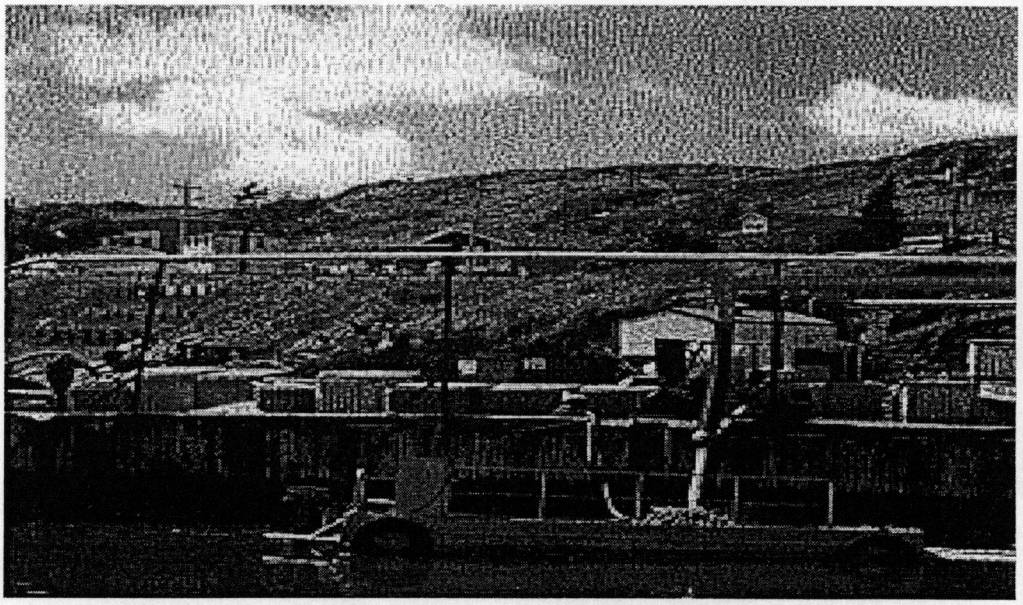
Environment Canada
Environmental Protection Branch
Ocean Disposal Program

July-August 1997



Compliance Promotion Project at Newfoundland Fish Plants

Introduction

During 1997, there were 45 fish plants in Newfoundland and Labrador which held permits to dispose of a total of 45,700 tonnes of fish offal in the sea. The permit system is administered under the Ocean Disposal Program of Environment Canada. An important aspect of this program is monitoring to ensure that permit conditions are met and that the disposal operations are carried out in an environmentally responsible manner.

During July and August, an environmental science student, Stephen Butters, was hired by the Newfoundland District Office of Environment Canada to carry out a project involving most of the fish plants in Newfoundland that had current ocean disposal permits. The purpose of the project was to encourage compliance with the ocean disposal regulations in the *Canadian Environmental Protection Act*, i.e., to remind fish plant operators of the obligations they incur when a permit is issued. Compliance promotion is a key part of Environment Canada's enforcement policy and the need for increased effort in this area was revealed during a monitoring project in 1995. At that time, LGL Limited was contracted to carry out physical and chemical monitoring of four fish offal disposal sites in Newfoundland. During the study, there appeared to be some discrepancies between actual and permitted disposal sites. An examination of the ocean disposal files also showed some confusion over the location of a few sites. Therefore, confirming disposal site locations with fish plant owners and barge operators was one of the goals of this year's project.

The scope of the project was increased to include a survey of plant owners in order to determine their thoughts on the suitability of the disposal sites, permit application dates, alternate methods of disposal, and the permit system in general. As well, secondary processing facilities were visited and some discussions were held to seek ways of diverting more offal from ocean disposal. This project also served to bolster the frequency of site visits and to provide contact between permit holders and Environment Canada.

The following report was prepared by Rick Wadman based on the information gathered by Stephen Butters. Thanks to Dave Curtis of the Shellfish Program for his time and assistance with the graphics.

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Site Visits

Foxtrap - Doug Norman and Sons

This plant was visited on July 3, 1997, by Rick Wadman and Stephen Butters. The load site coordinates were verified but the disposal site was not marked with a buoy, resulting in confusion as to its precise location. The plant was open in anticipation of the start of the caplin fishery on July 4, and a small amount of cod was being processed. This plant uses alternatives to ocean disposal by diverting offal to local farmers and a local compost operation whenever possible. During high production periods, however, these outlets cannot handle the volume. Mr. Norman, the plant owner, expressed the opinion that when a dumpsite is approved for fish offal, the user should not have to reapply on a yearly basis and that the renewal of the site should be automatic as long as there are no problems. He also feels that the permit fee is too expensive for the dumping of a substance that only feeds other animal species. Mr. Norman has no preferred application time (see table 2) for the permit.

Harbour Main - Gorman Fisheries Limited

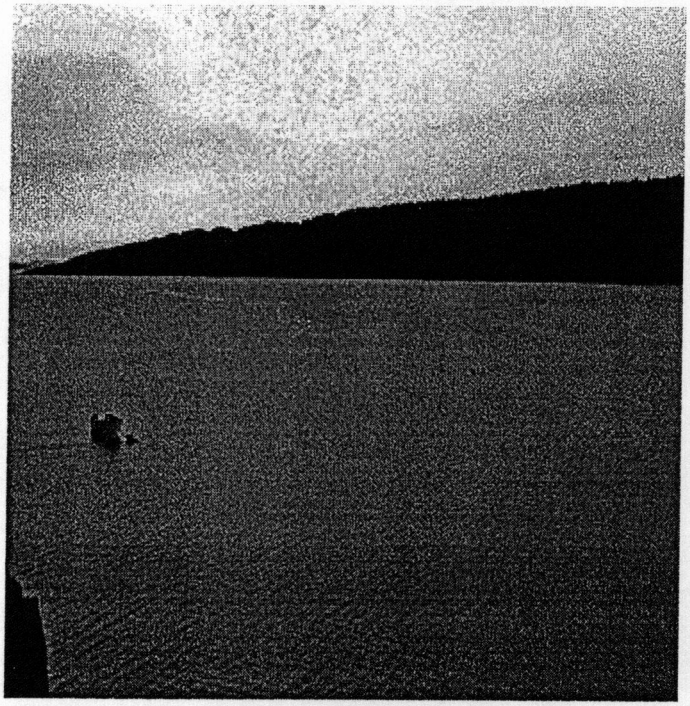


Fig. 1

This plant was visited on July 3, 1997, by Rick Wadman and Stephen Butters, but was not operating during the visit. The coordinates for the load site agreed with the permit but the plant was not indicated correctly on the map on file. The wharf area was clean as was the water surrounding the load site. During the interview, Patrick Gorman, the plant owner, proposed that the permit fee be paid in installments. He not only questioned the timing of the fee increase- just after the moratorium, but also the need for such a large increase. Pictured is the area of the disposal site (Fig. 1).

Witless Bay - Shawmut Fisheries Limited

This plant was visited by Rick Wadman and Stephen Butters on July 4, 1997. The load site coordinates were correct and the area surrounding the barge and wharf was clean. The plant was not processing during this visit due to the delayed crab fishery. Francis Tobin, a plant foreman, commented that ocean disposal allows for a large amount of offal to be dumped in a short period of time suiting the needs of this plant. The plant sometimes uses Cape Broyle Composting as an alternative means of offal disposal. Photographs of the loading area and dumpsite are shown in figures 2 and 3.

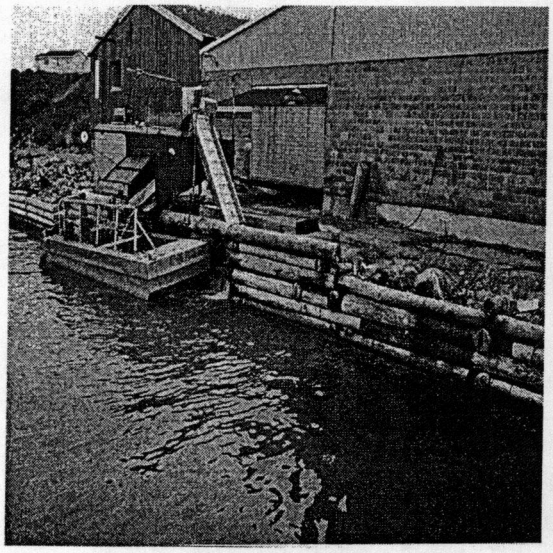


Fig. 2

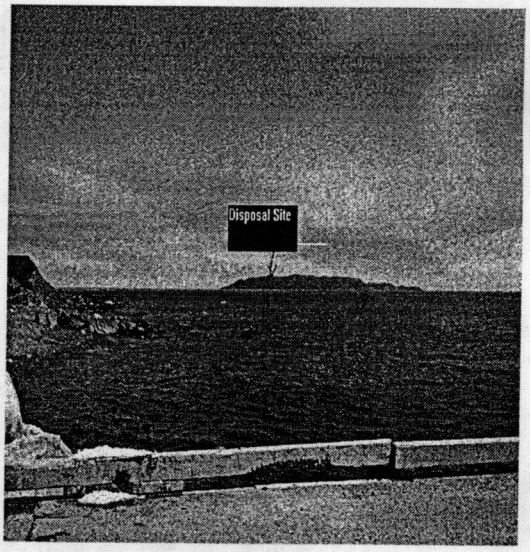


Fig. 3

During the week of August 11, 1997, several complaints were received concerning crab offal on the beaches in Witless Bay. On two separate occasions Wayne Pierce and Stephen Butters responded to the complaints and photographed the beach area (Fig. 4).

Fig. 4

Witless Bay continued:

During a conversation with the barge operator on August 14, 1997, he explained that the barge doors had accidentally opened during a nighttime disposal in rough weather, spilling some offal. When observing the water around the load site, Stephen Butters observed a fairly large amount of crab offal to the right of the barge along with tags and scrub brushes in the barge. The plant manager was informed of the problems and ordered to clean the affected beach area of offal. On August 19, 1997, Rick Wadman and Stephen Butters visited the site and noted that the barge was being filled. It was decided to carry out a nighttime observation of the disposal operation and both Wadman and Butters returned at midnight. Shortly after midnight, the barge operator disposed of the offal near the permitted location and it was decided that unless other complaints of beach fouling were received, the incident would be regarded as an accidental spill.

Hant's Hr. - P. Janes and Sons Limited

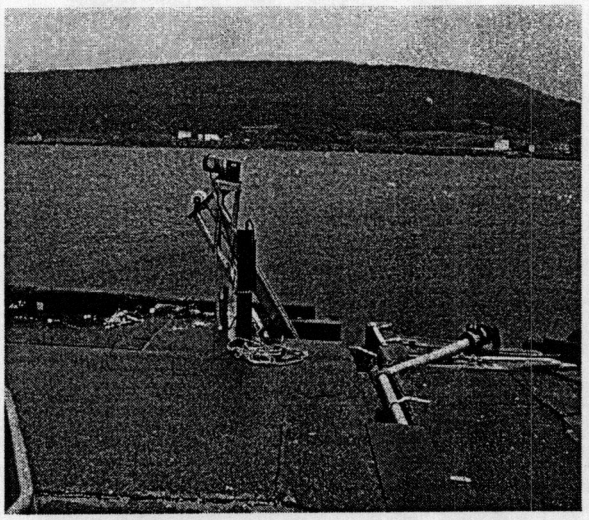
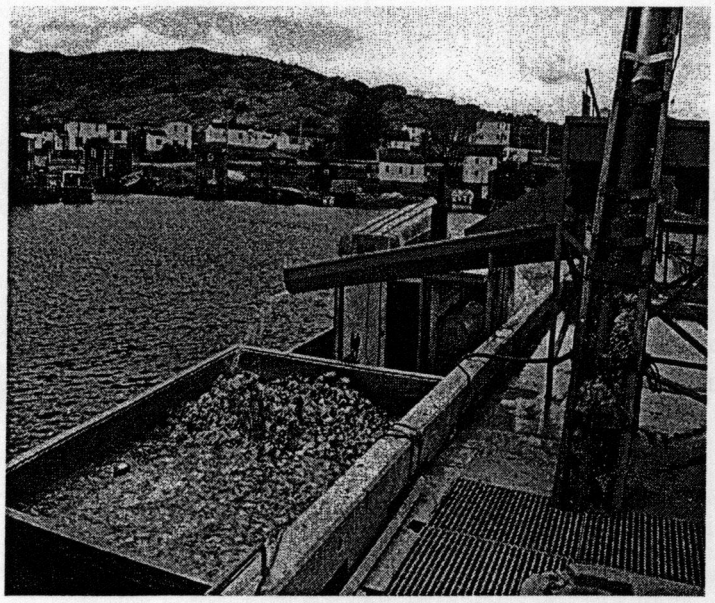


Fig. 5

This plant was visited on July 15, 1997. The load site coordinates were as indicated on the permit. Due to the ongoing crab negotiations, the plant was not in operation. The plant manager, Kevin Pynn, indicated he was pursuing a market in Japan for the crab shells. He said he could not use landfill as an alternative due to odour problems. Mr. Pynn would prefer to have his permit expire in the spring rather than the fall. Figure 5 shows the loading area.

Salvage - P. Janes and Sons Limited



This plant was visited on July 21 , 1997. The load site and dumpsite coordinates matched those on the permit. The dumpsite was not marked with a buoy, but the site is located using coastal navigation. Allan Butcher commented that, at one time, Fishery Products International picked up the offal for their meal plant. Since the meal plant is no longer operating, the fish plant has no other viable alternative to ocean disposal. Figure 6 shows the barge and the loading area.

Fig. 6

Jackson's Arm - P. Janes and Sons Limited

This plant was visited on August 6, 1997. Load and dumpsite coordinates were as specified in the permit. There was some offal lying around on the wharf area and management was informed that it should be removed. The plant uses a local compost operation to dispose of some offal but high trucking costs prevent more use of this alternative. The plant wishes to move its permit expiration date to the spring.

Bonavista - Fishery Products International

The plant was not operating during the visit on July 14, 1997, due to the crab negotiations. The coordinates of the load site were checked and found to be accurate. This plant has no other means to get rid of crab offal and must use ocean disposal. The plant manager, Gordon Cullimore, mentioned the long distance to the disposal site, however, there were historical problems with sites located closer to shore. Figure 7 shows the boat used to carry the offal.

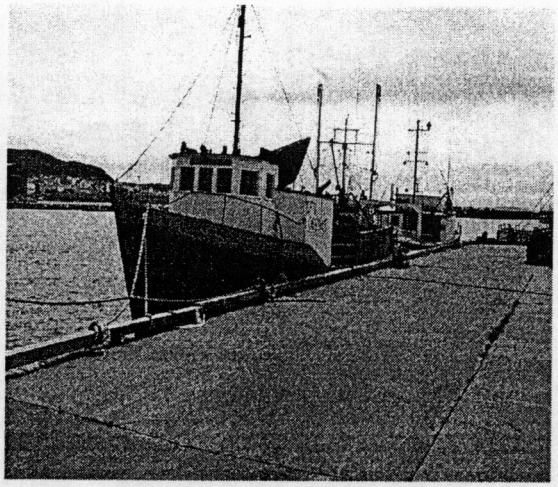


Fig.7

Triton - Fishery Products International

This plant was not operating during the visit on August 5, 1997, but the plant manager mentioned that the plant used alternative methods to ocean disposal in the past. Mr. Vincent would like to see all of the offal being used but concedes that without a strong market here in Newfoundland, most plants will find it easier to dispose of their waste in the ocean.

Long Cove - Dorset Fisheries

This visit took place on July 14, 1997. The load site coordinates were checked and found to agree with the permit. Due to bad weather, the disposal site coordinates were not checked. At this plant, the offal is collected in gray tubs placed under the load chute, shown in figure 8, and the tubs are then dumped into the barge. The barge is covered with a net to deter the seagulls and the wharf area is kept free of fish offal.

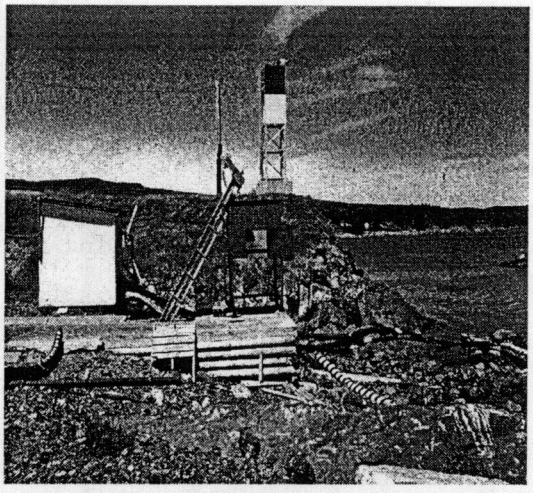


Fig. 8

Winterton - Green Seafoods Limited

This plant was not processing during this visit on July 15, 1997. The load area coordinates agreed with the permit. As an alternative, this plant sometimes uses Earle Brothers meal plant in Carbonear to dispose of some offal. The fish plant requires a disposal permit since the meal plant is not always open. According to the plant manager, Irvin C. Green, the price paid for the offal barely covers the trucking costs. Figure 9 shows the loading area.

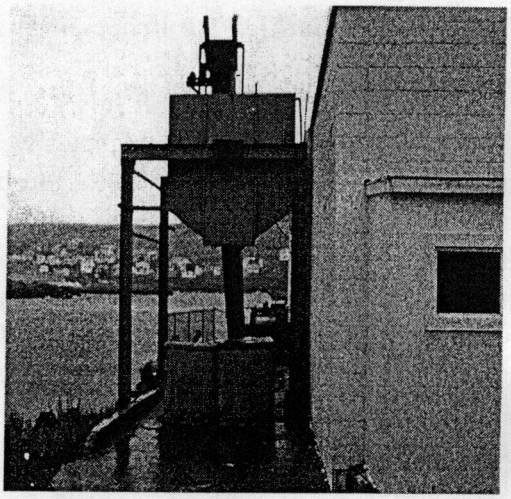


Fig. 9

Happy Adventure - Happy Adventure Sea Products

This plant was visited on July 21, 1997, when the plant had just finished processing caplin for the day. There was some caplin on the wharf but the plant foreman said that the dock would be cleaned at the end of the shift. This plant does not dump much of its offal since it has markets to supply food to zoos. The plant manager, Geoff Moss, stated that the $2500.00 permit fee is too expensive considering the amount of offal that is dumped. He also suggested having the permit fees based on a per dump scale or having the fee cover a three year period. Figure 10 shows the loading area.

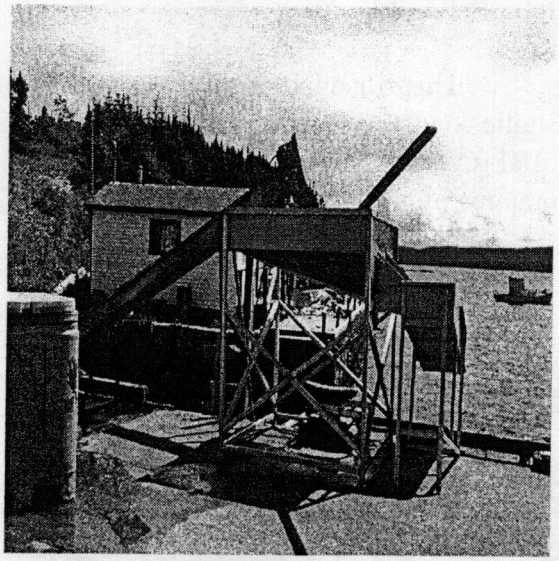


Fig. 10

Greenspond - Beothic Fish Processors Limited

The Greenspond plant is operational only during the caplin fishery. This plant had an ocean dumping permit in the past but is currently shipping offal to a sister plant in Valleyfield.

Valleyfield - Beothic Fish Processors Limited

This visit took place on July 22, 1997. The load and disposal site coordinates were correct. This plant disposes of offal through ocean disposal because there is no other alternative. The nearest compost operation is three hours away, the nearest meal plant almost five hours away and the local terrain rules out land fill. Valleyfield disposes of the largest amount of offal, by ocean disposal, in the Atlantic Provinces - 6000 tonnes.

Fig. 11

The load site is shown in figure 11. The offal boat anchors to the dumpsite and discharges the offal, insuring that the release is in the designated area. This operation is shown in figures 12 - 14.

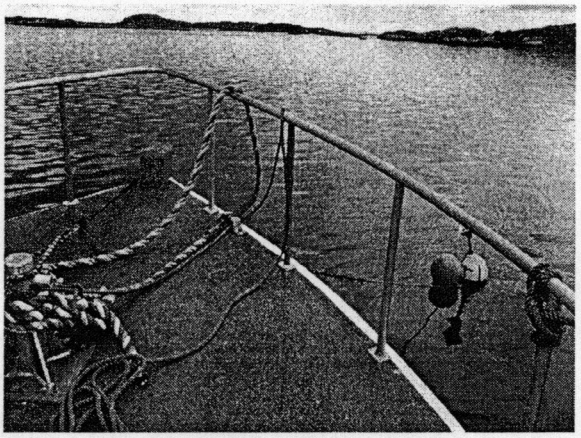


Fig. 12

This site appears to be very suitable for studies on the effects of ocean disposal of fish offal given the large volume of offal and the practice of tying on to the marker.

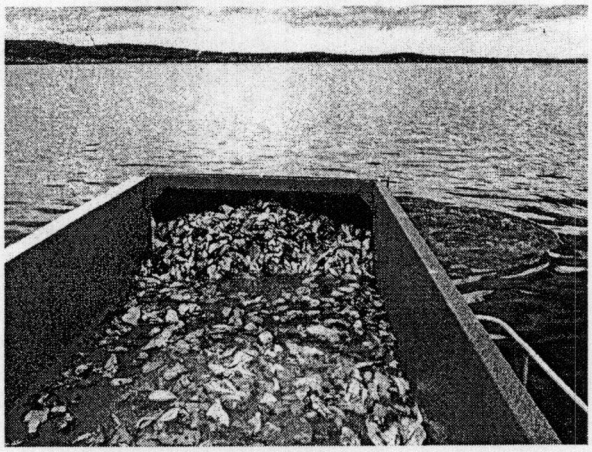


Fig. 13

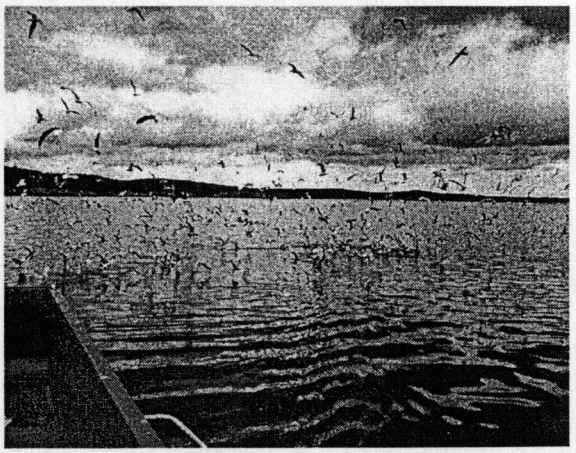


Fig. 14

Fogo - Fogo Island Co-op Society

This plant was visited on July 23, 1997. The coordinates of the load and disposal sites were the permitted ones. The barge trip to the disposal site takes about 30 minutes. This plant has no readily available alternative to ocean disposal. Figures 15 and 16 show the load and disposal sites.

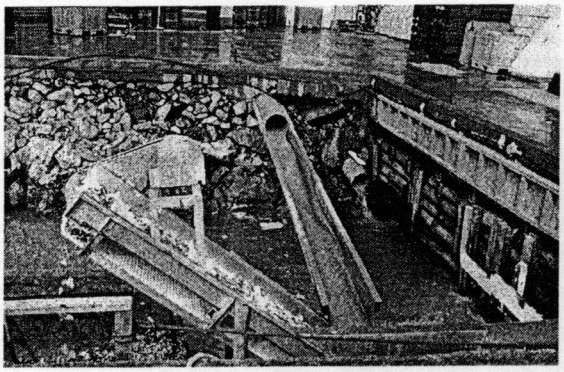


Fig. 15

Fig. 16

Joe Batt's Arm - Fogo Island Co-op Society

The plant was not processing during the visit on July 23, 1997. The load site coordinates were the permitted ones. Figure 17, a photograph of the barge, shows that it contains some garbage.

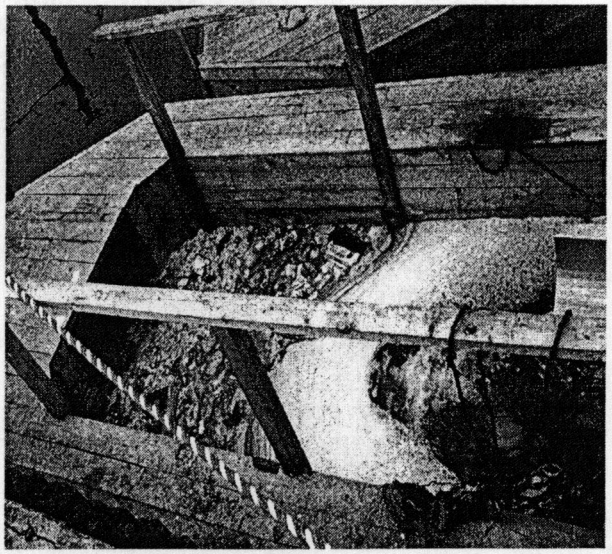


Fig. 17

Cottlesville - Breakwater Fisheries Limited

This plant was visited on July 23, 1997. The area surrounding the load site had some shells scattered around and the water was discoloured, possibly indicating poor circulation. Since the plant owner finds the current expiration date quite inconvenient, he expressed a preference to have the date moved to December. Figures 18 and 19 show the load area and the offal scow.

Fig. 18

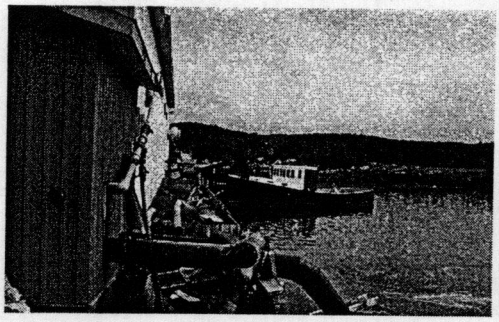


Fig. 19

Dover - Crimson Tide Fisheries Limited

This plant was not processing during the visit on July 24, 1997. The offal barge was used only three times this year. Last year, this plant transported some of its offal to a meal plant in Nova Scotia but this did not prove to be economically feasible. The plant uses the ocean disposal method because of its ease and relatively minor cost.

St. Lawrence - Grand Atlantic Seafoods Inc.

This site was visited on July 21, 1997, while the plant was processing crab. The coordinates for the load site were the permitted ones but the disposal site coordinates differed slightly and this was pointed out to the barge operator. The area surrounding the plant was clean. The standard practice is to wash any spilled offal into a de-watering tank and then into the barge. The operators have recently acquired the plant and are planning to upgrade the offal loading system.

Southern Harbour - Port Enterprises Limited

The visit took place on July 30, 1997, but the plant was not in operation this season due to the small catches of caplin. The load site coordinates were the permitted ones and the disposal site location is about three-quarters of the way across the bay. The plant owner, Alphonsus Best, intended to contact Rick Wadman concerning the possibility of extending this year's permit into next year. The current permit was issued on June 16, 1997. Mr. Best did not believe there was a need for a disposal permit as "fish offal does not hurt in deep water (and) indeed only feeds fish." He prefers to make the permit application in the summer.

Little Bay Islands - Sea Treat Limited

This site was visited on August 5, 1997. The load site in Little Bay Islands was found to be mapped in the wrong spot on the permit file but the actual coordinates agreed with the permitted ones. The plant is located in Southern Harbour, not on Macks Island as indicated on the permit file. The disposal site coordinates were as specified in the permit. To reach the disposal site, the barge must pass over water 1-3 meters in depth. During the trip, the bottom was observed to be free of fish offal. Since there are no meal plant facilities in the area, ocean disposal is the only option available to the fish plant. The plant operator expressed a preference for making the permit application in April or May.

La Scie - La Scie Fisheries Limited

This plant was visited on August 5, 1997. The load site is located on the northwest side of the plant not the northeast side as the coordinates indicate. There was not enough offal in the barge to warrant a trip to the disposal site.

Fleur de Lys- Coldwater Seafoods Limited

This plant was not operating during the site visit on August 6, 1997, consequently, only the load site coordinates were checked but the disposal site could be viewed from the wharf looking towards Caplin Cove.

Sandy Cove - Diamond's Industries Limited

This visit took place on August 6, 1997. The load site coordinates were the permitted ones. The plant was operating on a very small scale and markets were obtained by the owners to supply food for mink farms resulting in no offal being dumped. The plant manager Raul Xavier, mentioned that ocean disposal is the most suitable method for this operation due to the ease of handling and the distance this plant would have to ship its offal. Mr. Xavier would prefer to have his permit expire in March or April since it currently expires during the fishing season.

St. Anthony - Chianti Food Processors

This plant was not operating during the visit on August 7, 1997. Consequently, only the load site coordinates were verified. According to the plant manager, Mr. Ward, the company is presently seeking markets to dispose of the offal at mink farms. There is a meal plant at this location but some of the equipment was removed by the previous operators.

Conche - E. J. Green and Company Limited

The visit took place on August 6, 1997. The load site coordinates obtained were correct. Disposal site coordinates were not checked due to the inactivity of the fish plant. This plant has dumped about 100,000 pounds of caplin this year. There is no alternative to ocean disposal in this area. The barge is shown in Figure 20.

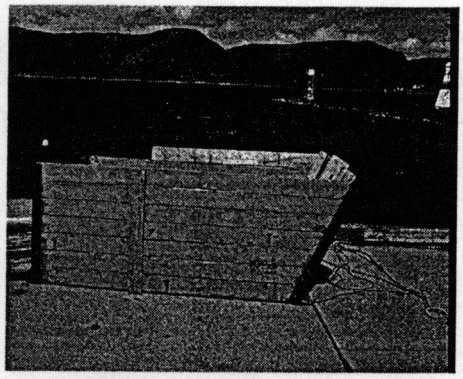


Fig. 20

Englee - Conpak Seafoods Incorporated

This plant was processing crab during the visit on August 5, 1997. The load site coordinates agreed with the permitted figures. No offal or crab shells were noticed either at dockside or the loading area. The barge operator was waiting for high winds to diminish before taking the barge out to the disposal site.

Rose Blanche - Snow Capped Fisheries

The plant was not operating during the site visit on August 11, 1997, but there was evidence of recent production at the plant. The load site coordinates were correct. Both fish offal and garbage were observed in a holding area along the offal pipeline as shown in figure 21. Although this plant is equipped to produce fish meal, there is not enough offal available to produce meal economically.

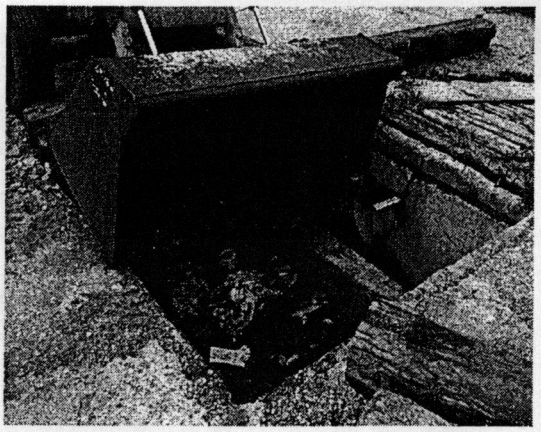


Fig. 21

Margaree - Billard Fisheries

This visit occurred on August 11, 1997. The permit was displayed and the load site coordinates agreed with the permit. The wharf surrounding the plant was free of offal and the water around the wharf was clear. The plant had dumped 147,000 pounds of fish offal up to this point in the season.

On November 17, 1997, the plant manager advised that they intend to send all offal to Barry's new meal plant in Burgeo, as will Gulf Seafoods and Eric King Fisheries.

Cox's Cove - T & H Fisheries Incorporated

This plant was visited August 11, 1997 but was not operating. The load site coordinates were obtained and these were found to be the permitted coordinates. The operator plans to send all offal to a meal plant in Burgeo when it opens later this year. (This plant recently began accepting offal.)

Ship Cove - Moorfish Limited
Bareneed - Ice Queen Fisheries

These sites were visited on August 21, 1997. The permit is shared by two fish plants, Ship Cove and Bareneed. According to the permit, there are three permitted load sites, however the site in Port de Grave was included due to a misunderstanding which has been rectified. The load site coordinates were the correct ones but the shared disposal site may not be used by both parties. Bareneed uses the permitted site but claims that Ship Cove uses a site closer to the mouth of the bay. This situation will be investigated to ensure both plants are using the proper disposal site.

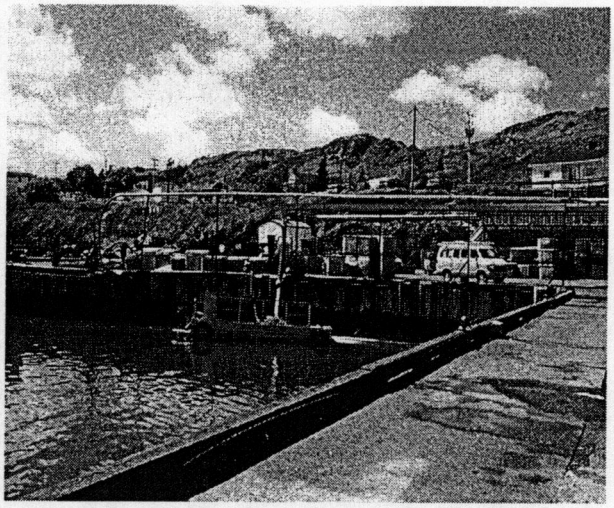


Fig. 22

Ocean disposal is the most suitable method available in this area due to the inactivity of the local meal plants. Figure 22 shows the plant and barge at Ship Cove and figure 23 shows the barge at the disposal site used by the plant at Bareneed.

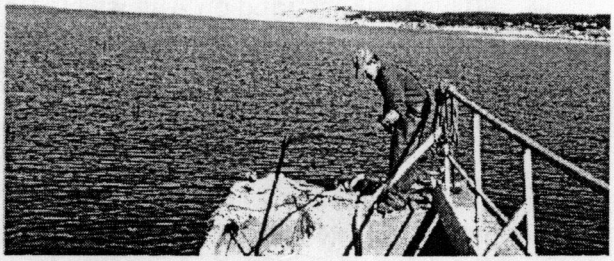


Fig. 23

St. Joseph's - Daley Brothers Limited

The plant was not operating during the site visit on August 21 ,1997, and the barge was out of the water for repairs. The load site coordinates were the permitted ones. This plant is not close enough to either Cape Broyle Composting or the fish meal plant in Carbonear to use them as alternatives.

New Harbour - Woodman's Sea Products Limited

This site was visited on July 15, 1997, after complaints were received that fish offal was being disposed of through a pipe directly into the shallow water adjacent to the wharf. Photographs were taken of the fish pile and passed along to Rick Wadman. Mr. Wadman visited the plant but was unsuccessful in speaking to the manager. Mr. Wadman then informed the Newfoundland Government Services Centre and the Canadian Food Inspection Agency of the problem. A follow-up visit by Rick Wadman confirmed that the fish pile had been removed.

In the questionnaire faxed to this plant, owner Geoff Woodman stated that the $2500.00 permit fee is too expensive. He claimed that the fish plant produces groundfish frames and uses the meal plant in Carbonear to dispose of most of the offal. As a result the plant disposes of a small amount of offal. The present permit expiration date was reported to be convenient for this plant.

Secondary Processing

During the course of this project, the three main secondary processors of fish offal were visited: Genesis Organics near Corner Brook (visited by Wayne Pierce), Cape Broyle Composting, and Earle's Proteins of Carbonear (both visited by Stephen Butters and Rick Wadman). The visits included a tour of the various operations and some discussions with the operators and other employees. The same points were raised during each discussion: the operators desired a larger and more reliable supply of raw material at little or no cost. However, the volume of offal varies considerably from day to day and the fish plant owners are not eager to pay transportation costs. These two statements partly explain why there is ocean disposal of offal and why Newfoundland aquaculture operations import feed made from fish offal produced in the Maritimes. This problem is not a new one and many people, both in industry and in government, have tried to develop solutions to reduce the amount of offal that is discarded. It is encouraging to note that the fate of fish offal is still a serious issue, and that plant operators are becoming more willing to seek and use alternatives to ocean disposal, *as long as they are not financially onerous.*

Recommendations

1. Ocean disposal permits expire at various times during the year including the middle of the fishing season. The possibility of adjusting the expiration dates is being considered as many operators prefer to have their permits expire during the spring or fall (Table 1). Moving these permit dates to two or three periods during the year would help eliminate the possibility of illegal dumping that may occur between permits. This situation is not always due to a late or forgotten permit applications. For example, delays and uncertainties in the start of the crab season resulted in a number of last-minute permit applications.

2. Perhaps not too surprisingly, many plant owners stated that the permit fee was too high given the relatively small amount of offal that they must dump. Some owners suggested that two or three post-dated cheques would help to relieve cash-flow problems.

3. A few barge operators were unsure of the precise disposal site location and since the majority do not use a GPS, dumping could occur in the vicinity of the proper site but not at the precise coordinates. However, there is considerable leeway before the operator is out of compliance. Barge operators should have a map with the proper disposal site clearly marked so that the disposal area is limited to a smaller area. This would also assist monitoring efforts. On the other hand, in some situations, a general disposal area may be best if it serves to disperse the offal more efficiently.

4. The disposal site at Valleyfield would be a suitable location for a project to monitor the effects of offal disposal. Not only is this the site of the largest volume of offal in the region, but the area is fairly sheltered and only eight metres deep. The remote undersea vehicle would be easy to operate under these conditions, allowing the operator to film the disposal process and the ocean floor.

5. The disposal site location for Bareneed and Ship Cove should be verified. Also, the loading operation at Bareneed should be inspected to make sure that offal is not going into the harbour while the barge is away.

Recommendations (continued)

7. From the conversations with the meal plant owners and offal processors, it is apparent that both groups wish to divert more offal from ocean disposal. However, there are still many problems to overcome. Environment Canada could provide some encouragement by more actively promoting alternative uses for fish offal. This could be as simple as an information package mailed to fish plant owners in the spring, or as involved as a demonstration project involving all interested groups.

Rick Wadman is a member of a group whose purpose is to explore solutions to this problem. He was invited to join as a result of a paper on fish waste that he delivered at the Canadian Waste Management Conference in September 1997. Members of the group also include industry consultants and a representative from ACOA and it is hoped that the membership may grow to include knowledgeable people from the province and the industry. The group first met on October 6, 1997, to exchange information about the current state of fish offal use in the province and to share ideas on maximizing the return from this raw material.

From this meeting and other discussions, ACOA has decided to hire a consultant to undertake a study that will examine the possibility of establishing a network of offal collection sites in the province. These sites will supply secondary processors who will produce food or food supplements for livestock, pets and fish raised in the aquaculture industry. The study will consider such things as offal volumes, stabilization of the offal at each site, capital costs for equipment modifications at the plants, transportation costs and possible markets for the products. If the results of this study are encouraging, a larger feasibility study is planned. This, in turn, may lead to the financing of a significant expansion in the fish waste processing industry in Newfoundland.

Table 1. Fish Plants with Ocean Disposal Permits in 1997

Location	Permittee	Type	Tonnes	Expiry
Anchor Point	Conpak Seafoods	Fish Offal	1000	5/05/97
Bay Roberts	Bay Roberts Seafoods	Fish Offal	1600	6/09/97
Bonavista	Fishery Products Int'l	Fish/Crab Offal	900	4/21/98
Brigus	J. W. Hiscock & Sons	Fish Offal	250	6/30/97
Cartwright	Lab. Fisherman's U.	Crab Offal	700	6/20/97
Chance Cove	Smith Seafoods	Fish Offal	1000	4/30/97
Conche	E. J. Green & Co.	Fish Offal	200	6/14/98
Cottlesville	Breakwater Fisheries	Fish/Crab Offal	1500	6/15/98
Cox's Cove	T & H Fisheries	Fish/Crab offal	2000	12/31/97
Domino	H. B. Dawe	Fish Offal	200	6/29/97
Dover	Crimson Tide Fisheries	Fish Offal	500	12/31/97
Englee	Conpak Seafoods	Fish Offal	250	6/16/98
Fleur de Lys	Sea Treat Limited	Fish Offal	500	5/31/97
Fogo	Fogo Island Co-op	Fish/Crab Offal	1000	6/29/98
Foxtrap	Doug Norman & Sons	Fish Offal	100	5/29/98
Greenspond	Beothic Fish Proc.	Fish Offal	1000	5/31/97
Hant's Harbour	P. Janes & Sons	Fish/Crab Offal	1000	6/15/97
Happy Advent	Happy Advent. Prod.	Fish Offal	500	5/04/98
Harbour Main	Gorman Fisheries	Fish Offal	300	10/27/97
Hopedale	Torngat Fish Prod.	Fish Offal	500	11/03/97
Jackson's Arm	P. Janes & Sons	Fish/Crab Offal	1500	6/15/97
Joe Batt's Arm	Fogo Island Co-op	Fish Offal	1000	12/31/97
La Scie	La Scie Fisheries	Fish/Crab Offal	1400	8/09/97
L'Anse au Loup	Lab. Fisherman's U.	Fish Offal	700	7/23/97
Little Bay Isls.	Sea Treat Limited	Shell Offal	1000	5/31/97
Long Cove	Dorset Fisheries	Fish Offal	1500	12/31/97
Makkovik	Torngat Fish Prod.	Fish Offal	500	11/03/97
Mary's Harbour	Lab. Fisherman's U.	Fish/Crab Offal	700	6/20/97
New Harbour	Woodman's Sea Prod.	Fish Offal	500	5/31/98
Portugal Cove	Conc. Bay Ocean Prod.	Fish Offal	500	7/04/97
Postville	Torngat Fish Prod.	Fish Offal	100	11/03/97
Rigolet	Torngat Fish Prod.	Fish Offal	100	11/03/97
Rose Blanche	Snow Capped Fisheries	Fish Offal	1500	6/09/98
Salvage	P. Janes & Sons	Fish Offal	2000	6/09/98
Sandy Cove	Diamond Fisheries	Fish Offal	500	10/27/97
Ship Cove	Moorfish	Fish/Crab Offal	1000	5/31/97
Southern Hr.	Port Enterprises Ltd.	Fish Offal	400	6/15/98
St. Anthony	Chianti Food Prod.	Fish Offal	2000	5/31/98
St. Joseph's	Daley Brothers	Fish Offal	1400	4/21/98
St. Lawrence	Grand Atl. Seafoods	Fish Offal	1000	6/15/98
St. Lewis	Coastal Lab. Fisheries	Crab Offal	1500	7/27/97
Triton	Fishery Products Int'l.	Fish Offal	2000	6/17/97
Valleyfield	Beothic Fish Proc.	Fish/Crab Offal	6000	3/31/98
Winterton	Green Seafoods	Fish Offal	400	6/14/98
Witless Bay	Shawmut Fisheries	Fish/Crab Offal	1000	3/31/98

Table 2. Permit Renewal Preferences

Plant Location	Permit expires	Preference
Foxtrap	August	None
Harbour Main	August	None
Witless Bay	March	None
Hant's Harbour	June	Spring
Salvage	June	None
Jackson's Arm	June	Spring
Bonavista	April	None
Triton	June	None
Long Cove	December	None
Winterton	June	June
Happy Adventure	May	Winter
Valleyfield	March	Fall/Winter
Fogo	June	None
Joe Batt's Arm	December	None
Cottlesville	June	December
Dover	December	None
St. Lawrence	June	None
Southern Harbour	June	Summer
Little Bay Islands	June	April/May
La Scie	June	None
Fleur de Lys	June	January-May
Sandy Cove	October	March/April
St. Anthony	May	None
Conche	June	Spring
Englee	June	None
Rose Blanche	June	None
Margaree	November	Fall/Winter
Cox's Cove	December	February
Ship Cove	May	None
Bareneed	May	None
St. Joseph's	April	None

Table 3. Percentage of Waste per Species

Species	Percentage discarded
Cod *Gadus morhua*	This varies from 10% or less to about 50%
Flounder *Pseudopleuronectes americanus*	This percentage varies from 10% to around 75%
Caplin *Mallotus villosus*	The percentage varies from 10% to 50%
Herring *Clupea harengus*	The percentage varies from 10% to 50%
Mackerel *Scomber scombrus*	The percentage is steady at 10%
Greysole *Glyptocephalus cynoglosus*	The percentage is steady at 75%
Turbot *Reinhardtius hippoglossoides*	The percentage is steady at around 40%
Crab *Chionoecetes opilio*	The percentage varies from 25% to 50%
Lumpfish *Cyclopterus lumpus*	The percentage is high (90%) as only the roe is taken
Squid *Illex illecebrosus*	The percentage for squid is between 10% and 25%

*Percentages are estimates given by fish plant operators on the questionnaire found in Appendix B.

Appendix A

Phone Contact Form

Plant Location .....

Date .....

Contact.....

Title .....

Questions:

1. Processing now? .....

   Species? .....

   If not, when? .....

2. Problems with waste disposal? .....
   .....
   .....
   Problems with disposal site? .....
   .....
   .....

Checklist:

( ) 1. Explain about the questions to be faxed.
( ) 2. Confirm fax number of respondent. Note here if different .....
( ) 3. Mention future call for appointment.

Appendix B

Fish Waste Survey

Plant Location .....

Name ..... Title .....

1. Please list the main species that your plant processes. For each species, estimate the percentage that you discard during processing.

Species	Percent discarded (circle one)				
.....	10% or less	25%	50%	75%	90% or more
.....	10% or less	25%	50%	75%	90% or more
.....	10% or less	25%	50%	75%	90% or more
.....	10% or less	25%	50%	75%	90% or more
.....	10% or less	25%	50%	75%	90% or more

2. Besides ocean disposal, what methods of fish waste disposal are you using now, or have you used in the past?

.....

.....

3. For your operation, is ocean disposal the most suitable method of fish waste disposal?

yes ..... no .....

4. Why? .....

.....

Appendix B (continued)

5. What alternatives to ocean disposal are available in your area?

.....

.....

6. Do you have any comments on any of the following:

i) the permit application
ii) the conditions of the permit
iii) the way ocean disposal is carried out
iv) your ocean disposal site

.....

.....

.....

.....

.....

7. Do you have a preferred time of year to make your application?

yes ..... (when?) ..... no.....

Is there a time when it would not be convenient? .....

Please fax to Mr. Rick Wadman at 709-772-5097
Any questions ? Please call 709-772-4269
Thank-you.

Appendix C

References

Christian, J. R. 1997. Monitoring Physical and Chemical Conditions at Four Fish Offal Disposal Sites in the Coastal Waters of Insular Newfoundland, November 1996. Report by LGL Ltd. to Environment Canada, Environmental Protection Branch. 31 p. + App.

Wadman, R., Pierce, W., Murdoch, M., Walsh, N. 1997. Fish Waste Disposal and Environmental Monitoring in Newfoundland. Paper delivered to the Canadian Waste Management Conference, September 16, 1997, at St. John's, Newfoundland.