Environmental Hydraulics Group Hydraulic Design & Analysis - Mining & Industrial	**Project:**	**Proposed Pascua Lama Mine Complex – Basic Engineering Review**	**2000-411**
	Location:	**Argentina**	
	Client:	**SNC Lavalin / Barrick Gold Inc**	
	Completed:	**January 2001**	

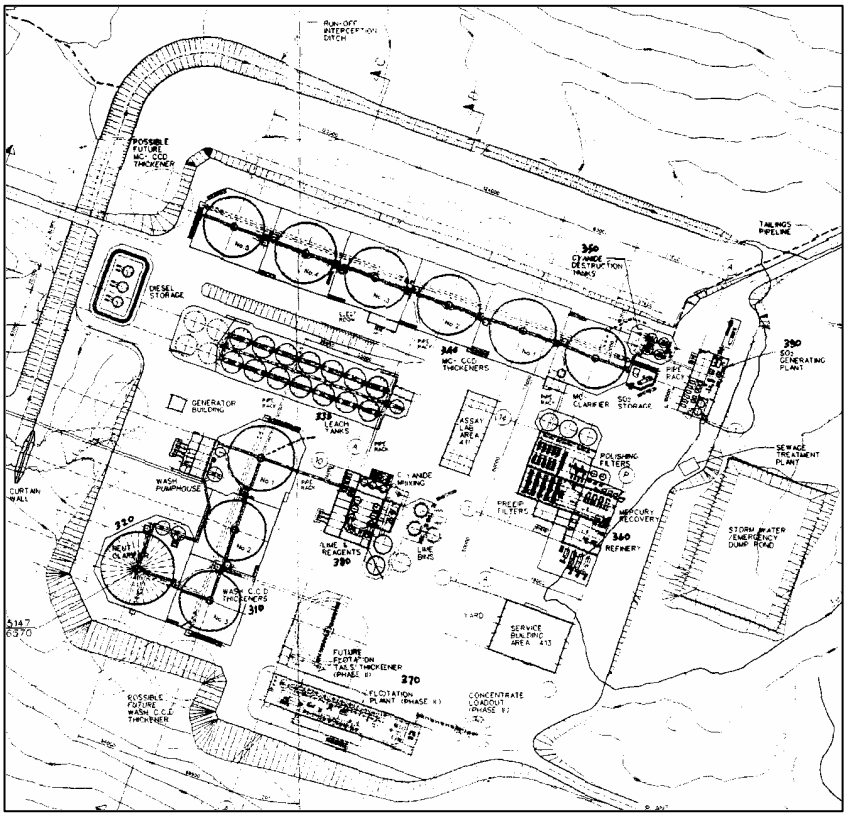
Description: EHG was pleased to participate in the Basic Engineering phase of the Pascua Lama project for SNC-Lavalin. This project had a greater scale and complexity than the previous Barrick projects EHG participated in.

The goals for the Basic Engineering Phase were to determine feasibility and to estimate costs. Consequently, the following objectives were achieved:

1. **Downhill slurry pipelines:** Alternatives were evaluated for linking both plants to the tailings pond and dam (route, number, and materials) and choose the optimal alternative.
2. **Uphill water reclaim pipelines:** Approximate surge protection requirements (if any) were determined based on an assessment of waterhammer issues and,
3. **Wet Process Plant:** The number and size of major components (tanks, launders and piping) were confirmed and major flow paths and operating modes (steady state, by-pass, start & stop) were checked to identify possible constraints relating to plant layout, hydraulic conveyance and spill potential. Particular attention was warranted at the many dilution/mix/reaction tanks throughout the plant.

Benefit to the Client: Three hydraulic design tasks, which could require significant time and/or resources, were identified during the Basic Engineering Phase. These items are listed in priority order in terms of plant hydraulics:

1. A numerical model was developed to analyze the dilution/mix tanks to ensure that process objectives were met and that normal and HAZOP operating conditions were satisfactory. These 12 tanks required very advanced hydraulic design to ensure enough contact time and de-aeration while avoiding adverse impacts to the upstream and downstream thickeners.
2. A Hammer™ computer model of **transient pressures and forces for major pipelines** was designed to ensure that pumps and lines can withstand transient pressures and that anchors and deflectors can withstand the forces.
3. PLANT computer model of **hydraulic conveyance for the wet plant** was designed to ensure that surges, spills and other poor process outcomes were eliminated by improved design. A dynamic model of a plant shut-down was developed for another plant (Boulder Valley water treatment plant) which identified a number of locations where uncontrolled spills could occur as flows backwatered or accumulated near capacity bottlenecks.



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