ROSEMONT PROJECT

ELECTRICAL POWER SUPPLY AND WATER SUPPLY SUPPLEMENT

Prepared for:

AUGUSTA RESOURCE CORPORATION
4500 Cherry Creek South Drive, Suite 1040
Denver, Colorado 80246

Prepared by:

WestLand Resources, Inc.
Engineering and Environmental Consultants
2343 East Broadway Boulevard, Suite 202
Tucson, Arizona 85719
(520) 206-9585

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1.1 Electrical Power Demand

The Rosemont mine and process facilities are estimated to generate a total connected load of 133 megawatts (MW) during peak operation. Provision of electrical power supply to the site will require a minimum transmission voltage of 138 kV. The estimated power load for the water supply wells and pump stations off site is about 7.2 MW. Appendix A provides a summary table of the connected loads by mine process area as well as the demand load and estimated running load. Appendix B includes a single line diagram of the Rosemont mine main power substation.

1.2 Electrical Power Sources

The electrical power supply for the Project facilities falls within both the Tucson Electric Power (TEP) and the TRICO service territories. The eastern area of the Project, which includes part of the mine and all the process facilities, falls in the TEP service territory. The western area of the Project, including the balance of the mine and the process water pumping system, falls in the TRICO service territory. Because most of the Project's estimated electrical load and power requirements fall within TEP's service territory area, TEP will be the main electric utility service provider for the entire facility, including the fresh water system. A joint-venture business arrangement between TEP and TRICO will be negotiated and established to compensate both service providers. The arrangement will probably be based on a percentage of actual electrical load between each of the service territories and the facilities located within each territory. However, Rosemont Copper will receive one electric utility rate and bill, with the breakdown of revenue between TEP and TRICO a matter of contract between the two utilities. The multiple service territory and provider agreement will be submitted, as required, to the Arizona Corporation Commission (ACC) for review and final approval prior to implementation.

In addition to traditional electrical service from commercial providers, Rosemont will generate energy on site using solar technologies. Passive solar installations will be used for appropriate applications, such as water heaters and fans, and photo-voltaic cell technology for supplemental electricity generation. By using the significant available surface area (approximately 300,000 sf) on facility roofs for the installation of solar systems, Rosemont Copper will be able to enhance the overall energy efficiency of the operation.

1.3 Preliminary Power Flow Analysis

A preliminary power flow analysis was prepared for two power supply options—one with the TEP system and another with the Southwest Transmission Co-op (SWTC) system. The power flow studies utilized a 2010 summer peak-load base-case prepared by the Western Electricity Coordinating Council (WECC). The studies assessed the impacts on the system in southern Arizona for both normal and outage contingency conditions and for both pre- and post-project scenarios. Contingencies were simulated on the 345 kV lines entering and within southern Arizona, and on all facilities in the area with an operating voltage greater than 100 kV.

The studies indicated that the TEP Vail substation could serve up to 75 MW of mine load if 20 MW of generation is on line at the Valencia generating facility, or up to 100 MW if the Gateway Project were in service. The Gateway Project is a new substation facility located near Sahuarita and is expected to come on line in 2010. The studies also indicated that shunt capacitors at Sonoita and the Rosemont Project substation would be required to maintain pre-project voltage levels. Upgrades to certain SWTC facilities would also be required to mitigate any impacts due to outages. The analysis of the SWTC substation at Sahuarita indicated that it could provide 100-plus MW of power to the mine; however, some upgrades to the facilities would be required to mitigate the impacts of outages. Shunt capacitors at Sahuarita and the Rosemont Project substation would also be required to maintain pre-project voltage levels.

1.4 Proposed Electrical Power Supply Facilities – Preferred Alignment

Based on analysis of several power supply alternatives, the preferred electrical power supply option was identified (Figures 1-1 and 1-2). This option was selected because the new transmission line to the project site, which covers 11.6 mi, will be the shortest possible route that avoids the Santa Rita Experimental Range (SRER). In addition, the TEP system will be capable of providing service to the Rosemont mine without upgrades, other than those already planned by TEP. This option would connect to the existing TEP power line serving Santa Cruz County, the Vail-Kantor line that runs approximately 9 mi northwest of the project site. The existing 115 kV TEP transmission line starts at the Nogales tap on the Western Area Power Administration (WAPA) line, and runs south through the SRER to Santa Cruz County and Nogales.

The line routing has been selected to avoid traversing the SRER. Administered by the University of Arizona, SRER is the oldest experimental range in the country, and was founded to study range recovery from drought and overgrazing, as well as sustainable grazing practices. The alignment avoids SRER where possible by traversing lands to the north and east. Where it cannot be entirely avoided, the line will follow the boundary of the range.

A new 138 kV switching station would be required to tap into this line with a new 138 kV transmission line running to the main substation at the plant site. The tap will be made at the intersection of the transmission line and the northern boundary of the SRER (Figure 1-1). A new switching station will be provided for the tap, which will be located just north of the location where the Vail-Kantor line enters the SRER. The new 138 kV transmission line will run about 4 mi east, along the northern boundary of the SRER. The transmission line will then turn south for another 4 mi until it intersects the west access road into the mine site. The new transmission line to the plant main substation is about 11.6 mi long and follows the same alignment as the proposed process water pipeline route from the well fields northwest of the tap near Sahuarita, Arizona (see Section 2.0).

The proposed 138 kV transmission poles will be single, steel, 90-ft, two-section, direct-buried poles, supporting a vertical-type, three-phase line configuration and will provide a minimum of 75 ft of ground clearance for the transmission line. Pole spacing will be about 800 ft on level ground and less where required to maintain ground clearance on varying and steep topography. A detail of the proposed power poles is included in Appendix B.

A new substation would also be located at the switching station, with a single 138 kV to 34.5 kV or 4.16 kV, step-down transformer, isolation switches, and circuit breakers to distribute electrical power to the process water wells and pump stations at either 34.5 kV or 4.16 kV, using a separate three-phase, overhead distribution wooden pole line. This distribution line will run in parallel to the 138 kV transmission line.

This scenario requires that the 115 kV Vail-Kantor line be upgraded to 138 kV and the connection moved from the Nogales tap on the WAPA 115 kV line to the Vail 345 kV substation. These changes are part of a previously planned TEP system upgrade to improve service to Santa Cruz County. Recent discussions with TEP have confirmed that the required Vail-Kantor transmission line upgrades will be completed in time to support the project and that the Vail substation can supply the 100-plus MW of power for the project.

1.5 Other Power Supply Options

Several other power supply options were evaluated for the Project, as discussed in the following sections.

1.5.1 Interconnection with TEP Line Serving Santa Cruz County

A tap on the Vail-Kantor line was initially considered at the location where that line crosses Santa Rita Road. From there, the transmission line would have followed Santa Rita Road and the Rosemont Project's west access road to the mine's main substation at the west side of the site. The process water distribution system would have followed the same corridor. At 9 mi, this alignment would have been shorter than the preferred alternative. However, this option was not selected due to the location within the SRER and the potentially negative impacts of construction, operation, and maintenance of the system.

1.5.2 Interconnection with SWTC Sahuarita 230 kV Substation

This option would have connected to the existing SWTC 230 kV substation located north of Sahuarita and included a new 230 kV transmission line running south. The alignment would run parallel to the existing SWTC transmission lines until the new line reaches Santa Rita Road. At this point, the line would follow the Santa Rita Road alignment to the mine's main substation. This option was not selected due to the location within the SRER, the longer length of the transmission line, overload on the existing 345/230 kV SWTC Bicknell transformer, and the added cost for substation electrical equipment rated for the higher, 230 kV transmission voltage.

1.5.3 Interconnection with TEP South 345/138 kV Substation

This option would have connected to the existing TEP South 345/138 kV substation located another 4 mi northwest of the SWTC Sahuarita substation. The new 21-mi 138 kV transmission line would run east about 2.3 mi and then south about 5.2 mi along the Santa Rita Road alignment to the mine site. This option was considered prior to determining that the planned upgrades to the TEP system for the Vail-Kantor line would be sufficient for service to the Rosemont mine site.

1.5.4 Interconnect the TEP South Line to the TEP Vail-Kantor Line

This option would connect the 138 kV transmission line from the TEP South 345/138 kV substation with the existing TEP Vail-Kantor line where the two lines cross at Santa Rita Road, when the Vail-Kantor transmission line is upgraded to 138 kV service voltage. This would be the most expensive option; however, the two sources of electrical power would provide greater reliability for the mine. This option was considered prior to determining that the planned upgrades to the TEP system for the Vail-Kantor line would be sufficient for service to the Project site.

1.6 Power Supply Line Corridor and Substation Sizing

The required corridor anticipated for the power supply lines, which will also accommodate the water supply line for the project, will be approximately 100 ft in width. The 100-ft corridor will provide sufficient width for both construction and ongoing operation and maintenance associated with the power and supply systems. The new substation at the Vail-Kantor line is anticipated to require approximately 150 ft by 150 ft. The power supply for each of the water well and booster station sites located remotely from the Project site will be incorporated into the water system facility site as discussed in Section 2.0.

2.0 Water Supply

2.1 Introduction

The Rosemont Project lies in the headwaters of the Davidson Canyon drainage in the Cienega Creek basin southeast of Tucson, Arizona. Historically, mining companies that have evaluated development of the ore deposits in the Rosemont area planned to develop the associated water supply for mining operations from groundwater aquifers that lie to the east of the Project site within the Cienega Creek watershed. Because of the recognized sensitivity of the Cienega basin, Rosemont Copper determined at the beginning of its planning process to acquire a water supply for the Project from the Santa Cruz basin to the west of the Project site.

This decision, though more costly, allowed Rosemont Copper to achieve two important water management goals in addition to meeting the mining operational requirements. First, the impact of the Rosemont Project on the water supply of the Cienega Creek drainage is minimized. Second, purchase and recharge of water from the Central Arizona Project (CAP) aqueduct, which reaches the Santa Cruz basin but not the Cienega basin, will allow Rosemont Copper to replace more than its entire consumption, thereby creating a net positive impact on the groundwater resources of the region.

In addition to the commitment to offset 105 percent of total project pumping with recharge in the Santa Cruz basin, Rosemont Copper also plans to utilize state-of-the-art water conserving technology, as described in the Mine Plan of Operations (MPO). Rosemont Copper is committed to having a cumulative recharge volume larger than its cumulative pumping quantity for mine operations. To this end, Rosemont Copper has begun its recharge program in calendar year 2007, well in advance of actual usage. Contracts are in place to recharge 15,000 acre feet (af) in 2007, which equals approximately three years of planned mine usage.

2.2 Legal and Regulatory Considerations

Process water for the Project will come from the aquifer within the Upper Santa Cruz sub-basin of the Tucson AMA groundwater basin. Water from this source will be used mostly at the mine site, which lies within the adjacent Cienega Creek groundwater basin. Both basins have been delineated by the Arizona Department of Water Resources (ADWR) pursuant to A.R.S. Section 45-403.

The right to extract and use groundwater from the Tucson AMA will be pursuant to a Mineral Extraction and Metallurgical Processing groundwater withdrawal permit (ME permit) issued by ADWR pursuant to A.R.S. Section 45-514. The permit application will be filed in 2007. This is a “shall issue” permit that must be granted unless reliable alternative water supplies (uncommitted municipal and industrial CAP water, surface water, or effluent) are available at comparable cost at the point where the mine’s wellhead or distribution system would otherwise exist (A.R.S. Section 45-514[A][2] and [3]). No such reliable alternative water supplies are available. An ME permit may be granted for a period of up to 50 years. The ME permit is expected to be issued for the quantity of water needed for the Rosemont Project on an annual basis, and for a term that will match the intended life of the Project.

Non-exempt water production wells for withdrawals regulated under an ME permit may be constructed in accordance with A.R.S. Section 45-596(B) without procuring a well permit pursuant to A.R.S. Sections 45-598 and -599. Thus, no well spacing or well interference analysis is required before siting such a well. Rosemont Copper has secured property for well sites as illustrated in Figures 2-1 and 2-2. The production wells will be constructed in accordance with the “shall issue” drilling authority described in a Notice of Intent to Drill filed under A.R.S. Section 45-596.

Groundwater extracted pursuant to an ME permit may be transported away from an active management area, such as the Tucson AMA, to another basin, such as the Cienega Creek basin, in accordance with A.R.S. Section 45-543. However, this transportation is subject to a claim of damages by groundwater users in the basin of origin. A.R.S. Section 45-545 provides, however, that such damages shall not be presumed from the fact of transportation. This section also provides that, in considering the effect of transportation, mitigating factors such as the procurement of additional sources of water for the basin of origin shall be considered.

To mitigate harm to the Tucson AMA basin, Rosemont Copper has procured an excess water subcontract from the Central Arizona Water Conservation District (CAWCD), which operates the CAP system. The subcontract allows Rosemont Copper to purchase CAP water on an annual basis, as available, and take delivery in the Tucson AMA. As described above, Rosemont Copper began the process of purchase and recharge in 2007 in order to offset any potential harm to the Tucson AMA. It is expected that, by the time actual mining operations commence, Rosemont Copper will have recharged several years of the supply required for mine operations. The Rosemont Copper CAP storage program will result in long-term storage credits issued by the State of Arizona to Rosemont Copper for approximately 95 percent of the CAP water stored.

Rosemont Copper will also have the option of modifying the ME permit wells to allow them to operate as recovery wells. This would allow some or all of the water pumped from the wells to be legally characterized as recovered CAP water, rather than as groundwater. For the portion of the pumping that is characterized as CAP water recovery rather than groundwater pumping, a quantity of long-term storage credits equal to the annual amount of CAP water recovered will be extinguished each calendar year. Other long-term storage credits will be voluntarily extinguished as needed to offset groundwater pumping pursuant to the ME permit.

2.3 Water Demands

During its first eight years of operation, the project will utilize a total of approximately 5,500 af of process water per year. Thereafter, with oxide ore leaching complete, annual water consumption will decline to approximately 4,700 af per year. Over the 20-year life of the project, water consumption will average approximately 5,000 af per year, which will be used on a continuous basis. At the maximum anticipated annual usage of 5,500 af per year, the average usage rate would be approximately 3,400 gallons per minute (gpm). Certain periods will require a higher peak flow; therefore, the water system will be designed to accommodate a peak flow of 5,000 gpm.

2.4 Production Plan

The wellfield and pipeline for the water supply system will be designed to accommodate both the peak delivery rate and the total annual supply requirement. The wellfield will have excess capacity so that it can meet the 5,000 gpm production requirement while maintaining at least one production well in reserve.

Rosemont Copper has acquired a 53-ac parcel along Santa Rita Road northwest of the SRER (Figures 2-1 and 1-2), which will be Production Site 1. Technical studies of this site have provided the following results:

- Pump testing of an exploration well drilled near the eastern boundary of Site 1 supports a production rate of at least 1,500 gpm from a large production well at that location.

- Site 1 can also likely provide a location for another production well of similar capacity near the western boundary of the property. Though the production capacity of two wells at Site 1 may exceed 3,000 gpm, the water production plan anticipates only 3,000 gpm of production from the site.

- The presence of nearby large-capacity agricultural wells may have some effect on the overall production capability if all wells are operating simultaneously. The depth to groundwater at the site appears to vary between 200 ft and 270 ft, and appears to fluctuate as a result of pumping by other wells in the region. The Montgomery and Associates report (2007) (Appendix C) provides details on the Site 1 exploration well.

Rosemont Copper is currently evaluating other properties in the vicinity of Site 1 for acquisition to provide well sites to meet the additional 2,000 gpm peak pumping requirement. This capacity requirement is expected to require two or three more production wells and will provide peak demand with adequate reserve capacity.

2.5 Delivery System

Figures 2-1 and 1-2 show the preferred water delivery pipeline route. The Arizona State Land Department (ASLD) owns most of the land that will be traversed by the alignment. This alignment was selected to avoid the SRER. Easement negotiations with private landowners and the ASLD will run concurrently with MPO review and analysis, allowing the finalized route to incorporate community input.

The water delivery system will consist of 20-in ductile iron or welded steel pipeline, a series of five forebay reservoirs and booster pump stations, and a power line along the pipeline alignment. The 20-in pipe will accommodate the expected maximum flow rate of 5,000 gpm at a flow velocity of 5.0 feet per second (fps). Each of the five pump station sites will consist of a forebay reservoir with a volume of 300,000 gallons, a pump station with three vertical turbine pumps (two active and one stand-by) totaling approximately 650 hp, and a 10,000-gallon hydropneumatic tank to absorb pressure fluctuations in the event of a power outage or equipment failure. Several options for concept site configurations for the reservoir and booster station sites are included in Appendix D. Options for the sites include above-ground steel or below-ground concrete reservoirs, and several configurations for the booster pumps, depending upon the type of reservoir used. The type and exact dimensions of each reservoir will be adjusted to the conditions at each site.

The first pump station will be located at Site 1 adjacent to the eastern water supply well. The forebay reservoir at that site will serve as a collection reservoir for all the wells that will provide the process water to the Project. Four additional pump stations, with associated forebay reservoirs, will be located at approximately 3,310 ft above mean sea level (msl) along the north boundary of the SRER, and at approximate elevations of 3,885 ft, 4,460 ft, and 5,035 ft in locations east of the SRER. Pumping stations at these elevations will help to maintain pipeline pressures at reasonable levels along the alignment. The maximum working pressure at each pump station ranges from 250 to 340 pounds per square inch (psi). A profile of the water supply pipeline and the proposed booster pump station locations is provided as Figure 2-2.

2.6 Pipeline Alignment and Construction

The alignment of the water supply pipeline is shown on Figures 1-2 and 2-1. The pipeline will be constructed with a minimum soil cover of 36 in within ASLD or BLM easements, and 24 in on the mine property. The pipe bedding requirements will follow the manufacturer’s recommendations. Isolation valves will be installed in the pipeline at intervals of approximately 3,000 ft and at elevation changes of 250 ft. The pipeline will cross a number of washes, including three with rated flows of 5,000 cubic feet per second (cfs) and a number of smaller washes. The pipeline at the wash crossings will be constructed below the calculated scour depth of the wash, and grade control structures will be provided at the large washes to provide additional protection. A preliminary plan and profile of the pipeline alignment is provided in Appendix E.

2.7 Water Supply Line Corridor and Reservoir and Pump Station Sizing

The required corridor anticipated for the construction and maintenance of the water supply line is approximately 30 ft, as shown on Figure 2-3. This 30-ft corridor will be contained within the anticipated 100-ft corridor utilized for all the off-site utilities for the project. The 100-ft corridor will provide sufficient width for construction, ongoing operation, and maintenance associated with the water and power supply systems. Each new booster station is anticipated to require a site of approximately 200 ft by 200 ft, which will include all required facilities including the power supply. Each new well site is expected to require a site of approximately 100 ft by 100 ft. The route for the well collection pipelines will be selected as the final well locations are selected, and the corridor for those pipelines is expected to be approximately 30 ft.

2.8 Recharge Plan

Rosemont Copper has no legal obligation to replace any of the water it will produce for the operation of the mine. No other mining operation in the region has previously done so. However, Rosemont has made a commitment to the local community to utilize available CAP water to recharge 105 percent of the total water production over the life of the Project. The recharge will be within the Tucson AMA, and as close to the water production site as possible. The total life-of-mine usage is currently estimated to be 100,000 af, resulting in a recharge commitment of 105,000 af.

Rosemont Copper began recharging CAP water in the Santa Cruz basin in 2007, with contracts in place to recharge 15,000 af at three state-permitted underground storage facilities, which include Pima Mine Road near the terminus of the CAP aqueduct, and the Lower Santa Cruz and Avra Valley sites near Marana. Rosemont Copper contracted to utilize all of the available capacity at Pima Mine Road (about 600 af in 2007), with the balance to be stored at the Lower Santa Cruz and Avra Valley sites. Rosemont plans to continue this water storage program for the next several years. A volume of water equal to several years of mine water supply will likely have been stored by the time Rosemont mining operations begin.

Pima Mine Road is the state-permitted underground storage facility closest to Site 1. Because available capacity at this facility may remain limited for the foreseeable future, Rosemont Copper has also begun evaluating construction of a new recharge facility in close proximity. Although construction and operation of a nearby recharge facility is not required by law, regulation, or any contractual obligation, Rosemont Copper is committed to recharge available CAP water at groundwater storage facilities close to its production wells to lessen impacts of mine water production on local water users.