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Minería Responsable

The Pascua-Lama Project, Chile – Argentina: Co-Existence of Mining and Agriculture in a Water-Scarce Environment

Derek Riehm, Vice President Permitting & Approvals
Barrick Gold Corporation, Toronto, ON

Butte, MT 3 May 2011

Barrick in the world



Pascua-Lama



Pascua-Lama

- 100% Barrick-owned (acquired in 1994)
- Currently permitted and in construction
- Gold production 750,000 – 800,000 oz annually during first five years of operation
- Cash costs \$20 – \$50 per oz
- Silver production \approx 35 Moz annually
- First production during first half of 2013
- Capital costs forecast to be US\$3.3 – 3.6 billion.



Pascua-Lama



Environmental approvals & permits



- Chile
 - Environmental Impact Study (Estudio de Impacto Ambiental, EIA) submitted to COREMA Region III in November 2004
 - Approved (with conditions) February 2006
 - In addition, approximately 600 permits required for construction & operation

- Argentina
 - Environmental Impact Report (Informe de Impacto Ambiental, IIA) submitted to Mining Department of San Juan province in November 2004
 - Approved (with conditions) December 2006
 - In addition, approximately 300 permits required for construction & operation

Approvals: Key Issues



- Water, water and water
 - Glaciers
- Others
 - Water
 - Air quality
 - Local procurement & hire
 - Community development
 - Flora & fauna
 - Water!

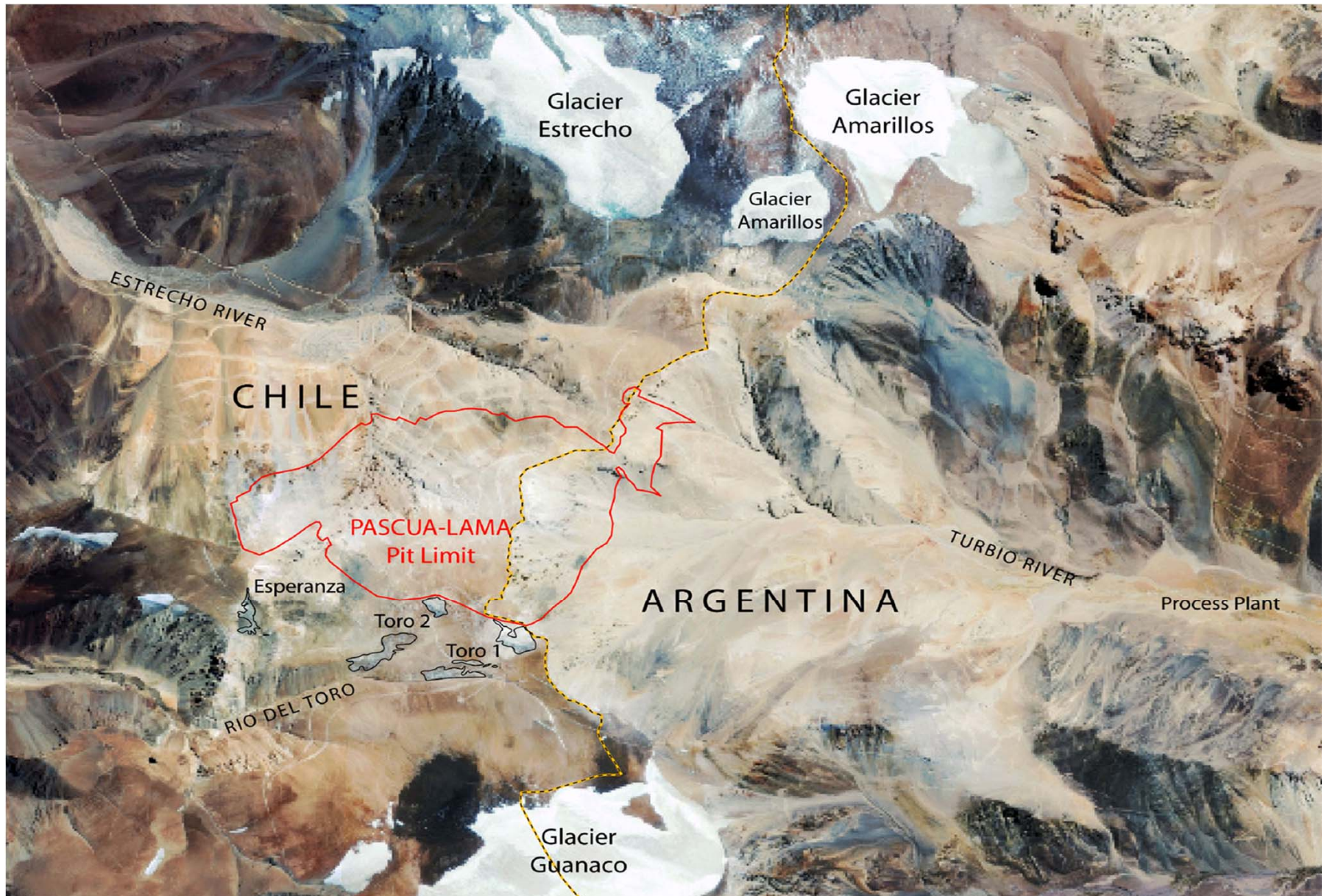
Glaciers



- Environmental Resolution RCA 24/06 :
 - “Barrick must undertake the mining and associated works in the zone of the glaciers Toro 1, Toro 2 and Esperanza in a way that does not produce removal, relocation, destruction or any physical intervention on them”
- Glacier Monitoring Plan: Approved by DGA and Corema Atacama Region (2008)



Glaciers & Glacierets



Glacier Monitoring

- Evaluate natural and possible mining related changes
- Monitoring in both Chile and Argentina
 - Chile: Glacier Monitoring Plan, a condition of the environmental approval
 - Argentina: national Glacier Protection Law passed in 2010
- Monitor albedo, mass balance, dust accumulation
- Produce studies using international protocols and validated by the scientific community
- Incorporate international experts into the study using research agreements and technology transfer



Env. Monitoring Argentina

ARGENTINA Monitoring Summary

Component	Data since Year	N° of Future Points	Actual Points	Frequency of Monitoring	Reporting Frequency
Ecological Processes	1998	4	4	Annual	Annual
Limnology	1998	20	20	Area Mine: Twice yearly Area Watershed: Four times per year Cuesta del Viento: Three time per year	Twice a year
Groundwater Quality and Water Levels	1998	23	7	Monthly but some points will change to daily or weekly in operations	Twice a year
Surface Water Quality and Flow Rates	1998	33	17	Monthly but some points will change to daily or weekly in operations	Twice a year
Wildlife	1998	13	13	Twice yearly	Twice a year
Plants	1998	23	23	Three times a year	Twice a year
Archeology	2000	12	12	Twice yearly	Twice a year
Socio-economic	Census since 2001	x	x	Permanent	Twice a year
Noise	2000	18	18	Area Mine: annual Area communities: Three times yearly	Twice a year
Vibration	2000	6	6	Three times yearly	Twice a year
Vehicular Flow	2002	4	4	Three times yearly	Twice a year
Meteorology	1998	4	4	Permanent	Twice a year
Glaciers	2007	2	2	Glacier Brown: annual Glacieres Lama: Twice annual	Annual
Air	2000	8	4	Monthly,, weekly, and daily during Construction, operation, and closure respectively	Twice a year
Soils	Baseline soils quality: 2008	3	x	Annual and after spills	Twice a year
Operational Monitoring including air quality	x	2	0	Continuous (During operations)	Twice a year
Wastewater Effluent	x	2	0	Monthly during construction and weekly during operation, and closure.	Twice a year

Env. Monitoring Chile

CHILE Monitoring Summary

Monitoring Item	Data Collected Since (year)	Number of monitoring points	Frequency of monitoring	Frequency of Reporting
Biology-Bioindicators	2007 (Bioindicators)	30	Twice yearly	Annual CONAMA
Limnology	1997-2006 Consolidated Report 2007 Prog. Actual	30	Three times a year	Annual CONAMA
Water Quality	1982 (Most data since 2000)	48	Monthly	Annual CONAMA
Plants-Flora	2001	4 Sub-basins	Annual	Annual CONAMA
Wildlife- Fauna	2001	7	Annual	Annual CONAMA
Meteorology	1994	9 stations	Continuous	Annual CONAMA
Glaciars	2007	Glacier Estrecho Glacier Guanaco Glacier Amarillo Glacierete Esperanza Glacierete Toro 1 Glacierete Toro 2 Glacier Ortigas 1 Glacierete Ortigas 2	Annual during construction and operation. Continuous for some parameters	Annual-CONAMA
Effluent Wastewater Plant /and Potable Water Plant	2000	2/4	Weekly	Annual-CONAMA

Protection of Water Resources

- Key stakeholder concern: availability of fresh water of suitable quality for irrigation
 - Featured prominently in environmental approval processes in Chile and Argentina
- Potential impacts to water include
 - Reduced availability due to project water demand
 - Impaired quality due to acid rock drainage (ARD)
 - Impaired quality due to NaCN (Argentina)
 - Reduced availability and/or impaired quality due to impacts project development on glaciers that serve as “strategic water reservoirs”
- Project environmental approvals and permits include many stipulations related to protection of water quality and quantity

Water quality protection Argentina

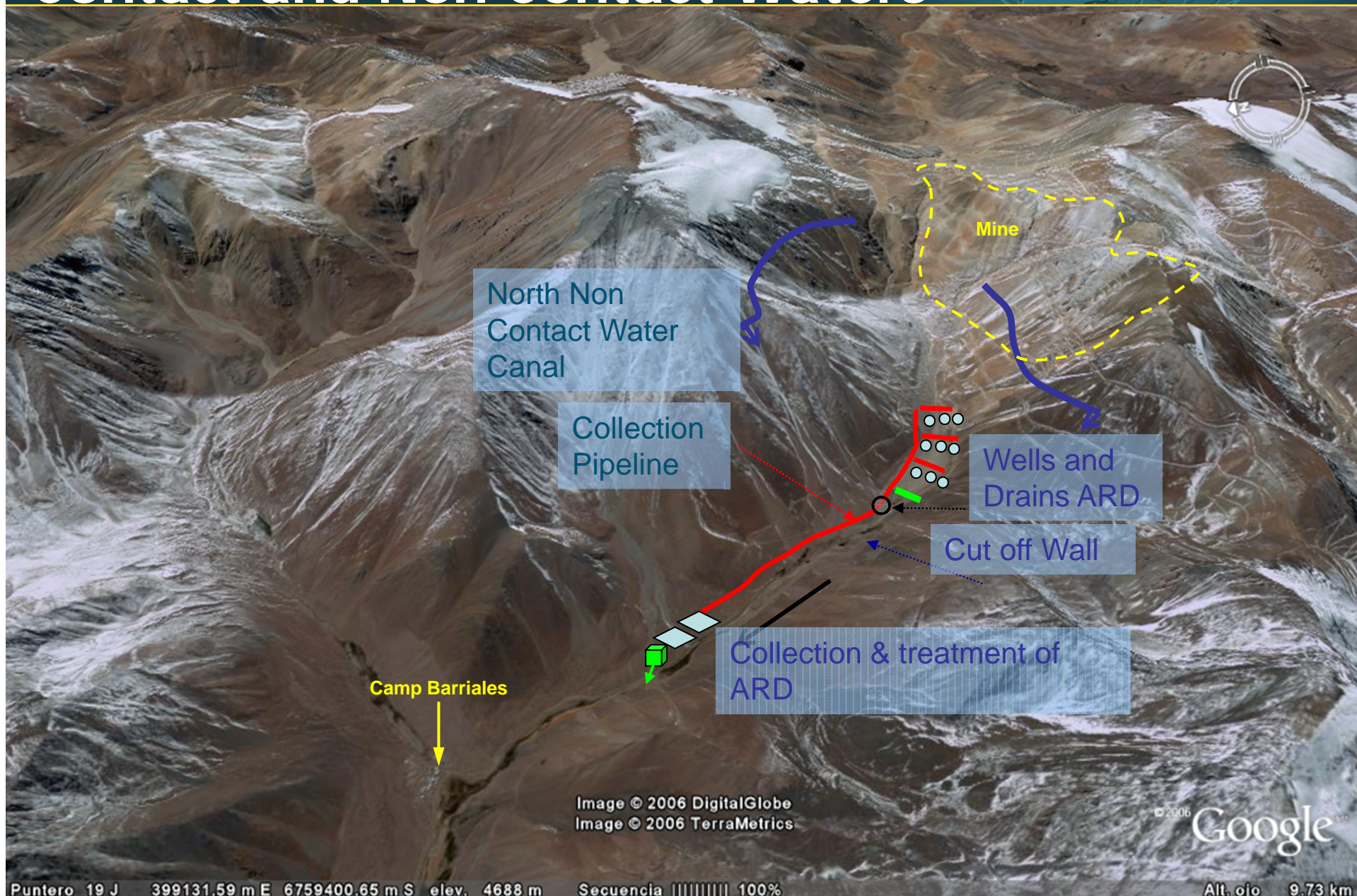


- Tailings storage facility (TSF)
 - Treatment of tailings for CN removal prior to deposition in TSF
 - “Zero discharge”: maximize recycle of water to process plant
 - Fully lined with comprehensive network of drains to capture and re-use tailings water
 - Wells for monitoring and, as required, capture and pumpback of seepage
 - Diversion channels and drains to route non-contact water around the facility
- Diversion of non-contact water around the process plant

Water quality protection Chile

- Diversion channels to capture non-contact water and route it around the Estrecho waste rock facility (WRF) and pit areas
- Redundant lines of wells and french drains capture contact waters below WRF and low grade ore stock piles.
- A cut off wall is located below the pit and WRF drainages to stop any potential ARD ground or surface waters from migrating downstream.
- Wells are located below the cut off wall as a redundant capture system.
- Collection and treatment of ARD

Pascua-Lama Water Management : Contact and Non Contact Waters



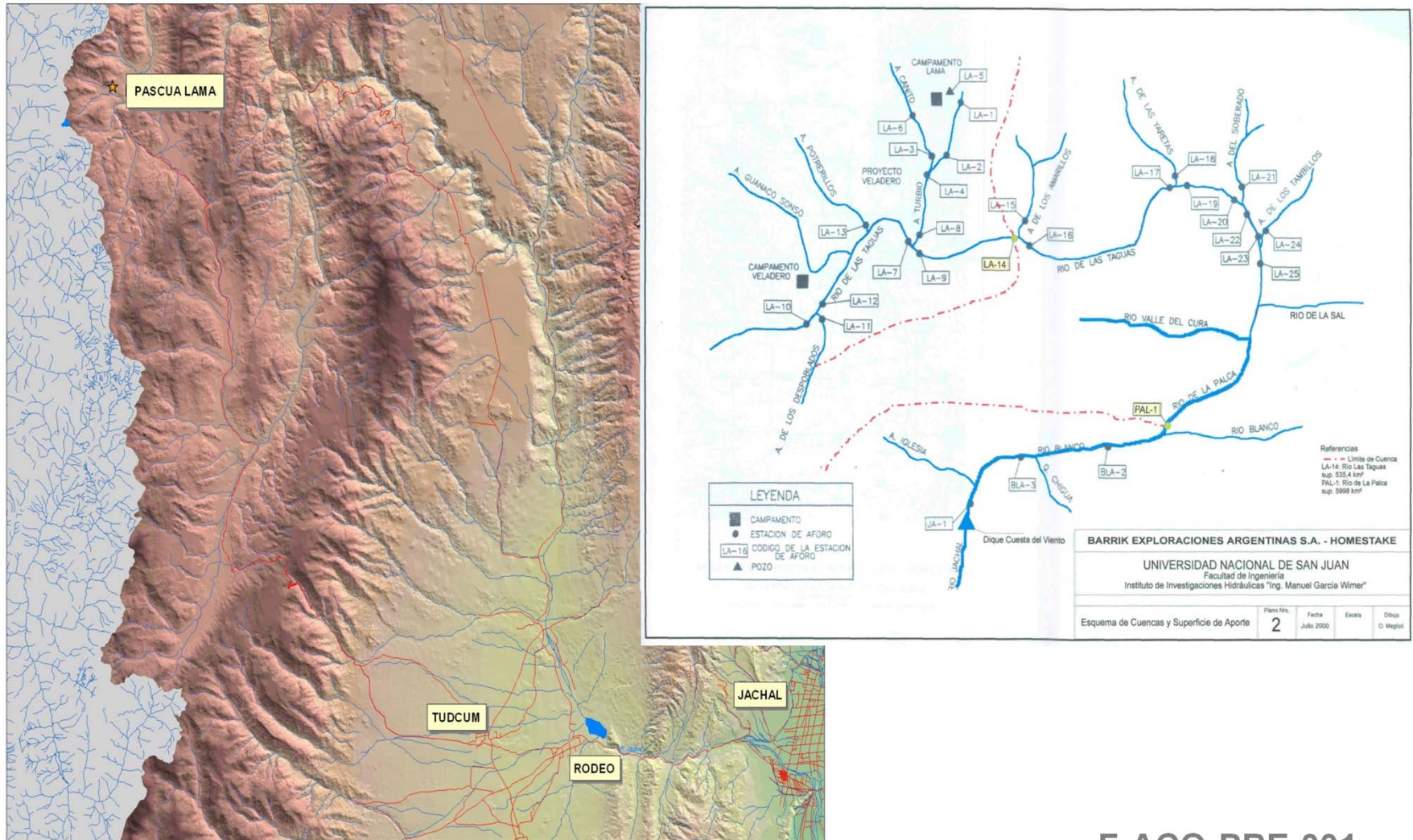
Pascua-Lama Water Monitoring

CHILE - Water Quality Monitoring Points



Pascua-Lama Water Monitoring

ARGENTINA - Water Quality Monitoring



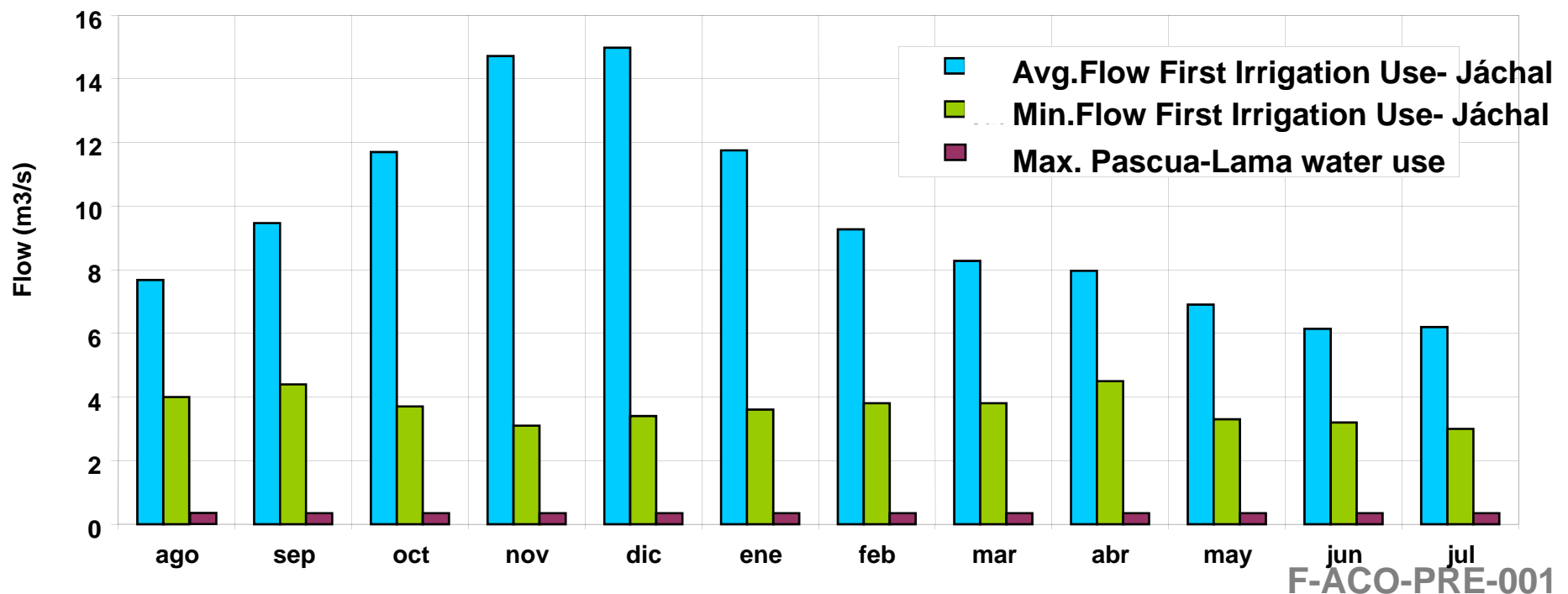
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Argentina and Chile Impacts:

- Argentina : Impact mitigation is based on:
Maximum water use of 346 liters per second (l/s).
- Chile : Impact mitigation based on:
Maximum water use of 42 l/s.

Pascua-Lama Water Use Mitigation

- The impact on water users (irrigation) below this water extraction has been evaluated by the Water Research Institute of the Universidad Nacional de San Juan, taking into account the regulatory effect of the dam Cuesta del Viento. This evaluation is incorporated in the Pascua-Lama Environmental Impact Report (IIA)



Water Mitigation

- Community Water Monitoring Program – 6 programs have been completed in Veladero/Lama(Argentina) & 2 in Pascua (Chile)
- Investment in water infrastructure
 - In Chile, \$60M to be invested over LOM in conjunction with the Huasco River Water Board (Junta de Vigilancia).
 - In Argentina, \$70M to be invested as condition of IIA approval



Canal Lining Construction



Canals During Lining



Before Canal Lining



During Canal Lining



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Finished Canal Lining



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Lined Canals



F-ACO-PRE-001

Lined Canals



Barrick Responsible Mining



- Barrick understands the only way to do business in our industry today is by doing responsible mining:
 - Taking care of environment
 - Economic and social growth of local communities
 - Use of proven technology
 - High safety standards



Pascua-Lama CSR



- Barrick has been working since 2005 with the communities, social organizations, national and international NGOs, foundations and universities, supply companies, productive organizations, cultural groups, unions, religious groups and authorities from the Atacama Region on:
 - **Employment / Training**
 - **Education**
 - **Economic Development**
 - **Health**
 - **Infrastructure (Irrigation)**
 - **Culture and Traditions**
 - **Community Relations**

Pascua-Lama CSR

ARGENTINA

- Potable Water Network Expansion Program - with Church-Jáchal Municipalities and OSSE - 3,170 people benefited.
- Community water Monitoring Program - Overall the Area of Environment and - Communications of Barrick and different institutions of Iglesia and Jáchal – Entire Community of Iglesia and Jáchal will benefit.
- Tomato Crop Program - with municipalities of Iglesia and Jáchal, Prune SA (exporting company), "Tomato 2000 Association, Cooperativa El Porvenir, Cattlemen and Agricultural Producers Association from Jáchal - 350 direct and indirect beneficiaries
- Among other sustainable programs.

Pascua-Lama CSR



Pascua-Lama CSR

CHILE

- To date, Barrick has carried out more than 28 programs and projects, benefiting nearly 10,000 inhabitants in the Huasco Valley and the Atacama Region.
- Atacama Commitment - Benefit in a first stage to about 6,000 people in the region of Atacama.
- Multi sector unprecedented alliance between Barrick, NGOs and the State.
- Sustainable over time





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Minería Responsable

Thanks!

