

REPORT OF THE  
NATIONAL PETROLEUM COUNCIL'S  
COMMITTEE ON  
ILLINOIS RIVER WINTER TRANSPORTATION

INTRODUCTION

In the early part of October, this Committee was requested to investigate the feasibility of ice-breaking operations on the Illinois Waterway during the coming winter months because of the urgent necessity of transporting maximum tonnage of petroleum products to the Chicago area by barge due to the shortage of railroad tank cars and pipe line facilities.

In view of the fact that the Department of the Interior does not presently have a Solid Fuels Division, the Oil and Gas Division of this Department subsequently requested that this Committee investigate the potential tonnage of coal as well as petroleum products scheduled for barge movement on the Illinois Waterway. It was immediately recognized that this Committee would need the cooperation of all shippers and operators interested in the Illinois Waterway. For this reason it was decided to call upon the American Waterways Operators, Inc., and the Illinois River Carriers' Association for assistance. After preliminary discussions with these organizations and with leading shippers and operators, officials of the U. S. Coast Guard and Corps of Engineers, U. S. A., a meeting was held in Chicago on October 10th under the joint auspices of this Committee, the American Waterways Operators, Inc., the Illinois River Carriers' Association and the Northern Illinois Coal Trade Association. All carriers operating on the Illinois Waterway and all known shippers of petroleum, coal, grain and other commodities were requested to attend, and to submit the tonnages scheduled for barge movement on the Illinois Waterway for the winter months.

The discussion at this meeting resolved into a definite conclusion that ice breaking operations as conducted in past years with light equipment, or by the cooperative action of carriers, would not be effective in preventing periods of complete suspension of traffic, and reduced efficiency at other times under average winter conditions. This was clearly shown by reports of the operators based on experience in the winter of 1946-1947 when one U. S. Coast Guard towboat of about 1,000 H.P. was employed, and the carriers, through cooperative action and reciprocal towing arrangements attempted to maintain open channels by detaching towboats from their barges to break ice. Statistics produced by several operators indicated that there were two complete suspensions of navigation because of ice.

When combined, this represented a total of 18 days of complete stoppage. In addition, there was an aggregate of about 20 or 25 days when channels were only sufficiently clear to allow navigation on a drastically reduced basis. In other words, normal tows of six or eight barges which operate two abreast, had to be reduced to single breast operations of 1, 2 or 3 barges. Despite the fact that December was practically ice-free, the records of a number of operators indicate that the average barging efficiency for December-February inclusive, was about 50% of the delivery experience in the other nine months. A Technical Advisory Committee of experienced Illinois Waterway barge operators was appointed at this meeting to develop recommendations, keeping in mind the very limited time for making arrangements. The recommendations of this committee are covered in the letter dated October 23rd which is attached. (Appendix 1).

### Tonnage

Shippers and operators submitted tonnage figures on commodities scheduled for movement on the Illinois Waterway during the winter months. After cross-checking these reports with shippers and carriers to eliminate duplications, it was found that approximately 1,200,000 tons per month of various commodities are planned, or scheduled for movement during the coming winter. These figures include other products besides petroleum, coal and grain, and as no special effort was made to obtain the complete tonnage of such other commodities, it is believed that the tonnage scheduled may be greater than the figures reported.

The breakdown of tonnage by commodities follows:

<u>Commodity</u>	<u>Monthly Tons</u>
Petroleum	407,200
Coal	510,000
Grain	135,000
Sulphur	13,000
Steel, Iron, Scrap	10,500
Sand and Gravel	95,000
Merchandise	41,000
	<u>1,211,700</u>

It should be noted at this point that all but 45,000 tons per month of the petroleum tonnage represents northbound movements. The petroleum figures did not permit breakdown by products, since the reports received generally were a total which incorporated all products. However, from available information, and discussions with shippers, it was evident that the major portion of petroleum products is distillate and residual fuels, probably in excess of 75%.

Records of the Corps of Engineers, U.S.A. show the following tonnage passed through either the La Grange or Lockport Locks (mile points 80 and 291 respectively) in the month of September, 1947:

Coal	365,000 tons
Petroleum	165,500 "
Grain	65,000 "
All Other	142,000 "
	<u>738,000</u>

These figures represent the largest tonnage passing through either lock for each commodity. They do not represent the total tonnage moved or delivered on the Illinois Waterway for that month, but cover the majority of the traffic, and are considered only for the purpose of affording a comparison with the scheduled winter movement. The step-up in the transportation of petroleum products during the winter months will begin in the latter part of November or early December when the upper Mississippi River closes and the barging equipment now operating on that waterway becomes available for other use. A large portion of this released barge capacity is scheduled for transfer to Illinois Waterway operation and the reports submitted by the carriers indicate that sufficient equipment will be allocated to handle the 400,000 tons per month planned or scheduled for winter movement, provided the waterway is kept open.

Some barging equipment for coal will also be transferred from the Upper Mississippi River when it closes and in this connection there is attached a copy of a letter (Appendix 2) dated October 17, 1947 from Mr. A. J. Christiansen, Secretary of the Northern Illinois Coal Trade Association.

Grain carriers and shippers have stated that sufficient barge equipment is available for the estimated grain movement and point out that the potential movement in winter months is greater than the average monthly shipments during the remainder of the year.

For comparative purposes a chart and table showing the recapitulation of Illinois Waterway traffic for the years 1936 through 1946 is also attached. (Appendix 3. Chart made a part of original report.)

### Terminal Facilities

#### Petroleum Terminals

A list of the terminals showing location owner or operator, and total storage capacity is attached. (Appendix 4.) The terminals in Chicago and suburban areas are grouped separately from those located below Lockport and the two refineries on the waterway at Lockport and Lemont.

Although both receive barge shipments, no storage is shown for these refineries because these storage facilities are primarily for refinery operations. Barge receipts either supplement refinery production of finished products or are blending stocks, such as natural gasoline.

Approximately 40,000 tons per month of the scheduled petroleum movement will be delivered to these two refineries. 100,000 tons per month are scheduled for deliveries to terminals below Lockport - 30,000 tons per month comprise southbound traffic for destinations below the Illinois Waterway and 230,000 tons per month are scheduled for Chicago terminals.

There can be no question concerning the adequacy of terminal facilities below Lockport.

The 230,000 tons per month scheduled for Chicago is equivalent to about 1,553,000 barrels per month or 52,000 barrels per day which must be handled by 11 terminals; an average of 4700 barrels per day per terminal. The terminals expected to handle the largest part of this volume were investigated as to adequacy of storage, barge unloading and transport truck and tank wagon loading facilities. They were found to be more than sufficient to handle the volumes scheduled. Three of these terminals combined are capable of handling a throughput of about 30,000 barrels per day.

In addition to these 11 terminals, temporary terminal service at the Lockport and Lemont refineries is available if needed.

Additional, or larger sized, pipe lines and faster pumping equipment have been installed recently at several terminals to improve barge unloading and truck loading efficiency.

#### Coal, Grain and other Terminals

No effort was made to analyze terminal facilities for other commodities. Generally, they are not subject to the limitations inherent in the handling of liquid cargoes. The committee was also assured that ample facilities for coal and grain are available.

#### Comments On Technical Committee Report

The recommendations of the Technical Advisory Committee contemplate four ice-breaking units operating between Alton Lock and Marseilles (mile 247). Heavy ice formations seldom occur above Marseilles. All operations would be directed by the Dispatcher or Supervisor (See item 6, Appendix 1).

The Federal Barge Lines presently plans winter lay-up for five of their so-called "city" type steam towboats, ("Natchez", "Cairo", etc.) at the close of Upper Mississippi River navigation. Under the ice breaking plan, one of these would replace the diesel towboat "Huck Finn" (about 2600 H.P.) in Lower Mississippi River operations. This vessel, with three of the city type steam towboats, could be assigned for ice-breaking; thus providing four towboats, each of 2000 horsepower or greater. The fifth city type boat scheduled for lay-up would be used as a relief vessel to permit annual overhaul of the other vessels. It may be possible to schedule overhauls so that this fifth towboat could be utilized for ice-breaking, if needed, in January and February when ice is likely to be heaviest.

The three 195' x 35' barges recommended would be equipped with the 3 Amsterdam ice plows mentioned. The two other breaker barges recommended would be obtained by cutting in half one of Federal Barge Lines' 300' x 50' Goultra type barges. One of these would be used with the fourth towboat. The other would be maintained as a standby breaker barge available for replacement of a damaged breaker barge or for operation with a fifth towboat if the need arises.

#### Conclusions

The feasibility of conducting ice breaking operations as recommended is established by the unanimous opinion of the experts consulted and by the records of ice formation for the winters 1939-40 to 1946-47 inclusive shown by the attached charts (Appendix 5 to 12 inclusive, charts made a part of the original report) compiled from recorded reports obtained from Lock Masters. These charts show or indicate the following:

1. That ice formation was heavy enough at certain times during each of these winters to require ice-breakers with the possible exception of the winter of 1940-1941.
2. That ice formation in the past two winters apparently can be considered as representative of average conditions.
3. That open channels could have been maintained throughout each of these winters with the possible exceptions of 1939-40 when the ice formation was generally very heavy and 1944-45 when there was an unusually heavy ice formation in Peoria Lake for a long period. Even in these winters, if a complete stoppage of traffic could not have been avoided, the duration of the period of complete suspension would have been substantially reduced by the ice breaking plan recommended.

Even though ice breaking equipment were provided it is conceivable that in an extremely severe winter, ice could form so fast and thick that suspension of traffic would result during the period when such extreme conditions prevailed. This might have been the case in the winter of 1939-1940 when there was a period of very heavy ice for over 40 days. On the other hand, it must be recognized that in a very mild

winter such as 1940-1941, ice breakers would probably not be needed as the volume of traffic would be sufficient to keep the channels open. In the light of these possibilities, it was decided that the past two winters should be used as a criterion for estimating the results to be obtained by the plan recommended. Therefore, the question was put to each member of the Technical Committee and to other experienced operators and interested parties, as to what the results would have been had the recommended equipment and plan been in operation during the past two winters. In the unanimous opinion of all consulted an open channel of sufficient width, could have been maintained for the entire winter, to permit continuous operation of tows as large as six 200' barges operating two abreast. Estimates of efficiency of barging operations during the periods of heavy ice, based on this plan, varied from 85% to 90% allowing for slightly reduced draft during such periods, to permit broken ice to pass under the barges. Hence, a three months' average efficiency of about 95% could reasonably have been expected.

Since barge commitments are made to fit the volume to be moved, it follows that if there is a suspension of traffic because of ice or if only limited navigation is permitted by ice conditions, the delivery rate of the volume scheduled will be reduced in proportion to the lost efficiency. As it appears that there is no other mode of transport available to move such volumes of petroleum, coal and perhaps other commodities which barges are unable to deliver, it must be concluded that the tonnage lost by reduced barge delivery efficiency will not reach consumers. This consideration alone justifies the estimated cost of \$265,000 (8¢ per ton for three months) calculated by the Technical Advisory Committee. Incidentally, this estimate is based on charter rental values. On an out-of-pocket basis, the cost to the Government would probably approximate \$175,000.

The ice-breaking equipment recommended is the only suitable equipment available or that can be obtained in the short time remaining before the possible necessity for ice-breaking.

All operators and shippers can be expected to cooperate to the fullest extent with the recommended plan. It is known that commitments by both shippers and carriers for the movement of petroleum, coal and grain scheduled for winter barge movement have already been made or are in the process of negotiation. Aside from the operating loss, if barge equipment is ice-bound, all carriers consulted have a keen appreciation of the critical transportation and supply position and have expressed a sincere desire to see the freight get through to consumers. It is apparent that they are willing to assume reasonable risks to their equipment to see that this objective is achieved.

Recommendations

At the meeting held in Chicago on October 10, a group of experienced river operators were appointed to act as technical advisors to the Barge Subcommittee of the National Petroleum Council. This committee has approved and adopted the recommendations of such Technical Advisory Committee (Appendix 1) and submits them herewith without qualification but with the following additional recommendations:

1. That the Dispatcher or Supervisor recommended (Item 6) should be an employee of the Inland Waterways Corporation (Federal Barge Line)
2. That the entire operation should be in charge of the Federal Barge Lines, because they have the equipment, the experienced pilot personnel, and the know-how. It is also believed that they have the legal authority to undertake this operation.
3. The volume, and the importance to the public weal, of the traffic involved justify the recommendation that the cost of this ice breaking be borne by the Government.

APPENDIX I

JOHN I. HAY COMPANY

332 S. Michigan Ave.  
Chicago

October 23, 1947

Mr. A. W. Frey  
25 Broadway  
New York, N. Y.

Dear Mr. Frey:

As you know, there was a general meeting here in Chicago on October 10 between shippers and barge carriers for the purpose of discussing measures which might be taken to relieve the acute transportation shortage into the Chicago area anticipated for the coming winter months. It was the conclusion of this meeting that steps should be taken to secure public assistance in minimizing the delays to water transportation along the Illinois River due to ice during the period from December 15 to March 15.

A group of experienced river operators was appointed at this meeting to act as technical advisers to the Barge Subcommittee of the National Petroleum Council on this project. Those appointed were the writer, as Chairman, Mr. J. C. Marting, Captain A. C. Ingersoll, Jr., Mr. A. L. Mechling, Mr. Morris Crandall, Mr. Lynn Childs, and Mr. B. J. Markham.

In a further meeting here at Chicago on October 21 this group has agreed on the following recommendations:

1. At least four river towboats of approximately 2000 horsepower each, equipped with suitable ice-breaking attachments, are the minimum required. It was the information of the above group that three of the so-called "city boats" of the Inland Waterways Corporation, such as the "NATCHEZ", "CAIRO", "VICKSBURG" could be made available for this service together with the "HUCK FINN", also of the Federal Barge Lines, which could be made available by substitution of alternate equipment by the Federal Barge Lines. In the opinion of the above group, these four towboats will furnish the optimum service in maintaining navigation on the Illinois River with a minimum of delay during the winter months.
2. In conjunction with the four towboats, the three "Amsterdam" ice-plows of the United States Coast Guard should be utilized. Two of these plows require alterations to fit the head of a standard barge of 35' beam, and these alterations should be begun at once.

3. Three standard barges of the dimensions 195' long and 35' beam of the "Defense Plant Corporation" type should be secured and ballasted to furnish weight behind the "Amsterdam" ice plows, before mentioned. It was the information of the group that such barges were available both from the Federal Barge Lines and other sources.

4. In addition to the "Amsterdam" plows and their accompanying barges two breaker barges should be built by cutting one 300' by 50' spoon raked barge (Goultra type) in two and bulkheading the separation.

5. Operating carriers on the Illinois River should reciprocate on towing, without liability and without charge, between themselves and with ice breaking power units as circumstances indicate and at the discretion of the dispatcher to move the maximum in ton miles.

6. A, full-time, paid dispatcher should be in charge of the following aspects of the operation:

- a. Dispatch of ice breaking equipment to areas of need in the Illinois Waterway and to Alton, Illinois.
- b. Coordination of the activities of carriers' towboats, relative to ice breakers and to the formation of convoys of transporting equipment behind the ice breaking equipment to utilize the full effect of the latter.
- c. Reception of voluntary reports from all carriers, preferably by radio, to the end of coordinating activities as above.
- d. Maintaining current reports on activities, of ice breakers and the degree of cooperation of carriers' towboats.
- e. Accumulating reliable statistics on ice conditions, which are not currently available in unified form.

7. Devices should be located behind the upper gates at Dresden Island, Marseilles, Starved Rock, Peoria, La Grange, and Alton Locks to forestall delay in opening these gates on account of accumulation of ice behind them. These devices might be in the form of jets, mechanical drags, or such other form as may be recommended by the Corps of Engineers of the United States Army. Consideration is suggested of the use of surplus heavy duty outboard motor units for this purpose.

8. Two of the towboats should be put in operation on December 15 and remain in service for 75 days. Two additional boats should be put in operation on January 1, to remain in service for 45 days.

Based on the foregoing, estimated cost of the project is as follows:

Charter expense of the 4 Towboats, above, for the	
Period. . . . .	\$192,000.00
Administration. . . . .	3,000.00
Preparation of Ice Breakers and Breaker Barges. . . . .	15,000.00
Repairs to Towboats during and following	
Operation on Ice. . . . .	50,000.00
Charter Rental of 3 195' x 35' Barges . . . . .	4,500.00
Total . . . . .	<u>\$264,500.00</u>

In reaching the above recommendations, the group has been influenced by the limited time available to organize and initiate this operation. Consideration was given to the economy of utilizing operating towboats by having them leave their tows and undertake ice breaking as conditions demanded. It was felt that this would delay river transportation rather than augment it. Consideration was also given to public advertising for bids on ice breaking service or ice breaking equipment, but it was felt that this would not produce the type of equipment needed in the time available to secure it. It was the added suggestion of the group that the Inland Waterways Corporation, operating the Federal Barge Lines, be the administrator of the project either directly or through their appointed dispatcher.

Respectfully submitted,

John O. Innes  
Chairman

Copy: Mr. J. C. Marting  
Captain A. C. Ingersoll, Jr.  
Mr. A. L. Mechling  
Mr. Morris Crandall  
Mr. Lynn Childs  
Mr. B. J. Markham

Appendix 2

NORTHERN ILLINOIS COAL TRADE ASSOCIATION  
307 North Michigan Avenue  
Chicago 1, Illinois

October 17, 1947

A. J. Christiansen,  
Secretary

Mr. A. W. Frey, General Traffic Manager  
National Oil Transport Corporation  
25 Broadway, New York 4, New York

Dear Mr. Frey:

I have your tabulation of the tonnages and your inquiry regarding the accuracy of 463,000 tons per month.

The figures that Mr. Wildman and I had used as an estimate of the approximate tonnage were based principally on the fact that the Commonwealth-Edison Company uses some 370,000 tons of coal per month, and the Fulton County district ships about 30,000 tons on the Illinois River.

However, I believe that the figures shown by the barge line companies themselves are probably more accurate, and I now find that the Marquette Cement tonnage is low, because as soon as the Upper Mississippi River closes the United Electric Coal Companies, who supply the Marquette Cement with coal, intend to put the barge coal now moving to Linwood and Dubuque, Iowa, to points on the Illinois River, such as Marquette. They now advise they can put as much as 35,000 tons a month into that plant. They also expect to put 20,000 tons a month, which is handled by Blaske, to the Illinois power plant at Havana.

I am of the opinion that you should now add the 45,000 tons which the Blaske Lines report they expect to handle, as I do not believe that is a duplication of the tonnage reported by these other companies. It would appear now that the 463,000 tons is low.

Yours very truly

/s/ A. J. Christiansen  
Secretary

ILLINOIS WATERWAY PETROLEUM TERMINALS & REFINERIES

<u>Chicago Area Refiners</u>	<u>Owner or Operator</u>	<u>Mile Pt. Location</u>	<u>No. of Tanks</u>	<u>Total Stge. Capacity</u>	<u>See Footnote</u>
Lockport	Texas Co.	293.4	-	-	1
Lemont	Globe Oil & Ref.	297.5	-	-	1
<u>Chicago Terminals</u>					
Forest View	Lake River Oil	314.0	*	300,000	2
Forest View	Waterways Term.	314.1	7	460,000	3
Forest View	Arrow Pet. Co.	314.2	18	306,000	
Forest View	Pure Oil Co.	314.3	11	249,500	2
Chicago	Hughes Oil Co.	317.0	*2	60,000	
Chicago	Socony-Vacuum	317.3	2	110,000	
Chicago	Apex Motor Fuel	319.8	*	188,800	
Chicago	Pet. Heat & Power	320.1	*	146,000	
Chicago	Texas Co.	322.0	26	8,000	
Blue Island	Martin Oil Co.	316.7	4	105,000	
Riverdale	Acme Pet. Co.	319.7	*	169,000	
				<u>2,102,300</u>	
<u>Terminals below Lockport, Ill.</u>					
Peru	Schermerhorn Oil	222.7	4	16,700	
Peru	Smith Oil & Ref.	221.3	4	90,000	
Peru	Wood River Oil	221.2	*	285,000	
Peoria	Sweney Gas & Oil	163.5	8	15,300	
Peoria	Simpson Oil Co.	162.1	5	85,000	
Peoria	Texas Co.	162.0	5	45,000	
Peoria	Std. Oil of Ind.	158.4	*	179,640	4
Peoria	Soc. Vacuum	158.3	4	75,000	
Kingston Mines	Ill. Farm Su.	145.4	7	230,000	
Havana	J. D. Streett	119.0	3	45,000	
				<u>1,066,640</u>	

(\* No. of tanks unreported)

## Footnotes:

- 1) Refinery storage not shown, however, facilities are used for barge receipts and may be available for use by other shippers, if needed.
- 2) Terminal under construction - estimated ready by 12/1/47.
- 3) Includes 4 new tanks, totalling 70,000 bbls. - final completion date 11/10/47.
- 4) Terminal under construction - estimated ready 3/31/48.