agrimarine inc.

sustainable aquaculture technology

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Aquaculture Innovation Workshop

Shepherdstown, WV

January 17-18, 2011

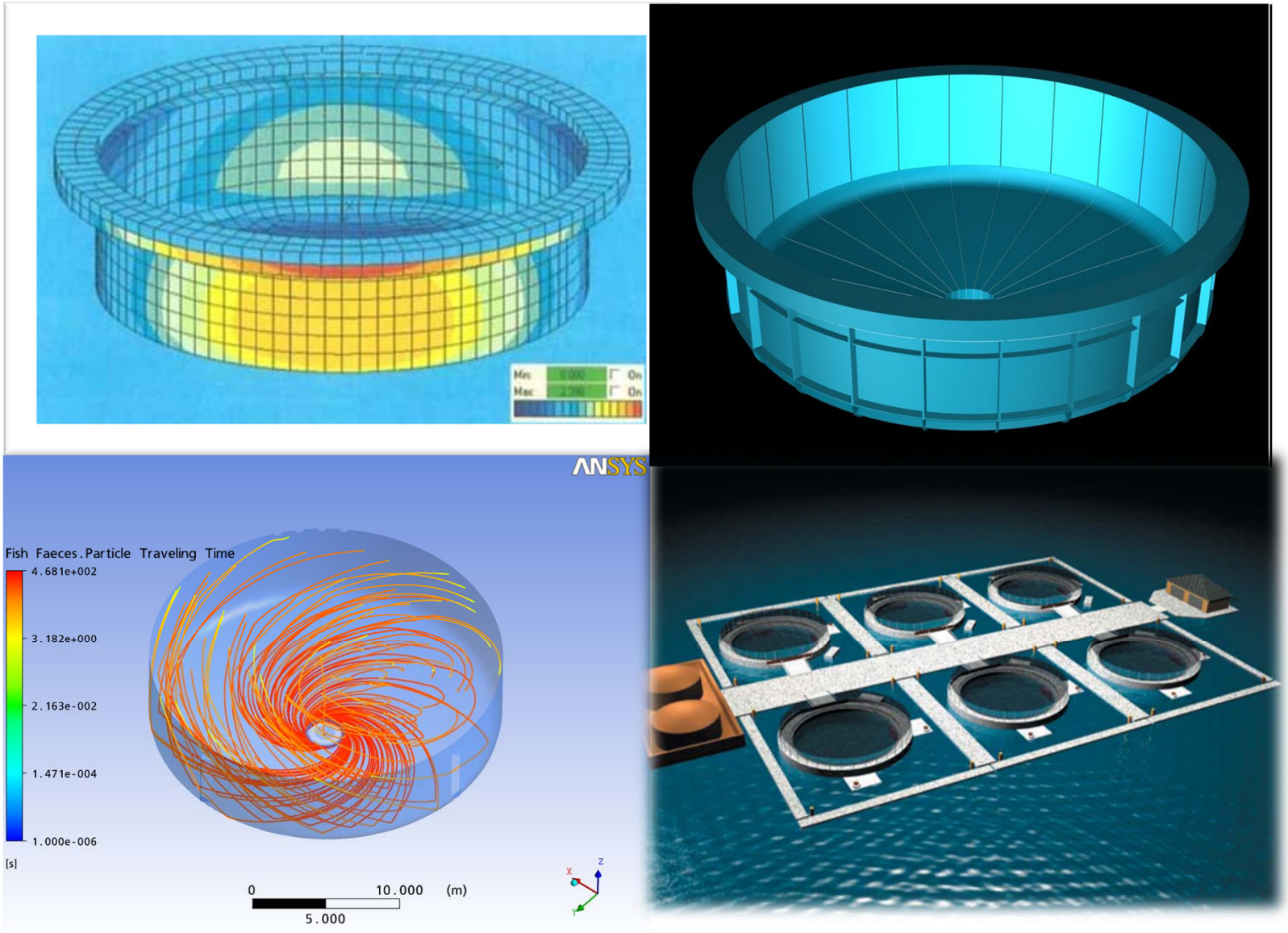
AgriMarine at a Glance

- Worldwide, AgriMarine is the only company that offers a closed containment solution for rearing salmon that has capacity for meeting food retailers' demands for sustainable practices.
- AgriMarine is a Canadian-based, food technology company with proven commercial salmon production in China and a new facility in British Columbia.
- The Company's unique technology provides an environmentally sustainable solution for seafood farming and production and is poised to become the industry standard.

Challenges of Perfecting an Aquatic Closed Containment System

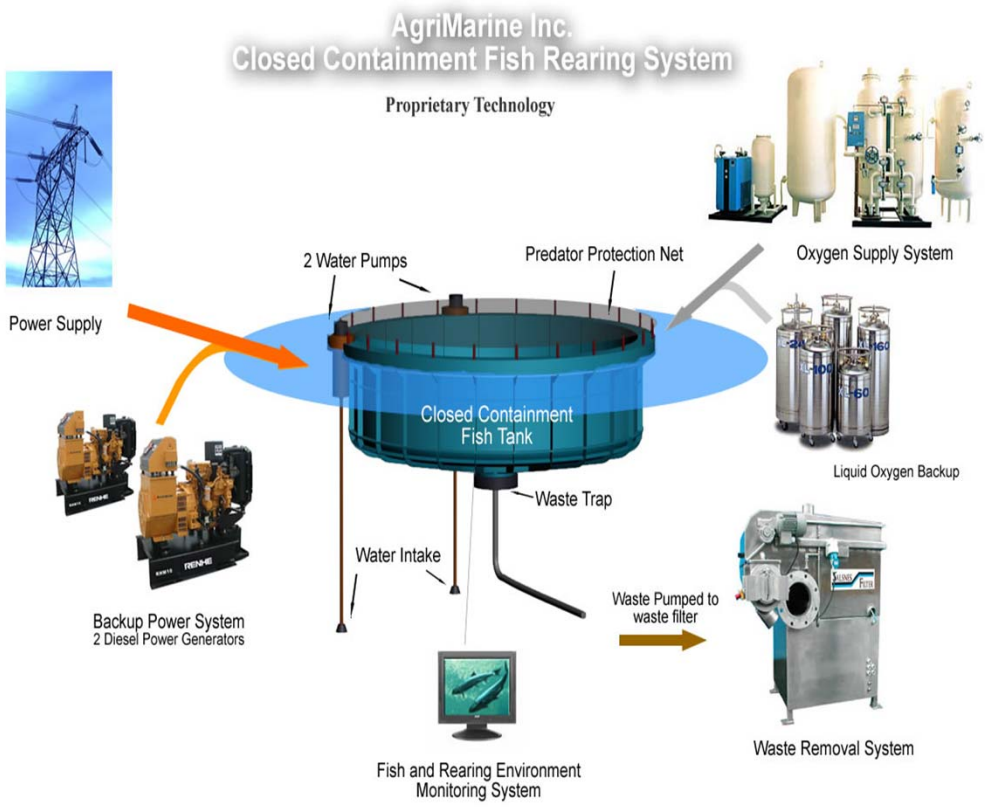
- **2000**: Selected by the B.C. government to study a land-based solid-wall containment
- The Cedar Project showed success for raising fish but failed to prove commercial viability
- **2005**: Set up Research & Development facility in BC, Partially funded by grants of CDN $5 Million
- Concept, technology, ecology and economics proven in sea water
- **2007**: Benxi AgriMarine subsidiary formed in China
- **2010**: Campbell River R&D site in development

10 Years to Perfect the Design



Design Features

- The solid-wall containment system enables **control over the finfish rearing environment**
- No escapes
- No predation
- No infestation
- No pesticides
- Minimal use of antibiotics
- Waste management
- Higher feed conversio
- Energy efficient



Project Funding

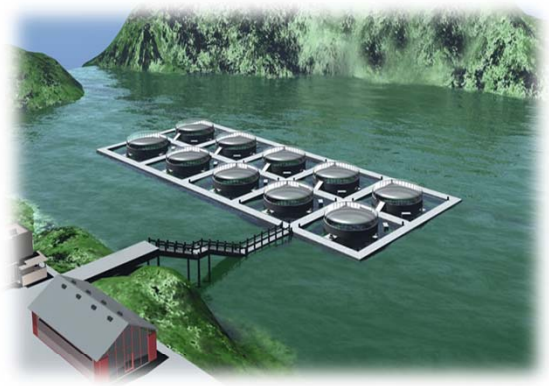
- Middle Bay Sustainable Aquaculture Institute (MBSAI) established for the purpose of researching and developing the use of commercial-scale solid wall containment systems for aquaculture.
- AgriMarine's R&D site in Campbell River is partially funded by grants from the Gordon and Betty Moore Foundation, Sustainable Development Technology Canada and Coast Sustainability Trust.
- AgriMarine went public in 2009 and has raised over $8 million to date

Commercializing the Technology in Freshwater

- First closed containment harvest in China successful
- Our systems are designed to produce high value species such as salmon, trout, tuna and yellow croaker
- 20-year leases (with rolling renewal options) in fresh water power reservoirs in China in close proximity to major population centres (Beijing, Shenyang)
- 100%-owned fish hatchery contains close to 1 million Canadian-sourced fingerlings, 50-year land use title
- Existing Chinese operations could scale up to a size that would rival the B.C. industry (over $600 million in annual sales) based on existing water rights

Expansion Plans in China

- Expand farm production, modernize Benxi Fish Hatchery and add fish processing capacity near Benxi farm
- Develop a second farm in Siping , Jilin Province
- Advance research for the intense rearing of yellow croaker fish using AgriMarine's technology in conjunction with the Zhoushan Fisheries Research Institute, in Zhejiang Province

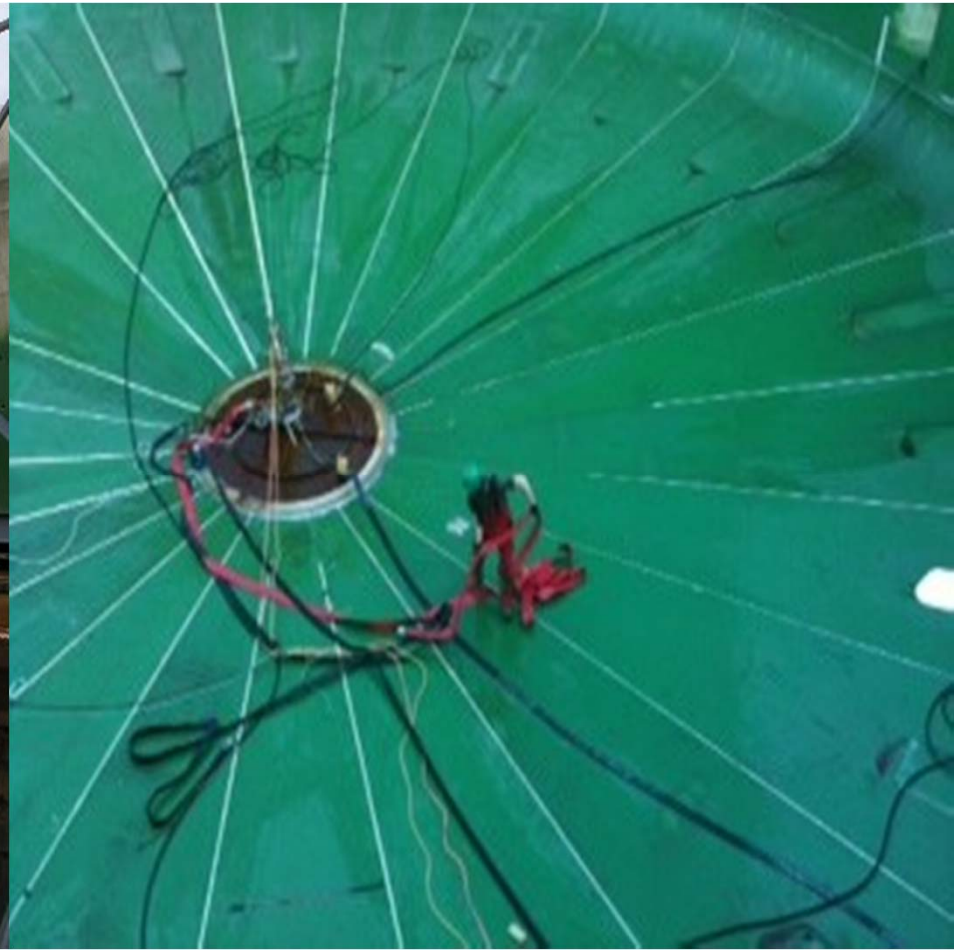





Commercializing the Technology in a Marine Environment

- First marine tank launched in Campbell River and will be stocked with Chinook salmon
- 4-6 tanks to be installed
- High tidal energy marine site required additional strengthening and anchor ring supports, high factor of safety mooring and anchoring systems

Assembly and Launch Process



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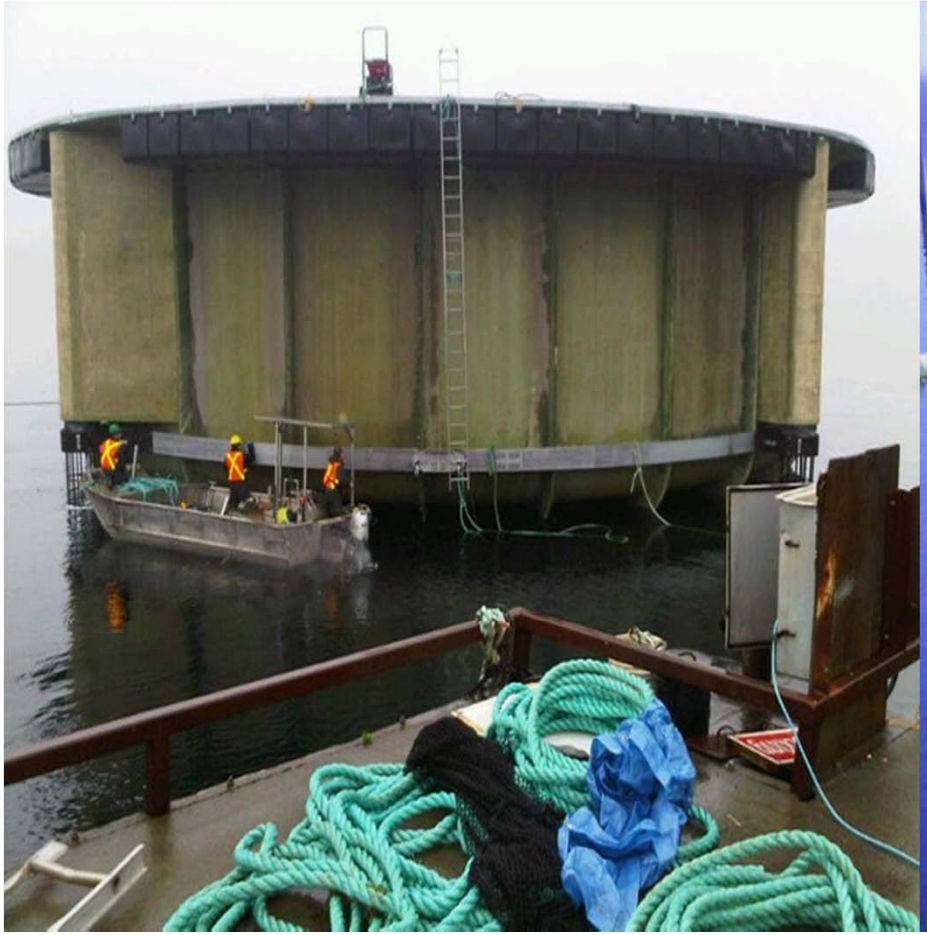

Sinking the tank into place

Marine Closed Containment vs. Current Industry

Issue	Conventional Open Net Farming	AgriMarine's Closed Containment Technology
Environmental Impact and Sustainability	Unsustainable given the credible evidence of damaging environmental impact.	Sustainable system, environmentally sound. Closed containment offers separation of farm salmon from wild species and the marine environment.
Waste Discharge	Heavy amounts of effluent flow directly into the ocean floor, creating marine pollution and algae blooms.	Waste discharge (fecal and feed matter) and mortalities are captured by our systems and can be used as liquid fertilizers and garden amendments.
Fish Health	Parasites, like sea lice, transfer is facilitated by a lack of solid barrier. Open nets are disease prone, and there is rampant use of SLICE, pesticides and antibiotics.	Salmon thrive in the controlled environment within an AgriMarine system due to the constant flow of new water at a comfortable temperature, with constant supplementation of oxygen. No sea lice have been demonstrated in our system and no pesticides used, minimal use of antibiotics.
Growth Cycles	Driven by water temperature. Net cages are exposed to freezing winter conditions and feed application is reduced.	Manipulation of water better for salmon, allows for year-round harvests. AgriMarine can shave 3-4 months off the net cage cycle. Technology can be applied in warm or cold climate conditions, including iced reservoirs or lakes.
Fish Quality	Flesh quality dependent on tidal action for currents in pen.	Water circulation system provides better flesh quality as fish get more exercise.
Production Costs	Cost efficient. However, entire crops at risks from fish escapes, disease outbreaks.	Economic and technical viability proven. No risk from loss of fish escapes, disease outbreaks controlled.
	Remote site construction and transportation costs add to the overall production cost.	Capital requirement for infrastructure comparable to net cages.
Feed Conversion	Inefficient feed system, adds to marine pollution, interaction with wild fish stocks and predators.	Effective feed application. No feed is lost to drift and any uneaten feed is captured in the waste trap and monitored in real time, so the farmer knows when to stop feeding.
Socio-Economic	Farms are deployed away from markets, adding to logistical costs, shorter shelf life of fish and negative food miles.	Our systems can be deployed close to markets, and can be adapted to a variety of sites, bringing the goodness of seafood closer to local markets - 'urban farming'.

Marine Closed Containment vs. Land-Based Systems

Issue	Land-Based System	AgriMarine's Technology
Environmental Impact and Sustainability	Sustainable system, although negative environmental impacts are outline below.	Sustainable system, environmentally sound. Closed containment offers separation of farm salmon from wild species and the marine environment.
Waste Discharge	Water re-circulation system requires ammonia removal.	No re-circulation of water in the rearing system, therefore eliminating the need for ammonia removal technologies
Fish Health	Can be managed; however, tight re-circulation systems have inherent high levels of dissolved organics and background bacterial levels, which can pose off-flavour challenges and disease risk.	Salmon thrive in the controlled environment within an AgriMarine system due to the constant flow of new water at a comfortable temperature, with constant supplementation of oxygen. No sea lice have been demonstrated in our system and no pesticides used, minimal use of antibiotics.
Growth Cycles	Manipulation of water quality good for fin-fish rearing. Produces a shorter growth cycle, shaving 6-9 months over net cages.	Manipulation of water better for salmon, allows for year-round harvests. AgriMarine can shave 3-4 months off the net cage cycle. Larger tank capacity than land-based systems makes up for the production difference.
Production Costs	Land-based systems have not proven to be economically viable due to: • high energy operating expenses • high land values • cost of construction of land-based tanks • difficulty in building tanks large enough to rear an economically viable amount	Water tenure, permitting, pristine water settings. Operating head of water systems in floating closed containment are less than 2 feet whereas land-based recycled are often as high as 20 feet. Given the proportionality of lift to energy cost in water systems, this is an order of magnitude savings in the power cost component of COP with AgriMarine systems over conventional land based recycle.
Feed Conversion	Both systems share similar advantages over net cages	Effective feed application. No feed is lost to drift and any uneaten feed is captured in the waste trap and monitored in real time, so the farmer knows when to stop feeding.
Socio-Economic	Jobs move to the region of the lowest cost production and proximity to markets, away from their traditional coastal communities.	Our systems can be deployed close to markets, and can be adapted to a variety of sites, bringing the goodness of seafood closer to local markets - 'urban farming'.
Economic Impact	Transitioning to closed containment on land will be too costly and disruptive to the existing industry.	Transitioning into closed containment on water would not be radically different and would gain more political support as AgriMarine could quickly convert all or most current net cages. This is the only solution were the existing socio-economic infrastructure can be kept intact.
Consumers and ENGOs	Consumer acceptance of closed containment is mounting. Overwaitea Foods recently took the #1 position in Greenpeace's Ranking due to their land based salmon closed containment. ENGO support.	Consumer acceptance, ENGO support. Support from several First Nations also secured. Product differential through labelling, packaging with benefits, in-store displays and promotions.

Environmental Considerations

AgriMarine has reviewed the proposed standards set by Aquaculture Stewardship Council and has determined that the Company complies with the draft standards and that its technology goes far beyond what ASC has proposed. The Company has already received a letter in support of this from the Coastal Alliance for Aquaculture Reform (CAAR).

Summary of Compliance

Principle	AgriMarine Compliance
1. Comply with all applicable international and national laws and local regulations	✓
2. Conserve natural habitat, local biodiversity and ecosystem function	✓
3. Protect the health and genetic integrity of wild populations	✓
4. Use resources in an environmentally efficient and responsible manner	✓
5. Manage disease and parasites in an environmentally responsible manner	✓
6. Develop and operate farms in a socially responsible manner	✓
7. Be a good neighbour and conscientious citizen	✓

Trend Toward Sustainability

- Strong environmental and government support to advance closed containment
- First Nations support: K'ómoks, Campbell River, Cape Mudge, and Homalco First Nation Bands
- ENGO support: David Suzuki Foundation, Living Oceans Society, Coast Sustainability Trust, Georgia Strait Alliance, T. Buck Suzuki Environmental Foundation, Watershed Watch Salmon Society

Gordon and Betty MOORE FOUNDATION

SUSTAINABLE DEVELOPMENT TECHNOLOGY CANADA™

David Suzuki Foundation
SOLUTIONS ARE IN OUR NATURE

Georgia Strait Alliance

CAAR
Coastal Alliance for Aquaculture Reform

LIVING OCEANS SOCIETY
Healthy Oceans. Healthy Communities.

AgriMarine

- Experienced management team in aquaculture and hatchery design
- Unique technology that resolves many of the negative environmental impacts associated with net cage fish farming
- First company to prove that closed containment fish farming is viable on water
- ‘Disruptive’ technology poised to become the industry standard
- Fastest growing food production sector in the world and huge consumer market
- By 2024, aquaculture will represent a market size of $100 billion
- 60% of world’s salmon production is cultured
- Increased worldwide demand for salmon as a healthy protein
- First company to grow salmon in China in order to fill China's growing consumer demand for salmon imports
- “Eco-Salmon” label and sustainable farm certification

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January, 2011