

Resolution Copper Project and Land Exchange Environmental Impact Statement

USDA Forest Service
Tonto National Forest
Arizona

July 1, 2019

Process Memorandum to File

Power Requirements of Mine, Mine Facilities, and Alternative Tailings Storage Facilities

This document is deliberative and is prepared by the third-party contractor in compliance with the National Environmental Policy Act and other laws, regulations, and policies to document ongoing process and analysis steps. This document does not take the place of any Line Officer's decision space related to this project.

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Purpose of Process Memorandum

The General Plan of Operations (GPO) discusses the anticipated power requirements of the mine (see GPO section 3.5.1), but focuses mainly on the size and location of proposed transmission lines. Additional information regarding the amount of power needed for the mine was received from Resolution Copper Mining, LLC (Resolution Copper) in June 2019, and has been summarized in the environmental impact statement (EIS).

The purpose of this process memorandum is to provide the detailed data for additional power information received and summarize the information.

Power Information Received

Two spreadsheets were received from Resolution Copper on June 16, 2019 (for the GPO) and June 20, 2019 (for the alternatives).

Each spreadsheet contains year-by-year estimates of power consumption between 2019 and 2038. These include anticipated power requirements from current activities, activities during the construction period, and activities during the operational ramp-up period to full ore throughput. Each spreadsheet provides power requirements broken out by major project components and equipment.

The information received is in units of kilowatts (kW). A kilowatt is a unit of electrical power, which is not a measure of the total amount of energy used, but a measure of the rate of energy use (specifically, a watt equals one joule of energy per second). The information provided therefore reflects the rate of energy use at any given moment by the mine; it could also be considered as the draw put on the electrical grid at any moment. This is a standard approach and this information factors directly into the sizing of the transmission lines.

It is important to note that this information has been estimated as part of the disclosure required under the National Environmental Policy Act (NEPA). Power would be provided to the mine by the Salt River Project. Initial design work indicates that the transmission lines are appropriately sized. However, Salt River Project would ultimately be responsible for ensuring the design of the transmission lines is sufficient to provide the necessary power to the mine.

Summary of Information Received

The full spreadsheets are shown in Attachments 1 and 2. Table 1 summarizes the maximum power requirements for major mine components, and the anticipated point in time of maximum usage.

Table 1. Summary of Power Requirements for Major Mine Components

Mine Component	Estimated Maximum Power Requirement (kW)	Year of Maximum Power Requirement
CONCENTRATOR & TAILINGS		
Services & Construction	1,280	2026–2038
Water Systems		
Wastewater Treatment Plant	550	2024–2028
Fresh Water Pumping	150	2025–2028
Shaft # 8 Pump	375	2019–2038
Concentrator	113,400	2037–2038
Refrigeration	4,000	2025–2038
SURFACE MINE FACILITIES		
Services & Construction	2,035	2034–2038
Refrigeration	7,837	2025–2038
Ventilation	5,943	2029–2038
Hoisting	57,800	2038
UNDERGROUND MINE FACILITIES		
Services & Construction	3,385	2029–2038
Dewatering	6,450	2034–2038
Ventilation	14,850	2034–2038
Refrigeration	6,000	2028–2038
Ore Flow		
Crushing	2,000	2034–2038
Conveying	25,000	2036–2038
ALTERNATIVES 2 and 3 TAILINGS STORAGE FACILITY		
Tailings Storage Facility	900	2037–2038
Cyclones/Thickener	4,056	2037–2038
ALTERNATIVE 4 TAILINGS STORAGE FACILITY		
Tailings Pumping	9,600	2037–2038
Filters	23,500	2037–2038
Stacking Conveyors	1,000	2037–2038
ALTERNATIVE 5 TAILINGS STORAGE FACILITY		
Tailings Storage Facility	4,370	2037–2038
Cyclones/Thickener	4,056	2037–2038
East Route Option	18,055	2037–2038
West Route Option	24,782	2037–2038
ALTERNATIVE 6 TAILINGS STORAGE FACILITY		
Tailings Storage Facility	54	2037–2038
Cyclones/Thickener	4,056	2037–2038
North Route Option	22,933	2037–2038
South Route Option	29,257	2037–2038

ATTACHMENT 1

Power Requirement Spreadsheet for GPO

Estimates of RC Power Requirements (Current, Construction and 10 years Production with Construction) - kW

May-19

	2019				2020				2021				2022				2023				2024				2025				2026				2027				2028				2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4						
Concentrator & Tailings																																																		
Services & Construction	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180		
Services & Buildings	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180		
Tailings																																																		
Concentrator and Infrastructure Construction																																																		
Water Systems	813	813	813	813	813	813	863	863	863	900	900	900	950	950	950	950	950	950	950	950	1,000	1,038	1,038	1,038	1,038	1,038	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075	1,075						
WTP	400	400	400	400	400	400	450	450	450	450	450	450	500	500	500	500	500	500	500	500	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550	550						
Fresh Water Pumping	38	38	38	38	38	38	38	38	38	75	75	75	75	75	75	75	75	75	75	75	75	113	113	113	113	113	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150						
# 8 Pump	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375	375						
Concentrator	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Concentrator Operation																																																		
Refrigeration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0						
Refrigeration Plant																																																		
Sub Total	993	993	993	993	993	993	1,043	1,043	1,043	1,080	1,080	1,080	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,130	1,180	1,218	1,218	1,218	2,218	3,818	4,855	5,855	5,855	6,355	6,355	6,355	6,355	6,355	6,355	6,355	6,355	6,355	6,355	6,355										
Mine																																																		
Surface																																																		
Services & Construction	400	400	435	435	435	435	435	435	400	400	400	400	400	400	400	400	435	435	435	435	485	485	485	485	535	1,135	1,235	1,335	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435	1,435										
Services & Buildings	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	300	400	500	500	500	500	500	500	500	500	500	500	500	500	500										
Batch Plant																																																		
Air Compressors	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	200	250	250	250	250	300	300	300	300	400	400	400	400	400	400	400	400	400	400	400	400										
Construction																																																		
Refrigeration	1,764	1,764	1,764	3,528	3,528	3,528	3,528	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	7,056	7,056	7,056	7,056	7,056	7,056	7,000	7,000	7,000	7,000	7,000	7,837	7,837	7,837	7,837	7,837	7,837	7,837	7,837	7,837	7,837														
Chilling System	1,764	1,764	1,764	3,528	3,528	3,528	3,528	5,292	5,292	5,292	5,292	5,292	5,292	5,292	5,292	7,056	7,056	7,056	7,056	7,056	7,056	6,000	5,000	4,000	3,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000														
Ice Plant																																																		
Ventilation	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000														
Portal Fan	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	178	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000														
Surface Fans																																																		
Hoisting	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000														
#9 Hoists	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800														
#10 Hoists	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800														
#11 Hoists																																																		
#12 Hoists																																																		
#13 Hoists																																																		
Underground																																																		
Services & Construction	821	821	821	821	821	821	821	821	821	1,325	1,325	1,325	1,325	1,325	1,325	938	821	938	938	821	1,595	1,829	1,829	1,829	1,829	1,946	1,946	1,946	1,946	1,946	1,946	1,946	1,946	1,946	1,946	1,946														
Services	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704	704														
Fresh Water Pumping	117	117	117	117	117	117	117	117	117	234	234	234	234	234	234	234	117	234	234	117	117	351	351	351	351	468	468	468	468	468	468	468	468	468	468	468														
Characterization Drifting																																																		
Construction & Lateral Development																																																		
Dewatering	1,050	1,050	1,050	1,050	1,950	1,950	1,950	1,950	1,950	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	2,850	3,750	3,750	3,750	3,750	3,750	3,750	3,750	3,750	3,750	3,750	3,750	3,750																		
#9 Pumps	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900	900																		
#10 Pumps	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050																		
UGC Pumps																																																		
#11 Pumps																																																		
#12 Pumps																																																		
#13 Pumps																																																		
#14 Pumps																																																		
Ventilation	1,925	1,925	2,488	2,488	3,275	3,275	3,275	3,275	3,275	3,575	2,938	2,938	2,938	2,938	2,938	2,938	2,938	2,938	2,938	2,938	3,150	5,850	5,850	5,850	6,300	6,300	6,300	6,300	7,200	7,200	7,200	7,200																		
#9-10 Exhaust Fans	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125	1,125																																								
#9 Exhaust Fans																																																		
#10 Force Fans	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800																		
#9 Force Fans																																																		
UGC (Exhaust & Force Fans)																																																		
Shaft 11 Fans																																																		
Shaft 12 Fans																																																		
Shaft 13 Fans																																																		
Shaft 14 Fans																																																		
Ore Drifts (Force Fans)																																																		
Ore Drifts (Exhaust Fans)																																																		
Refrigeration	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,800	2,800	2,800	2,800	2,800	2,800	2,800	4,500	4,500	4,500	4,500																		
Chilling System (Ice Melt)																																																		
Ore Flow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0																		
Crushing																																																		
Conveying																																																		
Sub Total	9,738	9,738	10,336	12,100	13,787	13,787	13,787	15,551	15,516	17,220	16,583	16,583	16,583	16,583	16,583	17,960	17,878	17,395	17,395	17,278	19,214	25,892	25,892	25,892	26,392	27,109	28,046	27,968	32,668	32,668	32,668	32,668	33,668	33,668	33,668	33,668														

ATTACHMENT 2

Power Requirement Spreadsheet for Tailings Alternatives

