M004-3
Sheboygan

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: JAN 22 1982

SUBJECT: Sheboygan Dredging

R. Webb for
FROM: Howard Zar
Great Lakes Enforcement Coordinator

TO: Tony Leffin
Indiana/Wisconsin Coordinator

At one point in last week's meeting, Val asked me to review the January 6, 1982 package from B. Backley and comment. I've done so and have reached the following conclusions which agree with those we reached that day.

For the proposed limited dredging project:

- Proposed disposal seems OK subject to review of the details
- Some exposure of higher level sediments will occur. This will have an adverse but relatively small effect on fish levels, it seems
- Economic effects will continue if dredging does not occur
- Elevated fish levels are largely due to upstream elevated sediment levels, it seems

Recommendation:

- Indicate limited adverse effect of limited dredging project but do not actively oppose it
- Find out if a compensating cleanup program exists with respect to upstream effluents or sediments. A good way to do this would be to ask Tony Kizlauskas of GLNPO to work with Corps and the State to make such a recommendation
- Alternately one could ask Backley or the new Water Division. Consideration could also be given to re-establishing the Ad Hoc Dredging Group that Ms. Philippi used to convene.

cc: Bryson
Kizlauskas
Backley

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

DATE: 6 JAN 1982

SUBJECT: Mr. Adamkus' Meeting with Governor Dreyfus and C. Besadny of WDNR

FROM: Barbara Taylor Backley, Acting Chief
Environmental Review Branch

TO: Tony Leffin
Indiana/Wisconsin Coordinator

In reference to your December 31, 1981 memo concerning the above subject, the following is an issue paper on an item that may be discussed at the upcoming meeting.

ISSUE: Corps of Engineers maintenance dredging project and the disposal of PCB contaminated sediment from Sheboygan Harbor, Wisconsin.

EPA FORM 1320-6 (REV 3-76)

Issue: Corps of Engineers maintenance dredging project and the disposal of PCB contaminated sediment from Sheboygan Harbor, Wisconsin.

Background

The Corps of Engineers is authorized to maintain a navigation project at Sheboygan, Wisconsin (Sheboygan County). The project was constructed in 1956, and consists of an outer harbor and a channel which extends about 1.0 mile up the Sheboygan River (Figure 1). As far as we know, the major user of the harbor is Carl Reiss Coal.

A draft Environmental Impact Statement (EIS) on harbor maintenance was prepared in 1979, which proposed dredging to project depth and disposal in a confined lake facility which would be used as a marina after project completion. In the same year, the river's bottom sediment was discovered to be contaminated with PCB. The extent of contamination is random; that is, pockets of highly contaminated sediment (greater than 50 ppm PCB) occur in different horizontal and vertical strata, and discrete layers can not be isolated (Table 1). We rated the proposed project as environmentally unacceptable (EU) because the proposed dredging would expose sediment contaminated with levels of PCB higher than what exist at the surface now, and the proposed disposal of the dredged sediment would be in conflict with EPA's PCB disposal regulations (40 CFR Part 761). The EU rating requires EPA to refer the project to the Council on Environmental Quality if the action proposed in the final EIS is still environmentally unacceptable. Since that time, the EPA, COE, and Wisconsin Department of Natural Resources have been working toward a solution so that a final EIS may be prepared on a proposed action which is environmentally acceptable.

Subsequent to the Draft EIS, several alternatives have been considered for dredging and disposal of the contaminated sediment from the navigation project. These alternatives involve everything from a total harbor clean-up with disposal in accordance with the PCB regulations, to routine dredging and disposal practices. Thus far, there has been no alternative that satisfies the needs of both environmental protection and navigation. Presently, the project is at a standstill.

Listed below are the factors that enter into formulating dredging and disposal alternatives at Sheboygan Harbor.

A. User surveys indicate navigation need only be maintained upstream to around station 44+00, about 1/2 of the project (navigation is authorized to station 79+00).

B. Authorized project depths should be maintained (-21 feet IGLD), but somewhat less, perhaps a foot, could be sufficient for navigation purposes. The COE has offered these reduced depth dredging alternatives in a letter dated November 19, 1980. (attached)

C. Sediment contaminated with greater than 50 ppm PCB should be disposed of in accordance with U.S. EPA's PCB disposal [illegible] (40 CFR Part 761)

D. Sediment contaminated with 10 to 50 ppm PCB should be disposed of in a specially built COE disposal facility, a secure landfill, a PCB disposal facility, or in some other environmentally protective manner.

E. The discharge of PCB from a disposal facility should not exceed 1 ppb.

F. After dredging, exposed sediment should not contain levels of PCB greater than what exists at the surface before dredging. EPA has expressed these environmental criteria in a letter dated January 12, 1981 (attached).

Listed below are the alternatives that have been considered thus far, and the problems associated with them. Many other alternatives and combinations of alternatives have been considered, but they can be divided into the following categories.

A. Dredging to authorized depths and disposal in a COE confined disposal facility located in the outer harbor of Sheboygan.

Problems: Sediment contaminated with higher levels of PCB than what exist now would be exposed following dredging (degradation); sediment contaminated with greater than 50 ppm PCB would be disposed of in the COE facility, which does not meet the requirements of the PCB regulations (40 CFR Part 761).

B. Dredging to reduced depths (-20 feet) and disposal in a COE confined disposal facility located in the outer harbor.

Problems: This avoids disposal of sediment contaminated with greater than 50 ppm PCB; however, it will expose sediment with higher levels of contamination than what exist now. Additionally, it leaves sediment contaminated with 50 ppm PCB or more dangerously near the surface of the navigation channel and subject to disturbance by shipping activities. Dredging to any depth less than -20 feet is inadequate to maintain navigation.

C. Total clean-up.

Problems: EPA's authorities for a total clean-up could come from superfund and Section 115 of the Clean Water Act; however, as far as we know, Sheboygan is not a superfund priority and Section 115 is not funded. Similarly, the COE does not have authority to effect a total clean-up because it involves dredging below authorized depths and because the COE cannot construct a facility to contain material they are not authorized to dredge. (NOTE: The extent of total clean-up (i.e., amount of material required to be removed to get sediment PCB levels below existing sediment-surface levels) is not precisely known. To determine the extent of contamination below project depths would require more testing.)

D. No Action

Problems: It does not allow navigation to continue efficiently, nor is this alternative attractive to commercial interests since they claim it will result in adverse economic impacts to Sheboygan and the State of Wisconsin.

Besides the total clean-up alternative, however, it is environmentally preferrable to the other alternatives.

Status:

To date, the action preferred by U.S. EPA and WDNR is a total clean-up (until this happens, no-action is recommended). This position has been expressed by EPA in a letter dated June 1, 1981 (attached) and in a letter by WDNR dated November 4, 1981 (attached). The COE, Wisconsin Governor Lee Sherman Dreyfus, and Sheboygan Mayor Richard W. Suscha prefer dredging to a reduced project depth (-20 feet) and confinement of the sediment in a confined disposal facility in the outer harbor. (We understand that the locals are very interested in having the marina that would result from the COE lake confined disposal facility.) Senator William Proxmire has also expressed interest in the project, but to our knowledged has not stated his position.

In a letter dated January 4, 1981 (attached), the COE has asked us, as a result of Governor Dreyfus' urging, if we will concur with the reduced depth dredging proposal. We have not yet responded. The COE is asking us to participate in a January 26 meeting to resolve the environmental issues. In accordance with our responsibility, EPA has 3 options: (1) maintain our objections to the proposed action and indicate to the COE that we will refer the project to CEQ if the COE issues the final EIS, (2) modify our environmental requirements and work toward another solution, or (3) indicate to the COE that they should make a "public interest" decision and issue the final EIS; we will maintain our objections but not refer the project to CEQ. The COE has stated that they will not issue the EIS without our approval. As a result, it appears to Governor Dreyfus and others that EPA is being uncooperative because without our approval, the project is stalemated.

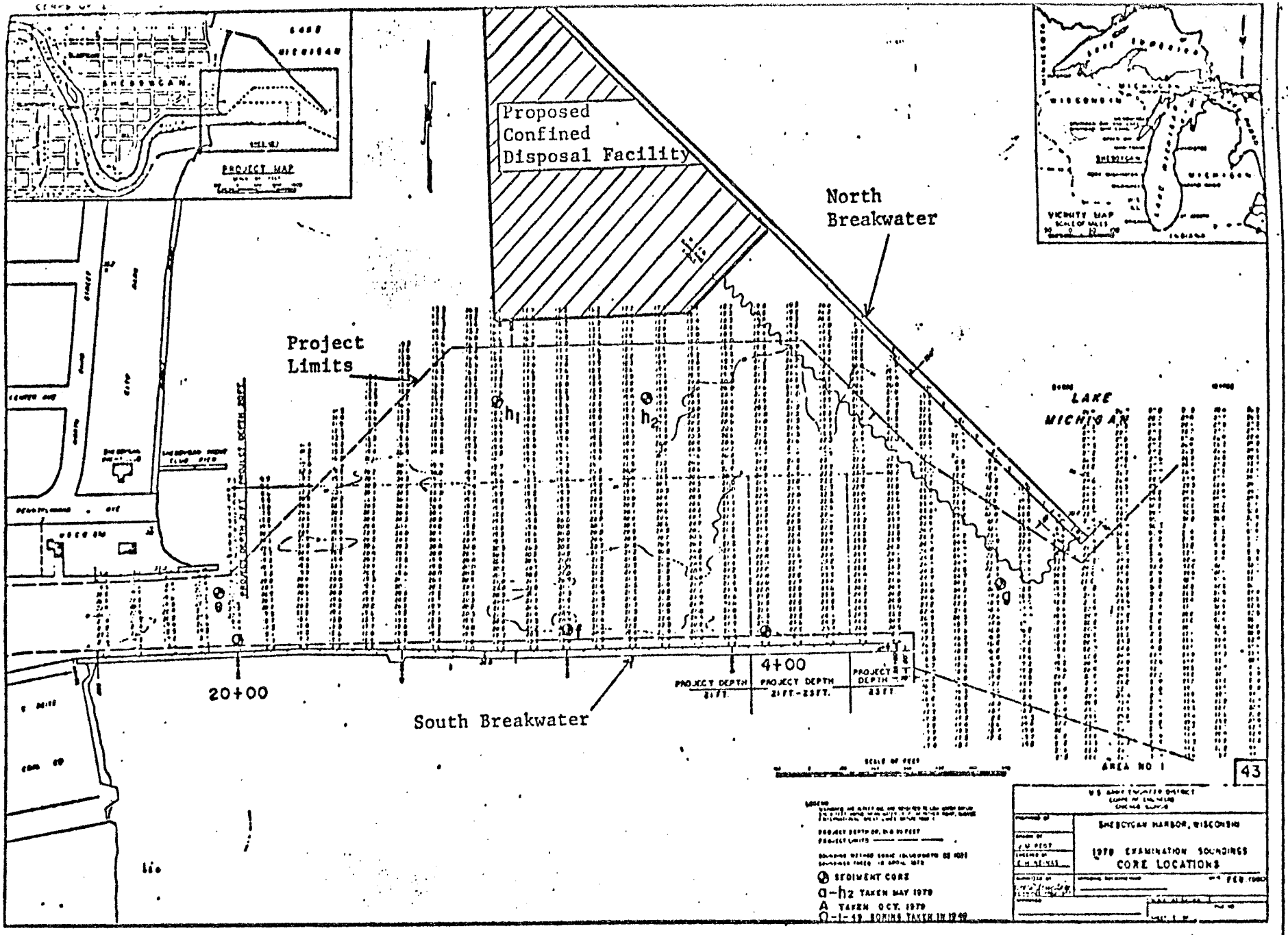
Proposed
Confined
Disposal Facility
North
Breakwater
Project
Limits
South Breakwater
20+00
4+00
LAKE
MICHIGAN
AREA NO 1
43
SHEBOYGAN HARBOR, WISCONSIN
1979 EXAMINATION SOUNDINGS
CORE LOCATIONS

FIGURE 1

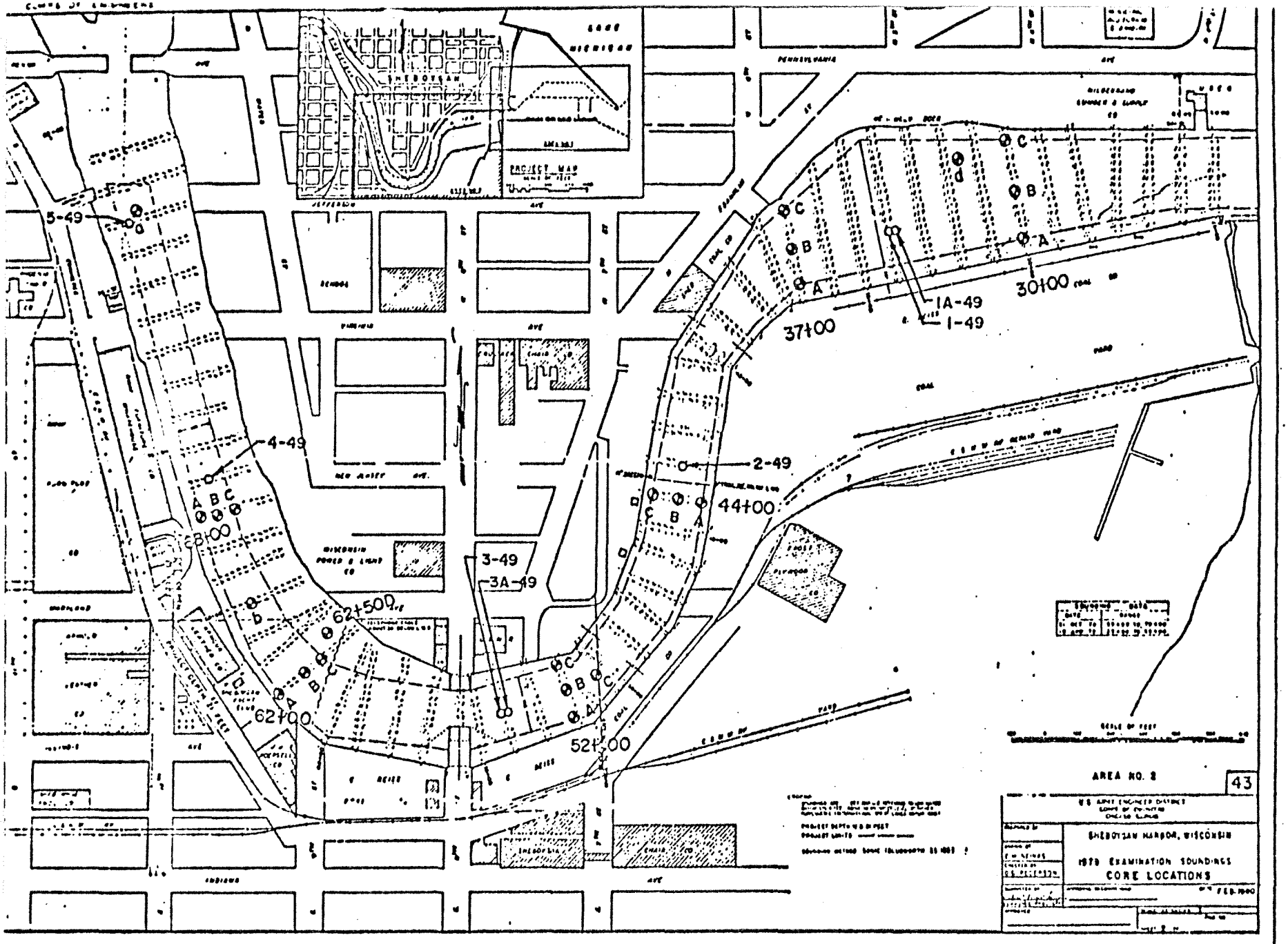

FIGURE 1 (cont')

TABLE 1

PCB concentrations (mg/kg - ppm) in the sediment profile of Sheboygan Harbor, Wisconsin

Channel Station and Depth (IGLWD)*		North	Center	South
30+00	-14 ft	26 (surface)		
	-15	26		
	-16	26	7 (surface)	
	-17	16	7	
	-18	16	7	
	-19	14	24	6 (surface)
	-20	14	24	6
	-21	14	31	6
	-22	14	31	54 **
	-23	14	31	57
37+00	-14	10 (surface)		
	-15	10		
	-16	10		
	-17	27		12 (surface)
	-18	27	10 (surface)	36
	-19	12	10	36
	-20	12	10	41
	-21	14	46	41
	-22	14	46	41
	-23	14	46	82
44+00	-12	10 (surface)		
	-13	10		
	-14	10		
	-15	14		
	-16	14	5 (surface)	
	-17	10	5	10 (surface)
	-18	10	5	10
	-19	23	10	10
	-20	23	10	10
	-21	25	71	10
	-22	25	71	8
	-23	25	71	8

* IGLWD is the International Great Lakes Water Datum, a standard measurment of water depth in the Great Lakes

** Authorized Project Depth

19 NOV. 1980

DEPARTMENT OF THE ARMY
DETROIT DISTRICT, CORPS OF ENGINEERS
BOX 1027
DETROIT, MICHIGAN 48231

REPLY TO
ATTENTION OF

NCEED-T

19 NOV 1980

Mr. John McGuire, Regional Administrator
United States Environmental Protection Agency
Region V
230 S. Dearborn St.
Chicago, IL 60604

Dear Mr. McGuire:

This letter concerns the Sheboygan Harbor, Wisconsin confined dredge disposal facility project.

Agreement on a confined disposal facility at Sheboygan has been at a standstill for over a year due to the discovery of PCB contamination of the harbor sediments. The main question is, can the proposed confined disposal facility to be located in the Sheboygan outer harbor provide adequate environmental protection for confinement of PCB contaminated sediments? The purpose of this letter is to provide a dredging and disposal alternative for your consideration which we believe would be environmentally safe.

Based upon the March 1980 PCB investigation, dredging to the authorized project depth of 21 feet below Low Water Datum (LWD) upstream of station 25+00 would uncover and expose to the water column some PCB concentrations of 50 parts per million (ppm) or higher. We agree that this would be environmentally unacceptable.

A possible alternative which was discussed at the 24 October meeting with Mayor Suscha would be to limit dredging to a maximum depth of 20 feet below LWD between channel stations 25+00 and 44+00 (see the attached Sheboygan Project Map.) This would accomplish the following:

a. The material to be dredged would contain only low to moderate levels of PCBs. No material containing high concentrations of PCBs (50 ppm or higher) would be dredged. Therefore, it should be less difficult to agree upon a disposal method that would be environmentally acceptable.

b. Since the high levels of PCBs (50 ppm or higher) are not identified until depths of 21.5 feet (below LWD) or deeper, this limited dredging would leave a minimum cover of 1-1/2 feet over the highly toxic sediment layers. This would prevent exposing the water column to hazardous PCB concentrations.

C: ~~ANDOER~~
CC: RF
Brand

NCEED-T
Mr. John McGuire, Regional Administrator 18 NOV 1980

We are proposing that the following approach be taken at Sheboygan Harbor:

a. Channel station 0+00 to 25+00 - Dredge to full authorized project depth. All samples indicate that PCB contaminations in this section of the project are below levels of concern.

b. Channel station 25+00 to 44+00 - Dredge to a maximum depth of 20 feet below LWD (LWD equals 576.8 feet - IGLD). This would leave a minimum cover of 1-1/2 feet over the materials containing highly toxic concentrations.

c. Perform no maintenance dredging upstream of channel station 44+00. High levels of PCB contamination are located well above authorized channel depth in this portion of the channel.

d. Upgrade the proposed confined disposal facility that would be located in the Sheboygan outer harbor. Use the proposed site to confine approximately 300,000 cubic yards of maintenance dredged material.

The inclosed figures 1.1, 1.4, 1.5, and 1.6 are taken from the draft EIS and show the disposal facility that was proposed prior to identifying the high levels of PCBs in the sediments. Due to the presence of PCBs, we propose that this facility be upgraded by installing a bentonite slurry trench membrane around the entire perimeter of the disposal facility. The bentonite slurry trench would start at the top of the dike and extend down to the natural clay layer located below the disposal facility. The final permeability of the bentonite seal would be approximately 1×10^{-7} cm/sec. This, combined with the natural strata, would create a highly impervious confinement facility and assure that polluted materials would not find their way into the surrounding environment. It is also proposed that the top two feet of the disposal facility be covered with clean sediments to be dredged from the outer limit of the channel where the sediments have been classified as unpolluted.

In our judgment this proposed plan for limited dredging and upgrading of the disposal facility would provide an environmentally safe and adequate solution to the dredged disposal problem at Sheboygan. This judgment is based upon the following:

a. The limited dredging plan would reduce the PCB concentrations in the dredged sediments from high levels to low or moderate levels. The highest level recorded in the material to be dredged is 36 ppm at channel station 37+00. Most samples indicate PCB concentrations of 10 ppm or lower. The average PCB concentration in the materials to be dredged would be only approximately 3.5 ppm. Since there are no PCB levels of 50 ppm or higher, this disposal facility should not fall under the requirements of the Toxic Substances Control Act and should not be required to provide the same degree of protection as a chemical waste land fill.

b. The proposed bentonite slurry trench seal would provide a highly impervious confinement facility and would prevent polluted material from seeping through or under the confinement dikes.

c. Effluents from the disposal facility would be discharged through a filter system that would limit the effluent suspended solids concentration to 15 mg/l. This would limit the release of PCB solids to approximately 5×10^{-5} mg/l. It is expected that there would also be some release of dissolved PCBs in the discharge water. However, the total release of PCBs from the confinement facility would be so small as to be insignificant and would cause no measureable degradation of water quality at the disposal site.

d. The confinement facility would provide a very important environmental benefit by permanently confining 300,000 c.y. of material containing approximately 400,000 grams of PCBs.

As you know, PCB contamination at Sheboygan extends below and beyond our authorized project limits. On several occasions, the possibility of performing a total cleanup by dredging all contaminated sediments has been discussed. Such an operation would be far beyond the scope of normal maintenance. We would not have the authority to perform such extensive dredging or to construct the large confinement facility that would be required to contain the sediments. A total cleanup would have to be funded under Section 115 of the Clean Water Act of 1977 or some other funding authority.

It appears, from Section 115, that Congress intended that USEPA should take a leading role in the identification, removal, and disposal of toxic pollutants in harbors and navigable waterways. In your letter of 21 October 1980, you suggested that Section 115 is not a viable source of funding since only $15,000,000 has been authorized to be appropriated nationwide. If it is determined that sediments at Sheboygan should be treated as a toxic substance rather than normal polluted dredge material, it is suggested that the USEPA seek appropriations from Congress as required to implement Section 115.

We believe that the proposed disposal site is the only expedient solution to the dredge disposal problem at Sheboygan. It is the only site that has received support from the local community since site selection started in 1971. If this site is eliminated from further consideration and we reinitiate the site selection process, dredging at Sheboygan will be delayed by years. Ultimately this could have an adverse economic impact on the community. Current high lake levels may receed with resultant reductions in cargo carrying capacity of vessels that use the harbor.

It is requested that you consider this proposal for limited dredging at Sheboygan and upgrading of the proposed disposal site. Please respond in writing as to your position on the alternatives which we have outlined.

NCEED-T
Mr. John McGuire, Regional Administrator

19 NOV 1980

If you have additional questions concerning this matter, please feel free to contact me or Mr. Bob Jones of my staff at 313-226-6784.

Sincerely,

Robert V. Vermillion

5 Incls
1. Sheboygan Harbor Map (2 shts)
2. Figure 1.1
3. Figure 1.4
4. Figure 1.5
5. Figure 1.6

ROBERT V. VERMILLION
Colonel, Corps of Engineers
District Engineer

Copy furnished:

Honorable Richard W. Suscha, Mayor, City of Sheboygan, City Hall, Sheboygan, Wisconsin 53081

Mr. Anthony S. Earl, Secretary, State of Wisconsin, Department of Natural Resources, Box 7921, Madison, Wisconsin 53707

Mr. Howard S. Druckenmiller, Director, Bureau of Environmental Impact, Wisconsin Department of Natural Resources, Box 7921, Madison, Wisconsin 53707

12 JAN 1981

12 JAN 1981

[illegible]

Colonel Robert V. Vermillion
District Engineer
U.S. Army Engineer District, Detroit
P.O. Box 1027
Detroit, Michigan 48231

Dear Colonel Vermillion:

Members of my Environmental Impact Review Staff, Office of Environmental Review are presently reviewing your proposal for limited dredging at Sheboygan Harbor. This proposal was sent to us in a letter dated 19 November 1980, and presents several new alternatives for the project. The Sheboygan Harbor project has come to our attention simultaneously with several other harbors which have similar PCB problems. There are some unprecedented aspects of these projects which require cautious review so as to avoid significant water quality problems. At the same time, we are concerned about requiring measures which may be exorbitant in cost for little additional environmental protection.

Since the last meeting in Mayor Suscha's office to discuss dredging plans for the Sheboygan River, I have had an intra-agency task force examining the issues generated by the existence, in sediments, of high levels (over 50 ppm) of polychlorinated biphenyls (PCBs). The group is proposing four conditions under which the dredging could occur without causing harmful releases of PCBs into the environment. They are described below.

First, we have determined that an adequate degree of environmental protection for the containment of dredged spoils contaminated with 50 ppm PCBs or greater would be provided by an upland disposal site designed with at least a three foot thick clay liner with a permeability rate of 1 x 10-7 cm/sec. A decision on whether or not a leachate collection system is required will be made based on site specific characteristics. Site conditions including proximity to a significant aquifer, depth to an apparent water table, topography of the area, flood protection, and presence of sensitive environmental areas will all be considered in this decision.

Second, we have determined that confined disposal in a water site of dredged sediment contaminated with levels of PCBs as high as 50 ppm should not be allowed. A disposal facility constructed in the water does not provide adequate protection, primarily because the proximity of PCB contaminated material to water significantly increases the chances of PCB migration to and dispersal in the environment. Safe, long-term confinement of PCB contaminated dredged spoil would be very difficult to attain with respect to engineering, and any necessary remedial action required would be next to impossible to accomplish.

cc: [illegible]
[illegible]
[illegible]

Third, we have determined that the environmentally acceptable PCB concentration that can be exposed upon completion of a dredging project is 10 ppm or less. Ongoing research is indicating that PCB levels in excess of 10 ppm in sediment are harmful in an aquatic environment. Studies done on the bioaccumulative potential of PCBs indicate that dredging to this concentration will result in reduction of fish PCB concentration to a level within or near the Food and Drug Administration's recommended guideline of 5 ppm.

The final issue addressed by the Task Force was the allowable level of PCBs that may be discharged in the overflow from a disposal facility. We determined that the maximum allowable discharge concentration is 1 ppb or less, as technology permits.

When the above determinations are compared with your recent proposal for limited dredging of Sheboygan Harbor, all the criteria appear to be met except for the third one. Unfortunately, even with limited dredging, PCB concentrations above 10 ppm will be exposed upon completion of the project. Although two areas of the harbor will be improved (in terms of PCB concentrations exposed), the majority of the harbor would be degraded by exposure of PCB concentrations at levels higher than those that currently exist at the sediment surface. In all cases, the PCB levels exposed would be above 10 ppm. Thus, we believe another alternative must be sought.

I do not intend that this submittal of our determinations be the end of the discussion. You and your staff are in the best position to determine how the conditions can be met, and further discussions between our two agencies are necessary to give them the "reality" test that they deserve. I have asked Nancy Philippi to pursue this with you further, on my behalf. She may be contacted at the letterhead address or by phone at FTS 353-3299 (COM: 312/353-3299).

We appreciate the necessity of expediting the dredging of the Great Lake's harbors and navigation channels. We look forward to working with members of your staff to resolve the problems of dredge spoil disposal.

Sincerely yours,

John McGuire
Regional Administrator

1 JUNE 1981

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

5XER
REPLY TO ATTENTION OF:

Honorable William Proxmire
United States Senate
Washington, D.C. 20510

1 JUN 1981

Dear Senator Proxmire:

Thank you for your letter of April 22, 1981, concerning the dredging of Sheboygan Harbor, Wisconsin. You requested an explanation of our current position on this issue and urged us to resolve the environmental problems at Sheboygan as quickly as possible. Please be assured that we are trying to do this, but the problems at Sheboygan Harbor present an unique and difficult case. Staff of my Office of Environmental Review have been continually working on these problems with the Corps of Engineers, the Wisconsin Department of Natural Resources, and in-house ever since the October 1980 meeting you refer to in your letter. Our efforts have been aimed toward developing a reasonable solution that will avoid further delays on the project but also minimize environmental risks. In the case of Sheboygan, this has been an especially difficult task.

I would like to take this opportunity to explain some of the difficulties we are facing in trying to minimize the environmental impact of dredging Sheboygan Harbor. As you are aware, the harbor is grossly contaminated with polychlorinated biphenyls (PCBs), which are very hazardous, persistent, man-made organic compounds. Although the behavior of PCBs in the environment is not completely understood, overall their effect on living organisms is fairly well documented in the literature. This effect is very undesirable and therefore PCBs must be handled with extreme care. In fact, because of their harmful effects, our Toxic Substances Control Act regulations regulate the disposal of sediments contaminated with 50 parts per million (ppm) PCBs or greater.

The distribution of PCB contaminated sediments in Sheboygan Harbor is random. Pockets of highly contaminated sediments (greater than 50 ppm) occur in different horizontal and vertical strata, and discrete layers can not be isolated. Because of the distribution of PCB contaminated sediments, there is no complete environmental solution to their removal except for a total clean-up. A total clean-up would significantly increase project costs and involve dredging to depths that have not been authorized by Congress. However, this solution is safe and permanent. The Corps of Engineers does not have authority to perform a total clean-up at Sheboygan Harbor, the State of Wisconsin is not prepared to participate in a total clean-up effort, and the U.S. Environmental Protection Agency, although authorized under Section 115 of the Clean Water Act to remove in-place pollutants such as those in Sheboygan Harbor, does not have funds appropriated to it to do this under this authority: so other solutions had to be sought.

The Detroit District, Corps of Engineers has proposed an alternative which involves dredging only the lower portion of the Federal navigation channel, and only to a depth of 20 feet instead of the authorized 21 foot project depth. This alternative avoids dredging sediment contaminated with greater than 50 ppm PCBs. Since the highly contaminated sediments would not be dredged under the

reduced depth dredging proposal, the less contaminated dredged sediments could be safely disposed of in the Corps of Engineers' proposed harbor disposal site. However, while the problem of disposal is solved, there is an additional problem that arises with this proposal: sediment with higher levels of PCB contamination than what exists now at the sediment surface will be exposed after dredging. This situation is of particular concern because disruption and mixing of the PCB contaminated sediment will result from normal harbor use. Thus, the amount of PCBs to be released in the aquatic environment is increased. The slow, continual release of even low levels of PCBs is highly undesirable because of the contaminant's persistent nature and ability to biomagnify at a tremendous rate. This concern was discussed in a January 12, 1981 letter to the Corps of Engineers with a concluding paragraph stating that the Environmental Protection Agency does not approve of this proposal because it could result in significant environmental degradation.

We have had follow-up meetings with the COE and other local interests to determine if other alternatives, or modifications of the reduced depth dredging alternative, could meet project needs while providing greater environmental protection. No other feasible alternatives have surfaced as a result of these efforts. We are certainly aware that the "no action" alternative would present serious economic and social costs to the area even though it appears to be environmentally preferable over the reduced depth dredging proposal. Although we know that a degraded environment will result from reduced depth dredging, the severity of that degradation at the local or Great Lakes system level can not be determined with certainty. Since there are potentially severe environmental risks involved with this proposal, we find it to be environmentally unsatisfactory.

To conclude, the decision at Sheboygan lies between an "action" alternative with its potentially severe environmental costs, and the "no action" alternative with its severe economic and social costs. In accordance with our responsibilities to comment on proposed Federal actions, it is our opinion that, thus far, the only "action" alternative that is environmentally sound is a total clean-up. Until a funding source or new authority is found to do this, the "no action" alternative is environmentally preferable.

I appreciate your concerns about Sheboygan and trust this letter has explained why it has been an unusually complex case. Please feel free to contact either me or Mr. Ronald L. Mustard, Director, Office of Environmental Review (312/886-6680) if we can be of further assistance or answer any additional questions.

Sincerely yours,

Valdas V. Adamkus
Acting Regional Administrator

4 Nov. 1981

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Carroll D. Besadny
Secretary

BOX 7921
MADISON, WISCONSIN 53707

November 4, 1981

File Ref:

Honorable Lee Sherman Dreyfus
Governor of Wisconsin
C A P I T O L

Dear Governor Dreyfus:

In response to your request of September 29, 1981, the Department of Natural Resources has reevaluated dredging of PCB contaminated sediment in Sheboygan Harbor. However, before further decisions are possible, several documentation steps must be completed. We agree that careful evaluation of the risks, benefits and costs associated with each available option is essential so that a sound decision can be made. The complex nature of the PCB contamination problem at Sheboygan and past efforts at resolving it suggest quick and easy solutions probably will not be possible.

The following description of the history of this project shows the number of efforts which have been made to resolve the problem, as well as what remains to be done if any progress is to be made. We will consider all legitimate options, as we have in the past, and will facilitate discussions among the parties for progress toward a satisfactory resolution.

History of Project

The Draft Environmental Impact Statement (DEIS) on operation and maintenance at Sheboygan Harbor was completed March 30, 1979. The DEIS evaluated the preferred alternative of dredging the entire federal navigation channel with disposal in a confined disposal facility. It included the following reports citing contamination of Sheboygan Harbor sediments:

1. EPA report on the degree of pollution of bottom sediments dated October 2, 1974.

2. Corps sediment PCB analysis dated July, 1978.

3. Wisconsin Department of Natural Resources PCB sediment analysis dated June 13, 1978.

Prior to submittal of the Final EIS, but after the EIS was completed, a March 15, 1979 letter from Mr. Ronald L. Mustard, Director, EPA Office of Federal Activities, to Colonel James Miller instructed the Chicago District of the Corps of Engineers to take additional samples in the Sheboygan River and harbor. Eleven sites were proposed by EPA and it

was indicated these sites were not necessarily all inclusive. Concurrence with the suggested sampling program was indicated in a letter dated May 4, 1979 from Colonel Miller to Mr. Mustard.

EPA completed review of the DEIS around the end of May, 1979. Significant points in the EPA letter were:

1. The total dredging of all bottom sediments may be environmentally warranted.

2. PCB "hot spots" may require special disposal methods, other than utilization of the Confined Disposal Facility (CDF) which had been proposed by the Corps.

3. Until a new sediment analysis was completed, EPA reserved judgment on the suitability of the CDF.

4. EPA rated this project as EU (environmentally unsatisfactory) with the DEIS itself classified as Category 2 (insufficient information).

It should also be noted that this DEIS did not fully explore the limited dredging proposal which has since been proposed by the Corps.

The results of the requested additional sampling program (performed by the Army, Waterway Experimental Station) were submitted to DNR on July 20, 1979. Comments received from DNR staff in August, 1979, stressed the need for additional sampling data due primarily to:

1. Identified PCB contamination information provided by the July 20, 1979 additional sampling program, and

2. Improper location of the Corps' sample points in the river "channel." The need for an expanded sampling program was identified so the Sheboygan River and Harbor sediments could be adequately characterized.

These concerns were expressed August 27, 1979, in Madison during a meeting between Corps and DNR representatives. At this time, the Department indicated additional sampling would be necessary to better characterize the Sheboygan River and harbor sediments and offered to provide an expanded sampling program to the Chicago Corps office.

Another meeting was held October 3, 1979 in Madison between Corps and DNR personnel. An expanded sampling program was coordinated and the Corps agreed to perform the sampling as soon as possible. This sampling program would utilize transects and depths determined by DNR personnel. The additional sampling occurred in either late October or early November and involved cores drilled to a depth of 26 feet. This depth was chosen because we believed that "clean" substrate would then be located, and if dredging was approved, a non-polluted and environmentally acceptable bottom would be exposed. The bottom of the cores was located in native materials and below the historic dredging limits. Transects were positioned to sample areas of sediment deposition. These areas should contain the highest concentrations of PCB's, and thus, it may be possible to selectively remove these hot spots. Upon completion of this sampling, the Corps once again shipped the samples to the Waterways Experiment Station.

In December, 1979, staff of the Chicago District of the Corps of Engineers contacted the Department. The Corps indicated the results of the latest sampling had been received from the Waterway Experiment Station. PCB contamination indicated by these results was worse than Corps' personnel had imagined. PCB's had migrated into the native undisturbed sediments. At numerous sampling points, PCB's exceeded 50 ppm; at one sample point a PCB concentration greater than 160 ppm was found (this location was not at the bottom of the sample point but at a composited interval in the core sample).

On April 11, 1980, the Department received copies of the Corps of Engineers' sampling report which confirmed the following:

1. Numerous locations in Sheboygan Harbor contained PCB's in concentrations higher than 50 ppm.

2. In general, the PCB concentrations increased with depth and decreased with distance downstream.

3. The PCB distribution indicated selective dredging for removal of hot spots was not feasible.

4. The average concentration of PCB's in sediments below Eighth Street was slightly less than 10 ppm.

5. Some unknown mechanism was causing a downward migration of PCB's into the substrate subsequently contaminating native, undisturbed materials.

6. The Corps concluded the proposed confined disposal facility in Sheboygan Harbor was environmentally safe and economically attractive for disposal of the materials and suggested a meeting to discuss the problem. This conclusion was not acceptable to EPA because of the degree of contamination of the harbor sediments and the EPA classification of toxic and hazardous wastes. Federal regulations classified materials with greater than 50 ppm of PCB's as contaminated. These contaminated materials require handling and disposal of licensed PCB management facilities. Currently there are no licensed PCB disposal facilities in Wisconsin.

On July 23, 1980, the Department was notified the Corps of Engineers' responsibilities at Sheboygan had been transferred from the Chicago District to the Detroit District. A meeting was confirmed for July 29, 1980 to discuss transition of this project. At this meeting, several dredging alternatives were discussed. The Corps continued to maintain that the proposed confined disposal facility (CDF) was appropriate. It also took the position that if the CDF could not be used for disposal, the Corps lacked authority to do the project. Consequently, in the Corps' view, any further responsibility for PCB contaminated material and the Sheboygan Harbor project would belong to EPA and the State of Wisconsin.

On August 15, 1980, the Department asked EPA to clarify its position on disposal of PCB contaminated dredge materials. EPA replied on October 1, 1980 that:

1. 40 CFR 761.1(b) required the entire dredging backlog be considered contaminated with greater than 50 ppm of PCB's even though the composite analysis would be about 10 ppm; and

2. A confined disposal facility would be an acceptable alternative disposal method provided the documentation indicated it adequately protected health and the environment.

EPA again clarified its position on PCB contaminated dredge material and use of Section 115 funds for cleanup in an October 21, 1980 letter to the Detroit District of the Corps of Engineers. Section 115 of the Clean Water Act allows the EPA Administrator to remove and properly dispose of toxic pollutants in harbors and navigable waterways. EPA indicated methods of disposal were incineration, chemical waste landfill or an alternative disposal method to be approved by the Regional Administrator. The latter option must include technical, environmental and economic documentation showing it would provide adequate protection of health and the environment. Any disposal alternative must provide essentially the same degree of environmental protection as a chemical waste landfill. Finally, EPA concluded Section 115 of the Clean Water Act was not a viable source of funding because only $15 million had been appropriated nationwide.

On November 19, 1980, the Corps developed a new proposal for limited dredging in Sheboygan Harbor. The Corps proposed to dredge to 20 feet below Low Water Datum (LWD) between channel stations 25+00 and 44+00. The limits of dredging would be 6 feet above the 26 foot depth which still showed PCB contamination. This proposal would result in:

1. Dredging of materials with an average lower concentration of PCB's.

2. Leaving approximately 1½ feet of cover over the more heavily polluted sediments.

EPA reviewed this report and determined in a January 12, 1981 letter to the Corps that:

1. An adequate degree of environmental protection would be provided by containing the dredge spoils contaminated by more than 50 ppm of PCB's in an upland disposal site designed with at least three feet of clay liner having a permeability rate of 1×10^{-7} cm/sec.

2. Confined disposal of dredge material contaminated with levels of PCB's higher than 50 ppm should not be allowed in a site located in the water.

3. The environmentally acceptable PCB concentration that can be exposed upon completion of the dredging project is 10 ppm or less.

4. The maximum allowable discharge concentration is 1 ppb or less, as technology permits.

EPA concluded by saying that all of these criteria appeared to be met except for the exposure of 10 ppm of PCB's upon completion of dredging. Dredging to 20 feet would uncover sediments which had more than 10 ppm

of PCB's. EPA concluded this level of PCB's would increase body burdens in fish flesh. Two areas of the harbor would be improved in terms of levels of PCB's exposed; however, the majority of the harbor would be degraded. Thus, they recommended that another alternative be sought and affirmed that they wanted discussions to continue.

In responding to Senator William Proxmire on June 1, 1981, EPA indicated the Corps did not have authority to remove all the PCB contaminated sediments at Sheboygan Harbor; Wisconsin was not prepared to participate financially; and EPA did not have funds appropriated to it under Section 115 of the Clean Water Act for this purpose. EPA explored other alternatives to limited dredging with the Corps of Engineers, but no other solutions were discovered. Thus, EPA concluded the only "action" alternative was a total cleanup. Until a funding source or new authority was found for a total cleanup, the no action alternative was environmentally preferable from EPA's standpoint.

In my July 16, 1981 letter to you, I also indicated the no action alternative was environmentally preferable because the PCB contaminated materials would remain buried under more recently deposited clean sediments. The total cleanup of PCB contaminated sediments presented unresolved environmental as well as funding and sponsorship problems. The Draft EIS completed in March, 1979, had not contemplated the consequences of the significant PCB contamination at Sheboygan since this was found out later. Finally, we believed the limited dredging proposal was least desirable unless it was linked to a long-term rehabilitation plan. Limited dredging would expose sediments containing more than 10 ppm of PCB's upon completion, and there was no assurance that 1½ feet of cover over the more heavily polluted material would be sufficient. We recommended the Governor's office set up a meeting between interested parties to resolve this problem.

The Department later met with EPA on the applicability of the Superfund to Sheboygan Harbor. The Superfund process could be long and involved. Its lack of guidance and program stability are causing problems. EPA believed that the Sheboygan Harbor project would not rank very high nationally, but they thought the likelihood of funding for the project would increase if it was listed as the state's top priority site. Presently, the State of Wisconsin has not listed any sites with EPA for the reasons explained in our letter to you on October 13, 1981.

Alternatives

Throughout the history of this project, a variety of alternatives have been presented. The Corps' draft EIS reviewed three alternatives including operational channel maintenance dredging, limited dredging and a no action alternative. Subsequently, EPA proposed the total dredging alternative and the Corp refined a limited dredging alternative. These alternatives can best be compared by evaluating the pros and cons of each of them. Additionally, several other alternatives are offered for consideration.

1. Limited Dredging - To include dredging to shallower depths and reduced maintenance of navigation channels.

Pros

a) Would provide for some level of commercial navigation traffic.

b) Would be less costly than total cleanup -- at least initially.

c) Would allow the use of a Confined Disposal Facility (CDF).

d) Use of a CDF would be financed through Corps of Engineers' Operation and Maintenance budget.

e) Would not require special funding.

f) Would be consistent with future development plans for a proposed small boat recreational harbor.

g) Construction could be initiated in the near future following completion of Final EIS because most of the design work is already completed.

Cons

a) Many commercial large draft vessels could only be partially loaded resulting in more frequent trips and increased costs for goods and services.

b) Increase both the unit cost and frequency of dredging.

c) Future disposal problems for dredge spoil because the Confined Disposal Facility can only be designed for ten years.

d) Result in following environmental problems:

(1) Frequent release of PCB's due to exposure of contaminated sediments.

(2) Frequent turbidity and disruption of harbor activities.

(3) Benthic organisms would be prevented from recolonizing.

e) Limited dredging could lead to scouring of upstream (nondredged) sediments exposing PCB's now covered by recent nonpolluted materials.

2. Total Removal of PCB Contaminated Sediments. This alternative was not discussed in the March 1979 Draft Environmental Impact Statement; however, EPA suggested total removal in their June 1979 comment letter.

Pros

a) Vessels would be able to operate fully loaded due to deeper dredging of sediments (+26 feet). Possibly even larger draft vessels than normally using the harbor could be accommodated.

b) Fully loaded vessels will result in fewer trips and possibly reduced costs.

c) Could stimulate increased traffic and additional investment.

d) The frequency of Operation and Maintenance dredging should be reduced.

e) Initial costs would be greater than a limited dredging alternative but amortized over time they may prove to be comparable.

f) The unit cost of dredging would be initially extremely high, but less frequent dredging would be required.

g) Would be a one-time exposure of PCB's and turbidity. Bottom sediments would then be composed of unpolluted materials, thus lessening long-term exposure to PCB's.

h) Benthic organisms could eventually recolonize and stabilize.

i) PCB contaminated sediments would be isolated from the Lake Michigan environment in an engineered site designed for their containment.

Cons

a) Costs would be high requiring special appropriation and authority change.

b) Corps would need Congressional approval to exceed authorized channels, depths and limits.

c) Potential physical damage to bridge footings, seawalls and adjacent river structures. Would require in-depth study.

d) Dredged material would require disposal in an engineered upland site. The upland disposal site would require or create:

(1) Sociologic problems in identifying and locating a nearby site (A site would need to be within a reasonable distance in order to minimize costs).

(2) Long-term site monitoring.

(3) Possibility for groundwater contamination.

e) Would need dewatering facility for river sediments in order to minimize disposal costs. The dewatering facility may require supernatant (the water portion of dredgings) chemical treatment.

f) Transportation of contaminated sediments to a disposal site would be costly.

g) Use of trucks (the logical transportation) would consume large quantities of fuel and disrupt local traffic.

h) Future use of disposal site would be restricted.

i) Could change river hydraulics by increasing depth and sediment transport by modifying slope of river bed. This modification could in turn change the littoral drift at the Sheboygan harbor mouth.

j) Would be higher exposures to turbidity and PCB's during dredging operations.

k) Mechanical dredging equipment may also be required for portions of the sediment removal program dependent on composition of native river materials. Hydraulic dredging is the preferred dredging option because it is more efficient resulting in reduced sediment transport. Mechanical dredging would result in the loss of more sediments and subsequently additional PCB contamination.

l) Bottom of PCB contamination is as yet unknown. Would require additional sampling and analysis.

m) Additional testing and studies will result in project implementation delays.

n) Not using Confined Disposal Facility would impact the feasibility of the proposed recreational small boat harbor which incorporates a portion of the CDF into its design.

o) Costs of total removal may exceed economic benefits. Thus, may not be economically justifiable.

3. No Action Alternative

Pros

a) Sediments containing greater than 10 ppm PCB would not be disturbed except through possibly natural processes such as extreme floods or wind generated storms.

b) Harbor clean-up and dredging costs would not materialize.

c) Would not need CDF or upland disposal site.

d) Harbor size would not be diminished by construction of CDF.

e) Ships would be able to operate at a limited but undetermined capacity dependent on lake levels.

f) Costs of government services and support would be reduced.

g) Commodities would be diverted to other ports and transportation modes increasing somewhat their economic potential.

h) Would not conflict with recreational uses of river and harbor.

i) Economic and environmental risks associated with dredging would not materialize.

Cons

a) Over time, the harbor would become unusable for deep draft commercial vessels possibly increasing transportation and unit costs of commodities delivered.

b) Sheboygan would eventually lose an economic base and a deep draft harbor would be lost.

c) C. Reiss Coal Company's economic viability would be threatened at Sheboygan.

d) May impact benefit/cost ratio of the proposed recreational small boat harbor due to sunk costs of using a portion of the CDF within its design.

4. Other Alternatives That Have not Been Considered

a) Limit dredging to inner harbor and transload materials to and from this point by conveyor belts, pnematic pipeline, etc. Inner harbor material is not contaminated in concentrations greater than 10 ppm and should be able to be disposed in the CDF.

b) Construct low-head dam upstream from station 44+00 to stabilize sediments and to prevent scour. Totally remove all sediments with PCB's downstream from station 44+00 disposing of them according to acceptable agency conditions.

c) Utilize a treatment process to remove PCB contaminants from sediments. Return sediments to river bed. This alternative would involve state legislative exemption and currently is not within state-of-the-art in engineering availability.

Solutions

We believe the technical analyses which still must be completed should be done through the environmental impact procedures laid out for such projects. This process assures a complete analysis of the risks and benefits of all alternatives and public hearings in the City of Sheboygan before the project is implemented. Two alternatives, limited dredging and total removal of all PCB contaminated sediments, have not been adequately assessed yet.

In order for an alternative to be considered environmentally acceptable, it must meet the four criteria set out in EPA's January 12, 1981 letter. First, an adequate upland disposal site must be engineered to accommodate

dredge spoil having more than 50 ppm of PCB's. Second, confined disposal of dredge material contaminated with levels of PCB's higher than 50 ppm would not be allowed in a site located in the water. Third, the environmentally acceptable PCB concentration that can be exposed upon completion of dredging is 10 ppm or less. Last, the discharge of return carriage water should not exceed 1 ppb of PCB's. In order for any alternatives to succeed, it must meet these tests.

EPA has already said the only condition which apparently could not be met is the 10 ppm of PCB exposed after limited dredging. They also recognized the Corps of Engineers was in the best position to evaluate whether the conditions and criteria can be met. Thus, we believe the Corps should initiate documentation for these criteria, and they should pay careful attention to the exposure of 10 ppm of PCB's after dredging. It must be shown that this level will not compromise protection for health and the environment if that can be done. It appears the Corps' proposal or some modification of it could be implemented.

The preceding documentation could be completed during preparation of a Final EIS by the Corps. Lack of jurisdiction or alternatives perceived to be outside of the Corps' authority should not be summarily disqualified from thorough analysis and disclosure. Thus, the Final EIS should fully explore the benefits and costs of all the available alternatives, including limited dredging and total removal of all PCB contaminated dredge materials. Consideration should be given to potential environmental impacts including: temporary release of PCB's during dredging; structural damage to bridge footings, building foundations and sea walls; changes in river hydraulics and sediment transport; destruction of benthic life; and possible groundwater contamination from siting of a chemical waste landfill.

The Final EIS should more fully explore the various social and economic benefits of the various alternatives. Questions which should be addressed are: an analysis of essential Lake Michigan ports; alternative transportation modes; the social problems of siting a chemical waste landfill; future commodities movements through Sheboygan; the costs of various alternatives; amortization of costs; cost recovery options; the loss of coal transshipment capabilities at Sheboygan; and other engineering solutions to coal loading and unloading outside the harbor.

Depending on the outcome of the Final EIS, several permits and approvals must be obtained. EPA must approve any disposal alternative under 40 CFR 761. If this requirement cannot be met, then the Final EIS can be used as documentation for obtaining the necessary authority for the Corps to totally remove the PCB contaminated sediments, have money added to Section 115 for this purpose or get a special appropriation. On the other hand, the Final EIS may show the most cost-effective and environmentally preferable alternative is to dredge to a limited depth or not dredge the harbor at all.

If the requirements of 40 CFR 761 are met and EPA grants its approval, then our Department must review the plans and specifications to determine if a solid waste license and wastewater treatment approval are necessary. A discharge of water from the dredge disposal site would require that a Wisconsin Pollution Discharge Elimination System (WPDES)

We agree with you that a careful evaluation of all risks and benefits of each available option should precede project implementation. We believe the approach we have outlined is workable if all the parties can keep open minds and their patience while the documentation is being gathered. Consequently, I request that you contact the Corps of Engineers and EPA to initiate completion of the environmental impact process.

Sincerely,

C. D. Besadny
Secretary

cc: Honorable Robert Kasten
Honorable William Proxmire
Honorable David Opitz
Honorable Calvin Potter
Honorable Kevin Suscha, Mayor of Sheboygan
Honorable Carl Otte
Colonel Robert Vermillion, COE
Valdus Adamkus - Regional Adm., EPA
F. Nauschultz - President, C. Reiss Coal Co.
Sheboygan Chamber of Commerce

DEPARTMENT OF THE ARMY

DETROIT DISTRICT CORPS OF ENGINEERS
P.O. BOX 1027
DETROIT, MICHIGAN 48231

4 JAN 1982

4 JAN

NCEED-T

Mr. Valdas V. Adamkus, Regional Administrator
United States Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, IL 60604

Dear Mr. Adamkus:

We have reviewed Secretary Busaday's suggestion, as detailed in the attached WDNR letter dated 4 November 1981, regarding the preparation of a final EIS on all available options to the contaminated sediment problem at Sheboygan Harbor. The following are my comments on the present situation, and my proposed course of action.

Because of the Polychlorinated Biphenol (PCB) situation, the Environmental Protection Agency (EPA) has set forth special conditions for dredging and disposal of contaminated sediments. The EPA conditions are:

a. That dredged material contaminated by more than 50 PPM be disposed upland at a site designed with a three foot thick clay liner (with a permeability rate of 1×10^{-7} cm/sec).

b. That the dredge material contaminated with more than 50 PPM not be disposed of at a site located in a water environment.

c. That no more than 10 PPM of PCB in the sediment be left exposed at completion of dredging.

d. That the overflow of discharge water from a disposal site cannot contain PCB concentrations exceeding one part per billion.

The alternative plans which presently are being considered include:

a. The no action plan,

b. Total clean-up,

c. Limited dredging.

14 JAN 82

NCEED-T
Mr. Valdas V. Adamkus, Regional Administrator

No Action Plan - To complete the evaluation of this plan, a detailed economic analysis of the results of no action would be required.

Total Clean-up Plan - Sediment tests from areas below project depth would be needed and, if necessary, a special Congressional authorization to permit dredging below project depth obtained. In addition, a detailed economic analysis and study of social impacts would be required. Data collection would involve gathering information on disposal sites. For example: ground water analysis, surveys of existing conditions (vegetation, wildlife, land use, drainage patterns) and the completion of hydraulic study.

Limited Dredging Plan - Implementation of this plan would require collection of additional field data (such as bioassay and/or bioaccumulation information to determine effects on aquatic life) and the assimilation of data on disposal sites, effects on ground water, surveys of existing conditions (vegetation, wildlife, land use, and drainage patterns).

Please note that the effect of the no action alternative could have economic consequences for Sheboygan Harbor, should water levels recede.

It is our position that the total removal of PCB is not practicable. Instead, a compromise solution, i.e. limited dredging, would provide the desired benefits, and is therefore our proposed course of action. However, in order to implement this option, an agreement with EPA regarding those prerequisite conditions mentioned above must be obtained, because it is doubtful that limited dredging could be performed without exposing sediments containing greater than 10 PPM of PCB. Hence, preparation of an EIS founded upon the EPA requirements as they now exist, or are interpreted, would be futile.

We are attempting to resolve this dilemma by re-establishing active dialogue between interested parties, but a consensus is required. A review of the EPA criteria by the involved parties and agencies, to permit limited dredging, would be valuable to develop the needed consensus. Also, we would like to explore several possible scopes of additional studies and environmental assessments. I propose that such a meeting be held in Madison, Wisconsin, on 26 January 1982 wherein a workable solution, including a plan for future testing, can be discussed. The final meeting arrangements will be coordinated by my project manager, Mr. Bruno Zoltowski, (313) 226-2212.

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Mr. Valdas V. Adamkus, Regional Administrator

I am inclosing copies of my letters to Governor Dreyfus, Secretary Besadny and Mayor Suscha.

Sincerely,

ROBERT V. VERMILLION
Colonel, Corps of Engineers
District Engineer

4 Incl
As stated

Copy Furnished:
Lee Sherman Dreyfus, Governor, State of Wisconsin

Richard W. Suscha, Mayor, City of Sheboygan, Wisconsin

Carroll D. Besadny, Secretary, Department of Natural Resources, State of Wisconsin

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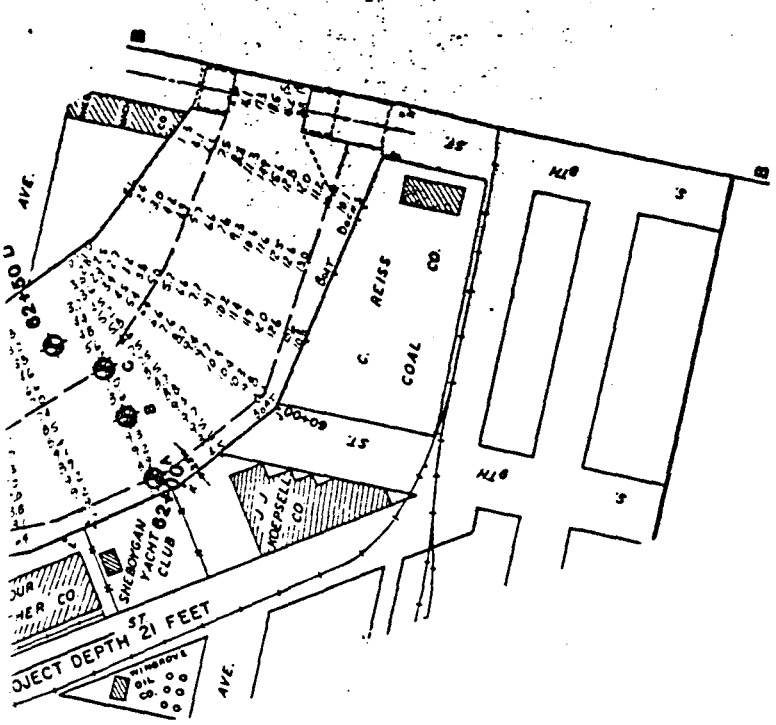

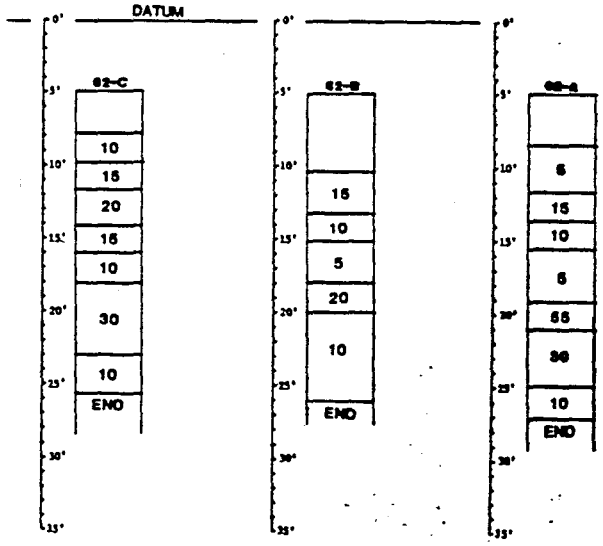

U. S. ARMY ENGINEER DISTRICT, DETROIT
CORPS OF ENGINEERS
DETROIT, MICHIGAN

SHEBOYGAN HARBOR, WISCONSIN

PCB PROFILE

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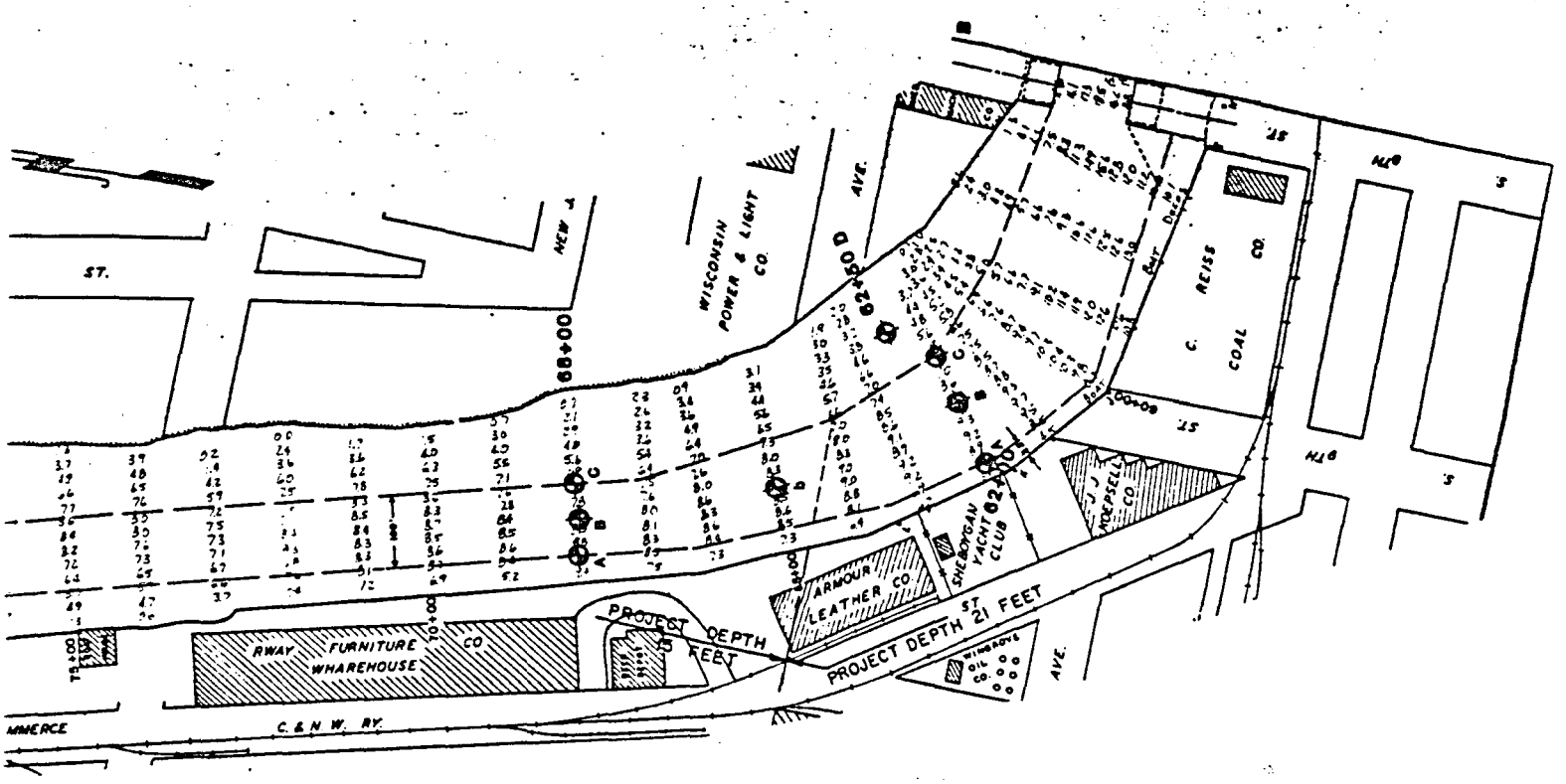

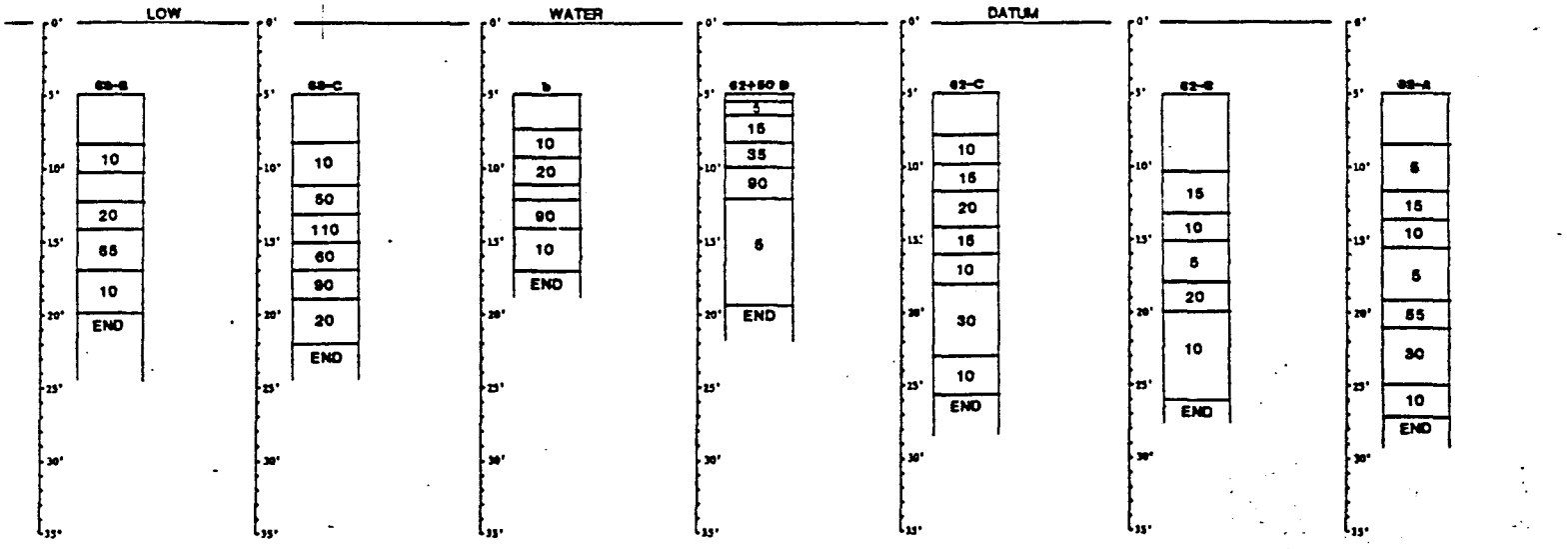

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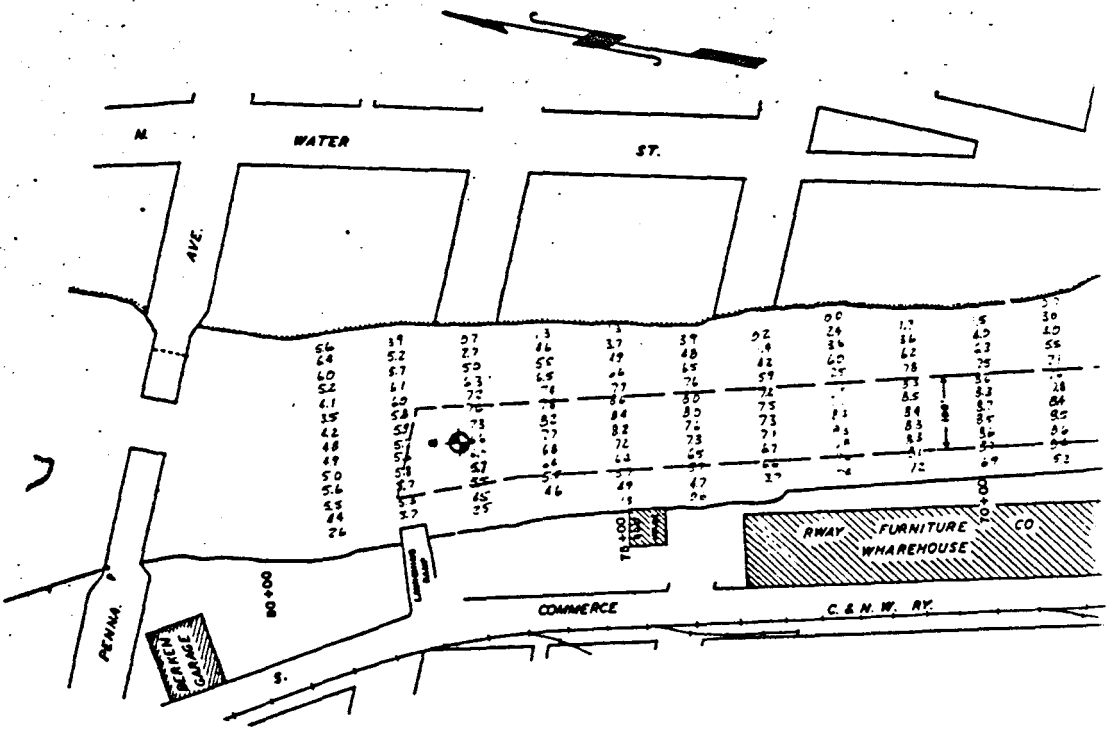
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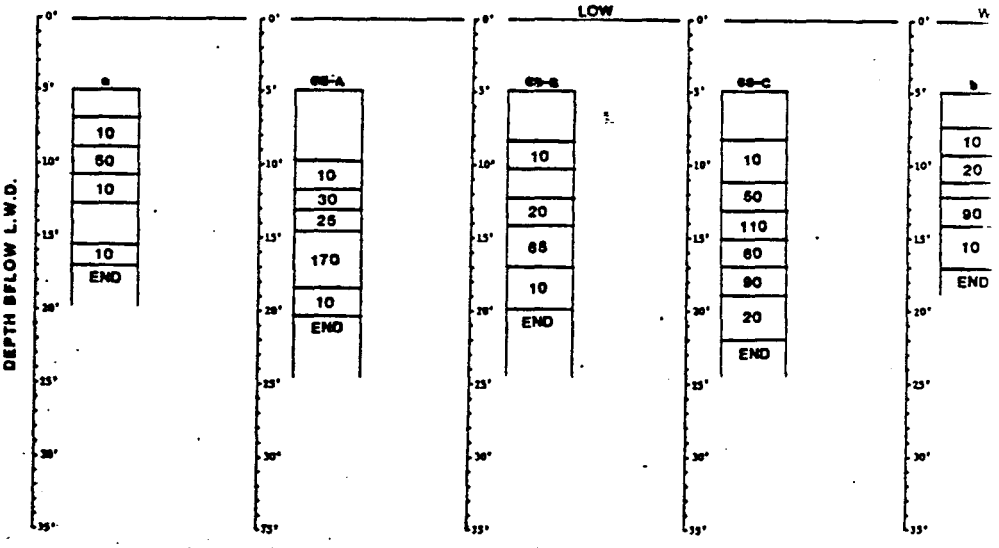
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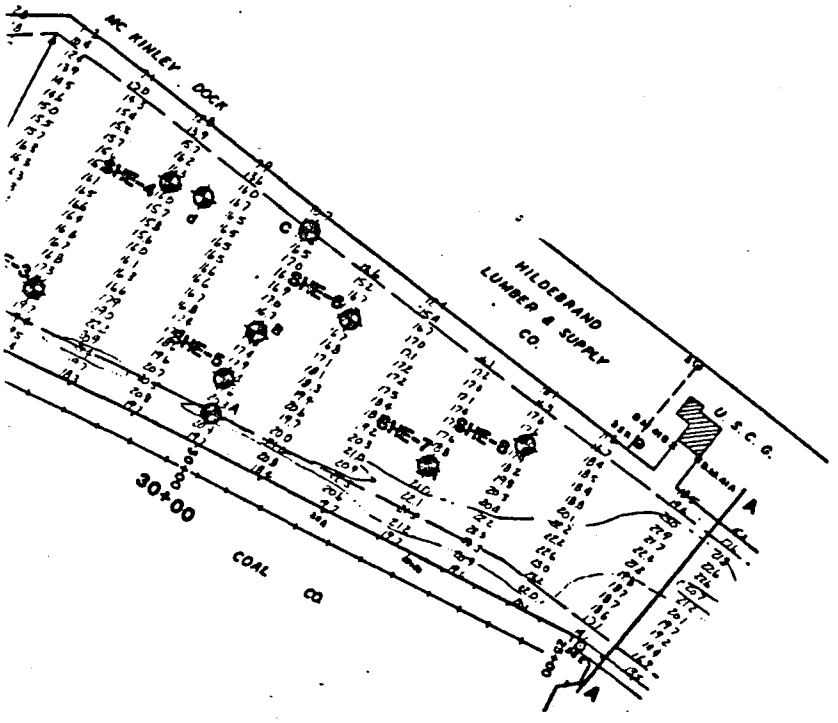

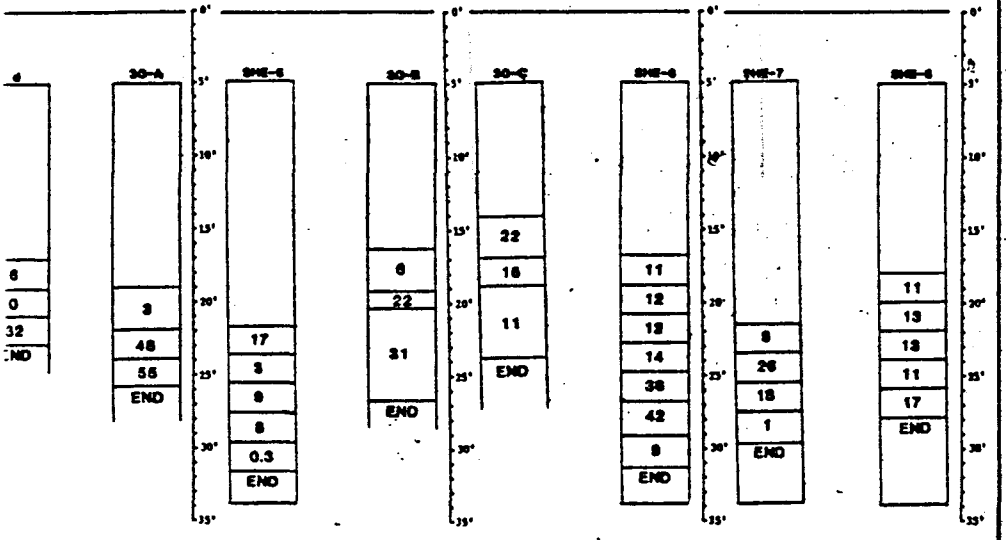

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DETROIT, MICHIGAN

SHEBOYGAN HARBOR,
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PCB PROFILE

MARCH 1984

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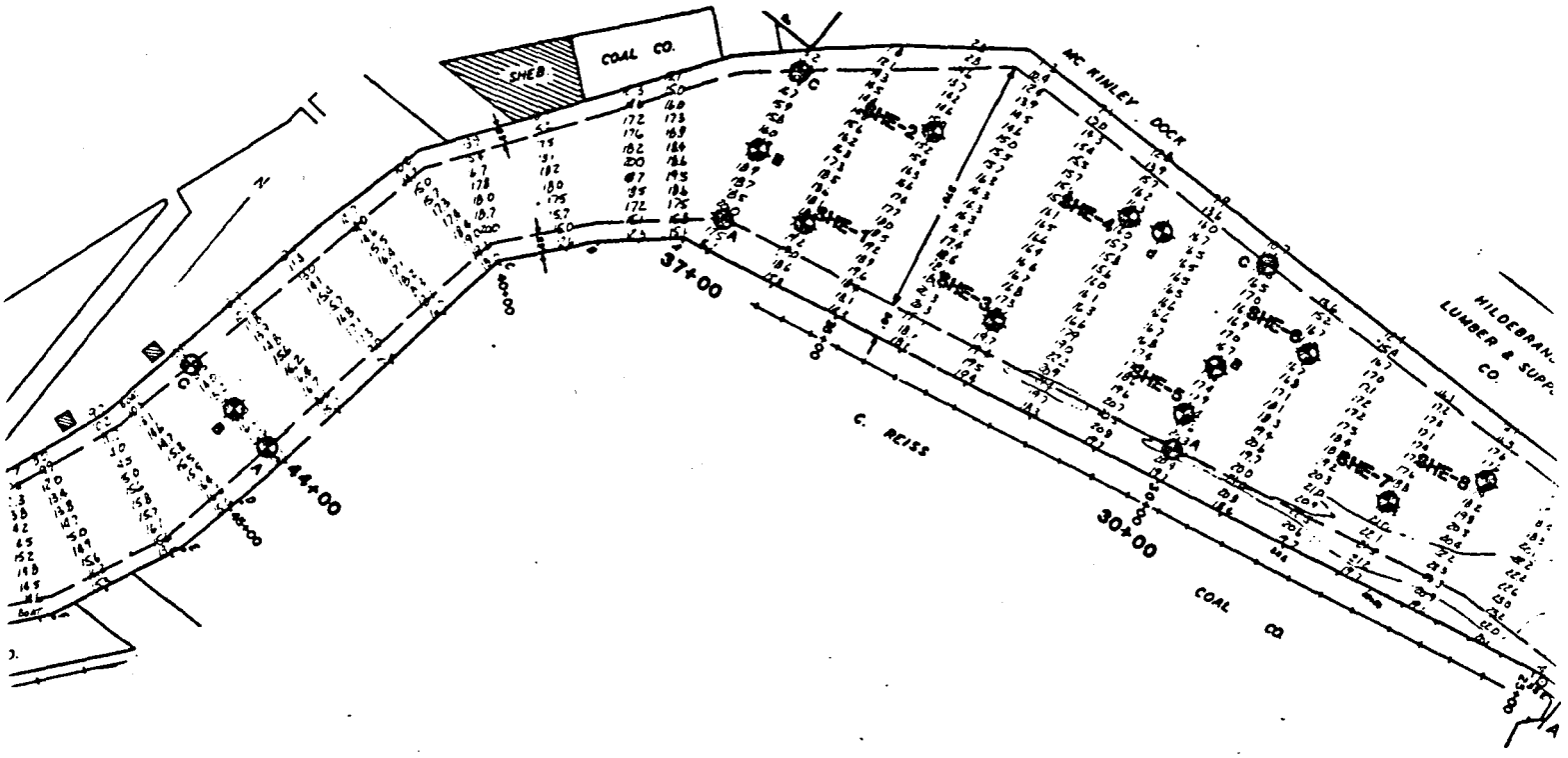

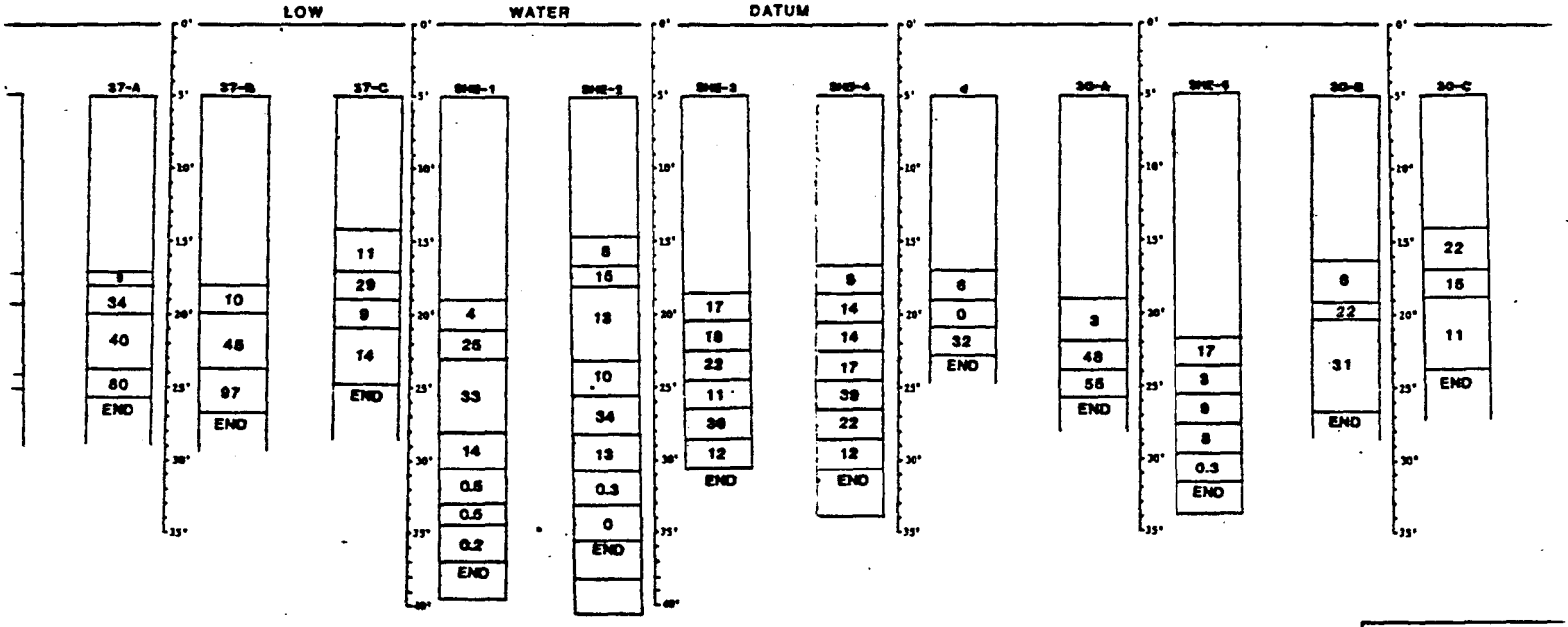

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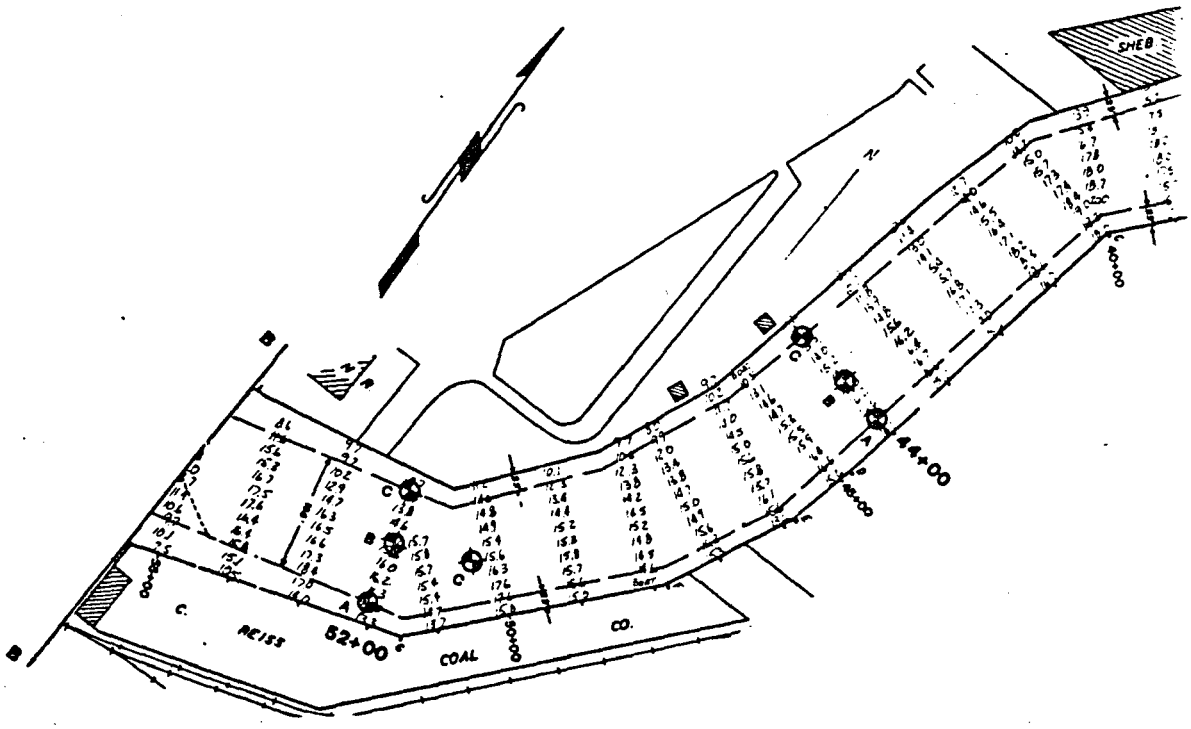
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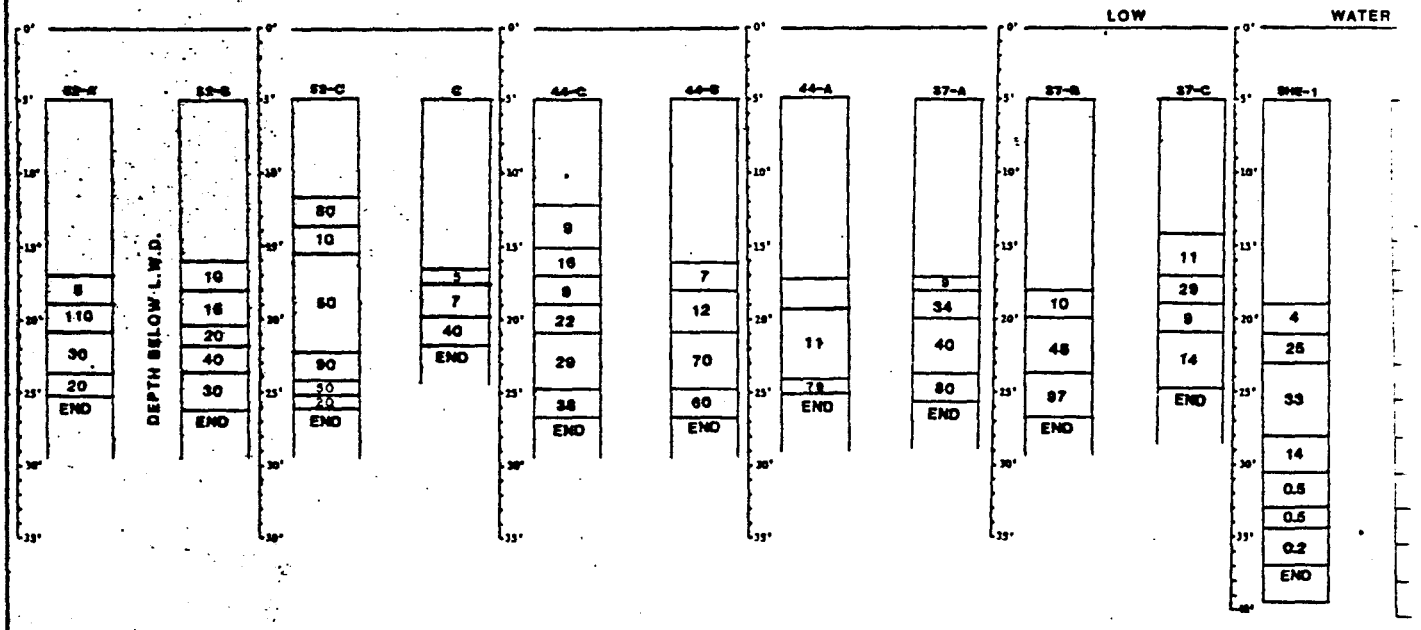
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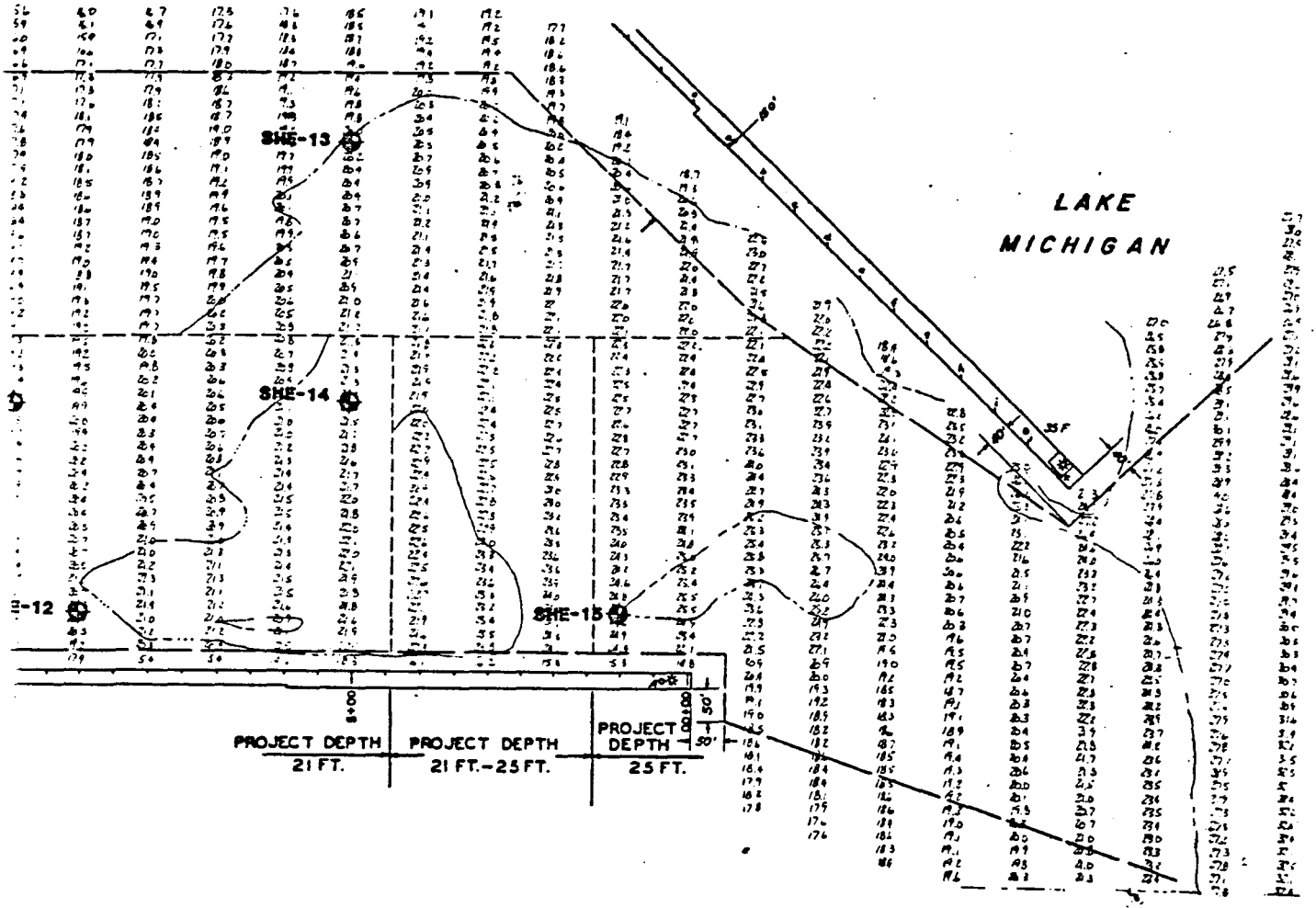

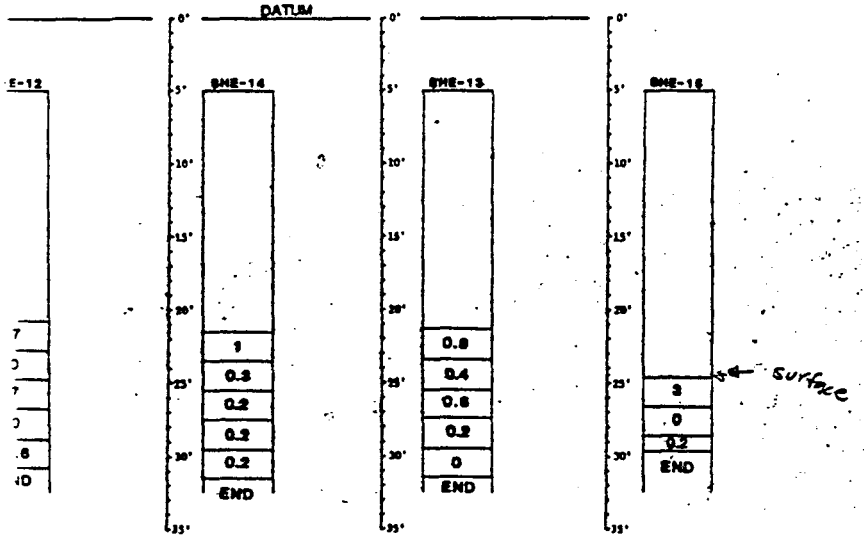

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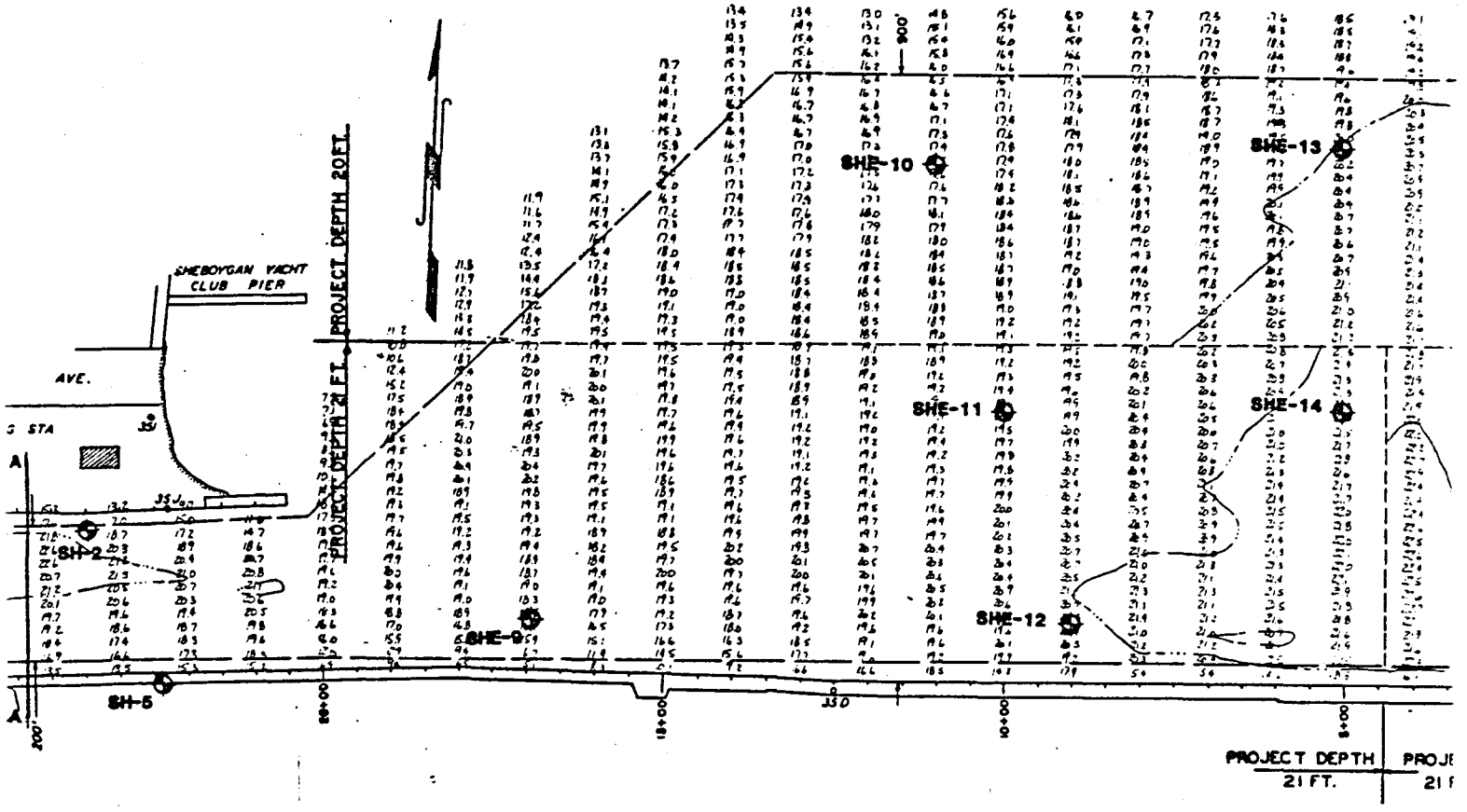
U.S. ARMY ENGINEER DISTRICT, DETROIT
CORPS OF ENGINEERS
DETROIT, MICHIGAN

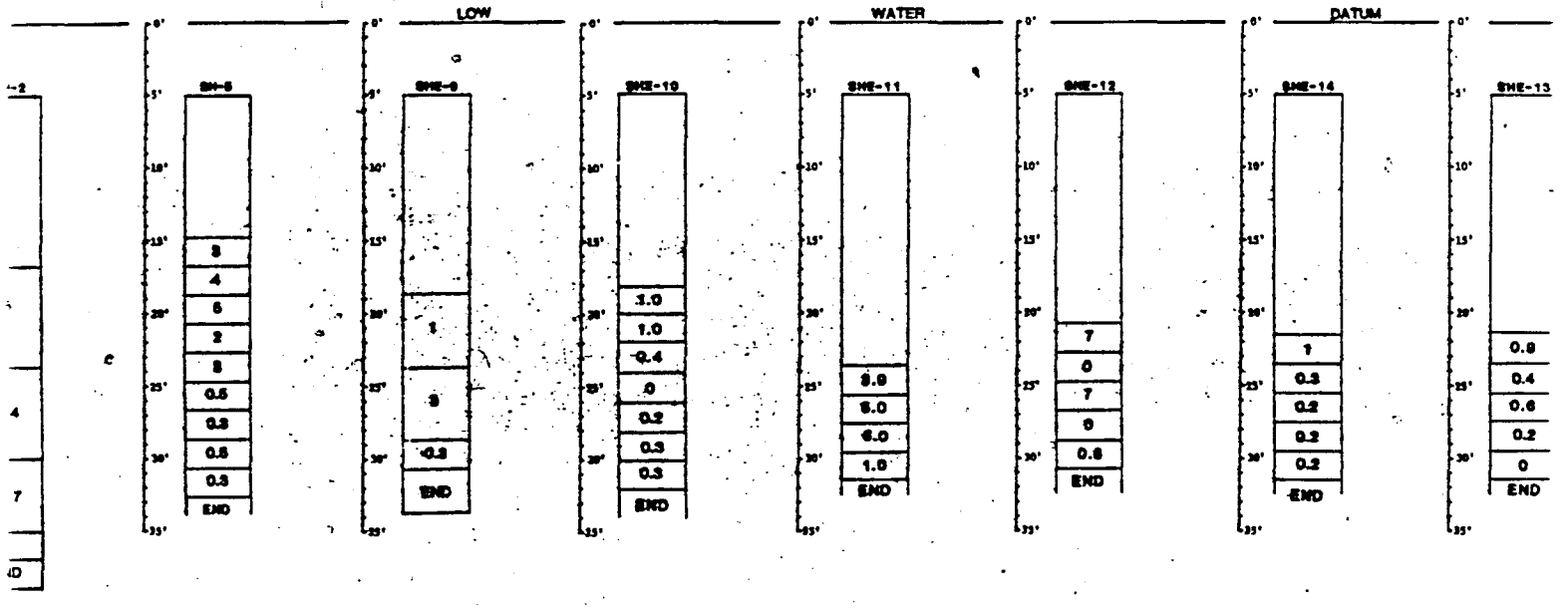
SHEBOYGAN HARBOR, WISCONSIN

PCB PROFILE

20 MARCH 1984

SCALE OF FEET

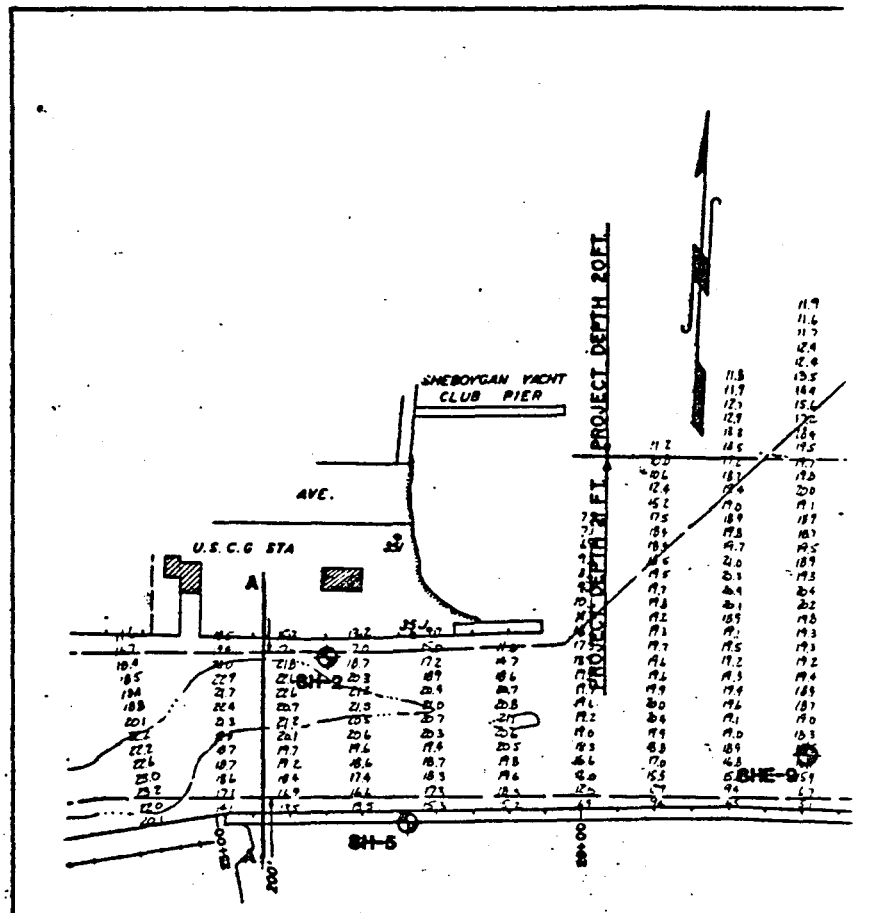


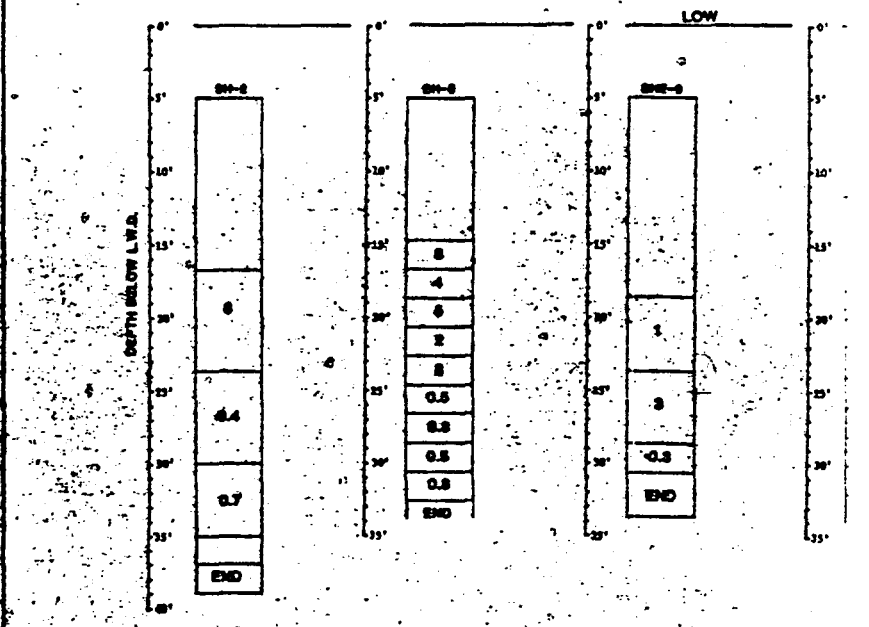


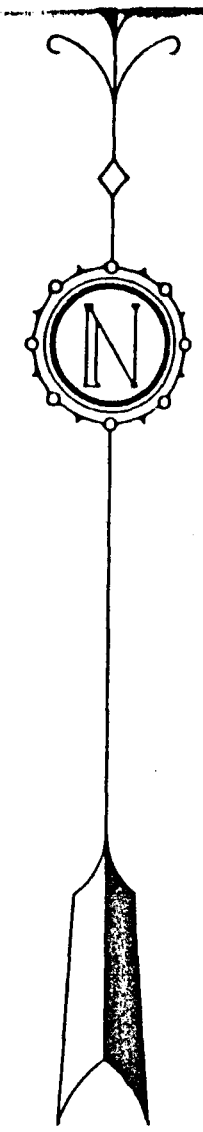
NOTE:

1. BORING INF
   SHE
   SH
   OTHE

2. BORING LOC


SHEBOYGAN YACHT CLUB PIER
AVE.
U.S.C.G STA
PROJECT DEPTH 21 FT.
PROJECT DEPTH 20FT.
SH-2
SH-5
SHE-9


LOW
DEPTH BELOW L.W.D.
SH-2
SH-5
SHE-9
END



500N

Darrell Stoege
Sheboygan Water Utility
Operations Supervisor
414 459-3800

APPROX. WATER DEPTH 45ft.

HIGH-LIFT PUMP STATION.
MAX. PUMP CAPACITY.

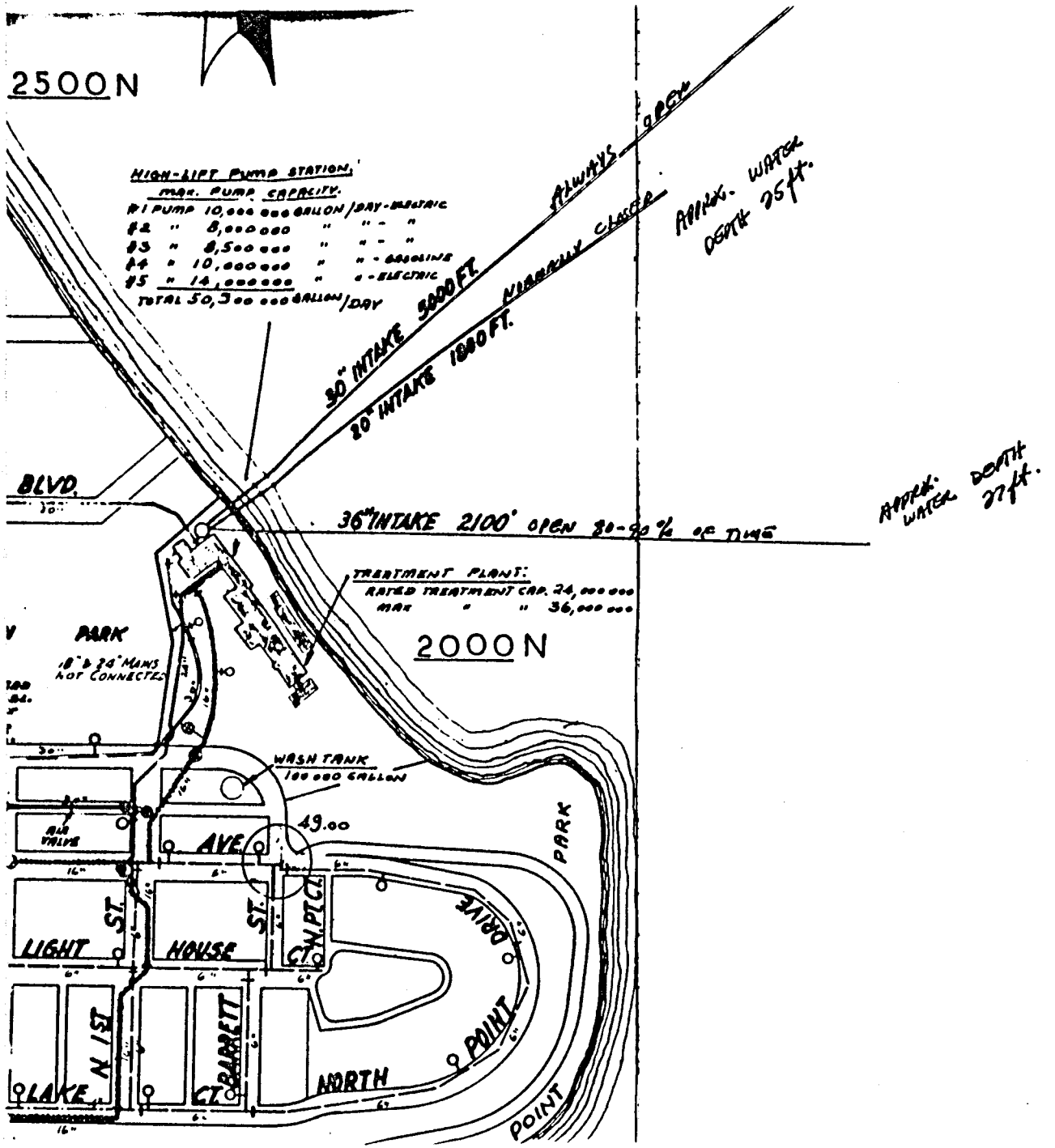
#1 PUMP	10,000 000	GALLON/DAY	- ELECTRIC
#2 "	8,000 000	"	" - "
#3 "	8,500 000	"	" - "
#4 "	10,000 000	"	" - GASOLINE
#5 "	14,000 000	"	" - ELECTRIC
TOTAL	50,500 000	GALLON/DAY	

400 FT.

ALWAYS OPEN

NORMALLY CLOSED

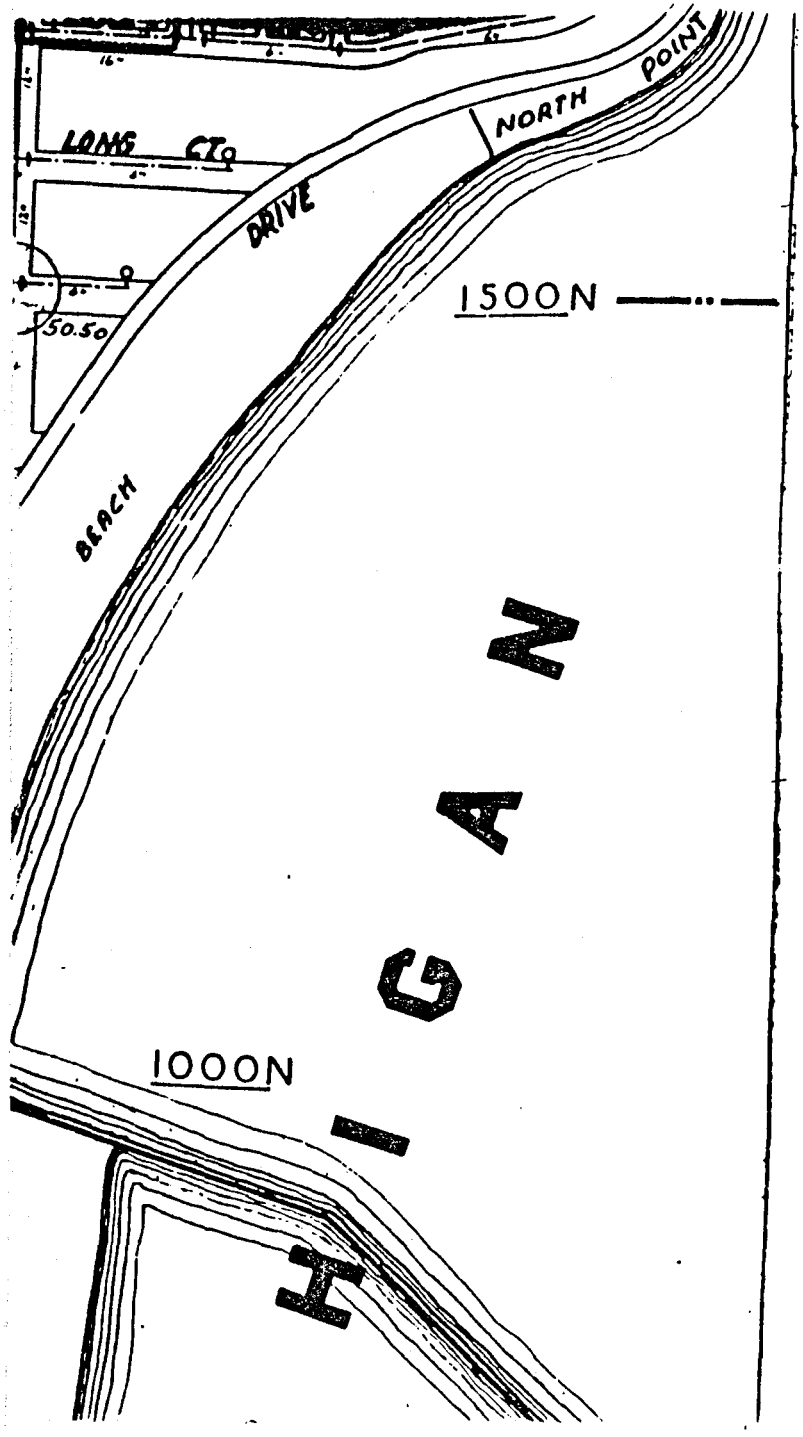
APPROX. WATER DEPTH 25ft.

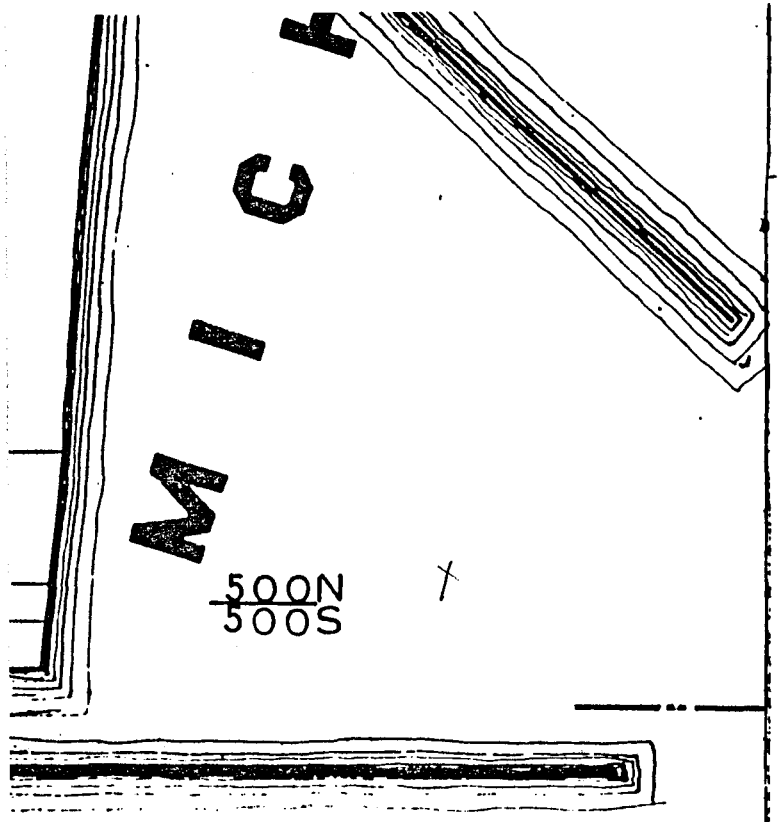


POPULATION SERVED

SHEBOYGAN	48,000	} approx.
SHEBOYGAN FALLS	8,000	
KOHLER	2,000	
TOTAL	58,000	

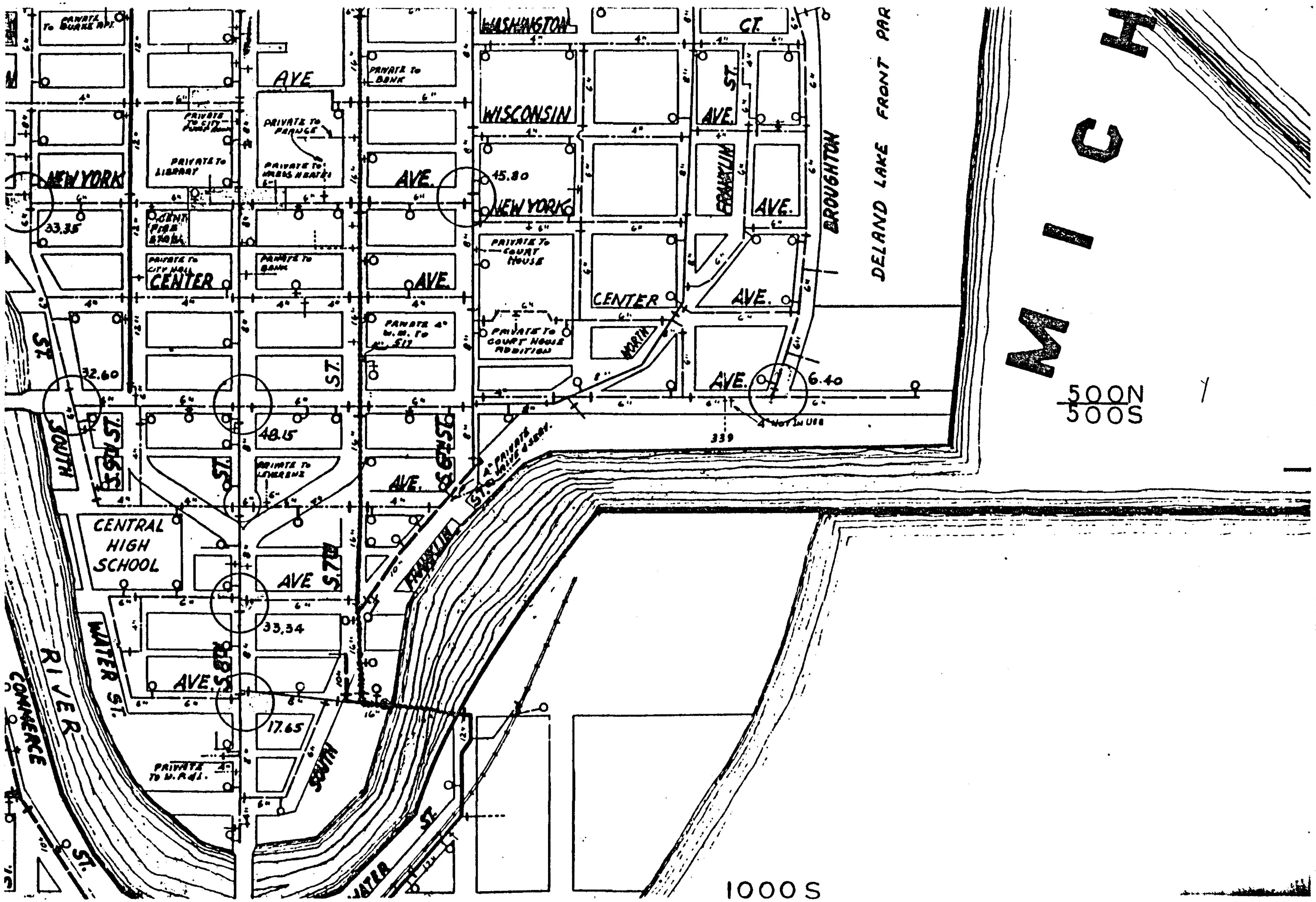
A STIFF SOUTH EAST WIND DOES PUSH RIVER FLUME TO OUR 36" INTAKE ON OCCASION.


LONG CT.
DRIVE
NORTH POINT
1500N
50.50
BEACH
1000N
HIGAN

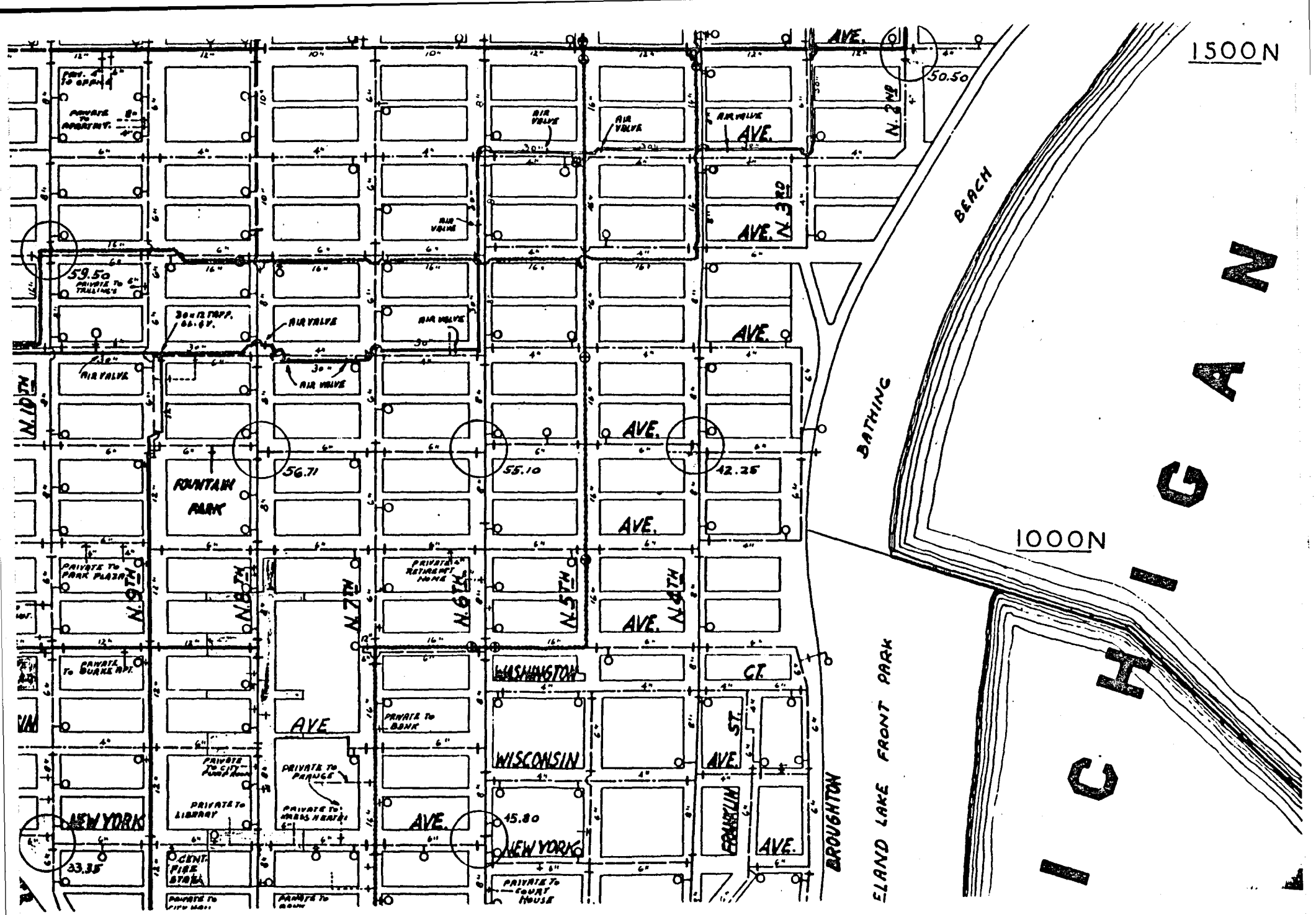


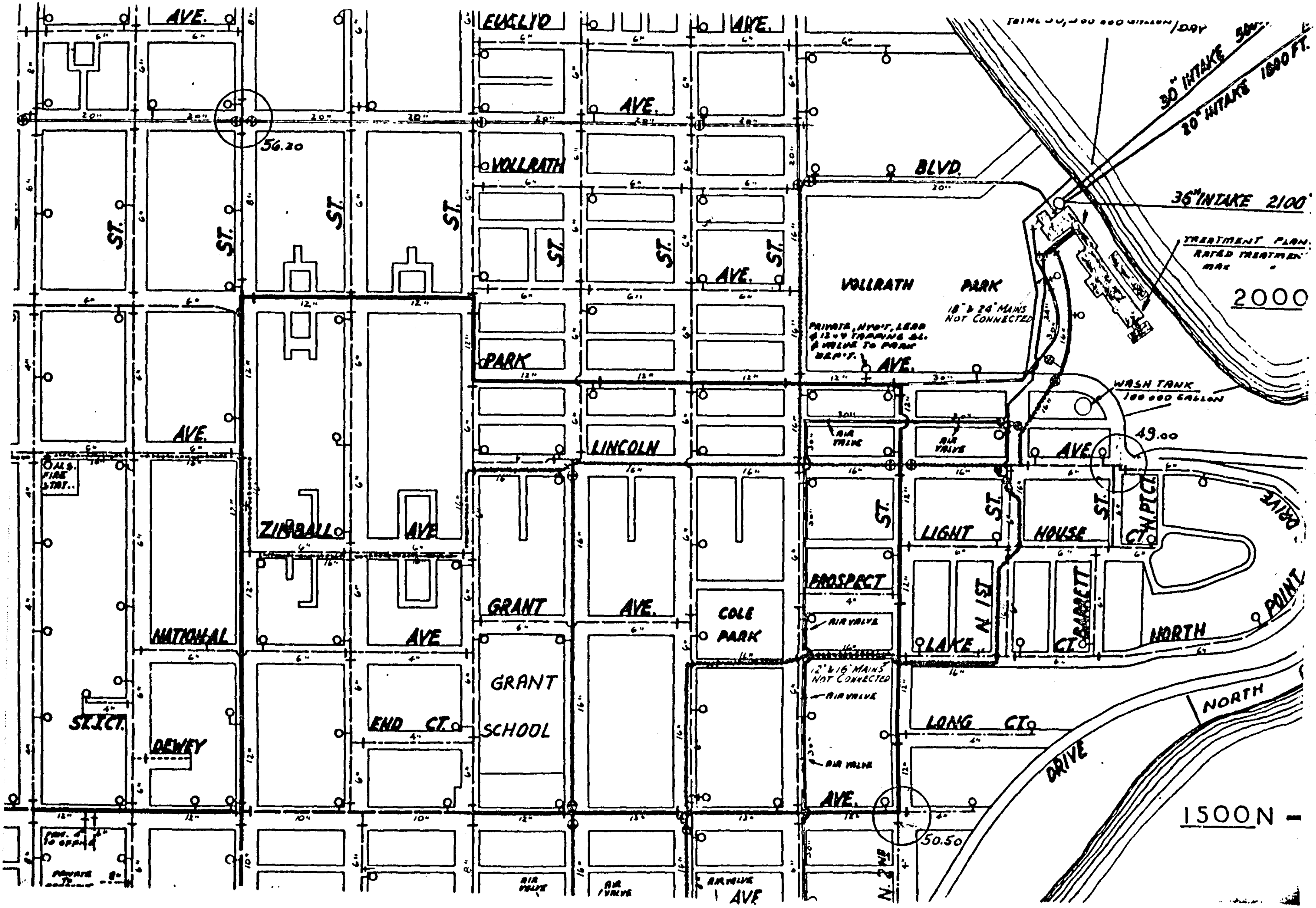
1 mile

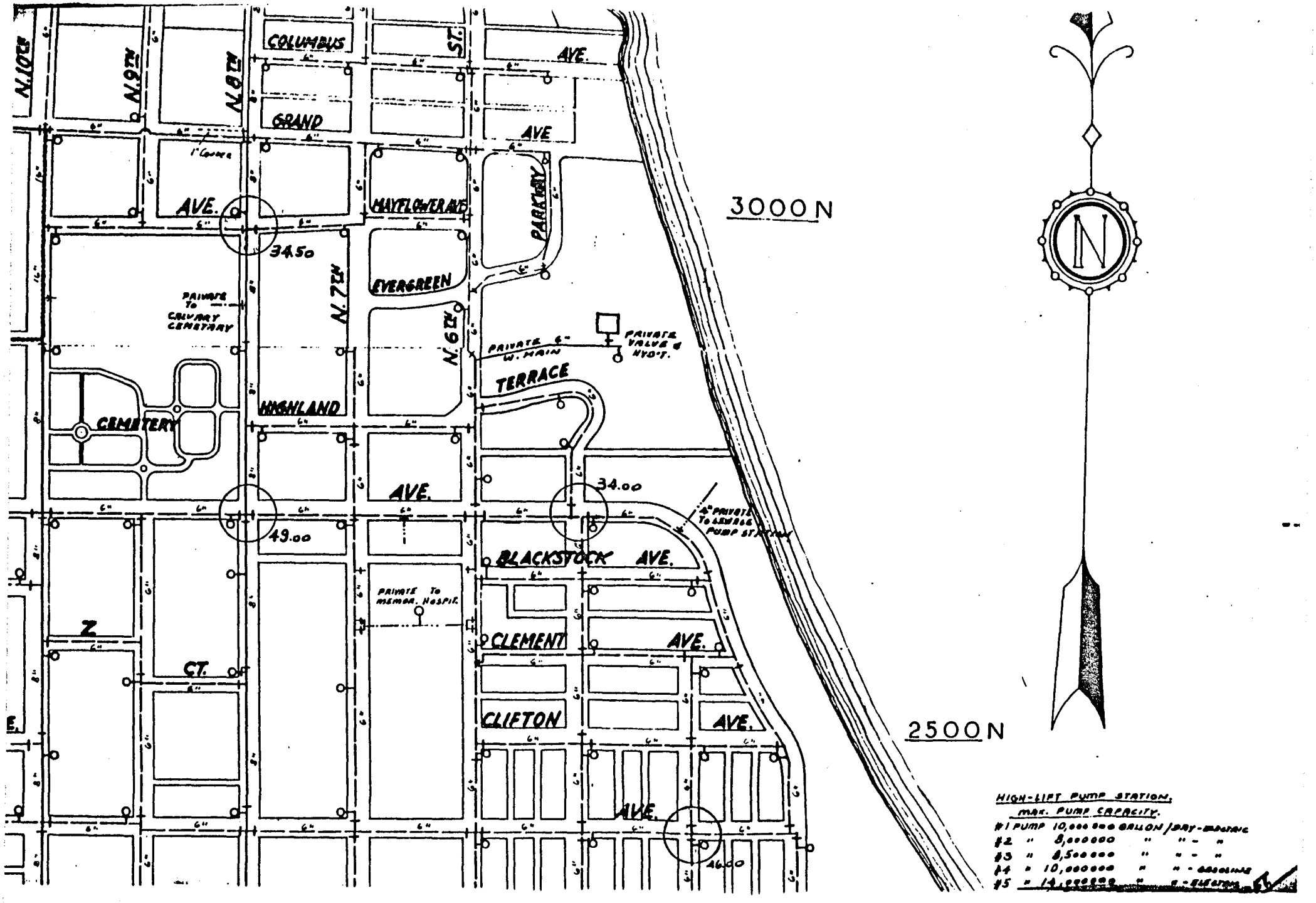
SCALE:
1" = 300'



WASHINGTON
CT.
WISCONSIN
AVE.
NEW YORK
AVE.
FRANKLIN
ST.
BROUGHTON
DELAND LAKE FRONT PAR
M I C H
CENTER
AVE.
NORTH
45.80
33.35
32.60
48.15
33.54
17.65
6.40
339
SOUTH
ST.
CENTRAL
HIGH
SCHOOL
WATER ST.
RIVER
COMMERCE
ST.
500N
500S
1000S


1500N
1000N
BEACH
BATHING
I C H I G A N
ELAND LAKE FRONT PARK
BROUGHTON
FOUNTAIN PARK
AVE.
N. 2ND AVE.
N. 3RD AVE.
N. 10TH
N. 6TH
N. 5TH
N. 4TH
WISCONSIN
WASHINGTON
FRANKLIN
NEW YORK
CT.
ST.
50.50
59.50
56.71
55.10
42.25
45.80
33.35
AIR VALVE
PRIVATE TO PARK PLACE
PRIVATE TO BANK
PRIVATE TO LIBRARY
PRIVATE TO PARAGE
CENT. FIRE STATION
PRIVATE TO COURT HOUSE


AVE.
EUCLID
AVE.
30" INTAKE
20" INTAKE 1800 FT.
AVE.
56.20
VOLLRATH
BLVD.
36" INTAKE 2100'
ST.
ST.
ST.
ST.
ST.
ST.
AVE.
ST.
TREATMENT PLANT
VOLLRATH
PARK
2000
18" & 24" MAINS NOT CONNECTED
PARK
AVE.
WASH TANK
100 000 GALLON
AVE.
LINCOLN
AVE.
49.00
AIR VALVE
AIR VALVE
ZIMBALL
AVE
ST.
LIGHT
ST.
HOUSE
ST.
N. PT. CT.
DRIVE
PROSPECT
GRANT
AVE.
COLE
PARK
N 1ST
BARRETT
NATIONAL
AVE
AIR VALVE
LAKE
CT.
NORTH
POINT
GRANT
12" & 16" MAINS NOT CONNECTED
AIR VALVE
NORTH
SCHOOL
END CT.
LONG CT.
DEWEY
DRIVE
AIR VALVE
AVE.
1500N
50.50
N. 2ND
AIR VALVE
AIR VALVE
AIR VALVE
AVE


N.10TH
N.9TH
N.8TH
COLUMBUS
ST.
AVE.
GRAND
AVE
1" Connec.
AVE.
MAYFLOWER RD.
PARKWAY
34.50
N.7TH
EVERGREEN
PRIVATE TO CALVARY CEMETARY
N.6TH
PRIVATE 6" W. MAIN
PRIVATE VALVE & HYD'T.
TERRACE
HIGHLAND
CEMETERY
AVE.
34.00
49.00
4" PRIVATE TO LEWIS & PUMP STATION
BLACKSTOCK AVE.
PRIVATE TO MEMOR. HOSPIT.
Z
CT.
CLEMENT AVE.
CLIFTON AVE.
AVE.
46.00
3000 N
2500 N
N
HIGH-LIFT PUMP STATION.
MAX. PUMP CAPACITY.
#1 PUMP 10,000,000 GALLON/DAY - ELECTRIC
#2 " 8,000,000 " " - "
#3 " 8,500,000 " " - "
#4 " 10,000,000 " " - GASOLINE
#5 " 14,000,000 " " - ELECTRIC