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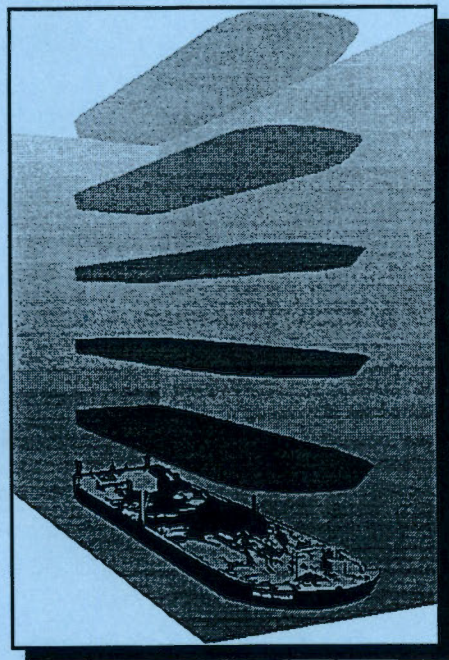


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Government of Canada
Gouvernement du Canada

Summary of the Further Assessment of the Recovery of the Irving Whale in Light of the Presence of PCBs



March 1996

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SUMM

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INTRODUCTION

The Project

The purpose of the 1996 Fisheries and Oceans and Environment Canada proposal to recover the *Irving Whale* is to remove the environmental hazard which the barge, its cargo and heating fluid containing PCBs pose to the environmental health and economic well-being of the Gulf of St. Lawrence and surrounding communities.

The objective is to raise the barge, place it on a transport vessel, transport it to Halifax via the Cabot Strait and deliver it to the Halifax Shipyard Limited (HSL) drydock, where it will be cleaned and decommissioned.

The Environmental Assessment (under EARPGO, 1984)

The purpose of the further assessment of this proposal is to review the recovery of the *Irving Whale* in light of the presence of PCBs, in compliance with the Environmental Assessment and Review Process Order in Council (1984).

BACKGROUND

The barge *Irving Whale* sank on September 7, 1970, in the southwestern Gulf of St. Lawrence (47°22'09"N, 63°19'00"W), approximately 60 km northeast of North Point, Prince Edward Island and 100 km west of the Iles-de-la-Madeleine, Québec. The *Irving Whale* gradually sank by her stern and came to rest on the seabed in an upright position. The barge, which lies at a depth of 67 metres (220 feet), initially contained 4,270 metric tonnes (4,200 long tons) of oil (Bunker "C", number 6 fuel oil). An initial spill of 400-600 metric tonnes occurred at the time of the sinking. Since then small quantities of oil have been leaking intermittently through the cargo tank vents of the barge. The amount of oil left in the barge is now estimated at approximately 3,150 metric tonnes (3,100 long tons).

An assessment of the presence of oil on board the barge and the proposed method of the vessel's recovery was carried out in 1994 under the Environmental Assessment and Review Process Order in Council, EARPGO. The original port of destination: Mulgrave, Nova Scotia, was also reviewed and was changed to Halifax, Nova Scotia in 1994. On June 9, 1995 a contract was awarded to Donjon/McAllister Joint Ventures Limited to conduct the lift. The subsequent revelation of the presence of PCBs on board necessitated an additional environmental assessment, which was completed in early July 1995.

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The amount of PCBs in the cargo heating system of the *Irving Whale* when it sank is estimated to have been approximately 6,800 litres (9.4 tonnes). Of this, an estimated 90 litres (90 kg) was lost at the time of the sinking. An unknown amount remains on board placed in the various components of the cargo heating system or vessel compartments.

On August 21, 1995, the recovery project was halted when a temporary stay was placed on the two initiating departments by the federal court, until the environmental consequences of the presence of PCBs are further assessed, or a judicial review regarding the assessment of the presence of PCBs is carried out. The two federal proponent departments have chosen to further assess the recovery of the *Irving Whale* in light of the presence of PCBs.

After consulting with various stakeholders in the four Atlantic provinces and Québec in January 1996 to identify issues of concern, the two federal departments awarded a series of contracts to obtain independent evaluations of the proposed recovery method; the various options and alternatives for dealing with the PCBs on board; the stresses to which the barge will be subjected during the lift; various potential PCB spill scenarios, including "worst case" scenarios and their social, environmental and economic impacts.

WHY WE ARE CONCERNED ABOUT THE PCBS

Biological and Economic Resources

The biological communities in the region provide a source of income for many people throughout the Atlantic provinces and Québec. There are a number of commercial fisheries for pelagic (water column) and benthic (bottom) species. The phytoplankton and zooplankton form the basis for these important fisheries resources.

This region supports a considerable diversity of organisms and is a highly-regarded tourist area. The region provides habitat for many species of birds, fish and mammals, including four species of seals and twelve species of whales and dolphins. The extensive coastline and the waters of the Gulf are highly productive.

The fisheries resources of the Gulf are highly valued and include: Atlantic herring, Atlantic mackerel, capelin, bluefin tuna, white hake, redfish, halibut, plaice and flounder. Lobster and snow crab are the most valued shellfish fisheries. Soft-shelled clams, blue-mussels, American oysters, quahaugs, scallops and surf clams are also harvested.

The natural resources and environmental aspects of the Gulf are highly valued by residents and visitors. Representative valued components of the Gulf of St. Lawrence environment were

identified, based on consultation during our scoping meetings in January 1996, with scientists of the Department of Fisheries and Oceans and others who were consulted during the preparation of the environmental assessment.

In determining the potential impact of a spill of PCBs at the site of the *Irving Whale* and the consequences to the environment and economy of the Gulf, Department of Fisheries & Oceans scientists analyzed five hypothetical PCB release scenarios: a release of 1,200 kg of PCBs at the surface, a 1,200 kg release at 67m (i.e., near the seafloor), and two "worst case" scenarios of release of 7,250 kg at the surface and at 67m. They concluded that in the short term a major spill at the surface or the bottom could have immediate, local, short-term lethal or sub-lethal effects which could have some immediate economic consequences, the snow crab fishery being the most vulnerable.

In the long term, spilled PCBs would be dispersed away from the barge and eventually over the entire Gulf, through dissolution, sediment transport and bioaccumulation in the food web. A certain portion would eventually evaporate into the atmosphere or accumulate in sediment of the Laurentian Trough, and some would exit the Gulf system through the Cabot Strait.

Increased PCB bioaccumulation, if any, in fisheries resources in other areas of the Gulf and the Estuary following a possible spill from the *Irving Whale* is expected to be negligible.

If not removed, the *Irving Whale* will, leak over time and its overall impact would therefore be that of the long-term worst case scenario at 67m: release all of its remaining PCBs .

Options considered for dealing with the PCBs

Two basic options were considered for dealing with the PCBs remaining on board the *Irving Whale*. These were:

- ▶ Encapsulation on the seafloor;
- ▶ Raising the barge and its cargo of bunker "C" and heating fluid containing PCBs.

Encapsulation Option

During the assessment of the recovery of the barge in light of the presence of PCBs, the suggestion was made that the barge should be buried, rather than being completely removed from the environment. Burial would involve depositing tons of sand, gravel and clay on top of the barge or encapsulating it in concrete in an attempt to contain the oil and PCBs by sealing over the barge.

The current, world-wide knowledge and experience regarding the permanent capping of vessels containing significant contaminants is limited. Given the fact that the Gulf area is one of great biological productivity and economic value, and that capping technology presents the certainty that this solution will ultimately fail at some unknown time in the future, it was concluded that capping is not a viable alternative in the mitigation of environmental impacts of the *Irving Whale* and the protection of the environment. Encapsulation was screened out from further evaluation. It was concluded that the complete and immediate removal of the vessel was the preferred option.

Recovery of the *Irving Whale*, Bunker "C" Cargo and PCBs

The Five Options:

We have determined that there are five options regarding PCBs with respect to the lifting of the *Irving Whale*, two of which involve removing partially or completely the PCB-containing heating fluid. How each of the five options considers or treats the presence of PCBs is outlined below.

Option 1 - OPERATION AS PLANNED/1995: the operation that was proposed in the Initial Environmental Assessment of June 1994.

Option 2 - OPERATION AS PROPOSED/1996: in light of the presence of PCBs, employs additional mitigation measures to ensure that any potential leakage of PCBs is minimized or prevented (e.g., mitigation such as protecting heating system piping, installation of cradles, lining bolsters).

Option 2a - OPTION 2 PLUS 'ISOLATION': adds compartmentalization of the heating fluid in the heating system to minimize any release.

Option 2b - OPTION 2 PLUS 'EMPTYING MAINS': additionally removes heating fluid from those parts of the distribution system (mains) that do not require divers to enter the barge.

Option 2c - OPTION 2 PLUS 'EMPTYING ALL': additionally removes the heating fluid from all parts of the barge, including those which require divers to enter the barge.

These options were assessed for risk to workers, the environment and risk of mechanical failure. It was concluded that the preferred option is "option 2," the removal of the *Irving Whale* with its cargo of Bunker "C" and the PCBs on board, without employing any means to remove the PCBs prior to the lift, but, nevertheless, utilizing a number of additional mitigation measures to ensure that potential leakage of PCBs is minimized or prevented.

The Searle and Associates Report, 1996, an independent evaluation of the proposed recovery of the *Irving Whale* considered the alternatives for dealing with the presence of PCBs, including removing all or part of the sunken *Irving Whale*. The report concluded that the additional risks of spillage associated with these options, as well as the increased risk to divers, did not justify the benefits which maybe gained by removing the PCBs before lifting the *Irving Whale*.

THE PROPOSAL (Option 2)

Department of Fisheries & Oceans and Environment Canada carried out an evaluation of the 1995 recovery project and, in consultation with the contractor, developed some additional mitigation which will be used in the next phase of this recovery operation.

In January and February of 1996, an independent review of the planned recovery of the *Irving Whale* was carried out by an internationally recognized marine salvage company: Searle and Associates, Ltd. of Alexandria, Virginia, U.S.A. Each step of the recovery process was evaluated. These steps include:

1. preparation of the *Irving Whale* and its site for the recovery operation;
2. placing the two slings and raising the barge;
3. lifting the barge;
4. de-watering equipment spaces;
5. placing the *Irving Whale* on a transportation vessel;
6. cleaning marine growth from the barge;
7. transporting the barge to the Halifax Shipyard Limited drydock. There, the cargo of Bunker "C" and the PCBs will be removed in a safe and controlled manner. The vessel will then be decommissioned; and
8. removing the PCBs at Halifax Shipyards Limited.

In addition, other evaluations were carried out to provide information needed to further evaluate the recovery of the *Irving Whale* in light of the presence of PCBs and for the completion of this assessment. They are as follows.

- ▶ **DFO Science Report** - Representatives of the departments of Fisheries and Oceans and Environment met to develop various hypothetical spill scenarios. These were used as an aid to predict potential impacts of an operational spill associated with the proposed

recovery procedure, and major spills, including "worst case" spills, on the seafloor. Their findings and conclusion are recorded in this report.

- ▶ ***Herbert Associates, San Francisco, U.S.A.*** - This company of Naval Architects has reviewed the calculations carried out by Donjon McAllister and CCG with regard to the strength of the barge *Irving Whale* and its ability to withstand the stress of the proposed two-point lift process.
- ▶ ***David Sawyer, Socio-economic Evaluation*** - An independent socio-economic study was commissioned. This study considered the findings and recommendations of previous studies (e.g., the CEF Report) as well as new fisheries, tourism and other data. The potential socio-economic and market impacts of various spill scenarios in light of the presence of PCBs were also evaluated.
- ▶ ***Bio-Response Systems Limited*** - This company was contracted to assist in the compilation of assessment data and to provide an evaluation of the potential risks associated with this project with respect to the various possible impact scenarios and recovery options.

1. Preparation of the *Irving Whale* and its Site for the Recovery Operation

The preparatory work for the lifting and recovery of the *Irving Whale* will include several steps.

First, there will be a thorough and detailed inspection of the stern hull area to ensure that there are no structural problems. The port and starboard side plating of the *Irving Whale* in the vicinity of the aft sling will be cleaned and ground smooth in preparation for the installation of the lifting "cradles." The cradles are designed to strengthen and protect the hull from damage by the lifting slings. The cradles will be shaped to fit the stern of the barge and will provide a seat for the lifting sling. The forward lifting brackets, which were attached to the hull in the 1995 operation, will be inspected for deterioration since the 1995 operation, and if found acceptable, they will be fitted with pads to prevent damage to the forward lifting sling.

Divers will carry out a detailed inspection of the port and starboard sides of the barge's ring main, including the branch pipes and valves. If they are damaged, repairs will be carried out where feasible. The ring main piping and cargo tank valves in the vicinity of the lifting slings will be protected against chafing or damage which might otherwise be caused by the lifting slings.

Sediment samples will be taken from the ocean floor around the barge to determine the concentrations of PCBs prior to the lift. Additional sediment samples will be taken at the after end of the vessel, under the stern rake, in the vicinity of the engine and pump rooms. Elevated PCB concentrations may indicate whether leakage has occurred from the engine room.

Water samples will be taken from the engine room and pump room at pre-selected heights in these spaces, and analyzed to determine if PCBs are present. In addition, a probe will be used to collect a sample of the liquid in the bilge at the lowest levels, of both the engine room and pump room. This will help to determine whether there are PCBs in the bottoms of these compartments, or if the heating fluid has remained contained within the piping systems in these compartments.

An Atmospheric Environment Service, Environment Canada meteorologist will be on site to advise on an appropriate "weather window" for the lift. A weather buoy will be positioned close to the site to continuously provide real-time data on the weather for the recovery operation.

Since last year's recovery attempt, sediment may have built up around the stern of the vessel and in the tunnel which was dug under the forward section. This sediment will be removed to enable the forward sling to be passed under the vessel and be correctly positioned in the U-shaped retaining bolsters.

Debris, such as polypropylene lines and cables, will be removed and brought to the surface for disposal in an approved manner. This will be done to ensure diver safety and to clear all obstructions to the lift. Large openings will be cut along the port and starboard sides of the barge's cargo bin bulwark to allow rapid discharge of water from the cargo bin when the *Irving Whale* is raised out of the water.

An apparatus will be positioned on the barge to monitor the stress on the barge's hull during the lift. The position of the barge before the recovery will be clearly marked on the seabed with buoys or pingers¹ to enable sampling and appropriate remediation, to be conducted after the removal of the barge.

The divers working on the barge will be instructed to exercise extra care when working in the area of the ring main, to avoid damaging the exposed cargo heating pipes and the valves in the cargo tank lines. The divers will also be instructed that there is a likelihood that the majority of

¹A pinger is a sound emitting device which can be placed on the sea floor and its position detected from the surface.

the PCBs are in the engine room bilges and that they must take appropriate care when fitting and welding the aft lifting cradles.

2. Placing the Two Lifting Slings and Raising the *Irving Whale*

This phase involves placing the two heavy duty slings under the barge, completing the rigging of the slings in accordance with the contractor's rigging plan and raising the barge to the surface of the water.

Calculations of the bending stresses that will be placed on the *Irving Whale* have been made by the contractor: Donjon McAllister Joint Venture, and these were verified by the Canadian Coast Guard for the 1995 summer operation. These calculations show that the projected hull stresses will be well within safety margins. An independent review of these calculations, carried out by Herbert Engineering, San Francisco, California, U.S.A. in early 1996, confirms the accuracy of the calculations carried out by the Canadian Coast Guard and Donjon McAllister.

3. Lifting the Barge

After the completion of the attachment of the two lifting slings, depth gauges (pneumo-fathometers) will be fitted at the four corners of the barge to ensure that the barge is lifted on level trim and heel. These gauges will be monitored at the surface by the operators. A partial load will be placed on each sling, and the effects will be monitored by a remotely operated vehicle (ROV). If satisfactory, the loads will be gradually increased until the calculated lift tension is reached. The tension on each sling will be continuously monitored from each of the lifting barges at the surface.

A device will be positioned on the *Irving Whale* to monitor the stress on the hull during the lift. Provided the allowable hull stresses are not exceeded, the lifting of the *Irving Whale* will then proceed.

The *Irving Whale* will first be raised to a sufficient height to allow the ROV to examine the bottom plating for damage. If damage is observed, an evaluation will be carried out and a decision will be made as to whether or not to proceed with the lift.

4. De-watering of the *Irving Whale*'s Equipment Spaces

The *Irving Whale* will be slowly raised, and once it is at the surface, the forward compartments, engine room and pump room will be de-watered to reduce the load on the two lifting slings.

If PCBs are present in the water, it will be pumped into approved containers for subsequent controlled disposal at an appropriate site.

The *Irving Whale's* forward and after compartments will be full of seawater when the barge is brought to the surface. The after compartments contain approximately 640 tonnes of water, while the forward compartments contain approximately 457 tonnes of water. The seawater will be removed from these compartments to reduce unnecessary weight.

5. Placing the *Irving Whale* on the Transport Vessel

Once the *Irving Whale* is at the surface, a submersible transport vessel will be submerged and positioned directly underneath it. As water is pumped from the ballast tanks of the submersible vessel, the *Irving Whale* will be slowly raised clear of the surface of the water. After the *Irving Whale* is secured on board the submersible vessel, a containment area will be deployed around the *Irving Whale* to contain any possible discharges from damaged cargo tanks.

6. Initial Cleanup of the *Irving Whale* and Disposal of Debris

The sides and other surfaces of the *Irving Whale* have become encrusted, to varying degrees, with marine plants and animals, such as seaweeds, sea urchins and crabs, as well as some fine sediments. Samples of the marine growth and sediments will be tested for PCBs, and if contaminated, will be retained on board the transport vessel and taken to an approved storage facility for subsequent disposal or destruction at a certified facility, such as Chem-Securities Limited in Swan Hills, Alberta. The storage and transportation of the materials will be in accordance with federal and provincial PCB Storage Regulations and Transportation of Dangerous Goods Regulations. Personnel working in contact with potentially contaminated materials will be properly trained and equipped. If the marine growth and sand are not contaminated and may be safely discharged overboard, this will be carried out in accordance with the provisions of an Ocean Disposal Permit.

7. Transporting the *Irving Whale* to Halifax

Once the *Irving Whale* is secured on the deck of the transport vessel, it will be taken to Halifax, Nova Scotia via the Cabot Strait, passing clear of the major shipping lines in the Gulf of St. Lawrence. This voyage will be a routine shipping operation similar to that of other vessels carrying cargo in marine waters. The voyage is expected to take 2-3 days and the transport vessel will be accompanied by a Canadian Coast Guard vessel. When the transport vessel arrives in Halifax, its deck will be suitably cleaned to remove any possible PCB-contaminated material prior to off-loading the *Irving Whale*. Once afloat, the *Irving Whale* will be stabilized prior to entering the dry-dock at Halifax Shipyards.

The weather will be continuously monitored during the voyage, and ports of refuge will be identified in advance, to be used in case of severe weather.

8. Removal of PCBs from the *Irving Whale* at Halifax Shipyards Limited

When the *Irving Whale* is safely dry-docked at Halifax Shipyards Limited, the PCBs contained in the heating system will be removed. The removal process will be carried out under Nova Scotia government regulations. However, prior to the removal, samples will be taken from the various parts of the barge to test the oil, water and barge surfaces for PCB contamination. Where PCBs are located, they will also be removed and disposed of in compliance with federal and provincial requirements.

9. Environmental Assessment of the Proposed Recovery Operation

Department of Fisheries & Oceans and Environment Canada have undertaken the Recovery Project because they are convinced that to protect the Gulf of St. Lawrence's environment, the barge and contents must be removed as soon as possible. This further environmental assessment of the recovery of the *Irving Whale* addresses the following important concerns in light of the presence of PCBs.

- ▶ Diverse biological resources (e.g., migratory birds, fish, marine mammals);
- ▶ Important habitat for the biological resources, including several rare, threatened and endangered species of migratory birds and marine mammals;
- ▶ Economically important tourism and fishing industries, each of which generates revenues in excess of \$200 million per year; and
- ▶ Health, particularly with regard to the impact of the presence of PCBs on the general environment, individual human health and on worker safety during the Recovery Project.

In addition to the project as proposed, the assessment also considers and evaluates the potential impact on the biological and socio-economic components of the environment that might result from major releases of PCBs at the surface or at 67m (the depth at which the *Irving Whale* rests).

MITIGATION AND PREVENTION OF IMPACTS

Mitigation is defined as a) avoiding the impact altogether by not taking a certain action, b) minimizing impacts by limiting the magnitude of the action, c) rectifying the impact by preservation and maintenance operations, and d) compensating for an impact by replacing or providing substitute resources or environments.

Liability insurance will be in place before the commencement of the lift operation.

Mitigation of a Major Release of PCBs

Because it was determined that a major release of PCBs would result in significant impacts, it is considered extremely important to prepare for and prevent that unlikely possibility. The situation in which it is possible to release most, if not all, of the PCBs on the barge, is if the barge should break up during the lift. It has therefore, been decided that a system will be used whereby the stress on the *Irving Whale* hull, during the lift process will be monitored. Calculations have been made to determine the amount of stress that could safely occur. The leaders of the recovery team will evaluate the actual stress measurements while the *Irving Whale* is lifted off the bottom. If the criteria for safety are not met, the operation will be immediately stopped and reassessed. If the reassessment fails to result in the criteria for safety being met, the lift will be halted and the vessel will be replaced on the seafloor. Thus, the avoidance of the "worst case" scenario entails **careful preparation of a well-planned operation that will prevent the worst case from occurring.**

Mitigation of Impacts of the *Irving Whale* Recovery Operation as it is Proposed to be Carried Out

For each step of the operation, mitigation is proposed which will minimize the risk to the workers, to the environment and to the economy. However, none of the mitigation strategies and methods proposed by engineering professionals, or the community via public comment, is risk-free. Therefore, the process of designing and choosing mitigation strategies must consider *relative risk*. The following principles were followed in the design portion of the project.

- ▶ Minimizing risk to workers;
- ▶ Planning and implementation to prevent any projected significant impacts from occurring, using engineering controls and procedures (e.g., engineering and recovery methods);

- ▶ Planning and implementation of measures for avoiding or minimizing any potential adverse environmental effects (e.g., application of contingency plans, compensation for economic loss); and
- ▶ The use of project designs and operational procedures which will provide the least risk for all relevant Valued Environmental Components.²

MITIGATION PROCEDURES TO BE EMPLOYED DURING THE RECOVERY OF THE *IRVING WHALE*

Mitigation During the Placing of the Lifting Slings:

- ▶ The forward lifting brackets, which were attached to the hull in the 1995 operation, will be fitted with pads to prevent damage to the forward lifting sling.
- ▶ The lifting “cradles” at the stern will be designed and installed to prevent damage to the aft lifting slings.
- ▶ Divers will carry out a detailed inspection of the port and starboard sides of the ring main, including the branch pipes and valves. In the event of existing damage, repairs will be made where feasible.
- ▶ The ring main piping and cargo tank valves in the vicinity of the lifting slings will be protected against chafing or damage which might otherwise be caused by the lifting slings.
- ▶ Debris, such as polypropylene lines and cables along the sides of the vessel, will be removed and brought to the surface for disposal in an approved manner. This is to ensure diver safety and to clear all obstructions to the lift.
- ▶ Large openings will be cut along the port and starboard sides of the cargo bin bulwark to allow rapid discharge of water from the cargo bin when the *Irving Whale* is raised out of the water.
- ▶ An apparatus will be positioned to monitor the deflection of the barge’s hull during the lift.

² (VEC): an identified biophysical or socio-economic aspect of the environment that is valued by society.

- ▶ The barge's position will be clearly marked on the seabed with buoys or pingers to enable sampling and appropriate remediation to be conducted after the barge's removal.
- ▶ The divers will be instructed to exercise extra care when working in the area of the ring main to avoid damaging the exposed cargo heating pipes and the valves in the cargo tank lines.
- ▶ The divers will be instructed that there is a likelihood that the majority of the PCBs are in the engine room bilges and that they must take appropriate care when fitting and welding the aft lifting cradles.

Mitigation During the Lifting of the Barge

- ▶ The tension on each sling will be continuously monitored from each of the lifting barges at the surface.
- ▶ The stress on the hull of the *Irving Whale* will be monitored during the lift operation. Provided the allowable stresses are not exceeded, the lift will then proceed.
- ▶ The barge will be raised to a sufficient height to allow the remote operated vehicle (ROV) to examine the bottom plating for damage.
- ▶ The barge will be raised slowly to the surface, and at that time the forward compartments and the engine room and pump room will be de-watered to reduce the load on the slings.
- ▶ The analysis of the water and bilge samples from the engine room and pump room will indicate whether the de-watering of these compartments is to be made directly overboard or into approved containers located on one of the contractor's vessels on site.

Mitigation in the Event the Hull is Holed or Otherwise Damaged

- ▶ The bottom of the *Irving Whale* will be inspected with a remote control vehicle (ROV) to determine if it is damaged before it is lifted to the surface. For safety reasons, divers will not attempt repairs to the vessel until it is secured. If damage is extensive and could affect the safety of the lift, the lift will not proceed.

Mitigation to Ensure no Contaminated Substances are Deliberately Released to the Environment

- ▶ Testing of water in various compartments of the *Irving Whale* for the presence of PCBs will be carried out where samples can be obtained without significantly increasing the risk to divers. If sampling is not possible at this stage, the water will be assumed to be contaminated, and will be treated as such until sampling becomes possible.

Mitigation During Transit to Halifax

- ▶ During transit to Halifax, the transport vessel will be accompanied by a CCG vessel.
- ▶ The route through the Gulf of St. Lawrence, until the Cabot Strait, will pass clear of the main shipping lanes.
- ▶ The weather will be continuously monitored during the voyage, and ports of refuge will be identified in advance to be used in case of severe weather.

Removal of PCBs from the *Irving Whale* in Halifax Shipyards Limited (HSL)

- ▶ When the *Irving Whale* is safely dry-docked at HSL, the vessel will be cleared and its cargo and its PCB containing heating fluid removed. This clean-up of the vessel at HSL will be carried out under provincial regulations.

REMEDICATION OF THE SITE AFTER THE *IRVING WHALE* IS REMOVED

The monitoring program for the project will focus first on the remediation of the ocean floor around the *Irving Whale*. During the preparation for the lift, some sediment samples will be taken from along the perimeter of the barge and tested for PCBs to establish levels prior to the lift. Following the proposed operation, samples of sediment will be taken from the site and tested for PCBs. If the difference between these samples and the pre-lift samples is sufficient to warrant it, the contaminated areas will be cleaned. In this case, the contaminated sediments will be removed with a suction dredge, transferred to approved waste containers on one of the surface vessels and disposed of in an appropriate manner.

PCB SPILL MONITORING PLAN

If the samples taken from the site of the *Irving Whale*, or observations made during the lift, indicate that a major release of PCBs has occurred, the sampling program will be expanded.

In the event of a major PCB release, it will also be necessary to sample commercial fish in the vicinity. Of particular interest are the snow crab, lobster, northern shrimp and mackerel. The scope and duration of this sampling would depend on the spill scenario. The sampling program, however, would extend into the springs of 1997 and 1998. The federal government will use the 2 parts per million (ppm) guideline, recommended by Health Canada for the consumption of fish products, to ensure continuing marketability of products from the area.

CONCLUSION

The avoidance of over-stressing the hull will prevent a failure of the hull. It is therefore concluded that a significant release of PCBs is highly unlikely to occur and can be avoided by halting the operation before structural damage to the hull of the *Irving Whale* occurs.

Numerous appropriate safety precautions have been planned so that the project may proceed in a secure and expeditious manner. The recovery of the *Irving Whale*, with the proposed mitigation and when carried out according to plan, could still release some PCBs; however, it is determined that the quantity that could be released will not have a significant impact on the valued environmental components.

The alternative to the removal of the *Irving Whale* with its PCBs is the certainty that all the remaining PCBs and other substances aboard the vessel will ultimately leak into the marine environment.

It is, therefore, the determination of the Supplementary Initial Environmental Assessment that the recovery and subsequent decommissioning of the vessel can be safely accomplished with an insignificant environmental impact, provided that the proposed mitigation, using known technology, is employed.

SUPPORTING DOCUMENTS

The full report: Supplementary Initial Environmental Assessment for Dealing with the *Irving Whale*: Assessment of the Presence of a Heating Fluid Containing PCBs.

Technical Review: PCBs on the *Irving Whale*, by Searle and Associates, 1996

Review of Bending Stress Calculations, by Herbert Engineering, 1996

Potential consequences of a PCB Spill from the Barge *Irving Whale* on the Marine Environment of the Gulf of St. Lawrence. A department of Fisheries and Oceans, Science Branch report, 1996.

Economic Assessment of the Options Related to the Salvage of the Barge *Irving Whale* with Emphasis on the Release of PCBs, by Sawyer Enviro-economic consulting, 1996.

Atlantic Towing Ltd. Letter to Nova Scotia Department of the Environment, August 15, 1995.

Atlantic Towing Ltd. Letter to Canadian Coast Guard, December 8, 1996.

Nova Scotia Department of the Environment memorandum on the *Irving Whale*: Disposal of specified waste, February 22, 1996.

Report on the *Irving Whale* Recovery Project Scoping Sessions held from January 10-19, 1996.

Irving Whale Wind Speed and Sea State Climatology, January 1996.

**COMMENTS ON THIS REPORT AND ON THE PROPOSAL
TO RECOVER THE WHALE**

In the **Atlantic Region** (New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland), comments on the report may be sent to:

Attention: Mr. Ken Hamilton or Captain William Dancer

The *Irving Whale* Recovery Project
c/o Environment Canada
45 Alderney Drive,
5th Floor, Queen Square
Darmouth, Nova Scotia
B2Y 2N6

Tel: (902) 426-3593
Fax: (902) 426-4352
E-mail: hamiltonk@am@cpdar

AND

In the province of **Quebec** comments may be sent to:

Attention: Mr. Jean Cinq-Mars

The *Irving Whale* Recovery Project
c/o Environment Canada
1179 De Bleury Street, 2nd Floor
Montreal, Quebec
H3B 3H9

Tel: (514)283-0178
Fax: (514)283-4423
E-mail: Cinq-MarsJ@am@CPCSL

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Copies of this may be obtained from either of the following locations:

Atlantic Region

The *Irving Whale* Recovery Project
c/o Environment Canada
45 Alderney Drive
5rd Floor, Queen Square
Dartmouth, Nova Scotia
B2Y 2N6

Tel: (902) 426-7162
Fax: (902) 426-3654
E-mail: DIDOMENICN@AM@CPDAR

AND

Quebec Region

The *Irving Whale* Recovery Project
c/o Environment Canada
1179 De Bleury Street, 2nd Floor
Montreal, Quebec
H3B 3H9

Tel: 1-800-463-4311
Fax: (418) 649-6140
E-mail: DOTS@A1@PKSBRQ

NOTICE

A SUPPLEMENT TO THE INITIAL ENVIRONMENTAL ASSESSMENT OF A PROPOSAL FOR DEALING WITH THE BARGE *IRVING WHALE*

(Pursuant to Section 15 of the
1984 Environmental Assessment and Review Process Guidelines Order)

Notice is hereby given by the Department of Fisheries and Oceans - Canadian Coast Guard and Environment Canada concerning a supplement to a determination made on a proposal for dealing with the barge "*Irving Whale*," currently at rest on the bottom of the Gulf of St. Lawrence.

Further to the proposal to raise the barge "*Irving Whale*" with the oil still on board, and to transport the barge on the deck of a large vessel to Halifax, Nova Scotia, for clean up, oil removal and ultimate disposal of the empty barge, a further environmental assessment has been completed in light of the presence of up to 6800 litres (1500 gallons) of heating fluid containing the PCB compound, Aroclor 1242, which was used in the oil cargo heating system of the barge. This heating fluid must be recovered and disposed of in an environmentally acceptable manner. The proposal (including the supplementary PCB aspect) has been assessed pursuant to the ENVIRONMENTAL ASSESSMENT AND REVIEW PROCESS GUIDELINES ORDER (EARPGO) (1984). It has been determined by the Department of Fisheries and Oceans - Canadian Coast Guard and Environment Canada that the potential environmental effects that may be caused by the proposal are insignificant or mitigable with known technology and that the project could proceed with mitigation.

In order to satisfy the requirements of Section 15 of the Guidelines Order, the Department of Fisheries and Oceans Canada - Canadian Coast Guard and Environment Canada hereby advise the public that it is invited to obtain copies of the assessment report and to respond to the proposal. In order to receive the report or offer comments, contact Captain William Dancer, Project Manager - *Irving Whale* Recovery Project, Canadian Coast Guard, at P.O. Box 1013, Dartmouth, Nova Scotia, B2Y 4K2, or at 902-426-7162, or Mr. Kenneth Hamilton, Regional Director, Environmental Protection Branch, Environment Canada, 45 Alderney Drive, Dartmouth, N.S. B2Y 2N6, or at (902) 426-3593.

Public response will be received until April 12, 1996, after which date the Minister of Fisheries and Oceans and the Minister of the Environment will make a final decision with respect to the proposal and the decision will be announced to the public.