EPA Region 5 Records Ctr.
202468

1995
STATE RESPONSE

DOCUMENTS 47-51

KALAMAZOO RIVER

SITE

INVESTIGATION

DOCUMENTS#47 - 51

HISTORY AND CLOSURE OF ON-SITE LANDFILL

DOCUMENT #47

LANDFILL MEMOS AND HISTORY

DOCUMENT #47A

August 16, 1972

Mr. Jeffery Lubbers
Allegan County Health Department
Allegan, MI 49010

Dear Mr. Lubbers:

This is in reference to your visit of August 14, 1972, to investigate the complaint of the liquor sludge deposit on our property at the intersection of Hill Road and the Penn Central railroad tracks.

As we explained to you, this was caused by liquor sludge leaking from our land disposal area when a section of the retaining dykes washed out during heavy rain falls.

To correct the present problem, we are having the low area, where liquor sludge has accumulated, filled in. We are also building up the area Northwest of here and repairing the retaining dykes to prevent a further a occurance of a washout. This work should be completed by the end of September.

The company is glad to cooperate in solving this problem. If we can be of further help, please let us know.

Very truly yours,

MENASHA CORPORATION

K. E. Lowe
Technical Manager

cc: Mr. William F. Ames
Mr. W. A. Schenck

jk

4529

STATE OF MICHIGAN
DEPARTMENT OF PUBLIC HEALTH
3500 N LOGAN, LANSING, MICHIGAN 48914

WILLIAM G. MILLIKEN, Governor
PRICE S. REIZEN, M D, Director

MEN02161

October 13, 1972

Mr. Joseph Cutro, General Manager
Menasha Corporation
P. O. Box 155
Otsego, Michigan 49073

Subject: Menasha Corporation Disposal Site

Dear Mr. Cutro:

On October 5, 1972, Mr. Jeffrey Lubbers, Allegan County Health Department, Mr. John Shauver, Michigan Department of Natural Resources, and I made a survey at Menasha Corporation Solid Waste Disposal Site. Completing our survey we noted the following conditions:

1. Refuse including paper, wood, various metals and what looked like an abrasive compound was being deposited into surface waters at the area of operation.
2. Refuse was not being properly spread, compacted and covered creating an open face of exposed refuse.
3. Leachate was moving from the filled area into the surface water at the area of operation.

As you may not be aware the geological suitability of a refuse disposal facility is undoubtedly the most important aspect of sanitary landfilling. We can no longer permit the disposal of refuse where it can enter the surface water or ground water, perhaps our most precious natural resource. Accordingly we are informing Menasha Corporation that they must cease disposing of refuse at the present site and find a more suitable area to do so. Partial utilization of the present disposal area is not out of the question but we are certain that restrictions will have to be strictly followed. A geological evaluation of the area should be made to determine whether or not the surface water and ground water can be protected and what portion of the area can be utilized.

We would be more than happy to meet with you at the site to discuss a reasonable approach to solving your disposal problems. If you have any questions please feel free to call this office.

Very truly yours,

Fred B. Kellow, Chief
Division of Solid Waste Management
Bureau of Environmental Health

Leonard D. Zulewski

By: Leonard D. Zulewski
Environmental Sanitarian

LDZ/yb

MICHIGAN THE GREAT LAKE STATE

"Equal Health Opportunity for All"

cc: Jeffery Lubbers, Allegan County Health Department

4530

MEN02162

Ken

October 23, 1972

Department of Public Health
State of Michigan
3500 N. Logan
Lansing, Michigan 48914

Attention: Mr. Leonard D. Zulewski, Evironmental Sanitarian

Dear Mr. Zulewski:

Your letter of October 13 just came to my attention since I returned from vacation today.

Your last paragraph indicates a willingness to meet us at the disposal site to help us solve our disposal problems. We would be most appreciative.

We certainly want to abide by the ground rules set up to prevent any refuse entering the surface or ground water and you have our assurance that we will do so.

We will wait to hear from you further when the meeting will be convenient to you and your associates.

Very truly yours,

Joe

MENASHA CORPORATION

Joseph Cutro
General Manager

12/6/72
Called J. Lubbers. He has not heard from State & doesn't know reason for no answer.

bh

CC: Ken Lowe
Al Schenck
Mr. Jeffery Lubbers
Allegan County Health Dept.
Allegan, Michigan 49010

I guess we should write and ask status

4531

SOILS INVESTIGATION

MENASHA CORPORATION
PROJECT

16 Aug 77

Shilts, Graves & Associates, Inc.
P.O. Box 521
Notre Dame, Ind. 46556

0877-500

16 August 1977

WALTER L. SHILTS, PE, Pres.
CARL P. LITTRELL, PE, Vice-Pres.
LEROY D. GRAVES, PE, Secy.-Treas.

Soil and Foundation Consultants
Materials Testing Services

Laboratory located at
1119 South Bend Ave.
Phone 233-6820

1-219

Menasha Corporation
P.O. Box 155
Otsego, Michigan 49078

Attention: Mr. Bruce Buchanan

Gentlemen:

As authorized by your Purchase Order No. 06121, we have made a hydrogeological survey of the south 30 acres of the east one-half of the NE¼ of Section 14, Township 1 North, Range 12 west, near Otsego, Michigan. Our survey has consisted of studying the geology of the area, reading the general soil map of the county and the U.S. Geological Survey topographic maps of the area, and making five soil borings 25 to 40 feet deep.

Geology tells us that the site lies in the Valparaiso morainic system. The Valparaiso morainic system is of the Wisconsin or recent glacial age and the recent drift is about 60 feet thick and lies on top of earlier glacial drift. The Wisconsin drift is granular in character, whereas the earlier drift is finer grained soil. The surface of the Wisconsin drift may have weathered to silts and clays. The total depth of soil over bedrock is over 200 feet, so bedrock is not a factor affecting the proposed land use.

The general agricultural soil map of Allegan County shows that the natural surface soils at the site are of the Kalamazoo, Oshtemo, Brady association, which are described as deep, well drained and somewhat poorly drained, nearly level to gently sloping, coarse textured soils on outwash plains. The only variation between the three soils is in topsoil thickness, grain size of the sand and the silt or clay content of the upper layers of the soil. The lower layers of the soil tend to be clean sands or gravels stratified with silt or clay layers. Water tables are low.

The U. S. Geological Survey topographic map shows that the site generally slopes from east to west with elevation 820 on the east, a low elevation in the swale on the west of 790. The map shows a swampy

MEN02165

Menasha Corporation

area on the south line of the site and extending several hundred feet into the property to the south. The site is more than 100 feet above the Kalamazoo River and about 1½ miles north of the river. The swale at the west edge of the site drains to a natural intermittent drainage path one-quarter mile to the west at elevation 740. This natural drain slopes southwesterly to the Kalamazoo River about one mile away and about 60 feet lower. A small depression occurs at the southwest corner of the site and at the center of the north side. These depressions and the swampy area have no surface drainage outlets. No houses exist on the site or in the surface drainage path from the site.

The logs of the five soil borings together with graphic logs and a location sketch are attached hereto. Samples of all soils encountered are stored in our laboratory where they may be examined by interested persons. The soil borings show that the soil at the site consists of three to four feet of sandy silt soil which has some organic content in its upper foot underlaid by stratified silt, clay and sand to depths of 12 to 22 feet and then sand to the bottom of the borings. The sands and silts are loose to medium in density.. The clays are stiff to very stiff. The water table is more than 25 to 40 feet below the surface. Job elevation 100 is approximately 820 feet above mean sea level, so the water table is lower than elevation 747.

Hand auger borings in the depressions showed that the north depression had about 5.5 feet of partially rotted vegetation and silt overlying the natural silty clay soil. The water was about two feet below the surface at job elevation 76.8. Thus, showing water pocketed in the depression, since no water table was found in Boring 5. A hand auger boring in the southwest depression showed no rotted vegetation and no water to a depth of 2.5 feet. The soil was clayey silt with considerable organic matter. The swampy spot on the south line had water standing in it, so no borings could be made, but the depth of organic soil is not likely to be more than a few feet. The water is pocketed by the impervious soil below and the levee constructed at the south property line since no water table was found in the borings.

We understand that the site is to be used for disposal and overland treatment of treated liquid waste from your Otsego paper manufacturing operations. The site should be excellent for this purpose. There is at least five to 12 feet of impervious silty clay or silt between the surface and the groundwater table and the water table is far below the surface. The wet soil lenses found in the borings are surface waters percolating vertically and horizontally in the sand layers and are not a water table. The water table is probably only a few feet above the river elevation of 699 above the dam and 682 below the dam. Thus, due to the impervious surface soils and the great distance to the

MEN02166

Menasha Corporation

water table, groundwater pollution is very unlikely. Surface water draining from the site will follow an established drainage path that encounters no houses. Surface water will pocket in the depressions unless drainage is provided. Most of the depression at the north edge of the site will be on another person's property. It might be good public relations to purchase all of this depression in addition to the 30 acres unless drainage is provided to prevent pocketing in that depression.

We will be glad to discuss the effect of the soil properties on your land use at any time.

Sincerely,

SHILTS, GRAVES & ASSOCIATES, INC.

Leroy D. Graves

Leroy D. Graves, P.E.
Secretary-Treasurer

mjr

1429

P.O. Box 521
Notre Dame, Ind. 46556
Telephone: 233-6820

SHILTS, GRAVES AND ASSOCIATES, IN

MEN02167 1

TEST BORING LOG

Sheet 1 of 1
Job No. 77-118

PROJECT Menasha Corporation Project

City Otsego County Allegan State Michigan

Boring Location As shown on location sketch Datum Job datum

Date Started 5 August 1977 Date Completed 8-5-77 Surface Elevation 100.3

Weather Cloudy, humid Boring Method Hollow auger

GROUND WATER DEPTH

Sampler: Type Split barrel Casing: Size At Completion none Ft.

Size 2.0" OD Length Used With Casing Removed Ft.

Casing Hammer: Wt. Drop After Hours Ft.

Sampler Hammer: Wt. 140 lbs Drop 30 ins

Soil Layer Limits From	To	Soil Description	Sample Data No.	From	To	N	Remarks
0.0	1.2	TOPSOIL - Dark brown sandy silty topsoil.	1	0.0	1.5	2-5-6	Medium.
1.2	4.2	SILT AND SAND - Brown silt and fine to medium grained sand.	2 3	1.5 3.0	3.0 4.5	10-10-8 9-9-10	Medium. Medium.
4.2	6.3	SANDY CLAY - Mottled gray-brown sandy clay.	4	4.5	6.0	7-8-9	Very stiff, damp.
6.3	8.6	SAND - Brown fine grained sand.	5 6	6.0 7.5	7.5 9.0	3-3-3 2-3-8	Loose. Medium.
8.6	10.8	SAND - Brown fine to medium grained sand, trace gravel.	7	9.0	10.5	7-7-9	Medium.
10.8	19.1	SAND - Light brown fine grained sand, trace gravel.	8 9 10	10.5 12.0 13.5	12.0 13.5 15.0	7-8-8 7-10-9 8-9-9	Medium. Medium. Medium.
19.1	22.0	SILTY CLAY - Brown silty sandy clay.	11	18.5	20.0	11-9-6	Very stiff, damp.
22.0	25.0	SAND - Light brown fine to medium grained sand, trace gravel.	12	23.5	25.0	12-19-20	Dense.
							End of boring: 25.0'

NOTES.

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P.O. Box 521
Notre Dame, Ind. 46556
Telephone: 233-6820

SHILTS, GRAVES AND ASSOCIATES, INC

MEN02168 2

Sheet 1 of 1

Job No. 77-118

TEST BORING LOG

PROJECT Menasha Corporation Project

City Otsego County Allegan State Michigan

Boring Location As shown on location sketch Datum Job datum

Date Started 5 August 1977 Date Completed 8-5-77 Surface Elevation 91.9

Weather Sunny, humid Boring Method Hollow auger

GROUND WATER DEPTH

Sampler: Type Split barrel Casing: Size Hole caved At Completion 18.9 Ft.

Size 2.0" OD Length Used With Casing Removed Ft.

Casing Hammer: Wt. Drop After 72 Hours 18.9 Ft.

Sampler Hammer: Wt. 140 lbs Drop 30 ins Hole caved

Soil Layer Limits From	Soil Layer Limits To	Soil Description	Sample Data No.	From	To	N	Remarks
0.0	3.5	SILT AND SAND - Brown silt and fine grained sand.	1 2	0.0 1.5	1.5 3.0	2-3-5 5-6-9	Loose. Medium.
3.5	4.8	SILTY SAND - Red-brown silty fine grained sand.	3	3.0	4.5	9-9-8	Medium.
4.8	8.9	SAND - Red-brown fine to medium grained sand, trace silt and gravel.	4 5 6	4.5 6.0 7.5	6.0 7.5 9.0	5-4-6 5-2-2 3-2-2	Loose. Loose. Loose.
8.9	12.2	SANDY SILT - Brown sandy silt, trace gravel.	7 8	9.0 10.5	10.5 12.0	2-8-6 3-6-5	Medium, wet. Medium, wet.
12.2	14.4	SILTY CLAY - Brown silty sandy clay, trace gravel.	9	12.0	13.5	5-9-9	Very stiff, damp.
14.4	17.5	SILTY CLAY - Gray silty, sandy clay, trace gravel.	10	13.5	15.0	7-8-8	Very stiff, damp.
17.5	24.0	SAND - Light brown fine to medium grained sand.	11	18.5	20.0	8-15-17	Dense.
24.0	25.0	SAND - Brown very fine grained sand.	12	23.5	25.0	5-10-16	Medium, moist.
							End of boring: 25.0'

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NOTES

P.O. Box 521
Notre Dame, Ind. 46556
Telephone: 233-6820

MEN02169 3

SHILTS, GRAVES AND ASSOCIATES, II

TEST BORING LOG

Sheet 1 of 1
Job No. 77-118

PROJECT Menasha Corporation Project

City Otsego County Allegan State Michigan

Boring Location As shown on location sketch Datum Job datum

Date Started 9 August 1977 Date Completed 8-9-77 Surface Elevation 94.2

Weather Cloudy, mild Boring Method Hollow auger

GROUND WATER DEPTH

Sampler: Type Split barrel Casing: Size At Completion none Ft.

Size 2.0" OD Length Used With Casing Removed Ft.

Casing Hammer: Wt. Drop After Hours Ft.

Sampler Hammer: Wt. 140 lbs Drop 30 ins

Soil Layer Limits From	Soil Layer Limits To	Soil Description	Sample Data No.	From	To	N	Remarks
0.0	0.5	TOPSOIL - Dark brown silty sandy topsoil.	1	0.0	1.5	1-2-4	Loose.
0.5	3.7	SILT AND SAND - Brown silt and fine grained sand.	2	1.5	3.0	5-6-6	Medium.
3.7	4.5	SILTY SAND - Brown silty fine grained sand.	3	3.0	4.5	8-7-8	Medium.
4.5	6.2	SILTY CLAY - Brown silty clay, trace gravel.	4	4.5	6.0	7-8-7	Stiff, damp.
6.2	8.0	CLAYEY SAND - Brown clayey medium grained sand.	5	6.0	7.5	6-5-4	Loose.
8.0	9.0	SILTY CLAY - Brown silty clay, trace gravel.	6	7.5	9.0	3-7-11	Very stiff, damp.
9.0	12.7	SILTY CLAY - Brown silty clay.	7	9.0	10.5	11-14-16	Very stiff, damp.
			8	10.5	12.0	12-14-14	Very stiff, damp.
12.7	25.0	SAND - Light brown fine to medium grained sand.	9	12.0	13.5	11-12-12	Medium.
			10	13.5	15.0	7-9-8	Medium.
			11	15.0	16.5	6-7-7	Medium.
			12	16.5	18.0	5-6-7	Medium.
			13	18.0	20.0	2-4-5-6	Medium.
			14	23.5	25.0	4-6-9	Medium.
							End of boring: 25.0'

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NOTES

P.O. Box 521
Notre Dame, Ind. 46556
Telephone: 233-6820

SHILTS, GRAVES AND ASSOCIATES, I

MEN02170 4

TEST BORING LOG

Sheet 1 of 2
Job No. 77-118

ROJECT Menasha Corporation Project

City Otsego County Allegan State Michigan

Boring Location As shown on location sketch Datum Job datum

Date Started 5 August 1977 Date Completed 8-5-77 Surface Elevation 67.6

Weather Partly cloudy, warm Boring Method Hollow auger

GROUND WATER DEPTH

Sampler: Type Split barrel Casing: Size At Completion none Ft.

Size 2.0" OD Length Used With Casing Removed Ft.

Casing Hammer: Wt. Drop After 72 Hours 24.5 Ft.

Sampler Hammer: Wt. 140 lbs Drop 30 ins Hole caved

Soil Layer Limits From	To	Soil Description	Sample Data No.	From	To	N	Remarks
0.0	3.3	SILT AND SAND - Brown silt and fine grained sand.	1 2	0.0 1.5	1.5 3.0	2-2-3 5-6-6	Loose. Medium.
3.3	6.5	SILTY SAND - Brown silty fine grained sand.	3 4	3.0 4.5	4.5 6.0	7-4-4 4-5-5	Loose. Loose.
6.5	8.0	SAND - Brown fine grained sand, trace silt and gravel.	5	6.0	7.5	4-7-7	Medium, moist.
8.0	9.0	SILTY SAND - Brown silty fine grained sand with clay seams.	6	7.5	9.0	4-4-8	Medium, wet.
9.0	9.3	SANDY CLAY - Brown sandy clay.	7	9.0	10.5	8-8-8	Very stiff, moist.
9.3	10.0	SAND - Light brown fine to medium grained sand.	7	9.0	10.5	8-8-8	Medium, wet.
10.0	11.3	SANDY CLAY - Brown sandy clay.	8	10.5	12.0	6-4-3	Stiff, damp.
11.3	13.8	SAND - Brown fine to medium grained sand.	9	12.0	13.5	4-5-3	Loose, wet.
13.8	17.5	SILTY SAND - Brown silty fine grained sand.	10	13.5	15.0	3-3-2	Loose, wet.
17.5	21.5	SAND - Brown fine grained sand with clay seams.	11	18.5	20.0	2-2-2	Loose, moist.
21.5	25.0	SAND - Brown very fine grained sand.	12	23.5	25.0	6-7-8	Medium, wet.
25.0	34.0	SAND - Light brown fine to medium grained sand.	13	28.5	30.0	3-3-6	Loose, damp.

continued

NOTES:

1433

P.O. Box 521
Notre Dame, Ind. 46556
Telephone: 233-6820

SHILTS, GRAVES AND ASSOC

MEN02171

TEST BORING LOG

Boring No. 4
Sheet 2 of 2
Job No. 77-118

PROJECT Menasha Corporation Project

Soil Layer Limits From	Soil Layer Limits To	Soil Description	Sample Data No.	Sample Data From	Sample Data To	Sample Data N	Remarks
34.0	40.0	SAND - Light brown fine grained sand.	14	33.5	35.0	7-14-21	Dense, damp.
			15	38.5	40.0	7-15-22	Dense, damp.
							End of boring: 40.0'

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Notre Dame, Ind. 46556
Telephone: 233-6820

SHILTS, GRAVES AND ASSC MEN02172

TEST BORING LOG

Boring No. 5
Sheet 1 of 1
Job No. 77-118

PROJECT Menasha Corporation Project

City Otsego County Allegan State Michigan

Boring Location As shown on location sketch Datum Job datum

Date Started 8 August 1977 Date Completed 8-8-77 Surface Elevation 83.1

Weather Cloudy, mild Boring Method Hollow auger

Sampler: Type Split barrel Casing: Size

Size 2.0" OD Length Used

Casing Hammer: Wt. Drop

Sampler Hammer: Wt. 140 lbs Drop 30 ins

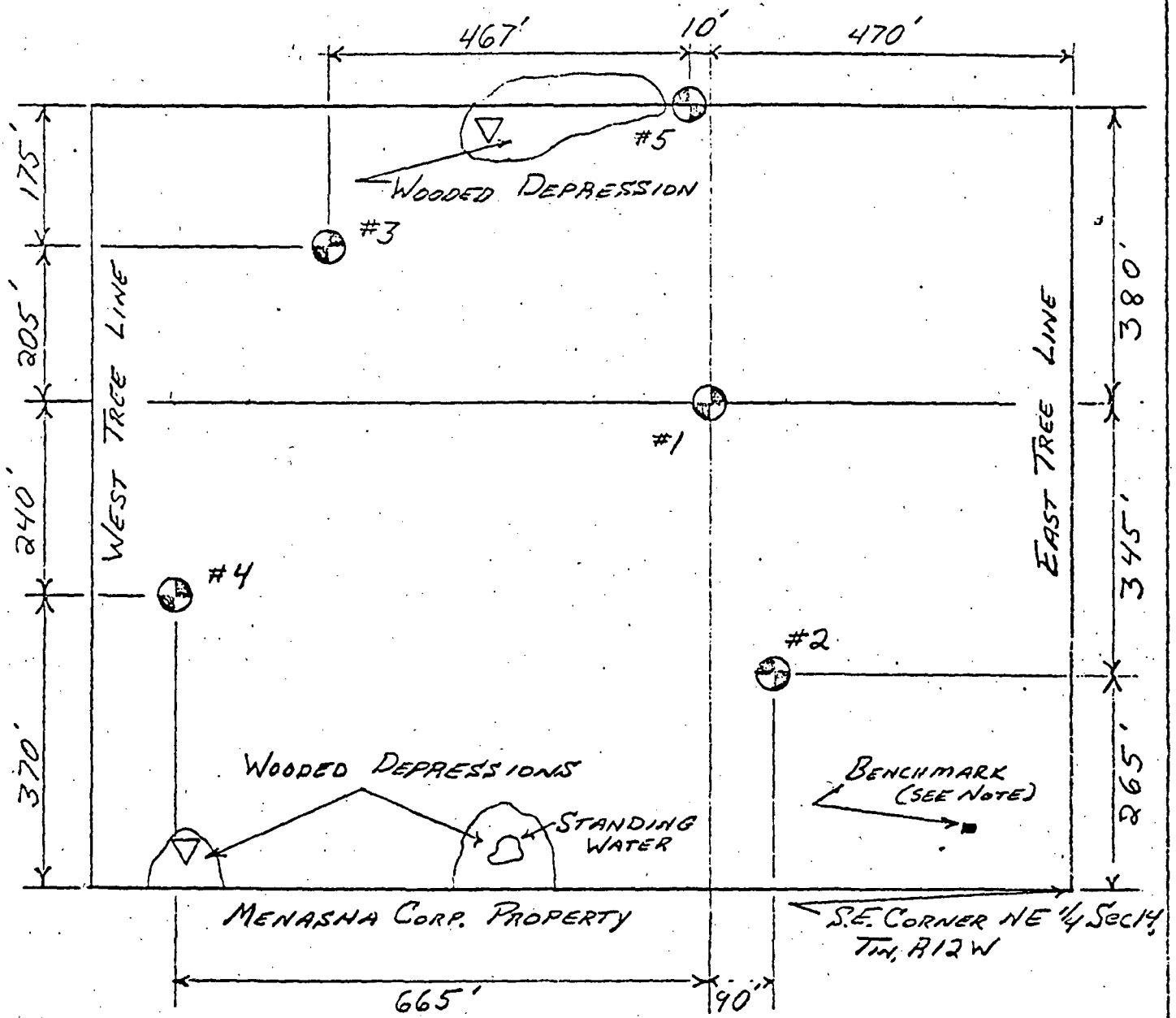
GROUND WATER DEPTH
Hole caved
At Completion 11.6 Ft.
With Casing Removed Ft.
After 72 Hours 11.6 Ft.
Hole caved

Soil Layer Limits From	To	Soil Description	Sample Data No.	From	To	N	Remarks
0.0	2.0	SILT AND SAND - Brown silt and fine grained sand.	1	0.0	1.5	1-3-3	Loose.
2.0	4.0	SILT AND SAND - Gray silt and fine grained sand.	2 3	1.5 3.0	3.0 4.5	3-4-6 5-4-5	Loose. Loose.
4.0	10.7	SILTY CLAY - Mottled gray-brown silty clay.	4 5 6 7	4.5 6.0 7.5 9.0	6.0 7.5 9.0 10.5	5-6-8 7-9-10 4-7-10 12-16-13	Stiff, damp. Very stiff, damp. Very stiff, damp. Very stiff, damp.
10.7	12.0	SANDY SILT - Brown sandy silt, trace gravel.	8	10.5	12.0	3-4-3	Loose, wet.
12.0	15.0	SILTY SAND - Brown silty medium grained sand, trace gravel.	9 10	12.0 13.5	13.5 15.0	2-2-2 3-2-1	Loose, wet. Very loose, wet.
15.0	19.5	SAND - Brown fine grained sand, some gravel.	11 12 13	15.0 16.5 18.0	16.5 18.0 20.0	1-1-2 3-1-2 2-3-2-7	Very loose, wet. Very loose, wet. Loose, wet.
19.5	23.0	SAND - Brown fine to medium grained sand.	13	18.0	20.0	2-3-2-7	Loose, wet.
23.0	25.0	SAND - Light brown fine to medium grained sand.	14	23.5	25.0	7-6-6	Medium, damp.
							End of boring: 25.0'

NOTES:

1435

MEN02173



NORTH

⊕ SOIL BORING SITE

▽ HAND AUGER SITE

SCALE 1" = 200'

NOTE: BENCHMARK LOCATED ON TOP OF LARGE WHITE ROCK NEAR SOUTH-EAST CORNER ELEV 98.50 FT.

LOCATION SKETCH

MENASHA CORP.
SOLID WASTE DISPOSAL SITE

OTSEGO MICHIGAN

SHILTS GRAVES & ASSOCIATES INC.

1436 77-118

STATE OF MICHIGAN

MEN02174

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
CARL T JOHNSON
E M LAITALA
HILARY F SNELL
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

RESOURCE RECOVERY COMMISSION
THOMAS J BLESSING, JR
ALBERT M BORKIN
ANN ESKRIDGE
PAMELA A FRUCCI
C ERNEST KEMP
JOHN W LAYMAN
CLIFFORD MILES
STUART B PADNOS
ROGER RASMUSSEN
JAMES STORNANT
MICHAEL L WALKINGTON

November 21, 1979

Jerry Hoyt

RESOURCE RECOVERY DIVISION
Grand Rapids — Dist. 9
State Office Bldg.
350 Ottawa St. N W
Grand Rapids, MI 49503
616/456-5071

456-5071

Mr. Bruce Buchanan
Menasha Corporation
Farmer Street
Otsego, MI 49078

Re: Menasha Corporation

Dear Mr. Buchanan:

A recent evaluation of your solid waste disposal facility revealed the following violations of the rules in effect under the Michigan Solid Waste Management Law, Act 641, P.A. 1978:

R 325.2721 Sanitary landfills; design. Maps (1) --

The design of the sanitary landfill shall include 1 or more topographich maps at a schall of not over 100 feet to the inch with contour intervals which clearly show the character of land. These maps and accompanying data shall indicate the following: the proposed fill area; any borrow area; access roads; on-site roads; grades for proper drainage of each lift required and a typical cross-section of a lift; special drainage devices if necessary; fencing; structures on the site; existing and proposed utilities; and all other pertinent information to indicate clearly the soil characteristics, water table, oderly development, operation and completion of the sanitary landfill. A sanitary survey and a land use plan of the adjacent areas may be required.

R 325.2721 Sanitary landfills; design. Characteristics of cover material. (3)

Cover material shall be of such character that it can be compacted to provide a tight seal and shall be free of putrescible materials and large objects.

R 325.2721 Sanitary landfills; design. Water pollution and nuisance control (4)

In pertinent part, "Sanitary landfill operations shall be so designed and operated that conditions of unlawful pollution will not be created..."

R 325.2721 Sanitary landfills; design. Equipment. (5)

Adequate numbers, types and sizes of properly maintained equipment shall be used in operating the landfill in accordance with good engineering practice and with these rules. Emergency equipment shall be available on the site or suitable arrangements made for such equipment from other sources during equipment breakdown or during peak loads.

MICHIGAN
THE GREAT LAKE STATE

4331

R1026-6 9/79

R 325.2722 Sanitary landfills; preparation of sites. On-site roads. (1)

On-site roads shall be designed and constructed so that traffic will flow smoothly and will not be interrupted by ordinary inclement weather.

R 325.2723 Sanitary landfills; operations. Supervision of operation. (1)

A landfill operation shall be under the direction of a responsible individual at all times.

R 325.2723 Sanitary landfills; operations. Limited access. (2)

In pertinent part, "Access to a sanitary landfill shall be limited to those times when an attendant is on duty..."

R 325.2723 Sanitary landfills; operations. Site maintenance. (4)

Control dust and blowing paper.

R 325.2723 Sanitary landfills; operations. Spreading and compacting of refuse. (5)

In pertinent part, "Refuse shall be spread so that it can be compacted in layers not exceeding a depth of 2 feet of compacted material..."

R 325.2723 Sanitary landfills; operations. Volumes of cells. (6)

Volumes of individual cells shall not exceed the daily quantity of wastes.

R 325.2723 Sanitary landfills; operations. Daily cover. (7)

In pertinent part, "...at least 6 inches of suitable cover material shall be placed on all exposed refuse by the end of each working day..."

R 325.2723 Sanitary landfills; operations. Final cover. (8)

In pertinent part, "A layer of suitable cover material compacted to a minimum thickness of 2 feet shall be placed over the entire surface of each protion of the final lift..."

R 325.2723 Sanitary landfills; operations. Maintenance of cover. (9)

All daily cover depths must be continually maintained and final cover depths shall be maintained for a period of 2 years.

R 325.2723 Sanitary landfills; operations. Hazardous materials, including liquids and sewage. (10)

Hazardous materials, including liquids and sewage, shall not be disposed of in a sanitary landfill unless special provisions are made for such disposal through the health department having jurisdiction. This provision in no way precludes the right of a landfill operator to exclude any materials as part of his operational standards.

R 325.2723 Sanitary landfills; operations. Burning. (11)

In pertinent part, "No garbage or refuse containing garbage shall be burned at a sanitary landfill."

R 325.2723 Sanitary landfills; operations. Salvage. (12)

In pertinent part, "Salvaging, if permitted, shall be organized..."

R 325.2723 Sanitary landfills; operations. Insect and rodent control. (13)

In pertinent part, "Conditions unfavorable for the production of insects and rodents shall be maintained..."

Sincerely,

RESOURCE RECOVERY DIVISION

Elizabeth A. Bols

Elizabeth A. Bols
Environmental Sanitarian

EAB:bjc

MEN02177

NATURAL RESOURCES COMMISSION
JACOB A. HOEFER
CARL T. JOHNSON
E. M. LAITALA
HILARY F. SNELL
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

RESOURCE RECOVERY COMMISSION
THOMAS J. BLESSING, JR.
ALBERT M. BORKIN
ANN ESKRIDGE
PAMELA A. FRUCCI
C. ERNEST KEMP
JOHN W. LAYMAN
CLIFFORD MILES
STUART B. PADNOS
ROGER RASMUSSEN
JAMES STORNANT
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
Grand Rapids — Dist. 9
State Office Bldg.
350 Ottawa St. N.W.
Grand Rapids, MI 49503
616/456-5071

December 7, 1979

Mr. Bruce Buchanan
Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Dear Mr. Buchanan:

Due to an error in the typing of your last notice of violation, enclosed is the corrected copy of the notice.

If you have any further questions, feel free to contact this office, otherwise we will see you January 6, 1980 at 10:00 A.M.

Sincerely,

RESOURCE RECOVERY DIVISION

Elizabeth A. Bols

Elizabeth A. Bols
Environmental Sanitarian

EAB:bjc

MICHIGAN
THE GREAT LAKE STATE

R1025-5 9/79

4582

MEN02178

NATURAL RESOURCES COMMISSION
JACOB A. HOEFER
CARL T. JOHNSON
E. M. LAITALA
HILARY F. SNELL
LARRY H. WHITELEY
JOAN L. WOLFE
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MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
Grand Rapids – Dist. 9
State Office Bldg.
350 Ottawa St. N.W.
Grand Rapids, MI 49503
616/456-5071

December 7, 1979

NOTICE OF VIOLATION

Mr. Bruce Buchanan
Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Re: Menasha Corporation

Dear Mr. Buchanan:

A recent evaluation of your solid waste disposal facility revealed the following violations of the rules in effect under the Michigan Solid Waste Management Law, Act 641, P.A. 1978:

R 325.2721 Sanitary landfills; design. Maps (1)

The design of the sanitary landfill shall include 1 or more topographic maps at a scale of not over 100 feet to the inch with contour intervals which clearly show the character of land. These maps and accompanying data shall indicate the following: The proposed fill area; any borrow area; access roads; on-site roads; grades for proper drainage of each lift required and a typical cross-section of a lift; special drainage devices if necessary; fencing; structures on the site; existing and proposed utilities; and all other pertinent information to indicate clearly the soil characteristics, water table, orderly development, operation and completion of the sanitary landfill. A sanitary survey and a land use plan of the adjacent areas may be required.

R 325.2721 Sanitary landfills; design. Water pollution and nuisance control (4)

In pertinent part, "Sanitary landfill operations shall be so designed and operated that conditions of unlawful pollution will not be created..." need Definition

R 325.2723 Sanitary landfills; operations. Limited access. (2)

In pertinent part, "Access to a sanitary landfill shall be limited to those times when an attendant is on duty..." need fence

R 325.2723 Sanitary landfills; operations. Site maintenance. (4)

✓ Control dust and blowing paper.

MICHIGAN
THE GREAT LAKE STATE

R1026-5 9/79

4580

R 325.2723 Sanitary landfills; operations. Spreading and compacting of Refuse. (5)

In pertinent part, "Refuse shall be spread so that it can be compacted in layers not exceeding a depth of 2 feet of compacted material..."

R 325.2723 Sanitary landfills; operations. Volumes of cells. (6)

Volumes of individual cells shall not exceed the daily quantity of wastes.

R 325.2723 Sanitary landfills; operations. Daily cover (7)

In pertinent part, "...at least 6 inches of suitable cover material shall be placed on all exposed refuse by the end of each working day..."

R 325.2723 Sanitary landfills; operations. Insect and rodent control. (13)

In pertinent part, "Conditions unfavorable for the production of insects and rodents shall be maintained..."

R 325.2723 Sanitary landfills; operations. Drainage of surface water. (14)

The entire site, including the fill surface, shall be graded and provided with drainage facilities to minimize runoff onto and into the fill, to prevent erosion or washing of the fill, to drain off rainwater falling on the fill, and to prevent the collection of standing water.

Sincerely,

RESOURCE RECOVERY DIVISION

Elizabeth A. Bols

Elizabeth A. Bols
Environmental Sanitarian

EAB:bjc

cc JKD

memo / MENASH CORPORATIO

MEN02180

TO: R. L. Johnson

DATE: 12/21/79

SUBJECT: Otsego - Solid Waste Landfill-Notice of Violation

FROM: W. Allan Schenck

As planned, I met with Bruce Buchanan and John Blawkamp Thursday, December 20, 1979, on the above subject. The following status summarizes the work and plans Bruce and John have made.

A copy of the Notice of Violation is attached. It cites authority of Michigan Statute 640 although Administrative Rules for this Statute are only in the hearing stage. The notice is vague and has no specific request on time requirement. Most items reflect obvious good practice and from what I've observed as actual practice in well run municipal landfill sites. Full fencing, two (2) foot layers, and daily covering will add to our cost but would not be excessively costly. The biggest unknown and potential cost is the requirement of no "unlawful pollution." Fly ash, wastepaper screenings, and digester screening are not potentially high risk. Garbarge, replaced electrical equipment (PCB) and obsolete chemicals may show up in ground water. In the worst case, this could lead to closing of the site and even some reclamation work required. If ground water is okay, a permit could be issued after compliance with the other points.

We should and will move ahead quickly to determine the location and testing of the ground water in the area. (approval will be requested when costs firmly determined).

4577

Otsego - Solid Waste Landfill

At the meeting set up January 3 with the D.N.R., we will keep a low profile (per discussion with MacDeeson). We will endeavor to determine exactly what they want and what timetable they have in mind. We will endeavor to determine if there are any approved landfills in our area. Bruce believes few, if any, landfills are approved under new criteria and the State is pushing the ground water and geology studies at each location so any which are not affecting ground water can be issued permits under the new law.

Longer range, we want to get the existing site approved under the new law as well as a new larger second site.

The above activity is under the Resources Recovery Commission (formerly Solid Waste). They will probably get into sludge disposal. We believe our subsoiling program for effluent treatment sludge will continue to be accepted. The refinement of liquor storage laid out earlier with Water Branch will continue as planned.

Proposals from CH_2M for 1.) Solid Waste (hydro geological, 2.) Liquor Storage (ponding), 3.) Phosphate control and 4.) Fully closing the mill white water system are to be received by January 1.

In connection with closing the system, PCA, who had a very good SLI operation, is having a serious fine dust problem in their SLI. It is believed to be a result of chlorides and other salt build up in the system when they closed their system more tightly.

Otsego - Solid Waste Landfill

We will dig out our old solid waste site permit believed to have been issued by Allegon County Health Department.

There are three kinds of sites recognized in the proposed Regulations. Roughly 1.) for toxics, 2.) for garbage and 3.) for innocuous material. We will look into getting the 3rd Class by having garbage hauled elsewhere.

WAS:eap

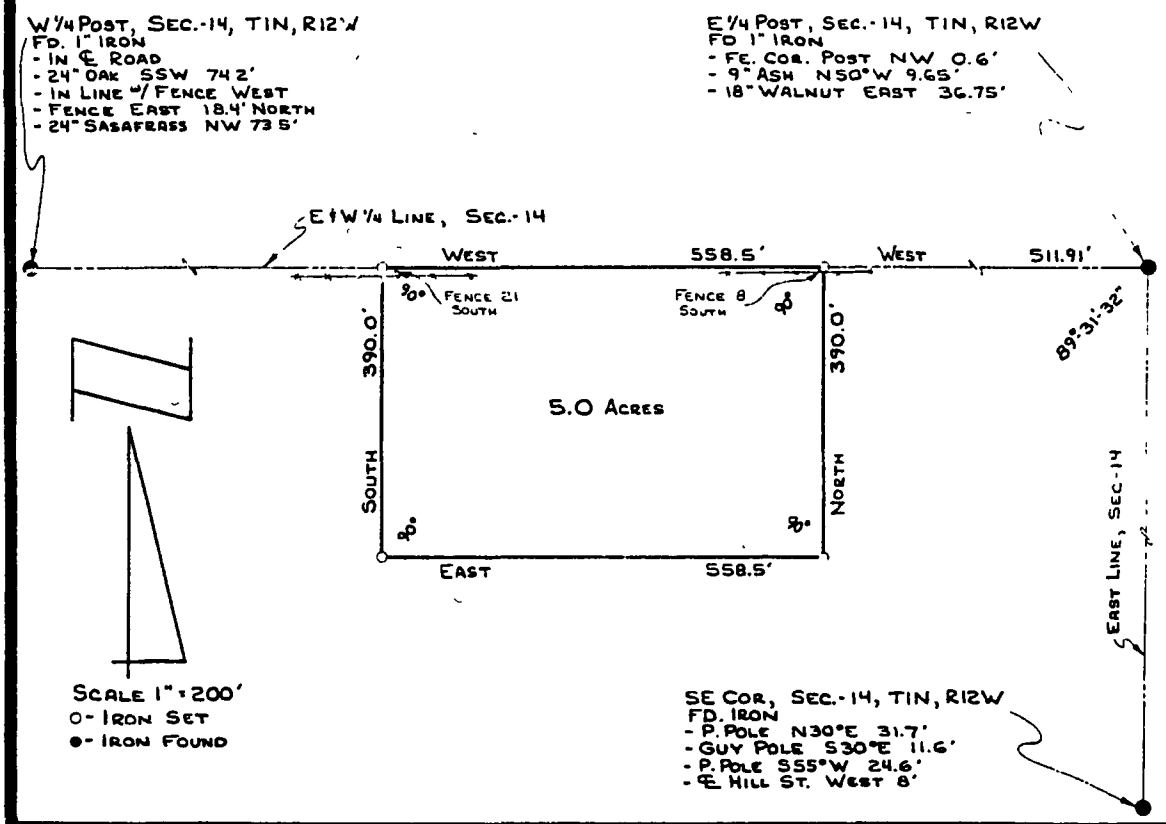
cc: D. C. Shepard
Bruce Buchanan
Tom Ray

Attachment

MEN02183

SURVEYED DESCRIPTION -

COMMENCING AT THE EAST 1/4-POST OF SECTION-14, T1N, R12W, THENCE WEST ON THE EAST AND WEST 1/4-LINE 511.91-FEET TO THE PLACE OF BEGINNING OF THIS DESCRIPTION, THENCE CONTINUING WEST ON THE 1/4-LINE 558.5-FEET, THENCE SOUTH AT RIGHT ANGLES 390.0-FEET, THENCE EAST 558.5-FEET, THENCE NORTH 390.0-FEET TO THE PLACE OF BEGINNING, BEING 5.0 ACRES.



Client MENASHA CORP.

Date 3-5-80 Job No. 80-6012

Being in SE 1/4
Sec. 14 T. 1N, R. 12W
OTSEGO Twp.
ALLEGAN Co. Mich.

STATE OF MICHIGAN
JOHN H. DILLINGHAM
LAND SURVEYOR
No. 15927
REGISTERED LAND SURVEYOR

The ratio of closure is within the accuracy of survey as required in Act No 288 of Public Acts of 1967. This survey complies with the requirements of Section-3 Public Act 132 of 1970.

Act 288 of Michigan Public Acts of 1967 should be checked to see that any property conveyance does not violate this act.

D.A. RATEKIN & ASSOCIATES, INC.
LAND SURVEYING & CONSULTING ENGINEERING
319 HUBBARD STREET
ALLEGAN, MICHIGAN 49010

4335

By _____

Registered Land Surveyor - Michigan No. 16927

MEN02184

L

EVALUATION REPORT - SANITARY LANDFILLS

Michigan Department of Natural Resources - Resource Recovery Division

Name of Facility Menasha Corporation Facility No. CB-[illegible]

Location _____ Allegan

Main Roads Section No. Township City County

Name of Operator _____ Name of Licensee _____

Landfill Type (X) II ( ) III ( ) Other _____

Facility Status (X) open & licensed (or licensable)
( ) closed & inspecting
( ) unlicensed

Restrictions/Stipulations to conside During Inspection

cc John Blauwkamp

(C) Indicates Compliance (N) Indicates Noncompliance (-) Does Not Apply

		REMARKS
(3)	A. Protection of Surface Waters	
—	B. Hazardous Material/Liquids Materials Authorized for Disposal	1) [illegible] to limit fug[illegible]
C	C. Surface Water Drainage	
(1)	D. Period and Adequacy of Cover	
—	E. Completion of Area/Final Cover	2) [illegible] is licensed as a type II [illegible] but company [illegible] the process to ha[illegible] [illegible]
—	F. Compaction	
(2)	G. Leachate Collection/Management	
(3)	H. Approved Engineering Plans and Hydrogeologic Evaluation	3) [illegible]
—	I. Operations conform to Plan & License Stipulations	4) no [illegible] ventilation [illegible] time
—	J. Vermin Control/Bird Control	
N(1)	K. Blowing Debris, Dust & Odor Control	
(4)	L. Gas Migration	license no [illegible] / expires June 26, 198[illegible]
C	M. Fire Protection and Restriction of Burning	
C	N. Equipment Adequacy [illegible]	
C	O. Restricted Access/Attendant [illegible]	
C	P. Traffic Flow	
—	Q. Salvaging/Scavenging	
C	R. Noise Level	
C	S. Fence/Screening	

Person Interviewed — Date [illegible] Time of Inspection _____
yy mm dd

Inspected by Elizabeth [illegible] Representing [illegible]

4327

FORM NO. 561

MEN02185

memo / MENASHA CORPORATION

TO: Notes to file **DATE:** 31 March 1980

SUBJECT: Relicensing of Class II Landfill **FROM:** John Blauwkamp

JRB

Elizabeth Bols of the DNR called today and said she needed our schedule of compliance before she could process our application for a landfill license. I told her that we were planning on having a meeting with our consultants on April 21 and that subsequent to that meeting we would be submitting our purposed schedule of complaince to them. Elizabeth said this would be alright and she would put a note on our application that the schedule of complaince would be submitted probably by the end of this month and that processing of the application for a license would begin subsequent to the approval of a schedule of compliance. She said the DNR has 90 days to process the application and if we keep the purposed timeschedule we should be in good shape.

cc: Ralph Peterson
Allan Schenck
Bruce Buchanan

JB/kj

MEN02186

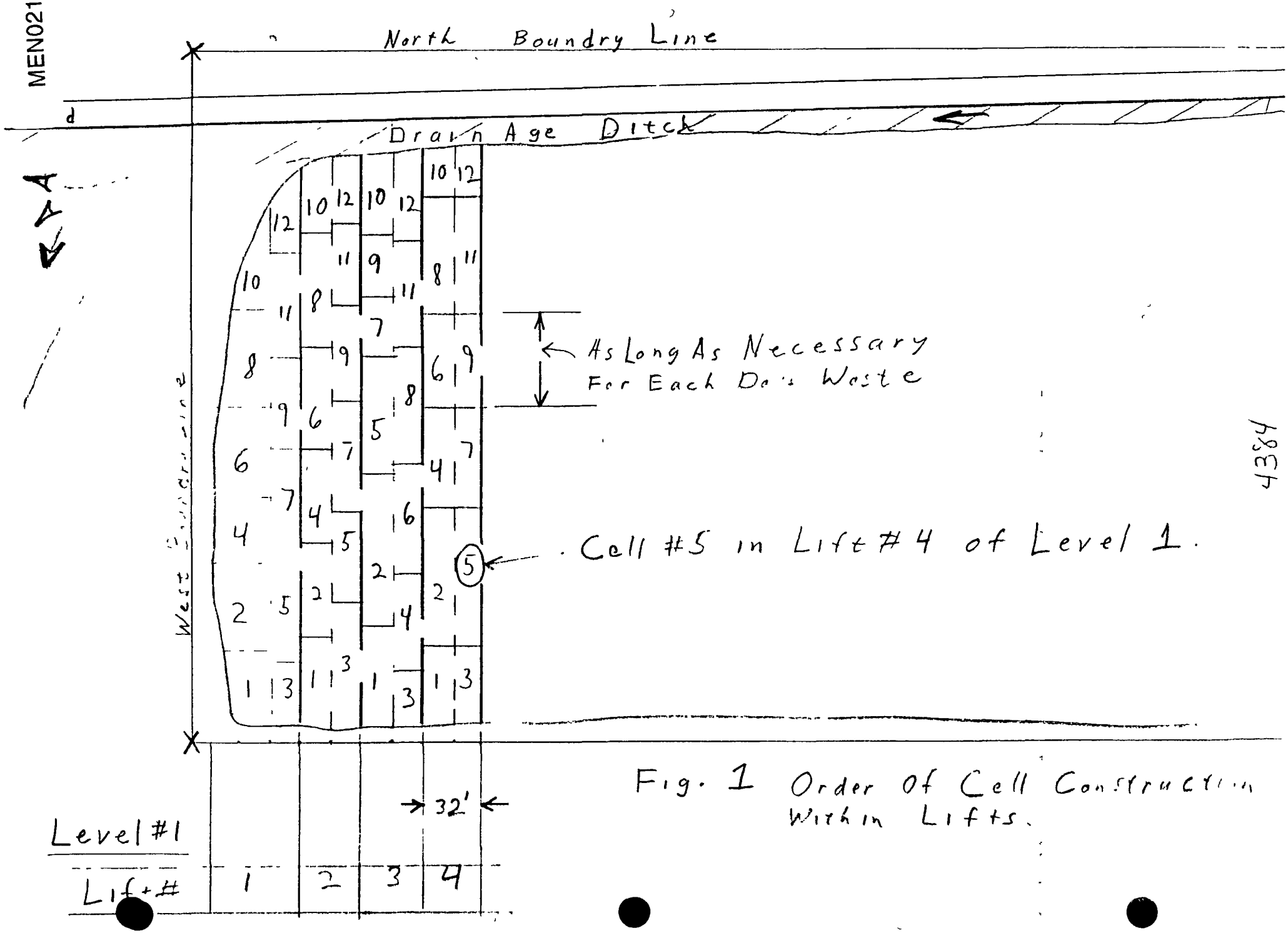


Fig. 1 Order Of Cell Construction Within Lifts.

4384

MEN02187

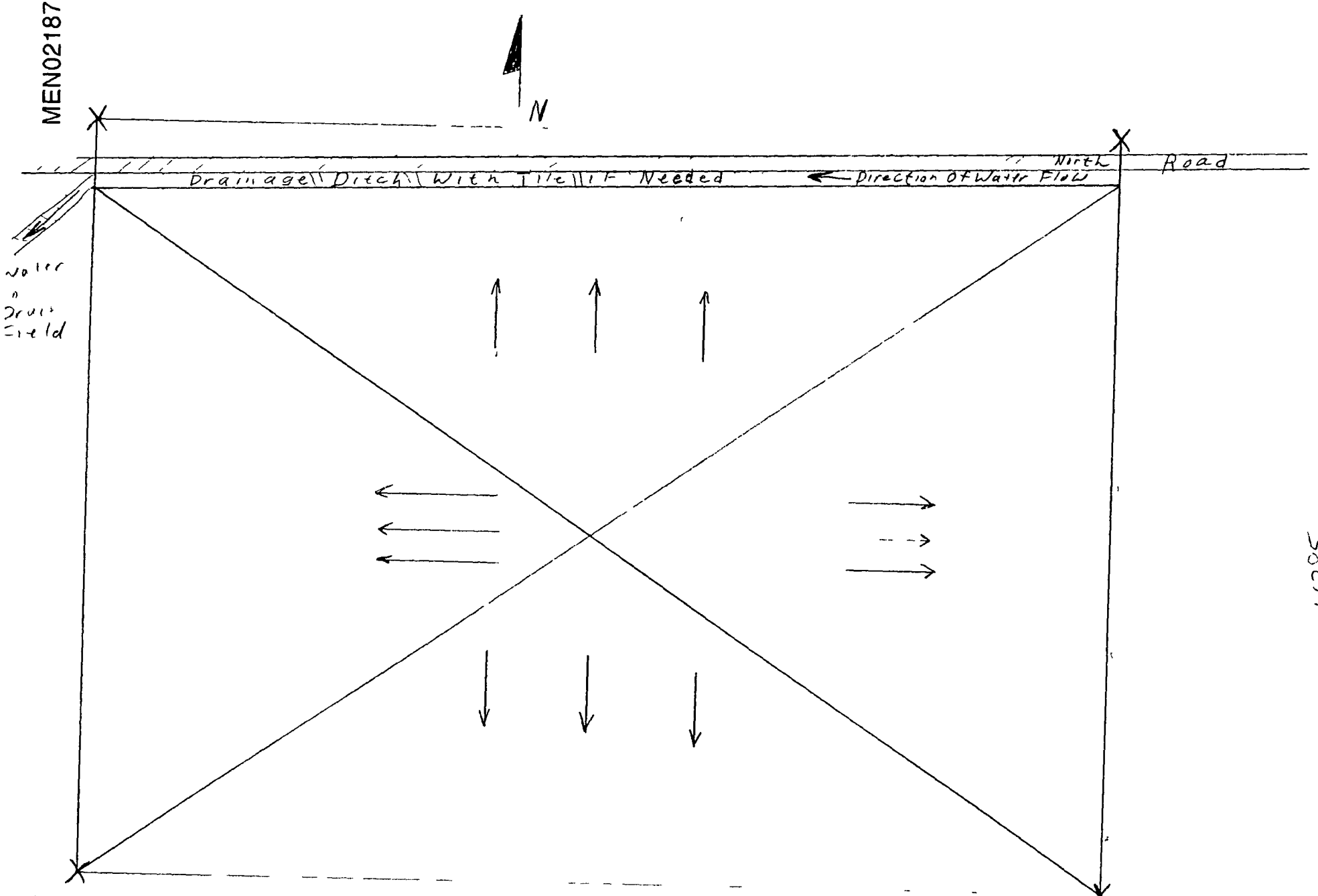


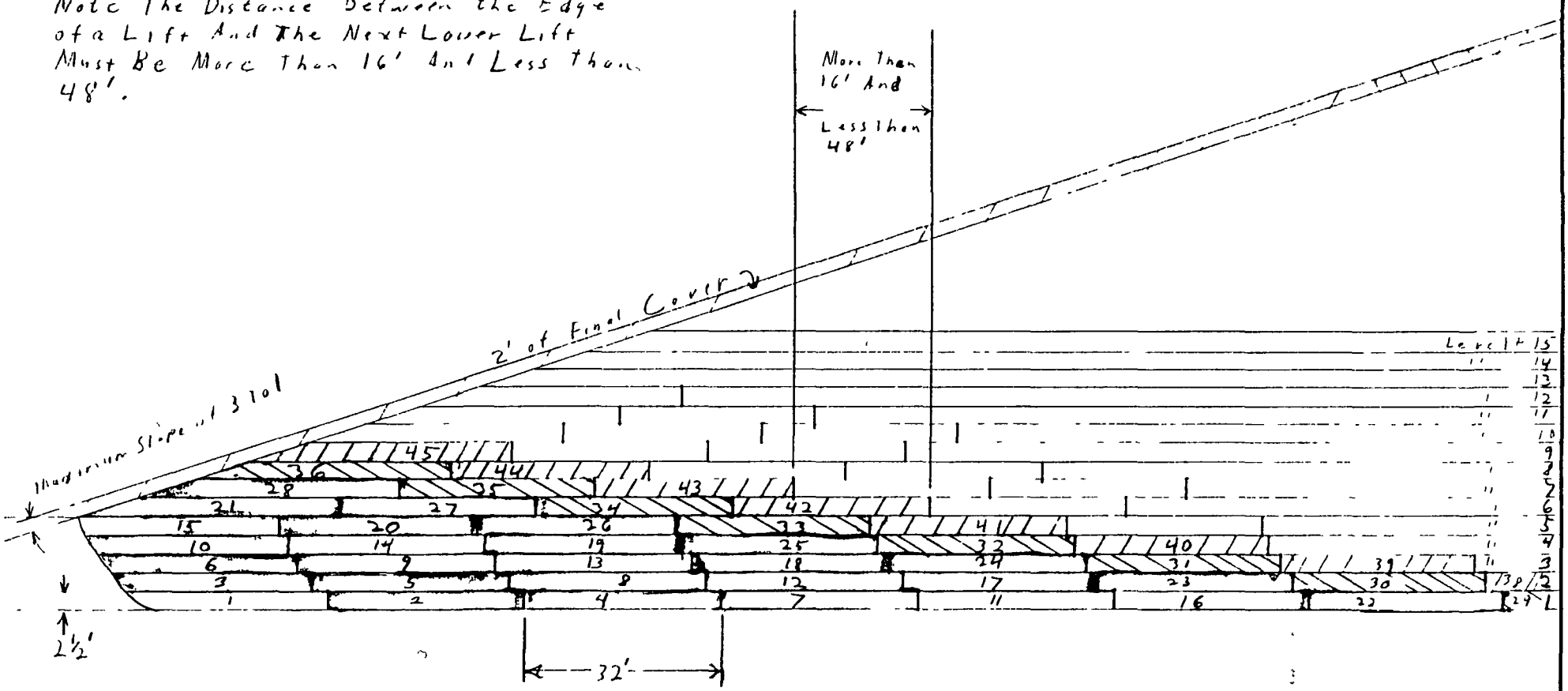
Fig. 3 Final Cover If Sloped So That Run Off IS In The Direction Indicated By The Arrows

4385

JRB 4/71

MEN02188

Note The Distance Between the Edge of a Lift And The Next Lower Lift Must Be More Than 16' And Less Than 48'.



The Numbers Indicate the Order That The Lifts Must Be Constructed IN.

DATE	NO	REVISION	BY

SUBJECT Fig 2 Step Wise Construction of the Lifts

SCALE 1/16" = 1' | APPROVED BY | DRAWN BY JKB

DATE 4-7-80

MENASHA CORPORATION
PAPERBOARD DIVISION OTSEGO, MICHIGAN

DRAWING NUMBER

4/3/4

4386

MEN02189

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
A. P. A. HOEFER
AR[illegible] JOHNSON
F. M. LATALA
[illegible]
[illegible] WHITELEY
[illegible] WOLFF
[illegible] YOUNGLOVE

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

RESOURCE RECOVERY COMMISSION
THOMAS J. BLESSING, JR.
ALBERT M. BORKIN
WILLIAM A. CILLUFFO
ANN ESKRIDGE
PAMELA A. FRUCCI
ERNEST KEMP
JOHN W. LAYMAN
STUART B. PADNOS
ROGER RASMUSSEN
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING, MI 48909
517 322 1315

April 29, 1980

Mr. John R. Blauwkamp
Menasha Corp.
P.O. Box 155
Otsego, MI 49078

Re: Menasha Corp. Disposal Site
Allegan County

Dear Mr. Blauwkamp

Attached is a Director's Order and Schedule for Final Closure Act 641, P.A. 1978, as amended, Section 14(2), requires before licensure a hydro to be implemented or on a schedule to implement.

Therefore, please review the attached schedule and if there are no questions, sign and return same to this office.

Very truly yours,
RESOURCE RECOVERY DIVISION

Elizabeth A. Bols

Elizabeth A. Bols
Environmental Sanitarian

EAB.bjc
attachment

cc: Reg. III File
Div. File
Dist. File

MAY 1980
RECEIVED

MICHIGAN

4339

STATE OF MICHIGAN

DEPARTMENT OF NATURAL RESOURCES

MEN02190

In the Matter of

Menasha Corporation Sanitary Landfill

Otsego Township

Allegan County

SCHEDULE OF COMPLIANCE

THE MICHIGAN DEPARTMENT OF NATURAL RESOURCES (MDNR) AND Menasha Corporation AGREE AND STIPULATE TO THE FOLLOWING:

1) Menasha Corporation has operated a solid waste disposal area in Section 14, Otsego Township, Allegan County since October 10, 1969.

2) Menasha Corporation desires to continue to operate said solid waste disposal area and Bruce Buchanan, as agent for
(Person in responsible charge)
Menasha Corporation intends to or has submitted an application for reissuance of the solid waste disposal area license for this facility.

3) Section 14 (2) of Act 641, P.A. of 1978, as amended, requires the following:

The Department shall not license a landfill facility operating without an approved hydrogeologic monitoring program until the Department receives a hydrogeologic monitoring program and the results of the program. The Director shall use the results of this information in conjunction with other information about the facility to determine a course of action regarding further licensing of the facility consistent with Section 4005 of title 2 of the solid waste disposal act, 42 U.S.C. 6945, and this act. In deciding a course of action, the Director shall consider, at a minimum, the health hazards, environmental degradation, and other public or private alternatives. The Director may revoke a license or issue a timetable or schedule to provide for compliance for the facility or operation which specifies a schedule of remedial measures including a sequence of actions or operation, which leads to compliance with this act within a reasonable time period, which shall not extend beyond September 1, 1984. This subsection shall take effect April 1, 1980.

4) Menasha Corporation has not provided the Director with an acceptable hydrogeological evaluation of the Menasha Corporation sanitary landfill in accordance with Act 641, P.A. of 1978, as amended, (and the rules promulgated thereunder).

5) Menasha Corporation has not provided the Director with an acceptable hydrogeological monitoring program for the Menasha Corporation sanitary landfill in accordance with Act 641, P.A. of 1978, as amended, (and the rules promulgated thereunder).

Menasha Corporation AND THE MICHIGAN DEPARTMENT OF NATURAL RESOURCES HEREBY AGREE TO THE FOLLOWING OPERATIONAL PROGRAM AND TIME SCHEDULE FOR REMEDIAL ACTION:

MEN02191

1) The landfill shall be operated at all times, specifically in accordance with the rules currently administered under Act 641, supra, pursuant to Section 31 of Act 306, P.A. of 1969, as amended (Administrative Procedures Act).

2) A hydrogeological consultant will be engaged by the licensee as soon as possible but not later than May 15, 1980.

3) An outline of the proposed work plan for the hydrogeological investigation will be submitted by June 30, 1980.

4) A preliminary findings report on the hydrogeology of the site will be submitted no later than October 1, 1980.

5) A series of permanent monitoring wells shall be installed at locations and depths approved by the staff of the Resource Recovery Division subsequent to review of the hydrogeological investigation. Said wells shall be installed no later than October 1, 1980.

6) The monitoring wells shall be sampled by qualified personnel and analyzed by an approved laboratory quarterly, to include but not limited to the following parameters COD, Fe, Cl, Spec. Cond., TOC, SO_4, pH, static water levels and annually, to include but not limited to the following parameters COD, Fe, Cl, Spec. Cond., TOC, SO_4, pH, Ca, Na, Mg, $CaCO_3$, Nitrate N, Nitrite N, NH_3, Pb, Cr, static water levels. All sample results are to be submitted to the Resource Recovery Division as per the sampling schedule.

7) A complete final hydrogeological report, including the initial water quality results, shall be submitted no later than December 1, 1980.

8) The Director shall use the results of the data established by the hydrogeologic evaluation and monitoring program to establish a time frame for revision or development of engineering plans and implementation of said plans.

The above measures are agreed to as a condition of licensure. Failure to comply with the time constraints established by this schedule may result in a) the initiation of procedures to revoke the operating license and/or b) the facility listed on the Federally Mandated Open Dump Inventory.

Menasha Corporation
COMPANY

Bruce T. Buchanan
AGENT'S SIGNATURE
Bruce T. Buchanan

5 June 1980
Date

Fred B. Kellow, Chief
Resource Recovery Division
DEPARTMENT OF NATURAL RESOURCES

MENASHA CORPORATION

6 June 1980

Elizabeth A. Bols
DNR
350 Ottawa Avenue, N.W.
Grand Rapids, MI 49504

Dear Ms. Bols;

Enclosed is the signed Schedule of Compliance required for processing our application for a landfill operating license. Also, enclosed is a letter from our consultant Steve Hoffman, of CH_2M-Hill, briefly explaining why the dates on the schedule of compliance are the way they are. If you have any questions, please contact me at (616) 692-6141 or Steve Hoffman at (206) 453-5000.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Steve Hoffman

Enclosure

JB/kj

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692 61

4364

CH2M HILL
engineers
planners
economists
scientists

MEN02193

RECEIVED

June 9, 1980

A960.33

Mr. John R. Blauwkamp
Technical Manager
Menasha Corporation
Box 155
Otsego, Michigan 49078

Dear Mr. Blauwkamp:

As we discussed in our June 5 conversation, I am submitting our recommendations regarding the Michigan Department of Natural Resources Director's Order and Schedule for Final Closure dated April 29, 1980. My discussions with Gerald Hyet, De Montgomery, and Elizabeth Bols of the DNR indicated that it will be acceptable for you to make the change in the dates listed below on your copy and then sign and return the document. As an added note, I am assuming that the order is really a "Schedule of Compliance" and not a "Schedule for Final Closure" as described in the cover letter.

The following changes should be made in the compliance schedule dates:

- Part 5, item 2 - no change. This requirement was met by hiring CH2M HILL.
- Part 5, item 3 - June 15, 1980, should be changed to June 30, 1980.
- Part 5, item 4 - August 1, 1980, should be changed to October 1, 1980.
- Part 5, item 5 - September 15, 1980, should be changed to October 1, 1980.
- Part 5, item 6 - no change.
- Part 6, item 7 - no change.

The change in dates for item 3 is needed to adequately prepare the work plan. The changes in items 4 and 5 are needed to allow us to conduct the hydrogeological study by our normal

4365

Seattle Office
1500 114th Avenue S.E., Bellevue, Washington 98004 206/453-5000

methods and to reduce the cost. Prior to beginning site drilling, all monitoring well locations and depths will be coordinated with the DNR. If changes are required, adjustments will be made in the field and additional review and approval sought from the DNR. The intent is to avoid, if possible, having to remobilize the driller and supervising hydrogeologist by installing the permanent monitoring wells during a combined initial and final drilling phase.

Though we do not anticipate any problems, the DNR personnel indicated that, if required and if sufficient progress is being made, the final report deadline could be extended to the initially discussed March 1981 date.

If there are any problems, please do not hesitate to call.

Sincerely,

Steven R. Hoffman

Steven R. Hoffman, P.E.
Project Manager

lkp

JUN 1980
RECEIVED

CLOW

HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

MEN02195

Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Mr. Gary Roys

July 30, 1980

P.O. #19870

Sample received 7-14-80

HYDRO NO:		40071	
CUST. ID:		030053	
	Sludge	EPA Leachate	ASTM "A" Leachate
Calcium Carbonate, $CaCO_3$, mg/kg	283,000	----	----
Solids, Total, %	23.6	----	----
pH	9*	7.74	9.39
Lead, Pb, mg/l	----	0.21	< 0.02
Arsenic, As, mg/l	----	0.0034	0.0039
Cadmium, Cd, mg/l	----	< 0.002	< 0.002
Chromium, Total, Cr, mg/l	----	0.016	< 0.002
Selenium, Se, mg/l	----	0.0028	0.0034
Iron, Fe, mg/l	----	0.03	< 0.02
Zinc, Zn, mg/l	----	0.054	0.028
Copper, Cu, mg/l	----	0.029	< 0.002
Solids, Total Diss., mg/l	----	7750	176
Nitrogen, Nitrate, N, mg/l	----	< 0.02	< 0.02
Sulfate, SO_4, mg/l	----	31	57
Chloride, Cl, mg/l	----	4.9	9.8

Results on sludge reported on a dry weight basis at 104°C

* Approximate value

Linda Carey/ns

Linda Carey/Manager
Analytical Services

4306

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Mr. Gary Roys

July 30, 1980

P.O. #19870

Sample received 7-14-80

HYDRO NO: 40070
CUST. ID: 030134 (002)

	Sludge	EPA Leachate	ASTM "A" Leachate
Calcium Carbonate, $CaCO_3$, mg/kg	267,000	----	----
Solids, Total, %	22.7	----	----
pH	9*	7.71	9.34
Lead, Pb, mg/l	----	0.15	< 0.02
Arsenic, As, mg/l	----	0.0044	0.0039
Cadmium, Cd, mg/l	----	< 0.002	< 0.002
Chromium, Total, Cr, mg/l	----	0.010	< 0.002
Selenium, Se, mg/l	----	0.0035	0.0041
Iron, Fe, mg/l	----	0.04	< 0.02
Zinc, Zn, mg/l	----	0.081	0.035
Copper, Cu, mg/l	----	0.029	< 0.002
Solids, Total Diss., mg/l	----	7740	165
Nitrogen, Nitrate, N, mg/l	----	< 0.02	< 0.02
Sulfate, SO_4, mg/l	----	28	45
Chloride, Cl, mg/l	----	5.5	9.2

Results on sludge reported on a dry weight basis at 104°C.

* Approximate value

4307

memo / MENASHA CORP

MEN02197

TO: Bruce Buchanan

DATE: October 1980

SUBJECT: October 28th Meeting with Resource Recovery Division of the DNR

FROM: John Blauwkamp

Elizabeth Bols started the meeting by reviewing the results of a recent site inspection. She had two comments as a result of the inspection. The first was that ash used to build the road on the north side of the landfill should be covered each night. Secondly she wondered by the drivers were dumping fly-ash in a pile at the bottom of the hill outside the landfill. At the time I didn't know the reason for this and I told her I would find out and get back to her. The following day after talking to Al Coleman, I informed Elizabeth that the purpose for the pile was to collect enough hard ash for a manufacturer to make a trial run using it for sinder blocks. I also informed her that the trial would be conducted soon and that the area would be cleaned up. Al Grim then presented the results of the preliminary hydrogeologocial study report. The DNR did not appear to be to concerned about the minor amounts of contamination found in one of the wells. They did however, insist that we would either have to clean out the plugged well or drill a new well, so that we could obtain acceptable background quality data. CH2M-Hill will take care of having this well either cleaned or replaced as soon as possible. CH2M-Hill still felt they could get the final hydrogeological study report completed by December 1st deadline.

In discussing the future of the landfill, the DNR stated that after June of 1982, the existing landfill would either have to be changed to a class III landfill or have the primary barrier and leachate collection systems required by Act 641. Since it is totally impractical to convert our existing landfill to a class II landfill which would meet Act 641 requirements and since there is no possibility of a various on this our alternatives are either build a new class II landfill or segregate our waste and find someone else to take the class II portion of our total waste stream.

The requirments for a Class III landfill are that the leachate test on the material going into the landfill, has no component which exceeds twice the National primary and secondard drinking water standards. General rubbish is specifically excluded from a Class III landfill. Due to the fact that we have specific types of material going into our landfill, Elizabeth said she would see if the DNR would accept the results of leachate tests as the sole basis for determining whether or not a material go into the Class III landfill. This may allow us to dump things like plastics and wires from the hydrapulper area in a Class III landfill. These materials are currently listed as general rubbish and excluded from a Class III landfill. As of June of 82 we may find that the only thing we can put into what would be our Class III landfill would be our fly ash.

cc: E. C. Manders, Al Grim, Frank [illegible]

4369

MENASHA CORPORATION

31 March 1981

Elizabeth Bols
DNR
350 Ottawa Ave., N.W.
Grand Rapids, MI 49504

Dear Ms. Bols;

As we have discussed several times, Menasha Corporation hereby requests that the fly ash from our coal fired boilers be classified as a type III material suitable for disposal in a Class III landfill. The required leachate analysis have been completed and the test results have been enclosed.

In addition to having the fly ash classified as a type III material, we would also like to know what tests must be done on the plastics and wire from our waste paper cleaning system so that these materials can also be classified as a type III material.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp
Technical Manager

JB/kj

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616 692

4633

MEN02199

CLOW HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Gary Roys

Date 2-13-80

ASTM-A
Leachate Procedure

Sample received 2-1-80

HYDRO NO:	357675
CUST. ID:	Fly Ash [illegible]
pH	6.82
Solids, Total, Diss., mg/l	233
Nitrogen, Nitrate, N, mg/l	0.20
Sulfate, SO_4, mg/l	120
Chlorides, Cl, mg/l	6
Lead, Pb, mg/l	< 0.05
Arsenic, As, ug/l	15
Cadmium, Cd, mg/l	< 0.002
Chromium, Total, Cr, mg/l	< 0.002
Selenium, Se, ug/l	9.6
Iron, Fe, mg/l	< 0.02
Zinc, Zn, mg/l	0.12
Copper, Cu, mg/l	< 0.002
Solids, Total, % (on fly ash as received)	73.5

Observations: The sample as received [illegible] a gray [illegible] dark [illegible] material with white particle [illegible] Particle size was 1/16" or less.

700 grams of sample was used for leaching. The leachate was [illegible] a silvery gray color which [illegible] transparent.

Industrial was the supplier of [illegible]

4634

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

MEN02200

Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Gary Roys

Date 2-13-80

EPA Leachate Procedure

Sample received 2-1-80

HYDRO NO:	35765
CUST. ID:	Fly Ash 123.80
Nitrogen, Nitrate, N, mg/l	1.0
Sulfate, SO_4, mg/l	22
Chloride, Cl, mg/l	< 2
Lead, Pb, mg/l	< 0.05
Arsenic, As, ug/l	11
Cadmium, Cd, mg/l	< 0.002
Chromium, Total, Cr, mg/l	< 0.002
Selenium, Se, ug/l	24
Iron, Fe, mg/l	0.22
Zinc, Zn, mg/l	0.19
Copper, Cu, mg/l	< 0.002

Note 1: TDS was not included because the addition of [illegible] was necessary to maintain the sample pH at 5.0 adds [illegible]

Note 2: pH was maintained at 5.0 for 24 hours [illegible]

CH2M HILL
engineers
planners
economists
scientists

MEN02201

April 29, 1981

L13351.D0

Mr. John R. Blauwkamp
Technical Manager
Menasha Corporation
Box 155
Otsego, Michigan 49078

Dear Mr. Blauwkamp:

Five final copies of the initial hydrogeologic investigation for the Menasha sanitary landfill report at Otsego, Michigan, are attached.

The report is the result of a surface and subsurface geologic and hydrogeologic investigation and monitoring and analysis of groundwater from three test wells. Existing conditions of the landfill site are documented, probable water quality impacts are discussed, and recommendations are presented.

Our findings indicate that general groundwater quality is not severely impactd by leachate. This preliminary observation is based on three monitoring wells. Continued drilling established that it is impossible to establish an upgradient monitoring well to the east of the site because of subsurface conditions. As a result DNR has agreed to use the three existing wells for the required system. This approach may be subject to their desire to reduce the site to class 3 landfill status. However, I think Menasha's position on this issue is fair and should not be changed until it is clear how strongly DNR feels about this point.

Two copies of the final report without this cover letter should be forwarded to Elizabeth Bols at DNR for the department's review and approval. We have enjoyed working on this project and will welcome the opportunity to continue to assist Menasha in your waste management program.

Sincerely,

Steven R. Hoffman/DNP

Steven R. Hoffman, P.E.
Assistant Director, Solid Waste Management

lch

Attachment

Seattle Office
1500 114th Avenue S E, Bellevue, Washington 98004 206/453-5000

1536

MEN02202

SANITARY LANDFILL

HYDROGEOLOGIC INVESTIGATION

For

MENASHA CORPORATION
Otsego, Michigan

April 1981

CH2M HILL Michigan, Inc.

1537

SANITARY LANDFILL HYDROGEOLOGIC INVESTIGATION

INTRODUCTION

This report presents the results of the hydrogeologic investigation for Menasha Corporation's sanitary landfill, Otsego, Michigan.

The study is in compliance with Act 641, Public Acts of 1978, for reissuance of a solid waste disposal license for the landfill. Our objectives were (1) to determine existing hydrogeologic conditions, (2) to evaluate the potential for groundwater degradation, and (3) to establish a groundwater quality monitoring program.

This report discusses site conditions, the field investigation and groundwater occurrence, groundwater quality, and rate of movement.

SITE LOCATION AND SURFACE CONDITIONS

The Menasha landfill is in a land parcel located in the southeast 1/4 of Section 14, Otsego Township, Allegan County, Michigan.

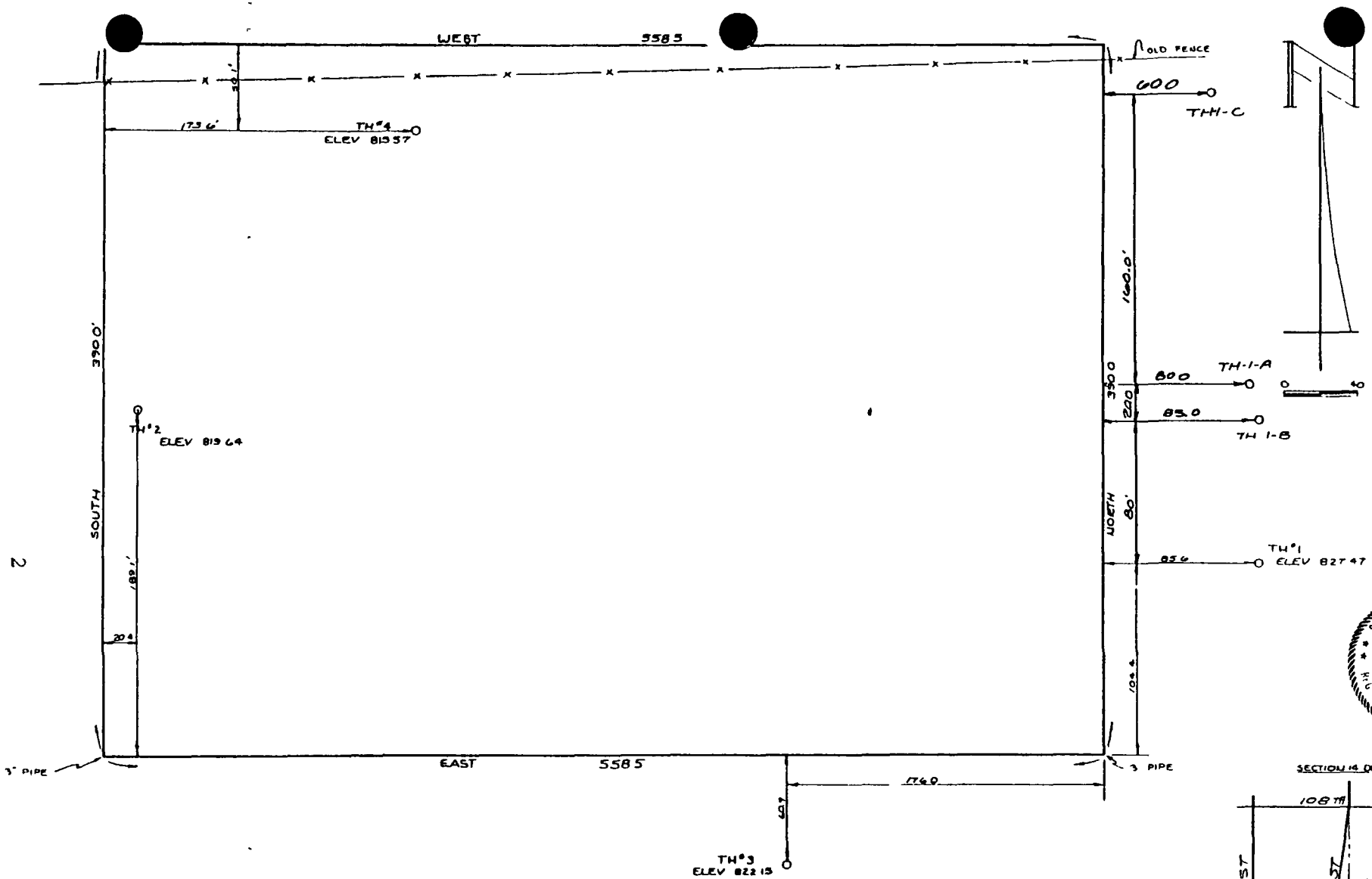
In essence, the subject site is located approximately 1 mile northeast of Otsego, Michigan, on a glacial moraine or ridge. The top of the ridge is characterized by "swell and swale" topography and poor drainage. Some marsh and bogs are located in natural topographic lows in the vicinity of the landfill. The fill itself occupies a natural depression. Surface runoff in the vicinity drains into the fill area as well as two adjacent boggy depressions where the runoff tends to pond on the surface.

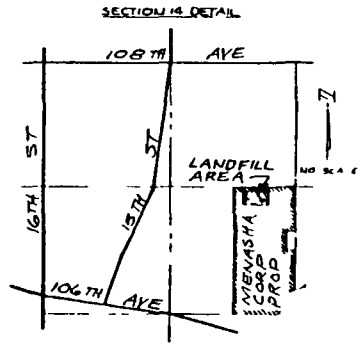
Vegetation in the vicinity consists of native grasses, shrubs, and pine trees. The landfill itself is devoid of vegetative cover. The area to the north of the landfill is being used for agricultural purposes. Figure 1 presents the landfill site survey.

GEOLOGIC SETTING

Regional Geology

The landfill area is located in the northeasternmost portion of the Interior Lowlands physiographic province. This region covers the central United States and is bounded on the west by the Great Plains, on the east by the Appalachian Plateau





PARCEL DESCRIPTION:
COMMENCING AT THE EAST 1/4 POST OF SECTION 14, T 1 N, R 12 W, THENCE WEST ON THE EAST AND WEST 1/4 LINE 511.51 FEET TO THE PLACE OF BEGINNING OF THIS DESCRIPTION; THENCE CONTINUING WEST ON THE 1/4 LINE 558.5 FEET, THENCE SOUTH AT RIGHT ANGLES 390.0 FEET, THENCE EAST 558.5 FEET, THENCE NORTH 390.0 FEET TO THE PLACE OF BEGINNING, BEING 5.0 ACRES

NOTE
1. TEST HOLE DESCRIPTION: 2" PVC PLASTIC PIPE SET IN CONCRETE
2. ELEVATIONS TAKEN FROM BLUE MARK ON TOP LIP OF PIPE
3. ALL BOUNDARY INFORMATION PER D.A. BATEKIN & ASSOC. INC SURVEY (INCLUDING SPOTTED FENCE).
4. ELEVATIONS ARE BASED ON U.S.G.S. DATUM

FIGURE 1 SITE SURVEY
MENASHA SANITARY LANDFILL
OTSEGO, MICHIGAN

2

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MEN02204

and on the south by the Ozark Dome and Ouachita Uplift. The Interior Lowlands are low altitude, relatively flat areas that are generally seismically stable. Most areas in the region, with the exception of great basins like the Michigan Basin, are characterized by relatively horizontal undeformed sedimentary rocks overlying Precambrian igneous and metamorphic basement rocks.

Regional Structure

The Michigan Basin is the dominant structural feature in Michigan. The Michigan Basin is an equidimensional depositional basin consisting of up to 14,000 feet of Paleozoic sedimentary rocks dipping gently toward a common center. Older rock formations occur farthest from the center. In many localities hundreds of feet of glacial deposits cover the bedrock formations that form the Michigan Basin. Figures 2 and 3 illustrate the regional geologic map and stratigraphic column section, respectively.

Local Geology and Structure

The landfill site is located in an area which has been extensively glaciated. It is located adjacent to the Kalamazoo Morainic System, a series of northeast-southwest trending glacial ridges or moraines made up of glacial till (unsorted silt, clay, gravel, and boulders). The area is characterized by hummocky topography and poor drainage resulting in numerous bogs on the surface of the ridges.

Adjacent to the moraines is an eroded outwash plain consisting of stratified silts, sands, and gravels that were deposited by glacial meltwater. Beneath these recent surficial deposits is the bedrock unit known as the Lower Marshall Formation.

The landfill is underlain by deposits of glacial outwash underlain and interbedded with unsorted, ice-deposited glacial till. The deposits beneath the site are erratic, consisting of numerous intertonguing or lenticular sands, gravels, silts, clays, and tills. These glacial deposits are underlain by sandstone bedrock unit. This unit is encountered at a higher elevation on the eastern end of the landfill than the western end. It appears that a bedrock ridge extends north from the falls area in the river to the eastern end of the landfill and possibly farther north. This subsurface bedrock ridge appears to control the groundwater movement and occurrence in the area.

FIELD INVESTIGATION

The field investigation included a geologic reconnaissance, drilling test borings, installing piezometers, and soil

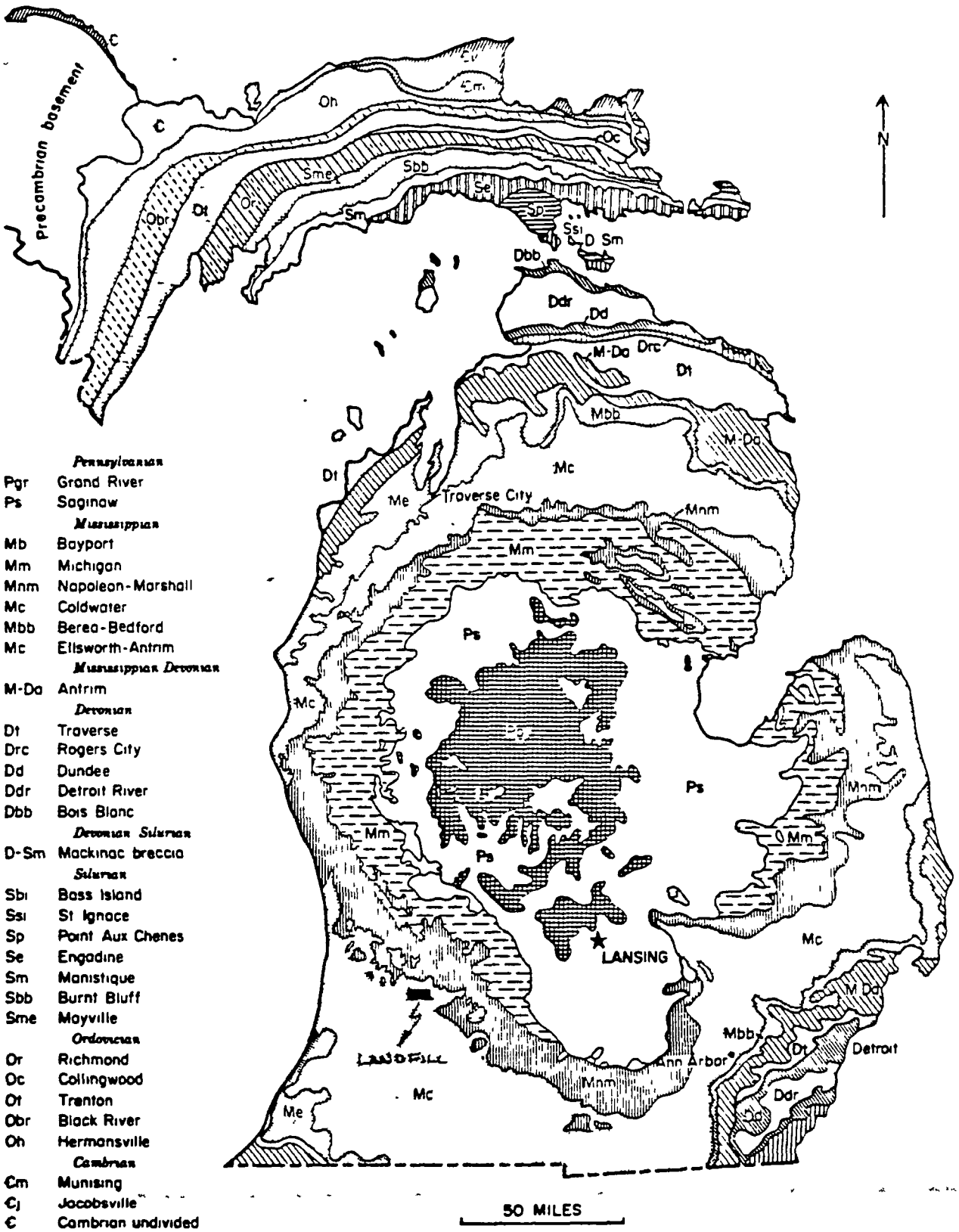
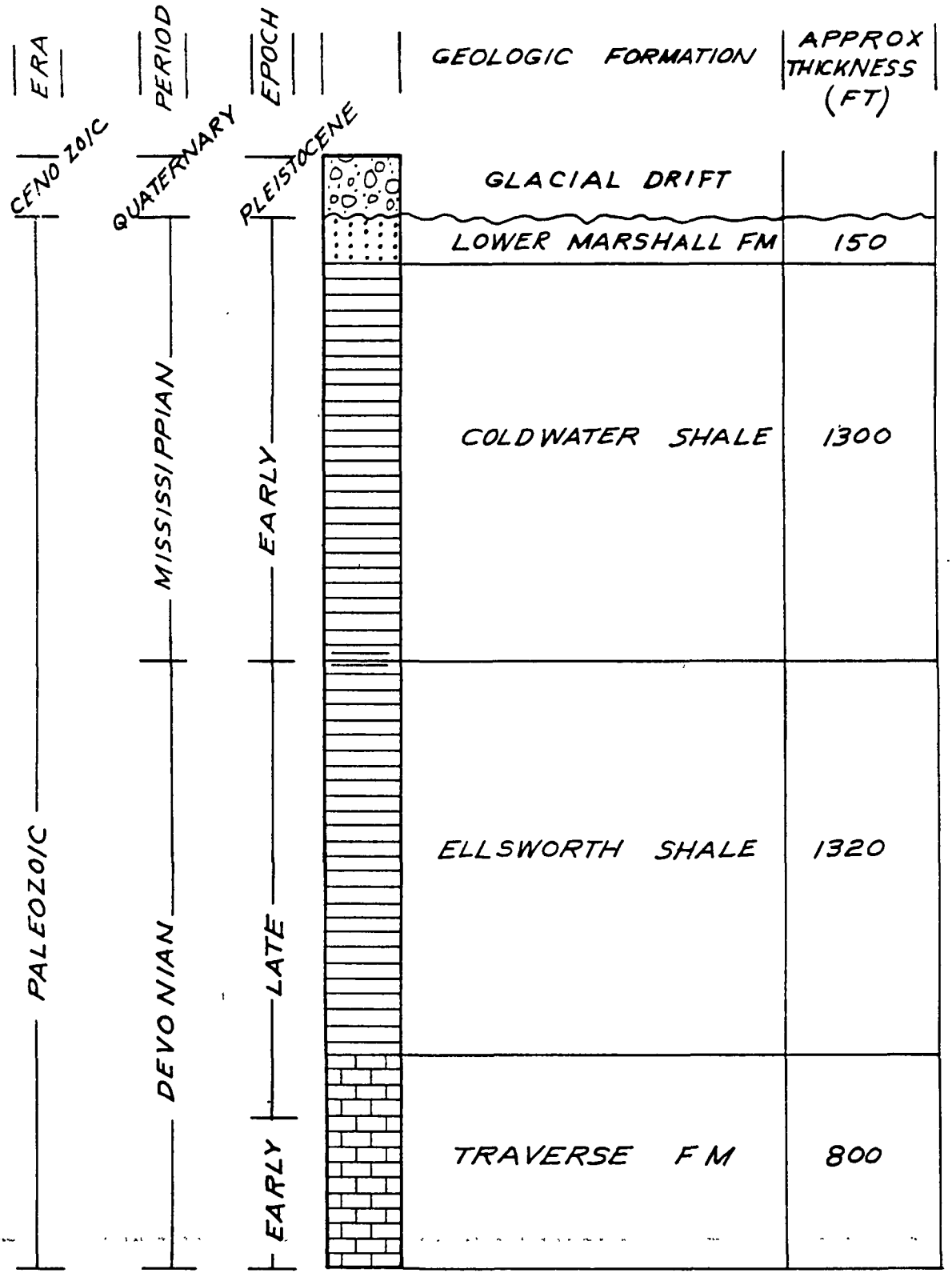


FIGURE 2 REGIONAL GEOLOGY

1541



LEGEND

- SANDSTONE
- SHALE
- LIMESTONE / DOLOMITE
- UNCONFORMITY (EROSIONAL GAP)

FIGURE 3
STRATIGRAPHIC COLUMN
GENERALIZED FOR OTSEGO AREA

1542

sampling. The initial field work was conducted from August 4, 1980, to August 18, 1980. Four borings ranging in depth from 102 to 140 feet were drilled under the supervision of a CH2M HILL engineering geologist. The drilling was conducted by Mateco Drilling, Inc., using a CME-55 rotary drill. Standard Penetration Tests (ASTM D 1586) were performed at 5- to 15-foot intervals. Samples were visually inspected and classified in the field. Figure 4 presents the boring locations and groundwater contours, and Figure 5 illustrates these boring logs. After drilling of these four wells was completed, 2-inch-diameter PVC casing attached to 5 feet of 1-1/4-inch slotted PVC was set and the slots flushed clean with water. The slotted PVC was then packed with "pea" gravel, which was sealed with a 2-foot bentonite seal. Bentonite/cement grout was placed from the top of the seal to the surface. Each completed piezometer has approximately 2 feet of casing rising above the ground and marked in a manner that identifies each well. Each well is capped with a PVC cap. Figure 6 illustrates typical monitoring well design.

Approximately 1 month after TH-1 was installed it was discovered that the well was dry and the bottom was full of soil material to elevation 740. After the attempted jetting of TH-1 to reestablish it as a monitoring well proved unsuccessful, TH-1A was drilled (see Figure 1 or 4 for location). The log of this well and the wells discussed below is presented in Table 1. After a period of time this well also proved to be dry.

In February 1981 another well was drilled (TH-1B) next to well TH-1A with the intent of going deeper, but the drillers were unable to penetrate the bedrock. The hole also proved to be dry, and the drill was moved to the TH-1C location to see if more depth could be obtained in that area. No additional depth could be achieved and water was not encountered at TH-1C.

It should be noted that TH-1A was drilled with a mud rotary drill rig. TH-1B and TH-1C were drilled with a solid stem auger rig. All the dry wells (TH-1, 1A, 1B, and 1C) were plugged with grout according to the standards of the State of Michigan.

LABORATORY TESTING

Sieve analyses, moisture contents, Atterburg limits, modified Proctor compaction, and permeability tests were run on representative samples recovered in the field. Table 2 presents the summary results of laboratory soil testing. No further testing was done on material from Test Holes 1A, B, and C.

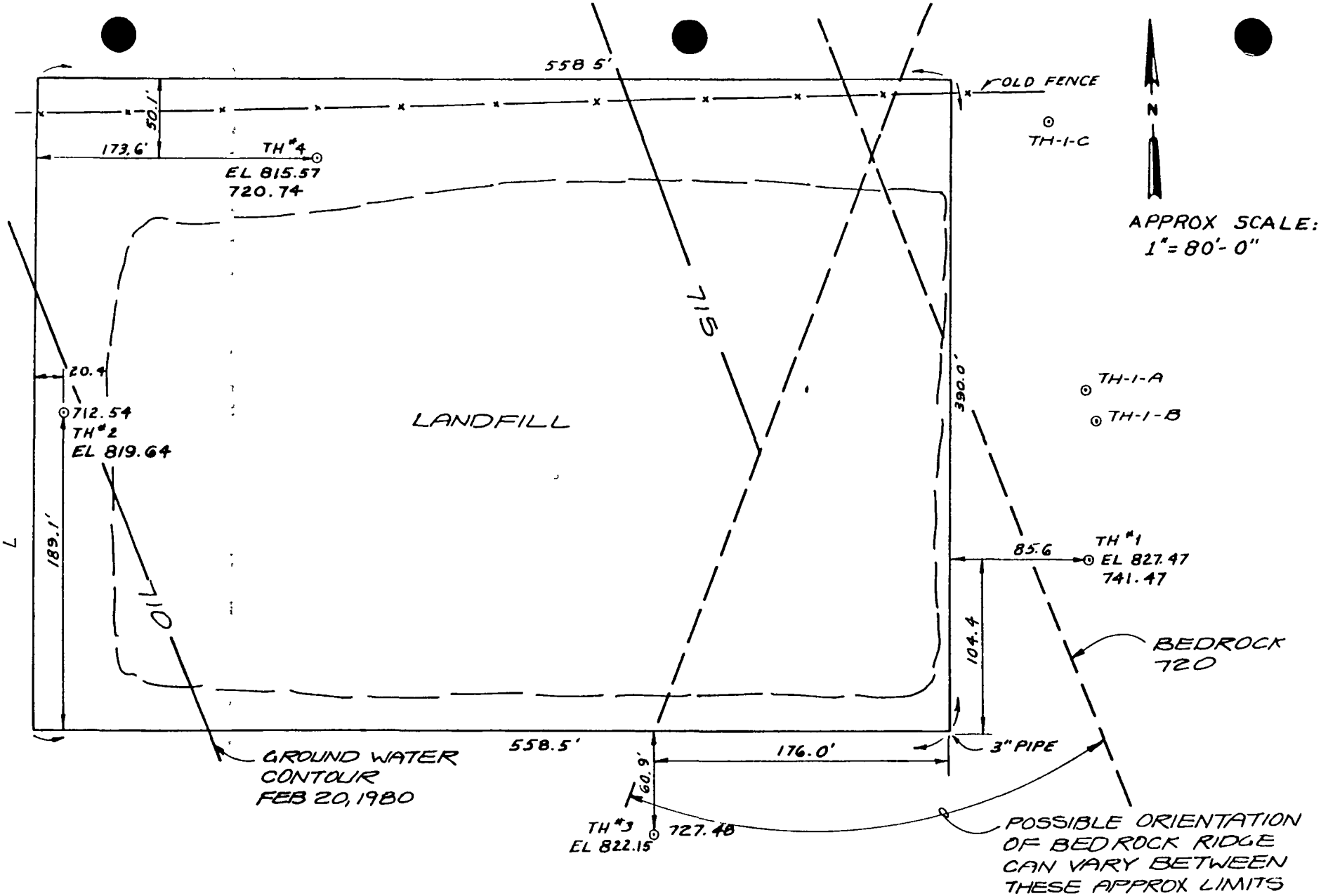


FIGURE 4 GROUNDWATER CONTOURS AND BORING LOCATIONS

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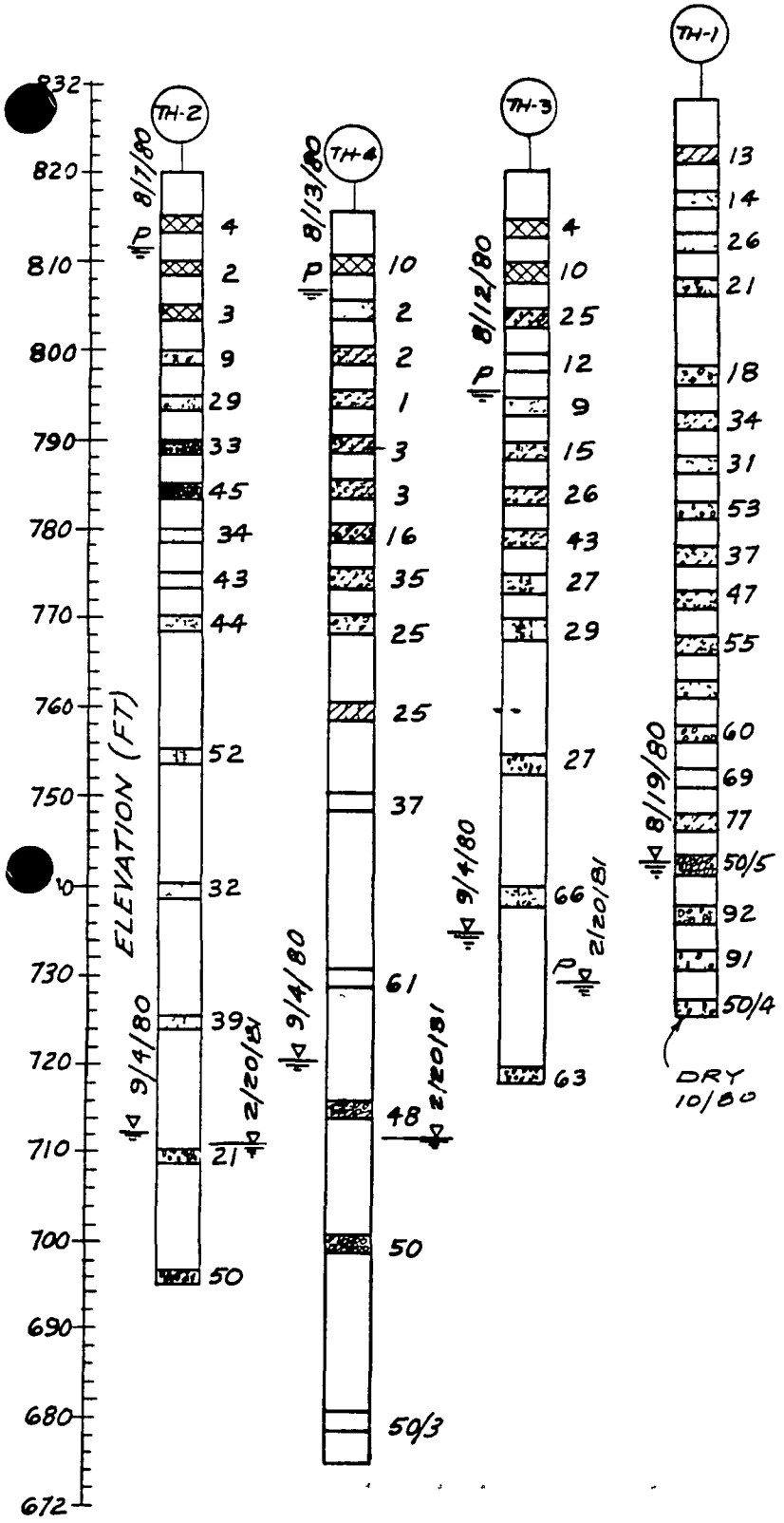

NOTES:

1. ELEVATIONS PROVIDED BY PEABODY SURVEYING USING USGS DATUM.

2. THE LOGS REPRESENT SUBSURFACE CONDITIONS ONLY AT BORING LOCATIONS. VARIATIONS FROM THE CONDITIONS SHOWN MAY OCCUR BETWEEN BORINGS ALSO, THE PASSAGE OF TIME MAY RESULT IN VARIATIONS FROM THE CONDITIONS SHOWN

LEGEND

- FILL
- SANDY, CLAYEY
- GRAVEL
- SAND
- SILT, SANDY
- GRAVEL, SANDY
- CLAY, SANDY
- CLAY, GRAVELLY
- SAND, GRAVELLY
- CLAY, SILTY
- SAND, SILTY
- NO SAMPLE RECOVERY

P PERCHED WATER TABLE

4 #BLOWS PER FOOT (STANDARD PENETRATION)

50/3 PENETRATION LESS THAN 1FT.

FIGURE 5 LOGS OF TEST HOLES

1545

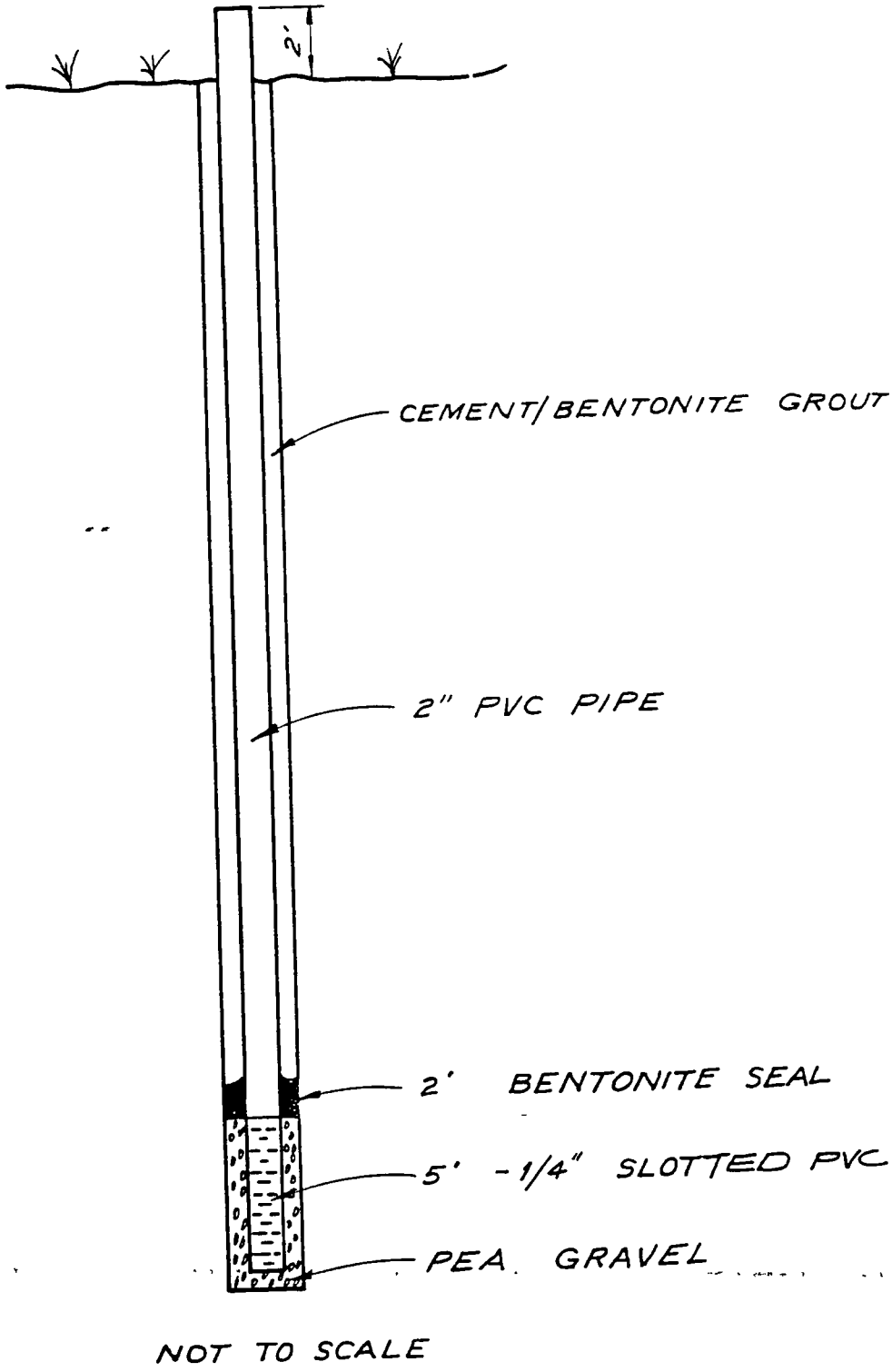

FIGURE 6 TYPICAL MONITORING WELL DESIGN

1546

Table 1
WELL LOG

Well No. TH-1A 19-21 November 1980
Driller: C. S. Raymer Co.

Depth	Description
0-3	Brown sand
3-8	Brown gravelly sand
8-18	Brown gravelly sandy silt
18-82	Brown gravelly sand
82-88	Fine gravelly sand (water bearing?)
88-93	Gravelly sand
92-104	Coarse sandy gravel
104-106+	Very dense sandy gravelly silt or bedrock

Water: 97' at completion
103' at 24 hours
None at 2 weeks

Well No. TH-1B* 13 February 1981
Driller: Craig Standish

Depth	Description
0-6	Brown clay and gravel
6-112	Sand gravel and stone
112	Auger refusal (bedrock ledge?)

Water None at completion
None at 72 hours

Well No. TH-1C* 20 February 1981
Driller: Craig Standish

Depth	Description
0-6	Brown clay and gravel
6-98	Sand, gravel, and stone
98	Auger refusal (bedrock ledge?)

Water: None at completion
None at 72 hours

*Note: Hole logged by driller.

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Table 2
SUMMARY OF LABORATORY SOIL TESTING

Boring	Depth	Atterburg Limits LL	PL	PI	Moisture %	Permeability (cm/sec)	Unified Classification
B1	5.0	36.4	20.8	15.6	17.1	--	CL-SC
B2	25.0	17.2	13.2	4.0	14.5	--	CL-ML
B2	65.0	--	--	NP	19.2	--	SM
B3	15.0	37.5	25.4	12.1	20.7	--	ML-SM
B3	65.0	17.2	15.4	1.8	20.7	--	SM
B4	5.0	13.8	11.9	1.9	9.4	--	SM
B4	20.0	--	--	NP	19.3	--	SP-SM
B4	35.0	32.8	19.5	13.3	91.4	--	CL-SC
B4	55.0	--	--	--	11.7	1.5×10^{-8}	ML
Borrow Pit	1.0	--	--	--	11.4	5.9×10^{-6}	SM-ML

FIELD TESTING

Field permeability tests were performed in each of the monitoring wells using the slug-injection method (Ferris and Knowles, 1953). Results of this testing will be discussed in the Groundwater section. No further field tests were performed on Test Holes 1A, B, and C.

GROUNDWATER

Water-Bearing Properties of Glacial Drift

As stated earlier, the landfill site is underlain by coarse stratified glacial outwash and zones of fine unsorted till. The materials encountered are lenticular and discontinuous in nature, and accurate correlation between borings is not possible. Aquifers in glacial deposits are characterized by discontinuities and zones of varying permeability. The best water-bearing zones are usually the coarse-grained, stratified outwash deposits described above.

For the purposes of this discussion, it is assumed that because the glacial deposits are so discontinuous in nature they are essentially acting as a single aquifer at depth. Where fairly impermeable lenses are located near the surface, shallow limited perched water tables exist. Perched water was encountered in Test Holes 2, 3 and 4.

Permeability Tests in Monitoring Wells

Slug-injection tests were performed in all four monitoring wells. By adding a known volume of water as a "slug" into

1548

the well and monitoring the rate of decline of water level versus time, the transmissivity and permeability of the water-bearing unit may be calculated (Ferris and Knowles, 1953). The results of the slug tests were analyzed by the Hvorslev Method based on the following assumptions: The test zone was isotropic soil; the well point was different diameter from the casing; the test section was below the water table; and the test section was at great depth. The formula used to determine approximate permeability was:

$$K = \frac{A}{F(t_2-t_1)} \quad 2.3 \frac{h_1}{h_2}$$

where: K = mean permeability
F = a shape factor determined by $F = \frac{2 \quad L}{2.3 \ L/R}$
A = casing area
L = length of the test section
h = active head
t = time since start test
R = radius pipe
h_1, h_2 and t_1, t_2 are determined graphically

The results of the field permeability are presented in Table 3.

The permeability tests indicate that the overall permeability of the water-bearing zone is moderate. The permeability may range from very high in the gravel lenses or beds to quite low in clay or silt lenses. Typical permeabilities for various materials are listed in Table 4.

The average transmissivity of the test sections is calculated to be 1,270 gpd/ft which is also in the moderate range.

GROUNDWATER OCCURRENCE AND MOVEMENT

Beneath the landfill site area, groundwater occurs within the pore spaces of the sediments comprising the glacial deposits. Below the water table, the pores are completely saturated. Above the water table in the unsaturated zone, the pore spaces are only partially filled with water. Within this zone, the direction of groundwater movement is essentially downward. However, the downward percolation of water may locally be impeded or the direction altered by small impermeable lenses of glacial till or clay. Beneath the water table groundwater follows the hydraulic gradient from areas of high groundwater elevation to areas of lower groundwater elevation.

The bedrock ridge described in the geology section appears to extend to a high enough elevation so it does not have

1549

Table 3
FIELD PERMEABILITY

	TH1	TH2	TH3	TH4
Approximate Saturated Thickness	15 ft.	15 ft.	10 ft.	15 ft.
Transmissivity*	1710.75 gpd/ft.	1156.68 gpd/ft.	646.90 gpd/ft.	1573.08 gpd/ft.
Mean Permeability	6.76×10^{-3} cm/sec	3.82×10^{-3} c/msec	3.04×10^{-3} cm/sec	5.1×10^{-3} cm/sec

*Saturated thickness of the test section is taken as being the thickness, in feet, from the bottom of the well screen to the static water level. The transmissivity is calculated by multiplying the permeability by the approximate saturated thickness.

1550

MEN02215

Table 4
TYPICAL PERMEABILITY FOR DIFFERENT SOILS

Soil Type	Permeability (cm/sec)
Clean gravels	10^{1} - 10^{2}
Clean sands	1.0
Sand and gravel mixtures	10^{-4} - 10^{-1}
Fine sands	10^{-5}
Silts; silt, sand, and clay mixtures; stratified clays	10^{-6} - 10^{-5}
Clays	10^{-9} - 10^{-7}

Source: Casagrade and Fadim (1940)

free groundwater occurring on top of it. Test Holes TH-1, TH-1A, TH-1B, and TH-1C all were dry holes. TH-1 and TH-1A were drilled with a mud rotary rig and developed by jetting with clean water: This water, which was induced into the formation, must have been water levels measured prior to the well becoming dry. The groundwater must flow away from this ridge.

Figure 7 is a portion of the USGS Otsego Quadrangle, which shows the area's general topography. We have depicted the trend of this bedrock ridge as probably being toward the dam site on the river (see Figure 7), but this is only inferred. Figures 8, 9, and 10 present topographic cross sections that illustrate the relationship of the landfill to the area's topography. Locations of the sections are presented in Figure 7.

Based on the water level data gathered to date (see Figure 5), the groundwater flow direction appears to be to the west-southwest in the area of the site. This localized condition beneath the site is probably caused by the bedrock ridge which does not allow the regional table to flow directly toward the river as the topographic cross sections and the position of the Kalamazoo River with respect to the landfill would suggest. A preliminary water table contour map is included based on the water levels taken (see Figure 4). More field data are required to confirm this.

Well TH-3 has a water level elevation approximately 17 feet above what we consider to be the regional water table based on levels in TH-2 and TH-4 and the lack of water in the TH-1 series. Our conclusion, based on these data, is that TH-3 must be tapping a localized perched aquifer. Its aerial extent must be small because all the other holes have not penetrated it and caused it to drain. The resulting water

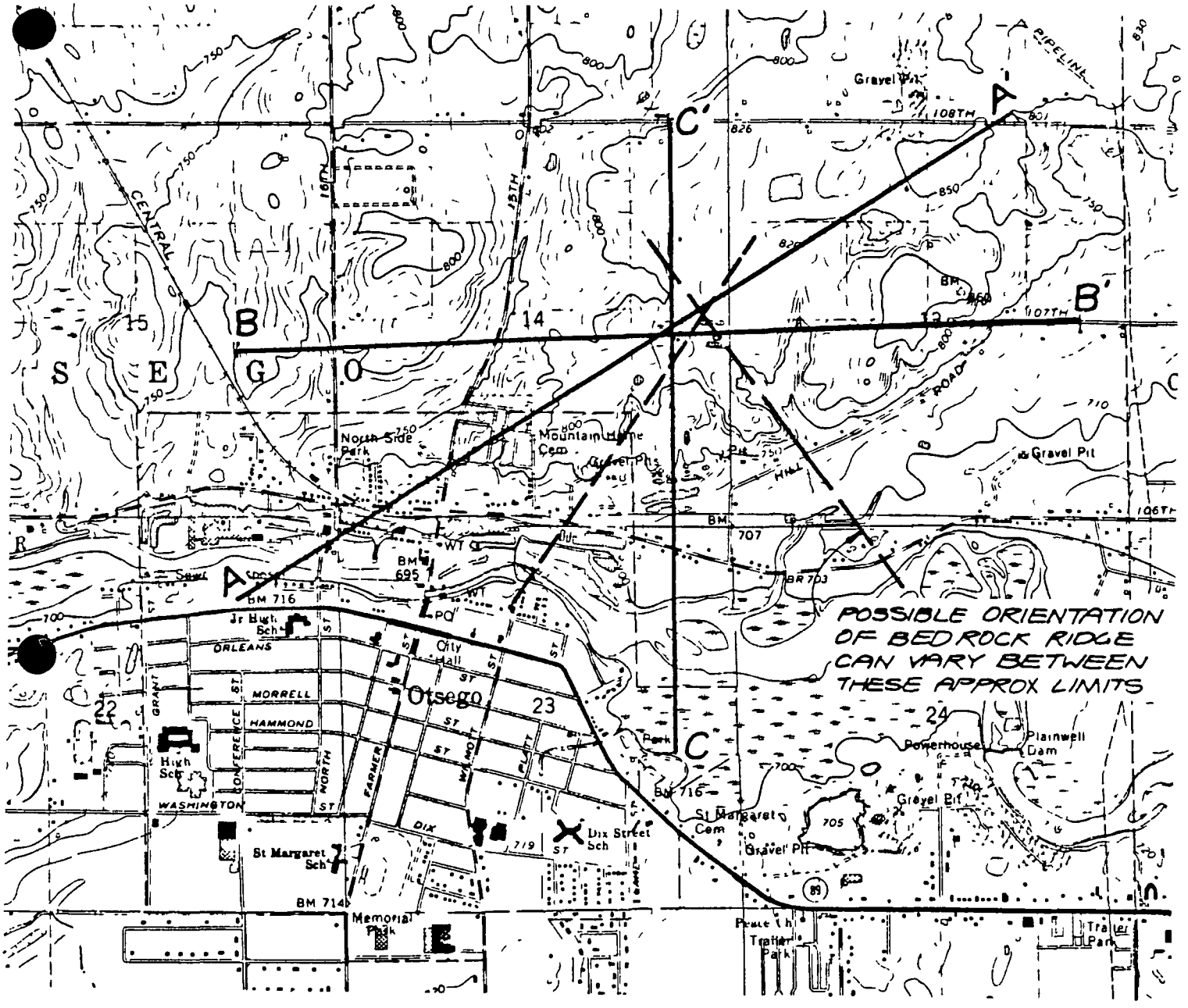


FIGURE 7 SECTION LOCATIONS

1552

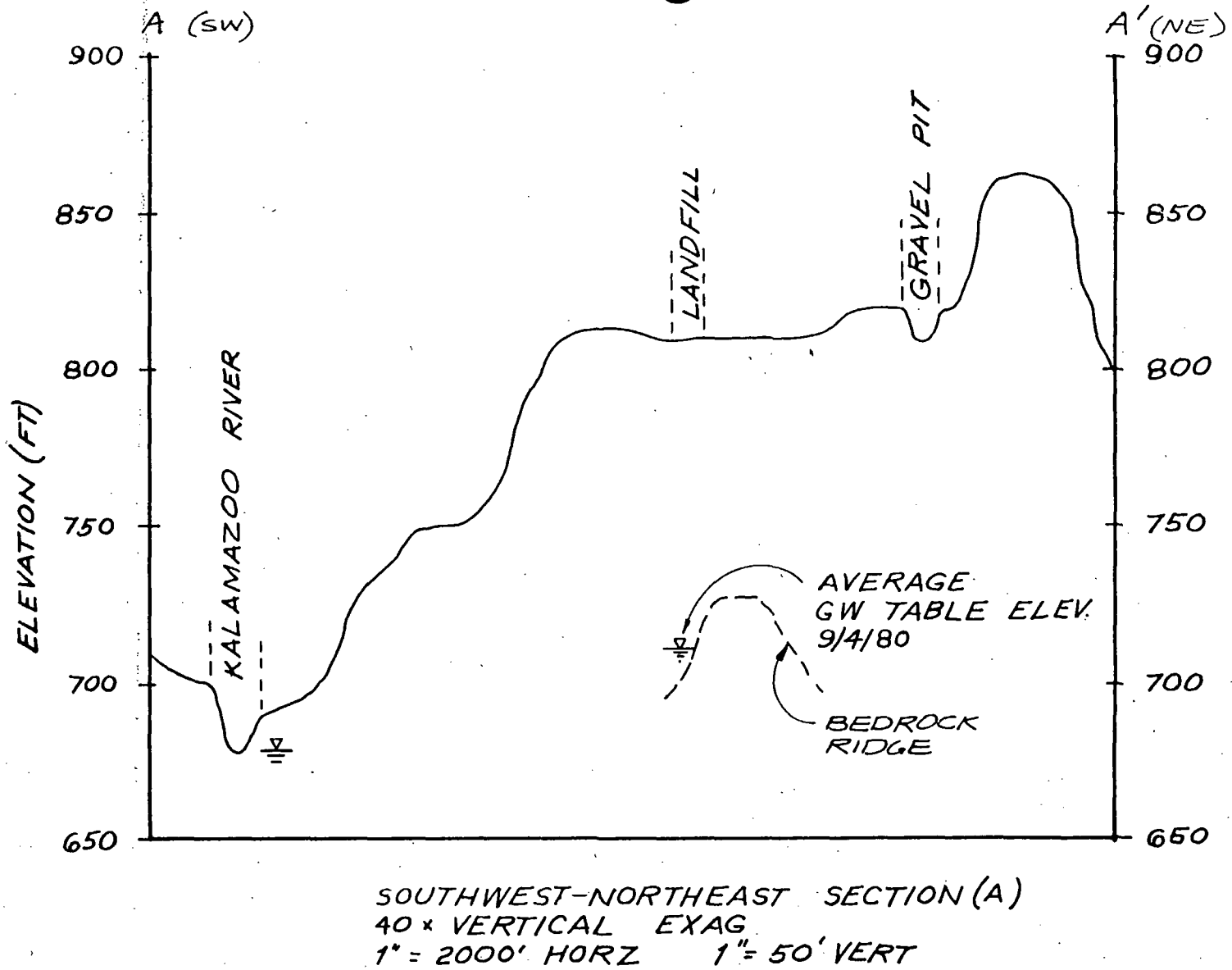


FIGURE 8 TOPOGRAPHIC SECTION A

1553

MEN02218

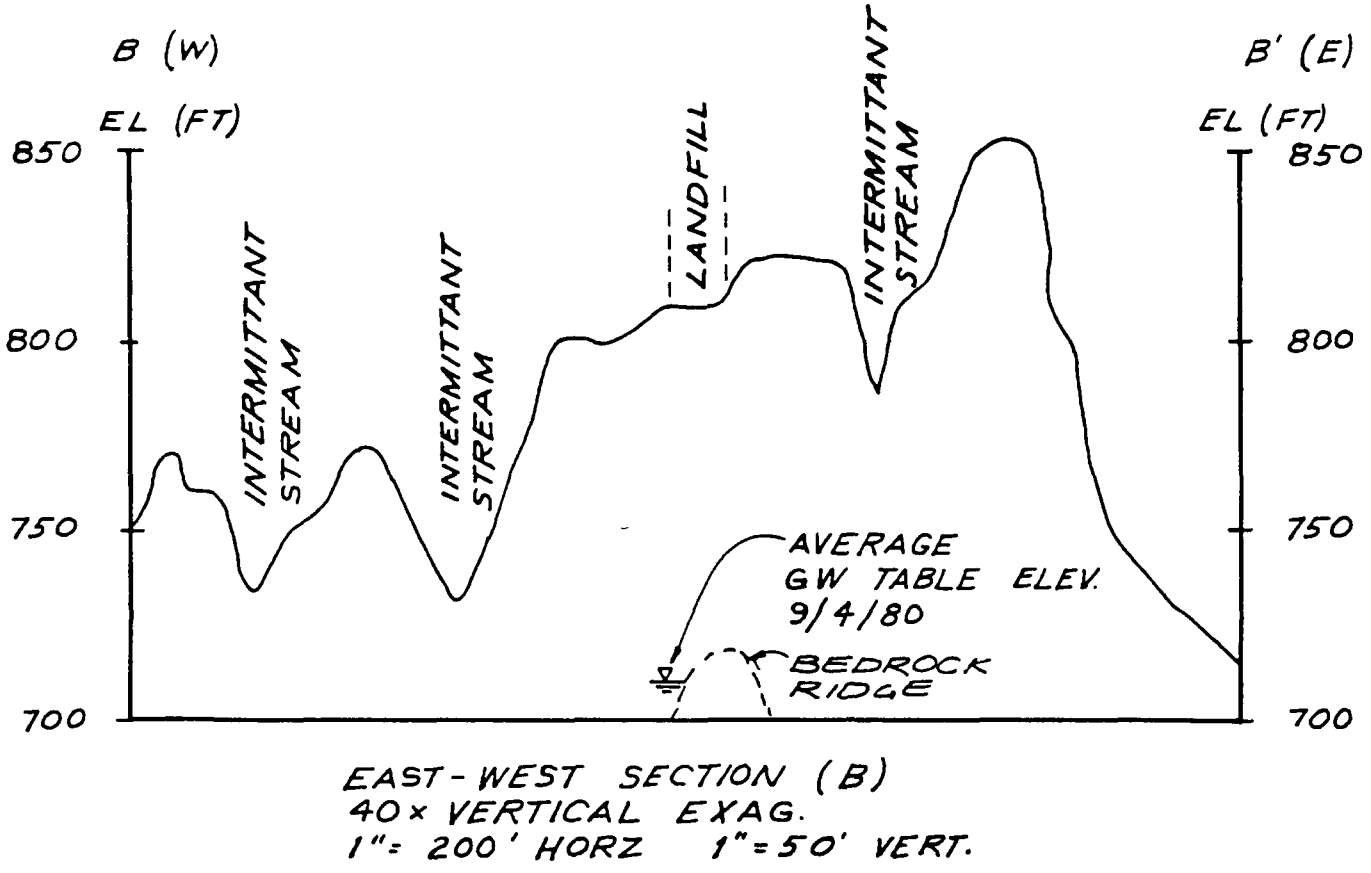
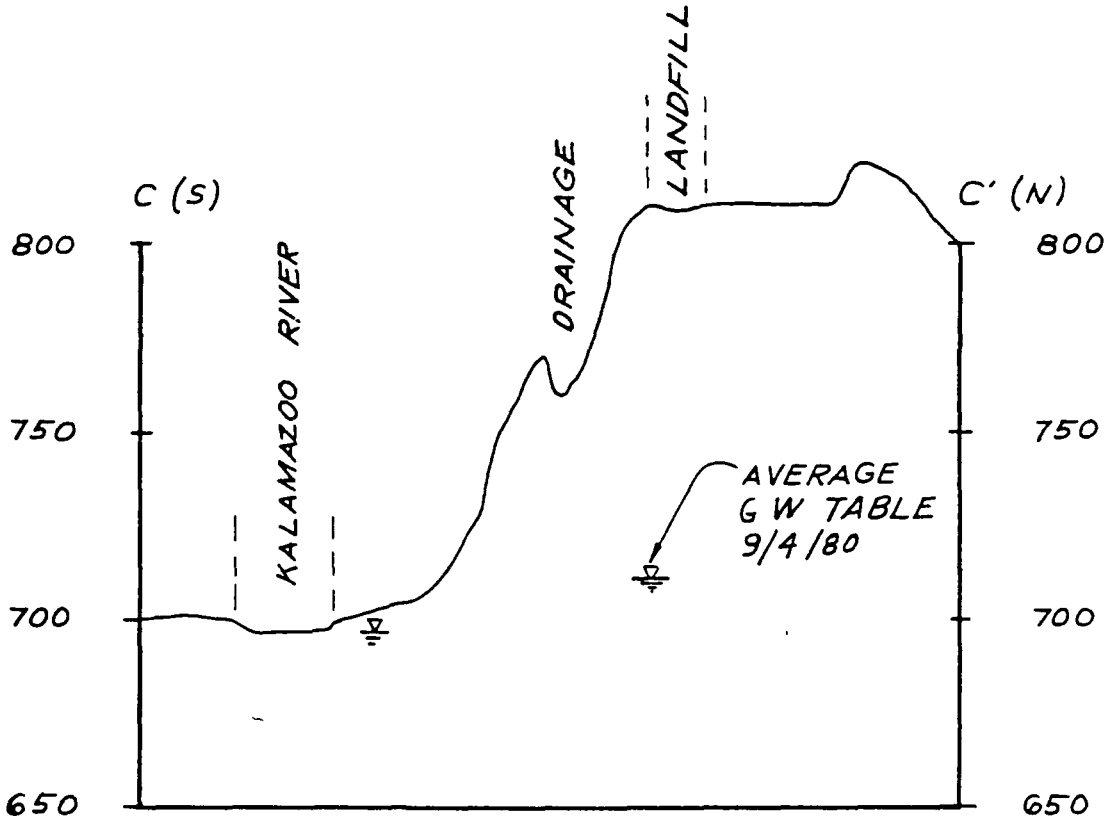


FIGURE 9 TOPOGRAPHIC SECTION B

1554



SOUTH - NORTH SECTION (C)
40 x VERTICAL EXAG.
1" = 2000 HORZ. 1" = 50' VERT.

FIGURE 10 TOPOGRAPHIC SECTION C

1555

quality results from this well must be tempered by the fact that this aquifer is not the regional aquifer and therefore the concentrations of contaminants do not reflect regional water quality more accurately described by wells TH-2 and TH-4.

We recommend that well TH-4 be considered the upstream well. Based on the groundwater data we have obtained, it appears to be not downgradient of the landfill because of parallel flow conditions and therefore representative of upgradient groundwater conditions. Well TH-2 would be the downstream monitoring well.

GROUNDWATER GRADIENT AND FLOW RATES

The quantity of groundwater moving beneath the site can be calculated from the following:

$$Q = TIL$$

where:
- Q = quantity (gpd) of groundwater moving beneath the site
- T = transmissivity (gpd/ft)
- I = hydraulic gradient
- L = aquifer width (ft)

The average calculated transmissivity of the test sections is 1,270 gpd/ft. The hydraulic gradient (based on the preliminary water table contour map) is about 0.05 ft/ft or less and the aquifer width is great (about 500 feet). Using the above equation, the quantity of groundwater moving beneath the site is about 31,000 gallons per day, 0.10 acre-foot per day, or 36 acre-feet per year.

The average groundwater velocity can be determined by:

$$V = \frac{KI}{\emptyset}$$

where:
- V = average groundwater velocity (ft/day)
- I = hydraulic gradient
- Ø = effective porosity
- K = permeability (ft/day)

The average calculated permeability of the portion of the aquifer tested is 13.13 ft/day, the gradient is 0.05 ft/ft, and the estimated effective porosity of the test sections is 0.45. The calculated velocity is then 1.31 ft/day or 480 ft/year. Based on this it would take approximately 1-3/4 years for groundwater to travel from east to west beneath the site. We believe this is a maximum value and the real flow is less.

PRESENT USE OF GROUNDWATER

No production wells exist within the boundaries of the existing landfill. A reconnaissance survey of wells in the area indicated 33 wells exist within a 1-mile radius of the site, with the majority of the wells supplying domestic water supplies. No wells exist immediately adjacent to or downstream of the landfill.

Appendix A presents the 33 water well records on file with the Michigan Department of Public Health. Figure A-1 in the same appendix illustrates the locations of the 33 waterwells. A review of the logs generally indicates that the wells on the ridges obtain their water from wells in the 100- to 140-foot-depth range. This is probably the same aquifer as that which is being measured in the monitoring wells at the landfill site.

GROUNDWATER QUALITY ANALYSIS

Groundwater samples were taken from three monitoring wells, (wells TH-2, TH-3, and TH-4) on October 2, 1980; well TH-1 was found to be dry. Analyses were performed for select parameters as presented in Table 5 in addition to their analytic results.

According to the groundwater flow direction, well TH-4 is on the upstream side and well TH-2 is downstream. The perched water from well TH-3 appears to be more contaminated than water from the other two wells. This water quality is based on one sampling episode only.

Table 5 illustrates the analytical water quality results from the three wells and compares them to the EPA primary and secondary drinking water standards. This comparison shows that well TH-3 has a high specific conductance, indicative of a high TDS and hardness. Well TH-3 surpasses the EPA secondary drinking water standards in TDS, SO_4, and Mn and surpasses the primary standards in Pb. Though there is a general increase in contaminant levels between the upgradient (Well TH-4) and the downgradient (Well TH-2), Well TH-2 surpasses the secondary EPA standard for only Mn, while Well TH-4 water quality meets all EPA standards.

CONCLUSIONS

1. Site is located in a geogologic area of glacial ridges or moraines. The area is characterized by hummocky topography and poor surface drainage.

Table 5
GROUNDWATER QUALITY FROM MENASHA LANDFILL WELLS

Parameters	Well Number 2	Well Number 3	Well Number 4	EPA Primary and Secondary Drinking Water Standards
pH	8.2	8.2	7.9	6.5-8.5
Specific Conductance (m mohns/cm)	660.	5200.	550.	
COD mg/l	220.	330.	32.	
TOC mg/l	50.	110.	11.	
Phenols mg/l	0.10	0.10	0.10	
TDS mg/l	420.	3900.	330.	500.*
Nitrate (N) mg/l	0.60	0.15	0.14	10.0*
Chloride mg/l	22.	120.	41.	250.
Hardness ($CaCo_3$) mgl	320.	480.	250.	
SO_4 mg/l	38.	660.	24.	250*
Ag mg/l	0.02	0.02	0.02	0.05*
As mg/l	0.002	0.002	0.002	0.05*
Ba mg/l	0.07	0.21	0.08	1.0*
Cd mg/l	0.02	0.02	0.02	0.01*
Cr (total) mg/l	0.02	0.02	0.02	0.05*
Cu mg/l	0.02	0.12	0.02	1.0
F mg/l	0.19	0.53	0.71	1.4-2.4*
Fe mg/l	0.03	0.07	0.02	0.3*
Hg mg/l	0.0002	0.0002	0.0002	0.002*
Mn mg/l	0.07	0.47	0.02	0.05*
Pb mg/l	0.02	0.08	0.02	0.05*
Se mg/l	0.002	0.002	0.002	0.01*
Zn mg/l	0.05	0.32	0.04	5.0

*Indicates EPA primary standards.

Note: Well No. TH-1 Dry.

2. The site is underlain by deposits of glacial outwash consisting of numerous intertonguing or lenticular sands, gravels, silts, clays, and tills, and a bedrock ridge along the eastern side.

3. Permeability tests show that the silt and clay deposits have a permeability approaching 1×10^{-8} cm/sec, or quite low, while the sands and gravels have a rate of approximately 4×10^{-3} cm/sec, which is moderate.

1558

4. Since the glacial deposits are so discontinuous in nature, it is assumed that they are essentially acting as a single aquifer at depth.

5. The groundwater contours indicate the flow direction to be to the west-southwest. This does not seem consistent with the topography with respect to the position of the Kalamazoo River, but is consistent with the inferred location of the bedrock ridge.

6. A review of the water well records indicates that those in the uplands on the moraine obtain their water from the 100- to 140-foot range, which is a similar depth to that beneath the landfill.

7. The rate of movement of the groundwater beneath the site is less than 480 ft/year.

8. The high concentrations in well TH-3 for TDS, SO_4, Mn, hardness, and Pb could be caused by groundwater mounding in a perched groundwater table and is not considered representative of the regional groundwater system.

9. In essence, the water quality from all three wells, based on one sampling episode, is not of a poor quality.

10. Some of the water quality parameters could be impacted by seepage from nearby bogs.

RECOMMENDATIONS

1. The existing three wells should be measured for water level elevation and samples obtained quarterly as required. These samples should be analyzed for the parameters as shown in Table 5. This would provide more complete background data.

2. The additional water quality data and water table information will provide additional data on the direction of groundwater flow and the currently minor level of decreasing groundwater quality that occurs as groundwater crosses the site.

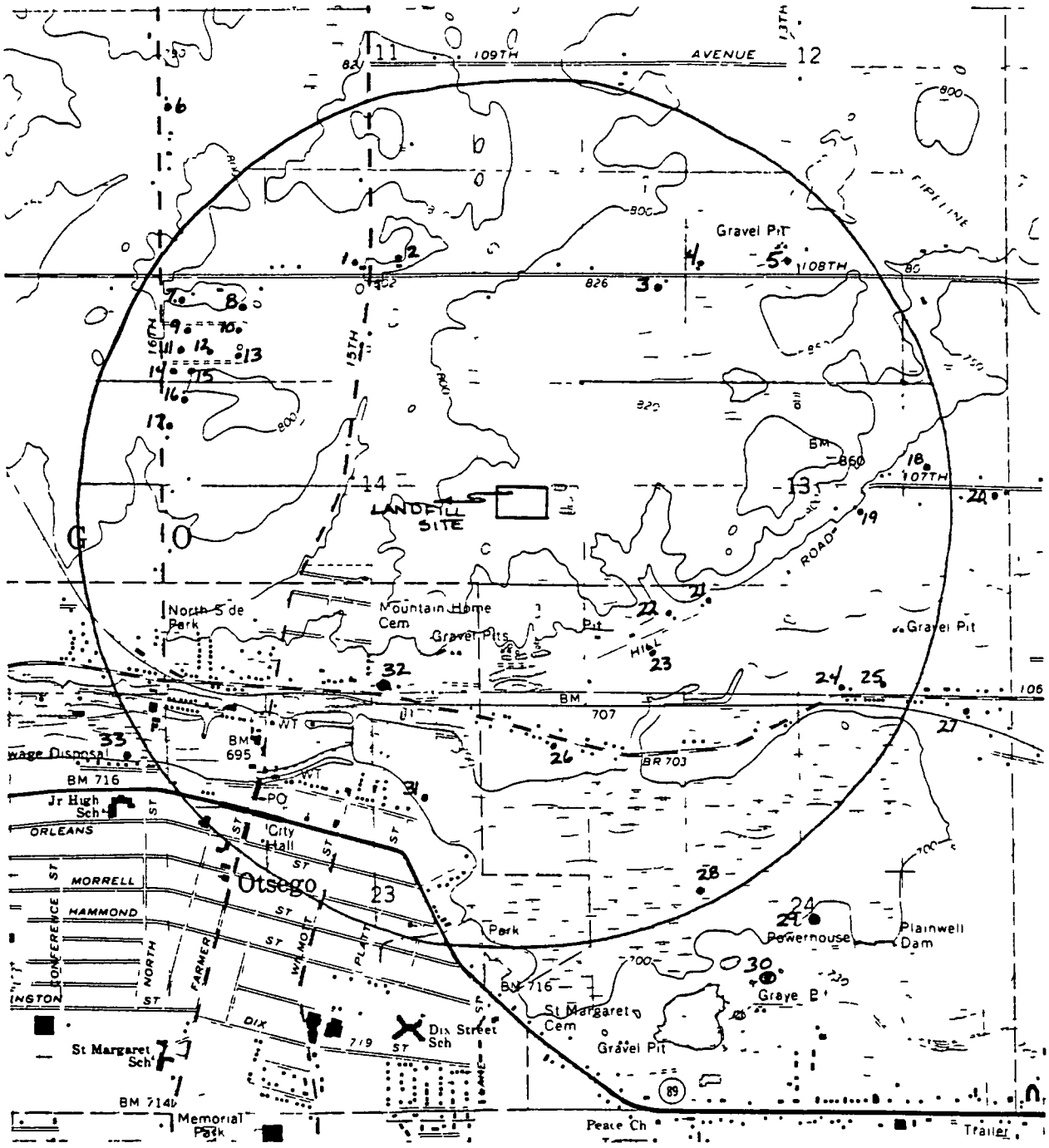
APPENDIX A

Existing Water Wells Within
One Mile of Landfill Site

Menasha Corporation
Otsego, Michigan

WATER WELLS WITHIN 1 MILE OF SITE

MEN02226



LEGEND

1. APPROXIMATE LOCATION DOMESTIC WATER WELL

29. APPROXIMATE LOCATION INDUSTRIAL WATER WELL

☐ APPROXIMATE SITE BOUNDARY

FIGURE A-1

MENASHA CORPORATION LANDFILL

1561

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02227

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

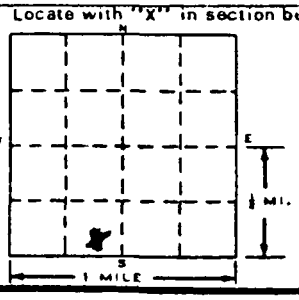
1 LOCATION OF WELL

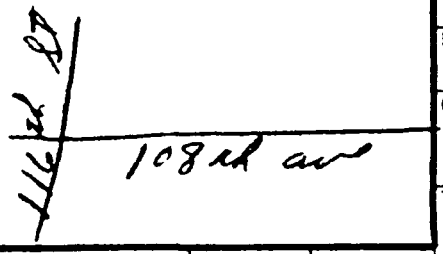
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	S.W. S.E. S.E.	11	1 N/S.	12 E/W

Distance And Direction from Road Intersections: NE of 116th St on 108th ave

Street address & City of Well Location: 1539 - 108th Otsego, Mich

Locate with "X" in section below — Sketch Map.





3 OWNER OF WELL: Wayne M. Vi... Sr. & Jr.

Address: 7045 Farmer St, Otsego, Mich

4 WELL DEPTH (completed) 94 ft. Date of Completion: Feb 26-72

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING Threaded ☒ Welded ☐

Diam. 2 in. to 90 ft. Depth

2 in. to 90 ft. Depth

Height Above/~~Below~~ Surface 1 ft.

Weight 3.65 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel - Clay	50'	50'
Sand & Gravel	18'	68'
Fine Sand	26'	94'

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Strainer Dia.: 1¼"

Slot/~~Gauze~~ 10 Length 4'

Set between 90 ft. and 94 ft.

Fittings. 1 - 1¼" coupling

9 STATIC WATER LEVEL 75 ft. below land surface

10 PUMPING LEVEL below land surface

85 ft. after 1 hrs. pumping 10 g.p.m.

85 ft. after 1 hrs. pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) NOT Chlorides (Cl) KNOWN

Hardness ____ Other ____

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

75 feet N.E Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP ☐ Not installed

Manufacturer's Name TAIT

Model Number 150-3 HP 1½ Volts 220

Length of Drop Pipe 82½ ft. capacity 10 G.P.M.

Type. ☐ Submersible ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

From 40' down to 70' packed sand

Hard to get through

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bates Well Drilling 9438

REGISTERED BUSINESS NAME — REGISTRATION NO

Address 300 Sh... Otsego, Mich

Signed [signature] Date Feb 28 72

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT COPY

WELL 1 1562

GEOLOGICAL SURVEY SAMPLE No.

MEN02228

434

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

#3

1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
ALLEGAN	OTSEGO	SE NWSW	11	1 N/S	12 E/W

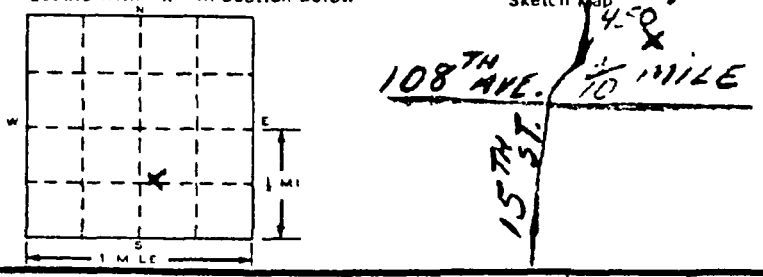
Distance And Direction from Road Intersections: OF 108TH AVE ON 15TH ST. 1/2 MILE NORTH

15TH ST OTSEGO, MICH.

Street address & City of Well Location

Locate with "X" in section below

Sketch Map



3 OWNER OF WELL

MRS. WILLIAM F. DEIKE

Address: 15TH ST. OTSEGO, MICH

4 WELL DEPTH (completed)

109 ft. Date of Completion: DEC 6 1979

5

☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE

☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING

Threaded ☒ Welded ☐

Diam. 1'

4 in to 103 ft. Depth

4 in to 103 ft Depth

Height Above ~~Below~~ Surface 1 ft.

Weight 10.19 lbs/ft.

Drive Shoe? Yes ☒ No ☐

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY	15'	15'
SAND + GRAVEL	75'	90'
BLUE CLAY	7'	97'
WHTER SAND	12'	109'

USE A 2ND SHEET IF NEEDED

8 SCREEN

U.S. STRAINER

Type JOHNSON Dia. 4"

Slot ~~Gauge~~ 7 Length 6'

Set between 103 ft and 109 ft.

Fittings LEAD PACKER 12"x3" NIP 3" PLUG

9 STATIC WATER LEVEL

82' ft. below land surface

10 PUMPING LEVEL below land surface

82 ft. after 1 hrs. pumping 18 g.p.m.

82 ft after 1 hrs pumping 18 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) Chlorides (Cl)

NOT KNOWN

Hardness Other

12 WELL HEAD COMPLETION

☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13

Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐

Depth From ft to ft

14 Nearest Source of possible contamination

90' feet W Direction SEPTIC Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

10CH7 ☐ Not installed

Manufacturer's Name FLINT + WALLING

Model Number 10CH7 HP 1 Volts 220

Length of Drop Pipe 89 ft capacity 27 G.P.M.

Type ☒ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

RIP BIKER WELL DRILLING 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 SHERWOOD ST. OTSEGO

Signed [signature] Date DEC 8, 1979

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT COPY WELL 2

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02229

#7

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

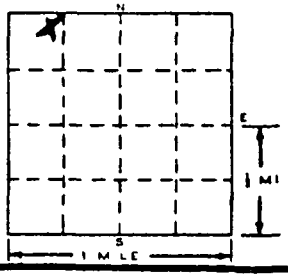
LOCATION OF WELL

City	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW-NW-NE	13	1 N/S	12 E/W

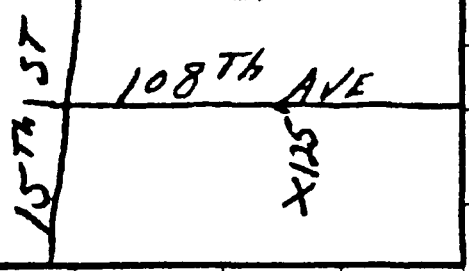
Distance And Direction from Road Intersections: ¼ MILE OF 15TH ST ON 108TH AVE

Street address & City of Well Location: 1356-108TH AVE OTSEGO. Mich

Locate with "X" in section below



Sketch Map



3 OWNER OF WELL: Andrew J. Edson

Address: 1356-108TH AVE OTSEGO, Mich

4 WELL DEPTH (completed): 144 ft. Date of Completion: MAY 9-73

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING Diam: Threaded ☒ Welded ☐

3 in to 138 ft Depth

3 in to 138 ft Depth

Height Above/~~Below~~ Surface 1 ft.

Weight 2.50 lbs /ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL / BROWN CLAY	132'	132'
WITH BIG STONES		
SAND & GRAVEL	12'	144'

8 SCREEN S.S.

Type STRAINER Dia. 2"

Slot ~~Gauge~~ 10 Length 6'

Set between 138 ft and 144' ft

Fittings

9 STATIC WATER LEVEL: 113 ft below land surface

10 PUMPING LEVEL below land surface

135 ft. after 1 hrs pumping 20 g.p.m.

135 ft after 1 hrs pumping 20 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) NOT Chlorides (Cl) KNOWN

Hardness _____ Other _____

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft to ____ ft

14 Nearest Source of possible contamination

75 feet N.W. Direction SEPTIC Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP ☐ Not installed

Manufacturer's Name REDA

Model Number 320X4P05 HP ½ Volts 110

Length of Drop Pipe 123 ft capacity 13 G.P.M.

Type ☒ Submersible ☐ Jet ☐ Reciprocating

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

LOTS OF LARGE STONES

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

BAKERS WELL DRILLING 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherwood ST. OTSEGO, Mich.

Roy Baker

AUTHORIZED REPRESENTATIVE Date May 16-73

WELL 3 1564

D67d 100M (Rev 12-68)

GEOLOGICAL SURVEY SAMPLE No.

MEN02230

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

14

1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
[illegible]	[illegible]	[illegible]	12	1 N N/S.	12 W E/W.

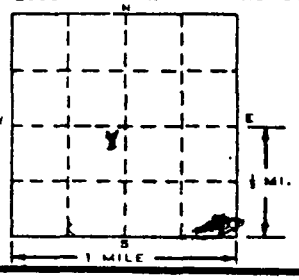
Distance And Direction from Road Intersections

[illegible]

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL: [illegible]

Address [illegible]

4 WELL DEPTH. (completed) Date of Completion

160 ft. [illegible] 28 1971

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☒ Jetted ☐ Bored ☐ ____

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING: Threaded ☒ Welded ☐ Diam.

3 in. to 121 ft. Depth

____ in. to ____ ft. Depth

Height: Above/Below Surface 1 ft.

Weight ____ lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
[illegible]	80	80
[illegible]	20	100
[illegible]	6	106

USE A 2ND SHEET IF NEEDED

8 SCREEN.

Type: [illegible] Dia.: 2

Slot/Gauze 10 Length [illegible]

Set between 101 ft. and 106 ft.

Fittings: [illegible]

9 STATIC WATER LEVEL

40 ft. below land surface

10 PUMPING LEVEL below land surface

45 ft. after 1 hrs. pumping 800 g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

75 feet [illegible] Direction [illegible] Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed

Manufacturer's Name [illegible]

Model Number [illegible] HP 1 Volts 220

Length of Drop Pipe 45 ft. capacity 200 G.P.M.

Type: ☐ Submersible ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

[illegible] [illegible]

REGISTERED BUSINESS NAME REGISTRATION NO

Address [illegible]

Signed [illegible] Date [illegible]

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

WELL 4 1565

LOCAL HEALTH DEPT COPY

GEOLOGIC SURVEY SAMPLE NO

MEN02231

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
[illegible]	[illegible]	[illegible]	[illegible]	[illegible] N S	[illegible] E W

Distance And Direction from Road Intersections

[illegible]

Street address & City of Well Location

Locate with "X" in section below — Sketch Map

3 OWNER OF WELL

Address [illegible]

4 WELL DEPTH (completed) ft. Date of Completion [illegible]

5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING Threaded ☒ Welded ☐ Height Above Below Surface [illegible] ft.

Diam. ____ in. to ____ ft. Depth Weight [illegible] lbs./ft.

____ in. to ____ ft. Depth Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type [illegible] Dia. [illegible]

Slot Gauze [illegible] Length [illegible]

Set between ____ ft. and [illegible] ft.

Fittings. [illegible]

9 STATIC WATER LEVEL

[illegible] ft. below land surface

10 PUMPING LEVEL below land surface

[illegible] ft. after [illegible] hrs. pumping [illegible] g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION. ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft

14 Nearest Source of possible contamination

[illegible] feet ____ Direction [illegible] Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP ☐ Not installed

Manufacturer's Name [illegible]

Model Number ____ HP [illegible] Volts [illegible]

Length of Drop Pipe [illegible] ft. capacity [illegible] G.P.M.

Type. ☒ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

REGISTERED BUSINESS NAME [illegible] REGISTRATION NO [illegible]

Address [illegible]

Signed [illegible] Date [illegible]

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev 12-68)

LOCAL HEALTH DEPT. COPY

WELL 5

1566

GEOLOGICAL SURVEY SAMPLE No

MEN02232

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

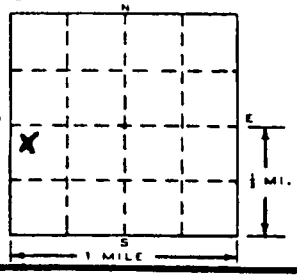
1 LOCATION OF WELL

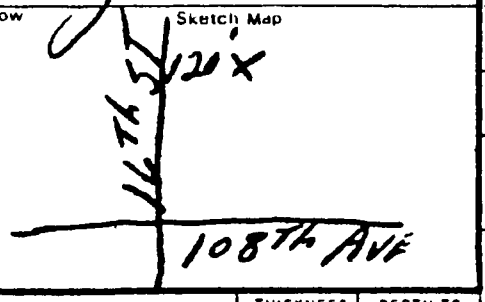
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	¼ ¼ ¼	11	1 N	12 E/W

Distance And Direction from Road Intersections: 5/10 M N of 108th Ave on 16th St

Street address & City of Well Location: 899 N 16th Otsego, Mich

Locate with "X" in section below





Sketch Map: 16th St, 120' X, 108th Ave

3 OWNER OF WELL

David Keith

Address: 899 N 16th Otsego, Mich

4 WELL DEPTH (completed)

112 ft. Date of Completion: Sept 4-76

5

☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug

☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE

☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐

7 CASING

Diam. Threaded ☒ Welded ☐

2 in. to 105 ft. Depth

2 in. to 105 ft. Depth

Height: Above/Below Surface 1 ft.

Weight 3.75 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Stones & Sand Gravel & Brown Clay	36'	36'
Quick Sand & Blue Clay	69'	105
Fine Sand	7'	112'

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Strainer Dia. 1¼"

Slot/~~Gauge~~ 10 Length 7'

Set between 105 ft. and 112 ft.

Fittings. 1¼" Cup

9 STATIC WATER LEVEL

60 ft. below land surface

10 PUMPING LEVEL below land surface

60 ft. after 1 hrs. pumping 12 g.p.m.

60 ft. after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million.

Iron (Fe) Not Known Chlorides (Cl)

Hardness ____ Other ____

12 WELL HEAD COMPLETION.

☐ In Approved Pit

☒ Pitless Adapter ☐ 12" Above Grade

13

Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

75 feet NW Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

☐ Not installed

Manufacturer's Name Tait

Model Number 10E2 HP 1 Volts 230

Length of Drop Pipe 84 ft. capacity ____ G.P.M.

Type ☐ Submersible

☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Baker Well Drilling 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherwood St Otsego

Signed [signature] Date Sept 4-76

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT COPY

WELL 6 1567

OLOGICAL SURVEY SAMPLE No

MEN02233

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
ALLEGAN	OTSEGO	NW NW NW	14	1 N	12 W

Distance And Direction from Road Intersections: CORNER OF Woodley Drive & 16th ST LOT 24

Street address & City of Well Location: 1592 Woodley Dr. OTSEGO, Mich

Locate with "X" in section below

Sketch Map: SKY HAVEN EST. Woodley Dr. 16TH ST

3 OWNER OF WELL: MERLIN MAPES

Address: 712 E Bridge PLAINWELL

4 WELL DEPTH (completed): 130 ft. Date of Completion: Aug 30 - 75

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING Diam. Threaded ☒ Welded ☐

2 in. to 126 ft. Depth

2 in. to 126 ft. Depth

Height Above/~~Below~~ Surface 1 ft.

Weight 3.25 lbs./ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN

Type STAINLEY Dia. 1¼"

Slot/~~Gauge~~ 10 Length 4'

Set between 126 ft. and 130 ft.

Fittings CHECK VALVE

9 STATIC WATER LEVEL

100 ft below land surface

10 PUMPING LEVEL below land surface

120 ft after 1 hrs. pumping 12 g.p.m.

120 ft after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) NOT KNOWN Chlorides (Cl)

Hardness Other

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐

Depth From ft. to ft

14 Nearest Source of possible contamination

75 feet S Direction SEPTIC Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP ☐ Not installed

Manufacturer's Name TAIT

Model Number 154053 HP 1½ Volts 230

Length of Drop Pipe 117 ft. capacity 10 G.P.M.

Type ☐ Submersible ☒ Jet ☐ Reciprocating

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	45'	45'
SAND & GRAVEL & BROWN CLAY	80'	125'
SAND & GRAVEL	5'	130'

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

BAKER'S WELL Drilling 0455

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherwood ST OTSEGO

Signed R.D. Baker AUTHORIZED REPRESENTATIVE Date Sept. 5-75

D67d 100M (Rev 12-68)

LOCAL HEALTH DEPT. COPY

WELL 7 1568

GEOLOGICAL SURVEY SAMPLE No

MEN02234

WATER WELL RECORD

ACT 294 PA 1961

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

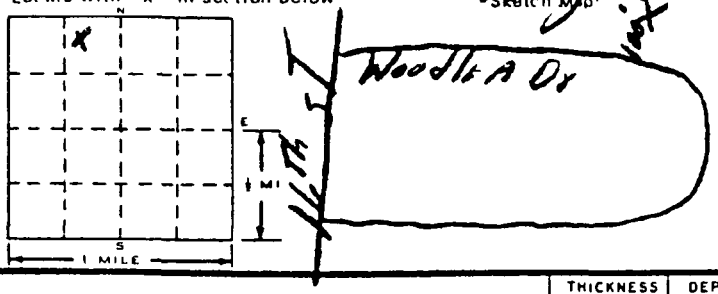
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW NE NW	14	1 N	12 W

Distance And Direction from Road Intersections: 3/4 mile of 16th St on Woodlea Dr to Lot 15 Woodlea Dr SW of Haven Est Otsego Mich

Street address or City of Well Location

Locate with "X" in section below



3 OWNER OF WELL Melvin Mapes

Address 712 E. Bridge St Plainwell Mich

4 WELL DEPTH (completed) 116 ft. Date of Completion June 12-76

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING. Threaded ☒ Welded ☐ Diam.

2 in. to 112 ft. Depth

2 in. to 112 ft. Depth

Height Above/~~Below~~ Surface 1 ft.

Weight 3.75 lbs./ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN.

Type Strainer Dia. 1¼"

Slot Gauge 10 Length 4'

Set between 112 ft. and 116 ft.

Fittings Brass

9 STATIC WATER LEVEL 80' ft. below land surface

10 PUMPING LEVEL below land surface

80 ft after 1 hrs. pumping 12 g.p.m.

80 ft after 1 hrs pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) Not Chloride (Cl) Known

Hardness ____ Other ____

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft to ____ ft

14 Nearest Source of possible contamination

75 feet NE Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP ☒ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type ☐ Submersible ☐ Jet ☐ Reciprocating

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel	36'	36'
Brown Clay Sand & Gravel	18'	54'
Blue Clay & Sand	40'	94'
Sand & Brown Clay	17'	111'
Onyse Sand	5'	116'

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bakes Well Drilling 0435
REGISTERED BUSINESS NAME — REGISTRATION NO

Address 300 Sherwood ST Otsego

Signed [signature] AUTHORIZED REPRESENTATIVE Date June 28-76

D67d 100M (Rev 12-68)

LOCAL HEALTH DEPT. COPY

WELL 8 1569

GEOLOGICAL SURVEY SAMPLE No. MEN02235

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

24

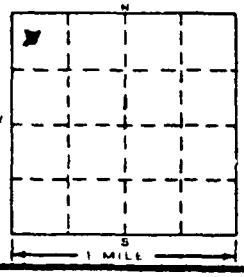
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	¼ ¼ ¼	14	1 N/S	12 E/W

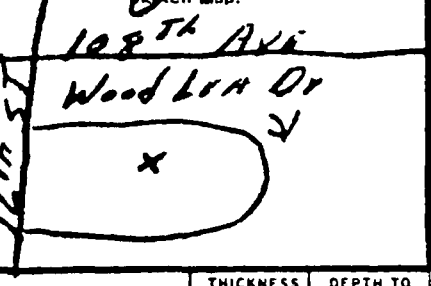
Distance And Direction from Road Intersections: 1/10 MILE E OF 16TH ON Wood Lea Dr LOT-27 SKY HAVEN EST

Street address & City of Well Location: Wood Lea Dr LOT 27 Otsego Mich

Locate with "X" in section below



Sketch Map.



3 OWNER OF WELL
Gene DeRuyscher
Address 8913 W-A13 Ave
Otsego Mich.

4 WELL DEPTH (completed) 133 ft. Date of Completion Sept 23-76

5 ☒ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING. Threaded ☒ Welded ☐
4 in. to 127 ft. Depth
4 in. to 127 ft. Depth
Height: Above/~~Below~~ Surface 1 ft.
Weight 10.79 lbs./ft.
Drive Shoe? Yes ☒ No ☐

8 SCREEN. 55
Type Strainex Dia. 3"
Slot/~~Gauze~~ 10 Length 5'
Set between 127 ft. and 133 ft.
Fittings. 12" Set Link Land Packer

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel & Brown Clay	46'	46'
Blue Clay Sand & Gravel	44'	90'
Quick Sand & Brown Clay	36'	126'
Coarse Sand	7'	133'

USE A 2ND SHEET IF NEEDED

9 STATIC WATER LEVEL
80 ft. below land surface

10 PUMPING LEVEL below land surface
80 ft. after 1 hrs. pumping 35 g.p.m.
80 ft. after 1 hrs. pumping 35 g.p.m.

11 WATER QUALITY in Parts Per Million
Iron (Fe) Not Chloride (Cl) Known
Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐
Depth: From _____ ft. to _____ ft.

14 Nearest Source of possible contamination
75 feet SE Direction Septic Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP. ☐ Not installed
Manufacturer's Name Tait
Model Number 5P215 HP ½ Volts 230
Length of Drop Pipe 117 ft. capacity 15 G.P.M.
Type ☒ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Baker's Well Drilling 0488
REGISTERED BUSINESS NAME REGISTRATION NO
Address 300 Sherwood ST Otsego
Signed [signature] AUTHORIZED REPRESENTATIVE Date Sept 24-76

D67d 100M (Rev. 12-68)

WELL 9 1570

LOCAL HEALTH DEPT. COPY

GEOLOGICAL SURVEY SAMPLE NO. [ ]

MEN02236

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

18

1 LOCATION OF WELL

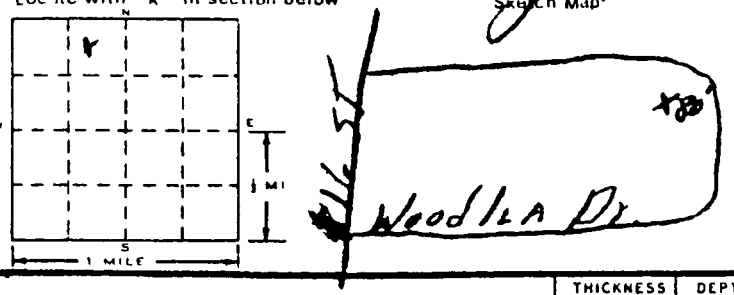
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW NE NW	14	1 N S	12 E W

Distance And Direction from Road Intersections: 1/8 mile E of #16th St on Woodlea Dr Lot 30 Woodlea Dr Sky Haven Est Otsego Mich

Street address & City of Well Location

Locate with "X" in section below

Sketch Map



3 OWNER OF WELL

Donald S. Miller

Address 11710-2nd Av Otsego Mich

4 WELL DEPTH (completed)

116' Date of Completion May 24-76

5

☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug

☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE

☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐ ____

7 CASING

Diam Threaded ☒ Welded ☐

2 in. to 112 ft. Depth

2 in. to 112 ft. Depth

Height Above/Below Surface 1 ft.

Weight 3.75 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel	36'	36'
Brown Clay & Sand & Gravel	18'	54'
Blue Clay & Sand	38'	92'
Sand & Brown Clay	19'	111'
Coarse Sand	5'	116'

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Strainer Dia. 1 1/4"

Slot Gauze 10 Length 4'

Set between 112 ft and 116 ft.

Fittings 1 1/4" cupling

9 STATIC WATER LEVEL

80' ft. below land surface

10 PUMPING LEVEL below land surface

80 ft. after 1 hrs. pumping 12 g.p.m.

80 ft after 1 hrs pumping 12 g.p.m

11 WATER QUALITY in Parts Per Million

Iron (Fe) Not Known Chlorides (Cl)

Hardness ____ Other ____

12 WELL HEAD COMPLETION

☐ In Approved Pit

☒ Pitless Adapter ☐ 12" Above Grade

13

Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft to ____ ft

14 Nearest Source of possible contamination

Septic Not in Yet Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

☒ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type ☐ Submersible

☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

Bakers Well Drilling 0458

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 3rd Sherwood St Otsego

Signed [signature] Date May 25-76

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12 68)

WELL 101571

LOCAL HEALTH DEPT. COPY

GEOLOGICAL SURVEY SAMPLE No

MEN02237

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

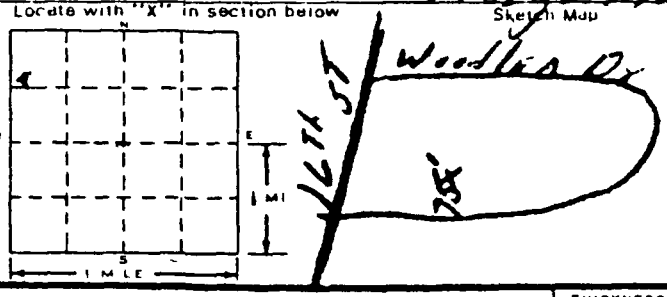
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW NW SW	14	1 N/S	12 E/W

Distance And Direction from Road Intersections
1/2 Mile E of 16th St on S Woodlea Dr
Lot-35 1587 Woodlea Dr Sky Haven Est

Street address & City of Well Location Otsego Mich

Locate with "X" in section below

Sketch Map



2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Brown clay sand & gravel	52'	52'
Sand & gravel	42'	94'
Blue clay & sand	19'	113'
Sand	6'	119'

USE A 2ND SHEET IF NEEDED

3 OWNER OF WELL
Larry K Keefer
Address 3310 Lincolnshire
Kalamazoo Mich

4 WELL DEPTH (Completed) Date of Completion
119 ft. Nov 19-76

5
☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug
☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE
☒ Domestic ☐ Public Supply ☐ Industry
☐ Irrigation ☐ Air Conditioning ☐ Commercial
☐ Test Well ☐

7 CASING
Diam. Threaded ☒ Welded ☐
2 in. to 115 ft. Depth
2 in. to 115 ft. Depth
Height, Above/Below Surface 1 ft.
Weight 3.75 lbs./ft.
Drive Shoe? Yes ☒ No ☐

8 SCREEN
Type Strainer Dia 1¼"
Slot/Gauze 10 Length 4'
Set between 115 ft and 119 ft.
Fittings 1¼" coupling

9 STATIC WATER LEVEL
80 ft. below land surface

10 PUMPING LEVEL below land surface
80 ft. after 1 hrs. pumping 10 g.p.m.
80 ft. after 1 hrs. pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million
Iron (Fe) Not known Chlorides (Cl)
Hardness ____ Other ____

12 WELL HEAD COMPLETION
☐ In Approved Pit
☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted?
☐ Yes ☒ No
☐ Neat Cement ☐ Bentonite ☐ ____
Depth From ____ ft to ____ ft

14 Nearest Source of possible contamination
75 feet NE Direction Septic Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP
☒ Not installed
Manufacturer's Name ____
Model Number ____ HP ____ Volts ____
Length of Drop Pipe ____ ft. capacity ____ G.P.M.
Type ☐ Submersible
☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Baker's Well Drilling 0728
REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherwood St - Otsego

Signed [illegible] Date Nov 24-76
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev 12-68)

LOCAL HEALTH DEPT. COPY

WELL 11 1572

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02238

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

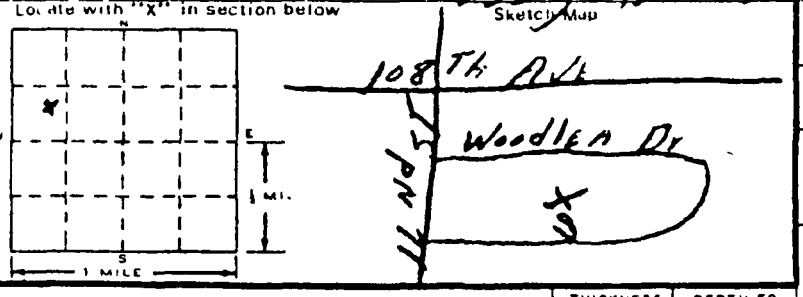
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	¼ ¼ ¼	14	1 N	12 W.

Distance And Direction from Road Intersections: ½ Mile E. of 16nd St on Woodlea Dr. Lot-34. Sky Haven Estates

Street address & City of Well Location: Woodlea Dr. Otsego, Mich

Locate with "X" in section below — Sketch Map



2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Brown Clay	36'	36'
Sand	48'	84'
Sand & Brown & Blue Clay	34'	118'
Coarse Sand	6'	124'

USE A 2ND SHEET IF NEEDED

3 OWNER OF WELL

Joe & Dan Butler

Address: P.O. Box 117, Otsego, Mich 49078

4 WELL DEPTH (completed) Date of Completion

124 ft. May 5-76

5

☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug

☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE

☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐

7 CASING

Threaded ☒ Welded ☐

2 in. to 120 ft. Depth

2 in. to 120 ft. Depth

Height, Above/~~Below~~ Surface 1 ft.

Weight 3.75 lbs./ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN

Type Stainlex Dia. 1¼"

Slot/~~Gauge~~ 10 Length 4"

Set between 120 ft. and 124 ft.

Fittings check valve

9 STATIC WATER LEVEL

80 ft. below land surface

10 PUMPING LEVEL below land surface

80 ft. after 1 hrs. pumping 12 g.p.m.

80 ft. after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) Not Known Chlorides (Cl)

Hardness ____ Other ____

12 WELL HEAD COMPLETION

☐ In Approved Pit

☒ Pitless Adapter ☐ 12" Above Grade

13

Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

75 feet N.W. Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

☐ Not installed

Manufacturer's Name Tait

Model Number 15E053 HP 1½ Volts 230

Length of Drop Pipe 108 ft. capacity 10 G.P.M.

Type ☐ Submersible

☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Baker Well Drilling 0488

REGISTERED BUSINESS NAME — REGISTRATION NO

Address 300 Sherwood St Otsego

Signed [signature] AUTHORIZED REPRESENTATIVE Date May 6 76

D67d 100M (Rev 12-68)

LOCAL HEALTH DEPT COPY

WELL 12 1573

GEOLOGICAL SURVEY SAMPLE No

MEN02239

WATER WELL RECORD

ACT 294 PA 1965

OF PUBLIC HEALTH

1 LOCATION OF WELL

County	Twp	Fraction	Section No	Town	Range
Allegan	Otsego	NW SW NE	14	1 N/S	12 E/W

Distance And Direction from Road Intersections: 1/10 Mile of 16th St on Woodlea Dr

OWNER No

Bakers Development 1570 Woodlea Dr. Otsego, Mich.

Street address & City of Well Location

3 OWNER OF WELL Merlin Mapes

Address 712 East Bridge St Plainwell, Mich.

4 WELL DEPTH (completed) 109 ft Date of Completion Aug 9. 74

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING Diam Threaded ☒ Welded ☐ Height: Above/~~Below~~ surface 1 ft. Weight 365 lbs/ft. Drive Shoe? Yes ☒ No ☐

2 in to 105 ft Depth

2 in to 105 ft Depth

8 SCREEN

Type Strainer Dia 1¼"

Slot/~~Gauze~~ 10 Length 4"

Set between 105 ft. and 109 ft.

Fittings: 1¼" coupling

9 STATIC WATER LEVEL 80 ft below land surface

10 PUMPING LEVEL below land surface

100 ft after 1 hrs. pumping 10 g.p.m.

100 ft after 1 hrs pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) Chlorides (Cl) NOT KNOWN

Hardness

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 GROUTING

Well Grouted? ☐ Yes ☒ No

Material: ☐ Neat Cement ☐

Depth: From ft to ft

14 SANITARY

Nearest Source of possible contamination 75 feet NE Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

Manufacturer's Name Fait

Model Number 15LD53 HP D

Length of Drop Pipe 78 ft capacity 10 G P M

Type: ☐ Submersible ☐ ☒ Jet ☐ Reciprocating

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Brown Clay & Sand	18'	18'
Sand & Gravel	69'	87'
Brown Clay & Sand	3'	90'
Sand & Gravel	19'	109'

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

Bakers Well Co.

REGISTERED BUSINESS NAME REGISTRATION NO

Address

Signed

AUTHOR

D67D 100M 6-66

LOCAL HEALTH DE

WELL 13 1574

GEOLOGICAL SURVEY SAMPLE No. 53

MEN02240

WATER WELL RECORD
ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

15

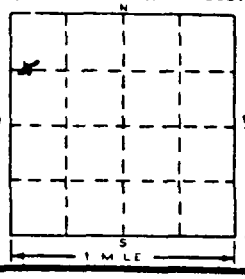
LOCATION OF WELL

City	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW NW SW	14	1 N	12 W

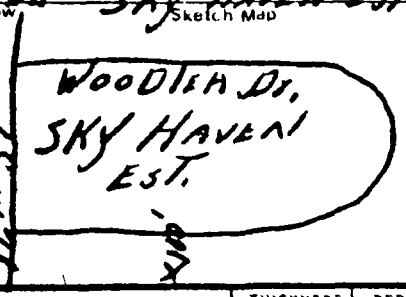
Distance And Direction from Road Intersections: 3/10 MILE S. OF 108TH AVE ON 16TH ST ON SOUTH-1578 WOODLEA THEN 1/4 MILE E ON WOODLEA DR. LOT-6 SKY HAVEN EST

Street address & City of Well Location

Locate with "X" in section below



Sketch Map



3 OWNER OF WELL: RON HINKLE

Address: 1578 WOODLEA DR OTSEGO, MICH

4 WELL DEPTH (completed): 121 ft. Date of Completion: SEPT 6-75

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING Diam: 2 in. to 112 ft. Depth; 2 in. to 117 ft. Depth. Threaded ☒ Welded ☐. Height Above/~~Below~~ Surface 1 ft. Weight 3.75 lbs/ft. Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL & BROWN CLAY	6'	6'
SAND & GRAVEL	28'	34'
SAND & GRAVEL & BROWN CLAY	81'	115'
SAND & GRAVEL	6'	121'

USE A 2ND SHEET IF NEEDED

8 SCREEN: Type STRAINER Dia. 1¼" Slot ~~Gauge~~ 10 Length 4' Set between 117 ft. and 121 ft. Fittings BRAMEY CHECK

9 STATIC WATER LEVEL: 83 ft. below land surface

10 PUMPING LEVEL below land surface: 110 ft after 1 hrs. pumping 12 g.p.m.; 110 ft. after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million: Iron (Fe) NOT KNOWN Chlorides (Cl) Hardness Other

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ Depth From ft. to ft

14 Nearest Source of possible contamination: 25 feet S.E Direction SEPTIC Type. Well disinfected upon completion ☒ Yes ☐ No

15 PUMP ☐ Not installed. Manufacturer's Name TAIT. Model Number 15EDS3 HP 1½ Volts 230. Length of Drop Pipe 105 ft. capacity 10 G.P.M. Type ☐ Submersible ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bakers Well Drilling 0488
REGISTERED BUSINESS NAME — REGISTRATION NO

Address: 300 Sherwood ST OTSEGO

Signed: [illegible] AUTHORIZED REPRESENTATIVE Date: Sept-11-75

WELL 14 1575

D67d 100M (Rev 12-68)

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02241

10

WATER WELL RECORD

ACT 294 P.A. 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

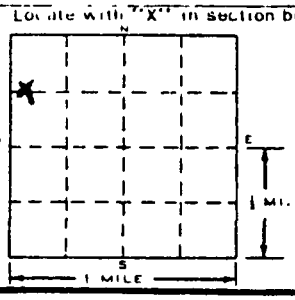
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
ALLEGAN	OTSEGO	¼ ¼ ¼	14	1 N/S.	12 E/W.

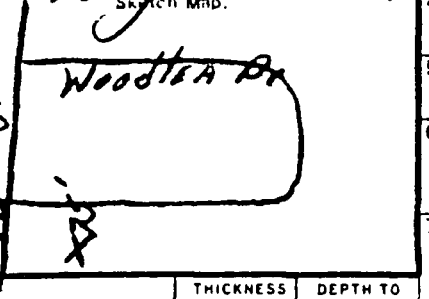
Distance and Direction from Road Intersections: 1/10 MILE E. OF 16TH ST ON S. WOODLEA DR

Street address & City of Well Location: LOT-3-S. WOODLEA DR. SKY HAVEN OTSEGO MICH 49078

Locate with "X" in section below



Sketch Map.



3 OWNER OF WELL: DONALD WILLIAMS

Address: 620 RUBY OTSEGO, MICH

4 WELL DEPTH (completed): 117 ft. Date of Completion: MAY-27-76

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING. Threaded ☒ Welded ☐ Diam.

2 in. to 113 ft. Depth

2 in. to 113 ft. Depth

Height, Above ~~Below~~ Surface 1 ft.

Weight 3.25 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY SAND & GRAVEL	54'	54'
SAND & GRAVEL	40	94'
BLUE CLAY & SAND	19'	113'
SAND	4'	117'

USE A 2ND SHEET IF NEEDED

8 SCREEN.

Type: STAINLEX Dia.: 1¼"

Slot Gauge 10 Length 4'

Set between 113 ft. and 117 ft.

Fittings: 1¼" COUPLING

9 STATIC WATER LEVEL

76 ft. below land surface

10 PUMPING LEVEL below land surface

76 ft. after 1 hrs. pumping 12 g.p.m.

76 ft. after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million.

Iron (Fe) NOT Chloride (Cl) BROWN

Hardness ____ Other ____

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

75 feet S.W. Direction SEPT. Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☒ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type: ☐ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bakers Well Drilling 0455

REGISTERED BUSINESS NAME — REGISTRATION NO.

Address 300 Sherwood ST OTSEGO

Signed [signature] AUTHORIZED REPRESENTATIVE Date AUG-27-76

D67d 100M (Rev. 12-68)

WELL 15 1576

GEOLOGICAL SURVEY SAMPLE N

MEN02242

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

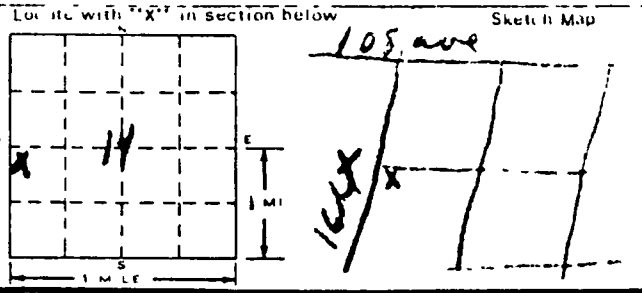
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW NW SW	14	1 N	12 W

Distance And Direction from Road Intersections: about 1720 ft from Cor 16 st + 105 ave.

Street address & City of Well Location

Locate with "X" in section below

Sketch Map



3 OWNER OF WELL: Frost Construction Co

Address: 1321 S. Westnedge Kalamazoo

4 WELL DEPTH (completed): 133 ft. Date of Completion: Sept 8 1973

5 [ ] Cable tool [ ] Rotary [ ] Driven [ ] Dug [X] Hollow rod [ ] Jetted [ ] Bored [ ] ____

6 USE [X] Domestic [ ] Public Supply [ ] Industry [ ] Irrigation [ ] Air Conditioning [ ] Commercial [ ] Test Well [ ] ____

7 CASING Diam. Threaded [X] Welded [ ]

3 in. to 129 ft. Depth

____ in. to ____ ft. Depth

Height Above/Below Surface ____ ft.

Weight ____ lbs./ft.

Drive Shoe? Yes [X] No [ ]

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Brown clay	16	16
Sand + gravel	42	58
Clay gray + gravel	53	111
Fine sand	17	128
Coarse sand Hard	6	134

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Johnson Dia. 2

Slot Gauze 10 Length 5 ft

Set between 129 ft. and 134 ft.

Fittings

9 STATIC WATER LEVEL: 68 ft. below land surface

10 PUMPING LEVEL below land surface

____ ft. after ____ hrs. pumping ____ g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million.

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION [ ] In Approved Pit [X] Pitless Adapter [X] 12" Above Grade

13 Well Grouted? [ ] Yes [X] No

[ ] Neat Cement [ ] Bentonite [ ] ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

100 feet E Direction Septic Tank Type

Well disinfected upon completion [ ] Yes [ ] No

15 PUMP [ ] Not installed

Manufacturer's Name Reda

Model Number 2313 T HP 1/2 Volts 110

Length of Drop Pipe 96 ft. capacity 600 G.P.M.

Type [X] Submersible [ ] Jet [ ] Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Joseph L Rush (REGISTERED BUSINESS NAME) 0791 (REGISTRATION NO)

Address 354 Water St. Otsego

Signed Joseph L Rush (AUTHORIZED REPRESENTATIVE) Date Sept 11, 1973

D67d 100M (Rev 12-68)

LOCAL HEALTH DEPT. COPY

WELL 16 1577

GEOLOGICAL SURVEY SAMPLE NO.

114

MEN02243

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPA[illegible] OF PUBLIC HEALTH

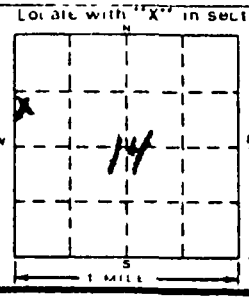
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NW SW NW	14	1 S	12 W

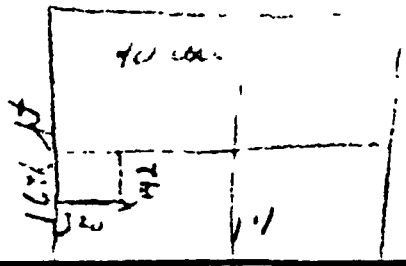
Place And Direction from Road Intersections: 320 ft from 16th St 142 ft in N by sect line

Street address & City of Well Location

Locate with "X" in section below



Sketch Map



3 OWNER OF WELL

Address: Thomas Bent, 517 W. Franklin Otsego

4 WELL DEPTH (completed) Date of Completion

106 ft ft. Sept 19 1972

5

[X] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Jetted [ ] Bored [ ]

6 USE

[X] Domestic [ ] Public Supply [ ] Industry [ ] Irrigation [ ] Air Conditioning [ ] Commercial [ ] Test Well [ ]

7 CASING

Diam. Threaded [X] Welded [ ]

2 in. to 102 ft. Depth

___ in. to ___ ft Depth

Height Above/Below Surface 3 ft ft.

Weight ___ lbs./ft.

Drive Shoe? Yes [X] No [ ]

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand	29	29
Brown Clay	7	36
Sand	4	40
Clayey sand & gravel	62	102
Coarse sand	4	106

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Johnson Dia. 1 1/4

Slot Gauze 10 Length 4 ft

Set between 102 ft and 106 ft.

Fittings

9 STATIC WATER LEVEL

56 ft. below land surface

10 PUMPING LEVEL below land surface

___ ft. after ___ hrs. pumping ___ g.p.m.

___ ft after ___ hrs. pumping ___ g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) ___ Chlorides (Cl) ___

Hardness ___ Other ___

12 WELL HEAD COMPLETION

[ ] In Approved Pit [X] Pitless Adapter [ ] 12" Above Grade

13

Well Grouted? [ ] Yes [X] No

[ ] Neat Cement [ ] Bentonite [ ] ___

Depth From ___ ft to ___ ft

14 Nearest Source of possible contamination

___ feet ___ Direction ___ Type

Well disinfected upon completion [X] Yes [ ] No

15 PUMP

[ ] Not installed

Manufacturer's Name [illegible]

Model Number 15EDS3 HP 1 1/4 Volts 220

Length of Drop Pipe 100 ft. capacity 12 G.P.M.

Type [ ] Submersible [X] Jet [ ] Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

[illegible] 0791

REGISTERED BUSINESS NAME REGISTRATION NO

Address [illegible] Otsego

Signed [illegible] Date 11-13-72

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

WELL 17 1578

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02244

438

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
ALLEGAN	OTSEGO	1/4 SE SW	13	1 N.S.	12 E.W.

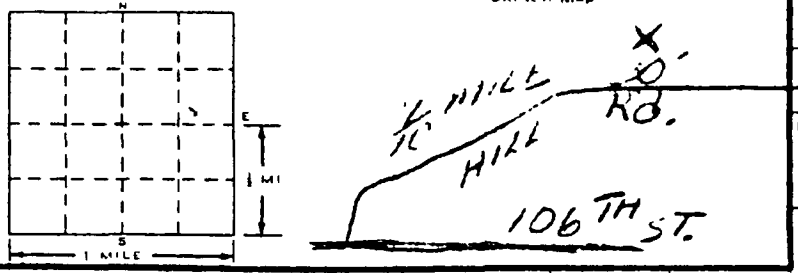
Distance And Direction from Road Intersections: 1/10 MILE N.E. OF 106TH ST. ON HILL Rd.

1289 HILL Rd. OTSEGO, MICH 49018

Street address & City of Well Location

Locate with "X" in section below

Sketch Map



3 OWNER OF WELL: GARY DUNHAM

Address 1289 HILL Rd. OTSEGO MICH. 49018

4 WELL DEPTH (completed) 94 ft. Date of Completion DEC. 21 1979

5 [X] Cable tool [ ] Rotary [ ] Driven [ ] Dug [ ] Hollow rod [ ] Jetted [ ] Bored [ ]

6 USE [X] Domestic [ ] Public Supply [ ] Industry [ ] Irrigation [ ] Air Conditioning [ ] Commercial [ ] Test Well [ ]

7 CASING Threaded [X] Welded [ ]

Diam. 4 in. to 10 ft. Depth

4 in. to 90 ft. Depth

Height Above/~~Below~~ Surface 1 ft.

Weight 10.24 lbs. ft.

Drive Shoe? Yes [X] No [ ]

8 SCREEN: SS.

Type JOHNSON Dia.: 4"

Slot ~~Gauze~~ 10 Length 4"

Set between 10 ft. and 14 ft.

Fittings LEAD PACKER 3"x12" NIP 3" PLUG

9 STATIC WATER LEVEL 45 ft. below land surface

10 PUMPING LEVEL below land surface

15 ft. after 1 hrs. pumping 35 g.p.m.

45 ft. after 1 hrs. pumping 35 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Chloride (Cl) NOT KNOWN

Hardness _____ Other _____

12 WELL HEAD COMPLETION. [ ] In Approved Pit [X] Pitless Adapter [ ] 12" Above Grade

13 Well Grouted? [ ] Yes [X] No

[ ] Neat Cement [ ] Bentonite [ ] _____

Depth From _____ ft. to _____ ft.

14 Nearest Source of possible contamination

90 feet NW Direction SEPTIC Type

Well disinfected upon completion [X] Yes [ ] No

15 PUMP. [ ] Not installed

Manufacturer's Name Tait

Model Number 101325 HP 1 Volts 220

Length of Drop Pipe 68 ft. capacity 25 G.P.M.

Type [X] Submersible [ ] Jet [ ] Reciprocating

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
BROWN CLAY + GRAVEL	60'	60'
Blue Clay & Stones	18'	78'
Sand & Gravel	16'	94'

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

Lots of Rocks Hard To get Through

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

RIP BAKER WELL DRILLING 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 605 HERMON ST. OTSEGO MICH

Signed [signature] Date 12-21-79

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT COPY

WELL 18

1579

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02245

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

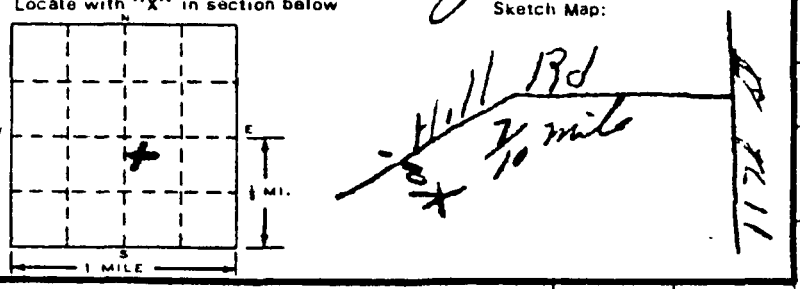
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	¼ ¼ ¼	13	1 N/S.	12 E/W.

Distance And Direction from Road Intersections: 7/10 mile S. of 11th St on Hill Rd

Street address & City of Well Location: 1256 Hill Rd Otsego, Mich.

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL: Dennis Cavalini

Address: 823 Elmwood Kalamazoo, Mich

4 WELL DEPTH: (completed) 68 ft. Date of Completion May 26-72

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING: Threaded ☒ Welded ☐

Diam. 2 in. to 64 ft. Depth

2 in. to 64 ft. Depth

Height: Above/~~Below~~ Surface 1 ft.

Weight 3.65 lbs./ft.

Drive Shoe? Yes ☒ No ☐

8 SCREEN:

Type: Stainless Dia.: 1¼"

Slot/Gauze 10 Length 4'

Set between 64 ft. and 68 ft.

Fittings: 1-1¼" coupling

9 STATIC WATER LEVEL

23 ft. below land surface

10 PUMPING LEVEL below land surface

50 ft. after 1 hrs. pumping 10 g.p.m.

50 ft. after 1 hrs. pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Not Chloride (Cl) Known

Hardness _____ Other _____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☒ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ _____

Depth: From _____ ft. to _____ ft.

14 Nearest Source of possible contamination

50 feet Tile Direction in yard Type

Well disinfected upon completion ☐ Yes ☒ No

15 PUMP: ☒ Not installed

Manufacturer's Name _____

Model Number _____ HP ____ Volts _____

Length of Drop Pipe _____ ft. capacity ____ G.P.M.

Type: ☐ Submersible ☐ Jet ☐ Reciprocating

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Brown clay Sand & Gravel	18'	18'
Blue clay Sand & Gravel	45'	63
Coarse & fine Sand	5'	68'

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Richard D. Bl[illegible] 4478

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 300 [illegible]

Signed [illegible] Date May 27 72

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

WELL 19 1580

GEOLOGICAL SURVEY SAMPLE No

MEN02246

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPA OF PUBLIC HEALTH

1 LOCATION OF WELL

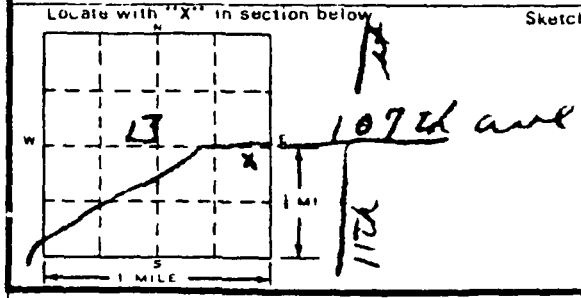
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NE NE SE	13	1 N S	12 E W

Distance And Direction from Road Intersections: well about 400 from east line and 200 ft south of 107th ave sect 13

Street address & City of Well Location

Locate with "X" in section below

Sketch Map



3 OWNER OF WELL

Ben A White

Address 1212 - 107th ave Otsego Mich

4 WELL DEPTH (completed)

60 ft

Date of Completion May 17, 1975

5

☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug

☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE

☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐

7 CASING

Diam. Threaded ☒ Welded ☐

2 in to 57 ft. Depth

____ in to ____ ft Depth

Height Above/Below Surface ____ ft.

Weight ____ lbs./ft.

Drive Shoe? Yes ☒ No ☐

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
fine sand	18	18
silty clay grey	38	56
Course sand	4	60

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Johnson Dia. 1 1/4

Slot/Gauze 10 Length 3 ft

Set between 57 ft and 60 ft.

Fittings

9 STATIC WATER LEVEL

4 ft. below land surface

10 PUMPING LEVEL below land surface

____ ft after ____ hrs. pumping ____ g.p.m.

____ ft after ____ hrs pumping ____ g p m

11 WATER QUALITY in Parts Per Million

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION

☐ In Approved Pit

☐ Pitless Adapter ☒ 12" Above Grade

13 Well Grouted?

☐ Yes ☐ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft

14 Nearest Source of possible contamination

____ feet ____ Direction ____ Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

☒ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type ☐ Submersible

☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Joseph L Rush 0791

REGISTERED BUSINESS NAME REGISTRATION NO

Address 354 Water St Otsego

Signed Joseph L Rush Date June 23, 75

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev 12 68)

LOCAL HEALTH DEPT COPY WELL 20 1581

GEOLOGICAL SURVEY SAMPLE No. 441

MEN02247

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

1 LOCATION OF WELL

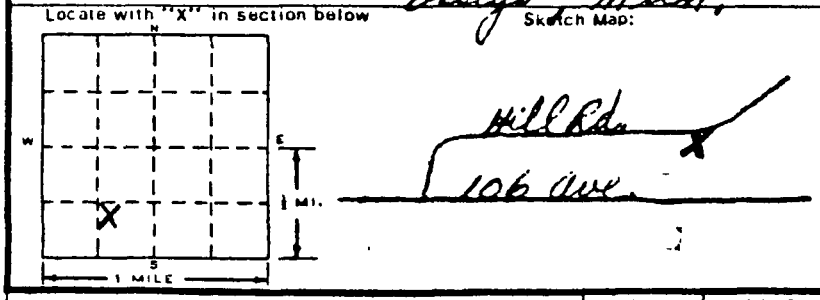
County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	SW. SE. NW.	13	N/S.	E/W.

Distance And Direction from Road Intersections: 1294 Hill Rd.

Street address & City of Well Location: Otsego, Mich.

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL

Address: Donald Church, 1294 Hill Rd., Otsego, Mich.

4 WELL DEPTH. (completed)

67 ft. Date of Completion: 11-20-79

5

[X] Cable tool [ ] Rotary [ ] Driven [ ] Dug
[ ] Hollow rod [ ] Jetted [ ] Bored [ ] ____

6 USE.

[X] Domestic [ ] Public Supply [ ] Industry
[ ] Irrigation [ ] Air Conditioning [ ] Commercial
[ ] Test Well [ ] ____

7 CASING.

Threaded [X] Welded [ ]

Diam. 4 in. to 63 ft. Depth
____ in. to ____ ft. Depth

Height: Above/~~Below~~ Surface 1 ft.
Weight 11.00 lbs./ft.
Drive ~~Shoe~~ coupling? Yes [X] No [ ]

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Clay & Stones	12	12
Gravel & clay	20	32
Hard pan with fine gravel	8	40
Gray Clay	19	59
Water Sand	8	67

USE A 2ND SHEET IF NEEDED

8 SCREEN.

Type: Johnson Stainless Dia.: 4"
Slot/~~Gauze~~ #10 Length 4'
Set between 63 ft. and 67 ft.
Fittings: Lead packer, nipple, plug

9 STATIC WATER LEVEL

27 ft. below land surface

10 PUMPING LEVEL below land surface

27 ft. after 1 hrs. pumping 50 g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

12 WELL HEAD COMPLETION:

[ ] In Approved Pit
[X] Pitless Adapter [ ] 12" Above Grade

13 Well Grouted?

[X] Yes [ ] No
[ ] Neat Cement [ ] Bentonite [X] Gravel
Depth. From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

____ feet ____ Direction ____ Type
Well disinfected upon completion [X] Yes [ ] No

15 PUMP:

[X] Not installed
Manufacturer's Name ____
Model Number ____ HP ____ Volts ____
Length of Drop Pipe ____ ft. capacity ____ G.P.M.
Type: [ ] Submersible
[ ] Jet [ ] Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION.

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Glen Leversee Well Drilling 1711
REGISTERED BUSINESS NAME REGISTRATION NO

Address 4224 N. 3rd St. Kilamazoo, Mich.

Signed Glen Leversee Date 11-26-79
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY WELL 21 1582

GEOLOGICAL SURVEY SAMPLE No.

MEN02248

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

#5

1 LOCATION OF WELL

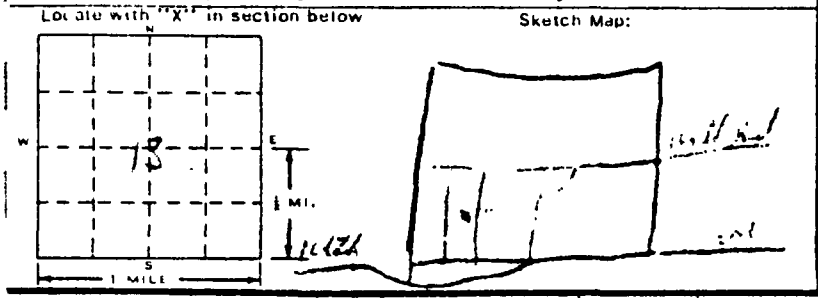
County	Township Name	Fraction	Section Number	Town Number	Range Number
Oregon	Otsego	NE ¼ SW ¼ SW ¼	13	N/S.	E/W.

Distance And Direction from Road Intersections: North of Hill Rd about 250 ft and about 190 feet from West line of sect 13

Street address & City of Well Location

Locate with "X" in section below

Sketch Map:



3 OWNER OF WELL

Harold E. Emmelhus

Address 171 N. 11th St Plainwell Mich

4 WELL DEPTH. (completed)

97 ft. Date of Completion Jan 10, 1976

5

☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug

☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE:

☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐ ____

7 CASING

Diam. Threaded ☒ Welded ☐

2 in. to 94 ft. Depth

____ in. to ____ ft. Depth

Height: Above/Below Surface ____ ft.

Weight ____ lbs./ft.

Drive Shoe? Yes ☒ No ☐

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand + gravel	80	80
Clay grey	13	93
Course sand	4	97

USE A 2ND SHEET IF NEEDED

8 SCREEN:

Type: Johnson Dia.: 1¼

Slot/Gauze 10 Length 3 ft

Set between 94 ft. and 97 ft.

Fittings:

9 STATIC WATER LEVEL

76 ft. below land surface

10 PUMPING LEVEL below land surface

____ ft. after ____ hrs. pumping ____ g.p.m.

____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) ____ Chlorides (Cl) ____

Hardness ____ Other ____

12 WELL HEAD COMPLETION.

☐ In Approved Pit

☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted?

☐ Yes ☐ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

100 feet S Direction Septic Tank Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☐ Not installed

Manufacturer's Name Jacuzzi

Model Number 7RM 2 HP ¾ Volts 220

Length of Drop Pipe 84 ft. capacity 400 G.P.M.

Type: ☐ Submersible

☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION.

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Joseph L. Nash 0791

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 354 Water St Mich

Signed Joseph L. Nash Date 1-22-76

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

WELL 22 1583

GEOLOGICAL SURVEY SAMPLE No. [ ]

19

MEN02249

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

#1

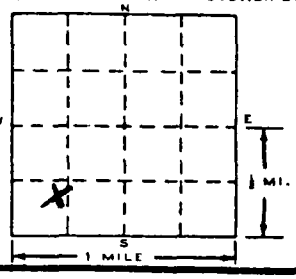
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	S.W. S.W. N.E.	13	1 N/S.	12 E/W.

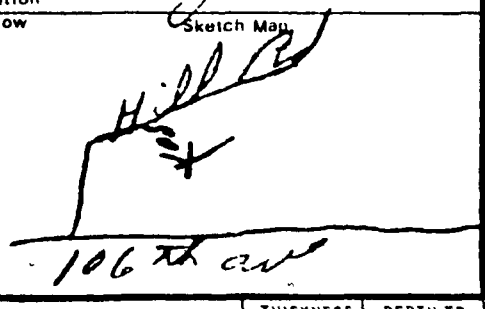
Distance And Direction from Road Intersections: 3½ North East of 106th ave on Hill Rd

Street address & City of Well Location: 1372 Hill Rd Otsego, Mich

Locate with "X" in section below



Sketch Map



3 OWNER OF WELL:

Owen L Davis

Address: 115 Sherman St. Otsego, Mich 49078

4 WELL DEPTH: (completed) 53 ft. Date of Completion June 5 - 72

5

- [ ] Cable tool
- [x] Hollow rod
- [ ] Rotary
- [ ] Jetted
- [ ] Driven
- [ ] Bored
- [ ] Dug
- [ ] ____

6 USE:

- [x] Domestic
- [ ] Irrigation
- [ ] Test Well
- [ ] Public Supply
- [ ] Air Conditioning
- [ ] Industry
- [ ] Commercial
- [ ] ____

7 CASING:

Threaded [x] Welded [ ]

Diam. 2 in. to 49 ft. Depth

2 in. to 49 ft. Depth

Height: Above/~~Below~~ Surface 1 ft.

Weight 3.65 lbs./ft.

Drive Shoe? Yes [x] No [ ]

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel	11'	11'
Sand & Gravel & Brown Clay	7'	18'
Blue Clay & Gravel	30'	48'
Fine & Coarse Sand	5'	53'

USE A 2ND SHEET IF NEEDED

8 SCREEN.

Type: Stainless Dia.: 1¼"

Slot/~~Gauze~~ 10 Length 4'

Set between 49 ft. and 53 ft.

Fittings: 1 - 1¼" coupling

9 STATIC WATER LEVEL

23 ft. below land surface

10 PUMPING LEVEL below land surface

45 ft. after 1 hrs. pumping 10 g.p.m.

45 ft. after 1 hrs. pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) NOT Chlorides (Cl) KNOWN

Hardness ____ Other ____

12 WELL HEAD COMPLETION:

- [ ] In Approved Pit
- [ ] Pitless Adapter
- [x] 12" Above Grade

13 Well Grouted?

- [ ] Yes
- [x] No
- [ ] Neat Cement
- [ ] Bentonite
- [ ] ____

Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

80 feet S.W. Direction Septic Type

Well disinfected upon completion [x] Yes [ ] No

15 PUMP:

[x] Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type: [ ] Submersible [ ] Jet [ ] Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

B. Fred Well Drilling 0488

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 300 Sherman St Otsego, Mich

Signed [signature] Date June 5-72

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

WELL 23 1584

LOCAL HEALTH DEPT. COPY

OGICAL SURVEY SAMPLE No.

MEN02250

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN OF PUBLIC HEALTH

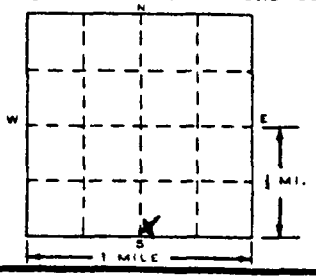
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	SE SW SE	1	1 N/S.	12 E W.

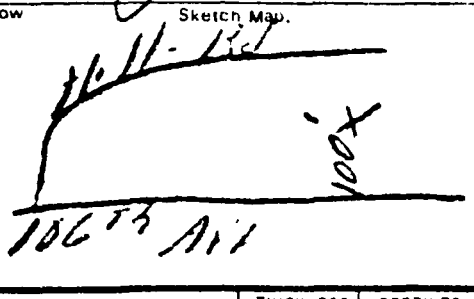
Distance And Direction from Road Intersections: 5 3/10 Mile E. of Hill Rd on 106th Ave Otsego, Mich

Street address & City of Well Location

Locate with "X" in section below



Sketch Map.



3 OWNER OF WELL: Mrs. Juanita Garcia

Address 16345 John R. Apt 203 Highland Park, Mich

4 WELL DEPTH (completed) 37 ft. Date of Completion April 30 74

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING Diam. Threaded ☒ Welded ☐

2 in. to 30 ft. Depth

2 in. to 30 ft. Depth

Height, Above/~~Below~~ Surface 1 ft.

Weight 3.65 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel (Fine Sand)	37'	37'

8 SCREEN

Type Strainer Dia. 1 1/4"

Slot/~~Gauze~~ 12 & 10 Length 7'

Set between 30 ft. and 37 ft.

Fittings. 1 1/4" cupling

9 STATIC WATER LEVEL

16' ft. below land surface

10 PUMPING LEVEL below land surface

27 ft. after 1 hrs. pumping 12 g.p.m.

27 ft. after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Not Known Chlorides (Cl)

Hardness ____ Other ____

12 WELL HEAD COMPLETION. ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth. From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

Septic Not in Yet Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☒ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type. ☐ Submersible ☐ Jet ☐ Reciprocating

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

Blue Clay & Sand & Gravel Down To 168 - No Water Below 37 To 168

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bakers Well Drilling 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherwood St Otsego

Signed [signature] Date April 30 74

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

WELL 24 1585

GEOLOGICAL SURVEY SAMPLE No. [ ]

MEN02251

70

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

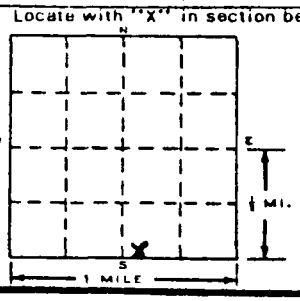
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	S.E. S.W. S.W.	13	1 N/S.	12 E/W

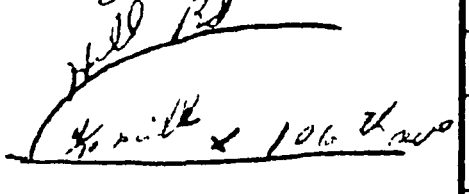
Distance And Direction from Road Intersection: 1/10 mile East of Blue Rd on 106th ave

Street address & City of Well Location: 1339-106th ave Otsego, mich

Locate with "X" in section below



Sketch Map



3 OWNER OF WELL: Kirk L. Mulcahy

Address: 1339-106th ave Otsego, mich.

4 WELL DEPTH (completed) 67 ft. Date of Completion apr. 17-71

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING. Threaded ☒ Welded ☐

Diam. 2 in. to 63 ft. Depth

2 in. to 63 ft. Depth

Height. Above/~~Below~~ Surface 1 ft.

Weight 3.75 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel	20'	20'
Quick Sand	2'	22'
Blue clay & Sand	6'	28'
Blue clay & Sand Gravel	30'	58'
Sand & Gravel	9'	67'

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type Johnson Thirst Dia.: 1 1/4"

Slot ~~____~~ 10 Length ____

Set between 63 ft. and 67 ft.

Fittings 1-1 1/4" coupling

9 STATIC WATER LEVEL 45 ft. below land surface

10 PUMPING LEVEL below land surface

30 ft. after 1 hrs. pumping 10 g.p.m.

30 ft. after 1 hrs. pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) NOT KNOWN Chlorides (Cl)

Hardness ____ Other ____

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination NOT IN YET Distance ____ Direction ____ Type SEPTIC

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP. ☐ Not installed

Manufacturer's Name TAIT

Model Number 10STA HP 1 Volts 220

Length of Drop Pipe 42 ft. capacity 12 G.P.M.

Type ☐ Submersible ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

Lots of Stones down to 40 feet

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Baker Well Drilling 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherman St Otsego, mich

Signed Rip Baker AUTHORIZED REPRESENTATIVE Date apr. 17-71

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT COPY

WELL 25 1586

GEOLOGICAL SURVEY SAMPLE No.

WATER WELL RECORD

ACT 294 PA 1965

MICHIG MEN02252

PUBLIC HEALTH

1 LOCATION OF WELL

County	Twp.	Fraction	Section No.	Town	Range
Allegan	Otsego	NE¼ N.E¼ S.W¼	23	1 N/S.	12 E/W.

Distance And Direction From Road Intersections: 1/10 mile W of Hill Rd on East River St

OWNER No.

1420 East River St Otsego Mich

Street address & City of Well Location

3 OWNER OF WELL: Fred Hampton

Address 1420 East River St Otsego, Mich

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Fine Sand & Gravel	28'	28'

4 WELL DEPTH: (completed) 28 ft. Date of Completion Mar 2 - 70

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☒ Jetted ☐ Bored ☐ ___

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ___

7 CASING: Threaded ☒ Welded ☐

Diam. 2 in. to 25 ft. Depth

2 in. to 25 ft. Depth

Height: Above/~~Below~~ surface 1 ft.

Weight 3.65 lbs/ft.

Drive Shoe? Yes ☐ No ☒

8 SCREEN.

Type: Clayton mark Dia.: 1¼"

~~Slot~~/Gauze 80 SS Length 3'

Set between 25 ft. and 28 ft.

Fittings: 1¼" coupling

9 STATIC WATER LEVEL

6 ft. below land surface

10 PUMPING LEVEL below land surface

20 ft. after 1 hrs. pumping 10 g.p.m.

20 ft. after 1 hrs. pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Not Chlorides (Cl) Known

Hardness ___

12 WELL HEAD COMPLETION: ☒ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade

13 GROUTING:

Well Grouted? ☐ Yes ☒ No

Material: ☐ Neat Cement ☐ ___

Depth: From ___ ft. to ___ ft.

14 SANITARY:

Nearest Source of possible contamination

90 feet S Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

Manufacturer's Name ___

Model Number Not Known HP ___

Length of Drop Pipe ___ ft. capacity ___ G.P.M.

Type: ☐ Submersible ☐ ___ ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bakers Well Drilling 0488

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 300 [illegible] St. Otsego, Mich.

Signed [illegible] Date Mar 4-70

AUTHORIZED REPRESENTATIVE

D67D 100M 6-66

LOCAL HEALTH DEPT. COPY WELL 26 1587

GEOLOGICAL SURVEY SAMPLE No.

206

MEN02253

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

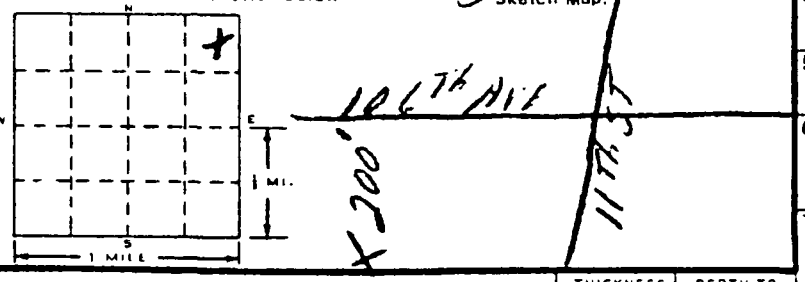
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
ALLEGAN	OTSEGO	NE NE NE	24	1 N/S.	12 E/W.

Distance And Direction from Road Intersections: 3/4 MI W of 11TH ST on 106TH AVE

Street address & City of Well Location: 1210 106TH AVE OTSEGO MICH

Locate with "X" in section below — Sketch Map:



3 OWNER OF WELL

HOMER JACKSON

Address: 1210-106TH AVE OTSEGO MICH

4 WELL DEPTH (completed) Date of Completion

43 ft. APRIL 29 76

5

☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug

☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE

☒ Domestic ☐ Public Supply ☐ Industry

☐ Irrigation ☐ Air Conditioning ☐ Commercial

☐ Test Well ☐

7 CASING

Diam. Threaded ☒ Welded ☐

2 in. to 39 ft. Depth

2 in. to 32 ft. Depth

Height: Above/Below Surface 1 ft.

Weight 3.75 lbs./ft.

Drive Shoe? Yes ☒ No ☐

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
SAND & GRAVEL	43'	43'

USE A 2ND SHEET IF NEEDED

8 SCREEN

Type: STRAINER Dia.: 1¼"

Slot/Gauze 10 Length 4'

Set between 39 ft. and 43 ft.

Fittings: 1¼" COUPLING

9 STATIC WATER LEVEL

6 ft. below land surface

10 PUMPING LEVEL below land surface

6 ft. after 1 hrs. pumping 12 g.p.m.

6 ft. after 1 hrs. pumping 12 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) NOT KNOWN Chloride (Cl)

Hardness ____ Other ____

12 WELL HEAD COMPLETION:

☐ In Approved Pit

☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted?

☐ Yes ☒ No

☐ Neat Cement ☐ Bentonite ☐ ____

Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination

75 feet S.E. Direction SEPTIC Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP:

☐ Not installed

Manufacturer's Name JAIT

Model Number 5-5TA HP ½ Volts 115

Length of Drop Pipe 31 ft. capacity 10 G.P.M.

Type: ☐ Submersible

☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

BAKER WELL DRILLING 0458

REGISTERED BUSINESS NAME REGISTRATION NO.

Address 300 SHERWOOD ST OTSEGO

Signed [signature] AUTHORIZED REPRESENTATIVE Date MAY 1 76

D67d 100M (Rev. 12-68)

LOCAL HEALTH DEPT. COPY

WELL 27 1588

GEOLOGICAL SURVEY SAMPLE No

MEN02254

WATER WELL RECORD

ACT 294 PA 1965

MICH. OF PUBLIC HEALTH

1 LOCATION OF WELL

County	Twp	Fraction	Section No.	Town	Range
Allegan	Otsego	S.W. SE. N.W.	24	1 N S	12 E/W.

Distance And Direction from Road Intersections: north of 13th where it ends on M89 - ½ mile ½ mile north of M89

OWNER No

Street address & City of Well Location: 1343 East M89 Otsego Mich

3 OWNER OF WELL Bernard McPherson

Address 249 W. Orleans Otsego, Mich

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel & Brown Clay	20'	20'
Sand & Gravel	34'	54'

4 WELL DEPTH (completed) 54 ft Date of Completion Sept 9-68

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☒ Jetted ☐ Bored ☐

6 USE ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ Machine Shop

7 CASING Diam Threaded ☒ Welded ☐ Height: Above/~~Below~~ surface 1 ft.

4 in. to 50 ft. Depth Weight 10.79 lbs/ft.

4 in to 50 ft Depth Drive Shoe? Yes ☐ No ☒

8 SCREEN

Type Johnson Stainless Dia.: 3 7/8"

Slot/~~Gauge~~ 7 Length 4'

Set between 50 ft. and 54 ft.

Fittings: 5' of 3" casing & 1 Bell Bottom 1 - Turned cupling

9 STATIC WATER LEVEL

32 ft below land surface

10 PUMPING LEVEL below land surface

40 ft after 1 hrs. pumping 30 g.p.m.

40 ft after 1 hrs. pumping 30 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) NOT Chlorides (Cl)

Hardness

12 WELL HEAD COMPLETION ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 GROUTING

Well Grouted? ☐ Yes ☒ No

Material: ☐ Neat Cement ☐

Depth: From ft. to ft

14 SANITARY

Nearest Source of possible contamination NOT ON YET Type

Well disinfected upon completion ☐ Yes ☐ No

15 PUMP

Manufacturer's Name TAIT

Model Number B 10 D 46 HP 1

Length of Drop Pipe 37 ft. capacity 35 G P M

Type. ☒ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

B. [illegible] 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 302 [illegible]

Signed [illegible] Date Sept 16-68

AUTHORIZED REPRESENTATIVE

D67D 100M 6-66

WELL 28 1589

LOCAL HEALTH DEPT COPY

GEOLOGICAL SURVEY SAMPLE No

WATER WELL RECORD

ACT 294 PA 1965

MICHI MEN02255

PUBLIC HEALTH

1 LOCATION OF WELL

County	Twp	Fraction	Section No.	Town	Range
Allegan	Otsego	SE NW NW	24	1 N/S	12 E/W

Distance And Direction from Road Intersections: 1 mile N of M89 on Plainwell Dam Rd, Plainwell Dam Rd, Otsego, Mich

OWNER No

Street address & City of Well Location

3 OWNER OF WELL Harry Pickett Cont.

Address E. M89 Otsego, Mich

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Stones & Gravel & Brown Clay	20'	20'
Sand & Gravel	25'	45'

4 WELL DEPTH (completed) 45 ft Date of Completion Dec. 13-68

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☒ Jetted ☐ Bored ☐ ___

6 USE ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☒ Commercial ☐ Test Well ☐ Pickett Sand & Gravel

7 CASING Diam. Threaded ☒ Welded ☐ Height: Above/~~Below~~ surface 1 ft.

2 in. to 42 ft. Depth Weight 3.65 lbs/ft.

2 in to 42 ft Depth Drive Shoe? Yes ☐ No ☒

8 SCREEN

Type: Clayton Mark Dia.: 1¼"

~~Slot~~/Gauze 60 Length 36"

Set between 42 ft. and 45 ft.

Fittings: 1¼" coupling

9 STATIC WATER LEVEL

32 ft below land surface

10 PUMPING LEVEL below land surface

40 ft. after 1 hrs. pumping 10 g p.m.

40 ft after 1 hrs pumping 10 g p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) ___ Chlorides (Cl) ___

Hardness NOT KNOWN

12 WELL HEAD COMPLETION. ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 GROUTING

Well Grouted? ☐ Yes ☒ No

Material: ☐ Neat Cement ☐ ___

Depth: From ___ ft to ___ ft.

14 SANITARY

Nearest Source of possible contamination

90 feet NE Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

Manufacturer's Name TAIT

Model Number 10E2 V2H HP 1 H.P.

Length of Drop Pipe 40 ft. capacity 14 G.P.M

Type: ☐ Submersible ☐ ___ ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

~~Rep~~ Baker Well Drilling — REGISTERED BUSINESS NAME

0488 — REGISTRATION NO.

Address 300 Sherwood St, Otsego Mich

Signed Rep Baker — AUTHORIZED REPRESENTATIVE

Date Dec. 18-68

067D 100M 6-66

LOCAL HEALTH DEPT. COPY

WELL 29 1590

GEOLOGICAL SURVEY SAMPLE No. 94

MEN02256

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

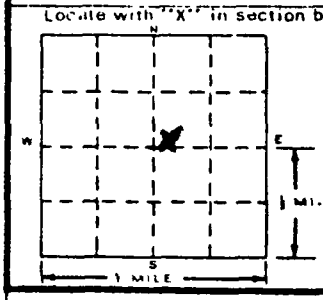
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	NE.S.W.S.W.	24	1 N/S.	12 E/W.

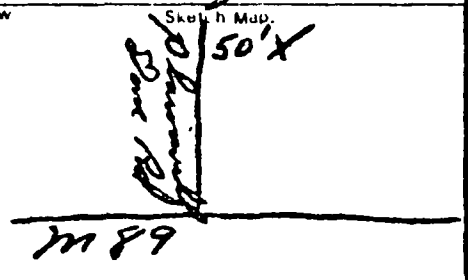
Distance And Direction from Road Intersections: 3/10 mile N of M 89 on Plainwell Dam Rd

Street address & City of Well Location: Plainwell Dam Rd Otsego, Mich

Locate with "X" in section below



Sketch Map



3 OWNER OF WELL: Consumers Ready Mix Concrete Co.

Address: Nazareth Rd Kalamazoo, Mich

4 WELL DEPTH: (Completed) 68 ft. Date of Completion: Sept 7-72

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☐ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☒ Ready-Mix-Plant

7 CASING Diam. Threaded ☒ Welded ☐ Height: Above ~~Below~~ Surface 1 ft.

4 in. to 58 ft. Depth Weight 10.79 lbs./ft.

4 in. to 58 ft. Depth Drive Shoe? Yes ☒ No ☐

2 FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand & Gravel & Brown Clay	18'	18'
Sand & Gravel	50'	68'

8 SCREEN:

Type: Strainer Dia.: 3 7/8

Slot ~~Gauze~~ 10 Length 8 1/2'

Set between 58 ft. and 68 ft.

Fittings: 1' of 3" casing 1 - Rubber pack 1 - 1 1/4" Nip in side

9 STATIC WATER LEVEL: 32 ft. below land surface

10 PUMPING LEVEL below land surface

50 ft. after 1 hrs. pumping 80 g.p.m.

50 ft. after 1 hrs. pumping 80 g.p.m.

11 WATER QUALITY in Parts Per Million:

Iron (Fe) Not Chlorides (Cl) KNOWN

Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☒ No ☐ Neat Cement ☐ Bentonite ☐ ____

Depth: From ____ ft. to ____ ft.

14 Nearest Source of possible contamination: 85 feet N.E. Direction Septic Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☒ Not installed

Manufacturer's Name ____

Model Number ____ HP ____ Volts ____

Length of Drop Pipe ____ ft. capacity ____ G.P.M.

Type ☐ Submersible ☐ Jet ☐ Reciprocating

USE A 2ND SHEET IF NEEDED

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Bakers Well Drilling 0488

REGISTERED BUSINESS NAME REGISTRATION NO

Address 300 Sherwood St. Otsego, Mich

Signed Roy Baker Date Sept 11-72

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

WELL 30 1591

LOCAL HEALTH DEPT. COPY

GEOLOGICAL SURVEY SAMPLE No

WATER WELL RECORD

ACT 294 PA 1965

MICHI MEN02257

PUBLIC HEALTH

1 LOCATION OF WELL

County	Twp	Fraction	Section No	Town	Range
Allegan	Otsego	[illegible]	[illegible]	1 N/S	12 E/W

Distance And Direction from Road Intersections: [illegible] NW [illegible] 1407 [illegible] Otsego Mich

OWNER No

Street address & City of Well Location

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand - Gravel & Stone	45'	45'

3 OWNER OF WELL

Address: [illegible] W Allegan St Otsego, Mich

4 WELL DEPTH (completed) 45 ft Date of Completion: Sept 2 [illegible]

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ___

6 USE ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ___

7 CASING Diam Threaded ☒ Welded ☐ Height: Above/Below surface 1 ft. Weight [illegible] lbs/ft. Drive Shoe? Yes ☒ No ☐

2 in. to 41 ft. Depth

2 in to 41 ft Depth

8 SCREEN

Type: [illegible] Dia.: 1 1/4"

Slot/Gauze 10 Length 4'

Set between 41 ft. and 45 ft.

Fittings: 1 1/4" coupling

9 STATIC WATER LEVEL

34 ft below land surface

10 PUMPING LEVEL below land surface

40 ft after 1 hrs. pumping 10 g.p.m.

40 ft after 1 hrs pumping 10 g.p.m.

11 WATER QUALITY in Parts Per Million

Iron (Fe) ___ Chlorides (Cl) Not known

Hardness ___

12 WELL HEAD COMPLETION ☒ In Approved Pit ☐ Pitless Adapter ☐ 12" Above Grade

13 GROUTING

Well Grouted? ☐ Yes ☒ No

Material: ☐ Neat Cement ☐ ___

Depth: From ___ ft. to ___ ft.

14 SANITARY

Nearest source of possible contamination: Agreed to move 25 feet NW Direction ___ Type

Well disinfected upon completion ☒ Yes ☐ No

15 PUMP

Manufacturer's Name [illegible]

Model Number [illegible] HP [illegible]

Length of Drop Pipe 4 ft capacity [illegible] G.P.M.

Type: ☐ Submersible ☐ ___ ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief

[illegible] REGISTERED BUSINESS NAME [illegible] REGISTRATION NO

Address [illegible]

Signed ___ AUTHORIZED REPRESENTATIVE Date [illegible]

167D 100M 6-66

LOCAL HEALTH DEPT. COPY

WELL 31

1592

GEOLOGICAL SURVEY SAMPLE No. 418

MEN02258

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

34

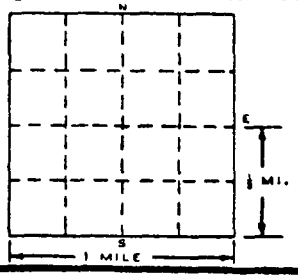
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
ALLEGAN	OTSEGO	¼ ¼ ¼	23	N/S.	E/W.

Distance And Direction from Road Intersections: 40' E. OF PLANT AND 80' N. OF RIVER.

Street address & City of Well Location

Locate with "X" in section below — Sketch Map



3 OWNER OF WELL MENASHA CORPORATION

Address: OTSEGO, MICHIGAN

4 WELL DEPTH (completed) 80 ft. Date of Completion 1-29-79

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☐ Hollow rod ☐ Jetted ☐ Bored ☒ EC

6 USE. ☐ Domestic ☐ Public Supply ☒ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐

7 CASING Diam. Threaded ☐ Welded ☒

12 in. to 62 ft. Depth

___ in. to ___ ft. Depth

Height (Above) Below Surface 2 ft.

Weight 51 lbs./ft.

Drive Shoe? Yes ☐ No ☒

2

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
DIRTY SAND, GRAVEL	11	11
CLAY	15	26
FINE SAND	14	40
COURSE SAND	36	76
COURSE GRAVEL, BOULDERS	4	80
CLAY, BOULDERS	-	-

USE A 2ND SHEET IF NEEDED

8 SCREEN.

Type JOHNSON W/W Dia.: 12"

Slot/Gauze 030 Length 20'

Set between 60 ft. and 80 ft.

Fittings

9 STATIC WATER LEVEL 11 ft. below land surface

10 PUMPING LEVEL below land surface

41 ft. after 8 hrs. pumping 800 g.p.m.

___ ft. after ___ hrs. pumping ___ g.p.m.

11 WATER QUALITY in Parts Per Million.

Iron (Fe) ___ Chlorides (Cl) ___

Hardness ___ Other ___

12 WELL HEAD COMPLETION. ☐ In Approved Pit ☐ Pitless Adapter ☒ 12" Above Grade

13 Well Grouted? ☒ Yes ☐ No

☐ Neat Cement ☒ Bentonite ☐

Depth From 14 ft. to 54 ft.

14 Nearest Source of possible contamination

___ feet ___ Direction ___ Type

Well disinfected upon completion ☐ Yes ☐ No

15 PUMP ☒ Not installed

Manufacturer's Name ___

Model Number ___ HP ___ Volts ___

Length of Drop Pipe ___ ft. capacity ___ G.P.M.

Type. ☐ Submersible ☐ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION

This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

[illegible] INC.

REGISTERED BUSINESS NAME — REGISTRATION NO

Address [illegible]

Signed [illegible] Date [illegible]

AUTHORIZED REPRESENTATIVE

D67d 100M (Rev 12 68)

LOCAL HEALTH DEPT. COPY

WELL 32 1593

GEOLOGICAL SURVEY SAMPLE No.

MEN02259

WATER WELL RECORD

ACT 294 PA 1965

MICHIGAN DEPARTMENT OF PUBLIC HEALTH

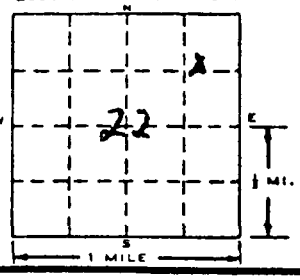
1 LOCATION OF WELL

County	Township Name	Fraction	Section Number	Town Number	Range Number
Allegan	Otsego	SE NE NE	22	1 N/S	12 E/W

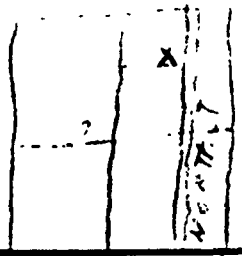
Distance And Direction from Road Intersection: 354 Water St about 800 ft W of E sect line + 40 ft N of N 1/4 of NE 1/4 line

Street address & City of Well Location: City of Otsego

Locate with "X" in section below



Sketch Map:



3 OWNER OF WELL: Joseph L. Rush

Address: 354 Water St Otsego Mich

4 WELL DEPTH. (completed) 53 ft. Date of Completion Feb 12, 1974

5 ☐ Cable tool ☐ Rotary ☐ Driven ☐ Dug ☒ Hollow rod ☐ Jetted ☐ Bored ☐ ____

6 USE: ☒ Domestic ☐ Public Supply ☐ Industry ☐ Irrigation ☐ Air Conditioning ☐ Commercial ☐ Test Well ☐ ____

7 CASING: Threaded ☒ Welded ☐ Diam. 2 in. to 49 ft. Depth ____ in. to ____ ft. Depth

Height: Above/Below Surface ____ ft. Weight ____ lbs./ft. Drive Shoe? Yes ☒ No ☐

2 FORMATION

FORMATION	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM
Sand	24	24
Brown clay	6	30
Fine sand	23	53

USE A 2ND SHEET IF NEEDED

8 SCREEN.
Type: Midwest Dia.: 1 1/4
Slot/Gauze gauge Length 4 ft
Set between 49 ft. and 53 ft.
Fittings:

9 STATIC WATER LEVEL
21 ft. below land surface

10 PUMPING LEVEL below land surface
____ ft. after ____ hrs. pumping ____ g.p.m.
____ ft. after ____ hrs. pumping ____ g.p.m.

11 WATER QUALITY in Parts Per Million:
Iron (Fe) ____ Chlorides (Cl) ____
Hardness ____ Other ____

12 WELL HEAD COMPLETION: ☐ In Approved Pit ☒ Pitless Adapter ☐ 12" Above Grade

13 Well Grouted? ☐ Yes ☐ No ☐ Neat Cement ☐ Bentonite ☐ ____
Depth From ____ ft. to ____ ft.

14 Nearest Source of possible contamination
150 feet N Direction Sewer line Type
Well disinfected upon completion ☒ Yes ☐ No

15 PUMP: ☐ Not installed
Manufacturer's Name Burks
Model Number 666-1850 cl HP 1 1/2 Volts 220
Length of Drop Pipe 40 ft. capacity 70 G.P.M.
Type. ☐ Submersible ☒ Jet ☐ Reciprocating

16 Remarks, elevation, source of data, etc.

17 WATER WELL CONTRACTOR'S CERTIFICATION:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.

Joseph L. Rush 0741
REGISTERED BUSINESS NAME REGISTRATION NO.

Address 354 Water St Otsego

Signed Joseph L. Rush Date Mar. 4-74
AUTHORIZED REPRESENTATIVE

D67d 100M (Rev. 12-68)

WELL 33 1594

LOCAL HEALTH DEPT. COPY

FORM NO 561

MEN02260

memo / MENASHA CORPORATION

TO: DNR Phone Call File-
RCRA

DATE: 13 May 1981

SUBJECT:

FROM. John Blauwkamp
JB

On May 7, 1981, I talked with Jerry Hyitt of the RCRA division in Grand Rapids, The main subject of conversation was if we could put the fly ash lime mixture from our settling pond in the landfill? I told Jerry that we intended to spread the mixture in a two foot layer on one side of the landfill to allow it to dry. Then if the mixture would dry properly, we could spread it on farmland for its lime value. If the mixture did not dry properly we could just cover it up. I gave Jerry the results of a leachate analysis we had done on the mixture, and he said he thought there would be no problem with this. However, if later we developed a dusting problem from the mixture while it was drying, we would have to cover it up.

JB/kj

4304

STATE OF MICHIGAN

MEN02261

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
CARL T JOHNSON
E M LAITALA
HILARY F SNELL
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

RESOURCE RECOVERY COMMISSIC
THOMAS J BLESSING JR
ALBERT M BORKIN
ANN ESKRIDGE
PAMELA A FRUCCI
C ERNEST KEMP
JOHN W LAYMAN
CLIFFORD MILES
STUART B PADNOS
ROGER RASMUSSEN
JAMES STORNANT
MICHAEL L WALKINGTON

RESOURCE RECOVERY DIVISION
Region III
Secondary Complex
Box 30028
Lansing MI 48909
517/322-1300

July 21, 1981

Mr. John R. Blauwkamp, Technical Manager
Menasha Corporation
320 Farmer Street
Otsego, Michigan 49078

Re: Menasha Corporation Landfill
Allegan County

Dear Mr. Blauwkamp:

As per your March 31, 1981, correspondence relative to classification of your waste streams, the Department renders the following decisions: Based upon results from your leach analyses performed upon the fly ash from your coal fired boilers, the fly ash may be classified as Type III. If you choose to place the ash within a Type III landfill facility, annual leach testing shall be required to reconfirm this classification.

Based upon a visual inspection of the waste generated through your waste paper cleaning system, the Department recommends utilizing a series of water quality sampling results from your landfill monitor system as the primary basis for waste classification. This, along with a comparison of water quality analyses from landfills primarily accepting similar wastes, will provide the deciding factors as to whether the waste is suited for Type III disposal.

Pursuant to the above determination, please note that a July 9, 1981, water sampling conducted by Resource Recovery Division personnel found Well TH-2 dry. As this well is our only downgradient sampling station, it is imperative that the well yield a sufficient supply of water for required groundwater analyses. Please contact this office at your earliest possible convenience with a decision as to correcting measures for this well. Without it, the Department cannot define the waste generated through your waste paper cleaning system as a Type III material.

Should you have any questions or comments, please contact me at (517) 322-0907.

Very truly yours,

Virginia L. Loselle

Virginia L. Loselle, Geologist

VLL:sl

cc: E. Bols
B. Curry
S. Hoffman

MICHIGAN THE GREAT LAKE STATE

R1026-6 9/79

4661-B

STATE OF MICHIGAN

MEN02262

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
CARL T JOHNSON
E M LAITALA
HILARY F SNELL
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

RESOURCE RECOVERY COMMISSI
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ALBERT M BORKIN
ANN ESKRIDGE
PAMELA A FRUCCI
C ERNEST KEMP
JOHN W LAYMAN
CLIFFORD MILES
STUART B PADNOS
ROGER RASMUSSEN
JAMES STORNANT
MICHAEL L WALKINGTON

RESOURCE RECOVERY DIVISION
Region III
Secondary Complex
Box 30028
Lansing MI 48909
517/322 1300

December 17, 1981

Mr. John Blauwkamp, Technical Manager
Menasha Corporation
Otsego Paperboard Mill
Farmer Street
Otsego, Michigan 48078

Re: Menasha Corporation Landfill
Allegan County

Dear Mr. Klauwkamp:

Pursuant to our December 15, 1981, meeting regarding the above captioned landfill, this letter summarizes our basic points of discussion.

Your landfill is currently licensed as a Type II facility. Wastes currently accepted for disposal at the site are fly ash, a fly ash-lime sludge mixture, a hydro-pulper scrap waste, a wood waste consisting of very fine fragments of wood, and waste from your waste paper baskets. Upon your next licensing, Menasha Corporation plans to seek approval to license the facility as a Type III site. This will necessitate verifying, through leach testing, a Type III classification for the first three wastes listed above. In addition, waste paper, as a Type II material, will no longer be an accepted waste for disposal.

The following time frame was established for submitting leach test results to this office:

1) Prior to January 15, 1982, Menasha Corporation will submit a letter to this office detailing leach test procedures and parameters for each waste to be tested.

2) Approval or denial from our office will be supplied to the company no later than January 31, 1982.

3) Leach test results will then be submitted to our office no later than March 1, 1982.

4) A decision by our office as to Waste Classification will be provided no later than March 15, 1982.

MICHIGAN
THE GREAT LAKE STATE

H1026-6 9/79

4637

Based upon the nature of the wastes involved, a monitor program for the landfill will need to be established. Attempts to install groundwater monitor wells in the past led to many problems since the water table is over 100 feet below ground elevation. If your site obtains licensure as a Type III Facility, it may be possible to develop a monitor program around monitoring the wastes entering the site rather than orienting around the establishment of a network of groundwater monitor wells. In either case, a monitor proposal must be submitted to our office for review prior to your June license renewal date.

Should you have any questions or comments, please feel free to contact me at (517) 373-0907.

Very truly yours,

Virginia L. Loselle

Virginia L. Loselle
Geologist

VLL:sl

Enclosure

cc: E. Dols, FRD
Region III
F. Curry, FRD

MEN02264

MENASHA CORPORATIOI

9 September 1982

Elizabeth Bols
350 Ottawa Avenue, N.W.
Grand Rapids, MI 49504

Dear Ms. Bols;

The trash compactor for our Class II waste was put in operation the week of August 16. Since that time, no Class II waste has been going to the landfill.

The installation of the two downstream test wells at the landfill, was completed this week. CH2M-Hill supervised the installation of these test wells. Stainless steel pipe was used for the test wells. We felt this was best because it would give us both the physical strength we need for these deep wells and avoid the contamination problems possible from using steel pipe. If you have any questions concerning this matter, please contact me at this office.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: B. Buchanan
T. Ray

JB/kj

4649

OTSEGO PAPERBOARD MILL FARMER STREET · OTSEGO MICHIGAN 49078 · PHONE 616 69

MEN02265

MENASHA CORPORATIO

13 December 1982

Tim Dahlstrand
STS Consultants Ltd.
3340 Ranger Rd.
Lansing, MI 48906

Dear Tim;

We should proceed with the landfill closure plan based on using a clay cover. It appears to be obviously the least expensive and probably the most acceptable by the DNR. In addition to this, the possibility of staging the closure and spreading the costs out over 1983 and 1984 is an additional advantage.

The proposed final contours would leave the hill on the west end essentially in tact and simply slope it gradually towards the east. I believe we should determine what the cost would be to take a large bulldozer and knock the high part off this hill and thus give the final landfill a much more uniform contour. The final closure plan should include a covering of the entire area that was filled with a final cover material and not just the area that is currently within the boundaries of the landfill. This would extend the area that must receive the final cover up to the roads located on the east and west sides of the landfill.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
Tom Clemmons

j

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616

MEN02266

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
E M LAITALA
HILARY F SNELL
PAUL H WENDLER
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G MILLIKEN Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

March 4, 1983

Mr. John Blauwkamp
Menasha Corporation
Paperboard Division
Box 155
Otsego, MI 49078

Re: Menasha Corp. Landfill
Allegan County #03-000016

Dear Mr. Blauwkamp:

Enclosed is a copy of the landfill inspection report for your information and evaluation.

If you have any questions concerning this form or the landfill operation, do not hesitate to contact me at (616) 456-5071.

Very truly yours,
GROUNDWATER QUALITY DIVISION

Richard Sadowski

Richard Sadowski, P.E.
Environmental Engineer

RS:bjc
enc.
cc: G. Kilmer

R1026 1 1/80

4329

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
RESOURCE RECOVERY DIVISION

L

EVALUATION REPORT

MEN02267

SANITARY LANDFILL: ☐ TYPE II ☑ TYPE III ☐ OTHER _____

NAME OF FACILITY	FACILITY NO
[illegible] CORPORATION	[illegible]

LOCATION Main Roads — Section No — Township — City — County
FARMER ST

NAME OF OPERATOR	NAME OF LICENSEE

STATUS ☑ Open & Licensed ☐ Closed & Inspecting ☐ Unlicensed

RESTRICTIONS/STIPULATIONS TO CONSIDER DURING INSPECTION

(C) Compliance (N) = Noncompliance (—) = Does Not Apply [illegible]

[illegible]	A	Protection of Surface Waters
	B	Hazardous Material/Liquids/Sewage Materials Prohibited for Disposal
	C	Surface Water Drainage
	D	Period and Adequacy of Drainage
[illegible]	E	Completion of Area/Final Coverage
	F	Compaction
	G	Leachate Control/Management
[illegible]	H	Engineering Plans, Hydrogeologic Evaluation & Construction Certification
	I	Operations Conform to Plan & License Stipulations
	J	Vermin Control/Bird Control
	K	Blowing Debris, Dust & Odor Control
	L	Gas Migration
	M	Fire Protection and Restriction of Burning
	N	Equipment Adequacy
	O	Restricted Access/Attendant
	P	Traffic Flow
	Q	Salvaging/Scavenging
	R	Noise Level
	S	Fence/Screening Maintenance

REMARKS
E [illegible]
H [illegible] Plans
[illegible]

Inspection item definitions are on back of this form

PERSON INTERVIEWED	DATE	TIME OF INSPECTION
JOHN BLANKAMP	Y Y M M D D	[illegible]

INSPECTED BY	REPRESENTING
[illegible]DOWSKI / S PEELAN	[illegible]

DISTRIBUTION Original to Dept of Natural Resources, 1 copy — Licensee, 1 copy — Certified Health Dept 4330

R5509
Rev 7/82

MEN02268

MENASHA CORPORATIO

April 15, 1983

Rick Sadowski
Department of Natural Resources
350 Ottawa Ave, N.W.
Grand Rapids, MI 49503

Dear Rick:

Menasha Corporation hereby requests permission to dispose of the sludge from our ash lime settling pond in our Class III landfill. The sludge is composed of the very fine ash from our ash storage silo and the lime from our hot process softener. These two slurries are mixed together and a small amount of polymer is added to help the fly ash settle out. The mixture is then pumped to the ash lime settling pond where the solids settle out and the supernate overflows to the main aeration pond.

Because the sludge is composed of only fly ash and lime from the hot process softener, it should be acceptable in the Class III landfill. A copy of the leachate tests that were conducted on the material in July of 1980 are attached.

If you do not agree that the material is acceptable for the Class III landfill or additional testing is necessary, we would appreciate learning of this as soon as possible so that other arrangements can be made.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
T. Ray
R. L. Janda
K. Kling

j

4305

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616

MEN02269

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
E M LAITALA
HILARY F SNELL
PAUL H WENDLER
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G MILLIKEN Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

April 26, 1983

Mr. John R. Blauwkamp, P.E.
Technical Manager
Menasha Corporation
Farmer Street
Otsego, MI 49078

Re: Fly Ash Sludge Request

Dear Mr. Blaukamp:

The fly ash sludge should have no detrimental impacts on your Type III landfill. This material is approved provided:

a) No free liquids are allowed to go to the fill area.

b) No hazardous nor Type II wastes are added.

c) This material is tested at least annually to see if it changes significantly from the test data supplied.

If you have questions, please contact me at (616) 456-5071.

Very truly yours,
GROUNDWATER QUALITY DIVISION

Richard Sadowski

Richard Sadowski, P.E.
Environmental Engineer

RS:bjc

4308

R1026-1 1 80

MEN02270

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
E M LAITALA
HILARY F SNELL
PAUL H WENDLER
HARRY H WHITELEY

JAMES J BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

September 16, 1983

Mr. John Blauwkamp
Menasha Corporation
Otsego, MI 49078

Re: Menasha Corp.
Allegan County

Dear Mr. Blauwkamp:

As indicated in our meeting August 26, 1983, the disposal of the lime sludge at your landfill is acceptable if you foresee no problems. Ensure that this material is adequately covered so that no unreasonable nuisance or dust release occurs.

Other items discussed were as follows:

1. The truck wash area is a potential source of contamination. This area should be paved and the spent wash water suitably managed.

2. Permanent removal of the remaining lime storage piles should be considered.

3. The empty barrel storage along the river, although acceptable environmentally, is an eyesore and a source of considerable citizen anxiety. Removal to recycling or traditional storage is desirable.

4. The lagoon to the north of the landfill should be addressed as part of the landfill closure plan.

If you have any questions or comments, please feel free to contact me at (616) 456-5071.

Very truly yours,
GROUNDWATER QUALITY DIVISION

Richard Sadowski

Richard Sadowski
Environmental Engineer

RS:bjc

cc: Mr. Kilmer
Ms. Peelen

R1026 1

4659

LANDFILL LICENSES AND BONDS

DOCUMENT #47B

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Environmental Protection Bureau
Resource Recovery Division

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

FOR DNR USE ONLY	MEN02272
FACILITY NO.	LICENSE NO.
COUNTY	Date Received by Resource Recovery Division

Application is hereby made to the Director, Michigan Department of Natural Resources, for a license to operate a solid waste disposal area under the provisions of Act 641, P.A. of 1978.

COMPLETE OR CORRECT ALL SECTIONS

DISPOSAL AREA NAME AND LOCATION

NAME OF FACILITY	ATTN.
Menasha Corporation Disposal Site	John R. Blauwkamp

STREET	CITY	STATE	ZIP
106th Ave. & Hill St.	Otsego	MI	490

TOWNSHIP	COUNTY	LOCAL HEALTH DEPT.
Otsego	Allegan	Allegan County

LOCATION

N [ ] 1/4 [ ] S [ ] E [ ] 1/4 [ ] Sec 1 4 T 1 [ ] N R 1 2 [ ] 1/ [ ] Sec

APPLICANT

NAME OF OPERATING ORGANIZATION	ATTN.
Menasha Corporation	John R. Blauwkamp

STREET	CITY	STATE	ZIP
P.O. Box 155	Otsego	MI	49078

TELEPHONE	FEDERAL ID NO.
(616) 692-6141	39-046-4680

PROPERTY OWNER

NAME OF PROPERTY OWNER	ATTN.
Menasha Corporation	John R. Blauwkamp

STREET	CITY	STATE	ZIP	TELEPHONE
P.O. Box 155	Otsego	MI	49078	692-6141

TYPE OF DISPOSAL OPERATION (IF MORE THAN ONE AREA INVOLVED, FILE A SEPARATE APPLICATION FOR EACH)

- [X] SANITARY LANDFILL TYPE: I ____, II X, III ____
- [ ] INCINERATION ____ (CAPACITY)
- [ ] REFUSE TRANSFER FACILITY
- [ ] PROCESSING PLANT
- [ ] OTHER: (SPECIFY)

DEPARTMENT OF NATURAL RESOURCES
RESOURCE RECOVERY DIVISION
JUN 26 1980
EXAMINED AND APPROVED
For Compliance with Act 641, P.A. 1978

CONSTRUCTION COST (EXCEPT LANDFILL)

NO. ACRES APPLIED FOR: Five acres

FEE, BOND AND CONSTRUCTION CERTIFICATION

- [X] The required license fee of $100 is attached.
- [X] Sanitary landfill bond of $4000/acre (minimum $20000) and Power of Attorney are attached. Bond value $ 20,000.
- [ ] Facility bond (other than landfills) of 1/4 of 1% of construction cost (minimum $4000) and Power of Attorney are attached.
- [ ] Certification of Construction by registered professional engineer is attached.
- [X] Restrictive deed covenant is attached.

I hereby certify that this information is correct and complete.

Bruce E. Buchenan — Acting General Manager
SIGNATURE — TITLE

Make checks payable and submit to:

Acknowledgement of receipt of $100.00 license fee received by me on

Date _____ 19__

Signature _____

Title _____

4336

FOR CASHIERS USE ONLY — **DO NOT SEPARATE— SEND ALL COPIES**

4337

R5501 Rev. 7/79

MEN02273

STATE OF MICHIGAN

DEPARTMENT OF NATURAL RESOURCES

MENASHA CORPORATION DISPOSAL SITE

SOLID WASTE DISPOSAL AREA LICENSE

This license is issued under the provisions of Act 641, Public Acts of 1978, as amended, to permit the operation of a solid waste disposal area in the State of Michigan. *This license does not obviate the necessity of obtaining other clearances and permits as may be required by state law or local ordinance. It is further made a condition of this license that the applicant give notice to public utilities in accordance with Act No. 53 of the Public Acts of 1974, being sections 460.701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act.* This facility shall not receive liquid wastes without special approval from the health department having jurisdiction or this office.

GRANTED TO: Menasha Corporation

COUNTY: ALLEGAN

ISSUE DATE: June 26, 1980

RESPONSIBLE PERSON TO CONTACT:

EXPIRATION DATE: (Two years from date of issue)

This license is applicable to the facility located at and described as follows: NE¼-SE¼ Sec 14
T1NW, R12

John R. Blauwkamp
Menasha Corp.
Box 155
Otsego, MI 49078

4336

Stipulations:

None

This license is subject to revocation by the Director of the Department of Natural Resources for any violation of the law under which it is issued or for any violation of the rules authorized thereunder, or any stipulations noted This license shall be available through the licensee during the entire effective date and remains the property of the Director of the Department of Natural Resources THIS LICENSE IS NOT TRANSFERABLE

LICENSE NO № 6607

Howard A. Tanner

DIRECTOR

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
Environmental Protection Bureau
Resource Recovery Division

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

FOR DNR US	MEN02274	☐ RENEWAL
FACILITY NO.		LICENSE NO.
COUNTY		Date Received by Resource Recovery Division

Application is hereby made to the Director, Michigan Department of Natural Resources, for a license to operate a solid waste disposal area under the provisions of Act 641, P.A. of 1978, as amended.

COMPLETE ALL SECTIONS

DISPOSAL AREA NAME AND LOCATION

NAME OF FACILITY: Menasha Corporation Disposal Site

STREET: 106th Ave., & Hill St. | CITY: Otsego | STATE: MI | ZIP: 49078

TOWNSHIP: Otsego | COUNTY: Allegan | LOCAL HEALTH DEPT.: Allegan County

LOCATION: N E 4 S E 4 Sec 14 T 11N W R 12 Sec

APPLICANT

NAME OF OPERATING ORGANIZATION: Menasha Corporation | ATTN.: John R. Blauwkamp, P.E.

STREET: P.O. Box 155 | CITY: Otsego | STATE: MI | ZIP: 49078

TELEPHONE: (616) 692-6141 | FEDERAL ID NO.: 39-046-4680

PROPERTY OWNER

NAME OF PROPERTY OWNER: Menasha Corporation | ATTN.: John Blauwkamp

STREET: P.O. Box 155 | CITY: Otsego | STATE: MI | ZIP: 49078 | TELEPHONE: 692-6141

TYPE OF DISPOSAL OPERATION
(if more than one area involved, file separate application for each)

- ☒ SANITARY LANDFILL TYPE II ____ TYPE III X
- ☐ INCINERATION ____ (CAPACITY)
- ☐ REFUSE TRANSFER FACILITY
- ☐ PROCESSING PLANT
- ☐ OTHER (SPECIFY) ____

TYPE OF WASTE

- ☐ GENERAL REFUSE
- ☒ CONSTRUCTION & DEMOLITION
- ☒ FLYASH
- ☐ FOUNDRY SAND
- ☐ TREES & STUMPS
- ☐ WASTEWATER SLUDGES
- ☒ OTHER (SPECIFY) Secondary Fiber Cleaning System Rejects & Wood Screening Rejects

CONSTRUCTION COST (EXCEPT LANDFILL) | NO. ACRES APPLIED FOR: Five

FEE AND CONSTRUCTION CERTIFICATION

- ☒ The required license fee of $100 is attached
- ☐ Certification of Construction by registered professional engineer is attached.
- ☒ Restrictive deed covenant is attached.

BONDS

☒ Sanitary landfill bond of $4000/acre (minimum $10,000) and Power of Attorney are attached. Bond value $ 20,000
- ☐ Certificate of Deposit
- ☐ Letter of Credit
- ☒ Cash Bond (Surety Bond)

☐ Facility bond (other than landfills) of 1/4 of 1% of construction cost (minimum $4000) and Power of Attorney are attached.
- ☐ Certificate of Deposit
- ☐ Letter of Credit
- ☐ Cash Bond

I hereby certify that this information is correct and complete.

SIGNATURE: [signature] | TITLE: General Manager | DATE: 9 April '82

Make checks payable and submit to:
1. Certified Health Department.
2. If your county is not certified, State of Michigan
   Department of Natural Resources
   Resource Recovery Division
   Box 30028
   Lansing, MI 48909

Acknowledgement of receipt of $100.00 license fee received.

Date ____ 19 ____

Signature ____

Title ____

FOR CASHIERS USE ONLY

DO NOT SEPARATE—SEND ALL COPIES

4374

R5501 Rev 12/81

STATE OF MICHIGAN

MEN02275

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
CARL T JOHNSON
M LAITALA
HILARY F SNELL
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

RESOURCE RECOVERY COMMISSION
THOMAS J BLESSING, JR
ALBERT M BORKIN
ANN ESKRIDGE
PAMELA A FRUCCI
C ERNEST KEMP
JOHN W LAYMAN
CLIFFORD MILES
STUART B PADNOS
ROGER RASMUSSEN
JAMES STORNANT
MICHAEL L WALKINGTON

April 30, 1982

RESOURCE RECOVERY DIVISION

Grand Rapids — Dist 9
State Office Bldg
350 Ottawa St N W
Grand Rapids MI 49503

616/456-5071

Mr. John R. Blauwkamp
Menasha Corp.
P.O. Box 155
Otsego, MI 49078

Re: Menasha Corp. Landfill
Allegan Co. 03-0016

Dear Mr. Blauwkamp:

This will acknowledge receipt of your administratively complete, but unevaluated solid waste disposal area license application for the Menasha Corp. Landfill, Allegan County.

The date of this acknowledgement initiates the timeframe for our review process of your permit application and will be in effect unless the application is denied or the matter is referred to the Michigan Environmental Review Board under the provisions of Section 12(1), as related to Executive Order 1974-4.

If you have any questions concerning the date established, please contact this office at (616) 456-5071.

Sincerely,

RESOURCE RECOVERY DIVISION

Gerard J. Heyt

Gerard J. Heyt
District Supervisor

GJH:bjc
cc: Reg. III File
Div. File
Dist. File

MICHIGAN
THE GREAT LAKE STATE

R1026-6 9/79

4371

MEN02276

STATE OF MICHIGAN

DEPARTMENT OF NATURAL RESOURCES

MENASHA CORPORATION DISPOSAL SITE - Type III

SOLID WASTE DISPOSAL AREA LICENSE

This license is issued under the provisions of Act 641, Public Acts of 1978, as amended, to permit the operation of a solid waste disposal area in the State of Michigan *This license does not obviate the necessity of obtaining other clearances and permits as may be required by state law or local ordinance It is further made a condition of this license that the applicant give notice to public utilities in accordance with Act No 53 of the Public Acts of 1974, being sections 460 701 to 460.718 of the Michigan Compiled Laws, and comply with each of the requirements of that Act* This facility shall not receive liquid wastes without special approval from the health department having jurisdiction or this office

GRANTED TO Menasha Corporation

COUNTY. ALLEGAN

ISSUE DATE July 16, 1982

RESPONSIBLE PERSON TO CONTACT

EXPIRATION DATE (Two years from date of issue)

John Blauwkamp
Menasha Corporation
PO Box 155
Otsego, MI 49078

This license is applicable to the facility located at and described as follows 5 acres; NE 1/4, SE 1/4, Sec 14, T1N, R12
106th Avenue & Hill St.

Stipulations.

1. Engineering plans shall be submitted to the Resource Recovery Division identifying all items contained in R 299.4304 Rule 304, 3 (a through r) no later than October 29, 1982 for review.
2. Written approval must be obtained for all solid wastes to be disposed of at the site from the Resource Recovery Division.

4372

This license is subject to revocation by the Director of the Department of Natural Resources for any violation of the law under which it is issued or for any violation of the rules authorized thereunder or any stipulations noted This license shall be available through the licensee during the entire effective date and remains the property of the Director of the Department of Natural Resources THIS LICENSE IS NOT TRANSFERABLE

LICENSE NO № 6779

Howard A. Tanner, Director

03 Rev 7/79

STATE OF MICHIGAN

MEN02277

NATURAL RESOURCES COMMISSION
JACOB A HOEFER
CARL T JOHNSON
E M LAITALA
HILARY F SNELL
HARRY H WHITELEY
JOAN L WOLFE
CHARLES G YOUNGLOVE

WILLIAM G MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A TANNER Director

350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49504

RESOURCE RECOVERY COMMISSION
THOMAS J BLESSING JR
ALBERT M BORKIN
WILLIAM A CILLUFFO
ANN ESKRIDGE
PAMELA A FRUCCI
C ERNEST KEMP
JOHN W LAYMAN
STUART B PADNOS
ROGER RASMUSSEN
MICHAEL L WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING MI 48909

517-322 1315

October 23, 1979

Mr. John Blauwkamp
Menash Corporation
320 N. Farmer
Otsego, MI 49078

Dear Mr. Blauwkamp:

Pursuant to our phone conversation, I am sending you information and forms needed for relicensing your existing solid waste landfill and a construction permit application package for the proposed fly ash site.

The enclosed surety bond form must accompany the rest of your application package, i.e.; restrictive deed covenant and application form, when you apply for renewal of your landfill license. We ask that you contact this office before issuance so that we may meet and work out a Director's Order and Schedule of Compliance.

When applying for a construction permit you have the option to ask for an advisory analysis which shall include a site inspection and a preliminary written report pertaining to feasibility at the disposal site.

The construction permit application package must include:

1. Application for construction permit for solid waste disposal area.

2. The correct fee and fee schedule for landfill construction permit.

3. Hydrogeological evaluation and engineering design data.

4. Leachate analysis (fly ash)

If you have any questions, feel free to contact this office.

Sincerely,

RESOURCE RECOVERY DIVISION

Elizabeth A. Bols

Elizabeth A. Bols
Environmental Sanitarian

EAB:bjc
enc.

MICHIGAN
THE GREAT LAKE STATE

R1026-6 5/79

4362

SAFECO

POWER OF ATTORNEY

SAFECO INSURANCE COMPANY OF AMERICA
GENERAL INSURANCE COMPANY OF AMERICA
HOME OFFICE: SAFECO PLAZA
SEATTLE, WASHINGTON 98185

No. 4666

MEN02278

KNOW ALL BY THESE PRESENTS:

That **SAFECO Insurance Company of America** and **General Insurance Company of America**, each a Washington corporation , does each hereby appoint

----------ALICE ALBANO----------

its true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, SAFECO Insurance Company of America and **General Insurance Company of America** have each executed and attested these presents

ACKNOWLEDGMENT BY SURETY

STATE OF Illinois
County of Cook } ss

On this 1st day of March, 1980, before me personally appeared Alice Albano, known to me to be the Attorney-in-Fact of SAFECO INSURANCE COMPANY OF AMERICA, GENERAL INSURANCE COMPANY OF AMERICA, FIRST NATIONAL INSURANCE COMPANY OF AMERICA or SAFECO NATIONAL INSURANCE COMPANY, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.

T. C. [illegible]

Notary Public in the State of Il My Commission Expires September 26, 1983
County of Cook

(Seal)

S-230 R4 6/78

PRINTED IN U.S.A.

(i) The provisions of Article VI, Section 12 of the By-Laws, and
(ii) A copy of the power-of-attorney appointment, executed pursuant thereto, and
(iii) Certifying that said power-of-attorney appointment is in full force and effect,
the signature of the certifying officer may be by facsimile, and the seal of the Company may be a facsimile thereof."

I, Wm. Hammersla, Vice President and Secretary of **SAFECO Insurance Company of America** and of **General Insurance Company of America**, do hereby certify that the foregoing extracts of the By-Laws and of a Resolution of the Board of Directors of these corporations, and of a Power-of-Attorney issued pursuant thereto, are true and correct, and that both the By-Laws, the Resolution and the Power-of-Attorney are still in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of each corporation

this 1st day of March, 19 80.

4338

MEN02279

SURETY BOND FORM

FOR

SOLID WASTE DISPOSAL LICENSE

Michigan Department of Natural Resources
Environmental Protection Bureau
Resource Recovery Division

MENASHA CORPORATION WASTE DISPOSAL SITE
(Name of Disposal Area)

OTSEGO TOWNSHIP - ALLEGAN COUNTY
(City or County)

4099196
(Bond Number)

KNOW ALL MEN BY THESE PRESENTS:

That MENASHA CORPORATION, of 320 N. Farmer Street, Otsego
(Street Address & City

as principal, and SAFECO INSURANCE COMPANY OF AMERICA

an insurer authorized to transact the business of surety and fidelity insurance in the State of Michigan are firmly bound unto the Director of the Department of Natural Resources on behalf of the State of Michigan in the sum of * $20,000 lawful money of the United States of America, to be paid to the said Director, his successor, or successors in office, to which payment well and truly to be made, we bind ourselves, our executors, administrators and heirs, and each and every one of them firmly by these presents.

Sealed with our seals, dated the 1st day of March, A.D., 1980.

Whereas, the principal has made application for a license to establish, maintain, and/or conduct a solid waste disposal area within the State of Michigan in accordance with the provisions of Act 641 of the Public Acts of 1978, as amended.

* For sanitary landfills, bonds shall be in an amount equal to $4,000 per acre of the disposal area, minimum $20,000 and maximum $500,000; for all other disposal areas, incinerators, transfer facilities, refuse processing plants and so forth, the following bond amounts are required: 1/4 of 1% of construction cost of facility, minimum $4,000.

Now therefore, the condition of this obligation is such that if the above bounden principal shall:

1) Faithfully perform all the provisions of Act 641 of the Public Acts of 1978, as amended, and

2) Faithfully comply with the applicable rules on solid waste disposal promulgated under the provisions of Act 641 of the Public Acts of 1978, as amended, and

3) Faithfully comply with the provisions of any stipulations under which the license is issued,

then this obligation shall be void, otherwise it shall remain in full force and effect. The bond is further executed and accepted subject to the following conditions and limitations:

This bond shall be in force for a period beginning with the date of issue of the license and ending on the same date two years hence, except that the bonds for sanitary landfills shall remain in full force and effect until the application for license renewal is approved or denied, and further bonds for sanitary landfills shall remain in full force and effect for a maintenance period of five years after the landfill is completed. This bond, if completed for disposal areas other than sanitary landfills, shall be continued in effect two years after said disposal area is closed. This bond may be extended by continuation or extension certificate signed by principal and surety to cover renewal license or licenses. On the determination of the Director of the Department of Natural Resources that any of the foregoing conditions have not been complied with, he shall have recourse to the rights created under the bond.

IN WITNESS WHEREOF, The principal herein has hereunto affixed his hand and seal and the Surety herein has caused this bond to be signed by its officers proper for the purpose and its corporate seal affixed and justification or power of attorney attached the day and date first above written.

Witnesses to signature of principal

Principal

SAFECO INSURANCE COMPANY OF AMERICA
Surety

By
Authorized Agent and Attorney in Fact
Alice Albano Attorney in Fact

Countersigned by:

John Shilcusky Michigan Resident Agent

4343

DECLARATION OF RESTRICTIVE COVENANT

THIS INDENTURE made the 17 day of March, 1980, by and between, Menasha Corporation whose address is: 320 N. Farmer St, Otsego, MI 49078, part(y)(ies) of the first part; and Howard A. Tanner, Director of the Michigan Department of Natural Resources for and on behalf of the State of Michigan, whose address is: Stevens T. Mason Building, Lansing, MI, party of the second part;

WITNESSETH THAT:

WHEREAS, application for licensure under provisions of 1978 PA 641, 1970 CL 299.401 et seq, for the purpose of conducting, managing, maintaining or operating a disposal area upon lands situated in the township of Otsego, County of Allegan, more particularly described as:
Commencing at the East 1/4-post of Section-14, T1N, R12W, thence West on the East and West 1/4-Line 511.91-Feet to the place of beginning of this description, thence continuing West on the 1/4-Line 558.5-feet, thence South at right angles 390.0-Feet, thence East 558.5-Feet, thence North 390.0-Feet to the place of beginning, being 5.0 Acres.
has been properly made; and

WHEREAS, the Director of the Department of Natural Resources, will contemporaneously issue such license; and

WHEREAS, 1978 PA 641, supra, Section 16 requires that at the time of licensing of a sanitary landfill, an instrument which imposes a restrictive covenant upon the land involved shall be executed by all the owners of the tract of land upon the landfill is located and the director.

NOW THEREFORE, Menasha Corp., the part(y)(ies) of the first part, do for themselves, their heirs, successors, lessees, or assigns declare, covenant and agree:

R-5527
8/6/79

1. That the lands hereinbefore described have been or will hereafter be used as a sanitary landfill, and that neither they, nor their servants, agents, employees, nor any of the heirs, successors, lessees or assigns shall (or shall by their leave or sufferance permit others to) engage in filling, grading, excavating, drilling or mining of the lands and premises above described until 15 years after completion of all landfill activity upon the same, unless written authorization therefor is obtained from the Director of the Department of Natural Resources; and that the State of Michigan or any municipality may in addition to any other remedy available at law bring an action for an injunction or other process against any person, county, or municipality to restrain or prevent any violation of the restrictive covenant hereby imposed upon the subject premises.

2. That at the time of the ensealing and delivery of these presents the above described premises are free from all encumbrances whatever, (except)

The director of the department of natural resources does for and on behalf of the State of Michigan covenant and agree to execute, acknowledge, and deliver to the party of the first part, a release of the within restrictive covenant, in suitable form, upon the expiration of the 15 year period provided for herein.

R-5527
8/6/79

MEN02283

-A-
(CORPORATION)

ONE OF THE FOLLOWING THREE PAGES MUST BE COMPLETED BY THE APPLICANT. PLEASE SELECT THE PAGE CORRESPONDING TO APPLICANT'S MANAGEMENT: A-Corporation B-Partnership C-Individual

Signed in presence of:

John R. Blauwkamp
* John R. Blauwkamp

_____
*

Signed

Menasha Corporation
GRANTOR

By Bruce T. Buchanan
* Bruce T. Buchanan
Its Acting General Manager

Signed in presence of:

_____
*

_____
*

STATE OF MICHIGAN

By _____
*

Director of the Department of Natural Resources for the State of Michigan

STATE OF MICHIGAN)
) ss
COUNTY OF)

The foregoing instrument was acknowledged before me this 17th day of March, 1980 by John R. Blauwkamp and Bruce T. Buchanan, the Technical Director and Acting General Manager of MENASHA CORPORATION, a private corporation on behalf of the corporation.

G. Hofacker
*
Notary Public
Antigen County, Michigan
My Commission Expires November 17, 1980

STATE OF MICHIGAN)
) ss
COUNTY OF INGHAM)

The foregoing instrument was acknowledged before me on this _____ day of _____ 19___, by _____, Director of the Department of Natural Resources, on behalf of the State of Michigan.

_____
*
Notary Public
Ingham County, Michigan
My Commission Expires _____

When recorded, return to:

State of Michigan
DNR-Resource Recovery Division
Box 30028
Lansing, Michigan 48909

Drafted by:

*TYPE OR PRINT NAME UNDER SIGNATURE

R-5527
8/6/79

4348

MEN02284

SURETY BOND FORM

for

SOLID WASTE DISPOSAL LICENSE

Michigan Department of Natural Resources
Resource Recovery Division

MENASHA CORPORATION WASTE DISPOSAL SITE
Name of Disposal Area

OTSEGO TOWNSHIP - ALLEGAN COUNTY
City or County

4099196
Bond Number

KNOW ALL MEN BY THESE PRESENT:

That MENASHA CORPORATION, of 320 N. Farmer Street, Otsego
(Street Address & City),

as principal, and SAFECO INSURANCE COMPANY OF AMERICA, an insurer authorized to transact the business of surety and fidelity insurance in the State of Michigan, are firmly bound unto the Director of the Department of Natural Resources on behalf of the State of Michigan in the sum of *$20,000.00, lawful money of the United States of America, to be paid to the said Director, his successor, or successors in office to which payment will and truly to be made, we bind ourselves, our executors, administrators and heirs, and each and every one of them firmly by these presents.

Sealed with our seals, dated the 25th day of February, A.D., 19 82.

Whereas, the principal has made application for a license to establish, maintain, and/or conduct a solid waste disposal area within the State of Michigan in accordance with the provisions of Act 641 of the Public Acts of 1978, as amended.

* For sanitary landfills, bonds shall be in an amount equal to $4,000 per acre of the disposal area (minimum $10,000 and maximum $500,000); for all other disposal areas, incinerators, transfer facilities, refuse processing plants and so forth, the following amount is required: 1/4 of 1% of construction cost of facility (minimum $4,000).

Now therefore, the condition of this obligation is such that if the above bound principal shall:

1. Faithfully perform all the provisions of Act 641 of the Public Acts of 1978, as amended; and

2. Faithfully comply with the applicable rules on solid waste disposal promulgated under the provisions of Act 641 of the Public Acts of 1978, as amended; and

3. Faithfully comply with the provisions of any stipulations under which the license is issued,

then this obligation shall be void, otherwise it shall remain in full force and effect. The bond is further executed and accepted subject to the following conditions and limitations:

This bond shall be in force for a period beginning with the date of issuance of the license and ending on the same date two years hence. Except: bonds for sanitary landfills shall remain in full force and effect until the application for license renewal is approved or denied. Further: bonds for sanitary landfills shall remain in full force and effect for a maintenance period of five years after the landfill is completed. This bond, if completed for disposal areas other than sanitary landfills shall be continued in effect two years after said disposal area is closed. This bond may be extended by continuation or extension certificate signed by principal and surety to cover renewal license or licenses. On the determination of the Director of the Department of Natural Resources that any of the foregoing conditions have not been complied with, he shall have recourse to the rights created under the bond.

IN WITNESS THEREOF, the principal herein has hereunto affixed his hand and seal and the Surety herein has caused this bond to be signed by its officers proper for the purpose and its corporate seal affixed and justification or power or attorney attached the day and date first above written.

Bond Effective 3/1/82.

Witnesses to signature of principal	Principal

SAFECO INSURANCE COMPANY OF AMERICA
Surety

By Denise Holdeman
Authorized Agent & Attorney in Fact
Denise Holdeman

9/9/81

SAFECO

POWER OF ATTORNEY

MEN02286

SAFECO INSURANCE COMPANY OF AMERICA
GENERAL INSURANCE COMPANY OF AMERIC
HOME OFFICE. SAFECO PLAZA
SEATTLE, WASHINGTON 98185

No. 6169

KNOW ALL BY THESE PRESENTS:

That **SAFECO INSURANCE COMPANY OF AMERICA** and **GENERAL INSURANCE COMPANY OF AMERICA**, each a Washington corporation, does each hereby appoint

----------DENISE HOLDEMAN----------

its true and lawful attorney(s)-in-fact, with full authority to execute on its behalf fidelity and surety bonds or undertakings and other documents of a similar character issued in the course of its business, and to bind the respective company thereby.

IN WITNESS WHEREOF, SAFECO INSURANCE COMPANY OF AMERICA and **GENERAL INSURANCE COMPANY OF AMERICA** have each executed and attested these presents

this 10th day of September, 19 80.

CERTIFICATE

Extract from the By-Laws of **SAFECO INSURANCE COMPANY OF AMERICA** and of **GENERAL INSURANCE COMPANY OF AMERICA:**

ACKNOWLEDGMENT BY SURETY

STATE OF Illinois
County of Cook } ss

On this 25th day of February, 1982, before me personally appeared Denise Holdeman, known to me to be the Attorney-in-Fact of SAFECO INSURANCE COMPANY OF AMERICA, GENERAL INSURANCE COMPANY OF AMERICA, FIRST NATIONAL INSURANCE COMPANY OF AMERICA or SAFECO NATIONAL INSURANCE COMPANY, the corporation that executed the within instrument, and acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.

Terance M. Andrew
Notary Public in the State of
County of

(Seal)

S-230 R4 6/78

PRINTED IN U.S.A.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the facsimile seal of said corporation

this 25th day of February, 19 82.

4376

R. Buchanan

MEN02287

MENASHA CORPORATION

PAPERBOARD DIVISION
OTSEGO PAPERBOARD MILL
FARMER STREET
OTSEGO, MICHIGAN

SOLID WASTE DISPOSAL LICENSE BOND

Property Covered: Menasha Corporation's Waste Disposal Site, Otsego Township, Allegan County, Michigan.

Bond No.	Company	Amount	Premium	Term
4099196	Safeco Ins. Co.	$20,000	$200.00	3/1/82-84

Broker: Johnson & Higgins
Chicago, IL.

3/08/82

4353

MEN02288

LANDFILL CLOSURE

DOCUMENT #47C

MEN02289

MENASHA CORPORATION

29 March 1983

Rick Sadowski
350 Ottawa
Grand Rapids, MI 49503

Dear Rick:

Enclosed are two copies of our landfill closure plan as required by our Class III operating license.

Between now and when we close the landfill, we will be filling in the low areas in the landfill in order to bring them up to the surrounding grade as is indicated in the landfill closure plan. We will be constructing lifts of approximately 2 foot in thickness in the lower areas of the landfill. These will be leveled, compacted and covered daily as required by Act 641. As we get time, we will be smoothing out and applying additional sand cover to the areas of the lanfill that are already at the elevations indicated in the landfill closure plan. The monitoring wells will also be sampled quarterly as required.

If you have any questions or comments on the landfill closure plan or our basic operating procedure, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
J. Porter
T. Clemmons
T. Ray
R. L. Janda

Encl.

j

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616 692 61

STS Consultants Ltd.
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

February 17, 1983

Mr. John R. Blauwkamp, P.E.
Menasha Corporation
Otsego Paper Board Division
Farmer Street
Otsego, MI 49078

RE: Closure of Menasha Corporation Disposal Site - Type III

STS Job No. 70901

Gentlemen:

The closure plan per your purchase order no. 29789 and our proposal dated September 22, 1982, has been completed. Attached you will find the results of our closure study complete with engineering drawings. After you have had a chance to review these, we will send a copy to the DNR.

We have appreciated this opportunity to provide engineering services for you. Should you have any questions regarding this report, please do not hesitate to contact us.

Yours Very Truly,

STS CONSULTANTS, LTD.

Robert C. Rabeler, P.E.
Senior Project Engineer

T.K. Dahlstrand

Timothy K. Dahlstrand, P.E.
Regional Vice President

RCR:lb

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INTRODUCTION

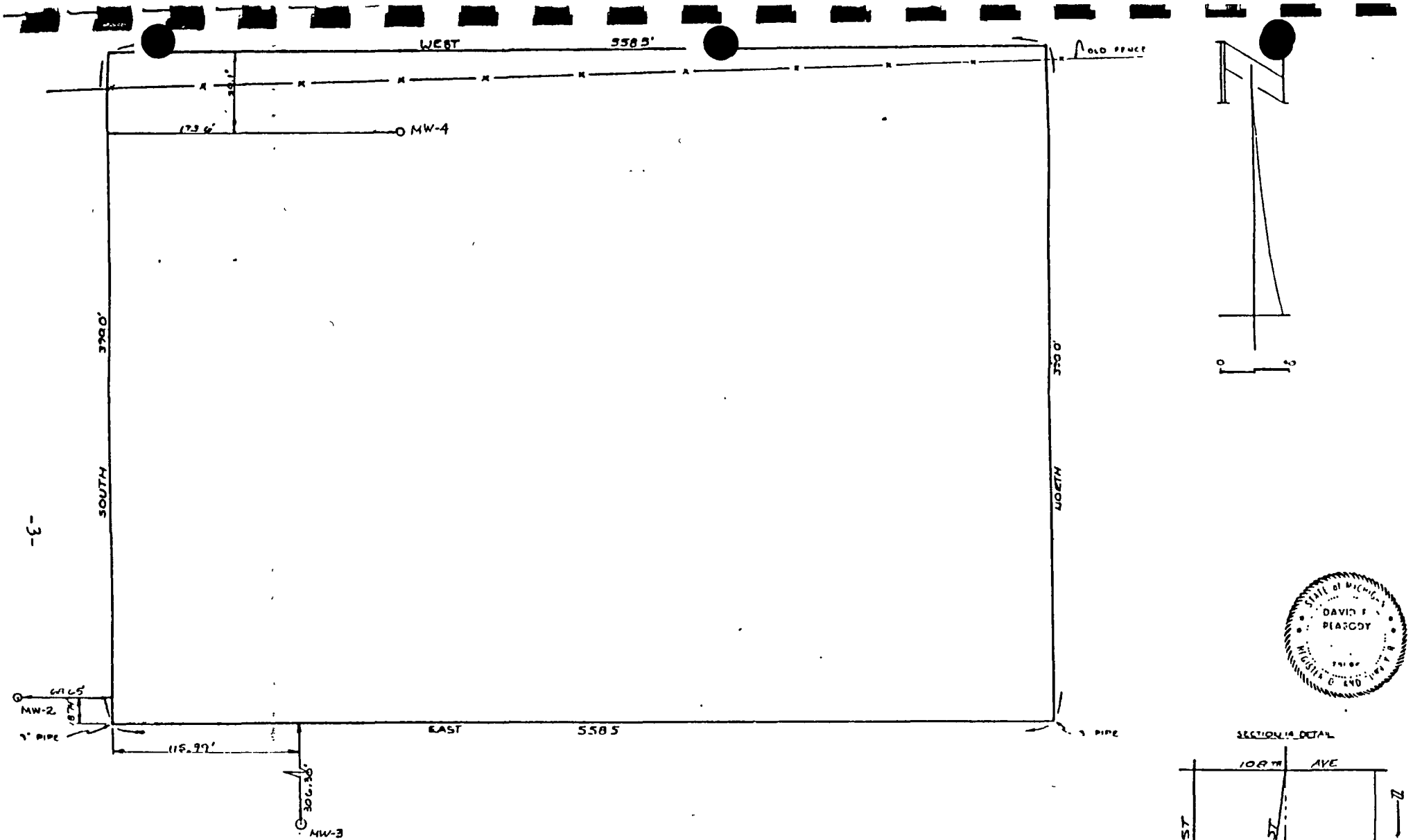
Menasha Corporation is preparing to close its existing Type III landfill, so that the closure can be completed by September of 1984.

A hydrogeologic investigation of the landfill was completed by CH2M Hill in April of 1981. This was submitted to Elizabeth A. Bols of the Michigan Department of Natural Resources (MDNR) on May 5, 1981.

Much of the waste deposited in the landfill consists of flyash. Ash samples were submitted for EP toxicity tests, the results of which were submitted to the DNR in the spring of 1982.

LOCATION

The site consists of about five acres located in the northeast quarter of the southeast quarter of Section 14, Township 1 North, Range 12 West in Otsego, Michigan. The legal description of the property as well as the property boundaries are shown on Figure 1 of the Hydrogeologic Investigation dated April, 1981, page 2. The site survey has been duplicated on the following page. The drawing has been modified to show the existing monitoring well locations. Previous soil borings/test holes were abandoned.



PARCEL DESCRIPTION
COMMENCING AT THE EAST ¼ POST OF SECTION 14, T. 1 N., R. 12 W., THENCE WEST ON THE EAST AND WEST ¼ LINE 511.51 FEET TO THE PLACE OF BEGINNING OF THIS DESCRIPTION; THENCE CONTINUING WEST ON THE ¼ LINE 558.5 FEET; THENCE SOUTH AT RIGHT ANGLES 390.0 FEET; THENCE EAST 558.5 FEET; THENCE NORTH 390.0 FEET TO THE PLACE OF BEGINNING, BEING 5.0 ACRES

NOTE:

1. ELEVATIONS TAKEN FROM BLUE MARK ON TOP LIP OF PIPE.
2. ALL BOUNDARY INFORMATION PER D.A. EATERIN & ASSOC. INC. SURVEY (INCLUDING SPOTTED FENCE).
3. ELEVATIONS ARE BASED ON U.S.G.S. DATUM

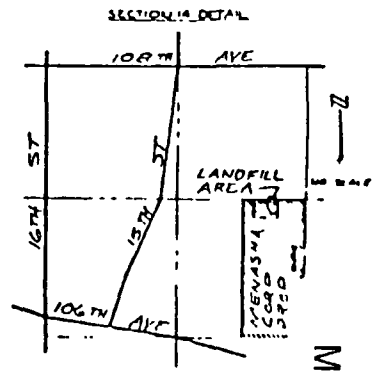


FIGURE 1 SITE SURVEY
MENASHA SANITARY LANDFILL
OTSEGO, MICHIGAN

MEN02294

WASTE CHARACTERIZATION

Menasha Corporation is presently disposing of approximately 210 yards per week of flyash, approximately 100 yards per week of mill rejects (plastics, wire, etc.), and approximately 28 yards per week of wood fines which are rejected from the digestor. These quantities were obtained from Mr. Blauwkamp of Menasha Corporation. For design purposes, we utilized a waste volume of 350 cubic yards per week. It is anticipated that Menasha Corporation will stop placing fill in this landfill about May of 1984. Based upon the above volumes, we calculated approximately 28,700 cubic yards of waste volume would be required from November, 1982 to May, 1984.

ORIGINAL AND EXISTING TOPOGRAPHY

An air photo topographic map was prepared of this area by Abrams Aerial Survey Corporation based on photography dated January, 1973. This information provided original ground surface contours for the landfill site prior to placing fill in this area. These contours have been reproduced and are shown on Sheet 1 of 5.

From 1969 to 1982, the site was used for Type II waste disposal. Since June of 1982, the site has been used for Type III waste disposal. In October, 1982, an additional survey was performed to determine the existing contours. This survey consisted of setting up grid lines at 50 foot intervals, and determining the ground surface elevations at these points. Existing contours were then interpolated from this data. The existing contours are shown on Figure 2 of 5 with this report. The existing monitoring wells (wells 1 through 4) are also shown on this drawing.

PROPOSED FINAL CONTOURS

Based upon the anticipated waste volumes mentioned previously, we prepared final contours of the site, taking into account not only volume of waste and cover, but also drainage considerations. The site is to be covered, as will be discussed in a subsequent section. The proposed final contours shown on Sheet 3 of 5 pertain to the top of the cover.

COVER MATERIAL

The final cover will consist of two feet of compacted clay. The source of clay will be obtained by Menasha Corporation from a borrow location off this property. As of this report, the borrow location has not been determined. The clay cover material should conform to Unified Soil Classification symbols ML, SC or CL. The clay should be compacted to at least 90% of the modified Proctor maximum dry density (ASTM D 1557). Non-destructive field testing, such as nuclear density testing, should be performed to document that adequate compaction is obtained. It may be necessary to adjust the moisture content of the clay in order to obtain adequate compaction. If the clay is too wet, it may be necessary to aerate the clay using disking techniques. If the clay is too dry, adding moisture to the clay may be required. Additions of moisture should be followed by adequate mixing to provide uniformity of the clay cover. Samples of proposed cover material should be submitted to a testing laboratory to determine the maximum dry density in accordance with ASTM specification D 1557 (modified Proctor). Additionally, compacted permeability tests should be performed to determine the coefficient of permeability. Although there are no specific DNR requirements of the coefficient of permeability for cover material, we recommend a minimum value of 1×10^{-6} cm/sec.

The western portion of the site is presently to grade. Therefore, the clay cover could be placed in this area and this portion of the landfill closed at any time.

Following placement of the clay cover, grass should be established to minimize erosion. The Michigan Department of Transportation specification 6.53 "Turf Establishment" should be followed.

VOLUMES

The table below presents the approximate volumes (in-place) of wastes and cover material used for this closure plan. The volumes were determined using both the average and area method, and using a planimeter.

Item	Volume available/required (yd^3)
In-place volume available for wastes	28,500
Clay liner volume - inside landfill boundary	14,400
Clay liner volume - outside landfill boundary	9,400

DRAINAGE

Proposed drainage considerations are shown on Sheet 3 of 5 of the plans. Note that all cover slopes are no steeper than 4 horizontal to 1 vertical, and all slopes should be at least 2%. The water from the landfill area is intended to drain to a drainage ditch surrounding this site. Proposed invert elevations of the ditch are also noted on Sheet 3 of 5. It is presently planned to drain this ditch to an existing pond area south of the landfill. Where the drainage ditch enters the pond, the slope is quite steep, and thus will require rip rap to minimize erosion. Also, a three foot diameter corrugated metal pipe will be required where the drainage ditch passes beneath an access road.

For the most part, the drainage ditch uses a slope of approximately 0.7%. This slope should be sufficient to provide adequate drainage, yet flat enough to minimize erosion. Cross sections C-C and D-D, noted on Sheet 3 of 5, are shown on Sheet 5 of 5. Where the drainage ditch has cut through existing fill areas, two feet of clay cover will be required beneath the ditch (see cross section D-D).

ACCESS ROAD

Access roads are presently existing around the landfill area. These roads will be utilized during the final waste placement and closure of this landfill. Some modification of the access road will be required on the north side of the landfill, as fill above grade would be necessary for drainage considerations. Cross section B-B illustrates this improvement. It will be necessary to place some sand fill above grade. On-site sandy materials could be used. This fill should be compacted to at least 90% of the modified Proctor maximum dry density (ASTM D 1558).

With the addition of fill for raising the roadway, it will be necessary to extend well no. 4 above its present height. Care should be taken to maintain this well for future groundwater sampling.

MISCELLANEOUS

No new structures, utilities, or fencing is anticipated for this area. There are no airports within 10,000 feet of the property.

Just north of the landfill area, there is an area of standing water. The water surface elevation of the pond is approximately +800. This property is not owned by Menasha Corporation.

Following closure of the landfill, it is not anticipated that the area will be put to any use other than serving as a grass area.

CONSTRUCTION TESTING

During closure of the landfill, an engineering firm should be retained to periodically review the closure process, to provide density testing and laboratory testing of the cover material, and to submit periodic and a final report to the Department of Natural Resources indicating that adequate closure has been obtained. STS Consultants would be pleased to provide this service, should you desire.

FORM 561

MEN02304

memo / CORPORATION

TO: Bruce Buchanan

DATE: February 10, 1984

SUBJECT: Timing of Lanfill Closure

FROM: John Blauwkamp

On February 3, I talked with Rick Sadowski, of the DNR's local ground water quality section. According to Rick, the landfill closure must be completed by the end of September. This means that the final cover, grass seed and drainage ditches must all be completed and in place by the end of September. Since this is mandated in Act 641, Rick felt that there was very little possibility of getting an extension of this date.

I talked with Rick concerning the time required to close a landfill. Rick suggested that we allow a minimum of two months for the work to be completed. He said that if everything went exactly right, it may be possible to complete the job in one month. However, since there will be 50 or 60 landfills in Michigan all being closed simultaneously and there are very few contractors experienced in doing this work, he suggested we allow as much time as possible for closure the landfill. In keeping with Rick's suggestion, we are planning on beginning the landfill closure at the end of July. At this time, we must have completed arrangements to have all of our class III waste taken to another landfill. This means that the secondary fiber rejects handling system must be completed to the point that the rejects will be acceptable at the landfill. Otherwise we will find it impossible to get rid of them. By the end of July, we must have located the clay source for capping the landfill and completed all the paperwork and contracts necessary to have the work supervised and completed.

Rick stated that all that was legally required for supervision was that the job was supervised by a professional engineer and the required testing was completed. Although it is technically possible that any professional engineer could undertake this job, about 90% of the jobs are contracted out to consulting firms which routinely handle these jobs. We are currently, investigating the possibility of having a consulting firm supervise the entire operation.

c T. Clemmons
R. Thaxton
J. Bonham
T. Ray
K. Kling
~~J.~~ Porter
M. Carlson
J. Barkel
D. Rao
R. L. Janda

MEN02305

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
THOMAS J. ANDERSON
E. R. CAROLLO
MARLENE J. FLUHARTY
STEPHEN F. MONSMA
O. STEWART MYERS
RAYMOND POUPORE
HARRY H. WHITELEY

JAMES J. BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

RONALD O. SKOOG, Director

District 12 Headquarters
P.O. Box 355, Plainwell, Michigan 49080

June 21, 1984

Wilkins & Wheaton
169-171 Portage Street
Kalamazoo, Michigan 49007

Attention: Messrs. William French, Gordon Jones

Re: Closure Plan, Menasha Corporation, Otsego

Gentlemen:

This is in response to your correspondence dated June 13, 1984, wherein you discussed the modification of the Closure Plan for Menasha Corporation.

You enclosed a plan showing modification of the final contours for the landfill and propose to bring the landfill to final grade using a mixture of flyash and sludge from former disposal lagoons. If you can demonstrate that the infield placement of the mixture has a permeability of less than 1×10^{-5} cm/sec, the clay cap as proposed in the approved Closure Plan can be eliminated and substituted with 1 foot of material which will provide a good root zone area.

As set forth in your correspondence after September 30, 1984, no other material shall be disposed of at the land other than the ash/sludge mixture.

Your timetable for placing the final cover is approved as proposed. We still need a proposal for elimination of leachate reaching the standing water to the north of the landfill. I will expect a proposal by July 30, 1984.

If you have any questions, please feel free to contact me.

Sincerely,

GROUNDWATER QUALITY DIVISION

Galen L. Kilmer
Plainwell District Supervisor
(616) 685-9886

GLK:ek

cc: John Bonham, Ron Thaxton
Menasha Corporation

2086

MEN02306

WILKINS & WHEATON TESTING LABORATORY, INC.

September 26, 1984

Mr. Galen Kilmer
Plainwell District Supervisor
Department of Natural Resources
P.O. Box 355
Plainwell, MI 49080

Re: Menasha Corporation
Otsego, Michigan

Dear Mr. Kilmer:

Please find enclosed the results of preliminary permeability testing at the above referenced site. The report includes the procedures used and test results of the sampling conducted on September 14, 1984. The samples were obtained from a test plot at the site to assess current conditions and construction procedures.

As per your June 21, 1984 letter, in-field placement of the sludge/ash mixture must result in permeabilities less than $1x10^{-5}$ cm/sec. to substitute one (1) foot of material to provide a good root zone area for the standard two (2) foot clay cap. As the results indicate, permeability values range between $1.5x10^{-5}$ to $2.9x10^{-8}$ cm/sec.

Based on this information, Menasha Corporation is requesting your preliminary approval to continue with construction as proposed and of the one foot of material to provide an adequate root zone. The actual cover on the landfill will well exceed the standard two (2) foot cap. Upon completion of construction we will take three (3) additional samples to confirm the test plot results for final approval.

If you have any questions or comments, please contact our office. Your prompt review of this information is appreciated.

Very truly yours,

WILKINS & WHEATON TESTING LABORATORY, INC.

Debra A. Yervasi

Debra A. Yervasi, Geologist

William B French

William B French
Vice President

DAY:WBF:wsk
Enclosures
cc: Mr.John Bonham.Menasha

169-171 Portage Street
Kalamazoo, Michigan 49007
(616) 345-1158

2087

WILKINS & WHEATON · TESTING LABORATORY, INC.

PERMEABILITY TEST RESULTS

Menasha Corporation
Otsego, Michigan

Three samples were obtained from a test plot for permeability testing at the Menasha Corporation Landfill on september 14, 1984. The tests were collected as per the request of the Michigan Department of Natural Resources Groundwater Quality Division correspondence dated June 21, 1984. As the following indicates, in-field placement of the sludge/ash mixture has demonstrated permeabilities less than 1×10^{-5}cm/sec. The following outlines procedures used and test results:

Procedure: Obtaining Samples

Samples were obtained from a test plot on the east side of the Menasha Corporation Landfill. A split spoon sampler with liners (7.5 x 3.5) was driven into the ground, and two sections of liners were removed for each test site. Three representative sites were tested for a total of six (6) samples. Samples were left in the liners for the remainder of the testing procedure, thus preserving the original packing of each sample. Samples were stored in sealed zip-lock plastic bags to maintain field consistencies.

Procedure: Density Determination

Three samples were used to determine the density of the landfill cover. One sample from each test site was used. Each sample was weighed (in its liner) and its volume was measured. An empty liner was weighed and the net weight of each sample was determined. The density of each sample was then calculated.

NOTE: Samples were not dried or compacted prior to weighing, so water and air pockets present during sampling were included in the density determination.

Procedure: Permeability Determination

Samples were sealed within their liners using a rubber stopper (with hole for water entry) and a fine mesh screen (to prevent sample from falling out of liner) at the base. All samples were allowed to saturate prior to testing. (Samples A were given two hours, Samples B were given fifteen hours.) Samples appeared to absorb water, and hold water; indicated by rapid, initial drops in water level followed by steady water levels.

After saturation was completed, water levels were measured (h_1) for each sample, and water temperature was taken. After time (t) had elapsed, new water levels were measured (h_2) for each sample, and final temperature measurements were made. Additional measurements of cross-sectional areas were made for samples and burrettes.

Coefficients of permeability (K) were then obtained by entering measured values into standard formulas. Temperature correction factors (n) were acquired from a table of viscosity corrections, and were applied to calculate.

NOTES: Samples were not compacted, and some air pockets were visible, but were apparently not interconnected, given the low K values obtained.

Care was taken to try and remove air bubbles from samples (by inverting samples during saturation), and thus reducing possible errors due to trapped air plocking passage of water.

Evaporation was minimized by sealing top of burrettes and samples. Evaporation at bottom of sample would act to increase water flow, and give greater K values, so error form this would yield conservative K measurements.

Permeability Equations

$$K_t = \frac{2.3\ aL}{At} \log \frac{h_1}{h_2}$$

K_t = Coefficient of Permeability at Temperature T

a = Cross-sectional area of burrette

L = Length of soil sample

A = Cross-sectional area of soil sample

t = Elapsed time

h_1 = Beginning hydraulic head (t=0)

h_2 = Ending hydraulic head (t=t)

$$K_{20} = K_t \cdot {}^{n}T/{}^{n}20$$

K_{20}= Coefficient of permeability standardized to 20°C

${}^{n}T/{}^{n}20$=temperature correction factor

WILKINS & WHEATON · TESTING LABORATORY, INC.

Density Results

Menasha Corporation
Otsego, Michigan

	Sample 1	Sample 2	Sample 3
Diameter	3.5 cm	3.5 cm	3.5 cm
Length	7.4 cm	7.4 cm	7.5 cm
Total Weight	129.0 g	122.7 g	129.3 g
Net Weight	111.65 g	105.35 g	111.95 g
Volume	71.2 cm^3	71.2 cm^3	72.2 cm^3
Density	1.57 gm/cm^3	1.48 gm/cm^3	1.55 gm/cm^3

Cylinder Weight = 17.35 (3.5 cm x 7.5 cm)

PERMEABILITY RESULTS

Menasha Corporation
Otsego, Michigan

	Sample 1		Sample 2		Sample 3	
	A	B	A	B	A	B
Length	7.2 cm	7.4 cm	7.2 cm	7.4 cm	7.3 cm	7.5 cm
Time	30,600 sec	84,000 sec	30,600 sec	84,000 sec	30,600 sec	84,000 sec
h_1	60.5 cm	88.5 cm	48.0 cm	83.5 cm	59.5 cm	88.0 cm
h_2	55.4 cm	79.6 cm	48.0 cm	81.8 cm	59.4 cm	71.2 cm
n_T/n_{20}	.9761	.9531	.9761	.9531	.9761	.9531
K_T	1.5×10^{-6} cm/sec	6.9×10^{-7} cm/sec	----------	1.5×10^{-5} cm/sec	3.0×10^{-8} cm/sec	1.4×10^{-6} cm/sec
K_{20}	1.5×10^{-6} cm/sec	6.6×10^{-7} cm/sec	----------	1.5×10^{-5} cm/sec	2.9×10^{-8} cm/sec	1.3×10^{-6} cm/sec
Time	185,400 sec.		185,400 sec.		185,400 sec.	
h_2	37.2 cm		46.9		58.5 cm	
n_T/n_{20}	.9600		.9600		.9600	
K_T	1.4×10^{-6} cm/sec		6.6×10^{-8} cm/sec		4.9×10^{-8} cm/sec	
K_{20}	1.3×10^{-6} cm/sec		6.4×10^{-8} cm/sec		4.7×10^{-8} cm/sec	

MEN02312

MENASHA CORPORATION

PAPERBOARD DIVISION

P O BOX 155 • OTSEGO MICHIGAN 49078 • PHONE 692-6141

MESSAGE	REPLY
TO BTB	DATE
DATE 10 Oct 84.	

DNR accepted our proposal for closure of the Landfill. This proposal specified a final completion Date of 14 Nov 84. We are currently on Schedule. A proposal on dealing with the Bog to the North will be submitted Soon. JB

BY JB

SIGNED

2274

RECIPIENT RETAIN WHITE COPY RETURN PINK COPY

GORDON E. JONES, P.E. KENNETH C. DETTLOFF, P.C.P. ROBERT E. SNELL, P.E., R.L.S.
KALAMAZOO COUNTY SURVEYOR

MEN02313

WILKINS & WHEATON
ENGINEERING CO.
169-171 PORTAGE STREET • KALAMAZOO, MICHIGAN, 49007-4881
PHONE: (616) 345-1158

December 17, 1984

Mr. John Blaukamp
Menasha Corporation
320 N. Farmer Street
Otsego, MI 49078

Re: MDNR Correspondence
Sludge Ponds and Landfill Closure

Dear Mr. Blaukamp:

Please find enclosed correspondence to and from the Michigan Department of Natural Resources related to Menasha's sludge ponds and landfill closure. Much of the correspondence with them has been verbal in nature. The permeability report and north pond issue were verbally approved as well as notification of the clay cover. We will be talking to Mr. Kilmer this week and will request written approval of these items. Additionally, our final report on the closure will be forthcoming.

We will make a point to send you copies on all further correspondence. If you have any questions or comments, please contact our office.

Very truly yours,

WILKINS & WHEATON ENGINEERING CO.

Gordon E. Jones, P.E.

GEJ:dlj

Enclosures

2092

GORDON E. JONES, P.E. KENNETH C DETTLOFF, P.C.P ROBERT E. SNELL, P.E., R.L.S.
KALAMAZOO COUNTY SURVEYOR

MEN02314

WILKINS & WHEATON
ENGINEERING CO.
169-171 PORTAGE STREET • KALAMAZOO, MICHIGAN, 49007-4881
PHONE: (616) 345-1158

December 20, 1984

Mr. John Bonham
Menasha Corporation
320 N. Farmer
P.O. Box 155
Otsego, MI 49078

Re: Landfill/Sludge Pond Closures

Dear Mr. Bonham:

Please find enclosed a summary report of the above referenced project for your internal use and transmittal to the Michigan Department of Natural Resources.

We were pleased with the landfill and sludge pond closures and felt they were constructed in accordance with our plans and specifications. We were particularly pleased with the field permeability measurements and final restoration work done by Peters Construction Company. As per their correspondence, any final surface restoration work required in the Spring will be completed under their warranty.

We would recommend transmittal of this summary report to Mr. Galen Kilmer at the Michigan Department of Natural Resources office in Plainwell for final review and approval. We have previously requested written communication from Mr. Kilmer in regard to approval of the site permeability and final clay landfill cover material provided. As you are aware, verbal approval was given at the time to expedite construction. As indicated in our report, we will conduct final field permeability tests for the site in early Spring. If you have any questions on the enclosed material or wish to schedule a follow-up meeting, please contact us.

Very truly yours,

WILKINS & WHEATON ENGINEERING COMPANY

Gordon E. Jones

Gordon E. Jones, P.E.

GEJ:wsk

Enclosure
cc: Mr. John Blaukamp 2275

WILKINS & WHEATON · TESTING LABORATORY, INC.

MENASHA LANDFILL/SLUDGE POND CLOSURES

Otsego, Michigan

December, 1984

In accordance with the Closeout Plan for the Menasha Landfill and plans for the closures of Ponds #1, #2, #10, #12, and #14, all work has been completed by Peters Construction Company of Kalamazoo. Work items specified & bid during July of this year required removal of paper mill sludges from the referenced ponds. This material was to be transported to the landfill site, mixed with fly ash, and placed over the entire site (varying in depth from approximatley 2-4 feet). From the laboratory testing, the resultant mixture would have the required permeability and would eliminate the need for two feet of clay cover over the site. This plan, approved by the Michigan Department of Natural Resources, required permeability testing of field samples to verify laboratory results.

Between August and October, the paper mill sludge material was removed from Ponds #1, #12, #2, #10, and #14 respectively and disposed of at the landfill site as outlined. A total of 31,504 cubic yards were removed from the pond sites, including bottom soils permeated with the sludge. This was a substantial increase over the yardage anticipated and was primarily due to conditions at Pond #12. Probings taken at Pond #12 did not delineate the sludges beneath the sand layer on the northern extremity of the pond. Early investigation of that material seemed to indicate depths in the area of two feet. During the excavation of materials from Pond #12, it was determined that paper mill wastes were originally dumped along the north slope of Pond #12 and at one time, apparently, became covered over through surface erosion. This additional material was, however, removed from the pond site and disposed of in the landfill area. A tabulation of the final sludge volumes removed from each pond area is included below:

Pond #1	6,358 cubic yards
Pond #2	600 cubic yards
Pond #10.....	2,846 cubic yards
Pond #12.....	21,000 cubic yards
Pond #14.....	700 cubic yards
Total	31,504 cubic yards

2276

While the sludge being removed varied in consistency, it was trucked in loads ranging from 3 to 12 yards and mixed with fly ash by means of a back hoe. The mixture, by volume, was generally 50% fly ash to 50% sludge. This mixture correlated fairly well with the weight percentages as included in the closure report.

Daily sludge volumes transported ranged from 600 to 700 cubic yards to day to 1,400 cubic yards per day, depending upon consistency and the number of trucks in operation. While the first week of operation included some experimentation on behalf of the contractor, a sequence of operations was established and worked reasonably well throughout the course of the project.

Equipment on site generally included two back hoes, three trucks, a front end loader and one or two bull dozers. As excavated material was removed from the ponds, backfill material was placed continuously. At the landfill site the sludge-ash mixture was stockpiled with a back hoe and subsequently spread by means of a front end loader and bull dozer.

Early in the project Peters Construction rough-graded the ditch areas and excavated the storm water pond to limit and control runoff throughout the constructon period. Throughout the construction, Menasha continued to haul fly ash which was used and blended with the excacated sludge material. The hauling of other materials to the landfill site was discontinued by September 30, 1984, in accordance with Michigan Department of Natural Resources requirements. By early October, all sludge was removed from the ponds as listed. From then through November, work on the site continued in spreading the stockpiled sludge mixture to finish contours in general accordance with project plans.

It had been decided to construct the landfill ridge in the area of the north third of the site inasmuch as a smaller ditch area was constructed along the north perimeter. Final shaping and compacting continued through the month of November.

During the course of the pond closures, Wilkins & Wheaton staff probed the area north of Pond #12 in an effort to locate clay loam or clay on Menasha property. Clay lenses extending from 2 to 6 feet deep were located approximately 400 feet north of Pond #12, adjacent to Menasha's west property line and immediately southwest of the landfill area. It was determined, through the probings, that substantial quantities of clay existed on Menasha property which could be used for not only ditch lining but for the one-foot clay cover over the entire site as well. The material was not a clay loam but a fairly impermeable clay material which was adequate to meet requirements outlined in the closure report.

The sludge-ash mixture placed and compacted at the site was field tested through the extraction of core samples. Permeabilities were documented in the range of 10^{-6} to 10^{-8} centimeters per inch. These were in agreement with the preliminary laboratory testing and documented to the Michigan Department of Natural Resources. By obtaining Michigan Department of Natural Resources approval, the contractor was instructed to place one foot of final cover in lieu of the two-feet of clay cover as originally required. Based on these results, cover material was placed in the ditches and over the entire site during October and November. This was followed by final compaction, seeding and mulching, and placement of a erosion control fabric in lower extremities of the ditch construction.

Four infiltrometers were placed approximately 4½ feet below the surface by Wilkins and Wheaton staff for future monitoring of landfill permeability. Restoration work also included final grading and shaping aground Ponds #1, #2, #12, #10, and #14, as required by the Contract.

An effort was made to hold slopes to a minimum to control future potential erosion. While the seeding was done late in the year for germination, it will lay dormant throughout the winter months and establish itself in the Spring. Straw was used to mulch the site and straw bales were placed across ditch lines in an effort to control potential erosion, together with the fabric, as discussed.

Stone ri-rap was placed at the discharge of the easterly ditch line for erosion control. Westerly ditch lines discharge to the recharge pond adjacent to the southwest corner of the landfill site. This basin was constructed in a good gravel and sand formation.

A secondary concern of the Michigan Department of Natural Resources, relative to the landfill site, was the proximity of a pond immediately north of Menasha property approximately one acre in size. While early contour maps showed general drainage to the south, there was some concern of potential mounding and leachate collection to the north into the impounded/perched water area. To eliminate the potential of leachate moving north, a clay cutoff trench was constructed adjacent to and at the toe of the north roadway. This clay cutoff trench was excavated from five to ten feet deep, removing the existing silt and peat found at the location. The cutoff trench was constructed on the Menasha property.

Upon acceptance of the final payment request, Peters Constructon has indicated to Menasha that they will return in the Spring and inspect the site for any possible erosion and/or any seeding which does not germinate. At that time, a final field permeability measurement will be made and instructions will be given to Menasha personnel relative to future infiltrometer measurements.

Submitted by:
Gordon E. Jones, P.E.

GORDON E. JONES, P E
KENNETH C DETTLOFF, P C P
ROBERT E SNELL, P E, R L S
KALAMAZOO COUNTY SURVEYOR

MEN02319

WILKINS & WHEATON
ENGINEERING CO.
169-171 PORTAGE STREET • KALAMAZOO, MICHIGAN, 49007-4881
PHONE: (616) 345-1158

December 27, 1984

Mr. John Bonham
Menasha Corporation
Paper Board Division
320 N. Farmer
Otsego, MI 49078

Re: Sludge Pond/Landfill Closure

Dear Mr. Bonham:

Please find enclosed a letter from Peters Construction Co. regarding their warranty with respect to restoration work at the site.

Very truly yours,

WILKINS & WHEATON ENGINEERING CO.

Gordon E. Jones

Gordon E. Jones, P.E.

GEJ:dlj

Enclosure

cc: Mr. John Blaukamp ✓

GORDON E. JONES, P.E. KENNETH C DETTLOFF, P.C.P. ROBERT E. SNELL, P.E., R.L.S.
KALAMAZOO COUNTY SURVEYOR

MEN02320

WILKINS & WHEATON
ENGINEERING CO.
169-171 PORTAGE STREET • KALAMAZOO, MICHIGAN, 49007-4881
PHONE: (616) 345-1158

April 30, 1985

Mr. Kevin Hale
Peters Construction Company
3325 East Kilgore
Kalamazoo, MI 49003

Re: Menasha Landfill

Dear Mr. Hale:

As per our discussion last December, we recently reviewed the referenced project. We were quite pleased that erosion over the winter months was minimal. The seed is starting to germinate and should "take" over a majority of the site. We would request that a few problems be corrected soon so as to avoid further problems. They are as follows:

1. The north bank completed late in the year did not stabilize. Additional clay and some grading is required along the north road. We would also ask that you obtain a price to seed that north slope. A separate Purchase Order can be issued for that work.

2. Some erosion has occurred along the south ditch lines. These should be filled, raked and seeded. Straw is required to help eliminate erosion.

3. Straw bales can be placed in several places where erosion is just beginning. Once the grass is up, the erosion should cease.

4. The recharge pond does not function and has apparently silted up. We realize that an attempt was made to clean it out late last year. Any spoil can be spread south of the pond area.

If you will contact Mr. Bonham at Menasha there may be some additional work, grading, etc... that they would like to do (outside of this contract). Please commence this work as soon as possible.

Very truly yours,

WILKINS & WHEATON ENGINEERING COMPANY

2099

GEJ:wsk

Gordon E. Jones, P.E.

cc: Mr. John Bonham, Menasha Corporation
Mr. John Blaukamp, Menasha Corporation

MEN02321

WILKINS & WHEATON TESTING LABORATORY, INC.

April 30, 1985

Mr. Galen Kilmer
Plainwell District Supervisor
Michigan Department of Natural Resources
P.O. Box 355
Plainwell, MI 49080

Re: Menasha Corporation
Otsego, Michigan

Dear Mr. Kilmer:

Based on our discussion of April 29, 1985, Menasha Corporation intends to complete the following items relative to the landfill and sludge pond closures completed last fall:

Final Permeability Testing

Three in-situ core samples will be obtained from the final cover of the landfill to confirm preliminary permeability test results. The results of this testing will be submitted to you for final approval of the cover material.

Final Construction (Clean-up)

Peters Construction has been notified for final construction procedures due to erosion from the spring thaw. Items to be addressed include stabilization and seeding of the north bank; erosion along ditch lines; additional seeding on landfill surface; and cleaning of the western recharge pond from siltation. This work should be completed in the next couple of weeks.

Upon completion of the above items, we will be submitting the results to you. Following your review and approval, Menasha would like to request a written letter confirming the landfill closure has been completed as per all Michigan Department of Natural Reosurces requirements.

If you have any questions or comments, please contact our office or Mr. John Bonham of Menasha.

Very truly yours,

WILKINS & WHEATON TESTING LABORATORY, INC.

Debra A. Lefler

Debra A. Lefler, Geologist

William B French

William B French, Vice President

169-171 Portage Street
Kalamazoo, Michigan 49007
(616) 345-1158

cc: Mr. John Bonham, Menasha
→Mr. John Blaukamp, Menasha

2100

WILKINS & WHEATON TESTING LABORATORY, INC.

July 15, 1985

Mr. Galen Kilmer
Plainwell District Supervisor
Michigan Department of Natural Resources
P.O. Box 355
Plainwell, MI 49080

Re: Menasha Corporation
Otsego, Michigan

Dear Mr. Kilmer:

In reference to our letter to you dated April 30, 1985, the final permeability testing and construction clean-up has been completed for the landfill and sludge pond closures at the above referenced site. The results of this additional work are as follows:

Final Permeability Testing

Three (3) in-situ coring locations were sampled on the landfill surface. The locations included a sample from the center of the site and one from each the eastern and western halves. Both the clay cover material and the sludge/ash cover material were sampled for permeability testing. Two cores of each material from each location were tested.

The included chart represents the results of the permeability testing. In summary, the permeability of the overlying cover material ranges between 4.00×10^{-6} and 3.84×10^{-7} cm/sec. The permeability of the sludge/ash cover material ranges between 1.75×10^{-5} and 5.63×10^{-7} cm/sec. As these figures indicate, these values are well within the acceptable range.

Final Construction (Clean-up)

Final construction and clean-up has been completed at the site. The north bank has been stabilized and seeded; erosion along ditch lines has been repaired; the western recharge pond was cleaned and additional straw bails were added; and additional seed was placed on the landfill surface. Additionally, Menasha intends to fertilize the surface of the site to enhance vegetative growth.

169-171 Portage Street
Kalamazoo, Michigan 49007
(616) 345-1158

2101

WILKINS & WHEATON · TESTING LABORATORY, INC

Mr. Galen Kilmer
Page Two
July 15, 1985

Upon your review of the above information, Menasha would like to request a written letter confirming and approving the completion of the landfill and sludge pond closures, as per all Michigan Department of Natural Resources requirements. Additionally, Menasha will continue to monitor the landfill surface and maintain it for erosion and other related problems.

If you have any questions or comments, please contact our office or Mr. John Bonham of Menasha Corporation. Thank you again for your assistance in this very successful project.

Very truly yours,

WILKINS & WHEATON TESTING LABORATORY, INC.

Debra A. Lefler

Debra A. Lefler, Geologist

William B French

William B French, Vice President

DAL:WBF:wsk

Enclosure

cc: Mr. John Bonham, Menasha Corporation
Mr. John Blaukamp, Menasha Corporation

WILKINS & W[illegible]TON TESTING
LABORATORY, INC.

PERMEABILITY TEST MEASUREMENTS

PROJECT: Menasha Corpo[illegible]on
DATES: 6/21/85 - 7/03/85
NAME: DL/DA/WBF

OVERALL CALCULATIONS:

$$K = \frac{2.3aL}{At} \log \frac{h_1}{h_2}$$

Starting Date	Material(s) Location	Material Ratio (Sludge/ash)	Buret Area* (a)	Length of Sample (L)	Sample Area* (A)	Start Time (t^1)	End Time (t^2)	Elapsed Time (t in seconds)	Start Height (h_1)	End Height (h_2)	Start Temp. (°C)	End Temp. (°C)	Temp. Correction	K_T/K_{20} Permeability (K in cm/sec)	Comments
6/21/85	Boring 1	Clay Cover	113.09	7.0	907.92	6/21 5:13pm	6/25 8:06am	312,780	887	730	23°	23°	0.9311	5.42×10^{-7} 5.05×10^{-7}	
6/25/85	Boring 1A	Clay Cover	201.06	7.0	907.92	6/25 1:30pm	6/27 8:13am	153,780	725	696	22.5°	23.5°	0.93305	4.11×10^{-7} 3.84×10^{-7}	
6/25/85	Boring 2	Clay Cover	113.09	7.0	907.92	6/25 1:30pm	6/27 8:13am	153,780	713	352	22.5°	23.5°	0.93305	4.00×10^{-6} 3.72×10^{-6}	
6/25/85	Boring 2B	Clay Cover	113.09	7.0	907.92	6/25 1:30pm	6/27 8:13am	153,780	805	705	22.5°	23.5°	0.93305	7.51×10^{-7} 7.01×10^{-7}	
6/21/85	Boring 3	Clay Cover	201.06	7.0	907.92	6/21 5:13pm	6/25 8:06am	312,780	887	684	23°	23°	0.9311	5.59×10^{-7} 5.20×10^{-7}	Insufficient sample for second test.
6/27/85	Boring 1	Sludge/ Ash	113.09	7.0	907.92	6/27 2:45pm	7/01 10:00am	328,500	832	370	23.5°	24°	0.91505	2.15×10^{-6} 1.97×10^{-6}	
7/01/85	Boring 1A	Sludge/ Ash	113.09	7.0	907.92	7/01 2:00pm	7/03 9:00am	154,800	825	739	24°	24°	0.9097	6.19×10^{-7} 5.63×10^{-7}	
6/27/85	Boring 2	Sludge/ Ash	113.09	7.0	907.92	6/27 2:45pm	7/01 10:00am	328,500	836	402	23.5°	24°	0.91505	1.94×10^{-6} 1.78×10^{-6}	
7/01/85	Boring 2A	Sludge/ Ash	113.09	7.0	907.92	7/01 2:00pm	7/03 9:00am	154,800	786	353	24°	24°	0.9097	4.5×10^{-6} 4.10×10^{-6}	
6/27/85	Boring 3	Sludge/ Ash	201.06	7.0	907.92	6/27 2:45pm	6/28 10:00am	69,300	835	382	23.5°	23.5°	0.9204	1.75×10^{-5} 1.61×10^{-5}	
7/01/85	Boring 3A	Sludge/ Ash	201.06	7.0	907.92	7/01 2:00pm	7/03 9:00am	154,800	745	408	24°	24°	0.9097	6.02×10^{-6} 5.48×10^{-6}	

LOCATIONS: Boring 1 - Center of landfill.
Boring 2 - East side of landfill.
Boring 3 - West side of landfill

*Area = πr^2

Note: All measurements recorded as centimeters.
Make temperature correction prior to recording permeability.

3/3

MEN02324

MEN02325

STATE OF MICHIGAN

URAL RESOURCES COMMISSION
OMAS J ANDERSON
R CAROLLO
ARLENE J FLUHARTY
STEPHEN F MONSMA
O STEWART MYERS
RAYMOND POUPORE
HARRY H WHITELEY

JAMES J BLANCHARD, Governor

DEPARTMENT OF NATURAL RESOURCES

RONALD O SKOOG, Director

District 12 Headquarters
P.O. Box 355, Plainwell, Michigan 49080

September 11, 1985

Mr. John Bonham
Mr. John Blaukamp
Menasha Corporation
320 North Farmer
Otsego, Michigan 49078

Re: Menasha Corporation Landfill Closure, Allegan County

Gentlemen:

This office accepts the landfill closure as submitted. While the data does not include the field compaction data, the supplied permeability measurements and onsite observations reasonably satisfy the Department of Natural Resources concerns.

Your cooperation in this matter has been appreciated. If questions or comments arise, please feel free to contact this office.

Sincerely,

GROUNDWATER QUALITY DIVISION

Richard Sadowski

Richard Sadowski, P.E.
Plainwell District
616-685-9886

RS:ek

cc: Tom Work
Galen Kilmer
Wm. French/Debra Lefler, Wilkins & Wheaton Testing Laboratory, Inc.

R1026-1

2104

1977 EPA ACT 308 SURVEY

DOCUMENT #48

SURVEY FORM
CHECKLIST
PART I

(x indicates Section and Item to be filled out by subcategory listed)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
I. MILL BACKGROUND DATA								
A.	13	X	X	X	X	X	X	X
B.	13-15	X	X	X	X	X	X	X
II. PRODUCTION INFORMATION								
A.	16	X	X	X	X	X	X	X
B.	17	X	X	X	X	X	X	X
C.	17-20	X	X	X	X	X	X	X
III. PROCESS RAW MATERIALS								
A.1 (39)	21-22	X	X	X	X			X
2 (40)	22-23	X	X	X	X			X
3 (41)	24-25					X	X	
B.	26-30	X	X	X	X	X	X	X
IV. MANUFACTURING PROCESS AND INTERNAL POLLUTION CONTROL PRACTICES								
A.	31	X	X	X	X			X
B.	31-32	X						
C.	33	X						

MEN02327

CHECKLIST
PART I
(Continued)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
D.	34-37	X						
E.	37	X						
F.	38		X					
G.	38-39		X					
H.	39		X					
I.	40-41		X					
J.	41							
K.	41			X				
L.	42			X				
M.	42							
N.	42				X			
O.	42							
P.	42				X			
Q.	43							
R.	44							
S.	44							
T.	44-45						X	
U.	45							

MEN02328

CHECKLIST
PART I
(Continued)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
V.	45						X	
W.	46							
X.	46					X		
Y.	47							
Z.	47							
A-1	47							X
B-1	47-48	X	X	X	X	X	X	
C-1	48							X
D-1	48							X
E-1	48							
F-1	48							
V. WATER USAGE AND EFFLUENT TREATMENT PRACTICES								
A.	49							
B.	49	X	X	X	X	X	X	X
C.	49-50	X	X	X	X	X	X	X
D.	51	X	X	X	X	X	X	X
E.	51	X	X	X	X	X	X	X
F.	51	X	X	X	X	X	X	X
G.	51	X	X	X	X	X	X	X
H.	52	X	X	X	X	X	X	X

MEN02329

CHECKLIST
PART I
(Continued)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
I.	52							
J.	52	X	X	X	X	X	X	X
K.	52							
L.	52							
M.	53							
N.	53	X	X	X	X	X	X	X
VI. FUEL AND ENERGY								
	53							
VII. PRIORITY POLLUTANT CONTROLS								
	54-57	X	X	X	X	X	X	X
VIII. PROCESS SCHEMATICS								
	53							

MEN02330

ENVIRONMENTAL PROTECTION AGENCY
SURVEY FORM
PULP, PAPER, AND PAPERBOARD INDUSTRY

INTEGRATED MILLS
PART I

I. MILL BACKGROUND DATA

A. Mill & Division Name: Menasha Corp. Otsego Division

Address: 320 N. Farmer ZIP 49078

Telephone 616 / 692-6141

Corporate Affiliation (if applicable) _____

Contacts and Title: (Use an asterisk next to the responsible personnel completing the survey form)

* Gary E. Roys	Process Chemist
Bruce T. Buchanan	Technical Director
John R Blauwkamp	Process Engineer
Jim Adams	General Manager

B. Age of Mill 90 yrs

1. Year of initial construction 1887

2. Please give the year of initial startup and each year since 1952 in which any major modifications or permanent shutdowns were made which significantly affected the composition or amount of effluent from the mill.

	Year(s) of Initial Startup	Year(s) of Waste Significant Modification or Permanent Shutdown
a. Woodyard		
Pulping continuous digester 1976		
b. Brown Stock Washers		
c. Screen Room		

Mill: [illegible] Location: [illegible]

	Year(s) of Initial Startup	Year(s) of Waste Significant Modification or Permanent Shutdown
d. Bleaching		
Chemical Recovery		
e. Recausticizing		
f. Evaporation	1973	
g. Recovery Furnace	[illegible]	
h. Paper Machine(s)	AUG 1965	
#2 P[illegible]	SEPT 1967	
i. New or Additional Refiner(s)		
j. Added TMP Process		
k. Added CMP Process		
l. Blow Heat and Condensate Recovery		
Air Pollution Control Systems that contribute to the waste load		
m. Wet Scrubber(s)		
n. Precipitator(s)		
o. Eliminatrion of Process(es) (please describe)		
COMBUSTION evaporators	1973	
ROTARY digesters	1972	
OLD #1 paper machine	1965	

Mill: _____ Location: _____

		Year(s) of Initial Startup	Year(s) of Waste Significant Modification or Permanent Shutdown
p.	Products Mix Changes		
q.	Process Changes		
r.	Other		

Mill: [illegible] Location: [illegible]

II. PRODUCTION INFORMATION

A. Pulp Manufactured	Average Daily* Air Dry Tons/Day Hardwood	Average Daily* Air Dry Tons/Day Softwood	Maximum Day Air Dry Tons/Day Hardwood	Maximum Day Air Dry Tons/Day Softwood	Maximum Month Air Dry Tons/Day Hardwood	Maximum Month Air Dry Tons/Day Softwood
3. Bleached Kraft						
4. Unbleached Kraft						
5. Dissolving Kraft						
6. NSCC	183		288		223	
7. Groundwood-Fine						
8. Groundwood-Coarse						
9. CMP						
10. TMP						
11. Bleached Sulfite						
12. Unbleached Sulfite						
13. Dissolving Sulfite						
14. Deinked Groundwood						
15. Deinked Kraft						
16. Deinked Mixed Waste						
17. Wastepaper - Manufactured Furnish	123		187		146	
18. Other (please list)						

*Average Daily = $\frac{\text{Total Production for year}}{\text{Total Production days for year}}$

Mill: _____ Location: _____

B.	Supplemental Fiber	Average Daily Air Dry Tons/day		Maximum Day Air Dry Tons/day		Maximum Month Air Dry Tons/day	
		Hardwood	Softwood	Hardwood	Softwood	Hardwood	Softwood
	Purchased pulp						
19.	Baled						
20.	Wet Lap						
21.	Slushed						
22.	Broke						
23.	Other (please list)						

C. Products

		Average Day Air Dry* Tons/Day	Maximum Day Air Dry* Tons/Day	Maximum Month Air Dry* Tons/Day
24.	Market Pulp			
	a. Pulp Bales and/or Rolls			
	b. Wet Lap Pulp			
	c. Slush Pulp			
25.	Groundwood Molded Pulp			
26.	Newsprint			

*Measured at the winder or pulp dryer.

Mill: _____ Location: _____

	Average Daily Air Dry* Tons/Day	Maximum Day Air Dry* Tons/Day	Maximum Month Air Dry* Tons/Day
27. Groundwood Printing, Writing and Related			
a. Uncoated Groundwood Printing and Converting	_____	_____	_____
b. Clay (50% or more kaolin) Coated Groundwood Printing and Converting	_____	_____	_____
c. Groundwood Specialties	_____	_____	_____
d. Other _____	_____	_____	_____
28. Wood Free Printing, Writing and Related			
a. Uncoated Free Sheet Printing	_____	_____	_____
b. Clay (50% or more kaolin) Coated Free Sheet Printing	_____	_____	_____
c. Uncoated Writing and Related	_____	_____	_____
d. Uncoated Solid Bleached Bristols	_____	_____	_____
e. Clay (50% or more kaolin) Coated Solid Bleached Bristols	_____	_____	_____
f. Other _____	_____	_____	_____
29. Cotton Fiber Papers			
a. Writing and Related	_____	_____	_____
b. Technical	_____	_____	_____
c. Other _____	_____	_____	_____
30. Thin Papers			
a. Carbonizing	_____	_____	_____
b. Cigarette	_____	_____	_____
c. Other _____	_____	_____	_____

*Measured at the winder or pulp dryer.

MEN02337

Mill: [illegible] Corp. Location: [illegible]

	Average Daily Air Dry* Tons/Day	Maximum Day Air Dry* Tons/Day	Maximum Month Air Dry* Tons/Day
31. Packaging and Industrial Converting			
a. Unbleached Kraft			
b. Bleached Kraft			
c. Other _____			
32. Specialty Packaging and Industrial Converting			
a. Tape Backing			
b. Saturating			
c. Gasket			
d. Other (list types)			
_____			
_____			
_____			
33. Sanitary Tissue			
34. Unbleached Kraft Paperboard (80% or more unbleached kraft pulp)			
a. Linerboard			
b. Folding			
c. Other _____			
35. Semi-Chemical Paperboard (75% or more semi-chemical pulp)			
a. Corrugating	346	416	372
b. Other _____			

*Measured at the winder or pulp dryer.

Mill: _____ Location: _____

	Average Daily Air Dry* Tons/Day	Maximum Day Air Dry* Tons/Day	Maximum Month Air Dry* Tons/Day
36. Bleached Paperboard (not less than 80% bleached chemical wood pulp)			
a. Clay Coated Bleached Food Board	_____	_____	_____
b. Uncoated Bleached Food Board	_____	_____	_____
c. Bleached Linerboard	_____	_____	_____
d. Folding	_____	_____	_____
e. Other _____	_____	_____	_____
37. Recycled Paperboard			
a. Linerboard	_____	_____	_____
b. Corrugating	_____	_____	_____
c. Chip & Filler Board	_____	_____	_____
d. Folding	_____	_____	_____
e. Set-up	_____	_____	_____
f. Gypsum Wall Board	_____	_____	_____
g. Other _____	_____	_____	_____
38. Construction Paper and Board			
a. Construction Paper	_____	_____	_____
b. Wet Machine Board	_____	_____	_____
c. Insulating Board	_____	_____	_____
d. Hard Pressed Board	_____	_____	_____
e. Other _____	_____	_____	_____

*Measured at the winder or pulp dryer.

III. PROCESS RAW MATERIALS

A. Total Mill Fiber Supply - Please fill in the following table for the year and quarters indicated. (Use bone dry tons if possible.)

39. Roundwood - Please use an asterisk (*) to indicate the wood received debarked. Entries in the table without an asterisk will be assumed to have been received with bark.

Year & Quarter	Tons/Day	Percent Hardwood (list the wood type, pine, spruce, etc. and the percent for each.)	Percent Softwood	Estimated Length of Time Fiber Supply is Stored Prior to Use (Days) (Field and Mill Storage)
1976				
1st Quarter				
2nd Quarter				
3rd Quarter				

Mill: _____ Location: _____

MEN02339

III. PROCESS RAW MATERIALS - Continued

Year & Quarter	Tons/Day	Percent Hardwood (list the wood type, pine, spruce, etc. and the percent for each.)	Percent Softwood	Estimated Length of Time Fiber Supply is Stored Prior to Use (Days) (Field and Mill Storage)
1976				
4th Quarter				

40. Sawdust and Chips -

1976				
1st Quarter	230	14% Aspen		
		86% OAK + MIXED HARDWOODS		45 days
		FOR ALL Chips		
2nd Quarter				
	254			37 days

Mill: [illegible]

Location: [illegible]

MEN02340

III. PROCESS RAW MATERIALS - Continued

Year & Quarter	Tons/Day	Percent Hardwood (list the wood type, pine, spruce, etc. and the percent for each.)	Percent Softwood	Estimated Length of Time Fiber Supply is Stored Prior to Use (Days) (Field and Mill Storage)
1976				
3rd Quarter	249			37 days
4th Quarter				
	281			27 days

Mill: _____

Location: _____

MEN02341

41. Paperboard from Wastepaper, Deink, and Builders Paper Mills - Total Mill Fiber Supply - Please provide the average tons/day for the year and quarters indicated below:

	1976 Quarter			
	1st	2nd	3rd	4th
Wastepaper				
a. Mixed Wastepaper				
b. Boxboard Cuttings				
c. No. 1 News				
d. Special News				
e. Fibre Containers				
f. Corrugated				
g. Corrugated Cuttings				
h. Kraft Bags				
i. Kraft Cuttings				
j. Groundwood Substitutes (coated)				
k. Groundwood Substitutes (uncoated)				
l. White Shavings				
m. Colored Ledger				
n. Tab Cards				

Mill:

Location:

MEN02342

Mill: _____

Location: _____

		1976 Quarter			
		1st	2nd	3rd	4th
o.	Colored Kraft Substitutes				
p.	White Ledger				
q.	Bleached Pulp Substitutes				
r.	Specialty Grades				
s.	Other				

MEN02343

Mill: _____ Location: _____

B. Chemicals and Other Raw Materials

The following list of purchased chemicals and raw materials should be used to indicate their use in the mill process and/or process maintenance work. If a chemical is used, please circle the appropriate answer. Two answers should be marked for each numbered chemical or raw material used. The following answers are possible: (a) Mill process chemical; (b) used for process maintenance work; (c) more than 500 lb/year is used; (d) less than 500 lb/year is used. For some chemicals a third answer may be marked. For chemicals applied to the surface of the formed paper, mark answer (e), surface application. If (e) is not marked, the chemical will be assumed to be used internally (combined with the stock) unless the specific type of chemical would indicate otherwise (i.e., cleaners and detergents). For chemicals which ask for trade name or types, please mark the appropriate item and indicate trade name or type below on the questionnaire. Chemicals used in laboratories should be excluded from the list. If chemicals are used which do not appear, please list under Other at the end of the list.

Adhesives

42. Animal Glue
(a) (b) (c) (d) (e)

43. Casein
(a) (b) (c) (d) (e)

44. Polyvinyl Acetate
(a) (b) (c) (d) (e)

45. Starch
(a) (b) (c) (d) (e)

46. Styrene-Butadiene
(a) (b) (c) (d) (e)

Other

47. _____
(a) (b) (c) (d) (e)

48. _____
(a) (b) (c) (d) (e)

49. _____
(a) (b) (c) (d) (e)

50. Alum
(a) (b) (c) (d) (e)

51. Ammonia
(a) (b) (c) (d) (e)

52. Ammonium Hydroxide
(a) (b) (c) (d) (e)

53. Amorphous Waxes
(a) (b) (c) (d) (e)

54. Asphalt
(a) (b) (c) (d) (e)

55. Binder
(a) (b) (c) (d) (e)

Bituminous Material
(list trade names)

56. _____
(a) (b) (c) (d) (e)

57. _____
(a) (b) (c) (d) (e)

58. _____
(a) (b) (c) (d) (e)

MEN02344

B. Chemicals and Other Raw Materials - Continued
(a) Mill process chemical; (b) Used for process maintenance work; (c) More than 500 lb/year used; (d) Less than 500 lb/year used; (e) Surface application

Mill: _____ Location: _____

Boil-Out Materials
(list trade names)

59. _____ (a) (b) (c) (d) (e)

60. _____ (a) (b) (c) (d) (e)

61. _____ (a) (b) (c) (d) (e)

62. Bronze Powders (a) (b) (c) (d) (e)

63. Chlorine (a) (b) (c) (d) (e)

64. Chlorine Dioxide (a) (b) (c) (d) (e)

Cleaners & Detergents
(list trade names)

65. BEAVER (a) (b) (c) (d) (e)

66. _____ (a) (b) (c) (d) (e)

67. _____ (a) (b) (c) (d) (e)

Coating Adhesives
(list types)

68. _____ (a) (b) (c) (d) (e)

69. _____ (a) (b) (c) (d) (e)

70. Crystalline Waxes (a) (b) (c) (d) (e)

Cutting Fluids
(list types)

71. SAFETY SOLVENTS (a) (b) (c) (d) (e)

72. DAV-TAP (a) (b) (c) (d) (e)

73. RIGID (a) (b) (c) (d) (e)

Defoamers
(list trade names)

74. Solvex 679 (a) (b) (c) (d) (e)

75. BISPERSE 53P (a) (b) (c) (d) (e)

76. _____ (a) (b) (c) (d) (e)

77. _____ (a) (b) (c) (d) (e)

Degreasers
(list trade names)

78. BEAVER (a) (b) (c) (d) (e)

79. _____ (a) (b) (c) (d) (e)

80. _____ (a) (b) (c) (d) (e)

Dispersants
(list trade names)

81. _____ (a) (b) (c) (d) (e)

82. _____ (a) (b) (c) (d) (e)

83. _____ (a) (b) (c) (d) (e)

Dyes (list types)

84. _____ (a) (b) (c) (d) (e)

85. _____ (a) (b) (c) (d) (e)

86. _____ (a) (b) (c) (d) (e)

Fillers

87. Diatomaceous Earth (a) (b) (c) (d) (e)

88. Clay (a) (b) (c) (d) (e)

89. Calcium Carbonate (a) (b) (c) (d) (e)

90. Talc (a) (b) (c) (d) (e)

MEN02345

B. Chemicals and Other Raw Materials - Continued
(a) Mill process chemical; (b) Used for process maintenance work; (c) More than 500 lb/year used; (d) Less than 500 lb/year used; (e) Surface application

91. TiO_2
(a) (b) (c) (d) (e)

Other

92. _____
(a) (b) (c) (d) (e)

93. _____
(a) (b) (c) (d) (e)

94. _____
(a) (b) (c) (d) (e)

Fungicides
(list trade names)

95. _____
(a) (b) (c) (d) (e)

96. _____
(a) (b) (c) (d) (e)

97. _____
(a) (b) (c) (d) (e)

98. Hydrogen Peroxide
(a) (b) (c) (d) (e)

99. Oil Base Ink
(a) (b) (c) (d) (e)

100. Water Base Ink
(a) (b) (c) (d) (e)

Latex (list types)

101. _____
(a) (b) (c) (d) (e)

102. _____
(a) (b) (c) (d) (e)

103. _____
(a) (b) (c) (d) (e)

104. Lime
(a) (b) (c) (d) (e)

105. Limestone
(a) (b) (c) (d) (e)

106. Magnesium Hydroxide
(a) (b) (c) (d) (e)

107. Magnesium Oxide
(a) (b) (c) (d) (e)

108. Oils
(a) (b) (c) (d) (e)

Organic Solvents

109. Alcohols
(a) (b) (c) (d) (e)

110. Esters
(a) (b) (c) (d) (e)

111. Ketones
(a) (b) (c) (d) (e)

Other

112. _____
(a) (b) (c) (d) (e)

113. _____
(a) (b) (c) (d) (e)

114. _____
(a) (b) (c) (d) (e)

Pigments

115. Cadmium Types
(a) (b) (c) (d) (e)

116. Chromium Types
(a) (b) (c) (d) (e)

117. Copper Types
(a) (b) (c) (d) (e)

118. Lead Types
(a) (b) (c) (d) (e)

119. Luminescent Types
(a) (b) (c) (d) (e)

120. Mercury Types
(a) (b) (c) (d) (e)

Mill: _____

Location: _____

MEN02346

B. Chemicals and Other Raw Materials - Continued

(a) Mill process chemical; (b) Used for process maintenance work; (c) More than 500 lb/year used; (d) Less than 500 lb/year used; (e) Surface application

121. Organic Types
(a) (b) (c) (d) (e)

122. Zinc Types
(a) (b) (c) (d) (e)

Other

123. _____
(a) (b) (c) (d) (e)

124. _____
(a) (b) (c) (d) (e)

125. _____
(a) (b) (c) (d) (e)

Plasticizers (list types)

126. _____
(a) (b) (c) (d) (e)

127. _____
(a) (b) (c) (d) (e)

128. _____
(a) (b) (c) (d) (e)

Polymers

129. Cellulose Acetate
(a) (b) (c) (d) (e)

130. Cyclized Rubber
(a) (b) (c) (d) (e)

131. Ethyl Cellulose
(a) (b) (c) (d) (e)

132. Nitrocellulose
(a) (b) (c) (d) (e)

133. Polyethylene
(a) (b) (c) (d) (e)

Other

134. _____
(a) (b) (c) (d) (e)

135. _____
(a) (b) (c) (d) (e)

136. _____
(a) (b) (c) (d) (e)

Preservatives

137. Borax
(a) (b) (c) (d) (e)

138. Formaldehyde
(a) (b) (c) (d) (e)

139. Glyoxcal
(a) (b) (c) (d) (e)

Other

140. _____
(a) (b) (c) (d) (e)

141. _____
(a) (b) (c) (d) (e)

142. Resins (Wet strength)
(a) (b) (c) (d) (e)

Resins (Other)
(list types)

143. _____
(a) (b) (c) (d) (e)

144. _____
(a) (b) (c) (d) (e)

145. _____
(a) (b) (c) (d) (e)

146. Rosin Size
(a) (b) (c) (d) (e)

147. Salt or Brine
(a) (b) (c) (d) (e)

148. Salt Cake
(a) (b) (c) (d) (e)

Slimicides (Biocides)
(list trade names)

149. _____
(a) (b) (c) (d) (e)

150. _____
(a) (b) (c) (d) (e)

151. _____
(a) (b) (c) (d) (e)

Mill: _____

Location: _____

MEN02347

Chemicals and Other Raw Materials - Continued
(a) mill process chemical; (b) used for proc aintenance work; (c) more than 500 lb/year is used; (d) less than 500 lb/year is used; (e) surface application

152. Sodium Bisulfite
(a) (b) (c) (d) (e)

153. Sodium Aluminate
(a) (b) (c) (d) (e)

154. Sodium Carbonate
(a) (b) (c) (d) (e)

155. Sodium Chlorate
(a) (b) (c) (d) (e)

156. Sodium Hydrosulfite
(a) (b) (c) (d) (e)

157. Sodium Hydroxide
(a) (b) (c) (d) (e)

158. Sodium Silicate
(a) (b) (c) (d) (e)

159. Sodium Sulfide
(a) (b) (c) (d) (e)

160. Sodium Sulfite
(a) (b) (c) (d) (e)

161. Sulfur
(a) (b) (c) (d) (e)

162. Sulfur Dioxide
(a) (b) (c) (d) (e)

163. Sulfuric Acid
(a) (b) (c) (d) (e)

164. Synthetic Size
(a) (b) (c) (d) (e)

165. TSPP
(a) (b) (c) (d) (e)

166. Varnish
(a) (b) (c) (d) (e)

Varnish Remover
(list trade names)

167. _____
(a) (b) (c) (d) (e)

168. _____
(a) (b) (c) (d) (e)

169. _____
(a) (b) (c) (d) (e)

Washing Aids (list types)

170. _____
(a) (b) (c) (d) (e)

171. _____
(a) (b) (c) (d) (e)

172. _____
(a) (b) (c) (d) (e)

173. Zinc Hydrosulfite
(a) (b) (c) (d) (e)

Other

174. _____
(a) (b) (c) (d) (e)

175. _____
(a) (b) (c) (d) (e)

176. _____
(a) (b) (c) (d) (e)

177. _____
(a) (b) (c) (d) (e)

178. _____
(a) (b) (c) (d) (e)

179. _____
(a) (b) (c) (d) (e)

180. _____
(a) (b) (c) (d) (e)

181. _____
(a) (b) (c) (d) (e)

182. _____
(a) (b) (c) (d) (e)

183. _____
(a) (b) (c) (d) (e)

184. _____
(a) (b) (c) (d) (e)

185. _____
(a) (b) (c) (d) (e)

Mill: _____

Location: _____

MEN02348

Mill: Manistique Papers Location: Ontonagon Mich.

IV. MANUFACTURING PROCESS AND INTERNAL POLLUTION CONTROL PRACTICES

A. General

189. Are the drum or mechanical barkers operated dry? Steam may be used for thawing logs.

(a) Yes

(b) No

B. Kraft and Soda Mills - Digesters

Give the permanganate number (if applicable) for the following: Answer either question 220 through 223 or questions 223 through 226.

	Percent of the Total Production
220. Hardwood	
(a) 10-11	_____
(b) 11-12	_____
(c) 12-13	_____
(d) 13-14	_____
(e) Above 14	_____

	Percent of the Total Production
221. Softwood	
(a) 16-18	_____
(b) 18-20	_____
(c) 20-22	_____
(d) 22-24	_____
(e) Above 24	_____

222. If the mill pulps a mixture of hardwood and softwood, please give the permanganate number.

_____ Permanganate Number

Mill: _____ Location: _____

223. Give the normal percent of the following:

a. Softwood _____

b. Hardwood _____

Give the Kappa number (if applicable) at the brown stock washers for the following:

	Percent of the Total Production
224. Hardwood	
(a) 15-17	_____
(b) 17-19	_____
(c) 19-21	_____
(d) 21-23	_____
(e) Above 23	_____

	Percent of the Total Production
225. Softwood	
(a) 28-30	_____
(b) 30-32	_____
(c) 32-34	_____
(d) 34-36	_____
(e) Above 36	_____

226. If the mill pulps a mixture of hardwood and softwood, please give the Kappa number.

_____ Kappa Number

Mill: _____ Location: _____

C. Kraft and Soda Mills - Brown Stock Washers and Screening

231-233. Give the approximate brown stock washer efficiency in terms of pounds of soda loss as washable Na_2O for the following:

		Percent of the Total Production
231.	Line #1	
	(a) Less than 15 #Na_2O/Ton	_____
	(b) 15-25	_____
	(c) 25-35	_____
	(d) 35-45	_____
	(e) Greater than 45	_____

		Percent of the Total Production
232.	Line #2	
	(a) Less than 15 #Na_2O	_____
	(b) 15-25	_____
	(c) 25-35	_____
	(d) 35-45	_____
	(e) Greater than 45	_____

		Percent of the Total Production
233.	Line #3	
	(a) Less than 15 #Na_2O	_____
	(b) 15-25	_____
	(c) 25-35	_____
	(d) 35-45	_____
	(e) Greater than 45	_____

Mill: _____ Location: _____

D. Kraft and Soda Mills - Bleaching

Indicate the normal bleaching sequence(s) used, (i.e. C=Chlorine, E=Caustic Extraction, D=Chlorine Dioxide, H=Hypochlorite, P=Peroxide) and the G.E. Brightness Range and percent shrinkage for the bleach line(s) for the principal grades produced on each line.

240-242.	Bleach Line #1	(240) Grade #1	(241) Grade #2	(242) Grade #3
	Normal Pulp Bleached	Production ADT/d	Production ADT/d	Production ADT/d
a.	Hardwood	_____	_____	_____
b.	Softwood	_____	_____	_____
c.	Mixed	_____	_____	_____
d.	Normal Fresh Water Usage	_____	_____	_____
e.	Stage	Chemical	Chemical	Chemical
	1	_____	_____	_____
	2	_____	_____	_____
	3	_____	_____	_____
	4	_____	_____	_____
	5	_____	_____	_____
	6	_____	_____	_____
	7	_____	_____	_____
f.	G.E. Brightness Range	_____	_____	_____
g.	Shrinkage (%)*	_____	_____	_____

*Equals $\frac{\text{tons/day input} - \text{tons/day output}}{\text{tons/day input}} \times 100$

Mill: _____ Location: _____

D. Kraft and Soda Mills - Bleaching - Continued

243-245.	Bleach Line #2	(243) Grade #1	(244) Grade #2	(254) Grade #3
	Normal Pulp Bleached	Production ADT/d	Production ADT/d	Production ADT/d
a.	Hardwood	_____	_____	_____
b.	Softwood	_____	_____	_____
c.	Mixed	_____	_____	_____
d.	Normal Fresh Water Usage	_____	_____	_____
e.	Stage	Chemical	Chemical	Chemical
	1	_____	_____	_____
	2	_____	_____	_____
	3	_____	_____	_____
	4	_____	_____	_____
	5	_____	_____	_____
	6	_____	_____	_____
	7	_____	_____	_____
f.	G.E. Brightness Range	_____	_____	_____
g.	Shrinkage (%)*	_____	_____	_____

*Equals $\frac{\text{tons/day input} - \text{tons/day output}}{\text{tons/day input}} \times 100$

Mill: _____ Location: _____

D. Kraft and Soda Mills - Bleaching - Continued

246-248. Bleach Line #3	(246) Grade #1	(247) Grade #2	(248) Grade #3
Normal Pulp Bleached	Production ADT/d	Production ADT/d	Production ADT/d
a. Hardwood	_____	_____	_____
b. Softwood	_____	_____	_____
c. Mixed	_____	_____	_____
d. Normal Fresh Water Usage	_____	_____	_____
e. Stage	Chemical	Chemical	Chemical
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
f. G.E. Brightness Range	_____	_____	_____
g. Shrinkage (%)*	_____	_____	_____

*Equals $\frac{\text{tons/day input} - \text{tons/day output}}{\text{tons/day input}} \times 100$

Mill: _____ Location: _____

258-260. Give the type of bleach line washing for the principle grades manufactured.

258. Bleach Line #1

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

(d) Other (please describe) _____

259. Bleach Line #2

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

(d) Other (please describe) _____

260. Bleach Line #3

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

(d) Other (please describe) _____

E. Kraft and Soda Mills - Recovery System

267. Give the type of evaporator condenser used.

(a) Barometric

(b) Surface

(c) Both (please give the number of each type)

Mill: _____ Location: _____

F. Kraft and Soda Mills - Liquid Waste Sources

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

G. Sulfite Mills - Pulping Area

292. What base is used?

(a) Mg

(b) Ca

(c) Na

(d) NH_3

293. Is the pulping process acid or bisulfite?

(a) Acid

(b) Bisulfite

297-299. Give the overall pulping yield for the following:

	Percent of the Total Production
297. Line #1	
(a) Below 40	_____
(b) 40-45	_____
(c) 45-50	_____
(d) 50-55	_____
(e) Above 55	_____

	Percent of the Total Production
298. Line #2	
(a) Below 40	_____
(b) 40-45	_____
(c) 45-50	_____
(d) 50-55	_____
(e) Above 55	_____

Mill: _____ Location: _____ MEN02357

	Percent of the Total Production
299. Line #3	
(a) Below 40	_____
(b) 40-45	_____
(c) 45-50	_____
(d) 50-55	_____
(e) Above 55	_____

H. Sulfite Mills - Screen Room and Washers

304-306. Give the approximate red stock washer efficiency.

	Percent of the Total Production
304. Line #1	
(a) 60-75%	_____
(b) 75-90%	_____
(c) 90-95%	_____
(d) 95-100%	_____

	Percent of the Total Production
305. Line #2	
(a) 60-75%	_____
(b) 75-90%	_____
(c) 90-95%	_____
(d) 95-100%	_____

	Percent of the Total Production
306. Line #3	
(a) 60-75%	_____
(b) 75-90%	_____
(c) 90-95%	_____
(d) 95-100%	_____

Mill: _____ Location: _____

I. Sulfite Mills - Bleaching

Indicate the normal bleaching sequence(s) used, (i.e. C=Chlorine, E=Caustic Extraction, D=Chlorine Dioxide, H=Hypochlorite, P=Peroxide) and the G.E. Brightness Range and percent shrinkage for the bleach line(s).

312-314		(312) Bleach Line #1	(313) Bleach Line #2	(314) Bleach Line #3
	Normal Pulp Bleached	Production ADT/d	Production ADT/d	Production ADT/d
a.	Hardwood	_____	_____	_____
b.	Softwood	_____	_____	_____
c.	Mixed	_____	_____	_____
d.	Normal Fresh Water Usage	_____	_____	_____
e.	Stage	Chemical	Chemical	Chemical
	1	_____	_____	_____
	2	_____	_____	_____
	3	_____	_____	_____
	4	_____	_____	_____
	5	_____	_____	_____
	6	_____	_____	_____
	7	_____	_____	_____
f.	G.E. Brightness Range	_____	_____	_____
g.	Shrinkage (%)*	_____	_____	_____

*Equals $\frac{\text{tons/day input} - \text{tons/day output}}{\text{tons/day input}} \times 100$

Mill: _____ Location: _____

315-317. Give the type of bleach line washing for the following:

315. Bleach Line #1

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

316. Bleach Line #2

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

317 Bleach Line #3

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

J. Sulfite Mill - Recovery System

325. Give the type of condenser used.

(a) Barometric

(b) Surface

(c) Both (please give the number of each type)

K. Sulfite Mills - Liquid Waste Sources

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

Mill: [illegible] Location: [illegible]

L. Groundwood Mills - Pulping Area

353. Describe the type of grinding operations; i.e., type of grinder, refiner.

(a) Stone

(b) Refiner

(c) Both

M. Groundwood Mills - Bleaching

358. Indicate the bleaching chemical(s) used.

(a) Zinc Hydrosulfite

(b) Sodium Hydrosulfite

(c) Peroxide

(d) Other (please note method and/or sequence) _____

N. Groundwood Mill - Liquid Waste Sources

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

O. NSSC, CMP and TMP Mills - Pulping Area

377. Give the percent yield:

a. NSSC 75 %

b. CMP _____ %

c. TMP _____ %

P. NSSC, CMP, and TMP Mills - Screens and Washers

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

Mill: _____ Location: _____

Q. NSSC, CMP, and TMP Mills - Bleaching N/A

Indicate the normal bleaching sequence(s) used, (i.e. C=Chlorine, E=Caustic Extraction, D=Chlorine Dioxide, H=Hypochlorite, P=Peroxide) and the G.E. Brightness Range and percent shrinkage for the bleach line(s).

390-392		(390) Bleach Line #1	(391) Bleach Line #2	(392) Bleach Line #3
	Normal Pulp Bleached	Production ADT/d	Production ADT/d	Production ADT/d
a.	Hardwood	_____	_____	_____
b.	Softwood	_____	_____	_____
c.	Mixed	_____	_____	_____
d.	Normal Fresh Water Usage	_____	_____	_____
e.	Stage	Chemical	Chemical	Chemical
	1	_____	_____	_____
	2	_____	_____	_____
	3	_____	_____	_____
	4	_____	_____	_____
f.	G.E. Brightness Range	_____	_____	_____
g.	Shrinkage (%)*	_____	_____	_____

*Equals $\frac{\text{tons/day input} - \text{tons/day output}}{\text{tons/day input}} \times 100$

Mill: _____ Location: _____ MEN02362

R. NSSC and CMP - Recovery System

398. Does the mill have a recovery system?

(a) Yes

(b) No

S. NSSC, TMP and CMP Mill - Liquid Waste Sources

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

T. Deink Mills - Pulper Area

424-426. Give the overall pulping yield for the following:

424. Line #1	Percent of the Total Production
(a) Below 50	_____
(b) 50-60	_____
(c) 60-70	_____
(d) 70-80	_____
(e) Above 80	_____

425. Line #2	Percent of the Total Production
(a) Below 50	_____
(b) 50-60	_____
(c) 60-70	_____
(d) 70-80	_____
(e) Above 80	_____

426. Line #3	Percent of the Total Production
(a) Below 50	_____
(b) 50-60	_____
(c) 60-70	_____
(d) 70-80	_____
(e) Above 80	_____

Mill: _____ Location: _____

429. What chemicals are added to the pulper for deinking. (Indicate amounts.)

_____

_____

_____

_____

U. Deink Mills - Stock Washers and Screening

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

V. Deink Mills - Bleaching

Indicate the normal bleaching sequence(s) used, (i.e. C=Chlorine, E=Caustic Extraction, D=Chlorine Dioxide, H=Hypochlorite, P=Peroxide) and the G.E. Brightness Range and percent shrinkage for the bleach line(s) used.

440-441	(440) Bleach Line #1	(441) Bleach Line #2
a. Production ADT/d	_____	_____
b. Normal Fresh Water Usage	_____	_____
c. Stage	Chemical	Chemical
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
d. G.E. Brightness Range	_____	_____
e. Shrinkage (%)*	_____	_____

*Equals $\frac{\text{tons/day input} - \text{tons/day output}}{\text{tons/day input}} \times 100$

Mill: _____ Location: _____

W. Deink Mills - Liquid Waste Sources

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

X. Paperboard from Wastepaper - Pulper Area

463-465. Give the overall repulped yield for the following:

463. Line #1	Percent of the Total Production
(a) Less than 80	_____
(b) 80-85	_____
(c) 85-90	_____
(d) 90-95	_____
(e) More than 95	_____

464. Line #2	Percent of the Total Production
(a) Less than 80	_____
(b) 80-85	_____
(c) 85-90	_____
(d) 90-95	_____
(e) More than 95	_____

465. Line #3	Percent of the Total Production
(a) Less than 80	_____
(b) 80-85	_____
(c) 85-90	_____
(d) 90-95	_____
(e) More than 95	_____

Mill: [illegible] Location: [illegible]

505. High pressure showers - Are high pressure showers (above 250 psig) used on the paper machines for felt cleaning?

(a) Yes

(b) No

(c) Limited Application

C-1 Builders Paper - Paper Mill

508. Give the number of paper machines at mill.

_____

D-1 Builders Paper - Saturating and Coating (if applicable)

514. Does the mill utilize a saturating and/or coating process?

(a) Yes

(b) No

E-1 Builders Paper - Internal Controls

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

F-1 Additional Information (All Mills)

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I

Mill: _____ Location: Otsego, MEN02366

V. WATER USAGE AND EFFLUENT TREATMENT PRACTICES

Instructions for Completing Section V

Section V requests information on the mill's wastewater treatment practices. In Section VIII a general schematic of the effluent treatment system is requested. You have the option of providing any of the data requested in Section V on the schematic. If you do this, please indicate on the question(s) involved that the data is presented on the schematic.

A. Water Usage

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I.

B. Background Data

532. Indicate the method(s) of disposal of the mill wastewater.

(a) Direct

(b) Indirect

(c) Self-contained

(d) Other (please describe) _____

533. Please give the year in which the following portions of the mill's existing wastewater treatment system were started up.

	Year of Startup
a. Primary Treatment System	_____
b. Secondary Treatment System	1970

CLAIRFIER - 1972 ADDED

C. Indirect Discharger (discharge to a POTW) please provide the following information:

536. Is raw wastewater pretreated externally prior to discharge to the POTW? (Pretreatment is considered to be any treatment device external from the mill production processes which is utilized prior to a primary and secondary treatment system, or prior to discharge by an indirect discharger to a POTW.)

(a) Yes

(b) No

Mill: _____ Location: _____

537. Give the treatment process used by the POTW to which your mill discharges. (Include biological and physical-chemical treatment if applicable)

(a) Activated sludge

(b) Aerated lagoon

(c) Oxidation ditch

(d) Trickling filter

(e) None

(f) Other (indicate type) _____

540. Give the preliminary treatment method used, if any.

(a) Neutralization

(b) Screening (indicate type used) _____

(c) Other (please describe) _____

542. Indicate the primary treatment method used, if applicable.

(a) Clarifier

(b) Sedimentation lagoon

(c) Mechanically cleaned sedimentation lagoon

(d) Other (please describe) _____

(e) Not applicable

546. Give the type of biological treatment used, if applicable.

(a) Storage oxidation basin

(b) Aerated Stabilization basin

(c) Activated sludge (air or oxygen)

(d) Other (please describe) _____

(e) Not applicable

Mill: _____ Location: Otsego Mi

D. Direct Discharger please provide the following information:

549. Is wastewater discharge continuous or non-continuous (effluent stored and discharged when conditions allow) when production facilites are operating.

(a) Continuous

(b) Non-continuous - daily

(c) Non-continuous - seasonally/intermittent

E. Preliminary Treatment (Direct Discharger)

551. Give the preliminary treatment method used, if any.

(a) Neutralization

(b) Screening (indicate type used) Impco Disc Saveall

(c) Other (please describe) _____

F. Primary Treatment (Direct Discharger)

553. Indicate the method used for primary treatment.

(a) Clarifier

(b) Sedimentation lagoon

(c) Mechanically cleaned sedimentation lagoon

(d) Other (please describe) N/A

G. Biological Treatment (Direct Discharger)

557. Give the type of biological treatment used.

(a) Storage oxidation basin

(b) Aerated stabilization basin

(c) Activated sludge (air or oxygen)

(d) Other (please describe) _____

Mill: Menasha Corp Location: Otsego Mich

H. Secondary Solids Removal

558. If secondary clarification is used, what is the method used?

(a) Clarifier

(b) Reactor clarifier

(c) Settling basin

(d) Other (please indicate) _____

559. Is a holding pond utilized after secondary treatment?

(a) Yes

(b) No

I. Spray Irrigation

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I.

J. Sludge Handling and Disposal

561. Indicate the method used for sludge disposal.

(a) Lagooning

(b) Landfill

(c) Hog fuel boiler

(d) Other (please describe) SPRAY IRRIGATION.

K. Foam Control

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I.

L. Cost Information

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I.

Mill: _____ Location: _____

M. Site Conditions and Availability of Land

NO QUESTIONS FOR THIS ITEM ARE TO BE ANSWERED IN PART I.

N. Wastewater Characteristics

572-577. Give the (1976) wastewater loads indicated below:

	Indirect & Direct Dischargers Please Answer					Direct Discharger Only Please Answe	
	(572) Pulp Mill	(573) Bleach Plant* Acid	(573) Bleach Plant* Alkaline	(574) Paper Mill	(575) Total Raw Wastewater	(576) Secondary Treatment System Effluent	(577) Final Effluen
a. Flow, MGD							
(1) Average Day				.861	SAME AS	.	.837
(2) Maximum Day				1.343	574	..	1.276
(3) Maximum Month				.954			.960
b. BOD, lbs/day							
(1) Average Day	UK			17329			2206
(2) Maximum Day	UK			36914			8234
(3) Maximum Month	UK			21302			3915
c. TSS, lbs/day							
(1) Average Day	UK			6365			431[illegible]
(2) Maximum Day	UK			55049			23,9[illegible]
(3) Maximum Month	UK			10563			12[illegible]

UNKNOWN

VI. FUEL AND ENERGY

NO QUESTIONS FOR THIS SECTION ARE TO BE ANSWERED IN PART I.

VII. PRIORITY POLLUTANTS

SEE NEXT PAGE

VIII. PROCESS SCHEMATICS

NO QUESTIONS FOR THIS SECTION ARE TO BE ANSWERED IN PART I.

MEN02371

Mill: _____ Location: _____

VII. PRIORITY POLLUTANT COMPOUNDS

Please fill in the following information for those priority pollutants which, to your knowledge, are in your raw water supply, or used, or generated in any of the processes in the mill (refer to the following pages for the priority pollutant list). Use the number shown to identify the compound.

It should be noted that many mills may be using quantities of the listed chemicals as additives, cleaning solution, or solvents which are purchased and referred to by a trade name. Please supply trade names of those proprietary type chemicals, which contain one or more of the listed priority pollutants as constituents, used in the mill. Exclude all laboratory chemicals.

	Compound Number or Trade Name	Process Where Compound is Used or Generated	Describe Use: Quantity	Describe Use: Frequency	Sampling or Monitoring Program for Compound (Yes or No)
CLORNIATED ORGANICS	Solvox 909	WIRE cleaner	55GAL	1/2WKS.	No
phenols	Sodium Sulfite	COOKING Chemical		Daily	Yes

PRIORITY POLLUTANTS

1. *acenaphthene
2. *acrolein
3. *acrylonitrile
4. *benzene
5. *benzidine
6. *carbon tetrachloride (tetrachloromethane)

*CHLORINATED BENEZENES (other than dichlorobenzenes)

7. chlorobenezene
8. 1,2,4-trichlorobenzene
9. hexachlorobenzene

*CHLORINATED ETHANES

10. 1,2-dichloroethane
11. 1,1,1-trichloroethane
12. hexachloroethane
13. 1,1-dichloroethane
14. 1,1,2-trichloroethane
15. 1,1,2,2-tetrachloroethane
16. chloroethane

*CHLOROALKYL ETHERS

17. bis(chloromethyl) ether
18. bis(2-chloroethly) ether
19. 2-chloroethyl vinyl ether (mixed)

*CHLORINATED NAPHTALENE

20. 2-chloronaphthalene

*CHLORINATED PHENOLS (Other than those listed elsewhere; includes chlorinated cresols)

21. 2,4,6-trichlorophenol
22. parachlorometa cresol
23. *chloroform (trichloromethane)
24. *2-chlorophenol

*DICHLOROBENZENES

25. 1,2-dichlorobenzene
26. 1,3-dichlorobenzene
27. 1,4-dichlorobenzene

*DICHLOROBENZIDINE

28. 3,3'-dichlorobenzidine

*DICHLOROETHYLENES

29. 1,1-dichloroethylene
30. 1,2-trans-dichloroethylene
31. *2,4-dichlorophenol

*DICHLOROPROPANE AND DICHLOROPROPENE

32. 1,2-dichloropropane
33. 1,3-dichloropropylene (1,3-dichloropropene)
34. *2,4-dimethylphenol

*DINITROTOLUENE

35. 2,4-dinitrotoluene
36. 2,6-dinitrotoluene
37. *1,2-diphenylhydrazine
38. *ethylbenzene
39. *fluoranthene

*Specific compounds and chemical classes as listed in the consent degree.

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PRIORITY POLLUTANTS (continued)

*HALOETHERS (other than those listed elsewhere)

40. 4-chlorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. bis(2-chloroisopropyl) ether
43. bis(2-chloroethoxy) methane

*HALOMETHANES (other than those listed elsewhere)

44. methylene chloride (dichloromethane)
45. methyl chloride (chloromethane)
46. methyl bromide (bromomethane)
47. bromoform (tribromomethane)
48. dichlorobromomethane
49. trichlorofluoromethane
50. dichlorodifluoromethane
51. chlorodibromomethane
52. *hexachlorobutadiene
53. *hexachlorocyclopentadiene
54. *isophorone
55. *naphthalene
56. *nitrobenzene

*NITROPHENOLS

57. 2-nitrophenol
58. 4-nitrophenol
59. *2,4-dinitrophenol
60. 4,6-dinitro-o-cresol

*NITROSAMINES

61. N-nitrosodimethylamine
62. N-nitrosodiphenylamine
63. N-nitrosodi-n-propylamine
64. *pentachlorophenol
65. *phenol

*PHTHALATE ESTERS

66. bis(2-ethylhexyl) phthalate
67. butyl benzyl phthalate
68. di-n-butyl phthalate
69. di-n-octyl phthalate
70. diethyl phthalate
71. dimethyl phthalate

*POLYNUCLEAR AROMATIC HYDROCARBONS

72. benzo(a)anthracene (1,2-benzanthracene)
73. benzo(a)pyrene (3,4-benzopyrene)
74. 3,4-benzofluoranthene
75. benzo(k)fluoranthene (11,12-benzofluoranthe)
76. chrysene
77. acenaphthylene
78. anthracene
79. benzo(ghi)perylene (1,12-benzoperylene)
80. fluroene
81. phenathrene
82. dibenzo (a,h)anthracene (1,2,5,6-dibenzanthracene)
83. indeno (1,2,3-cd)pyrene (2,3-o-phenylenepyrene)
84. pyrene
85. *tetrachloroethylene
86. *toluene
87. *trichloroethylene
88. *vinyl chloride (chloroethylene)

PESTICIDES AND METABOLITES

89. *aldrin
90. *dieldrin
91. *chlordane (technical mixture & metabolite

*Specific compounds and chemical classes as listed to the greatest degree

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PRIORITY POLLUTANTS (continued)

*DDT AND METABOLITES

92. 4,4'-DDT
93. 4,4'-DDE (p,p'-DDX)
94. 4,4'-DDD (p,p'-TDE)

*ENDOSULFAN AND METABOLITES

95. a-endosulfan-Alpha
96. b-endosulfan-Beta
97. endosulfan sulfate

*ENDRIN AND METABOLIES

98. endrin
99. endrin aldehyde

*HEPTACHLOR AND METABOLITES

100. heptachlor
101. heptachlor epoxide

*HEXACHLOROCYCLOHEXANE (all isomers)

102. a-BHC-Alpha
103. b-BHC-Beta
104. r-BHC (lindane)-Gamma
105. g-BHC-Delta

*POLYCHLORINATED BIPHENYLS (PCB's)

106. PCB-1242 (Arochlor 1242)
107. PCB-1254 (Arochlor 1254)
108. PCB-1221 (Arochlor 1221)
109. PCB-1232 (Arochlor 1232)
110. PCB-1248 (Arochlor 1248)
111. PCB-1260 (Arochlor 1260)
112. PCB-1016 (Arochlor 1016)

113. *Toxaphene
114. *Antimony (Total)
115. *Arsenic (Total)
116. *Asbestos (Fibrous)
117. *Beryllium (Total)
118. *Cadmium (Total)
119. *Chromium (Total)
120. *Copper (Total)
121. *Cyanide (Total)
122. *Lead (Total)
123. *Mercury (Total)
124. *Nickel (Total)
125. *Selenium (Total)
126. *Silver (Total)
127. *Thallium (Total)
128. *Zinc (Total
129. 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)

ADDITIONAL COMPOUNDS

130. Abietic Acid
131. Deyhydroabietic Acid
132. Isopimaric Acid
133. Pimaric Acid
134. Oleic Acid
135. Linoleic Acid
136. Linolenic Acid
137. 9, 10 - Epoxystearic Acid
138. 9, 10 - Dichlorostearic Acid
139. Monochlorodehydroabietic Acid
140. Dichlorodehydroabietic Acid
141. 3, 4, 5 - Trichloroguaiacol
142. Tetrachloroguaiacol

*Specific compounds and chemical classes as listed in the consent degree.

MEN02374

SURVEY FORM
CHECKLIST
PART II

(x indicates Section and Item to be filled out by subcategory listed)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
I. MILL BACKGROUND DATA								
A.	62	X	X	X	X	X	X	X
B.	62							
II. PRODUCTION INFORMATION								
A.	62							
B.	62							
C.	62							
III. PROCESS RAW MATERIALS								
A. 1 (39)	62							
2 (40)	62							
3 (41)	62							
B.	62							
IV. MANUFACTURING PROCESS AND INTERNAL POLLUTION CONTROL PRACTICES								
A.	63-65	X	X	X	X	PARTIAL	PARTIAL	PARTIAL
B.	65-67	X						
C.	67-69	X						

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CHECKLIST
PART II
(Continued)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
D.	69-71	X						
E.	71-74	X						
F.	74-75	X						
G.	75-76		X					
H.	76-77		X					
I.	78		X					
J.	79-82		X					
K.	82		X					
L.	82-83			X				
M.	84			X				
N.	84-85			X				
O.	85-86				X			
P.	86-88				X			
Q.	88-90				X			
R.	90-92				X			
S.	92-93				X			
T.	93						X	
U.	94-96						X	

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CHECKLIST
PART II
(Continued)

Section and Item	Page No.	Kraft & Soda	Sulfite	Groundwood	NSSC, CMP & TMP	Paperboard from Wastepaper	Deink	Builders Paper
V.	96-97						X	
W.	97-98						X	
X.	98					X		
Y.	99					X		
Z.	99					X		
A-1	100-101							X
B-1	102-105	X	X	X	X	X	X	
C-1	106							X
D-1	107							X
E-1	107-108							X
F-1	109	X	X	X	X	X	X	X
V. WATER USAGE AND EFFLUENT TREATMENT PRACTICES								
	110-120	X	X	X	X	X	X	X
VI. FUEL AND ENERGY								
	121	X	X	X	X	X	X	X
VII. PRIORITY POLLUTANT CONTROLS								
	121							
VIII. PROCESS SCHEMATICS								
	122-123	X	X	X	X	X	X	X

MEN02377

ENVIRONMENTAL PROTECTION AGENCY
SURVEY FORM
PULP, PAPER, AND PAPERBOARD INDUSTRY

INTEGRATED MILLS
PART II

I. MILL BACKGROUND DATA

A. Mill & Division Name: Menasha Corp. Otsego Division

Address: 320 N. Farmer St., Otsego ZIP: 49078

Telephone: 616/692-6141

Corporate Affiliation (if applicable) _____

Contacts and Title: (Use an asterisk next to the responsible personnel completing the survey form)

Jim Adams	General Manager
Bruce T. Buchanan	Technical Superintendent
Gary E. Roys *	Process Chemist
John R. Blauwkamp	Process Engineer

B. Age of Mill

1-2 DELETED - ANSWERED IN PART I

II. PRODUCTION INFORMATION

3-38 DELETED - ANSWERED IN PART I

III. PROCESS RAW MATERIALS

39-185 DELETED - ANSWERED IN PART I

Mill: _____ Location: _____

IV. MANUFACTURING PROCESS AND INTERNAL POLLUTION CONTROL PRACTICES

A. General

186. Give the typical production days per year. 344

187. If flume is used - what is the water source? Where is the discharge point?

NA _____

188. What is the discharge rate and frequency from flume?

_____ _____

189. DELETED - ANSWERED IN PART I

190. If there is a discharge from the barking operation, where does it go?

(a) Effluent treatment

(b) Other (please describe) NA

191. Use of mill wastewater for woodyard - Is wastewater such as bleach plant effluent or white water used in the woodroom for flume make-up, washdown hoses or wood showers?

(a) Yes

(b) No

192. High level alarms - do chemical and stock tanks have operable high level alarms to prevent spills?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

193. pH or conductivity monitor of internal sewers - Do most sewers have such devices to detect or divert spills?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

194-214 Is cooling water collected and reused from the following locations:

(a) Yes; (b) No; (c) Seasonal; (d) To Extent Possible; (e) Not Applicable

	a	b	c	d	e
194. Air compressor cooling water				✓	
195. Dryer drainage condensate cooling					✓
196. Lube oil cooling				✓	
197. Calendar cooling heat exchangers					✓
198. Rewinder brake cooling	✓				
199. Evaporator surface condenser					✓
200. Digester blow condenser	✓				
201. Paper machine clutch cooling	✓				
202. Lime kiln turnions (kraft only)					✓
203. Hot Lime conveyors (kraft only)					✓
204. Cooling in power plant		✓			
205. Feed water pump bearings				✓	
206. Power Plant I.D. fan bearings					✓
207. Other bearing cooling		✓		✓	
208. Refiner Cooling				✓	

Mill: _____ Location: _____

	a	b	c	d	e
209. Motor control center cooling				✓	
210. Water chiller		✓			
211. Smelt spout cooling (kraft only)					✓
212. Condensate sample coolers		✓			
213. Air conditioning		✓			
214. Concentrator condenser					✓

B. Kraft and Soda Mills - Digesters

215. What type of digester(s) is used at the mill?

(a) Batch

(b) Continuous

216. What is the white liquor sulfidity range?

_____

217-219. Give the overall pulping yield for the following:

	Percent of the Total Production
217. Line #1	
(a) Below 40	_____
(b) 40-45	_____
(c) 45-50	_____
(d) 50-55	_____
(e) Above 55	_____

Mill: _____ Location: _____

218. Line #2 — Percent of the Total Production

(a) Below 40 _____

(b) 40-45 _____

(c) 45-50 _____

(d) 50-55 _____

(e) Above 55 _____

219. Line #3 — Percent of the Total Production

(a) Below 40 _____

(b) 40-45 _____

(c) 45-50 _____

(d) 50-55 _____

(e) Above 55 _____

220-226. DELETED - ANSWERED IN PART I

227. Does the mill have a pulp mill spill collection system for floor drains?

(a) Yes

(b) No

(c) Partial

Explanation (if needed) _____

_____

Mill: _____ Location: _____

228. If the answer to the preceding question is (a), describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate.

(b) Collected and reused in the process

(c) Other (please describe) _____

229. Prehydrolysate disposal by burning - Only applicable if mill makes dissolving kraft.

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

C. Kraft and Soda Mills - Brown Stock Washers and Screening

230. If the information is available, indicate the approximate amount of spills and washdown water from the brown stock washers which goes to the sewers.

a. Line 1 _____ GPM

b. Line 2 _____ GPM

c. Line 3 _____ GPM

231-233. DELETED - ANSWERED IN PART I

234. Decker filtrate for vacuum washer showers - Is any decker filtrate used on the brown stock washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

235. Give the approximate percent of the total screen room decker filtrate which is normally sewered.

(a) 0-20%

(b) 20-40%

(c) 40-60%

(d) 60-80%

(e) 80-100%

236. Evaporator condensates for brown stock washer showers - Is any of the evaporator condensate reused on the brown stock washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

237. Close up screen room - Is the decker filtrate used for all of the dilution on the screens and cleaners?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

238. Recook screen room rejects - Are screen room rejects normally excluded from the sewer?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

239. Give the normal method of knots disposal.

(a) Sewered

(b) Landfilled

(c) Reprocessed

(d) Burned

(e) Other (please describe) _____

D. Kraft and Soda Mills - Bleaching

240-248. DELETED - ANSWERED IN PART I

249-251. What percent of the chlorine washer filtrate is reused?

(249) Bleach Line #1	(250) Bleach Line #2	(251) Bleach Line #3
(a) 0-20%	(a) 0-20%	(a) 0-20%
(b) 20-40%	(b) 20-40%	(b) 20-40%
(c) 40-60%	(c) 40-60%	(c) 40-60%
(d) 60-80%	(d) 60-80%	(d) 60-80%
(e) 80-100%	(e) 80-100%	(e) 80-100%

252. If any is reused, where is it used and give the approximate amount.

a. Where _____

b. Usage, GPM _____

253. What are the typical chlorine residuals in the filtrates?

a. _____ mg/l (Line #1) b. _____ mg/l (Line #2) c. _____ mg/l (Line #3)

Mill: _____ Location: _____

254-256. What percent of the caustic extraction washer filtrate is reused?

(254) Bleach Line #1	(255) Bleach Line #2	(256) Bleach Line #3
(a) 0-20%	(a) 0-20%	(a) 0-20%
(b) 20-40%	(b) 20-40%	(b) 20-40%
(c) 40-60%	(c) 40-60%	(c) 40-60%
(d) 60-80%	(d) 60-80%	(d) 60-80%
(e) 80-100%	(e) 80-100%	(e) 80-100%

257. If it is reused, where is it used and give the approximate amount.

a. Where _____

b. Usage, GPM _____

258-260. DELETED - ANSWERED IN PART I

261. Do the materials of construction (washers, pumps, piping and tanks) in the bleach plant allow for straight counter-current washing?

(a) Yes

(b) No

262. White water use on bleach washer showers - Is any excess paper or pulp machine white water used on the bleach plant washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

263. Is the waste acid from ClO_2 generation normally excluded from the sewer?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

264. What type of ClO_2 generation system(s) is used?

(a) Solvay

(b) Mathieson

(c) Hooker or ERCO

(d) Other (please describe) _____

E. Kraft and Soda Mills - Recovery System

265. Give the percent solids to the evaporators.

a. Set 1 _____% b. Set 2 _____%

c. Set 3 _____% d. Set 4 _____%

266. Give the percent solids from evaporators.

a. Set 1 _____% b. Set 2 _____%

c. Set 3 _____% d. Set 4 _____%

267. DELETED - ANSWERED IN PART I

Mill: _____ Location: _____

268. Is the weak evaporator boil-out liquor returned to the process?

(a) Yes

(b) No

(c) To extent possible

Explanation (if needed) _____

_____

269. Is strong evaporator boil-out liquor all returned to process?

(a) Yes

(b) No

(c) To extent possible

Explanation (if needed) _____

_____

270. Does the mill have weak black liquor oxidation?

(a) Yes

(b) No

271. Indicate what is normally done with soap.

(a) Sent to mill's tall oil system

(b) Marketed commercially

(c) Sewered

(d) Burned

(e) Not applicable

Mill: _____ Location: _____

272. Black liquor storage tank spill collection:

Total Tankage Volume

a. Weak black liquor _____

b. Strong black liquor _____

273. Does the mill steam strip condensate and reuse?

(a) Yes

(b) No

(c) To extent possible

Explanation (if needed) _____

_____

274. Does the mill have a turpentine recovery system?

(a) Yes

(b) No

275. Is the causticizing area spill collection system returned to process?

(a) Yes

(b) No

(c) To extent possible

Explanation (if needed) _____

_____

276. Is blow heat condensate used for causticizing make-up?

(a) Yes

(b) No

Mill: _____ Location: _____

277. Does the mill utilize a lime mud storage pond?

(a) Yes

(b) No

278. Reuse kiln scrubber water - Is the kiln scrubber water reused so that the lime dust in it will be recovered, such as at the mud washer?

(a) Yes

(b) No

279. Are green liquor dregs sewered?

(a) Yes

(b) No

280. How many pounds per day of NSSC liquor solids are reused in the kraft process?

_____ #/day

281. Is semichemical pulp produced using green liquor?

(a) Yes

(b) No

F. Kraft and Soda Mills - Liquid Waste Sources

For questions 282 through 291 please indicate the usual discharge point for the liquid waste listed. Indicate the answer utilizing one of the following: (a) Evaporator & Burned; (b) Sewered; (c) Reused (Totally); (d) Reused (Partially); (e) Landfill or Sold.

	a	b	c	d	e
282. Digester Relief Condensate					
283. Blow Condensate					
284. Cleaner Rejects					
285. Screen Rejects					

Mill: _____ Location: _____

		a	b	c	d	e
286.	Pump Seal Water	____	____	____	____	____
287.	Surface Heat Exchanger Coolant	____	____	____	____	____
288.	Spills & Washup	____	____	____	____	____
289.	Stripped (or clean) Condensate	____	____	____	____	____
290.	Hot Water from the Economizers	____	____	____	____	____
291.	Decker Filtrate (screen room)	____	____	____	____	____

G. Sulfite Mills - Pulping Area

292-293. DELETED - ANSWERED IN PART I

294. What is the fortified cooking liquor total SO_2?

_____

295. What is the fortified cooking liquor free SO_2?

_____

296. Give the permanganate, Kappa or ROE number after the red stock washers.

a. Line #1 _____

b. Line #2 _____

c. Line #3 _____

297-299. DELETED - ANSWERED IN PART I

300. Does the mill have a pulp mill spill collection system for floor drains?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

301. If the answer to the preceding question is (a) describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate

(b) Collected and reused in the process

(c) Other (please describe) _____

H. Sulfite Mills - Screen Room and Washers

302. Decker filtrate for vacuum washer showers - Is any decker filtrate used on the brown stock washer showers?

(a) Yes

(b) No

303. Give the approximate percent of the total screen room decker filtrate which is normally sewered.

(a) 0-20%

(b) 20-40%

(c) 40-60%

(d) 60-80%

(e) 80-100%

304-306. DELETED - ANSWERED IN PART I

307. If the information is available, indicate the approximate amount of spills and washdown water from the red stock washers which goes to the sewers.

a. Line #1 _____ GPM

b. Line #2 _____ GPM

c. Line #3 _____ GPM

Mill: _____ Location: _____

308. Evaporator condensates for brown stock washer showers - Is any of the evaporator condensate reused on the brown stock washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

309. Close up screen room - Is the decker filtrate used for all of the dilution on the screens and cleaners?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

310. Recook screen room rejects - Are screen room rejects either recooked or refined?

(a) Yes

(b) No

(c) Impractical with quality demands

Explanation (if needed) _____

_____

311. Give the normal method of knots disposal.

(a) Sewered

(b) Landfilled

(c) Reprocessed

(d) Burned

(e) Other (please describe) _____

Mill: _____ Location: _____

I. Sulfite Mills - Bleaching

312-317. DELETED - ANSWERED IN PART I

318. Do the materials of construction (washers, pumps, piping and tanks) in the bleach plant allow for straight counter-current washing?

(a) Yes

(b) No

319. White water use on bleach washer showers - Is any excess paper or pump machine white water used on the bleach plant washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

320. Is any chlorine washer filtrate reused?

a. Line #1 - (a) Yes (b) No

b. Line #2 - (a) Yes (b) No

c. Line #3 - (a) Yes (b) No

321. What is the chlorine residual in the filtrate?

_____ mg/l

322. Is any caustic extraction washer filtrate reused?

a. Line #1 - (a) Yes (b) No

b. Line #2 - (a) Yes (b) No

c. Line #3 - (a) Yes (b) No

Mill: _____ Location: _____

J. Sulfite Mill - Recovery System

323. Do you have a recovery system? If answer is (a), please answer questions 324 through 339; if (b), omit questions.

(a) Yes (please describe type) _____

(b) No

324. Give the percent solids to the evaporators.

a. Line #1 _____% b. Line #2 _____%

c. Line #3 _____% d. Line #4 _____%

325. DELETED - ANSWERED IN PART I

326. Does the mill have an evaporator boil-out tank?

(a) Yes

(b) No

327. What is the pH of the spent liquor to the evaporators?

a. Line #1 _____ b. Line #2 _____

c. Line #3 _____ d. Line #4 _____

328. Does the mill neutralize its spent liquor prior to evaporation?

a. Line #1 (a) Yes (b) No

b. Line #2 (a) Yes (b) No

c. Line #3 (a) Yes (b) No

d. Line #4 (a) Yes (b) No

Mill: _____ Location: _____

329. Does the strong boil-out go to the weak liquor tank?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

330. What happens to the weak boil-out liquor?

(a) Recovered

(b) Sewered

331. Acid condensate holding tank for sulfite evaporator boil-out - Is the acid condensate collected and stored to be used for evaporator boil-outs?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

332. Waste liquor storage tank spill collection:

Total tankage volume

a. Weak waste liquor _____

b. Strong waste liquor _____

333. Does the mill steam strip condensate and reuse?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

334. Give the following flows to the sewer:

a. Digester Blow Condensate _____

b. From evaporator system including the ejector intercondenser and the surface condenser _____

335. What percentage of the spent liquor is recovered?

_____

336. Is any of the spent liquor sold?

(a) Yes - indicate percentage _____%

(b) No

337. If the answer to the preceding question is "Yes", what is done with the sold liquor?

(a) Road binder

(b) Cattle feed

(c) Linoleum paste

(d) Other (please describe) _____

338. Are any by-products manufactured from the spent liquor by the mill?

(a) Yes

(b) No

Mill: _____ Location: _____

339. If the answer to the preceding question is (a), indicate what the by-products are.

(a) Yeast

(b) Vanilla

(c) Alcohol

(d) Other (please describe) _____

K. Sulfite Mills - Liquid Waste Sources

For questions 340 through 352, please indicate the usual discharge point for the liquid waste listed. Indicate the answer utilizing one of the following answers: (a) Evaporated & Burned; (b) Sewered; (c) Reused (Totally); (d) Reused (Partially); (e) Landfill or Sold.

		a	b	c	d	e
340.	Digester Vent Condensate					
341.	Blow Vent Condensate					
342.	Blow Liquor					
343.	Spent Liquor from Digester Extract					
344.	Chipwashing or Steaming					
345.	Cleaner Rejects					
346.	Screen Rejects					
347.	Pump Seal Water					
348.	Surface Heat Exchanger Coolant					
349.	Spills and Washup					
350.	Stripped (or clean) Condensate					
351.	Hot Water from the Economizers					
352.	Decker Filtrate (screen room)					

L. Groundwood Mills - Pulping Area

353. DELETED - ANSWERED IN PART I

Mill: _____ Location: _____

354. Does the mill have a pulp mill spill collection system for floor drains?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

355. If the answer to the preceding question is (a), describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate

(b) Collected and reused in the process

(c) Other (please describe) _____

356. Give the approximate percent of the total screen room decker filtrate which is normally sewered.

(a) 0-20%

(b) 20-40%

(c) 40-60%

(d) 60-80%

(e) 80-100%

357. Close up screen room - Is the decker filtrate used for all of the dilution on the screens and cleaners?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

M. Groundwood Mills - Bleaching

358. DELETED - ANSWERED IN PART I

359. Is neutralization used after bleaching?

(a) Yes

(b) No

360. Is washing or thickening used after bleach?

(a) Yes

(b) No

361. Give the quantity of bleach used per ton of pulp.

_____

362. Give the brightness gain.

_____ points/lb. bleach/ton

N. Groundwood Mill - Liquid Waste Sources

For questions 363 through 371, please indicate the usual discharge point for the liquid water listed. Indicate the answer utilizing one of the following answers: (a) Evaporator & Burned; (b) Sewered; (c) Reused (totally); (d) Reused (partially); (e) Landfill or Sold.

	a	b	c	d	e
363. Grinder and/or Refiner Cooling					
364. Chipwashing					
365. Pump Seal Water					
366. Spills and Washups					
367. Hot Water from the Economizers					
368. Decker Filtrate					

Mill: _____ Location: _____ MEN02401

	a	b	c	d	e
369. Cleaner Rejects					
370. Bull Screen Rejects					
371. Final Screen Rejects					

O. NSSC, CMP and TMP Mills - Pulping Area

372. What is the NSSC cooking liquor composition?

a. Na_2CO_3 .75 lbs/gal

b. Na_2SO_3 .95 lbs/gal

373. How many gallons of cooking liquor per ton of pulp?

180 gallons

374. What is the pressure, temperature and retention time in the digester?

a. 145 psi

b. 350 °F or ~~°C~~ (indicate one)

c. 0.45 hours

375. Indicate the type of digester used.

(a) Batch

(b) M & D

(c) Other Continuous

(d) Other Systems (please describe) _____

376. Are any cooking additives (penetrants) used?

(a) Yes

(b) No

377. DELETED - ANSWERED IN PART I

Mill: _____ Location: _____

378. Does the mill have a pulp mill spill collection system for floor drains?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

379. If the answer to the preceding question is (a), describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate

(b) Collected and reused in the process

(c) Other (please describe) _____

P. NSSC, CMP, and TMP Mills - Screens and Washers

380. Give the type of washer(s) used.

(a) Drum

(b) Screw Press

(c) Other (please describe) American Defibrator DKP presses

381-383. Indicate the washer(s) efficiency in terms of pounds of Na_2O per ton.

381. Line #1 UNKNOWN	Percent of the Total Production
(a) Below 25 #Na_2O/Ton	_____
(b) 25-50	_____
(c) 50-75	_____
(d) 75-100	_____
(e) Above 100	_____

Mill: _____ Location: _____

382. Line #2

	Percent of the Total Production
(a) Below 25 #Na_2O/Ton	_____
(b) 25-50	_____
(c) 50-75	_____
(d) 75-100	_____
(e) Above 100	_____

383. Line #3

	Percent of the Total Production
(a) Below 25 #Na_2O/Ton	_____
(b) 25-50	_____
(c) 50-75	_____
(d) 75-100	_____
(e) Above 100	_____

384. Give the approximate percent of the total screen room decker filtrate which is normally sewered. N/A

(a) 0-20%

(b) 20-40%

(c) 40-60%

(d) 60-80%

(e) 80-100%

385. Decker filtrate for vacuum washer showers - Is any decker filtrate used on the brown stock washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) N/A

Mill: _____ Location: _____ MEN02404

386. Evaporator condensates for brown stock washer showers - Is any of the evaporator condensate reused on the brown stock washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) N/A

387. Close up screen room - Is the decker filtrate used for all of the dilution on the screens and cleaners? N/A

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

388. Recook screen room rejects - Are screen room rejects either recooked or refined? N/A

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

389. Give the normal method of knots disposal.

(a) Sewered

(b) Landfilled

(c) Reprocessed

(d) Burned

(e) Other (please describe) _____

Q. NSSC, CMP, and TMP Mills - Bleaching

390-392. DELETED - ANSWERED IN PART I

Mill: _____ Location: _____

393-395. Give the type of bleach plant washing. N/A

393. Bleach Line #1

(a) Single stage

(b) Multi-stage co-current

(c) None

(d) Other (please describe) _____

394. Bleach Line #2

(a) Single Stage

(b) Multi-stage co-current

(c) None

(d) Other (please describe) _____

395. Bleach Line #3

(a) Single Stage

(b) Multi-stage co-current

(c) None

(d) Other (please describe) _____

396. White water use on bleach washer showers - Is any excess paper or pulp machine white water used on the bleach plant washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

397. Is any of the chlorination washer filtrate reused?

a. Line #1
(a) Yes
(b) No

b. Line #2
(a) Yes
(b) No

c. Line #3
(a) Yes
(b) No

R. NSSC and CMP - Recovery System

398. DELETED - ANSWERED IN PART I

399. Give the percent solids to the evaporators.

a. Line #1 10-15 %

b. Line #2 _____ %

c. Line #3 _____ %

400. Give the percent solids from evaporators.

a. Line #1 25-35 %

b. Line #2 _____ %

c. Line #3 _____ %

401. Give the type of condenser used.

(a) Barometric

(b) Surface

(c) Both (please give the number of each type)

402. Does the mill have a recovery area spill collection system?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

403. Is evaporator condensate used for liquor make-up?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

404. Is the brown liquor filtered prior to evaporation?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

405. Does the mill have an evaporator boil-out tank?

(a) Yes

(b) No

406. Does the strong boil-out go to the weak liquor tank?

(a) Yes

(b) No

407. What happens to the weak boil-out liquor?

(a) Recovered

(b) Sewered

Mill: _____ Location: _____

408. Brown liquor storage tank spill collection:

Total Tankage Volume

a. Weak Brown Liquor 1,600,000 GAL

b. Strong Brown Liquor 70,000 GAL

409. Does the mill steam strip condensate and reuse?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

410. Give the following flows to the sewer:

a. Digester blow condensate NONE

b. From evaporator system including the ejector intercondenser and the surface condenser UNKNOWN

S. NSSC, TMP and CMP Mill - Liquid Waste Sources

For questions 411 through 423, please indicate the usual discharge point for the liquid waste listed. Indicate the answer utilizing one of the following answers: (a) Evaporated & Burned; (b) Sewered; (c) Reused (totally); (d) Reused (partially); (e) Landfill or Sold.

		a	b	c	d	e
411.	Digester Vent Condensate					N/A
412.	Blow Vent Condensate			✓		
413.	Blow Liquor	✓				
414.	Spent Liquor from the Washers	✓				
415.	Chipwashing or Steaming		✓			
416.	Cleaner Rejects					✓

Mill: _____ Location: _____

	a	b	c	d	e
417. Screen Rejects				✓	
418. Pump Seal Water		✓			
419. Surface Heat Exchanger Coolant	✓				
420. Spills and Washup				✓	
421. Stripped (or clean) Condensate					N/A
422. Hot Water from the Economizers			✓		
423. Decker Filtrate (screen room)					N/A

B. Deink Mills - Pulper Area

424-426. DELETED - ANSWERED IN PART I

427. Does the mill have a pulp mill spill collection system for floor drains?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

428. If the answer to the preceding question is (a), describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate

(b) Collected and reused in the process

(c) Other (please describe) _____

429. DELETED - ANSWER IN PART I

430. What is the normal pulper temperature? _____

Mill: _____ Location: _____

U. Deink Mills - Stock Washers and Screening

431. If the information is available, indicate the approximate amount of spills and washdown water from the deinked stock washers which goes to the sewers.

a. Line 1 _____ GPM

b. Line 2 _____ GPM

c. Line 3 _____ GPM

432-434. Indicate the type of washers used.

432. Line #1

(a) Screw washers

(b) Side hill washers

(c) Gravity deckers

(d) Vacuum washers

(e) Other (please describe) _____

433. Line #2

(a) Screw washers

(b) Side hill washers

(c) Gravity deckers

(d) Vacuum washers

(e) Other (please describe) _____

434. Line #3

(a) Screw washers

(b) Side hill washers

(c) Gravity deckers

(d) Vacuum washers

(e) Other (please describe) _____

Mill: _____ Location: _____

435. Counter-current washing for wastepaper and deinking - Is counter-current washing of the stock practiced?

(a) Yes

(b) No

436. Close up screen room - Is the decker filtrate used for all of the dilution on the screens and cleaners?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

437. Recook screen room rejects - Are screen room rejects either recooked or refined?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

438. Give the approximate percent of the total screen room decker filtrate which is normally sewered.

(a) 0-20%

(b) 20-40%

(c) 40-60%

(d) 60-80%

(e) 80-100%

Mill: _____ Location: _____

439. Decker filtrate for vacuum washer showers - Is any decker filtrate used on the brown stock washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

V. Deink Mills - Bleaching

440-441. DELETED - ANSWERED IN PART I

442-443. Give the type of bleach line washing for the following:

442. Bleach Line #1

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

443. Bleach Line #2

(a) Jump-stage counter-current washing

(b) Straight counter-current washing

(c) Co-current washing

444. White water use on bleach washer showers - Is any excess paper or pulp machine white water used on the bleach plant washer showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

445. Do the materials of construction (washers, pumps, piping and tanks) in the bleach plant allow for straight counter-current washing?

(a) Yes

(b) No

446-447. What percent of the chlorine washer filtrate is reused?

(446) Bleach Line #1	(447) Bleach Line #2
(a) 0-20%	(a) 0-20%
(b) 20-40%	(b) 20-40%
(c) 40-60%	(c) 40-60%
(d) 60-80%	(d) 60-80%
(e) 80-100%	(e) 80-100%

448. If any is reused, where it is used and give the approximate amount.

a. Where _____

b. Usage, GPM _____

449. What is the chlorine residual in the filtrate?

_____ mg/l

W. Deink Mills - Liquid Waste Sources

For questions 450 through 462 please indicate the usual discharge point for the liquid waste listed. Indicate the answer utilizing one of the following answers: (a) Evaporated & Burned; (b) Sewered; (c) Reused (totally); (d) Reused (partially); (e) Landfill or Sold.

		a	b	c	d	e
450.	Digester Vent Condensate	___	___	___	___	___
451.	Blow Vent Condensate	___	___	___	___	___
452.	Blow Liquor	___	___	___	___	___
453.	Spent Liquor from the Washers	___	___	___	___	___
454.	Chipwashing or Steaming	___	___	___	___	___

Mill: _____ Location: _____

		a	b	c	d	e
455.	Cleaner Rejects	____	____	____	____	____
456.	Screen Rejects	____	____	____	____	____
457.	Pump Seal Water	____	____	____	____	____
458.	Surface Heat Exchanger Coolant	____	____	____	____	____
459.	Spills and Washup	____	____	____	____	____
460.	Stripped (or clean) Condensate	____	____	____	____	____
461.	Hot Water from the Economizers	____	____	____	____	____
462.	Decker Filtrate (screen room)	____	____	____	____	____

X. Paperboard from Wastepaper - Pulper Area

463-465. DELETED - ANSWERED IN PART I

466. Does the mill have a pulper area spill collection system for floor drains?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

467. If the answer to the preceding question is (a), describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate

(b) Collected and reused in the process

(c) Other (please describe) _____

Mill: _____ Location: _____

Y. Paperboard from Wastepaper - Washers and Screens

468. If the information is available, indicate the approximate amount of spills and washdown water from the thickeners which goes to the sewers.

a. Line 1 _____ GPM

b. Line 2 _____ GPM

c. Line 3 _____ GPM

469. Give the approximate percent of the total screen room decker filtrate which is normally sewered.

(a) 0-20%

(b) 20-40%

(c) 40-60%

(d) 60-80%

(e) 80-100%

Z. Paperboard from Wastepaper - Liquid Waste Sources

For questions 470 through 475 please indicate the usual discharge point for the liquid waste listed. Indicate the answer utilizing one of the following answers: (a) Evaporated & Burned; (b) Sewered; (c) Reused (totally); (d) Reused (partially); (e) Landfill or Sold.

		a	b	c	d	e
470.	Cleaner Rejects					
471.	Screen Rejects					
472.	Pump Seal Water					
473.	Spills and Washup					
474.	Hot Water from the Economizers					
475.	Decker Filtrate (screen room)					

Mill: _____ Location: _____ MEN02416

A-1. Builders Paper - Stock Preparation

476. DELETED - ANSWERED IN PART I

477. If digester is used, indicate whether water or steam is used for cooking.

(a) Water

(b) Steam

478. If water is used, indicate the source and approximate amount.

a. Fresh Water _____ gallons per day.

b. Recycled Water _____ gallons per day.

479. Are any chemicals used in this digester process?

(a) Yes

(b) No

480. List the approximate tons/day of rejects from the attrition mill (refiner).

_____ tons/day

481. How and where are rejects handled or disposed of?

_____

482. For other fiber sources used, indicate the preparation process used prior to the blending chest. (Cutting and shredding, beater tank, etc.)

a. Rags _____

b. Wastepaper _____

c. Other

_____ _____

_____ _____

_____ _____

Mill: _____ Location: _____

483. For each of the preparation processes used, indicate the source and amount of water used (i.e., fresh water, white water, etc.)

	Source of Water	Amount (gal/day)
a. Rags	_____	_____
b. Wastepaper	_____	_____
c. Other		
_____	_____	_____
_____	_____	_____
_____	_____	_____

484. Please give the source and amount of water used at the refiners.

_____

_____

_____

485. List the approximate tons/day of rejects resulting from the stock preparation process(es) used. (Attrition Mill and/or Pulper)

_____ tons/day

_____ tons/day

_____ tons/day

486. How and where are rejects handled or disposed of?

_____

487. Please fill in the following information on the rifflers and/or screening after the blending chest.

ITEM	Rejects (tons/day)	Method of Rejects Handling and Disposal
a. Rifflers	_____	_____
b. Screens	_____	_____

Mill: _____ Location: _____

B-1. Paper Mill - (All mills except Builders Paper. Builders Paper mills go to Item C-1)

488-490. DELETED - ANSWERED IN PART I

491. Is felt vacuum pump water reused?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

492. Does the mill have a stock spill collection system?

(a) Yes

(b) No

(c) Partial

493. If the answer to the preceding question is (a), describe the collection system's function.

(a) Collected and discharged to the sewer at a controlled rate

(b) Collected and reused in the process

(c) Other (please describe) _____

494. Give the frequency of waste significant grade changes; also, if possible, give the stock quantity sewered.

INSIGNIFICANT

Mill: _____ Location: _____ MEN02419

495. Is the mill central storage of white water (a) and slush broke (b) adequate with regard to effluent discharge?

a. White Water

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

b. Slush Broke

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

496. Are special provisions made for spills, screen rejects, and excess materials from coating or sizing systems? N/A

(a) Yes

(b) No

(c) Limited

497. Does the mill employ organic solvent coating/saturating operations?

(a) Yes

(b) No

498. If yes, please give the type and quantities (lbs/day) of organic solvent used.

_____

_____

Mill: _____ Location: _____ MEN02420

499. Give the average daily organic solvent coated/saturated paper produced.

N/A tons/day

500. Please indicate effluent from the combined papermaking facilities as follows: (i.e., total flow from all machines).

Waste Source	Volume GPM	Suspended Solids (if applicable) lbs/day
a. Centricleaner and machine screen rejects	N/A	N/A
b. Couch pit, seal box, and any other unclarified white water overflows	N/A	N/A
c. Thick stock spills, dumps, washups from stock prep. area and machine	UK gal/day	
d. Excess clarified white water	598	6365
e. Cloudy water from vacuum systems, or pump sealing applications	296	256
f. Clear water discharges - i.e., cooling services, condensate, other non-process services	249	40
g. Other effluent sources - Not included above. POWER HOUSE TURBINE cooling	4362	
h. Total papermill effluent	5505	

i. Is (f) discharged via process sewer or separately (circle answer)?

(a) Yes

(b) No

501. White water showers - Are white water showers used on the paper machines for such purposes as wire cleaning or knock off showers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed _____

Mill: _____ Location: _____

502. Reuse press effluent - Is the press effluent reused in the paper mill?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

503. White water for vacuum pump sealing - Is white water used for vacuum pump sealing?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

504-505. DELETED - ANSWERED IN PART I

506. White water storage for upsets and pulper dilution - Is excess white water, overflows from the main white water tank or the cloudy side of the saveall saved in a white water storage tank of sufficient size for charging and dilution at the pulpers?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

507. Does the mill have either four stages of cleaning or three stages of cleaning with elutriation in the paper mill?

(a) Yes

(b) No

Mill: _____ Location: _____

C-1 Builders Paper - Paper Mill

508. DELETED - ANSWERED IN PART I

509. Give the number of savealls used.

_____

510. Provide the following water use information:

Process	Water Source	Amount of Water
a. Stock Dilution	_____	_____
b. Wet End Showers (including felt cleaning showers)	_____	_____

511. Are low volume showers used?

(a) Yes

(b) No

512. Average daily discharge of white water from wet end area (forming section.).

_____ MGD

513. Fill in the following information on the white water:

White water recycled:

a. Recycled To	Amount
_____	_____ MGD
_____	_____ MGD
_____	_____ MGD

b. White water sewered _____ MGD

Mill: _____ Location: _____

D-1 Builders Paper - Saturating and Coating (if applicable)

Include the saturating and coating process, specifically the number of stations, what raw materials are used and where (i.e. asphalt, talc etc.), and the amount and location of cooling water used on the schematic requested in Item B, Section VIII.

514. DELETED - ANSWERED IN PART I

515. Are low volume cooling water showers in use on the saturating and coating process?

(a) Yes

(b) No

516. Is any of this cooling water reused?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

517. Give the amount of cooling water reused and the amount sewered.

a. Reused _____ MGD

b. Sewered _____ MGD

E-1 Builders Paper - Internal Controls

518. Is recycled water used for the packing glands of process pumps, and/or the vacuum pump seal water?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

Mill: _____ Location: _____

519. If "Yes" indicate the amount of water recycled.

a. Process pumps packing gland _____

b. Vacuum pump seal water _____

520. Is a spill control system used?

(a) Yes

(b) No

(c) To the extent possible

Explanation (if needed) _____

_____

521. If "Yes", what process areas are handled by the spill collection system?

_____

_____

522. Which of the following is true of the mill's spill collection system procedure?

(a) Water recycled

(b) Water gradually discharged to treatment

(c) Water treated separately

(d) Other (please describe) _____

523. Describe any other internal controls which are being used to decrease the water and/or reduce the wastewater pollution load.

Mill: _____ Location: _____

F-1 Additional Information (All Mills)

524. Does the mill have a program for disposal of old electrical transformers?

(a) Yes

(b) No

525. Please give the number of people employed at your mill.

233

Mill: _____ Location: _____

V. WATER US GE AND EFFLUENT TREATMENT PRACTICES

Instructions for Completing Section V

Section V requests information on the mill's wastewater treatment practices. In Section VIII a general schematic of the effluent treatment system is requested. You have the option of providing any of the data requested in Section V on the schematic. If you do this, please indicate on the question(s) involved that the data is presented on the schematic.

A. Water Usage

526. Indicate the source and amount of process water.

(a) Surface (i.e., river, lake or reservoir) _____ MGD

(b) Groundwater 1.6 MGD

(c) Other (please describe) _____ _____ MGD

527. Does the quality of the raw water limit the reuse of water in this mill?

(a) Yes - explain _____

_____

(b) No

528. Indicate the source and amount of the mill's cooling water.

(a) Surface _____ MGD

(b) Groundwater UK MGD

(c) Other (please describe) _____ _____ MGD

529. Indicate the source and amount of the mill's boiler feed water.

(a) Surface _____ MGD

(b) Groundwater .3 MGD

(c) Other (please describe) _____ _____ MGD

Mill: _____ Location: _____

530. Describe treatment used for boiler feed water conditioning.

Hot Process Lime Softner followed by zeolites and anthracite.

531. Give the disposal method now employed for boiler blowdown water.

(a) Sewered to treatment plant

(b) Directly discharged

(c) Directly discharged with pH adjustment

(d) Directly discharged after cooling

(e) Other (please describe) _____

B. Background Data

532-533. DELETED - ANSWERED IN PART I

534. How is cooling water disposed?

(a) Separate discharge to receiving stream.

(b) Combined with process waters before treatment.

(c) Combined with treated process waters.

(d) Recycled.

C. Indirect Discharger please provide the following information:

535. Name and location of POTW which handles your wastewater.

_____

536-537. DELETED - ANSWERED IN PART I

538. Are there specific pretreatment requirements or limits upon pollutant parameters imposed by the POTW system to which you discharge?

(a) Yes

(b) No

Mill: _____ Location: _____

539. If the answer to the preceding question was (a), please list the specific pretreatment requirements or pollutant parameter limits imposed on your mill by the POTW.

540. DELETED - ANSWERED IN PART I

541. If neutralization is practiced, fill in the following.

Chemical used _____

542. DELETED - ANSWERED IN PART I

543. Are any chemicals or other settling aids added to the primary treatment units?

(a) Yes

(b) No

(c) To the extent necessary (intermittent)

544. Please show the wastewater streams which enter the secondary treatment system (if applicable).

	Process Source or Sewer No.*		Flow, MGD	BOD, lb/D	TSS, lb/D
a.	Design Values	Average Day			
		Maximum Day			
		Maximum Month			
b.	Primary Treatment Effluent	Average Day			
		Maximum Day			
		Maximum Month			
c.	_____	Average Day			
		Maximum Day			
		Maximum Month			

*Process source or sewer number should be keyed to the mill process and wastewater treatment schematics requested in Section VIII.

Mill: _____ Location: _____

545. Give the normal pH of the wastewater at the influent to the secondary treatment system.

(a) 4-6

(b) 6-8

(c) 8-10

546. DELETED - ANSWERED IN PART I

D. Direct Discharger please provide the following information:

547. Name of the effluent discharge receiving water

KALAMAZOO RIVER

548. Enclose a copy of current or proposed NPDES effluent discharge limits.

549. DELETED - ANSWERED IN PART I

550. If wastewater discharge is seasonal or intermittant non-continuous, approximately how many days out of the year do you discharge to the receiving water.

(a) Less than 30

(b) 31-90

(c) 91-120

(d) 121-180

(e) 181-121

(f) 211-240

(g) 241-270

(h) 271-300

(i) 301-330

(j) 331-360

E. Preliminary Treatment

551. DELETED - ANSWERED IN PART I

552. If neutralization is practiced, fill in the following:

Chemical used N/A

Mill: _____ Location: _____

F. Primary Treatment

553. DELETED - ANSWERED IN PART I

554. Are any chemicals or other settling aids added to the primary treatment units?

(a) Yes

(b) No

(c) To the extent necessary (intermittent).

G. Biological Treatment

555. Provide the following information for the biological treatment system (if applicable).

Process Source or Sewer No.*		Flow, MGD	BOD, lb/D	TSS, lb/D
a. Design Influent Values	Average Day	.600	15,000	1200
	Maximum Day	1.000	20,000	5220
	Maximum Month	UK	UK	UK
b. Primary Treatment Effluent	Average Day	.861	17329	6365
	Maximum Day	1.343	36914	55049
	Maximum Month	.954	21302	10563

Other Wastewater Streams Which Enter the Biological Treatment Systems Without Primary Treatment

c. Evaporator Condensate	Average Day	UK	UK	UK
	Maximum Day	UK	UK	UK
	Maximum Month	UK	UK	UK
d. _____	Average Day			
	Maximum Day			
	Maximum Month			

*Process source or sewer number should be keyed to the mill process and wastewater treatment schematics requested in Section VIII.

Mill: _____ Location: _____

556. Give the normal pH of the wastewater at the influent to the secondary treatment system.

(a) 4-6

(b) 6-8

(c) 8-10

557. DELETED - ANSWERED IN PART I

H. Secondary Solids Removal

558-559. DELETED - ANSWERED IN PART I

I. Spray Irrigation

560. Is treated wastewater used for irrigation?

(a) Yes

(b) No

(c) Partial

J. Sludge Handling and Disposal

561. DELETED - ANSWERED IN PART I

562. Give the percent solids of the sludge after dewatering and prior to disposal.

(a) 5-10% N/A

(b) 10-20%

(c) 20-30%

(d) 30-40%

(e) above 40%

563. Describe any leachate management practices performed at the mill for sludges which are disposed of on land.
GROUND WATER SURVEY WORK AROUND the mill.

Mill: _____ Location: _____

K. Foam Control - (Wastewater treatment system only)

564. Does the mill use foam control measures?

(a) Chemical

(b) Physical Methods

(c) None

(d) Other - explain _____

Mill: _____ Location: _____

L. Cost Information

565. Provide cost data indicated for effluent treatment system in 1976 dollars. Use the cost multiplier factors, which follow, to convert to 1976 dollars.

	Total Capital Cost	Annual Operation and Maintenance Cost*
a. Internal control devoted to effluent waste load reduction.		
b. External Treatment System		$800,133
c. Primary Treatment	$87,147	
d. Secondary Treatment	$3,502,427.00	

Construction Cost Multipliers
to Convert Capital Cost to 1976 Dollars

1956 =	2.535	1963 =	2.186	1969 =	1.794
1957 =	2.380	1964 =	2.161	1970 =	1.689
1958 =	2.325	1965 =	2.124	1971 =	1.564
1959 =	2.254	1966 =	2.051	1972 =	1.485
1960 =	2.220	1967 =	1.978	1973 =	1.317
1961 =	2.220	1968 =	1.884	1974 =	1.242
1962 =	2.207			1975 =	1.100

*Factors to be considered in Annual Operation and Maintenance Costs (O & M Costs).

1. Manpower - both operators and maintenance personnel
2. Contracted services
3. Energy Cost
4. Trucks for hauling
5. Nutrients
6. Leased equipment
7. Disposal costs
8. Sludge handling
9. Sampling and analysis
10. Equipment replacement (except major capital)

Exclude Depreciation

Mill: _____ Location: _____

566. For mills which discharge to a POTW, please give the annual user fee with a breakdown for capital cost recovery and operation and maintenance costs.

a. Capital Cost Recovery(if available) _____

b. Operation and Maintenance (if available)_____

c. Total Annual User Fee _____

567. Please give the basis used by the POTW to determine the mill's user fee.

(a) Flow only

(b) BOD only

(c) TSS only

(d) Combination of parameters (please indicate) _____

(e) Unknown

M. Site Conditions and Availability of Land

568. Is there sufficient land for expansion of your wastewater treatment system for BATEA?

(a) Yes

(b) No

(c) Unknown

569. Can the mill purchase land from adjoining property owners for possible expansion of the wastewater treatment system?

(a) Yes

(b) No

(c) Unknown

Mill: _____ Location: _____

570. Are the soil conditions in the land available for future expansion of such a quality as to require special construction methods or special facility equipment (i.e., ledge, water table and liners needed for basins)?

(a) Yes

(b) No

(c) Unknown

571. Miscellaneous Discharges - Indicate any wastewater discharges not described in Section V which do not flow to the wastewater treatment system.

N. Wastewater Characteristics

572-577. DELETED - ANSWERED IN PART I

578. Was the analysis procedure used for BOD measurement in accord with the method presented in Standard Methods for the Examination of Water and Wastewater?

(a) 13th Edition

(b) 14th Edition

(c) No (please describe other method used) _____

579. Is a glucose-glutamic acid BOD standard analyzed?

(a) Yes

(b) No

Mill: _____ Location: _____

580. If the answer to the preceding question was (a), please indicate the normal frequency of the analysis.

(a) Daily

(b) Weekly

(c) Monthly

(d) Quarterly

(e) Semi-annual

581. Please indicate the percent difference found between the BOD determinations and the glucose-glutamic acid BOD standard

(a) 0-5%

(b) 5-10%

(c) 10-15%

(d) 15-20%

(e) Over 20%

582. Indicate the analysis procedure used for TSS determination at the mill.

(a) Standard Methods for the Examination of Water and Wastewater, 13th and/or 14th Edition.

(b) EPA analysis procedure adopted on October 16, 1973, and any subsequent amendments.

(c) Other (please describe) _____

Mill: _____ Location: _____ MEN02437

VI. FUEL AND ENERGY

A copy of the API "Monthly Fuel and Energy Report" has been included in this section to assist the mill in calculating (if information is not already available) the answer(s) to the questions asked. The API sheets should be used as a guide for computation only, do not return the pages with the questionnaire. For internal treatment energy cost calculations, include only the following:

1. Equivalent steam (MBTU/Ton product) required to evaporate reclaimed spilled pulping liquors from the average solids level at which dumped up to a 10% solids level.

2. Also include steam (MBTU/Ton product) required in condensate stripping operations necessitated by condensate reuse projects.

583. Give the total purchased energy (fossil fuel, electricity, steam, etc.) as equivalent millions BTU/ton of product (Items 1 to 9, less 10 from API forms).

0.018945

584. Give the energy used for external treatment operations in KW Hr/Ton of product.

NOT AVAILABLE

585. Give the energy used for internal treatment as equivalent millions BTU/ton of product.

N/A

VII. PRIORITY POLLUTANTS

DELETED - ANSWERED IN PART I

Mill: _____ Location: _____

VIII. PROCESS SCHEMATICS

Attach separate general block diagrams for the three items listed below.

A. Water Treatment (if applicable) - Provide a general block diagram showing the water treatment system used, chemical application points, average flow, and disposal method for backwash water. If the mill has a raw water analysis available please attach a copy.

B. Manufacturing Process Schematic - Provide a general schematic of the total mill process to include water balance and all process wastewater streams. (See note at start of Section V.) Wastewater streams should be cross referenced to the effluent treatment system schematic.

C. Effluent Treatment System - Provide a general schematic of the effluent treatment system. Please key the diagram to the manufacturing process block diagram so that the point of influent to the treatment system for individual process sewers can be determined. Also show all chemical application points; chemicals used; flow monitoring and sampling points; average flow; size or area, volume, and number of each treatment system component; sludge recycle and volume; and sludge dewatering/thickening system.

Additional information on the mill's wastewater treatment system is also needed to complete the data request. Please provide answers to the following questions which pertain to your wastewater treatment system. For questions which do not apply, indicate by writing N/A (not applicable) on the space provided for the answer.

Primary Treatment

586. Give the following primary clarifier overflow rates:

a. Design N/A gpd/ft^2 at _____ MGD

b. Current N/A gpd/ft^2 at _____ MGD

Mill: _____ Location: _____ MEN02439

Biological System

For the biological system employed, please give answers to the appropriate questions listed below:

	System	Question	Answer	
587.	Aerated Stabilization Basin	a) Volume of the aeration zone	8.22	Mil. Gal.
		b) Connected horsepower for aeration	500	
588.	Activated Sludge	a) Volume of the aeration zone	N/A	Mil. Gal.
		b) Connected horsepower for aeration	N/A	
		c) MLSS (Mixed Liquor Suspended Solids)	N/A	
589.	Trickling Filer	a) Volume of media	N/A	
		b) Surface area of filter	N/A	ft^2
590.	RBC	a) Surface area of RBC	N/A	ft^2
591	Post Storage	a) Volume of storage	N/A	Mil. Gal.

592 If nutrient addition is used, please give the average BOD:N:P ratio.

BOD:N:P 100 :1.9:0.6

Secondary Solids Removal

593. Give the secondary clarifier overflow rates:

a. Design 517 gpd/ft^2 at 0.650 MGD

b. Current 666 gpd/ft^2 at 0.837 MGD

PART II

CONFIDENTIALITY CLAIMED FOR THE FOLLOWING

Question Number	Question Number	Question Number	Question Number	Question Number	Question Number	Question Number

MEN02441

1990 EPA ACT 308 SURVEY

DOCUMENT #49

MEN02442

SURVEY ID=1200

OMB # 2040-0144
Expires: 08/92

U.S. ENVIRONMENTAL PROTECTION AGENCY

1990 National Census of Pulp, Paper, and Paperboard Manufacturing Facilities

QUESTIONNAIRE

Part A: Technical Information

NOTICE OF ESTIMATED BURDEN

EPA estimates that completing this questionnaire will take an average of 170 hours per facility, depending on the size and complexity of pulp, paper, and paperboard manufacturing operations. This estimate includes time for reading the instructions, assembling the requested information, and completing and reviewing the questionnaire. Send any comments on this estimate or suggestions for reducing this burden to: Chief, Information Policy Branch (PM-223), U.S. EPA, 401 M St. SW, Washington, DC, 20460; and to: Office of Management and Budget, Paperwork Reduction Project, Washington, DC 20503.

GENERAL INSTRUCTIONS

INTRODUCTION

The U.S. Environmental Protection Agency (EPA) is revising the effluent limitations guidelines and standards for the pulp, paper, and paperboard manufacturing industry. EPA is also developing guidance and standards under the Clean Air Act for air emissions from this industry and is assessing solid waste generation under the Resource Conservation and Recovery Act. This questionnaire is part of the data gathering efforts within the effluent guidelines revision program and the air emissions program. You have received a questionnaire because your facility has been identified as being involved in pulp, paper, or paperboard manufacturing. This questionnaire also includes sections on waste minimization practices, and worker exposure. The data from these questions will be used in the development of the regulation and in the assessment of non-water quality impacts.

AUTHORITY

The authority for this data gathering effort is Section 308 of the Clean Water Act, as amended, 33 U.S.C. §1318, Section 114 of the Clean Air Act, as amended, 42 U.S.C. §7414, and Section 3007 of the Resource Conservation and Recovery Act, 42 U.S.C. §6927. Late filing or failure otherwise to comply with the following instructions may result in criminal fines, civil penalties, or other sanctions as provided by law.

COMPLETION AND RETURN OF THE QUESTIONNAIRE

All recipients must complete the questionnaire. Completed questionnaires must be returned, **no later than 60 days after receipt of this package**, to:

Pulp, Paper, and Paperboard Census
Industrial Technology Division (WH-552)
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

To complete this survey, you may need to circulate it to different groups within your facility. However, the certification statement appearing as the last item of the General Instructions must be completed by the individual or individuals (no more than two—i.e., one for Part A and one for Part B) responsible for supervising the completion of the questionnaire. The same official may certify for both Parts A and B.

There are four appendices attached to both parts of this questionnaire which should be used while the forms are being completed: Appendix A—Glossary; Appendix B—Process Codes; Appendix C—Product Categories and Codes; and Appendix D—Selected Industry SIC Codes.

EPA has prepared this survey so that it is applicable to a wide variety of pulp, paper, and paperboard manufacturing facilities. Therefore, not all the questions may apply to your facility. Unless instructed otherwise, you are expected to make an effort to complete every item using available data. You are not required to perform non-routine tests or measurements solely for the

CHECKLIST

Be sure that the following additional information is included with the completed questionnaire, unless instructed otherwise:

- ❑ **Question 23:** 1989 daily production data, listing the date and the day's production of pulp from wood/non-wood for each pulp-type/raw-material combination *(if applicable)*
- ❑ **Question 25:** 1989 daily production data, listing the date and the day's production of unbleached secondary fiber pulp for each pulp-type/raw-material combination *(if applicable)*
- ❑ **Question 39:** 1989 daily production data, listing the date and the day's production of each product category for each product/pulp-type combination *(if applicable)*
- ❑ **Question 41:** a schematic of water flow through the manufacturing process
- ❑ **Question 49:** available data from 1985 to the present for PCBs, PCDDs, PCDFs, AOX, TOX, TOCl, individual chlorinated compounds, and bioassays for:
  - a. wastepaper (paper stock)
  - b. unbleached pulp
  - c. bleached pulp
  - d. untreated wastewaters (in-process)
  - e. untreated wastewaters (influent to wastewater treatment plant)
  - f. treated effluent
  - g. chemical additives/defoamers
  - h. wastewater treatment sludges
- ❑ **Question 62:** a schematic of the wastewater treatment system
- ❑ 1989 daily data on water flow and TSS and BOD_5 concentrations for
  - **Question 63:** the influent-to-primary treatment wastestream
  - **Question 65:** the primary effluent wastestream
  - **Question 68:** influent-to-secondary treatment wastestream *(not required if the answer to Question 63 is "no")*
  - **Question 71:** secondary effluent wastestream *(not required if the answer to Question 66 is "no")*
  - **Question 73:** final effluent wastestream
- ❑ **Question 76:** available stormwater monitoring data
- ❑ **Question 97:** available data associated with chlorine reduction activities
- ❑ **Question 98:** available data associated with planned chlorine reduction activities
- ❑ **Question 102:** available data associated with other pollution prevention activities
- ❑ **Question 105:** available test data, including the date, duration, and method of sampling, on chloroform and hazardous air pollutant emissions

SURVEYID=1200

Part A: Technical Information

SURVEY ID=1200

Keith Kling

SECTION 1: FACILITY IDENTIFICATION

Review the information on the preprinted label above. If any of the information is incorrect, enter the correct information in the appropriate spaces on this page.

1. **If the mailing address shown on the preprinted label is not correct, enter the corrections to the label in the spaces provided below.**

   ☒ N/A

   Name of Facility: _____

   Street Address or P.O. Box: _____

   City: _____ State: _____ Zip: _____

2. **If the street address of the facility is different from the mailing address, provide the street address in the spaces provided below.**

   ☒ N/A

   Name of Facility: _____

   Street Address: _____

   City: _____ State: _____ Zip: _____

SECTION 2: PROCESS OPERATIONS AND PRODUCTION

Section 2 requests process information and production data for calendar years 1985-1989. This information will be used to characterize the process operations at this facility so that EPA can assess the current subcategorization scheme.

Unless otherwise instructed, all responses should reflect information on current mill operations. If your facility has more than one pulping line, please indicate this in Question 9 and refer to the individual pulping lines in Questions 10-17.

Please read each question. If a particular question does not apply, answer with N/A and continue to the next question. If you have any questions about this section or this survey, call the Survey Helpline (1-800-635-8850).

Use the NOTES spaces within and at the end of the section if you wish to explain your response to any question. Reference each comment with the appropriate question number. Photocopy tables if necessary.

5. **List the total marketable 1989 production attributable to the SIC codes that pertain to this facility's pulp, paper, and paperboard manufacturing operations. Report these numbers in off-the-machine tons (OMT). Consider products shipped to other company facilities as "marketable" production.**

	SIC Code	Total 1989 Yearly Production (OMT)
a.	2611 Pulp Mills	___,___
b.	2621 Paper Mills	___,___
c.	2631 Paperboard Mills	184,151
d.	2661 Building Paper and Board Mills	___,___

SURVEYID=1200

8. **Indicate all wood preparation and handling operations at your facility.**
(Circle all numbers that apply.)

❑ N/A *(GO TO THE NEXT QUESTION)*

01 Log ponds

02 Log flumes

03 Log washing

(04) Screening

05 Wet debarking

06 Chipping

(07) Chip washing

08 Dry debarking

09 Other *(specify)*: _____

SURVEYID=1200

10. **In what mode are the pulping digesters at your facility operated?**
(Circle all numbers that apply.)

❑ N/A *(GO TO THE NEXT QUESTION)*

(01) Continuous

02 Semi-continuous

03 Batch

04 Other *(specify)*: _____

_____

11. **Is extended delignification practiced at your facility?**
(Circle one number.)

01 Yes

(02) No

12. **Indicate all pulping chemicals used at your facility.**
(Circle all numbers that apply.)

❑ N/A *(GO TO THE NEXT QUESTION)*

(01) Sodium-based

02 Calcium-based

03 Magnesium-based

04 Ammonia-based

05 Polysulfides

06 Other *(specify)*: _____

SURVEYID=1200

16. **What are the maximum and typical total cycle times for pulping?**
(Typical cycle time is the cycle time occuring most frequently under normal operating conditions.)

	Maximum	Typical
a. Mechanical pulping:	☐,☐☐☐ minutes	☐,☐☐☐ minutes
b. Chemical pulping:	☐,☐☐☐ minutes	☐,☐☐☐ minutes
c. Secondary fiber:	☐,☐☐☐ minutes	☐,☐☐☐ minutes

17. **What are the maximum and typical approximate cooking times of the pulp?**
(Typical cooking time is the cooking time occuring most frequently under normal operating conditions.)

	Maximum	Typical
a. Mechanical pulping:	☐,☐☐☐ minutes	☐,☐☐☐ minutes
b. Chemical pulping:	0,040 minutes	0,035 minutes
c. Secondary fiber:	☐,☐☐☐ minutes	☐,☐☐☐ minutes

18. **How many washing stages are employed in brownstock pulp washing on each washing line?**
(If no brownstock washing is done on any washing line, check the 'NA' box.)

☐ N/A *(GO TO QUESTION 20 ON PAGE 13)*

	Line 1	Line 2	Line 3	Line 4	Line 5
Washing stages:	☒	☐	☐	☐	☐

SURVEYED=1230

20. **Complete Table A, *Process Unit Operations*, on pages 14-21, using the instructions below. Information gathered from this table will be used to evaluate equipment utilization at this facility.**

Instructions for Completing Table A

Table A requests information on process unit operations, either one or several pieces of equipment. If you need additional space, photocopy Table A ***BEFORE*** *writing on it and label each copy in the space provided at the top right corner of the page.*

Column (1): ***Type of Unit.*** *For each unit, list the type by model name*

Column (2): ***Manufacturer.*** *For each different unit, give the name of manufacturer.*

Column (3): ***Number of Units.*** *List the number of like units at this facility.*

Column (4): ***Year Installed.*** *Report the year the first unit was installed at this facility. If similar units were added at later dates, please list in the NOTES section. Also please explain if equipment has been renovated and the date of renovation.*

Column (5): ***Production Capacity.*** *For each process unit operation listed in Column (1), report the maximum expected daily production capacity (total of all like units). This is calculated by dividing the highest monthly production by the number of production days in that month. If more than one grade is produced on a machine, calculate the maximum daily production capacity using the* total *tonnage for all grades produced on that machine.*

Column (6): ***Unit of Measure.*** *Units of measure for the production capacity listed in Column (5) are provided for some operation categories. Specify the unit of measure for those categories if it is different than the one provided, and for all of the remaining categories.*

Column (7): ***1989 Average Operating Rate.*** *Report the average daily operating rate for calendar year 1989 for each process unit listed, using the same unit of measure listed in Column (6). If equipment is idle please note. The respondent is expected to use professional judgment in estimating average daily operating rates. If more than one grade is produced on a machine, estimate the average operating rate using the* total *tonnage for all grades produced on that machine.*

Column (8): ***Number of Units in Operation in 1989.*** *List the number of units operating in 1989 on which the average operating rate listed in Column (7) is based.*

SURVEY ID=1200

REPLACEMENT PAGE FOR TABLE A
PROCESS UNIT OPERATIONS FOR SECONDARY FIBER PROCESSING

Copy # 1 of 2 L(e)

(1) Type of Unit	(2) Manufacturer	(3) Number of Units	(4) Year Installed
aa. Repulpers *(list each type).*			
14 ft. Modified D	Black Clawson	01	1969
			19
			19
			19
			19
bb. Contaminant Removal Systems *(list each system).*			
High Density Cleaners	Bird	05	1981
Fiberizer	Bird Escher-Wyss	01	1981
Centrsorter Pressure Screen	Bird	01	1981
Stage II reverse Cleaners	x-claie + Celeco	01	19[illegible]
Stage I reverse Cleaners	Noss	01	1985
cc. Ink Removal Systems *(list each system).*			
			19
NA			19
			19
			19
			19
dd. Bleaching *(list each system).*			
			19
NA			19
			19
			19
			19

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corporation Survey ID 1200

REPLACEMENT PAGE FOR TABLE A

PROCESS UNIT OPERATIONS FOR SECONDARY FIBER PROCESSING

Copy # 1 of 2 R(e)

(5) Production Capacity (Highest Daily Production Demonstrated)	(6) Unit of Measure	(7) 1989 Average Operating Rate	(8) Number of Units In Operation in 1989
	air dry tons/day		01
	tons/day	320	05
	tons/day	320	01
	tons/day	300	01
	tons/day	113	01
	tons/day	321	01

21b INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corporation Survey ID 1200

MEN02454

REPLACEMENT PAGE FOR TABLE A
PROCESS UNIT OPERATIONS FOR SECONDARY FIBER PROCESSING

Copy # 2 of 2 L(e)

(1) Type of Unit	(2) Manufacturer	(3) Number of Units	(4) Year Installed
aa. Repulpers *(list each type).*			
			19
			19
			19
			19
			19
bb. Contaminant Removal Systems *(list each system).*			
Stage III Reverse Cleaners	Celeco	01	19 88
Flotation Clarifier	Krofta	01	19 81
Hydradenser	Black Clawson	01	19 88
Secondary Pressure Screen	Beloit	01	19 87
Jonsson Screen	Jonsson	02	19 69
cc. Ink Removal Systems *(list each system).*			
			19
			19
			19
			19
			19
dd. Bleaching *(list each system).*			
			19
			19
			19
			19
			19

21a INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corporation Survey ID 1200

REPLACEMENT PAGE FOR TABLE A

PROCESS UNIT OPERATIONS FOR SECONDARY FIBER PROCESSING

Copy # 2 of 2 R(e)

(5) Production Capacity (Highest Daily Production Demonstrated)	(6) Unit of Measure	(7) 1989 Average Operating Rate	(8) Number of Units In Operation in 1989
	air dry tons/day		01
	Tons/day	20	01
	Tons/day	3	01
	Tons/day	1	01
	Tons/day	35	01
	Tons/day	4	02

21b INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corporation Survey ID 1200

Question 24, pages 33-38

- Table C: SECONDARY FIBER PULP PRODUCTION (BEFORE BLEACHING) - Row (2): Wastepaper Grades.

  The instructions for Row 2 should be revised as follows: for each secondary fiber pulp type listed in Row (1), describe its composition using the appropriate American Paper Institute Paper Recycling Committee Codes for wastepaper grades (shown on the next page). Crossout the preprinted Grade numbers on Table C and write in the appropriate four-digit code. Then report the percentage of each wastepaper grade used to make up the pulp to the nearest percentage.

  For example, if a facility made paperboard from wastepaper in 1989, using 50% boxboard cuttings and 50% old corrugated boxes, they would complete Table C as in the example on page 8.

The API Codes for wastepaper grades are as follows:

API Paper Recycling Committee Code	API Grade Name	Paper Stock Institute of America Classification Grades
1311	Corrugated, Old Boxes	Corrugated containers.
1314	Corrugated New Cuttings	New double-lined kraft corrugated cuttings
1209	News, Printed (old and over-issue)	News Special news Special news deink quality
1226	News, Unprinted	White newsblanks Groundwood computer printout Publication blanks
1244	Other Groundwood Papers	Mixed groundwood shavings Flyleaf shavings Coated groundwood sections
1105	Boxboard Cuttings	Boxcoated cuttings Mill wrappers Printed TMP
1103	Mixed	Mixed paper Super mixed paper
1421	Brown Kraft	Used brown kraft bags Mixed kraft cuttings New colored kraft Grocery bag waste Kraft multi-wall bag waste New brown kraft envelope cuttings
1447	Bleached Kraft	Coated soft white shavings Hard white shavings Hard white envelope cuttings Manila tabulating cards Unprinted bleached sulfate Unprinted TMP
1446	Printed Bleached Kraft	Printed bleached sulfate cuttings Misprint bleached sulfate

The API Codes for wastepaper grades (continued):

API Paper Recycling Committee Code	API Grade Name	Paper Stock Institute of America Classification Grades
1443	Ledger Grades	New colored envelope cuttings Semi-bleached cuttings Colored tabulating cards Sorted colored ledger Manifold colored ledger Sorted white ledger Manifold white ledger Computer printout
1615	Other	Specialty grades such as paper stock containing wet strength, polycoatings, plastic, foil, and hot melt glues. Also included are manifold ledger containing carbon paper, books with covers, tab cards in small boxes on skids, magazines, carbonless paper, solid fiber containers, plastic windowed envelopes, and textile boxes.

TABLE C: SECONDARY FIBER PULP PRODUCTION (BEFORE BLEACHING) IN 1989

1989

Copy # 1 of 1

(1) Secondary Fiber Pulp Code	P Paperboard from Wastepaper			
(2) Wastepaper Grade (percentage)	50 ~~Grade 1~~ 1105 50 ~~Grade 2~~ 1311 Grade 3 Grade 4 Grade 5	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5
(3) Total Secondary Fiber Pulp Produced (ADT)	. .	. .	. .	. .
(4) Total Production Days				
(5) Highest Monthly Production Rate–Daily Average (ADT/day)	.	.	.	.
(6) Production Days in Month of Highest Production				

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

MEN02459

Copy # ☐ of ☐ R(a)

TABLE A: PROCESS UNIT OPERATIONS

(5) Production Capacity (Highest Daily Production Demonstrated)	(6) Unit of Measure	(7) 1989 Average Operating Rate	(8) Number of Units in Operation in 1989
☐☐☐,☐☐☐,☐☐☐	air dry brown-stock tons/day	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
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☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	air dry tons/day	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
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☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	air dry brown-stock tons/day	☐☐☐,☐☐☐,☐☐☐	☐☐
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SURVEYID=1200

Copy # ☐ of ☐ R(b)

TABLE A: PROCESS UNIT OPERATIONS

(5) Production Capacity (Highest Daily Production Demonstrated)	(6) Unit of Measure	(7) 1989 Average Operating Rate	(8) Number of Units in Operation in 1989
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	lbs liquor solids/day	☐☐☐,☐☐☐,☐☐☐	☐☐
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SURVEYID=1200

Copy # ☐ of ☐ R(c)

TABLE A: PROCESS UNIT OPERATIONS

(5) Production Capacity (Highest Daily Production Demonstrated)	(6) Unit of Measure	(7) 1989 Average Operating Rate	(8) Number of Units in Operation in 1989
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SUPVBYID=1200

Copy # ☐ of ☐ R(d)

TABLE A: PROCESS UNIT OPERATIONS

(5) Production Capacity (Highest Daily Production Demonstrated)	(6) Unit of Measure	(7) 1989 Average Operating Rate	(8) Number of Units in Operation in 1989
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
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☐☐☐,☐☐☐,☐☐☐	tons ClO_2/day	☐☐☐,☐☐☐,☐☐☐	☐☐
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☐☐☐,☐☐☐,☐☐☐	off machine tons/day	☐☐☐,☐☐☐,☐☐☐	☐☐
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☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	off machine tons/day	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐
☐☐☐,☐☐☐,☐☐☐	_____	☐☐☐,☐☐☐,☐☐☐	☐☐

SURVEY ID= 1200

21. Indicate what unit process or processes (e.g., pulping digester, washers, recovery boiler) is the current *limiting* process in terms of production at your facility and explain why.

When the secondary fiber system (Kraft) is shutdown and the H.D chest is empty the paper machines are shutdown. We do not run on wood alone.

22. Complete Table B, *Pulp-from-Wood/Non-Wood Production*, on pages 26 through 30, using the instructions on the next page if your facility produced pulp from wood or non-wood (e.g., cotton linters, hemp, bagasse, straw), for use in further production or for sale, in any of calendar years 1985-1989. The information requested in this table will be used to categorize pulp production at this facility in order to assess the subcategorization scheme.

If the information requested is not applicable to your facility (if your facility does not produce pulp from wood) or if data is not available, indicate below. *(Circle all numbers that apply.)*

01 Not applicable—*GO TO QUESTION 34 ON PAGE 32*

02 Not available for 1985

03 Not available for 1986

04 Not available for 1987

05 Not available for 1988

06 Not available for 1989

SURVEYID=1200

EXAMPLE TABLE B: PULP-FROM-WOOD/NON-WOOD PRODUCTION IN 1985

1985

Copy # 1 of 1

(1) Pulp Process Code				
(2) Fiber Furnish	100 % HW % SW % Other *specify* ____ % Other *specify* ____	% HW 100 % SW % Other *specify* ____ % Other *specify* ____	% HW % SW % Other *specify* ____ % Other *specify* ____	% HW % SW % Other *specify* ____ % Other *specify* ____
(3) Total Pulp Produced (ADBT)	100,000	35,000	,	,
(4) Percentage Bleached	0 %	100 %	%	%
(5) Total Production Days	350	100		
(6) Highest Monthly Production Rate–Daily Average (ADBT/day)	,250	,350	,	;
(7) Production Days in Month of Highest Production	30	29		

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

SURVEY ID=1200

MEN02465

TABLE B: PULP-FROM-WOOD/NON-WOOD PRODUCTION IN 1986

1986

Copy # 1 of 1

(1) Pulp Process Code	E			
(2) Fiber Furnish	100 % HW 0 % SW % Other *specify* % Other *specify*	% HW % SW % Other *specify* % Other *specify*	% HW % SW % Other *specify* % Other *specify*	% HW % SW % Other *specify* % Other *specify*
(3) Total Pulp Produced (ADBT)	84,346	, ,	, ,	, ,
(4) Percentage Bleached	0 %	%	%	%
(5) Total Production Days	349			
(6) Highest Monthly Production Rate–Daily Average (ADBT/day)	,264	,	,	,
(7) Production Days in Month of Highest Production	30			

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

SURVEYID=1200

MEN02466

TABLE B: PULP-FROM-WOOD/NON-WOOD PRODUCTION IN 1988

1988

Copy # 1 of 1

(1) Pulp Process Code	E			
(2) Fiber Furnish	100 % HW 0 % SW % Other *specify*	% HW % SW % Other *specify*	% HW % SW % Other *specify*	% HW % SW % Other *specify*
	% Other *specify*	% Other *specify*	% Other *specify*	% Other *specify*
(3) Total Pulp Produced (ADBT)	,87,610	, ,	, ,	, ,
(4) Percentage Bleached	0 %	%	%	%
(5) Total Production Days	351			
(6) Highest Monthly Production Rate–Daily Average (ADBT/day)	,263	,	,	,
(7) Production Days in Month of Highest Production	30			

23. **For all pulp-from-wood/non-wood production reported in Table B for 1989, provide a listing of your facility's daily production data listing the date and the day's production for calendar year 1989. You may provide either transcribed data or copies of daily production data.**

NOTES

Describe the method used for estimating production data: Production data is calculated by the digester computer using the Impregnator feed screw rpm's, chip density + chip moisture information.

Question Number(s)	Notes, comments, etc.
3,6,7	1986, 1987, 1988 Production information is unavailable.
	Omit above note. Production information was found.

SUEVEYID=1206

1987

MEN02469

FEB 1	117.44	
FEB 2	230.65	
FEB 3	230.10	
FEB 4	201.61	
FEB 5	226.41	
FEB 6	269.88	
FEB 7	255.68	
FEB 8	245.47	
FEB 9	264.04	
FEB 10	295.93	
FEB 11	239.22	
FEB 12	198.37	
FEB 13	166.67	
FEB 14	240.37	
FEB 15	96.93	
FEB 16	251.88	
FEB 17	173.30	
FEB 18	201.14	
FEB 19	218.33	
FEB 20	241.02	
FEB 21	266.52	
FEB 22	237.60	
FEB 23	262.01	
FEB 24	245.51	
FEB 25	172.39	
FEB 26	246.81	
FEB 27	255.17	
FEB 28	292.52	
	6342.97	226.53

1989

MEN02470

01-Mar-89	247.70	
02-Mar-89	134.05	
03-Mar-89	255.20	
04-Mar-89	305.06	
05-Mar-89	296.69	
06-Mar-89	283.48	
07-Mar-89	303.78	
08-Mar-89	263.32	
09-Mar-89	242.20	
10-Mar-89	271.36	
11-Mar-89	305.26	
12-Mar-89	284.86	
13-Mar-89	273.33	
14-Mar-89	260.13	
15-Mar-89	231.59	
16-Mar-89	72.63	
17-Mar-89	289.23	
18-Mar-89	214.80	
19-Mar-89	249.65	
20-Mar-89	199.96	
21-Mar-89	85.20	
22-Mar-89	232.64	
23-Mar-89	183.47	
24-Mar-89	249.53	
25-Mar-89	221.15	
26-Mar-89	113.07	
27-Mar-89	285.64	
28-Mar-89	291.76	
29-Mar-89	272.60	
30-Mar-89	261.15	
31-Mar-89	286.14	
	7467.17	240.88

1989

MEN02471

01-Apr-89	284.29
02-Apr-89	306.30
03-Apr-89	275.27
04-Apr-89	287.01
05-Apr-89	243.58
06-Apr-89	296.95
07-Apr-89	304.31
08-Apr-89	297.74
09-Apr-89	232.03
10-Apr-89	232.01
11-Apr-89	96.69
12-Apr-89	308.93
13-Apr-89	277.41
14-Apr-89	267.23
15-Apr-89	294.99
16-Apr-89	294.65
17-Apr-89	284.64
18-Apr-89	307.36
19-Apr-89	300.40
20-Apr-89	309.67
21-Apr-89	303.51
22-Apr-89	267.07
23-Apr-89	271.20
24-Apr-89	303.46
25-Apr-89	311.33
26-Apr-89	314.56
27-Apr-89	310.36
28-Apr-89	313.50
29-Apr-89	316.40
30-Apr-89	305.68
	8516.53

283.95

1989

MEN02472

01-May-89	310.85	
02-May-89	270.99	
03-May-89	299.36	
04-May-89	281.72	
05-May-89	298.15	
06-May-89	270.90	
07-May-89	286.65	
08-May-89	204.99	
09-May-89	185.05	
10-May-89	277.75	
11-May-89	297.10	
12-May-89	273.58	
13-May-89	304.06	
14-May-89	318.86	
15-May-89	280.38	
16-May-89	289.49	
17-May-89	314.99	
18-May-89	236.69	
19-May-89	277.08	
20-May-89	326.16	
21-May-89	217.96	
22-May-89	159.57	
23-May-89	288.01	
24-May-89	257.97	
25-May-89	271.69	
26-May-89	300.20	
27-May-89	280.53	
28-May-89	302.62	
29-May-89	315.39	
30-May-89	319.63	
31-May-89		
	8318.37	277.28

1989

MEN02473

	DATE	DIG PULP PROD T/D
1	JULY 1	263.81
2	JULY 2	307.78
3	JULY 3	235.15
4	JULY 4	0.00
5	JULY 5	175.18
6	JULY 6	305.86
7	JULY 7	262.66
8	JULY 8	315.50
9	JULY 9	323.62
10	JULY 10	262.23
11	JULY 11	292.46
12	JULY 12	308.82
13	JULY 13	285.80
14	JULY 14	104.85
15	JULY 15	289.60
16	JULY 16	299.28
17	JULY 17	305.95
18	JULY 18	316.66
19	JULY 19	257.84
20	JULY 20	208.32
21	JULY 21	317.35
22	JULY 22	313.44
23	JULY 23	290.35
24	JULY 24	310.44
25	JULY 25	323.79
26	JULY 26	192.98
27	JULY 27	302.34
28	JULY 28	313.96
29	JULY 29	301.16
30	JULY 30	303.37
31	JULY 31	301.66
		8392.21

279.74

1984

MEN02474

AUG 1	306.04	
AUG 2	278.52	
AUG 3	97.84	
AUG 4	288.17	
AUG 5	193.45	
AUG 6	291.60	
AUG 7	246.41	
AUG 8	274.23	
AUG 9	284.84	
AUG 10	241.80	
AUG 11	313.87	
AUG 12	217.64	
AUG 13	255.63	
AUG 14	260.31	
AUG 15	224.51	
AUG 16	291.37	
AUG 17	257.83	
AUG 18	276.91	
AUG 19	229.68	
AUG 20	297.01	
AUG 21	165.01	
AUG 22	313.00	
AUG 23	287.51	
AUG 24	258.40	
AUG 25	313.61	
AUG 26	237.40	
AUG 27	217.31	
AUG 28	309.35	
AUG 29	314.66	
AUG 30	273.99	
AUG 31	301.02	
	8119.28	261.91

.989

MEN02475

SEPT 1	309.23
SEPT 2	236.92
SEPT 3	112.63
SEPT 4	
SEPT 5	
SEPT 6	
SEPT 7	217.89
SEPT 8	266.27
SEPT 9	290.09
SEPT 10	299.56
SEPT 11	252.28
SEPT 12	251.45
SEPT 13	297.22
SEPT 14	295.30
SEPT 15	290.72
SEPT 16	292.64
SEPT 17	263.40
SEPT 18	294.75
SEPT 19	258.89
SEPT 20	246.91
SEPT 21	185.93
SEPT 22	290.94
SEPT 23	293.66
SEPT 24	286.41
SEPT 25	302.69
SEPT 26	291.81
SEPT 27	229.16
SEPT 28	272.74
SEPT 29	213.74
SEPT 30	264.58
	7107.81

263 25

OCT 17	169.44
OCT 18	213.94
OCT 19	244.23
OCT 20	226.08
OCT 21	302.29
OCT 22	272.54
OCT 23	162.42
OCT 24	225.86
OCT 25	194.65
OCT 26	243.06
OCT 27	286.68
OCT 28	271.14
OCT 29	316.58
OCT 30	281.55
OCT 31	122.05

DATE	DIG PULP PROD T/D
OCT 1	300.00
OCT 2	220.74
OCT 3	204.10
OCT 4	49.36
OCT 5	255.15
OCT 6	289.60
OCT 7	289.97
OCT 8	206.99
OCT 9	252.62
OCT 10	235.35
OCT 11	314.00
OCT 12	159.97
OCT 13	167.34
OCT 14	284.24
OCT 15	195.09
OCT 16	191.58
OCT 17	169.44
OCT 18	213.94
OCT 19	244.23
OCT 20	226.08
OCT 21	302.29
OCT 22	272.54
OCT 23	162.42
OCT 24	225.86
OCT 25	194.65
OCT 26	243.06
OCT 27	286.68
OCT 28	271.14
OCT 29	316.58
OCT 30	281.55
OCT 31	122.05
	7148.61

230.60

1989

MEN02477

NOV 1	268.09	
NOV 2	276.31	
NOV 3	304.06	
NOV 4	269.73	
NOV 5	308.75	
NOV 6	308.80	
NOV 7	244.77	
NOV 8	219.24	
NOV 9	222.82	
NOV 10	244.09	
NOV 11	292.61	
NOV 12	298.80	
NOV 13	252.55	
NOV 14	173.28	
NOV 15	253.27	
NOV 16	272.11	
NOV 17	318.59	
NOV 18	318.59	
NOV 19	185.79	
NOV 20	208.89	
NOV 21	305.86	
NOV 22	326.96	
NOV 23	283.18	
NOV 24	265.00	
NOV 25	270.36	
NOV 26	270.14	
NOV 27	299.59	
NOV 28	249.42	
NOV 29	263.00	
NOV 30	244.51	
	8019.16	267.31

1939

MEN02478

JAN 1	268.54
JAN 2	271.47
JAN 3	250.35
JAN 4	95.86
JAN 5	246.22
JAN 6	185.11
JAN 7	212.03
JAN 8	206.78
JAN 9	255.25
JAN 10	208.38
JAN 11	253.87
JAN 12	257.49
JAN 13	252.19
JAN 14	262.34
JAN 15	241.43
JAN 16	223.63
JAN 17	258.56
JAN 18	234.45
JAN 19	217.24
JAN 20	263.78
JAN 21	211.92
JAN 22	183.76
JAN 23	202.15
JAN 24	243.21
JAN 25	232.70
JAN 26	180.33
JAN 27	279.52
JAN 28	268.14
JAN 29	252.58
JAN 30	249.16
JAN 31	219.93
	7186.37

231.88

DATE	DIG PULP PROD T/D
OCT 1	300.00
OCT 2	220.74
OCT 3	204.10
OCT 4	49.36
OCT 5	255.15
OCT 6	289.60
OCT 7	289.97
OCT 8	206.99
OCT 9	252.62
OCT 10	235.35
OCT 11	314.00
OCT 12	159.97
OCT 13	167.34
OCT 14	284.24
OCT 15	195.09
OCT 16	191.58

Instructions for Completing Table C

Table C requests information on the history of secondary fiber pulping operations for calendar years 1985-1989. Refer to the row instructions below and the example on page 25 in completing this table. If you need additional space, photocopy Table C ***BEFORE*** *writing on it and label each copy in the space provided at the top of the page.*

Row (1): ***Secondary Fiber Pulp Code.*** *For each type of secondary fiber pulping operation performed onsite, list the corresponding secondary fiber pulp code representing wastepaper pulped, either for sale or for use in further production, during any of calendar years 1985-1989. The secondary fiber pulp codes are listed below and are explained in Appendix B. If you must use the 'Other' category, be sure to specify the pulp type in the space provided on the table.*

Row (2): ***Wastepaper Grades.*** *For each secondary fiber pulp type listed in Row (1), describe the composition by wastepaper grade and list the percentage of each grade used to the nearest percent. Use the five grades of wastepaper used by the American Paper Institute in its annual wastepaper consumption reports; namely, Grade 1—High grade deinking, Grade 2—Pulp substitutes, Grade 3—Mixed grades, Grade 4—Corrugated, Grade 5—Newspapers.*

Row (3): ***Total Secondary Fiber Pulp Produced.*** *For each column, report the total quantity of secondary fiber pulped before bleaching in each calendar year 1985-1989. Units of production should be air dry* unbleached *tons (ADT).*

Row (4): ***Total Production Days.*** *For each column, report the number of production days in each calendar year 1985-1989. Production days equals 365 minus total downtime due to scheduled maintenance or lengthy nonroutine plant shutdowns.*

Row (5): ***Highest Monthly Production Rate—Daily Average.*** *For each column, report the daily average for the month of highest production in each calendar year 1985-1989. This is calculated by dividing the highest monthly production by the number of days in that month. Units of production should be air dry* unbleached *tons per day (ADT/day). The method used in estimating your production should be explained in the NOTES section following the table.*

Row (6): ***Production Days in Month of Highest Production.*** *Give the number of days in the month of highest production.*

Secondary Fiber Pulp Codes

K	Deink—Fine papers	O	Wastepaper-Molded Products
L	Deink—Newspaper	P	Paperboard from Wastepaper
M	Deink—Tissue paper	Q	Builder's Paper and Roofing Felt
N	Tissue from Wastepaper	Z	Other *(specify in table)*

SURVEYID=1200

TABLE C: SECONDARY FIBER PULP PRODUCTION (BEFORE BLEACHING) IN 1986

1986

Copy # 1 of 1

(1) Secondary Fiber Pulp Code	P Paperboard from Waste Paper			
(2) Wastepaper Grade (percentage)	98 ~~Grade 1~~ 1311	Grade 1	Grade 1	Grade 1
	02 ~~Grade 2~~ 1314	Grade 2	Grade 2	Grade 2
	Grade 3	Grade 3	Grade 3	Grade 3
	Grade 4	Grade 4	Grade 4	Grade 4
	Grade 5	Grade 5	Grade 5	Grade 5
(3) Total Secondary Fiber Pulp Produced (ADT)	76,337	,	,	,
(4) Total Production Days	349			
(5) Highest Monthly Production Rate–Daily Average (ADT/day)	,242	,	,	,
(6) Production Days in Month of Highest Production	30			

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

SURVEYID=1200

MEN02480

TABLE C: SECONDARY FIBER PULP PRODUCTION (BEFORE BLEACHING) IN 1988

1988

Copy # 1 of 1

(1) Secondary Fiber Pulp Code	P Paperboard from wastepaper			
(2) Wastepaper Grade (percentage)	98 ~~Grade 1~~ 1311 02 ~~Grade 2~~ 1314 Grade 3 Grade 4 Grade 5	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5	Grade 1 Grade 2 Grade 3 Grade 4 Grade 5
(3) Total Secondary Fiber Pulp Produced (ADT)	85,818			
(4) Total Production Days	351			
(5) Highest Monthly Production Rate–Daily Average (ADT/day)	267			
(6) Production Days in Month of Highest Production	30			

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

SURVEYID=1200

MEN02481

25. For all secondary fiber pulping processes reported in Table C for 1989, provide a listing of your facility's daily production data listing the date and the day's production for calendar year 1989. You may provide either transcribed data or copies of daily production data.

NOTES

Describe the method used for estimating production data: Production is based on Number of bales used during each month.

Question Number(s)	Notes, comments, etc.

SURVEYID=1250

30. What is the source of oxygen utilized in the bleach plant?
(Circle one number.)

❑ N/A *(GO TO THE NEXT QUESTION)*

01 Purchase

02 Onsite generation

03 Other *(specify)*: _____

31. At what point in the first chlorination stage is chlorine dioxide added?
(Circle all numbers that apply.)

01 Not added

02 Before elemental chlorine addition

03 At the same point of elemental chlorine addition

04 After elemental chlorine addition

05 In total place of elemental chlorine

06 Other *(specify)*: _____

32. Specify the percent substitution of chlorine dioxide for chlorine in the chlorination stage.

Percent substitution: ☐☐☐.☐☐ %

33. Is there an extraction stage before the first chlorination stage?
(Circle one number.)

01 Yes

02 No

34. How is chlorine added at the first chlorination stage?
(Circle one number.)

01 Multiple points

02 Single point

SURVEYID=1230

Instructions for Completing Table D

Complete Table D for each grade of bleached pulp (virgin or secondary fiber) produced onsite. Photocopy Table D as necessary BEFORE writing on it and label each copy in the space provided at the top right corner of the page. For each grade of pulp or wastepaper, report the wood type or wastepaper grade, bleach line, bleach sequence, bleach line yield, and brownstock washing loss in the spaces provided at the top of the table. The method used for estimating your washing loss should be explained in the NOTES section following the table.

*Row (1): **Pulp Flow**. Report the pulp flow rate in air dry tons per hour (ADT/hr). Unbleached and final bleached pulp rates must be provided.*

*Row (2): **Kappa No.** Report the kappa number for virgin pulp.*

*Row (3): **K No.** Report the permanganate number for virgin pulp.*

*Row (4): **K No.** Report the permanganate number for caustic extraction stage.*

*Row (5): **Brightness**. Report the final pulp brightness as GE brightness equivalent.*

*Row (6): **T**. Report the temperature in degrees Fahrenheit.*

Row (7): t_r. Report the residence time in hours for each stage of chemical application.

*Row (8): **pH**. Report the pH for each stage of chemical application.*

*Row (9): **Cl_2 Residual**. Report the chlorine residual measured in filtrate in grams per liter (g/l).*

*Rows (10)-(24): **Chemical Application Rates**. Report the chemical application rates for each stage of bleaching in terms of pounds of chemical per air dry ton of unbleached pulp. Please specify in the NOTES section if your data are reported as active chemical or total weight of the compound.*

Pulp Process and Secondary Fiber Pulping Codes

A	Dissolving sulfite pulp	J	Groundwood—refiner pulp
B	Papergrade sulfite pulp	K	Deink—fine papers
C	Kraft pulp	L	Deink—newspapers
D	Dissolving kraft pulp	M	Deink—tissue paper
E	Semi-chemical pulp	N	Tissue from wastepaper
F	Groundwood—chemi-mechanical pulp	O	Wastepaper-molded products
G	Groundwood—thermo-mechanical pulp	P	Paperboard from wastepaper
H	Groundwood—stone pulp	Q	Builders' paper and roofing felt
I	Groundwood—chemi-thermo-mechanical pulp	Z	Other

SURVEYID=1200

Copy # ☐ of ☐ R(a)

TABLE D: BLEACH PLANT PROCESS INFORMATION

Bleach Sequence: _____ Bleach Line Yield: _____% Brownstock Washing Loss for Virgin Pulp: _____lb Na_2SO_4/ton pulp

d. Second	e. Third	f. Fourth	g. Fifth	h. Sixth
☐☐☐.☐☐	☐☐☐.☐☐	☐☐☐.☐☐	☐☐☐.☐☐	☐☐☐.☐☐
☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐
☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐
☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐
☐☐.☐	☐☐.☐	☐☐.☐	☐☐.☐	☐☐.☐
☐☐☐	☐☐☐	☐☐☐	☐☐☐	☐☐☐
☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐	☐☐.☐☐
☐☐.☐	☐☐.☐	☐☐.☐	☐☐.☐	☐☐.☐
☐.☐	☐.☐	☐.☐	☐.☐	☐.☐

SUTVEYID=1200

Copy # ☐ of ☐ R(b)

TABLE D: BLEACH PLANT PROCESS INFORMATION

Bleach Sequence: _____ Bleach Line Yield: _____% Brownstock Washing Loss for Virgin Pulp: _____lb Na_2SO_4/ton pulp

d. Second	e. Third	f. Fourth	g. Fifth	h. Sixth
☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐
☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐
☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐
☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐
☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐
☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐	☐☐☐.☐
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SURVEYID=1200

36. **List the five chemical additives used in stock preparation in the largest amounts by weight. This information will be used to assess what chemicals are used at pulp and paper mills and in what quantities.**
(Calculate the chemical amount added in the stock preparation. In the NOTES section, indicate approximate purity of technical grade commodity chemicals.)

	Compound	CAS Number (if available)	Total Usage	Units (specify)
a.	Nopcoset 2272 R	Mixture	1.00	lb/ton
b.	Hercon UBK	Mixture	14.89	lb/ton
c.				
d.				
e.				

37. **List the five sizing and coating materials applied to the sheet in the largest amounts by weight. This information will be used to assess what chemicals are used at pulp and paper mills and in what quantities.**
(Calculate the chemical amount added onto the sheet. If a trade name is listed, indicate the general chemical composition of the principal active ingredient.)

	Compound	Total Usage	Units (specify)
a.	N/A		
b.			
c.			
d.			
e.			

38. Complete Table E, *Production History*, on pages 51 through 55, using the instructions on the next page. The purpose of this table is to obtain production data for this facility so that the facility will be properly subcategorized.

TABLE E: PRODUCTION HISTORY FOR 1985

1985

Copy # 1 of 1

(1) **Product Code** *(see Appendix C)*: 41

(2) **Fiber Furnish Percentage by Process Code** *(see Appendix B)*:

		Process Code	Percent Bleached	Percent HW	Percent SW
a. Pulp Produced Onsite from Virgin Fiber	56 %	E	0	100	0
	%				
	%				
b. Purchased Pulp	0 %				
	%				
	%				
c. Secondary Fiber	44 %	P	0		
	%				
	%				
d. Other *(specify)*: _____	0 %				
	%				
	%				

(3) **Total Production (OMT)**: 1,130,716

(4) **Percent Moisture**: 7 %

(5) **Total Working Days**: 344

(6) **Highest Monthly Production Rate (OMT)—Daily Average**: 463

(7) **Production Days in Month of Highest Production**: 29

SURVEYID=1200

TABLE E: PRODUCTION HISTORY FOR 1987

1987

Copy # 1 of 1

(1) **Product Code** *(see Appendix C)*	41

(2) **Fiber Furnish Percentage by Process Code** *(see Appendix B)*:

		Process Code	Percent Bleached	Percent HW	Percent SW
a. Pulp Produced Onsite from Virgin Fiber	50 %	E	0	100	0
	%				
	%				
b. Purchased Pulp	0 %				
	%				
	%				
c. Secondary Fiber	50 %	P	0		
	%				
	%				
d. Other *(specify)*: _____	0 %				
	%				
	%				

(3) **Total Production (OMT)**	165,898
(4) **Percent Moisture**	7 %
(5) **Total Working Days**	347
(6) **Highest Monthly Production Rate (OMT)—Daily Average**	490
(7) **Production Days in Month of Highest Production**	30

SURVEY ID=1200

TABLE E: PRODUCTION HISTORY FOR 1989

1989

Copy # 1 of 1

		Process Code	Percent Bleached	Percent HW	Percent SW
(1) **Product Code** *(see Appendix C)*		41			
(2) **Fiber Furnish Percentage by Process Code** *(see Appendix B)*:					
a. Pulp Produced Onsite from Virgin Fiber	49 %	E	0	100	0
	%				
	%				
b. Purchased Pulp	0 %				
	%				
	%				
c. Secondary Fiber	51 %	P	0		
	%				
	%				
d. Other *(specify)*: _____	0 %				
_____	%				
_____	%				
(3) **Total Production (OMT)**			,177,323		
(4) **Percent Moisture**			7 %		
(5) **Total Working Days**			356		
(6) **Highest Monthly Production Rate (OMT)—Daily Average**			,529		
(7) **Production Days in Month of Highest Production**			29		

SURVEYID=1200

40. **Provide the following information for any scheduled or announced mill investment projects (i.e., bleach plant modernization or replacement).**
(Refer to the product category list in Appendix C for code numbers.)

	Project Description	Product Category Affected [List code(s)]	Estimated Startup Month	Estimated Startup Year	Estimated Incremental Capacity (OMT)
a.	Brown Stock Washer	17, 17	07	91	___, 0
		___, ___			
b.	#1 Paper Machine	41, 41	07	91	56, 000
		___, ___			
c.		___, ___			___, ___
		___, ___			
d.		___, ___			___, ___
		___, ___			
e.		___, ___			___, ___
		___, ___			
f.		___, ___			___, ___
		___, ___			

SURVEYID=1200

SECTION 3: WATER USE AND WASTESTREAM CHARACTERISTICS

Section 3 requests current and historical information on water use and wastestream characteristics for the pulping and papermaking operations at this facility.

Unless otherwise instructed, all responses should reflect information on current mill operations.

Please read each question. If a particular question does not apply or data is not available, answer with N/A and continue to the next question. If you have any questions about this section or this survey, call the Survey Helpline (1-800-635-8850).

Use the NOTES space at the end of the section if you wish to explain your response to any question. Reference each comment with the appropriate question number.

41. Provide a schematic of water flow through the manufacturing process.

(The following items must be included on your schematic:

- *major process areas,*
- *intake water flow,*
- *recycle streams, and*
- *typical flows from process areas discharged to sewer systems.*

Use the sample schematic on the next page as a guide. Label your schematic with the above question number and return it with the completed questionnaire.)

SURVEYID=1200

Question #4!

MEN02493

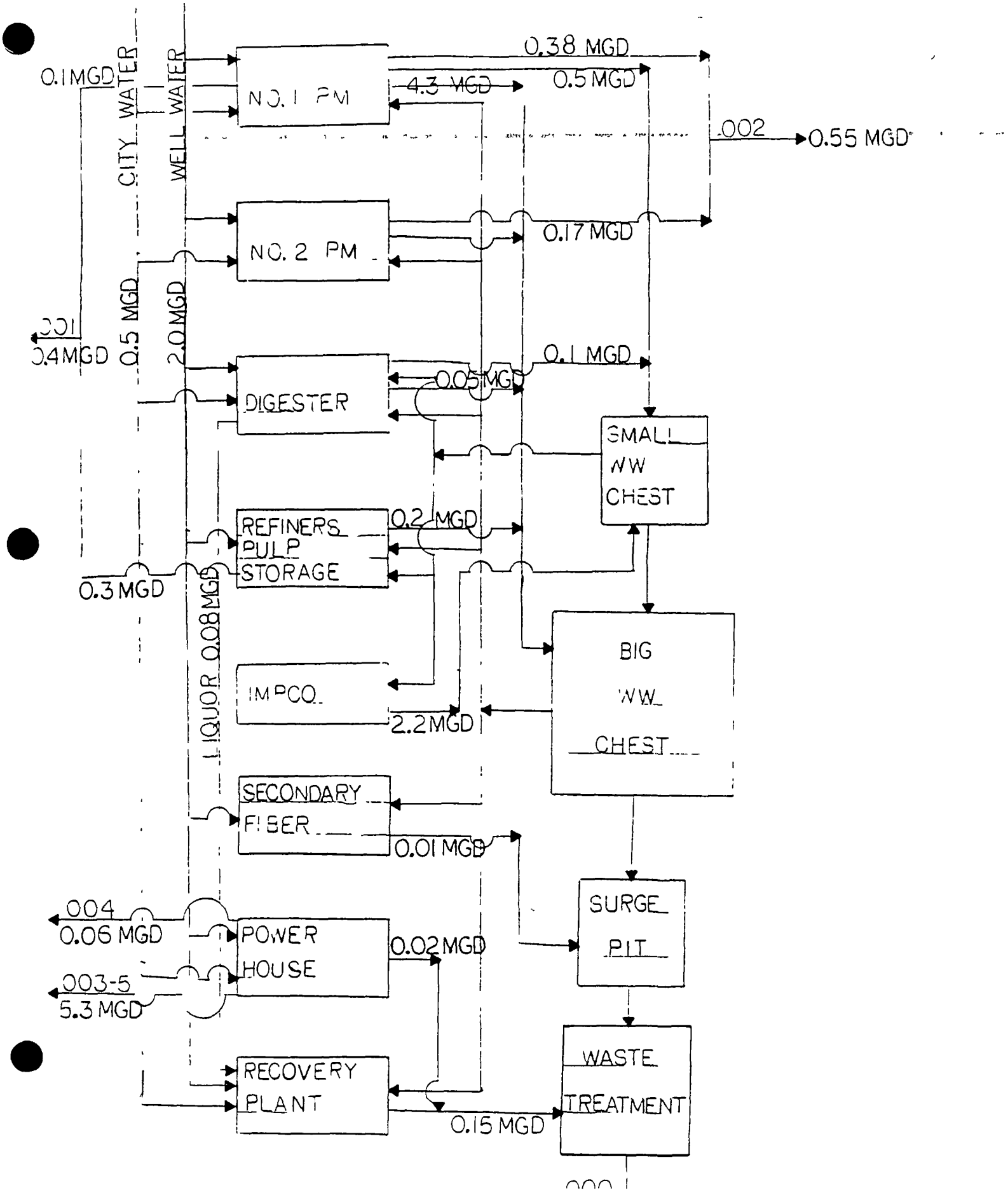
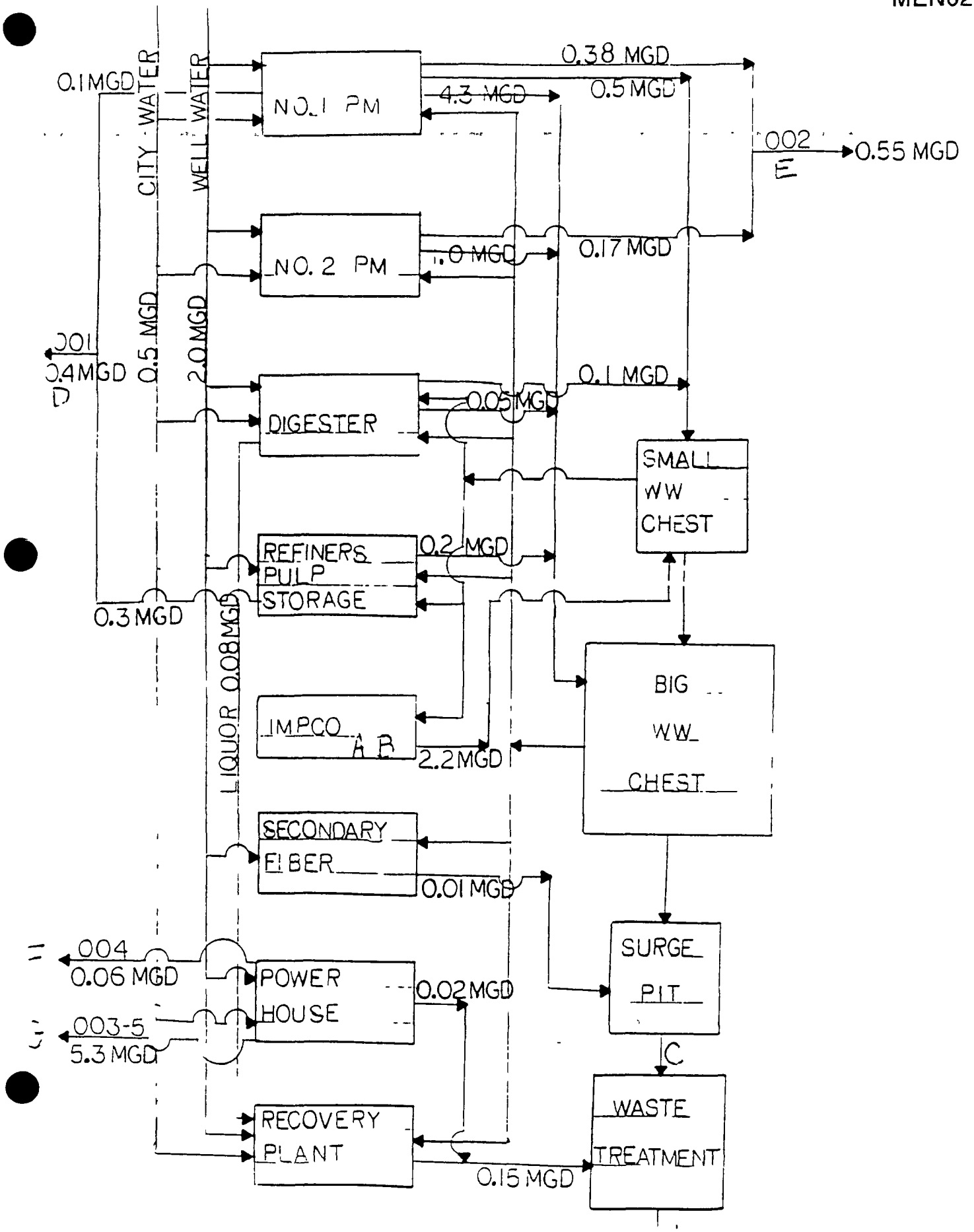


Fig. E2

MEN02494



*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: No. 1 Paper Machine **Copy #** 1 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 2

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

(02) No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

02 Underground sewer

03 Open sewers or ditches

(04) Other *(specify)*: See below

① White water is pumped to a common tank for reuse.
② Vacuum Pump Cooling water is pumped to CO2 outfall.

SURVEYID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: No. 2 Paper Machine **Copy #** 2 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 2

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

(02) No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

02 Underground sewer

03 Open sewers or ditches

(04) Other *(specify)*: See below

(1) White water is pumped to a common tank for reuse.

(2) Vaccuum pump cooling water is pumped to CO2 outfall.

SURVEY ID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Digester **Copy #** 3 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 1

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

(02) No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

(02) Underground sewer

03 Open sewers or ditches

04 Other *(specify)*: _____

SURVEYID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Refiners **Copy #** 4 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 2

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

(02) No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

02 Underground sewer

(03) Open sewers or ditches

(04) Other *(specify)*: _____

03 - whitewater from floor runs to sump and pumped to storage for reuse.

04 - Air compressor water is piped directly to CC1 outfall

SURVEY ID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Impco **Copy #** 5 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 1

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

(02) No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

02 Underground sewer

03 Open sewers or ditches

(04) Other *(specify)*: Piped directly back to strage for reuse.

SURVEYID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Secondary Fiber **Copy #** 6 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 2

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

(02) No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

02 Underground sewer

03 Open sewers or ditches

(04) Other *(specify)*: _____

04 (1) Whitewater is pumped to the surge pit.
(2) Seal water sump is piped to CC2 outfall.

SURVEYID=1230

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Power House **Copy #** 7 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 4

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

(01) Yes

02 No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

(02) Underground sewer (1)+(2) Lime water + washup water combined are pum to the aeration basin.

03 Open sewers or ditches

(04) Other *(specify)*: _____

(3) Mill process water is collected in piping which goes to 004 outfall

(4) Turbine cooling water is pumped from the river through the turbine condensor, and flows through underground piping back to river.

SURVEYID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Power House - (continued) **Copy #** 8 **of** 9

42. Where is this process area located?

(Circle one number.)

01 Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: ☐☐☐

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

01 Yes

02 No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

02 Underground sewer

03 Open sewers or ditches

04 Other *(specify)*: _____

Above questions answered on Pg 7 of 9

SURVEYID=1200

*Complete Questions 42 through 46 on the next two pages for **EACH** process area identified in the water flow schematic for your facility provided for Question 41. Photocopy these pages **BEFORE** writing on them and label each copy, by process area and numerically, in the space provided.*

PROCESS AREA: Recovery Plant **Copy #** 9 **of** 9

42. Where is this process area located?

(Circle one number.)

(01) Enclosed building

02 Open area

43. How many wastewater streams are generated within this process area?

Number of wastewater streams: 1

44. Do the waste streams combine in a sump before leaving the process area?

(Circle one number.)

(01) Yes

02 No

45. How does the combined wastewater stream leave the process area?

(Circle one number.)

01 Overhead piping

(02) Underground sewer

03 Open sewers or ditches

04 Other *(specify)*: _____

SURVEYID=1200

47. Complete Table F, *Water Use and Wastestream Characteristics*, on pages 64 and 65, using the instructions below. The purpose of this table is to characterize sources of waste water within your facility.

Instructions for Completing Table F

Table F requests information on typical water use and wastestream characteristics for pulping and papermaking operations. Refer to the column instructions below in completing this table.

*Column (1): **Process Area**. Listed in Column (1) are the major process areas and their definitions for pulping and papermaking operations. Complete Columns (2) through (6) for each process area.*

*Column (2): **Water Applied to Process**.. Report the sum of service water, water reused from the process, water reused or recycled from other processes, and any other water applied to the process. Report this amount in millions of gallons per day (MGD) to three significant digits.*

*Column (3): **Discharge to Wastewater Treatment**. Report amount of water discharged in millions of gallons per day (MGD) to three significant digits.*

*Column (4): **Percent Recycle**. Report amount of water reused or recycled in the process prior to discharge to wastewater treatment. For example, if water applied to the process is used on a once-through basis, the percent recycle will be zero (0%); if half of the applied water is reused or recycled in or at the process, the percent recycle will be 50%.*

*Column (5): **Waste TSS**. Report total suspended solids (TSS) discharge in pounds per day (lb/day).*

*Column (6): **BOD_5**. Report the five-day biochemical oxygen demand waste load in pounds per day (lb/day).*

SURVEYID=1200

TABLE F: WATER USE AND WASTESTREAM CHARACTERISTICS

(3) Discharge to Waste Treatment (MGD)	(4) Percent Recycle	(5) Waste TSS (lb/day)	(6) BOD_5 (lb/day)
.050	68		
.250			560
5.300	0		
.002	60	0	0
0	100		
0	100		
.682	93	6,856	23,786
0	100		

SURVEY ID=1200

REPLACEMENT PAGE FOR QUESTION 48, PAGE 66

Copy # 1 of 3

PART A, SECTION 3: WATER USE AND WASTESTREAM CHARACTERISTICS

48a. List the name, manufacturer (if applicable), and amount of each material used as a biocide, defoamer, pitch dispersant or for processing secondary fiber in mill operations.

(Do not list additives reported in Question 36. Do not list coatings or sizings reported in Question 37. Indicate in the NOTES section if any recycled materials are used in these products).

	Production and Manufacturer/Supplier	Amount Used lbs/ton	Amount Used lbs/month	Point of Application
a. Biocides	Busan 881 Buckman Laboratories		795	Impco
b. Defoamers	Sclvex 1211 Sclvex Corporation		380	Digester Scrubbe
c. Pitch Dispersants	Naptha CHEM CENTRAL		11,741	Machine Lines
d. Secondary Fiber Processing Chemicals				

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corp Survey ID 1200

REPLACEMENT PAGE FOR QUESTION 48, PAGE 66

Copy # 2 of 3

PART A, SECTION 3: WATER USE AND WASTESTREAM CHARACTERISTICS

48a. List the name, manufacturer (if applicable), and amount of each material used as a biocide, defoamer, pitch dispersant or for processing secondary fiber in mill operations.

(Do not list additives reported in Question 36. Do not list coatings or sizings reported in Question 37. Indicate in the NOTES section if any recycled materials are used in these products).

	Production and Manufacturer/Supplier	Amount Used lbs/ton	Amount Used lbs/month	Point of Application
a. Biocides	Busan 40 Buckman Laboratories		1,237	Brike System
b. Defoamers	Selvex 1211 Selvex Corporation		2,280	#1 PM whitewate
c. Pitch Dispersants	Isopar-(Y) CHEM CENTRAL		6,727	Machine Press Rel
d. Secondary Fiber Processing Chemicals			,	
			,	
			,	
			,	
			,	
			,	

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corporation Survey ID 1200

REPLACEMENT PAGE FOR QUESTION 48, PAGE 66

Copy # 3 of 3

PART A, SECTION 3: WATER USE AND WASTESTREAM CHARACTERISTICS

48a. List the name, manufacturer (if applicable), and amount of each material used as a biocide, defoamer, pitch dispersant or for processing secondary fiber in mill operations.

(Do not list additives reported in Question 36. Do not list coatings or sizings reported in Question 37. Indicate in the NOTES section if any recycled materials are used in these products).

	Production and Manufacturer/Supplier	Amount Used lbs/ton	Amount Used lbs/month	Point of Application
a. Biocides	Busan 110		560	Wells
b. Defoamers				
c. Pitch Dispersants				
d. Secondary Fiber Processing Chemicals				

 INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corp Survey ID 1200

REPLACEMENT PAGE FOR QUESTION 48, PAGE 66

PART A, SECTION 3: WATER USE AND WASTESTREAM CHARCTERISTICS

48b. List the name, manufacturer, color index name and amount of each material used as a dye, pigment, coloring agent, optical brightener or color additive in mill operations. Report this information for the ten materials used in the greatest amount (by weight) at your mill.

(Indicate in the NOTES if any recycled materials are used in the makeup of these products).

	Product and Manufacturer/Supplier	Dye Color Index Name	Amount Used lbs/ton	Amount Used lbs/month	Point of Application
a.	NA				
b.					
c.					
d.					
e.					
f.					
g.					
h.					
i.					
j.					

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

Facility Name Menasha Corporation Survey ID 1200

49. **Attach copies of any and all available data from 1985 to present for polychlorinated biphenyls (PCBs), polychlorinated dibenzo-*p*-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), adsorbable organic halides (AOX), total organic halides (TOX), total chlorinated organics (TOCl), individual chlorinated compounds, and bioassays. Return the data with your completed questionnaire. If these data were previously submitted in the U.S. EPA/Paper Industry Cooperative Dioxin Study, or if no data are available, please note below. Include the date of the sample, the type of the sample, the sample point, the analytical method, the analytical results, the name of the analytical laboratory, and QA/QC support data.**

(Circle one number for each category below.)

		Data Attached	Data Previously Submitted	No Data Available
a.	Wastepaper (paper stock) *(List results by Paper Stock Institute of America grade.)*	01	02	03
b.	Unbleached pulp	01	02	03
c.	Bleached pulp	01	02	03
d.	Untreated wastewaters (in-process)	01	02	03
e.	Untreated wastewaters (influent to wastewater treatment plant)	01	02	03
f.	Treated effluent	01	02	03
g.	Chemical additives/defoamers	01	02	03
h.	Wastewater treatment sludges	01	02	03

SURVEYID=1200

MEN02511

WESTERN MICHIGAN
ENVIRONMENTAL SERVICES, INC
245 EAST LAKEWOOD BLVD
HOLLAND, MI 49424-206
PHONE 616-396-120

TO: Menasha Corporation
Box 155
Otsego, Michigan 49078

Attn: Keith Klinge

DATE: January 12, 1988

ANALYSIS: OF VARIOUS SAMPLES

REPORTED BY: Robert W. Hamm
Robert W. Hamm, Laboratory Director

SAMPLING DATE: Received from client December 15, 1987.

RESULTS: Expressed as noted.

ESI #	SAMPLE I.D.	PARAMETER	CONCENTRATION
8712098-3	Sample #000G-121487	PCB's (µg/ℓ)	<0.5
-4	Sample #002G-121487	PCB's (µg/ℓ)	<0.5
-5	Sample #Sludge-121487	PCB's (mg/kg dry wt)	<0.2*
-5	Sample #Paper-121487	PCB's (mg/kg dry wt)	<0.1

*Very small peaks seen that could be PCB 1242, but estimated to be only about 0.1 mg/kg, which is below reported detection limit.

BLE 3

Scan 3-Chlorinated [illegible] PCBs & [illegible] Chlorine [illegible]

Outfall		[illegible]	[illegible]
Matrix		water	water
Sample Type		composite	grab
Survey Period	from	04/18/88 [illegible]	04/18/88 1145
	to	04/19/88 [illegible]	
Dilution Factor		1	1
		ug/l	ug/l
Aldrin	<	.01	< .01
*Aroclor 1016	<	.05	< .05
*Aroclor 1221	<	.05	< .05
*Aroclor 1232	<	.05	< .05
Aroclor 1242	<	.05	< .05
*Aroclor 1248	<	.05	< .05
Aroclor 1254	<	.05	< .05
Aroclor 1260	<	.05	< .05
*Aroclor 1262	<	.05	< .05
*Aroclor 1268	<	.05	< .05
a-BHC	<	.01	< .01
b-BHC	<	.01	< .01
d-BHC	<	.01	< .01
g-BHC (lindane)	<	.01	< .01
P-6 (PBB)	<	.05	< .05
a-Chlordane	<	.01	< .01
g-Chlordane	<	.01	< .01
2-Chloronaphthalene	<	.2	< .2
4,4'-DDD	<	.01	< .01
4,4'-DDE	<	.01	< .01
1,4'-DDT	<	.01	< .01
4,4'-DDT	<	.01	< .01
1,2-Dichlorobenzene	<	.1	< .1
1,3-Dichlorobenzene	<	.1	< .1
1,4-Dichlorobenzene	<	.1	< .1
Dieldrin	<	.01	< .01
Endosulfan I	<	.01	< .01
Endrin	<	.01	< .01
Heptachlor	<	.01	< .01
Heptachlor epoxide	<	.01	< .01
Hexabromobenzene	<	.01	< .01
Hexachlorobenzene	<	.01	< .01
Hexachlorobutadiene	<	.01	< .01
Hexachlorocyclopentadiene	<	.01	< .01
Hexachloroethane	<	.01	< .01
Methoxychlor	<	.01	< .01
Mirex	<	.01	< .01
Pentachlorobenzene	<	.01	< .01
Pentachloronitrobenzene	<	.01	< .01
1,2,3,4-Tetrachorobenzene	<	.01	< .01
1,2,4,5-Tetrachlorobenzene	<	.01	< .01
*Toxaphene	<	.05	< .05
1,2,3-Trichlorobenzene	<	.01	< .01
1,4,4-Trichlorobenzene	<	.01	< .01
1,3,5-Trichlorobenzene	<	.01	< .01

TABLE 3 Menasha

Scan 3-Chlorinated Hydrocarbons, PCBs & Organochlorine Pesticides

Outfall		030134 (002)		030055 (004)	
Matrix		water		water	
Sample Type		composite		composite	
Survey Period	from	04/18/88 1000		04/18/88 1045	
	to	04/19/88 1000		04/19/88 1045	
Dilution Factor		1		1	
		ug/l		ug/l	
Aldrin	<	.01	<	.01	
*Aroclor 1016	<	.05	<	.05	
*Aroclor 1221	<	.05	<	.05	
*Aroclor 1232	<	.05	<	.05	
Aroclor 1242	<	.05	<	.05	
*Aroclor 1248	<	.05	<	.05	
Aroclor 1254	<	.05	<	.05	
Aroclor 1260	<	.05	<	.05	
*Aroclor 1262	<	.05	<	.05	
*Aroclor 1268	<	.05	<	.05	
a-BHC	<	.01	<	.01	
b-BHC	<	.01	<	.01	
d-BHC	<	.01	<	.01	
BHC (lindane)	<	.01	<	.01	
Br-6 (PBB)	<	.05	<	.05	
a-Chlordane	<	.01	<	.01	
g-Chlordane	<	.01	<	.01	
2-Chloronaphthalene	<	.2	<	.2	
4,4'-DDD	<	.01	<	.01	
4,4'-DDE	<	.01	<	.01	
1,4'-DDT	<	.01	<	.01	
4,4'-DDT	<	.01	<	.01	
1,2-Dichlorobenzene	<	.1	<	.1	
1,3-Dichlorobenzene	<	.1	<	.1	
1,4-Dichlorobenzene	<	.1	<	.1	
Dieldrin	<	.01	<	.01	
Endosulfan I	<	.01	<	.01	
Endrin	<	.01	<	.01	
Heptachlor	<	.01	<	.01	
Heptachlor epoxide	<	.01	<	.01	
Hexabromobenzene	<	.01	<	.01	
Hexachlorobenzene	<	.01	<	.01	
Hexachlorobutadiene	<	.01	<	.01	
Hexachlorocyclopentadiene	<	.01	<	.01	
Hexachloroethane	<	.01	<	.01	
Methoxychlor	<	.01	<	.01	
Mirex	<	.01	<	.01	
Pentachlorobenzene	<	.01	<	.01	
Pentachloronitrobenzene	<	.01	<	.01	
1,2,3,4-Tetrachorobenzene	<	.01	<	.01	
1,2,4,5-Tetrachlorobenzene	<	.01	<	.01	
*Toxaphene	<	.05	<	.05	
1,2,3-Trichlorobenzene	<	.01	<	.01	
1,4,4-Trichlorobenzene	<	.01	<	.01	
1,3,5-Trichlorobenzene	<	.01	<	.01	

TABLE 3 Menasha

Scan 3-Chlorinated Hydrocarbons, PCBs & Organochlorine Pesticides

Outfall		030171 (000)
Matrix		water
Sample Type		composite
Survey Period	from	05/01/90 1040
	to	05/02/90 1040
Dilution Factor		1

		ug/l	
Aldrin	<	.01	ND
*Aroclor 1016	<	.05	ND
*Aroclor 1221	<	.05	ND
*Aroclor 1232	<	.05	ND
Aroclor 1242	<	.05	ND
*Aroclor 1248	<	.05	ND
Aroclor 1254	<	.05	ND
Aroclor 1260	<	.05	ND
*Aroclor 1262	<	.05	ND
*Aroclor 1268	<	.05	ND
a-BHC	<	.01	ND
b-BHC	<	.01	ND
d-BHC	<	.01	ND
g-BHC (lindane)	<	.01	ND
BP-6 (PBB)	<	.05	ND
a-Chlordane	<	.01	ND
g-Chlordane	<	.01	ND
2-Chloronaphthalene	<	.2	ND
4,4'-DDD	<	.01	ND
4,4'-DDE	<	.01	ND
1,4'-DDT	<	.01	ND
4,4'-DDT	<	.01	ND
1,2-Dichlorobenzene	<	.1	ND
1,3-Dichlorobenzene	<	.1	ND
1,4-Dichlorobenzene	<	.1	ND
Dieldrin	<	.01	ND
Endosulfan I	<	.01	ND
Endrin	<	.01	ND
Heptachlor	<	.01	ND
Heptachlor epoxide	<	.01	ND
Hexabromobenzene	<	.01	ND
Hexachlorobenzene	<	.01	ND
Hexachlorobutadiene	<	.01	ND
Hexachlorocyclopentadiene	<	.01	ND
Hexachloroethane	<	.01	ND
Methoxychlor	<	.01	ND
Mirex	<	.01	ND
Pentachlorobenzene	<	.01	ND
Pentachloronitrobenzene	<	.01	ND
1,2,3,4-Tetrachorobenzene	<	.01	ND
1,2,4,5-Tetrachlorobenzene	<	.01	ND
*Toxaphene	<	.05	ND
1,2,3-Trichlorobenzene	<	.01	ND
1,4,4-Trichlorobenzene	<	.01	ND
1,3,5-Trichlorobenzene	<	.01	ND

* Seldomly encountered, reported semi-quantitatively

esi

WESTERN MICHI
ENVIRONMENTAL SERVICES,
245 EAST LAKEWOOD B
HOLLAND, MI 49424-
PHONE 616-396-

MEN02515

TO: Menasha Corporation
320 North Farmer
Otsego, Michigan 49078

Attn: Keith Kling

DATE: August 24, 1990

ANALYSIS: OF PAPER SAMPLES

REPORTED BY: Robert K. Zahray, Laboratory Manager

SAMPLING DATE: Received from client August 8, 1990.

RESULTS: Expressed as milligrams per kilogram (mg/kg).

Parameter	#1 Mach 40 lb. 12/16/89	#2 Mach 26 lb. 04/11/90	#1 Mach 26 lb. 06/26/90	#2 Mach 26 lb. 100% Recycle 08/07/90
PCB-1016	<0.14	<0.14	<0.14	<0.14
PCB-1221	<0.26	<0.26	<0.26	<0.26
PCB-1232	<0.48	<0.48	<0.48	<0.48
PCB-1242	<0.16	<0.16	<0.16	<0.16
PCB-1248	<0.16	<0.16	<0.16	<0.16
PCB-1254	<0.09	<0.09	<0.09	<0.09
PCB-1260	<0.09	<0.09	<0.09	<0.09
Total PCB's	<0.5	<0.5	<0.5	<0.5
ESI #9008083	-1	-2	-3	-4

* = Below detection limit

Report #MI/DNR/SWQ-88/070

Attachment B

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
SURFACE WATER QUALITY DIVISION
AUGUST, 1988

STAFF REPORT

ACUTE TOXICITY ASSESSMENT OF MENASHA CORPORATION PROCESS EFFLUENTS OTSEGO, MICHIGAN APRIL 20-21, 1988 NPDES PERMIT #MI 0003824

As part of a routine compliance inspection survey, staff of the Great Lakes and Environmental Assessment Section (GLEAS), conducted fathead minnow static acute toxicity tests on composite samples of Menasha Corporation's outfalls 002 and 003 process effluent. The effluent samples were collected by SWQD-District staff during April 18-19, 1988. Menasha discharges 0.8 mgd via outfall 002 and 0.92 mgd via outfall 003 to the Kalamazoo River. Testing was conducted according to GLEAS Procedure #42. Chambers were aerated during the study.

SUMMARY

1. Toxicological and physical/chemical data generated during the study are presented in Tables 1a, 1b, 2a, and 2b.

2. The 002 and 003 effluents were not acutely toxic to fathead minnows.

3. The acute toxicity of 002 and 003 effluents to Daphnia magna could not be determined because of the extreme turbidity of these effluents.

Toxicity Testing and Report by: Megan McMahon, Aquatic Biologist
Great Lakes and Environmental Assessment Section
Water Quality Appraisal Unit

Table 1a. Percent survival of fathead minnows exposed to select concentrations of Menasha Corporation's outfall 002 effluent during the period of April 20-22, 1988.

Percent Effluent	Percent Survival/Exposed Period 24 Hours	48 Hours
control*	100	100
50	100	100
100	100	100

* Control was carbon-filtered Lansing City water

Table 1b. Test chamber water quality characteristics during the static, acute fathead minnow toxicity test conducted on Menasha Corporation's outfall 002 effluent.

	Initial: 4/20/88		Final: 4/22/88		
Parameter	control	100%	control	50%	100%
Temperature(C)	22.0	23.0	22.7	22.7	22.8
Dissolved Oxygen(mg/l)	8.5	6.9	8.7	7.5	8.3
pH(S.U.)	8.31	7.68	8.22	8.55	8.86
Conductivity(umhos)	478	837	526	595	837
Alkalinity(mg/l)	48	404	-	-	-
Hardness(mg/l)	88	CNR*	-	-	-
Total Residual Chlorine(mg/l)	-	ND**	-	-	-

* CNR indicates 'could not run' due to color of sample

** ND indicates 'non-detect' (detection level of 0.02 mg/l)

Table 2a. Percent survival of fathead minnows exposed to select concentrations of Menasha Corporation outfall 003 effluent during the period of April 20-22, 1988.

Percent Effluent	Percent Survival/ Exposed Period 24 Hours	48 Hours
control*	100	100
50	100	100
100	100	100

* Control was carbon-filtered Lansing City water

Table 2b. Test chamber water quality characteristics during the static, acute fathead minnow toxicity test conducted on Menasha Corporation outfall 003 effluent.

	Initial: 4/20/88		Final: 4/22/88		
Parameter	control	100%	control	50%	100%
Temperature(C)	22.0	23.0	23.1	23.0	22.9
Dissolved Oxygen(mg/l)	8.5	6.9	8.8	8.7	8.1
pH(S.U.)	8.31	8.69	8.94	8.91	8.90
Conductivity(umhos)	478	1620	491	1061	1630
Alkalinity(mg/l)	48	CNR*	-	-	-
Hardness(mg/l)	88	CNR*	-	-	-
Total Residual Chlorine(mg/l)	-	ND**	-	-	-

* CNR indicates 'count not run' due to color of sample

** ND indicates 'non-detect' (detection level of 0.02 mg/l)

REPORT OF ACUTE TOXICITY TEST RESULTS FOR MENASHA CORPORATION

Prepared for:

MENASHA CORPORATION
Otsego, Michigan

Prepared by:

ECKENFELDER INC.
227 French Landing Drive
Nashville, Tennessee 37228
(615) 255-2288

September 1989

6696

ATTACHMENT C

ECKENFELDER INC.

September 20, 1989 6696

Keith Kling
Menasha Corporation
Box 155
Otsego, MI 49078-0155

Dear Keith:

The report on the toxicity tests conducted on your wastewaters is attached. Acute screening tests on Outfalls 000 to 002 were conducted using fathead minnows and Daphnia magna. The tests were 96 hr in duration with daily renewals for the fathead minnows and 48 hr in duration without renewals for D. magna. None of the tests resulted in significant mortality in 100 percent effluent.

If you have any questions, please contact me at (615) 255-2288.

Sincerely,

ECKENFELDER INC. (formerly AWARE Incorporated)

Richard J. Mirenda

Richard J. Mirenda, Ph.D.
Senior Aquatic Toxicologist

Attachment

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Methods	2
Quality Assurance	2
Results	3

APPENDICES

A	ECKENFELDER INC. Toxicity Test Report
B	Raw Data Sheets

INTRODUCTION

Municipal and industrial dischargers are required, as part of the National Pollutant Discharge Elimination System (NPDES), to measure the toxicity of their wastewater. The permit requirement may be for monitoring purposes only or may contain toxicity limits. The type of tests required vary from state to state and may depend on flow conditions or dilution by the receiving water. The most common tests required are acute tests which measure the short-term toxicity of the wastewater. The test duration may vary from 24 hr to 96 hr, depending on the organism tested and the state requirements. More recently, mini-chronic tests have been utilized to look at longer-term toxicity. These tests involve more subtle effects on the organism, e.g., growth and reproduction, and last 7 days.

The organisms used in these tests have been limited to those that are easily cultured in the laboratory. This ensures that the quality and health of the organisms are consistent over time and does not affect the results of the test. Fish species most often used are the fathead minnow (Pimephales promelas) which is easily reared in the laboratory. The invertebrates used are the water fleas (Daphnia pulex, Daphnia magna and Ceriodaphnia sp.) which are freshwater crustaceans. The culturing methods for these organisms have been outlined by the U.S. Environmental Protection Agency and the American Society for Testing and Materials.

Menasha Corporation in Otsego, Michigan requested that acute screening tests be conducted on Outfalls 000 and 002. The tests exposed fathead minnows and Daphnia magna to 100 percent effluent from each outfall for 96 hr and 48 hr, respectively.

METHODS

Test procedures adhered to those outlined in the U.S. Environmental Protection Agency Manual, "Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms", EPA 600/4-85/013.

Samples were received from Menasha on September 12 and 14, 1989. The temperature of the samples was adjusted to 20°C prior to the start of the test. Water chemistry data were measured and recorded on the appropriate data sheet (Appendix C). Parameters measured were pH, dissolved oxygen, temperature, conductivity, hardness and alkalinity. In addition, a final dissolved oxygen concentration was measured on the test concentrations and control at the time of renewal and at the conclusion of the test.

The tests were started with 28 day old fathead minnows and <24 hr old Daphnia magna. The fathead test consisted of two replicates with ten fish in each test vessel. The D. magna test had four replicates with five organisms in each vessel. The effluent was tested at 100 percent along with controls of reconstituted water made according to USEPA procedures. The fathead minnow tests involved renewal of effluents and control water daily for the duration of the tests. The test chambers were checked every 24 hr for mortality and the number alive recorded on the data sheet (Appendix C). The test was terminated after 48 hr and was deemed acceptable if 90 percent of the control organisms survived.

QUALITY ASSURANCE

All of the organisms which were tested were obtained from cultures maintained by ECKENFELDER INC. The animal stocks were originally obtained from USEPA - Cincinnati and are cultured according to EPA recommended procedures (EPA 600/4-85/013 and EPA 600/4-85/014).

The control water used in the tests was reconstituted water made with glass distilled water to which is added appropriate amounts of KCl, $MgCl_2$, $NaHCO_3$ and $CaSO_4$. The pH, hardness and alkalinity of each batch of water is checked prior to use. Adjustments to these parameters are made if they fall outside the acceptable ranges. The water quality data for each batch of water is recorded in the Water Chemistry Log.

Reference toxicant tests are conducted every month on all of the organisms cultured in our laboratory. The tests are acute and the reference toxicant is cadmium chloride which is obtained from USEPA. Data sheets and LC50 values are kept in laboratory notebooks. The results of the most recent reference tests for the fathead minnow and Daphnia magna are available upon request.

RESULTS

There was no mortality observed in the test of Outfall 002 on the fathead minnows. The test of Outfall 000 resulted in 7 out of 20 fish dead or 35 percent mortality. This is not considered a significant effect since greater than 50 percent of the organisms survived the test. The control mortality was zero so the tests were acceptable.

The mortality observed in the tests with Daphnia magna was also deemed not significant. The test of Outfall 000 resulted in 30 percent mortality (6 out of 20 dead), while the test of Outfall 002 resulted in 20 percent mortality (4 out of 20 dead). The control had 10 percent mortality which is within acceptable limits.

APPENDIX A

ECKENFELDER INC. TOXICITY TEST REPORT

REPORT OF AQUATIC TOXICITY TEST RESULTS

I. GENERAL INFORMATION

A. PLANT INFORMATION

Industry: Menasha Corporation Permit No.:

Address: Paperboard Group
Box 155
Otsego, MI 49078-0155

Contact: Keith Kling

Phone Number: (616) 692-6141

Type of Plant: Paper

Plant Operating Schedule:

Receiving Stream: Kalamazoo River

B. SAMPLE(S)

Source(s): Outfall 002
Outfall 000

Collection Period: 9/11/89

Type of Collection: Grab

Collected by: Menasha personnel

	000	002
Alkalinity (mg/l as $CaCO_3$):	2,700	300
Conductivity (µmhos/cm):	3,950	690
Hardness (mg/l CaCO3):	240	300
pH (standard units):	8.4	7.8

II. DATA FOR FATHEAD MINNOW TESTS

A. TEST TYPE

X Renewal	___ 24 hr	X Static	X Acute
___ Nonrenewal	___ 48 hr	___ Flowthrough	___ Chronic
	X 96 hr		
	___ 7 day		

B. TEST ORGANISM

Common Name: Fathead Minnow Scientific Name: Pimephales promelas

Age: 28 days Source: ECKENFELDER INC. cultures

Observed Diseases: None

Treatment: None

Acclimation: Held in control water prior to testing.

C. TEST METHOD - Reference Material

Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA, Third edition, March 1985.

Other:

D. DILUTION WATER

Source: Reconstituted water Collection Period: 9/12/89

Type Collection: Grab Pretreatment: None

Alkalinity (mg/l as $CaCO_3$): 100 Hardness (mg/l $CaCO_3$): 260

Conductivity (µmhos/cm): 700 pH (standard units): 8.2

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT

DAILY MONITORING

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: TRTD PROCESS WASTE WATER

PERMIT NUMBER: MI0003824

DISCHARGE NUMBER: 003 A

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	7	1	TO	89	7	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EX FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPL THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORM THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND (Penalties under these statutes may include fines up to $10,000 and or imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EX: Jim Porter, General Man.

TYPED OR PRIN

DAY	PAR # / PARAMETER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	50060 CHLORINE (TRC) MG/L	91110 OUTFALL OBS	
01		.546	177	733		8.6		C	
02		.664	162	433		8.5		C	
03		.652	194	400		8.5		C	
04		.608	180	333	0.51	8.6		C	
05		.644	147	400		8.6		C	
06		.728	138	420		8.7		C	
07		.684	146	500		8.6		C	
08		.688	87	440		8.5		C	
09		.704	154	520	0.70	8.6		C	
10		.664	141	480		8.8		C	
11		.616	154	400		8.8		C	
12		.672	150	440		8.8		C	
13		.672	144	440		8.8		C	
14		.668	153	380		8.7		C	
15		.668	209	480		8.7		C	
16		.724	222	500	0.60	7.5		C	
17		.704	273	480		8.5		C	
18		.704	285	640		8.6		C	
19		.656	246	500		8.6		C	
20		.720	192	640		8.4		C	
21		.760	174	480		8.6		C	
22		.720	186	500		8.6		C	
23		.720	147	500	0.48	8.5		C	
24		.720	180	480		8.5		C	
25		.720	173	480		8.6		C	
26		.404	174	600		8.7		C	
27		.641	138	320		8.3		C	
28		.684	137	360		8.5		C	
29		.652	164	480		8.5		C	
30		.720	144	430		8.3		C	
31		.656	156	340		8.3		C	
	TOTAL	20.913							
	AVERAGE	.675	172	[illegible]	[illegible]				

MEN02559

PERMITTEE NAME/ADDRESS (Include Facility Name, Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	002 B
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	84	7	1	TO	89	7	31

I CERTIFY UNDER PENALTY OF LAW I HAVE PERSONALL FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASE THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND C THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INF THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 (Penalties under these statutes may include fines up to $10,000 and or m between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL A
Jim Porte
General M
TYPED OR

DAY	PAR # / PARAMETER / LIMIT / UNITS	85001 BOD-5 LBS/DAY 3354/6261	85002 SUSP-SOLIDS LBS/DAY 3584/5376							
01		848	3711							
02		924	2437							
03		1676	2232							
04		940	1695							
05		821	2246							
06		811	2599							
07		394	2895							
08		514	2535							
09		926	3093							
10		500	2306							
11		906	2345							
12		853	2504							
13		829	2518							
14		269	2173							
15		1144	2730							
16		1365	3093							
17		1626	2856							
18		1643	3788							
19		1324	2755							
20		1213	3910							
21		1123	3074							
22		1139	3017							
23		905	3035							
24		1092	2897							
25		1647	2886							
26		609	2059							
27		745	1713							
28		742	1500							
29		848	3620							
30		726	2632							
31		434	1437							
	TOTAL	30,636	81,796							
	AVERAGE	988	2634							

MEN02560

REPORT OF AQUATIC TOXICITY TEST RESULTS (Cont'd)

E. TEST CHAMBERS

Composition: Glass

Depth: 195mm

Size: 1.0 L

Test Volume per Chamber: 750 ml

F. LOADING TECHNIQUE

Organisms per concentration: 20

Replicates per concentration: 2

Organisms per replicate: 10

G. TESTING DATES

Start: 9/12/89

Complete: 9/16/89

H. SUMMARY OF TEST OBSERVATIONS

1. Most sensitive index: no significant mortality observed in either test

LOEC:

NOEC:

ChV:

LC_{50}:

95 percent confidence limits:

Method:

2. Survival Rates (%)

Concentration (% Effluent)	Survival Rate (%)
1. Control	100
2. 100% - Outfall 000	65
3. 100% - Outfall 002	100
4.	
5.	
6.	
7.	
8.	
9.	
10.	

3. Comments:

I. ATTACHMENT

___ Data Summary Sheets

___ Other:

By: Richard Miranda Date: 7/20/89

ECKENFELDER INC.
227 French Landing Drive
Nasnville, TN 37228

(615) 255-2288

III. DATA FOR WATER FLEA TESTS

A. TEST TYPE

____ Renewal	____ 24 hr	X Static	X Acute
X Nonrenewal	X 48 hr	____ Flowthrough	____ Chronic
	____ 96 hr		
	____ 7 day		

B. TEST ORGANISM

Common Name: Water Flea

Scientific Name: Daphnia magna

Age: <24 hr

Source: ECKENFELDER INC. cultures

Observed Diseases: None

Treatment: None

Acclimation: Held in control water prior to testing

C. TEST METHOD - Reference Material

Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, EPA, Third edition, March 1985.

Other:

D. DILUTION WATER

Source: Reconstituted water

Collection Period: 9/12/89

Type Collection: Grab

Pretreatment: None

Alkalinity (mg/l as $CaCO_3$): 100

Hardness (mg/l $CaCO_3$): 260

Conductivity (µmhos/cm): 700

pH (standard units): 8.2

E. TEST CHAMBERS

Composition: Plastic

Depth: 75mm

Size: 250 ml

Test Volume per Chamber: 50 ml

F. LOADING TECHNIQUE

Organisms per concentration: 20

Replicates per concentration: 4

Organisms per replicate: 5

G. TESTING DATES

Start: 9/12/89

Complete: 9/14/89

H. SUMMARY OF TEST OBSERVATIONS

1. Most sensitive index: no significant mortality observed in either test

LOEC:

NOEC:

ChV:

LC_{50}:

95 percent confidence limits:

Method:

2. Survival Rates (%)

Concentration (% Effluent)	Survival Rate (%)
1. Control	90
2. 100% - Outfall 000	70
3. 100% - Outfall 002	80
4.	
5.	
6.	
7.	
8.	
9.	
10.	

3. Comments:

I. ATTACHMENT

X Data Summary Sheets

____ Other:

By: Richard Miranda Date: 9/20/89

ECKENFELDER INC.
227 French Landing Drive
Nashville, TN 37228

(615) 255-2288

APPENDIX B

RAW DATA SHEETS

TOXICITY TEST DATA SHEET

CLIENT: Menasha PROJECT NO. _____ EFFLUENT ✓ CHEMICAL (SPECIFY): _____
SAMPLE ID#: _____ GRAB _____ COMPOSITE _____ COLLECTED BY: _____
TEST STARTED 9/12 ENDED: 9/16/89 TEST SPECIES: Pimephales promelas AGE: 28d WEIGHT/LENGTH: _____
ORGANISMS PER CONCENTRATION: 20 DILUTION WATER: Reconstituted Water TEST CONDUCTED BY: WSH
COMMENTS: _____
STATIC _____ STATIC RENEWAL ✓ FLOW-THROUGH _____ TOTAL VOLUME PER CHAMBER: 750 ml

	REP	pH (standard unit)					DISSOLVED OXYGEN (mg/l)					CONDUCTIVITY (umho/cm) SALINITY (mg/l)					TOTAL ALKALINITY (mg/l CaCO3)					TOTAL HARDNESS (mg/l CaCO3)					OTHERS					CUMULATIVE MORTALITY			
F		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	24	48	72	96
P	A	8.2	7.9	8.1	8.1	8.3	8.3	7.9	8.5	7.9	8.1	700	720	730	600		100	85	90	100		260	240	260	210							0	0	0	0
	B																															0	0	0	0
	A	8.4	8.9	8.5	8.6	8.8	8.4	8.1	8.6	8.2	7.1	3150	9200	4000	6000		2700	2250	2500	2750		240	220	200	300							3	4	4	4
II	B																															0	1	2	3
	A	7.8	7.9	7.8	7.7	8.1	8.5	7.9	7.5	7.6	7.1	690	750	720	680		300	300	260	285		300	280	400	300							0	0	0	0
II	B																															0	0	0	0

T TEMPERATURES AND TIMES MEASURED: 20°C throughout test

_____ HOUR LC-50 = _____ 95 % CONFIDENCE LIMITS: _____ TO _____ METHOD OF CALCULATION: _____
_____ HOUR LC-50 = _____ 95 % CONFIDENCE LIMITS: _____ TO _____ METHOD OF CALCULATION: _____
_____ HOUR LC-50 = _____ 95 % CONFIDENCE LIMITS: _____ TO _____ METHOD OF CALCULATION: _____

MEN02534

TOXICITY TEST DATA SHEET

CLIENT Menasha PROJECT NO. FREEDOM ✓ CHEMICAL (SPECIFY):
SAMPLE ID# GRAB ✓ COMPOSITE COLLECTED BY:
TEST STARTED 9/12 ENDED 9/14/94 TEST SPECIES Daphnia magna AGE: <24h WEIGHT/LENGTH
ORGANISMS PER CONCENTRATION 20 DILUTION WATER Reconstituted Water TEST CONDUCTED BY: WSH
COMMENTS
STATIC ✓ STATIC RENEWAL FLOW THROUGH TOTAL VOLUME PER CHAMBER: 50 ml

REP	pH (standard unit)					DISSOLVED OXYGEN (mg/l)					CONDUCTIVITY (umho/cm) SALINITY (mg/l)					TOTAL ALKALINITY (mg/l CaCO3)					TOTAL HARDNESS (mg/l CaCO3)					OTHERS					CUMULATIVE MORTALITY			
	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	24	48	72	96
A	81		81			89		89			730					90					24										0	1		
B																															0	0		
C																															0	1		
D																															0	0		
A	8[illegible]		92			86		72			1052					320					22[illegible]										–	1		
B																															–	4		
C																															–	1		
D																															–	0		
A	78		82			64		86			720					260					100										0	0		
B																															1	1		
C																															1	2		
D																															0	1		

TEMPERATURES AND TIMES MEASURED. 20°C throughout the test

____ HOUR LC-50 = _____ 95 % CONFIDENCE LIMITS: _____ TO _____ METHOD OF CALCULATION: _____
____ HOUR LC-50 = _____ 95 % CONFIDENCE LIMITS: _____ TO _____ METHOD OF CALCULATION: _____
____ HOUR LC-50 = _____ 95 % CONFIDENCE LIMITS: _____ TO _____ METHOD OF CALCULATION: _____

MEN02535

SECTION 4: WASTEWATER TREATMENT

Section 4 requests information on the facility's wastewater treatment system and wastestreams.

Unless otherwise instructed, all responses should reflect information on current mill operations.

Please read each question. If a particular question does not apply or data is not available, answer with N/A and continue to the next question. If you have any questions about this section or this survey, call the Survey Helpline (1-800-635-8850).

Use the NOTES spaces within and at the end of the section if you wish to explain your response to any question. Reference each comment with the appropriate question number. Photocopy tables if necessary.

50. Which of the following best describes the discharge practices of your facility?

(Circle all numbers that apply.)

(01) Discharge after treating in a company-owned treatment plant that handles waste only from this facility

02 Discharge after treating in combination with wastes from other facilities in a company-owned treatment plant

03 Discharge to a treatment plant that is not owned by the mill (e.g., a POTW)

04 Dispose of wastewater by spray irrigation or percolation

05 Discharge without treatment

51. If you have an intermittent or controlled release discharge describe the conditions to your discharge.

(If necessary, use the NOTES space to complete your description. Reference your comments by the above question number. If you do not have an intermittent or controlled release discharge, GO TO THE NEXT QUESTION.)

_____

_____

_____

_____

SURVEY ID= 1200

59. **What is the expiration date of your facility's NPDES permit?**

(Report the month, date, and year as two-digit numbers; e.g., June 1, 1990 = 06-01-90.)

Expiration date: 05 - 31 - 90 Recently approved permit expires 10-1-95

60. **Does your facility's NPDES permit contain bioassay requirements on the facility's final effluent?**

(Circle one number.)

01 Yes *(CONTINUE TO NEXT QUESTION)* In new permit as described below.

02 No *(GO TO QUESTION 62)*

61. **On what frequency are your facility's bioassay tests conducted?**

(Circle one number.)

01 At the time of permit reissuance only

02 Once over the life of the permit

03 Once per year

04 Quarterly (four times per year)

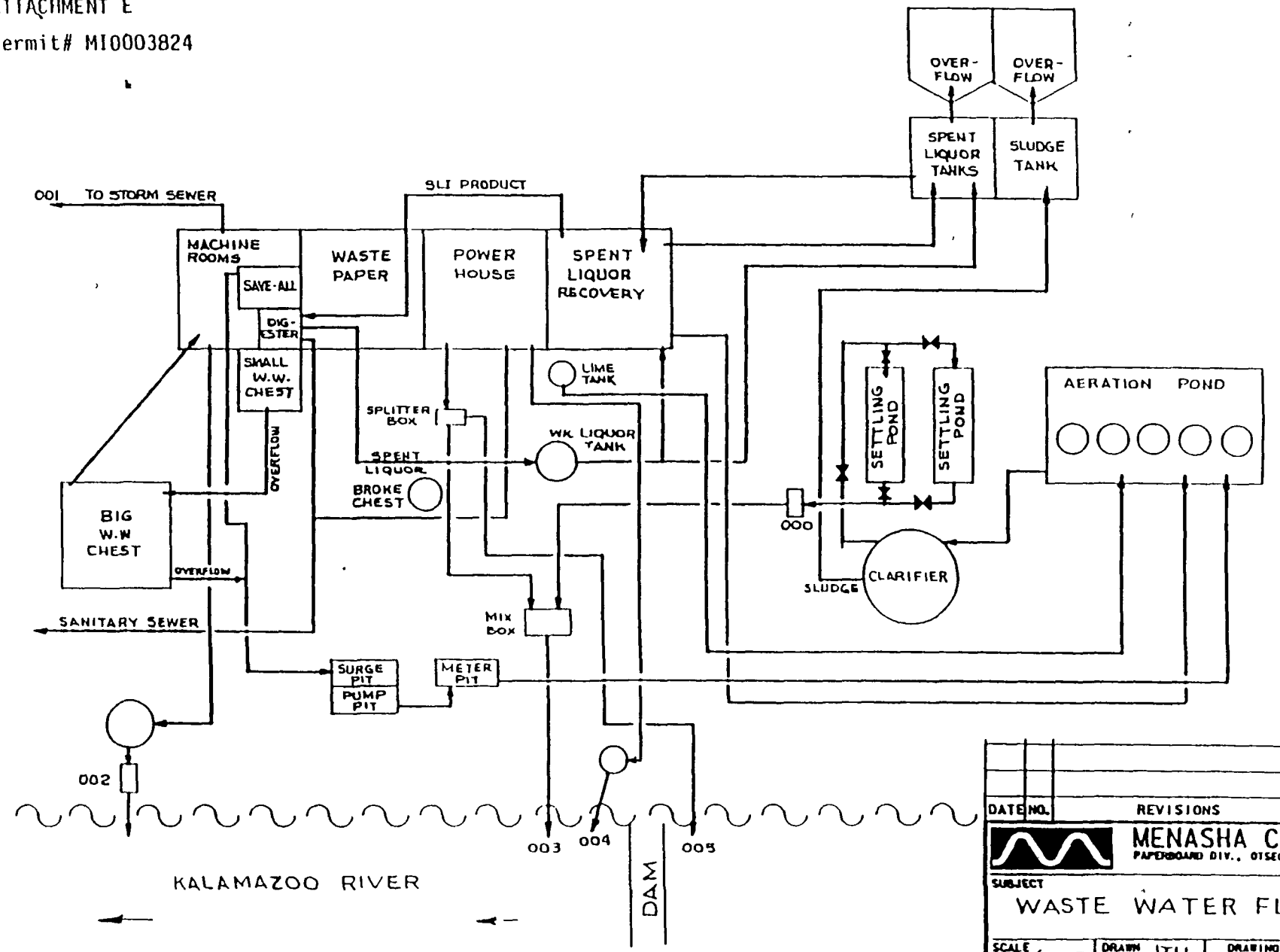
05 Monthly

06 Other *(specify)*: Four tests to be conducted once every two months upon approval of a written biomonitoring plan.

SURVEY ID=1200

ATTACHMENT E

Permit# MI0003824



DATE	NO.	REVISIONS	BY

MENASHA CORP.
PAPERBOARD DIV., OTSEGO, MICH.

SUBJECT
WASTE WATER FLOW

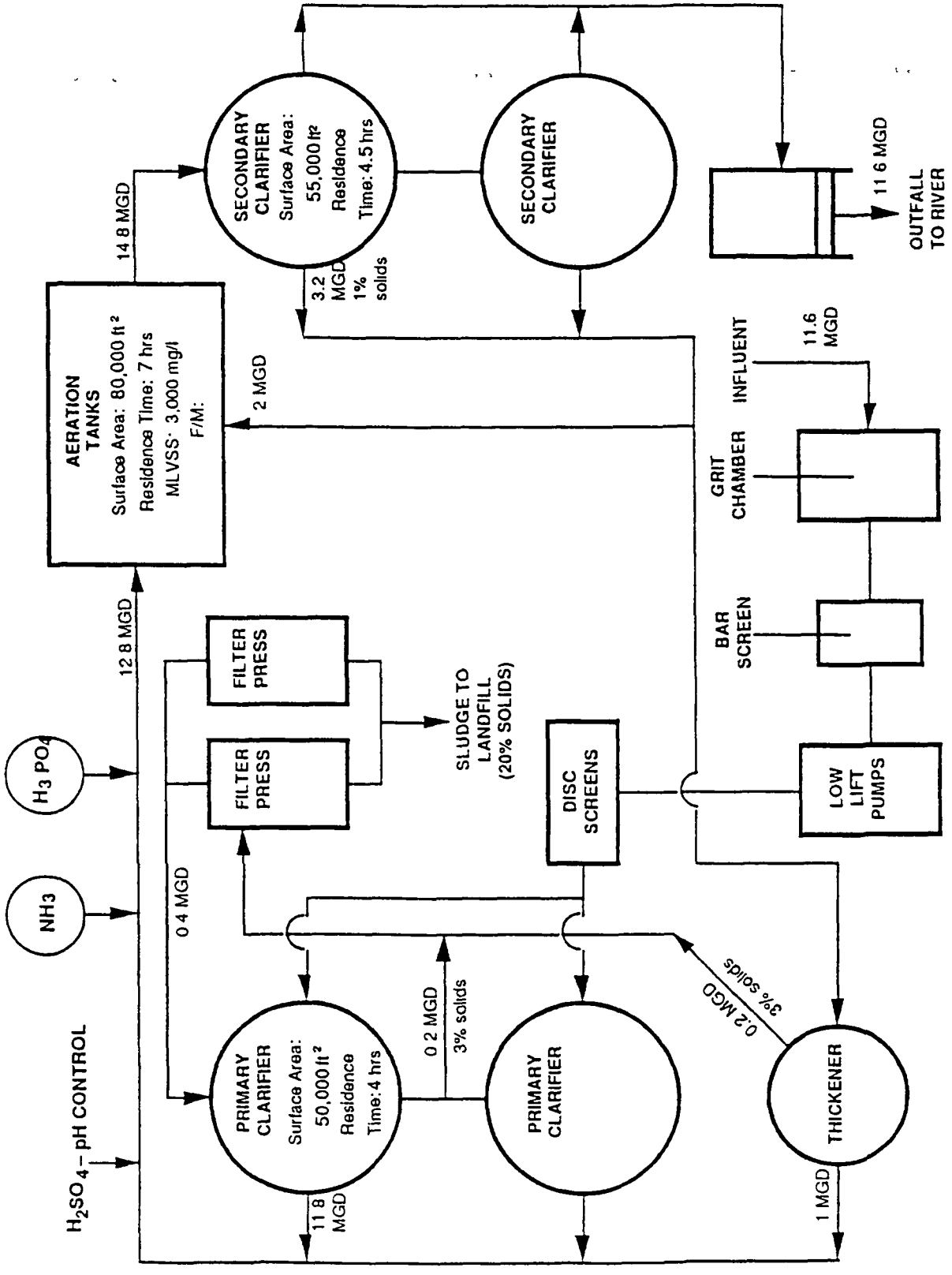
SCALE	DRAWN JTH	DRAWING NUMBER
	DATE 11-17-89	CKD

SHEET _ OF _

MEN02538

231SEEDEE1 SAV

SAMPLE WASTEWATER TREATMENT SYSTEM SCHEMATIC



If you wish to supply the wastewater characteristic data requested from computer printouts, you must ensure that the printout provides a tabular format similar to the following tables. Label each printout with the appropriate title used in the questionnaire and label columns with the same column headings used in the tables.

SURVEYID=1200

TABLE G: INFLUENT-TO-PRIMARY TREATMENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	11,201	,	0	,	,
FEB 89	,	,	0	,	,
MAR 89	,	,	0	,	,
APR 89	,	,	0	,	,
MAY 89	,	,	0	,	,
JUN 89	,	,	0	,	,
JUL 89	,	,	0	,	,
AUG 89	,	,	0	,	,
SEP 89	,	,	0	,	,
OCT 89	,	,	0	,	,
NOV 89	,	,	0	,	,
DEC 89	8,960	,	0	,	,

SURVEYID=1200

TABLE H: PRIMARY EFFLUENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89			0		
FEB 89			0		
MAR 89			0		
APR 89			0		
MAY 89			0		
JUN 89			0		
JUL 89			0		
AUG 89			0		
SEP 89			0		
OCT 89			0		
NOV 89			0		
DEC 89			0		

SURVEYID=1200

SURVEYED=1200

TABLE I: INFLUENT-TO-SECONDARY TREATMENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	10,304	4,455	04	40,538	28,211
FEB 89	6,293	3,145	04	20,257	17,584
MAR 89	6,877	4,260	05	32,514	23,795
APR 89	6,169	4,510	04	27,376	23,329
MAY 89	5,267	4,353	04	27,695	24,824
JUN 89	5,173	4,472	05	26,411	21,855
JUL 89	5,229	4,077	04	33,649	25,021
AUG 89	4,463	4,490	05	29,574	24,416
SEP 89	6,462	3,779	04	32,590	26,397
OCT 89	6,548	3,562	04	29,890	20,834
NOV 89	11,703	3,936	05	35,221	27,641
DEC 89	7,788	4,230	04	28,442	21,530

SURVEYID=1220

TABLE J: SECONDARY EFFLUENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
FEB 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
APR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAY 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUL 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
AUG 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
SEP 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
OCT 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
NOV 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
DEC 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐

SURVEYID=1200

TABLE K: FINAL EFFLUENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	32	21	31	375	75
FEB 89	45	17	28	136	68
MAR 89	31	16	31	238	55
APR 89	28	12	30	87	45
MAY 89	63	17	31	464	63
JUN 89	59	13	30	98	44
JUL 89	39	06	31	61	22
AUG 89	18	05	31	82	18
SEP 89	46	15	30	677	53
OCT 89	48	19	31	337	77
NOV 89	69	10	30	235	43
DEC 89	34	13	31	130	45

SURVEYID=1200

TABLE J: SECONDARY EFFLUENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
FEB 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
APR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAY 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUL 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
AUG 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
SEP 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
OCT 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
NOV 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
DEC 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: TRTD PROCESS WASTE WATER

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER: MI0003824

DISCHARGE NUMBER: 003 A

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	1	1	TO	89	1	31

THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and/or imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Jim Porter, General Manager (TYPED OR PRINTED)

DAY	PAR # / PARAMETER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	50060 CHLORINE (TRC) MG/L	91110 OUTFALL OBS		
01		.608	227	330		8.4		0		
02		.588	230	370	.29	8.4		0		
03		.528	216	310		8.4		0		
04		.580	214	430		8.5		0		
05		.544	219	430		8.5		0		
06		.556	241	500		8.5		0		
07		.648	231	500		8.5		0		
08		.688	259	400	.34	8.4		0		
09		.616	239	400		8.4		0		
10		.616	253	500		8.4		0		
11		.660	263	460		8.5		0		
12		.664	265	533		8.5		0		
13		.732	306	700		8.3		0		
14		.676	302	600		8.3		0		
15		.692	358	800	.63	8.4		0		
16		.552	360	733		—		0		
17		.176	269	733		8.5		0		
18		.728	230	467		8.4		0		
19		.728	225	667		8.4		0		
20		.688	291	800		8.6		0		
21		.680	317	667		8.6		0		
22		.712	302	600		8.5		0		
23		.656	332	567	.49	8.4		0		
24		.748	240	700		8.5		0		
25		.708	286	633		8.5		0		
26		.684	310	667		8.6		0		
27		.684	228	633		8.5		0		
28		.668	317	700		8.5		0		
29		.712	247	733	.77	8.3		0		
30		.628	228	533		8.4		0		
31		.700	315	667		8.4		0		
	TOTAL	19.91								
	AVERAGE	.642	272	588	.50	—	—	0		

MEN02547

DISCHARGE MONITORING REPORT

DAILY MONITORING

(Name Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY
LOCATION OUTFALL 000 & 002 COMBINED

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	002 B

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	1	1	TO	89	1	31

THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
Jim Porter
General Manager
TYPED OR PRINTED

	PAR #	85001	85002							
	PARA MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
DAY	UNITS									
01		1173	1678							
02		1150	1820							
03		970	1634							
04		1094	2094							
05		1091	1990							
06		1138	2332							
07		1317	2714							
08		1525	2316							
09		1256	2067							
10		1335	2588							
11		1472	2544							
12		1506	2977							
13		1902	4299							
14		1744	3413							
15		2096	4641							
16		1700	3395							
17		442	1115							
18		1445	3868							
19		1773	4076							
20		1731	4628							
21		1871	3818							
22		2168	3632							
23		1857	3125							
24		1742	4445							
25		1906	3809							
26		2010	3871							
27		1710	3658							
28		1836	3949							
29		1582	4397							
30		1369	5394							
31		1888	3929							
	TOTAL	47,798	99,216							
	AVERAGE	1542	3,200							

MEN02548

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION: TRTD PROCESS WASTE WATER

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	003 A

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	2	1	TO	89	2	28

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EX FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED OI THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPL THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORM THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U S C § 1001 AND (Penalties under these statutes may include fines up to $10 000 and or maxim between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT: 6/1/89

NAME/TITLE PRINCIPAL EX: Jim Porter, General Man

TYPED OR PRIN

DAY	PAR # / PARAMETER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	50060 CHLORINE (TRC) MG/L	91110 OUTFALL OBS
01		.620	291	767		8.5		0
02		.496	277	800		8.4		0
03		.548	236	733		8.4		0
04		.600	255	733		8.5		0
05		.552	263	667	.28	8.4		0
06		.620	266	567		8.3		0
07		.616	246	561		8.3		0
08		.644	229	500		8.4		0
09		.600	253	500		8.5		0
10		.596	234	867		8.4		0
11		.656	264	433		8.4		0
12		.624	238	500	.68	8.2		0
13		.620	245	567		8.5		0
14		.616	222	633		8.3		0
15		.584	277	667		8.3		0
16		.628	261	733		8.4		0
17		.530	298	733		8.4		0
18		.600	295	700		8.4		0
19		.536	317	700	.49	8.3		0
20		.644	300	633		8.4		0
21		.656	293	567		8.3		0
22		.612	352	700		8.3		0
23		.608	328	400		8.5		0
24		.584	320	733		8.3		0
25		.576	342	667		8.4		0
26		.616	323	600	.57	8.4		0
27		.632	305	500		8.4		0
28		.620	315	467		8.3		0
29								
30								
31								
TOTAL		16.94						
AVERAGE		.605	287	[illegible]	.10			

MEN02549

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

MICHIGA DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	002 B
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	2	1	TO	89	2	28

I CERTIFY UNDER PENALTY OF LA HAT I HAVE PERSONA FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BA THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINI BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AN THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U S C § 1 (Penalties under these statutes may include fines up to $10 000 and o between 6 months and 5 years)

for TP
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCI
Jim Port
General
TYPED (

DAY	PAR # / PARAMETER / LIMIT / UNITS	85001 BOD-5 LBS/DAY 3354/6261	85002 SUSP-SOLIDS LBS/DAY 3584/5376						
01		1581	4007						
02		1206	3349						
03		1096	3407						
04		1330	3706						
05		1278	3100						
06		1429	2055						
07		1333	2049						
08		1298	2719						
09		1322	2535						
10		1234	4366						
11		1490	2397						
12		1279	2623						
13		1319	2969						
14		1199	3239						
15		1403	3290						
16		1438	3881						
17		1524	3694						
18		1554	3557						
19		1483	3162						
20		1693	3458						
21		1690	3163						
22		1381	3618						
23		1799	2160						
24		1390	3635						
25		1696	3230						
26		1387	3439						
27		1661	2688						
28		1674	2438						
29									
30									
31									
	TOTAL	43310	89,696						
	AVERAG	1,549	3203						

MEN02550

PERMITTEE NAME/ADDRESS (Include Facility Name / Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: TRTD PROCESS WASTE WATER

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	003 A
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	24	3	1	TO	24	3	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to $10,000 and/or imprisonment for up to 5 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT: Kell-6 Kl, jr. JP

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER (TYPED OR PRINTED): Jim Porter, General Manager

	PAR #	50050	00310	00530	85005	00400	50060	91110		
	PARA METER	FLOW CONDUIT MGD	BOD-5 MG/L	SUSP-SOLIDS MG/L	PHOS-SOLUB LBS/DAY	PH 0 TO 14	CHLORINE (TRC) MG/L	OUTFALL OBS		
	LIMIT				AVE. 8.0	6 TO 9				
DAY	UNITS									
01		.636	320	267		8.3		C		
02		.661	332	433		8.4		C		
03		.6[illegible]	324	567		8.0		0		
04		.656	273	367		8.4		0		
05		.664	302	200	.33	8.4		0		
06		.620	276	467		8.5		0		
07		.664	288	500		8.4		0		
08		.628	294	467		8.4		0		
09		.668	326	600		8.4		0		
10		.668	368	367		8.4		0		
11		.684	352	567		8.4		0		
12		.664	341	700	.66	8.4		0		
13		.624	352	800		8.4		0		
14		.632	342	633		8.4		0		
15		.648	322	600		8.4		0		
16		.592	319	533		8.4		0		
17		.604	326	600		8.4		0		
18		.696	297	567		8.4		0		
19		.636	294	600	.42	8.4		0		
20		.664	311	567		8.4		0		
21		.636	266	533		8.4		0		
22		.616	328	500		8.3		0		
23		.631	335	467		8.5		0		
24		.644	337	467		8.5		0		
25		.677	346	500		8.5		0		
26		.700	265	533	.41	8.3		0		
27		.632	264	533		8.3		0		
28		.637	295	500		8.3		0		
29		.686	310	533		8.3		0		
30		.668	301	533		8.4		0		
31		.681	312	500		8.3		0		
	TOTAL	20.763								
	AVERAGE	.654	296	492	.41		0	0		

MEN02551

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT

DAILY MONITORING

MI0003824	002 B
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	3	1	TO	89	3	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years)

Kurt B. Klug for JT	Jim Porter General Manager
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT	NAME/TITLE PRINCIPAL EXECUTIVE OFFICER TYPED OR PRINTED

	PAR #	85001	85002							
	PARA MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
DAY	UNITS									
01		1762	3035							
02		1930	2499							
03		1724	2910							
04		1612	2055							
05		1726	2803							
06		1533	2445							
07		1649	2800							
08		1606	2464							
09		1761	3376							
10		2045	3124							
11		2052	3274							
12		1925	3203							
13		1255	4179							
14		1288	3462							
15		1568	3243							
16		1602	2631							
17		1280	3099							
18		1774	3329							
19		1594	3194							
20		1647	3172							
21		1469	2662							
22		1369	2922							
23		1271	2477							
24		1349	2516							
25		1445	2124							
26		1576	3157							
27		1432	2812							
28		1710	2776							
29		1834	3089							
30		1668	2981							
31		1482	2831							
	TOTAL	51,834	92,482							
	AVERAGE									

MEN02552

PERMITTEE NAME/ADDRESS (Include Facility Name, Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION TRTD PROCESS WASTE WATER

MICHIGAN DEPARTMENT OF [illegible]RAL RESOURCES

DISCHARGE MONITO[illegible]G REPORT
DAILY MONITORING

MI0003824	003 A
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	4	1	TO	89	4	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years)

Keith G Kl[illegible] for JP
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
Jim Porter
General Manager
TYPED OR PRINTED

	PAR #	50050	00310	00530	85005	00400	50060	91110		
	PARA MATER	FLOW CONDUIT MGD	BOD-5 MG/L	SUSP-SOLIDS MG/L	PHOS-SOLUB LBS/DAY	PH 0 TO 14	CHLORINE (TRC) MG/L	OUTFALL OBS		
	LIMIT				AVE. 8.0	6 TO 9				
DAY	UNITS									
01		.644	253	433		8.4		0		
02		.636	244	500	0.27	8.3		0		
03		.584	316	700		8.3		0		
04		.564	315	633		8.4		0		
05		.532	284	633		8.3		0		
06		.500	303	633		8.3		0		
07		.504	329	733		8.4		0		
08		.533	323	633		8.4		0		
09		.567	298	567	0.57	8.3		0		
10		.588	306	633		8.3		0		
11		.583	293	567		8.4		0		
12		.560	261	667		8.4		0		
13		.540	249	433		8.4		0		
14		.536	237	800		8.4		0		
15		.576	267	600		8.4		0		
16		.584	291	600	0.93	8.2		0		
17		.541	280	667		8.1		0		
18		.572	274	600		8.2		0		
19		.603	247	533		8.2		0		
20		.576	257	600		8.2		0		
21		.572	270	633		8.2		0		
22		.564	265	533		8.1		0		
23		.540	231	667	0.72	8.1		0		
24		.612	250	767		8.1		0		
25		.584	270	767		8.0		0		
26		.536	231	500		8.4		0		
27		.576	144	500		8.5		0		
28		.584	213	500		8.4		0		
29		.560	192	400		8.5		0		
30		.560	204	433	0.28	8.4		0		
31										
	TOTAL	16,911	7902	18065						
	AVERAGE	.564	263	602	0.55		0	0		

PR4612 1 12/86

MEN02553

PERMITTEE NAME/ADDRESS (Include Facility Name, Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	002 B

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	4	1	TO	89	4	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

Keith B. King For JP
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
Jim Porter
General Manager
TYPED OR PRINTED

	PAR #	85001	85002							
	PARA MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
DAY	UNITS									
01		1402	2342							
02		1332	2667							
03		1579	3434							
04		1525	3007							
05		1309	2841							
06		1318	2665							
07		1440	3961							
08		1691	3142							
09		1498	2710							
10		1577	3144							
11		1455	2773							
12		1258	3142							
13		1159	1965							
14		1101	3603							
15		1323	2902							
16		1458	2946							
17		1307	3043							
18		1343	2888							
19		1290	2729							
20		1305	3003							
21		1367	3147							
22		1289	2532							
23		1089	3032							
24		1322	3954							
25		1362	3783							
26		138	1446							
27		127	2440							
28		1079	2466							
29		929	1887							
30		980	2049							
31										
	TOTAL	38,504	85,651							
	AVERAGE	1283	2855							

PR4612 1 12/86

MEN02554

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: TRTD PROCESS WASTE WATER

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	003 A
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	5	1	TO	89	5	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to $10,000 and/or imprisonment of between 6 months and 5 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER (TYPED OR PRINTED): Jim Porter, General Manager

DAY	PAR # / PARA MATER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	50060 CHLORINE (TRC) MG/L	91110 OUTFALL OBS		
01		.552	204	433		8.4		0		
02		.552	214	367		8.5		0		
03		.513	186	333		8.5		0		
04		.544	186	433		8.4		0		
05		.548	228	400		8.5		0		
06		.520	241	333		8.5		0		
07		.624	210	367	2.33	8.4		0		
08		.552	233	467		8.5		0		
09		.620	211	367		8.6		0		
10		.600	219	433		8.6		0		
11		.596	211	400		8.6		0		
12		.600	318	533		8.7		0		
13		.584	339	667		8.6		0		
14		.620	224	533	2.21	8.5		0		
15		.516	251	467		8.5		0		
16		.584	239	500		8.5		0		
17		.632	252	633		8.5		0		
18		.600	282	567		8.6		0		
19		.600	238	533		8.7		0		
20		.600	214	433		8.7		0		
21		.656	222	600	2.60	8.4		0		
22		.536	214	467		8.5		0		
23		.568	228	500		8.6		0		
24		.576	228	500		8.6		0		
25		.572	210	567		8.6		0		
26		.624	210	467		8.6		0		
27		.568	198	600		8.7		0		
28		.576	204	500		8.4		0		
29		.517	138	500	2.34	8.4		0		
30		.556	222	500		8.3		0		
31		.604	234	433		8.5		0		
	TOTAL	18.130								
	AVERAGE	.586	226	478	1.01		0	0		

PR4612 • 12/86

MEN02555

PERMITTEE NAME AND ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION: OUTFALL 000 & 002 COMBINED

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	002 B

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	5	1	TO	89	5	31

I HEREBY CERTIFY THAT I AM FAMILIAR WITH THE INFORMATION CONTAINED IN THIS REPORT AND BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Jim Porter, General Manager (TYPED OR PRINTED)

DAY	PAR # / PARAMETER / LIMIT / UNITS	85001 BOD-5 LBS/DAY 3354/6261	85002 SUSP-SOLIDS LBS/DAY 3584/5376							
01		976	2020							
02		1004	1717							
03		924	1630							
04		907	2008							
05		1193	1869							
06		1630	1714							
07		1309	1964							
08		1121	2183							
09		1126	1927							
10		1127	2184							
11		1100	2024							
12		1647	2695							
13		1649	3270							
14		1195	2774							
15		1253	2280							
16		1197	2458							
17		1359	3367							
18		1442	2862							
19		1173	2689							
20		1142	2231							
21		1260	3355							
22		990	2141							
23		1112	2399							
24		1134	2454							
25		1143	2772							
26		1133	2524							
27		1064	2485							
28		1007	2414							
29		706	2490							
30		1048	2356							
31		1203	2224							
	TOTAL	36,173	73,985							
	AVERAGE	1167	2387							

PR4612 12/86

MEN02556

PERMITTEE NAME/ADDRESS (Include Facility Name Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: TRTD PROCESS WASTE WATER

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	003 A

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	6	1	TO	89	6	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
Jim Porter
General Manager
TYPED OR PRINTED

	PAR #	50050	00310	00530	85005	00400	~~50060~~ -	91110		
	PARA MATER	FLOW CONDUIT MGD	BOD-5 MG/L	SUSP-SOLIDS MG/L	PHOS-SOLUB LBS/DAY	PH 0 TO 14	~~CHLORINE (TRC) MG/L~~	OUTFALL OBS		
	LIMIT				AVE. 8.0	6 TO 9				
DAY	UNITS									
01		.622	216	366		8.5		0		
02		.800	150	400		8.6		0		
03		.680	132	400		8.6		0		
04		.686	168	367	0.97	8.5		0		
05		.608	156	333		8.5		0		
06		.624	150	400		8.5		0		
07		.628	138	367		8.5		0		
08		.629	218	967		8.6		0		
09		.588	192	633		8.4		0		
10		.572	161	267		8.4		0		
11		.684	156	333	0.46	8.4		0		
12		.636	164	433		8.3		0		
13		.624	144	300		8.2		0		
14		.660	168	533		8.1		0		
15		.664	312	266		8.3		0		
16		.620	152	400		8.9		0		
17		.648	153	433		8.4		0		
18		.716	156	300	0.72	8.3		0		
19		.592	144	333		8.4		0		
20		.512	138	233		8.4		0		
21		.572	132	233		8.4		0		
22		.536	138	367		8.3		0		
23		.592	114	267		8.3		0		
24		.544	114	300		8.5		0		
25		.580	135	500		8.5		0		
26		.584	137	433	0.29	8.6		0		
27		.576	150	433		8.6		0		
28		.576	150	433		8.6		0		
29		.584	142	400		8.6		0		
30		.600	150	600		8.6		0		
31										
	TOTAL	18.477								
	AVERAGE	.616	158	408	.61					

MEN02557

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	002 B
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	6	1	TO	89	6	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or imprisonment up to 5 years or between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
Jim Porter
General Manager
TYPED OR PRINTED

	PAR #	85001	85002							
	PARA MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
DAY	UNITS									
01		1158	2997							
02		880	2707							
03		798	2323							
04		1042	2191							
05		837	1749							
06		848	2145							
07		777	1942							
08		1169	5080							
09		981	3154							
10		785	1214							
11		946	1956							
12		938	2340							
13		790	1595							
14		966	2998							
15		1780	1554							
16		818	2129							
17		845	2368							
18		958	1840							
19		744	1727							
20		637	1111							
21		612	1131							
22		654	1718							
23		614	1439							
24		560	1411							
25		653	2454							
26		705	2150							
27		756	2122							
28		756	2145							
29		721	1899							
30		783	3075							
31										
	TOTAL	25,571	64,819							
	AVERAGE	852	2161							

MEN02558

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply)*:
- 01 pastureland
- 02 woodland
- 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number)*:
- 01 Yes
- 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number)*:
- 01 Yes
- 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number)*:
- 01 Yes
- 02 No

p. Other run-on/run-off controls *(specify)*: _____

_____

SURVEYED=1200

Copy # ☐ of ☐ R

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   02 No

p. Other run-on/run-off controls *(specify)*: _____

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p. Other run-on/run-off controls *(specify):* _____

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- 01 Yes
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_____

SURVEYID=1200

Questions 95 through 104 request information about waste minimization efforts implemented at this facility in the last five years. Only include those efforts that reduce pollutant formation/discharge, air emissions, or solid waste generation. Please do not include information on recycling of materials unrelated to pulp, paper, and paperboard manufacturing processes.

***Waste** is defined as any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, but does not include solid or dissolved material in domestic sewage.*

***Waste minimization** is the reduction, to the extent feasible, of the waste that is generated or subsequently treated, stored, or disposed of. It includes any **source reduction** or **recycling** activity undertaken that results in either (1) the reduction of total volume or quantity of waste, or (2) the reduction of toxicity of waste, so long as such reduction is consistent with the goal of minimizing present and future threats to human health and the environment.*

***Source reduction** refers to the reduction or elimination of waste generation at the source, usually within a process. Source reduction measures can include process modification, feedstock substitutions or improvements in feedstock purity, various housekeeping and management practices, increases in the efficiency of machinery, and even recycling within a process. Source reduction implies any action that reduces the amount of waste exiting from a process.*

***Recycling** refers to the use or reuse of material as an effective substitute for a commercial product, or as an ingredient or feedstock in an industrial process. Recycling also refers to the reclamation of useful constituent fractions within a waste material or removal of contaminants from a waste to allow it to be reused. Recycling implies use, reuse, or reclamation of material either onsite or offsite after it is generated by a particular process.*

Treatment, disposal, and other activities that shift chemicals or wastes from one media to another (such as installing a scrubber or an incinerator, resulting in a shift from air emissions to water or land releases) do not prevent pollution and should not be reported as such.

*The following are examples of activities that **should not be reported** as waste minimization activities:*

- *Incineration or other thermal treatment*
- *Installation of a filter press or other equipment to reduce water content*
- *Treatment to reduce volume or toxicity*
- *Burning in boilers or other energy recovery*
- *Sending wastes offsite for management other than recycling*

SURVEYID=1200

96. List all process wastestreams from which materials are recovered for re-use at this facility or that are transferred to offsite materials recovery operations.
(List the process from which the wastestream originates, indicate whether it is onsite or offsite, and describe the recovered material and the quantity recovered.)

	Process/ Recovered Material	Onsite (circle one)	Offsite	Quantity Recovered	Unit of Measure
a.	Aeration Pond Sludge	(01)	02	44,000	GPD
b.	Liquor Incinerator Sodium Carbonate	(01)	02	9,804	Tons per year
c.		01	02	,	
d.		01	02	,	
e.		01	02	,	
f.		01	02	,	
g.		01	02	,	
h.		01	02	,	

SURVEYID=1200

98. **Describe activities planned by your facility for the long term to reduce chlorine usage.**

(List the activity, month and year to be implemented, affected process, affected media, wastestream affected, and anticipated quantity of waste reduced. If your facility plans to conduct more than one chlorine reducing activity, photocopy this page BEFORE writing on it and label each page in the space provided at the top of the question box. If your facility does not plan any chlorine-reducing activities, check the 'N/A' box.)

❑ N/A—*CONTINUE TO THE NEXT QUESTION*

Planned Chlorine Reduction Activity—Copy # ☐ of ☐

a. Activity: _____

b. Month and year to be implemented: ☐☐ – ☐☐

c. Affected process: _____

d. Affected media
(circle all that apply): 01 Air 02 Solids 03 Water 04 Product

e. Wastestream affected: _____

f. Anticipated quantity reduced: _____

Attach all available data associated with this activity.

SURVEYID=1200

102. **Describe activities not listed in the previous questions conducted within the last five years for the purpose of reducing pollutant formation/discharge, air emissions, and solid waste generation. Please indicate any chlorine minimization activities other than those conducted in the bleach process (e.g., substitution of slimicides).** *(List the activity, month and year implemented, affected process, affected media, wastestream affected, and estimate the quantity of waste reduced. If your facility conducted more than one waste minimization activity, photocopy this page BEFORE writing on it and label each page in the space provided at the top of the question box. If your facility has not conducted any waste minimization activities, check the 'N/A' box.)*

❑ N/A—*CONTINUE TO THE NEXT QUESTION*

Waste Minimization Activity—Copy # ☐ of ☐

a. Activity: _____

b. Month and year implemented: ☐☐ - ☐☐

c. Affected process: _____

d. Affected media
(circle all that apply): 01 Air 02 Solids 03 Water 04 Product

e. Wastestream affected: _____

f. Quantity reduced *(list by year if available):* _____

(Describe method used to calculate quantity reduced): _____

Attach all available data associated with this activity.

SURVEYID=1200

NOTES

Question Number(s)	Notes, comments, etc.

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION TRTD PROCESS WASTE WATER

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	003 A

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	8	1	TO	89	8	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMI FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON M THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE IN BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATI THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 (Penalties under these statutes may include fines up to $10,000 and or imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXEC
Jim Porter
General Manag
TYPED OR PRINTED

DAY	PAR # / PARAMETER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY	00400 PH 0 TO 14	~~50060 CHLORINE (TRC) MG/L~~	91110 OUTFALL OBS		
	LIMIT				AVE. 8.0	6 TO 9				
01		.632	159	440		8.3		0		
02		.636	174	360		8.3		0		
03		.626	171	380		8.3		0		
04		.646	147	420		8.5		0		
05		.692	141	500		8.4		0		
06		.700	134	340	0.41	8.2		0		
07		.616	126	360		8.2		0		
08		.624	120	360		8.2		0		
09		.612	117	380		8.3		0		
10		.668	114	320		8.3		0		
11		.644	114	380		8.3		0		
12		.640	108	340		8.3		0		
13		.700	99	340	0.47	8.3		0		
14		.704	105	280		8.3		0		
15		.688	87	300		8.3		0		
16		.658	90	300		8.3		0		
17		.676	87	320		8.3		0		
18		.732	90	340		8.2		0		
19		.716	96	320		8.3		0		
20		.620	99	300	0.41	8.1		0		
21		.660	99	320		8.0		0		
22		.732	141	760		7.9		0		
23		.232	227	1520		8.5		0		
24		.620	69	160		8.5		0		
25		.712	75	200		8.4		0		
26		.736	84	380		8.4		0		
27		.776	75	200	0.58	8.4		0		
28		.780	78	240		8.4		0		
29		.688	84	200		8.3		0		
30		.712	105	140		8.3		0		
31		.744	120	280		8.1		0		
	TOTAL	20.632								
	AVERAGE	.666	114	370	0.47					

MEN02587

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	002 B
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	8	1	TO	89	8	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION, I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBLITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to $10,000 a day or imprisonment between 6 months and 5 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT (TYPED OR PRINTED)
Jim Porter
General Man.

DAY	PAR #	85001	85002							
	PARAMETER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
	UNITS									
01		848	2336							
02		960	1935							
03		917	2012							
04		802	2270							
05		827	2899							
06		793	1992							
07		654	1852							
08		631	1873							
09		602	1940							
10		642	1787							
11		622	2051							
12		586	1822							
13		584	1988							
14		628	1656							
15		581	1839							
16		521	1751							
17		517	1835							
18		564	2105							
19		587	1918							
20		528	1564							
21		558	1771							
22		871	4646							
23		452	2957							
24		370	841							
25		457	1191							
26		531	2346							
27		496	1294							
28		521	1568							
29		511	1177							
30		661	843							
31		786	1758							
	TOTAL	19,608	59,817							
	AVERAGE	633	1930							

MEN02588

MICHIGA[illegible]EPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION TRTD PROCESS WASTE WATER

MI0003824	003 A
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	9	1	TO	89	9	30

I CERTIFY UNDER PENALTY OF L[illegible]IAT I HAVE PERSONA[illegible] FAMILIAR WITH THE INFORMATION S[illegible]MITTED HEREIN AND B[illegible] THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAIN[illegible] BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AN[illegible] THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE[illegible] THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1[illegible] (Penalties under these statutes may include fines up to $10,000 and [illegible] between 6 months and 5 years.)

[signature] for JP
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINC[illegible] Jim Port General
TYPED [illegible]

DAY	PAR # / PARAMATER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	50060 ~~CHLORINE (TRC) MG/L~~	91110 OUTFALL OBS	
01		.676	126	340		8.4		0	
02		.684	138	420		8.5		0	
03		.756	209	420		8.1		0	
04		.364	247	480	0.30	7.6		0	
05		.648	268	680		8.0		0	
06		.088	268	940		8.6		0	
07		.588	84	360		8.6		0	
08		.580	75	220		8.6		0	
09		.584	75	260		8.5		0	
10		.636	78	300	0.32	8.4		0	
11		.584	90	320		8.4		0	
12		.644	117	300		8.4		0	
13		.680	114	320		8.4		0	
14		.704	135	320		8.4		0	
15		.712	144	280		8.4		0	
16		.760	148	280		8.5		0	
17		.768	153	240	0.45	8.3		0	
18		.784	162	420		8.2		0	
19		.700	198	360		8.1		0	
20		.588	198	360		8.2		0	
21		.652	204	320		8.2		0	
22		.648	236	400		8.3		0	
23		.740	222	300		8.3		0	
24		.787	170	400	0.79	8.3		0	
25		.798	202	420		8.3		0	
26		.702	199	380		8.4		0	
27		.766	204	480		8.3		0	
28		.821	216	360		8.2		0	
29		.895	249	420		8.3		0	
30		.712	272	560		8.4		0	
31									
	TOTAL	20.049							
	AVERAGE	.668	173	389	.47				

MEN02589

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824	002 B
PERMIT NUMBER	DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	9	1	TO	89	9	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE AND I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § (Penalties under these statutes may include fines up to $10,000 and imprisonment between 6 months and 5 years)

for JP

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Jim Por General

TYPED

	PAR #	85001	85002						
	PARA-MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY						
	LIMIT	3354/6261	3584/5376						
DAY	UNITS								
01		759	1954						
02		827	2424						
03		1355	2687						
04		756	1466						
05		1458	3679						
06		206	713						
07		1089	2017						
08		408	1184						
09		410	1303						
10		445	1626						
11		460	1587						
12		642	1630						
13		667	1866						
14		801	1884						
15		893	1729						
16		975	1832						
17		1005	1555						
18		1087	2802						
19		1175	2134						
20		988	1791						
21		1129	1773						
22		1304	2204						
23		1396	1884						
24		1157	2653						
25		1376	2825						
26		1205	2254						
27		1330	3083						
28		1582	2568						
29		1908	3173						
30		1644	3402						
31									
	TOTAL	30,457	63,682						
	AVERAGE	1015	2123						

MEN02590

Name (Location if different)
NAME Menasha Corporation
ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY
LOCATION TRTD PROCESS WASTE WATER

DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	003 A

MONITORING PERIOD

FROM YEAR	MO	DAY	TO YEAR	MO	DAY
89	10	1	89	10	31

THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319 (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment of between 6 months and 5 years)

[signature] for JP
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER
Jim Porter
General Manager
TYPED OR PRINTED

DAY	PAR # / PARA MATER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	50060 ~~CHLORINE (TRC) MG/L~~	91110 OUTFALL OBS		
01		.796	258	440		8.5		0		
02		.800	255	360		8.2		0		
03		.745	249	460		8.2		0		
04		.768	210	360		8.4		0		
05		.748	174	260		8.4		0		
06		.692	166	200		8.4		0		
07		.820	199	240		8.3		0		
08		.820	174	240	0.75	8.4		0		
09		.792	174	240		8.4		0		
10		.828	192	220		8.4		0		
11		.852	180	240		8.5		0		
12		.808	180	260		8.4		0		
13		.800	192	220		8.4		0		
14		.848	230	480		8.4		0		
15		.850	221	420	0.78	8.3		0		
16		.768	208	440		8.4		0		
17		.568	176	280		8.3		0		
18		.608	180	320		8.4		0		
19		.652	168	280		8.5		0		
20		.500	150	500		8.5		0		
21		.724	230	380		8.5		0		
22		.704	210	360	0.35	8.4		0		
23		.664	218	340		8.4		0		
24		.684	204	240		8.3		0		
25		.688	210	260		8.4		0		
26		.772	192	280		8.3		0		
27		.784	210	360		8.4		0		
28		.864	204	320		8.4		0		
29		.760	192	300		8.4		0		
30		.732	186	320		8.4		0		
31		.750	199	380		8.4		0		
	TOTAL	23.189								
	AVERAGE	.748	200	323	0.63					

PR4812 1 1

MEN02591

PERMITTLE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

DISCHARGE MONITORING

DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	002 B

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	10	1	TO	89	10	31

BELIEVE THE SUBMITTED INFORMATION IS TRUE ... THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 AND 33 U.S.C. (Penalties under these statutes may include fines up to $10,000 and or maximum imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT: for SA

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Jim Porter, General Manager (TYPED OR PRINTED)

	PAR #	85001	85002							
	PARA-MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
DAY	UNITS									
01		1764	2980							
02		1773	2446							
03		1579	2874							
04		1392	2326							
05		1135	1657							
06		1013	1180							
07		1455	1688							
08		1257	1674							
09		1215	1622							
10		1443	1595							
11		1453	1811							
12		1356	1860							
13		1378	1515							
14		1789	3456							
15		1726	3149							
16		1407	2848							
17		879	1342							
18		1048	1703							
19		1250	1621							
20		716	2141							
21		1473	2330							
22		1262	2132							
23		1243	1895							
24		1195	1400							
25		1227	1550							
26		1214	1848							
27		1397	2374							
28		1485	2321							
29		1237	1933							
30		1155	1980							
31		1269	2419							
	TOTAL	41,235	63,670							
	AVERAGE	1330	2054							

MEN02592

PERMITTEE NAME/ADDRESS (Include Facility Name Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION TRTD PROCESS WASTE WATER

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT

DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	003 A

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	11	1	TO	89	11	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASE THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND C THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE IN THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. § 1001 (Penalties under these statutes may include fines up to $10,000 and imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT (TYPED OR PRINTED)
Jim Porte
General M

DAY	PAR # / PARA MATER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	91110 Outfall OBS		
01		.728	204	320		8.6	0		
02		.750	192	340		8.5	0		
03		.720	222	360		8.6	0		
04		.596	213	480		8.6	0		
05		.620	229	460	0.83	8.5	0		
06		.688	229	500		8.4	0		
07		.576	240	460		8.5	0		
08		.608	249	500		8.4	0		
09		.620	243	520		8.4	0		
10		.564	220	520		8.5	0		
11		.608	264	590		8.6	0		
12		.660	224	480		8.4	0		
13		.616	235	520		8.4	0		
14		.763	204	420		8.4	0		
15		.664	192	340		8.3	0		
16		.744	174	440		8.3	0		
17		.676	183	380		8.5	0		
18		.784	172	360		8.5	0		
19		.856	210	520	0.26	8.4	0		
20		.824	201	400		8.5	0		
21		.850	168	360		8.5	0		
22		.692	192	560		8.6	0		
23		.724	234	480		8.6	0		
24		.796	255	580		8.5	0		
25		.756	243	580		8.5	0		
26		.840	210	420	0.42	8.4	0		
27		.728	246	480		8.4	0		
28		.772	246	520		8.5	0		
29		.776	257	460		8.5	0		
30		.728	248	540		8.5	0		
31									
	TOTAL	21.387							
	AVERAGE	.713	220	466	0.70				

MEN02593

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY LOCATION: OUTFALL 000 & 002 COMBINED

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	002 B

MONITORING PERIOD

FROM YEAR	MO	DAY	TO YEAR	MO	DAY
89	11	1	89	11	30

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE, ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT. SEE 18 U.S.C. § 1001 AND 33 U.S.C. § 1319. (Penalties under these statutes may include fines up to $10,000 and/or imprisonment for a period of between 6 months and 5 years.)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EXECUTIVE OFFICER: Jim Porter, General Manager (TYPED OR PRINTED)

DAY	PAR #	85001	85002							
	PARAMETER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY							
	LIMIT	3354/6261	3584/5376							
	UNITS									
01		1257	2028							
02		1239	2165							
03		1354	2183							
04		1080	2407							
05		1292	2602							
06		1549	3268							
07		1271	2395							
08		1380	2683							
09		1272	2710							
10		1097	2483							
11		1309	3046							
12		1259	2708							
13		1223	2679							
14		1162	2377							
15		1090	1910							
16		1104	2750							
17		1069	2238							
18		1154	2373							
19		1555	3891							
20		1405	3317							
21		1205	2562							
22		1125	3249							
23		1540	3147							
24		1717	3879							
25		1555	3680							
26		1538	3086							
27		1552	2972							
28		1625	3389							
29		1696	3022							
30		1536	3322							
31										
	TOTAL	40,210	84,501							
	AVERAGE	1340	2817							

MEN02594

PH46

Answer Questions 111-113 only if you circled response '02' for Question 107; that is, if the potential for inhalation of particulates exists.

111. Report the types of process equipment used in the wastewater treatment sludge management and disposal areas to reduce worker exposure to particulates.

	Process Equipment
a.	
b.	
c.	
d.	

112. Report the types of personal protective equipment used to limit inhalation of particulates in the wastewater treatment sludge management and disposal areas and the number of workers affected.

	Personal Protective Equipment	Number of Workers
a.		..... ☐☐☐
b.		..... ☐☐☐
c.		..... ☐☐☐
d.		..... ☐☐☐

113. What is the average time per day that each wastewater treatment sludge management and disposal areas worker is exposed to inhalation of particulates?

☐☐ hrs.

SURVEYID=12)

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION TRTD PROCESS WASTE WATER

HIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

MI0003824 — PERMIT NUMBER

003 A — DISCHARGE NUMBER

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	12	1	TO	89	12	31

I CERTIFY UNDER PENALTY [illegible]W THAT I HAVE PERS[illegible] FAMILIAR WITH THE INFORM[illegible] SUBMITTED HEREIN AN[illegible] THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBT[illegible] BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE [illegible] THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FA[illegible] THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. [illegible] (Penalties under these statutes may include fines up to $10,000 a[illegible] between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PR[illegible] Jim Po[illegible] General[illegible]

TYP[illegible]

DAY	PARA # / PARA MATER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	91110 Outfall OBS		
01		.7[illegible]	255	520		8.5	C		
02		.744	277	680		8.6	C		
03		.752	235	500	.33	8.3	C		
04		.604	243	480		8.4	C		
05		.732	277	500		8.4	C		
06		.696	264	480		8.5	C		
07		.648	259	520		8.6	C		
08		.534	274	560		8.6	C		
09		.644	300	540		8.6	C		
10		.700	279	520	.46	8.4	C		
11		.744	263	540		8.4	C		
12		.716	306	540		8.4	C		
13		.712	301	520		8.5	C		
14		.736	331	500		8.5	C		
15		.585	315	540		8.6	C		
16		.616	334	520		8.5	C		
17		.720	300	520	.60	8.4	C		
18		.572	310	480		8.5	C		
19		.616	356	500		8.4	C		
20		.603	337	500		8.7	C		
21		.572	319	600		8.6	C		
22		.660	318	420		8.6	C		
23		.536	312	420		8.6	C		
24		.528	331	530		8.5	C		
25		.660	302	620		8.6	C		
26		.644	249	600		8.8	C		
27		.572	318	520	.54	8.7	C		
28		.534	316	620		8.7	C		
29		.552	235	540		8.6	C		
30		.544	265	600		8.6	C		
31		.634	266	600		8.4	C		
	TOTAL	19.910							
	AVERAGE	.642	303	534	.50				

MEN02595

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME Menasha Corporation

ADDRESS 320 N. Farmer St.
Otsego, MI. 49078

FACILITY

LOCATION OUTFALL 000 & 002 COMBINED

CHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	002 B

MONITORING PERIOD	YEAR	MO	DAY		YEAR	MO	DAY
FROM	81	12	1	TO	81	12	31

I CERTIFY UNDER PENALI LAW THAT I HAVE PE FAMILIAR WITH THE INFOR N SUBMITTED HEREIN A THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR O BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURAT THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U S (Penalties under these statutes may include fines up to $10 000 between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE Jim P Gener

	PAR #	85001	85002
	PARA-MATER	BOD-5 LBS/DAY	SUSP-SOLIDS LBS/DAY
	LIMIT	3354/6261	3584/5376
DAY	UNITS		
01		1767	3191
02		1751	4240
03		1527	3166
04		1274	2478
05		1725	3066
06		1574	2810
07		1474	2874
08		1312	2751
09		1674	2920
10		1685	3044
11		1638	3376
12		1888	3256
13		1346	3110
14		2152	3213
15		1995	2669
16		1359	2693
17		2189	3163
18		1673	2367
19		1345	2587
20		2004	2556
21		1555	2891
22		1740	2136
23		1468	1980
24		1693	2558
25		1313	3005
26		1634	3243
27		1600	2582
28		1565	3075
29		1338	2490
30		1236	2731
31		1576	3443
	TOTAL	52204	89766
	AVERAGE	1684	2894

MEN02596

TABLE K: FINAL EFFLUENT

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	3,148	272	31	1,839	1,456
FEB 89	3,179	262	28	1,821	1,423
MAR 89	2,956	296	31	2,050	1,614
APR 89	2,832	263	30	1,539	1,237
MAY 89	2,336	226	31	1,651	1,105
JUN 89	2,096	158	30	1,728	812
JUL 89	2,618	172	31	1,673	968
AUG 89	2,055	114	31	923	633
SEP 89	2,167	173	30	1,859	964
OCT 89	2,015	200	31	1,713	2,418
NOV 89	2,771	220	30	1,692	3,018
DEC 89	2,859	308	31	2,162	1,649

77. **What is the total surface area of your facility?**

Surface area: [ ][ ],[ ][5][1] ~~square miles~~ *(or specify units):* Acres

78. **What portion of the total surface area of your facility drains to the wastewater treatment system?**

Surface area: [ ][ ],[ ][2][0] ~~square miles~~ *(or specify units):* Acres

79. **Does your facility generate any other process wastestreams (process wastestreams from manufacturing operations other than those that are part of pulp, paper, and paperboard operations)?**

(Circle one number.)

01 Yes *(CONTINUE TO NEXT QUESTION)*

02 No *(GO TO QUESTION 81 ON PAGE 89)*

SURVEYID=1200

Copy # ☐ of ☐ R

TABLE L: OTHER PROCESS WASTESTREAMS

Type of process wastestream: _____

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
FEB 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
APR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAY 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUL 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
AUG 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
SEP 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
OCT 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
NOV 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
DEC 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐

81. **Does your facility generate any other non-process wastestreams that are either treated with process wastes or collected and not treated, but either mixed with treated waste prior to discharge or collected and discharged separately?**

(Circle one number)

01 Yes *(CONTINUE TO NEXT QUESTION)*

02 No *(GO TO QUESTION 83 ON PAGE 93)*

Copy # 1 of 3 R

TABLE M: OTHER NON-PROCESS WASTESTREAMS

Type of non-process wastestream: 001 Non-Contact Cooling Water

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89			0		
FEB 89			0		
MAR 89			0		
APR 89			0		
MAY 89			0		
JUN 89			0		
JUL 89			0		
AUG 89			0		
SEP 89			0		
OCT 89			0		
NOV 89			0		
DEC 89			0		

SURVEYID=1200

Copy # ☐ of ☐ R

TABLE L: OTHER PROCESS WASTESTREAMS

Type of process wastestream: _____

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
FEB 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
APR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAY 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUL 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
AUG 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
SEP 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
OCT 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
NOV 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
DEC 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐

81. Does your facility generate any other non-process wastestreams that are either treated with process wastes or collected and not treated, but either mixed with treated waste prior to discharge or collected and discharged separately?
(Circle one number.)

(01) Yes *(CONTINUE TO NEXT QUESTION)*
02 No *(GO TO QUESTION 83 ON PAGE 93)*

Copy # 2 of 3 R

TABLE M: OTHER NON-PROCESS WASTESTREAMS

Type of non-process wastestream: _____

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	0		0		
FEB 89	2		0		
MAR 89	0		0		
APR 89	1		0		
MAY 89	1		0		
JUN 89	1		0		
JUL 89	0		0		
AUG 89	0		0		
SEP 89	2		0		
OCT 89	0		0		
NOV 89	1		0		
DEC 89	0		0		

SURVEYID=1200

Copy # ☐ of ☐ R

TABLE L: OTHER PROCESS WASTESTREAMS

Type of process wastestream: _____

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
FEB 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
APR 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
MAY 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUN 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
JUL 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
AUG 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
SEP 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
OCT 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
NOV 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐
DEC 89	☐☐,☐☐☐	☐☐,☐☐☐	☐☐	☐☐,☐☐☐	☐☐,☐☐☐

SURVEYID=1200

81. Does your facility generate any other non-process wastestreams that are either treated with process wastes or collected and not treated, but either mixed with treated waste prior to discharge or collected and discharged separately? *(Circle one number.)*

(01) Yes *(CONTINUE TO NEXT QUESTION)*
02 No *(GO TO QUESTION 83 ON PAGE 93)*

Copy # 3 of 3 R

TABLE M: OTHER NON-PROCESS WASTESTREAMS

Type of non-process wastestream: 003-5 Turbine Cooling Water

Month	(6) Average Daily TSS Loading (lb/day)	(7) Average Daily BOD_5 Concentration (mg/l)	(8) Number of Daily BOD_5 Samples to Compute (7)	(9) Maximum Daily BOD_5 Loading (lb/day)	(10) Average Daily BOD_5 Loading (lb/day)
JAN 89			0		
FEB 89			0		
MAR 89			0		
APR 89			0		
MAY 89			0		
JUN 89			0		
JUL 89			0		
AUG 89			0		
SEP 89			0		
OCT 89			0		
NOV 89			0		
DEC 89			0		

SURVEYID=1200

83. Complete Table N, *Monitored Pollutants*, on the next page, following the instructions below. The purpose of this table is to collect all available information on pollutants of concern not previously supplied in Question 46 to assess the need for regulations.

Instructions for Completing Table N

Table N requests information on all wastewater pollutants (other than BOD_5, TSS, pH, conductivity, sodium, color, alkalinity, sulfate, and residual chlorine) that were monitored at this facility during 1989. Refer to the column instructions below and the example before completing this table. If you need additional space, photocopy Table N BEFORE writing on it and label each copy in the space provided at the top right corner of the page.

*Column (1): **Pollutant**. List all pollutants, other than other than BOD_5, TSS, pH, conductivity, sodium, color, alkalinity, sulfate, and residual chlorine, that your facility routinely monitors in final treated wastewater, combined untreated wastewater, or individual process wastestreams.*

*Column (2): **Type of Sample**. Grab or composite. If composite, list period of collection and number of aliquots collected.*

*Column (3): **Approximate Date of Sample**. Report the approximate month and year of the sample.*

*Column (4): **Result (or Detection Limit if Not Detected)**. Report the analytical result and specify the unit of measure (mg/l, ug/l, etc.). If a pollutant was not detected, report as ND("x"), where "x" is the detection limit.*

*Column (5): **Method**. List the analytical procedure employed (reference EPA Standard methods or other methods used).*

*Column (6): **Wastewater**. List the type of wastewater (i.e., final treatment wastewater, combined untreated wastewater, or individual process wastestreams) in which the pollutant listed in Column (1) is monitored.*

SURVEY ID=1230

MENASHA CORPORATION
PAPERBOARD GROUP

March 23, 1990

Mr. John Bantjes
MDNR
District 12 Headquarters
621 10th Street
Plainwell, MI. 49080

Dear John:

In accordance with our phosphorus monitoring requirements for NPDES permit #MI 0003824, I am reporting our test results for total phosphorus from 000 weir, as listed below.

Date	Mg/l as Total P
1/29/89	0.13
2/05/89	<0.06
2/12/89	0.13
2/19/89	0.11
2/26/89	2.61
3/05/89	3.70
3/19/89	3.57
4/03/89	3.25
4/16/89	3.53
5/07/89	3.04
5/21/89	3.44
6/04/89	2.89
6/18/89	2.32
7/04/89	0.83
7/16/89	2.95
7/30/89	2.50
8/06/89	2.75
8/20/89	2.35
9/04/89	1.31
9/17/89	1.87
10/01/89	2.67
10/15/89	3.27
10/29/89	1.50
11/26/89	1.04
12/03/89	2.79
12/17/89	1.65

Test Method
424 F

SURVEYID=1200

Copy # 1 of 6

TABLE N: MONITORED POLLUTANTS

(1) Pollutant	(2) Type	(3) Date	(4) Result (or Limit)	(5) Method	(6) Wastewater
EXAMPLE					
ZINC	Composit 24/24	09-89	50 mgL	1620	Final Effluent
orthophosphorus	Composite 24/	01 02-89	.06 mg/L	424F	Final Effluent
"	"	01 06-89	.06	"	"
"	"	01 15-89	.11	"	"
"	"	01 23-89	.09	"	"
"	"	01 29-89	.13	"	"
"	"	02 05-89	.06	"	"
"	"	02 12-89	.13	"	"
"	"	02 19-89	.11	"	"
"	"	02 26-89	.09	"	"
"	"	03 05-89	.06	"	"
"	"	03 12-89	.12	"	"
"	"	03 19-89	.08	"	"

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

SURVEYID=1200

Copy # 2 of 6

TABLE N: MONITORED POLLUTANTS

(1) Pollutant	(2) Type	(3) Date	(4) Result (or Limit)	(5) Method	(6) Wastewater
EXAMPLE					
ZINC	Composit 24/24	09-89	50 mgL	1620	Final Effluent
Orthophosphorus	Composite 24/24	03 26-89	.07 mg/L	424F	Final Effluent
"	"	04 02-89	.05	"	"
"	"	04 09-89	.12	"	"
"	"	04 16-89	.19	"	"
"	"	04 23-89	.16	"	"
"	"	04 30-89	.06	"	"
"	"	05 07-89	.39	"	"
"	"	05 14-89	.11	"	"
"	"	05 21-89	.11	"	"
"	"	05 29-89	.17	"	"
"	"	06 04-89	.17	"	"
"	"	06 11-89	.08	"	"

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION

MEN02608

SURVEYID=1200

Copy # 3 of 6

TABLE N: MONITORED POLLUTANTS

(1) Pollutant	(2) Type	(3) Date	(4) Result (or Limit)	(5) Method	(6) Wastewater
EXAMPLE					
ZINC	Composit 24/24	09-89	50 mgL	1620	Final Effluent
Orthophosphorus	Composite 24	06 18-89	.12 mg/L	424F	"
"	"	06 26-89	.06	"	"
"	"	07 04-89	.10	"	"
"	"	07 09-89	.12	"	"
"	"	07 16-89	.10	"	"
"	"	07 23-89	.08	"	"
"	"	07 30-89	.11	"	"
"	"	08 06-89	.07	"	"
"	"	08 13-89	.08	"	"
"	"	08 20-89	.08	"	"
"	"	08 27-89	.09	"	"
"	"	09 04-89	.10	"	"

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

MEN02610

SUBVEYID=1200

Copy # 4 of 6

TABLE N: MONITORED POLLUTANTS

(1) Pollutant	(2) Type	(3) Date	(4) Result (or Limit)	(5) Method	(6) Wastewater
EXAMPLE					
ZINC	Composit 24/24	09-89	50 mgL	1620	Final Effluent
Orthophosphorus	Composite 24	01 10-89	.06 mg/L	424F	Final Effluent
"	"	01 17-89	.07	"	"
"	"	01 24-89	.12	"	"
"	"	10 08-89	.11	"	"
"	"	10 15-89	.11	"	"
"	"	10 22-89	.06	"	"
"	"	10 29-89	.19	"	"
"	"	11 05-89	.16	"	"
"	"	11 19-89	.12	"	"
"	"	11 26-89	.06	"	"
"	"	12 03-89	.06	"	"
"	"	12 10-89	.08	"	"

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION

SURVEYID=1200

Copy # 5 of 6

TABLE N: MONITORED POLLUTANTS

(1) Pollutant	(2) Type	(3) Date	(4) Result (or Limit)	(5) Method	(6) Wastewater
EXAMPLE					
ZINC	Composit 24/24	09-89	50 mgL	1620	Final Effluent
Orthophosphorus	Composite 24	12 17-89	.10 mg/L	424F	Final Effluent
"	"	12 27-89	.11	"	"
		--			
Orthophosphorus	Grab	01 03-89	3.34 mg/L	424F	Pond Influent
"	"	01 23-89	3.66	"	"
"	"	02 12-89	4.09	"	"
"	"	02 19-89	5.06	"	"
"	"	05 30-89	2.74	"	"
"	"	06 11-89	.565	"	"
"	"	06 27-89	3.41	"	"
"	"	07 10-89	4.63	"	"
"	"	07 24-89	2.75	"	"

Number of aliquots on Final Effluent is based on Flow

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

SURVEYID=1200

Copy # 6 of 6

TABLE N: MONITORED POLLUTANTS

(1) Pollutant	(2) Type	(3) Date	(4) Result (or Limit)	(5) Method	(6) Wastewater
EXAMPLE					
ZINC	Composit 24/24	09-89	50 mgL	1620	Final Effluent
Orthophosphorus	Grab	06 14-89	4.86 mg/l	424F	Final Effluent
"	"	06 28-89	2.77	"	"
"	"	09 11-89	3.93	"	"
"	Composite 24/24	09 24-89	2.77	"	"
"	"	10 08-89	5.12	"	"
"	"	10 22-89	3.29	"	"
"	"	11 05-89	4.03	"	"
"	"	11 19-89	0.42	"	"
"	"	12 10-89	9.23	"	"
"	"	12 27-89	1.78	"	"
		-			
		-			

INFORMATION ON THIS PAGE SHOULD BE CONSIDERED CONFIDENTIAL BUSINESS INFORMATION ☐

MEN02612

The purpose of the following section is to assess sludge handling and estimate solids generation.

84. What sludge dewatering devices were in use at your facility in 1989?
(Circle all numbers that apply.)

01 Sludge thickening

(02) Chemical conditioning

03 Belt filter press

04 Coil filter(s)

05 Screw press

06 Centrifuge

07 Plate/frame filter

08 Vacuum filter

09 Other *(specify)*: _____

_____

_____

85. How many hours per week did sludge dewatering devices typically operate in 1989?

Hours per week: 168

86. If primary and secondary sludges are combined prior to disposal, what was your facility's average daily combined sludge production in 1989, and what percentage of that sludge was primary sludge?

☒ N/A

a. Average daily combined sludge production: ___,___ dry tons

b. Final moisture content
[as a percent of total (wet) weight]: __ %

c. Percent primary sludge
(as a percent of the combined dry solids): ___ %

SUBVLYID=1260

Questions 88-94, pages 97-102

- Use the following definitions of wastewater treatment sludge management units to respond to Questions 88 through 94:

  Land Application (land treatment unit). The application of liquid, dewatered, dried or composted sludge to the land by surface spraying, surface spreading, or subsurface injection. Sludge may be applied to land intended for a number of end uses including but not limited to, cropland, pasture, commercially grown turf, silviculture, land for reclamation, and dedicated sites.

  Landfill. An area of land or an excavation that is used for the permanent disposal or long-term storage of solid waste, residuals and/or wastewater treatment sludge. A landfill is not a land treatment facility, a surface impoundment, an injection well, a pile, a salt dome formation, a salt bed formation, a cave, or a mine. The wastes placed in a landfill may or may not be covered with a cover material at the end of each operating day or other specified interval.

  Incinerator. An incinerator is an enclosed device using controlled flame combustion that neither meets the criteria for classification as a boiler nor is listed as an industrial furnace. Some examples of incinerators are: multiple hearth, rotary kiln, fluidized bed, and liquid injection incinerators.

  Sludge Surface Impoundments. A surface impoundment is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials), which is designed to hold an accumulation of wet sludges and is not part of the wastewater treatment process.

Question 107, page 115

- Question 107 is intended to apply to all mills that generate wastewater treatment sludges, not just those mills known to have PCDDs/PCDFs in sludge. Therefore, Question 107 should be reworded to read: "What are the potential means of workers in the wastewater treatment sludge management and disposal areas contacting sludge?

88. **How much sludge in percentage terms was disposed of by each of the following methods at your facility in 1989?**
(Circle all numbers that apply, and provide the appropriate percentage for each.)

		Primary Sludge	Secondary Sludge	Combined
01	Landfill—company-owned	0 %	0 %	0 %
02	Landfill—municipal	0 %	0 %	0 %
03	Landfill—commercial	0 %	0 %	0 %
04	Surface impoundment	0 %	0 %	0 %
05	Incineration	0 %	0 %	0 %
06	Land application	0 %	100 %	0 %
07	Compost	0 %	0 %	0 %
08	Saleable product *(specify)*:			
	NA	%	%	%
		%	%	%
		%	%	%
09	Recycle to process *(specify)*:			
	NA	%	%	%
		%	%	%
		%	%	%
10	Other *(specify)*:			
	NA	%	%	%
		%	%	%
		%	%	%
		100 %	100 %	100 %

We have no Primary clarification

SURVEY ID=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around landfill *(circle all that apply):*
- 01 pastureland
- 02 woodland
- 03 fallowland (i.e., no vegetation)

j. How many total years is the landfill expected to be used: ☐☐☐ years

k. Does the landfill have a leachate collection system? *(circle one number):*
- 01 Yes
- 02 No

l. Does the landfill have groundwater monitoring? *(circle one number):*
- 01 Yes
- 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number):*
- 01 Yes
- 02 No

p. Other run-on/run-off controls *(specify):* _____

_____

SURVEYID=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply):*
   - 01 pastureland
   - 02 woodland
   - 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number):*
   - 01 Yes
   - 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number):*
   - 01 Yes
   - 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number):*
   - 01 Yes
   - 02 No

p. Other run-on/run-off controls *(specify):* _____

_____

SURVEYID=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply):*
   - 01 pastureland
   - 02 woodland
   - 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number):*
   - 01 Yes
   - 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number):*
   - 01 Yes
   - 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number):*
   - 01 Yes
   - 02 No

p. Other run-on/run-off controls *(specify):* _____

_____

SURVEYED=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply)*:
- 01 pastureland
- 02 woodland
- 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number)*:
- 01 Yes
- 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number)*:
- 01 Yes
- 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number)*:
- 01 Yes
- 02 No

p. Other run-on/run-off controls *(specify)*: _____

_____

SURVEYID=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply):*
- 01 pastureland
- 02 woodland
- 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number):*
- 01 Yes
- 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number):*
- 01 Yes
- 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number):*
- 01 Yes
- 02 No

p. Other run-on/run-off controls *(specify):* _____

_____

SURVEYID=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply):*
- 01 pastureland
- 02 woodland
- 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number):*
- 01 Yes
- 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number):*
- 01 Yes
- 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number):*
- 01 Yes
- 02 No

p. Other run-on/run-off controls *(specify):* _____

_____

SURVEYID=1200

Copy # ☐ of ☐ R

i. Surrounding vegetation around surface impoundment *(circle all that apply):*
- 01 pastureland
- 02 woodland
- 03 fallowland (i.e., no vegetation)

j. How many total years is the surface impoundment expected to be used: ☐☐☐ years

k. Does the surface impoundment have a leachate collection system? *(circle one number):*
- 01 Yes
- 02 No

l. Does the surface impoundment have groundwater monitoring? *(circle one number):*
- 01 Yes
- 02 No

m. Distance to the groundwater: ☐☐☐ _____ *(specify unit)*

n. Distance to the nearest residence: ☐☐☐ _____ *(specify unit)*

o. Berm use *(circle one number):*
- 01 Yes
- 02 No

p. Other run-on/run-off controls *(specify):* _____

_____

SURVEYID=1200

SECTION 5: AIR EMISSIONS

Section 5 requests information on the facility's air emissions.

Please read each question. If you have any questions about this section or this survey, call the Survey Helpline (1-800-635-8850).

Use the NOTES space at the end of the section if you wish to explain your response to any question. Reference each comment with the appropriate question number. Photocopy tables if necessary.

105. **Return with the completed questionnaire copies of any available air emission test data on chloroform and any of the other hazardous air pollutants listed in Section 112 of Title III of the Clean Air Act Amendments of 1990. Include test data from your facility, which includes the wastewater treatment system, from 1985 to the present. Note on the copies the date, duration, and method of sampling.**

SURVEYID=1200

SECTION 6: WORKER EXPOSURE

Section 6 requests information on the potential for worker exposure to wastewater treatment sludges at this facility.

Please read each question. If you have any questions about this section or this survey, call the Survey Helpline (1-800-635-8850).

Use the NOTES space at the end of the section if you wish to explain your response to any question. Reference each comment with the appropriate question number.

106. Report the number of workers in the wastewater treatment areas that are exposed to sludge management (handling and dewatering) and disposal operations.

a. Total number of workers employed in the wastewater treatment sludge management and disposal areas: ..... [ ][ ][3]

b. Number of shifts per day: ..... [ ][2]

c. Number of workers per shift: ..... [ ][ ][1]

d. Average time per day that each worker is in the wastewater treatment sludge management and disposal areas: ..... [ ][4] hrs.

107. What are the potential means of workers in the wastewater treatment sludge management and disposal areas contacting PCDDs/PCDFs?

(Circle all numbers that apply.)

01 Dermal contact of wastewater treatment sludge

02 Inhalation of particulates

03 Other *(specify)*: PCDD's/PCDFs are not present in our sludge.

SURVEYID=1200

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

DISCHARGE MONITORING REPORT
DAILY MONITORING

PERMITTEE NAME/ADDRESS (Include Facility Name/Location if different)

NAME: Menasha Corporation

ADDRESS: 320 N. Farmer St.
Otsego, MI. 49078

FACILITY: TRTD PROCESS WASTE WATER

LOCATION:

PERMIT NUMBER	DISCHARGE NUMBER
MI0003824	003 A

MONITORING PERIOD

	YEAR	MO	DAY		YEAR	MO	DAY
FROM	89	7	1	TO	89	7	31

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EX FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPL THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORM THE POSSIBLITY OF FINE AND IMPRISONMENT SEE 18 U.S.C. §1001 AND (Penalties under these statutes may include fines up to $10,000 and or imprisonment between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

NAME/TITLE PRINCIPAL EX
Jim Porter
General Man
TYPED OR PRIN

DAY	PAR # / PARAMETER / LIMIT / UNITS	50050 FLOW CONDUIT MGD	00310 BOD-5 MG/L	00530 SUSP-SOLIDS MG/L	85005 PHOS-SOLUB LBS/DAY AVE. 8.0	00400 PH 0 TO 14 6 TO 9	~~50060 CHLORINE (TRC) MG/L~~	91110 OUTFALL OBS		
01		.546	177	733		8.6		C		
02		.664	162	433		8.5		C		
03		.652	194	400		8.5		C		
04		.608	180	333	0.51	8.6		C		
05		.644	147	400		8.6		C		
06		.728	138	420		8.7		C		
07		.684	146	500		8.6		C		
08		.688	87	440		8.5		C		
09		.704	154	520	0.70	8.6		C		
10		.664	141	480		8.8		C		
11		.616	154	400		8.8		C		
12		.672	150	440		8.8		C		
13		.672	144	440		8.8		C		
14		.668	153	380		8.7		C		
15		.668	209	480		8.7		C		
16		.724	222	500	0.60	8.7		C		
17		.704	213	480		8.5		C		
18		.704	285	640		8.6		C		
19		.656	240	500		8.6		C		
20		.720	142	640		8.4		C		
21		.760	174	480		8.6		C		
22		.720	186	500		8.6		C		
23		.720	147	500	0.48	8.5		C		
24		.720	180	480		8.5		C		
25		.720	173	480		8.6		C		
26		.404	174	600		8.7		C		
27		.641	138	320		8.3		C		
28		.684	137	360		8.3		C		
29		.652	164	480		8.5		C		
30		.720	144	430		8.3		C		
31		.656	156	340		8.3		C		
	TOTAL	20.413								
	AVERAGE	.175	172	[illegible]	[illegible]					

MEN02559

NOTES

Question Number(s)	Notes, comments, etc.

Appendix A: Glossary

APPENDIX A: GLOSSARY

CHEMICAL TERMINOLOGY

AOX: adsorbable organo-halogens.

BOD_5: biochemical oxygen demand measured after five days. Biochemical oxygen demand is a measure of biological decomposition of organic matter in a water sample. It is determined by measuring the oxygen required by microorganisms to oxidize the organic contaminants of a water sample under standard laboratory conditions.

congener: any one particular member of the same chemical family; a specific congener is denoted by unique chemical notation.

homologue: a group of structurally related chemicals that have the same degree of chemical substitution.

isomer: substances that belong to the same homologous class.

PCBs: polychlorinated biphenyls.

PCDDs: polychlorinated dibenzo-*p*-dioxins; chemical family consisting of 8 homologues (monochlorinated through octachlorinated) and 75 congeners.

PCDFs: polychlorinated dibenzofurans; chemical family consisting of 8 homologues (monochlorinated through octachlorinated) and 135 congeners.

TOCl: total organo-chlorines.

TOX: total organo-halogens.

TSS: total suspended solids (non-filterable residue).

PROCESS/INDUSTRY TERMS

air dry (AD): refers to weight of moisture-free pulp or paper plus 10 percent moisture (in actuality moisture content is dependent on the atmospheric conditions to which the paper is exposed). Air dry weight is determined by dividing the oven dry weight by a factor of 0.9.

biocide: toxic material for microbiological control.

bleach plant: that portion of a pulp facility where the bleaching process is performed. This area also includes the area where bleach chemicals are prepared.

bleach sequence: sequence of bleaching chemical addition in the bleach plant.

bleaching: brightening and delignification of pulp by the addition of oxidizing chemicals (such as chlorine) or reducing chemicals (such as hypochlorite).

broke: partly or completely manufactured paper that does not leave the machine room as salable paper or paperboard; also paper damaged in finishing operations such as rewinding rolls, cutting and trimming.

brownstock: pulp, usually kraft or groundwood, not yet treated other than in the pulping process.

wastepaper: paper or paperboard that has undergone a manufacturing process and is being recycled as the raw material for another manufacturing product. This does not include internal broke, finishing room trimmings, repulped rolls, and other materials recycled internally.

white water: waters formed when stock or other fiber-bearing suspensions are dewatered on, for instance, paper machines, deckers, or save-alls.

WASTEWATER TREATMENT TERMS

continuous discharge: discharge that occurs without interruption throughout the operating hours of the facility.

controlled-release discharge: a discharge that occurs at a rate that is intentionally varied to accommodate fluctuations in receiving stream assimilative capacity or for other reasons.

direct discharge: conveyance of treated or untreated process wastewater or non-process water (such as storm water runoff) into surface water bodies.

indirect discharge: conveyance of wastestream (process, sanitary, etc.) to a publicly owned treatment works, or a treatment works not owned by your facility.

intermittent discharge: discharge that occurs only during specific periods of time (seasonal, or operating shift variations). Does not apply to treatment plant or process upset conditions; periods of no discharge are at least 24 hours in duration.

NPDES: National Pollutant Discharge Elimination System. The NPDES program is authorized by the Clean Water Act and requires permits for the discharge of pollutants from any point source into waters of the United States.

point source: any discernible, confined, and discrete conveyance including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel or other floating craft from which pollutants are or may be discharged.

pollutant: dredged spoil, solid waste, incinerator residue, filter backwash, sewage sludge, munitions chemical wastes, biological materials, certain radioactive materials, heat-wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.

process wastewater: water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, by-product, or waste product.

recycling: the use or reuse of material as an effective substitute for a commercial product, or as an ingredient or feedstock in an industrial process.

SIC Code: Standard Industrial Classification Code. The SIC is used to group establishments by the primary activity in which they are engaged. A SIC Code refers to the principal product, or group of products, produced or distributed or services rendered by an operating establishment. SIC Codes are listed in *The 1987 Standard Industrial Classification Manual* published by the Executive Office of the President, Office of Management and Budget, Washington, D.C.

source reduction: the reduction or elimination of waste generation at the source, usually within a process.

influent: mill wastes, water, and other liquids, which can be raw or partially treated, flowing into a treatment plant, reservoir, basin, or holding pond.

land application: a disposal process in which waste is applied onto or incorporated into the soil surface.

leachate: liquid containing dissolved and suspended chemicals picked up by flowing the liquid through a material, such as water through the contents of a landfill.

MGD: million gallons per day.

MLSS: mixed-liquor suspended solids.

MLVSS: mixed-liquor volatile suspended solids.

outfall: the mouth of conduit drains and other conduits from which a mill effluent discharges into receiving waters.

POTW: publicly-owned treatment works.

primary sludge: the settlings removed from the first stage of a wastewater treatment plant. The sludge is normally dewatered prior to disposal.

primary treatment: the removal of suspended matter from mill wastewater. It is usually the first stage in a multi-stage wastewater treatment process, where substantially all floating and settleable solids are mechanically removed by screening, skimming, and sedimentation.

secondary wastewater treatment: biological treatment of wastewater effluents.

sedimentation: the settling of suspended solids from pulp slurries, liquid solutions, treated water, wastewater, and other fluids. It is usually accomplished by reducing the velocity of the liquid below the point where it can transport the suspended material.

sedimentation basin: a large container in which wastewater is retained so that any suspended solids will settle by gravity and then can be removed.

sludge: semifluid mixture of fine solid particles with a liquid. It may contain fibrous and filler materials and/or biological solids.

surface impoundment: natural or man-made depressions or diked areas which can be used to treat, store, or dispose of waste. Surface impoundments may be any shape and any size (from a few hundred square feet to hundreds of acres in area). Surface impoundments are often referred to as pits, ponds, lagoons, and basins.

vacuum filter: any type of filter in which suction is employed to deposit and form a pad of solids on the surface of a separating material (screen) with the liquid flowing through it.

waste minimization: the reduction, to the extent feasible, of the waste that is generated or subsequently treated, stored, or disposed.

waste reduction: the reduction or elimination of waste generation within a process.

wastewater: water carrying waste materials from a mill. It is a mixture of water, and dissolved and suspended pollutants.

water softener: apparatus designed to remove the dissolved calcium and magnesium minerals that produce hardness from water to prevent scaling in power and recovery boilers.

water treatment: the processing of mill source waters from rivers, lakes, groundwater, and streams to remove impurities by sedimentation, filtration, and the addition of chemicals including alum, sodium carbonate, and chlorine.

Appendix B: Process Codes

APPENDIX B: PROCESS CODES

A **Dissolving Sulfite Pulp**

A purified pulp is obtained using a full-cook process employing strong solutions of sulfites of calcium, magnesium, ammonia, or sodium. The pulps produced by this process are viscose, nitration, cellophane, or acetate grades and are used principally for the manufacture of rayon and other products that require the virtual absence of lignin.

B **Papergrade Sulfite Pulp**

Pulp is produced employing a full-cook process using an acidic cooking liquor of sulfites of calcium, magnesium, ammonia, or sodium. Paper products manufactured from this pulp include tissue papers, fine papers, newsprint, and market pulp.

C **Kraft Pulp**

Pulp is produced using a full-cook process employing a highly alkaline sodium hydroxide and sodium sulfide cooking liquor.

D **Dissolving Kraft Pulp**

This pulp is obtained from a full-cook process employing a highly alkaline sodium hydroxide and sodium sulfide cooking liquor. The manufacturing process includes a pre-cook operation termed pre-hydrolysis. The principal product is a highly purified dissolving pulp used mainly for the manufacture of rayon and other products requiring the virtual absence of lignin and a very high alpha cellulose content.

E **Semi-Chemical Pulp**

Pulp is produced using a process that involves the cooking of wood chips under pressure using a variety of cooking liquors including neutral sulfite and combinations of soda ash and caustic soda. The cooked chips are usually refined before being converted on-site into board or similar products. The principal products include corrugating medium, insulating board, partition board, chip board, tube stock, and specialty boards.

F **Groundwood—Chemi-Mechanical Pulp**

The chemi-mechanical groundwood pulp is produced using a chemical cooking liquor to partially cook the wood; the softened wood fibers are further processed by mechanical defibration using refiners, resulting in yields of 90 percent or greater. The pulp is produced with or without brightening. The principal products include fine papers, newsprint, and molded fiber products.

G **Groundwood—Thermo-Mechanical Pulp**

The thermo-mechanical groundwood pulp is produced on-site using a "brief cook" process employing steam, followed by mechanical defibration in refiners, resulting in yields of approximately 95% or greater. The pulp may be brightened using hydrosulfite or peroxide bleaching chemicals. The principal products include market pulp, fine papers, newsprint, and tissue papers.

Appendix C: Product Categories and Codes

APPENDIX C: PRODUCT CATEGORIES AND CODES

The product category codes to be used in the survey are given in the first numerical column. The survey categories follow categories established by the U.S. Department of Commerce, Bureau of the Census for its annual survey of manufacturers and current business report survey. For reference purposes, the Bureau of the Census codes are given in the two right-hand columns.

		Bureau of the Census	
		Current Industrial Report	*Annual Survey of Manufactures*
Product Category	**EPA Survey Code**	**Form MA26A Code**	**Form MA-1000 Code**
PULP			
Special Alpha and dissolving woodpulp	10	2700	26111 00
Sulfate–bleached	11	2707	26113 35
Sulfate–unbleached	12	2710	26113 43
Sulfite–bleached	13	2702	26114 16
Sulfite–unbleached	14	2704	26114 26
Groundwood	15	2713	26114 65
Thermomechanical	16	2715	26114 67
Semichemical	17	2716	26114 72
Defibrated or exploded	18	2721	26114 78

Product Category	EPA Survey Code	Bureau of the Census: *Current Industrial Report* Form MA26A Code	Bureau of the Census: *Annual Survey of Manufactures* Form MA-1000 Code
PAPERBOARD (Including construction paper and board)			
Unbleached kraft packaging and industrial converting paperboard	40	5108	26311
Semichemical paperboard, including corrugated medium and other uses	41	5125	26313
Recycled paperboard	42	5159	26314
Wet machine board, including binder's board and shoe board	43	6001	26318
Construction paper	50	7020	2621B
Hardboard	51	7069	24934
Insulating board	22	7041	24935
Bleached packaging and industrial converting paperboard (80% or more bleached fiber)			
Linerboard	60	5109	26312 10
Folding carton type board	61	5111	26312 40
Milk carton board	62	5113	26312 61
Heavyweight cup and round nested food container	63	5115	26312 62
Plate, dish, and tray stock	64	5117	26312 63
Bleached paperboard for miscellaneous packaging	65	5119	26312 83
Other solid bleached board including bleached paperboard for moist, oily, and liquid foods	66	5123	26312 86
MOLDED PULP			
Molded pulp products including fruit and vegetable packs and egg cartons	70		26794

Appendix D: Selected Industry SIC Codes

APPENDIX D: SELECTED INDUSTRY SIC CODES

LUMBER AND WOOD PRODUCTS

2411 Logging camps and logging contractors
2421 Sawmills and planing mills, general
2426 Hardwood dimension and flooring
2429 Special product sawmills, not otherwise classified (nec)
2431 Millwork
2434 Wood kitchen cabinets
2435 Hardwood veneer and plywood
2436 Softwood veneer and plywood
2439 Structural wood members, nec
2441 Nailed wood boxes and shook
2448 Wood pallets and skids
2449 Wood containers, nec
2451 Mobile homes
2452 Prefabricated wood buildings
2491 Wood preserving
2492 Particle board
2499 Wood products, nec

PAPER PRODUCTS

2611 Pulp mills
2621 Paper mills, except building paper
2631 Paperboard mills
2641 Paper coating and glazing
2642 Envelopes
2643 Bags, except textile bags
2645 Die-cut paper and board
2646 Pressed and molded pulp goods
2647 Sanitary paper products
2648 Stationery products
2649 Converted paper products, nec
2651 Folding paperboard boxes
2652 Set-up paperboard boxes
2653 Corrugated and solid fiber boxes
2654 Sanitary food containers
2655 Fiber cans, drums, and similar products
2661 Building paper and board mills

PRINTING AND PUBLISHING INDUSTRIES

2711 Newspapers
2721 Periodicals
2731 Book publishing
2732 Book printing
2741 Miscellaneous publishing
2751 Commercial printing, letterpress
2752 Commercial printing, lithographic
2753 Engraving and plate printing
2754 Commercial printing, gravure
2761 Manifold business forms
2771 Greeting card publishing
2782 Blankbooks and looseleaf binders
2789 Bookbinding and related work
2791 Typesetting
2793 Photoengraving
2794 Electrotyping and stereotyping
2795 Lithographic platemaking services

ROADBINDER APPLICATION PROGRAM

DOCUMENT #50

While irate individuals and government agencies have been snarling and gnashing their teeth at each other over the condition of the Kalamazoo River, Otsego and its industries have been quietly going about the business of doing their part to clean up the river.

The newest of these projects to go into operation is at Otsego Falls Paper Mills, where city and county trucks are this week beginning to pick up Roadbinder for dust relief and stabilization of road beds. This type of waste reclamation goes back many years in the case of the sulphite mills of Sweden, where conservation has been practiced more consistently than in this country. More recently the process of road building with sulphite pulp mill wastes has been used in Canada and Wisconsin. However, this is the first instance in which semi-chemical pulp mill wastes are known to have been adapted for road building purposes.

Working with the Otsego City Street Department and the Allegan County Road Commission, Otsego Falls last year carried out experiments which showed that this medium was as satisfactory as the sulphite waste and had the additional advantage of being chemically neutral, and therefore less damaging to metal than either sulphite wastes or the commonly used calcium chloride. With this information, Otsego Falls proceeded to install the necessary storage and loading facilities to permit rapid handling of the anticipated number of tank trucks which will be hauling Roadbinder for the city and county.

At present the flow of pulp mill wastes to the river is substantially reduced, and when the plan goes into full scale operation on June 1, this discharge will be reduced to the small controlled flow permissible under agreement with the State--perhaps eliminated altogether. For their part, the City of Otsego and the Allegan County Road Commission expect to get a handsome return on their experiment in the form of a substantial volume of material for road treatment at an absolute minimum cost.

The Otsego Falls mill which has been under such heavy attack during the recent months, was converted in 1946, with the encouragement of the Michigan Department of Conservation, to a pulp mill designed to make use of large quantities of wood from state forests and private lands which was previously unmarketable for any purpose. A somewhat similar case exists at present in Ontonagon, in Michigan's Upper Peninsula, where a paper mill has been shut down and a hundred-odd employees are subsisting on Unemployment Compensation. The Michigan Department of Economic Development is trying to encourage conversion to a semi-chemical pulp mill, but fear of the Water Resources Commission's reaction is holding up developments.

An interesting sidelight on the Roadbinder story is that in draining the waste liquor pond to eliminate leaks, a number of pan fish were found, and Conservation Officer Harry Plotts had to be called in for permission to net them out.

MENASHA CORPORATION
OTSEGO, MICHIGAN

There is an old adage that says, "There is no great loss but what there is some small gain," and this is true of what is now known as ~~XXXXXXX~~ MENASHA ROADBINDER.

Back in the early 1950's the Otsego Paperboard Division was faced with the problem of disposing of the waste cooking liquor blown and pressed from chips in the manufacture of CORRUGATING MEDIUM. While it had been dumped in the Kalamazoo River, officials at the mill and the Water Resources Commission were anxious to cut down if not eliminate altogether this type of stream pollution.

In 1954 experiments were conducted in the laboratory and field tests were conducted on selected roads in the county for the use of this waste as a dust laying and road stabilizing material. The Allegan County Road Commission and the Otsego City Street Department aided in the tests. The experiments which were carried out showed that this medium was as satisfactory as the sulphite waste and had the additional advantage of being chemically neutral and therefore less damaging to metal than either sulphite wastes or the commonly used calcium chloride. Besides it provided a substantial volume of material for road treatment at an absolute minimum of cost.

It was stated by County officials that roads treated with this so called waste material withstood snow and ice through the winter and the eventual spring thaw better than other roads not so treated.

Since 1954 over 45 million gallons of roadbinder has been used to lay dust and stabilize road beds by the Allegan County Road Commission and the City of Otsego. During the summer season as much as 20,000 gallons a day ~~XXXXXXX~~ is hauled.

memo / MENASHA CORPORATION

TO: DNR phone Call File - Water Quality

DATE: 8 April 1981

SUBJECT: April 8th phone conversation with Tom Leap

FROM: John Blauwkamp JRB

On April 8, 1981, I talked with Tom Leap of the Oil and Hazardous Materials section in the water quality division in Lansing. The main topic of discussion was our possible sale of spent liquor as road binder. Tom said they intended to have Gene Hall pick up a sample of the spent liquor, they would then in turn analyze it to determine if they felt it would create a water quality problem. The first thing they would do is to determine if it would meet the criteria for hazardous waste. This would be their first indication that the material may cause a problem and subject to regulation under Act 245. I explained to Tom that because the material was not a waste it was not subject to Act 64 regulation. Based on this and the previous history, Tom said he could not disapprove of the use of the material as road binder. However, he explained that it was not his departments position to approve of the material either. He took the position that you can do anything you want and if it causes a problem they will disapprove of it. Since the material is not hazardous waste and it was not considered a liquid industrial waste, Tom said we could use the material as road binder if we chose but we would still be subject to liability if the person who bought the material applied it wrong or if it caused some problem at a later date.

cc: ✓DNR phone call file -
Hazardous waste
1981 Road binder file

JB/kj

MEN02642

memo / MENASHA CORPORATION

TO: DNR phone Call File - Hazard Waste

DATE: 8 April 1981

SUBJECT: April 8th phone conversation with Lonnie Lee

FROM: John Blauwkamp

JRB

On April 8, 1981, I talked with Lonnie Lee of the hazardous waste section in Lansing, MI. The main subject of conversation was whether or not our spent liquor would be subject to regulation by Act 64, if it was used as a road binder. Lonnies interpretation of the rule was that if we were selling the material to someone it would not be considered waste and therefore would not be subject to control by Act 64. If the spent liquor met the toxicity requirements for hazardous waste it would probably be subject to regulation by the oil and hazardous materials section. Lonnie suggested we check with the oil and hazardous material section, the water quality section and the air quality people before selling the material as road binder.

Lonnies interpretation of the definition of a waste was that the sometimes disposed of clause refers to a particular facility rather than what might be done in the industry as a whole. For example, if we never disgarded our spent liquor, then our spent liquor would not be considered a waste. However, if someone else sometimes disgarded their spent liquor, then their spent liquor would always be considered a waste. I asked Lonnie to send me a letter briefly explaining his interpretation of this rule and they said they were not allowed to put anything of this nature in writting.

cc: 1981 Road Binder File

JB/kj

memo / MENASHA CORPORATION

TO: DNR Phone Call File - Water Quality

DATE: 21 April 1981

SUBJECT: April 20th phone conversation with Tom Leep

FROM: John Blauwkamp

JRB

On April 20, 1981, I talked with Tom Leep of the oil and hazardous materials section of the water quality division in Lansing. I asked Tom what Menasha's liability would be if we began using the spent liquor as roadbinder before the DNR had completed their tests. Tom said that if they found something they didn't like in the spent liquor, they would most likely to tell us to stop using it as roadbinder. He thought it would be very unlikely if the DNR would take any inforcement action other than just making us stop using the product. He did however, point out that we would still have our normal product liability the same as for any product.

cc: Roadbinder 1981 File

JB/kj

memo / MENASHA CORPORATION

TO: DNR Phone Call File
Oil & Hazardous Waste File

DATE: 16 June 1981

SUBJECT: June 12 conversation with Gene Hall

FROM: John Blauwkamp

On June 12, 1981, I received a call from Gene Hall of the Oil & Hazardous Waste Section of the Michigan DNR. He said that the DNR lab. had completed its tests on our spent liquor and found nothing that would prevent the use of the spent liquor as a dust control agent. New regulations are making it very difficult for people to use oil as a dust control agent. Therefore, the DNR is putting together a list of possible substitutes for used oil. Gene asked permission to list Menasha as a supplier of a substitute material for road oil. I told Gene he had our blessings to list us as a supplier and suggested that he list it under the name of roadbinder which we have been using for more than 15 years.

I asked Gene if I could sell the material to anyone or if they needed a special license to apply the spent liquor as a dust control agent. Gene said that I could sell the material to anyone who wanted to use it for dust control agent and no special license was required.

cc: B. Buchanan
E. C. Manders
Roadbinder 1981 File

JB/kj

MENASHA CORPORATION
PAPERBOARD GROUP

MENASHA ROAD BINDER-RECOMMENDED APPLICATION PROCEDURE

1. Road binder should be spread uniformly at a rate that is adequate to cover the road, but restricted enough to avoid puddling or direct run-off into ditches. The normal application rate is 4,000 to 8,000 gallons/mile, depending on road conditions.

2. Road binder should be applied as often as needed. More road binder will be required on freshly graveled and recently graded roads than on roads with hard, compacted surfaces. Normally, four to eight applications per year will be required depending on road conditions, traffic, and application rates used. Usually, if higher application rates are made, fewer applications will be required.

3. Road binder must not be applied with any part of the spray extending beyond the edge of the road, i.e., when meeting another vehicle. The end of the spray must be kept within the edge of the road's surface. It is strongly recommended that a dry strip be left down each edge of the road's surface.

4. In order to avoid the possibility of rain washing the road binder off the road surface, it should be applied only when the roads are dry, and it is not likely to rain for at least sixteen (16) hours.

5. Road binder must not be applied to any impermeable surface. For example, the flow of road binder must be turned off prior to crossing a bridge or paved road, and must not be restarted until the spray bar has completely passed the impermeable surface.

6. Do not apply road binder within 50 feet of a stream, river, or drainage ditch crossing.

7. Road binder must not be applied within 100 feet of a well.

8. The discharge valve on the road binder truck must be closed while the vehicle is stationary. The discharge valve must be maintained such that it will prevent dripping of the road binder from the spreader bar.

OTSEGO MILL BOX 155 • 320 N FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616 692 6141

MENASHA ROAD BINDER-RECOMMENDED APPLICATION PROCEDURE

9. The spray bar and nozzles must be of a design that will give an even application of road binder to the road surface. To minimize the nozzle plugging problems, only nozzles that will pass up to 1/4" in diameter particles should be used.

10. All road binder trucks must be equipped with a cab operated control valve on the spray bar. To avoid puddling, the truck must be moving while the valve is being opened or closed.

Since Menasha Corporation does not control the application procedure or end uses, Menasha road binder is sold on an "AS IS WHERE IS" basis.

MEN02647

MENASHA CORPORATION

16 October 78

Roger Przybysz
Water Quality Specialist
Department of Natural Resources
State Office Building
350 Ottawa Avenue N.W.
Grand Rapids, MI 49503

Persuant to your letter of October 5, 1978 a meeting was held on 13 October 78 to discuss the roadbinder application program. Present were Fred Niles of the Allegan County Road Commission, Art Brindley of Menasha, yourself and the writer.

Although the roadbinder program has been operating for 25 years at Menasha, no formal documentation of guidelines had been established. Purpose of this meeting was to establish application guidelines. Listed below are the principle guideline agreements;

1. In order to establish better communication between Menasha and the Allegan County Road Commission, Art Brindley will be principle contact at the mill and Charley Kurtz or Robert Hartsuiker will be principle contacts for the road commission.
2. Where required, the Allegan County Road Commission will grade before roadbinder application.
3. Maps, supplied by the Allegan County Road Commission, will be used to determine the points of application. A list of the roads applied and their dates of application will be keep current.
4. Application rate shall be two 4,000 gallon loads per mile.
5. Trucks must have cab control of discharge valves.
6. Trucks will skip over impervious sections of road.
7. Application will not be made within 100 feet of streams, river crossings, drainage ditches etc..
8. Allegan County Road Commission will identify those areas where people do not want roadbinder and these areas will be avoided.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 0

9. As a general rule, the Northwest portion of the county will be avoided on Sunday.
10. Application will not be made if it is raining or if rain is impending.
11. Good judgement will be used regarding when to reapply.
12. A chemical analysis of the liquor will be forwarded to the Grand Rapids D.N.R. office.
13. Slow moving vehicle signs will be mounted on any units applying roadbinder.
14. If applications are made after dark, four-way emergency flashers will be used.

Sincerely,

Menasha Corporation

Bruce T. Buchanan

Bruce T. Buchanan
Technical Director

cc: Jim Adams
Fred Niles
Jud Hays
Art Brindley
Russ Fisher

BB:kj

FRED NEILS, Engineer-Manager
DELWIN REDDER, Ass't. Engineer

NAOMI WEAVER, Secy.-Clerk

Board of County Road Commissioners of Allegan County

ALLEGAN, MICHIGAN 49010

1308 LINCOLN ROAD

TELEPHONE:
(616) 673-2184

MEN02649

October 24, 1978

Mr. Bruce T. Buchanan,
Technical Director
Menasha Corporation
Farmer Street
Otsego, MI 49078

Dear Bruce:

This letter is your company's authorization to place roadbinder (spent liquor) on designated gravel roads in Allegan County according to the guidelines as set forth in our meeting of October 13, 1978 and as confirmed in your letter of October 16, 1978.

Very truly yours,

Fred Neils
Engineer-Manager

FN/pb

cc: Mr. Roger Przybysz
Water Quality Specialist
Department of Natural Resources
State Office Building
350 Ottawa Avenue N.W.
Grand Rapids, MI 49503

COMMISSIONERS

FRANCIS CRONEN, Otsego WILLIS RIKSEN, Allegan PAUL BAYLESS, Chairman, Fennville

INVESTIGATION OF RUMORED LIQUOR CONTAMINATION

DOCUMENT #51

FORM 561

MEN02651

memo / CORPORATION

TO: Notes to the File

DATE: December 20, 1984

SUBJECT: Rumored mixing of toxic waste into Menasha roadbinder by A-1 Disposal.

FROM: Keith Kling KBK

Results of the samples referred to in the attached memo from Bruce Buchanan were recently received. Sample #1 was taken from the mixing pond at 3:00 P.M. 8/22/84. Sample #2 was taken from the A-1 semi on 8/23/84 prior to filling up in the morning. Sample #3 was taken from the mixing pond on 8/23/84 as the A-1 semi was filling.

Comparison of the three samples shows no evidence of any contamination by A-1 disposal. The comparitively small differences between the three samples may be attributed to different consistencies of each sample.

cc: J. Bonham
T. Clemmons
D. Hackler
B. Janda
B. Buchanan
J. Sarosiek
B. Shepard
J. Blauwkamp

kj

FORM 561

-Kling

memo / MEN02652 CORPORATION

TO: Notes to the File

DATE: August 21, 1984

SUBJECT: Rumored mixing of toxic waste into Menasha roadbinder by A-1 Disposal

FROM: Bruce Buchanan

Bruce

At the staff meeting on 21 August 84, Doug Downing; Paper Machine Superintendent, reported that at the UPIU breakfast meeting this morning, Jeff Volker; temporary Local 1025 President, stated that there was a rumor going around the mill that A-1 Disposal was putting a 55 gallon drum of toxic waste into trucks that were being used to spread Menasha roadbinder.

After that 8:30 meeting, I met with Dan Hackler; Personnel Manager, to further discuss our strategy and approach. In Dan's presence, I called Jim Sarosiek; Corporate Attorney, who was on vacation at the time. Jim was located at area code 715-799-3961. I discussed several approaches with Jim and he suggested that we bring the DNR on board immediately and advise them of the rumor, all-be-it unsubstantiated, and ask for their advice on how to proceed. At that point and time it was nearly lunch time.

Dan Hackler and I drove to Jeff Volker's house, he was the UPIU person who reported the rumor at the breakfast meeting, at 405 West Allegan during the noon hour. We woke Jeff, who was sleeping and asked him to repeat the information he had divulged at this mornings breakfast meeting. Jeff stated that there had been a persistent rumor for several days in the mill around the fact that an A-1 Disposal driver had told one of our wood yard or receiving people that A-1 was putting toxic waste into the trucks used to spread roadbinder. He had nothing further to add.

After returning to the mill from the visit with Jeff Volker, I then met with John Bonham; Project Engineer in charge of the roadbinder project, and Mickey Morey; Production Supervisor, separately. Mickey Morey had nothing further to add and reported essentially the same rumor that Jeff Volker had reported. John Bonham added that he had heard that a gentleman by the name of Stan Wymatt (phonetic spelling only) from A-1 Disposal was the driver who had reportedly talked to one of our wood yard or receiving personnel about the contamination problem.

At approximately 1:20 p.m., I called Tom Leep, Hazardous Waste Supervisor at the DNR office in Plainwell, phone number 685-9886. I relayed to Tom the events of the day relating to the mill rumor. Tom stated that he failed to

see any motivation on the part of A-1 to dispose of a few barrels a day this way when indeed they were processing hundreds of barrels a week of toxic waste. Tom asked that Menasha personnel pay attention to any unusual odors or anything visually unusual when the trucks arrive for loading. I asked Tom if he wished to pursue this matter further and he indicated that he felt it was unnecessary at this time and that he would disucss it with staff and get back with me if they felt further action was warranted. I advised Tom that Menasha Corporation had no way at this point in time of determining whether the rumor was substantive and that we were not equipped to undertake covert or clandestine activities to substantiate. I advised Tom that we would cooperate in whatever way possible if the DNR should request our assistance. Dan Hackler was present during this conversation with Tom Leep. The conversation ended approximately 1:30 p.m.

I then called Bill Shepard and discussed with him the results of my conversation with Tom Leep. Again in the presence of Dan Hackler, the decision was made to take a sample of the contents of A-1 Disposal's trucks and to undertake an analysis for toxic organics and inorganics. Not knowing what to test for, we decided to focus on the presence of pesticides, chlorinated aromatics and alaphatics and heavy metals. It was agreed to take the first sample tomorrow morning when the truck arrived for it's first load.

Spoke later in the afternoon with Al Switzenberg; Supervisor of the liquor roadbinder project, and Al stated he was prepared to sample tomorrow morning. He also commented that on several past occasions he had observed the A-1 trucks during and before loading, and had never observed anything unusual (smell or visual).

BB/d

c J. Bonham
T. Clemmons
D. Hackler
B. Janda
K. Kling
J. Sarosiek
B. Shepard

A & L AGRICULTURAL LABORATORIES, INC.
411 N. Third St. ● Memphis, TN 38105-2723 ● (901) 527-2780
ACCT # - #

REPORT NUMBER

282-003A
CORRECTED COPY

November 30, 1984

Menasha Corporation
P.O. Box 155
Otsego, MI 49078
ATTN: Keith B. Kling

DATE REC'D - 8-24-84

LABORATORY NUMBER:	46818	46819	46820
SAMPLE IDENTIFICATION:	EP TOXICITY Leachate of #1 Liquor	EP TOXICITY Leachate of #2 Liquor	EP TOXCITY Leachate of #3 Liquor
ANALYSIS:			
Arsenic (mg/l)	< 0.01	< 0.01	< 0.01
Barium (mg/l)	0.74	0.58	1.43
Cadmium (mg/l)	0.020	0.020	0.045
Total Chromium (mg/l)	0.03	0.04	0.15
Lead (mg/l)	0.03	0.02	0.07
Mercury (mg/l)	0.0099	0.0042	0.0042
Selenium (mg/l)	0.001	0.001	0.001
Silver (mg/l)	0.02	0.02	0.05

NOTE: Organics will follow on separate report. Samples were analyzed by methods in SW-846, Test Methods for Evaluating Solid Waste, 1982.

A & L ENVIRONMENTAL SERVICES

Sarah Chrestman

Sarah Chrestman, Chemist

SC/csd

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411 N. Third St. ● Memphis, TN 38105-2723 ● (901) 527-2780
ACCT # - 4766

REPORT NUMBER
338-012A

December 4, 1984

Menasha Corporation
P.O. Box 155
Otsego, MI 49078
ATTN: Keith B. Kling

DATE REC'D - 8-24-84

LABORATORY NUMBER:	46818	46819	46820
SAMPLE IDENTIFICATION:	EP TOXICITY Leachate of #1 Liquor	EP TOXICITY Leachate of #2 Liquor	EP TOXCITY Leachate of #3 Liquor
ANALYSIS:			
Endrin (mg/ 1)	< 0.0002	< 0.0002	< 0.0002
Methoxychlor (mg/1)	< 0.0002	< 0.0002	< 0.0002
Toxaphene (mg/1)	< 0.0002	< 0.0002	< 0.0002
2,4-D (mg/1)	< 0.0002	< 0.0002	< 0.0002
2,4-5-TP (mg/1)	< 0.0002	< 0.0002	< 0.0002
Lindane (mg/1)	< 0.0002	< 0.0002	< 0.0002

NOTE: Samples were analyzed by method in SW-846, Test Methods for Evaluating Solid Waste, 1982.

A & L ENVIRONMENTAL SERVICES

Sarah Chrestman

Sarah Chrestman, Chemist

SC/csd

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