	$463.40
ABA + S speciation	ea.	$150.00
WAD Cyanide in water	ea.	$56.00
Water Analysis (Profile II) (1)	ea.	$461.00
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	
	ea.	

(1) WET Lab, Reno, Nevada (July 2020)
Well pump and Sample supply costs adjusted to 2020.
Original source unknown.

Fuel, Etc.

Description	Units	Cost/unit
Off-road Diesel - delivered (1)	$/gal	$2.580
Pickup Truck Mileage	$/mi	$0.580
Electical Power	$/kWh	$0.080

(1) Source: AZ Tucson Fuel Cost, adjusted for red dye diesel
Source: Federal Government Vehicle Allowance Rate 2020
Source: NV Energy (July 2020) $0.07872

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Closure Cost Estimate
Misc. Unit Costs

Project Name: Rosemont Copper World Mined Land Reclamation Plan - Reclamation Plan
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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Color Code Key	
User Input - Direct Input	Direct Input
User Input - Pull Down List	Pull Down Selection
Program Constant (can override)	Alternate Input
Program Calculated Value	Locked Cell - Formula or Reference

Revegetation

	Means Number	Unit	Crew	Daily Output	Daily Output User	Materials	Labor	Equipment	Total	Notes
Seeding - Broadcast Hand (1)		acres					$140.00	$50.00	$190.00	
Seeding - Broadcast Mechanical (1)		acres					$140.00	$50.00	$190.00	
Seeding - Drill (1)		acres		365			$140.00	$120.00	$260.00	
Seeding - Hydroseeding (1)				365			$250.00	$150.00	$400.00	
Shrub Planting - bare root 6-10 in (150- 250mm) (2)	02910-400-0561	ea.	1 Clab	365					$0.00	
Tree Planting - bare root 11-16 in (270- 400mm) (3)	02910-400-0562	ea.	1 Clab	260					$0.00	
Cactus Planting (4)		ea.	1 Clab						$0.00	
NOTES:										
(1) Seeding Source:	Source: Kelley Erosion Control (July 2020)									
(2) Shrub Source:										
(3) Tree Source:										
(4) Cactus Source:										

Building and Wall Demolition

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets

	Means Number	Unit	Crew	Daily Output	Daily Output User	Labor	Equipment	Premium	Total	Notes
Building Demolition										
Lg. steel	02220-110-0012	C.F.	B-8	21500		$0.20	$0.12		$0.32	
Lg. concrete	02220-110-0050	C.F.	B-8	15300		$0.28	$0.17		$0.45	
Lg. masonry	02220-110-0080	C.F.	B-8	20100		$0.21	$0.13		$0.34	
Lg. mixed	02220-110-0100	C.F.	B-8	20100		$0.21	$0.13		$0.34	
Sm. steel	02220-110-0500	C.F.	B-3	14800		$0.24	$0.13		$0.37	
Sm. concrete	02220-110-0600	C.F.	B-3	11300		$0.32	$0.17		$0.49	
Sm. masonry	02220-110-0650	C.F.	B-3	14800		$0.24	$0.13		$0.37	
Sm. wood	02220-110-0700	C.F.	B-3	14800		$0.24	$0.13		$0.37	
Wall Demolition										
Block 4 in (100 mm) thick	02220-130-2000	S.F.	1 Clab	180		$2.64	$0.00	20%	$3.17	
Block 6 in (150 mm) thick	02220-130-2040	S.F.	1 Clab	170		$2.80	$0.00	20%	$3.36	
Block 8 in (200 mm) thick	02220-130-2080	S.F.	1 Clab	150		$3.17	$0.00	20%	$3.80	
Block 12 in (300 mm) thick	02220-130-2100	S.F.	1 Clab	150		$3.17	$0.00	20%	$3.80	
Conc 6 in (150 mm) thick	02220-130-2400	S.F.	B-9	160		$22.15	$1.93	10%	$26.49	
Conc 8 in (200 mm) thick	02220-130-2420	S.F.	B-9	140		$25.32	$2.20	10%	$30.27	
Conc 10 in (250 mm) thick	02220-130-2440	S.F.	B-9	120		$29.54	$2.57	10%	$35.32	
Conc 12 in (300 mm) thick	02220-130-2500	S.F.	B-9	100		$35.45	$3.09	10%	$42.39	

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Model Version: Version 1.4.1
Cost Data: User Data
Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Waste Disposal

Unit rates from Means Heavy Construction 2006 Edition by permission of R.S.Means/Reed Construction Data .

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment		Total	Notes
Rubbish Handling										
Dumpster delivery (average for all sizes)	02220-350-0910	ea.			$51.50				$51.50	
Haul (average for all sizes)	02220-350-0920	ea.			$161.00				$161.00	
Rent per month (average for all sizes)	02220-350-0940	ea.			$55.00				$55.00	
Disposal fee per ton (tonne) (average for all sizes)	02220-350-0950	ton			$60.50				$60.50	
NOTES:										
Dumpster Cost Source	R.S. Means Heavy Construction (2020 Q2).									
Dumpster Disposal Fee Source:	R.S. Means Heavy Construction (2020 Q2).									
Hazardous Material Handling - Solids (+ Liquids in drums)										
Pickup fees 55 gal (200 L). drums	02110-300-1100	ea.			$251.00				$251.00	
Bulk material (average)	02110-300-1220/1230	ton			$409.50				$409.50	
Transport - truck load (80 drums, 25 cy (m3), 18 tons)	02110-300-1260/1270	mile			$5.88				$5.88	
Dump site solid disposal fee	02110-300-6000/6020	ton			$288.50				$288.50	
NOTES:										
Solid Handling Cost Source	R.S. Means Heavy Construction (2019 Q2).									
Solid Disposal Fee Source:	2019 Q2 R.S. Means Heavy Const. ave. 02 81									
Hazardous Material Handling - Liquids										
Vacuum Truck Pickup (2200 gal/8300 L)	02110-300-3110	hr.			$147.00				$147.00	
Vacuum Truck Pickup (5000 gal/19000 L)	02110-300-3120	hr.			$213.00				$213.00	
Dump site liquid disposal fee	02110-300-6000/6020	ton			$288.50				$288.50	
NOTES:										
Liquid Handling Cost Source	R.S. Means Heavy Construction (2020 Q2).									
Liquid Disposal Fee Source:	2020 Q2 R.S. Means Heavy Const. ave. 02 81									
Hydrocarbon Contaminated Soils (HCS)										
Insitu Biotreatment	02115-200-2020/2021	C.Y.			$17.64				$17.64	
HCS disposal fee	02115-200-2050/2055	C.Y.			$278.50				$278.50	
NOTES:										
Insitu Treatement Cost Source	2020 Q2 RS Means Heavy Const., ave. 02 65									
HCS Disposal Fee Source:	2020 Q2 R.S. Means Heavy Const., ave. 02 65									

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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Concrete Structure Installation

Weekly dumpster rental rates from Means Heavy Construction 2005 Edition with permission by R.S.Means/Reed Construction Data .
Weekly dumpster rental rates include haul to off-site disposal site and disposal fees

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Reinforced Concrete Bulkheads and Shaft Covers										
Grade walls - 15 in (400mm) thick, 8 ft (2.5m) high	03310-240-4300	C.Y.	C-14D	80.02	$163.00	$179.13	$11.12		$353.25	includes reinforcing
Grade walls - 15 in (400mm) thick, 12 ft (3.7m) high	03310-240-4350	C.Y.	C-14D	26.2	$163.00	$547.10	$33.95		$744.05	includes reinforcing
Elevated conc, 1-way beam & slab - 15ft (4.6m) span	03310-240-2700	C.Y.	C-14B	20.59	$278.00	$710.32	$43.20		$1,031.52	includes reinforcing
Elevated conc, 1-way beam & slab - 25ft (7.5m) span	03310-240-2750	C.Y.	C-14B	28.36	$265.00	$515.71	$31.37		$812.08	includes reinforcing
Bat Gate/Foam Plug Installation										
Bat Gate (5)		ea.			$3,367.61					materials $/ea. Installed
Culvert Gate (5)		ea.			$6,735.21					materials $/ea. Installed
Adit Foam Plug (6)		ea./C.Y.			$336.76					materials $/cy placed
Production Opening Foam Plug (6)		ea./C.Y.			$336.76					materials $/cy placed

NOTES:

(5) Bat Gate Source:	NV BLM, 2/2006: 8 hr + 1hr mob/demob + 1hr setup per gate (adjusted to 2020)
(6) Foam Plug Source:	NV BLM, 2/2006: 8 hr+ 1hr mob/demob + 1hr setup per adit, 16 hrs per production opening (adjusted to 2020)

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Misc. Linear Projects

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Fencing Installation										
Barbed 3-strand	02820-170-1650	L.F.	B-80A	760	$0.51	$1.88	$0.31		$2.70	
Barbed 4-strand	extrapolated	L.F.	B-80A	570	$0.68	$2.50	$0.41		$3.59	
Barbed 5-strand	02820-130-0920	L.F.	B-80A	456	$0.85	$3.13	$0.52		$4.50	
Chain link 8-10ft (2.5-3m) Install	02820-130-0920	L.F.	B-80C	180	$38.00	$7.93	$1.31		$47.24	
Wood stockade fence 6 ft (2 m) high - Install	02820-510-1240	L.F.	B-80C	150	$16.00	$9.52	$1.57		$27.09	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
Fencing Removal										
Barbed 3-strand Removal	02220-220-1600	L.F.	2 Clab	430		$2.21	$0.55		$2.76	
Barbed 4-strand Removal	extrapolated	L.F.	2 Clab	355		$2.68	$0.67		$3.35	
Barbed 5-strand Removal	02220-220-1650	L.F.	2 Clab	280		$3.40	$0.84		$4.24	
Chain link 8-10 ft (2.5-3 m) Removal	02220-220-1700	L.F.	B-6	445		$3.60	$1.02		$4.62	
Wood, all types 4-6 ft ("1.5-2 m) high - Removal	02220-220-1775	L.F.	2 Clab	430		$2.21	$0.55		$2.76	
	user	L.F.								
	user	L.F.							$0.00	
	user	L.F.							$0.00	
	user	L.F.							$0.00	
Culvert Removal										
12 in (300 mm) Diameter	02220-220-2900	L.F.	B-6	175		$9.17	$2.59		$11.76	
18 in (450 mm) Diameter	02220-220-2930	L.F.	B-6	150		$10.69	$3.03		$13.72	
24 in (600 mm) Diameter	02220-220-2960	L.F.	B-6	120		$13.37	$3.78		$17.15	
36 in (1m) Diameter	02220-220-3000	L.F.	B-6	90		$17.82	$5.04		$22.86	
Pipeline Removal										
0.75 in (20mm) - 4 in (100 mm) diameter	02220-381-1600	L.F.	B-20	700		$2.82	$0.34		$3.16	
6 in (150 mm) - 8 in (200 mm)	02220-381-1700	L.F.	B-20	500		$3.94	$0.47		$4.41	
10 in (250 mm) - 18 in (450 mm)	02220-381-1800	L.F.	B-20	300		$6.57	$0.79		$7.36	
20 in (500 mm) - 36 in (1 m)	02220-381-1900	L.F.	B-20	200		$9.86	$1.18		$11.04	
Pipe and Drainpipe Installation										
Water 4in (100mm) 40ft (12m) length, welded HDPE	02510-760-0100	L.F.	B-22A	400	$2.70	$6.84	$4.85		$14.39	
Water 6in (150mm) 40ft (12m) length, welded HDPE	02510-760-0200	L.F.	B-22A	380	$5.85	$7.20	$5.11		$18.16	
Water 12in (300mm) 40ft (12m) length, welded HDPE	02510-760-0500	L.F.	B-22A	260		$10.53	$7.46		$17.99	
Drain 4in (100mm) perforated PVC	02620-630-2100	L.F.	B-14	315	$1.74	$11.35	$1.60		$14.69	
Drain 6in (150mm) perforated PVC	02620-630-2110	L.F.	B-14	300	$4.22	$11.92	$1.68		$17.82	
Drain 4in (100mm) corrugated, perf or plain	02620-660-0040	L.F.	2 Clab	1200	$0.78	$0.79	$0.20		$1.77	
Drain 6in (150mm) corrugated., perf or plain	02620-660-0060	L.F.	2 Clab	900	$2.18	$1.06	$0.26		$3.50	

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Closure Cost Estimate
Misc. Unit Costs

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Model Version: Version 1.4.1
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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

Drain Rock Preparation										
Crushing		C.Y.							$0.50	
Screening		C.Y.							$0.50	
TOTAL									$1.00	
Misc.										
Backhoe work	02210-700-0120	C.Y.	B-11M	28		$23.39	$9.58		$32.97	
Powerline and Transformer Removal										
Single Pole		mile							$46,804.00	
Double Pole		mile							$53,490.00	
Transformer (9)		ea.							$58,997.00	
NOTES:										
(7) Single Pole Source:	NV Energy estimate (2009) Adjusted to 2020									
(8) Double Pole Source:	NV Energy estimate (2009) Adjusted to 2020									
(9) Transformer Source:	NV Energy estimate (2009) Adjusted to 2020									

Erosion and Sedimentation Control

Hourly productivity rates and crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
All equipment, labor and material unit costs are from Labor Costs, Equipment Costs and Material Costs spreadsheets

	Means Number	Unit	Crew	Daily Output	Materials	Labor	Equipment	Premium	Total	Notes
Rip-Rap & Rock Lining										
Rip-Rap 3/8 to 1/4 CY (m3) pieces, grouted	02370-450-0110	S.Y.	B-13	80	$25.00	$44.67	$8.51		$78.18	assumes on-site source of rip-rap
Rip-Rap 18 in (450 mm) min thick, no grout	02370-450-0200	S.Y.	B-13	53	$7.65	$67.43	$12.85		$87.93	assumes on-site source of rip-rap
Gabions, 6 in (150 mm) deep	02370-450-0400	S.Y.	B-13	200	$7.05	$17.87	$3.41		$28.33	assumes on-site source rock fill for gabions
Gabions, 9 in (250 mm) deep	02370-450-0500	S.Y.	B-13	163	$9.85	$21.92	$4.18		$35.95	assumes on-site source rock fill for gabions
Gabions, 12 in (300 mm) deep	02370-450-0200	S.Y.	B-13	153	$14.30	$23.36	$4.45		$42.11	assumes on-site source rock fill for gabions
Gabions, 18 in (450 mm) deep	02370-450-0200	S.Y.	B-13	102	$18.35	$35.04	$6.68		$60.07	assumes on-site source rock fill for gabions
Gabions, 36 in (1m) deep	02370-450-0200	S.Y.	B-13	60	$31.00	$59.56	$11.35		$101.91	assumes on-site source rock fill for gabions
HDEP Liner Installation										
Finish grading large area	2310-100-0100	S.F.	B-11L	18000		$0.06	$0.06		$0.12	
Compaction-riding, vibrating roller - 12in (300mm) lifts	2315-310-5100	C.Y.	B-10Y	2600		$0.43	$0.19		$0.62	
60 mil HDPE	2660-610-0010	S.F.	3 Skwk	1600	$0.57	$1.31	$0.47		$2.35	
80 mil HDPE	user	S.F.	3 Skwk	149		$14.02	$5.03		$19.05	
40 mil VLDPE	user	S.F.	3 Skwk	150		$13.92	$5.00		$18.92	
	user	S.F.	3 Skwk	149		$14.02	$5.03		$19.05	
	user	S.F.	3 Skwk	149		$14.02	$5.03		$19.05	

Construction Management Support

Office Trailer, Furnished, no hook-ups	0150-500-0250	mo.			$198.00				$198.00	
Toilet Portable, chemical	1590-400-6410	mo.			$214.20				$214.20	
TOTAL					$412.20				$412.20	

Pump and Casing Removal

	Pump Type	Measurement	Unit				Labor	Equipment		Total	Notes
Pump Removal											
Submersible		ft to pump	L.F.				$7.65	$18.86		$26.51	
Line Shaft		ft to pump	L.F.				$7.65	$18.86		$26.51	
NOTES:											
(10) Pump Removal Source:	Boart Longyear Quote: June 2020										

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Cost Data: User Data
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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
RIPPING					
Rip road					
Waste rock dumps, heaps, tails - rip flat surfaces					
Surface preparation					
Scarify					
Small Dozer w/ multi-shank					
D7R		1	$105.03	$81.52	$186.55
Totals			$105.03	$81.52	$186.55
Medium Dozer w/ multi-shank					
D9R		1	$247.48	$81.52	$329.00
Totals			$247.48	$81.52	$329.00
Large Dozer w/ multi-shank					
D10R		1	$336.67	$81.52	$418.19
Totals			$336.67	$81.52	$418.19
Grader w/ multi-shank					
16G/H		1	$195.45	$81.66	$277.11
Totals			$195.45	$81.66	$277.11
GRADING					
Grading storage and structure areas					
Grading waste rock dumps and heaps					
Grading landfills					
Constructing pit safety berms					
Small Dozer Fleet					
D7R		1	$105.03	$81.52	$186.55
Totals			$105.03	$81.52	$186.55
Medium Dozer Fleet					
D9R		1	$247.48	$81.52	$329.00
Totals			$247.48	$81.52	$329.00
Large Dozer Fleet					
D10R		1	$336.67	$81.52	$418.19
Totals			$336.67	$81.52	$418.19
EXPLORATION GRADING					
Backfilling and grading exploration trenches					
Grading flat exploration roads					
Small Dozer Fleet					
D6R		1	$95.65	$81.52	$177.17
Totals			$95.65	$81.52	$177.17
Medium Dozer Fleet					
D7R		1	$105.03	$81.52	$186.55
Totals			$105.03	$81.52	$186.55
Large Dozer Fleet					
D8R		1	$181.65	$81.52	$263.17
Totals			$181.65	$81.52	$263.17
EXCAVATING					
Earthen Berms					
Diversion ditch excavation and backfill					
Underground openings backfill - excavate and place					
Pit berm construction (excavator option)					
Small Excavator					
325C		1	$81.10	$81.86	$162.96
Totals			$81.10	$81.86	$162.96
Medium Excavator					
345B		1	$133.39	$81.86	$215.25
Totals			$133.39	$81.86	$215.25
Large Excavator					
385BL		1	$209.76	$81.86	$291.62
Totals			$209.76	$81.86	$291.62
EXCAVATE AND RECONTOUR					
Recontour large roads (haul roads, access roads, etc.)					
Ponds - Excavate and pull liner and bury					

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EQUIPMENT FLEETS					
ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
Small Excavator + Dozer					
325C		1	$81.10	$81.86	$162.96
D7R		1	$105.03	$81.52	$186.55
Total Equipment			$186.13	$163.38	$349.51
Medium Excavator + Dozer					
345B		1	$133.39	$81.86	$215.25
D9R		1	$247.48	$81.52	$329.00
Totals			$380.87	$163.38	$544.25
Large Excavator + Dozer					
385BL		1	$209.76	$81.86	$291.62
D10R		1	$336.67	$81.52	$418.19
Totals			$546.43	$163.38	$709.81
EXPLORATION ROAD/PAD RECONTOUR					
Recontour small roads (exploration roads, service roads, etc.)					
Cut and Fill reclamation on slopes					
Drill pad recountour					
Drill sump backfill					
Small Dozer					
D6R		1	$95.65	$81.52	$177.17
Totals			$95.65	$81.52	$177.17
Large Dozer					
D8R		1	$181.65	$81.52	$263.17
Totals			$181.65	$81.52	$263.17
Grader					
14G/H		1	$134.32	$81.66	$215.98
Totals			$134.32	$81.66	$215.98
Small Excavator					
320C		1	$60.22	$81.86	$142.08
Totals			$60.22	$81.86	$142.08
Medium Excavator					
325C		1	$81.10	$81.86	$162.96
Totals			$81.10	$81.86	$162.96
LOAD, HAUL AND PLACE MATERIAL					
Rock placement					
Haul overburden for backfill					
Haul borrow for backfill					
Haul cover or growth media					
Small Truck/Loader Fleet					
725		Calculated	$134.30	$61.54	$195.84
966G	Loader	1	$108.12	$81.52	$189.64
D7R		1	$105.03	$81.52	$186.55
Totals			$347.45	$224.58	$572.03
Medium Truck/Loader Fleet					
740		Calculated	$151.11	$61.54	$212.65
988G	Loader	1	$216.98	$81.66	$298.64
D8R		1	$181.65	$81.52	$263.17
Totals			$549.74	$224.72	$774.46
Large Truck/Loader Fleet					
769D		Calculated	$176.80	$61.54	$238.34
988G	Loader	1	$216.98	$81.66	$298.64
D7R		1	$105.03	$81.52	$186.55
Totals			$498.81	$224.72	$723.53
Extra Large Truck/Loader Fleet					
777D		Calculated	$426.81	$61.54	$488.35
992G	Loader	1	$526.09	$81.66	$607.75
D7R		1	$105.03	$81.52	$186.55
Totals			$1,057.93	$224.72	$1,282.65
Scraper/Dozer Fleet					
631G		Calculated	$227.93	$81.52	$309.45
D10R		1	$336.67	$81.52	$418.19
D7R		1	$105.03	$81.52	$186.55
Totals			$669.63	$244.56	$914.19
Tandem Scraper Fleet					
637G		2	$319.08	$81.52	$400.60
D7R		1	$105.03	$81.52	$186.55

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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
EQUIPMENT FLEETS					
Totals			$424.11	$163.04	$587.15
MISC. LOAD AND HAUL AND EARTHWORKS					
Sludge removal					
Drainage controls					
Misc. - Cat 325B Excavator / 10-12 yd3 Truck					
325C		1	$81.10	$81.86	$162.96
Dump Truck (10-12 yd3)		1	$88.65	$61.54	$150.19
Totals			$169.75	$143.40	$313.15
Misc. - Cat D9R Dozer/ Loader (5 yd3) / 10-12 yd3 Truck					
D9R		1	$247.48	$81.52	$329.00
966G		1	$108.12	$81.52	$189.64
Dump Truck (10-12 yd3)		1	$88.65	$61.54	$150.19
Totals			$444.25	$224.58	$668.83
Misc. - Cat D6 Dozer / Cat 966 Loader / 10-12 yd3 Truck					
D6R		1	$95.65	$81.52	$177.17
966G		1	$108.12	$81.52	$189.64
Dump Truck (10-12 yd3)		1	$88.65	$61.54	$150.19
Totals			$292.42	$224.58	$517.00
CONCRETE BREAKING					
Slab demolition					
Footing demolition					
Wall demolition					
Small - Cat 325B Excavator w/ H140D s Hammer					
325C		1	$81.10	$81.86	$162.96
H-120 (fits 325)		1	$41.93	$0.00	$41.93
D9R		1	$247.48	$81.52	$329.00
Totals			$370.51	$163.38	$533.89
Medium - Cat 345B Excavator w/ H180D s Hammer					
345B		1	$133.39	$81.86	$215.25
H-160 (fits 345)		1	$87.48	$0.00	$87.48
D9R		1	$247.48	$81.52	$329.00
Totals			$468.35	$163.38	$631.73
Large - Cat 385B Excavator w/ H180D s Hammer					
385BL		1	$209.76	$81.86	$291.62
H-180 (fits 365/385)		1	$116.26	$0.00	$116.26
D9R		1	$247.48	$81.52	$329.00
Totals			$573.50	$163.38	$736.88
DRILL HOLE ABANDONMENT					
Drill Hole - Grout or Cement					
Pump (plugging) Drill Rig		1	$231.51	$77.90	$309.41
Driller's Helper		2	$0.00	$119.46	$119.46
Totals			$231.51	$197.36	$428.87
Drill Hole - Inert Media (Means Crew B-11M+ 1 Laborer)					
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
General Laborer		1	$0.00	$59.49	$59.49
Totals			$33.52	$141.35	$174.87
Drill Hole - Casing Perforation or Removal					
Heavy Duty Drill Rig		1	$236.81	$77.90	$314.71
Driller's Helper		2	$0.00	$119.46	$119.46
Totals			$236.81	$197.36	$434.17
MAINTENANCE FLEET					
Road Grading, Dust Suppression, Clean Up					
Maintenance - Small Water Truck and Cat 14G Grader					
613E (5,000 gal) Water Wagon		1	$66.28	$61.54	$127.82
120H		1	$92.83	$81.66	$174.49
Totals			$159.11	$143.20	$302.31
Maintenance - Medium Water Truck and Cat 16G Grader					
613E (5,000 gal) Water Wagon		1	$66.28	$61.54	$127.82
14G/H		1	$134.32	$81.66	$215.98
Totals			$200.60	$143.20	$343.80
Maintenance - Large Water Truck and Cat 16G Grader					
621E (8,000 gal) Water Wagon		1	$114.27	$61.54	$175.81
16G/H		1	$195.45	$81.66	$277.11
Totals			$309.72	$143.20	$452.92
PROJECT SUPERVISION					
Foreman		1	$0.00	$127.23	$127.23
Supervisor's Truck		1	$25.64	$0.00	$25.64

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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
Totals			$25.64	$127.23	$152.87

MEANS CREW DEFINITIONS

Crew composition from Means Heavy Construction 2005 Edition by permission of R.S.Means/Reed Construction Data .
For use with misc. unit costs where Means is the source for productivity

1 Clab - Seedling Planting/Block Wall Demolition					
General Laborer		1	$0.00	$59.49	$59.49
Totals			$0.00	$59.49	$59.49
2 Clab - Barbed Wire/Wood Fence Removal, Drainpipe Installation, Pumping, Evaporation					
General Laborer		2	$0.00	$118.98	$118.98
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$29.52	$118.98	$148.50
2 Clab + Excavator - Pond Liner Cut and Fold					
General Laborer		2	$0.00	$118.98	$118.98
325C		1	$81.10	$81.86	$162.96
Totals			$81.10	$200.84	$281.94
2 Clab + Welder - Bat Gates					
General Laborer		2	$0.00	$118.98	$118.98
Welding Equipment		1	$24.28	$81.52	$105.80
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$53.80	$200.50	$254.30
3 Clab - Foam Adit Plugs					
General Laborer		2	$0.00	$118.98	$118.98
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$63.04	$200.84	$263.88
3 Clab + Welder - Culvert Bat Gate					
General Laborer		2	$0.00	$118.98	$118.98
Welding Equipment		1	$24.28	$81.52	$105.80
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$87.32	$282.36	$369.68
3 Clab D - 3 Laborers + Foreman - Decontamination					
General Laborer		3	$0.00	$178.47	$178.47
Foreman		1	$0.00	$127.23	$127.23
Supervisor's Truck		1	$25.64	$0.00	$25.64
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$55.16	$305.70	$360.86
3 SKWK - Liner Installation					
Skilled Laborer		3	$0.00	$179.19	$179.19
HDEP Welder (pipe or liner)		1	$60.16	$0.00	$60.16
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
Totals			$93.68	$261.05	$354.73
B-3 - Small Building Demolition					
LABOR					
General Laborer		2	$0.00	$118.98	$118.98
Foreman		1	$0.00	$127.23	$127.23
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
EQUIPMENT					
928G		1	$56.75	$81.52	$138.27
Dump Truck (10-12 yd3)		2	$177.30	$123.08	$300.38
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
Totals			$234.05	$450.81	$684.86
B-6 - Chain Link Fence/Culvert Removal					
General Laborer		2	$0.00	$118.98	$118.98
928G		1	$56.75	$81.52	$138.27
Totals			$56.75	$200.50	$257.25
B-8 - Large Building Demolition					
LABOR					
General Laborer		2	$0.00	$118.98	$118.98

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EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
Foreman		1	$0.00	$127.23	$127.23
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
EQUIPMENT					
928G		1	$56.75	$81.52	$138.27
20 Ton Crane		1	$85.13	$81.52	$166.65
Dump Truck (10-12 yd3)		2	$177.30	$123.08	$300.38
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
			$0.00		$0.00
Totals			$319.18	$532.33	$851.51
B-9 - Concrete Wall Demolition					
General Laborer		4	$0.00	$237.96	$237.96
Foreman		1	$0.00	$127.23	$127.23
Air Compressor + tools			$38.58	$77.90	$116.48
Totals			$38.58	$443.09	$481.67
B-10Y - General Compaction					
General Laborer		1	$0.00	$59.49	$59.49
CS533E Vibratory Roller		1	$60.81	$81.86	$142.67
Totals			$60.81	$141.35	$202.16
B-11L - Fine Grading for Evaporation Pond Liner Base					
General Laborer		1	$0.00	$59.49	$59.49
14G/H		1	$134.32	$81.66	$215.98
Totals			$134.32	$141.15	$275.47
B-11M - Backhoe Work					
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
Totals			$33.52	$81.86	$115.38
B-12G - Rip-Rap Machine Placed (Modified)					
966G		1	$108.12	$81.52	$189.64
325C		1	$81.10	$81.86	$162.96
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$218.74	$163.38	$382.12
B-13 - Grouted Rip-Rap & Gabion Baskets					
General Laborer		4	$0.00	$237.96	$237.96
Foreman		1	$0.00	$127.23	$127.23
20 Ton Crane		1	$85.13	$81.52	$166.65
Totals			$85.13	$446.71	$531.84
B-14 PVC Drain Pipe Installation					
Foreman		1	$0.00	$127.23	$127.23
General Laborer		4	$0.00	$237.96	$237.96
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$63.04	$447.05	$510.09
B-20 - Remove Pipelines					
Foreman		1	$0.00	$127.23	$127.23
Skilled Laborer		1	$0.00	$59.73	$59.73
General Laborer		1	$0.00	$59.49	$59.49
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$29.52	$246.45	$275.97
B-22A - HDEP Installation - Pipe or Liner					
Skilled Laborer		1	$0.00	$59.73	$59.73
General Laborer		2	$0.00	$118.98	$118.98
D7R		1	$105.03	$81.52	$186.55
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
420D 4WD Backhoe		1	$33.52	$81.86	$115.38
Generator 5KW		1	$14.30	$0.00	$14.30
HDEP Welder (pipe or liner)		1	$60.16	$0.00	$60.16
Totals			$242.53	$342.09	$584.62
B-80A - Install Barbed Wire Fence					
General Laborer		3	$0.00	$178.47	$178.47
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$29.52	$178.47	$207.99

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Cost Data File: SRCE_Cost_data-USR_1_12_Rosemont Copper World_06032021.xlsm
Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
B-80C - Install Chain Link Fence (Flatbed truck has small crane)					
General Laborer		3	$0.00	$178.47	$178.47
Light Truck - 1.5 Ton		1	$29.52	$0.00	$29.52
Totals			$29.52	$178.47	$207.99
C-14B - Elevated Concrete Slabs (Reinforced Concrete Shaft Covers)					
Foreman		1	$0.00	$127.23	$127.23
Supervisor's Truck		1	$25.64	$0.00	$25.64
Carpenter		16	$0.00	$1,142.08	$1,142.08
General Laborer		2	$0.00	$118.98	$118.98
Rodmen (reinforcing concrete)		4	$0.00	$238.92	$238.92
Cement finisher		2	$0.00	$119.46	$119.46
Gas Engine Vibrator		1	$6.11	$81.52	$87.63
Concrete Pump		1	$79.44	$0.00	$79.44
Totals			$111.19	$1,828.19	$1,939.38
C-14D - Concrete Walls Formed in Place (Reinforced Concrete Adit Bulkheads)					
Foreman		1	$0.00	$127.23	$127.23
Supervisor's Truck		1	$25.64	$0.00	$25.64
Carpenter		18	$0.00	$1,284.84	$1,284.84
General Laborer		2	$0.00	$118.98	$118.98
Rodmen (reinforcing concrete)		2	$0.00	$119.46	$119.46
Cement finisher		1	$0.00	$59.73	$59.73
Gas Engine Vibrator		1	$6.11	$81.52	$87.63
Concrete Pump		1	$79.44	$0.00	$79.44
Totals			$111.19	$1,791.76	$1,902.95
User Crew #1					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
D10R			$336.67	$81.52	$418.19
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$683.34	$613.85	$1,297.19
User Crew #2					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					

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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #3					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #4					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00

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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #5					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #6					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #7					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23

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Cost Estimate Type: Surety Cost Basis: Southern Nevada - Adjusted for Arizona

EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #8					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
EQUIPMENT					
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #9					
Description:					
LABOR					
General Laborer			$0.00	$118.98	$118.98
Foreman			$0.00	$127.23	$127.23
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00

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EQUIPMENT FLEETS

ACTIVITY AND FLEET		Standard Crew Size	EQUIPMENT UNIT COST (Hourly)	TOTAL LABOR UNIT COST (Hourly)	TOTAL COST (Hourly)
					$0.00
					$0.00
	EQUIPMENT				
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$532.33	$879.00
User Crew #10					
Description:					
	LABOR				
General Laborer			$0.00	$59.49	$59.49
Foreman			$0.00	$0.00	$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
	EQUIPMENT				
928G			$56.75	$81.52	$138.27
50 Ton Crane			$86.98	$81.52	$168.50
Dump Truck (10-12 yd3)			$177.30	$123.08	$300.38
Supervisor's Truck			$25.64	$0.00	$25.64
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
					$0.00
Totals			$346.67	$345.61	$692.28

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Dozer Operator Skill:	Average
Grader Operator Skill:	Average
Truck/Scraper Operator:	Average
Loader Operator Skill:	Average
Excavator Operator Skill:	Average
Dozer Job Efficiency:	50 min/hr
Truck Job Efficiency:	50 min/hr
Scraper Job Efficiency:	50 min/hr
Loader Job Efficiency:	50 min/hr
Excavator Job Efficiency:	50 min/hr
Grader Job Efficiency:	50 min/hr

Productivity - Bulldozers

Dozer Specifications

Description	D11R	D10R	D9R	D8R	D7R	D6R
Blade Width (SU) (ft)	18.33	15.92	14.17	12.92	12.08	10.67
Shank Guage (3 shanks) (ft)	9.83	8.67	7.67	7.08	6.5	6.5
Pocket Spacing (ft)	4.75	4.33	3.87	3.58	3.25	3.25
Ripping Width (Ripper + 1 Pocket) (ft)	14.58	13	11.54	10.66	9.75	9.75
Ripping Speed (mph)	1	1	1	1	1	1
Ripping Maneuver (turn) Time (min)	0.25	0.25	0.25	0.25	0.25	0.25
Altitude Deration Factor	1	1	1	1	1	1
Ripping Hourly Production (excluding maneuvering time) (ft)	5,280	5,280	5,280	5,280	5,280	5,280

Source: Caterpillar Performance Handbook Edition 35

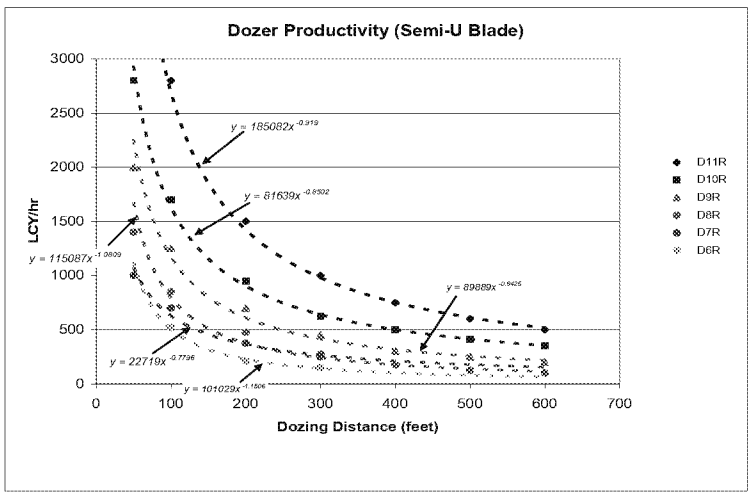
Dozer Productivity vs. Grading Distance

Average Dozing Distance (feet)	Production (LCY/hr)					
	D11R	D10R	D9R	D8R	D7R	D6R
50	4,800	2,800	2,000	1,400	1,000	
100	2,800	1,700	1,250	850	700	520
200	1,500	950	700	475	375	210
300	1,000	625	450	275	250	150
400	750	500	300	175		
500	600	410	250	125		
600	500	350	200	100		

Source: Caterpillar Performance Handbook Edition 35

dozer productivity = k x Dozing Distance^{p}
(see graph)

k =	185082	81639	89889	115087	22719	101029
p =	-0.919	-0.8502	-0.9425	-1.0809	-0.7796	-1.1506



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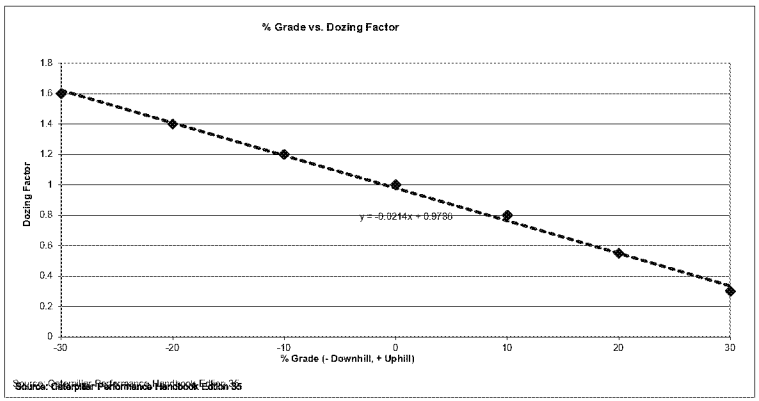
Productivity - Bulldozers (cont.)

% Grade vs. Dozing Factor	
% Grade	Dozing Factor
-30	1.6
-20	1.4
-10	1.2
0	1
10	0.8
20	0.55
30	0.3
Source: Caterpillar Performance Handbook Edition 35	
% Grade Dozing Factor = -0.0214x + 0.9786 (see graph)	



Job Condition Correction Factors - Bulldozers	
OPERATOR	
Average	0.75
MATERIAL (1)	
Loose stockpile	1.2
Normal	1
Hard to cut; frozen — with tilt cylinder	0.8
Hard to drift; "dead" (dry,non-cohesive material) or very sticky material	0.8
Rock, ripped or blasted	0.6
SLOT DOZING OR SIDE BY SIDE (1)	1.2
VISIBILITY	
Good conditions	1
JOB EFFICIENCY	
50 min/hr	0.83
(1) Selected in facility worksheets. Other factors included as standard factors. Source: Caterpillar Performance Handbook Edition 35	

Material Densities(1)		
Material	lb/cy	kg/m^3
Alluvium	2,900	1,720
Basalt	3,300	1,960
Clay - Dry	2,500	1,480
Granite - broken	2,800	1,660
Gravel	2,550	1,510
LS - broken	2,600	1,540
LS - crushed	2,600	1,540
Sandstone	2,550	1,510
Shale	2,100	1,250
Stone - crushed	2,700	1,600
Tailings - Coarse (dry, loose sand)	2,400	1,420
Tailings - Slimes (loose sand & clay)	2,700	1,600
Topsoil	1,600	950
(1) Source: Caterpillar Performance Handbook Edition 35		

Note: uses Sand & Gravel - Dry from Caterpillar Handbook

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Productivity - Scrapers

Scraper Specifications		
Description	631G	637G
Empty Weight	100,600	112,760
Payload Capacity (cy)		
Struck	24	24
Heaped	34	34
Average	29	29
Loaded by	One D10R	Self*
Load Time (min)	1	1
Maneuver and Spread (min)	1	1
Job Efficiency	1	1
Rolling Resistance**	3	3
Altitude Deration Factor	1	1

* Requires pair

**A firm, smooth, rolling roadway with dirt or light surfacing, flexing slightly under load or undulating, maintained fairly regularly, watered

Source: Caterpillar Performance Handbook Edition 35

Weight of Materials			Downhill Scraper Speed - Grade Retarding vs. Effective Grade (Grade - Rolling Resistance)											
			631G						637G PP					
Material	lb/cy	Scraper Load lb	Loaded Weight (lbs)	22	16	10	5	1	Loaded Weight (lbs)	25	15	10	5	1
Alluvium	2,900	84,100	184,700	7.5	10	13	33	33	196,860	7	10	18.5	34	34
Basalt	3,300	95,700	196,300	7.5	10	13	24.5	33	208,460	7	10	18.5	25	34
Clay - Dry	2,500	72,500	173,100	7.5	10	13	33	33	185,260	7	10	18.5	34	34
Granite - broken	2,800	81,200	181,800	7.5	10	13	33	33	193,960	7	10	18.5	34	34
Gravel	2,550	73,950	174,550	7.5	10	13	33	33	186,710	7	10	18.5	34	34
LS - broken	2,600	75,400	176,000	7.5	10	13	33	33	188,160	7	10	18.5	34	34
LS - crushed	2,600	75,400	176,000	7.5	10	13	33	33	188,160	7	10	18.5	34	34
Sandstone	2,550	73,950	174,550	7.5	10	13	33	33	186,710	7	10	18.5	34	34
Shale	2,100	60,900	161,500	7.5	10	18	33	33	173,660	10	13.5	18.5	34	34
Stone - crushed	2,700	78,300	178,900	7.5	10	13	33	33	191,060	7	10	18.5	34	34
Tailings - Coarse (dry, loose sand)	2,400	69,600	170,200	7.5	10	13	33	33	182,360	7	10	18.5	34	34
Tailings - Slimes (loose sand & clay)	2,700	78,300	178,900	7.5	10	13	33	33	191,060	7	10	18.5	34	34
Topsoil	1,600	46,400	147,000	7.5	10	18	33	33	159,160	10	13.5	18.5	34	34
			Empty	10	18	24.5	33	33	Empty	10	13.5	18.5	34	34

Source: Caterpillar Performance Handbook Edition 34

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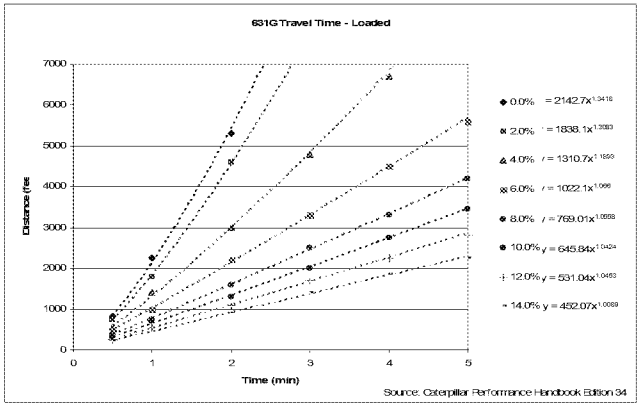
Productivity - Scrapers (cont.)

631G Scraper Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	825	2,250	5,300				2142.7	1.3418
2	750	1,800	4,600				1838.1	1.3083
4	550	1,400	3,000	4,800	6,700		1310.7	1.1893
6	490	1,000	2,200	3,300	4,500	5,600	1022.1	1.066
8	375	750	1,600	2,500	3,300	4,200	769.01	1.0558
10	300	700	1,300	2,000	2,750	3,450	645.84	1.0424
12	250	550	1,100	1,700	2,250	2,800	531.04	1.0453
14	225	450	900	1,400	1,850	2,250	452.07	1.0089

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

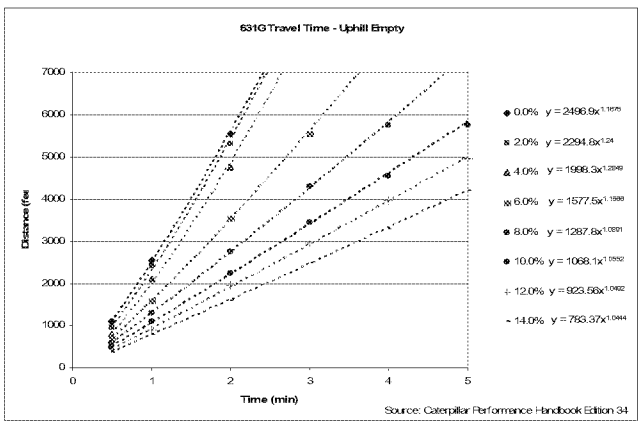


631G Scraper Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,100	2,550	5,550				2496.9	1.1675
2	950	2,400	5,300				2294.8	1.24
4	800	2,100	4,750				1998.3	1.2849
6	700	1,600	3,550	5,550			1557.5	1.1566
8	600	1,300	2,750	4,300	5,750		1287.8	1.0891
10	500	1,100	2,250	3,450	4,550	5,750	1068.1	1.0552
12	450	900	1,950	2,950	3,950	4,950	923.56	1.0492
14	375	800	1,600	2,500	3,300	4,200	783.37	1.0444

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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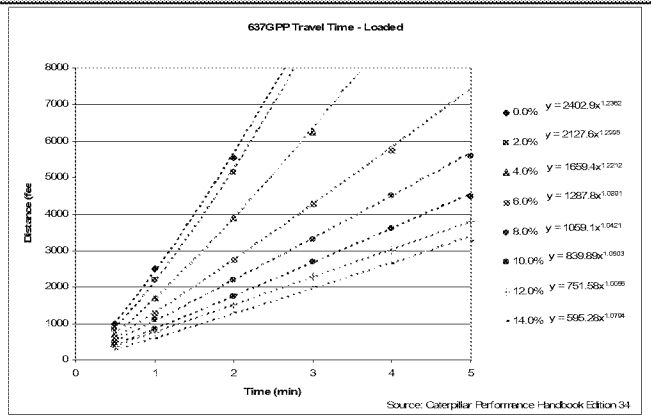
Productivity - Scrapers (cont.)

637G Push-Pull Scraper Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,000	2,500	5,550				2402.9	1.2362
2	850	2,200	5,150				2127.6	1.2995
4	700	1,700	3,900	6,250			1659.4	1.2212
6	600	1,300	2,750	4,300	5,750		1287.8	1.0891
8	500	1,100	2,200	3,300	4,500	5,600	1059.1	1.0421
10	400	850	1,750	2,700	3,600	4,475	839.89	1.0503
12	375	750	1,500	2,300	3,000	3,800	751.58	1.0055
14	275	600	1,300	2,000	2,650	3,250	595.28	1.0794

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

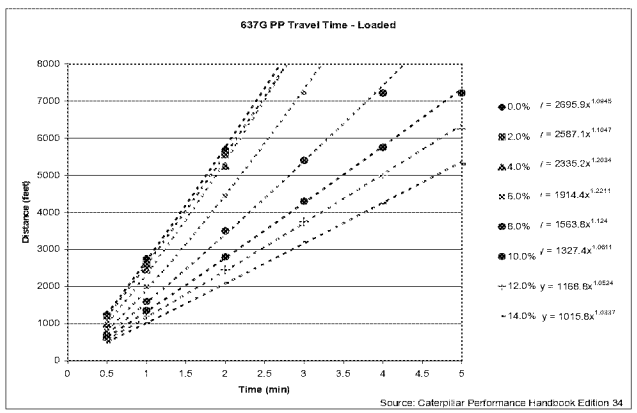


637G Push-Pull Scraper Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,250	2,750	5,700				2695.9	1.0945
2	1,200	2,600	5,550				2587.1	1.1047
4	990	2,450	5,250				2335.2	1.0234
6	800	2,000	4,450	7,216			1914.4	1.2211
8	700	1,600	3,500	5,400	7,216		1563.8	1.124
10	625	1,350	2,800	4,300	5,750	7,216	1327.4	1.0611
12	550	1,200	2,450	3,750	5,000	6,250	1168.8	1.0524
14	495	1,010	2,100	3,200	4,250	5,300	1015.8	1.0337

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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Productivity - Haul Trucks

Haul Truck Specifications

Description	769D	773E	777D	785C	793C	797B
Chassis Weight (lb)	53,506	70,330	113,160	170,000	259,500	473,600
Body Weight (lb)	17,350	20,300	34,785	36,788	70,785	104,200
Standard Liner Weight (lb)	7,000	8,600	12,040	16,846	24,418	8,800
Total Truck Weight (lb)	77,856	99,230	159,985	223,634	354,703	586,600
Payload Capacity (cy)						
Struck	21.6	34.8	55	78.5	126	228
Heaped	31.7	46	78.6	102	169	290
Average	26.65	40.4	66.8	90.25	147.5	259
Maneuver to Load Time (min)	0.7	0.7	0.7	0.7	0.7	0.7
Maneuver and Dump Time (min)	1.1	1.1	1.1	1.1	1.1	1.1
Job Efficiency	0.83	0.83	0.83	0.83	0.83	0.83
Rolling Resistance**	2.5	2.5	2.5	2.5	2.5	2.5
Altitude Deration Factor	1	1	1	1	1	1

**A firm, smooth, rolling roadway with dirt or light surfacing, flexing slightly under load or undulating, maintained fairly regularly, watered

Source: Caterpillar Performance Handbook Edition 35

Weight of Materials / Downhill Haul Truck Speed - Grade Retarding vs. Effective Grade (Grade - Rolling Resistance)

Material	lb/cy	Truck (769D) Load lb	Truck (773E) Load lb	Truck (777D) Load lb	769D Loaded Weight (lbs)	20	15	10	5	773E Loaded Weight (lbs)	20	15	10	5	777D Loaded Weight (lbs)	20	15	10	5
Alluvium	2,900	77,285	117,160	193,720	155,141	11	11	15	26	216,390	7	7	13	23	353,705	7	9	12	29
Basalt	3,300	87,945	133,320	220,440	165,801	11	11	11	20	232,550	7	7	13	23	380,425	7	7	12	21
Clay - Dry	2,500	66,625	101,000	167,000	144,481	11	11	15	26	200,230	7	9	13	23	326,985	7	9	16	29
Granite - broken	2,800	74,620	113,120	187,040	152,476	11	11	15	26	212,350	7	7	13	23	347,025	7	9	12	29
Gravel	2,550	67,958	103,020	170,340	145,814	11	11	15	26	202,250	7	9	13	23	330,325	7	9	16	29
LS - broken	2,600	69,290	105,040	173,680	147,146	11	11	15	26	204,270	7	9	13	23	333,665	7	9	12	29
LS - crushed	2,600	69,290	105,040	173,680	147,146	11	11	15	26	204,270	7	9	13	23	333,665	7	9	12	29
Sandstone	2,550	67,958	103,020	170,340	145,814	11	11	15	26	202,250	7	9	13	23	330,325	7	9	16	29
Shale	2,100	55,965	84,840	140,280	133,821	11	11	15	26	184,070	7	9	13	31	300,265	7	9	16	29
Stone - crushed	2,700	71,955	109,080	180,360	149,811	11	11	15	26	208,310	7	7	13	23	340,345	7	9	12	29
Tailings - Coarse (dry, loose sand)	2,400	63,960	96,960	160,320	141,816	11	11	15	26	196,190	7	9	13	23	320,305	7	9	16	29
Tailings - Slimes (loose sand & clay)	2,700	71,955	109,080	180,360	149,811	11	11	15	26	208,310	7	7	13	23	340,345	7	9	12	29
Topsoil	1,600	42,640	64,640	106,880	120,496	11	11	15	26	163,870	7	9	17	31	266,865	9	12	16	29
					Empty	15	15	26	36	Empty	13	17	23	42	Empty	16	16	29	39

Source: Caterpillar Performance Handbook Edition 35

Weight of Materials / Downhill Haul Truck Speed - Grade Retarding vs. Effective Grade (Grade - Rolling Resistance)

Material	lb/cy	Truck (785C) Load lb	Truck (793C) Load lb	Truck (797B) Load lb	785C Loaded Weight (lbs)	20	15	10	5	793C Loaded Weight (lbs)	20	15	10	5	797B Loaded Weight (lbs)	20	15	10	5
Alluvium	2,900	261,725	427,750	751,100	485,359	8	8	14	27	782,453	7	7	10	17	1,337,700	7	7	9	17
Basalt	3,300	297,825	486,750	854,700	521,459	8	8	14	27	841,453	7	7	10	17	1,441,300	7	7	9	17
Clay - Dry	2,500	225,625	368,750	647,500	449,259	8	11	14	36	723,453	7	7	10	25	1,234,100	7	7	9	23
Granite - broken	2,800	252,700	413,000	725,200	476,334	8	8	14	27	767,703	7	7	10	17	1,311,800	7	7	9	17
Gravel	2,550	230,138	376,125	660,450	453,772	8	8	14	36	730,828	7	7	10	25	1,247,050	7	7	9	23
LS - broken	2,600	234,650	383,500	673,400	458,284	8	8	14	27	738,203	7	7	10	25	1,260,000	7	7	9	23
LS - crushed	2,600	234,650	383,500	673,400	458,284	8	8	14	27	738,203	7	7	10	25	1,260,000	7	7	9	23
Sandstone	2,550	230,138	376,125	660,450	453,772	8	8	14	36	730,828	7	7	10	25	1,247,050	7	7	9	23
Shale	2,100	189,525	309,750	543,900	413,159	8	11	14	36	664,453	7	7	10	25	1,130,500	7	7	13	23
Stone - crushed	2,700	243,675	398,250	699,300	467,309	8	8	14	27	752,953	7	7	10	17	1,285,900	7	7	9	23
Tailings - Coarse (dry, loose sand)	2,400	216,600	354,000	621,600	440,234	8	11	14	36	708,703	7	7	10	25	1,208,200	7	7	9	23
Tailings - Slimes (loose sand & clay)	2,700	243,675	398,250	699,300	467,309	8	8	14	27	752,953	7	7	10	17	1,285,900	7	7	9	23
Topsoil	1,600	144,400	236,000	414,400	388,034	8	11	19	36	590,703	7	10	13	25	1,001,000	7	9	13	23
					Empty	14	19	36	36	Empty	10	13	17	33	Empty	13	17	23	42

Source: Caterpillar Performance Handbook Edition 35

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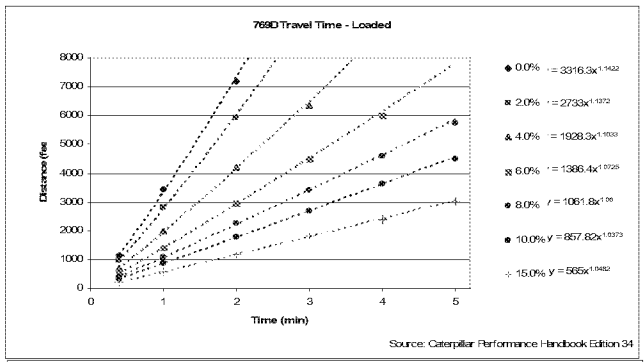
Productivity - Haul Trucks (cont.)

769D Haul Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	1,148	3,428	7,183				3316.3	1.1422
4	689	1,984	4,198	6,330			1928.3	1.1033
6	508	1,427	2,952	4,510	6,002		1386.4	1.0725
8	394	1,082	2,263	3,411	4,592	5,740	1061.8	1.06
10	328	869	1,771	2,690	3,608	4,510	857.82	1.0373
15	213	574	1,181	1,804	2,394	3,018	565	1.0482

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



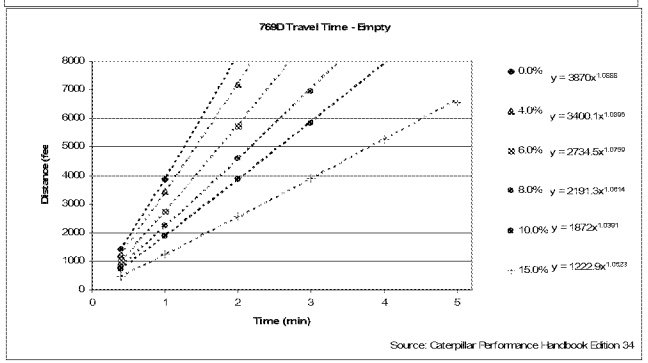
Source: Caterpillar Performance Handbook Edition 34

769D Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	1,427	3,870					3870	1.0888
4	1,246	3,444	7,183				3400.1	1.0895
6	1,017	2,755	5,740				2734.5	1.0759
8	820	2,230	4,592	6,954			2191.3	1.0614
10	722	1,870	3,870	5,838			1872	1.0391
15	459	1,246	2,558	3,903	5,248	6,560	1222.9	1.0523

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



Source: Caterpillar Performance Handbook Edition 34

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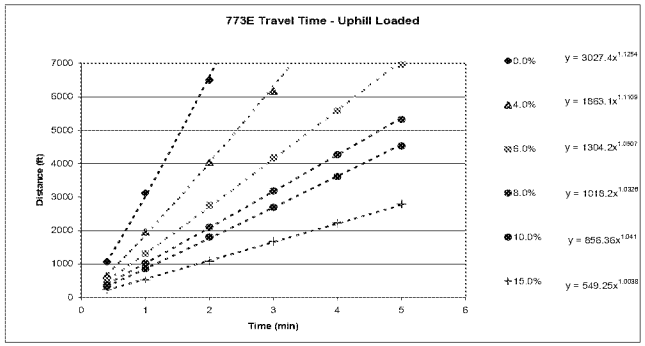
Productivity - Haul Trucks (cont.)

773E Haul Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	1,066	3,117	6,496				3027.4	1.1254
4	656	1,952	4,035	6,168			1863.1	1.1109
6	492	1,312	2,756	4,167	5,577	6,955	1304.2	1.0507
8	394	1,017	2,100	3,182	4,265	5,315	1018.2	1.0326
10	328	853	1,804	2,690	3,609	4,528	856.36	1.041
15	226	525	1,083	1,673	2,231	2,789	549.25	1.0038

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

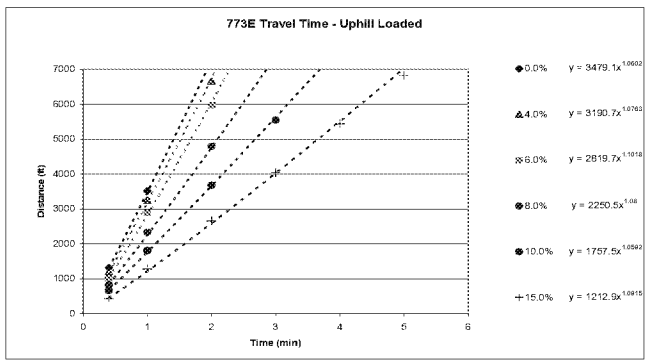


773E Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	1,312	3,510	7,218				3479.1	1.0602
4	1,181	3,248	6,660				3190.7	1.0763
6	1,017	2,887	5,971				2819.7	1.1018
8	820	2,329	4,790	7,218			2250.5	1.08
10	656	1,804	3,675	5,545			1757.5	1.0592
15	427	1,280	2,657	4,035	5,446	6,824	1212.9	1.0915

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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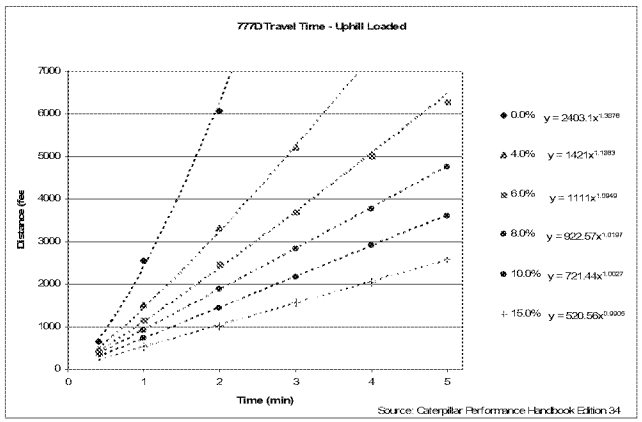
Productivity - Haul Trucks (cont.)

777D Haul Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	656	2,558	6,068				2403.1	1.3876
4	459	1,509	3,313	5,215	7,085		1412	1.1863
6	394	1,148	2,460	3,706	5,018	6,298	1111	1.0949
8		918	1,886	2,837	3,772	4,756	922.57	1.0197
10		722	1,443	2,165	2,919	3,608	721.44	1.0027
15		525	1,017	1,558	2,034	2,591	520.56	0.9905

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Editon 35

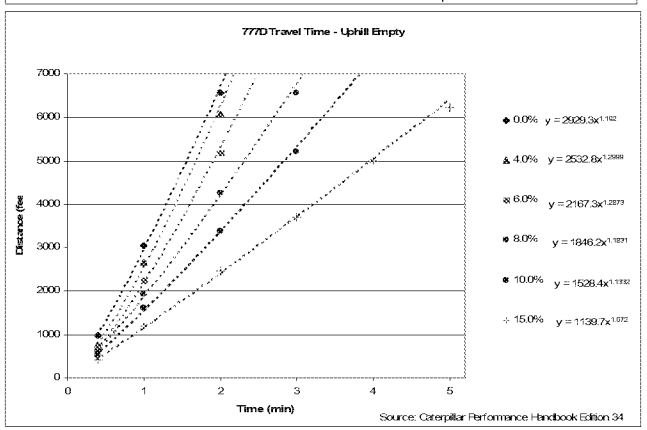


777D Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	968	3,034	6,560				2929.3	1.192
4	754	2,657	6,068				2532.8	1.2999
6	656	2,247	5,182				2167.3	1.2873
8	607	1,935	4,248	6,560			1846.2	1.1831
10	525	1,607	3,378	5,215	7,282		1528.4	1.1332
15	410	1,197	2,460	3,706	4,986	6,232	1139.7	1.072

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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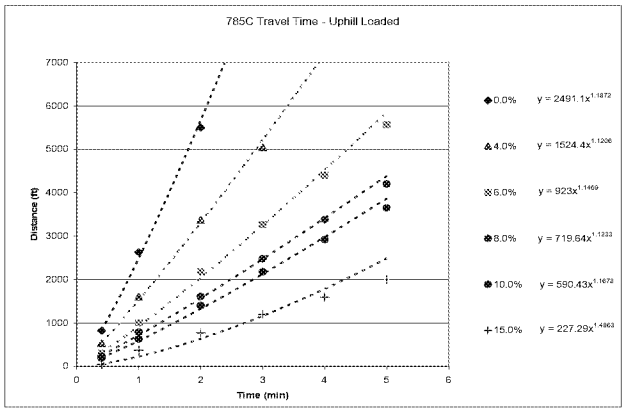
Productivity - Haul Trucks (cont.)

785C Haul Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	820	2,630	5,500				2491.1	1.1872
4	530	1,600	3,370	5,040			1524.4	1.1206
6	300	1,000	2,180	3,270	4,400	5,570	923	1.1469
8	240	790	1,610	2,480	3,380	4,200	719.64	1.1233
10	190	630	1,400	2,180	2,920	3,650	590.43	1.1678
15	40	370	770	1,200	1,590	2,000	227.29	1.4863

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

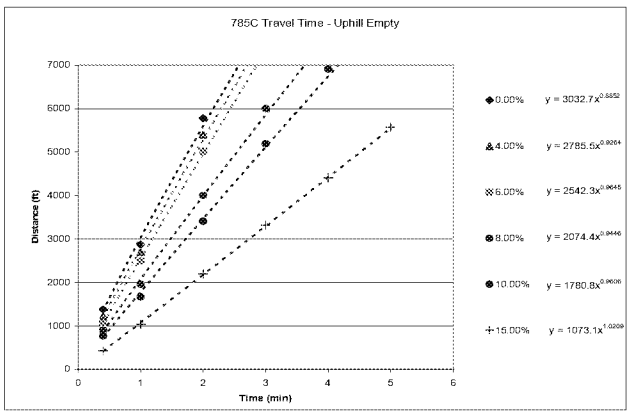


785C Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.4	1	2	3	4	5	k	p
0	1,380	2,870	5,780				3032.7	0.8852
4	1,210	2,690	5,400				2785.5	0.9264
6	1,060	2,490	5,020				2542.3	0.9645
8	900	1,960	4,000	6,000			2074.4	0.9446
10	770	1,670	3,410	5,190	6,910		1780.8	0.9606
15	430	1,030	2,200	3,320	4,410	5,570	1073.1	1.0209

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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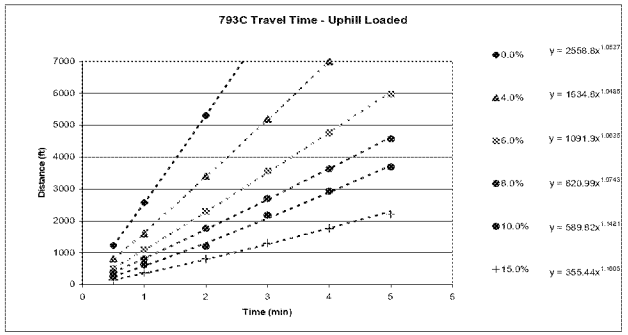
Productivity - Haul Trucks (cont.)

793C Haul Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,230	2,570	5,300				2558.8	1.0537
4	800	1,600	3,400	5,190	7,000		1634.8	1.0485
6	520	1,090	2,300	3,560	4,760	5,970	1091.9	1.0635
8	390	810	1,760	2,700	3,630	4,570	820.99	1.0743
10	260	630	1,200	2,180	2,930	3,690	589.82	1.1481
15	150	380	810	1,300	1,760	2,210	355.44	1.1605

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Editon 35

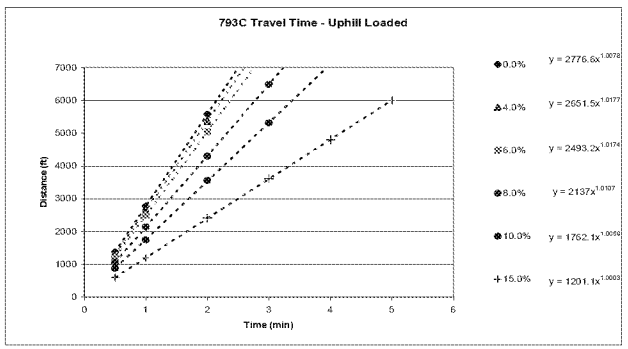


793C Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,380	2,780	5,580				2776.6	1.0078
4	1,310	2,650	5,370				2651.5	1.0177
6	1,230	2,500	5,040				2493.2	1.0174
8	1,060	2,140	4,300	6,490			2137	1.0107
10	880	1,750	3,560	5,310			1762.1	1.0059
15	600	1,200	2,410	3,610	4,800	6,000	1201.1	1.0003

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Editon 35



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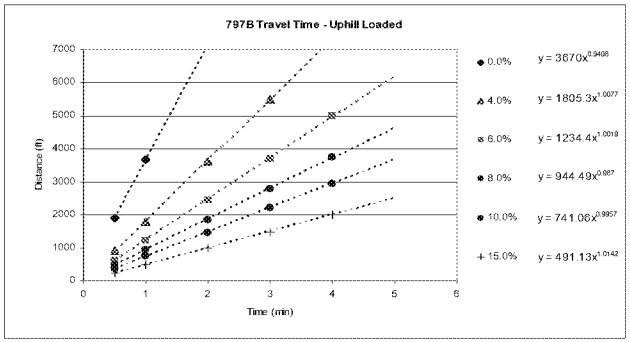
Productivity - Haul Trucks (cont.)

797B Haul Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,900	3,670					3670	0.9498
4	900	1,800	3,620	5,480			1805.3	1.0077
6	620	1,230	2,450	3,700	5,000		1234.4	1.0019
8	480	940	1,850	2,790	3,750		944.49	0.987
10	370	750	1,460	2,220	2,950		741.06	0.9957
15	240	500	1,000	1,480	2,000		491.13	1.0142

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Editon 35

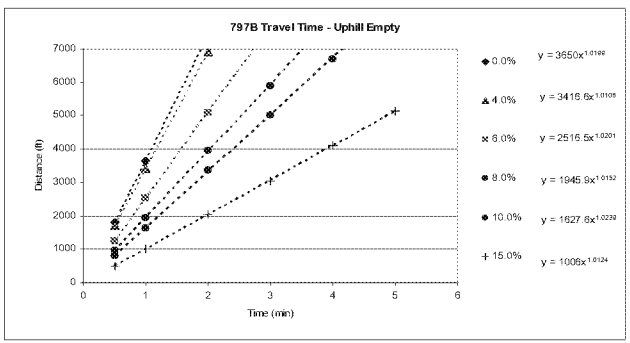


797B Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	1,800	3,650					3650	1.0199
4	1,700	3,400	6,900				3416.6	1.0105
6	1,240	2,520	5,100				2516.5	1.0201
8	960	1,950	3,960	5,900			1945.9	1.0152
10	800	1,620	3,350	5,000	6,700		1627.6	1.0239
15	500	1,000	2,040	3,050	4,100	5,130	1006	1.0124

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Editon 35



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Productivity - Articulated Trucks

Articulated Truck Specifications

Description	725	730	735	740
Chassis Weight (lb)				
Body Weight (lb)				
Standard Liner Weight (lb)				
Operating Weight (Empty) (lb)	50,120	51,220	65,830	72,070
Payload Capacity (cy)				
Struck	14.5	17.1	19.3	23.3
Heaped	18.8	22.1	31.8	30.2
Average	16.65	19.6	25.55	26.75
Maneuver to Load Time (min)	0.7	0.7	0.7	0.7
Maneuver and Dump Time (min)	1.1	1.1	1.1	1.1
Job Efficiency	0.83	0.83	0.83	0.83
Rolling Resistance**	2.5	2.5	2.5	2.5
Altitude Deration Factor	1	1	1	1

**A firm, smooth, rolling roadway with dirt or light surfacing, flexing slightly under load or undulating, maintained fairly regularly, watered

Source: Caterpillar Performance Handbook Edition 35

Weight of Materials / Downhill Haul Truck Speed - Grade Retarding vs. Effective Grade (Grade - Rolling Resistance)

Material	lb/cy	Truck (725) Load lb	Truck (730) Load lb	725 Loaded Weight (lbs)	725 20	725 15	725 10	725 5	730 Loaded Weight (lbs)	730 20	730 15	730 10	730 5
Alluvium	2,900	48,285	56,840	98,405	9	9	13	30	108,060	5	8	13	29
Basalt	3,300	54,945	64,680	105,065	5	9	13	22	115,900	5	8	13	29
Clay - Dry	2,500	41,625	49,000	91,745	9	13	13	30	100,220	8	8	13	29
Granite - broken	2,800	46,620	54,880	96,740	9	13	13	30	106,100	5	8	13	29
Gravel	2,550	42,458	49,980	92,578	9	13	13	30	101,200	8	8	13	29
LS - broken	2,600	43,290	50,960	93,410	9	13	13	30	102,180	8	8	13	29
LS - crushed	2,600	43,290	50,960	93,410	9	13	13	30	102,180	8	8	13	29
Sandstone	2,550	42,458	49,980	92,578	9	13	13	30	101,200	8	8	13	29
Shale	2,100	34,965	41,160	85,085	9	13	22	30	92,380	8	13	13	29
Stone - crushed	2,700	44,955	52,920	95,075	9	13	13	30	104,140	8	8	13	29
Tailings - Coarse (dry, loose sand)	2,400	39,960	47,040	90,080	9	13	13	30	98,260	8	8	13	29
Tailings - Slimes (loose sand & clay)	2,700	44,955	52,920	95,075	9	13	13	30	104,140	8	8	13	29
Topsoil	1,600	26,640	31,360	76,760	9	13	22	30	82,580	8	13	22	35
				Empty	13	13	22	30	Empty	13	13	22	35

Source: Caterpillar Performance Handbook Edition 35

Weight of Materials / Downhill Haul Truck Speed - Grade Retarding vs. Effective Grade (Grade - Rolling Resistance)

Material	lb/cy	Truck (735) Load lb	Truck (740) Load lb	735 Loaded Weight (lbs)	735 20	735 15	735 10	735 5	740 Loaded Weight (lbs)	740 20	740 15	740 10	740 5
Alluvium	2,900	74,095	77,575	139,925	7	9	13	27	149,645	7	9	17	23
Basalt	3,300	84,315	88,275	150,145	7	9	13	27	160,345	7	9	13	23
Clay - Dry	2,500	63,875	66,875	129,705	7	9	13	27	138,945	9	13	17	31
Granite - broken	2,800	71,540	74,900	137,370	7	9	13	27	146,970	7	9	17	23
Gravel	2,550	65,153	68,213	130,983	7	9	13	27	140,283	7	9	17	31
LS - broken	2,600	66,430	69,550	132,260	7	9	13	27	141,620	7	9	17	31
LS - crushed	2,600	66,430	69,550	132,260	7	9	13	27	141,620	7	9	17	31
Sandstone	2,550	65,153	68,213	130,983	7	9	13	27	140,283	7	9	17	31
Shale	2,100	53,655	56,175	119,485	9	9	18	27	128,245	7	13	17	31
Stone - crushed	2,700	68,985	72,225	134,815	7	9	13	27	144,295	7	9	17	23
Tailings - Coarse (dry, loose sand)	2,400	61,320	64,200	127,150	7	9	13	27	136,270	9	13	17	31
Tailings - Slimes (loose sand & clay)	2,700	68,985	72,225	134,815	7	9	13	27	144,295	7	9	17	23
Topsoil	1,600	40,880	42,800	106,710	9	13	18	36	114,870	9	13	17	31
				Empty	13	18	27	42	Empty	17	17	23	31

Source: Caterpillar Performance Handbook Edition 35

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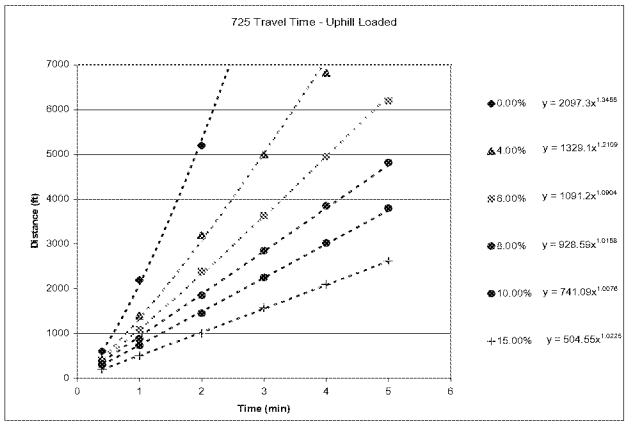
Productivity - Articulated Trucks (cont.)

725 Articulated Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	600	2,190	5,200				2097.3	1.3455
4	420	1,400	3,200	5,000	6,820		1329.1	1.2109
6	400	1,080	2,390	3,630	4,950	6,200	1091.2	1.0904
8	380	880	1,850	2,850	3,850	4,820	928.59	1.0158
10	300	729	1,450	2,250	3,020	3,800	741.09	1.0076
15	200	500	1,000	1,570	2,100	2,620	504.55	1.0225

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Editon 35

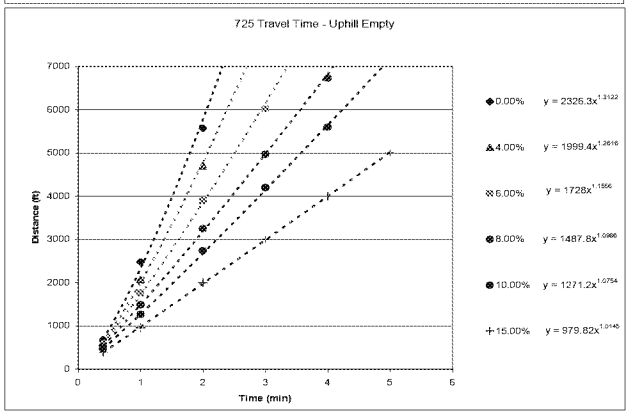


725 Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	680	2,480	5,570				2326.3	1.3122
4	620	2,070	4,700				1999.4	1.2616
6	590	1,770	3,900	6,020			1728	1.1556
8	540	1,490	3,250	4,970	6,730		1487.8	1.0986
10	470	1,270	2,740	4,200	5,600	7,050	1271.2	1.0754
15	390	960	2,000	3,000	4,000	5,000	979.82	1.0145

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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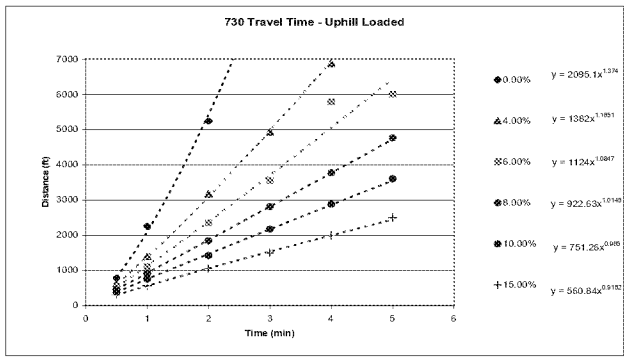
Productivity - Articulated Trucks (cont.)

730 Articulated Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	780	2,250	5,240				2095	1.374
4	610	1,390	3,170	4,930	6,880		1382	1.1651
6	540	1,100	2,340	3,550	5,780	6,000	112	1.0847
8	460	920	1,840	2,810	3,770	4,760	922.63	1.0145
10	390	750	1,420	2,170	2,880	3,600	751.26	0.965
15	300	560	1,050	1,500	1,995	2,500	560.84	0.9152

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

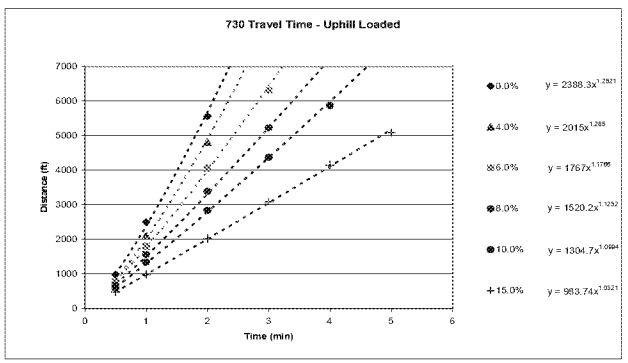


730 Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	980	2,500	5,560				2388	1.25621
4	810	2,100	4,810				2015	1.285
6	770	1,800	4,060	6,310			1767	1.1766
8	680	1,560	3,390	5,230	7,070		1520.2	1.1252
10	595	1,340	2,840	4,370	5,870		1304.7	1.0994
15	480	980	2,020	3,090	4,150	5,090	983.74	1.0321

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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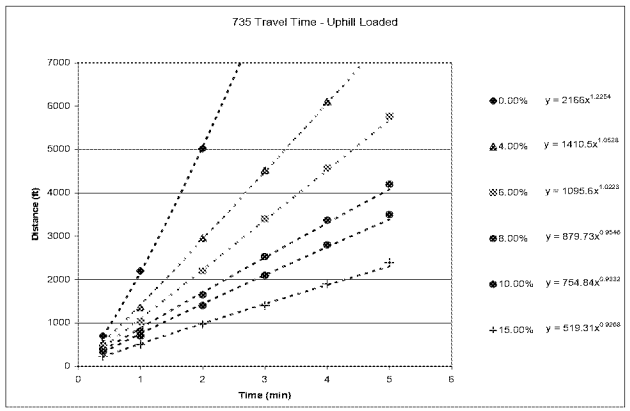
Productivity - Articulated Trucks (cont.)

735 Articulated Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	700	2,200	5,020				2166	1.2254
4	550	1,350	2,950	4,520	6,100		1410.5	1.0528
6	450	1,020	2,200	3,400	4,570	5,770	1095.6	1.0223
8	390	810	1,650	2,530	3,370	4,200	879.73	0.9546
10	340	700	1,400	2,100	2,800	3,500	754.84	0.9332
15	230	500	970	1,400	1,900	2,390	519.31	0.9268

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

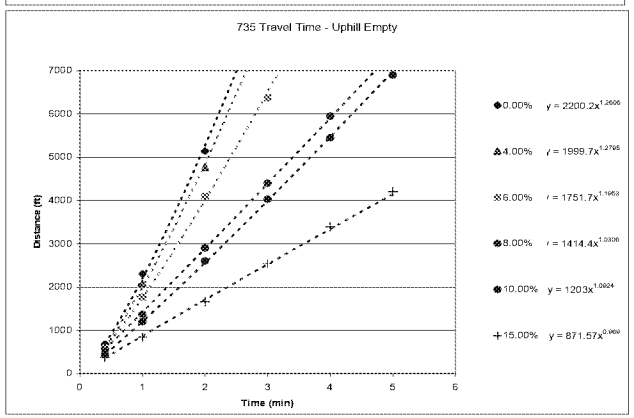


735 Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	680	2,300	5,140				2200.2	1.2606
4	610	2,070	4,760				1999.7	1.2795
6	580	1,770	4,100	6,370			1751.7	1.1953
8	560	1,370	2,900	4,400	5,950		1414.4	1.0306
10	440	1,200	2,600	4,030	5,450	6,900	1203	1.0924
15	370	840	1,660	2,540	3,390	4,200	871.57	0.969

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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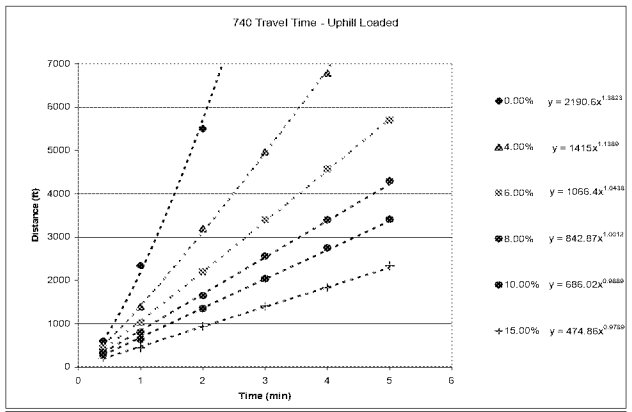
Productivity - Articulated Trucks (cont.)

740 Articulated Truck Travel Time - Uphill Loaded

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	600	2,340	5,500				2190.6	1.3823
4	500	1,390	3,190	4,960	6,780		1415	1.1389
6	420	1,020	2,200	3,400	4,580	5,700	1066.4	1.0438
8	350	800	1,650	2,560	3,400	4,300	842.87	1.0012
10	290	640	1,350	2,040	2,750	3,410	686.02	0.9889
15	200	450	940	1,400	1,830	2,340	474.86	0.9789

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35

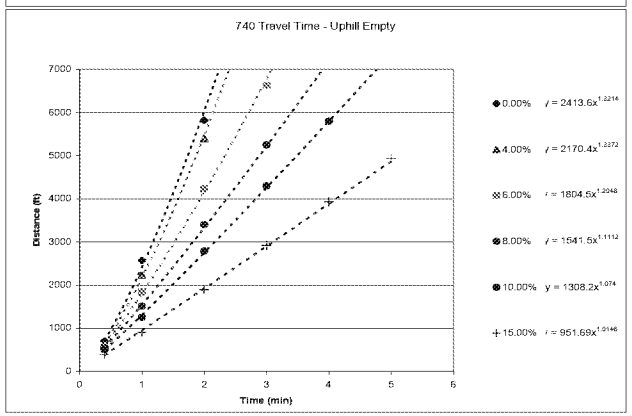


740 Haul Truck Travel Time - Uphill Empty

Total Resistance (%) (rolling + grade)	Time (min) 0.5	1	2	3	4	5	k	p
0	700	2,570	5,820				2413.6	1.3214
4	630	2,230	5,400				2170.4	1.3372
6	590	1,840	4,230	6,630			1804.5	1.2048
8	560	1,510	3,400	5,250	7,120		1541.5	1.1112
10	500	1,250	2,790	4,300	5,800		1308.2	1.074
15	390	900	1,900	2,920	3,930	4,930	951.69	1.0146

$$\text{Travel Time (min)} = \sqrt[p]{\frac{\text{distance}}{k}}$$

Source: Caterpillar Performance Handbook Edition 35



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Productivity - Wheel Loaders

Wheel Loader Specifications

Description	924G	928G	950G	966G	972G	972G (2)	980G	988G	988G(2)	990	992G	992G(2)	994D	L2350
Payload Capacity (cy)														
Struck	2.2	2.5	3.46	4.46	4.71	4.71	6.34	6.9	6.9	9.5	13.2	13.2	18	
Heaped	2.7	3.25	4	5.25	5.5	5.5	7.25	8.33	8.33	11.25	16	16	22.5	
Average	2.45	2.875	3.73	4.855	5.105	5.105	6.795	7.615	7.615	10.375	14.6	14.6	20.25	53
Matched Truck	N/A	N/A	N/A	725	730	735	N/A	740	769D	773D	777D	785C	793C	797B
Average Cycle Time (min)	0.45	0.45	0.5	0.5	0.5	0.5	0.55	0.55	0.55	0.55	0.6	0.6	0.6	0.75
Passes to Fill Truck	N/A	N/A	N/A	3	4	5	N/A	4	3	4	5	6	7	5
Altitude Deration Factor	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Operator Efficiency	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Job Efficiency	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Time to Fill Truck	N/A	N/A	N/A	1.5	2	2.5	N/A	2.2	1.65	2.2	3	3.6	4.2	3.75
Rolling Resistance**	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5

Loader matched to small truck fleet
Loader matched to medium truck fleet
Loader matched to large truck fleet
Loader matched to extra large truck fleet

**A firm, smooth, rolling roadway with dirt or light surfacing, flexing slightly under load or undulating, maintained fairly regularly, watered
992G (2) - can be used to load 785 with 6 passes

Source: Caterpillar Performance Handbook Edition 35; LeTourneau/actual Chilean mine operating data for L2350.

Wheeled Loaders	General Purpose	Spade Nose-Rock
928G	3.25 cubic yard	not available
966G	5.0 cubic yard	not available
972G	5.5 cubic yard	not available
988G	not available	8.3 cubic yard
992G	not available	16.0 cubic yard

note: capacities are 2:1 heaped, SAE standards
NOTES: Buckets for both Track Excavators and Wheel Loaders are offered by CECo & available for the rental rates quoted. Bucket sizes and capacities obtained from CATERPILLAR PERFORMANCE HANDBOOK, ED 34; Section 12, Wheel Loader and Section 4, Excavators

Bucket capacity and width dictated by material weight and configuration, ie., shot, loose, tight bank, stockpile, rock, etc. Typical Nevada applications were used to determine above bucket capacities as related to materials & densities. Job site specifics may alter specific bucket requirements. (Cashman Equipment, Elko, Nevada - February 21, 2005)

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ED_013507_00000769-00127

Productivity - Shovels

Shovel Specifications (Komatsu equivalent)

Description	PC2000	PC3000	PC4000	PC5500	PC8000
Payload Capacity (cy)					
Struck	10.46	18.84	26.16	33.48	47.09
Heaped	14.39	25.9	35.97	46.04	64.75
Average	12.43	22.37	31.07	39.76	55.92
Matched Truck	740	777D	785C	793C	797B
Average Cycle Time (min)	0.49	0.49	0.59	0.59	0.69
Passes to Fill Truck	2.05	2.84	3.38	4.69	5.11
Altitude Deration Factor	1	1	0.9	1	1
Operator Efficiency	1	1	1	1	1
Job Efficiency	0.83	0.83	0.83	0.83	0.83
Time to Fill Truck	1.68	2.33	3.32	4.61	5.86
Rolling Resistance**	2.5	2.5	2.5	2.5	2.5

Shovel matched to small truck fleet
Shovel matched to medium truck fleet
Shovel matched to large truck fleet
Shovel matched to extra large truck fleet

**A firm, smooth, rolling roadway with dirt or light surfacing, flexing slightly under load or undulating, maintained fairly regularly, watered
992G (2) - can be used to load 785 with 6 passes

Source: Caterpillar Performance Handbook Edition 35; Komatsu actual Peruvian mine (Lagunas Norte) operating data for PC4000.

Productivity - Motor Graders

Motor Grader Specifications

Description	120H	14G/H	16G/H	24M
Grader Width (ft)	8	9.25	10.08	14.04
Blade Width (ft)	12	14	16	16
Ripper Width (7 shanks) (ft)	7.6	8.5	9.75	12.83
Road Maintence Speed (mph)				
Minimum	3	3	3	3
Maximum	9.5	9.5	9.5	9.5
Average	6.25	6.25	6.25	6.25
Hourly Production	33,000	33,000	33,000	33,000
Ripping Speed (mph)	1	1	1	1
Minimum	0	0	0	0
Maximum	3	3	3	3
Average	1.5	1.5	1.5	1.5
Altitude Deration Factor	1	1	1	1
Hourly Production (with job efficiency correction & altitude deration factors) (excluding manuever time)	6,574	6,574	6,574	6,574
Maneuver time per pass (min)	0.5	0.5	0.5	0.5
Operator Efficiency	1	1	1	1
Job Efficiency	0.83	0.83	0.83	0.83

Source: Caterpillar Performance Handbook Edition 35

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Productivity - Excavators

Track Excavator Specifications

Description	312C	320C	325C	330C	345B	365BL	385BL
Bucket Capacity (cy)	0.68	1.57	2.22	2.22	3	4.6	7.3
Fill Factor	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Average Bucket Load (cy)	0.612	1.413	1.998	1.998	2.7	4.14	6.57
Soil Type	packed earth	hard clay	hard clay	hard clay	hard clay	hard clay	hard clay
Job Condition	med-hard	med-hard	med-hard	med-hard	med-hard	med-hard	med-hard
Cycle Times (minutes) - based on hard clay							
Load Bucket	0.07	0.09	0.09	0.09	0.13	0.1	0.19
Swing Loaded	0.06	0.06	0.06	0.07	0.07	0.09	0.06
Dump Bucket	0.03	0.03	0.04	0.04	0.02	0.04	0.03
Swing Empty	0.05	0.05	0.06	0.07	0.06	0.07	0.07
Total Cycle Time	0.21	0.23	0.25	0.27	0.28	0.3	0.35
Job Efficiency	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Operator Efficiency	1	1	1	1	1	1	1
Altitude Deration Factor	1	1	1	1	1	1	1
Corrected Productivity (LCY/hr)	145	306	398	369	480	687	935
Exploration Road Cycle Time (1)(min)	N/A	0.38	0.4	N/A	0.42	N/A	N/A
Exploration Road Corr Prod (LCY/hr)	N/A	185	249	N/A	320	N/A	N/A
Track Width (ft)	8.17	9.17	9.83	10.5	11.42	11.5	11.5
Ditch/Trench Excavation							
Bucket Capacity (cy)	0.42	0.58	0.88	0.89	2.09	3.27	2.75
Fill Factor	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Corrected Productivity (LCY/hr)	50	63	88	82	186	271	196

Source: Caterpillar Performance Handbook Edition 35

Track Excavators	Hvy Duty Rock	Extreme Service Exc (e.g. haulroad recontour)	Hvy Duty Trench
312C	30", 0.68 cubic yd	47", 0.94 cubic yd	22", .42 cubic yd
320C	30", 0.90 cubic yd	55.1", 1.57 cubic yd	23.6", .58 cubic yd
325C	36", 1.25 cubic yd	60", 2.22 cubic yd	30", .88 cubic yd
330C	36", 1.25 cubic yd	60", 2.22 cubic yd	30", .89 cubic yd
345B	43.2", 1.69 cubic yd	65", 3.0 cubic yd	48", 2.09 cubic yd
365BL	60", 3.25 cubic yd	82", 4.6 cubic yd	59", 3.27 cubic yd
385BL	85", 6.30 cubic yd.	96.0, 7.30 cubic yd	57", 2.75 cubic yd

Note: capacities are 2:1 heaped, SAE standards
NOTES: Buckets for both Track Excavators and Wheel Loaders are offered by CECo &

available for the rental rates quoted. Bucket sizes and capacities obtained from CATERPILLAR
PERFORMANCE HANDBOOK, ED 34; Section 12, Wheel Loader and Section 4, Excavators
Bucket capacity and width dictated by material weight and configuration, ie., shot, loose,
tight bank, stockpile, rock, etc. Typical Nevada applications were used to determine above
bucket capacities as related to materials & densities. Job site specifics may alter specific
bucket requirements (Cashman Equipment, Elko, Nevada - February 21, 2005)

(1) Exploration cycle time assumes feathering/smoothing performed by excavator

Concrete Breaking Production

Track Excavator w/Hammer Specifications

Description	325C	345B	385BL
Hydraulic Hammer	H120D s	H160D s	H180D s
Material	reinforced concrete		
Min Shift Production (yd3/8hr)	160	300	350
Max Shift Production (yd3/8hr)	300	850	1,550
Avg Shift Production (8hr)	230	575	950
Job Efficiency	0.83	0.83	0.83
Altitude Deration Factor	1	1	1

Source: Caterpillar Performance Handbook Edition 35

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Drill Hole Plugging Productivity

Drill Hole Plugging Productivity		
Description	Drill Rig	Pump Rig
Move-to-hole, set-up, tear-down [1,2]	2	2
Trip in tremmie pipe [1,2]	500	
Pulling casing (threaded, not cemented)	200	
Single-pass perforating (water wells)	Productivity(all p	Passes
4	60	4
6	60	4
8	50	4
12	45	6
18	40	9
24	28	12
Perforation setup,trip in/out,tear-down	2	
Perforation tool cost (wear cost) [1,2]	2.5	
Inert Material Placement (backfill)		
Grouting/Cement [3,4] (cy/hr)		5.33
Cuttings (see below) (cy/hr)		3.5

Sources:
1. Drillers daily logs from Newmont, Barrick, New West Gold, Agnico Eagle, Idaho General Mines Inc.
2. Drillers daily logs from Newmont, Barrick, Target Minerals
3. Drillers daily logs from Newmont
4. WDC Exploration, Dec 2005

Source: WDC Exploration, Dec 2005

Cuttings Placement Productivity		
Shift productivity (Means 02210-700-0120; Crew B11M)	28	cy / shift
Shift length	8	hours
Estimated Hourly Productivity	3.5	cy / hour

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Altitude Deration Table

MODEL	Elevation											
	0-760 m (0-2500')		760-1500 m (2500-5000')		1500-2300 m (5000-7000')		2300-3000 m (7500-10,000')		3000-3800 m (10,000-12,000')		3800-4600 m (12,500-15,000')	
	CAT	User	CAT	User	CAT	User	CAT	User	CAT	User	CAT	User
Bulldozers												
D6R	100		100		100		100		92		84	
D6R w/ Winch	100		100		100		100		92		84	
D7R	100		100		100		100		100		96	
D8R	100		100		100		93		85		77	
D9R	100		100		100		93		85		77	
D10R	100		100		100		100		97		89	
D11R	100		100		100		93		85		77	
Wheeled Dozers												
824G	100		100		100		100		92		84	
834G	100		100		100		100		92		84	
844	100		100		100		100		100		96	
854G	100		100		100		93		85		77	
Graders												
120H	100		100		100		100		96		93	
14G/H	100		100		100		100		98		96	
16G/H	100		100		100		100		98		96	
24M	100		100		100		100		98		96	
Excavators												
312C	100		100		100		83		78		73	
320C	100		100		90		87		83		76	
325C	100		100		100		100		100		100	
330C	100		100		100		100		100		100	
345B	100		100		100		100		93		93	
365BL	100		100		100		86		86		86	
385BL	100		100		100		93		85		78	
Scrapers												
631G	100		100		100		100		97		90	
637G	100		100		100		95		87		80	
Loaders												
924G	100		100		100		100		97		89	
928G	100		100		100		100		92		85	
950G	100		100		100		100		100		100	
966G	100		100		100		100		96		88	
972G	100		100		92		84		77		70	
980G	100		100		100		100		96		88	
988G	100		100		100		95		85		75	
990	100		100		100		100		92		85	
992G	100		100		100		100		93		87	
994D	100		100		100		100		96		88	
L2350	100		100		100		100		96		90	
Shovels												
PC2000	100		100		100		100		96		90	
PC3000	100		100		100		100		96		90	
PC4000	100		100		100		100		96		90	
PC5500	100		100		100		100		96		90	
PC8000	100		100		100		100		96		90	
Other Equipment												
420D 4WD Backhoe	99		97		95		91		91		91	
428D 4WD Backhoe	99		97		95		91		91		91	
CS533E Vibratory Roller	100		100		98		95		91		86	
CS633E Vibratory Roller	100		100		100		100		91		86	
CP533E Sheepsfoot Compactor	100		100		98		95		91		100	
CP633E Sheepsfoot Compactor	100		100		100		100		91		86	
Light Truck - 1.5 Ton												
Supervisor's Truck												
Flatbed Truck												
Air Compressor + tools												
Welding Equipment												
Heavy Duty Drill Rig												
Pump (plugging) Drill Rig												
Concrete Pump												
Gas Engine Vibrator												
Generator 5KW												
HDEP Welder (pipe or liner)												
5 Ton Crane												
20 Ton Crane												
50 Ton Crane												
120 Ton Crane												
Trucks												
725	100		100		100		100		100		95	
730	100		100		100		100		100		95	
735	100		100		100		100		99		91	
740	100		100		100		100		99		91	
769D	100		100		100		93		88		82	
773E	100		100		100		100		93		85	
777D	100		100		100		100		93		87	
785C	100		100		100		93		86		80	
793C	100		100		100		100		100		93	
797B	100		100		100		100		100		93	
613E (5,000 gal) Water Wagon	100		100		100		100		95		87	

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621E (8,000 gal) Water Wagon	100		100		100		100		97		90	
777D Water Truck	100		100		100		100		93		87	
785C Water Truck	100		100		100		93		86		80	
Dump Truck (10-12 yd^3) (5)												

Notes:
User entered deration value will override values from CAT Performance Handbook, except L2350 Loader: data from actual mine performance in Chile.
Komatsu altitude deration assumed from LeTourneau L2350

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