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CENTRAL REGION

ACTIVITY REPORT

in

CANADIAN ARCTIC
POLAR CONTINENTAL SHELF PROJECT
PROJECT NO. 92-76

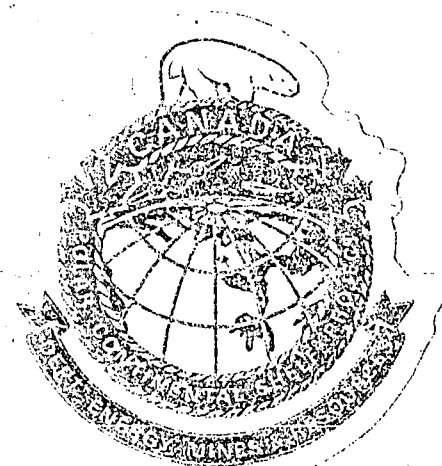
July, 1976

AERIAL PHOTOGRAPHY OF THE ARTIFICIAL ISLANDS

MACKENZIE DELTA, N.W.T.

JB

BY H.W. Pulkkinen
Principal Investigator
Polar Continental Shelf Project



CANADIAN HYDROGRAPHIC SERVICE
MARINE SCIENCES DIRECTORATE
DEPARTMENT OF THE ENVIRONMENT

AERIAL PHOTOGRAPHY OF THE ARTIFICIAL ISLANDS
MACKENZIE DELTA, N.W.T.

July 15, 1976

The Canadian Hydrographic Service, Environment Canada, which is responsible for the safety of navigation in Canadian waters, decided to investigate the man-made Islands in the Mackenzie Delta area to establish both the positions and the conditions of these Islands.

After conferring, the Acting Dominion Hydrographer, Captain Adam Kerr, and the Director of the Polar Continental Shelf Project, Mr. George D. Hobson, assigned the responsibility for this project, PCSP No. 92-76 to me (see my memo to G.D. Hobson of January 27, 1976).

The only aerial camera available for this operation was the model K-20. Unfortunately, this model was not in proper condition and the film that this camera used, the Super XX SP 940 5½", had been discontinued. However, I was able to obtain some TRi-X TX 884 12.7 cm film from the National Air Photo Library Surveys and Mapping Division, Department of Energy, Mines and Resources, and after some experimentation with this film, I obtained positive results.

On July 13th, I left for Edmonton to meet with Mr. Bruce Eby, the Field Operations Manager, Imperial Oil Limited, to discuss the latest information on the islands in question.

On July 14th I arrived at the Tuktoyaktuk Polar Shelf base camp. I had arranged my time of arrival to coincide with the ice observation flight schedule, so that when the Beechcraft D-18 TAE arrived in Tuktoyaktuk on July 15th, I was ready to start investigations of the man-made islands. Unfortunately, all day July 15th the visibility was very poor: low cloud and fog. However, by 20:00 the weather had improved sufficiently enough to make an ice observation flight of the area. At midnight we returned to the TUK base camp.

Because the midnight sun in the Arctic at this time of year is high over the horizon, the pilot and myself decided to try to do some photography. At 00:30 hours, on July 16th, we were airborne and at 03:00 hours we returned to the base camp after having photographed all eleven islands. The morning of July 16th was foggy, but around noon the sky cleared and, to make sure that the photography would turn out right, I decided to make a second flight under daylight conditions. At 14:30, my mission completed, the TAE immediately departed for Resolute Bay.

After completing the air photography, I did a small geodetic control survey in the Tuktoyaktuk area (as requested by the Geodetic Survey of Canada) by establishing and observing five control stations and measuring two Tellurometer distances.

On July 21st I returned to Ottawa and immediately delivered the films to the National Air Photo Library to be developed. On July 30th the negatives and contact prints were made and turned out satisfactorily. The negatives are now filed in the National Air Photo Laboratory under file references:

Roll No. 1 PCSP 1-22, and

Roll No. 2 PCSP 1-14.

Every photo is numbered, indicating the number of the island, the area and the date photographed. A general plotting sheet of the Islands is available in the scale of 1:500,000.

Position and Description of the Islands

Islands in Operation:

F-40 NETSERK: Latitude $69^{\circ} 39' 22.7''$ N; Longitude $135^{\circ} 54' 21.0''$ W
Sandbags surrounding bottom dredged sand, round in shape,
established September 19, 1975.

L-24 SUN UNARK: Latitude $69^{\circ} 33' 30.2''$ N; Longitude $134^{\circ} 37' 00.1''$ W, square in shape, sand, mud.

B-35 SARPIK: Latitude $69^{\circ} 24' 07.21''$ N; Longitude $136^{\circ} 23' 10.04''$ W, Sandbags surrounding gravel island, round in shape,
established March 15, 1976.

Islands Abandoned:

B-48 IMMERK: Latitude $69^{\circ} 37' 06.53''$ N; Longitude $135^{\circ} 10' 47.34''$ W, Sandbag reinforcements washed out, only sand left, round in shape, Established July 7 - August 15, 1973.

B-44 NETSERK: Latitude $69^{\circ} 33' 03.04''$ N; Longitude $135^{\circ} 55' 57.74''$ W, Some sandbags left from the northwest side and wharf pillars and dredged sand, round in shape, established September 21, 1974.

J-17 IKATTOK: Latitude $69^{\circ} 16' 40.57''$ N; Longitude $136^{\circ} 18' 13.00''$ W, Sandbags surrounding gravel island, established July 4, 1975.

E-17 PULLEN: Latitude $69^{\circ} 46' 15.60''$ N; Longitude $134^{\circ} 19' 43.23''$ W, Sandbags, possibly removed; only gravel and sand remain, square in shape, established March 30, 1974.

P-25 ADGO: Latitude $69^{\circ} 24' 56.84''$ N; Longitude $135^{\circ} 50' 29.93''$ W. Only some centre part left above the water. The island was surrounded with sandbags and bottom silt, established September 28, 1974.

F-28 ADGO: Latitude $69^{\circ} 27' 16.6''$ N; Longitude $135^{\circ} 51' 15.8''$ W, This island is almost washed out. Only the centre part is above water. Building materials were similar to those of P-25 island, established September 30, 1973.

D-35 SUN PELLE: Latitude $69^{\circ} 34' 10.9''$ N; Longitude $135^{\circ} 23' 27.3''$ W. Only the borderline is left of the island which is covered by ice. Small patches of mud and sand are left on the east and west sides of the Island.

C-15 ADGO: Latitude $69^{\circ} 24' 12.73''$ N; Longitude $135^{\circ} 49' 03.12''$ W, square in shape and in the process of eroding, established March 20, 1975.

A total of eleven islands were photographed. From the aerial photos the condition of the abandoned islands is clearly visible. In particular, D-35, F-28, P-25 and C-15, which were built in 1973-74 and abandoned, are now already in a submerged condition. The flight altitude was 1,000 feet; the course west-east.

Islands Under Construction:

L-30 ARNAK: Latitude $69^{\circ} 49' 36.4''$ N; Longitude $133^{\circ} 52' 07.2''$ W
Date proposed for completion of construction is September 15, 1976.

B-37 ISSERK: Latitude $69^{\circ} 56' 13.8''$ N; Longitude $134^{\circ} 23' 26.2''$ W.
Date proposed for completion of construction is September 30, 1976.

H-59 KUGMALLIT: UTM Zone 8, N-77 26 223.86; E-559 656.27
Grid Coordinates are Latitude $69^{\circ} 40'$ N; Longitude $133^{\circ} 15'$ W

Date proposed for completion of construction is August 30, 1976.

In addition to my own photography, I contacted Mr. Keith Arnold of Environment Canada, Aerial Photography Section, knowing that they also would be carrying out aerial photography in the area of the Mackenzie River. I asked Mr. Arnold if it would be possible for him to photograph the artificial island. Mr. Arnold agreed to cooperate fully and suggested that I get in contact with Mr. D. Terroux who would carry out the actual work. (See my letters to Mr. Terroux of May 20 and June 4, 1976.) Mr. John Morton of the Canadian Hydrographic Service informed me that this particular photography had been done just a few days before my flight and that as soon as the processing is completed the prints will be available.

Acknowledgements

In conclusion, I wish to express my gratitude to the people who assisted me in the preparation of the project and also in the field operation. Most particularly, I would like to thank Mr. Richard Lavigne of the National Air Photo Library, Messrs. Keith Arnold and D. Terroux of Environment Canada, Mr. Andre Blouin of CANMET-PMRL, Department of Energy, Mines and Resources, and Messrs. F. Stephenson and M. Woods of the West Coast Hydrographic Services, Environment Canada.

The long-range continuation of the project 92-76, in other words the second flight schedule, will be carried out in autumn before the Delta refreezes. This should take place in late September or mid-October using the Twin Otter aircraft which will be carrying out the ice patrol flight in the western Arctic. This will be a similar arrangement to my earlier flight using the Beechcraft wherein combined flight utilization contributed to the economics of flying in the Arctic.

Hans W. Pulkkinen

Hans W. Pulkkinen
Principal Investigator
Polar Continental Shelf Project

Encls.
Island Position Map
Correspondence covering
the project

c.c. G.D. Hobson
G.N. Ewing
A. Kerr
M. Bolton
R. Melanson
B. Eby
H.Q. Hydrographic
IOC
GSC

Oil drilling platforms were established by Imperial Oil Limited.



TO
A → Mr. G. D. Hobson
Director
Polar Continental Shelf Project

FROM
DE Hans W. Pulkkinen
Hydrographic Section
PCSP

SECURITY CLASSIFICATION - DE SÉCURITÉ
OUR FILE - N/ RÉFÉRENCE
YOUR FILE - V/ RÉFÉRENCE
DATE January 27, 1976

SUBJECT
OBJET Project No. 92-76
Artificial Islands in Mackenzie Delta, Beaufort Sea, N.W.T.

During the last five years, the oil companies of Canada have erected seventeen artificial islands in the Canadian Arctic and most of them in the Mackenzie Delta.

The Canadian Hydrographic Service, which is responsible for the safety of navigation in Canadian waters, was concerned with the positions of these islands and primarily with those that have been abandoned.

Over a period of years presumably they are eroded by ice, waves and currents and eventually become shoals, which will present a hazard for shipping. In order to prevent this, their present positions must be established most accurately. Aerial photography is to be taken-- in the spring as soon as the area becomes free of ice, and again in the autumn before freezing time--and this process of photography should be repeated a year later.

This data will give information on physical changes of the islands and help to determine how rapidly the process of erosion is progressing, and will help predict the time when one island or another will submerge.

In August, 1975 the Acting Dominion Hydrographer, Capt. Adam Kerr, approached me with the possibility of assisting in the project by Polar Continental Shelf Project, and combining their work with our ice patrol flights. I recommended that he write you a formal request on the matter.

On February 11th, 1976, you assigned me to be in charge of the project and handed me all correspondence and documentation of the proposed project which had been received by you earlier from Canadian Hydrographic Service.

The form 11 of the project No. 92 is enclosed.

Hans W. Pulkkinen

May 20, 1976

Mr. D. Terroux
Environment Canada
Inland Waters Directorate
Water Resources Branch
Place Vincent Massey
St. Joseph Blvd.
Hull, Quebec
K1A OE7

Re: Aerial Photography of Artificial Islands in
the Mackenzie Delta

Dear Mr. Terroux:

I will be carrying out aerial photography of the oil exploration artificial islands in the Mackenzie Delta this summer. I have had several telephone conversations with Messrs. K.C. Arnold and D.M. Christian concerning the possibility of your photographing the artificial islands when you fly over the area in July.

Unfortunately, I have been unable to contact you directly; however, both Mr. Arnold and Mr. Christian have expressed the possibility of doing this aerial photography and have suggested that I forward to you the enclosed, self-explanatory material.

I greatly appreciate your offer to photograph the islands. I hope this will not be too much of a burden for you.

Very truly yours,

Hans W. Pulkkinen
Polar Continental Shelf Project

Encls.

4th Floor
City Centre Tower
880 Wellington St.
Ottawa, Ontario
K1A OE4

June 4, 1976

Dear Mr. Terroux,

To our telephone conversation of May 27th concerning the aerial photography of the artificial islands in the Mackenzie Delta.

Enclosed please find the maps and charts as additional material requested by you. (for the photography).

I spoke with Mr. G. Hobson of the possibility to have additional flying hours for the project to which I have his consent.

Thank you again for your cooperation

Very truly yours.

Hars.

H.W. PUUKKINEN.

P.C.S.P. E.M.R.

4th FLORE

CITY CENTRE TOWER

830 WELLINGTON ST.

OTTAWA, K1A 0E4.



August 5, 1976

Your file *Voire référence*

Our file *Notre référence*

Mr. Bruce Eby
Imperial Oil Ltd.
10025 Jasper Ave.
Edmonton, Alberta
T5J 1S6

Dear Mr. Eby:

I met you on my way to Tuktoyaktuk on July 14th in your office in Edmonton.

My trip was very successful, the weather was perfect and I was able to photograph all eleven artificial islands.

I returned to Ottawa July 21st and I am now processing the films. When the prints become available I will forward them to you for your information. Some of the islands are almost level with the water, but eventually will be completely under.

Mr. Eby, if it is possible I would greatly appreciate it if you were able to provide information on when the Islands were established and when they were abandoned. This data will help to estimate the length of time the erosion process took place.

Thank you very much for your kind co-operation.

Yours very truly,

Hans Pulkkinen
Polar Continental Shelf Project

HP/ss

Room 418
City Centre Towers
880 Wellington St.
Ottawa, Ontario
K1A 0E4



MEMORANDUM

NOTE DE SERVICE

TO
A

Mr. Richard Lavigne
National Air Photo Laboratory
Surveys and Mapping

FROM
DE

G.D. Hobson
Director
Polar Continental Shelf Project

SECURITY - CLASSIFICATION - DE SECURITE
OUR FILE - REFERENCE
YOUR FILE - REFERENCE
DATE August 16, 1976

SUBJECT
OBJET

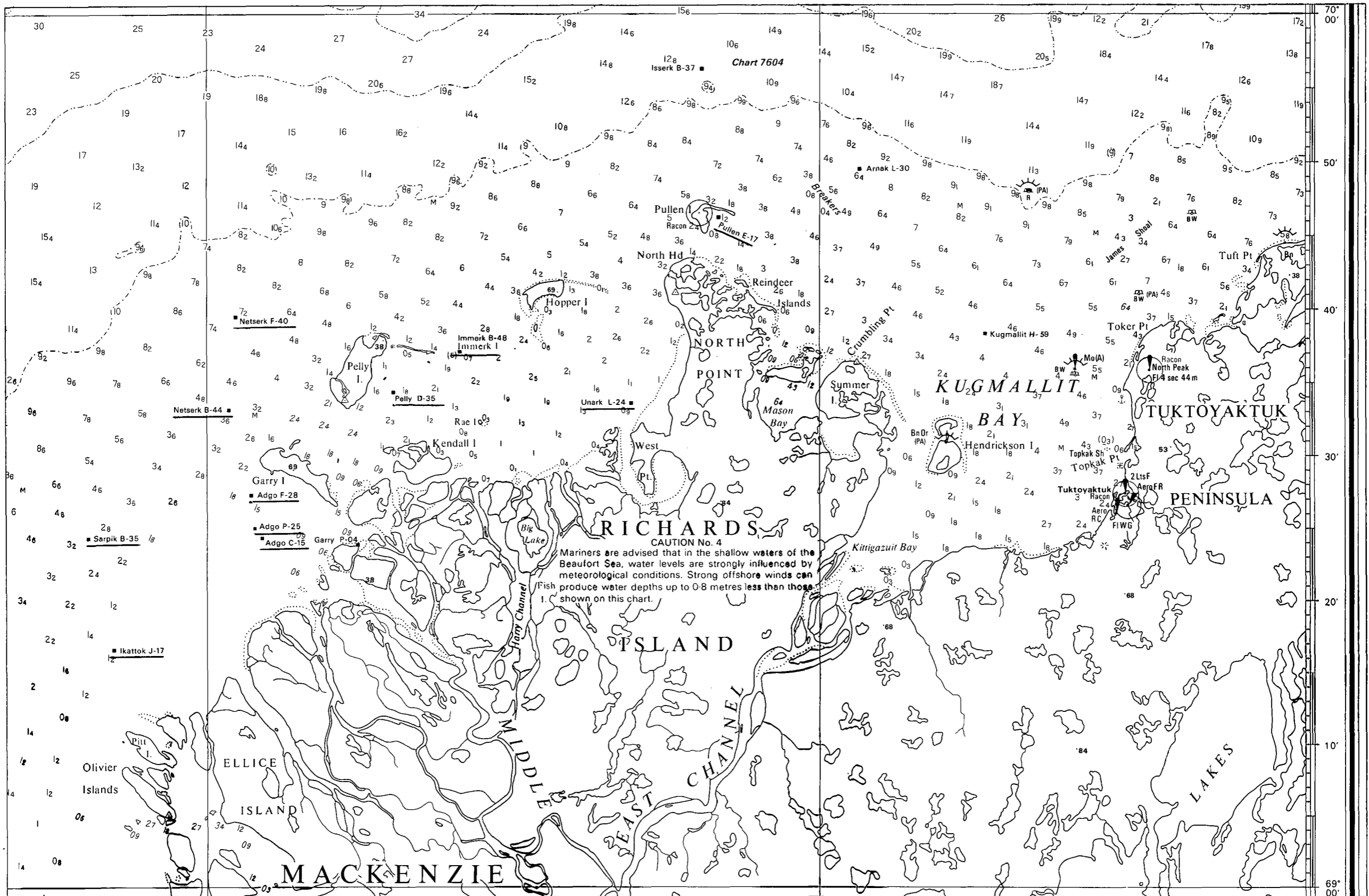
FILM FOR CAMERA K-20

The Senior Officer of the Hydrographic Section of the Polar Continental Shelf Project, Hans Pulkkinen, recently carried out air photography of the artificial Islands in the Mackenzie Delta, N.W.T. During his preparation for the project he had some difficulty refurbishing the K-20 camera and particularly in obtaining the proper film for the camera.

Mr. Pulkkinen would like you to know that you assisted him in many ways, especially in the processing of the film and primarily in experimental photography.

I wish to take this opportunity to express my appreciation for the personal courtesy extended to Mr. Pulkkinen, which made it possible to satisfactorily fulfill the assignment.

G.D. Hobson



Patch to fit Chart 7650