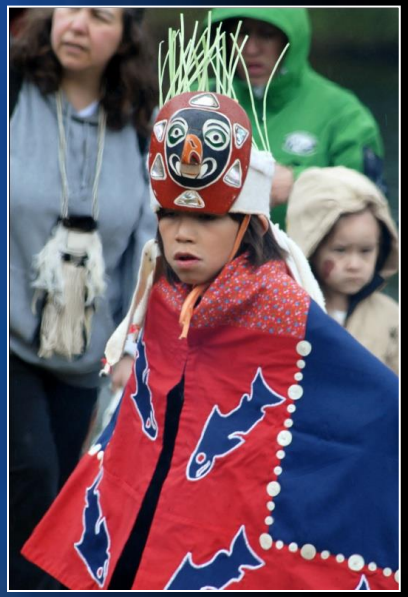
Update - ‘Namgis Closed Containment Atlantic Salmon Farm

Garry Ullstrom *Senior Financial Officer - ‘Namgis First Nation*

Cathal Dinneen *Operations Manager - K’udas LP*

Eric Hobson *President - SOS Marine Conservation Foundation*



Working to Catalyze Change

Goal is to make a positive environmental difference by proving the economics of farming Atlantic salmon on land using RAS.

February 18, 2013 – Blessing Ceremony

Who is Involved?

- **‘Namgis First Nation** - 100% owner.
  People of the Salmon

- **The SOS Marine Conservation Foundation** (Save Our Salmon) – Project Partner providing funding and business expertise.

- **Tides Canada** - through the Salmon Aquaculture Innovation Fund provides funding, project management support, and technical support through the *Conservation Fund’s Freshwater Institute*

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Funding – Construction & Operations

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SUSTAINABLE DEVELOPMENT TECHNOLOGY CANADA™

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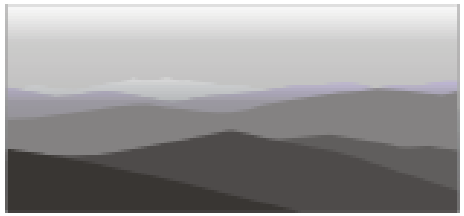
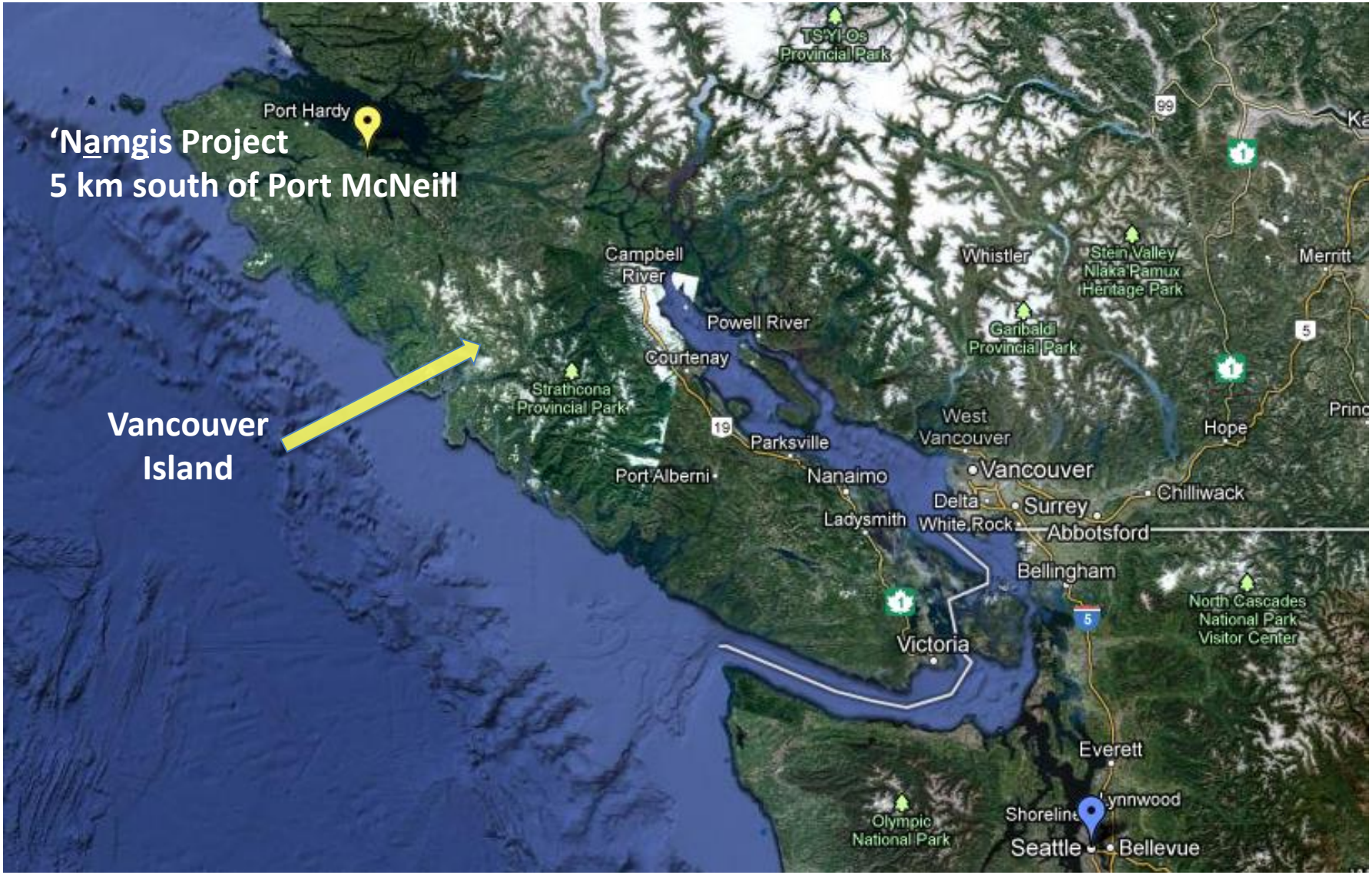

The Coast Sustainability Trust

- DFO – Aquaculture Innovation & Market Access Program
- Ritchie Foundation

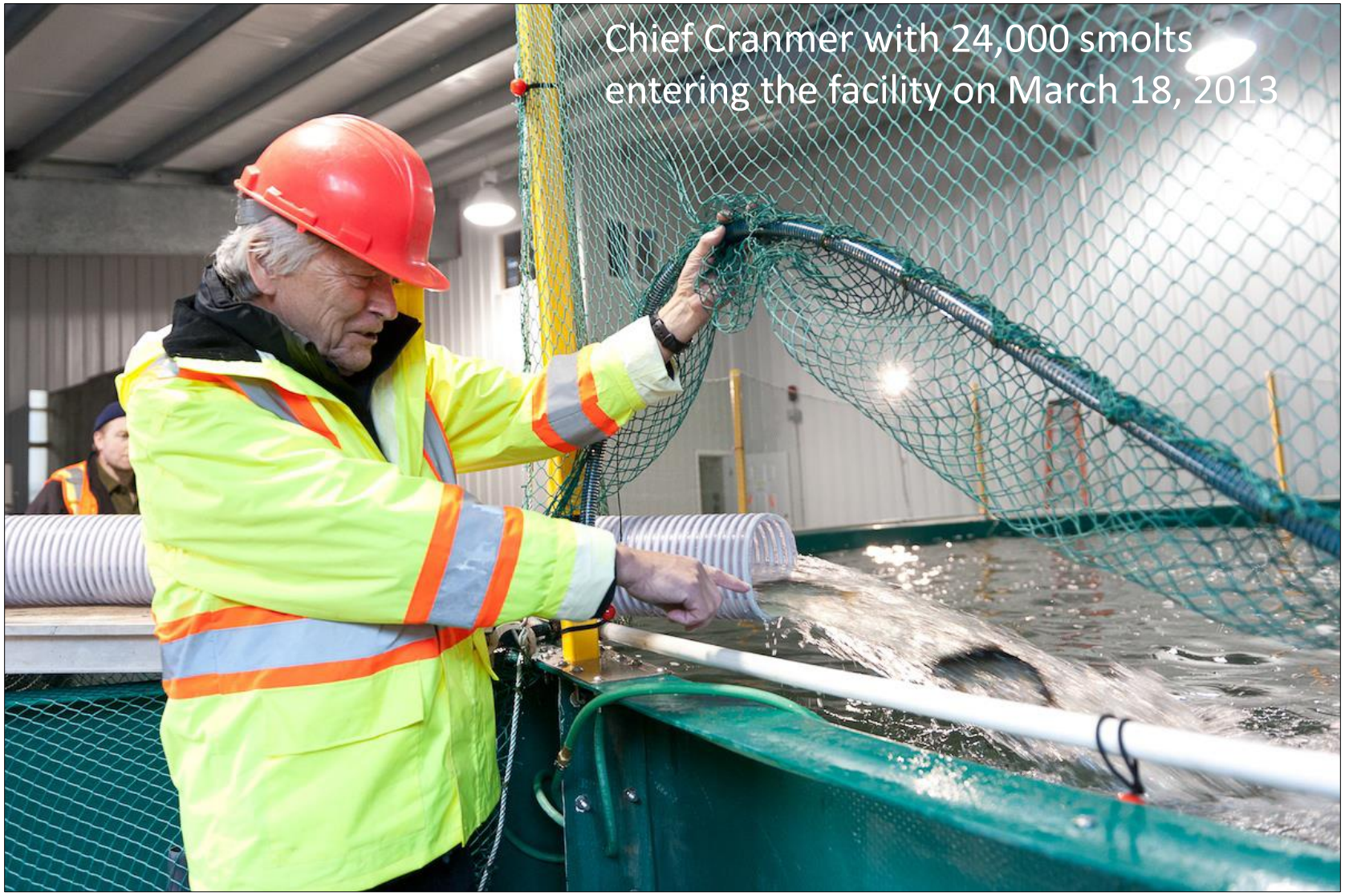
BC hydro
powersmart

Total Funding = **$8,524,964**

Project Location



The Fish Are In!



The Fish Are In!

- As the first Atlantic salmon RAS facility in Canada, received much attention.

- E.g. previous image with smolt announcement viewed 8K times on FaceBook.

FOPO Report Released

March 8th front page of the Vancouver Sun.

Randy Shore reporting on the Fisheries and Oceans Standing Committee's (FOPO) Report on Closed Containment:

- *Committee report found "Canada should support the development and expansion of closed containment salmon farming and explore transitioning the aquaculture industry away from ocean-based net pens"*
- *"There is only one commercial-sized, closed containment, Atlantic salmon farm in B.C. It's at the 'Namgis First Nation on Vancouver Island".*

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Fish farms on the move?

A federal committee is recommending a move toward land-based pens. Industry says it will be too costly; environmentalists say the government needs to move more quickly.

RANDY SHORE
VANCOUVER SUN

Canada should support the development and expansion of closed containment salmon farming and explore transitioning the aquaculture industry away from ocean-based net pens, according to a committee report tabled in the House of Commons Thursday.

A high-tech, environmentally friendly land-based industry could be a significant economic driver in rural and First Nations communities, according to the report of the Standing Committee on Fisheries and Oceans.

But while the report promotes closed containment systems as a technology of the future, it leaves the door open to the continued growth of the existing ocean-based salmon farming industry, dismissing evidence of environmental damage caused by open net-pen fish farms as "inconclusive."

Industry members testified that a forced or legislated transition from ocean-based farming to closed containment systems that are not yet proven to be profitable would be a disaster for the industry in Canada and the 15,000 direct and indirect jobs it already supports.

It is "physically impossible" to move 40,000 tonnes of production onto land, according to Ruth Salmon, executive director of the Canadian Aquaculture Industry Alliance. "The industry would look at operations elsewhere if that were mandated," she told the committee.

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Active salmon farms in B.C. waters

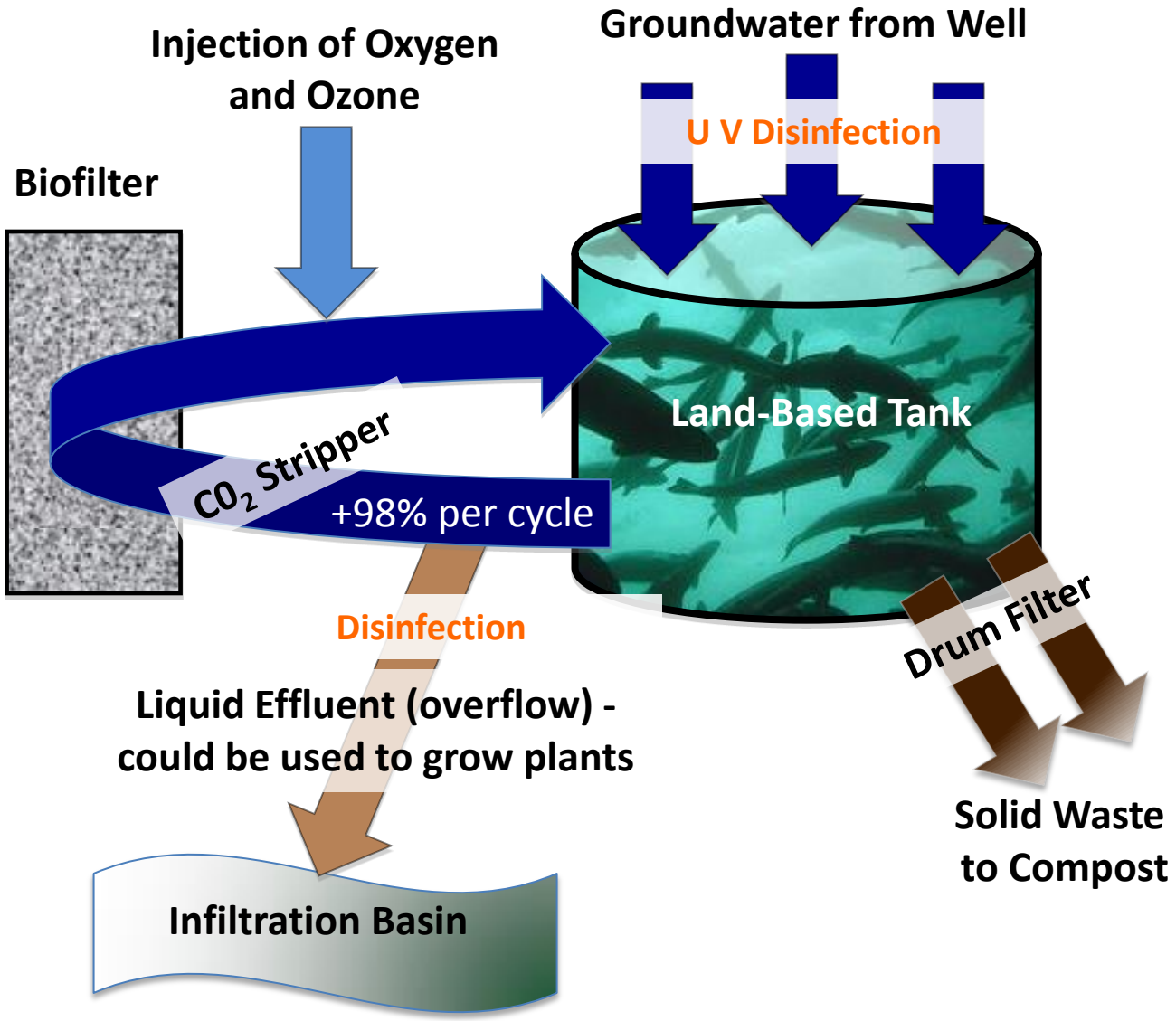
There are 130 licensed locations in B.C. for ocean net-pen fish the red dots representing active sites in the summer of 2012. only one commercial-sized, closed containment, Atlantic salm in B.C. It's at the 'Namgis First Nation on Vancouver Island (gr

Klemtu
Port Hardy
Port McNeill
Campbell River
Powell River
Tofino

Source: BC Salmon Farmers Assoc.

We agree!
March 9th during one of the ‘Namgis community tours.

Recirculation Aquaculture Systems



Project Overview

- First of 5 modules
- Groundwater disinfected on entry
- +98% of the water is recirculated; all water goes through biofilters for cleaning
- Smolts disease screened and are quarantined for 4 months; overflow water is disinfected
- Independent Environmental Monitoring via the Pacific Salmon Foundation funded by Tides Canada
- Harvest planned for April 2014 with no use of antibiotics or pesticides
- Capital cost $8.5 million
- Construction of Module 1 near completion
  - 1 x 250 m^3 smolt quarantine tank + biofilter
  - 5 x 500 m^3 growout tanks + biofilter
  - 1 x 250 m^3 depuration tank

Capital Costs of Pilot

RAS Equipment	$ 5,500,000	$11.70/kg
Site Develop. & Bldgs.	2,200,000	4.68/kg
Other Equipment	800,000	1.70/kg
Total Capital Costs	**$ 8,500,000**	**$18.08/kg**
		$ 8.21/lb

470 Tonnes of Production Per Year

Costs to First Harvest

Inventory Buildup:	
Feed & Smolts	$ 583,791
Labour	280,450
Other Prod'n Costs	294,607
Processing & Marketing	83,546
Pre-production salaries, etc.	287,870
Administration & Overhead	449,115
Total Op. Costs to 1st Harvest	**1,979,379**
Total Capital Costs	**8,500,000**
Total Costs to 1st Harvest	**$10,479,379**

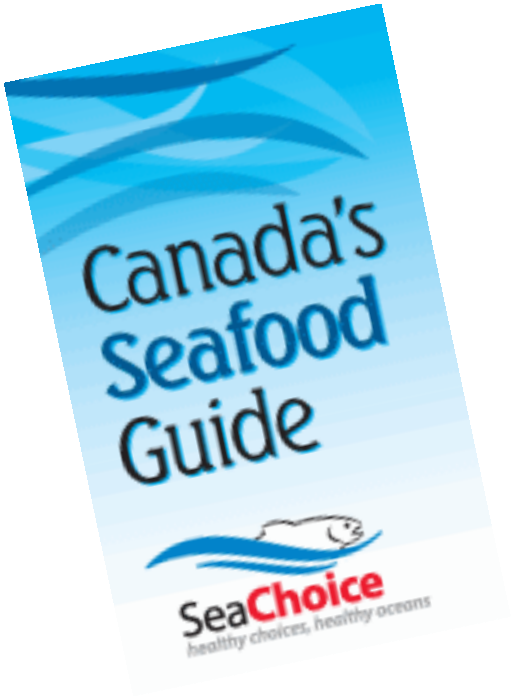
Capital Costs – Pilot vs. Commercial

	Cost Per Module ($'000)	
	First Module	**Commercial Scale**
Engineering	520	130
RAS Equipment	2,880	2,200
RAS Installation	2,100	1,500
Civil Works	1,220	570
Main Building	980	880
Other Equip.	800	220
Cost Per Module	**8,500**	**5,500**
Permanent Inventory	1,979	7,200
Hatchery		1,500
Total Capital Cost	**10,479**	**30,700**

Operating Expenses – Pilot vs. Commercial

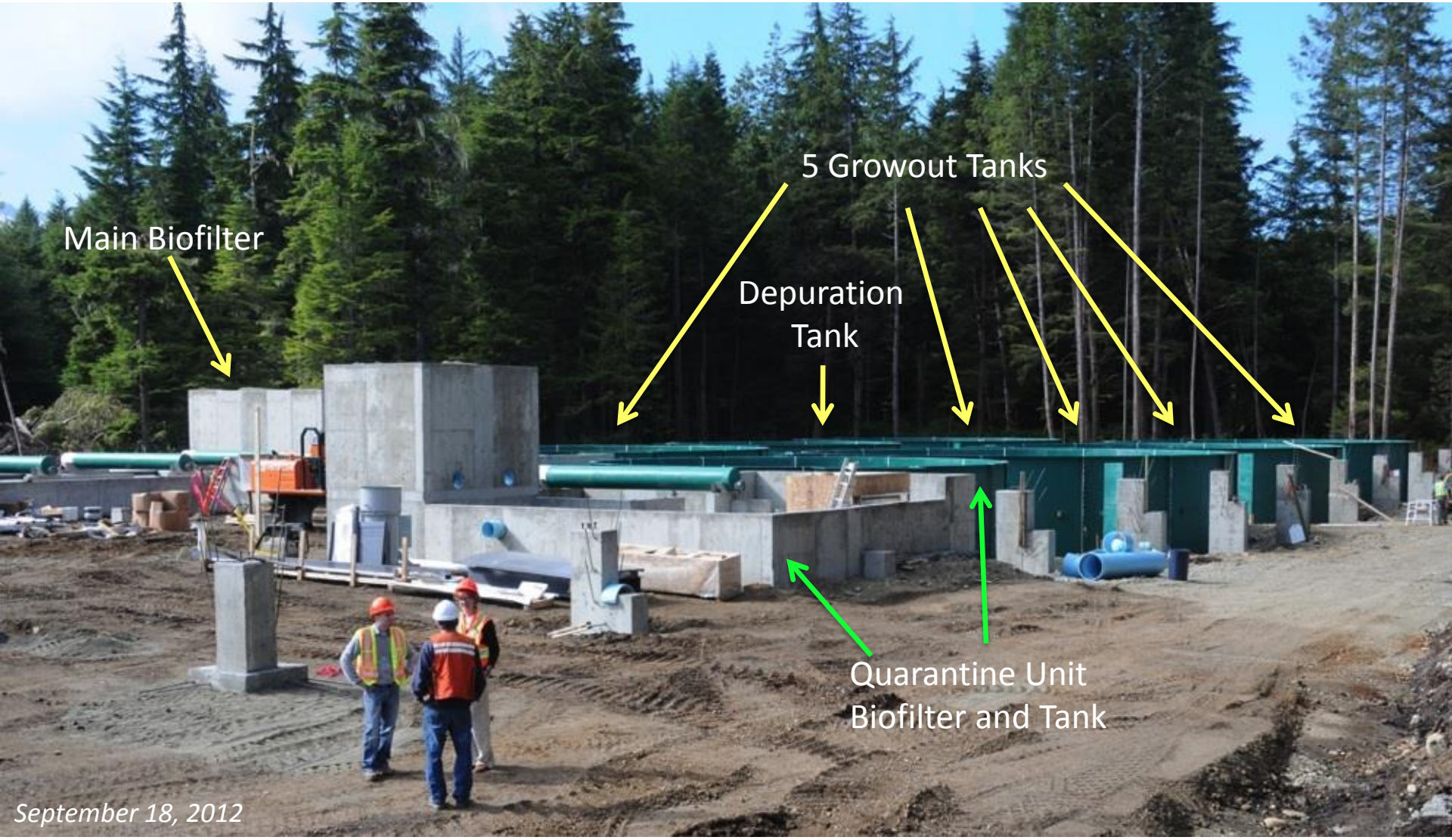
Key Variables	First Module	Commercial-Scale & Optimized	
	$/kg HOG		% Improve
Feed	2.10	1.77	16%
Labour	0.75	0.45	40%
Power	0.31	0.28	10%
Smolts	0.85	0.64	25%
Maintenance	0.09	0.09	0%
Fish Health Treatments	0.30	0.27	10%
Other Operating	0.49	0.37	25%
Process, Pkg, Freight	0.78	0.70	10%
Marketing, Sales Adm.	0.51	0.46	10%
Corporate Overhead	0.050	0.045	10%
Total Production Costs	6.22	5.08	18%

Marketing and Sales



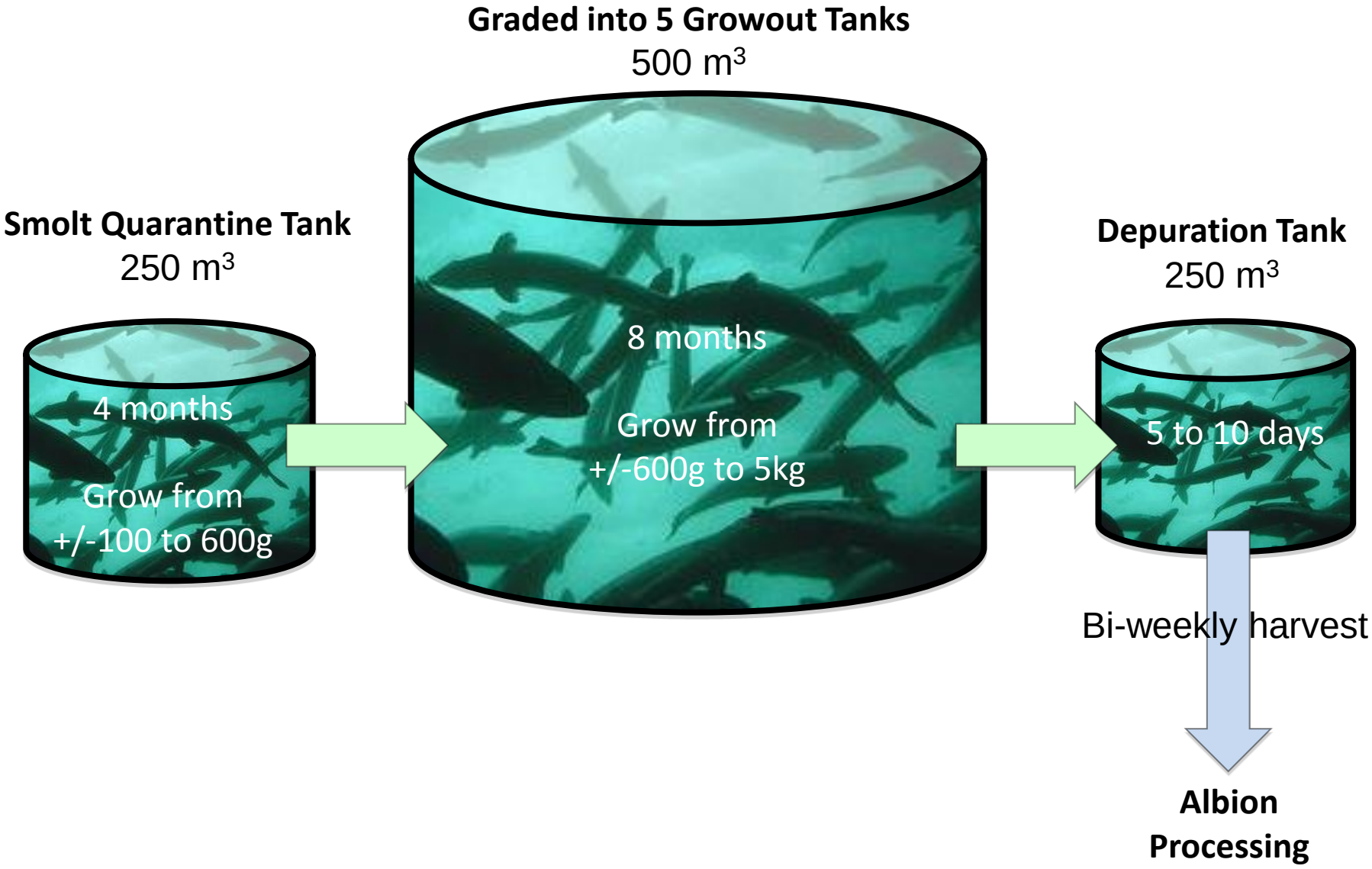
- Strategic partnership with Albion Fisheries to process and distribute the product is currently being negotiated.
- Branding and marketing proposals are being evaluated.
- Working with Kelly Roebuck (SeaChoice) to ensure that production method, including feed formulation and supply, meets Monterey Bay Aquarium's Best Choice sustainability ranking criteria.

Facility Layout



2,870 m^2 (35m x 82m; 116’ x 270’)

Fish Production Flow



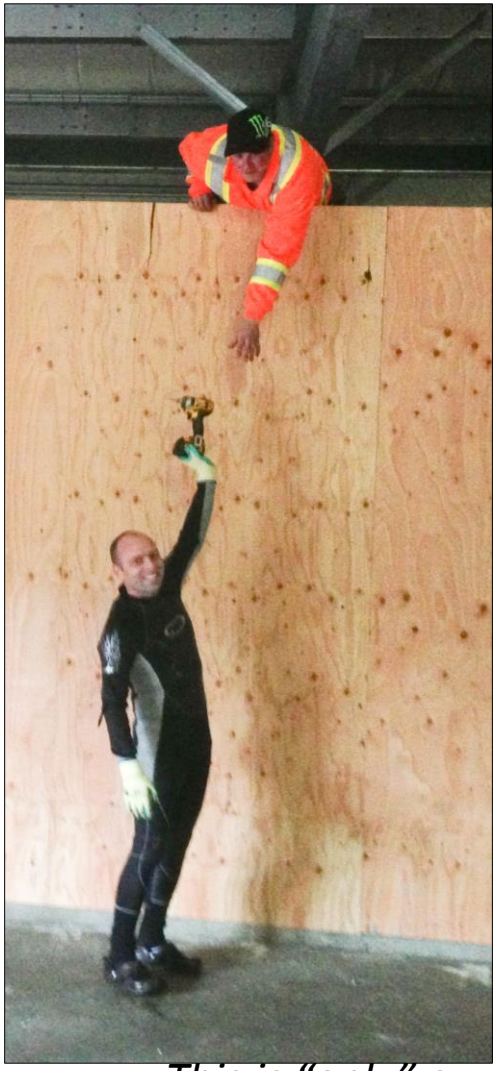
Bioplan Summary

- 3 cohorts of Atlantic salmon smolts/year
- Slightly salty water at 15° C
- Target density = 90 kg/m^3 (starting at 50 kg/m^3)
- Module 1 = 470 MT/yr; plan for 5 modules = 2,000 to 3,000 MT/yr
- Growout in 12 -15 months
- Harvest sizes 3 to 5 kg; every two weeks
- Currently - smolts at 10° C; stocking density 8 kg/m^3
  - Lower temp due to supply gap; potentially reduces grilse

Video - Smolts

Challenges?

- Delays
  - Power (available only 1 week prior to arrival of smolts); availability of smolts
- Smolts – first cohort is the "commissioning cohort"
  - Salinity; next cohort – smolt availability; reducing grilsing
- Equipment adjustments
  - Tweaking of the system e.g. mort removal system; drill dropped in header tank!
- Public perception re. pathogens
  - Installation of disinfection system as "extraordinary measure of precaution"



This is "only" a drill?!

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www.namgis.bc.ca - Project updates

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