Transport Canada Transports Canada

TP 1???? E

ARCTIC WATERS GUIDELINES

FOR LAY-UP OF PETROLEUM BARGES/VESSELS

IN LAND-FAST ICE

Transport Canada
Prairie and Northern Region, Marine (RM-WIN)
344 Edmonton Street
Box 8550
Winnipeg, Manitoba
R3C 0P6

Tel: (204) 984-1624
Fax: (204) 984-8417

Canada

CHANGE OF ADDRESS/
REQUEST TO BE INCLUDED IN THE MAILING LIST

Please print your current address so that we can add it to our mailing list and send you any revisions made to the publication entitled "Arctic Waters Guidelines for Lay-up of Petroleum Barges/Vessels in Land-fast Ice" TP 1???? E

You can mail this form to the address below or fax it to at (204) 984-8417

Name/Title: _____

Company: _____

Street Address: _____

Apt: _____

City and Province: _____

Postal Code: _____

Transport Canada
Prairie and Northern Region, Marine (RM-WIN)
344 Edmonton Street
Box 8550
Winnipeg, Manitoba
R3C 0P6

This publication has been printed in limited numbers. We encourage you to copy this document and distribute it to your fleet, or to any person interested in Arctic Waters Petroleum Barge or Vessel Lay-up in Land-fast Ice.

Ce document est aussi disponible en français.

Frozen in for the winter

ARCTIC WATERS GUIDELINES FOR LAY-UP
OF PETROLEUM BARGES/VESSELS IN LAND-FAST ICE

TABLE OF CONTENTS

1.0 INTRODUCTION

The safe lay-up in land-fast ice of petroleum barges and other offshore units or vessels has been successfully achieved for many years in Canadian Arctic Waters.

Close cooperation between government agencies (Transport Canada, Canadian Coast Guard, Indian and Northern Affairs Canada, Environment Canada and Territorial Petroleum Products Divisions) with the marine and offshore industries is, in large part, responsible for this success.

Recently, offshore exploration/exploitation activities and marine transportation in Canadian Arctic waters is seen to be increasing and the need for guidelines such as these has been recognized.

These guidelines have been developed jointly by Canadian government and industry. They are intended to provide better understanding of the concerns, problems and potential pitfalls inherent with the lay-up of petroleum barges, vessels and other offshore units in Canadian waters.

These guidelines are intended to provide all supervisors and crews engaged in the lay-up of vessels in the waters specified below with practical reminders of good Arctic practices and procedures. This will enable them to continue the good record that Arctic operators have had in this kind of endeavour.

2.0 APPLICATION

These guidelines apply to any vessel that is to be laid-up in the Canadian Arctic waters as indicated below, if such vessel(s) contain bulk petroleum products and/or other hazardous materials as defined in the Canada Shipping Act, 2001 (CSA 2001) and the Arctic Waters Pollution Prevention Act (AWPPA) or regulations made under them.

However, only vessel lay-ups that contain in excess of $100M^3$ of petroleum or hazardous materials should be reported according to the instructions in Section 9.

These guidelines apply to any lay up operation carried out in Canadian waters north of 60° North to 200 nautical miles from shore, the waters of Ungava, Hudson and James Bays as well as the Mackenzie River, its tributaries and connected lakes including Great Slave and Great Bear Lakes and the Hay and Slave Rivers north of 60° North. See Diagram 2.1.

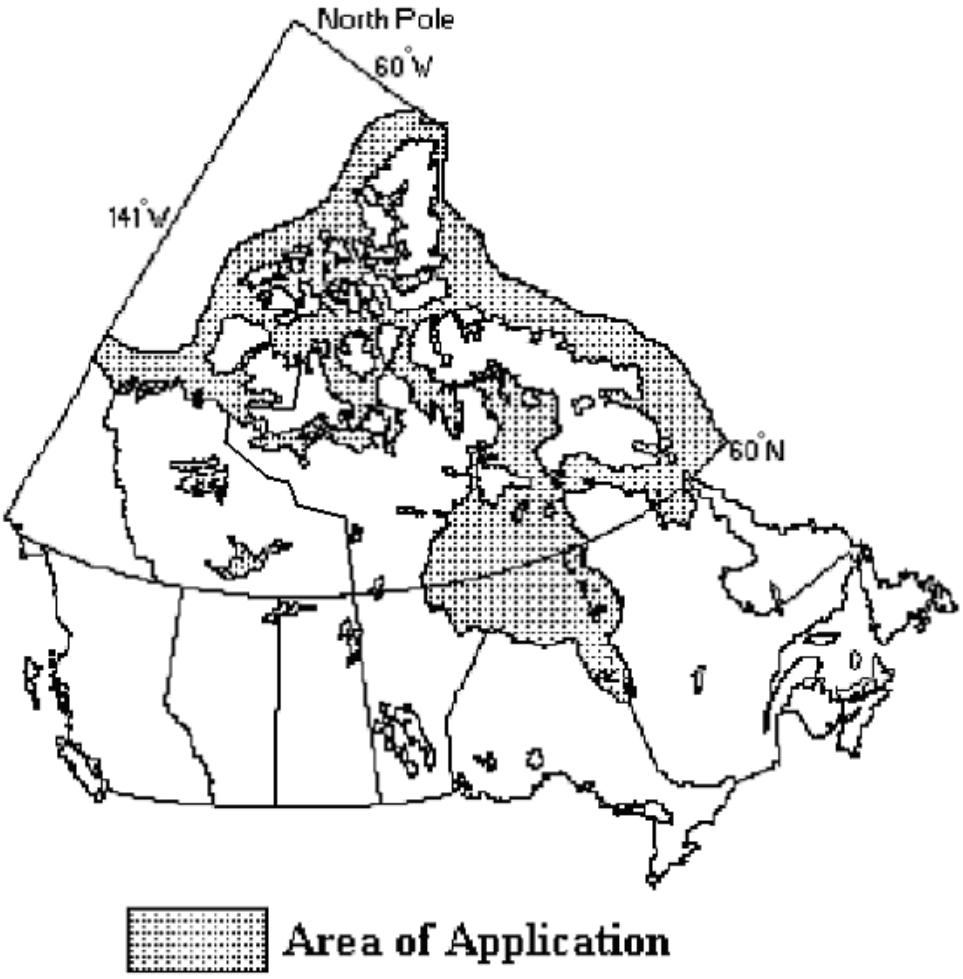

Diagram 2.1

3.0 PRINCIPLES

The aim of these guidelines is to prevent cargo/fuel oil spillage, and the resulting environmental damage, during the lay-up period, lay-up itself and reactivation of vessels or other offshore units containing petroleum product or other hazardous materials. It applies general principles already in force south of 60º N to the northern environment.

Cargo/fuel oil spillage can be prevented by:

- The safe storage/lay-up of oil cargo or fuel under all reasonable circumstances using sound, well rehearsed practices, adequate numbers of trained/experienced and alert personnel, appropriate/sufficient materials and well maintained, thoroughly tested equipment.

- Compiling and exercise contingency and emergency plans regularly and thoroughly to familiarize all personnel involved with the essential needs and potential hazards of such lay-ups and operations.

- Thorough historical analysis and assessment of ice conditions at lay-up location(s) to ensure that land-fast (non-pressured) ice conditions are assured throughout the lay-up period. This includes establishment of a safe lay-up season/period for average, poor and good ice years.

- Assignment of an appropriate level and duration of marine support to the lay-up vessel(s) throughout freeze-up and break-up.

- Appropriate level of monitoring vessel(s) throughout lay-up and particularly during freeze-up, break-up and adverse weather/ice events.

- Prompt and appropriate local response in the event of a spill:

    - to safeguard life and property; and
    - to lessen the environmental impact of a spill

- Prompt and accurate reporting of spills together with initial response and the need for back up will enable authorities to mobilize resources/measures, if required, to lessen the impact of such an event.

In summary, supervisors and crews involved in the lay-up of barges/vessels containing petroleum product or other hazardous materials in applicable waters must be able to work safely and carefully, secure in the knowledge that reasonable plans and precautions have been taken and that adequate resources can be deployed in the event of damage, spills or unforeseen problem development.

This document is intended as a guide only. The information it provides does not take precedence over present or future Canadian laws and regulations covering petroleum/hazardous materials carriage, transfer, storage and related activities.

The supervisor/crew conduct must at all times be governed by the normal practice of good seamanship and in compliance with all applicable requirements.

4.0 GENERAL CONSIDERATIONS

4.1 AUTHORITIES

All persons or organizations responsible for managing petroleum/hazardous material vessel lay-up in excess of 100 cubic metres should notify, in advance, Prairie & Northern Region, Marine in Winnipeg via NORDREG or the nearest Coast Guard radio station or at the address shown on page 1, of intentions for oil storage/lay-up operations in Arctic waters. See also section 9, below.

4.2 REGULATIONS

The following regulations apply to all carriage, storage and transfers of petroleum oil products in Canadian waters.

- Arctic Shipping Pollution Prevention Regulations (ASPPR), under the Arctic Waters Pollution Prevention Act (AWPPA):

  This covers ship standards and activities in waters north of the 60th parallel, and east of the 141st meridian, for 100 nautical miles seaward, or an equidistant line between Canada and Greenland, and as defined in Section 3 of the AWPPA (Shipping Safety Control Zones).

- Arctic Waters Pollution Prevention Regulations (AWPPR), under the AWPPA. This covers the ship owner's liability provisions regarding spillage of waste.

- Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals (RPPSDG), under the Canada Shipping Act, 2001 (CSA 2001) – this applies to all Canadian waters.

4.3 ENFORCEMENT AND PENALTIES

To ensure that regulations governing the carriage, lay-up/storage and transfer of oil and petroleum/hazardous products are enforced:

- Marine Safety Inspectors may inspect any barge/vessel or facility in Canadian Waters to determine compliance with the ASPPR and RPPSDG.

- Persons or ships found guilty of offences described in Sections 18 and 19 of the Arctic Waters Pollution Prevention Act are liable for fines ranging from $5,000 to $100,000 depending on the nature and duration of the offence.

- All vessels must be covered for pollution/spills and are liable to the extent provided by regulations.

- Persons or ships that discharge a pollutant in contravention of any regulation made pursuant to Section 187 of the Canada Shipping Act 2001 are guilty of an offence or indictable offence, and are liable to fines up to $1,000,000, to imprisonment, or both. There are provisions under the same Act concerning reporting of discharges, non-compliance with a direction of a Marine Safety Inspector and detention of ships.

4.4 VESSELS

Any vessel engaged in oil transportation, transfer or lay-up/storage in the Arctic should be subject to the following conditions:

- Designed, constructed and suitably equipped for the task and conditions. This includes the need for double sides (or void side tanks) and tank (size) subdivision. Double hull with ice strengthening is considered the most suitable for Arctic application.

- Operated by competent, qualified persons.

- Only laid-up/stored in suitable land-fast ice locations.

4.5 LIFESAVING, SAFETY, FIRE AND EMERGENCY CONSIDERATIONS

All appropriate/suitable lifesaving, safety, fire fighting and emergency equipment and contingency procedures must be considered throughout the lay-up period and particularly throughout freeze-up and break-up period/operations.

4.6 SPILL CONTROL AND RECOVERY

Vessel owners and operators are the first responders to a spill incident. South of 60° North, vessel owners or operators are required to have a contractual arrangement with a spill response organization. Due to significantly lower levels of marine traffic, the Canadian Coast Guard is the de-facto response organization for vessels navigating in Canadian waters north of 60° North.

The following regulations and guidelines have requirements and/or recommendations for a minimal amount of pollution clean-up equipment to be carried onboard:

Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals
Guidelines for the Operation of Tankers and Barges in Canadian Arctic Waters (Interim) TP 11663 E
Arctic Waters Oil Transfer Guidelines TP 10783 E

While these requirements and recommendations are for minimal clean-up provisions, it should be realized that the Arctic is a vast region and there could be significant delays before help can be brought on site for a major spill.

4.7 PETROLEUM PRODUCTS

It is expected that clean/non-persistent oils will be stored in laid up vessels. Storage of residual fuel oils and/or crude oil will be subject to rigorous assessment by Transport Canada Marine Safety.

4.8 WEATHER AND LOCAL ICE CONDITIONS

As mentioned in 3.0 above, a thorough historical analysis and assessment of ice conditions and weather at lay-up location(s) is vital to ensure that land fast (non pressured) ice conditions are assured throughout the lay-up period. A thorough historical analysis of ice conditions typically requires between 10 and 20 years of the most recent yearly data. This should assure a reasonable assessment of the safe land-fast ice season (dates of freeze-up and break-up) and probability of ice movement and/or ice incursions.

4.9 EXISTING/HISTORICALLY SAFE HARBOURS AND LAY-UP LOCATIONS

For harbours, basins, ports of refuge and other such locations that have a history of safe/successful vessel lay-up, an historical ice analysis may not be necessary. However, a thorough understanding of the limits of such safe/successful lay-up periods and other appropriate measures for such locations must be completed. This should take into account the latest information on possible changes/impacts of global/Arctic warming on ice and weather conditions at such locations.

Appendix 1 lists various locations that have been used by the offshore oil industry and tug/barge industry for the winter lay-up of drilling units, OBO's, large and small petroleum barges, etc.

5.0 LARGE VOLUMES OF BULK PETROLEUM AND OTHER CONSIDERATIONS REQUIRING SPECIFIC TRANSPORT CANADA CONSIDERATION

In the past large tankers/OBO's or barges have been safely/successfully utilized as "Offshore Floating Tank Farms" (OFTF) in support of offshore drilling in the Canadian Arctic.

Typically, such units are mobile and manned in the summer season such that fuel transfers between drilling units, support vessels and OFTF are accomplished safely and within reasonable proximity of drill prospects/locations.

In the winter, such vessels can be safely stored/laid-up in land-fast ice but always subject to special consideration by Transport Canada Marine Safety, who will determine the conditions/criteria which should be met to assure such safe storage/lay-up. The conditions/criteria for safe storage/lay-up will be determined by Transport Canada Marine Safety on an individual case by case basis as the size, type, design, construction, subdivision, volumes, cargo, etc. will vary with each vessel. Also the storage/lay-up location with respect to shelter, sea room, under keel clearance, proximity/type of navigation hazards, marine and other support, monitoring, access, emergency equipment, etc., etc. must also be considered on an individual basis.

Without limiting such conditions/criteria for each individual case in any way, the following list of general considerations is provided to assist industry with their own deliberations and preparations.

5.1 LARGE TANKERS, OBO'S AND PETROLEUM BARGES

As listed in Appendix 1 the offshore oil industry has favoured four principal locations for the safe winter lay-up/storage of vessels containing large volumes of bulk petroleum products. These are:

- McKinley Bay
- Herschel Basin
- Wise Bay
- Summers Harbour

Herschel Basin requires marine support (AHTS ice management vessels) for such units during freeze-up and break-up. Quantity and location of petroleum products must also be provided to TCMS.

In all cases, the storage vessels used were double hull. For large petroleum barges, which also transported petroleum products in the ice season and therefore necessitated ice transits, they were double hull and ice strengthened (Type A or higher).

For information purposes a list of such vessels follows:

- OBO GULF BEAUFORT (150,000 dwt)
- OBO SKAUVANN (120,000 dwt)
- Barge ARCTIC KIGGIAK (10,000 dwt)
- Barge PETER KOMINGAK (7,000 dwt)
- Barge CANMAR SEA SHUTTLE (22,000 dwt)
- Barge ARCTIC TUK (9,700 dwt)
- Barge ARCTIC BREAKER (8,929 dwt)
- Barge ARCTIC IMMERK KAMOTIK (11,295 dwt)

In all cases above the petroleum products stored consisted entirely of "clean/non-persistent oils".

5.2 BOTTOM FOUNDED DRILLING UNITS AND FLOATER DRILLING UNITS

Purpose built bottom founded drilling units (Molikpaq, SSDC, CIDS, CRI) were designed and constructed to operate in severe (dynamic) ice conditions. Thus safe winter storage of such units in land-fast ice is readily achievable.

However, the lay-up locations must be properly investigated with respect to seabed hazards, bottom grade, soil strength, tides, weather/sea conditions, ice incursions, etc. Such investigation results should be provided to Transport Canada Marine Safety. Quantity and location of petroleum products should also be provided to TCMS.

6.0 SEA ROOM, UNDER KEEL CLEARANCE, ICE INCURSIONS AND OTHER CONSIDERATIONS

As mentioned earlier and particularly in Section 5.0, TCMS will treat each winter lay-up request/location on an individual basis such that all relevant conditions for both the vessel and location are taken into account.

Typically, harbours/basins with limited sea room (Tuktoyaktuk Harbour, McKinley Bay, Wise Bay, Summers Harbour, etc.) offer the best (most secure) land-fast ice environment.

For such locations vessels are "parked" in the land-fast ice for the winter duration. Moorings (of various types) may be used/required for break-up, freeze-up and open water. In lieu of moorings marine support (AHTS ice management vessels) are utilized to position storage units until the land-fast ice condition has been reached and stabilized. Such vessels will be required at break-up.

For larger harbours/basins such as Herschel Basin, with more dynamic ice conditions, conditions should be monitored closely during freeze-up to ensure proper/secure land-fast ice condition has been reached and stabilized. Break-up should also be closely monitored and marine support will be required for non-propelled vessels.

Conventional moorings/anchors are not usually used in large basins/harbours to prevent damage to mooring equipment in the event of large ice movement. However, moorings to pre-laid anchors with mooring buoys have been used successfully at some locations as these can be readily released in the event of large ice movement.

Operators should be aware and take into account that vessels that over winter in the Arctic can experience ice growth against the hull and under water. The "cold sink" effect of the vessel in the water column causes ice to grow around and under the entire hull to thicknesses in the order of

0.7m to 1.2m. For this, and other purposes, the general guideline for under keel clearance is 20 to 25% of draft.

Harbours/basins that have unprotected entrances and that lie close to ice shear zones may be subjected to ice incursions from such shear zones. This may/can destabilize the land-fast ice or in extreme cases come into contact with storage vessels.

7.0 MARINE SUPPORT REQUIREMENTS (FRONT AND LATE SEASON)

Except in enclosed harbours such as Tuktoyaktuk or McKinley Bay large non-propelled petroleum barges will require marine support (AHTS ice management vessels) during freeze-up and break-up.

Large self-propelled tankers/OBO's used as OFTF may also require ice management service by suitable AHTS vessels during freeze-up/break-up and particularly in large harbours/basins such as Herschel Basin.

8.0 MONITORING

Transport Canada Marine Safety will require continued monitoring of petroleum barges or other petroleum storage vessels throughout freeze-up/break-up and periodically throughout the winter. The need/requirement for continuous monitoring will be assessed on an individual basis.

9.0 NOTIFICATION OF TRANSPORT CANADA MARINE SAFETY

All marine transport/supply of bulk petroleum products is presently reported to TCMS through the NORDREG reporting system. As NORDREG is only operational in the Arctic navigation season, operators/industry should contact TCMS directly, at the address below, with relevant details of winter petroleum product lay-up/storage plans. This should be done in a timely fashion in order that such requests can be given appropriate consideration.

Transport Canada
Prairie and Northern Region, Marine (RM-WIN)
344 rue Edmonton Street
Box/CP 8550
Winnipeg, Manitoba
R3C 0P6

Tel: (204) 983-7498
Fax: (250) 984-8417

10.0 DEFINITIONS/GLOSSARY OF TERMS

CSA 2001	Canada Shipping Act, 2001
AWPPA	Arctic Waters Pollution Prevention Act
Landfast Ice	Ice that has adhered to land features and is stationary (also ice with no lateral pressure)
Double Hull	As defined in TP11960E Construction Requirements, Standards and Guidelines for Oil Barges
Contingency Plan	Plan of action to be taken in the event of an unforeseen or unusual circumstance, i.e. loss of communication or equipment damage.
Emergency Plan	Plan of action to be taken in the event of a sudden state of danger i.e. a ship/barge fire, movement/pressure in ice or sudden breakage of moorings.
RPPSDG	Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals under the Canada Shipping Act, 2001.
Lay-Up Supervisor	Competent, qualified persons who are usually qualified ship's officer or licensed barge operator.
OFTF	Offshore floating tank farm
OBO	Ore, bulk, oil vessel and when used in this document/application means a double hull tanker with no petroleum cargo directly against external ship's side or bottom.
Non-persistent oils	As defined in RPPSDG.
AHTS	Anchor handling tow support vessels.
Ice management vessels	AHTS vessels with icebreaker design/construction for ice breaking, pressure mitigation, etc.
TCMS	Transport Canada Marine Safety and for this document/application pertains to Prairie and Northern Region.
Shear Zone	As defined in TP5064E – the contact zone between fast ice and pack ice where motion and pressure frequently result in an area of heavily ridged and rubbled ice.

APPENDIX 1

LIST OF LOCATIONS PREVIOUSLY USED FOR WINTER LAY-UP

A. LARGE TANKERS/OBOs/LARGE PETROLEUM BARGES AND DRILL UNITS:

- McKinley Bay
- Herschel Basin
- Wise Bay
- Summers Harbour

B. SMALL PETROLEUM BARGES, BARGE CAMPS, OFFSHORE SUPPLY VESSELS AND PORTS OF REFUGE:

- McKinley Bay
- Herschel Basin
- Wise Bay
- Summers Harbour
- Tuktoyaktuk
- Cambridge Bay
- Roberts Bay
- Bathurst Inlet
- Kuglugtuk (Coppermine)
- Johansen Bay
- Gillet Bay
- Holman Island
- Mason Bay
- Gary Island
- Ellice Island
- Gladman Pt. (Cam 2)
- Various locations in MacKenzie Delta (**not** in main stream), i.e. Inuvik, Oniak, Bar C, Farewell, East Channel (Oniak to Bar C)