

Who we are:

David L. Sprague holds over 20 US patents assigned to RCA, GE, and Intel.

Holly Faubel worked for Intel as a Business Development Manager reporting to the Founder of Intel Capital.

These are our comments regarding the Technical Abilities section of the Nordic Permit Application under review.

Agenda Item 4.4: Technical ability:

The following is our understanding of development activities in Fredrickstad according to announcements made by Nordic and covered in the trade press.

In April of 2018 Nordic Aquafarms's CEO, Eric Heim, announced that Intra Aqua Advance (IAA), a company with over 30 years of experience in the aquaculture industry, would supervise the operation of the Fredrikstad Phase 1 grow-out of Atlantic Salmon. They would assist Nordic A/S in utilizing a turn-key system called RAS 2020, invented by Bent Urp and now owned and licensed by Veolia. This system includes a Moving Belt Bio-Reactor (MBBR) in a drum configuration.

IAA would also design, develop and operate a new system to be solely owned by Nordic A/S and to be used in Fredrikstad Phase 2 and in Phase 1 and 2 of their new Belfast facility.

Five months after that announcement, in August of 2018, IAA declared bankruptcy. Its senior technical advisor, Jens Ole Oleson who held the patent on MBBR self cleaning technology, and the inventors of other IAA's patents went to a company called Aqua CleanTech and Aqua CleanTech's various affiliated companies. Nordic A/S did take on 6-8 other engineering and staff members from IAA.

In the Technical Abilities section of the Nordic Aquafarms Permit Application the following statement is made: "*The company owns a number of patents and has a patent pending application for its new generation of RAS facility designs.*"

In searching the world wide patent database, we could only find one patent currently owned by Nordic Aquafarms and no other pending patent applications from Nordic.

There were three patents filed by and granted to IAA:

1. **Container, series of containers and method for treating liquids**, is currently active and assigned to **Nordic Aquafarms AS** in the US, Australia and pending in Canada.

2. **Biological treatment and installation with air-lift and biofilm carriers** is assigned to Aqua Cleantech,
3. **Fish Farming Plant with Fish Extraction** is still held by an IAA affiliate in Denmark (IAA IP ApS).

There's no record of any other patents or applications by Nordic Aquafarms.

Here are some questions for the Belfast Planning Board to obtain answers to:

1. Does Nordic Aquafarm AS have other patents aside from this one acquired from IAA?
2. How is the patent acquired from IAA relevant to Nordic Aquafarms new RAS design?
3. Has Nordic Aquafarm filed any patent applications of their own, we see no record?
4. Does Nordic Aquafarm have any licensing agreement with Veolia for patents related to the RAS2020 system or is there a joint development agreement between Veolia and Nordic A/S?
5. Given that some patents now reside with Aqua CleanTech, are there any licensing or joint development agreements between Aqua CleanTech and Nordic?
6. Who at Nordic Aquafarms is responsible for the overall design of the new RAS system including filtration and water chemistry management?
7. What are the milestones for implementing, debugging, and proving the flow and chemistry balance of this new RAS system design in Fredrikstad?
8. At what point will operating manuals for the new system become available for review.

Comment Submitted
by email 8/19/19

5:01 PM

COMMENTS TO: The Belfast Planning Board Members
FROM: Jim Merkel, 97 Patterson Hill Rd, Belfast Me.
Date: August 19 2019

NAF Technical ability:

NAF is inexperienced and has a short history in small aquaculture projects, as venture capital firm. Extreme monocultures or CAFO's have little to no track record in operating without significant harmful chemistry including pesticides, fungicides, antibiotics and toxic cleaners. See attachment g. This operation poses serious threat to a destroyed yet ready to recover marine aquatic ecosystem in Belfast Bay, long abused. Nordic's information to you is obviously biased. There are no "facts" in their plans or their projected operating parameters. The performance of NAF's systems will only be know years after it is built and operating, but by then, the damage to our bay could have been done. NAF has no experience in designing, constructing and managing a massive Concentrated Animal Feeding Operation or CAFO. Its other facilities are small by comparison.

NAF has no track record in dealing with the serious potential problems that could arise. Because of small margins in the profits from RAS, small technical issues could easily result in inability to profit, leading to decisionmaking that could skirt proper protections of the bay.

- a. The company Nordic had hired to design its RAS system went bankrupt in August 2018. See attachment a.
- b. The firms NAF has chosen have no experience in land-based aquaculture. They site building a brewery in Mexico as experience. See attachment b. "Gilbane will draw upon its experience constructing Constellation Brands' 983-acre brewery expansion project in Mexicali, Mexico, as well as the 260,000 square foot Kerry Innovation and Technical Center."
- c. **November 18, 2018, Awash in \$100M debt, VeroBlue files for Chapter 11, Iowa's RAS system.** Dozens of lenders left unpaid. See attachment c.
- d. Technical ability is also subject to market forces to complete a risky project. See attachment d. August 16, 2019, Salmon Business report "**Salmon prices fall to new low.**" Salmon prices are volatile and Nordics lacking technical experience coupled with dropping salmon prices could easily scare investors who have yet to commit and leave Belfast with a clearcut forest covered in half-built tanks at the mouth of the Little River. "There is a lot of fish being produced, there is a lot of fish in Scotland and there is a downward price trend."
- e. Banks skeptical to lend. See attachment e. Vegard Helland, executive vice president of business Sparebank 1 SMN, said that In order for us to contribute with financing, the developer must set a considerable amount of equity, and not least, must demonstrate extremely good expertise," He believes the risks, in addition to the obvious biological risks in a relatively untested technology, are too large. "Farming is volatile stuff, if you start with larger projects on land and it works, then we will soon

see prices drop, but' we can risk not getting anything in return for what we have financed"

- f. Insurers of aquaculture unwilling to insure RAS operations. See attachment f. Arne Gangdal, head of aquaculture and marine insurance at Gjensidige, one of Norway's largest insurers, said he sees far too many question marks at this time. "We want to see that it works well and that there is a period of stress-testing before we dare to enter the sector," he told **IntraFish**. That means, in short, that Gjensidige isn't offering insurance to land-based salmon producers. "That's a risk the companies involved must take themselves," Gangdal said. "We have no experience with large-scale farms on land and there are no statistics to even calculate prices." The aquaculture industry is already a low-margin business for the insurance sector, he noted, so adding any additional risk isn't viewed as a positive.
- g. CAFO's are operations known for being the breeding grounds for the toughest fungi, viruses, diseases with the potential for resistant strains entering the bay. See attachment g. NAF has no way to guarantee their effluent will not cause damage to marine ecology. There is no track history or independent assessment available as this size operation has yet to be built.
- h. **Thousands of salmon escape from land-based site** See attachment h.
- i. The pipeline would be an attractor of marine life and substances in the outflow will bioaccumulate up the food chain, concentrating at higher trophic level birds, fish, marine mammals, and aquatic plants. See attachment i.
- j. Mass sudden die offs have recently happened at RAS facilities in New Brunswick, Canada.

Attachments:

a.) **Nordic Aquafarms' RAS supplier goes bankrupt**
News

By Stian Olsen

5 September 2018

Inter Aqua Advance bankruptcy may have consequences for Nordic Aquafarms.

Nordic Aquafarms entered into a long-term strategic agreement with the Danish Inter Aqua Advance in April. However Inter Aqua Advance is now in bankruptcy proceedings in Aarhus, Denmark after a request was received on 29 August.

Confirms bankruptcy

Nordic Aqua farms build land-based industrial fish farms and in April, the company announced that they had entered into an agreement with Inter Aqua Advance to develop, design and supply large recirculating plants in Norway and the United States. Nordic Aquafarms is currently building land-based facilities in both Fredrikstad and as well as a proposed \$150-million salmon factory farm in Belfast, Maine in the United States. The RAS supplier has also been involved in Grieg Seafood's new grow-out expansion plant in Finnmark, northern Norway.

"We received the notification of bankruptcy just before the weekend," said Grieg Seafood CEO, Andreas Kvame, to iFinnmark.

He said that the company will not lose any money because of the bankruptcy.

“For our part, the work has come so far in Landersfjord that it does not matter to us. We implement Plan B, and I expect that we can complete the construction using local labour. However, according to the same newspaper, a number of subcontractors fear that they will lose money on bankruptcy.

Profit over the last three years

Inter Aqua Advance achieved a profit before tax of 3.9 million Danish kroner in 2017, and has delivered surplus in the last three years.

At year-end, the company had a book equity of close to DKK 6 million (EUR 804 thousand) and a total debt of DKK 37 million (EUR 5 million).

First in the world to deliver RAS

Inter Aqua Advance was established in 1978. It was the first in the world to develop and deliver RAS, according to the company’s website.

SalmonBusiness has attempted to contact CEO of Nordic Aquafarm, Erik Heim, without success. Neither has Inter Aqua Advance responded to our inquiry.

Erik Heim in April explained why he chose Inter Aqua Advance as its supplier:

“We have wanted to cooperate with a competitive RAS partner who can meet needs over the next few years.

b.)

Nordic Aquafarms selects construction managers for Belfast, Maine RAS

By **Chris Chase**

June 7, 2019

Nordic Aquafarms has announced that the company has selected Gilbane Building Company and Landry/French Construction as construction managers for the planned salmon recirculating aquaculture system (RAS) in Belfast, Maine.

The two companies will manage the construction of the company’s 850,000 gross-square-foot production facility, which is being planned in two phases. The first phase, according to Nordic, is slated to be operational in 2020.

“By partnering with Gilbane, an experienced builder of food production facilities and a company that shares our commitment to environmental stewardship, we’re confident that the Belfast site will serve as the future of land-based seafood production in the United States,” Nordic Aquafarms CEO Erik Heim said. “We are excited for the opportunity to expand the relationship with Gilbane as a national service provider to include future projects as NAF grows.”

The proposed layout of the building, according to the company, includes nine buildings including hatcheries, freshwater juvenile facilities, grow-out facilities, and peripheral support facilities.

Gilbane has rated highly as one of the top contractors in the country, and has previous experience constructing a 985.5-acre brewery expansion project in Mexicali Mexico for Constellation Brands, as well as the 260,000-square-foot Kerry Innovation and Technical Center in Beloit, Wisconsin, U.S.A. a LEED-NC Gold certified building.

“As a leading builder of manufacturing facilities in the U.S., Gilbane will leverage our vast experience in constructing complex and varied food production facilities in making that mission a reality while Landry/French, a leading contractor in Maine, will bring the local knowledge and key relationships to this important project,” Mike O’Brien, head of Gilbane’s Boston and Northern New England offices, said. “We share Nordic

Aquafarms' commitment to sustainability and minimal environmental impact and are extremely excited to break ground on this pioneering project."

Photo courtesy of Nordic Aquafarms

By James McCarthy

Nordic Aquafarms Inc. has named Gilbane Building Co. and Landry/French Construction as its construction managers for the land-based salmon farm that will be built on 54 acres off Route 1 in Belfast.

Construction on the facility — to be built in two phases and which in aggregate would be 850,000 square feet — would begin upon approval of submitted permit applications. It will be built in two phases, with the first phase targeted for completion in 2021.

Based in Providence, R.I., with 48 offices worldwide, Gilbane Building Co. has been a construction manager in northern New England for nearly 50 years. Clients have included Bank of America, the University of New Hampshire and Concord Hospital.

Landry/French is based in Scarborough and provides construction management, design/build, and general contracting services to a range of clients. Earlier this week, Colby College announced that Landry/French will manage construction of its downtown hotel.

Erik Heim, president of Nordic Aquafarms Inc., said Gilbane brings to the Belfast project particular expertise in building food production facilities.

"We are committed to delivering high-quality seafood with low environmental impact and take pride in the sustainable practices embedded into every facet of our business," he said. "By partnering with Gilbane, an experienced builder of food production facilities and a company that shares our commitment to environmental stewardship, we're confident that the Belfast site will serve as the future of land-based seafood production in the United States. We are excited for the opportunity to expand the relationship with Gilbane as a national service provider to include future projects as Nordic Aquafarms grows."

The proposed layout of the site features nine buildings, including hatcheries, freshwater juvenile facilities (smolt buildings), grow-out facilities, and peripheral support facilities such as office space, a central utility plant, and a water treatment plant.

Electrical infrastructure will include a substation, back-up generation, and fish processing. In managing this unique project, Gilbane will draw upon its experience constructing Constellation Brands' 983-acre brewery expansion project in Mexicali, Mexico, as well as the 260,000 square foot Kerry Innovation and Technical Center. Located on a 124-acre parcel in Beloit, Wisc., this campus for Kerry's worldwide food production houses over 800 employees and is LEED-NC Gold certified.

"Nordic Aquafarms' innovative land-based farming method is poised to transform the U.S. market for fresh farmed fish," said Mike O'Brien, head of Gilbane's Boston and northern New England offices. "As a leading builder of manufacturing facilities in the U.S., Gilbane will leverage our vast experience in constructing complex and varied food production facilities in making that mission a reality while Landry/French, a leading contractor in Maine, will bring the local knowledge and key relationships to this important project. We share Nordic Aquafarms' commitment to sustainability and minimal environmental impact and are extremely excited to break ground on this pioneering project."

About Nordic Aquafarms

Nordic Aquafarms is an investor in and developer of land-based aquaculture internationally, with production plants in Norway (Fredrikstad Seafood) and Denmark (Sashimi Royal and Maximus) and two projects in the United States (Maine and California). Nordic Aquafarms Inc. is its U.S. subsidiary.

Land-based production is a rapidly emerging method for sustainable production of salmon. It is based on indoor production in large tanks and water treatment systems, and its benefits include: the ability to recycle and treat water on site to reduce overall water consumption, recycling of waste resources, the prevention of sea lice and parasites, the elimination of fish escape into the sea and co-mingling with wild species, the application of renewable energy concepts, and a shorter distance to market for a high quality, fresh product, reducing the carbon footprint of air and land transport.

c.)

**Awash in \$100M debt, VeroBlue files for Chapter 11, sues top management
Four of the start-up's five principals paid themselves each \$400K a year; Creditors
include city of Webster City, IRS, Hamilton County, Van Diest Medical**

LOCAL NEWS

NOV 18, 2018

JANE CURTIS

Editor

jcurtis@messengernews.net

-Messenger file photo

Cindy Reher, of Humboldt, uses her tablet to take a photo of barramundi in an aquarium during an open house in Webster City when VeroBlue first ventured into the business.

WEBSTER CITY — VeroBlue Farms, which promised to make fish a leading commodity in this landlocked Hamilton County town, has filed for Chapter 11 in federal bankruptcy court, disclosing that it is drowning in more than \$100 million debt, most of which is unsecured.

VBF, according to its bankruptcy petition, owes \$98,943,246.22 in unsecured debt to its top 20 creditors.

It has another \$6 million in secured debt, that being assigned to Broadmoor Financial LP, of Wichita, Kansas, VBF's top creditor. VBF owes more than \$53 million to that firm alone.

In a separate civil lawsuit, five of Vero-Blue's top management are accused of misappropriation of funds. The suit, filed in federal court, claims Leslie A. Wulf, Bruce A. Hall, James Rea, John E. (Ted) Rea, and Keith Driver "wasted VBF assets."

The news leaves in its wake more than 80 creditors that run the gamut of large to small, local to national, all with one thing in common: They are left holding the bag.

The firm hasn't paid its more than \$279,000 in property taxes in both Hamilton and Hardin counties, according to online county treasurers' records.

It owes the Internal Revenue Service an undisclosed sum.

And it's on the hook for unpaid utility bills.

The city of Webster City is owed \$135,997.96, according to bankruptcy documents. Interim City Manager Kent Harfst said that debt is money the company owes for sanitary sewer service and electricity provided by the municipal electric utility.

While the company has unpaid sanitary sewer bills, it does not owe the city government any money for water service because it gets its water from its own well.

Harfst said attorneys representing the city have been in contact with attorneys handling the bankruptcy proceedings.

"They're hoping to come out of it," he said of VeroBlue. "We're hopeful something good will come out of it."

In early 2015, Wulf outlined his vision for the firm in a story in The Messenger.

"The long-term goal for the company is to perfect what we're doing in Webster City," he said, "a hub and a grower network.

"The urban farm is the hub and the grower network is the fingers off of that," he said.

"Fast forward a couple years from now and we have this (system) perfected, we think that around the country, we could have five to seven other hubs. Wherever there is water and a vibrant farming community, we can do other hubs."

The reality is anything but that vision.

The civil suit filed July 31, 2018, details what it calls "schemes consummated by the defendants" that it says continued for about three years.

Those accusations include the following:

- The defendants directed that 1.25 million shares of VBF stock be transferred from VBF's Canadian affiliate to a separate company that was owned and controlled by some of the defendants. The stock was transferred at a rate of \$1.25 per share at a time the same stock was offered elsewhere for 90 cents a share. The result, the suit claims, is that the defendants pocketed \$1.125 million in stock at no cost. It claims that this action caused the resulting VBF stock to lose value. All of the defendants, with the exception of Hall, are Canadian citizens, according to the civil lawsuit filing.
- A \$375,000 payment from VBF to a separate company, American Growth Funding LLC, was actually for two loans from AGF to BAJJEER II LLC, another Canadian company owned and controlled by some of the defendants.
- Wulf rebuilt a personal lake house using a VBF employee, Tracy Arbanas, as a construction overseer while her \$97,500 annual salary was being paid by VBF. VBF also picked up the tab for Arbanas' housing during that period and snacks for the work crew. Total bill to VBF: \$107,490.51.
- Gregg Sedun loaned VBF \$200,000 and \$50,000 on separate occasions through his firm, Alcaron Capital Corp., in June 23, 2016, the suit says. The next month, on July 12, 2016, VBF paid Alcaron \$326,056. That showed an interest payment of \$76,000 for a less than one month period. On the same day, the suit claims, Wulf authorized VBF to issue 1,500,000 shares of VBF stock to Alcaron without requesting that it pay for the stock. At the time, the stock was worth 90 cents a share, or \$1,350,000. Two days later, on July 14, Sedun loaned Wulf \$225,000 for the Texas lake house, the suit says. Also, Wulf made Sedun a VBF director.
- The five defendants set their own compensation at \$400,000 each annually, the suit says. The exception is Driver, who was paid \$325,000 a year. The tab: \$1.675 million a year.

- *"None of you have ever seen me and you do not know who I am."* That is the statement the lawsuit claims was uttered by Christine Gagne, Wulf's daughter, who worked for VBF occasionally, but under another name: Ronnie O'Brien. According to the suit, Gagne is a Canadian citizen *"who would often drive from Canada allegedly to work at VBF in Webster City."* The suit alleges it was Wulf who directed that his daughter be paid as *"O'Brien."* Total paid: \$52,264.28.

- Because the delivery of live fish was ordinarily handled by the purchaser, the suit questions why VBF, under the direction of the defendants, bought six tractor trailers that sat dormant. Cost: \$375,237.77.

- Instead of directly buying the specialized fish tanks needed from a supplier, the defendants set up another company, Opposing Flows Aquaculture Inc., in 2014, which became a *"middleman"* for tank purchases, according to the civil suit. Cost: That is what the suit would like to know.

The suit also alleges that VBF money was misused for personal expenses: a \$310,000 house in Webster City, a fleet of 22 company vehicles, personal travel expenses out of state and out of the country, personal living expenses and use of a VBF comptroller for personal accounting.

Overall, the lawsuit claims, the defendants spent VBF into a \$100 million hole.

- The specialized tanks that VBF used, according to Wulf, were designed with multiple species of fish in mind. VBF decided to grow barramundi in them.

"Iowa's First (another incorporation) perfected growing barramundi in these tanks, so we may get to a point of perfecting other fish species and we may get to the point where in Webster City, we're growing two or three different species of fish."

The goal was to produce 7.2 million pounds of fish when in full operation, VBF said when it announced in 2015 that it had contracted the purchase of 2,000 patented *"opposing flows"* technology land-based recirculating aquaculture tank systems, a three-year deal worth \$100 million, according to Messenger archives.

The aquaculture business took over some buildings left empty when Webster City's main employer left town in 2011. People hoped VBF would succeed where others had failed to fill the economic void left when Electrolux closed.

An example of that lack of success was the more than \$700,000 in economic development funds Webster City lost when an electric car start-up company failed in 2012 and went into bankruptcy.

This time, it appears the damage cuts deeper, and has spread further.

An attorney for the debtors in the bankruptcy case did not respond to a request for information.

Although he did not have specific figures, Harfst said he believes the workforce at VeroBlue has been significantly reduced. But he added that some operations are apparently still underway at the company's facility.

"It's my understanding that they still have a couple tanks of fish going."

Messenger City Editor Bill Shea contributed to this story.

20 largest unsecured claims, and are not insiders

- Broadmoor Financial LP, of Wichita, Kansas, \$53,803,271.65 total claim, \$6,000,000 collateral, \$47,803,271.65 in unsecured claims.

- Cablevey Conveyors, of Oskaloosa, a feed system vendor, \$252,255.52

- CEC Electric, of Fort Dodge, an electrical contractor, \$12,563.60
- City of Webster City, for utilities, \$135,979.96
- FM Controls Inc., of Duncombe, a controls vendor, \$23,689.27
- Grant Thornton, of Dallas, Texas, professional fees, \$32,826.67
- First State Bank/UMB, of Kansas City, Missouri, for credit card business expenses, \$82,541.88
- ISG, of Mankato, Minnesota, for wastewater treatment plant, \$27,525.72
- McDonald Supply, of Ames, a material vendor, \$22,510.73
- Midwest Manure Management, of Swaledale, for fish waste disposal, \$38,279.72
- Optimal Fish Food LLC, of Brookings, South Dakota, a feed vendor, \$25,520.27
- Orschein Farm & Home, of Moberly, Missouri, a salt vendor, \$42,732.90
- Packard Electric Inc., of Belmond, an electrical vendor, \$47,694.32
- Phillip L. Sheets LTD, of Belleville, Illinois, breached lease of fish farm, \$416,000
- Select Propane & Fuel Inc., of Red Bud, Illinois, a propane vendor, \$16,185.24
- Skretting, of Tooele, Utah, a feed vendor, \$170,660
- Tropic Star Seafood, of Lakeland, Florida, a fish processor, \$54,570
- Wastewater Technologies LLC, of Monterrey, Virginia, wastewater treatment plant, \$266,815.66
- Westfield Insurance, of Louisville, Kentucky, workers comp insurance audit, \$122,524.49
- Eldon C. Stutsman Inc., of Hills, a salt vendor, \$15,995.92

All creditors listed in the Chapter 11 bankruptcy, filed Oct. 31, 2018

AE Properties LLC, Webster City
 Ag Source, Verona, Wisconsin
 AG Vantage FS, Waverly
 Airgas USA LLC, Atlanta, Georgia
 AmericInn, Webster City
 Analytical Environmental Laboratories, Tyler, Texas
 Baader, Chicago
 Brown & Joseph LTD, Schaumburg, Illinois
 Campbell Supply Company, Iowa Falls
 Cannonball Express Transportation LLC, Omaha
 Card Services, Kansas City, Missouri
 Central Building Supply, Webster City
 CenturyLink, Seattle, Washington
 Cold Locker Processing LLC, Sumner, Washington
 Commodity Forwarders Inc., Los Angeles
 Decker, Fort Dodge
 Envirotech AG Systems Ltd, Sioux Falls, South Dakota
 Forklifts of Des Moines, Des Moines
 Freemont Industries, Shakope, Minnesota
 Fresh by Design, Moss Vale, New South Wales, Australia
 Hamilton County Hospital dba VanDiest Medical Center, Webster City
 Hamilton County Treasurer, Webster City
 Hardin County Treasurer, Eldora
 Hawkins Inc., Roseville, Minnesota

HDR, Omaha
HEMCO Corporation, Independence, Missouri
Internal Revenue Service, Philadelphia
Iowa Department of Revenue and Finance, Des Moines
Johnstone Supply, Ames
JTS Investment LLC, Webster City
Kennebec River Biosciences Inc., Richmond, Maine
Mauer Supply Inc., Oskaloosa
Mediacom, Carol Stream, Illinois
Belin McCormick, Des Moines
Midland Power Cooperative, Jefferson
Midwest Manure Management Inc., Swaledale
Mobile Mini, Des Moines
New Jersey Feed Laboratory Inc., Trenton, New Jersey
NMC, Omaha
NMC Exchange LLC, Denver
Overhead Door Co. of Webster County, Fort Dodge
P&P Electric, Webster City
Pace Analytical Services LLC, Chicago
Pargreen Water Technologies, Addison, Illinois
PFS of Boston Harbor LLC, Everett, Massachusetts
Pier 7 Inc., Boston, Massachusetts
Plumb Supply Company, Des Moines
Prairie Energy Cooperative, Clarion
Qwest Corporation, Broomfield, Colorado
Richard A. Gump Jr. PC, Dallas, Texas
Ruba Lawn Care, Webster City
SNB Farms, Blairsburg
State Hygenic Lab, Des Moines
Strauss Security Solutions, Urbandale
Tony's Tire Service, Webster City
Twin City Fan and Blower Co., Minneapolis
University of Iowa, Iowa City
University of Iowa, Office of General Counsel, Iowa City
UPS, Philadelphia, Pennsylvania
VBF Construction Assets Inc., Webster City
VBF IP Inc., Webster City
VBF Operations Inc., Webster City
VBF Transport Inc., Webster City
VeroBlue Farms USA Inc., Webster City
Verostream Seafood Marketing Inc., Webster City
Washer Systems of Iowa Inc., Des Moines
Wastewater Technologies LLC, Monterrey, Virginia
Wastewater Technologies LLC, Minneapolis, Minnesota
Whitehair Consulting LLC, Muncie, Indiana
Windstream, (no address listed, parent company is in Little Rock, Arkansas)

d.)

SalmonBusiness

Salmon prices fall to new low

News

by **Aslak Berge**

-

16 August 2019

Now it is approaching break-even for several fish farmers.

“Max 40 kroner (€4 euro) for 3-4 (kilograms), FOB fish farmer,” says a fish importer to SalmonBusiness. “There is a lot of fish being produced, there is a lot of fish in Scotland and there is a downward price trend.

For salmon buyers in the world market, this means cheap raw material and increased margins.

FACTS

Every Friday after lunch, SalmonBusiness report spot prices for salmon. These are fish to be delivered the following week. We contact several links in the value chain, including farmers, exporters and importers, and always have at least five independent sources, although not all sources are necessarily displayed in print. We vary the sources we use and do not use the same sources each time.

Losing money

“It’s good for us. But several farmers are losing money – and it’s been a while since the last time,” he notes.

“There is a lot of unsold fish. The first time under 40 kroner (€4) on I do not know how many years. It’s been a while since,” says an exporter.

At the same time, good growth conditions are reported from the cages.

“There is less mortality, better feed conversion ratio. They are better at fighting sea lice. Now you use only the best feed. There are many factors that come into play.”

Derail

As if that wasn’t enough, it’s the trouble with the logistics.

“And now they are struggling with the Nordlandsbanen railroad, which is closed due to derailment. We have not been able to get enough trucks to cover that in Northern Norway. Many customers out there also buy fish to keep in (frozen) stock for later this fall,” he adds.

“Is there a bottom in the market?” asks one exporter.

Fulfilled

“It is a fairly confusing picture,” says another. “The market is so filled with fish that it is hopeless. Prices must now be under 40 kroner, but will you sell at that level?” he asks rhetorically.

“It is almost impossible to sell. I think it will be two to three weeks now that will be very difficult. I don’t think it will be ok until August is over as the smokers are packed with fish.”

SalmonBusiness’ industry sources refer to the following farm gate prices for the most traded weight classes.

- 3-4 kilograms NOK 38-39 (€3.8-3.9)
- 4-5 kilograms NOK 40-43 (€4.0-4.3)
- 5-6 kilograms NOK 46-48 (€4.6-4.8)

This is the lowest price level recorded since late fall 2017.

e.) Too Banks

https://salmonbusiness.com/banks-skeptical-about-financing-land-based-fish-farms-must-have-a-better-overview-of-the-overall-risks/?fbclid=IwAR3qcT2_BhR7AJ8RpNqtaAovmy4VTWGsXgrPFN5pBMjoQPefoJV SFr_psuY

Banks skeptical about financing land-based fish farms: “Must have a better overview of the overall risks”

News by **Andreas Witzøe** - 15 January 2019

“As a bank, we must have a better overview of the overall risks before we consider financing full-scale food fish farms in addition to the current traditional aquaculture,” said **Rune Søvdsnes, aquaculture manager at SR-Bank.**

More and more people are planning large food fishing facilities on land in Norway. This week, SalmonBusiness was able to reveal that serial entrepreneur Geir Nordahl-Pedersen is planning three land fish farms with a total capacity of over 100,000 tonnes of salmon. However the entrepreneur didn't want to divulge anything about how the plant is financed.

There are big plans in the Nordic country. In southeastern Norway, Nordic Aquafarms are gearing up for their Fredrikstad facility. In Western Norway in Møre og Romsdal, Salmon Evolution has been granted a license for a land-based salmon farm, which could become Europe's largest.

Norwegian banks, on the other hand, are still very skeptical about whether this is something to focus on in. DNB has previously stated that it will not contribute with funding at such facilities in Norway, but has stated that they interested facilities outside of Norway.

The risk is significant and unresolved

Aquaculture manager at Sparebank 1 SR-Bank, Rune Søvdsnes, said that they currently fund post-smolt facilities on shore, but believe it's too early before they are become interested in, and willing to, contribute to funding for land-based facilities.

“We are following developments, but for the time being, the bank only finances post-smolt facilities on land. Full-scale farming of salmon on land is still in a relatively early phase. The biological risk is currently both significant and unresolved. And we must remember that there are still major challenges for the post-smolt facilities that have been built,” said Søvdsnes.

Søvdsnes believes it's important to have a better overview of the overall risk involved before they consider financing full-scale food fish farms in addition to what they finance today with traditional aquaculture.

“We must see (how) competitive land-based fish production is in the long term proves to be competitive (in relation to its current forms in the sea) both – on the cost *and* risk side – before even considering financing this type of plant,” said Søvdsnes.

Requires significant equity and extreme competence from the developer

Vegard Helland, executive vice president of business Sparebank 1 SMN, said that, like Sparebank 1 SR-Bank, they contribute funding to post-smolt facilities onshore.

“Regionally, there have been no projects in the field of fish farming that have been aimed at us, nor have we wanted to contribute in such. In order for us to contribute with financing, the developer must set a considerable amount of equity, and not least, must demonstrate extremely good expertise,” said Helland.

He believes the risks, in addition to the obvious biological risks in a relatively untested technology, are too large.

“Farming is volatile stuff, if you start with larger projects on land and it works, then we will soon see prices drop, but’ we can risk not getting anything in return for what we have financed,” said Helland.

He added that they believe the lowest production costs still exist in the sea and are uncertain whether lan-based fish production in Norway will pay off at all.

“If you farm in land, you must save costs on transport, and then it needs to be closer to the markets. As a bank, we have been involved in farming ever since the start and have a good overview of what works,” he concluded.

f.) <https://www.intrafish.com/aquaculture/1616786/land-based-salmon-farmers-proceed-at-their-own-risk-insurers-say>

Land-based salmon farmers proceed at their own risk, insurers say

Though there's plenty of promise, there's also a huge amount of risk.

by Anders Furuset

October 26th, 2018 11:13 GMT Updated October 26th, 2018 12:40 GMT

With new technology, massive capital investments and an as-of-yet unclear model for production and marketing success, land-based salmon farmers are blazing a new trail in aquaculture.

New analysis finds greater costs for land-based aquaculture

Read more

While pioneering an industry is exciting, it also comes with significant risk, and as of now, some insurers aren't ready to make any bets.

Arne Gangdal, head of aquaculture and marine insurance at Gjensidige, one of Norway's largest insurers, said he sees far too many question marks at this time.

“We want to see that it works well and that there is a period of stress-testing before we dare to enter the sector,” he told **IntraFish**.

That means, in short, that Gjensidige isn't offering insurance to land-based salmon producers.

"That's a risk the companies involved must take themselves," Gangdal said. "We have no experience with large-scale farms on land and there are no statistics to even calculate prices."

The aquaculture industry is already a low-margin business for the insurance sector, he noted, so adding any additional risk isn't viewed as a positive.

Too limited

Danish insurance group Tryg also told **IntraFish** it isn't very enthusiastic about land-based salmon farming.

"Research and development is taking place, but there's a lot left before salmon-farming on land becomes a real alternative," the company wrote in an email.

"When assessing new technology where the experience base is limited, it's reasonable for a policyholder to carry a greater part of the risk themselves."

Still, the company said it was "basically positive," but would consider each facility individually.

g.)

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5484108/>

Bacteria can acquire antimicrobial resistance (AMR) either through mutation, or more likely horizontal gene transfer (HGT) in the environment, via natural transformation, transduction, or conjugation [27,28,29,30,31,32,33]. The genetic plasticity of the microbial community enables resistance genes to move quickly throughout different environmental bacterial populations and communities. The resistome (a collection of all AMR genes in a microbial community) in many different habitats has become an area of intense focus, with many studies examining how AMR pathways spread and evolve [34,35,36,37].

Aquaculture systems and farms have been designated as "genetic reactors" or "hotspots for AMR genes" where significant genetic exchange and recombination can occur, which can shape the evolution of future resistance profiles [38,39]. It has been estimated that 90% of bacteria originating in seawater are resistant to one or more antibiotics and up to 20% of the bacteria are resistant to at least five [40]. Once bacteria have acquired AMR genes, they may exist in the environment for a long time, even after the selection pressure ceases [41].

The prolonged use of antibiotics in aquaculture increases the selective pressure on bacterial populations, even at concentrations of antibiotics well below the minimum inhibitory concentration of the susceptible wild type population [42], and also increases HGT rates, including human and fish pathogens. Due to antibiotics being relatively stable and non-biodegradable, residual antibiotics can remain in commercialised fish and shellfish for consumption [7,8]. Done and Halden (2015) [43] measured low but significant levels of tetracycline (oxy- and 4-epioxytetracycline), macrolide (virginiamycin), and sulfonamide (sulfadimethoxine/ormetoprim) antibiotics in samples of farmed trout (*Oncorhynchus* spp.), tilapia (*Oreochromis* spp.), and salmon from 11 countries including the US, China, Mexico, Thailand, Scotland, and Canada. While the

concentrations were in compliance with US FDA regulations, it was suggested that the presence of these antibiotics might provide a selection and enrichment mechanism for resistant bacteria [43]. Similarly, Wang et al. (2017) [44] screened finfish and shrimp samples collected from across Shanghai City for 20 common antibiotics (tetracyclines, fluoroquinolones, macrolides, β -lactams, sulfonamides, and phenicols). Antibiotic residues were found in 52% of the samples (40–91% of the finfish sampled and 17% of shrimp), with residues and their consumption accounting for 75% and 70% of the overall variance of estimated antibiotic exposure for men and women, respectively [44]. Given that 10% of the aquatic products sampled exceeded the maximum residue limits (MRL) for some antibiotics [44], it is clear that aquatic products have the potential to pose multiple health and AMR selection risks in countries where MRLs are not strictly enforced.

In addition to the use of antibiotics, other pharmaceuticals and metal-containing products are often used in aquaculture to prevent fouling, and to feed and treat fish, in order to limit the spread of infections [17]. For example, copper (Cu)-containing materials are often applied as anti-fouling agents for farm cages and nets and in the chemical control of parasites [45]; some cages themselves are made from Cu alloys [17], and high concentrations of cadmium, iron, lead [46], and mercury [47] have been reported in some commercial fish feeds. The introduction of heavy metals into the natural environment through aquaculture practices and other anthropogenic sources to the environment (e.g., the use of cadmium in pesticides and fertilizers [48]), frequently results in metal concentrations in water and sediments that exceed levels predicted to drive the co-selection of antibiotic resistance in the marine environment [49]. Therefore, the exposure of bacterial communities in and around aquaculture operations to the combination of heavy metals, antibiotics, and other co-selecting factors may further increase the likelihood of selection and co-selection of antibiotic resistance [37,38,40]. For example, previous studies on fish and eel aquaculture systems have found strains of *Aeromonas* with high levels of resistance to antibiotics and heavy-metals [50], with multiple plasmids, integrons, and gene cassettes for antibiotic resistance [51]. Fish are reservoirs of zoonotic pathogens that cannot only infect the animal host but can also infect humans who are in contact with the aquaculture facility and via foodborne infections [52]. Common infections in aquaculture facility fish handlers include *Aeromonas hydrophilia*, *Mycobacterium marinum*, *Streptococcus iniae*, *Vibrio vulnificus*, and *Photobacterium damsela* [53,54]. Although problematic as zoonotic pathogens, these microorganisms may also contain and spread AMR genes such as extended-spectrum beta-lactamases (ESBL) [5]. Faecal matter from *Sparus aurata* (Gilthead seabream) was found to contain ESBL-resistance genes, including *bla*_{TEM-52}, *bla*_{SHV-12}, as well as *cmlA*, *tetA*, *aadA*, *sul1*, *sul2*, and *sul3* [55]. Furthermore, bacterial strains carrying resistance determinants in commercial seafood products [56] include disease-causing pathogenic bacteria in humans [57,58], thereby increasing the risk of spreading AMR from aquaculture to the consumer.

Li et al. (2017) [90] found that biofilms from RAS mixed bed biofilters are a reservoir for antibiotic resistance genes, including *tetO*, *qnrA*, and *tetE*. Biofilms, however, are generally resistant to penetration by antibiotics [90,91], which, makes the treatment of pathogens difficult [92]. While Bebak-Williams (2002) [93] found increased levels of

oxytetracycline residue in sediment, biofilter, and fish muscle in a freshwater RAS after treatment with medicated feed, oxytetracycline levels decreased to nearly undetectable levels with time after withdrawal of the drug. Very little is known about the occurrence of AMR bacteria in RASs and those that have screened for AMR pathogens concluded that their presence could be explained by the use of infected fish stocks [94,95]. Table 1 details some of the representative antimicrobial resistance factors that have been detected in aquaculture facilities across the world.

Table 1
Representative microbial antibiotic resistance determinants identified from aquaculture systems.

Antibiotic Class	Antibiotic Resistance Gene	Aquaculture System or Fish Species	Reference
β-Lactam (e.g., Ampicillin, Amoxicillin)	<i>bla_{TEM-52}</i> , <i>bla_{SHV-12}</i>	Gilthead Seabream	Sousa et al. [55]
	<i>bla_{TEM}</i>	Fish farms, Pakistan and Tanzania	Shah et al. [96]
Tetracycline (tetracycline, oxytetracycline, chlortetracycline)	<i>tetM</i> , <i>tetO</i> , <i>tetT</i> , <i>tetQ</i>	Fish farms, Tianjin, and Guangdong, China	Gao et al. [64], Xiong et al. [65]
	<i>tetM</i> , <i>tetS</i>	Japanese and Korean coastal farms	Kim et al. [97]
	<i>tetA</i> , <i>tetG</i>	Chilean salmon Fish farms, Pakistan and Tanzania	Shah et al. [98] Shah et al. [96]
	<i>tetA</i>	Marine aquaculture, Spain and Portugal	Rodriguez-Blanco et al. [99]
	<i>tetA</i> , <i>tetB</i> , <i>tetK</i>	Salmon aquaculture, Chile	Buschmann et al. [19]
Sulfonamide, sulfamethizole	<i>sul1</i> , <i>sul2</i> , <i>sul3</i>	Fish farms, Tianjin, China; farmed freshwater fish, Guangdong, China; Gilthead seabream	Sousa et al. [55], Gao et al. [64], Xiong et al. [65]
	<i>sul1</i> , <i>sul2</i>	Chilean salmon; fish farms, Tanzania and Pakistan	Shah et al. [96], Shah et al. [98]
Aminoglycoside (Streptomycin, spectinomycin, neomycin)	<i>aadA</i> <i>strA-strB</i>	Chilean salmon, fish farms, Tanzania and Pakistan; catfish farm, Vietnam; carp farms, Poland	Shah et al. [96], Shah et al. [98], Nguyen et al. [100], Piotrowska et al. [101]
	<i>aad1</i>	Gilthead Seabream	Sousa et al. [55]
Amphenicol (chloramphenicol, florfenicol)	<i>cmlA</i>	Gilthead Seabream	Sousa et al. [55]
	<i>cat-1</i>	Fish farms, Tanzania and Pakistan	Shah et al. [96]
	<i>floR</i>	Salmon aquaculture, Chile	Buschmann et al. [19]
	<i>catB</i>	Catfish farm, Vietnam	Nguyen, et al. [100]
Quinolones (oxolinic acid, ciproflaxin)	<i>qepA</i> , <i>oqxAB</i> , <i>qnrS</i> , <i>aac(6)-Ib</i> , <i>qnrB</i> , <i>qnrD</i>	Farmed freshwater fish, Guangdong, China	Shah et al. [98], Jiang et al. [102]
	<i>qnrA</i> , <i>qnrB</i> , <i>qnrS</i>	Salmon aquaculture, Chile	Buschmann et al. [19]
Macrolides (erythromycin)	<i>mefA</i>	Fish farms, Tanzania	Shah et al. [96]
	<i>ermC</i> , <i>ermE</i> , <i>ermX</i> , <i>ermC</i>	Carp farms, Poland	Piotrowska et al. [101]
Trimethoprim	<i>dfpA1</i> , <i>dfpA5</i> , <i>dfpA12</i>	Chilean salmon; fish farms, Tanzania and Pakistan	Shah et al. [96], Shah et al. [98]

Antibiotic Class	Antibiotic Resistance Gene	Aquaculture System or Fish Species	Reference
	<i>dfra12</i>	Catfish farm, Vietnam	Nguyen et al. [100]
Quinoxaline 1, 4-di-N-oxides (carbadox, olaquinox, mequinox)	<i>oqxA</i>	Salmon aquaculture, Chile	Buschmann et al. [19]

h.)

<https://salmonbusiness.com/thousands-of-salmon-escape-from-land-based-facility/>

Thousands of salmon escape from land-based site

News

By Stian Olsen

2 August 2019

On Tuesday this week, Directorate of Fisheries received an escape report at Fjordsmolt's land-based facility in Troms, Northern Norway, which happened in connection with ongoing work at the plant.

"The extent is not yet known, but it is clear that this is a larger escape," wrote the Directorate of Fisheries.

Fjordsmolt has so far captured about 47,000 salmon.

The Directorate of Fisheries has carried out an inspection of the site following the incident and will follow up the case, among other things, with a view to mitigation measures.

Fjordsmolt also plans to establish a large smolt plant in Bogen, Northern Norway, in an old foundry. The reason is limited expansion possibilities at existing facilities in Grovfjord. This is how the new plant should look.

Last month, 49,000 salmon escaped from SinkabergHansen's site Oksbåsen in Bindal, also Northern Norway. On Thursday, 11,431 salmon were recovered, according to Sinkaberg CEO Svein-Gustav Sinkaberg.

i.)

An 11-year study in Port Mouton Bay, Atlantic Canada was released June 28, 2018.

"Our results indicate that average market lobster catch per unit effort (CPUE) was significantly reduced by 42% and berried lobster counts by 56% in feed compared to fallow periods. Moreover, both market and berried lobster CPUE tended to be lower in fishing region 2, which included the fish farm, and higher in region 5, furthest away from the farm." The study reported:

- Lobster "sniff" the odor seascape with their antennules and chemoreceptors found on their legs
- Odors are used to locate food, find mates, detect predators and avoid environmental stresses

- Sulphides and ammonium have toxic and behavioural effects on adults and other lobster life stages
 - In laboratory studies, 50% of lobsters die within 3.3 days in low oxygen, low sulphides (5.5 μM) and ammonium (17 μM) conditions (Draxler et al. 2005)
 - Berried lobster are very sensitive to odors and temperature
 - Berried lobster show retreat behaviour at 50 μM sulphide (Butterworth et al. 2004); at 500 μM and regular oxygen conditions, 50% of lobster died in 22.5 hr.

Further, the study cited the effects of nitrogen pollution include:

- Decrease in water quality
- Increase in epiphyte growth on eelgrass
- Increase in benthic algae
- Increase in nuisance or “slime” algae

Re: submittal for tonight

Wayne Marshall

Mon 8/19/2019 3:32 PM

To: Natalie c <mallard1843@gmail.com>

Hello Natalie

I have received your email. I will be providing printed copies of your comments at tonight's Board meeting.

Wayne

From: Natalie c <mallard1843@gmail.com>

Sent: Monday, August 19, 2019 2:23 PM

To: Wayne Marshall <wmarshall@cityofbelfast.org>; Wayne Marshall <wmarshall@cityofbelfast.org>

Subject: submittal for tonight

Dear Members of the Belfast Planning Board:

Here are some concerns about Nordic's technical ability:

Nordic's experience with salmon is limited to a facility in Norway that is not yet operational. So they have no track record with salmon, let alone a factory the size of what they propose for Belfast. Further, nobody else has a track record with a facility of this size.

Nordic has never run a facility anywhere near as big as what they propose to build here. While they assure us that they have some experience with pod technology and that there would just be many more pods in their potential Belfast facility, a project magnitudes larger will have its own significant unforeseen problems.

These concerns are borne out by the insurance industry's caution about insuring RAS facilities. Here is just one of many recent articles on this topic that came up on an online search:

<https://salmonbusiness.com/aquaculture-insurer-on-ras-less-than-2-premium-but-over-5-of-the-losses/>

Here are two quotes:

"“(RAS has) less than 2% premium, but over 5% of the losses. This has so far been a loss making project for us.” That is what Geir Myre, global head of aquaculture insurance at insurance company AXA XL Catlin, said during a presentation during the North Atlantic Seafood Conference in Bergen on Tuesday.”

““This is our insurance risk,” he said. “There are many small things that can go wrong. We need more expertise in place before we can assure it or if we are going to insure it.”

Banks also share concerns about lending to RAS facilities because it is very new, untested technology. Here is a quote from the Deloitte Report commissioned by the City of Belfast:

“Bank financing will likely be dependent on a high share of capital being raised from private investors.”

Articles addressing this concern are also available online.

Comment by email
8/19/19 FB mfg

If the board does approve this project, an adequate Security Bond must be in place to cover any environmental damages from technology failure to protect Belfast taxpayers.

Thank you.

Sincerely,
Natalie Charles, Belfast

Written comment
by email.

Re: Planning Board Testimony for August 15, 2018

PB Hearing

Tue 8/14/2018 4:39 PM

To: John Krueger <jkrueg1@gmail.com>

Dear Mr. Krueger

I acknowledge receipt of your comments submitted via this email. The City will provide the comment to the Board in advance of the upcoming August 15 public hearing.

Wayne

On Tue, Aug 14, 2018 at 4:16 PM, John Krueger <jkrueg1@gmail.com> wrote:

Please share my written testimony to the Belfast Planning Board. Please also share my testimony submitted in April to the City Council on the zoning change as well as it also discusses my concern with the lack of participation with comprehensive plan and planning board.

Planning Board Testimony, August 15, 2018

My name is John Krueger. I am a Northport resident. What happens in Belfast does not stay in Belfast, but affects people in surrounding towns. Thank you for inviting my testimony.

As selectmen in the Town of Liberty for 23 years and a one Term School Board member and having witnessed the complexity of town volunteer work, I can easily state that serving on a planning board is about as difficult as it gets. There are often complex and objective technical issues to be weighed against strong political, environmental, and economic constraints. Thank you for listening to concerns about this large zoning change that may affect multiple towns in the area.

For me personally, I think it is a shame that such a pristine and beautiful spot in Belfast could be home to the size of experimental industries described in the amendments: with 50 foot buildings, huge cuttings of protected forests, seemingly unlimited access to groundwater, and production of large quantities of wastes. I would find it particularly difficult to recommend these amendments without significant planning efforts. I would have hoped for other options for use of this property such as the Belfast area need for housing. The amendments before you should not be recommended in haste.

In addition, I believe that the new amendments give the planning board responsibilities that might require significant outside resources. In particular I cite your responsibility in complex potential large scale activities such as:

- **Land based aquaculture operation discharge of wastewater to and use of water from a marine or fresh waterbodies**
- **Significant groundwater well extraction.**
- **Significant water intake or significant water discharge/to both marine and fresh water**

I would feel more comfortable if a path is defined that provides non-biased professional assistance to the planning board. To be clear, State and Federal assistance cannot be assured in these volatile times. Few standards are even available for aquaculture.

Belfast is essentially offering to industries its natural resources. These include both Waldo County's ground water on a scale never seen before in Maine and also its bay for discharge of effluents not totally understood. These amendments then put the Belfast Planning Board in the difficult position to impose conditions necessary to minimize adverse impacts of a huge industrial experiment. Your reviews and decisions may require understanding of complex environmental science. As an early director of the Maine DEP Hazardous Wastes Programs I can point to numerous huge disagreements between hydrogeologists regarding groundwater flow. Ultimately many resolutions could only be made after testing for contaminants after the fact. One should also add that evaluating the dispersal of nutrient discharges into the bay is complex with limited data.

In closing, I would like to see some assurances that the planning board has the necessary resources to take on this responsibility before recommending the adoption of such a broad and over reaching amendments. In my opinion, planning for such huge changes to Belfast and the surrounding towns deserves additional input before they can be recommended.

--

John Krueger
207-322-6297
291 Rocky Road

8/5/19 Comment
Presented at Board mtg

TO: Belfast City Planning Board
Att: Wayne Marshall
Director, City of Belfast Code & Planning

FROM: Holly Faubel & David L. Sprague
1 Steamship Point, Belfast ME

RE: August 5, 2019 Planning Board review of
Nordic Aquafarms, Inc. proposed project

As owners of a waterfront home in Belfast, Maine, longtime tax payers, and supporters of both the City and the idea of Belfast having thriving aquaculture businesses located here, we are submitting these comments.

Our input is based on our work experience in production, technology, and business development for broadcast television, the US Government, RCA Research Labs, GE, and Intel Corporation.

Overview:

The Land Based RAS industry is going through similar growth patterns as the computer industry in the early 80's-late 90's.

Rapid innovation

Highly speculative investment through equity and venture capital

High volatility in terms of failure and success rates

Rapid forming and reforming of corporate alliances

Shifting of key technical contributors from one entity to another

Complex intellectual property challenges

However, there is a key difference between those entrepreneurial efforts and the Land Based Land-based Aquaculture industry. Many of these are only partial re-use systems require high volume fresh water intake and

effluent discharge. Therefore, it is ***highly dependent on natural resources and could have a substantial public impact on those resources.***

- Unlike accidents or pollution on land, where remediation is manageable, accidents or on-going pollution in water spreads quickly and is not easily contained
- Today, Maines DEP has no benchmark for, and doesn't test for nitrogen in effluent, yet nitrogen cause visible algae blooms and deep current algae streams

There are zero-discharge, Closed RAS systems that are growing and selling salmon raised in saltwater. To date, Nordic has chosen to implement a partial recirculation system.

The difference between a Partial RAS operating at 90 - 99% reuse and a 100% zero-discharge, Closed RAS system is substantial in terms of natural resource impact.

Here are the list of questions that we feel are important to for the Board to have answers to before ruling on the Financial sufficiency and Technical sufficiency:

Regarding Financial Capability:

1. How much of the \$63 million in reported equity that Nordic AS holds are they contributing to Nordic Inc, when will that money transfer take place, and how much of it will be earmarked and held for the Belfast project?
2. If and when Noric AS raises any new equity what portion of that equity raised what will be transferred from Nordic AS to Nordic Inc and what portion will be earmarked and held for the Belfast Project?
3. At what point will Nordic Inc. obtain sufficient insurance coverage for its construction and start of operation and what will be the amount of coverage?
 - a. To date Nordic shows insurance coverage of only \$2 Million to cover the construction of a \$125-\$250 Million dollar Phase 1 facility.
4. What is your requirement to NAF for performance bonds and ongoing indemnification for duration of the Phase 1 construction and operation

REGARDING TECHNICAL CAPABILITY:

1. Each of you is being asked to determine the technical capabilities of NAF to successfully construct and operate this facility, based on a new, untested design.
 - a. Do each of you have the knowledge necessary to make this decision based on sources independent of NAF?
 - i. By independent, we mean sources other than those funded by NAF or ones that are potential recipients of future funding from NAF.
 - b. What sources have you consulted?
2. At what point does Nordic AS expect its first basic patent to be granted in the US?
 - a. A search of the World Intellectual Property Organization (WIPO) and other databases shows only a grant in Australia, with Canada as pending.
3. What is the schedule for any further filings that are expected as this patent is very basic and we see no additional filings being made that resemble the current design?
4. As Nordic has stated that the "Belfast Design" a next generation, improvement of RAS2020 can you provide us with a cross-license agreement from the holders of the RAS2020 patents?
5. Is there a consulting contract between Nordic AS/Inc and the chief designer of the Belfast System system design and plant integration is still underway.

Recommendations:

1. Grant a continuance to the Financial and Technical Capabilities so that the board has an opportunity to answer the questions raised in this meeting.
2. Obtain an Indemnification Agreement signed by Nordic AS prior to the Board issuing its first findings. (Attachment # 1, Attachment # 2)
 - a. It was used to protect and indemnify the County Planning office, their legal Counsel and their staff from Litigation arising from legal challenges when discretionary approvals are required.
3. Require that an Indemnification Agreement and a Performance Bond be entered into before issuing any final approvals which would cover both the course of construction and the Operation of the facility at least through Phase 1 delivery of fish to market.
4. Require Nordic AS/Inc to sign a non-disclosure agreement regarding any press releases or discussions regarding the Boards findings until the Board has finished it final approvals.
 - a. The rolling approval structure is fraught with challenges. The external pressure will only increase on the Board when and if it tries to make changes after Nordic has been issuing statements in public forums

Attachments

Attachment 1:

http://rivcocob.org/agenda/2015/03_24_15_files/03-35.pdf

Note: Change Property Owner to "Applicant/NAF AS"

Change County to "City of Belfast"

Change California Environmental Quality Act to "Maine Department of Environmental Protection, Land Laws Title 38, Chapter 3: Protection and Improvement of Waters"

Attachment 2:

Maine Department of Environmental Protection, Land Laws
Title 38, Chapter 3: Protection and Improvement of Waters

<https://www.maine.gov/dep/land/laws/index.html>

To: City of Belfast Planning Board

Comment by email

for 8/5/19

Board meeting

From: Lawrence Reichard, Belfast Resident

Re: Nordic Aquafarms

I am a freelance journalist; I have lived in Belfast for five years; and I have lived in midcoast Maine for most of the last 37 years. Over the course of the last year and half I have done extensive research on Nordic Aquafarms, and I have written extensively on the company. That writing has appeared in The Republican Journal, Village Soup, the Bangor Daily News, two California newspapers and one national publication.

In the fall of 2018, I traveled to Norway and Denmark to look at Nordic Aquafarms' operations in those countries. As chance would have it, I was an exchange student in Denmark, and as a result, I speak Danish and am able to understand Norwegian.

What I found in Norway and Denmark, and what I have found through my research, should be of considerable concern to this body and to the entire Belfast community.

In the interest of brevity, I won't here go into all that I have uncovered about Nordic Aquafarms, but I urge all members of the Planning Board to read the eight columns I wrote on Nordic Aquafarms that were published by The Republican Journal and Village Soup. All eight of these columns are available online at waldo.villagesoup.com.

I understand that the Planning Board is accepting comments on Nordic's technical capacity to manage and administer a large land-based fish farm, and on the company's financial ability to successfully build and manage such a project, and I shall address these two areas, which are related and interconnected.

I am not an expert of Nordic's finances, and frankly I don't think anyone outside of the company knows much about this, as Nordic Aquafarms has publicly said essentially nothing about its finances except to issue assurances that it is financially capable of completing its planned \$500 million project.

But the signs and indications that are public are not re-assuring.

Despite its statements to the contrary, Nordic Aquafarms has little experience in financing, building, or managing fish farms, and it has no experience in financing, building or managing a fish farm at anywhere near the scale of what the company proposes to do in Belfast. Nordic Aquafarms did not build its Maximus smolt operation in Denmark — it purchased the facility. And according to Danish aquaculture expert Bent Urup, Nordic Aquafarms played a relatively minor role in the development of its Sashimi Royal fish farm in Denmark. Urup was himself heavily involved in the development of both facilities and in fact owned the Maximus operation and sold it to Nordic Aquafarms.

Nordic did build its operation in Fredrikstad, Norway, but none of Nordic's three fish farms is more than one fifth the size of what the company has proposed for Belfast — and its Maximus plant is much smaller than one fifth that size.

What little we do know about Nordic's finances raises considerable doubts about the company's ability to build and operate a very complicated and complex project of this size.

By its own admission, Nordic doesn't yet have in place the financing necessary to complete its Belfast project. In other words, Nordic Aquafarms proposes to clearcut and pave over dozens of acres of the cherished Belfast Woods for the sake of an unsure - and unprecedented - industrial project.

For its operations in Norway and Denmark, Nordic Aquafarms has sought and received numerous grants and tax breaks from local and national governments, and from the European Union (EU). And Nordic has sought, and in at least some cases received, similar grants and tax breaks here in Belfast. Nordic's track record on project financing is clear: it has not carried its own financial burden; it does not intend to start carrying its own financial burden; and by its own admission, its very ability to carry its own financial burden is open to question. Clearly Nordic Aquafarms is not averse to having taxpayers shoulder financial responsibility for its operations.

As stated previously, the issues of Nordic's finances and expertise are inter-related. According to the previously cited Danish aquaculture expert Bent Urup, at least some of the personnel hired by Nordic Aquafarms to manage its facilities are not of the caliber to manage here in Belfast what even Nordic itself admits is a very complex and complicated system. And the evidence suggests that Mr. Urup is correct. Nordic's chief technology officer has no advanced degree, has published no papers or articles, and has no experience running or managing anything near as large as what is being proposed for Belfast.

Other key personnel pegged for Belfast have similar minimal or negligible experience and give every appearance of being woefully unprepared for managing a system such as that being proposed for Belfast. No land-based fish farm this big has ever been built anywhere in the world, and the credentials of Nordic's Belfast personnel are well short of what is likely required for the successful operation of such an unprecedented operation. This glaring lack of experience contrasts sharply with, for example, the plans of Aquabanq, a U.K.-based company that seeks to build another land-based fish farm in Maine and which has hired Mr. Urup to oversee its Maine operation.

In announcing the hiring of some of its key Belfast personnel, Nordic Aquafarms cited their experience as lab assistants, in building log cabins, and in having lived in Florida. Clearly this is not re-assuring.

But one need not rely on the questionable resumes of Nordic personnel to assess the company's abilities. Nordic's actions here in Maine also speak to the company's lack of experience, or worse. Earlier this year, in official testimony to the Maine legislature's Joint Standing Committee on Agriculture, Conservation and Forestry, Nordic Aquafarms management stated that fish cannot escape from land-based fish farms. As I fully demonstrated in a subsequent letter to the committee, this is simply not true, and even Nordic Aquafarms itself had admitted this on multiple occasions prior to this testimony. This testimony, made in contradiction to Nordic's own previous statements, seems to have been the result of incompetence or an intentional attempt to mislead. I am happy to make my letter to the legislative committee available to the Planning Board.

In fact, the lack of experience and expertise of Nordic's Belfast personnel is so glaring that cost-cutting, incompetence and or sheer indifference to end results seem to be the only logical explanations. With the health and wellbeing of Belfast Bay and our watershed and aquifer at stake, this is no place to gamble or experiment on a decided, profound and glaring lack of expertise.

But Nordic's struggles with managerial competence stretch beyond its proposed Belfast project. In Denmark I interviewed a former Nordic Aquafarms employee whose duties, at the age of 14, included cleaning with a DuPont chemical called Virkon S. The labels on containers of Virkon S clearly state that the chemical can be harmful to human eyes, but in violation of Danish law, this former employee was employed to clean in Nordic's Maximus smolt plant without protective eyewear. And what is more, it is illegal under Danish law for a child of 14 to handle Virkon S under any circumstances.

Clearly this magnitude of incompetence on the part of Nordic Aquafarms management does not speak well for the caliber of such management, nor does it bode well for the successful management of Nordic's operations here in Belfast. And while Nordic Aquafarms attacked my reporting on this mismanagement, the company has never denied this charge made against it.

In closing, Nordic Aquafarms will face many sizable and significant hurdles and challenges if it is allowed to proceed with its proposed Belfast project, and the evidence to date is strong and clear: Nordic's experience, expertise and competence is well short of what should be expected of a company that wants to risk the future of our bay, our watershed, our aquifer and indeed our community as a whole on a project of unprecedented scope.

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Public Comment to Planning Board

Having attended the City of Belfast Planning Board meeting last night (August 19) , I first want to thank all the people on the Board for your great time and effort in fulfilling your responsibilities to the people of Belfast and surrounding communities. What a huge time consuming task!

I am taking up the suggestion from last night's meeting to wade through the information that I heard and pick just a few questions that were raised about the technical ability of Nordic to complete this project successfully, and send these on to the Board. They are:

1. What is the ACTUAL experience, with land based salmon farming --ie how many full grown salmon have been farmed to maturity successfully by Nordic? I think the scale of the project may be what makes it experimental.
2. Can we get a clear description of the actual waste water system that is so critical to ensuring that the effluent of 7.7 million gallons a day is not harmful to the Bay, or aquifer? Who is the designer of this and what is their experience?
3. And what about the software? This project's success will be totally reliant on the computerized system that operates it---who is the team designing this? And who will be the responsible party? As a Nurse Practitioner who has been in the office when the computers go down, and we have absolutely no access to anyone's charts, this is a major concern that I never thought about until it was brought up last night. Fish need lights, heat, feed and cleaning 24 hours a day, no matter what.
4. The patents--does Nordic hold them or are they in contractual agreement with those who do? Also something I know nothing about and seems critical to have someone review this that understands patent law.
5. And finally, is there a surety bond or a specific contract with the city so that in the event the facility has major glitches, or goes bankrupt like several previous ventures, so the local taxpayer does not pay for clean up or an empty facility of this tremendous size?

These were some of the questions raised during the public response part of the meeting that sound to me like good questions to look at. Thank you again for your diligence and time.

Meredith Bruskin

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