

CSE: **BAC** | OTCQB: **BCCEF** | FRA: **0BT1** | [BACTECHGREEN.COM](https://www.bacTechGreen.com)



BacTech
Environmental

Q2 2024

CORPORATE
PRESENTATION

**OUR BUGS
EAT ROCKS!**

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COMMERCIALLY PROVEN **CLEANTECH COMPANY**

Focused on sustainable mining and environmental remediation bioleaching technology



Commercially Proven

Over 30 years of R&D, millions invested, and 3 plants built across the world



Environmentally Friendly

Bioleaching plants remediate toxic concentrates and produce an EPA landfillable waste product



Favourable Macroeconomics

Ecuadorian artisanal and small miners are currently being paid <50 cents on the dollar for their high-grade concentrates



Large Market

The market for artisanal and small mines globally is US\$27B or approximately 20% of global gold production



Niche Opportunity

BacTech is one of the only companies with the expertise to chase high-gold and high-arsenic concentrates



Research & Development

Numerous ongoing R&D projects with the potential to make a large impact on the company's revenues in the coming years

SUSTAINABILITY AT OUR CORE

BACTERIA

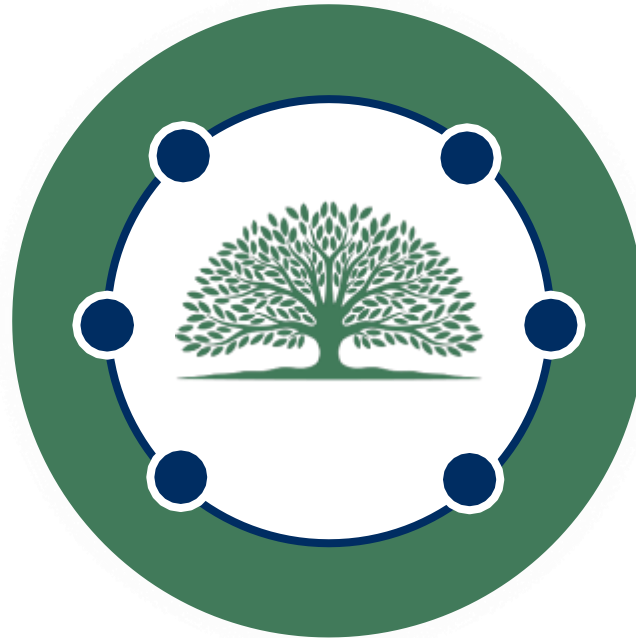
The bacteria are naturally occurring and harmless to the environment and human health

HEAVY METAL RECOVERY

Toxic heavy metals, like arsenic, are converted into stable environmentally benign products that can be disposed of in a landfill

NO MERCURY & REDUCED CYANIDE

Reduction in use of mercury by artisanal miners. We will not buy pre-treated concentrates



WATER

Efficient recycling of water from the process

EMISSIONS

No toxic gaseous emissions (e.g., SO₂, As₂O₃)

PERMANENT SOLUTION

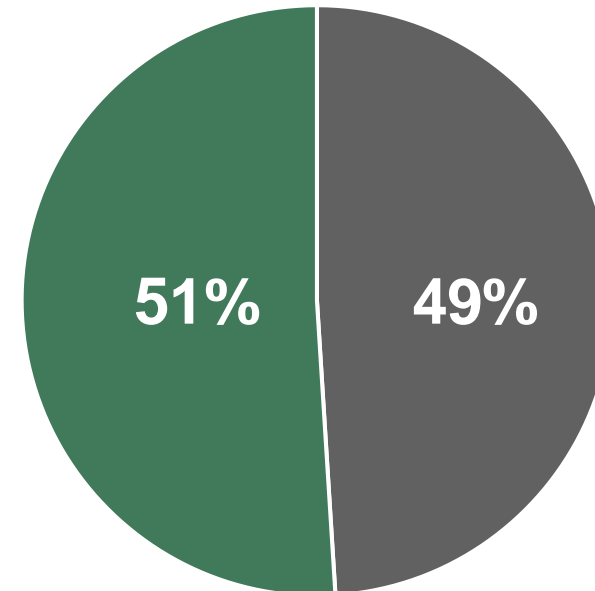
Bioleaching is a permanent solution, not a Band-Aid fix

CAPITALIZATION STRUCTURE

As at January 1, 2024

Basic Shares Outstanding	193,035,333
Reserved for Issuance (Options & Warrants)	39,339,015
Fully Diluted	232,374,348
Market Capitalization (\$0.07)	C\$13.5M
Average Daily Volume	80,000+
52 Week Range	\$0.10 – \$0.06

- Insiders, Management and Strategic Shareholders
- Public



BACTECH TEAM

MANAGEMENT

Board of Directors



Ross Orr
President and CEO



David Tingey
Chief Operating Officer



Louis R. Nagy
Chief Financial Officer



Dr. Paul C. Miller
VP Technology



Kate Castro
VP Environmental



Bernardo Brito
Country Manager,
Ecuador

BOARD OF DIRECTORS



Timothy Lewin
Chairman



Ross Orr
Director, President
and CEO



Walter Cimowsky
Director, Audit
Committee



Donald Whalen
Director



Jay Richardson
Director, Audit
Committee



Jay Naster
Director, Audit
Committee



**Carolina
Orozco**
Director

PAST MILESTONES

April 2021



Carried out test work on five samples that produced **96.2% gold** recovery and **99.9% arsenic** stabilization.

February 2022



Completed Bankable Feasibility Study showing **US\$17M** in Capex, **\$US75M NPV @ \$1800 gold**.

October 2022



Received **Environmental Impact Study (EIS)** in **7 months** and was granted the **final permit**.

July 2023



Received an **80% rating** (very good) from Moody's for our proposed **US\$20M green/social bond**.

November 2023



Received Consultation Permit which is the **final MAJOR permit-100% local support**.

THE PROBLEM

Sulfides are the **GLUE**
of nature...

SPHALERITE Millerite
Arsenopyrite COVELLITE
Chalcopyrite PYRITE
Galena Molybdenite
MARCASITE **Pyrrhotite**
Chalcocite

THE PROBLEM

...and the CAUSE of



Toxic Concentrates and Tailings

High arsenic concentrates are generally burned and pollute the air, and tailings cause acid rock drainage



Toxic Elements Released into Atmosphere

Pyrometallurgical processing releases arsenic trioxide and sulfur dioxide in the atmosphere



Expensive Reclamation and Remediations

Billions are spent every year on land reclamation and remediation without solving the problem – a band aid solution

THE SOLUTION

Bioleaching AKA Bacterial Oxidation

Our Bugs Eat Rocks!

BacTech Environmental is one of 2 companies worldwide with the expertise for vat bioleaching as an alternative to smelting/roasting.

How?

We like to use the analogy of a brick wall where the sulfides are the mortar holding everything together in the rocks. The bacteria we use break down and oxidize the sulfides.

Once the mortar is gone, the wall comes crashing down. The pH in the tanks is very acidic. Acid soluble metals such as iron, arsenic and copper dissolve into the solution. Gold and silver are now free for recovery in the solids.



ECUADOR **BIOLEACHING FACILITY**

THE FIRST DOMINO

Substantial Revenues within 12 months

TENGUEL PROJECT

BacTech is working to construct an owner operated **50 TPD bioleach processing** facility in Tenguel, Ecuador.

The project is at an advanced stage and expected to begin construction once financing is secured.

Assumptions: Gold \$1,798 | Silver \$18

Annual Gold Production	30,981 Ounces
Capital Cost	US\$17M
Operating Cost	US\$212 per Tonne
Purchase Price of Feedstock	65-70% of Contained Gold Value
After-Tax NPV 5%	US\$75.4M
After-Tax Payback	2.95 Years
Annual Revenue	US\$56M

Project Milestones

✓ Bioleach Test Work
✓ Bankable Feasibility Study
✓ Land Acquisition
✓ Construction Permit Granted
✓ EIS Granted in 7 Months
✓ Consultation Permit
Detailed Engineering Ongoing
Financing Discussions Ongoing

Primary Ore	Metals Recovered
Arsenopyrite	Gold, Silver

GREEN BONDS

- BacTech to issue US\$20M Green Bond for the Ecuador project
- US\$16M for plant + US\$4M for working capital
- Moody's has reviewed the proposed plant and technology and awarded an 80% rating for bonds issued by BacTech as "green" and "social"
- Engaged Quito-based broker Analytica Securities to market US\$20M to their clients
- BacTech "ticks all the boxes" with respect to green bond issuers

WHY ECUADOR?

- ✓ Providing environmentally friendly processing locally and with positive local economic impact as BacTech can offer much better prices to miners.
- ✓ Full support from the Ecuadorian Ministry of Artisanal and Small Miners and the Ministry of Mines.
- ✓ Potential to become a regional processing hub. Opportunity to expand **without** disrupting operations.
- ✓ **Access to green hydro power** and existing local infrastructure. BacTech Environmental owns the land that the plant will be built on.
- ✓ Capture majority of the local small miner production because of reduction in revenues due to Chinese arsenic import limits.

Ecuador needs to generate investment into green resource development to grow their economy.



Project Site
Tenguel, Ecuador

INVESTMENT PROTECTION AGREEMENT

- Historic agreement signed on April 28, 2022, with the Government of Ecuador.
- Covers up to US\$75M in investment into Ecuador extending to any plant and operations expansions.
- Under the IPA agreement specific protections relate to investor rights and guarantees such as:
 - Guarantee of non-discrimination;
 - Right to property;
 - Freedom of production and marketing of goods and services, free transfer abroad of profits, freedom of import and export operations; tax stability, **including exemption from Income Tax for 12 years**; and arbitration for dispute resolution.



Julio José Prado, Ecuador's Minister of Production, Foreign Trade, Investment & Fisheries & Bernardo Brito, BacTech's Country Manager.

ECONOMIC SENSITIVITY

Au Price	NPV (5%)	IRR	EBITDA
\$1,600 USD	\$60.7M	58.0%	\$10.9M Annually
\$1,700 USD	\$68.0M	63.6%	\$11.9M Annually
\$1,800 USD	\$75.4M	69.3%	\$12.9M Annually
\$1,900 USD	\$82.7M	74.9%	\$13.9M Annually
\$2,000 USD	\$90.1M	80.5%	\$14.9M Annually
\$2,100 USD	\$97M	86%	\$15.9M Annually

TENGUEL PROJECT – PHASE 2

- Part of the IPA was BacTech's commitment to build a Phase 2 of the project
- The technology is modular, so expansion is straight forward
- Expected total production >100,000 oz. per annum
- Total market in Ponce area is **250 TPD** of concentrate
- Estimated CAPEX is US\$60M, in addition to the US\$17M for Phase 1
- Working capital will be provided by Phase 1



1 tonne mining sacks filled with arsenopyrite in Ponce Enriquez.



PYRRHOTITE TAILINGS TREATMENT

SECOND OPPORTUNITY

~US\$13-\$15B of Nickel Ready for Recovery

SUDBURY BASIN MARKET OPPORTUNITY

In the Sudbury basin of Ontario, there is a vast resource of approximately 80-100 million tonnes of 0.8% Ni-bearing pyrrhotite tailings, which has been disposed of separately in shallow lakes since production began many years ago.

Assumptions: Nickel \$16,000

~US\$13-\$15B

In recoverable Nickel in the Sudbury Basin

Metal Recovery from Radio Hill Pilot Plant

Metals	Recovery Rate
Nickel	98%
Cobalt	98%
Iron	99%

Primary Ore	Metals Recovered
Pyrrhotite	Nickel, Cobalt, Iron

SUDBURY BASIN TAILINGS

- BacTech has filed a provisional patent application for a novel bioleaching process relevant to the treatment of pyrrhotite tailings for iron, sulphur and nickel-cobalt recovery.
- From 1997-1999, BacTech demonstrated that bioleaching is effective in liberating nickel, cobalt and iron.

Metal Recovery from Radio Hill Pilot Plant

Metals	Recovery Rate
Nickel	98%
Cobalt	98%
Iron	99%

Project Milestones

✓ Provisional Patent Filed
✓ Stakeholder Identification
✓ Research & Development Program
Technical Study – Q4 2024
Economic Study
Pilot Plant
Commercialization

Primary Ore	Metals Recovered
Pyrrhotite	Nickel, Cobalt, Iron

RADIO HILL PILOT PLANT

- From 1997 to 1999, BacTech demonstrated that bioleaching was effective at liberating nickel, cobalt and iron from pyrrhotite tailings at the Radio Hill Pilot Plant.
- At the time, the economics of the metal prices led to the project not being pursued.
- BacTech is updating the technology to liberate billions of dollars of battery metals from tailings in the Sudbury Basin.

Metal Recovery from Radio Hill Pilot Plant

Metals	Recovery Rate
Nickel	98%
Cobalt	98%
Iron	99%

Metals Prices in 1999

Nickel	\$5,000/t
Cobalt	\$16,000/t
Iron	\$30/t

Metals Prices Today

Nickel	\$16,000/t
Cobalt	\$35,000/t
Iron	\$130/t

Primary Ore	Metals Recovered
Pyrrhotite	Nickel, Cobalt, Iron

INVESTMENT SUMMARY



Market Position

- One of 2 companies worldwide with commercial applications for bioleaching
- Focused on high-arsenic gold concentrates produced by artisanal and small miners
- Environmentally friendly process



Economics

- EBITDA margin of 25-30%
- Low CAPEX to EBITDA ratio
- ~US\$60M annual revenue generated from US\$17M Capex (\$1800 Au)
- Internal Rate of Return of 57.9%



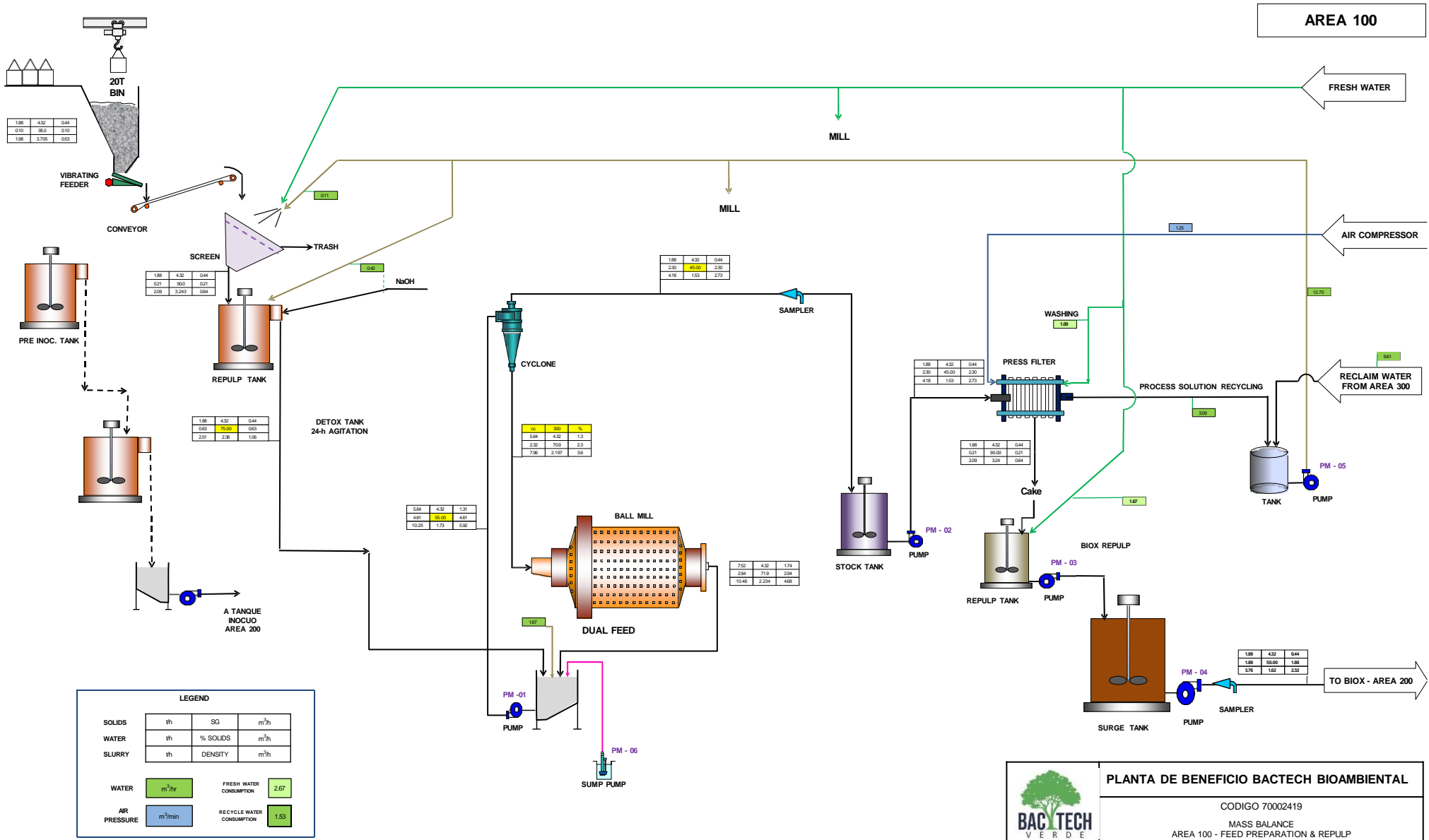
Milestones

- Bioleaching test work complete
- Bankable feasibility study complete
- Environmental impact study approved
- Consultation permit approved



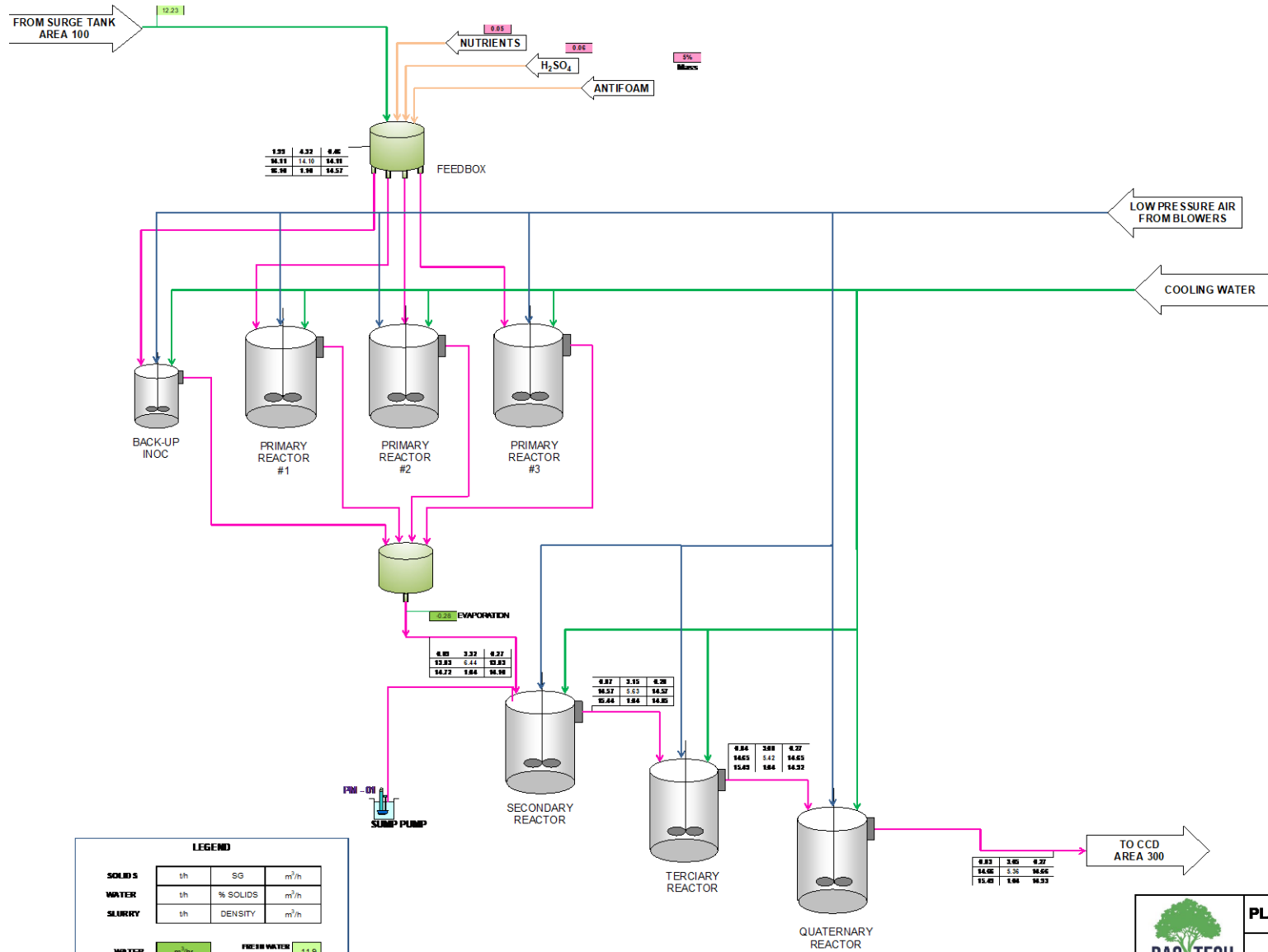
APPENDIX

TENGUEL, ECUADOR PLANT FLOWCHART



	PLANTA DE BENEFICIO BACTECH BIOAMBIENTAL	
	CODIGO 70002419	
	MASS BALANCE	
	AREA 100 - FEED PREPARATION & REPULP	
SCALE: NTS	DATE: 27 JUL 2022	SIGNATURES
DRAWN		
DESIGNED		
REVIEWED		
APPROVED		
CLIENT APPROVED		
CLIENT APPROVED		
70002419-050-F-11-001		Rev. C

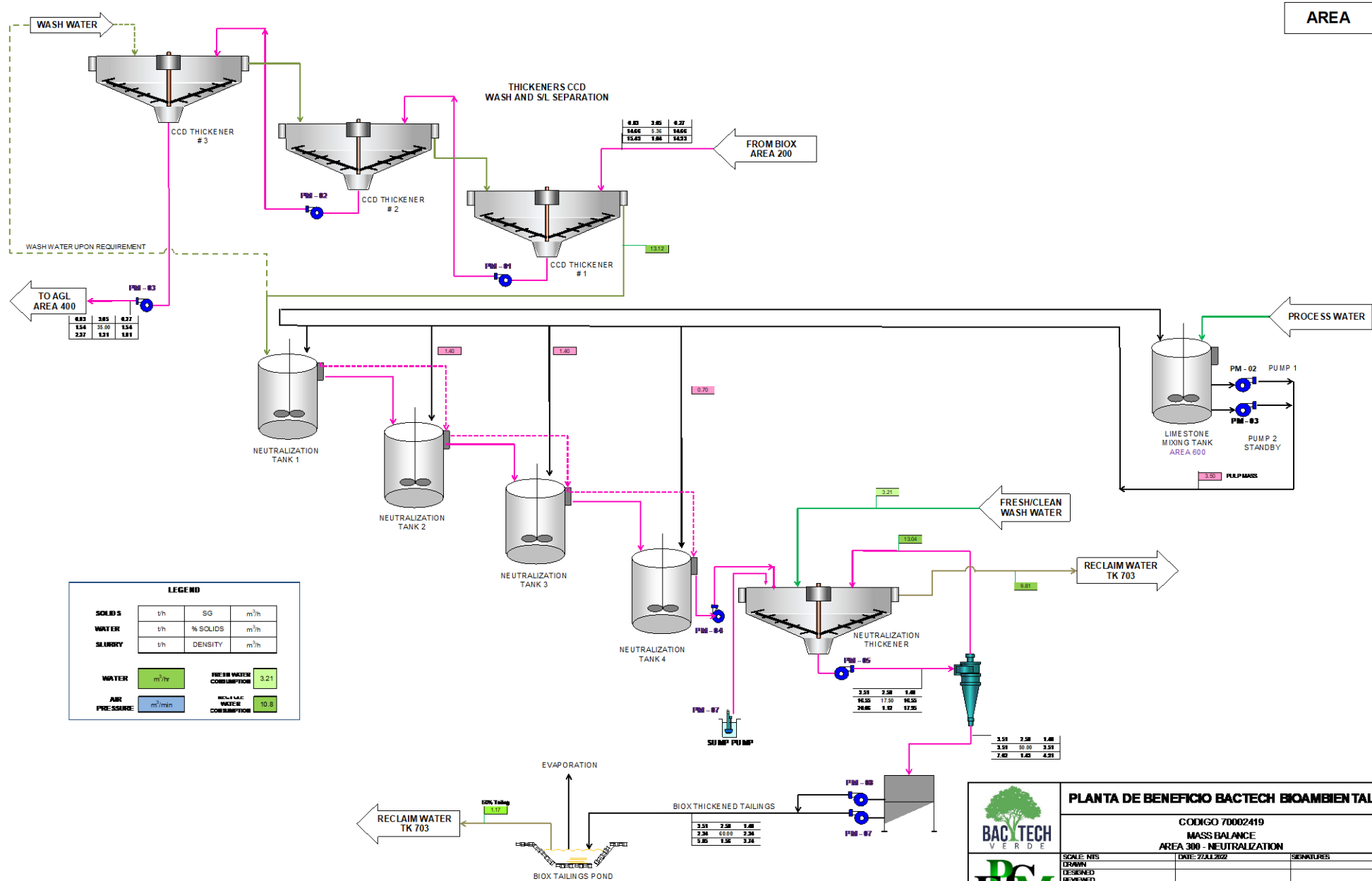




LEGEND

SOLIDS	th	SG	m ³ /h
WATER	th	% SOLIDS	m ³ /h
SLURRY	th	DENSITY	m ³ /h
WATER	m ³ /hr	FRESH WATER CONSUMPTION	11.9
AIR PRESSURE	m ³ /min	WATER CONSUMPTION	-

	PLANTA DE BENEFICIO BACTECH BIOAMBIENTAL	
	CODIGO 70002419 MASS BALANCE AREA 200 - BACTERIAL OXIDATION	
SCALE: NTS	DATE: 27 JUL 2022	SIGNATURES
DESIGNED		
REVIEWED		
APPROVED		
CLIENT APPROVED		
70002419-050-F-11-002		Rev. C



PLANTA DE BENEFICIO BAC TECH BIOAMBIENTAL

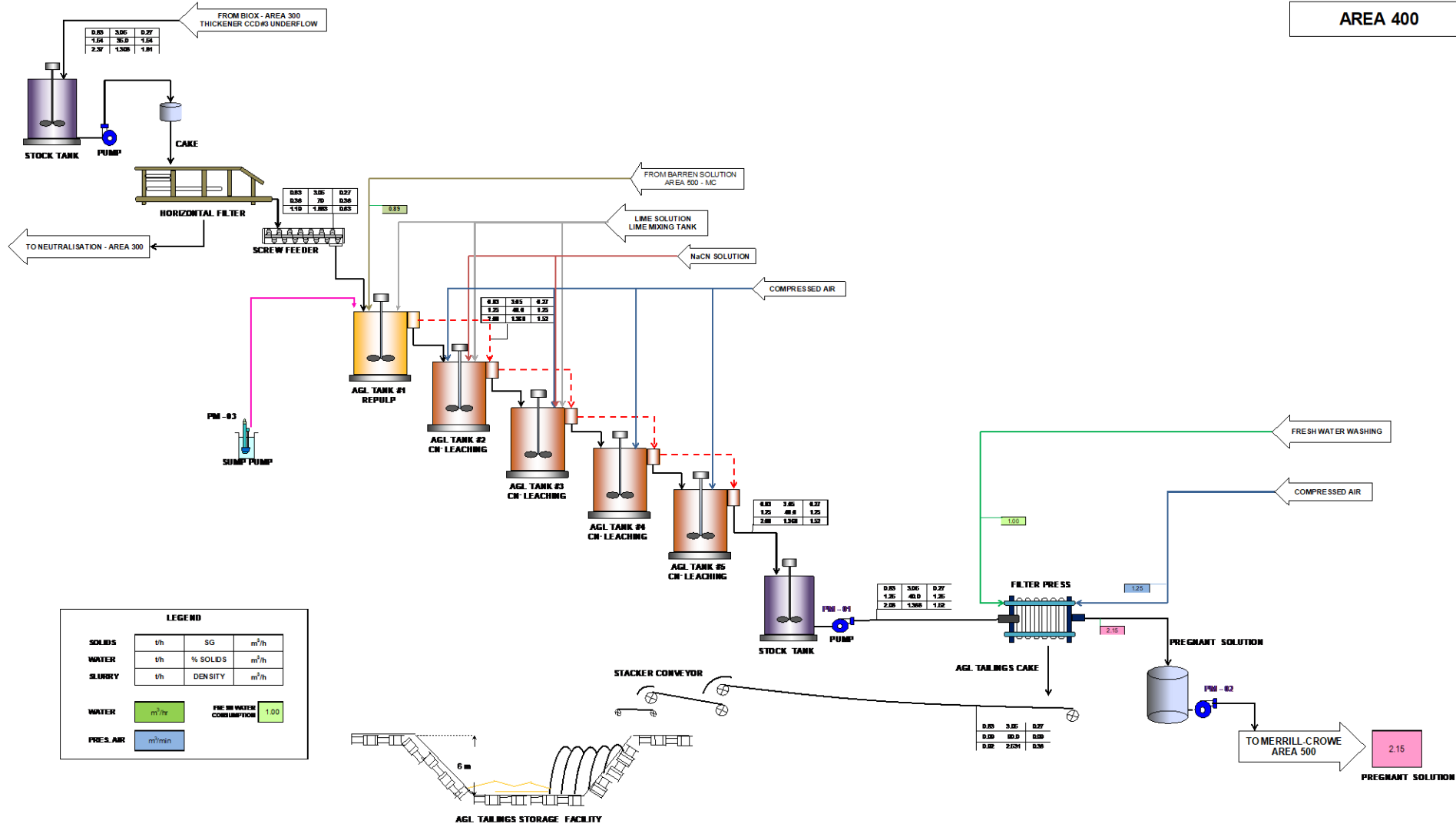
CODIGO 70002419
 MASS BALANCE
 AREA 300 - NEUTRALIZATION

SCALE: NIS	DATE: 27.11.2022	SIGNATURES
DRAWN		
REVIEWED		
APPROVED		
CLIENT APPROVED		
CLIENT APPROVED		

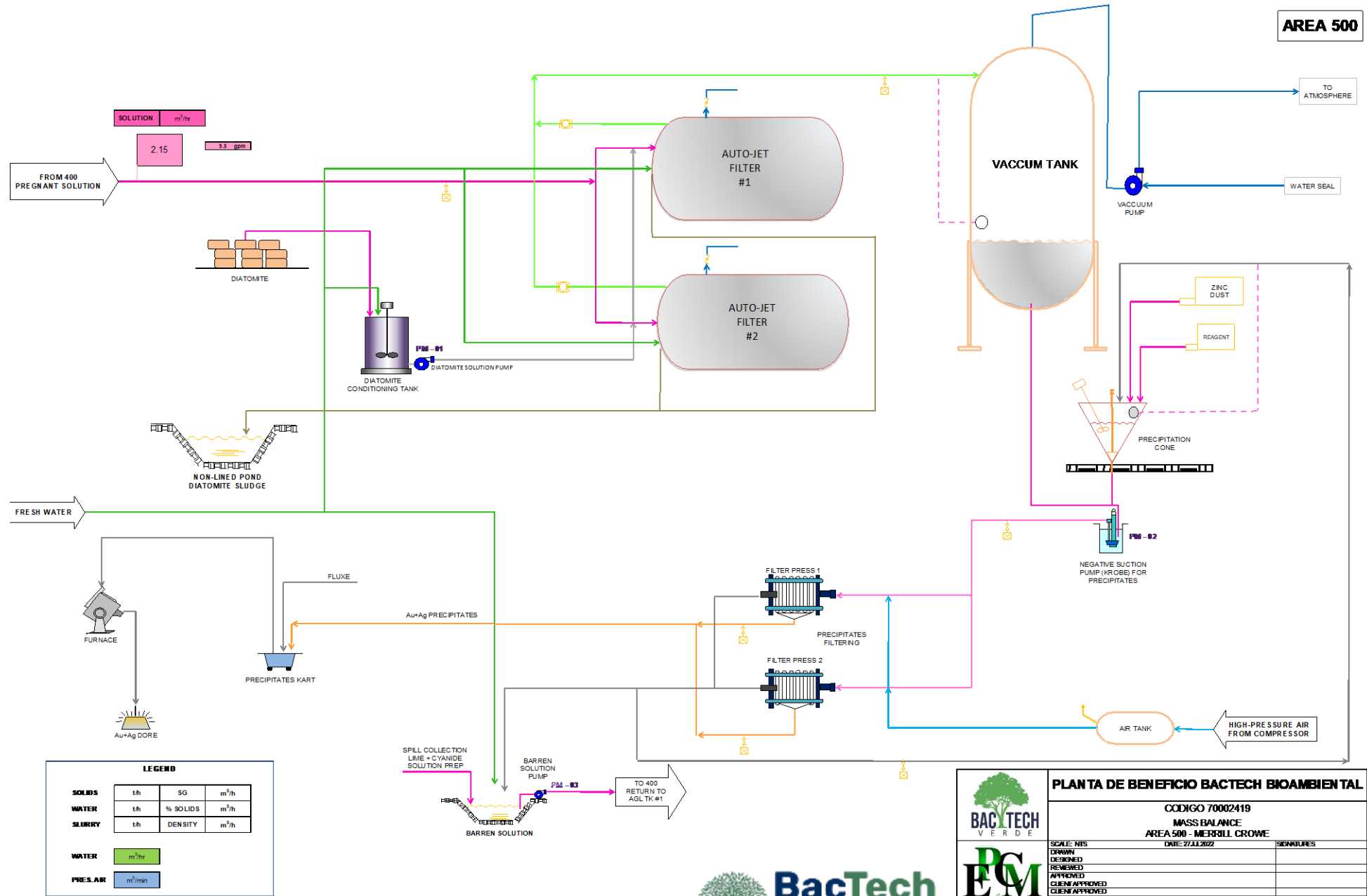
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Rev. C





PLANTA DE BENEFICIO BACTECH BIOAMBIENTAL		
CODIGO 70002419 MASS BALANCE AREA 400 - AGITATION LEACHING		
SCALE: WFS	DATE: 27.AUG.2022	SIGNATURES
DRAWN		
REVIEWED		
APPROVED		
CLIENT APPROVED		
70002419-050-F-11-004		Rev. C



PLANTA DE BENEFICIO BACTECH BIOAMBIENTAL

BAC TECH VERDE

PCM Consultores S.R.L.

CODIGO 70002419

MASS BALANCE

AREA 500 - MERRILL CROWE

DATE: 27/11/2022

SCALE: NTS

DESIGNED

DRAWN

REVIEWED

APPROVED

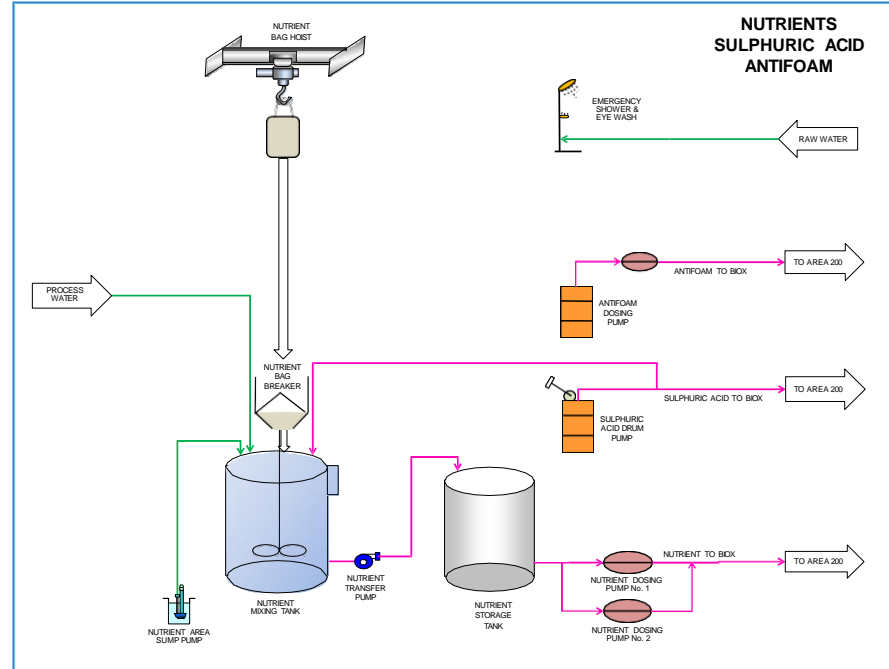
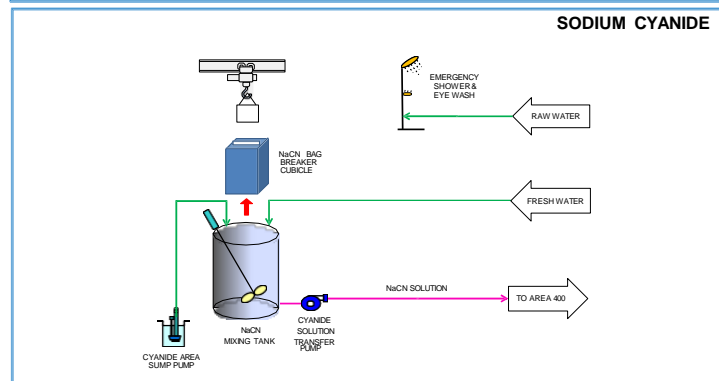
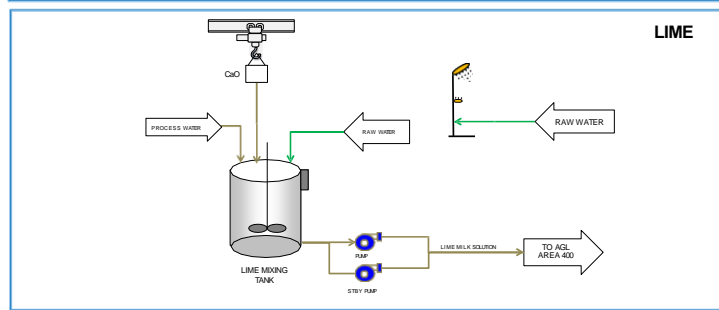
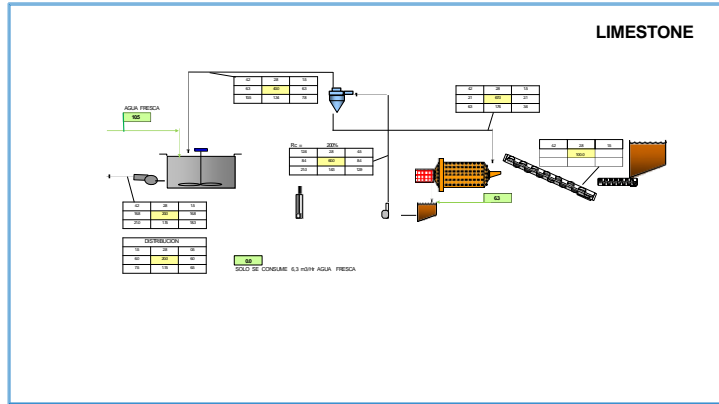
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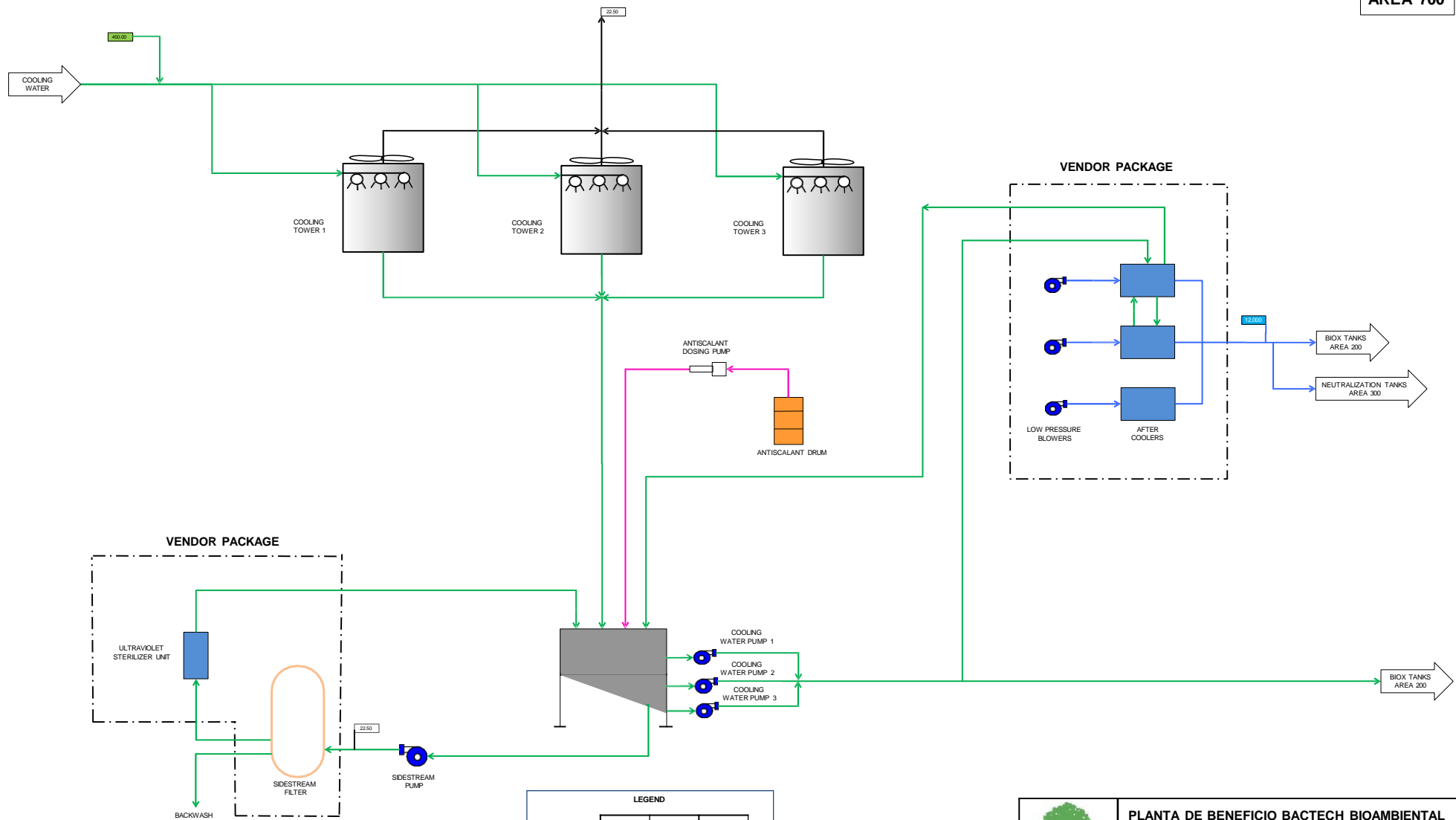
CYAN APPROVED

70002419-050-F-11-005

Rev. B







LEGEND

SOLIDS	th	SG	m ³ /h
WATER	th	% SOLIDS	m ³ /h
SLURRY	th	DENSITY	m ³ /h
WATER	m ³ /hr	FRESH WATER CONSUMPTION	460.0
AIR PRESSURE (BAR)	12,000	RECYCLE WATER CONSUMPTION	460.0



 Consultores S.R.L. <small>Asesoría y Ejecución de Proyectos</small>	PLANTA DE BENEFICIO BACTECH BIOAMBIENTAL		
	CODIGO 70002419 MASS BALANCE AREA 700 - COOLING TOWERA & AIR SUPPLY		
SCALE: NIS	DATE: 27JUL2022	SIGNATURES	
DRAWN			
DESIGNED			
REVIEWED			
APPROVED			
CLIENT APPROVED			
CLIENT APPROVED			
70002419-050-F-11-007		Rev. A	

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