

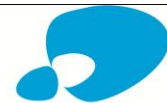
**AGUAMARINA**  
BIOMINERÍA

Technology for a greener Mining

**AguaMarina S.A**  
Chile

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Director of R&D&I  
Endeavor Entrepreneur

December 2010



**AGUAMARINA**  
BIOMINERÍA

# Opportunity in the Mining Industry



## Some Facts:

- ✓ 3 billions tons<sup>1</sup> of ore are available to be extracted
- ✓ 13.4 million tons of additional worldwide copper demand is expected by 2030<sup>2</sup>.
- ✓ Long term copper price is expected to reach US \$2.20/lb

<sup>1</sup>According to the 2010 US Geological Survey

<sup>2</sup> [www.cruanalysis.com](http://www.cruanalysis.com)

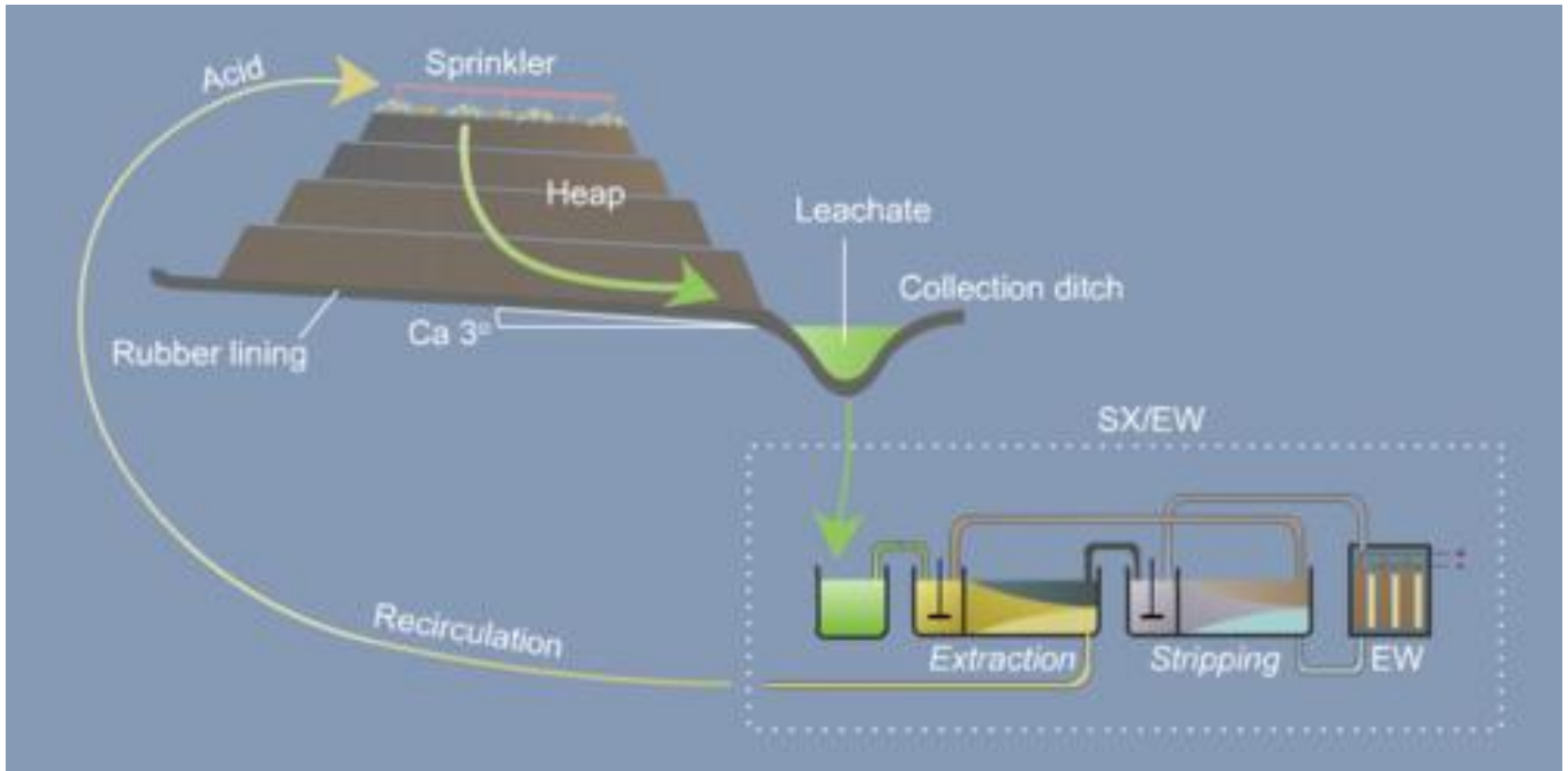
<sup>3</sup>[www.ft.com](http://www.ft.com)

# The Problem is

- ✓ Traditional leaching is not economically feasible for ore extraction
- ✓ Natural bioleaching is effective, economically feasible, but highly inefficient (450 days/heap)
- ✓ Several experimental bioleaching solutions tested the last 20 years. No industrial applications yet.



# Agua Marina's Solution



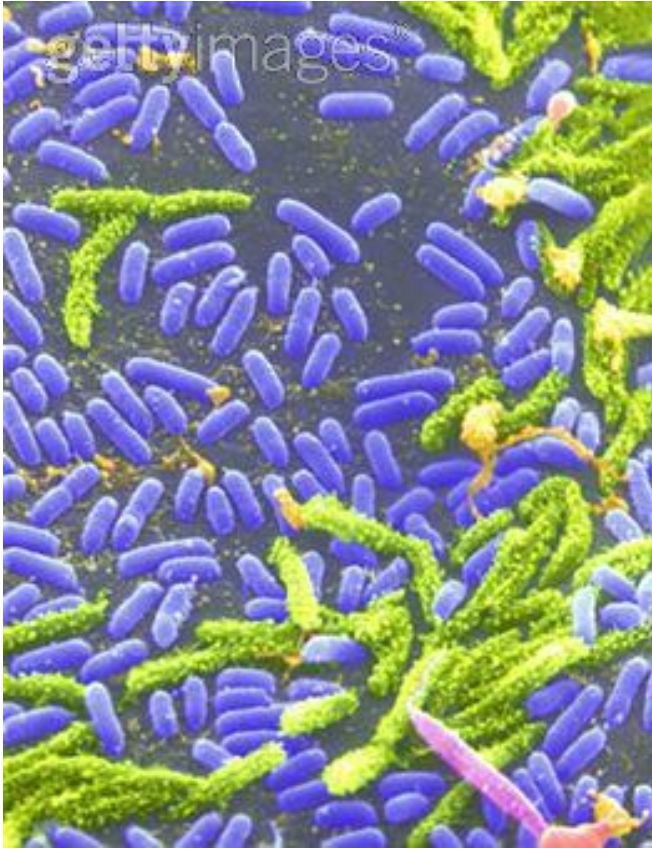
A Faster, Scalable, Greener and Cost Effective Bioleaching System

# Value Proposition for the Mining Companies

- 33% faster than natural bioleaching process
- Reduce operational cost
- Industrial scalability
- Automated and remote operation
- Reduce enviromental footprint



# Proprietary Technology



- ✓ Reactor for Bioaugmentation of nativa bacterias
- ✓ Biofilter for organic compounds
- ✓ Monitoring and Control System
- ✓ Optical system for biofilm formation.

# Business Model



Clients: Large Copper Mines

Leasing of the Bioleaching System (pay by heap)

Monitoring services and maintenance.

Training (on demand)

# Market

- ✓ 35 large copper mines only in Chile
- ✓ 20 large copper mines as target
- ✓ Aproximately 150 new bioleaching heaps
- ✓ US\$360M





# Competition worldwide



**ALTA**  
Metallurgical Services



**BioPro**  
International, Inc.



Heap bioleaching using native microorganisms.



Heap bioleaching using genetically modified microorganisms.

# Competitive Advantages

- ✓ Solution's scalability
- ✓ Intellectual property
- ✓ Industrial know how
- ✓ Close relations with the clients and their needs

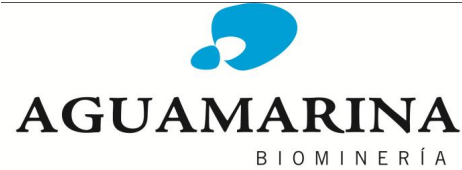


# Go to Market Strategy

- ✓ Direct contact with the clients
- ✓ Mouth to mouth clients referrals
- ✓ Corporate website
- ✓ Specialized magazines
- ✓ International Conferences of the Mining Industry



# The Team



Funder, CEO, CTO  
Pamela Chávez Crooker, PhD



Funder, Director  
Juan Manuel Aguirre, MBA



Lab Manager,  
Johana Obreque, PhD



Project Manager,  
Jorge Castro, PhD



Project Manager,  
Jannete Vera, PhD



Jennifer Yañez , MSc.



Denisse Quiroga, PhD(s).



Andrea Contreras, MSc



Karla Moya, Ph.



Claudia Veloso



Martin Antunez



Ximena Gonzalez



Danitza Pérez, Eng.

# Achievements

- ✓ 30 Clients
- ✓ US\$ 1.5M in government grants (R&D)
- ✓ 3 patents in process
- ✓ Official business partner of BHP Billiton
- ✓ Research partner of J. Craig Venter Institute
- ✓ Endeavor Company since Sep, 2010



# Financials...

	2011	2012	2013	2014	2015
REVENUES	US \$1.1M	US \$2.3M	US \$3.4M	US \$4.6M	US \$5.7M
COST	US \$285K	US \$300K	US \$400K	US \$400K	US \$400K
EBITDA	US \$1M	US \$2.1M	US \$3.3M	US \$4.4M	US \$5.6M
NET PROFIT	US \$900K	US \$2M	US \$3M	US \$4M	US \$5M

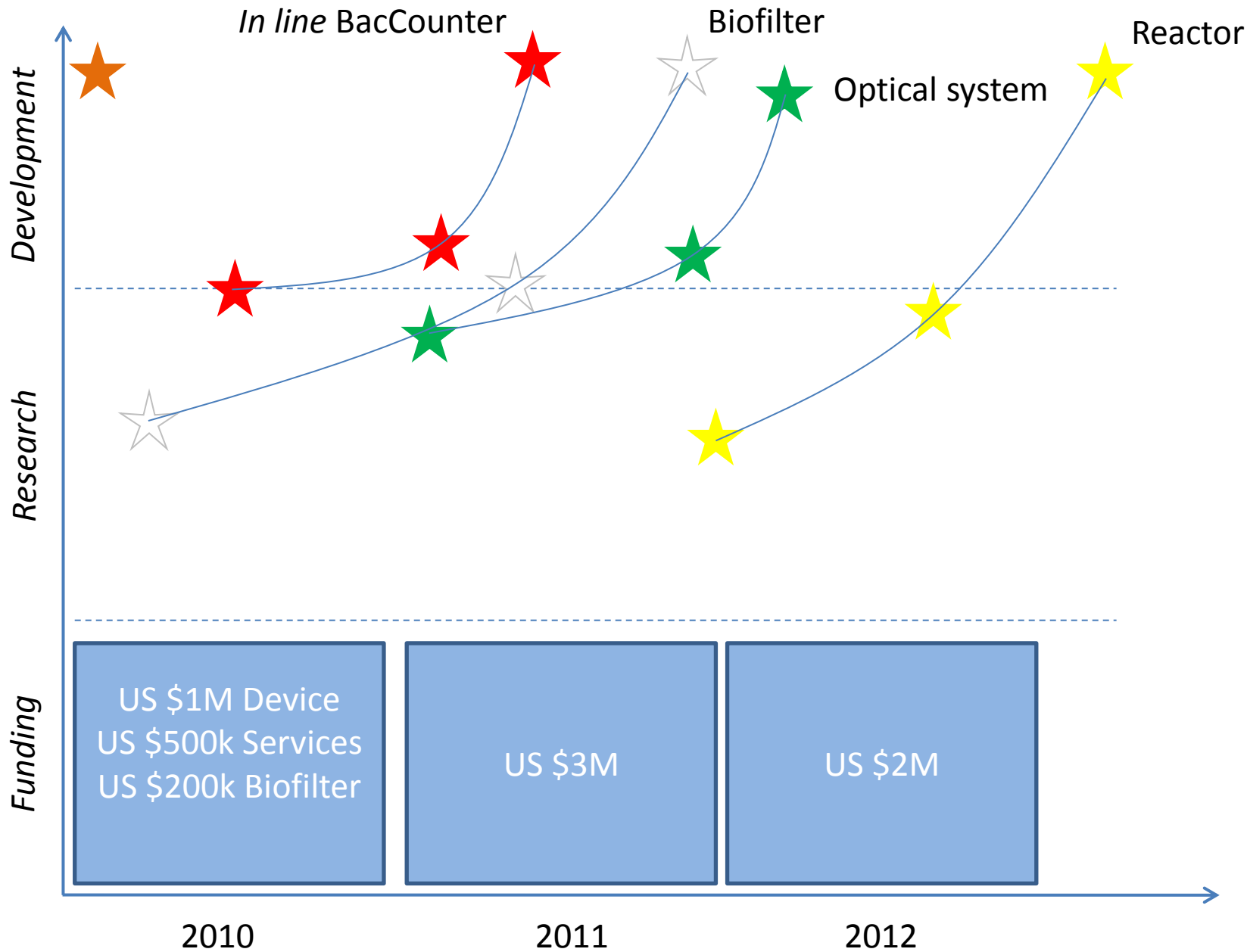




# Funding

- Aguamarina is looking for US\$ 5M
  - ✓ 4M R&D: Pilot scale testing, equipments.
  - ✓ 330k for HHRR: CEO
  - ✓ 500k for IP
  - ✓ 170k Marketing





# Summary

- ✓ A great opportunity for investing
- ✓ An strong team
- ✓ Scalability
- ✓ A great space to create new products and solutions

