

ALGAE BIODIESEL



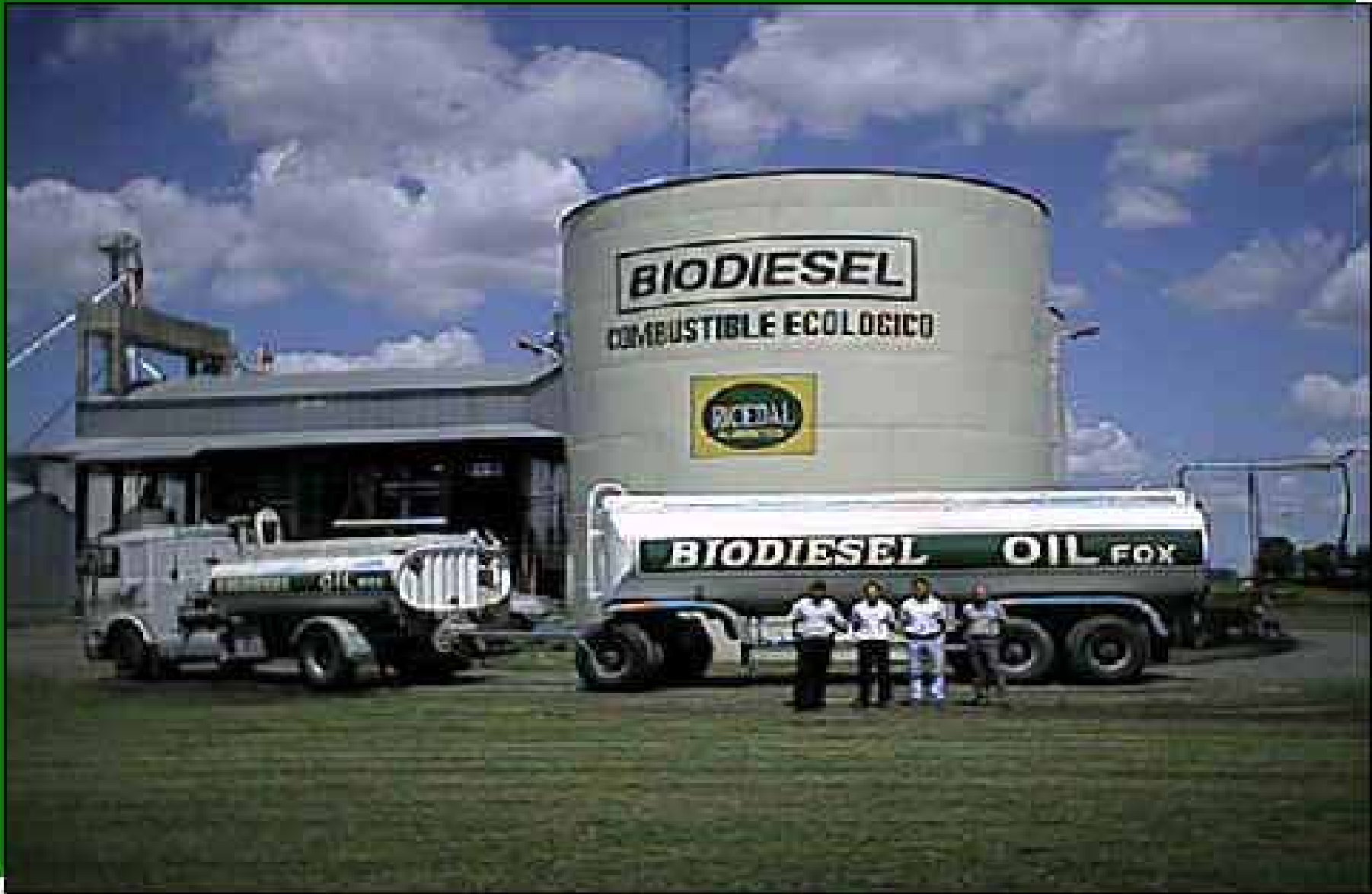
1997 - 2009

HISTORY OF EVENTS

- 1997 Agreement with Ricedal giving rise to Oil Fox
- 1999 Castor oil (caper spurge) crops
- 2000 Growing algae as nutritional supplements
- Liaising with the Energy & Agricultural Depts.
- Resolution 129 - Executive Order 1396, Biodiesel in Argentina
- 2002/2005 Biodiesel Bill. NC 2003/30 CE
- May 2005, Biodiesel Sales Negotiations.
- January 2006 Biodiesel Sales Agreement.
- July 2006 Funding Agreement.
- January 2008 Development of a further biodiesel plant.



OUR FIRST BIODIESEL FACILITY: 1997 Partnering with Ricedal Alimentos





Research Work



- Institute Technological Buenos Aires (ITBA).
- UBA College of Exact Sciences.
- UBA College of Chemistry
- UBA College of Engineering.
- UBA College of Physics and Natural Sciences.
- UNSAL College of Engineering (Salta)
- UNL College of Engineering.



MILESTONES

- 40.000.000 Km test drive.
- Over 150 corporate customers.
- Panamericana 2006.
- Argentine Air Force.



**ADVANTAGE OF
RESINS OF IONIC
INTERCHANGE FOR
ASPHALT
ELABORATION
AFTER ITS USE AND
COLLECTION OF
RAINWATER FOR
IRRIGATION**




Algae-based Biodiesel Processing

Operating Costs

Our key concern to test various processing methods, namely:

- ✓ Outdoors algae growing, low throughput, low cost
- ✓ Increased throughput using bioreactors, higher costs
- ✓ Increased throughput and reduced costs by developing a greenhouse





Our data is not theoretical, but rather empirical (actually proven). We did our best efforts to obtain algae concentration beyond 1.5g/lt using **mixotrophic** methods.

➤ We ensured algae growing through photosynthesis using seven (7) interdependent factors:

1. **Salinity and nutrients.**
2. **Temperature.**
3. **pH.**
4. **Light.**
5. **Agitation in the algae growing environment**
6. **CO₂ absorption**
7. *Trade secret*



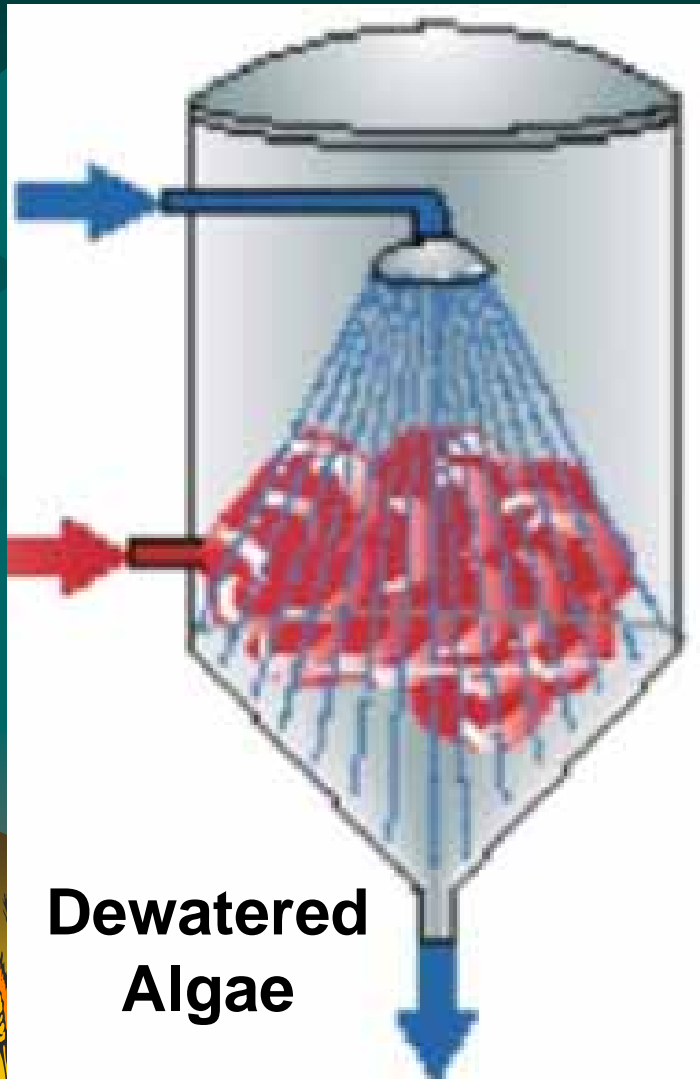
It may be held that this method uses improved photobioreactor principles. Our greenhouse may therefore be regarded as a large scale, low-cost bioreactor.



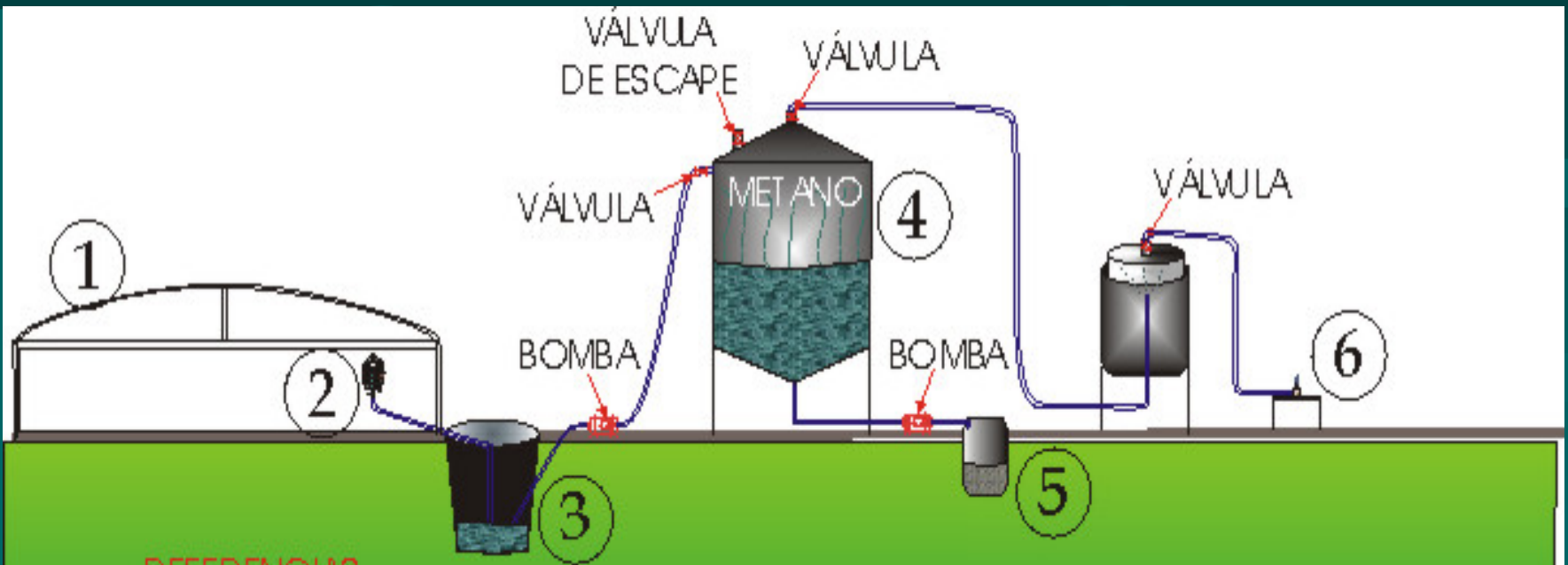
Drying Process Flowchart

Wet Algae

Hot Air



Generating scheme of Biogas to produce electrical energy for the light and the motors



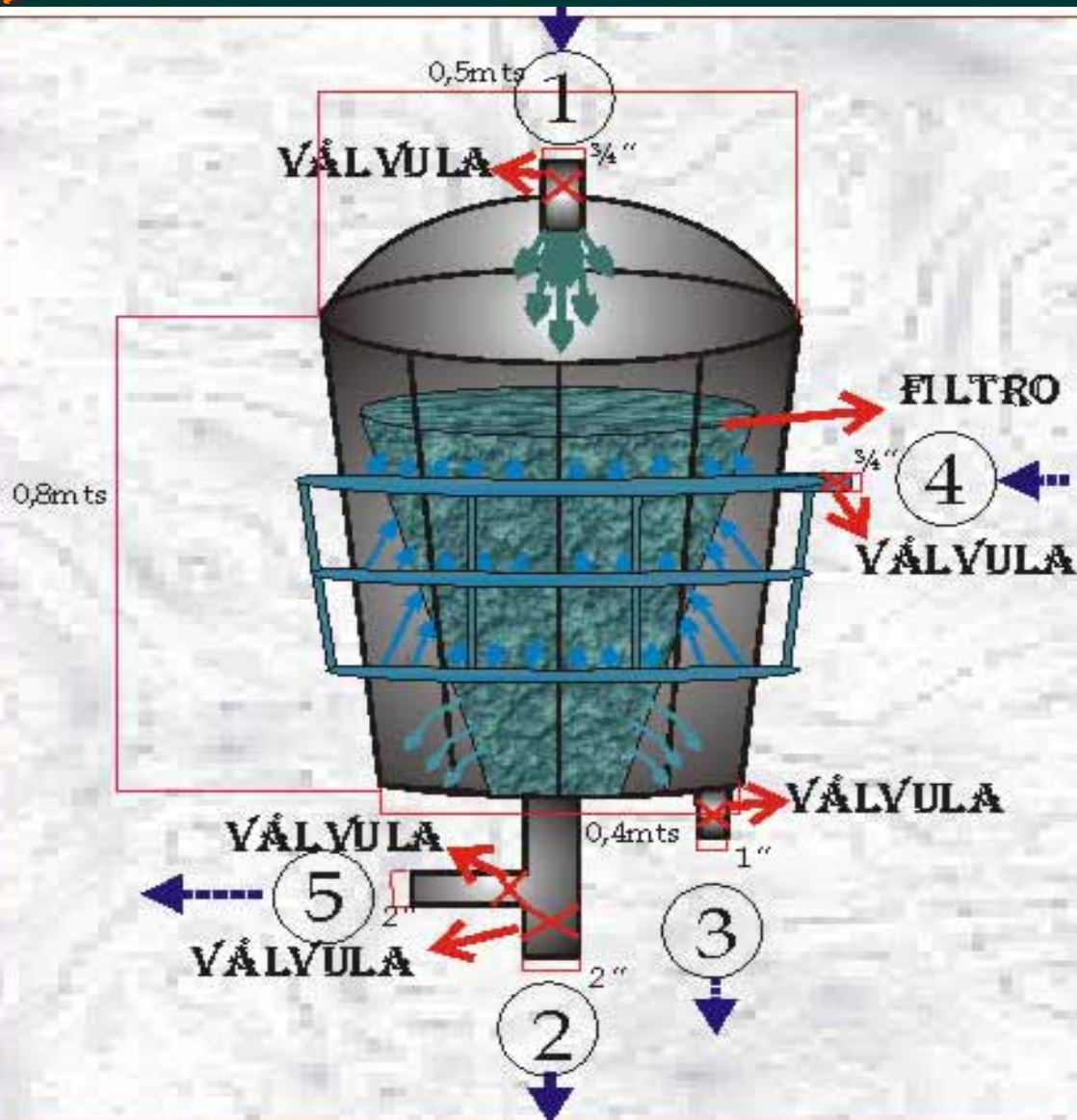
REFERENCIAS

- 1 INVERNADERO
- 2 COSECHADOR

- 3 COLECTOR DE ALGAS DE COSECHA
- 4 BIODIGESTION

- 5 FERTILIZANTE
- 6 MECHERO

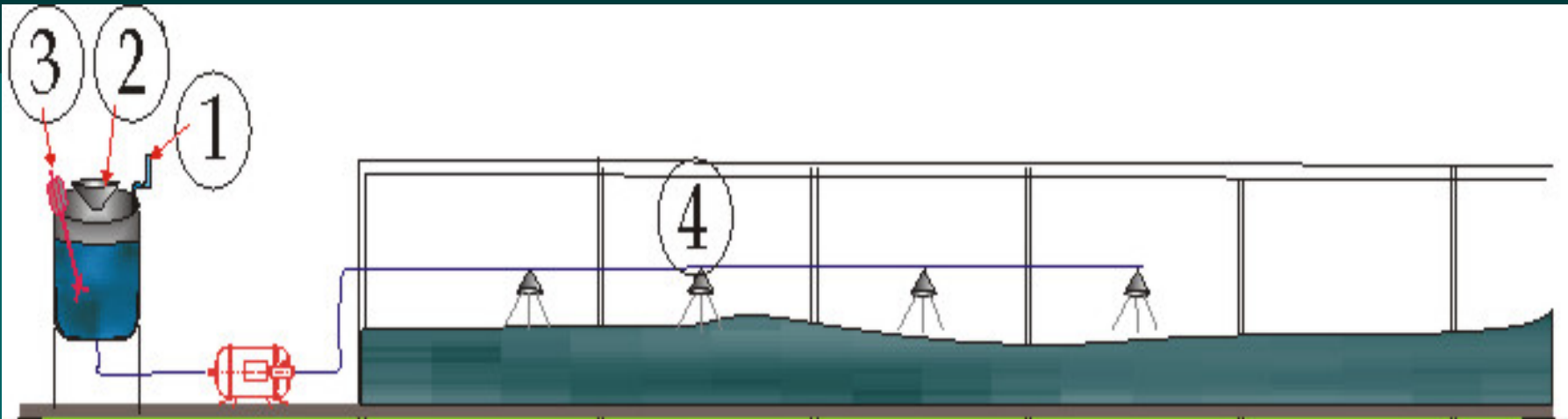
Design of the Harvester



REFERENCIAS

- 1 - AGUA MAS ALGAS
- 2 - PASTA DE ALGAS
- 3 - AGUA DESPUÉS DEL FILTRADO (AGUA + UN POCO DE ALGAS)
- 4 - AGUA PARA LAVADO EXTERNO DEL FILTRO
- 5 - AGUA DE LAVADO MAS ALGAS (DESPEGADAS DE LAS PAREDES INTERNAS DEL FILTRO)

Design for inclusion of Nutrients



REFERENCIAS

① AGUA

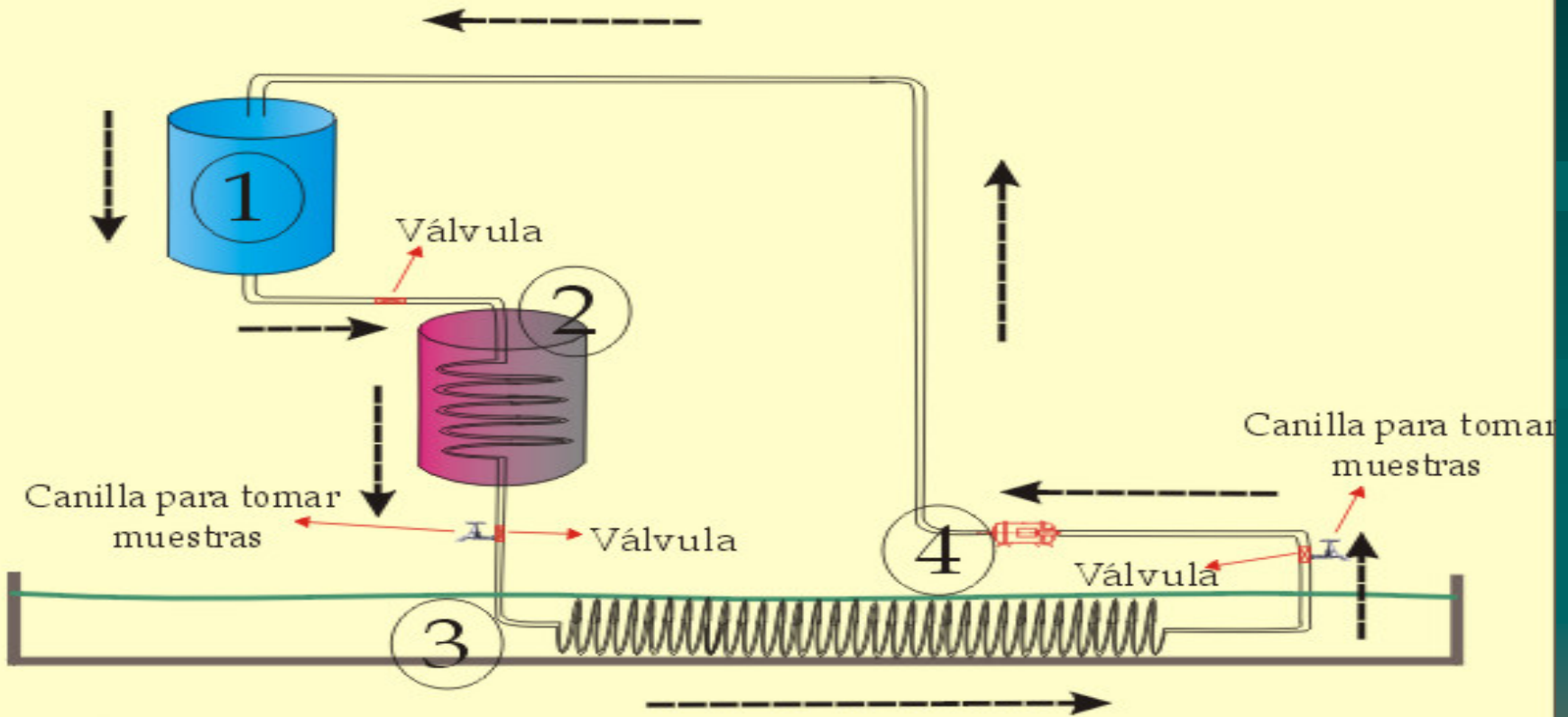
③ MOTOR

② ENTRADA DE SALES A DISOLVER

④ DISPERSORES



Design of the Heating



- ① Tanque de Agua
- ② Termotanque Eléctrico

- ③ Serpentina
- ④ Bomba de circulación