STATE OF MAINE
DEPARTMENT OF MARINE RESOURCES
Standard Aquaculture Lease Application
Suspended & bottom culture of shellfish & seaweeds
Damariscotta River, Damariscotta

Johns River Shellfish, LLC
Lease DAM BN

Docket #2014-10
February 19, 2015

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION

Johns River Shellfish, LLC, a Maine corporation, applied to the Department of Marine Resources ("DMR") for a standard aquaculture lease on 3.36 acres located in the coastal waters of the State of Maine, south of Blackstone Narrows in the Damariscotta River in the Town of Damariscotta in Lincoln County, for the purpose of cultivating American oysters (*Crassostrea virginica*), European oysters (*Ostrea edulis*), hard clams/quahogs (*Mercenaria mercenaria*), and the marine algae/seaweed species nori (*Porphyra spp.*), dulse (*Palmaria palmata*), and sea lettuce (*Ulva lactuca*) using suspended and bottom culture techniques. DMR accepted the application as complete on July 7, 2014. No one intervened in this case. A public hearing on this application was held on November 10, 2014, in Damariscotta.

1. THE PROCEEDINGS

Notices of the hearing and copies of the application and DMR site report were provided to numerous state and federal agencies for their review, as well as to various educational institutions, aquaculture and environmental organizations, the Town of Damariscotta and the Damariscotta Harbormaster, members of the Legislature, representatives of the press, riparian landowners, and other private individuals. Notice of the hearing was published in the *Lincoln County News* on October 9, 2014 and October 28, 2014, and in the *Commercial Fisheries News* November 2014 edition.

Sworn testimony was given at the hearing by: David Cheney, President and owner of Johns River Shellfish, LLC; DMR Aquaculture Environmental Coordinator Jon Lewis; DMR Aquaculture Scientist Marcy Nelson; Damariscotta Harbormaster Paul Bryant; and riparian landowners David Atwater, Matthew Goetting, and William Judd. Each witness was subject to questioning by the Department, the applicant, the intervenors, and members of the public. The hearing was recorded by DMR. The DMR hearing officer was Diantha Robinson. DMR hearing officer Gail Mackinson also participated.

The evidentiary record before the Department regarding this lease application includes exhibits introduced at the hearing (see exhibit list below), the record of testimony at the hearing itself, and the revised site plan submitted by Mr. Cheney after the hearing at the hearing officer's request. The evidence from all of these sources is summarized below.[1]

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[1] In references to testimony, "Smith/Jones" means testimony of Smith, questioned by Jones.

LIST OF EXHIBITS[2]

1. Case file, # 2014-10
2. Application signed and dated January 7, 2013
3. DMR site report dated Sept. 29, 2014
4. Aerial photograph (8.5" x 11") of LPA gear taken by Marcy Nelson 11-10-14 (PDF version saved as "Cheney Blackstone Narrows 2.jpg")
5. Aerial photograph (8.5" x 11") of LPA gear taken by Marcy Nelson 11-10-14 (PDF version saved as "Cheney Blackstone Narrows.jpg")
6. Aerial photograph (8.5" x 11") of LPA gear taken by Marcy Nelson 11-10-14 (PDF version saved as "Cheney from Goetting property.jpg")
7. Poster-size enlargement (22" x 36") of Figure 3 of DMR Site Report showing aerial photograph of proposed lease site with boundaries and existing LPA license sites
8. Revised site plan and narrative dated November 24, 2014 (with FAX date 11-22-14)

2. DESCRIPTION OF THE PROJECT

A. Site History

Mr. Cheney and a family member together operate four Limited-Purpose Aquaculture Licenses (LPAs) for the culture of shellfish and marine algae within a portion of the area he is proposing to lease. Two of the LPAs were granted in 2010 and two in 2014. In 2011, the Department reinterpreted its rules to reduce the allowable area that licensed gear can occupy. The 2010 licenses are grandfathered through 2014, after which they must either meet the new size limit or they will not be renewed. Thus, the 2010 license sites have been allowed to occupy a larger area than the 400 square feet allowed for the 2014 sites.

B. Proposed Operations

Mr. Cheney proposes to grow American and European oysters, quahogs, and three species of marine algae (seaweed) on the proposed lease site, using both bottom culture (free-planting of shellfish on the sea bottom with no gear) and suspended culture (gear at the surface, in the water column, or on the bottom). American oysters are the main focus of shellfish aquaculture on the proposed lease site; Mr. Cheney testified that he is growing four different varieties of American oyster bred for resistance to the oyster disease MSX, which has been prevalent in the Damariscotta River since at least 2010. The oyster varieties are marked and kept separate as they grow to market size.

Both American and European oysters will be grown initially in various types of floating gear, including plastic mesh bags of various sizes, wooden trays, and wire cages of varying dimensions. Floating cages can hold 4-6 bags of oysters on interior shelves. During the growing season, oysters will be periodically removed from the gear, graded by size, and replaced in the gear, which will be re-deployed on

[2] Exhibits 1, 2, and 3 are cited below as: Case file – "CF"; Application – "App", site report – "SR". Other exhibits are cited by number.

the site. Larger oysters will be free-planted on the bottom in most areas of the lease site. Oysters not ready for bottom planting will be over-wintered on the bottom in bags and cages. Oysters ready for market will also be kept in bottom cages (App 3-7, 24-29).

Although Mr. Cheney testified that he will also grow quahogs in cages, Mr. Lewis indicated that quahogs need the pressure of mud on their shells and that cage culture might not be productive. Mr. Cheney testified that he is "tinkering" with culture methods and that quahogs will represent only about 5% of his operation, mainly planted on the bottom (Cheney/Lewis).

Oysters and quahogs will be harvested by diving, wading, and by raking from a skiff, or by lifting cages and bags and removing the shellfish. Mr. Cheney testified that, at the request of the riparian Damariscotta River Association, he will not harvest by dragging (Cheney/Robinson).

A shellfish raft approximately 24 feet x 14 feet by 4 feet high will be moored within the site to serve as a work platform for sorting and grading oysters and drying gear. A framed structure 10 feet x 10 feet x 10 feet with a temporary roof to provide shelter from the sun will be erected on the raft and eventually enclosed to provide four-season shelter for work on the lease site (App 4). Boats used on the site will include a 16-foot skiff with a 40 HP 4-stroke outboard motor and a 24-foot processing boat with a 60-HP 4-stroke outboard motor, both of which will be moored on the lease site when not in use. Floating bags and trays will be rotated and air-dried on the raft to remove accumulated growth of algae and other fouling material (App 5); cages will be flipped over in the water periodically to dry and de-foul (Cheney, testimony). Gear may also be cleaned on the raft using a pressure washer on days not suitable for air-drying (App 8). In winter, the cages will be sunk to the bottom, and the raft and floating bags will be removed from the water.

Marine algae (three species of kelp) will be grown on submerged long lines below the surface on the western portion of the site nearest the channel. The lines will be seeded in the fall to grow nori and sea lettuce over the winter for harvest in late winter or early spring, when the kelp will be cut from the lines (App 13-14). Mr. Cheney also expects to harvest naturally-occurring dulse in late October, allowing for two seaweed crops per year from approximately 10% of the total area of the lease site (App 14). As the crops grow, additional buoys or toggles will be added to the lines to counteract the increasing weight and keep them submerged at the proper depth (App 12). The application notes that growing seaweed enables the lease site to produce a marketable crop in the colder part of the year, as well as at some times when oyster harvest is prohibited owing to heavy rainfall (App 15).

Mr. Cheney testified that in order to be managed profitably, his aquaculture activities require more space than he has had to date on his LPA sites (Cheney, testimony; App 8). He said that his recent experience in operating the LPA license sites led him to consider some changes in the layout of the gear from that shown in the application.

At the request of the hearing officer, Mr. Cheney prepared a revised gear plan after the hearing which he reviewed with Mr. Judd and Mr. and Mrs. Goetting, the riparians with property closest to the proposed lease site. The hearing officer set a deadline for receipt of the plan and for any requests by the riparians to re-open the hearing to take further testimony with regard to the revisions. The gear plan was

duly submitted, accompanied by a written narrative describing the changes. Mr. Judd and Mr. Goetting both submitted brief written comments on the plan but did not request to re-open the hearing.

The revised gear plan and narrative are labeled as Exhibit 8 and included in the record of this application. The riparians' comments on the plan are also included in the record. The plan itself is reproduced in this decision as Appendix I. The narrative notes that Mr. Cheney and the riparians toured the proposed lease site together by boat and walked the shore and that he provided them with copies of the revised plan (Exhibit 8).

The plan divides the lease site into northern and southern sections for gear, separated by an access corridor across the site. The original site plan (App 26) did not contain an access corridor, and gear was distributed across the entire site. The revised plan relocates the shellfish raft approximately 150 feet north of its originally-proposed location to a site in the northern section; Mr. Cheney testified that it would be screened from view from the shore by trees along the river bank.

The access corridor is a gear-free area 75 feet wide that crosses the proposed lease site from east to west, providing direct, open access between the Goetting property to the east and the channel to the west of the lease site. Although no surface or bottom gear will be placed in this corridor, the narrative states that Mr. Cheney plans to free-plant oysters on the bottom there.

The revised plan changes the length and location of the lines of floating oyster gear from those depicted in the application (App 26). The north section will have up to 218 floating oyster cages in six lines, plus the shellfish raft. Bottom cages will be deployed on the east side of the north section, and up to fifty 450-foot seaweed longlines will occupy a 25-foot strip along the west side, possibly replaced by floating bags in summer (Exhibit 8).

The south section will have seven lines holding either floating bags or oyster cages; initially, the four lines nearest the eastern shore will contain up to 86 floating bags each, and the three westward lines will each have 50 cages. The narrative indicates that over time Mr. Cheney will replace the floating bags with oyster cages; at maximum development, the south section would have 600 bags, if only bags are used, or 350 cages, if only cages are deployed. Mr. Cheney testified that he believes the cages are more efficient to manage than the bags and will enable him to grow more oysters while using the least amount of gear (Exhibit 8). The south section will also have bottom cages along the east side; up to 100 bottom cages will be used on both sections of the lease site. Oysters will be free-planted on the bottom of the entire site (Exhibit 8).

Mr. Cheney testified that his goal in applying for a lease site is to acquire sufficient space to deploy the gear necessary to develop his aquaculture business. It is apparent from his testimony that while the revised site plan shows the maximum amount of gear he will deploy on the site, it will take time for him to reach that level of development, involving a certain amount of experimentation to determine how best to operate the site with the optimum combination of gear (Exhibit 8; Cheney, testimony).

Lease operations are expected to be at their peak from April to November, primarily involving oysters. Some winter harvest of oysters could occur if weather is mild, while kelp harvest will occur in late

winter or early spring and possibly also in late October (App 6). Work will include moving bags and cages by boat, cleaning gear, and grading oysters with a mechanical tumbler.

C. Site Characteristics

The proposed lease site lies just south of Blackstone Narrows, where the headwaters of the Damariscotta River flow out of Great Salt Bay[3] (see Site Report Figure 3, reproduced below). The Narrows is formed by two opposite points of land shown at the upper left of the photograph in Figure 3. Below the Narrows, the river widens briefly, narrowing again below the U.S. Route 1 highway bridge about 375 feet south of the proposed lease site (SR 5). This wider area at the head of the river between the Narrows and the bridge is home to several aquaculture sites, including the four LPA license sites currently operated by Mr. Cheney. His proposed lease site is located on the east side of the channel, parallel to the east and southeast shore. The area is classified by DMR as "conditionally approved" for shellfish harvest and is closed to harvesting during any malfunction of the sewage treatment facility in Damariscotta Mills, which empties into Great Salt Bay (SR 11).

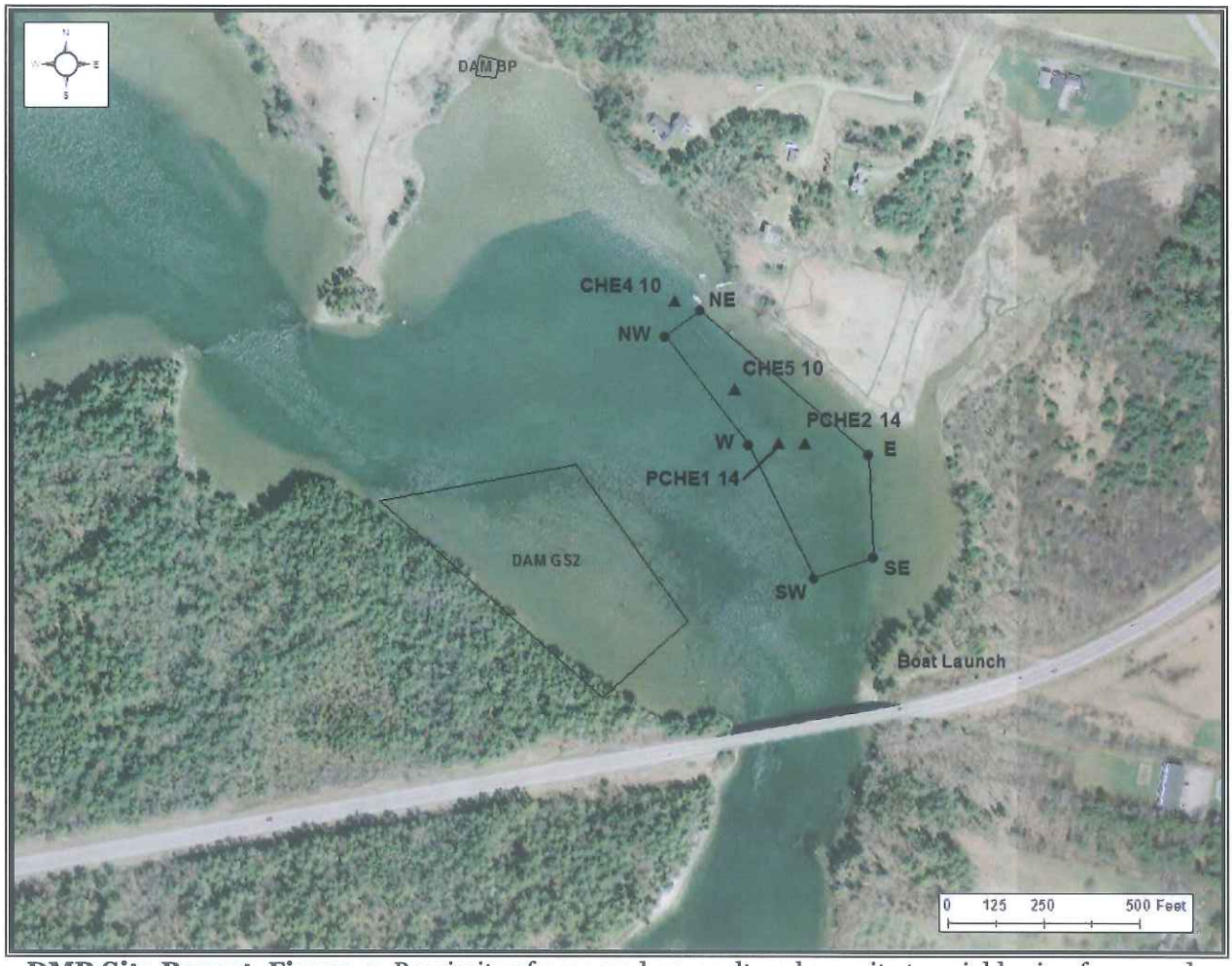
The western shore of the river below Blackstone Narrows is wooded and undeveloped. The eastern shore consists of open fields along the shore, interspersed with wooded areas and marsh; four residential properties lie along this shore, two of which parallel the proposed lease site.

The site report describes the bottom of the site as follows:

> The bottom topography within the proposed lease site consists of nearshore shallow sand/mud bottom with intermittent boulders and a wide variety of red, green and brown algae, that rapidly slopes downward on westerly approach to the channel. The channel is characterized by cobble, rocks and minimal vegetation. (SR 3)

The site report notes that water depths in the shallower eastern part of the site are "less than 1 foot" at mean low water, while the western two-thirds of the site "occupies the deeper channel waters," where depths of 32 feet were measured during the site visit (SR 3). According to the application, the tide range in the vicinity of the site is 4-5 feet (App 10), and the tides run approximately 2.25 hours later than those normally given for the upper Damariscotta River (App 6).

[3] Great Salt Bay is designated by statute (12 M.R.S. §6961) as a marine shellfish preserve in which "all shellfish harvesting and other harvesting activities involving bottom disturbance are prohibited," north of a line between two points 600 yards north of the U.S. Route 1 highway bridge. This line is actually the location of Blackstone Narrows.



DMR Site Report, Figure 3: Proximity of proposed aquaculture lease site to neighboring farms and shore.

Access to the site can be gained from the launching site at the Damariscotta town landing downriver, from Great Salt Bay to the north, or from a launching area just above the Route 1 bridge south of the proposed lease site. The application notes that the half-mile of river between the bridge and the public boat launch site to the south in Damariscotta village is difficult to navigate, owing to "areas of rapids and swift currents on incoming and outgoing tides, which frequently render navigation hazardous and impossible for all but smaller vessels" (App 10). The application also notes that "The Damariscotta side of the river experiences severe turbulence during incoming tides (Flood). Newcastle's side is impacted by the outgoing tides" (App 11).

3. STATUTORY CRITERIA & FINDINGS OF FACT

Approval of standard aquaculture leases is governed by 12 M.R.S.A. §6072. This statute provides that a lease may be granted by the Commissioner of DMR upon determining that the project will not unreasonably interfere with the ingress and egress of riparian owners; with navigation; with fishing or other uses of the area, taking into consideration the number and density of aquaculture leases in an area;

with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna; or with the public use or enjoyment within 1,000 feet of beaches, parks, docking facilities, or conserved lands owned by municipal, state, or federal governments. The Commissioner must also determine that the applicant has demonstrated that there is an available source of organisms to be cultured for the lease site; that the lease will not result in an unreasonable impact from noise or lights at the boundaries of the lease site; and that the lease will be in compliance with visual impact criteria adopted by the Commissioner relating to color, height, shape and mass.

A. Riparian Access

Of the 17 parcels of riparian (shorefront) land within 1,000 feet of the proposed lease site, two are located directly opposite the site's eastern boundary. The northeast corner of the site is approximately 95 feet from Mr. Judd's shore; he has a dock and a haul-out mooring located just north of the northern end of the proposed lease. Mr. and Mrs. Goetting's shore is an open, undeveloped field approximately 80 feet from the proposed lease site, with no dock or mooring (SR 5). The Goettings acquired their property after Mr. Cheney had applied for the lease. There are no other docks or moorings in the vicinity.

With all the proposed gear in place on the lease site as originally described in the application, vessels navigating to or from the Goettings' shore would need to travel several hundred feet around the north or south end of the lease site in order to reach open water and the channel. The entire shoreline of the property would have had lines of floating gear deployed approximately 80 feet away, impairing riparian ingress and egress between the channel and the shore.

Mr. Cheney noted in the application that the Goetting property was for sale and stated, "If the new property owner desires to build a dock I would modify my suspended grow lines to allow for a navigational corridor to access the dock..." (App 16). Although discussions regarding access to and from the shore were held between Mr. Cheney and the Goettings prior to the hearing, no definite plan was devised. At the hearing, Mr. Goetting testified that while he had an idea for a dock, he did not have a specific plan. The provision of a 75-foot access corridor in Mr. Cheney's revised gear plan elicited approval from both Mr. Judd and Mr. Goetting.[4]

According to the narrative accompanying Mr. Cheney's revised gear plan, the access corridor is large enough to "allow for a future dock and allow a large powerboat direct access through the farm to the channel." He also states, "I wish to install the Goetting mooring if installed within the proposal" (Exhibit 8). Mr. Cheney's request to install any mooring in the corridor himself is reasonable, given the need to ensure that the nature and location of the mooring and the scope of the line will not interfere with his gear, stock, or the activities on the lease site.

With the provision of the access corridor, riparian access to and from shore will not be unreasonably impaired. Therefore, the following condition will be included in the lease: A 75-foot gear-free access corridor will be maintained by the leaseholder as described in the lease decision and shown in

[4] CF, William Judd email to Diantha Robinson, 11-25-14; Matthew Goetting email to Diantha Robinson, 11-25-15.

the revised gear plan dated November 24, 2014 (Exhibit 8). Any mooring placed in the access corridor must be installed by or with the prior knowledge and consent of the leaseholder.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the ingress and egress of any riparian owner, provided the condition described above is made part of the lease.

B. Navigation

The Blackstone Narrows area is located between Great Salt Bay to the north and the main portion of the Damariscotta River to the south. The site report reviews the status of navigation in the area as follows:

> The proposed lease site is located ~375 feet to the north of the Route 1 Bridge. The Route 1 bridge is approximately 1.3 miles north of the "downtown Damariscotta" Main Street Bridge and the reversing falls. There are two potential access points to the area of the proposed lease.
>
> To gain access to the area of the proposed lease site from the navigable waters of the Damariscotta River, a boat would need to travel the 1.3 miles at high water (or close to high water) only. As the tide ebbs and flows, the area between the bridges consists of rapidly moving rock strewn waters locally known as the "Johnny Orr Rapids". Only small vessels with an operator with local knowledge are likely to navigate through this area.
>
> Alternatively, a small unimproved boat launch immediately northeast of the Route 1 Bridge provides immediate access to the area of the proposed lease. Several other hand-carry access locations exist along the northern portion of the river.
>
> In all cases, vessels navigating through the area of the proposed lease site would be small outboard powered or human powered (canoe and kayak) boats. Sufficient water depths exist both around and within the proposed lease site to accommodate this type of navigation. (SR 2)

The site report also notes that the width of the channel to the west of the lease ranges from 180 to 290 feet. There is approximately 350 feet of open water between the southwest corner of the proposed lease site and the aquaculture lease site on the western shore, DAM GS2 (SR 4). With the lease gear in place, there will be adequate room in the channel for navigation by the type of vessels likely to operate in the area, as well as for access to the DAM GS2 lease site. The access corridor across will also facilitate navigation between the channel and the eastern shore.

According to the Damariscotta Harbormaster, Paul Bryant, the proposed lease site "should not interfere with navigation above the Route One Bridge" (CF, Harbormaster questionnaire). At the hearing, Mr. Bryant testified that he has not seen any diminution in recreational use of the upper Damariscotta River since the establishment of aquaculture lease sites there (Bryant, testimony).

Based on this evidence, it appears that the proposed lease site will not interfere with navigation. Aquaculture lease sites are required to be marked for navigation purposes in accordance with U.S. Coast Guard requirements.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with navigation. The lease site must be marked in accordance with U. S. Coast Guard requirements.

C. Fishing & Other Uses

The site report indicates that while no commercial or recreational fishing was observed in the area on either of two site visits made by DMR biologists in 2013 and 2014, recreational fishing for striped bass does take place in the area, primarily from the shore; this was confirmed by the harbormaster. The report observes that lobster or crab fishing, if it were to occur, would take place in the deeper waters of the channel, west of the proposed lease site. "No commercially exploitable quantities of crustaceans, echinoderms, or mollusks were observed during assessments of the benthic ecology," according to the report (SR 5).

The report observes that fishing activity is also likely to be limited by the difficulty of reaching the area by boat from the launching area in Damariscotta Village, given the shallow water, swift current, and narrow, rocky, unmarked channel. Larger vessels would find it quite challenging to navigate upriver to this area, but only small skiffs, kayaks, and canoes can be launched at the small site north of the Route 1 bridge (SR 6).

Mr. Cheney testified that he sited the lease to keep gear out of the channel so as not to interfere with recreational fishing.

The evidence indicates that while some level of recreational fishing is likely to occur in the Blackstone Narrows area, it is unlikely that the presence of the aquaculture lease site will interfere with fishing of any kind. The lease site must be marked in accordance with DMR Rule 2.80.[5]

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[5] **2.80 Marking Procedures for Aquaculture Leases**

1. When required by the Commissioner in the lease, aquaculture leases shall be marked with a floating device, such as a buoy, which displays the lease identifier assigned by the Department and the words SEA FARM in letters of at least 2 inches in height in colors contrasting to the background color of the device. The marked floating device shall be readily distinguishable from interior buoys and aquaculture gear.

2. The marked floating devices shall be displayed at each corner of the lease area that is occupied or at the outermost corners. In cases where the boundary line exceeds 100 yards, additional devices shall be displayed so as to clearly show the boundary line of the lease. In situations where the topography or distance of the lease boundary interrupts the line of sight from one marker to the next, additional marked floating devices shall be displayed so as to maintain a continuous line of sight.

3. When such marking requirements are unnecessary or impractical in certain lease locations, such as upwellers located within marina slips, the Commissioner may set forth alternative marking requirements in an individual lease.

4. Lease sites must be marked in accordance with the United State's Coast Guard's Aids to Private Navigation standards and requirements.

Exclusivity. The application states that recreational hook-and-line fishing is welcome on the proposed lease site. Mr. Cheney testified that motorized vessels could catch their propellers on the floating gear, but that kayaks and canoes could navigate over the lease site (Cheney/Robinson). Mr. Cheney requests the exclusive right to harvest quahogs and oysters within the lease site (App 17). Since both species of shellfish will be planted and/or located in cages on the bottom of the lease site, activities that would disturb the bottom should be avoided. Mr. Cheney testified that, in accordance with the request of the Damariscotta River Association, he would not drag the bottom.

Such conditions are reasonable in order to enable the aquaculture project to be carried out while encouraging the greatest number of compatible uses of the area, as provided in 12 MRS §6072 (7-B). Therefore, the following conditions will be included in the lease: Navigation by kayaks and canoes and recreational hook-and-line fishing are allowed within the lease site. Navigation by motorized vessels is allowed within the open areas of the lease site. Mooring, anchoring, and shellfish harvesting are prohibited within the lease site except with the authorization of the leaseholder. Dragging is prohibited on the lease site.

Other aquaculture leases. According to the site report, the nearest aquaculture site is DAM GS2, 632 feet to the west. Lease DAM BP is approximately 800 feet northeast of the site. Two LPA license sites, in addition to the Cheney LPAs, are located to the northwest (FAUX-1-14 and FAUX-2-14). The site report states that no conflicts between the Cheney LPAs and the neighboring aquaculture sites have been reported since the LPAs were installed in 2010 (SR 6). The various aquaculture sites are sufficiently far apart that the activities conducted on them will not interfere with each other.

Therefore, considering the number and density of aquaculture leases in the area, I find that the aquaculture activities proposed for this site will not unreasonably interfere with fishing or other uses of the area. The lease must be marked in accordance with DMR Rule 2.80.[6] The conditions listed above will be included in the lease.

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[6] **2.80 Marking Procedures for Aquaculture Leases**

1. When required by the Commissioner in the lease, aquaculture leases shall be marked with a floating device, such as a buoy, which displays the lease identifier assigned by the Department and the words SEA FARM in letters of at least 2 inches in height in colors contrasting to the background color of the device. The marked floating device shall be readily distinguishable from interior buoys and aquaculture gear.

2. The marked floating devices shall be displayed at each corner of the lease area that is occupied or at the outermost corners. In cases where the boundary line exceeds 100 yards, additional devices shall be displayed so as to clearly show the boundary line of the lease. In situations where the topography or distance of the lease boundary interrupts the line of sight from one marker to the next, additional marked floating devices shall be displayed so as to maintain a continuous line of sight.

3. When such marking requirements are unnecessary or impractical in certain lease locations, such as upwellers located within marina slips, the Commissioner may set forth alternative marking requirements in an individual lease.

4. Lease sites must be marked in accordance with the United State's Coast Guard's Aids to Private Navigation standards and requirements.

D. Flora & Fauna

Site observations. Numerous species of marine flora and fauna were noted by Department biologists during the site visit (SR 7). No live quahogs (*Mercenaria mercenaria*) were observed on the proposed lease site, only quahog shells (SR 5, 7); it appears that there is no existing quahog resource in that location. Two species of algae were observed in unexpectedly large amounts, as described in the report:

> The presence of *Chaetomorpha spp.* and *Enteromorpha spp.* are indicative of a high level of nutrients in the water. *Chaetomorpha spp.*, also known as spaghetti algae, or green hair algae, is naturally distributed from Bermuda to Nova Scotia. It is frequently used in the aquaria trade. While the area of the proposed lease site is somewhat unique in its oceanography and hydrography, the heavy presence of this algae is unprecedented for the DMR divers in their collective 30 years of diving in Maine marine waters.
>
> The southern-half of the lease site, in waters less than 20 feet, has an over-abundance of this plant. In many instances this algae is dead or dying and using up the oxygen in the top layer of sediment (anoxia). This leads to the production of hydrogen sulfide and methane gases within the sediments. Disturbance of these sediments through digging or walking results in gas bubbles being released into the water column. This could be hazardous for oyster growth and development.
>
> This heavy nutrient load may be coming from Great Salt Bay or from high-nutrient freshwater runoff from land. It may be attributable to local land uses such as agriculture, septic tank discharges, natural freshwater drainage through streams, or sewer plant discharges.
>
> Ecologically, oysters in this body of water would be beneficial as they filter up to 50 gallons of water per day per oyster and could help reduce the amount of nutrients and phytoplankton in the water leading [to]the growth of *Chaetomorpha spp.* and *Enteromorpha spp.* Sea vegetables would also utilize and mitigate the excess nitrogen in the water. (SR 7-8)

Mr. Lewis testified that Mr. Cheney would probably need to remove some of the *Chaetomorpha spp.* from the site in order to plant oysters on the bottom. There is no legal prohibition on doing this, according to Mr. Lewis. He noted that *Chaetomorpha spp.* has not been seen in the rest of the Damariscotta River before, but that it is not considered an invasive species, being ubiquitous in high-nutrient environments along the eastern Atlantic coast. Speaking strictly as a biologist, Mr. Lewis said, growing oysters on the proposed lease site would improve the environment in the area by reducing the high nutrient levels that are leading to the production of hydrogen sulfide in the sediments (Lewis/Robinson). Mr. Lewis also noted that the structure provided by the gear on the lease site provides shelter to some marine species, including striped bass, which are a popular species for recreational fishing in the area.

Fisheries & wildlife. A copy of the application was provided to the Maine Department of Inland Fisheries and Wildlife for review. The site report notes:

> According to data maintained by The Maine Department of Inland Fisheries and Wildlife there are no Endangered and Threatened Species, Species of Concern (i.e. bald eagle nests), or Seabird Nesting Islands within the area of the proposed lease. The nearest documented Bald Eagle (*Haliaeetus leucocephalus*) nest is located more than 2300 feet to the northwest on small island in Great Salt Bay proper. Due to the historical presence of eelgrass, the shoreline and shallows surrounding the proposed lease area are designated as "moderate value tidal wading bird and waterfowl habitat" (SR 9).

Eelgrass. DMR biologists assessed the proposed lease site and surrounding area for eelgrass twice, once in August, 2013, by on-site inspection and underwater video and again in July, 2014, by observing the site during a SCUBA dive and recording underwater video of the bottom. Both sets of observations were consistent, showing only intermittent individual eelgrass plants within the proposed lease site, which was dominated by various types of algae, particularly *Chaetomorpha* sp. Some eelgrass ("a patchy eelgrass bed") was observed north of the proposed site, "in the area surrounding Mr. Judd's property and dock" (SR 8).

The most recent aerial survey of eelgrass was conducted by DMR in 2005; it showed that eelgrass "has been present historically within and surrounding the proposed lease site." While the 2013 and 2014 on-site observations showed that the eelgrass north of the site was "consistent if not slightly less" than the 2005 survey results, they showed a more significant reduction of eelgrass on the proposed lease site itself, accompanied by a significant increase in algae species (SR 8). This is consistent with Mr. Lewis's testimony that eelgrass virtually disappeared from many locations along the Maine coast between 2012 and 2014. No specific cause has been identified, although green crab activity and the cold winter of 2013-14 are considered possible contributors (Lewis, testimony).

The letter from MDIF&W included in the application notes that "Where eelgrass is present we encourage you to design your project in a way that will minimize direct disturbance to submerged vegetation as well as indirect impacts as a result of shading" (App 31) Mr. Lewis testified that, although virtually no eelgrass is present on the proposed lease site at this time, it is possible that it may re-grow; should that happen, it will be necessary to decide how to protect it. He noted that the U.S. Army Corps of Engineers and the National Marine Fisheries Service could request that Mr. Cheney establish "light corridors" on the site for better light penetration to the eelgrass plants on the bottom (Lewis/Cheney).

Mr. Cheney testified that, should eelgrass re-grow within the lease site, he would manage his gear so as to reduce shading (Cheney/Robinson). As noted above, he also testified that he would not harvest oysters by dragging; a lease condition will prohibit dragging on the site, as well. He said that the larger area offered by a lease would enable him to use the bottom for shellfish culture and still have room to move that portion of his project toward the channel, should eelgrass return to the site (Cheney/Atwater).

This evidence indicates that the proposed aquaculture activities will not have an adverse impact upon the ecology of the proposed lease site and the surrounding area. The effects of oysters, quahogs, and kelp upon the environment will be beneficial. No significant amounts of eelgrass are present on the site, but if it returns, Mr. Cheney will work with federal and state agencies to reduce shading. No dragging will be allowed on the lease site, as discussed above.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna.

E. Public Use & Enjoyment

This criterion is concerned with the potential effect of the proposed lease on beaches, parks, and docking facilities or certain conserved lands owned by local, state, or federal governments. The site report notes one such facility within 1,000 feet of the proposed lease site:

> There exists a small public boat launch approximately 300 feet to the south of the proposed lease site. This launch is accessed by a dirt/grass drive off Route 1. Access to Great Salt Bay by this ramp is limited to small skiffs, canoes, kayaks, etc. that can be launched from the small beach. The proposed activities will not interfere with the use of this facility (SR 9-10).

Also within 1,000 feet of the site is the Whaleback Shell Midden State Historic Site in Damariscotta, owned by the Maine Department of Agriculture, Conservation, and Forestry, Bureau of Parks and Lands.[7] This property lies south of the Route 1 bridge and affords public access to the eastern shore of the river to view the ancient oyster shell mounds on both sides of the river. The proposed lease site is located well upriver and more than 80 feet from shore; it will not affect the use or enjoyment of this historic site.

Therefore, I find that the aquaculture activities proposed for this site will not unreasonably interfere with the public use or enjoyment within 1,000 feet of beaches, parks, or docking facilities or certain conserved lands owned by municipal, state, or federal governments.

F. Source of Organisms

The application indicates that the sources of shellfish stock (American and European oysters and quahogs) for this proposed lease site are Mook Sea Farm, Inc., in Walpole, Maine, and Muscongus Bay Aquaculture in Bremen, Maine. Sources of marine algae include the Darling Marine Center in Walpole, Maine; Ocean Approved, LLC, in Portland, Maine; and "wild spores from natural set on lease site" (App, cover page).

Moving European oysters in anywhere in Maine requires a permit from the Department, since they are classified as "restricted" in order to prevent the spread of disease. Movement of American oysters from within the waters between Ocean Point, Linekin Neck, Boothbay and Pemaquid Point, Bristol (including the Damariscotta and Johns Rivers) to any other coastal waters is also restricted and requires a permit from the Department under DMR Rule 24.05.

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[7] For a description of this site, see: http://www.maine.gov/dacf/mgs/explore/marine/sites/apr11.pdf.

Therefore, I find that the applicant has demonstrated that there is an available source of stock to be cultured for the lease site.

G. Light

The application indicates that no lights will be used at the proposed lease site, and that no work will be done after dark, except in the case of emergency repairs (App 6, 9).

Therefore, I find that the aquaculture activities proposed for these sites will not result in an unreasonable impact from light at the boundaries of the lease site.

H. Noise

Noise produced by equipment used on the proposed lease site will come mainly from operating outboard motors, a pot hauler, a hydraulic tumbler/sorter, a hose, and possibly a pressure washer (App 8). Mr. Cheney testified that the boats will not be run at full speed (Cheney/Robinson). The site report states:

> The applicant proposes to use four-stroke outboard power on his boats. These are the quietest outboards available and as indicated in the application, are barely audible at idle.

The tumbler/sorter, referred to in the application as a "tumbler," is located in the processor boat and is used to clean and sort oysters (App 8, 9). The noise it produces comes not only from the engine, but also from the movement of the oyster shells through the device. The site report describes the tumbler as follows:

> Other noise inputs include the use of a hydraulic sorter. This sorter is powered by a 13 h.p. Honda engine that is contained within a box, mounted using rubber vibration dampening pads, and has a second muffler installed "downstream" of the factory installed Honda muffler (SR 10).

The application states "On a vessel this size, expert fabricators proposed no further action" besides the box, the pads, and the second muffler, for sound deadening of the tumbler (App 8). Mr. Cheney testified that, although the tumbler and other gear are muffled as much as possible, workers will wear hearing protection when using the equipment (Cheney/Robinson).

The application states that the tumbler "will not be used before 7 am. It is run throughout the day as needed" and "Monday-Friday the tumbler would be in action up to eight hours a day for nursery operations" (App 8, section 2). The site report observes:

> On page 9, section 3, the applicant provided a description from Bill Judd, the abutting landowner where Mr. Judd described the tumbler as "like a leaf blower or lawn mower which everyone else uses".
>
> While the applicant has clearly invested in the best available technology, and made every accommodation to minimize noise intrusion, a leaf blower or lawn mower tends not to

> operate for 8 hours per day. The applicant has clearly stated his desire (page 8, section 1) to keep noise levels to a minimum and not create a disturbance. (SR 10)

At the hearing, Mr. Judd clarified his description of the sound from the tumbler, which he has heard from his property. When outside on his land he may hear a faint noise, he said, but the Route 1 road noise is louder. The sound is louder closer to the tumbler, he said, and he approved of Mr. Cheney's plan for workers operating the tumbler and other equipment to wear hearing protection (Judd, testimony). Mrs. Goetting commented that she does not hear the tumbler from her property and has not had a problem with it,[8] although she was concerned about the potential impact of the noise on the animals in the vicinity (Cheney/Karen Goetting). Mr. Lewis noted that, in his experience, birds and seals become habituated to noise and activity over time (Lewis, testimony).

In the application, Mr. Cheney states, "I doubt this processing activity will be observed over the traffic noise associated from the RTE 1 Bridge 700 feet away." He notes that during the time he has worked on the LPA sites in Blackstone Narrows, "I have done my best to keep my noise levels to a minimum" (App 8).

The application also states, "I want to have the right to work this site Monday-Sunday from 7:00 am - 6 pm although actual operations will be less" (App 9). At the hearing, Mr. Cheney testified that he expects to work at the site five to six days each week, from 7:30 to 4:30 or 5:00 pm (Cheney/Robinson).

The revised plan narrative notes that another riparian landowner, Mr. Atwater, requested that no oyster processing occur on Sunday and states that Mr. Cheney "will manage my farm with a focus on M-F workdays" and "will refrain from playing music...and keep noise levels as quiet as possible" (Exhibit 8). Both Mr. Goetting and Mr. Judd, in their comments on the revised gear plan, mentioned their concerns about the potential noise from expanded operations at the larger site.[9]

Mr. Cheney's proposed project, with its increased amount of gear and oysters, and with mechanical processing being conducted on the site, has the potential to create more noise than his activities at the LPA sites did, primarily from the duration of use of the tumbler and possibly the pressure washer over long work days as described in the application. It is not clear how much noise will be generated on the site at full operation, nor how often operations might be conducted outside the Monday-Friday time period.

Testimony of riparians closest to the present LPA sites indicated that noise from the aquaculture operations has not been a significant problem to date. The nearby highway traffic already creates a significant amount of noise in the area. It does not appear that noise from other activities on land or water in the vicinity of the proposed lease is currently restricted by law or ordinance, so it might be

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[8] Mrs. Goetting made this comment in the course of asking a question of Mr. Cheney, not as sworn testimony.

[9] Mr. Goetting said his concerns include "density of equipment and associated noise/traffic," Mr. Judd said, "Also, the more gear, the more activity to process the oysters which means more processor operation and more boat traffic, therefore, more noise." (CF, E-mails from Matthew Goetting and William Judd to Diantha Robinson, 11-25-14)

ineffective to restrict the aquaculture operations to prevent noise if other noise-generating activities were not similarly restricted.[10]

The evidence indicates that the motorized equipment used at the lease site will be muffled to the maximum extent practical, as required by the DMR rule on noise.[11] Mr. Cheney's commitment to focus his operations on Mondays through Fridays between 7:30 am and 5:00 pm is a reasonable measure to mitigate the impact of noise by confining noise-generating activities to those days and hours.

The Department recognizes the need of a leaseholder for flexibility in scheduling work to accommodate changing conditions, including weather, equipment problems, market demands, temporary closures of the area to shellfish harvesting because of poor water quality, and other factors. Nevertheless, should noise become a problem during the term of the lease, the Department needs to have the ability to require additional mitigation, if necessary. Consequently, the lease will contain a condition subjecting it to review by the Department to determine whether additional "reasonable measures" need to be taken "to mitigate noise impacts from the lease activities" during the term of the lease. Should the addition of noise reduction measures be determined reasonable and appropriate by the Department, in its sole discretion, the lease will be amended to include further conditions requiring the implementation of those measures.

Based on this evidence, it appears that any noise generated by operations on the site is unlikely to have a significant effect at the boundaries of the lease, providing a condition as described above is placed on the lease.

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[10] A review of the ordinances listed on the website of the Town of Damariscotta revealed no general ordinance regarding noise.

[11] DMR Rules, Chapter 2.37 (9) Noise

> Applicability. These rules apply to the routine operation of all aquaculture facilities, including harvesting, feeding, and tending equipment at leases authorized by the Department of Marine Resources, with the following exemptions:
>
> - Watercraft, harvest or transport barges, and maintenance equipment while underway;
> - The unamplified human voice and other sounds of natural origin;
> - Bells, whistles, or other navigational aids;
> - Emergency maintenance and repair of aquaculture equipment;
> - Warning signals and alarms; and
> - Events not reasonably within the control of the leaseholder.
>
> Mitigation:
>
> All motorized equipment used during routine operation at an aquaculture facility must be designed or mitigated to reduce the sound level produced to the maximum extent practical.
>
> Centralized feeding barges, or feeding distribution systems, shall be designed or mitigated to reduce noise by installing the most effective commercially available baffles at air intakes and outlets, mounting of all relevant equipment to minimize vibration between it and the hull, and using the most effective commercially available soundproofing insulation.
>
> All fixed noise sources shall be directed away from any residences or areas of routine use on adjacent land.
>
> An applicant shall demonstrate that all reasonable measures will be taken to mitigate noise impacts from the lease activities.

Therefore, I find that the aquaculture activities proposed for this site will not result in an unreasonable impact from noise at the boundaries of the lease, provided that the lease contains a condition subjecting it to review by the Department to determine whether additional "reasonable measures" need to be taken "to mitigate noise impacts from the lease activities" during the term of the lease; and, should the addition of noise reduction measures be determined reasonable and appropriate by the Department, in its sole discretion, that the lease will be amended to include further conditions requiring the implementation of those measures.

I. Visual Impact

The Department's visual impact rule focuses on ensuring that "The size, height, and mass of buildings and equipment used at aquaculture facilities shall be constructed so as to minimize the visual impact as viewed from the water" and requires structures and gear to blend with the surroundings as much as possible (DMR Rule Chapter 2.37 (1)(A)(10)).[12]

The site report notes that

> The applicant proposes to use floating bags to contain the cultured oysters. These bags are black in color with black floatation and rise only about 2-3 inches above the water's surface (see application, page 24). Other culture containers include oyster ranches, wooden seed trays or lobster crates. These containers would also protrude approximately 4- 18" above the water's surface and would be tied in rows along horizontal lines.

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[12] DMR Rule Chapter 2.37(10) Visual Impact

> Applicability. This rule applies to all equipment, buildings, and watercraft used at an aquaculture facility, excluding watercraft not permanently moored or routinely used at a lease location such as harvest or feed delivery vessels. Other equipment or vessels not moored within the boundaries of a lease, but routinely used or owned by the leaseholder are subject to these requirements.
>
> Building profiles. The size, height, and mass of buildings and equipment used at aquaculture facilities shall be constructed so as to minimize the visual impact as viewed from the water.
>
> Height limitations. All buildings, vessels, barges, and structures shall be no more than one story and no more than 20 feet in height from the water line. Height shall be measured from waterline to the top of the roof or highest fixed part of the structure or vessel. This height limitation excludes antennae, cranes, and other similar auxiliary equipment. Structures that exist or are under construction as of the effective date of this rule are exempted from the height restriction for their useful lifetime.
>
> Roof & siding materials. Roofing and siding materials shall not be reflective or glossy in appearance or composition.
>
> Color. Equipment and structures shall be painted, or be of, a color that does not contrast with the surrounding area. Acceptable hues are grays, blacks, browns, blues, and greens that have a sufficiently low value, or darkness, so as to blend in with the surrounding area. Colors shall be flat, not reflective, in appearance.
>
> The color of equipment, such as buoys, shall not compromise safe navigation or conflict with US Coast Guard Aids to Private Navigation standards.

> A 24' by 14' work float with a 10 foot square "building" is proposed to be moored within the boundaries of the lease site (see application page 5, Section H) This would look like a typical lobster work float except the applicant is proposing to place a metal roof or seasonal tarp over the float. The application states "any house like structure will be built to blend in with the surroundings." (SR 10)

At the hearing, Mr. Cheney indicated that he would use a combination of oyster cages and floating oyster bags at the surface, with the possibility of transitioning eventually to more cages than bags. Both are standard gear in oyster aquaculture and are used on lease sites farther south on the Damariscotta River.

The size of the leased area will be larger than the area occupied by the LPA license gear over the past several years, and the amount of gear will also increase, as described in the revised gear plan (Exhibit 8). This increase in gear was of concern to the riparians, as both Mr. Judd and Mr. Goetting commented following their review of the revised plan.[13] Mr. Lewis testified that the size of the proposed lease site and the amount of gear are "within bounds" of the range of oyster aquaculture sites in Maine, although toward "the higher end" (Lewis/Matthew Goetting).

The shellfish raft is a wooden platform colored gray with black plastic or aluminum pontoons; any shelter built on the raft will blend in with the surroundings (App 5). The height of the shelter (ten feet) is well within the 20-foot limit in the DMR rule. Colors of gear as described in the application are black, green, and brown, with blue buoys on the algae lines and white marker buoys (App 5). These colors are also consistent with the requirements of the visual impact rule.

This evidence shows that the gear and structures proposed to be used on the lease site will blend with the surroundings as much as possible.

Therefore, I find that the equipment, buildings, and watercraft to be used at the proposed lease site will comply with the visual impact criteria contained in DMR Regulation 2.37 (1) (A) (10).

4. CONCLUSIONS OF LAW

Based on the above findings, I conclude that:

1. The aquaculture activities proposed for this site will not unreasonably interfere with the ingress and egress of any riparian owner. A 75-foot gear-free access corridor will be maintained by the leaseholder as described in the lease decision and shown in the revised gear plan dated November 24, 2014 (Exhibit 8). Any mooring placed in the access corridor must be installed by or with the prior knowledge and consent of the leaseholder.

[13] CF, E-mails from Matthew Goetting and William Judd to Diantha Robinson, 11-25-14

2. The aquaculture activities proposed for this site will not unreasonably interfere with navigation. The lease site shall be marked in accordance with U. S. Coast Guard requirements.

3. The aquaculture activities proposed for this site will not unreasonably interfere with fishing or other uses of the area, taking into consideration the number and density of aquaculture leases in the area. The lease boundaries must be marked in accordance with the requirements of DMR Rule 2.80. Navigation by kayaks and canoes and recreational hook-and-line fishing are allowed within the lease site. Navigation by motorized vessels is allowed within the open areas of the lease site. Mooring, anchoring, and shellfish harvesting are prohibited within the lease site except with the authorization of the leaseholder. Dragging is prohibited on the lease site.

4. The aquaculture activities proposed for this site will not unreasonably interfere with the ability of the lease site and surrounding areas to support existing ecologically significant flora and fauna.

5. The aquaculture activities proposed for this site will not unreasonably interfere with the public use or enjoyment within 1,000 feet of beaches, parks, or docking facilities or conserved lands owned by municipal, state, or federal governments.

6. The applicant has demonstrated that there is an available source of American oysters (*Crassostrea virginica*), European oysters (*Ostrea edulis*), hard clams/quahogs (*Mercenaria mercenaria*), and the marine algae/seaweed species nori (*Porphyra spp.*), dulse (*Palmaria palmata*), and sea lettuce (*Ulva lactuca*) to be cultured for the lease site.

7. The aquaculture activities proposed for this site will not result in an unreasonable impact from light at the boundaries of the lease site.

8. The aquaculture activities proposed for this site will not result in an unreasonable impact from noise at the boundaries of the lease site. The lease is subject to a condition subjecting it to review by the Department to determine whether additional "reasonable measures" need to be taken "to mitigate noise impacts from the lease activities" during the term of the lease. Should the addition of noise reduction measures be determined reasonable and appropriate by the Department, in its sole discretion, the lease will be amended to include further conditions requiring the implementation of those measures.

9. The aquaculture activities proposed for this site will comply with the visual impact criteria in DMR Regulation 2.37(1)(A)(10).

Accordingly, the evidence in the record supports the conclusion that the proposed aquaculture activities meet the requirements for the granting of an aquaculture lease set forth in 12 M.R.S.A. §6072.

5. DECISION

Based on the foregoing, the Commissioner grants the requested lease of 3.36 acres to Johns River Shellfish, LLC, for ten years for the purpose of cultivating American oysters (*Crassostrea virginica*), European oysters (*Ostrea edulis*), hard clams/quahogs (*Mercenaria mercenaria*), and the marine algae/seaweed species nori (*Porphyra spp.*), dulse (*Palmaria palmata*), and sea lettuce (*Ulva lactuca*) using suspended and bottom culture techniques. The applicant shall pay the State of Maine rent in the amount of $100.00 per acre per year. The applicant shall post a bond or establish an escrow account pursuant to DMR Rule 2.40 (2) (A) in the amount of $5,000.00, conditioned upon performance of the obligations contained in the aquaculture lease documents and all applicable statutes and regulations.

6. CONDITIONS TO BE IMPOSED ON LEASE

The Commissioner may establish conditions that govern the use of the lease area and impose limitations on aquaculture activities, pursuant to 12 MRSA §6072 (7-B)[14] Conditions are designed to encourage the greatest multiple compatible uses of the lease area, while preserving the exclusive rights of the lessee to the extent necessary to carry out the purposes of the lease.

The following conditions shall be incorporated into the lease:

1. The lease site must be marked in accordance with both U.S. Coast Guard requirements and DMR Rule 2.80.

2. A 75-foot gear-free access corridor will be maintained on the lease site by the leaseholder as described in the lease decision and shown in the revised gear plan dated November 24, 2014. Any mooring placed in the access corridor must be installed by or with the prior knowledge and consent of the leaseholder.

3. Navigation by kayaks and canoes and recreational hook-and-line fishing are allowed within the lease site. Navigation by motorized vessels is allowed within the open areas of the lease site. Mooring, anchoring, and shellfish harvesting are prohibited within the lease site except with the authorization of the leaseholder. Dragging is prohibited on the lease site.

4. The Department may, in its sole discretion, review the lease to determine whether additional "reasonable measures" need to be taken "to mitigate noise impacts from the lease activities" during the term of the lease. Should the addition of noise reduction measures be determined reasonable and appropriate by the Department, in its sole discretion, the lease will be amended to include further conditions requiring the implementation of those measures.

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[14] 12 MRSA §6072 (7-B) states: "The commissioner may establish conditions that govern the use of the leased area and limitations on the aquaculture activities. These conditions must encourage the greatest multiple, compatible uses of the leased area, but must also address the ability of the lease site and surrounding area to support ecologically significant flora and fauna and preserve the exclusive rights of the lessee to the extent necessary to carry out the lease purpose."

7. REVOCATION OF LEASE

The Commissioner may commence revocation procedures upon determining pursuant to 12 MRSA §6072 (11) and DMR Rule Chapter 2.42 that no substantial aquaculture has been conducted within the preceding year, that the lease activities are substantially injurious to marine organisms, or that any of the conditions of the lease or any applicable laws or regulations have been violated.

Dated: Feb. 19th, 2015

Patrick C. Keliher, Commissioner
Department of Marine Resources

APPENDIX I – Revised site plan (Exhibit 8)

[See following page for plan]

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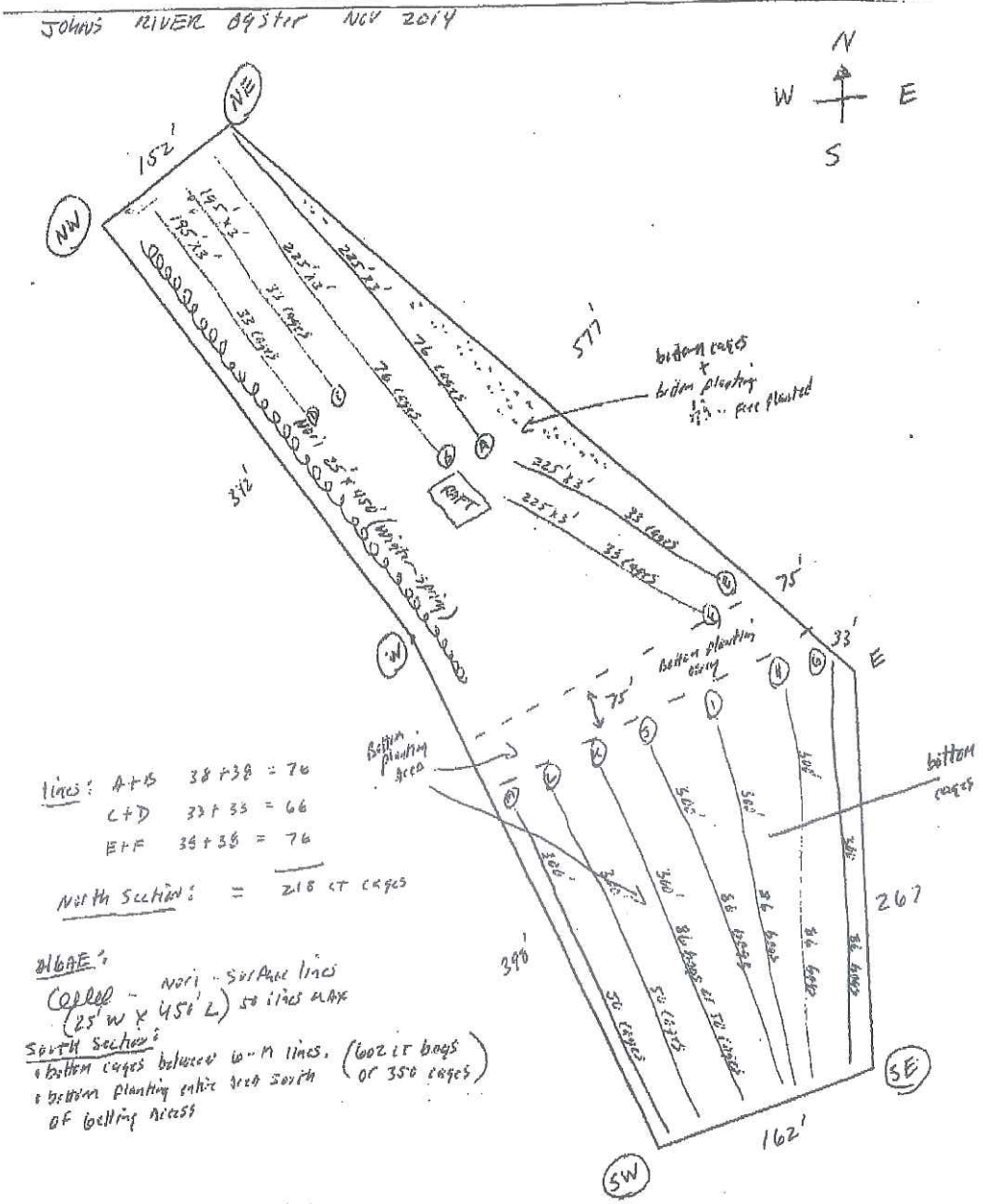
JOHNS RIVER OYSTER NOV 2014



lines: A+B 38+38 = 76
C+D 33+33 = 66
E+F 38+38 = 76

North Section: = 218 LT cages

21GAE:
Cooled - Nori - surface lines (25' W x 450' L) 50 lines MAX

South Section:
• bottom cages between 6-M lines. (602 LT bags or 350 cages)
• bottom planting entire area south of belting access

MAX capacity: 100 bottom cages
568 - surface cages (apr-nov) south nov 15-March 15.
or
100 bottom cages
218 north surface cages
600 south surface bags