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SUPPLEMENTAL
PRODUCTION

VOL. III

DOCUMENTS 14-35

MEN04110

MENASHA CORPORATION

10 August 1979

Mr. Robert F. Babcock
Water Quality Administrator
Michigan Water REsources Commission
Water Quality Division/ NPDES
Compliance Section
P.O. Box 30028
Lansing, MI 48909

I received your notice of compliance dated August 3, 1979 concerning NPDES Permit No. MI-0003824, WRC #: 8-79-05-3174. A problem exists and has been documented in numerous previous monthly reports concerning the phenol and phosphorous problems. The phenol problem is analytical methodology and the phosphorous problem is associated with the phosphorous tied up in the cell material of the suspended solids. The temperature excursion cause was identified and corrective action immediately taken.

The underlying factors contributing to excusions detailed in the notice of noncompliance, have been addressed in a number of ways. Firstly, the phenol results are not accurate since positive lignin interference has clearly been demonstrated in our effluent. The standard steam distillation procedure with four amino antipyrine colorimetric determination can not be demonstrated to show repeatable or adequate recovery. The inaccuracy of currently approved methodology has been demonstrated on our effluent by Clow Laboratories in Pontiac and Preis and Newhof Laboratory in Grand Rapids. Additionally, the National Council for Air and Stream Improvement has documented positive lignin interference in many pulp and paper mill wastes.[1]

In recognition of these problems, two actions have been taken. 1) our new NPDES permit phenol limit is based on the average of the monthly tests rather than a single test value and 2) a request for alternate test procedure form is being submitted to the Chief Engineer, Water Resources Commission to improve the quality of the numbers generated.

An inequality has existed in the phosphorous specification during the entire life of this permit. Biological material (i.e. bacteria) contain phosphorous as a part of their

[1] N.C.A.S.I. Technical Bulletins 250 and 268.

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MEN04111

cellular structure. Typically, this phosphorous comprises .4 to .8% of the weight of the bacteria. Taking the median concentration of .6% times the allowable suspended solids discharge from the waste treatment system (the vast majority of the suspended solids discharge is bacterial matter) then factoring in our average discharge volume, total phosphorous concentrations in the effluent due strictly to phosphorous incorporated in the cellular material of the allowable suspended solids discharge equals just under 4 parts per million on a concentration basis. The numbers used here are 600,000 gallons per day effluent, 8.34 lbs. per gallon, 3200 lbs. of suspended solids and .6% phosphorous in the cellular material. Since viable bacterial populations require soluable phosphorous for nutrition, it becomes readily apparent that none can be present since, more than 100% of the allowable phosphorous discharge is already incorporated in the cellular structure of the allowable suspended solids being discharged. This inequality has been resolved in the new permit recently received. The new permit now specifies testing for soluable, ortho-phosphorous. Ortho-phosphorous is the biologically available material of concern both environmentally with regard to the receiving water and operationally with regard to the waste treatment system.

The [illegible]° water temperature specification on outfall 004 has been deleted from the new permit. The volume of discharge from this outfall is so small, that no significant impact on the receiving water exists due to high discharge temperatures.

With the new permit specifically addressing these problem areas, the aforementioned difficulties should be resolved. The repetitive, month after month after month explanation and repeat of the same information dealing with the phenol, phosphorous and temperature problems becomes difficult to justify when administrative remedies on the part of a W.R.C. are all that is needed to resolve these technical violations. Since this action has now been taken, the only problem still to be resolved is the approval of the modified analytical methodology for phenol testing. A request to the State D.N.R. laboratory for assistance is resolving the phenol methodology problem was rejected over a year ago. Going it alone has surely delayed resolution of this problem. Erroneous results will continue to be reported until this or some other modified test proceedure is approved which will eliminate analytical inaccuracies and interferences.

Sincerely,

Otsego Paperboard Div.
Menasha Corporation

Bruce Buchanan
Mgr. Technical & Utilities

cc: Chet Harvey
Robert Courchaine

BB/kj

6172

MEN04112

MENASHA CORPORATION

10 August 1979

Comprehensive Studies Sec.
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen;

This letter addresses excursions in the July 1979 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. The following items were out of compliance; Outfall 004 contained 2 of 2 tests where phosphorous concentrations exceeded the 2 milligram per liter limit and also one of four phenol tests exceeded the 300 microgram per liter limit. No phosphorous is being added to the waste treatment system in the form of nutrients. Soluable ortho-phosphorous levels are below the newly received NPDES limits. The phenol value of 1500 microgram per liter on the 17th is an obvious analytical error with methodology at fault.

Outfall 004 showed two excursions each in suspended solids, concentration and pounds per day, one excursion in pH and one excursion in temperature. The suspended solids problem is believed to be related to large growths of iron bacteria within the well systems feeding the powerhouse. Our No. 6 well has just been taken off line today in order to proceed with chlorination and caustic backwashes and etc. to reduce the bacterial problems. These bacteria have been growing rapidly in the cooling water systems and floor drains and have been seen floating in large quantities from the outfall pond. The temperature and pH problems on the 3rd where related to a very short term blowdown from the boilers. This condition existed for only a short time at around 10:30 in the morning when the daily grab sample was being taken.

Sincerely,

Otsego Paperboard Div.
Menasha Corporation

Bruce Buchanan, E

Bruce Buchanan
Mgr. Technical & Utilities

cc: Bob Courchaine

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 [illegible]

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MEN04113

MENASHA CORPORATION

10 August 1979

Mr. Robert F. Babcock
Water Quality Administrator
Michigan Water REsources Commission
Water Quality Division/ NPDES
Compliance Section
P.O. Box 30028
Lansing, MI 48909

I received your notice of compliance dated August 3, 1979 concerning NPDES Permit No. MI-0003824, WRC #: 8-79-05-3174. A problem exists and has been documented in numerous previous monthly reports concerning the phenol and phosphorous problems. The phenol problem is analytical methodology and the phosphorous problem is associated with the phosphorous tied up in the cell material of the suspended solids. The temperature excursion cause was identified and corrective action immediately taken.

The underlying factors contributing to excusions detailed in the notice of noncompliance, have been addressed in a number of ways. Firstly, the phenol results are not accurate since positive lignin interference has clearly been demonstrated in our effluent. The standard steam distilation proceedure with four amino-antipyrine colorimetric determination can not be demonstrated to show repeatable or adequate recovery. The inaccuracy of currently approved methodology has been demonstrated on our effluent by Clow Laboratories in Pontiac and Prein and Newhof Laboratory in Grand Rapids. Additionally, the National Council for Air and Stream Improvement has documented positive lignin interference in many pulp and paper mill wastes.[1]

In recognition of these problems, two actions have been taken. 1) our new NPDES permit phenol limit is based on the average of the monthly tests rather than a single test value and 2) a request for alternate test proceedure form is being submitted to the Chief Engineer, Water Resources Commission to improve the quality of the numbers generated.

An inequality has existed in the phosphorous specification during the entire life of this permit. Biological material (i.e. bacteria) contain phosphorous as a part of their

[1] N.C.A.S.I. Technical Bulletins 250 and 268.

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MEN04114

cellular structure. Typically, this phosphorous comprises .4 to .8% of the weight of the bacteria. Taking the median concentration of .6% times the allowable suspended solids discharge from the waste treatment system (the vast majority of the suspended solids discharge is bacterial matter) then factoring in our average discharge volume, total phosphorous concentrations in the effl due strictly to phosphorous incorporated in the cellular material of the allowable suspended solids discharge equals just under 4 parts per million on a concentration basis. The numbers used here are 600,000 gallons per day effluent, 8.34 lbs. per gallon 3200 lbs. of suspended solids and .6% phosphorous in the cellular material. Since viable bacterial populations require soluable phosphorous for nutrition, it becomes readily apparent that none can be present since, more than 100% of the allowable phosphorous discharge is already incorporated in the cellular structure of the allowable suspended solids being discharged. This inequality has been resolved in the new permit recently received. The new permit now specifies testing for soluable, ortho-phosphorous. Ortho-phosphorous is the biologically available material of concern both environmentally with regard to the receiving water and operationally with regard to the waste treatment system.

The 85° water temperature specification on outfall 004 has been deleted from the new permit. The volume of discharge from this outfall is so small, that no significant impact on the receiving water exists due to high discharge temperatures.

With the new permit specifically addressing these problem areas, the aforementioned difficulties should be resolved. The repetitive, month after month after month explanation and repeat of the same information dealing with the phenol, phosphorous and temperature problems becomes difficult to justify when administrative remedies on the part of a W.R.C. are all that is needed to resolve these technical violations. Since this action has now been taken, the only problem still to be resolved is the approval of the modified analytical methodology for phenol testing. A request to the State D.N.R. laboratory for assistance is resolving the phenol methodology problem was rejected over a year ago. Going it alone has surely delayed resolution of this problem. Erroneous results will continue to be reported until this or some other modified test proceedure is approved which will eliminate analytical inaccuracies and interferences.

Sincerely,

Otsego Paperboard Div.
Menasha Corporation

Bruce Buchanan

Bruce Buchanan
Mgr. Technical & Utilities

cc: Chet Harvey
Robert Courchaine

BB/kj

6447

MEN04115

MENASHA CORPORATION

30 August 79

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Test results for Outfall 003 received on 24 August 1979 for a sample dated 8/7/79 indicated that soluble orthophosphorous concentration exceeded new permit conditions at Outfall 003. The permit specification is 1.0 ppm. and the analytical data reported 1.63 ppm. There is no phosphorous feed to the waste treatment system at all and only about 3/4 lbs. per day worth of phosphorous is used within the mill. A complete phosphorous balance survey has been initiated and analytical results will be used to determine if an unknown source of phosphorous is being introduced into the system. All raw materials, chemicals, etc. will analyzed as soon as possible.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

Bruce Buchanan

Bruce Buchanan
Acting Manager

cc: Robert F. Babcock
Comprehensive Studies
Chet Harvey

BB/kj

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MEN04116

MENASHA CORPORATION

10 September 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The August Monthly Operating Report for the Otsego Paperboard Division reveals three excursions in milligram per liter and pound per day specifications for soluble phosphorous discharge at outfall 000. Per my previous memo, an analytical survey of all raw materials used within this facility is underway. Again, no nutrient phosphorous addition is being made to the waste treatment system.

If you would like to discuss this matter, please advise. I will be available at your convenience.

Best regards,

Menasha Corporation
Otsego Paperboard Division

Bruce Buchman

Bruce Buchman
Acting General Manager

cc: Robert Babcock
Chet Harvey
Comprehensive Studies

BB/kj

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MEN04117

MENASHA CORPORATION

1 October 1979

Robert J. Courchaine
Executive Secretary, D.N.R
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for [illegible] fall [illegible] received on 28 September 1979 for samples dated August 14 and August 21, 1979 indicated that soluble orthophosphorous concentrations exceeded the new permit conditions at Outfall 003. The permit specification is one part per million and the analytical data reported 1.35 and 1.45 ppm. respectively for the two days. The permit limit of 5.8 lbs. per day was also exceeded on both days. On August 14 we discharged 7.1 lbs. and on August 21 the discharge was [illegible] lbs.

As mentioned in previous letters, there is no phosphorous feed to the waste treatment system at all and only about [illegible] lbs. per day worth of phosphorous is used within the mill. The analytical survey of all raw materials used within the mill is still underway. The samples have all been sent in for analysis but as of this date we have not received any results back from the lab.

If you would like to discuss this matter, please advise. I will be available at your convenience.

Best regards,

Menasha Corporation
Otsego Paperboard Div.

John Blauwkamp

John Blauwkamp
Acting Technical Director

cc: R. Babcock
C. Harvey
Comprehensive Studies

JB - j

OTSEGO PAPERBOARD [illegible]

John

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MEN04118

MENASHA CORPORATION

8 October 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The September Monthly Operating Report for the Otsego Paperboard Division revealed one excursion of the milligram per liter specification for soluable ortho-phosphorous discharge at outfall 000. The test results for outfall 003 received October 4, 1979 for sample dated September 4, 1979 indicated a soluable ortho-phosphorous concentration of 1.15 ppm.. As mentioned in previous letters there is no phosphorous feed to the waste treatment system at all and the analytical survey of all raw materials used within the mill is still underway. To date we still have not received the test results back from the lab..

If you would like to discuss this matter, please advise. I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: C. Harvey
R. Babcock
Comprehensive Studies Sec.

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MEN04119

MENASHA CORPORATION

11 October 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 003 received on October 10, 1979 for a sample dated September 25, 1979 indicated that soluble orthophosphorous concentrations exceeded the new permit conditions at Outfall 003. The permit specification is 1 ppm. and the test results indicated a concentration of 1.07 ppm.. On this day we discharged [illegible] lbs. of soluble orthophosphorous which slightly exceeds the permit limit of 5.8 lbs. per day.

As mentioned in previous letters there is no phosphorous added to the waste treatment system at all. And the analytical survey of all materials used within the mill is still underway. The Lab. doing the phosphate analysis said the tests would be completed by October 1[illegible] so we should have the test results by October 22.

If you would like to discuss this matter, please advise. I will be available at your convenience.

Sincerely

Otsego Paperboard Div.
Menasha Corporation

John R. Blauwkamp
Acting Technical Director

cc: Chet Harvey
Robert Babcock
Comprehensive Studies Sec.

JB/aj

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MEN0412

MENASHA CORPORATION

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Tod

29 October 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for the combined Outfall of 003 and 002 for the dates of October 26, 1979 and October 27, 1979 indicated the total suspended solids exceeded the permit conditions at these outfalls. The permit specification is 3200 lbs. per day and the test results indicated a total suspended solids discharge of 3274 lbs. on the 26th of October, and 3218 lbs. on October 27, 1979 It is felt that this may have been caused by an excess of foaming in the aeration pond. Defoamer is being added to the aeration pond to reduce the amount of foam. By doing this we should be able to bring the suspended solids back into specifications.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

Gary E. Roys

Gary E. Roys
Process Chemist &
Group Leader

cc: R. Babcock
C. Harvey
Comprehensive Studies Sec.

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MEN04121

MENASHA CORPORATION

2 November 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The results for Outfall 003 received on 1 November 1979 for samples dated October 16 and October 23, 1979 indicated at soluble orthophosphorous concentrations exceeded the new permit condition at Outfall 003. On October 16, 1979 the orthophosphorous concentration was [illegible] ppm. and we discharged 10.6 lbs . On October 23, 1979 the orthophosphorous concentration was 1.33 ppm. and we discharged 6.6 lbs..

An analytical survey of the phosphorous content of all chemicals used within the mill has been completed. This survey did not reveal a source or a combination of sources of phosphorous which could be responsible for the high concentration of phosphorous in our waste treatment system. We are in the process of conducting a phosphorous balance on the entire mill including the waste treatment system. Samples from various points in the process were sent in for phosphorous analysis. These test results should help us pinpoint where the phosphorous is getting into the system. We have received the results of the additional tests done for the phosphorous balance. However the results of the phosphorous balance are inconsistent. Therefore we are having some of the tests rerun.

Test results for Outfall 004 for October 31, 1979 indicated that the susp. solids exceeded the permit conditions at this outfall. On this date 152 lbs. of suspended solids discharged at a concentration of 179 milligrams per liter.

The record will show that in the past we had quite a lot of trouble with rain water washing dust and silt from the road into this outfall. To solve this problem we installed

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MEN04122

a curbing around the outfall and a storm sewer to take away the rain water. Some grading work which was done near this outfall allowed the rain water from the road to by pass the curbing. Thus alot of dirt and grime from the road washed into the outfall and caused a high suspended solids discharge. The problem was corrected immediately.

If you would like to discuss any of these matters, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Chet Harvey
Robert Babcock
Comprehensive Studies Sec.

JB/kj

MEN04123

MENASHA CORPORATION

5 November 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for outfall 004 for 31 October 1979 and for November 4, 79 indicate that the pH was above State specification. On 31 October 1979 the pH of the discharge was 9.5. This is the same day that we had the high suspended solids from outfall 004 as reported in my letter of Noverber 2. The two incidences maybe related but it is equally possible that the high pH on this day was caused by something other than the suspended solids that washed into the pond. On 4 November 1979 the pH of our grab sample was 9.3. Four and a half hours later we took another grab sample and the pH was 8.0. Whatever caused this high pH was short lived in nature. At this point we are not sure what caused either of these high pH's but we have started an intensive monitoring program to find out. As soon as we find the cause of the problem we will immediately take whatever corrective action is possible and inform you of the corrective action taken.

If you would like to discuss any of these matters, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Plauwkamp
Acting Technical Director

cc: Chet Harvey
R. Babcock
Comprehensive Studies Sec.

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MEN04124

MENASHA CORPORATIO

9 November 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The October Monthly Operating Report for the Otsego Paperboard Division revealed five excursions of both milligram per liter and the lb. per day specifications for soluble orthophosphorous discharge at Outfall 000. As per my November 7 letter we are still trying to work out the inconsistencies which occurred in the phosphorous balance we are conducting. The samples which must be retested have been sent in and to date we have not received any test results back on them.

If you would like to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Chet Harvey
Comprehensive Studies Sec.

JB/kj

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MENASHA CORPORATION

9 November 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results for Outfall 000 received on 9 November 1979 for a sample dated October 30, 1979 indicated that the soluble orthophosphorous concentration exceeded the new permit conditions at Outfall 003. On this date the soluble orthophosphorous concentration was 3.24 ppm. and 9.5 lbs. of soluble orthophosphorous were discharged.

As stated in my letter of November 2, 1979 results of the phosphorous balance we conducted on the mill were inconsistent. The calculated amounts of phosphorous going into the system did not at all match up with the calculated amounts of phosphorous in the effluent. In order to resolve this inconsistency we are having the required samples retested for phosphorous content. The required samples have been sent in for analysis and we are putting pressure on the Laboratory to get these tests done as soon as possible.

I will be available to discuss this situation with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Chet Harvey
Comprehensive Studies Sec.

JB/kj

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-392-6141

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MEN04126

MENASHA CORPORATION

3 December 1979

Robert J. Courchain
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results for Outfall 000 received on 30 November 1979 for samples dated 13 November 1979 and 20 November 1979 indicated that soluble orthophosphorous concentrations exceeded the new permit condition at Outfall 000. On these dates the soluble orthophosphorous concentrations were 1.6 and 1.7 milligrams per liter respectively. On these dates 6.1 and [illegible] lbs. of soluble orthophosphorous were discharged respectively.

Phosphorous balance we have been conducting has been completed. The results of this phosphorous balance indicate that approximately [illegible] of the phosphorous getting into the system comes from the wood. Because this input phosphorous from the wood to the waste treatment system [illegible] always be [illegible] a while to [illegible] we are now [illegible] problem with high phosphorous concentrations in the waste treatment system.

[illegible] November [illegible] we used in NSSC pulping process [illegible] liquor produced from this process was burned in our [illegible] incinerator [illegible] we could not use the salt cake produced by this incineration process therefore it was sold, primarily to Kraft Mills. In order to avoid several environmental problems associated with the NSSC process, in November 1977 we switched to a no sulfur pulping process.

[illegible] this pulping process [illegible] burned in out SLI. However now the salt cake produced by the incineration process can be and is reused in the pulping process thus avoiding the disposal problems of the sulfur based salt cake and conserving a valuable natural resource. Initially we had difficulty burning the new spent liquor and ended up storing a considerable quantity of it for about a year. Since then we have learned to burn the liquor much more efficiently and have been using large quantities of the new salt cake in our pulping process.

OTSEGO PAPERBOARD MILL [illegible] • PHONE 616 692 61[illegible]

6378

Salt cake we are now using in the pulping process is on its third or fourth cycle through the system. Each time the salt cake is used in the pulping process the phosphorous content of the salt cake increases. The spent liquor which results from the pulping process has in it the phosphorous which was removed from the wood and the phosphorous which was in the salt cake. Therefore when the spent liquor is burned in the SLI the resulting salt cake has a higher phosphorours concentration than it did when it was used in the pulping process. This concentration effect will continue until the mill reaches a steady state condition where the amount of phosphorous leaving in the effluent and the paper is equal to the amount of phosphorous in the wood coming in.

Prior to November 1977 we sold the salt cake and thereby got rid of most of the phosphorous that was taken out of the wood. Since that time the phosphorous concentration in our salt cake has most likely been gradually building up and has just recently reached a concentration where it has been causing a problem.

We are in the process of trying to arrange a meeting with the Water Quality Representatives of District III to discuss what possible courses of action we may have to deal with this situation. I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: R. Babcock
C. Harvey
Comprehensive Studies Sec.

JB/kj

MEN04128

MENASHA CORPORATION

10 December 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the November 1979 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. The fall 002 had an excursion in its average phenol concentration. As indicated in previous correspondence we have spent a great deal of time and money having Vulcan Labs. develope a test proceedure for phenols which would be free from interference. Application was made to the State for approval of an alternate test proceedure. They have rejected this alternate test proceedure without even evaluating it because they said there was an existing proceedure which was free from interferences. We are currently working with the laboratory to determine if the method suggested by the State is applicable to our effluent. After the method suggested by the State has been evaluated we will either switch to that method or reapply for approval for the alternate test proceedure.

Outfall 000 had three excursions of the milligram per liter and lb. per day limits on its soluble orthophosphorous discharge. The phosphorous balance we have been conducting on the mill has been completed and my December 3rd letter to you deals with this subject at length. We have arranged a meeting for December 12, 1979 with the water quality representatives of District III to discuss what possible courses of action we may have to deal with this situation.

As discussed in Gary Roys' October 29 letter we had two days when the combined suspended solids discharges from Outfalls 000 and 002 exceeded the 3200 lb. per day specifications. At the time we thought the large amount of foam on the pond maybe responsible for the poor settling in the clarifier. Analysis of available data indicates that our treatment of the pond to reduce the amount of foam was not responsible for the suspended solids in the effluent returning to normal levels.

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Therefore the foam on the pond may not have been responsible for the poor settling in the clarifier. The data indicates that we had a rather short lived upset in the pond which resulted in poor settling for several days. The suspended solids concentration in the effluent gradually returned to normal over about a four day period. It appears that the most probable cause of this upset was a rapid change in the aeration ponds temperature which dropped from 70 degrees to 58 degrees in four days.

Outfall 004 had one excustion of its suspended solids specification and one excursion of its pH specification. As explained in my letter of November 2 the high suspended solids discharge was caused by rain washing dirt and grime from the road into the pond. This problem was taken care of immediately. Our investigation showed that the cause of the high pH was the draining of a boiler which was being shut down for repair. Further investigation showed that installation of a temperature control valve in the boiler blowdown tank would solve the problem. When this valve is installed it will add well water to the boiler blowdown tank and thus keep both the temperature and pH of the boiler blowdown within discharge specifications. This valve will be installed as soon as possible.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Chet Harvey
Comprehensiv. Studies Sec.
Bruce Buchanan

RJJ

TC - MOR

MEN04130

MENASHA CORPORATION

14 December 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 000 received on 10 December 1979 for sample dated November 26, 1979 indicated that the soluble orthophosphorous concentration exceeded the new permit conditions at Outfall 000. On this date the soluble orthophosphorous concentration was 2.5 ppm and 10.6 lbs. of soluble orthophosphorous were discharged.

My December 3rd letter to you discussed in detail the cause of the high orthophosphorous concentration in our effluent. This letter also stated that we were trying to arrange a meeting with the water quality representatives of District III to discuss what possible courses of action we may to deal with this situation. This meeting was held on December 12 and among other things it was agreed that Menasha would by 30 January 1980 provide the D.N.R. with our plan of attack for dealing with the phosphorous problem. It was agreed that this plan of attack would outline the various methods and technologies that we will be evaluating to remove the phosphorous from the system. I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Chet Harvey
Comprehensive Studies Sec.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616 692 6141

TB/k

384

MEN04131

memo / MENASHA CORPORATION

TO: Notes for File

DATE: 20 December

SUBJECT: Minutes of Meeting on 12 December 1979 with the Department of Natural Resources, Water Resources Commission, Grand Rapids Michigan

FROM: John Blauwkamp JRB

Representing the DNR were Chet Harvey, Roger Przybysz, Mike Beck and Marge Spruit. Representing Menasha Corporation were John Blauwkamp and Bruce Buchanan.

The first topic of discussion was the high soluble orthophosphorous concentration in our discharge from weir No. The history of the problem was reviewed from when the discharge spec. was changed from total phosphorous to soluble orthophosphorous. Included in the discussion was the work we did on the analysis of the phosphorous content of all chemicals used in the mill and the phosphorous balance we did on the mill. There was also a lengthy discussion on how the phosphorous tends to build up in the SLI product which is reused in the digester as a cooking chemical. Several possible means of removing the phosphorous before it gets to the waste treatment system were discussed. However it was agreed that this problem is much to complex to reach any decisions at this time. Menasha explained that it was working with consultants from CH_2M-Hill on a variety of environmental problems and that the phosphorous problem was one of the areas they would be helping us with.

It was noted that there was some discrepencies between the phosphorous concentration the DNR Lab got on samples of our effluent and those reported by our testing lab.. There was also some discussion of the results of the toxicity test done on our effluent. It was agreed that the DNR would take new samples for phosphorous and toxicity tests and that these samples would be split and we would have the phosphorous tests redone by our testing lab.. This should determine whether the differences in the results of the phosphorous tests were due to random errors or differences in testing proceedures.

The next topic of discussion was the high phenol concentration in the effluent. The history of our problems with the phenol tests and our work on developing a new phenol testing proceedure were very briefly reviewed. It was agreed by all that our application to have the new phenol testing procedure accepted should have been given more careful consideration than it received. It was suggested by the DNR that we resubmit the application to have the new testing procedure accepted and that this time we build a much stronger case for the new testing method.

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MEN04132

The next topic of discussion was Menasha's sludge management program. The DNR stated that Menasha must have a sludge management program which accounts for both storage and ultimate disposal of all the sludge. They also stated that the existing sludge storage ponds would have to be eliminated. There was then some discussion on what the problems were with the existing ponds and what the requirements would be for new sludge holding ponds. There was some discussion of how the development of a sludge management program gets complicated by possible changes in mill operations and other environmental regulations. The development of the sludge management program is another one of the things we plan to have CH_2M-Hill help us with.

The next topic of discussion was the use of a temporary liquor storage pond. Menasha explained both why the pond was still necessary and what measures were planned for 1980 to eliminate the need for this pond. The specific plans for 1980 were discussed and it was pointed out these methods were not fool proof. The problem of liquor storage is another one of the items that CH_2M-Hill may be helping us with.

The prevention of ground water contamination from the piles of SLI product temporarily stored North of River Street was the next topic of discussion. It was agreed that Menasha would cover the piles with a water proof barrier and that this would be sufficient means to prevent ground water contamination from this source.

The results of the toxicity tests done on our effluent weir 000 were then discussed in greater detail. Several possible causes of the poor results of the tests were discussed. The most probable cause of poor results was the low D.O. in the test solution at the end test. It was decided the DNR would get new samples and have the toxicity tests rerun. This time the DO of the tests solution would be held constant at a much higher level.

Summary

All the new laws which affect every aspect of environmental concern create a very complex and interrelated situation with regards to Mill operations and environmental concerns. What-ever action Menasha takes to modify Mill operations to comply with one law will affect how easy or difficult it is to comply with the rest of the laws. For this reason Menasha feels that it must at this time evaluate its total environmental situation in regards to all the new laws. This is the only way that Menasha can be reasonably sure that the actions taken in regards to the problems discussed today will be compatible with their future operating plans and overall environmental programs. Menasha is considering hiring the consulting firm, CH_2M-Hill, to help them develop a complete coordinated environmental policy. With this overall point of view in mind the following points of action were agreed on;

MEN04133

1. Menasha would submitt by January 30, 1980 its plan of attack for dealing with phosphorous and phenol problems. This plan of attack would briefly explain the various possible courses of action available to deal with each problem that would be investigated in greater detail.

2. By January 30, 1980 Menasha would submit to the DNR a report on the progress it has made in its plans regarding the sludge management program, the temporary liquor holding pond and the cover for the piles of SLI product.

3. By the end of each month beginning in February 1980 Menasha will submit to the DNR a status report on the five items mentioned in No. 1 and No. 2 above.

4. The DNR would take new grab samples for rerunning the phosphorous tests and bioassay tests our effluent.

cc: B. Buchanan
W.A. Schenck
Mark Spruit
D. C. Shepard

JB:kj

MEN04134

MENASHA CORPORATION

22 December 1979

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 000 received on 20 December 1979 for samples dated 3 December and 10 December 1979 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at Outfall 000. On these dates the soluble orthophosphorous concentrations were 4.1 and 3.8 ppm. respectively and 17.1 and 8.4 lbs. of soluble orthophosphorous were discharged respectively.

My December 3rd letter to you discussed in detail the cause of high orthophorphorous concentration in our effluent. My December 14th letter to you discussed what plans we have for dealing with this problem. To date there have been no changes in these plans. I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Direct

cc: Robert Babcock
Chet Harvey
Comprehensive Studies Sec.

JB/kj

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MEN04135

MENASHA CORPORATION

10 January 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursion in the December 1979 Monthly Operating Report for the Otsego Paperboard Div. of Menasha Corporation. Outfall 002 had an excursion in its average phenol concentration. As indicated in my letter of 10 December 1979 we had applied for approval of a alternate phenol test procedure. The application was denied on the basis that there was an existing method for eliminating the interferences. Our lab. has determined that this suggested method does not work on our effluent. Therefore, we will be reapplying for approval of the alternate phenol test procedure.

Outfall 000 had five excursions of both the milligram per liter and lb. per day limits on its soluble ortho-phosphorous discharge. As indicated in previous correspondence and agreed to in our December 12 meeting with the Water Quality Representatives of District III, we are evaluating various means of removing the excess phosphorous from our system.

I will be available at your convenience to discuss any of the matters mentioned above.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Chet Harvey
Comprehensive Studies Sec.

JB/kj

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6796

MEN04136

MENASHA CORPORATION

23 January 1980

Mr. Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 000 received on 21 January 1980 for samples dated 31 December 1979 and 7 January 1980 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at Outfall 000. On these dates the soluble orthophosphorous concentrations were 1.8 and 3.0 ppm. respectively and 7.3 and 12.2 lbs. of soluble orthophosphorous were discharged respectively.

As indicated in previous correspondence we are evaluating various means of removing the phosphorous from the system. Our progress report to the Water Quality Division of District III will discuss some of the various means of removing the phosphorous that we will be investigating.

I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: R. Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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6797

MEN04137

MENASHA CORPORATIO

7 February 1980

Robert J. Courchaine
Executive Secretary,DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 000 received on 4 February 1980 for samples dated January 14 and January 21, 1980 indicated that the soluble orthophosphorous discharge exceeded permit conditions at Outfall 000. On these days the soluble orthophosphorous concentrations were 1.3 ppm. and 7.7 and 6.2 lbs. of soluble orthophosphorous were discharged respectively.

As indicated in previous correspondence and in our progress report to the Water Quality Division of District III, we are investigating several means of reducing the soluble orthophosphorous concentrations in our effluent.

I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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MEN04138

MENASHA CORPORATION

8 February 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This addresses the excursions in the January 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. Outfall 000 had four excursions of both milligram per liter and lbs. per day limit on soluble orthophosphorous discharge. As indicated in our progress report to the Water Quality Representatives of District III, we are investigating several means of reducing the phosphorous concentration in our effluent. The progress of this investigation will be documented in our Monthly Progress Report. I will be available at your convenience to discuss any of the matters mentioned above.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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6000

MEN04139

MENASHA CORPORATION

15 February 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resource Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 000 received on 13 February 1980 for a sample dated 21 January 1980 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at Outfall 000. On this day soluble orthophosphorous concentrations was 1.3 ppm. and 6.2 lbs. of soluble orthophosphorous was discharged.

As indicated in previous correspondence we are evaluating several means of removing the excess phosphorous from the system. The progress of this investigation will be documented in our Monthly Progress Reports to the Water Quality Division of District III. I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Acting Technical Director

cc: R. Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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MEN04140

MENASHA CORPORATION

18 February 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for Outfall 000 received on 18 February 1980 for a sample dated 4 February 1980 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at Outfall 000. On this date the concentration was 6.4 ppm. and 31.2 lbs. of soluble orthophosphorous was discharged.

As indicated in previous correspondence we are evaluating several means of removing the excess phosphorous from the system. To date we have completed a phosphorous balance on the mill and the waste treatment system and have determined how much of the phosphorous must be removed from the SLI product to keep the effluent within limits. In order to speed up the evaluation of different means of removing the phosphorous from the SLI product we are getting set up to run the phosphorous tests for this project in house rather than at the contract laboratory. After we get the phosphorous testing procedure set up and checked out it should greatly speed up the evaluation because we will not have to wait two weeks for the results of each test to come back from the laboratory. The progress of this investigation will be documented in our monthly reports to Water Quality Division of District III.

I will be available to discuss this problem with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: R. Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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MEN04141

MENASHA CORPORATION

7 March 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This addresses the excursions in the February 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. On February 4 and February 18, 1980 Outfall 000 had excursions of both the milligram per liter and pound per day limits on soluble orthophosphorous discharge. On these dates the concentrations were 6.4 and 1.8 ppm. respectively and 31.2 and 10 lbs. of soluble orthophosphorous were discharged respectively.

As agreed to in our December 12, 1979 meeting with the Water Quality Representatives of District III and indicated in our January and February letters to them we are attacking the phosphorous problems on two fronts. First we are trying to resolve the discrepancies between our contract laboratory and the EPB laboratory. Test results from our contract laboratory have indicated soluble orthophosphorous concentrations from 2 to 5 times higher than those indicated by the EPB laboratory. When this discrepancy is resolved we will know whether or not non-compliance actually exists. We are currently having an additional set of split samples evaluated by both the EPB laboratory and a contract laboratory. The contract laboratory is testing several theories that we have on what may be causing the difference in readings between the two laboratories. Hopefully, we will have the results back from the two laboratories before the end of this month and will be able to resolve this problem once and for all. Secondly, just in case the results of the work mentioned above indicated that non-compliance actually does exist, we are continuing our work on finding ways of removing phosphorous from the system.

The progress of this investigation will be documented in our

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monthly letters to the District III, Water Quality Staff
If you wish to discuss any of the above mentioned items
I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Acting Technical Director

cc Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB

6426

MEN04143

MENASHA CORPORATION

7 March 1980

Robert S. Babcock
Water Quality Administrator
Michigan Water Resources Commission
Water Quality Division
Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Dear Mr. Babcock;

This is in reply to your letters of February 15, and February 22, 1980 giving Notice of Non Compliance under our Permit MI 0003824. Based on conversation our John Blauwkamp had with your office, we understand the requested date for our response will be considered March 7, 1980, as specified in the original letter.

We take our responsibility to maintain the environment seriously, and work hard to comply with the provisions of our Water Permit as well as other Environmental Regulations. I believe most of the excursions which you cite has been discussed and the corrective action noted in previous correspondence.

The suspended solids on October 31, outfall 004 was explained and corrected as noted in our letter of 2 November 1979, copy attached. There has been no recurrence and we expect none.

The pH as cited on 004 for October 31 and November 4 were explained in our letter dated 10 December 1979, copy attached. Here again we have not had a recurrence up to the present time and do not expect one .

Concerning oil and grease. There has been, to the best of our knowledge, no significant change in effluent character with respect to oil and grease at 004 during the last year. We have not in the past, nor do we now at anytime impart a visual sheen on the receiving water. In a letter of July 9, 1979 (attached), a request was made for clarification of reading point for oil and grease. To this date, no written response to that letter has ever been received! As stated in the July 9, 1979 letter, we assumed the reading point for

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MEN04144

oil and grease was the receiving stream. However, during the September 10, 1979 point source survey, the survey crew verbally informed our waste treatment operator that henceforth, readings for oil and grease should be taken at the weir box. From that time on, we have reported trace values of oil and grease at the weir box on our monthly operating reports. Until the Notice of Violation was received, we had not considered ourselves in violation of the permit since no visable sheen has ever been created on the receiving water.

In addition to the one(1) values reported in the Notice of Violation, there were fifteen (15) values of one(1) and 6 values of two (2) in December. There were eleven (11) values of one (1), six (6) values of two (2) and one (1) value of three (3) reported in January. Again, none of these values created a visable sheen on the receiving stream and we do have a emergency oil spill program (SPCC plan) in force to deal with same.

To further confuse matters, you will see there are no violations in February 1980. This is because contrary to Point Source Survey crew instructions, DNR staff advised verbally on 30 January 1980 that we should again return to reading oil and grease on the receiving stream. Then, after issuance of the Notice of Violation, on 29 February 1980, DNR staff verbally advised that readings were again to be taken on the weir box. You can see the position this puts us in!

Please be advised that we do not consider reading the weir box either logical or necessary. The intent, as with other outfalls, is to protect the receiving stream. Since, as has been stated earlier, there never has been a sheen on the receiving stream, it is obvious that the micro quantities of oil present at the weir boxes is meaningless. Coupling the above with the readily apparant confusion, we can only assume it logical to continue reading the receiving stream unless written justification to the contrary is received.

With regard to phenol there has been a continuing technical problem in spite of aggressive changes which have been made to correct the situation. Our summary memo of 1977, attached, refers to the problem on phenol in its original form. Since that time, we have changed chemical suppliers to get a raw material sodium sulphite free of phenol. Subsequently we changed our cooking process at a great deal of cost, eliminating sodium sulphite completely. In spite of these changes and with no known phenol being brought into the mill, we still get excursions of the type noted in your letter.

In your February 15 letter, you have cited a test result discrepancy in the Deptember 10 survey. As noted above, phenol has been a problem and part of the problem is the weakness of the test method on pulp mill effluent such as ours. In our letter to the Grand Rapids office of January 29, (copy attached)

MEN04145

and in our subsequent letter to Grand Rapids of February 29, the investigation of accurately measuring phenol on our waste is reported. Subsequent to the February 29 letter, we have heard from the Technical Services Section of the Water Quality Division and they have stated the objective of the phenol test is to measure those compounds which will impart a taste to water. Having established those, the test method should measure such compounds and no others. By the end of March, we will have prepared a submission to the Technical Services Section of the Water Quality Division with data to show that the method we proposed earlier (gas chromatography) to determine phenol was the best one to be certain of measuring only those compounds which will cause trouble.

Since we first started exceeding our phosphorous limits, no phosphate has been added in our system but still excursions occur. We are investigating the test method used by our contract laboratory which has had test results from 2 to 5 times, higher than the EPB Laboratory As described in the February 29 memo to Grand Rapids, we are endeavoring to find the source of the difference between laboratories. Also as noted, research directed to find a method of reducing or removing phosphate from our system is proceeding.

We did considerable work in 1978 on the source of suspended solids discrepancy between the EPB Laboratory and the Menasha laboratory. This was traced down to differences in technique which were reported on 19 January 1979. (copy attached). We believe the results found here are the principal source of discrepancy between our laboratories.

The first Notice of Non Compliance August 1979 was explained in our letter of 10 August 1979, copy attached. Three of the items related to the ongoing phenol and phosphorus problem which appeared to be unique to the product made by the pulping process at this mill.

We believe we have moved aggressively in all cases where infractions occurred. The phenol and phosphorus situation have proven to be very difficult. If you feel we have overlooked any actionable points, we would like you or whoever you designate, meet with us to discuss action which should be taken.

Very truly yours,

Menasha Corporation
Otsego Paperboard Div.

Bruce T. Buchanan

Bruce T. Buchanan
Acting General Manager

cc: Grand Rapids Office of DNR,
Marge Spruit
Technical Service Section,
Galen Kilmer
W. A. Schenck
Ralph Peterson, CH M-Hill

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MEN04146

MOR
File

MENASHA CORPORATION

11 March 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for outfall 000 received on 10 March 1980 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at outfall 000. On this date the concentration was 3.9 ppm. and 4.3 lbs. of soluble orthophosphorous was discharged.

As mentioned in my letter of 7 March 1980 we are trying to resolve the differences between our contract laboratory and the EPB laboratory to determine if noncompliance actually exists. Todate the results of the tests mentioned in the 7 March letter have not been received.

The progress of this investigation will be documented in our monthly reports to the District III, Water Quality Staff. If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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MEN04147

MENASHA CORPORATION

21 March 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for outfall 000 received on 21 March 1980 for a sample dated 3 March 1980 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at outfall 000. On this date concentration was 2.6 ppm. and 13.1 lbs. of soluble orthophosphorous was discharged.

My March 14 letter to you contained several errors. The date of the sample had been omitted and the concentration and lbs. of phosphorous given were incorrect. The first paragraph of the March 14 letter should have read as follows:

Test results for outfall 000 received on 10 March 1980 for a sample dated 26 February 1980 indicated that the soluble orthophosphorous discharge exceeded the permit conditions at outfall 000. On this date the concentration was 1.2 ppm. and 5.1 lbs. of soluble orthophosphorous was discharged.

We have received some of the test results from the samples we split between the State EPB Lab., our contract lab., and our own lab.. Consistent with earlier results the State EPB lab. results indicate that the soluble orthophosphorous levels are below the 1 ppm. limit and the results from our contract lab. indicate orthophosphorous levels in excess of 1 ppm. The test results from our own lab. are not available yet. We are still trying to determine the cause of the differences between the contract lab. and the State EPB lab.. The progress of this investigation will be documented in our monthly reports to the Water Quality Staff of District III. I will be available to discuss this matter with you at your convenience.

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MEN04148

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

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MEN04149

STATE OF MICHIGAN

RAL 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

STEVENS T. MASON BUILDING
BOX 30028
LANSING, MI 48909

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

State Office Building
350 Ottawa, N.W., Suite 6D
Grand Rapids, Michigan 49503

March 27, 1980

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

Dear Mr. Buchanan:

This letter is meant to be a written clarification of the reading point for the oil and grease parameter as required by NPDES Permit MI0003824. The oil and grease, visual observation, is listed as a final effluent limitation in Menasha's NPDES Permit for two (2) outfalls. The effluent from these outfalls must be in compliance at the sampling point listed in Section d. The "no visible film" limitation for outfall 004 is to be met "prior to discharging to the Kalamazoo River." The same limitation is listed for the non-contact cooling waters from outfalls 003 and 005 and the effluent shall be in compliance "at the splitter box prior to discharging through outfalls 003 and 005."

As you pointed out in your July 9, 1979 letter, an oil skimming baffle on the weir box at outfall 004 prevents oil from being discharged to either the weir box or the receiving waters. Because the weir box is the last convenient point a visual observation can be made "prior to discharging to the Kalamazoo River," this would appear to be the most logical place to read the visual observation. If the company would like to install an observation site downstream of the weir box yet prior to discharging to the Kalamazoo River, district staff would be available to review the plans.

Section c, "The discharge shall not contain oil or other substances in amounts sufficient to create a visible film or sheen on the receiving waters," is a statement of water quality standards and is included as a limitation on all outfalls to surface waters. Sections b and c are included in all surface water permits.

If you should have any further questions concerning the above matter, feel free to contact me at this office.

Sincerely,

WATER QUALITY DIVISION

Marge Spruit

Marge Spruit
Water Quality Specialist

MS:nc
cc: Galen Kilmer, Tech. Serv.
WGD files, Lansing

6457

MEN04150

MENASHA CORPORATION

4 April 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results for outfall 000 received on 31 March and 4 April 1980 for samples dated 10 March and 17 March 1980 indicated at the soluble orthophosphorous discharge exceeded the permit conditions ac outfall 000. On these dates the concentrations were 1.7 and 1.5 ppm. respectively and 9.7 and 6.8 lbs. of soluble orthophosphorous was discharged respectively.

As indicated in our March 31 status report to the District III Water Quality staff we have made significant progress in resolving the orthophosphorous test differences between our contract lab. and the State EPB Lab.. As indicated in the status report, for the next two months, we will collect phosphorous data using sample preservation, preparation, and analytical methods which are essentially the same as thoughs used by the State EPB Lab..

The results of the first two tests run by this method indicate that the actual soluble orthophosphorous concentration in the effluent is well below the 1 ppm. limit. This is consistent with tests which were previously done by the State EPB Lab.. Current indications are that tests results which indicated an apparent violation of the soluble orthophosphorous discharge limit were the result of errors in methodology. Hopefully at the end of the two month trial of the new methodology we will be able to accept it as a permanent method and everyone concerned will be satisfied that outfall 000 is now and always has been in compliance with the soluble orthophosphorous discharge limit.

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MEN04151

The progress of this investigation and the results of the trial will be documented in our monthly reports to the Water Quality Staff of District III. I will be available to discuss this matter with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

MEN04152

MENASHA CORPORATIO

9 April 1980

Robert J. Courchaine
Executive Secretary, DNR
Water REsources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This addresses the excursions in the March 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. On four days we reported apparent violations of the milligram per liter limit on our soluble orthophosphorous discharge from weir 000. On three of these same days we also reported an apparent violation of the lbs. per day limit on our soluble orthophosphorous discharge from weir 000.

As indicated in my April 4, 1980 letter to you, we are conducting a two month trial using sample preservation, preparation, and analytical methods which are identical to those used by the State EPB Lab.. Results of the first two tests run by this method indicate that the actual soluble orthophosphorous concentrations in the effluent from weir C00 are well below the 1 ppm. limit. At this time it appears that the high soluble orthophosphorous concentrations reported in the last few months have been the result of sample preservation, preparation and analytical methods which gave erroneously high readings. We feel confident that at the end of the two month trial of the new methodology, everyone concerned will be satisfied that outfall 000 is now and has been in compliance with the soluble orthophosphorous discharge limits.

The results of this trial will be one of the items covered in our monthly status report to the Water Quality Staff of District III. I will be available to discuss this matter with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

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JB/kj

68.11

MEN04153

MENASHA CORPORATION

8 April 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on 4 April 1980 indicate that on April 2, 1980 the combined suspended solids discharge from weirs 002 and 000 exceeded the 4800 lb. per day limit. On this day 5293 lbs. of suspended solids were discharged.

Analysis of available data indicates that either testing error or short term upset in the clarifier and/or post clarifier settling ponds was the cause of this apparently high suspended solids discharge. On April 2, the suspended solids concentration in the effluent from weir 000 was 840 mg/l in the composite sample. The grab sample taken when this composite sample was begun was 480 mg/l and the grab sample taken at the end of this composite sample was 520 mg/l. Given the fact that the suspended solids concentrations in the grab samples taken at the beginning and end of the composite sample were slightly below average, if an upset did occur it was quite short lived in nature and therefore would have had to have taken place in the clarifier and/or post clarifier settling pond. For the four days prior to April 2, the average suspended solids concentration in the effluent from weir 000 was 552 mg/l with a standard deviation of 138 mg/l. For the four days after April 2, the suspended solids concentraiton in the effluent from weir 000 was 540 mg/l with a standard deviation of 126 mg/l. Based on this, a suspended solids concentration of 840 mg/l has only a 5% chance of occurring. It is unlikely that an upset which would cause a suspended solids concentration so much larger than normal variances could come and go so quickly that the grab samples taken before and after the composite are

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normal and still attain an average for the composite sample of 840 mg/l. For these reasons we feel that the unusually high suspended solids concentration of 840 mg/l and the resulting indication of a high suspended solids discharge are probably the result of a sampling or testing error.

If you wish to discuss this matter with me, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blouwkamp

John R. Blauwkamp
Acting Technical Director

cc: Robert Babcock
Comprehensive Studies Sec.
Marge Spruit

JB/kj

MEN04155

MENASHA CORPORATION

14 April 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on 8 April 1980 indicate that on April 7, 1980 the oil and grease reading at outfall 004 exceeded the daily limit of 0. On this day an oil and grease reading of 1 was obtained indicating that a miniscule amount of oil was present in the discharge. The almost inmeasurably small quantity of oil required to give a reading of greater than 0 in the weir box, of course, in no way caused a visible sheen on the receiving waters.

As allowed in our NPDES Permit, miscellaneous floor drains from the power plant area are discharged through outfall 004. Inspite of the unusual amount of care with which we handle oil and grease in this part of the mill, it is inevitable that sooner or later a few drops will work their way from the machinery to the floor and end up being discharged through outfall 004. In recognition of this fact we installed an oil absorbing boom prior to the weir box at outfall 004. Since installation of the oil absorbing boom and prior to March 7, we have had no problems with oil and grease at outfall 004. It appears that the unusually high di charge rate at the time the reading was taken caused enough turbulence in the area of the oil absorbing boom to allow a few drops of oil to reach the weir box at outfall 004. To solve this problem we installed a second oil absorbing boom such that the water must now pass under three oil absorbing barriers before reaching the weir box. This measure along with our continued emphasis on careful oil and grease handling practices appears to be sufficient to solve the problem.

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If you wish to discuss this matter with me, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Acting Technical Director

JRB/kj

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
Alan Schenck

6814

MEN04157

MENASHA CORPORATION

9 May 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the April 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. On April 2, 1980 our combined suspended solids discharge from weirs 002 and 000 apparently exceeded the daily maximum limit. My April 8 letter to you, explained the circumstances surrounding this apparent violation and the reasons we felt the unusually high values reported were most likely the result of sampling or testing error.

My April 14 letter to you reported an oil and grease reading of 1 at outfall 004. This letter explained the circumstances surrounding this exceedence and what actions were taken to reduce the liklihood of its reoccurring.

On April 30, 1980 we had a meeting with the District III Water Quality Staff. One of the items agreed to at this meeting was that Menasha would continue using the soluble orthophosphorus testing methodologies used by the State EPB Lab.. The results of this testing methodology indicates that Menasha is now and always has been in compliance with its soluble orthophosphorus discharge limit.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Director

cc: Scott C. Ross
Marge Spruit
B. Buchanan
E. C. Manders

JB/kj

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DNR meeting file

memo / MENASHA CORPORATION

MEN04158

TO: DNR Meeting File

DATE: 11 May 1980

SUBJECT: Minutes of April 30 meeting with District III, Water Quality Staff

FROM: John Blauwkamp

On April 30, 1980, a meeting was held between Menasha Corporation and the DNR's District III, Water Quality Staff. Present for the DNR were Mike Beck, Roger Przybysz, and Marge Spruit. Present for Menasha Corporation were Bruce Buchanan, Ralph Peterson and John Blauwkamp.

Phenol: In order to bring everyone up to date there was a brief review of recent developments in the phenol situation. We are still in compliance with the phenol limit at outfall 002, and are still trying to determine the cause of this change. Because we do not know the cause of the recent change in the phenol concentration at outfall 002 we believe it would be premature to assume at this time that the outfall will stay in compliance. Therefore we would like to continue pursueing having the phenol testing procedure changed and thereby eliminate the cause of this problem rather than just treating its symptoms. There was a great deal of discussion concerning the complexities of using gas chromotography to measure the many different phenolic type compounds in the effluent and assigning some order of significance to their impact on the environment. There was also considerable discussion concerning the causes of the interferences with the four AAP method of measuring the phenol concentrations.

After discussion of the National Council Studies on the Affect of Pulp Mill Effluents on Taste and Odor in Receiving Waters the DNR stated that they do not feel they needed an alternate test procedure for phenolic substances but needed a test procedure which would test only for phenol (carbolic acid). It was agreed that Menasha would write a letter to the District III staff requesting approval of the gas chromotography proceedure for testing for phenol only. No one knew for sure if gas chromotography had been approved as a test proceedure for carbolic acid. If Menasha can find where the proceedure has been approved for testing for carbolic acid, this information would be referenced in the letter.

Orthophosphorous: Menasha is now and always has been in compliance with its soluble orthophosphorous discharge from outfall 000. The apparently high phophorous discharges were caused by sample preservation and sample preparation methodologies which erroneously gave high phosphorous indications. Menasha will adopt as standard procedure the sample preparation and testing methods that it has been trying for the last two months. The only change will be that the samples will be shipped

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MEN04159

packed in ice. As Menasha continues to reduce its effluent volume the concentrations of various ions in the system will increase. One of these will be phosphorous. Although the pounds per day of phosphorous discharge will remain about the same or decrease slightly its increased concentration would still cause a violation of our effluent permit. The DNR agreed that the mill-gram per liter limit in the permit should be eliminated and only the pound per day limit on the phosphorous discharge should remain. Every effort will be made to get this accomplished the next time the permit is renewed.

Salt Cake Piles: About 4/5's of the salt cake has been covered with plastic. The rest of the pile was not covered because the manufacturer didn't ship the second piece of plastic. The missing piece of plastic should be here by the middle of May and will be installed as soon as possible.

One of our 1980 capital projects is to install a crusher in the SLI which would prevent a further buildup in the salt cake pile. It maybe possible to use the same crusher to recover some of the material that is already in the piles. Our contract engineers should have the detailed work on this project by June 1 and the project should be completed by the end of this year. After the crusher has been installed we will try recovering some of the salt cake from the piles. If it is not economically feasible to recover the salt cake from the piles an alternative means of disposal will be developed at that time.

Liquor Storage: As it has been explained previously, development of our liquor storage plans depends on the success or failure of the overbed feed gun we are installing. This project is running behind schedule. The mechanical work will be done during the May 19 shutdown but the instrumentation will not have been completed at this time.

In order to keep the development of our liquor storage plans moving along we will as best we can estimate the volume of liquor storage required. If after the overbed feed gun is running we find that our estimated liquor storage volume was close we will have to make only minor modifications to the plans. If however we find that our first estimate was all wrong, the completion of the liquor storage plan maybe delayed by whatever time the completion of the overbed feed gun was delayed.

Part of the work for developing the liquor storage plan is determining what causes the sludge buildup in the bottom of the liquor storage ponds and what ways maybe used to either prevent the sludge buildup or remove it from the ponds. Determining whether the sludge removed from the ponds can be reused, burned or must be landfilled is another important phaze of the project. We will begin working on finding

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the answers to these questions in the near future.

We currently have suppliers of artifical liners conducting tests to determine the compatibility of their liners with our spent liquor.

Sludge Management Program: The preliminary cost work on composting of our sludge has been completed. At this point the economics do not look good. We will however conduct a few mixing tests to determine if the actual sludge characterics would be significantly different from those expected.

Preliminary costs analysis has been conducted on various storage means. At this point it looks like clay lined ponds would probably be the most cost effective. This however will depend a great deal on what the final volumes required is and what means we can find to deal with the layer that forms on top of the ponds when the sludge separates. The volume of sludge storage required in turn depends on whether or not our winter sludge disposal plan is approved and how much of a volume reduction can be obtained by thickening with centrifuges.

We will be conducting tests using centrifuges to thicken the sludge. The results of these tests will determine what storage volume reduction can be obtained through thickening with centrifuges. At this time we will also determine if the thickened sludge can be mixed with fly ash and chip screen fines and then be disposed of in the landfill during the winter. The outcomes of these tests will have a very significant affect on the sludge storage volume required and on the size of the landfill that must be built.

Everyone thought that the plan to apply sludge to private farmland in the winter time would be beneficial to all. It would allow application of sludge to the land that was otherwise not available to us and would also significantly reduce the amount of sludge storage volume we required. It was agreed that Menasha would send in a proposal for winter land application program as soon as possible.

Miscellaneous: There was some discussion on the pros and cons of Menashas continuing to send the DNR monthly status reports on the development of its plans to deal with the problems discussed today. The DNR requested that Menasha continue to send them status reports on the development of its liquor storage facilities and its sludge management program. Items such as phosphorous, phenols and the salt cake piles would be eliminated from the reports unless there were new developments to report.

There was some discussion as to whether or not the issue of Menashas 1977 violations had been legally closed. Menasha was going to check this out and get back to them.

MEN04161

The results of the last toxicity test have been received. The results were quite favorable. A full report will be sent to us soon.

The meeting went very well and at the end of it I believe everyone had a feeling that we had made very significant progress towards the resolution of some problems that have been bothering all of us for quite some time.

cc: B. Buchanan
Ralph Peterson
Marge Spruit
E. C. Manders

JB/kj

memo / MENASHA CORPORATION

MEN04162

TO: Bruce Buchanan

DATE: 5 June 198

SUBJECT: June 1980 Violation of B.O.D. Discharge Limits.

FROM: John Blauwkamp

From June 24 through June 28 we will have been in violation of our B.O.D. discharge limit. The following is a brief summary of the events that lead up to this violation. Prior to June 13 the effluent flow to the aeration pond was high averaging 659,000 gal/day. The B.O.D loading on the aeration pond was about normal at about 2300 lbs/day and the D.O. in the pond was averaging about 4 ppm.. At 4 P.M. on June 13, the #3 aerator had to be turned off because it lost one of its four paddles. June 13 was also the day that the effluent flow to the aeration pond jumped an addition 100,000 gal/day. On June 14 the digester production increased from an average of 185 tons per day before the 13th to 234 tons per day on the 15th. By morning on the 14th the D.O. in the pond was already down from an average of about 3 ppm. to 1.6 ppm.. From the 14th through the 22nd the digester production averaged 236 tons per day the traywater disolved solids increased from about 1.3% to about 1.65% disolved solids, the influent to the aeration pond averaged about 700,000 gal/day and the B.O.D. concentration in the effluent gradually increased from about 250 mg/l to 580 mg/l. From June 19 to June 21 it looked as though the B.O.D. concentration in the effluent was going to level out at about 570 mg/l and on June 21and the morning of June 22 the D.O. in the pond was back up to over 1 ppm. Then on the 22nd digester put out a record of 265 tons per day, the dissolved solids in the effluent reached its high point of 1.43%, the S.L.I. put out about 37,000 gals. of 13% liquor. As a result of all this the D.O. in the pond dropped down to .6 and the B.O.D. concentration in the effluent started to climb again and on the 26th reached 900 mg/l. On June 27, we started washing in the digester at 50 gals./minute and at 10 A.M. the No. 3 aerator was put back on line again. However, due to the very large buildup of B.O.D. in the aeration pond, the D.O. in the pond did not increase from the .6 range to 4.3 until the morning of July 1st. Our B.O.D. discharges were above 3725 lb/day on June 24 and 25, and 26. Because the aerator was not put back on line until the 27th, the B.O.D. discharge for this day will most likely also be over the limits. Becasue the D.O. in the pond did not come up to normal until the first, it is also very possible that the discharge for the 28th and 29th will also be over the limits.

The main causes of this violation were the high flow rates, the high B.O.D. loading on the pond and of course, having the No. 3 aerator off. We could have successfully coped with any one of these problems and possibly any two of them, but the combination of all three of them at one time proved to much for the system to handle. The high flow rates were due to high

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MEN04163

seal water usage, malfunctions in the vacuum pump seal sump pump for several days, and having the Sinclair system off line for several days. The high B.O.D. loadings were due to high digester productions without washings and an apparent liquor spill in the SLI.

Recommendations:

In order to prevent future occurances of this nature we must accomplish three things: 1) we must do whatever is necessary in the SLI to prevent any more discharges of liquor to the waste treatment system. 2) we must establish a better preventative maintenance program on the aerators. 3) we must do the correlations, or studies, or literature researches required to establish what B.O.D. loading our waste treatment system is capable of handling under different conditions. This information could then be used to dictate what washing level is required in the digester and if necessary what the maximum production rate in the digester would be to keep the waste treatment in compliance.

I will be working with the appropriate personnel to accomplish the three items listed above and would appreciate any imput you may have on how we can prevent a reoccurance of this situation.

JB/kj

MEN04164

MENASHA CORPORATION

June 18, 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on June 14, indicate that on June 12, 1980 the combined suspended solids discharge from weirs 002 and 000 exceeded the 3200 lb. per day limit. On this day 5130 lbs. of suspended solids were discharged.

A very high concentration of suspended solids rather than a large volume of effluent was the cause of the high suspended solids discharge. The suspended solids concentration in the composite sample for the 12th was 810 mg/l. The fact that the grab samples taken at the beginning and end of the composite sample for the 12th were both about 1/2 of the composite sample (470 and 340 mg/l respectively) indicate that the cause of the high suspended solids concentration in the composite sample was a short term upset in the post clarifier settling ponds. Our data indicate that the most probable cause of this upset was that the unusually low evening temperatures caused the settling pond to turn over. When the evening temperature stopped dropping down into the 30's, both the water temperature and the suspended solids concentration return to normal.

I will be available to discuss this matter with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan

JB/kj

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MEN04165

MENASHA CORPORATION

July 2, 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on June 30, 1980 and July 1, 1980 indicate that on June 24, 1980 and June 25, 1980 the combined B.O.D. discharge from weirs 000 and 002 exceeded the 3725 lb. per day limit. 4263 and 4269 lbs. of B.O.D. were discharged respectively.

The primary cause of the high B.O.D. loading in the effluent is that on June 13, 1980, we had to shut down one of our five aerators because it lost one of its paddles. Several days before the aerator went down, we noticed an increase in the B.O.D. loading on the system but this did not change the dissolved oxygen in the pond. As soon as the aerator went down, the D.O. in the pond started to drop and the B.O.D. concentration in the effluent started to increase. The aerator was put back in operation on June 27. However, due to the high concentration of B.O.D. in the aeration pond the D.O. in the pond did not increase until July 1st.

At the present time it looks as though we will most likely still be over the limits on June 26 and 27 (the two additional days before the aerator was put back on line). Because the D.O. in the pond took several days to come back up to normal it's possible we will also be over the limits on the 28, 29 and 30th

By July 7, we expect to have data indicating that we are back in compliance and will advise you on the status of the situation at that time. If you have any questions regarding this matter, please contact Bruce Buchanan or myself at this office.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: B. Buchanan
M. Spruit
E. C. Manders

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MEN04166

MENASHA CORPORATION

7 July 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This is the follow-up letter to my July 2nd letter to you which indicated that on June 24 and June 25, 1980 the combined B.O.D. discharge from weirs 002 and 000 exceeded the 3725 lb./day limit. In addition to June 24 and June 25, test results received on July 2 and July 3, 1980 indicate that on June 26 and June 27, 1980 the 3725 lb./day limit was again exceeded. On these two dates 4245 and 4016 lbs. of B.O.D. were discharged respectively.

As stated in my July 2nd letter, the primary cause of the high B.O.D. loading in the effluent was having our #3 aerator down. From the time that the aerator went down on the 13th, the B.O.D. loading in the effluent steadily increased until the 27th when the aerator was put back on line. The sample for the 27th showed a decrease from that of the 26th and the sample for the 28th showed that we were back in compliance again. The B.O.D. concentration in the effluent continued to decrease and by July 1st, we were back in a normal operating range.

The primary cause of this excursion was that on June 13th our #3 aerator lost one of its paddles and had to be shut down. The aerator was down until a new paddle could be fabricated and installed. Since this time we have begun implementation of a preventative maintenance program which will greatly reduce the likelihood of this incident reoccurring. If you have any questions regarding this matter, please contact Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
B. Buchanan
E. C. Manders

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MEN04167

MENASHA CORPORATION

July 10, 1980

Robert J. Courchaine
Executive Secretary, DNR
WaterResources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the June 1980 Monthly Operating Report for the Otsego Paperboard Div. of Menasha Corporation. On June 12, 1980, the combined suspended solids discharge from weirs 002 and 000 exceeded the 3200 lb/day limit. As indicated in my June 18th letter to you, the cause of the high suspended solids concentration in the effluence was a short term upset in the post clarifier settling pond. The most probable cause of this upset was that the unusually low evening temperatures caused the settling pond to turn over.

On June 24, 25, 26 and 27, 1980, the combined B.O.D. discharge from outfalls 002 and 000 exceeded the 3725 lb/day limit. My letters of 2 July and 7 July, 1980 indicated that having our No. 3 aerator down for repairs was the cause of this high B.O.D. discharge. The aerator was put back in operation on the 27th and the composite sample for the 28th showed that we were back in compliance again. By July 1st the B.O.D. concentration in the effluent had returned to a normal operating range.

In regards to the high phenol concentration in the effluent from outfall 000, we are still working on establishing a new phenol monitoring proceedure. Marge Spruit's June 19th letter to me, outlined the basic steps they feel we should take in developing the new phenol monitoring proceedure. As indicated

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MEN04168

in my June 30th letter to Marge, we are making arrangements with out contract lab. to determine what the accuracy and repeatability of the testing proceedure would be when testing our effluent. We will keep you advised of the development of this proposed phenol monitoring proceedure.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: M. Spruit
Scott C. Ross
B. Buchanan
E. C. Manders

JB/kj

MEN04169

MENASHA CORPORATION

18 July 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results received on July 14, 1980 indicate that on 7 July 1980 the soluble orthorphosphorous discharge exceeded the permit conditions at outfall 000. On this date the concentration was 2.7 ppm. and 11.1 lbs. of soluble orthophosphorous was discharged.

On June 30, 1980, the soluble orthophosphorous concentration was .49 ppm. and on July 14th, the concentration was .28 ppm.. At the present time, we do not know what caused the large increase in the soluble orthophosphorous concentration of the sample taken on July 7th. To the best of our knowledge no phosphorous was added to the system and all operating parameters appeared normal at that time. To be sure that the test results were not in error, we had the test rerun on that sample. The results of the retest were essentially the same as those of the original test. However, the Lab. technician did note an unusually high background color reading in the sample. This high background color level may have interferred with the test, but at the present time we have no idea what may have caused this high background color.

The test results for the following week, indicated that the orthophosphorous level was back down to normal. If we have reocurrances of this nature, we may have to do further investigative work to determine what is causing it. If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan

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JB/kj

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MEN04170

MENASHA CORPORATION

23 July 1980

Robert J. Courchaine
Executive Secretary, DNR
Water REsources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on July 21 and July 22, indicate that on July 20 and July 21 the combined suspended solids discharge from weirs 002 and 000 exceeded the 3200 lb./day limit. On these days, 3352 and 4030 lbs. of suspended solids were discharged respectively. Test results received today indicate that on 22 July we were back in compliance again.

At this point in time, we do not have a clear understanding of what may have caused the high suspended solids concentrations in the effluent. We have however, noticed several unusual things which we suspect may have contributed to the high suspended solids. About four days after the temperature in the pond reached 82 degrees, we noticed the suspended solids concentration in the effluent was climbing and becoming erratic. About the same time, we noticed a slimy type film on the filter pads of our effluent samples. We believe that it is this new slimy bacteria which is not settling well and is causing the high suspended solids discharge. The cause of this slimy bacteria could be the increase in temperature, the rain washing material into the pond or it could be a contamination of the system from an outside source, such as the waste paper coming into the mill. Another unusual thing we have noticed but have no explanation for at this time is that the suspended solids concentration on the composite samples have been averaging about 200 mg/l higher than the grab samples taken at the beginning and end of each composite sample. These results for 22 July indicate that we are back in compliance again but because of our lack of understanding of what is currently happening in the aeration pond, we can not make any predications as what

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MEN04171

is to happen next. We will keep you advised if there should be any further adverse development in the situation.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

B. S. Buchanan for J. R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

6500

MEN04172

MENASHA CORPORATION

6 August 80

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Dear Mr. Courchaine;

Test results received on August 3, indicate that on August 2, the pH of the effluent from outfall 000 exceeded the permit limit of 9.0. On this date the pH of the effluent from outfall 000 was 9.2. The effluent from outfall 000 is mixed with the noncontact cooling water from our condensor and the combined effluent is discharged to the river through outfall 003. The pH of the effluent from outfall 003 was 8.6. At no time did any point within the mixing zone exceed the 9.0 pH limit.

If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

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MEN04173

MENASHA CORPORATION

8 August 80

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in July 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. On June 26 and June 27, 1980 the combined B.O.D. discharge from outfalls 000 and 002, exceeded the permit limits. As indicated in my letters of July 2 and July 7, the primary cause of this high B.O.D. discharge was having our No. 3 aerator down for repairs.

Tests indicated that on July 7, 1980, the soluble orthophosphorous concentration exceeded the permit limits at outfall 000. The soluble orthophosphorous concentration on the samples taken on June 30 and July 14 were both normal. As indicated in my July 18th letter to you, the most probable cause of this high test result was the high level of background color in the test sample.

On July 20 and July 21, the combined suspended solids discharge from outfall 000 and outfall 002 exceeded the permit limits. My July 23rd letter to you indicated that we believed the problem was due to a poorly settling slimy bacteria which was either new to the system or present in unusual amounts. Since the 23rd the variability in the suspended solids concentration has decreased as has the concentration of the new slimy bacteria. We still do not understand what caused the sliminess to appear nor do we know if it will reappear. We will keep you advised of any further developments in this situation.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan
E. C. Manders

JB/kj

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MEN04174

MENASHA CORPORATION

9 September 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the August 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. The only excursion we had this month was in the pH limit on outfall 000. On August 2, the pH of the effluent from outfall 000 was 9.2. As stated in my August 6, 1980 letter to you, the effluent from this outfall is mixed with a noncontact cooling water from our condensor and the combined effluent is discharged to the river through outfall 003. The pH of the effluent from outfall 003 to the river was 8.6. At no time did any point within the mixing zone exceed the 9.0 pH limit.

If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

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MEN04175

MENASHA CORPORATION

19 September 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results received on September 15, 1980 indicate that on that day the oil and grease reading at outfall 004 exceeded the daily limit of 0. On this day an oil and grease reading of 1 was obtained indicating that an extremely small amount of oil was present in the discharge from the weir. The extremely small amount of oil required to give a reading of greater than 0, of course, cause no visible scheen on the receiving waters.

Our NPDES permit allows us to discharge the floor drains from the power plant area through outfall 004. Inspite of the great deal of care we use in handling oil in this area of the mill, it is inevitable that where ever there is machinery a small amount of oil will eventually end up on the floor and work its way to the U-drains, thus being discharged through outfall 004. Because of this we have had an oil skimming plate on the discharge weir and an oil absorbing boom before the discharge weir since early this year.

Normally the oil absorbing boom can effectively absorb the small amounts of oil which are discharged to outfall 004. In this case, we believe a leaky oil seal was responsible for allowing more oil to be discharged through outfall 004 than the oil absorbing boom can handle. The oil seal and the bearing failed several days before the oil showed up at outfall 004. When the leak in the oil seal was noticed, the area was immediately covered with a large amount of oil dry to absorb the oil. The area was also cleaned with oil dry after the bearing was repaired to absorb any remaining oil on the floor.

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MEN04176

Apparently either some oil reached the floor drain in the area before the leak was discovered or enough oil remained on the floor after the bearing was repaired, such that after several days and a few showers the oil showed up at outfall 004.

We will continue to use great care in handling of grease and oil and will continue to respond to situations such as this as fast as humanly possible. Inspite of these efforts it is inevitable that every-once-in-a-while trace amounts of oil will be discharged from outfall 004. Again, the minute quantities of oil necessary to cause a reading of greater than 0 at this outfall have not now nor never have caused a detectable scheen on the receiving waters.

If you wish to discuss this matter with me, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

MEN04177

MENASHA CORPORATION

7 October 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results received on October 3, 1980 indicate that on October 2 the oil and grease reading at outfall 004 exceeded the daily limit of 0. On this day an oil and grease reading of 2 was obtained indicating that a small amount of oil was discharged from the weir. The extremely small amount of oil required to cause a less than continuous sheen on the weir, of course, caused no visible sheen in the receiving waters.

The oil skimming baffle in the weir box and oil obsorbing boom ahead of the weir box can normally take care of the small amounts of oil discharged to outfall 004. On October 2nd the oil seal failure in one of our boiler feed water pumps allowed about 1/2 pint of oil to leak onto the floor where it was washed to the U-drain by the pumps packing seal water. The leaking oil from the this bearing was collected and properly disposed of as soon as it was discovered. However, apparently enough of it had leaked to the U-drain to cause the high oil reading the next day.

We will continue to use great care in the handling of all oil and grease in this area and will continue to respond to equipment malfunctions such as this as fast and effectively as humanly possible. However, wherever equipment is involved occasional failures are inevitable. In order to immediately provide an additional degree of protection from reoccurrences of this type of incident, we will install an additional oil boom at the weir. This will give the oil booms more than

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one chance to absorb the last traces of the oil. We are also working on a more positive long term means of preventing oil and grease from getting to outfall 004. We are currently working out the feasibility and cost associated with isolating the cooling water at the power plant and discharging it to outfall 004 and discharging the U-drains in the area to the waste treatment system. This would greatly reduce the possibility of oil and grease from this area being discharged through outfall 004. The money for this project is one of the items for which we are requesting approval from Corporate headquarters in our 1981 budget.

I will be available to discuss this matter with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan

JB/kj

6515

MEN04179

MENASHA CORPORATION

10 October 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the September 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation. The only excursion we had in this reporting period was an oil and grease excursion at outfall 004 which occurred on September 14. My September 19th letter to you explain the circumstances surrounding this excursion. On October 2nd, we had another oil and grease excursion at outfall 004 and my October 7th letter to you explain the circumstances surrounding this excursion.

Our response to these two unrelated mechanical failures both of which caused oil and grease excursions, has been two fold. As indicated in my October 7th letter, to immediately provide additional protection, we are installing an additional oil absorbing boom at outfall 004. Secondly, to provide a more positive and a more permanent means of preventing oil and grease from reaching outfall 004, we are investigating the feasibility and the cost associated with having the U-drains in this area discharge to the waste treatment system, rather than to outfall 004. This would greatly reduce the possibility of oil and grease from this area from being discharged to outfall 004. This project is one of the items on our 1981 capital budget list for which we will seek approval from Corporate Headquarters later on this year.

Please contact either Bruce Buchanan or myself if you wish to discuss this matter.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: M. Spruit
S. C. Ross
B. Buchanan

JB/kj

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6929

MEN04180

MENASHA CORPORATION

10 November 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the October 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

The only excursion we had this month was a high average phenol concentration in the effluent from outfall 002. As indicated in my July 10th letter to you, we are proceeding with the development of the alternate phenol testing proceedure as outlined in Marge Spruits' June 19th letter to me. The initial set of samples we tested by the proposed proceedure indicated that the proceedure was accurate, on our effluent when testing for the four phenolic compounds indicated. A second set of samples is currently being run. With this set of samples we will further define the precision and repeatability of gas chromotography proceedure when testing our effluent. For the next six months we will have both 4 AAP and the gas chromotography proceedures performed on our effluent samples. At the end of this time we should be able to establish what correlation if any exist between the two proceedures.

We feel confident that the gas chromotography proceedure will show that the concentration of phenolic compounds in our effluent is now and always has been well below the 300 ppb. limit. At the end of the trial period we should be able to establish the gas chromotography proceedure as a standard method or decide on a suitable correction factor to be applied to the 4 AAP method and thus put an end to this problem.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan

JB/kj

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6830

MEN04181

MENASHA CORPORATION

9 December 1980

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the November 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

The phosphorous sample taken on November 4, 1980 for outfall 000 was broken in shipment. Therefore this data is missing from the monthly operating report.

The only excursion we had this month was the phenol concentration from outfall 000 as determined by the 4 AAP method. The phenol concentration as determined by the 4 AAP method for both outfall 000 and outfall 002 indicate that whatever causes the interferences in the 4 AAP method was increasing during the month. However the phenol concentration at outfall 002 as determined by the gas chromotography procedure did not indicate an increase in phenol concentration. To further establish the validity of the gas chromotography procedure and show that outfall 000 as well as outfall 002 is in compliance with the phenol limit, we will be expanding the six month trial on the gas chromotography procedure to include outfall 000 as well as outfall 002. We believe that the test will show that both outfalls are consistently below the 300 ppm. phenol limit.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan

JB/kj

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6519

MEN04182

MENASHA CORPORATION

9 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results received on January 7 and January 8, 1981 indicate that on January 1st and January 2nd, 1981 the combined B.O.D. discharge from outfalls 000 and 002 exceeded the daily maximum limit of 5590 lbs. On these days the combined B.O.D. discharge from the two outfalls was 6607 and 7745 lbs. per day respectively.

At the present time it appears that a sudden drop in the aeration pond temperature is the primary cause of the high B.O.D. discharge. For the five days prior to December 21st the temperature in the aeration averaged about 48 degrees. Then on December 21st the temperature took a sudden drop to 44 degrees and on the 23rd it dropped down to 40 degrees. These were the first days this winter that the temperature in the pond has been below 47 degrees. Apparentaly this temperature change was enough of a shock to upset the aeration pond. Beginning with December 21st the B.O.D. concentration in the effluent started climbing and kept climbing until January 2nd. Current indications are that for January 3rd the B.O.D. concentration in the effluent will be low enough so that we will be in compliance again. Beginning with December 21st the B.O.D. concentration in the effluent started increasing thus indicating there was plenty of food in the aeration pond for the bacteria. However, beginning with December 21st the dissolved oxygen in the pond started increasing indicating that the bacteria were not using up the oxygen. In addition to this beginning with the 21st the suspended solids concentration in the aeration pond started decreasing and the total pounds of sludge removed from the clarifier also started decreasing. The total B.O.D. loading on the aeration pond decreased

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only slightly during this period. All this indicates that beginning on December 21st something dramatically decreased the growth rate of the bacteria in the aeration pond. The only thing we have been able to find that could have caused this is the sudden drop in temperature.

We have been recycling some sludge from the clarifier back to the aeration pond to increase the concentration of bacteria in the pond. Hopefully this will compensate for the lower growth rate of the bacteria. At the present time it appears we will be in compliance from January 3rd on. If we have any more excursions, we will keep you advised of the situation.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

MEN04184

MENASHA CORPORATION

9 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addressess the excursions in the December 1980 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

This month, based on the 4AAP method, we had excursions in the phenol concentration in the effluent from both outfalls 000 and 002. Based on the gas chromotography method, of determining phenol concentration, we were well below the 300 ppb. limit at outfall 002. As indicated in last months letter, the initial samples from outfall 000 have been sent to our contract laboratory. The work of determining how accurate and repeatable this procedure is when testing the effluent from outfall 000 for the phenolic compounds in question has begun. The results of this testing should be available in about two weeks.

At the end of the sixth month trial, we will review the data with the DNR's local water quality people. At this time we believe we will have sufficient data to warrant submitting an application to modify the phenol testing requirements of our NPDES permit. I will be available to discuss this matter with you at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

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6526

MEN0418.

MENASHA CORPORATION

14 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

My January 9th letter to you indicated that on January 1st and January 2nd 1981 the combined B.O.D. discharge from outfalls 000 and 002 exceeded the daily maximum limit of 5590 lbs.. This letter also indicated that at the time it looked as though from January 3rd on, we would be in compliance. It turned out that the combined B.O.D. discharge on January 3 was indeed in compliance. However, on 4 January the B.O.D. concentration in the effluent from outfall 000 took a sharp increase & we exceeded daily maximum limit from 4 January through 8 January 1981. Test results received on the 10th, 11th, 12th, 13th and 14th of January 1981 indicate that on January 4th, 5th, 6th, 7th and 8th the combined B.O.D. discharge from outfalls 000 and 002 was 7209, 8202, 6376, 6483, and 8282, lbs. per day respectively. Current indications are that it will be a minimum of three or four more days before we are in compliance again.

My January 9th letter indicated that the problem was apparently brought on by a sudden drop in aeration pond temperature. This still appears to be the case. However it is quite unusual that this sudden drop in temperature would cause such a drastic difference in the activity of the bacteria in the pond. My January 9th letter also indicated that we were recycling some of the sludge back to the aeration to compensate for the low growth rate in the pond. This does not appear to have had a significant effect on the problem.

On January 13th, I talked with Roger Przybysz of the DNR District III, Water Quality staff in Grand Rapids and brought him up to date on the problem. I explained to him that reseeding with our sludge did not seem to have any significant effect on the problem and

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suggested that we reseed with sludge from the Kalamazoo sewage treatment plant as we have done several times in the past. Roger agreed that this appeared to be the best course of action at this time. On January 14th, we started seeding our aeration pond with sludge from the Kalamazoo sewage treatment plant. We will seed our aeration pond with approximately 35,000 gallons of this sludge. Hopefully a few days from now we will be in compliance again. We will keep you advised of the situation. If you wish to discuss this matter please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

6529

MEN04187

MENASHA CORPORATION

19 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Unfortunately, the combined B.O.D. discharge from outfalls 000 and 002 is still exceeding the daily maximum limit of 5590 lbs.. Test results received on January 15th through the 19th, indicate that on January 9, 10, 11, 12 and 13th, the combined B.O.D. discharge from outfalls 000 and 002 was 7349, 7487, 8440, 8270 and 7890 lbs. per day respectively.

As indicated in my January 14th letter, we started reseeding our system with sludge from the Kalamazoo Sewage Treatment Plant on the 14th and finished the seeding on the 15th. Our first good indication of what affect this seeding will have on the pond will be the test results for the 17th. These will not be available until Friday the 23rd. At that time we will bring you up to date on the situation and if necessary inform you of any future plans we have of dealing with the situation. If you wish to discuss this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan

JB/kj

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MEN04188

MENASHA CORPORATION

22 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The combined B.O.D. discharge from outfalls 000 and 002 is still exceeding the daily maximum limit. Test results received on January 20, 21 and 22 indicate that on January 14, 15, and 16th, the combined B.O.D. discharge from outfalls 000 and 002 was 6470, 7418, and 8810 lbs. respectively. On Monday, January 19th, I called Marge Spruit in Grand Rapids and brought her up to date on the situation. At that time neither the D.O. utilization in the pond nor the suspended solids generation in the pond indicated a significant change in the performance of the system. Although it was too short a time to tell for sure what the seeding with the Kalamazoo Waste Treatment Sludge would do, we both felt it would be good insurance to increase the bacterial population in the pond by recycling all our sludge back to the pond for several days. Since our sludge hauling equipment would not be utilized for several days, we decided to also reseed the pond with more sludge from the Kalamazoo Treatment system.

On the morning of the 20th we had our first indication that conditions in the pond were changing. The suspended solids in the pond formed a fluffier more normal looking sludge, although an additional aerator had been turned on, the D.O. in the pond was down, and the temperature in the pond had jumped from 44 to 48 degrees. All this indicated that there had been a significant increase in the activity in the pond. However at this point we did not know how great of an increase this would be, so we carried out our sludge recycling and reseeding plans.

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MEN04189

At the present time the oxygen utilization, suspended solids generation, and pond temperature all indicate that if we are not now in compliance we should be within the next two or three days.

We will, of course, keep you advised of the situation and the actions we have taken or plan to take to deal with the problem. Please contact either Bruce Buchanan or myself if you wish to discuss this matter.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

MEN04190

MENASHA CORPORATION

27 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received from 23 January through 27 January indicate that on 17 January through 21 January, the combined B.O.D. discharge from outfall 000 and 002 exceeded the daily maximum limit. On the 17th through the 21st of January 1981, the combined B.O.D. discharge from these outfalls was 8217, 9286, 6915, 8033, and 8187 lbs. per day respectively.

As indicated in my January 22nd letter to you the conditions in the aeration continue to improve. We are seeing a gradually increasing of utilization of oxygen in the pond as well as a significant increase in suspended solids generation in the pond. The combined effects of higher temperature and reseeding the pond appear to be significantly increaseing the activity in the pond.

We have a meeting scheduled with the DNR, District III Water Quality Staff for Thursday, 29 January at 2 P.M. in Grand Rapids. At that time we will review the situation in detail. Hopefully the B.O.D. test results for the 23, which will be available for that meeting, will have established a downward trend in the B.O.D. concentration of the effluent. The 23rd maybe a little too soon for this trend to have been established. At the present time, I am anticipating that the BOD test results for the 24, 25, and 26th will establish a significant downward trend in the B.O.D. concentration from outfall 000. These test results will be available on Monday, February 2. On Friday, January 30th, I will bring you up to date on the situation at that time and the results of our meeting with

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MEN04191

District III staff.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

MEN04192

MENASHA CORPORATION

30 January 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on January 28 and 30, 1981 indicate that on January 22 and 24 the combined B.O.D. discharge from outfalls 000 and 002 exceeded the daily maximum limit. On the 22nd and 24th of January 1981, the combined B.O.D. discharge from these outfalls was 7336 and 8529 lbs. per day respectively.

The combined B.O.D. discharge for the 23rd was under the daily maximum limit. On this day we changed settling ponds and the resulting lower flow rate and lower B.O.D. concentration brought us within limits on this day. As expected, test results for the 21st through the 24th are indicating a gradual decrease in the B.O.D. concentration of the effluent. Based on oxygen utilization and suspended solids generation, we expect the B.O.D. concentration in the effluent to continue decreasing at least through the 27th of January. On the 28th the temperature in the pond dropped and we saw a corresponding increase in the D.O. in the pond indicating a decrease in the biological activity.

To compensate for the decrease in temperature in the pond we will be recycling our sludge from the clarifier as necessary to maintain the suspended solids concentration in the pond at about 3000 mg/l. In addition to this, when the pond temperature drops below about 45 degrees F. we will also begin reseeding the pond with some new strains of bacteria.

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MEN04193

Currently we are investigating the possibilities of reseeding with more sludge from Kalamazoo, some other treatment syste. operating at a low temperature, or some commerically available strains of bacteria.

At our meeting with the District III Water Quality Staff we discussed in detail what happened, what actions we have taken to date, and also the planned actions mentioned above. There was generally agreed that the key factor in solving this problem would be to establish a population in the pond which could handle the lower temperatures. It was also agreed that our plans for recycling sludge and reseeding with new strains of bacteria was probably the best way to handle the problem. It was also agreed that to allow the new strains to acclimate and take over the pond, they should be introduced into the pond after the temperature dropped low enough to greatly reduce the activity of the current dominating population.

On Monday, February 2, I will bring you up to date on the latest test results and any other actions that have been taken or have been planned. If you wish to discuss this matter please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

6542

MEN04194

MENASHA CORPORATION

2 February 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on January 31, February 1, and February 2, 1981 indicate that on January 25, 26, and 27, 1981 the combined B.O.D. discharge from outfalls 000 and 002 exceeded the daily maximum limit. On these days the combined B.O.D. discharge was 6876 lbs, 8127 lbs., and 6145 lbs. respectively.

My January 30th letter said that we expected to see a gradual reduction in the B.O.D. concentration for the period from January 20 through at least the 27th. During this period we have seen an average of a 100 mg/l per day decrease in the B.O.D. concentration of the effluent from the outfall 000. My January 30th letter also mentioned that on the 28th we saw a decrease in the temperature in the aeration pond with a corresponding increase in the D.O. in the pond indicating a reduction in the biological activity in the pond. To date we have seen further decreases in the pond temperature with corresponding increases in the D.O.. However, to date we have not seen a significant reduction in the suspended solids generation in the pond as we did previously.

So far, we have not had to recycle sludge from the clarifier to the aeration pond to maintain the suspended solids concentration in the pond above the 3000 ppm. level. At this time we do not feel that the reseeding of the system with sludge from the Kalamazoo system had any significant affect on the aeration pond. Therefore, we are currently investigating the possibility of reseeding the pond with sludge from another paper mill or with a commerically available bacteria. The other possibility is to reseed the pond with our own sludge. By February 9th we will have decided which of these three alternatives will be utilized.

To help establish the conditions in the pond and in preparation for some bacteria selection work to be done by the supplier Mutant Bacteria, we are having the aeration pond analyzed for both basic and micro nutrients. These test results should be available in about two weeks. We have already received the

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results of the heavy metals toxicity testing work. These tests indicate that the concentrations of toxic heavy metals is well below that which would begin to affect the biological population in the pond.

On the 6th, I will bring you up to date on the situation and any decisions that have been made. If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan

JB/kj

MEN04196

memo / MENASHA CORPORATION

TO: DNR Meeting File - Water Quality

DATE: 4 February 1981

SUBJECT: January 29, 1981 Meeting with District III water quality staff

FROM: John Blauwkamp

At 2 P.M. on Thursday, January 29. 1981 we had a meeting with the district III water quality staff in Grand Rapids. Representing the DNR were Marge Spruit and Roger Przybysz. Bruce Buchanan and John Blauwkamp were representing Menasha Corporation.

The first topic of discussion was Menasha's Effluent B.O.D. problem. We explained how the aeration pond appeared to have undergone a severe upset when the temperature dropped from 47 to 44 degrees. At that time the dissolved oxygen concentration in the pond took a sharp increase and the suspended solids generation in the pond had a dramatic decrease. There was also a dramatic decrease in the suspended solids concentration in the aeration pond itself. For several days during the first part of the month some sludge was recycled back to the pond from the clarifier each day with no apparant affect on the pond. On the 15th and 16th of January we reseeded the pond with 45,000 gals. of sludge from the Kalamazoo sewage treatment plant. Then on the 20, 21st and 22nd we recycled all the sludge from the clarifier back to the settling pond and reseeded with some more sludge from the Kalamazoo sewage treatment plant. The results of these operations along with a increase in temperature which occurred on the 20th caused a significant reduction in the D.O. in the pond and an large increase in suspended solids generation in the pond, both indicating a significant increase in biological acitivity. B.O.D. results through the 24th were available at the meeting and indicated a definite downward trend in the B.O.D. concentration in the effluent.

To cope with the lower temperatures which started showing up on the 28th, we will recycle sufficient sludge to maintain the suspended solids concentration in the pond above 300 ppm. and after the pond temperature stabilizes below 45 degrees we will reseed the pond with some new strains of bacteria. By introducing a new strains at the low temperature when the current population is decreased in activity, we may allow the new strains to take over the pond. The new seed will most probably come from either Kalamazoo sewage plant or a commerically available bacteria.

At this time Menasha has not joined a quality control program to check B O.D. results. We are however, at this time having a sample run by the city sewage treatment plant to check our B.O.D. figures. Marge said that Plainwell Paper was interested in joining a quality control program with us and suggested that the three of us make arrangements for monthly or quarterly cross checks.

MEN04197

The status of the phenol testing procedure was di ussed briefly and it was decided that the final decisions on this testing procedure should be made in time for including the decision in the new NPDES permit. We should have a meeting before the end of April to make the final decision on this matter.

The status of the salt cake situation was also discussed briefly. The equipment for crushing the chunks from the incinerator and reusing them is on order and will be installed this year.

Menasha does not at this time have refrigerators on the B.O.D. composite samplers. Marge said that refrigeration was required in the new EPA sampling regulations and she will send me a copy of the significant parts of these regulations. Menasha will investigate getting a small apartment refrigerator for outfall 002 and will have to investigate to determine a means of refrigerating the sample from outfall 000.

The results of the first centrifuge trial were very encouraging but because the sludge from the clarifier was much thicker than is normal for January, the trial will be rerun near the end of February. Hopefully, by this time we will have a more normal sludge condition. Results of the overbed feed gun looked promising but much work needs to be done to obtain a continuous burn. The money for preliminary design of the sludge and liquor storage facilities has been approved for this years budget. CH2M-Hill will commense active work on this project sometime within the next month.

The rules governing the storage of both sludge and liquor are the Part 22 ground water quality rules and the part V rules. Roger said the only significant things we had to be concerned about were achieving a 10^{-7} centimeters per second permeability in a one foot layer of compacted clay. At this time, test wells are not required but are advised for our own protection.

The ash lime pond has not been cleaned out. The main holdup in the trial of using the material on farmland is to find someone with equipment suitable to spread this material. Marge said she thought there was a marrow company still in operation in South Montaray. We will investigate this and if we can not find suitable place to spread this lime and a means of spreading it within the next month, we will have to dip at least one of the ponds and take it to a landfill.

The meeting closed with a brief discussion on what the effluent limitations in 83 and 84 would be. The new effluent limits are currently planned to be about a 50% reduction in the average effluent limitation. The limits stipulated in the NPDES permit will be changed when the new regulations go into effect.

cc: B. Buchanan
M. Spruit

JB/kj

6548

MEN04198

MENASHA CORPORATION

6 February 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on February 3, indicate that on January 28, 1981 the combined B.O.D. discharge from outfalls000 and 002 exceeded the daily maximum limit. On this day the combined B.O.D. discharge was 6011 lbs.

B.O.D. concentration in the effluent from outfall 000 decreased from the 20th through the 27th. Then on the 28th the temperature in the aeration pond started decreaseing again and we saw corresponding increases the D.O. in the pond. From the 28th through the 31st of January we've seen a more gradual decrease in B.O.D. concentration. For the 29th, 30th and 31st we were under the daily maximum discharge limit. On Monday February 9, we should know whether the B.O.D. is going to decrease at a more gradual rate or if it will start to increase again.

We continue to see increases in the D.O. of the pond as the temperature in the pond drops. The encouraging thing is that since the 28th the suspended solids generation in the pond has not decreased but it actually has increased slightly. This could mean that although, the lower temperatures are causing a decrease in the biological activity we are not experiencing a die off as we did previously. On Monday we should know whether the B.O.D.'s are going to continue decreaseing gradually or if they will start increaseing again. At that time we will decide to either to reseed the pond with sludge from the clarifier or use some other source.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan
E. C. Manders

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MEN04199

MENASHA CORPORATION

10 February 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the January 1981 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

Based on the 4AAP method, the average phenol concentration in the effluent from outfall 002 was above the 300 ppb. limit. However, based on the GC method, the phenol concentration at outfall 002 was under the limit by a comfortable margin. At our January 29th meeting with District III water quality staff in Grand Rapids, it was decided that the results of the alternate phenol testing procedure would be reviewed prior to April 30th so that any decisions on the test method could be incorporated into the new NPDES permit.

The combined B.O.D. discharge from outfalls 000 and 002 exceeded the daily maximum limit 23 days of this reporting period. The circumstances surrounding this problem have been thoroughly documented in my recent letters to you. From January 20th through January 27th, the B.O.D. concentration in the effluent from outfall 000 decreased at the rate of about 100 mg/l per day. Then on January 28th we saw a drop in the pond temperature and a corresponding increase in the D.O. concentration in the pond. My February 6th letter indicated that on February 9 we would know if the B.O.D. concentration was going to continue to decrease inspite of the lower temperature or if it would begin to increase. Inspite of a gradual drop in pond temperature from January 28th through February 4th, the B.O.D. concentration in the effluent continued to decrease at the rate of about 50 mg/l per day. This indicates that the population in the pond was becomming acclamated to the lower temperatures. On February 4th there was a sudden drop in the pond temperature from 39 to 34 degress. We saw a corresponding jump in the D.O. in the pond and a significant drop in the generation of suspended solids

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MEN04200

in the pond. However, after two days the pond temperature was back up to 42 degrees and stayed there from the 6th through the 9th. Since the 6th when the pond temperature stablized at 42 degrees there has been a gradual drop in the ponds D.O. indicating that the population is becomming acclamated to the lower temperatures. We have also seen a corresponding increase in the suspended solids generation in the pond. However, to get the population back to a sufficient concentration as soon as possible, we are recyling sludge from the clarifier back to the aeration pond.

At the present time it appears that the population in the pond is becomming acclamated to the lower temperatures and that through recycling of sludge we will be able keep the system in compliance. We have investigated the use of a commerically available bacteria, which has been specially adapted to cold weather. If it should become necessary, we can begin using this bacteria on about one weeks notice. The reason we have not already begun using this bacteria is that several years ago we tried a mutant bacteria and it caused a severe problem in our waste treatment system. Because the supplier of the bacteria can not give us any references on systems nearly identical to ours where the bacteria has been used successfully, we feel we should take the risk of using this bacteria only as a last resort.

The phenol concentration in the effluent from outfall 000 also exceeded the limit. Several times in the past we have seen that when the B.O.D. concentration in the effluent is high we also have high phenol concentrations. One theory behind this is that the phenols are much more difficult for the bacteria to digest. Therefore, they do not begin eating the phenols until the supply of other organics has reached relatively low concentrations. We believe that when the B.O.D. concentration is back down to normal, the phenol concentration in the effluent will also be back down to its normal range.

We will keep you advised of any significant changes in the status of the B.O.D. problem and of any changes in our indicated course of action. If you wish to discuss this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

JB/kj

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MEN04201

MENASHA CORPORATION

6 March 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the February 1981 monthly operating report for the Otsego Paperboard Division of Menasha Corporation.

In my February 10th letter to you, I indicated that it appeared the pond was becomming acclimated to the lower temperatures and that through recirculation of sludge, would be able to keep the system in compliance. For this reporting period, we were over the daily maximum discharge limit for three days. Beginning with January 29th the combined B.O.D. discharge from outfalls 000 and 002 has been less than the daily maximum limit. My February 10th letter indicated that on February 4th the temperature in the pond dropped down to 34 degrees and that this caused a very noticable upset in the pond. However on the 6th the temperature in the pond was back up to 42 degrees. Since the 6th the B.O.D. concentration in the effluent has been decreasing. On the 16th of February the temperature in the pond reached 52 degrees and caused a very noticable increase in the rate that the B.O.D.'s were dropping. On the 19th the concentration wa low enough so that the combined B.O.D. discharge was less than the monthly average limit. However this did not occurr early enough in the month, and the overall average for the month of February was still greater than the monthly average limit. Due to the warmer weather and careful control of the mixed liquor solids in the pond, the system appears to be back to normal and we do not expect to have anymore problems with the B.O.D. discharge.

The phenol discharge from outfall 000 was again considerably higher than the 300 ppb. limit. My February 10th letter indicated that one theory for the high phenol concentration was that the bacteria did not start digesting phenols until the concentration of the more easily digestable organics was at a relatively low level. The B.O.D. concentrations in the effluent did not reach

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MEN04202

normal levels until about February 23. We expect that the phenol test results for samples taken on February 26 and March 4 will indicate that the phenol concentration is either back down to normal or has been significantly reduced from previous tests.

Based on the 4AAP method the phenol concentration in the effluent from outfall 002 was over the 300 ppb. limit. However based on the GC method the phenol concentration from outfall 002 was well within the 300 ppb. limit. As indicated in my February 10th letter, we plan to meet with the District III water quality staff sometime in April so that any changes on the phenol testing procedure can be incorporated into our NPDES permit.

If you wish to discuss any of these matters, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp P.E.

John R. Blauwkamp
Technical Manager

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

JB/kj

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MEN04203

MENASHA CORPORATION

March 9, 1981

Mr. D. C. Tummala,
Water Quality Specialist
Water Quality Division
P. O. Box 30028
Lansing, MI 48909

Gentlemen:

This letter addresses your February 24, 1981 notice of noncompliance on NPDES Permit No. MI 0003824. This notice of noncompliance indicated three violations of our NPDES permit. The violations cited were:

(1) The phenol discharge from OUtfalls 000 and 002.

(2) Improper pH sampling at Outfalls 000 and 002.

(3) Late submission of monthly operating report.

Phenol discharge from Outfalls 000 and 002 is a problem that has received a great deal of attention in the past year. As indicated in my February 10th letter to Robert J. Courchaine we are currently undergoing a six-month evaluation of an alternate phenol testing procedure using a gas chromatography method. At our January 29th meeting with the District III Water Quality Staff it was decided that the results of this six-month evaluation would be reviewed in April so that appropriate changes if warranted could be made to our new NPDES permit. We believe that adoption of this phenol testing procedure will once and for all put an end to this problem.

Until I received the notice of noncompliance on February 25th, I was unaware that the pH testing was not being done as called for in the NPDES permit. On February 26, 1981 we began testing pH of the effluent from Outfalls 000 and 002 on grab samples as called for in the permit.

The notice of noncompliance said that "said reports are to be postmarked no later than the tenth day of the month following each completed report." Notice of noncompliance also stated that "be advised that the monthly operating report submitted for the month of December 1980 was late and not received until January 21, 1981." As there are so many parts to our monthly operating report we submit them in an envelope along with a cover letter. I

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MEN04202

normal levels until about February 23. We expect that the phenol test results for samples taken on February 26 and March 4 will indicate that the phenol concentration is either back down to normal or has been significantly reduced from previous tests.

Based on the 4AAP method the phenol concentration in the effluent from outfall 002 was over the 300 ppb. limit. However based on the GC method the phenol concentration from outfall 002 was well within the 300 ppb. limit. As indicated in my February 10th letter, we plan to meet with the District III water quality staff sometime in April so that any changes on the phenol testing procedure can be incorporated into our NPDES permit.

If you wish to discuss any of these matters, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

John R. Blauwkamp P.E.

John R. Blauwkamp
Technical Manager

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

JB/kj

MEN04203

MENASHA CORPORATION

March 9, 1981

Mr. D. C. Tummala,
Water Quality Specialist
Water Quality Division
P. O. Box 30028
Lansing, MI 48909

Gentlemen:

This letter addresses your February 24, 1981 notice of noncompliance on NPDES Permit No. MI 0003824. This notice of noncompliance indicated three violations of our NPDES permit. The violations cited were:

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Phenol discharge from Outfalls 000 and 002 is a problem that has received a great deal of attention in the past year. As indicated in my February 10th letter to Robert J. Courchaine we are currently undergoing a six-month evaluation of an alternate phenol testing procedure using a gas chromatography method. At our January 29th meeting with the District III Water Quality Staff it was decided that the results of this six-month evaluation would be reviewed in April so that appropriate changes if warranted could be made to our new NPDES permit. We believe that adoption of this phenol testing procedure will once and for all put an end to this problem.

Until I received the notice of noncompliance on February 25th, I was unaware that the pH testing was not being done as called for in the NPDES permit. On February 26, 1981 we began testing pH of the effluent from Outfalls 000 and 002 on grab samples as called for in the permit.

The notice of noncompliance said that "said reports are to be postmarked no later than the tenth day of the month following each completed report." Notice of noncompliance also stated that "be advised that the monthly operating report submitted for the month of December 1980 was late and not received until January 21, 1981." As there are so many parts to our monthly operating report we submit them in an envelope along with a cover letter. I

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MEN04204

Mr. D. C. Tummala March 9, 1981

suspect the envelope is automatically discarded. If the envelope were to remain on file along with the MOR's it would prove that our MOR's are always postmarked no later than the tenth of the month. If the envelope cannot be retained and the MOR cannot be stamped to indicate the postmark date on the envelope, then we will have to begin submitting them such that the postmark is on the MOR's.

If you wish to discuss any of these matters, please contact either Bruce Buchanan or the writer.

Sincerely,

MENASHA CORPORATION

John R. Blauwkamp
Technical Manager

JRB/k

cc: Robert J. Courchaine
Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

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MEN04205

MENASHA CORPORATION

8 April 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the March 1981 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

As expected and stated in my March 6th letter to you, the phenol test results for samples taken on February 23 and March 3, indicated that the phenol concentration at outfall 000 was back down to normal levels. Based on the 4AAP method the phenol concentration varied between 56 and 963 ppb.. However, based on the GC method the phenol concentration was much less than the 300 ppb. limit. Based on the 4AAP method the phenol concentration in the effluent from outfall 002 was again over the 300 ppb. limit. However again based on the GC method the phenol concentration was much less than the 300 ppb. limit.

Our meeting with the District III Water Quality Staff is currently scheduled for April 28 at 1:15 P.M. in Grand Rapids. At this time we will review the status of the alternate phenol testing procedure and any other changes that may be necessary in our NPDES permit. If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkarp P.E.

John R. Blauwkarp
Technical Manager

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

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JB/kj

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MEN04206

memo / MENASHA CORPORATION

TO: DNR Meeting File - Water Quality

DATE: 28 April 1981

SUBJECT: April 28th meeting with District III Water Quality Staff in Grand Rapids

FROM: John Blauwkamp

J.P.B.

On April 28, 1981 we had a meeting with the District III Water Quality Staff in Grand Rapids. Representing Menasha Corporation were John Blauwkamp and Bruce Buchanan. Representing the DNR were Roger Przybysz and Marge Spruit.

Phosphorous Limit: First topic of discussion was the phosphorous limit for the new NPDES Permit. Menasha requrested that the concentration limit on phosphorous be eliminated and that only the pound per day limit be retained. This is to allow further reduction in our effluent volumes. At present the concentration limit on the phosphorous discharge would prevent us from doing this. As we reduce the effluent volume, the concentration of phosphorous will increase even though the pounds per day of phosphorous discharged may actually decrease. To avoid this problem the concentration limit on phosphorous should be eliminated and only the pounds per day of phosphorous discharged should be regulated. Roger stated that there is currently a policy of limiting discharges to 1ppm. of phosphorous but that in light of the special circumstances, he would see if they could get around this obstacle. Roger also suggested that we should determine what our likely pounds per day of phosphorous discharge would be in 1986 in light of further close ups, better operation of the SLT, and increased production rates. Menasha agreed to try to provide Roger with this information before the end of May.

Phenol Testing: The test results of the special phenol testing procedure were reviewed briefly. Basically, Roger was a little dissappointed in the recovery rates of the GC procedure. However, they were significantly better than those of the 4AAP method. Roger suggested that we assimulate the data into a single table and get the chemist at Clow Labs. to wright a justification for the GC procedure opposed to the 4AAP procedure. They would then get this evidence reviewed by the DNR chemist to see if the appropriate changes could be incorporated into the new permit. Menasha agreed to provide this to the DNR by the end of May.

Liquor/Sludge: The DNR inquired about our intentions regarding the sludge from the bottom of the liquor ponds. Menasha explained that it intended to make every practical effort it could to find a way of burning this material as opposed to landfilling it. This is one of the primary problems that CH2M-Hill will be working on.

6562

The new storage facility will be designed such that it would either prevent a sludge buildup or be capable of dealing with the sludge in the bottom of the tanks.

Sludge storage: The sludge storage facilities will be designed and built along with the liquor storage facilities. At this time, the centrifuge is being looked at as a separate project. It will be evaluated on it's own economic merits. The sludge storage system will be designed without a centrifuge but will allow the addition of the centrifuge at a later date to reduce the hauling costs.

Sludge Permit: The DNR indicated that it will be looking at consolidating our NPDES Permit and our sludge disposal permit as one new overall permit. The sludge disposal permit would come under the residuals management section of the NPDES permit.

Soil Crusher: The main parts for the new SLI crusher have been on order for about 15 weeks and delivery is expected in about 15 weeks. Menasha expects to have the system on line by the end of the year. After the system is put on line, we will try to recover as much as possible of the existing piles. However, there is a certain amount of the material which is from the sulfite based cook which will have to either be sold to a kraft mill or landfilled.

Wood Rejects: Menasha is currently selling all of its wood rejects to Bill Warren for fuel and to another person for producing wood alcohol from them. The possibility of using the wood rejects as a supplement to our sludge disposal program is still very real. If we ever find ourselves with a potential nitrate leaching problem, we intend to apply sufficient wood rejects to absorb the excess nitrogen. A good example of this would be, if we were contained to the land site for an unusual length of time, we may have to apply wood rejects to absorb the excess nitrogen.

Surge Pond Fiber: At the present time, Menasha intends to dip the surge pond about twice per year. However, the frequency of this is determined primarily by the amount of fiber that gets into the surge pond. We are currently experimenting with a method of stirring the fiber up in the surge pond, such that it goes through the wastewater treatment system and [illegible] the sludge. However, to date, this method has not been very successful.

Sludge Storage Ponds: This year Menasha intends to haul the supernate from the sludge storage ponds up the hill back to the aeration pond.

Quality Control Program: At the present time Menasha is not set up on a formal quality control program. The results of recent EPA Quality Control Survey were very good. However, we did not receive results from the 2nd survey. Menasha will get a suitable quality control program established.

MEN04208

Refrigeration of Composited BOD sample: At the present time Menasha does not refrigerate its BOD samples while they are being composited. The proposed Federal regulations would require that the BOD sample be refrigerated while it is being composited. To date Menash has investigated the possiblity of refrigerating its samples and the cost would be about $3000. When the proposed regulations are finalized the appropriate equipment will be obtained.

Prevention of Winter Time BOD problems: To prevent a reoccurance of last years BOD excursions, Menasha has developed a monitoring procedure which will indicate a potential problem within a few days On indication of a problem, we will take one or more of the following actions:

1. Recycle sludge from the clarifier back to the aeration pond.
2. Reseed with sludge from the Kalamazoo waste treatment system.
3. Reseed the pond with a combination of special cold weather and phenol reducing bacteria.

We are confident that taking one or more of these actions at the first indication of a problem, will prevent a reoccurance of the BOD excursions we experienced last winter.

Test Wells at the Sludge Disposal Basesite: The DNR would like the background data on the test wells at the basesite. They also need the water levels in the wells given as feet from the sea level as opposed to depth from the top of the well casing. Menash will provide them with the necessary information or have the wells surveyed if necessary.

Chromium levels in the Effluent: Roger pointed out that all of the chromium levels in the effluent samples were very high. After a short discussion, everyone agreed that there has to be some errors in the test. Menasha will submit the NPDES permit as it is with a letter stating they suspect a problem with the reported chrome levels and that corrections will be sent as soon as possible.

Grease and Oil: Roger also pointed out a relatively high grease and oil reading from outfall 006. Bruce explained that many of the fatty acids present in the treatment system could be from extracted and therefore, read as grease and oil. To determine the true significance of this reading in our effluent it would be necessary to determine which testing procedure was used.

The DNR inquired as to the source of the plastercisers found in several of the outfalls. Menasha explained that these are the most common plastercisers used and come from the plastics found in the recylced wastepaper.

PIP Update: Menasha agreed to submit and update its PIP plan to the DNR by the end of May.

1977 NPDES Permit violations: The DNR indicated that as yet the 1977 NPDES permit violation had not been closed. The single fact preventing

MEN04209

1977 NPDES Permit Violations (cont.): closing of the issue was Menasha's noncompliance with its phenol discharge limit. As soon as the phenol question is resolved the 1977 violation file can be closed. No action on this is required other than resolution of the phenol question.

cc: B. Buchanan
E. C. Manders
M. Spruit

TB/kj

6565

MEN04210

MENASHA CORPORATION

5 June 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the May 1981, Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

As measured by the 4AAP method the average phenol concentration from Outfall 000 exceeded the 300 ppb. limit. The test data from the sixth month trial of GC procedure indicates that except when we have a very high BOD discharge from outfall 000 the phenol concentration is much less than the 300 ppb. limit. Since the waste treatment is operating normally, we believe the actual concentration was less than the 300 ppb. limit.

As indicated in my May 5th letter, the test results of the sixth month trial on GC procedure and our arguments concerning this procedure have been submitted to the District III Water Quality Staff for review. Hopefully the GC testing procedure can be included in our new NPDES Permit which District III staff is currently working on. If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

JB/kj

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MEN04211

MENASHA CORPORATION

4 August 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

This letter addresses the excursions in the July 1981, Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation.

As measured by the 4AAP method, the average phenol concentration from outfall 002 exceeded the 300 ppb. limit. The test results of our sixth month trial of the GC testing procedure indicate that the actual phenol concentration from this outfall stayed well below the 300 ppb. limit. Since we are operating normally we believe the actual phenol concentration is considerably less than 300 ppb.. If the GC testing procedure can be incorporated in our new NPDES permit, we believe it will put an end to this problem.

The phosphorous discharge from outfall 000 shows a concentration of 1.24 ppm. on 8 July 1981. The mill was down during this period of time causing a very low effluent flow. Because of these unusually low flows, we did not have enough composite sample for the phosphorous test. Therefore a grab sample was used for the test. Because of the unusually low B.O.D. loading on the pond, there was a reduced growth rate in the aeration pond. This lower growth rate would tend to increase the phosphorous concentration in the effluent. However due to the extremely small effluent volume, the actual pounds of phosphorous discharged were less than normal.

The B.O.D. concentration in the effluent from outfall 000 is missing for 12 and 17 July 1981. An error resulted in the loss of these two days B.O.D. data. Since the aeration pond was in excellent shape, we have absolutely no reason to believe the effluent on those days would have come anywhere near the permit limit.

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MEN04212

If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Gary E. Roys

Gary E. Roys
Process Chemist &
Group Leader

cc: Scott C. Ross
Marge Spruit
Bruce Buchanan
E. C. Manders

GR/kj

MEN04213

MENASHA CORPORATION

18 September 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results received on September 16, 1981, and September 17, 1981 indicated that on September 15, and 16, 1981 the oil and grease reading were 2 and 1 respectively at 004 weir. This exceeds the daily limit of 0 allowed at 004 weir. This indicated that a small amount of oil was discharged from the weir. The small amount of oil to cause a sheen on the weir, of course, caused no visible sheen on the receiving waters.

At the start up of the mill, the boiler water feed pump's oil plug vibrated loose. Because this was the only pump available oil was put into the pump on the run, and due to the nature of the situation, more oil was spilled.

Normally the oil skimming baffle in the weir box, and the 3 oil absorbing booms ahead of the weir box can take care of the small amounts of oil that may come to this weir. However, during these two days the rain caused the oil to move underneath the oil booms and discharge to the weir. Thus, giving the high oil readings for the 2 days.

We will continue to use great care in handling of oil and grease in this area, and will continue to respond to equipment malfunctions, such as this, as fast and effectively, as humanly possible. However in spite of these efforts it is inevitable that once in a while a trace amount of oil maybe discharged from 004 weir.

If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

Gary E. Roys

Gary E. Roys
Process Chemist & Group Leader

cc: Marge Spruit
Scott C. Ross
B. Buchanan

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GR/kj

6843

MEN04214

MENASHA CORPORATION

November 6, 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on November 5, indicate that on October 20, the soluble orthophorphorous concentration and pounds per day discharged, exceeded the permit limits at outfall 000. The test results indicated that on October 20, the soluble orthophosphorous concentration was 2.35 mg/l and that 7 lbs. soluble orthophosphorous was discharged from outfall 000.

We do not add any phosphorous to the waste treatment system and the soluble orthophosphorous discharge normally runs less than .5 ppm.. There was no evidence of increased phosphorous in the system before the 20th and the sample taken on the 27th indicated that the phosphorous concentration was still normal. It appears that the sample taken on the 20th was either contaminated or there was a shock load of phosphorous into the waste treatment system. We are currently investigating both of these possibilities.

As measured by the 4AAP method, the phenol discharge from outfall 002 exceeded the permit limit of 300 ppb.. Our sixth month trial on the GC testing procedure indicated that the phenol concentration from this outfall stays well below the 300 ppb. limit. To assure everyone that this is still the case, we have decided to resume testing both outfalls 002 and 003 on a monthly basis using the GC procedure. The DNR water quality staff is currently writing our new NPDES Permit. When the permit has been issued, we should be able to replace the 4AAP test results required on the M.O.R. with the test results from the GC procedure. This should put an end to the apparent phenol discharge violations. If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

cc: M. Spruit
Scott C. Ross
B. Buchanan
R. Janda

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MEN04215

MENASHA CORPORATION

30 December 1981

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results received on December 28 and 29, indicate that on December 26 and 27, the combined suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum limit of 4800 lbs.. On December 26 and 27, combined suspended solids dischargesfrom outfalls 000 and 002 were 6854 and 19206 lbs. respectively.

Our two post clarifier settling ponds are used to remove the last traces of suspended solids from the effluent before it is discharged to the Kalamazoo river. One pond is in use while the other is being pumped out. When the pond in use gets full of sludge, suspended solids start to carryover into the effluent. Normally, we switch ponds before this occurrs. Recently we have been changing settling ponds about every three months. The settling pond that was in use on the weekend of the 26th and 27th, should not have been full for another three or four weeks. We have been training a new substitute waste treatment operator and the weekend of the 26th and 27th was the first weekend he had worked completely alone. Although he had been told what the settling pond looks like when it is full, and needs to be changed, he had never had an opportunity to actually see it. The new operator failed to recognize the subtle indications that the pond was indeed full and did not switch to the other settling pond. Consequently the suspended solids carried through the settling pond and caused the high dischanges indicated above.

When the regular operator returned on Monday, he recognized what the problem was, and immediately switched settling ponds. The discharge for the 28th was well within the daily maximum limits.

In the future we will insure that any new operators received suf-

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MEN04216

ficient instruction to allow them to recognize when the settling ponds are full even when it is unexpected. If you have any questions or comments, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda

JB/kj

6602

MEN04217

MENASHA CORPORATION

7 January 1982

Robert J. Courchaine
Executive Secretary, DNR
Water REsources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

I am pleased to report that for the month of December, none of the discharges exceeded the permit limit. Unfortunately, this will not be the case for the January monthly operating report. My December 30 letter to you explain the circumstances around the high suspended solids discharges on the 26th and 27th of December. The condition that caused the settling pond to fill unexpectedly still exists and caused the new settling pond to fill up in only 8 days. The results of the very poor settling and the full settling pond was that on January 4, 1982, the combined suspended solids discharge from outfalls 000 and 002 was 5180 lbs.. The settling ponds were changed again on the 5th and we expect the suspended solids discharge for the 5th will be well within the 4800 lb. limit.

We are currently experiencing a problem similar to the suspended solids problem we had last year. The combination of the low temperatures in the aeration pond and the high mixed liquor suspended solids required to keep the B.O.D. concentration under control gives us a very old sludge which does not settle very well in the clarifier. The resulting carryover to the settling ponds causes them to fill very rapidly. Last year we found the solution to the problem was to bring the temperature in the aeration pond up and take the sludge from the settling ponds out of the system, rather than recycling it back to the aeration pond. We are currently doing what we can to accomplish both of these. As much sludge as possible will be trucked from the settling ponds to the storage facilities rather than recycled back to the pond. We are also shutting one or more of the aerators down part time. This will help get the D.O. in the pond down to the 2 ppm. range and will help increase the temperature in the pond. The downtime on the aerators must be controlled very carefully to avoid going to low in D.O. and avoid excess settling in the aeration pond. However both the lower D.O. and higher temperatures should improve the settling in the clarifier.

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MEN04218

We had planned to have the new barfle installed in the aeration pond by the 1st of the year. However, we recently received word from the manufacturer, that it would not be shipped until the middle of January. This will be installed as soon as possible after we receive it. The new baffle should have the affect of significantly raising the temperature in the first half of the aeration pond, thus, improving both the B.O.D. removal and settling characteristics of the sludge.

We will advise you of any significant changes in the situation. If you have any questions, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda

JB/kj

6605

MEN04219

MENASHA CORPORATION

14 January 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

As mentioned in my letters of December 30 and January 7, we are currently experiencing a problem with settling in the clarifier. This is causing a lot of carryover to the post clarifier settling pond. As explained in my previous letters, we believe the cause of this settling problem is a combination of the extremely low temperatures in the pond and the high biomass concentration in the pond required to get the necessary B.O.D. removal. As we have seen in previous years, the combination of the low temperatures and old sludge causes settling problems in the clarifier. Last year the carryover from the clarifier filled the settling ponds in about 8 days. We got out of the problem by hauling the sludge from the settling ponds to our storage facility rather than returning it to the aeration pond. When the ponds are filling in about 8 days we had enough time to truck the sludge from the settling ponds to the storage facility.

This year we've found we were able to pump the ponds down only about halfway because the sludge in the bottom of the settling ponds was too thick to pump. As a result of this, we had to change ponds about every 2 or 3 days to prevent carryover from the settling ponds into the weir.

We've been trying to accomplish two things simultaneously. Number one is to change the settling ponds often enough to prevent carryover of suspended solids into the weir and number two, was to haul enough sludge from the settling ponds to the storage facility, so that we can get out of the settling problem. Because of the long time it takes to pump water off the top of the settling pond before you can start hauling sludge out of it, we've only been changing settling ponds when it was necessary to prevent carryover into the weir. We've been checking the settling ponds in use late at night for signs of being full, but they been filling so fast that some times by morning, we are seeing some carryover into the weir already. Saturday, January 9, was one such day. When our operator came in

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MEN04220

at 6 A.M. and checked the weir, it was clear but the composite sampler was frozen up. When he came back at his normal time to get a grab sample, the weir was cloudy, indicating carryover from the settling pond. The grab sample for January 9, 1982 indicated that the combined suspended solids discharge from weirs 000 and 002 was 9,0[illegible] lbs. which is over the 4800 lb. limit. Since the effluent from the weir was clear for about 21 out of 24 hours, we believe that if the composite samples had not frozen up, the sample would have indicated that the actual discharge for the 9th was less than 4800 lb. limit. We thawed out the sampler and put an additional heat lamp on and changed the settling ponds again. The discharge for the 10th was under the 4800 lb. limit.

Sunday the 10th was the day that the snow storm hit this area with subzero temperatures and very strong winds. As a result of this, everything froze up including the pump we use to pump out the settling ponds. The low temperatures and the extremely high winds froze this pump up inspite of the fact that it is in a reasonably tight heated building. The blizzard conditions also made it impossible to get the necessary people into the mill to work on the pump. On Monday, we got the pump and associated piping thawed out as fast as humanly possible, and started pumping out another settling pond.

We checked the settling pond late Monday night and the weir was still clear, however, by morning there was evidence of carryover from the settling pond into the weir. The composite sample for Monday, January 11, showed that the combined suspended solids discharge from outfalls 000 and 002 was 5384 lbs.. On Tuesday morning we again changed settling ponds, even though the pond had not had time to pump down sufficiently to last more than about a day. On Tuesday we made the arrangement necessary to have a contractor and our own trucks haul sludge from the settling ponds on a 24 hour a day basis until we have managed to empty both settling ponds. When we got the settling ponds down about 2/3rds the way, it became impractical to try to pump the sludge anymore and we arranged for a different contractor to dip the ponds with a crane and haul the sludge to the storage facility.

We will continue with both contractors and our own trucks until we have managed to remove the unusually thick sludge from the bottom of both ponds. We will then use our own trucks and contractors as necessary to empty the settling ponds. If the weather permits us to continue our sludge hauling operation at a reasonable rate, we should be able to empty the settling ponds fast enough to prevent any carryover into the weir after the 14th. If you have any questions or you wish to discuss this matter, please contact either Bruce Buchanan or myself.

MEN04221

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda

JB/kj

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MEN04222

MENASHA CORPORATION

19 January 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

My letter of 14 January 1982 indicated what measures we were taking to remove the sludge from the two settling ponds. We completed cleaning the first settling pond on the evening of January 14 and switched to that pond later that evening. After dipping the pond with a crane, the small amount of sludge which remained in the bottom of the pond was so stirred up that a considerable amount of it carried over into the weir. This caused the combined suspended solids discharge from outfalls 000 and 002 to exceed the 4800 lb. per day limit. On January 14th, the combined suspended solids discharge was 6371 lbs.. Indications are that the suspended solids discharge from the 15th on will be under the 4800 lb. per day limit.

The situation that caused this problem still exists in the aeration pond and we are still getting considerable carryover from the clarifier to the post clarifier settling pond. However, now that we have the unusually thick sludge removed from both settling ponds, we will be able to empty the ponds fast enough to have one available when needed. If we can not do this with our own truck, we will hire a contractors as necessary.

If you have any questions or wish to discuss this matter, please contract either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda
T. Ray

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MEN04223

MENASHA CORPORATION

22 January 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resrouces Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on the 20th indicated that on January 19, 1982, the oil and grease reading was 1 at outfall 004. This exceeds the daily limit of 0 at this outfall. The extremely small amounts of oil required to cause a reading of 1 at this outfall, of course, cause no visible sheen on the receiving waters.

At the time this incident occurred, we had essentially new oil skimming ropes on the pond and the oil absorbing pads were in good condition. The only thing our investigation turned up that could have contributed to the problem was that someone washed down the floor under one of the boilers. We always use a great deal of care in the handling of all grease and oil in this area of the mill and respond to equipment malfunctions as fast as humanly possible. However, wherever you have a great deal of machinery, it is inevitable that trace amounts of oil and grease will eventually have to be washed from the machinery and floors into the U-drains.

As stated in our correspondence with you at the time that the oil and grease limit of 0 was put on this weir, we do not believe this is a reasonable limit for this outfall. However, since we have been unable to get this limit changed and have been unable to consistently meet the existing limit, we are currently investigating what changes would be required to meet the limit. We are currently evaluating whether it would be more practical to divert the U-drains from this outfall or install an oil skimming device that has the 100% efficiency required to meet the oil and grease discharge limit of 0. When we have determined what changes will be required, we will be able to establish

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MEN04224

the schedule for their completion. In the interm we will continue to do everything we can to prevent further incidences of this nature. If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
Bob Janda
Tom Ray

JB/kj

MEN04225

MENASHA CORPORATION

3 February 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on February 1, 1982 indicate that on January 30, 1982, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lb. per day limit. On this day the combined suspended solids discharge from outfalls 000 and 002 was 14,767 lbs.. The cause of this large discharge appears to be a short term upset in the system. In the recent past we have had problems with the settling ponds filling up rapidly and then carrying over into the weir. This however, was not the cause of the problem this time. The settling pond was checked both on the morning of the 30th and the 31st and was not full. The grab sample taken when we began compositing the sample for the 30th had a suspended solids concentration of 600 miligrams per liter. The composite sample for the 30th had a suspended solids concentration of 2200 miligrams per liter. The grab sample taken when we had finished compositing the sample for the 30th had a suspended solids concentration of 1100 miligrams per liter. This indicates that something caused a large upset in the system which had mostly worked its way through the system by the time the grab sample was taken the next morning. The operator reports that the weir looked clear when he left on the 30th. This means that the large suspended solids carryover had to occur within about 16 hours. The upset had to be rather large in order to bring the average for the composite sample up to 2200 miligrams per liter. When the grab sample was taken the next morning the concentration in the weir was back down to 1100 miligrams per liter. When the settling pond was checked it still was not full. However, due to the amount of carryover in the weir, the operator changed settling ponds anyway. The composite sample for the 31st was 480 miligrams per liter.

At this point we don't know what caused this large upset. Because of

MEN04226

of the high concentrations involved, we believe the upset mostly likely occurred in the settling ponds rather than in the clarifier or the aeration pond. At this point we dont' know what could have stirred up the sludge in the settling pond. We are still investigating any possibilities we can think of. We will keep you advised of any significant developements in this situation. If you have any questions concerning this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

JRB/kj

cc: Marie Spruit
Scott C. Ross
Bruce Buchanan
R. J. Janda
Tom Ray

MEN04227

MENASHA CORPORATION

8 February 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The January monthly operating report indicates that there was an oil and grease violation at outfall 004. The circumstances surrounding this violation were explained in my January 22nd letter to you. As indicated in my January 22nd letter, we are currently evaluating whether it would be more practical to divert the U-drains from this area of the mill or install an oil skimming devise that has the 100% efficiency required to meet the oil and grease discharge limit of 0 at outfall 004. When we have determined what changes will be required we will establish the schedule for their completion. In the mean time we will continue to do everything we can to prevent further incidences of this nature.

The combined suspended solids discharge limit on outfalls 000 and 002 was exceeded six times during this reporting period. The circumstances surrounding these incidences were explained to you in detail in my letters of December 30, January 7, January 14, and January 19.

The basic cause of the problem is the low temperatures in the aeration pond. Because of the low temperatures we must carry a higher than normal biomass concentration in the pond to keep the B.O.D. discharge under control. The combination of the older sludge which results from the higher biomass concentration and the cold temperatures is causing a very poor settling condtion in the clarifier. The resulting carryover from the clarifier to the post clarifier settling ponds is causing the settling ponds to fill very rapidly. Since the 14th, we've been able to have a empty settling pond available when the one in use got full. This has been for the most part successful in keeping the suspended solids discharge under the 4800 lb./day limit. The remaining problem was that the test results on the suspended solids concentration are not available using the State procedure until 24 hours after the sample is collected. Under normal conditions this posses no problem. But when the settling ponds are filling very rapidly, we could end up with two days of violations before we know that the first days suspended solids were high. To help overcome this time lag, we have been using judgement factors such as cloudiness in the weir and the looks of the suspended solids on the

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MEN04228

filter paper when the sample is run through it to determine when it was necessary to change ponds. This method has not always been successful. The time it takes for one of the settling ponds to fill has also been rather erratic. The last settling pond filled in only three days. Because of this extremely rapid buildup in the settling pond, our methods did not indicate it was necessary to change the settling ponds soon enough. On February 6th, 1982 the combined suspended solids discharge from outfalls 000 and 002 was 21,340 lbs.. To eliminate the time delay problem associated with the State approved testing procedures, we have developed a testing program which will give us a rapid estimate of the suspended solids concentration in the weir. Effective immediately and continuing for as long as necessary, we will obtain grab samples from the weir three times a day. The grab samples will be tested for suspended solids and the results will be available within about two hours. The test results will not be as accurate as the State approved procedures but we believe they will serve as an effective indicator of an increase in the suspended solids concentration in the weir. This procedure should help solve the problem of knowing when to change settling ponds. However, it will not help solve the cause problem.

Originally we believed it would be best to truck the sludge from the settling ponds to the sludge storage ponds rather than recycling it back to the aeration pond. Last year we seemed to come out of the poor settling condition when we did this. However, this year it seems to have had no affect. The settling conditions in the clarifier have not improved. The aeration pond baffle has been in place for two weeks now but has caused only a very small increase in temperature in the first part of the aeration pond. Several days ago we began noticing a decrease in the biomass concentration in the aeration pond. This coupled with the results of our last phenol tests indicates that we may be developing a toxic condition in the pond. To prevent the same situation from developing this year that we had last year, we have begun recycling sludge from the clarifier to the aeration pond to build up the biomass concentration in the pond. We have also begun seeding the pond with the special phenol reducing and cold weather bacteria, which we had obtained from a supplier just in case such a condition developed.

We will also be working with the suppliers engineers and the National Council to determine if there are any other measures we can take to overcome the settling problem and possible toxic condition. At the present time, we believe we will be able to determine when the settling ponds need to be changed soon enough to stay under the 4800 lb/day limit. Since we caught the possible toxic condition at its very beginning, we also expect that the measures we are taking will be able to keep the situation from deteriorating any further. We will keep you advised of any significant changes in the situation. If you wish to discuss any of these matters, please contact either Bruce Buchanan or myself.

MEN04229

MEMO TO FILE

SUBJECT: Meeting with Menasha Corporation Date: January 28, 1982

PRESENT: John Blauwkamp, Bruce Buchanan, and David Rao of Menasha Corporation; Roger Przybysz and Marge Spruit of the DNR

Topics covered:

Spent liquor/sludge storage - The project has been funded for 1982. The consultant, CH2M Hill, is to meet February 5, 1982 to discuss alternatives Menasha can afford. The conceptual design will be presented to the DNR for approval prior to beginning detailed engineering. The company will obtain a time schedule for the project soon. The company was reminded that back in October, 1979 they were notified these methods of unlined storage were unacceptable.

Over the years a sludge has accumulated in the spent liquor ponds. This sludge will be mixed with the liquor and applied as a roadbinder. The liquor has been approved for use as a roadbinder by ER & WHLS of the DNR.

The use of a centrifuge to thicken the sludge is being studied to determine economic feasibility.

SLI salt cake crusher - Because of a switch in engineering firms, the crusher is not on line yet. Funds have been requested to get the project underway. The company expects to reclaim about 15% of the present stockpile and properly dispose of the remainder. It was suggested that analysis on the salt cake begin now and proper permits be obtained so, upon the arrival of warm weather, the salt cake pile can be eliminated.

The company has not been keeping the present pile adequately covered.

Surge pond fiber application - Recently a complaint was received regarding the land application of the fibers. The company has been lax in assuring the disposal process has been completed. In one case the fibers were not disced into the ground. In the other, the fibers were left in a pile and not spread out on the land. It was suggested that Menasha withhold payment until the job is completed.

At one time the company had considered putting a grinder on the discharge line and sending the ground fiber to the wastewater treatment system. Due to the organi loading, this idea is no longer being entertained.

Ash lime pond sludge - Because of the volume of sludge needed for fertilizer value, land application is not a viable alternative. The sludge is dewatered and landfilled.

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MEN04230

Quality control program - As a method to upgrade the laboratory, it was suggested a quality control program be initiated. A beginning would be to incorporate replicate samples, EPA quality control samples, known standards, etc. into the routine work.

Sludge base site - Due to the approval of wintertime application, the base site was used only a few times this past year. Presently, Menasha is pursuing a sludge marketing program, with the site evaluations to be conducted by Menasha foresters. As the program gains momentum, the company hopes to be able to phase out the base site completely.

Whether the groundwater sampling needs to be continued was brought up. The accumulated results will be evaluated and a decision made regarding the monitoring program.

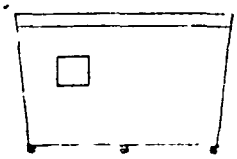
Spent liquor incenator (SLI) - Although the company is still experiencing problems, they have more control over its operation now. The SLI gets shut down when Menasha shuts it down, not when it wants to shut down! At the present time the emergency spent liquor pond is filled.

Winter sludge applications - Are going smoothly, considering the recent weather (blizzards!).

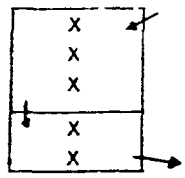
Consumers Power transformer station - To begin construction in September, 1982.

Chip screen rejects - Going to S.D. Warren and others as fuel. The larger rejects are being stored on-site until a decision is made regarding their disposal.

Baffle in aeration lagoon - A large plastic curtain was recently installed in the aeration lagoon The curtain has continuous flotation on the top and several anchors to hold it down. A window in one area allows a flow through.



The curtain was placed to contain 3/5 of the influent.



(x = aerator)

Hopefully, the curtain will have the effect of raising the temperature in the pond during cold weather (~13°F.) and increase BOD removal.

MEN04231

Present suspended solids problem - In an attempt to avoid the BOD problem of last year, a higher concentration of solids was maintained in the aeration lagoon. Due to the severe cold weather and the age of the sludge, problems were encountered in settling the sludge. No flocculents were used to aid in settling because the company has not yet found an effective one. Ordinarily, the secondary clarifier (122,000 gal.) has a 6 hour detention time, and the polishing ponds have just less than 24 hours detention time. Because the sludge was rising in the clarifier and filling up the final settling ponds, excess solids were carried over into the discharge. Efforts to correct the problem were hindered by frozen equipment (-80° windchill).

NPDES Permit - The permit is presently being drafted in the District Office. The land application program, now regulated by the State permit, will be incorporated into the NPDES permit under a Residuals Management Plan. Whether Menasha should apply for reissuance of the State permit which expires February 28, 1982 needs to be determined.

Menasha inquired whether sludge could be deposited in unlined lagoons at various farm sites in order to provide more efficient transportation and application of the sludge. Questions regarding size, liability, cost effectiveness, current allowable practices, closure plans, etc. need investigation before an answer can be given.

Roger informed the company about the Kalamazoo River Preservation Association and the upcoming Kalamazoo River Study by DNR - Fisheries and Water Quality.

MS/mam

CC: Menasha Corporation

MEN04232

MENASHA CORPORATION

11 February 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commision
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results recevied on the 8th, 9th, 10th, and 11th indicate that on February 6, 1982, February 7th, February 8th, and February 9th, 1982, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lb. per day limit. On these days the combined suspended solids discharges were 21,340 lbs., 6411 lbs., 12742 lbs., and 7930 lbs. respectively.

The grab sample of the 5th did indicate that the suspended solids would be high but this data was not known until the 7th, at which time the settling ponds were changed. But producing the high suspended solids for the 6th.

Previously, changing settling ponds would take care of the carryover from the clarifier. However, the settling characteristics of the pond solids seemed to have changed after the 6th. Present testing shows the settling of the pond solids in the clarifier and settling ponds is very poor. Even though the settling pond have been changed on the 7th, 9th and 11th, suspended solids continue to be high.

To try and remedy this problem, and due to the results of our last phenol test that indicated we may be developing a toxic condition in the pond. We have begun seeding the pond with special phenol reducing and cold weather bacteria, which we obtained from a supplier for just such a situation. Also, we have been recycling sludge from the clarifier to the aeration pond to build up the biomass concentration in the pond.

At present we are working with suppliers engineers, technical service, and the National Council to determine if there are any measures we can take to overcome the settling problem and possible toxic condition. We will keep you advised of any significant developments in this situation. If you have any questions concerning this matter, please

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MEN04233

obert J. Courchaine
age 2
1 Feb. 82

ontact either Bruce Buchanan, John Blauwkamp, or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Gary E. Roys

Gary E. Roys
Process Chemist &
Group Leader

c: Marge Spruit
Scott C. Ross
R. L. Jarda
Bruce Buchanan
Tom Ray

/kj

6629

MEN04234

MENASHA CORPORATION

11 February 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received February 9, 1982 indicated that on February 8, 1982, the oil and grease reading was 1 at outfall 004 This exceeds the daily limit of 0 at this outfall. The extremely small amounts of oil required to cause a reading of 1 at the 004 outfall, of course, cause no visable sheen on the receiving waters.

At the time this occurred the oil skimming rope and the oil absorbing pads on the pond were in good shape. The only thing our investigation turned up was there was a small amount of oil near a critical pump and oil absorbant was applied. We always use a great deal of care in the handling of all oil and grease in this area of the mill and respond to equipment malfunctions as fast as humanly possible. However, where you have a great deal of machinery, it is inevitable that trace amounts of oil and grease will eventually find their way to the floor and into the U-drains.

As stated in our correspondence with you at the time the oil and grease limit 0 was put on this weir, we do not believe this is a reasonable limit for this outfall. However, since we have been unable to get this limit changed and have been unable to consistently meet the existing limit we are currently investigating what changes would be required to meet the limit. We are currently evaluating whether it would be more practical to divert the U-drain from this outfall or to install an oil skimming devise that has the 100% efficiency required to meet the oil and grease discharge limit of 0. When we have determined what changes will be required, we will be able to establish the schedule for their completion. In the interm we will continue to do everything we can to prevent

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MEN04235

further incidences of this nature. If you wish to discuss this matter, please contact either Bruce Buchanan or John Blauwkamp.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Gary E. Roys

Gary E. Roys
Process Chemist &
Group Leader

CC: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. L. Janda
Tom Ray

GR/kj

MEN04236

MENASHA CORPORATION

16 February 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on February 12 indicate that on February 10, 1982 the combined suspended solids from outfall 000 and 002 exceeded the 4800 lb/day limit. On the 10th, 11,143 lbs. of suspended solids were discharged. Test results received on February 12, 13, 14, and 16 indicate that on February 6, 7, 8, and 10, the combined B.O.D. discharge from outfalls 000 and 002 exceeded the daily limit of 5590. On these days 8,800, 6,500, 7,670, and 5,963 lbs. of B.O.D. were discharged respectively.

As explained in our letter of February 11, beginning on February 6th, the sludge did not settle in the clarifier or the settling ponds. Inspite of having empty settling ponds the sludge still carried through into the weir. This continued from the 6th through the 10th. On the 11th we started to see a decrease in the SV and also noticed that we were again getting a sludge layer in the clarifier and some settling in the settling ponds. From the 10th through the 14th, the suspended solids discharge was under the 4800 lbs/day limit. The situation improved slightly after the 10th but we were still experiencing a great deal of carryover from the clarifier to the settling ponds. As a result of this, we have to change settling ponds about every three days. We are still monitoring grab samples from the weir three times a day as a aide in detecting a full settling pond. On one ocassion we noticed the suspended solids in the weir doubled in about eight hours. As a result of this, we changed settling ponds in the middle of the night and avoided going over the limit for that day.

I originally thought it would help the situation if we took the sludge from the settling ponds and trucked it to our storage lagoons rather than returning it to the aeration pond. However, after about three weeks of doing this, we saw no improvement in the situation at all.

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This in addition to the fact, that we were experiencing a low biomass concentration in the pond, we decided to discontinue hauling the sludge from the settling ponds and pump it back to the aeration pond instead. This with recycle of sludge from the clarifier has enabled us to maintain a biomass concentration sufficient to keep the B.O.D. concentration down in the effluent. The five high B.O.D.'s reported for the 6th through the 10th are the result of the large amount of suspended solids carried over into the weir for those days. The actual dissolved B.O.D. concentration in the effluent is still under control.

We are currently working with the supplier of the mutant bacteria and the National Council to find ways of solving the problem. In addition to this we are working with the suppliers to find a combination of materials that for short term would help us improve the settling characteristics in the clarifier and settling ponds. Our efforts to solve the problem involve doing a juggling act between maintaining a sufficient biomass concentration to keep the B.O.D. and phenols under control without getting the sludge so old that it won't settle at all. This special phenol reducing and cold weather bacteria should prevent a toxic condition from developing at lower biomass concentration. In other places they have been very successful in dealing with pulpmill wastes and have improved the settling characteristics of the biomass. At the present time we intend to continue with the special bacteria and keep the biomass concentration just high enough to keep the B.O.D. concentration under control. At the advise of the mutant bacteria supplier and the National Council we have increased our ammonia addition to the pond to several times normal levels to insure that sufficient nitrogen is present for the biomass. In addition to this we are doing another delicate juggling act between running the aerators sufficiently to keep the aeration pond thoroughly mixed and keep the D.O. in the pond between the 1 and 3 ppm. range.

As has been our experience in the past, the polymer suppliers we have had in todate have been unsuccessful in finding anything that would improve the settling characteristics of the sludge at dosage rates that would be allowed in the effluent for the polymers involved. We are currently trying various combinations of pH changes in polymers to see if we can do anything this way. If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
B. Buchanan
R. L. Janda
Tom Ray

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MEN04238

MENASHA CORPORATION

February 19, 1982

Mr. Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

Test results received on February 18th indicate that on February 16th the combined suspended solids discharged from outfalls 000 and 002 exceeded the 4,800# per day limit. On this day the combined discharge was 6,204#.

As explained in my letter of February 16th, the situation seemed to improve slightly from the 10th through the 14th as the SV and SVI were gradually decreasing. The grab samples on the morning of the 15th indicated that the SV and SVI both took another large jump. Our grab samples indicated that we had a high suspended concentration in the weir in spite of the fact that we had changed settling ponds the previous day. As soon as we had the settling pond pumped down we changed the pond again on the 16th. This brought the concentration in the weir down somewhat but not enough to keep us under the 4,800# per day limit, even if the entire day had been at the lower concentration. We changed settling ponds again on the 17th. The encouraging signs are that this time when we pumped the settling pond out we found there was significant amounts of sludge in the bottom of the pond. In addition to this, we again have a significant sludge blanket forming in the clarifier. However, the SV is still running over 950 ml. This is still forcing us to change settling ponds every couple of days. Each time we change the settling ponds we have to pump the full pond back into the aeration pond. This increases the flow that we must put through the clarifier which in turn only increases the amount of carry-over to the settling pond. This in turn increases the frequency that we must change settling ponds. We hope to get out of this vicious cycle by increasing the settling in the clarifier with the use of a new Hercules product which showed promising results in the lab tests. This is the first time that we have found something that significantly improved settling characteristics of our sludge. The tests were conducted on Wednesday. We

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Mr. Robert J. Courchaine February 19, 1982

immediately made arrangements for purchase and shipping of some of the material. We will begin feeding the material to the clarifier on Friday. If the polymer works even half as well in the clarifier as it did in the lab tests it should enable us to both break out of the cycle of having to change settling ponds every couple of days and keep the suspended solids under the 4,800# per day limit.

We will let you know of any significant changes in the situation. If you have any questions or wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

MENASHA CORPORATION

John R Blauwkamp P.E.

John Blauwkamp, P.E.
Technical Manager

JRB/k

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
Bob Janda
Tom Ray

MEN04240

MENASHA CORPORATION

24 February 1982

Robert J. Courchaine
Executive Secretary DNR
Water Resources Commission
Stevens T. Mason Building
Landing, MI 48926

Gentlemen;

Test results received on February 22 and 24 indicate that on February 19 and 22, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lbs./day limit. On these days 6638 and 8152 lbs. of suspended solids were discharged. Test results received on February 22, 23, and 24 indicate that on February 16, 17, and 18, the combined B.O.D. discharge from outfalls 000 and 002 exceeded the 5590 lb./day limit. On these days 5756, 5995, and 6088 lbs. of B.O.D. were discharged

My February 19th letter mentioned that we hoped to improve the settling in the clarifier with the use of a relatively new polymer. We began feeding the polymer on the 19th but it made no detectable difference in the amount of carryover from the clarifier to the settling pond or from the settling pond to the weir. We discontinued use of the polymer in the clarifier on the 20th. Since that time we have tried various combinations of the polymer and pH adjustments but have not been able to duplicate the original lab. results. The service engineer will be back in this week to see if he can determine what is wrong.

On both the 19th and 22nd, the suspended solids carried over from the settling pond to the weir inspite of the fact that the settling ponds were essentially empty on both days. With the SV's running at 950 plus for the 1/2 hour settling test, we simply get a lot of suspended solids that won't settling out in the settling pond or the clarifier.

We are still changing settling ponds every couple of days in order to minimize the carryover from the settling ponds to the weir. We are currently pumping sludge from the bottom of the settling and hauling it to the sludge storage ponds. This allows us to get the thickest sludge out of the settling ponds as fast as possible and minimizes the amount of water and sludge that must be pumped from the top of the settling pond back to the aeration pond.

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Our consulting firm CH_2M-Hill has had their best waste treatment trouble-shooter in here for the last two days. In his opinion the problem is not one of pinpoint floc but of sludge bulking. His microscopic examination confirmed our believe that the bulking problem has not been caused by filamentous bacteria. After reviewing our records for the last several months, he believes that the most likely cause of the bulking problem is a nutrient deficiency. We will be doing some pilot scale work in the lab to confirm this theory. In the mean-time we will be increasing both the nitrogen and phosphorous feed to the waste treatment system. We will be increasing the nitrogen feed right away but we will have to increase the phosphorous feed in several steps to avoid going over the phosphorous discharge limit.

We are still pursuing the settling aid approach as a way to control the immediate problem. Todate we do not have anything that appears workable in our waste treatment system. We will keep you informed of any significant changes in the situation. If you have any questions or wish to discuss the matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda
T. Ray

JB/kj

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MEN04242

MENASHA CORPORATION

2 March 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received from February 26 through March 1, 1982, indicate that on February 24 through February 27, 1982, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lb. per day limit. On these days 8136, 7243, 17,002, and 6363 lb. of suspended solids were discharged. On the 25th, one of our main sludge trucks blew an engine, and we could not get the settling ponds emptied as soon as we normally would have. This caused the exceptionally high discharge on the 26th. On March 1st, the contractor began helping us empty the ponds. We expect to be caught up by the end of the working day on the 3rd. On the other days, the suspended solids were simply carrying through the settling ponds inspite of the fact that the ponds were in reasonably good shape.

Even when we keep the settling ponds empty, we expect the suspended solids discharge will be in the 5000 plus pound per day range until we can significantly improve the settling characteristics of the sludge. We are still looking for some additives which will help settle the sludge on a short-term basis. We have found another polymer which looked good in the laboratory trials. These results have been repeatable and have been reasonably consistant. We have placed an emergency order for a two weeks supply of the polymer and expect to be able to begin feeding it by the end of the week. We will keep you informed of any significant changes in the situation. If you have any questions, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda
T. Ray

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MEN04243

MENASHA CORPORATION

March 5, 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

Test results received on March 1 and March 2, indicate that on those days the oil and grease reading at outfall 004 exceeded the permit limit of 0. On both of these days, an oil and grease reading of 1 was obtained. Of course, the minuscule amount of oil required to cause a reading of 1, caused no visible sheen on the receiving waters. As stated in previous letters, we are still investigating two alternate means of effecting a permanent solution to this problem. To date, we have not been able to find a separator suitable for the job. We are, however, still investigating this possibility while we are determining the cost of diverting the U-drains in this area from outfall 004. While these permanent solutions are being worked on, we are putting into effect a temporary means of containing the small amount of oil that may be getting washed from some of the equipment to the U-drains. This should keep the problem under control until a permanent solution can be put into effect.

Test results received on March 1 and March 2, indicate that on February 27 and 28, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800# per day limit. On these days 14857 and 15807# of suspended solids were discharged.

My March 2nd letter indicated that we were having a contractor help us empty the settling ponds. This operation was completed on March 3rd. On March 1, we began mixing river water with the influent to the clarifier. This appears to have reduced the carryover from the clarifier to the settling ponds. On Thursday, we began feeding the polymer mentioned in my March 2nd letter. After several hours it did not appear to have reduced the carryover from the clarifier to the settling ponds. However, after about 12 hours it did apparently reduce the carryover from the settling ponds to the weir. We are still conducting laboratory tests to determine just how much benefit the polymer has.

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March 2nd was the first full day that we added river water to the clarifier inlet. Since then, the suspended solids discharge has been under the limit. In addition to this, we see some encouraging signs in the aeration pond itself. Both the dissolved B.O.D. and the B.O.D. per lb. of suspended solids have come down to more normal levels. In addition to this, we have see small improvements in the SV and the SVI. At the present time, we plan to continue adding both the river water and polymer to the clarifier inlet. We also plan to continue adding the nutrients at the unusually high levels and gradually reducing the mixed liquor suspended solids concentration in the aeration pond. I will keep you advised of any significant changes in the situation. If you wish to discuss this matter, I will be available at your convenience.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. Janda
T. Ray

JB/kj

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MEN04245

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

State Office Building
350 Ottawa N. W.
Grand Rapids, Michigan 49503
Phone: 456-6232

March 8, 1982

Mr. John Blauwkamp
Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078

Dear Mr. Blauwkamp:

As evidenced by the continuous supply of letters being received at this office, Menasha Corporation has been unable to meet the permit requirements for the suspended solids and BOD contained in the process discharge since the beginning of the year. This problem is similar to the one experienced last year during the winter period.

"The discharge of any pollutant identified in the permit . . . at a level in excess of that authorized shall constitute a violation of the permit" (N.P.D.E.S. Permit Part II, A, 1). The company should take immediate steps, whether it be in reduction of production or in wastewater treatment design, to comply with the permit requirements.

If the noncompliance should persist, the question arises whether or not a N.P.D.E.S. permit could be reissued for this facility. Substantial compliance of the existing terms of the permit is a requirement for permit reissuance.

Sincerely,

WATER QUALITY DIVISION

Marge Spruit
Water Quality Specialist

MS/mam

CC: WQD Files, Lansing
Scott Ross, Compliance Section, Water Quality Division

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MEN04246

MENASHA CORPORATION

9 March 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on March 6,7 and 8, indicate that on March 4,5 and 6, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lb. per day limit. On these days 6,844 lbs.. 7,144 lbs., and 7,126 lbs. of suspended solids were discharged.

One correction must be made to my March 5th letter. The second paragraph indicated that the high suspended solids discharges occurred on February 27 and 28. The actual dates were February 28 and March 1.

My March 5th letter indicated that addition of the river water to the clarifier inlet had apparantly reduced the carryover from the clarifier to the settling pond and that addition of the polymer appeared to reduce the carryover from the settling pond to the weir. Inspite of these improvements, the settling pond lasted less than two days and started carrying over into the weir late Thursday night. We changed settling ponds on Friday, but the sludge continued to carryover into the weir inspite of the empty settling pond. On Sunday,we changed settling ponds again and the discharge for Sunday and Monday was under the 4800 lb. per day limit. On Monday, we rechecked the affect of river water and polymer on the settling characteristics of the sludge. We found that the minimum effective dose of polymer had not changed, but river water no longer had any beneficial affect either by itself or in combination with the polymer. Therefore, we've discontinued the addition of river water to the clarifier inlet.

The encouraging signs are that the B.O.D. in the pond is now very low and that once-in-a-while, the S.V. is below 900. The higher than normal nutrient addition rates appear to have had a significant affect on the B.O.D. reduction in the pond. The soluble and suspended B.O.D. have both dropped a great deal. If a lack of nutrients was the original problem, we should start to see an improvement in the situation very soon. Since the soluble B.O.D.

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concentration in the pond is quite low, we now have a much higher biomass concentration than we need. This is due primarily to the recirculation of the dilute sludge from the top of the settling ponds back to the aeration pond. Our current plans are to continue the nutrient addition and reduce the biomass concentration in the aeration pond. Since the B.O.D. concentration in the pond appears to have bottomed out, we should see a reduction in the suspended solids generation in the pond. In addition to this, through the use of the polymer, we hope to be able to simultaneously reduce the suspended solids concentration in the effluent and reduce the recycle of sludge from the settling ponds back to the aeration pond. This should get our biomass concentration down to the level where we have historically had better settling in the clarifier.

National Council and our consultant, CH2M-Hill have both been working on the problem with us. We have a joint meeting scheduled for Friday of this week, to derive an action plan which will take us to resolution of the problem. We will advise you of the results of that meeting.

We also plan to review the situation with the District III Water Quality Staff on March 11. The meeting will be held at 1:30 P.M. in Otsego.

We will keep you advised of any signficant changes in the situation. If you have any questions or wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. L. Janda
Tom Ray

JB/kj

MEN04248

MENASHA CORPORATION

March 10, 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The February monthly operating report indicates that the oil and grease limit of 0 was exceeded twice at outfall 004. The circumstances surrounding these excursions and the actions being taken to prevent recurrence were discussed in our previous correspondence to you. My March 5th letter, indicated we are making some temporary changes to improve the situation until a permanent solution could be implemented. These temporary measures will be completed by March 20. We will continue to use a great deal of care in the handling of all grease and oil in this area of the mill and do everything humanly possible to prevent any oil and grease from reaching outfall 004.

The phenol discharge limit of 300 micrograms per liter was exceeded at outfall 002 and outfall 000. We have been checking the phenol at these outfalls by both the 4AAP method and the GC method. Based on the GC test results, the phenol concentration at outfall 002 was actually less than 100 ppb.. The average phenol concentration at outfall 000 based on the 4AAP method was 2553 ppb.. To better track the phenol concentration in the pond, we have been sending in weekly samples for GC analysis. These samples indicated that the actual phenol concentration average is only about 9% of that indicated by the 4AAP test results. When the new NPDES permit allows us to report the GC test results instead of the 4AAP test results, we will be able to put an end to this problem.

The combined B O.D. discharge from outfalls 000 and 002 exceeded the daily maximum limit seven times during the reporting period. The average B.O.D. limit was also exceeded. As stated in previous letters, both the high average B.O.D. discharge and the B.O.D. discharges that exceeded the daily maximum limit were the result of the high suspended solids discharge.

The combined suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum limit twelve times during the reporting period. The average suspended solids discharge also exceeded its limit. The details surrounding each of these excursions and the actions we are taking to resolve the problem have been covered in detail in my various letters to you.

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MEN04249

Since the first of the year, we have had many polymer suppliers in to see if they could find anything that would help settle the sludge in the clarifier until the cause of the problem could be eliminated. After testing, literally hundreds of different polymers in the laboratory, we found two that would be very expensive but would improve the settling in the clarifier. One of these is now being used and we plan to run a trial on the second one this week.

We have had consultants from the Institute of Paper Chemistry, N.C.A.S.I. and CH2M-Hill working with us on the problem. We have scheduled a joint meeting of these consultants for this week, where we will define an action plan that will bring us to resolution of this problem. Our current plans are to continue the nutrient addition at the higher rates and lower the biomass concentration in the pond. The polymer will be used to improve the settling in the clarifier and thus reduce the recycle of sludge from the settling ponds back to the aeration pond. Additional measures may be taken as a result of the meeting mentioned above. As soon as we have the immediate problem behind us, we will begin working with our consultants on defining what must be done to prevent recurrence of this problem next year.

We also plan to review the situation with the District III Water Quality Staff on March 11. The meeting will be held at 1:30 P.M. in Otsego.

Both the soluble B.O.D. concentration and the pounds of B.O.D. per lb. of suspended solids are quite low. Within the next one to two weeks, we should see a significant improvement in the settling characteristics of the sludge. This together with reducing the suspended solids concentration in the pond, should put an end to the problem. We will keep you advised of any significant changes in the situation. If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. L. Janda
Tom Ray

JB/kj

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MEN04250

memo / MENASHA CORPORATION

TO: Tom Clemmons

DATE: 12 March 1982

SUBJECT: Oil spill to 004.

FROM: Steve Rosenthal S.J.R.

A meeting was held this morning with all power house, salary staff to go over the recent oil spills to 004. It is our opinion that the most likely area for contamination from the power house comes from the No. 4 boiler feed pump area.

Maintenance is working on this project now to pick up and isolate all run off water from this area to a separate drain. The area will be covered with oil dry, thick enough to capture any oil drips.

The environmental impact was gone over thoroughly with supervision and all efforts will be made to capture any and all oil spills.

The maintenance foremen had a meeting with all power house maintenance employees and explained the situation asking for their cooperation in obtaining our 0 oil spill target.

I met with all operating personnel on the day shift, explaining and requesting the same program.

All remaining operating personnel will be contacted individually with the same explanation and request.

The area engineer was also brought on board with full background history and has made his first inspection of the area.

cc: B. Buchanan
K. Hartman
J. Blauwkamp
A. Coleman
S. J. Rosenthal

SR/kj

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MEN04251

MENASHA CORPORATIO

March 16, 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

Test results received on March 11 indicate that on March 10 the oil and grease reading and outfall 004 exceeded the permit limit of zero. On this date oil and grease reading of one was obtained.

My March 10th. letter indicated some temporary measures are being taken to keep the problem under control while a permanent solution was being investigated. These temporary measures have been completed, and the engineering work on a permanent solution has been started. In addition to this we have had crew meetings with all the maintenance and operating personnel to review the oil and grease handling procedures and impress on them the great deal of care they are to use in handling all oil and grease.

Test results received on March 13 and 14 indicated that on March 11 and 12 the combined suspended solids discharged from outfalls were 000 and 002 exceeded the 4800 pound per day limit. On these days 6,365 and 7,525 pounds of suspended solids discharged.

Due to a combination of load restrictions, mechanical difficulties and trucks getting stuck in the mud, we did not have an empty settling pond available on the morning of the 11th.. By the time we were able to switch settling ponds that afternoon, enough suspended solids had already carried over into the weir to put the composite samples over the limit for the day. On the 12th. the discharge flow rate from the aeration pond was high. This contributed to the suspended solids carrying over into the weir

MEN04252

in spite of the fact that the settling pond was essentially empty and the polymer was being added at the proper rate. The flow was high as a result of recirculation from the settling ponds. This recirculation has been routinely necessary to minimize solids carryover to the river.

My March 10th. letter indicated that we were having a joint meeting with our consultants to define the course of action that had the highest probability of resolving the current problem. The results of this meeting are as follows:

1. Continue the high nutrient addition rates.

2. Continue reducing the biomass concentration in the pond by using the polymer to minimize the recycle of sludge from the settling ponds to the aeration ponds.

3. We will develop and review the data for a longer period of time prior to when the problem started.

4. Our consultants will develop a yield versus nutrient correlation to allow better control of nutrient addition rates.

The first two measures will help us resolve the current problem. The second two measures will help us confirm that our analysis of the situation was correct.

At the meeting we also spent a great deal of time discussing what actions must be taken to prevent a recurrence of this problem next winter. The first step will be to conduct pilot plant studies to find out if temperature and/or nutrients are indeed the cause of the problem. Pilot plant studies will also try to determine which variables must be changed to successfully operate under winter conditions. While the pilot plant studies are being conducted, our consultants will be doing preliminary design work to determine what type of process modifications may be feasible for our system. Based on the results of the pilot studies and the preliminary design work, we will determine what process or operational changes are necessary.

At the present time we are working on the design of pilot studies and the time table for the project. We will keep you advised on

MEN04253

the progress of the efforts, and any significant changes in the current situation.

If you wish to discuss this matter, please contact either Bruce Buchanan or myself.

Sincerely,

MENASHA CORPORATION
Otsego Paperboard Division

John R. Blauwkamp

John R. Blauwkamp, P.E.
Technical Manager

JB/mm

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. L. Janda
Tom Ray

MEN04254

MENASHA CORPORATION

March 19, 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

Test results received on March 16 and 17 indicate that on March 14 and 15, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800#/day limit. On these days, 6,482 and 5,174# of suspended solids were discharged.

My March 16th. letter indicated that on the 12th. the suspended solids carried over into the weir in spite of the fact that the settling pond was empty and the polymer was being added at the appropriate rate. This same condition occurred again on both the 14th. and 15th.. Our investigation has shown that the cause of this is that the aeration pond has developed a very dispersed biomass condition. On days when the suspended solids have carried over into the weir, the effluent sample has had zero settleable solids, but high total suspended solids. These very fine solids have been centrifuged from the effluent samples and examined under the microscope. Both the microscopic examination and oxygen up-take rate done on the effluent indicate that this very fine suspended material is biological in nature. Since a dispersed floc-culate is the cause of the problem, current direction is to agressively reduce biomass concentration in the aeration pond. This will be accomplished with maximum sludge hauling and polymer addition.

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MEN04255

Our recent observations confirm an increase in the presence of properly flocculated sludge. Our consultants agree. Sludge settling volumes are improving along with the increased presence of "better" sludge.

Sincerely,

MENASHA CORPORATION
Otsego Paperboard Division

John R. Blauwkamp

John R. Blauwkamp
Technical Manager

JB/mm

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. L. Janda
Tom Ray

MEN04256

MENASHA CORPORATION

29 March 1982

Robert J. Courchaine
Executive Secretary, DNR
Water REsources Commission
Stevens T. Mason Building
Lansing, Mi 48926

Gentlemen;

Test results received on March 25, indicate that on March 24, the oil and grease reading at outfall 004 exceeded the permit limit of 0. On this date an oil and grease reading of 2 was obtained.

As indicated in my March 16th letter, we have completed the temporary measures to prevent oil and grease from getting from the various pieces of equipment into the U-drains. We have also reviewed our very strict oil and grease handling procedures with all personnel in the department. After this incident, we conducted a thorough investigation to determine where the oil and grease got into the system. There was no evidence of any oil and grease spill and no floors had been washed down in the entire department. In addition to this, we checked with all personnel in the department and no one knew of any place where oil or grease could have gotten into the U-drain system. At the present time, we are investigating the possibility that the oil sheen was caused by one of our water treatment chemicals rather than lubricating oil. The engineering work on separating the U-drains in this area of the mill from the outfall is proceeding. We should have established a time table for completing this job within about three weeks. While the engineering and construction are in progress, we will continue to do whatever we possibly can to prevent oil and grease from entering this outfall.

The situation in the waste treatment system is now improving at a significant rate. Through the use of the polymer, we have managed to lower the mixed liquor suspended solids concentration from 6000 down to about 3000 ppm.. The SV in the pond without polymer has decreased from over 900 to about 700 ml. This is partially due to the lower mixed liquor solids concentration but the settleability of the sludge has also improved significantly. The SVI is now down from 300 to about 200. In addition to this, the polymer dosage required to obtain both a good thick sludge in the clarifier and prevent carryover to the settling ponds has been greatly reduced. Because of the lower carryover from the clarifier to the settling ponds, the settling ponds are now lasting about 5 days each instead of two.

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MEN04257

This in turn makes it much easier for us to control the biomass concentration in the aeration pond and reduces the volumetric loading on the clarifier.

If the present trend continues, as we believe it will, the aeration pond should be back to normal within a few weeks. Then we will be able to concentrate our time and energy on determining what changes must be made to the system to keep it under control next year.

We will keep you informed of any significant changes in the situation.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
Bruce Buchanan
R. L. Janda
Tom Ray

JB/kj

MEN04258

MENASHA CORPORATION

8 April 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The March monthly operating report indicates that the average phenol discharge from outfall 000 exceeded the 300 ppb. limit. As measured by the 4AAP method, the average phenol discharge was 309 ppb.. We have also been testing the phenol concentration by the GC method. These test results indicate that the actual average phenol concentration was less than 50 ppb.. The test results of the 4AAP method are now down to a normal level. Therefore, we have gone back to our normal testing frequency on both the 4AAP and GC methods.

The oil and grease limit on outfall 004, was exceeded 4 times during the month. Circumstances surrounding these incidences, and the actions taken, were explained in detail in my various letters to you. In summary, we have completed what temporary measures we can to keep oil and grease out of the U-drain system in this part of the mill, and have also reviewed our very strict oil and grease handling policy with all personnel that work in this area of the mill. In addition to this, we have taken measures to insure that none of the water treatment chemicals used in this area, get into the system and thus cause a false oil and grease reading at the weir. The engineering work on the permanent solution to the problem is also in progress. The preliminary layout work on the system is currently being worked on and we should have a time table for completion of the project within a couple of weeks. While the engineering and the construction are in progress, we will continue to do whatever we can to keep this outfall free of oil and grease.

The combined suspended solids discharge limit from outfalls 000 and 002 was exceeded 11 times during the first half of the month. These high discharges also caused the average discharge for the month to be over its limit. The circumstances surrounding each of these excursions and the actions being taken to resolve the problem, have been covered in detail in my various letters to you. The conditions in the aeration pond have been steadily improving. We have continued with the high nutrient addition rates and using the polymer to control the suspended solids discharge and the recycle of sludge back to the waste treatment system. As a result of these measures, we currently have the mixed liquor suspended solids concentration in the aeration pond under control, and the settleability of the sludge continues to

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improve.

Within a couple of weeks, the current problem should be completely behind us. Therefore, we are directing our main efforts at determining what must be done to prevent a recurrance of this nature next year. We will be utilizing the services of the Institute of Paper Chemistry, NCASI, Dr. Eckenfelder of Vanderbilt University, Dr. Pipes of Drexile University, and CH2M-Hill to help us accomplish this. The project will consist of conducting data analysis, pilot studies, and engineering work to determine what caused the problem this year and identify the best short and long term solution to the problem.

We will keep you informed of any significant changes in the situation. If you wish to discuss any of these matters, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C Ross
Bruce Buchanan
R. L. Janda
Tom Ray

jb kj

6851

MEN04260

MENASHA CORPORATION

28 May 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on May 27, 1982, indicate that on May 16 & May 20, the soluble orthophosphorous concentration at outfall 000 exceeded the 1 ppm. limit. On these days the soluble orthophosphorous concentration was 2.2 and 6.5 ppm. respectively and 11 and 27.4 lbs. of soluble orthophosphorous were discharged respectively.

Since our settling problems started last January, we've been trying to control the phosphorous addition, so that, we just barely maintain a measureable residual in the effluent and thus insure that a phosphorous deficiency does not exist in the aeration pond. We originally established the B.O.D.. to phosphorous ratio, by gradually increasing the phosphorous addition until we obtained a measureable residual in the pond. However, as the temperature in the pond increases, the pounds of phosphorous required/pound of B.O.D., decreases. Because this is the first year we've tried to maintain a measureable phosphorous residual in the system, our knowledge of how the B.O.D. to phosphorous ratio changes with temperature is not very precise. Without knowing this ratio, there is no way of knowing how much phosphorous you have to add until you obtain a residual in the effluent. Then it's a matter of only a few more pounds before you've exceeded the 1 ppm. limit. When the temperature in the pond is changing, the control range between avoiding a phosphorous deficiency and exceeding the 1 ppm. discharge limit, becomes a very narrow moving target.

Using the information we've gathered this past winter and spring and the information from this coming summer, we will be able to establish how the phosphorous to B.O.D. ratio changes with

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MEN04261

temperature. This fall we will begin controlling the phosphorous addition based on the B.O.D. to phosphorous ratio for the temperature at any particular time. By using this relationship and carefully watching the residual phosphorous concentration, we should be able to both avoid a significant phosphorous deficiency and avoid exceeding the permit limit. If you have any questions concerning these matters, please contact either Bruce Buchanan or myself.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

JB/kj

cc: Marge Spruit
Scott C. Ross
R. L. Jandr
Tom Ray
Bruce Buchanan

MEN0426.

MENASHA CORPORATION

9 June 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The May Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation indicates that there were three excursions of our phosphorous discharge limits at outfall 000. My May 28th letter to you, reported the excursions on May 16 and 20. More recently received test results indicate that on May 24, May 31, June 2, and June 6th both the soluble orthophosphorous concentration limit and the pounds per day limit were exceeded at outfall 000. On these days, the soluble orthophosphorous concentration was 5.8, 7.3, 7.9, and 5.7 ppm. respectively and 38.3, 47.6, 41.8, and 35.4 lbs. per day of soluble orthophosphorous was discharged respectively.

As explained in my May 28th letter, we believe the reason for the high phosphorous in the effluent was due to the fact that as the temperature in the pond increases, the endogenous respiration rate also increases and less nutrients are required in the system. Since this is the first year we've ever tried to maintain a measurable phosphorous residual in the system, our knowledge of how much phosphorous is required at various temperatures is not very precise. When I received the results from the first few tests indicating high residual, we reduced the phosphorous feed by 25% hoping, thus to bring the concentration down and still avoid a severe shock on the system. The results of the third test were also high, so we reduced the phosphorous feed by an additional 25%. The results of the fourth test showed an increase in the phosphorous residual, so we turned the phosphorous feed off completely until such time as, the residual is less than the 1 ppm. limit. The results of the test taken after the phosphorous was turned off, indicate that the residual is dropping. Based on the rate of drop from the time the phosphorous was turned off to the first test, the phosphorous concentration should be under the 1 ppm. limit in about two weeks. At this time, we believe the high phosphorous concentration is due to the reduced phosphorous

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MEN04263

requirement of the system at higher temperatures. However, to insure that this is the case, we are checking all of the influents to the system, to insure that there are no unaccounted for sources of phosphorous.

With the data we've obtained this past winter and spring, and the data we will obtain this coming summer, we will be able to determine the phosphorous requirement of the system as the temperature in the aeration pond changes. This will allow us to keep the system in balance this fall and next winter.

The engineering work being done on the U-drain modifications required to keep oil and grease out of outfall 004, has been completed. Our proposed plans have been submitted to the District III Water Quality Staff for their review and comment. As soon as we receive their reply, a time table for completion of the project will be established. In the meantime we will continue to use the temporary measures and handling procedures mentioned in previous letters.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan

JB/kj

6856

MEN04264

CONFIDENTIAL

memo / MENASHA CORPORATION

TO: Mike Carlson

DATE: 30 June 1992

SUBJECT: Broke Spills to the surge pond.

FROM: John Blauwkamp

JRB

Attached is a list of the tons of broke fiber that have been spilled to the surge pond on various days this year. Through June 28, 238.96 bone dry tons of broke have been spilled to the surge pond. 168.92 of these tons were spilled during May and June of this year. At the present time, the surge pond is full of stock and there is more than 40 tons of fiber in the aeration pond. All of this fiber has increased our sludge volume by about 1/3. Because of this additional volume, we can just barely haul enough sludge to keep up when the system is running normally. Because we are always hauling the maximum number of loads we don't have the flexibility required to increase the flow through the pond and reduce the biomass concentration in the system. We also, don't have any catchup capacity to make up for the short periods of time that the equipment is down for minor repairs.

In addition to the problems of dealing with all the fiber in the sludge hauling operation, and the continual broke spills to the surge pond, have made the surge pond essentially useless. Out of a total capacity of more than 250,000 gallons, we now have room for less than 100,000 gallons in the surge pond.

The total of the value of the stock that has been dumped, and the cost of dealing with this stock in the waste treatment system, is about $300.00 per ton. For this year it adds up to $71,400.00. We absolutely must find a way to stop the continual dumping of broke in the surge pond. Please let me know if there is any way I can help you with this.

JB/kj

John
I don't know the solution, but I agree with the seriousness of the situation. We obviously must resolve. I will get with Steve and back to you concerning a system needed equipment to install.
Thx
[illegible]

6701

MEN04265

MENASHA CORPORATION

8 July 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results indicate that on June 9, 1982, the soluble orthophosphorous discharge limit was exceeded at outfall 000. On this date, the soluble orthophosphorous concentration was 3.0 ppm. and 11.0 lbs. of orthophosphorous were discharged.

My June 9 letter described the phosphorous problem we were having in the waste treatment system and what we were doing to cope with it. The latest test results available at that time indicated that the phosphorous concentration in the waste treatment system was decreasing. The sample taken on the 9th indicated another significant drop in the phosphorous concentration and was the last sample that was greater than the 1 ppm. limit. The sample taken on the 13th indicated that we were once again under the 1 ppm. limit.

We have completed the phosphorous balance on all of the streams entering and leaving the waste treatment system. From this we were able to calculate the lbs. of phosphorous utilized per lb. of B.O.D. reduced at summer operating temperatures. We've found that the system utilizes about 1/4 of the phosphorous per lb. of B.O.D. that it needs in the winter. This information along with mass balances that will be conducted this coming fall, will enable us to feed the phosphorous at the appropriate rate as the temperatures in the aeration pond change. If you have any questions regarding this, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

cc: Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan

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6857

MEN04266

MENASHA CORPORATION

July 9, 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The June monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that on six days the soluble orthophosphorous discharge limit was exceeded at outfall 000. My letters of June 9 and July 8 reported and explained the circumstances surrounding the excessive phosphorours discharges that occurred through June 9th. On June 16, the soluble orthophosphorous concentration was under the 1 ppm. limit but an unusually high discharge volume caused us to exceed the 5.8 lb. per day discharge limit. On the 16th, 7.4 lbs. of soluble orthophosphorous were discharged. As mentioned in my July 8th letter, since June 13 we have been under the 1 ppm. discharge limit and since June 20 we have also been under the 5.8 lb. per day discharge limit.

During the time that the phosphorous concentration in the waste treatment system was decreasing, we conducted a mass balance on all the flows to and out of the waste treatment system. This told us how much phosphorous was utilized per lb. of B.O.D. reduced at summer operating conditions. By conducting this balance when there was an excess of phosphorous in the system, we found out how much phosphorous could be utilized by the bacteria. If we had conducted the balance when there was an insufficient amount of phosphorous present, we could only have found that the bacteria used all of the available phosphorous.

With the information we've obtained so far this year plus the information we will gather this coming fall, we are confident we will be able to supply a sufficient amount of phosphorous to the waste treatment system without exceeding the discharge limits.

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MEN04267

If you have any questions or comments concerning this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P. E.

John R. Blauwkamp, P.E.
Technical Manager

JRB/kj

cc: Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan

MEN04268

MENASHA CORPORATION

20 July 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results indicate that on July 16, 1982, the pH limit of 9.0 at outfall 000 was exceeded. On this date, the test indicated that the grab sample had a pH of 9.4. For the 15th and 17th, the test indicated that the grab samples had pH's of 8.2 and 8.7 respectively. Since our waste treatment system has a retention time of 12 to 16 days, it is very unlikely that the whole system could have changed pH that rapidly. At this time, we believe that this high pH was either an erroneous reading by the substitute waste treatment operator on duty or something raised the pH in the weir during the time that the grab sample was being taken. Both of these possibilities are being investigated. As soon as we have determined the cause, we will take whatever corrective actions are necessary to prevent recurrence of this problem.

If you have any questions concerning this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

JR/kj

cc: Scott C. Ross
Marge Spurit
R. L. Janda
Tom Ray
Tom Clemmons
Ron Thaxton
B. Buchanan

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MEN04269

MENASHA CORPORATION

9 August 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The July monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that on July 16, 1982, the pH limit at outfall 000 was exceeded. This incident was discussed in my July 20 letter to you. After checking the equipment and interviewing the waste treatment operator on duty at the time and the other personnel in the area, we've been unable to determine what caused this very short term high pH.

The effluent from our outfall 000 is mixed with our turbine condensor water before it is discharged to the river through outfall 003. Laboratory tests indicate that when the effluent from 000 with a pH of 9.4 is diluted by the turbine condensor water, the pH of the discharge to the river from outfall 003 is 8.95. Therefore the pH of the water that was actually discharged to the river through outfall 003 was under the 9.0 limit.

We will continue trying to determine what caused this short term problem. As soon as we do, we will take whatever actions that are necessary to correct the situation. If you have any questions concerning this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

cc: Scott C. Ross
Marge Spruit
R. L. Janda
T. Ray
B. Buchanan

OTSEGO PAPERBOARD MILL [illegible] OTSEGO MICHIGAN [illegible] • PHONE 616 692 61[illegible]

JB/kj

6862

MEN04270

MENASHA CORPORATION

22 September 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Test results received on September 17, 1982, indicate that on that day we had an oil and grease reading of 1 at outfall 004. The minuscule amount of oil required to cause a reading of 1 on this outfall, of course, caused no visible sheen on the receiving waters. On investigation of the cause of this indicent we found that a leaky seal on one of our steam turbine driven boiler feed pumps was allowing condensate to drip into the containment around the boiler feed pump. This condensate apparently washed some oil out of the oil dry in the containment to the U-drain. At the time of this incident, a very light sheen could be seen on the floor just outside the containment area. Therefore, we suspect that this was the original source of the oil that caused this problem. Normally, the oil absorbing pads and oil ropes on the pond would have absorbed this small amount of oil. We believe it was the unusually high flow rate through the pond and the light rain that allowed a minuscule amount of oil to escape the oil absorbing pads and the oil ropes and get into the outfall.

After discovering the source of this oil, we immeidately took measures to prevent the leaky seal from washing anymore oil from the containment area into the U-drain. We also replaced the oil dry in the containment area with new oil dry. By the next morning the flow rate through the pond had returned to normal, the rain had stopped, and the last traces of the oil inthe outfall had disappeared.

The engineering work on the U-drain modifications required to keep all of the oil and grease out of outfall 004 has been completed. The final review meeting on this project with the District III Water Quality Staff was originally scheduled for September 22. This meeting has been rescheduled for October 7. If you have any questions concerning this matter, please contact either Bruce Buchanan or the writer.

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MEN04271

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

JB/kj

cc: Marge Spruit
Scott C. Ross
R. L. Janda
T. Ray
B. Buchanan

6864

MEN04272

MENASHA CORPORATION

5 October 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

Our October 2, inspection of outfall 004 indicated that on this day we had an oil and grease reading of 1 at this outfall. The extremely small amount of oil required to give a reading of 1 at this outfall, naturally, caused no visible sheen on the receiving waters. Upon detection of this small amount of oil in the weir and a visible sheen in the pond ahead of the weir, an inspection was conducted in the power plant to determine the source of this oil. After a thorough inspection of the power plant, we could find no indication that any oil or grease had gotten into the U-drains. None of the operators or maintenance personnel on duty that day, had noticed any oil or grease on the floors or knew how any could have gotten into the U-drains. Only one thing occurred that day, that may have contributed to the problem. Due to a leak in the economizer of the No. 4 boiler, a portion of the boiler water was drained to outfall 004. This boiler blow-down water is drained to the flash tank where fresh water is added to cool the blow-down water. The flash tank overflows into the main pipe leading to outfall 004. When the flash tank was overflowing, the large volume of warm water may have washed a small amount of oil off the walls in the U-drain and thus, caused the sheen on outfall 004. The high flow rates to the pond, due to the boiler blow-down water and its cooling water, apparently caused a small amount of this oil to bypass the oil absorbing pads and the oil skimming ropes and get into the weir box. Within a few hours after the flow rate returned to normal, the oil absorbing pads had absorbed the last traces of the oil from the pond and the weir box.

The final review meeting with the District III Water Quality Staff on the proposed changes to this outfall is scheduled for October 7. After this meeting, we will have the final decision

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MEN04273

on what is to be done with this outfall and the time table for the changes should be available shortly after this. If you have any questions concerning this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Otsego Paperboard Division

John R. Blauwkamp

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
T. Ray
Bruce Buchanan

j

6866

MEN04274

MENASHA CORPORATION

8 October 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The September monthly operating report for the Otsego Paperboard Division of Menasha Corporation, indicates that on September 17, 1982, we had an oil and grease reading of 1 at outfall 004. The minuscule amount of oil required to give a reading of 1 on this outfall naturally caused no visible sheen on the receiving waters. The circumstances surrounding this incident were detailed in my September 22 letter to you.

On October 7, 1982, we had a meeting with the District III Water Quality Staff. At this meeting we explained the work being done to determine what changes must be made to the waste treatment system to obtain compliance with existing and future discharge limits. The pilot study will begin in mid October and we should have the final report by the end of January 1983. Once we have the results of the pilot study, the changes required to the waste treatment system can be determined and a definite time table established for completion of the required changes. We also discussed the efforts being made to maintain compliance this coming winter. At the meeting a re-evaluation was made as to the criteria for determining the presence of oil on the discharge from outfall 004. The outfall parameter for oil and grease will be changed to an outfall observation. No physical changes will be made to the outfall as previously considered. We will continue to use the oil and grease control procedures currently being used to minimize the occasional small blips that appear on the weir. If you wish to discuss any of the matters mentioned above, please contact either Bruce Buchanan or the writer.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 692 6141

MEN04275

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
T. Ray
B. Buchanan

j

MEN04276

File

memo / MENASHA CORPORATION

TO: DNR Meeting File - Water Quality

DATE: 11 October 1982

SUBJECT: October 7, 1982 meeting with District III Water Quality Staff

FROM: John Blauwkamp
JB

Present at the meeting representing the District III Water Quality Staff were Marge Spruit and Roger Przybysz. Representing Menasha Corporation were Professor Eckenfelder and Jeff Bauer of Aware Corporation and Bruce Buchanan, Gary Roys, Keith Kling and John Blauwkamp of Menasha Corporation.

The first main topic of discussion was the time table for the work being accomplished to determine what changes must be made to the waste treatment system to attain longterm compliance with the effluent limits. The time table presented to the DNR was as follows:

1. Pilot plant study will begin mid October and the final report should be available by the end of January.
2. The conceptual development of the changes required to the waste treatment system will be available by the end of April. The purchasing of the major parts of the equipment should be accomplished by the end of May.
3. The detailed engineering should be completed by the end of June.
4. Major equipment deliveries should be completed by the end of September.
5. The new system should be on line by the end of October 1983.

The second topic of discussion was the activities being done to attain compliance for this coming winter. The projects reviewed were the chlorination feeding stations, the new polymer feeding station, the new sludge disposal equipment and the pilot plant studies which should give us some additional operating guide lines. We expect these changes will significantly reduce the number of suspended solids violations but we do not expect them to enable us to stay under the discharge limit 100% of the time. The possibility of moving the aerators to one end of the aeration pond and converting the system to an activated sludge system for this coming winter was also presented. The idea is one that still needs a great deal of work to determine how close the aerators can be placed and what type of barrier will be required to affectively isolate the activated sludge portion of the aeration pond. In addition to this, the pilot studies will have to provide the necessary operating data and prove that the idea does have the possibility of working this coming winter. Provided all of these problems can be worked out without an unreasonable cost, Menasha will proceed to modify the waste treatment system and operate it as an activated sludge system this coming winter.

6703

DNR Meeting File - Water Quality

October 7, 1982 meeting with
District III Water Quality Staff

The proposed changes at outfall 004 were also discussed. The primary concern was that the extremely small amounts of oil, the proposed changes would prevent from entering the river were not worth the $36,000 it would take to make the changes. The oil and grease limit on outfall 004, is 0. There is no equipment available that can guarantee a oil and grease reading 0. Therefore, if the oil and grease reading of 0 is to remain on the outfall, the only way we can possibly meet it is to prevent the oil and grease from ever getting there in the first place. The only way to do this, is the proposed changes. The district III staff agreed that preventing the minuscule amounts of oil and grease that now are in outfall 004 would not be worth the extremely high price tag. They agreed it would be much better to use this money for the changes that would be required on the main aeration pond. It was agreed that Menasha would continue to manage the handling of oil and grease in this portion of the mill and the outfall to minimize the occasional blip of oil that appears in the weir box. The oil and grease limit of 0 on the outfall would be changed to and outfall reading of either 0 or 1. The criteria for reading this outfall were also redefined. The outfall will have a reading of 1 when there is a continuous film of oil going over the weir. With the oil control procedures currently in place in the power plant, and the oil absorbing pads and oil ropes on the pond, we believe we will be able to maintain a reading of 0 on this outfall as redefined.

c B. Buchanan
K. Kling
G. Roys

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MENASHA CORPORATION

4 November 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The October 1982, Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation indicates that on October 2, we had an oil and grease reading of 1 at outfall 004. The circumstances surrounding this incident were explained in detail in my October 5th letter. The minuscule amount of oil required to cause a reading of 1 at this outfall, of course, caused no visible sheen on the receiving waters. The results of our October 7th meeting with the District III Water Quality Staff concerning this outfall were discussed in my October 8 letter to you.

The pilot plant study to determine what changes must be made to the waste treatment system was started on schedule and is operating well. We expect to have the results of this study by the end of January. Once we have the results of the pilot plant study, the changes required to the waste treatment system can be determined and a definite time table established for completion of the required changes. From the pilot plant study, we also, will obtain additional information to help maintain compliance this coming winter. If you wish to discuss any of these matters, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
T. Ray
B. Buchanan

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6131

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MEN04279

THE AWARE CORPORATION MEMORANDUM

TO John Blaukemp

cc: W.W. Eckenfelder

FROM Jeffrey H. Bull

R.M. Stein

DATE 12/6/82 PROJECT Menasha Corp. JOB No. 6885

SUBJECT Winter Operation

Pursuant to our conversation of November 19, 1982 and based upon AWARE's investigation of the treatment plant operating problems Menasha has observed during past winters, AWARE has the following recommendations to help minimize operating problems and permit violations for the winter of 1982-83.

1. The depth of sludge blanket on the final clarifier should be kept below 5 ft. This will help to keep solids from billowing over the wier and subsequently filling up the final settling ponds. The lower blanket level will also allow the clarifier to better accomodate surges in clarifier hydraulic and influent solids loads. To maintain the lower blanket level throughout the day, it will be necessary to routinely draw sludge from the clarifier. It is recommended that the pumps used to pump the sludge to the new sludge holding basin be put on a timer and operated approximately 5 minutes every 15 minutes or as necessary to maintain the blanket level between 3 and 5 ft.

2. The use of a polymer appears to improve solids settling based upon jar tests conducted this year and last year. When the polymer was used last year on the full-scale plant it also appeared to reduce the effluent solids concentration. However, the plant had trouble maintaining a constant polymer feed. The polymer feed system was set up as a response to an emergency which resulted in operating problems associated with the severe cold weather. It is recommended that every provision possible be made to minimize similar occurrences including:

   a. Install the polymer feed system within a building. The building should be heated. If the building cannot be heated, the drums of polymer should be kept warm with heated drum bands and the polymer continually mixed to maintain a constant temperature and viscosity.

   b. All pipes both internal and external to the building should be heat traced.

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c. A spare parts inventory including polymer feed pump, heat tracing tape, heated drum bands, and mixer should be maintained in case of a system breakdown.

d. Plant personnel should check the system hourly to ensure its proper working condition.

3. When polymer is being added, the plant should conduct a daily jar test to determine the proper dose. This will help minimize polymer overdosing which results in operating problems and higher operating costs. Attached is a procedure developed for Menasha to conduct the jar tests. In addition, the plant should request that a representative from the manufacturers of the polymers conduct jar tests every other week to confirm proper use of the polymer.

4. The plant should maintain a good nutrient balance in the system. This can be done by maintaining effluent concentrations of ammonia as N and soluble ortho phosphorus as P of 0.5 to 1.0 mg/l.

5. The plant should attempt to maintain the basin operating temperature as high as possible. Two ways of increasing the temperature include maintaining a 1-2 ft foam layer on the basin and by alternately shuting down aerators; especially during the night. If the use of alternating aerators is employed, it is recommended that aerators 1 and 3 be shut down for a period of 2 to 4 hours followed by aerators 2 and 4. Aerator #5 should never by shutdown unless it is necessary for deicing. This will help maintain a constant flow of solids to the clarifier.

6. The plant should conduct sludge volume index (SVI) and zone settling velocity (ZSV) tests three times a week on samples of the clarifier influent with and without polymer. Both stirred and unstirred SVI tests should be conducted. The tests will aid in defining the problem and a solution to the problem. Attached is a procedure for conducting the tests.

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MENASHA CORPORATION

23 December 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

One of the things we are doing to try to keep the waste treatment system under control this winter is to maintain a residual of phosphorous and nitrogen in the effluent to insure that proper nutrients are available. As explained in my December 8th letter to Galen Kilmer, it is nearly impossible for us to consistently both maintain a detectable residual phosphorous and avoid going over the 1 ppm. limit. Because of the long retention time in our system, the endogenous respiration can have a significant effect on the amount of phosphorous required by the system. Because the endogenous respiration rate depends on temperature, the phosphorous requirement ranges from less than 50 lbs. per day in the summer to more than 150 lbs. per day in the winter. In addition to the changes in the phosphorous demand that are caused by changes in temperature, the fluctuations in the B.O.D. loading also changes the phosphorous demand. Our system is most sensitive to settling problems under winter operating conditions. It is at this time that the largest amount of phosphorous is required and that it is most important to maintain a sufficient phosphorous concentration to discourage filamentous growth. Our phosphorous discharge limit is only 5.8 lbs. per day. This means that a 4% change in the phosphorous feed rate would be the difference between feeding too little and exceeding the discharge limit. To be able to consistently predict the B.O.D. to the system and predict the lbs. of phosphorous required per lb. of B.O.D. based on a predicted operating temperature and control the actual phosphorous feed to the system, all with an accuracy of plus or minus 2% is impossible.

The pilot plant study we have been conducting on the waste treatment system was completed early this month. The preliminary results of this study confirmed that maintaining a sufficient phosphorous and nitrogen supply had a significant affect on the settleability of the sludge at winter operating temperatures even when significant amounts of filamentous were not present.

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Following this indication, we have been gradually increasing our phosphorous feed to the system. Our intention was to increase the feed until such time as we obtained a measureable residual in the effluent and thus determine the appropriate phosphorous feed at the current loading and operating temperature. For the reasons mentioned above, there is always a very substantial risk of exceeding the discharge limit, whenever we are close to meeting the phosphorous demand of the system. To minimize this risk, we have been monitoring the phosphorous concentration in the effluent from outfall 000 twice per week instead of once per week as required by the discharge permit. On December 17th, we received the test results for the sample taken on December 9th. This indicated that for the first time, we had a measureable soluble orthophosphorous residual. We immediately, called the laboratory and asked them to run the samples for the 13th and 16th as soon as possible, and call us with the test results as soon as they were available. Late on the 17th, the laboratory called with the results as requested. These results indicated that on December 13 and December 16, the soluble orthophosphorous concentration at outfall 000 exceeded the 1 ppm. limit. On these days, the soluble orthophosphorous concentration was 2.49 and a 4.27 ppm. respectively. On the 16th, 22.5 lbs. of soluble orthophosphorous was discharged which exceeds the 5.8 lbs. per day limit. Having received these test results, we immediately discontinued the phosphorous feed to the waste treament system. Based on the pilot plant test results, the phosphorous concentration should be under the 1 ppm. discharge limit in about five days. At this time, we will resume feeding phopshorous to the system at a reduced rate.

As explained previously, it is impossible to consistenly run the system with a soluble orthophosphorous concentration of from 0 to 1 ppm.. Because of this, we will be trying to run the system as close to meeting the phosphorous demand as possible without going over the discharge limit. We will be trying to run the system such that, most of the time, we would have to add 10% more phosphorous to obtain a residual in the effluent. The biggest problem with this strategy, is that, you can not measure how far you are from meeting the phosphorous demand. Consequently, we will be gradually increasing the phosphorous addition until we obtain a residual and then reduce the feed by about 10%. This procedure will have to be repeated each time there is significant changes in the B.O.D. load or operating temperature of the system. We will continue monitoring the phosphorous concentration in the effluent twice per week and will continue having the laboratory report the results to us as soon as possible. Although we can not predict precisely how much of a change in the phosphorous feed is required to compensate for a change in the operating temperature of the system, we will begin reducing the feed to the system whenever there is a significant increase in the operating temperature. We will also be proactively compensating for significant variations in the B.O.D, loading to the system. This

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method of control is far from ideal but it should allow us to maintain sufficient phosphorous in the system to maintain a healthly biomass population and still minimize the risks of exceeding the discharge limit. The effectiveness of this control strategy will continue to improve we gain additional knowledge on the lbs. phosphorous required per lb. of B.O.D. at various operating temperatures.

If you have any questions concerning this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan
Jeff Bull -Aware Corp.

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MEN04284

MENASHA CORPORATION

30 December 1982

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Bldg.
Lansing, MI 48926

Gentlemen;

Test results indicate that on December 22, the soluble orthophosphorous concentration at outfall 000 was still over the 1 ppm. limit. On this day, the soluble orthophosphorous concentration was 2.3 ppm. and 7.9 lbs. were discharged.

The test results for December 27th, indicated that the soluble orthophosphorous concentration at outfall 000 was once again under the 1 ppm. limit. On this day, the phosphorous was again below detection limit. Using this information, a phosphorous mass balance was conducted on the waste treatment system. Based on this information it appears that the soluble orthophosphorous concentration at outfall 000 should have gone under the 1 ppm. limit sometime on Friday, December 24th. The phosphorous balance also told us the pounds of phosphorous used per pound of B.O.D. reduced in the waste treatment system at the current operating conditions. This information was used to recalculate the proper phosphorous addition rate. The phosphorous feed was restarted at the new lower rate as soon as laboratory tests confirmed that the discharge was again under the 1 ppm. limit.

At this time, we plan to continue using the phosphorous control strategy I outlined to you in my December 23rd letter. Each time we can very gradually bring the phosphorous addition rate up to obtain a detectable phosphorous concentration in the effluent, we learn a lot more about the phosphorous requirements of the system. Our ability to predict the system operating temperature and B.O.D. loading will still be a serious problem but our ability to cope with these will improve with each new data point, thus reducing the chances of exceeding the phosphorours discharge limit in the future.

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If you have any questions or wish to discuss this matte. please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan
Jeff Bull - Aware Corp.

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MEN04286

MENASHA CORPORATION

10 January 1983

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

The December 1982 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation, indicates that on December 13, 16 and 22, the soluble orthophosphorous concentration at outfall 000 exceeded the 1 ppm. discharge limit. On the 16th and 22nd, the 5.8 lbs. of soluble orthophosphorous per day discharge limit was also exceeded. The circumstances surrounding this incident were explained in detail to you in my letters of December 23 and December 30, 1982. The test results for December 27, indicated that the soluble orthophosphorous concentration was once again below the 1 ppm. discharge limit.

We are currently using the phosphorous control strategy outlined to you in my December 23 letter. The soluble orthophosphorous concentration at outfall 000 is currently below the detection limit. Following the indicated control strategy, we will be increasing the ratio of lbs. of phosphorous per lb. of B.O.D. by about 10% every two weeks until we obtain a detectable residual in the effluent. At the first sign of a detectable residual in the effluent, we will again reduce the phosphorous feed by about 10% and hold this phosphorous to B.O.D. ratio until significant changes in temperature or other pond conditions occur.

As we gain additional data on the proper phosphorous to B.O.D. ratio as a function of temperature, our ability to control the system proactively rather than reactively will improve significantly. If you wish to discuss this matter, please contact either Bruce Buchanan or the writer.

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MEN04287

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan
Jeff Bull Aware Corp.

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MEN04288

MENASHA CORPORATION

14 January 1983

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The test results indicate that on January 10, 1983, the soluble orthphosphorous concentration at outfall 000 exceeded the 1 ppm. limit. On this day, the soluble orthophosphorous concentration was 1.84 ppm. and 11.54 lbs. were discharged.

Test results for January 6, indicated that the soluble orthophosphorous concentration was still below the detection limit. The temperature in the aeration pond was 42 degrees and we continued to feed 10% less phosphorous than should be required at this temperature. Over the next three days, the temperature increased to 52 degrees. We then reduced the phosphorous feed rate to compensate for the higher temperature. Inspite of this, the effluent concentration exceeded the 1 ppm. limit several days later. At this time, we believe this high phosphorous concentration is a direct result of the sudden increase in temperature in the pond. We are still investigating how this actually occurs, so we can better respond to the rapid increases in temperature.

Based on previous rates of decrease in the phosphorous concentration, we should be under the 1 ppm. limit sometime on the 14th. If you wish to discuss this matter, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan
Jeff Bull-Aware

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MEN04289

MENASHA CORPORATION

9 February 1983

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen;

The January 1983 monthly operating report for the Otsego Paperboard Division of Menasha Corporation, indicates that on January 10, 1983, the soluble orthophosphorous concentration at outfall 000 exceeded the 1 ppm. discharge limit. On this day, the soluble orthophosphorous concentration was 1.84 ppm. and 11.54 lbs. of soluble orthophosphorous were discharged. The details surrounding this incident were explained in my January 14 letter to you.

We are still using the phosphorous control strategy outlined in my previous letters to you. At the present time, the phosphorous concentration is below the detection limit and we are in the process of gradually increasing the phosphorous feed until we have obtained a detectable residual. At that time, we will lower the phosphorous feed such that we are about 10% less than what should be required at the operating temperature.

The overall condition in the waste treatment system is still very good for this time of year. The nutrient addition, the sludge management control changes, and the mild winter, are the primary reasons for this very large improvement over last years operation. We intend to discuss the effects of each of these on our present operation at our meeting with the District III Water Quality Staff which is scheduled for February 9 at 1:30 P.M. in Grand Rapids. At the meeting we will also be discussing the results of our treatability study, our plans for the future, and our new NPDES Permit. If you wish to

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discuss any of these matters, please contact either Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Marge Spruit
Scott C. Ross
R. L. Janda
Tom Ray
Bruce Buchanan
Jeff Bull - Aware Inc.

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memo / MENASHA CORPORATION

TO: DNR Meeting Minutes - Water Quality

DATE: 11 February 1983

SUBJECT: February 9, 1983 - Meeting with District III Water Quality Staff

FROM: John Blauwkamp

On February 9, at 1:30 P.M. in Grand Rapids, a meeting was held between the District III Water Quality Staff and Menasha Corporation. Representing the DNR were Marge Spruit, Fred Morley, Garth S. Aslakson, and Brian Page. Representing Menasha Corporation were Bruce Buchanan, John Blauwkamp, and Jeff Bull (Aware Corporation). The main topics of discussion were Menasha history regarding environmental compliance, the current operating conditions in the waste treatment system, the reasons the system is currently operating so much better than it ever has before, and Menasha's plans and possible courses of action in the future.

The history of Menasha's winter operating problems was briefly reviewed as a background for the current operating conditions of the waste treatment system. The waste treatment system is currently operating better in the winter than it has previously operated during the summer months. Current operations for December and January are better than our previous best winter. This is at an operating temperature comparable to the normal winter operating temperatures. The present performance demonstrates that we can operate very well down as low as 45 degrees. At this time we do not know how well the system will operate when the temperature drops below 45. The reasons we are running so much better are:

1. Proper nutrient addition to the waste treatment system maintains a biomass that will settle well in the clarifier. This is probably the most important change over previous years. The high phosphorous feed required to do this however, keeps us very close to violating our phosphorous dicharge limit.
2. The new sludge day tank in the tankfarm system allows us to maintain a low level in the clarifier on a consistent basis which minimizes carryover to the settling ponds.
3. The polymer feed system allows a continuous reliable addition of polymer which also helps minimize carryover from the clarifier to the settling ponds.
4. The additional sludge disposal equipment and personnel allow disposal of the sludge removed in the clarifier on a more uniform basis thus avoiding upsetting the clarifier or the waste treatment system

By minimizing the carryover from the clarifier to the settling ponds, we avoid filling the settling ponds on a frequent basis. This in turn helps us avoid having to pump the water

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back to the waste treatment system which would increase the volume through the clarifier and in turn increase the carryover to the settling ponds. Once this cycle gets started, it just gets worse until you reach the point where you can't change ponds fast enough and the solids end up carrying out into the river anyway.

We feel that the nutrients are the most important thing in keeping the biomass healthy so that we will settle and compact properly in the clarifier. The other changes we have made to the sludge management system allow us to keep the system operating smoothly and thus prevent the cycle of filling and emptying of settling ponds from getting started.

The primary goals for the treatability study that was conducted last winter where to optimize winter operation for the short and long term and define the operating limits for various possible waste treatment systems. The purpose of the four bench scale units operated and the methods of operating the units were briefly reviewed.

The most important short term result of the treatability study was a definition of the nutrient requirements of the system. The system requires .05 lbs. of nitrogen/lb. of B.O.D. and .003 lbs. of phosphorous/lb. of B.O.D. The temperature modeling and treatability study also defined three alternative solutions to the winter operating problems we have experienced in the past. These solutions are based primarily on the minimum operating temperature required by the waste treatment system. If the minimium operating temperature is 20 to 35 degrees C. we would need an activated sludge system with submerged aeration. If the minimum operating temperature was 10 degrees C. an aerated lagoon with submerged aeration would be sufficient. If the system will operate well at less than 10 degrees C. the existing aerated lagoon with surface aerators would be sufficient.

Both the treatability study and the operation of the full scale unit have shown the system will operate satisfactorily at a temperature of 10 degrees C. Since the operation of both the full scale unit and the pilot plant units are much better than we had anticipated at 10 degrees C., we are currently running an additional two pilot plant units to determine the minimum operating temperature of the existing waste treatment system. The two units still operating will also help us refine the nutrient requirements and enable us to determine which polymers will be most effective at these new operating conditions. The final selection of the design of the waste treatment system will be based on the results of how the pilot plant units operate in the 0 to 5 degrees C. range, the performance of the waste treatment system if the temperature gets down to this range this winter, and how effective we are in treating the pin-point floc, which develops at this temperature, with polymers.

MEN04293

One of the most important things we learned from the treatability study was that the nutrients are a key factor in maintaining a sludge that will settle well in the clarifier. At the present time, it is impossible for us to maintain a residual phosphorous in the effluent and avoid violating our phosphorous discharge limit. The main factors responsible for this problem are:

1. Because of the low volume and high concentration in our waste treatment system and a 1 mg/l discharge limit, Menasha can discharge only .1 lbs. of phosphorous per lb. of phosphorous required by the biomass.
   A normal system operating at much lower influent concentrations, would be typically able to discharge .7 lbs. of phosphourous per lb. of phosphorous required by the biomass. This means that if the B.O.D. load on the system and the temperature of the system are both constant, we would still have to do seven times as good as a job in controlling our phosphorous addition rate as normal waste treatment systems to be able to supply enough phosporous for the biomass and avoid exceeding our discharge permit limits. This extremely small control range by itself makes proper control of the phosphorous nearly impossible.
2. The endogenous respiration taking place in the waste treatment system because of the long retension time, causes release of the phosphorous. The endogenous respiration rate is much more sensitive to the temperature in the pond than the respiration rate is. Therefore when we have rapid increases in temperature in the pond, there is a rapid release of phosphorous which causes a spike in the effluent phosphorous concentration. This sensitivity to temperature coupled with the extremely narrow control range make it impossible to avoid exceeding our effluent phosphorous discharge limit when there is a rapid increase in temperature in the aeration pond.
3. The plug flow characteristic we believe is present in our waste treatment system agrivates the problems associated with both a very tight control range and the endogenous repiration rates dependence on temperature. The plug flow characteristic causes us problems both in the summer and when there are rapid increases in temperature. During the summer, the endogenous respiration rate is very high. Therefore, a large amount of phosphorous which is required at the inlet of the pond is released near the discharge end of the pond. Because of this, the only way to avoid exceeding the discharge limit, is to operate with a severe phosphorous deficiency at the inlet of the pond. This is one of the primary factors that caused the severe filamentous growth we saw last summer. When there are sudden increases in the ponds temperature, the plug flow characteristic makes the spikes in the effluent phosphorous concentration much larger than it would be if the pond were completely mixed. If the pond were completely mixed some of the phosphorous released through endogenous repiration, could be reused by the bacteria that was still growing. Due to the plug flow characteristic, all of the

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phosphorous that is released is present in the effluent.

At the present time, we are investigating the possibility of converting the pond to a completely mixed system. A litnium tracer study will be done on the system in the near future to determine just how much of a plug flow characteristic there is in the system. Once the plug flow characteristic has been confirmed, we will proceed with the design and implementation of a means to convert the system to a more completely mixed system.

Conversion of the waste treatment system to a completely mixed system would reduce the magnitude of the spikes in the effluent phosphorous concentration but would not eliminate them. We believe it would still be impossible to maintain a residual phosphorous in the effluent and avoid exceeding the 1 ppm. discharge limit. Everytime there was a rapid increase in temperature, the effluent phosphorous concentration would still exceed the 1 ppm. limit. Because the phosphorous is essential to maintaining good operation of the waste treatment system, and it is impossible to do this and consistently stay under the 1 ppm. discharge limit, we would like to change our phosphorous discharge limit to a daily maximum and monthly average system. Until we at least complete the lithium tracer study on the existing pond, we will not be able to determine what daily maximum and monthly average discharge limits we would be able to live with and still insure a sufficient phosphorous supply for proper operation of the waste treatment system. Although it would be very unusual, Brian said he would investigate the possibility of writing our new NPDES permit with this type of a phosphorous limit.

The other changes requested in our proposed NPDES permit were also briefly discussed. The letters that have been sent to the DNR requesting changes in the purposed permit are being considered as updates to the permit application. The requested volume changes at outfall 001 and the volume of sludge to be disposed of will be included in the revision of the purposed permit. Menasha will continue to work with its biocide suppliers and the toxic materials section to resolve the difficulties involved with the water treatment chemicals.

It was agreed that since the new residuals management plan will not require a basesite, that it would be best for Menasha to not renew its lease on the current basesite, just to obtain technical compliance with the existing sludge disposal permit. Brian said he saw no problem with this, but he would have to check with the compliance section before this course of action could be formally approved.

At the end of the meeting everyone felt that the meeting had been very worthwhile and that both now have a much better understanding of the others position. It was also felt that the spirit of cooperation had been maintained and that we could work together to solve the problems at hand, in a way that would be satisfactory to both Menasha and the DNR.

MEN04295

MENASHA CORPORATION

24 February 1983

Robert J. Courchaine
Executive Secretary, DNR
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

Test results received on February 20, 1983, indicate that on February 18, 1983, the combined suspended solids discharge from outfalls 000 and 002, exceeded the 4800 lb. per day limit. On this day 5352 lbs. of suspended solids were discharged.

Due to the cold weather we had in January, we have been experiencing a dispersed floc condition in the aeration pond. With the use of polymers, we have been able to satisfactorily control this condition. The suspended solids discharge from outfall 000 has been running at a high but acceptable level. To help keep track of short term changes in the waste treatment system, we run suspended solids tests on three grab samples per day from outfall 000. These grab samples indicate that on the 18th there was a large short term increase in the suspended solids concentration at outfall 000. The grab sample taken 1:30 A.M. was normal, the sample taken at 8 A.M. was up 300 mg/l. and the sample taken at 6 P.M. was down to normal. As a result of this, the composite sample for the 18th had a suspended solids concentration about 200 mg/l. above normal. However, the composite sample for the 19th was below normal. The samples since the 19th have shown a very rapid decrease in the suspended solids concentration at outfall 000. Apparently, the dispersed floc condition is rapidly disappearing and we are returning to a more normal operation.

During the time period that the high concentration of suspended solids was being discharged, it was observed that the ice layer that had covered most of the pond had disappeared. This ice layer had formed on the pond when it was not being used and contained a large amount of sludge and fiber in it. When we began using this settling pond the ice naturally floated to the surface. We believe it was the release of the fiber and sludge from this ice layer that caused the high suspended solids concentration on the 18th.

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MEN04296

Conditions in the aeration pond are currently looking very good. We are currently having a mild bulking condition in the waste treatment system similar to that which was present most of last summer and last fall. The condition is currently responding quite well to polymer treatment as it did last year. If you have any questions concerning this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson
Scott C. Ross

j

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MEN04297

MENASHA CORPORATION

9 March 1983

~~Robert J. Courchaine~~
Executive Secretary
Water Resources Commission
Stevens T. Mason Building
Lansing, MI 48926

Gentlemen:

The February 1983 Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation indicates that on February 18, 1983, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lb. per day limit. On this day, 5352 lbs. of suspended solids were discharged. The circumstances surrounding this incident were explained in detail in my February 24 letter to you. Since this incident, the conditions in the aeration pond have been steadily improving. We currently have excellent B.O.D. reduction in the aeration pond and a very low suspended solids concentration in the effluent.

We are currently conducting a Lithium tracer study on the aeration pond to more precisely define the plug flow characteristics that currently exist in the aeration pond. The test will last for 28 days. We should have the results of the test available in about eight weeks. Once we have the test results, we will be able to determine what physical and/or NPDES permit changes will be required to allow us to feed sufficient phosphorous to the system without exceeding our phosphorous discharge limit. If you have any questions concerning any of these matters, please contact the writer.

Sincerely,
Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Garth Aslakson
Scott C. Ross
R. L. Janda
T. Ray
B. Buchanan

j

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

6883

MEN04298

memo / MENASHA CORPORATION

TO: Steve Rosenthal

DATE: 13 April 1983

SUBJECT: Oil on 004 Weir

FROM: Keith Kling KBK

After the mill was started back up on 4/8/83, there was a substantial amount of oil on 004 pond. I attributed this to washup of the floors and any minor spillage that may occur during general maintenance downs. On 4/9/83, the oil problems appeared worse. During the course of the day, I checked the pond several times. At 4:20 P.M., I found a large discharge of water and lime with a heavy coating of oil on top discharging from the pipe at the pond surface. Also, about 4:22 P.M., the pipe under the pond surface began discharging water. This water appeared clear, but contained an occasional oil spot. I discussed this with Brian King, the operator. He said, the only flow going out which was unusual or intermittent was the blow-down from the boiler. He said this had been started about 4:15 P.M. Both discharges lasted approximately 5 minutes. Possibly this new information will help us to track down the excess oil on this pond.

c A. Coleman
T. Collins
J. Blauwkamp

j

6746

MEN04299

MENASHA CORPORATION

15 June 1983

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results received on June 12, 1983, indicate that on June 10, 1983, the combined suspended solids discharge from outfalls 002 and 003 exceeded the 3200 lb. per day limit. The composite samples indicate that on June 10th 5,883 lbs. of suspended solids were discharged.

The composite sample for the main process outfall had a suspended solids concentration of 1420 ppm. However, the velleity of this sample is somewhat suspect. The suspended solids concentrations of grab samples taken at the beginning, middle and end of the period of time that the sample was being composited, did not indicate a high suspended solids concentration. Grab samples were taken at 9 A.M. on the 10th, 2 A.M. on the 11th, and 9 A.M. on the 11th. They had suspended solids concentrations of 460 ppm, 320 ppm. and 540 ppm. respectively. None of the grab samples showed any indication of a major upset in the aeration pond or the settling pond.

If the composite sample is representative of what was actually in the weir, an upset would have had to occur in the settling pond, the suspended solids concentration in the weir would have had to go up to about 3800 ppm. for at least 7 hours and then conditions return to normal before the next grab sample was taken. Since the settling pond has an effective retention time of about 6 hours, it is unlikely that this could have occurred during the 11 hour period between when the waste treatment supervisor left for the day and the 2 A.M. grab sample was taken. We believe the very high suspended solids concentration in the composite sample was most likely the result of a high concentration of floating solids getting caught in the sampler. This would raise the concentration in the composite sample much more than the actual concentration in the effluent. The fact that the composite sample was significantly higher than the grab samples is an indication that some sort of short term upset did occur. The actual total pounds of suspend solids that was discharged was somewhere between the 1006 lbs. indicated by the grab samples and that indicated by the composite sample. The 3200 lb. per day limit may not have been exceeded.

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MEN04300

When the waste treatment operator started running the suspended solids test on the composite sample, he immediately noticed the high suspended solids concentration. He then changed settling ponds just to be sure everything was alright. Since this incident, everything indicates that the waste treatment system is currently operating very well. If you have any questions concerning this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
G. Aslakson

6888

VRB

MEN04301

MENASHA CORPORATION

July 7, 1983

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The composite sample test results for June 29, which were received on July 1, indicate that we may have exceeded our suspended solids discharge limits for outfalls 000 and 002. On this day, the composite sample indicates that a total of 3,240# of suspended solids were discharged.

None of the grab samples which were taken at the beginning, middle, and end of the compositing period, indicated a high suspended solids concentration. In addition to this, there were no other indications of an upset in either the aeration pond, the clarifier, or the settling ponds which would have caused a short-term high suspended solids concentration in the weir.

We believe the high suspended solids concentration in the composite sample was caused either by slime in the sampling device breaking loose and contaminating the sample, or by slime growing in the sample while it was being composited.

This summer we have noticed a much larger accumulation of slime on everything in the aeration pond than we have seen before. This may be related to the higher nutrient addition rate than in previous years. Before beginning the 29th's composite sample, the Waste Treatment Supervisor removed an accumulation of slime from the sampling scoop. He then rinsed the sample scoop to remove any loose pieces of slime and began compositing the 29th's sample. We believe either a piece of slime broke loose from the sampling device and contaminated the sample, or a significant amount of slime grew in the sample container while the sample was being composited, or possibly both.

We are in the process of changing to a sampling device that will be easier to clean and we will be installing a refrigeration unit to keep the sample cold while it is being composited. These changes will be completed by the end

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MEN04302

of July and will eliminate both sources of sample contamination.

If you have any questions concerning this matter, please contact the writer.

Sincerely,

MENASHA CORPORATION

John R. Blauwkamp, P.E.
Technical Manager

JRB/k

cc: Bruce Buchanan
Robert Janda
Tom Ray
G. Aslakson

JRB

MEN04303

MENASHA CORPORATION

July 8, 1983

rface Water Compliance Section
. Box 30028
sing, MI 48909

tlemen:

June Monthly Operating Report for the Otsego Paperboard ision of Menasha Corporation indicates that we may have eeded our suspended solids discharge limits on June 10th.

this day, the composite sample indicated that 5,883# of pended solids were discharged from outfalls 000 and 002. e of the grab samples taken at the beginning, end, and dle of the time period that the sample was being composited icated a high suspended solids concentration. No other cations of an upset were observed in the aeration pond, clarifier, or the settling ponds. Our conclusion at that was that the composite sample was most likely not esentative of what was actually discharged from the weir.

tional details of this incident were covered in my 15th letter to you.

une 29th, we had a nearly identical recurrence of the 10th incident. The composite sample showed a high sus- ed solids concentration and neither the grab samples nor other conditions in the pond showed any signs of a suspended solids concentration, or a process upset. We concluded that the composite sample was most likely not sentative of the water that was actually discharged.

scribed in my July 7th letter to you, we now believe both of these incidents were most likely caused by the site sample being contaminated with slime that broke from the inaccessible portions of the sampling device. may also be substantial amounts of growth taking place a sample is being composited. To eliminate both of possible sources of contamination, we are changing to pling device which can be easily cleaned and we will stalling a refrigeration unit for the composite sample.

n on having these changes completed by the end of July.

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JRB

MEN04303

MENASHA CORPORATION

July 8, 1983

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The June Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation indicates that we may have exceeded our suspended solids discharge limits on June 10th.

On this day, the composite sample indicated that 5,883# of suspended solids were discharged from outfalls 000 and 002. None of the grab samples taken at the beginning, end, and middle of the time period that the sample was being composited indicated a high suspended solids concentration. No other indications of an upset were observed in the aeration pond, the clarifier, or the settling ponds. Our conclusion at that time was that the composite sample was most likely not representative of what was actually discharged from the weir.

Additional details of this incident were covered in my June 15th letter to you.

On June 29th, we had a nearly identical recurrence of the June 10th incident. The composite sample showed a high suspended solids concentration and neither the grab samples nor the other conditions in the pond showed any signs of a high suspended solids concentration, or a process upset. We again concluded that the composite sample was most likely not representative of the water that was actually discharged.

As described in my July 7th letter to you, we now believe that both of these incidents were most likely caused by the composite sample being contaminated with slime that broke loose from the inaccessible portions of the sampling device. There may also be substantial amounts of growth taking place while a sample is being composited. To eliminate both of these possible sources of contamination, we are changing to a sampling device which can be easily cleaned and we will be installing a refrigeration unit for the composite sample.

We plan on having these changes completed by the end of July.

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6891

MEN04304

If you have any questions concerning this matter, please contact the writer.

Sincerely,

MENASHA CORPORATION
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

JRB/k

cc: Garth Aslakson
R. L. Janda
T. Ray
B. Buchanan

MEN04305

MENASHA CORPORATION

July 29, 1983

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The July Monthly Operating Report for the Otsego Paperboard Division of Menasha Corporation indicates that we may have exceeded our suspended solids discharge limit at outfall 000 and 002 on June 29th. The composite sample for the 29th, indicated that 3240 lbs. of suspended solids were discharged from outfalls 000 and 002. None of the grab samples taken at the beginning, middle and end of the compositing period indicated a high suspended solids concentration in the weir. As explained in my July 7th letter, we believe this high suspended solids reading in the composite sample was due to an accumulation of slime in the sampling device. My July 7th letter indicated that we were changing to a different sampling device and installing a refrigeration unit to prevent the recurrence of this incident. These changes were completed on July 22. We believe this will prevent recurrence of this problem.

If you have any questions concerning this incident, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Garth Aslakson
R. L. Janda
T. Ray
B. Buchanan

j

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6893

MEN04306

MENASHA CORPORATION

20 December 1983

Chief of the Surface Water Quality Div.
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The test results which became available on December 15, indicate that on December 13, the combined total suspended solids discharged from outfalls 000 and 002 exceeded the daily maximum limit. On this date, the total suspended solids discharge was 7,594 lbs.

In late in November we had a mild filamentous bulking problem occur. At that time, our consultant, Dr. Richard, identified the filamentous bacteria as type 021N. This filamentous bacteria is normally associated with either a nitrogen or phosphoros deficiency. This particular filamentous bacteria grows extremely rapidly once it gains an advantage. Dr. Richard believed it could take over a pond such as ours in about a week. Fortunately, this filamentous bacteria disappears nearly as rapidly as it grows once its advantage has been eliminated. In late November we got the system back under control by going to a higher ammonia residual. In early December, we began gradually reducing the ammonia feed rate to get the residual down to the 2 ppm range.

On Friday, December 9, microscopic examination indicated there were very few filamentous bacteria in the pond. Sometime between Friday and Monday, the ammonia residual decreased to the point that the filamentous bacteria started growing very rapidly. Mondays' ammonia sample indicated a residual of .08 ppm. which is still above detection limit. Although we maintained a residual ammonia in the pond, it was not high enough to prevent the very rapid filamentous growth.

The composite and grab samples taken prior to the morning of December 14 indicated normal conditions in the pond. Sometime between midnight and 7 A.M. the bulking condition got so severe that it caused large amounts of suspended solids to carry-over into the weir. The grab sample taken at 7 A.M. had a suspended solids concentration of over 2000 ppm whereas the grab sample taken about 7 hours before that only had a suspended solids concentration of 500 ppm. When the operator inspected

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6898

MEN04306

MENASHA CORPORATION

20 December 1983

Chief of the Surface Water Quality Div.
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The test results which became available on December 15, indicate that on December 13, the combined total suspended solids discharged from outfalls 000 and 002 exceeded the daily maximum limit. On this date, the total suspended solids discharge was 7,594 lbs.

In late in November we had a mild filamentous bulking problem occur. At that time, our consultant, Dr. Richard, identified the filamentous bacteria as type 021N. This filamentous bacteria is normally associated with either a nitrogen or phosphoros deficiency. This particular filamentous bacteria grows extremely rapidly once it gains an advantage. Dr. Richard believed it could take over a pond such as ours in about a week. Fortunately, this filamentous bacteria disappears nearly as rapidly as it grows once its advantage has been eliminated. In late November we got the system back under control by going to a higher ammonia residual. In early December, we began gradually reducing the ammonia feed rate to get the residual down to the 2 ppm range.

On Friday, December 9, microscopic examination indicated there were very few filamentous bacteria in the pond. Sometime between Friday and Monday, the ammonia residual decreased to the point that the filamentous bacteria started growing very rapidly. Mondays' ammonia sample indicated a residual of .08 ppm. which is still above detection limit. Although we maintained a residual ammonia in the pond, it was not high enough to prevent the very rapid filamentous growth.

The composite and grab samples taken prior to the morning of December 14 indicated normal conditions in the pond. Sometime between midnight and 7 A.M. the bulking condition got so severe that it caused large amounts of suspended solids to carry-over into the weir. The grab sample taken at 7 A.M. had a suspended solids concentration of over 2000 ppm whereas the grab sample taken about 7 hours before that only had a suspended solids concentration of 500 ppm. When the operator inspected

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MEN04308

MENASHA CORPORATION

10 January 1984

Surface Water Quality Div.
P.O. Box 30023
Lansing, MI 48909

Gentlemen:

The December Monthly Operating Report for Otsego Paperboard Division of Menasha Corporation indicates that on December 13, the combined suspended solids discharge from outfalls 000 and 003 exceeded the daily maximum limit. On this day, 7,594 lbs. of suspended solids were discharged. The details of this incident were explained in my December 20th letter to you.

Since December 20, the higher ammonia residual has caused the filamentous bacteria concentration to continue declining. The waste treatment system is currently in good shape and is responding to the cold weather even better than indicated by the pilot studies we completed last year.

If you have any questions concerning this matter, please contact the writer.

Sincerely,

Menahsa Corporation
Otsego Paperboard Division

John R Blauwkamp · P.E.

John R. Blauwkamp, P.E.
Technical Manager

c Garth Aslakson
R. L. Janda
T. Ray
B. Buchanan

j

6900

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MEN04309

MENASHA CORPORATION

February 17, 1984

Surface Water Quality Division
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results which became available on February 13 indicate that on February 11, 1984, the total suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum limit. On this day 11,742 lbs. of suspended solids were discharged from outfall 000.

The cause of this high suspended solids discharge was an unexplained increase in the flow to the clarifier which washed the solids out of the clarifier and through the post clarifier settling ponds into the weir. The flow recorder on the weir indicates that the flow was constant at about 600,000 gpd until 2 P.M. Saturday afternoon. Then, suddenly the flow increased from 600,000 to 900,000 gpd. The high flow rate caused a large amount of solids to carryover from the clarifier to the post clarifier settling ponds. This apparently continued from 2 P.M. until the evening weir sample was taken at about midnight. This high rate of carryover from the clarifier filled the settling pond and caused a significant amount of solids to be carried over into the weir.

As soon as the condition was detected, the waste treatment supervisor was notified. As soon as the flow was reduced to normal and we switched to a empty settling pond, the suspended solids concentration in the weir returned to normal.

At this time, we believe the most probable cause of this incident was that a buildup of debris behind the valve used to control the flow to the clarifier broke loose, thus allowing a significant increase in the flow to the clarifier. Plans are currently being made to install a smaller diameter valve which will both give us more accurate control of the flow rate to the clarifier and be less susceptible to plugging.

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6902

MEN04310

The new throttling valve will be located in a different position and will be locked. We expect to have the new throttling valve installed by the end of April. If you have any questions concerning this incident, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson

j

6903

MEN04310

The new throttling valve will be located in a different position and will be locked. We expect to have the new throttling valve installed by the end of April. If you have any questions concerning this incident, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson

j

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MEN04311

MENASHA CORPORATION

March 9, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The February monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that on February 11, 1984, the total suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum limit. On this day, a total of 11,742 lbs. of suspended solids were discharged. As explained in my February 17th letter to you, this high suspended solids discharge was caused by an unintentional high flow rate of water to the clarifier. We believe this high flow rate of water was due to an accumulation of debruis behind the throttling valve breaking loose. This allowed the influent to the clarifier to increase about 50%. To prevent this from recurring, we will be installing a new throttling valve which will give us more precise control of the flow rate to the clarifier and be less susceptible to plugging. We plan on having the new valve installed by the end of April.

At the present time, we are experiencing a bulking problem due to a filamentous bacteria in the aeration pond. At present we are able to control the suspended solids discharge through the use of polymers.

We believe the growth of filamentous is due to a phosphorus shortage in the system. Therefore, we have increased our phosphorus feed to the system and will continue to feed excess phosphorus until we obtain a measurable residual in the effluent. To minimize the possibility of exceeding our 1 mg/l phosphorus discharge limit, we will continue monitoring the effluent for residual orthophosphorus until we have the situation back to normal. Indications are that this particular filamentous bacteria will disappear very rapidly as soon as we establish a residual phosphorus in the system. We will

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6904

MEN04310

The new throttling valve will be located in a different position and will be locked. We expect to have the new throttling valve installed by the end of April. If you have any questions concerning this incident, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson

J

keep you informed of significant changes in the situation If you wish to discuss this matter, please contact Bruce Buchanan or the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.
Technical Manager

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

j

6905

MEN04313

MENASHA CORPORATION

28 March 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The test results which became available on March 23 and 24, indicate that the combined suspended solids discharge from outfalls 002 and 003 exceeded the 4800 lb/day limit on March 21 and 22. On these days, 6195 and 5179 lbs. of suspended solids were discharged respectively.

The high suspended solids discharges were the result of a filamentous bacteria and bulking problem. As mentioned in my March 9th letter, we believe the filamentous growth is a result of a phosphorus deficiency in the system. We have been gradually increasing our phosphorus feed to the system and monitoring the effluent on a daily basis in order to obtain a phosphorus residual without exceeding our phosphorus discharge limit. Todate we have not been able to obtain a detectable soluble orthophosphorus residual in the effluent inspite of the fact that we are currently feeding about three times the amount of phosphorus as should be required by the BOD loading. It appears that each time we increase the phosphorus feed to the system, the concentration of filamentous bacteria increases and uses up the additional phorphorus without leaving a detectable residual. Our current plans are to continue to increase the phosphorus feed until we do obtain a residual. When the filamentous bacteria find they have enough phosphorus, it is unlike we will be able to prevent the soluble orthophosphorus concentration from spiking above the 1 ppm limit.

On March 19, we noticed a substantial change in the settling characteristics of the sludge and an increase in the carryover to the settling ponds. At that point, we retested the polymers we currently have on site to see if a change in dosage would be beneficial. When that failed, we had our polymer suppliers come in to see if they could find something that would work at the new condition. The settling characteristics of the sludge continued to deteriorate on the 20th and on the 21st, and the sludge would not settle either in the clarifier or the post clarifier settling ponds. As a result of this, the suspended solids discharged on the 21st and 22nd exceeded the daily maximum discharge limit. On the 21st, one of our polymer suppliers found a product that looked like it would both reduce the suspended solids concentration in the effluent

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MEN04314

and improve the compacting characteristics of the sludge. This polymer was put on emergency order and shipped by special delivery to the mill. The polymer was put on line on the morning of the 23rd. As a result of this, the suspended solids discharged on the 23rd was back down to the 4800 lb/day limit. On the 24th, 25th, the total suspended solids discharged was well under the ~~2400~~ 2100 lb/day limit. If the polymer continues to work, we will be able to keep the suspended solids discharge under control until the higher phosphorus feed rates can eliminate the filamentous bacteria and the system returns to normal operation.

We will keep you informed of significant changes in the situation. If you wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp,P.E.
Technical Manager

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

j

MEN04315

MENASHA CORPORATION

April 6, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results that became available on April 2nd, indicate that on April 1, the soluble orthophosphorus discharge from outfall 000 exceeded the 1 ppm limit. On this day, 7.1 lbs. of phosphorus were discharged.

As indicated in my letter of March 28, we have been increasing the phosphorus feed rate in order to obtain a detectable phosphorus residual in the effluent. In order to manage the phosphorus addition as well as possible, we have been taking grab samples in the morning and having someone drive them to the lab in Grand Rapids so that we can obtain the results the same day. The grab sample taken on the morning of Friday, March 30, indicated that we did not have a detectable residual. The composite sample for Sunday, April 1st, was the first indication that we had finally obtained a detectable residual in the effluent. These results became available late in the afternoon of the 2nd. We immediately reduced the phosphorus feed rate to about 3/4 of what it had been the previous 10 days in order to minimize the spite in the effluent phosphorus concentration. We obtained a grab sample from the weir at the time we reduced the phosphorus feed rate and have obtained grab samples at about 8 A.M. each morning. These have all been driven to the lab the same day and we have received the test results in the afternoon of the day the samples were taken. Based on the rate of change in these grab samples and the BOD loadings, we have made adjustments in the phosphorus feed rate. The grab sample for April 5th, indicated that the phosphorus concentration was under the 1 ppm limit.

Our consultant, Dr. Richard, has identified the filamentous bacteria responsible for the bulking problem as type 021N. This particular filamentous organism has the capability of growing over a wide range of phosphorus concentration in its cell structure. Dr. Richard estimates that the organism can contain from as little as .5% phosphorus up to 2% phosphorus. This explains the extremely large amount of phosphorus that was required for us to obtain a detectable residual in the effluent. As we continued to increase the phosphorus feed rate, the filamentous bacteria both increased

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MEN04316

in numbers and increased their phosphorus content.

This means that we must maintain a measureable phosphorus residual in the effluent at all times. When there are sufficient nutrients in the system, the population of the 021N bacteria is limited by the available food supply. If during a sudden increase in the BOD loading, the system also becomes limited in either phosphorus or nitrogen, the 021N bacteria will gain an advantage and multiply extremely rapidly. As the population of the 021N bacteria increases, they will absorb the limited nutrient thus making it unavailable for the floc forming bacteria. This intern means the floc forming bacteria can not metabolize the available food supply which leaves more food available for the 021N bacteria. The cycle feeds on itself until in as little as 3 to 4 days the filamentous bacteria can completely take over the aeration pond.

To get out of this viscious cycle, you must add much more of the limiting nutrient than would be required for the normal BOD loading. The 021N bacteria will have increased in numbers to match the available food supply and will have a very low concentration of the limiting nutrient in them. Enough of the limiting nutrient must be added to satisfy this demand by the filamentous bacteria and still have some left over for the floc forming bacteria. This is exactly what we have just seen take place in our system.

The only way to stay out of this viscious cycle, is to insure that there is sufficient phosphorus in the system at all times so that the cycle never gets started. Until our new NPDES permit is issued, we will continue using our current phosphorus control procedure except we will be trying to control to a .5 ppm residual rather than a just barely detectable residual. This will probably result in our occasionally exceeding the 1 ppm limit. If you have any questions or comments concerning these matters, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T Ray
Garth Aslakson

j

MEN04317

MENASHA CORPORATION

10 April 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen;

The March monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that on March 21 and 22, the combined suspended solids discharge from outfalls 002 and 003 exceeded the 4800 lb/day limit. On these days 6195 and 5179 lbs of suspended solids were discharged respectively. These high suspended solids discharges were the results of the filamentous bulking problem we are currently experiencing in our waste treatment system. The details of this incident were explained in my March 28 letter to you.

We believe the cause of this filamentous bacteria bulking problem was a phosphorus shortage in the waste treatment system. As explained in my April 6th letter, we have finally obtained a residual of phosphorus in the effluent. We are currently seeing a very gradual reduction in the concentration of filamentous bacteria. In order to minimize the amount of phosphorus discharged from the system, we will continue to have grab samples from the aeration pond tested daily and control the effluent phosphorus concentration as close to .5 ppm as possible.

We are currently having a great deal of difficulty dealing with a layer of floating sludge that is forming on the post-clarifier settling ponds. After floating for several days, this layer of sludge starts breaking up and settling very slowly. As this happens a large amount of suspended solids is carried over into the weir. We continue to check the weir periodically through the night so that we can minimize the length of time that this occurs. When the suspended solids start to carryover into the weir, we change to the other settling pond.

We will keep you informed of any significant developments in

OTSEGO PAPERBOARD MILL [illegible] STREET • [illegible] MICHIGAN [illegible] • PHONE 616 692-6141

6910

the situation. If you wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson

j

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MEN04319

MENASHA CORPORATION

12 April 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing,MI 48909

Gentlemen:

Test results for April 6 and April 9 which became available on April 8 and April 11 respectively, indicated that on these days the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 lb/day limit. On these days, the suspended solids discharges were 6599 and 5840 lb/day respectively. Test results for April 8 which became available on April 9 indicate that on this day, the soluble orthphosphorus concentration at outfall 000 was still over the 1 ppm limit. The lb. per day limit was also exceeded. On this day, the soluble orthophosphorus concentration was 4.3 ppm and the 12 lbs of soluble orthophosphorus were discharged.

In addition to the floating sludge problem mentioned in my April 10th letter, we are also experiencing a dispersed floc condition. At this time, we are still investigating the causes of both of these conditions. Sometime between midnight and 6 A.M. on the 7th, the floating sludge layer in the settling pond started to break up and carryover into the weir. When the operator saw the high suspended solids concentration in the weir, he changed settling ponds as soon as possible. This eliminated the floating sludge layer problem but the dispersed floc condition persisted. Inspite of the relatively low volume discharged that day, the combination of the floating sludge layer breaking up and the dispersed floc caused the suspended solids discharge to exceed the daily maximum limit. The composite phopshorus sample taken on the 8th was driven to the lab on Monday morning so that we would have the results Monday afternoon. This sample indicated that we still had a phosphorus residual in the effluent. This information was used to do a phosphorus mass balance on the waste treatment system and we found that the phosphorus demand per lb. of BOD loading had reduced over the weekend. We have continued to take grab samples from the weir each morning and drive them to the lab so that we can get the results the same afternoon. The phosphorus mass balances conducted with this information indicate that our phosphorus usage per lb. of BOD loading is beginning to stabilize. It appears that we will probably end up at a phosphorus usage that is slightly higher than we had prior to the current filamentous problem. Within two weeks, we should be able to stabilize the effluent phosphorus concentration between .5 and 1 ppm.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616-692 6141

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On Sunday and Monday, the dispersed floc condition continued to worsen. On Monday, we retested the polymers we had available to determine which one would best deal with the dispersed floc condition. We also changed settling ponds again to see if this would help improve the situation. Between changing to a polymer that was more affective and the new settling pond, we managed to significantly reduce the suspended solids carryover into the weir. However, the total amount of suspended solids discharged on the 9th was still over the discharge limit. From the 10th on we have been under the discharge limit and continue to see the settling characteristics of the sludge gradually improve. The gradual reduction in the concentration of the filamentous bacteria and the systems return to a near normal phosphorus utilization are all indications that the system is gradually returning to normal. I will of course, keep you informed of any significant developments in the situation. If you have any questions or wish to discuss these matters, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson

j

MEN04321

MENASHA CORPORATION

18 April 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for April 12 and April 15 which became available on April 14 and April 17 respectively, indicate that on these days, the combined suspended solids discharge from outfalls 000 and 002 exceeded the 4800 #/day limit. On these days, the combined suspended solids discharges were 5679 and 8657 #/day respectively. The soluble orthophosphorus test results for April 15 which became available on April 16 indicate that on this day, the soluble orthophosphorus discharge from outfall 000 exceeded both the ppm and #/day limits. On this day, the soluble orthophosphorus concentration was 3.77 ppm and 22.3 lbs were discharged.

The floating sludge problem has been eliminated but the dispersed floc condition still remains. As the conditions in the waste treatment system keep changing the polymers stop working and we must re-evaluate the dosage rates and the various polymers available. Because of the high discharge occurring on Thursday, we began re-evaluating various polymers and a supplier found one on Friday that appeared to work very well at the new conditions. We then placed an emergency order for the polymer and it was received Monday evening. Since the polymer was put on line, it appears to have been working fairly well. However, because conditions in the pond are still changing, we are doing daily polymer tests to adjust the dosage and we will rescreen the available polymers when this one stops working.

One possible cause for the dispersed floc condition is a build up poor settling material in the aeration pond due to the recycling of the water from the settling ponds back to the aeration pond. To eliminate this possible cause of the problem, we have begun pumping the entire contents of the settling pond to the sludge disposal system rather than pumping the water off the top of the pond back to the aeration pond. We have hired contractors to help dispose of the additional volume of sludge generated by this change in procedure. We will continue this practice for several settling ponds changes to determine if it has a significant effect on the rate of recovery of the system.

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MEN04322

We have continued to have residual nutrients in the effluent and the settling characteristics of the mixed liquor solid continue to show gradual improvement. Microscopic examination and the generation of foam also indicate that the system is returning to normal. The phosphorus utilization per lb. of BOD is also returning to near normal levels. As indicated in my April 12th letter we expect to have the phosphorus residual stabilized between .5 and 1 ppm by about April 26th. Grab samples analyzed daily are showing a gradual reduction in the phosphorus residual which is an indication that we are now feed just slightly less than the lbs. of phosphorus per lb. of BOD that is required for steady state operation. We will keep you informed of any significant changes in the situation. If you have any questions or wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
T. Ray
Garth Aslakson

j

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MENASHA CORPORATION

27 April 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for April 22 which became available on April 23, indicated that on this day the soluble orthphosphorus discharge from outfall 000 exceeded both the part per million and lb per day discharge limits. On this day, the soluble ortho-phosphorus concentration was 2.94 ppm on the composite sample and 7.9 lbs. of soluble orthophosphorus were discharged.

The composite sample indicated a significant phosphorus residual but the grab sample taken at the same time the composite sample was collected indicated there was no phosphorus residual. It is very unlikely that the conditions in the pond could have changed rapidly enough to go from nearly a 3 ppm in the composite sample to a 0 residual in the grab sample. We are currently running additional tests to determine if this difference was real or possibly a testing error. If the difference between the weir and aeration pond is real and consistent, we will do whatever testing is necessary to find the cause of the problem.

Since we have been maintaining a residual phosphorus in the pond, the overall condition of the pond is improving rapidly. At the present time, the filamentous bacteria have almost disappeared from the pond and the dispersed floc condition is still improving steadily. Polymers are still necessary to get the required settling. As conditions in the aeration pond continue to change, we will retest the available polymers as necessary to keep the situation under control.

Due to the discrepancy between the phosphorus concentration in the weir and the phosphorus concentration in the pond, it will probably take us at least another couple of weeks to resolve this discrepancy and get the phosphorus residual in the aeration pond stabilized between .5 and 1 ppm. We will keep you informed of any

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MEN04324

MENASHA CORPORATION

3 May 1984

Surface Water Compliance Section
P.O. Box 30038
Lansing, MI 48909

Gentlemen:

Test results for April 29 which became available on April 30, indicate that on this day, the soluble orthophosphorus discharge from outfall 000 exceeded both the ppm and lb. per day discharge limit. On this day, the soluble orthophosphorus concentration was 2.99 ppm on the composite sample and 12.3 lbs of soluble orthophosphorus were discharged.

The discrepancy between the composite sample taken from the weir and the grab samples taken from the aeration pond still persist. The additional sampling we have conducted indicates that the difference between these two sampling points was not a one time occurance or a random testing error. We will do whatever testing is necessary to explain this problem. At the present time, it appears that the phosphorus is either being released in the post clarifier settling pond and thus the concentration in the weir is higher than the concentration in the aeration pond or there is a significant problem with our sample collecting procedure. Both possibilities will be investigated until a satisfactory conclusion is reached. Until such time as we have explained the problem, we will be controlling the aeration pond to maintain a residual of from .5 to 1 ppm in the aeration pond. This will most likely give us a phosphorus concentration of 2 to 3 ppm in the wier. If we were to control the phosphorus addition low enough to obtain a residual phosphorus of less than 1 ppm at the weir, we would be severely deficient in phosphorus in the aeration pond. Within a week we would be back into the same filamentous bulking problems we just got out of.

We will keep you advised of our progress in resolving the phosphorus concentration discrepancy. If you wish to discuss this problem, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

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MEN04325

MENASHA CORPORATION

May 9, 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The April monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that the combined suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum limit on four (4) days during this reporting period. The monthly average limit was also exceeded by a small amount. The soluble orthophosphorus discharge from outfall 000 exceeded both the milligram per liter limit and the pound/day limit on four (4) days during the reporting period.

The details of the high suspended solids and high phosphorus discharges were explained in my April 6, April 12, April 18 and April 27, 1984 letters to you. The high suspended solids discharges were the result of a filamentous bulking problem which in turn was caused by a phosphorus deficiency in the waste treatment system. For reasons discussed in previous correspondence, the phosphorus deficiency was a result of our efforts to avoid exceeding the daily maximum soluble orthophosphorus discharge limit of 1 ppm. When the filamentous bacteria gained a significant advantage in the waste treatment system it took extremely large doses of phosphorus to obtain a residual in the pond.

We first obtained a soluble orthophosphorus residual on April 1st. We have maintained a soluble orthophosphorus residual in the aeration pond since that date and have seen a steady improvement in the settling characteristics of the sludge. At the present time, most of the filamentous bacteria have disappeared from the system.

The settling characteristics of the sludge are not as good as they should be but are at a point where we can keep the system under control without a great deal of difficulty or extremely high polymer dosages. The settling characteristics of the sludge are still improving slowly and should continue to do so as long as we maintain the phosphorus residual in the aeration pond.

One additional problem we encountered with the phosphorus discharge was a discrepancy between the composite sample taken from the weir

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MEN04326

and the grab samples taken from the aeration pond. The phosphorus concentration in several composite samples was higher than the phosphorus concentration in the grab samples from the aeration pond taken at the beginning and end of the period of time that the composite sample was collected. For the purposes of controlling the aeration pond properly we will continue to control to a phosphorus residual of from .5 to 1 ppm in the aeration pond. If this is not a short term phenomenon we may continue to have a higher phosphorus concentration at the weir than we have in the aeration pond.

We will continue our investigation to learn more about the causes, magnitude, variability and duration of this problem. We will keep you advised of any significant developments in the situation.

If you wish to discuss this matter, please contact the writer.

Sincerely,

MENASHA CORPORATION

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager
Otsego Paperboard Division

JRB/k

cc: Bruce Buchanan
R. L. Janda
G. Aslakson

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MEN04327

MENASHA CORPORATION

15 May 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for May 7 and May 8 which became available on May 9, 1984, indicate that on these days the soluble orthophosphorus discharge from outfall 000 exceeded both the ppm and lb./day limits. On these days, the composite sample taken from the weir indicated a phosphorus concentration of 1.62 mg/l and 1.98 mg/l respectively. 6.3 and 7.4 lbs. of soluble orthophosphorus were discharged respectively.

The average phosphorus concentration in composite samples taken from the weir continues to be higher than the phosphorus concentration in grab samples taken from the aeration pond. To control the aeration pond properly, we will continue to add sufficient phosphorus to maintain a soluble orthophosphorus residual of from .5 to 1 ppm. based on grab samples taken from the aeration pond. If the difference in the phosphorus concentrations is not a short term problem, the phosphorus concentration in the composite samples taken from the weir may continue to exceed the 1 ppm. limit.

We will continue our investigation into the causes, magnitude, variability and duration of this problem. We will also inform you of any significant developments in the situation. If you wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R.L. Janda
Garth Aslakson

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MEN04328

MENASHA CORPORATION

18 May 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for May 13 which became available on May 14, indicate that on this day the soluble orthophosphorus discharge from outfall 000 exceeded both the ppm and the lb/day discharge limit. On this day, the composite sample taken from the weir indicated a soluble orthophosphorus concentration of 2.7 ppm and 7.2 lbs of soluble orthophosphorus were discharged. A composite sample collected on May 15 indicated that the soluble orthophosphorus concentration in the weir was down to .9 ppm. The special testing work completed todate, indicates that the composite samples taken from the weir are most probably an accurate representation of the soluble orthophosphorus concentration in the weir. The main question is why the difference exists between the phosphorus concentration in the aeration pond and the phosphorus concentration in the weir. We will continue our investigation into the causes, variability, magnitude and duration of this problem. To keep the aeration pond as healthy as possible, we will continue to control to a .5 to 1 ppm residual in the aeration pond. This may cause the soluble orthophosphorus concentration at the weir to exceed the 1 ppm discharge limit at least part of the time.

Test results which became available on 5/14 indicate that on 5/12, the combined suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum discharge limit. On this day 12,286 lbs of suspended solids were discharged from the two weirs. This high suspended solids discharged was caused by a bulking sludge that would not settle either in the clarifier or the post clarifier settling ponds. This bulking condition was due in part, at least, to a sudden increase in the concentration of a very fine filamentous bacteria called H-hydrosis. Lab tests had indicated that a different polymer was much more effective than the one being currently used. This new polymer was put on line shortly before the severe bulking condition occurred in the settling pond. About the time the settling ponds would have changed over the suspended solids concentration in the weir began dropping

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MEN04329

very rapidly. Therefore, it is suspected that an adverse reaction between the two polymers while the settling pond was changing over, may have also contributed to the high suspended solids discharge. We will be watching for future adverse reactions between polymers. The dissolved oxygen concentration in the aeration pond is up to about 6 ppm. Therefore, we expect to be able to see a noticeable reduction in the population of the H-hydrosis bacteria within the next few days. The settling characteristics of the sludge should continue to improve as the population of this bacteria decreases. We will keep you advised of any significant developments in the situation.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
Garth Aslakson

j

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MEN04330

MENASHA CORPORATION

25 May 1984

Surface Water Compliance Section
DNR
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for May 20 which became available on May 21, indicate that the soluble orthophosphorus discharge exceeded both the ppm and the lb. per day limit. On this day, the composite sample indicated a soluble orthophosphorus concentration of 3.7 ppm and 20.7 lbs. of soluble orthophosphorus were discharged. Test results for May 20 which became available on May 22, indicate that the combined suspended solids discharge from outfalls 000 and 002 exceeded the daily maximum discharge limit. On this day, 5681 lbs. of suspended solids were discharged.

The high suspended solids discharge was the result of what appears to be a rather large upset in the clarifier and settling ponds that occurred during the night. The midnight grab sample indicated a suspended solids concentration of only 600 mg/l. Sometime after this, the suspended solids concentration in the weir must have increased substantially then started tapering off. When the grab sample was taken at 10 A.M., the suspended solids concentration was 900 mg/l. Recognizing the suspended solids concentration in the weir was still unacceptably high, the waste treatment operator changed ponds as soon as possible. However by this time, sufficient solids had carried over into the weir to cause the composite sample for the day to have a concentration of 1000 mg/l. The suspended solids discharge from the clean settling pond was under the discharge limit and has remained there.

Last week, grab samples taken from the pond indicated that we no longer had a phosphorus residual in the aeration pond. Because increasing the phosphorus feed slowly could result in another outbreak of 021N, we increased the feed rate sufficiently to insure that we would have a residual in the pond by Monday morning. The grab sample taken from the pond Monday morning, confirmed we had established a residual in the pond and the feed rate was adjusted to bring us back

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MEN04331

to the target of .5 ppm.

We will continue to control to a phosphorus residual of from .5 to 1 ppm based on grab samples taken from the aeration pond. This may continue to cause the soluble orthophorphorus concentration at the weir to exceed the 1 ppm discharge limit at least part of the time. The dissolved oxygen concentration in the pond has remained relatively high and the settling characteristics of the sludge are quite variable but are generally improving. We will continue to evaluate and use polymers as necessary to keep the system under control and will keep you informed of any significant changes in the situation.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
Garth Aslakson

j

6926

MEN04332

MENASHA CORPORATION

May 29, 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for May 24 which became available on May 26, indicate that on this day, the combined suspended solids discharge from outfall 000 and 002 exceeded the lb./day limit. On this day, 5333 lbs. of suspended solids were discharged.

The grab samples taken from the weir at 10 A.M., 3 P.M., midngiht indicated very low suspended solids concentrations. Sometime between midnight and 6 A.M., the settling pond filled and suspended solids began carrying over into the weir. When the operator inspected the weir at about 6 A.M. he observed high suspended solids concentrations in the weir and changed settling ponds as soon as possible. The discharge from the new settling pond was under the discharge limit and has remained there since then.

This settling pond filled in only three days which was unexpected since the previous settling pond took nearly 10 days to fill. One of the factors that contributed to this rapid filling was a discontinuous polymer feed to the system. We have been using a polymer which gave us both very good effluent quality and very good compaction in the clarifier but we were having problems with the polymer plugging the feed pumps. The operator worked on the polymer feed pumps until 11 P.M. on the 24th and everything appeared to be going well. When he returned at 6 A.M., the polymer had stopped feeding sometime during the night, the settling ponds had filled and there was a high suspended solids concentration in the weir. Before switching to the new settling pond, the waste treatment operator switched to a polymer which although, it did not give us as clear an effluent, or as good of compaction in the clarifier could be feed reliably with our existing chemical feed pumps. We will be using some of the manufacturers supplied pumps when we retry using the polymer we had difficulty with.

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MEN04333

At the advise of Professor Eckenfelder of Aware Corporation, we have begun using a period of zero DO in the aeration pond to try to kill off some of the filamentous bacteria. According to Professor Eckenfelder, although many filamentous bacteria do well at low DO conditions, they die off much faster than floc forming bacteria when the DO goes to zero. Since we have only tried this for two days, we can not be sure of what the results will be but the initial effects on the system have been very encouraging.

We have correlated the large amounts of foam on the aeration pond and the thick sludge crust on the settling ponds to a high ammonia feed rate to the system. Based on last years good operations, we have reduced our ammonia feed to the system such that we are running under a constant ammonia deficiency. This has greatly reduced the foam on the aeration pond which has also allowed the DO in the pond to average significantly higher and has essentially eliminated the thick sludge crust on the settling ponds. According to Dr. Richard, the 021N bacteria should disappear at either a constant ammonia residual or a constant ammonia deficiency. The hydrosis on the other hand should be eliminated by the combination of a high average DO in the pond and the zero DO treatment for several hours per day. Initial results of this treatment program are very encouraging. We currently have the lowest carryover from the clarifier to the settling ponds that we have seen in quite a few weeks.

We will keep you informed of any significant developments in the situation. If you wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
Garth Aslakson

j

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MEN04334

MENASHA CORPORATION

1 June 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for May 27 which became available on May 29, indicate that on this date, the soluble orthophosphorus concentration from outfall 000 exceeded both the ppm and lb/day limit. The soluble orthophosphorus concentration was 1.62 ppm measured on the composite sample collected from the weir and 7.0 lbs were discharged.

As explained in my May 29th letter, we are currently controlling the waste treatment system to a phosphorus residual of from .5 to 1 ppm in the aeration pond and are controlling to a nitrogen deficiency. We are also continuing the periods of zero DO in the aeration pond to eliminate the current filamentous bacteria and prevent those that would grow because of the nitrogen deficiency. After about 5 days of this treatment, we continue to see a slow but steady improvement in the system. Microscopic examination continues to show that the concentration of filamentous bacteria is decreasing and settling tests continue to show a gradual improvement in the settling characteristics of the sludge.

The grab sample taken from the aeration pond on the 28th, indicated that the aeration pond was again within its targeted range of from .5 to 1 ppm soluble orthophosphorus. As we continue to control the aeration pond to this phosphorus residual, the soluble orthophosphorus measured at the weir may occasionally exceed the 1 ppm limit. We will continue to keep you informed of significant developments in the situation. If you wish to discuss this matter, please contact the writer.

Sincerely,
Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R. L. Janda
Garth Aslakson

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 692-6141

6929

MEN04335

MENASHA CORPORATION

PAPERBOARD GROUP

7 June 1984

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The May monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that the combined suspended solids discharge from outfalls 001 and 002 exceeded the daily maximum limit on 3 days during this reporting period. The circumstances surrounding these excursions were explained in detail in my letters of May 18, May 25, and May 29.

Due to the additional testing we are conducting to determine the cause of the discrepancy between the phosphorus concentration in the composite samples collected from the weir and the phosphorus concentration in the grab samples taken from the aeration pond, seven phosphorus tests were conducted during this reporting period rather than the normal four tests. Six of the composite samples collected from the weir indicated a phosphorus concentration above the 1 ppm limit and a phosphorus discharge which was greater than the pound per day limit. The circumstances surround each of these high phosphorus discharges, except the one on April 26th were reported in my letters of May 3, May 15, May 18 and May 25. The phosphorus tests on the April 26 composite sample was part of the special phosphorus testing we are doing. The high phosphorus concentration on this composite sample was accidentally omitted from the May 3 letter. On the 26th, the composite sample collected from outfall 001 indicated a phosphorus concentration of 3.19 ppm and 15.4 lbs of soluble orthophosphorus were discharged.

As explained in my May 29 and June 1 letters, we are maintaining a phosphorus residual as measured by grab samples taken from the aeration pond and are maintaining a nitrogen deficiency in the aeration pond. We are also continuing the period of zero D.O. in the aeration pond to eliminate the existing filamentous bacteria and discourage those that would grow because of the nitrogen deficiency. The results of this treatment program continue to be very encouraging. Based on settling tests and microscopic examination of the mixed liquor

MEN04336

solids, the concentration of filamentous bacteria continues to decrease and the settling characteristics of the sludge continue to improve.

We plan to continue controlling the aeration pond in this manner throughout the summer and fall. As we continue to control the soluble orthophosphorus concentration in the aeration pond between .5 and 1 ppm, the composite samples from the weir may occasionally exceed the 1 ppm discharge limit. At our last meeting with the Permits Section, they indicated our new NPDES permits phosphorus discharge limit would be based on best professional judgement rather than the standard 1 ppm discharge limit. If this is indeed the case, we should be able to maintain the necessary phosphorus residual in the aeration without exceeding the phosphorus discharge limit of the new NPDES permit. If you wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R.L. Janda
Garth Aslakson

dkk

MEN04337

MENASHA CORPORATION

PAPERBOARD GROUP

7 June 84

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Test results for June 3 which became available on June 5 indicate that on this date the soluble orthophosphorus discharge from outfall 000 exceeded both the concentration and pound per day discharge limits. On this day, the composite sample indicated a soluble orthophosphorus concentration of 1.4 mg per liter and 6.0 pounds of phosphorus were discharged.

As explained in my June 5 letter, we are continuing to control the soluble orthophosphorus concentration in the aeration pond between .5 and 1 ppm. This may continue to cause the concentration in the composite sample to occasionally exceed the 1 ppm limit. When our new NPDES permit is issued, the phosphorus discharge limit will be based on best professional judgement rather than the standard 1 ppm limit. This will allow us to both maintain the phosphorus residual in the aeration pond between .5 and 1 ppm and stay under our phosphorus discharge limit.

The overall conditions in the waste treatment system continue to show a slow but steady improvement in the settling characteristics of the sludge. Microscopic examination also continues to show a steady decrease in the filamentous bacteria concentration. We will continue to keep you informed of significant developments in the situation. If you wish to discuss this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp, P.E.

John R. Blauwkamp, P.E.
Technical Manager

c B. Buchanan
R.L. Janda
Garth Aslakson

dkk

6932

MEN04338

MENASHA CORPORATION

10 July 1984

Surface Water Quality Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

The June monthly operating report for the Otsego Paperboard Division of Menasha Corporation indicates that the soluble orthophosphorus discharge from outfall 000 exceeded both the ppm and lb/day limits on May 27 and June 3. The circumstances surrounding each of these high phosphorus discharges were explained in detail in my letters of June 1 and June 7, 1984.

Since my June 7th letter, the conditions in the waste treatment system have improved a great deal. The filamentous concentration in the waste treatment system is very low and we are currently getting excellent settling in the clarifier. We are still controlling to a significant nitrogen deficiency in the waste treatment system and are maintaining a very low phosphorus residual in the system. The difference between the phosphorus concentration measured on composite samples taken from the weir and grab samples taken from the aeration pond has decreased a great deal. We are currently able to maintain a detectable phosphorus residual in the aeration pond without exceeding the 1 ppm discharge limit based on composite samples taken from the weir. The special testing we have done to date is insufficient for firm conclusions of the cause of this phenomna. The data does definitely show that the problem is temporary in nature and is possibly connected with the bulking condition that was taking place in the system at the time. If as indicated in previous meetings, the new NPDES permits phosphorus discharge limit is based on best professional judgement rather than the 1 ppm discharge limit and we can keep the waste treatment system operating properly, the high phosphorus concentration based on composite samples taken from the weir should not be a recurring problem.

About eight weeks ago, we began running two waste treatment pilot plant units in order to help us determine which was the best method of running the waste treatment system during the summer months. In one unit we maintained both an ammonia residual and a phosphorus residual. In the other unit we maintained a phosphorus residual and a significant ammonia

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MEN04339

deficit comparable to that in the waste treatment system itself. In the low ammonia unit, we also maintained a period of zero DO for two hours each day. Within a relatively short time, both the low ammonia pilot plant unit and the waste treatment system began recovering much faster than the high ammonia unit did. Due to a high BOD loading on the waste treatment system, we had to discontinue the zero DO periods in the waste treatment system for about ten days. During this time, the low ammonia pilot plant unit began recovering slightly faster than the waste treatment system did. We can not be sure however, if the more rapid recovery in the pilot plant unit was because of the periods of zero DO or because the pilot plant unit maintained a higher DO concentration than the aeration pond did. While the low ammonia feed rate pilot plant unit and the waste treatment system were recovering very nicely, the high ammonia feed rate pilot plant unit was growing filamentous bacteria at an incredible rate. At the present time we are just seeing the first signs of recovery in the high ammonia pilot plant unit. At this time we can not explain why but both the aeration pond and the pilot plant unit indicate that choosing to go with the low ammonia feed rate was the right choice for the summer months.

At this time our plans are to resume maintaining an ammonia residual in the aeration pond when the temperature in the pond gets down to the 50 degree range. This would correspond to the very good operating conditions we had during the first part of last winter. If you wish to discuss any of these matters, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John Blauwkamp, P.E.
Technical Manager

c Bruce Buchanan
R. L. Janda
Garth Aslakson

j

MEN04340

MENASHA CORPORATION

October 3, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Results from our composite sample of outfall 000 for September 28 indicated suspended solids of 3923 pounds, which is in violation of our 3200 lb/day limit.

The reason for the excessive suspended solids is almost certainly due to the recent sharp drop in air temperature, which resulted in a 17°F drop in pond temperature over a period of only five days. This probably caused an inversion in the settling pond which stirred up the sludge, and an upset of the bacteria which reduced settling. A routine grab sample taken at 11:30 PM on the 28th showed suspended solids of 500 g/ml, which is typically no cause for alarm. The grab sample taken at 10:00 AM on the 29th (just after the composite sample was analyzed), however, showed the very high rate of 1670 g/ml. Clearly the upset occurred over a very short period of time. Settling ponds were switched immediately after the high solids were noticed, which eliminated the problem.

Actions taken to prevent recurrence include: (1) spot checking suspended solids twice per night rather than once, (2) adding a polymer to the clarifier to enhance settling, and (3) adding more nutrients to the aeration pond. Basically, this entails going to our winter mode of operations. Suspended solids have been under 1500 lb/day since the violation.

If there are any further questions, please give me a call.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

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MEN04341

MENASHA CORPORATION

October 5, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

I regret to report that we had another violation on Wednesday, October 3. Our composite sample indicated suspended solids of 3,871 pounds, which is 671 pounds above our 3,200 lb/day limit.

I am quite confident that this high level of suspended solids in the composite sample is unrepresentative of the actual suspended solids flow out to the river. The reason is that the four grab samples taken on October 3 and early October 4 are all relatively low. This is the first time this settling pond has been used since early June. Consequently, there were some dried out chunks of fiber floating on top of the water in the settling pond. I believe one of the chunks broke apart and was picked up by the sampler. If this happened, it would give us an artificially high amount of solids in the sample jar.

Since adding the polymer and additional nutrients to the system as I mentioned in my letter of October 3, the system looks quite good, and has been improving every day.

We are going to switch settling ponds once again tomorrow so we can safely dispose of the floating chunks of fiber.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

cc: B. Buchanan
R. L. Janda
Garth Aslakson
K. Kling
J. Blauwkamp

kj

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6940

MEN04342

MENASHA CORPORATION

October 19, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O Box 30028
Lansing, MI 48909

Gentlemen:

I have two minor violations to report.

On October 14, our composite sample showed a phosphorus level of 2.26 ppm, in violation of the 1.0 ppm limit. I believe John Blauwkamp has described our concern with this low phosphorus limit. Once again, we find it extremely difficult to manage our environmental operation within the constraint of 1.0 ppm of phosphorus residual. We have found that as the phosphorus residual decreases below 1.0 ppm, settling deteriorates rapidly. Hopefully this limit will be changed to a pound/day basis with our new permit. Upon recognizing the phosphorus violation, we reduced phosphorus flow. We are presently pricing ion-chromatography equipment, which would allow us to keep tighter control on phosphorus residual. This is approximately a $25,000 piece of equipment.

The result of the decrease in phosphorus was a suspended solids violation. The composite sample of October 16 showed of 3,296 pounds, in violation of our 3,200 pound/day limit. This limit increases to 4,800 pound/day on November 1. In response, we changed settling ponds and increased phosphorus as far as our limit would allow. We are putting a new polymer on line today which appears to be very effective.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

cc: B. Buchanan
R. L. Janda
Garth Aslakson
John Blauwkamp

kj

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MEN04343

MENASHA CORPORATION

PAPERBOARD GROUP

7 November 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Enclosed is the monthly operating report for October. As you are aware from my correspondence during that period, we had five suspended solids violations, and two phosphorus violations. None of the suspended solids violations were particularly serious, as all would have been within the "winter" specifications, which went into effect on November 1. One of the phosphorus violations was in excess of the limit by only 3%.

The month of October was marked with extremely volatile temperature swings. This caused upsets in the settling ponds and hence was the predominant cause of the suspended solids violations. Nutrients were being added at the optimum level throughout the period. Consequently our only option remaining was to use polymers to enhance settling. It took time to find the optimum polymer, but we feel confident that the polymer now being used is doing the job well. Now that we have an effective polymer on line and should be seeing more stable air temperatures, November should be a far better month.

The phosphorus limit of 1 mg/l is difficult to maintain, since a phosphorus residual of near that level is an important variable in controlling settling, and consequently in minimizing suspended solids violations. We take every precaution to stay within the phosphorus limit but since we run to as close to the limit as possible, an occasional violation may sometimes occur. I do not feel that one significant violation is particularly serious.

If you have any questions, please contact me at any time.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

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MEN04344

MENASHA CORPORATION

PAPERBOARD GROUP

December 6, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Due to high mill effluent flows and continuing volatility in outside air temperature, three violations occurred this week. Suspended solids discharge was 5,366 pounds on November 29, 5,474 pounds on December 2, and 5,303 pounds on December 4.

A great deal of effort has been channelled recently into reducing mill effluent. Sump pumps are being installed to redirect clean water to the clean water outfall. Seal water is being reduced as low as possible. Fresh water is being replaced with white water wherever possible. General awareness throughout the mill of the importance of reducing fresh water usage has been raised. As a result, mill effluent has finally come down in the last few days, and will come down further as water conservation methods come on line.

Adding to the problem of high mill effluent has been air temperatures fluctuating between 15° and 60° over the past two weeks. This keeps the settling ponds in constant turmoil. The aeration pond temperature got so high last week that we had to reduce the rate of nutrient addition to summer levels. Hopefully the colder temperatures of the last few days will stay with us for a while. If so, our waste treatment facility will perform far more efficiently.

For your information, a malfunction has been discovered in our flowmeter on the main 000 outfall. The flow indicated on the meter yesterday did not visually appear correct, and therefore was checked out immediately. It was found to be inaccurate, and hence was replaced by the meter used on the 002 outfall. The much smaller 002 flow will be metered by observation of the weir until the meter is replaced.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

OTSEGO MILL [illegible] • PHONE 616-694-6741

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MEN04345

MENASHA CORPORATION

PAPERBOARD GROUP

December 7, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen;

Enclosed is the monthly operating report for November. As you can see, there were no violations over the daily maximum limits. We were, however, in violation of the permit level for average suspended solids from outfall 000 for the month of November. Average suspended solids for the month was 3,474 lb/day, which was 274 lb/day over our permit level.

The reasons for the high average were high mill effluent flow and continuing volatile air temperatures. As has been explained to you in my letter of December 6, we are taking positive steps in reducing mill effluent. As new sump pumps and fresh water conservation procedures come on line, we will see significant improvement. Some real improvement has already been seen over the past few days.

Volatile air temperatures have seriously hurt us. In the last two weeks, the air temperature has ranged from 15° to 60°F. The warm weather has caused growth of filamentous bacteria, and consequent deterioration of settling characteristics in the pond. In response, we lowered nutrient feed to the rate used during the summer months. The filamentous bacteria are now dying off and settling has improved significantly.

The fluctuations in temperature throw the settling ponds into turmoil. Inversions occur, and sludge settling becomes nearly impossible. We are applying the best polymer we can find, and are continuously searching for a better one.

December, with stabilizing temperatures, will be a far better month.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

OTSEGO MILL BOX 155 • [illegible]

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MEN04346

MENASHA CORPORATION
PAPERBOARD GROUP

December 13, 1984

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen,

We were in violation of our suspended solids limit on December 6, with total suspended solids for the day at 7,623 pounds.

As I have reported in recent letters, fluctuating air temperatures and high mill effluent have been giving us serious problems. In response to particularly high flow from the aeration pond due to the necessity of lowering the pond level last week, we put our two settling ponds in a parallel configuration. By doing this we were able to keep the suspended solids within our limit during the period of high flow. Unfortunately, however, when we reverted back to single pond operation (a necessity in order to pump the sludge out of the other pond), we disturbed the sludge layer, and high solids effluent resulted.

This violation occurred the day that I wrote my last letter to you, though it was not detected until Saturday, December 8. In my letter I mentioned that mill effluent flows had decreased significantly. This trend has continued, except for an upset two days ago. As a result, the level of suspended solids in our effluent has been falling. Consequently I anticipate far fewer violations in the near future.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

cc: B. Buchanan
R. L. Janda
G. Aslakson
K. Kling
J. Blauwkamp

kj

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MEN04347

MENASHA CORPORATION
PAPERBOARD GROUP

January 2, 1985

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Due to an equipment failure, we had a phosphorus violation on December 25. The feed tube broke, which allowed the phosphorus to flow into the pond unchecked for several hours. As a result, the residual was 2.62 ppm on that day. The equipment was repaired immediately after the failure was observed.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

cc: B. Buchanan
R. L. Janda
G. Aslakson
K. Kling
J. Blauwkamp

kj

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MEN04348

MENASHA CORPORATION
PAPERBOARD GROUP

January 7, 1985

Surface Water Quality Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Though December was not a good month, we ended it on a good note. The chlorination which I wrote to you about on December 21 was a complete success. We eliminated the filamentous bacteria which were giving us the settling problems and consequently reduced our suspended solids discharge very substantially. Our suspended solids discharge from weir 000 has averaged under 3000 lb/day since the chlorination.

You will find enclosed the December monthly operating report. Seven suspended solids violations occurred during the month, all of which have been addressed in individual letters. The suspended solids average for the month was 4,152 lb/day, which was in excess of our limit of 3,200 lb/day.

Two phosphorus violations were also reported. One of which was a result of increased efforts to reduce suspended solids discharge, and one was due to an equipment failure.

Though November and December were not good months, I am extremely encouraged that the chlorination process has given us a means of preventing similar poor months in the future.

If you have any questions, please contact me at any time.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

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MEN04349

MENASHA CORPORATION

January 8, 1985

Surface Water Compliance
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Enclosed is the operating report for the month of December.

We did not exceed any of our permitted discharges on a daily basis. We did however exceed the monthly average on suspended solids discharge.

As I stated in my last letter to you, we have been struggling with control of the suspended solids. Our problem stems from a certain type of bacteria, common to our system, which normally flocs and settles. For the past few months it hasn't been settling. We have called consultants, experimented with settling time, polymers, nutrient addition rates, and chlorination in pilot plants, all so far without much success. Our consultant has given us more ideas and we are presently trying these in the pilot plant.

If you have any questions, please call me.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Mark T. Reed

Mark Reed
Technical Manager

cc: B. Buchanan
J. Blauwkamp
T. Oldham
F. Katje
R. L. Janda
K. Kling
G. Roys
L. Koivumiemi

kj

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MEN04350

MENASHA CORPORATION

March 5, 1985

The Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Testing of our composite sample shows that we were in violation of our suspended solids permit on the 25th of February. The tests, completed on February 27, indicated a suspended solids level of 7287 lb for the day.

Given that our waste treatment system has been working so well lately, we were extremely surprised with the test results, and in fact are questioning whether or not they are truly valid. Our daily discharge previous to the 27th was less then 2500 lb/day, and has averaged exactly 2500 lb/day since that date. Further, grab samples taken during the day of the 27th had suspended solids concentrations of 500, 680, and 200 mg/liter. Yet the concentration of the composite sample was 1080 mg/liter.

The only possible explanation for this high composite sample concentration is that at some point during the day a surge of high solids effluent went through the sampler. If this happened, the sample would show a higher concentration of solids than was actually representative for the day. This could have been due to peculiar behavior in the settling pond due to rapidly increasing pond temperature.

We are currently evaluating the possibility of bypassing the settling ponds during the transition season, since it may be that they hurt us more then help us during these periods. Other than that there is nothing else to do, since all other information leads us to believe that the system is working perfectly.

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MEN04351

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

cc: B. Buchanan
R. L. Janda
G. Aslakson
K. Kling
J. Blauwkamp

kj

MEN04352

MENASHA CORPORATION

March 6, 1985

Surface Water Compliance Section
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Enclosed is the monthly operating report for the month of February. As you can see, there was one violation, which occurred on the last reporting day of the month. I described the circumstances surrounding this violation in my letter dated March 5, and hopefully convinced you that this violation was not a result of poor control of the waste treatment operation. We are further pursuing the idea of bypassing the settling ponds as we become more convinced that this will reduce much of the fluctuation in suspended solids concentration, without increasing the average solids discharge to the river.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

William A. Shepard
Technical Manager

cc: B. Buchanan
R. L. Janda
K. Kling
G. Aslakson
J. Blauwkamp

kj

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MEN04353

MENASHA CORPORATION

May 2, 1985

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Tests run on our composite samples from April 28 show us to be in violation of our phosphorus discharge limits. The residual phosphorus concentration was 1.12 ppm, 0.12 ppm over our limit. Since we had reduced the phosphorus feed to the aeration pond over the past week, and our last set of tests showed the residual to be 0.47 ppm, we feel the cause of this viclation was related to a reduced ammonia feed to the pond. The equipment problem which caused the reduced ammonia flow has been corrected.

It is worth mentioning that our total phosphorus discharge for April 18 was 5.77 lbs/day which is well under the 8 lbs/day limit proposed in our new NPDES Permit.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Mark Reed

Mark T. Reed
Technical Manager

cc: B. Buchanan
R. L. Janda
G. Aslakson
K. Kling
J. Blauwkamp

kj

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MEN04354

MENASHA CORPORATION

May 9, 1985

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Testing on our composite sample from May 5 show us to be in violation of our phosphorus discharge limit. The composite sample had a 1.16 ppm residual phosphorus concentration, 0.16 over our limit.

The test results were received on May 7, we immediately cut the phosphorus feed rate in half and the following day shut it off completely. We will leave the phosphorus feed off until our residual is well within our limits.

The total phosphorus discharge for May 5 was 5.07 pounds which was well below the limit proposed in our new NPDES permit.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Mark T. Reed

Mark T. Reed
Technical Manager

cc: B. Buchanan
G. Aslakson
K. Kling
J. Blauwkamp
R. L. Janda

kj

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MEN04355

MENASHA CORPORATION

May 16, 1985

Surface Water Compliance Section
Department of Natural Resources
P.O. Box 30028
Lansing, MI 48909

Gentlemen:

Testing of our composite sample from May 12 show us to be in violation of our phosphorus discharge limit. The test results, which were received on May 14, show a residual phosphorus concentration of 1.23 ppm.

Our indicators pointed to a phosphorus concentrationn within our discharge limits, which turned out not to be the case. Testing of a grab sample taken on May 9, had shown a 0.56 ppm phosphorus concentration, also our phosphorus feed has been shut off since May 7th.

We will continue to leave the phosphorus feed shut off until the residual concentration is near undetectable. Adjustments have also been made to our ammonia feed rate in an effort to bring the residual phosphorus down.

The total phosphorus discharge for May 12 was 4.7 lbs/day, well below our current 5.8 lb/day limit and the 8 lb/day limit proposed in our new NPDES permit.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

Mark T. Reed

Mark T. Reed
Technical Manager

cc: Bruce Buchanan
R. L. Janda
G. Aslakson - DNR
K. Kling
J. Blauwkamp

kj

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

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MEN04356

Natural Resources Defense Council

122 East 42nd Street
New York, New York 10168
212 949-0049

September 23, 1986

Mr. Bruce Buchanan
Menasha Corporation
320 North Farmer Street
Ostego, Michigan 49078

Dear Mr. Buchanan:

Section 505(b) of the Clean Water Act (the "Act"), 33 U.S.C. §1365(b), requires that sixty (60) days prior to the filing of a citizen suit in federal district court under §505(a) of the Act, the alleged violator, the Environmental Protection Agency and the state in which the alleged violations occur be given notice of the alleged violations.

The Natural Resources Defense Council, Inc. and Sierra Club hereby place you on notice, pursuant to 33 U.S.C. §1365(b), that they believe that the Menasha Corporation plant in Ostego, Michigan has violated and continues to violate "an effluent standard or limitation" under §505(a)(1)(A) of the Act, 33 U.S.C. §1365(a)(1)(A), by failing to comply with NPDES permit number MI0003824, issued under §402 of the Act, as summarized below, and specified in Attachment A.

Parameter	Concentration		Mass Loading		Total
	Mo. Avg.	Daily Max.	Mo. Avg.	Daily Max.	
Total Suspended Solids	1	1	5	31	38
Soluble ortho phosphorus		20		17	37
Biochemical Oxygen Demand			--	1	1
pH	--	1			1
TOTAL	1	22	5	49	77

We believe that this NOTICE OF INTENT TO SUE sufficiently states the grounds for complaint. If, however, you have any

MEN04357

questions, or wish to discuss the matter, please contact Nancy Marks or me at (212) 949-0049.

Sincerely,

James Thornton
Natural Resources Defense Council, Inc.
122 East 42nd Street, 45th Floor
New York, New York 10168

JT/mcd
attachment

cc: Lee Thomas, Administrator
United States Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

Valdus V. Adamkus, Regional Administrator
Region 5, United States Environmental Protection Agency
230 South Dearborn Street
Chicago, Illinois 60604

Gordon E. Guyer, Director
State of Michigan Department of Natural Resources
Stevens T. Mason Building, Box 30028
Lansing, Michigan 48909

5328

MEN04358

Menasha Corporation

ATTACHMENT A
VIOLATIONS

Reporting Period	Outfall	Parameter	Permit Limitation Average	Permit Limitation Maximum	Reported Violation Average	Reported Violation Maximum	Number of Violation
3/86	000+002	TSS (lbs/day)	3584	5376	—	7188 ✓	1
12/85	000+002	TSS (lbs/day)	3584	5376	4444 ✓	—	1
11/85	000+002	TSS (lbs/day)	3584	5376	3618 ✓	7142 ✓	2
10/85	004	TSS (mg/l)	20	50	30	141	2
10/85	004	TSS (lbs/day)	39	96	—	154	1
'85	004	pH (S.U.)	6.0(min)	9.0	—	9.8	1
85	000+002	BOD (lbs/day)		3725		4434	1
/85	000	Phosphorus (mg/l) (soluble)		1.0		1.23	3
5/85	000	Phosphorus (lbs/day) (soluble)		5.8		6.43	1
2/85	000+002	TSS (lbs/day)	3200	4800	—	7287	1
12/84	000+002	TSS (lbs/day)	3200	4800	4152	7623	8
12/84	000	Phosphorus (mg/l) (soluble)		1.0		2.62	2
12/84	000	Phosphorus (lbs/day) (soluble)		5.8		11.8	2
11/84	000+002	TSS (lbs/day)	3200	4800	3474	—	1
10/84	000	Phosphorus (mg/l) (soluble)		1.0		2.26	2
10/84	000	Phosphorus (lbs/day) (soluble)		5.8		11.01	1
10/84	000+002	TSS (lbs/day)		3200		4013	5
6/84	000	Phosphorus (mg/l) (soluble)		1.0		1.62	2
6/84	000	Phosphorus (lbs/day) (soluble)		5.8		7.02	2
5/84	000	Phosphorus (mg/l) (soluble)		1.0		3.74	6
5/84	000	Phosphorus (lbs/day) (soluble)		5.8		20.96	6
5/84	000+002	TSS (lbs/day)	3200	4800	—	12286	3

MEN04359

enasha Corporation
age 2

ATTACHMENT A
VIOLATIONS

Reporting Period	Outfall	Parameter	Permit Limitation Average	Permit Limitation Maximum	Reported Violation Average	Reported Violation Maximum	Number of Violation
4/84	000	Phosphorus (mg/l) (soluble)		1.0		4.28	4
4/84	000	Phosphorus (lbs/day) (soluble)		5.8		22.26	4
/84	000+002	TSS (lbs/day)	3200	4800	3290	8657	5
/84	000+002	TSS (lbs/day)	3200	4800	--	5195	2
2/84	000+002	TSS (lbs/day)	3200	4800	--	12074	1
12/83	000+002	TSS (lbs/day)	3200	4800	--	7594	1
7/83	000+002	TSS (lbs/day)		3200		3240	1
6/83	000+002	TSS (lbs/day)		3200		5883	1
2/83	000+002	TSS (lbs/day)	3200	4800	--	5352	1
1/83	000	Phosphorus (mg/l) (soluble)		1.0		1.84	1
1/83	000	Phosphorus (lbs/day) (soluble)		5.8		11.54	1

MEN04360

asna Corporation

ATTACHMENT A
VIOLATIONS

orting riod	Outfall	Parameter	Permit Limitation Average	Permit Limitation Maximum	Reported Violation Average	Reported Violation Maximum	Number of Violations
3/86	000+002	TSS (lbs/day)	3584	5376	—	7188	1 1
2/85	000+002	TSS (lbs/day)	3584	5376	4444	—	1 1
1/85	000+002	TSS (lbs/day)	3584	5376	3610	7142	2 2
0/85	004	TSS (mg/l)	20 30	50 100	30	141	2 1
0/85	004	TSS (lbs/day)	39 20	96 67	—	154	1 1
0/85	004	pH (S.U.)	6.0(min)	9.0	—	9.8	1 1
7/85	000+002	BOD (lbs/day)		3725		4434 - due w/ 534	1 1
5/85	000	Phosphorus (mg/l) (soluble)		1.0		1.23	3 3
5/85	000	Phosphorus (lbs/day) (soluble)		5.8		6.43	1 1
[illegible]	000+002	TSS (lbs/day)	3200	4800	—	7287	1 1
[illegible]	000+002	TSS (lbs/day)	3200	4800	4152	7623	8 8
2/84	000	Phosphorus (mg/l) (soluble)		1.0		2.62	2 2
2/84	000	Phosphorus (lbs/day) (soluble)		5.8		11.8	2 2
/84	000+002	TSS (lbs/day)	3200	4800	3474	—	1 1
1/84	000	Phosphorus (mg/l) (soluble)		1.0		2.26	2 1
1/84	000	Phosphorus (lbs/day) (soluble)		5.8		11.01	1 1
/84	000+002	TSS (lbs/day)		3200		4013	5 5
/84	000	Phosphorus (mg/l) (soluble)		1.0		1.62	2 2
/84	000	Phosphorus (lbs/day) (soluble)		5.8		7.02	2 2
/84	000	Phosphorus (mg/l) (soluble)		1.0		3.74	6 6
/84	000	Phosphorus (lbs/day) (soluble)		5.8		20.96	6 6
/84	000+002	TSS (lbs/day)	3200	4800	—	12286	3 3

MEN04361

Menasha Corporation
Page 2

ATTACHMENT A
VIOLATIONS

Reporting Period	Outfall	Parameter	Permit Limitation Average	Permit Limitation Maximum	Reported Violation Average	Reported Violation Maximum	Number Violati
4/84	000	Phosphorus (mg/l) (soluble)		1.0		4.28	4
4/84	000	Phosphorus (lbs/day) (soluble)		5.8		22.26	4
4/84	000+002	TSS (lbs/cay)	3200	4800	3290	8657	5
3/84	000+002	TSS (lbs/day)	3200	4800	—	5195 6195	2
2/84	000+002	TSS (lbs/day)	3200	4800	—	12074	1
12/83	000+002	TSS (lbs/day)	3200	4800	—	7594	1
7/83	000+002	TSS (lbs/day)		3200		3240	1
6/83	000+002	TSS (lbs/day)		3200		5883	1
1/83	000+002	TSS (lbs/day)	3200	4800	—	5352	1
1/83	000	Phosphorus (mg/l) (soluble)		1.0		1.84	1
1/83	000	Phosphorus (lbs/day) (soluble)		5.8		11.54	1

MEN04362

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF INGHAM

FRANK J. KELLEY, Attorney General,
ex rel MICHIGAN NATURAL RESOURCES
COMMISSION, MICHIGAN WATER RESOURCES
COMMISSION, and GORDON E. GUYER,
Director of the Michigan Department
of Natural Resources,

Plaintiffs,

v

File No.: 86-[illegible]-CE

MENASHA CORPORATION,
a Wisconsin corporation,

Defendant.

Stewart H. Freeman (P 13692)
Assistant Attorney General
in Charge
Mark S. Meadows (P 24101)
Assistant Attorney General
Environmental Protection Division
720 Law Building
Lansing, MI 48913
Attorneys for Plaintiffs

Frederick J. Dindoffer (P 31398)
Attorney at Law
34th Floor, 100 Renaissance Center
Detroit, MI 48243
Attorney for Defendant

CONSENT DECREE

At a session of the Court, held in the Circuit Courtroom, County of Ingham, City of Lansing, State of Michigan, on Dec. 17, 1985.

PRESENT: _____
Circuit Judge

5309

Plaintiffs having filed a complaint which alleges the discharge of substances, which are or may be injurious to the waters of the State, by Defendant from its facility located at Otsego, Michigan, and the parties having agreed that settlement of this matter by entry of this Consent Decree, without further litigation, is the most appropriate means of resolving this matter,

NOW THEREFORE, without trial of any issue of fact or law and upon the consent of the parties, by their attorneys, it is hereby ORDERED, ADJUDGED AND DECREED:

1. This Court has jurisdiction of the subject matter of the case for the purpose of entering this Consent Decree pursuant to the Michigan Water Resources Commission Act, 1929 PA 245, as amended, MCL 323.1 et seq; MSA 3.521 et seq, and the Michigan Environmental Protection Act, 1970 PA 127, MCL 691.1201 et seq; MSA 14.528(201) et seq.

2. Neither entry of this Consent Decree nor anything in this Consent Decree shall constitute, nor be construed as, an admission of law or fact or as evidence of the violations alleged in the complaint.

3. This Court determines that the terms and conditions contained herein are reasonable, adequately resolve the environmental issues raised in Plaintiff's complaint, and properly protect the interests of the people of the State of Michigan.

5310

MEN04364

4. Defendant shall pay to the State of Michigan, for violations of Defendant's surface water discharge (NPDES) Permit No. MI 0003824, occurring between January 1, 1983 and October 31, 1986 the sum of Thirty Thousand Dollars ($30,000.00). This payment shall be made within ten (10) days of entry of this Consent Decree, by check payable to the State of Michigan, and delivered to the Assistant Attorney General in Charge, Environmental Protection Division, Michigan Department of Attorney General. The word "violations," as used in Paragraph Nos. 4 and 6 of this Consent Decree, is specifically limited to any excursion, exceedence, or other act of non-compliance with the Defendant's surface water discharge (NPDES) permit and which was reported, in writing, to the Michigan Department of Natural Resources as part of a monthly operating report ("MOR") filed by Defendant, pursuant to the permit, prior to the date of entry of this Consent Decree.

5. Defendant shall hereafter comply in all respects with the requirements of NPDES Permit No. MI 0003824.

6. This Consent Decree is with prejudice and in full settlement and satisfaction of all claims which could have been or were asserted by Plaintiffs in their Complaint herein for violations of Defendant's NPDES Permit No. MI 0003824 through and including October 31, 1986.

[illegible]

Circuit Judge

5311

A TRUE COPY
CLERK OF THE COURT
30th JUDICIAL CIRCUIT COURT

MEN04365

Approved as to Form and Substance

FRANK J. KELLEY
Attorney General

Stewart H. Freeman (P13692)
Assistant Attorney General
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Environmental Protection Division

Mark S. Meadows (P 24101)
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(313) 259-7777
Attorney for Defendant

5312

MEN04366

STATE OF MICHIGAN

IN THE CIRCUIT COURT FOR THE COUNTY OF INGHAM

FRANK J. KELLEY, Attorney General
ex rel MICHIGAN NATURAL RESOURCES
COMMISSION, MICHIGAN WATER RESOURCES
COMMISSION, and GORDON E. GUYER,
Director of the Michigan Department
of Natural Resources,

Plaintiffs,

v

File No.: 86-57658-CE

MENASHA CORPORATION,
a Wisconsin corporation,

Honorable James T. Kallman

Defendant.

SATISFACTION OF JUDGMENT

Plaintiffs hereby acknowledge receipt of $30,000.00, in full satisfiaction of Defendant's monetary indebtedness to Plaintiffs established in paragraph 4 of the Consent Decree in the above referenced lawsuit.

FRANK J. KELLEY
Attorney General

Stewart H. Freeman
Assistant Attorney General in
Charge

Mark S. Meadows
Assistant Attorney General
Environmental Protection Division
720 Law Building
Lansing, MI 48913
(517) 373-7780

Dated: December 1, 1986

5314

MEN04367

August 81

Influent Flow GPD	Influent BOD mg/l	Influent BOD #/day	Influent Susp Solids mg/l	Influent Susp Solids #/day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phenol mg/l
499000			544	20371	7.6	1.73	134	
524000	6520	28483	1368	59798	7.5	1.86	110	
608000			548	2779	7.4	1.49	142	
787000			1720	11289	7.4	1.48	136	5310
554000	2817	12383	892	3786	7.3	1.45	124	
349000			565	1606	7.1	1.14	—	
332000	4275	22337	760	1006	7.0	.94	—	
334000			304	847	7.0	1.07		
491000	3105	12723	196	803	6.8	1.23	138	
152000			188	1022	7.2	1.08		
711000			144	854	7.2	.97	58	5183
459000	297	16032	644	2539	7.0	.84	113	
370000			106	358	6.8	.69	—	
239000	2870	5780	164	327	6.8	.71	—	
[illegible]			1221	2421	6.2	.24	121	
671000	3900	21817	524	2932	7.0	1.1	115	
441000			376	1383	6.9	1.14	129	5092
635000			244	3940	7.2	1.83	130	
5[illegible]000	[illegible]	25605	302	1338	7.1	1.85	133	
231000			424	1039	7.2	2.0	131	
465000	1160	43646	40	155	7.6	2.4	—	
303000			548	1385	7.0	1.85	—	
[illegible]	6467	34139	920	4857	7.0	1.69	148	
400000			124	394	7.1	1.75	124	3929
521000			220	956	7.2	1.25	132	
231000	2133	17668	466	1139	7.2	1.74	115	
470000			2748	10060	6.8	1.67	141	
651000	5[illegible]	35706	608	3453	6.8	1.48	143	
410000			184	445	6.8	1.34	—	
592000	5720	27030	500	2468	6.8	1.39	129	
[illegible]			716	[illegible]	6.6	1.37	127	[illegible]

Effluent Flow GPD	Effluent BOD mg/l	Effluent BOD #/day	Effluent Susp Solids mg/l	Effluent Susp Solids #/day	Effluent pH	Effluent Settl. Solids %	Effluent Nitro P mg/l	Effluent Nitrate mg/l
463000	173	624	236	905	8.5	.16		
478000	129	524	92	374	8.5	.68		
456000	131	498	260	989	8.5	.68		
496000	129	534	240	993	8.6	.70		
526000	80	442	252	1126	8.5	.73	.3	.22
488000	144	576	284	1155	8.5	.73		
478000	158	560	260	1058	8.6	.72		
412000	102	350	248	850	8.6	.70		
600000	98	490	268	1341	8.5	.71		
508000	172	721	268	1135	8.6	.70		
476000	143	568	188	746	8.7	.67	.3	.23
476000	102	405	148	588	8.4	.67		
480000	184	736	238	953	8.4	.66		
448000	162	628	276	1031	8.4	.64		
520000	175	585	184	792	8.3	.61		
448000	154	575	236	880	8.3	.60		
447000	164	613	224	837	8.3	.60		.23
432000	150	540	224	807	8.3	.61	.3	
428000	167	596	224	800	8.2	.63		
360000	24	272	376	1128	8.3	.65		
408000	165	561	184	626	8.4	.65		
364000	251	762	298	886	8.2	.63		
400000	211	704	280	934	8.2	.70		
540000	299	1342	324	1459	8.3	.74		.27
224000	329	615	242	463	8.3	.74	.3	
532000	317	1406	304	1349	8.5	.75		
548000	239	1321	310	1426	8.5	.75		
392000	285	932	324	1059	8.4	.75		
500000	358	1493	352	1468	8.3	.74		
524000	338	1422	178	822	8.3	.74		
464000	247	1347	498	1888	8.2	.74	.03	.13

7304

MEN04368

August 81

CO Mixl Hrs	Pond BOD5 mg/l	Pond Bomers mg/l	Pond SV	Pond SVI	Pond DO mg/l	Pond Temp °F	Pond Level	*NH3	Aerators hrs	Sludge Total Solids	Sludge hauled Amp	Sludge hauled Gals	Air Temp	Phosphorus to U.T. #/Day
	2420	1726	270	112	2.7	76	36.5	—	120	4.38		50000	25	—
	3420	2415	270	85	1.0	78	360	—	120	4.1		50000	71	—
	2120	1512	310	146	.2	80	34.25	—	120	3.82		43000	67	—
4	2800	2087	300	.06	.5	80	36.00	—	120	3.80		50000	67	—
	2400	1688	330	138	.5	78	32	—	120	3.85		50000		—
	3200	2183	300	94	1.6	80	36	—	120	3.90		50000		—
	2320	1594	320	138	2.0	80	34	—	120	3.88		50000	64	—
	2440	999	340	139	2.4	80	36	—	120	2.99		50000		19.4
	3200	2140	340	104	1.4	79	37.5	—	120	3.24		50000	63	23.04
	3400	2195	330	87	.21	79	38	—	120	3.27		50000	64	17.28
	2840	1922	330	114	1.2	76	36	—	120	4.15		50000	68	18.72
	3040	2051	320	105	1.6	75	33	—	120	4.33		50000	62	23.04
	3200	2116	410	128	1.2	77	28.5	—	120	4.48		37500	64	17.28
	2760	2142	330	111	5.8	76	320	—	120	4.42		37000	69	28.8
	3200	2160	440	138	.4	75	300	—	120	4.66		37000	57	21.12
	3000	1974	460	150	2.8	71	310	—	120	4.78		37000	45	31.20
	3100	1949	460	145	.7	69	330	—	120	4.93		37000	48	31.00
7	3300	2011	330	15	.2	69	[illegible]		120	5.30		28000	47	29.92
	3080	1856	390	127	.6	70	33	—	120	4.65		37000	59	28.08
	3020	2042	420	110	.6	68	36.25	—	120	4.15		28000	56	—
	1100	627	530	480	.7	64	380	—	120	4.00		50000	61	—
	2300	1380	520	286	1.1	64	41.0	—	120	4.45		50000	59	—
	3400	2035	510	150	.8	74	34.0	—	120	4.56		50000	69	—
8	3140	1922	460	156	.3	76	37.5	—	120	4.52		50000	57	—
	2560	1402	510	250	.3	73	36	—	120	4.24		50000	63	—
	2080	1704	450	156	.4	74	35.5	—	120	—		43000	63	—
	2700	696	470	170	.2	75	33	—	120	5.77		35000	68	—
	2720	359	380	123	.4	77	30.5	—	120	4.59		50000	64	—
	2020	810	440	143	.4	76	33	—	20	4.5		50000	64	—
	2400	[illegible]	480	180	.4	70	34.0	—	120	4.21		50000	64	—
9	3000	[illegible]	530	107	.3	[illegible]	[illegible]			4.83		50000	64	—

7305

MEN04369

7306

September 71

Inlet Flow MGD	Influent BOD mg/l	Influent BOD #/day	Influent Susp Solids mg/l	Influent Susp Solids #/day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phenol
77000			280	1347	7.0	1.52	132	
427000	6201	22434	284	1011	7.0	1.56	132	
185000			2332	9453	7.1	1.23	139	
52000	623	26305	1195	5003	7.5	1.76	132	
443000			1460	5385	7.5	1.20	140	
05000	5717	42958	592	4271	7.0	1.43	145	
43000			164	57	6.9	1.21	145	7710
78000			788	2250	6.7	1.09	145	
3000	4723	2761	4828	4789	6.7	1.08	145	
2	—	—	—	—	—	—	145	
73000	3	2223	540	550	6.7	.95	5	
50000			72	648	7.0	.22	130	
43000	900	4[illegible]	268	394	7.0	.40	125	
12000			3210	32447	7.3	.83	123	3750
131000			3.6	9120	7.6	.63	130	
77000	6100	21353	968	4658	7.3	1.48	130	
76000			604	4221	7.5	1.50	130	
30000	2150	16087	867	4395	7.3	.89	130	
75000			656	4340	7.4	1.50	120	
92000	6233	37243	808	4423	7.6	1.54	[illegible]	
159000			620	5847	7.1	1.38	123	13200
73000			716	5286	7.7	1.81	125	
150000	7575	91140	544	29588	7.6	1.52	126	
51000			1056	4853	7.3	1.31	127	
83000	7850	22343	916	2836	7.5	1.80	[illegible]	
453000			1056	3990	7.4	1.87	125	
33000	5700	30050	960	5068	7.5	1.66	125	
13000			1040	3729	7.5	1.77	132	7345
170000			3804	6608	7.8	1.91	131	
16020	5382	30426	4500	25575	7.5	1.72	132	

000 Flow GPD	000 BOD mg/l	000 BOD #/day	000 Susp Solids mg/l	000 Susp Solids #/day	000 pH	000 Total Solids %	000 Ortho P	000 NH_3
364000	269	817	304	923	8.3	.23		
350000	324	951	356	1045	8.1	[illegible]		
936000	268	760	247	756	8.2	.21		
452000	237	773	160	643	8.2	.22		
708000	247	704	180	642	8.2	.23		
350000	271	796	308	964	8.3	.24		
356000	248	736	280	831	8.3	.25	.3	
316000	274	722	304	801	8.3	.26		.08
250000	201	422	288	816	8.3	.26		
130000	195	221	292	331	8.3	.25		
140000	172	201	432	504	8.4	.29		
96000	235	188	256	205	8.4	.29		
164000	165	226	200	274	8.3	.27		
490000	181	664	212	778	8.3	.22		
600000	168	602	234	1248	8.6	.16	.3	.11
688000	125	206	396	1357	8.5	.25		
708000	96	567	144	850	8.7	.25		
700000	60	350	208	1214	8.6	.25		
708000	127	750	264	1557	8.5	.26		
600000	119	585	216	1081	8.5	.26		
529000	157	686	274	979	8.5	.26	.3	
328000	208	569	236	696	8.5	.26		.10
252000	202	424	212	446	8.5	.21		
304000	239	606	244	577	8.3	.22		
467000	250	976	326	1277	8.4	.22		
499000	291	1125	370	1534	8.4	.23		
400000	234	780	396	1321	8.3	.24		
436000	289	1050	356	1294	8.2	.26		
505000	247	960	338	1414	8.6	.24	.3	.22
346000	153	637	216	743	8.3	.21		

MEN04370

7307

September 81

300 level	Pond MLSS mg/l	Pond Biomass mg/l	Pond SV	Pond SVI	Pond D.O. mg/l	Pond Temp °F	Pond Level	# NH_3	Aerators hrs.	Sludge Total Solids %	Sludge Hauled Dump Farm	Air Temp	Phosphorus to UT #/Day
GC													
	3060	1930	400	131	.4	77	30	—	120	4.64	50000	67	—
	3173	1905	370	118	.7	76	32	—	120	4.66	43000	64	—
	2760	1681	390	141	.2	75	31.5	—	120	4.55	37000	6[illegible]	—
	2300	1928	530	129	1.6	68	33.5	—	120	4.79	37000	64	—
	3640	2332	480	135	2.6	66	34	—	120	5.34	36000	60	—
	3400		410	118	.5	74	28	—	120	—	36000	61	—
34	3300	2079	660	200	3.7	70	34	—	120	5.54	18000	55	—
	3620	2260	590	163	5.4	67	37	—	120	5.92	18000	47	—
	3120	2267	720	188	5.3	65	40.25	—	120	5.67	18000	62	
	[illegible]	2338	530	139	.5	68	42	—	99	5.74	0	58	—
	4260	2[illegible]	460	10[illegible]	2.9	69	43	—	96	4.41	18000	64	—
	1880	1142	600	319	3.2	62	32	—	96	4.85	37000	64	—
	3120	1907	510	173	3.1	69	28	—	96	4.39	37000	68	—
	[illegible]340	2039	630	189	2.5	71	21.5	—	96	3.71	37000	47	12.48
	[illegible]	2082	550	171	2.7	62	23	—	96	4.14	37000	49	18.72
	3[illegible]	1847	[illegible]	191	3.1	65	27	—	96	4.88	37000	48	21.84
	[illegible]00	1706	600	200	.3	69	28.5	—	96	5.27	37000	42	12.48
	3640	2125	630	216	3.6	63	33	—	12	5.00	43000	5[illegible]	28.08
	[illegible]0	2119	600	209	2.2	63	37	—	120	4.64	43000	4	21.84
	[illegible]	2130	[illegible]	[illegible]	4.5	62	41	—	120	4.82	50000	57	24.96
	[illegible]	2082	300	199	3.2	60	43	—	120	4.83	56000	48	21.84
	[illegible]40	2171	740	227	.2	59	33.5	—	120	5.34	67000	7	15.6
	[illegible]	—	740	201	.4	61	36.0	—	120	5.70	62000	48	24.96
	[illegible]	2048	[illegible]	[illegible]	.6	63	34.25	—	120	4.15	62000	55	34.32
	[illegible]	2625	[illegible]	17	2.3	57	37.50	—	120	5.06	62000	58	28.56
	[illegible]00	2803	560	183	1.0	69	36.0	—	120	4.56	62000	59	30.24
	[illegible]	2511	730	181	.2	59	32.50	—	120	3.94	62000	52	30.24
	[illegible]132	2458	[illegible]	226	2.2	56	32.50	—	120	4.17	50000	47	30.24
	[illegible]033	2443	420	223	3.0	55	33.0	—	120	3.33	50000	52	40.32
	[illegible]	2223	[illegible]	236	.4	58	30.0	—	120	4.42	43000	68	20.16

MEN04370

7307

September 81

000 Level	Pond MLSS mg/l	Pond Biomass mg/l	Pond SV	Pond SVI	Pond D.O. mg/l	Pond Temp °F	Pond Level	# NH3	Aerators hrs.	Sludge Total Solids %	Sludge Hauled Dump Form	Air Temp	Phosphorus to UT #/Day
	3060	1950	400	131	.4	77	30	—	120	4.64	50000	67	—
	3143	1905	370	118	.7	76	32	—	120	4.66	43000	64	—
	2760	1681	390	141	.2	75	31.5	—	120	4.55	37000	61	—
	2800	1928	530	189	1.6	68	33.5	—	120	4.79	37000	64	—
	3640	2332	480	135	2.6	66	34	—	120	5.34	36000	60	—
	3460		410	118	.5	74	29	—	120	—	36000	61	—
34	3300	2079	660	200	3.7	70	34	—	120	5.54	18000	55	—
	3620	2260	590	163	5.4	67	37	—	120	5.92	18000	47	—
	3820	2267	720	188	5.3	65	40.25	—	120	5.67	18000	62	
	3500	2238	530	139	.5	68	42	—	99	5.74	0	58	—
	4260	2556	460	108	2.9	69	43	—	96	4.41	18000	64	—
	1880	1142	600	319	3.2	62	32	—	96	4.85	37000	64	—
	3120	1907	510	173	3.1	69	28	—	96	4.39	37000	68	—
	2340	2089	630	189	2.5	71	21.5	—	96	3.71	37000	48	12.48
	3220	2082	550	171	2.2	62	23	—	96	4.14	37000	48	18.72
	3[illegible]	1847	560	191	3.1	65	27	—	96	4.88	37000	48	21.84
	3000	1706	600	200	.3	64	28.5	—	96	5.27	37000	42	12.48
	3040	2125	830	216	3.6	63	33	—	112	5.04	43000	52	28.08
	20	2119	800	209	2.2	63	37	—	120	4.64	43000	4[illegible]	21.84
	[illegible]	2130	[illegible]	206	4.5	62	41	—	120	4.82	50000	57	24.96
17	[illegible]	2082	830	199	3.2	60	43	—	120	4.83	56000	48	21.84
	[illegible]	2121	740	227	1.8	59	33.5	—	120	5.34	67000	[illegible]	15.6
	[illegible]	—	840	201	.4	61	36.0	—	120	5.70	62000	48	24.96
	[illegible]	2248	790	218	.6	63	34.25	—	120	4.15	62000	55	34.32
	[illegible]	2625	[illegible]	117	2.3	57	37.50	—	120	5.06	62000	58	28.56
	[illegible]	2863	560	183	1.0	69	36.0	—	120	4.56	62000	59	30.24
	[illegible]	2511	730	181	.2	59	32.50	—	120	3.94	62000	52	30.24
	[illegible]	2458	[illegible]	226	2.2	56	32.50	—	120	4.17	50000	42	30.24
	[illegible]	2443	720	223	3.0	55	33.0	—	120	3.93	50000	52	40.32
	[illegible]	2223	[illegible]	236	.4	58	30.0	—	120	4.47	43000	68	20.16

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Event Time	Influent BOD mg/l	Influent BOD #/day	Influent Susp Solids mg/l	Influent Susp Solids #/day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phenol mg/l
12000			792	2706	7.8	1.24	130	
18400	7012	22472	395	1200	7.5	1.65	130	
53000			148	497	7.9	1.85	127	
429000	5900	21162	927	3320	8.1	1.44	126	
527000			864	9342	8.1	1.27	130	1500
90000			272	1112	8.0	1.83	130	
92000	4550	18669	1540	6319	8.1	1.3	130	
56000			1180	7440	8.2	1.62	129	
154000	5675	21460	420	1590	7.9	1.74	129	
627000			364	2307	8.0	1.22	129	
70000	5317	21170	570	2270	7.9	1.84	34	
189000			172	791	7.8	1.21	129	7574
59000			272	1041	7.8	1.46	130	
260000	4217	22413	200	1044	7.7	1.43	127	
12000			372	1334	7.8	1.27	128	
337000	5727	21574	128	627	7.5	2.01	130	
59000			521	2621	7.0	1.40	130	
97000	6367	23186	308	1025	7.7	2.01	112	
31000			420	1304	7.5	1.57	120	
57000			930	4320	7.8	1.65	122	7700
327000	6700	18816	470	2282	7.8	1.74	124	9150
175000			190	584	7.9	1.76	115	
111000	6167	21170	1000	4371	8.0	1.67	116	
46000			430	1600	7.8	1.70	119	
94000	7437	13667	830	2874	8.0	1.42	117	
289000			152	318	7.7	1.61	109	
914000			1100	6521	7.8	1.72	118	
15000	2200	13119	388	2314	7.8	1.83	121	
194000			9340	24755	8.1	1.37	122	
98000	540	2472	720	3567	7.1	.56	117	
[illegible]			160	761	[illegible]	.60	118	

000 Flow GPD	000 BOD mg/l	000 BOD #/day	000 Susp Solids mg/l	000 Susp Solids #/day	000 pH	000 Total Solids %	000 Ortho-P	000 NH_3
462000	244	1032	244	1032	7.4	.76		
456000	264	1004	264	1004	7.5	.79		
460000	256	969	360	1271	7.5	.77		
488000	227	922	372	1514	7.5	.78		
660000	234	1289	262	1442	7.5	.80	.35	
622000	259	1345	324	1682	7.5	.82		.01
520000	224	971	224	971	7.5	.81		
3920000	208	680	200	654	7.5	.83		
356000	226	720	212	629	7.5	.86		
516000	237	1222	268	1382	7.5	.86		
584000	320	1558	380	1851	7.4	.88		
576000	309	1484	352	1689	7.4	.89	.31	
574000	270	1267	236	1071	7.4	.87		.22
570000	285	1356	340	1618	7.5	.88		
532000	284	1260	266	1182	7.4			
518000	324	1435	174	772	7.5	.87		
432000	264	951	336	1211	7.5	.88		
444000	252	932	300	1110	7.4	.82		
480000	372	1490	300	1201	7.5	.88		
350000	418	1216	276	803	7.5	.86	.335	
434000	242	873	364	1316	7.5	.87		.12
422000	197	725	400	1474	7.6	.88		
384000	239	765	292	934	7.6	.89		
450000	188	712	400	1516	7.5	.87		
380000	207	630	348	1058	7.5	.88		
400000	264	880	343	1143	7.5	.87		
388000	201	645	297	953	7.6	.86	.2	.01
394000	232	916	253	998	7.6	.86		
536000	167	746	372	1660	7.5	.85		
512000	167	741	348	1542	7.5	.84		
416000	252	1126	320	1431	7.4			

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12208

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Event Time	Influent COD mg/l	Influent COD #/day	Influent Susp Solids mg/l	Influent Susp Solids #/day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phenol mg/l
12000			792	2286	7.8	1.21	130	
184000	7263	22172	375	1200	7.5	1.65	130	
103200			148	497	7.9	1.85	127	
429200	5900	21142	928	3320	8.1	1.44	126	
523200			964	4342	8.1	1.77	130	2500
10000			272	1112	8.0	1.83	130	
93000	4550	18669	1540	6319	8.1	1.13	130	
56000			1180	7440	8.2	1.63	128	
54000	5675	21820	420	1580	7.9	1.74	129	
127000			764	2907	8.0	1.72	129	
70000	5917	21280	570	2070	7.9	1.81	130	
189000			172	791	7.8	1.21	129	9574
59000			272	1041	7.8	1.46	130	
260000	6217	22417	300	1044	7.7	1.43	132	
412000			300	1324	7.8	1.87	122	
337000	5717	21574	128	627	7.5	2.01	130	
59000			570	2621	7.0	1.60	130	
73000	6317	23186	308	1025	7.7	2.01	112	
31000			420	1404	7.5	1.57	120	
580000			830	4330	7.9	1.65	120	7000
127000	6900	18816	470	1282	7.8	1.74	124	9150
375000			190	594	7.9	1.76	113	
411000	6167	21170	400	1371	8.0	1.67	116	
46000			430	1600	7.8	1.70	119	
96000	7033	13657	830	2824	8.0	1.42	117	
289000			172	318	7.7	1.61	109	
114000			1900	6541	7.8	1.37	119	
175000	2200	13119	388	2314	7.8	1.83	119	
187000			4340	94255	8.1	1.37	122	
311000	500	2427	220	3567	7.1	.88	117	
[illegible]			[illegible]	[illegible]	[illegible]	.60	119	

000 Flow gpd	000 BOD mg/l	000 BOD #/day	000 Susp Solids mg/l	000 Susp Solids #/day	000 pH	000 Total Solids %	000 Ortho-P	000 NH_3
461000	244	1037	247	1052	7.4	.76		
456000	264	1004	268	1004	7.5	.77		
460000	254	892	360	1271	7.5	.77		
488000	227	922	372	1514	7.5	.78		
660000	234	1289	362	1992	7.5	.86		
632000	259	1365	324	1708	7.5	.82		.01
520000	204	971	244	1195	7.5	.81		
392000	208	680	266	869	7.5	.83		
356000	226	770	212	623	7.5	.86		
516000	237	1017	268	1151	7.5	.86		
584000	320	1558	380	1851	7.4	.88		
576000	309	1484	352	1691	7.4	.87		
524000	270	1267	236	1071	7.4	.77		.02
520000	225	1096	340	1654	7.5	.79		
532000	284	1260	360	1597	7.4			
597000	284	1435	176	622	7.5	.82		
432000	214	861	334	1211	7.5	.88		
850000	243	1722	300	1421	7.4	.84		
450000	372	1426	300	1351	7.5	.81		
356000	413	1226	276	819	7.5	.81	.038	
424000	262	883	364	1226	7.5	.82		.12
422000	197	725	400	1574	7.6	.81		
384000	239	745	282	879	7.6	.79		
350000	189	792	400	1678	7.5	.82		
388000	207	670	548	1770	7.5	.82		
440000	264	970	343	1263	7.5	.87		
388000	281	845	297	893	7.6	.86		.01
594000	202	916	253	1148	7.6	.86		
534000	167	746	302	1348	7.5	.85		
532000	167	741	368	1633	7.5	.84		
520000	250	1126	300	1351	7.4			

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Event Time PD	Influent BOD mg/l	Influent BOD #/day	Influent Susp Solids mg/l	Influent Susp Solids #/day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phosphorus mg/l
28000			792	2286	7.8	1.24	130	
29000	7022	22472	375	1200	7.5	1.45	130	
03000			148	487	7.6	1.24	125	
129000	5900	21162	928	3320	8.1	1.14	126	
127000			964	4342	8.1	1.27	130	2500
10000			272	1112	8.0	1.23	130	
12000	4550	18669	1540	6319	8.1	1.3	130	
56000			1180	7440	8.2	1.62	129	
54000	5675	21420	420	1580	7.9	1.24	129	
27000			364	2307	8.0	1.22	129	
30000	5917	21710	580	2370	7.9	1.34	34	
39000			172	791	7.8	1.21	129	2574
59000			272	1041	7.8	1.46	20	
26000	4417	22412	200	1044	7.7	1.42	22	
2000			312	1324	7.8	1.27	122	
37000	5717	21574	128	627	7.5	2.01	130	
59000			572	2621	7.0	1.60	130	
39000	6217	23186	308	1025	7.7	2.01	112	
31000			420	1804	7.5	1.57	120	
57000			930	4320	7.9	1.45	122	2700
27000	4700	18816	970	3882	7.8	1.34	124	9150
37500			130	594	7.9	1.76	115	
11000	6167	21170	900	4391	8.0	1.67	116	
46000			430	1600	7.8	1.70	118	
96000	7433	13657	830	2824	8.0	1.42	117	
89000			172	318	7.7	1.61	109	
14000			1100	6501	7.8	1.87	118	
15000	2200	13119	388	2314	7.8	1.83	121	
28000			4348	24785	8.1	1.77	122	
29000	580	2472	720	3067	7.1	1.58	117	
00000			600	1667	7.0	1.60	118	

000 Flow GPD	000 BOD mg/l	000 BOD #/day	000 Susp Solids mg/l	000 Susp Solids #/day	000 pH	000 Total Solids %	000 Ortho-P	000 NH_3
468000	264	1037	264	1037	7.4	.76		
456000	264	1004	264	1004	7.5	.76		
460000	250	957	360	1381	7.5	.77		
488000	227	962	372	1574	7.5	.72		
460000	234	1079	360	1379	7.5	.80		
632000	259	1365	324	1707	7.5	.82		.02
500000	264	991	264	995	7.5	.81		
392000	208	680	200	654	7.5	.83		
356000	226	790	212	629	7.5	.86		
516000	237	1527	268	1450	7.5	.96		
584000	320	1557	330	1551	7.4	.88		
576000	209	1484	352	1681	7.4	.87	.31	
524000	270	1267	236	1031	7.4	.87		.02
500000	285	1236	340	1429	7.5	.88		
532000	284	1260	366	1625	7.4			
548000	314	1435	176	672	7.5	.87		
432000	264	951	336	1211	7.5	.88		
400000	265	882	300	1001	7.4	.81		
450000	378	1405	300	1121	7.5	.88		
350000	413	1206	276	899	7.5	.84	.38	
424000	242	883	364	1326	7.5	.87		.17
422000	197	725	400	1574	7.6	.88		
504000	239	745	288	1498	7.6	.87		
450000	188	772	400	1502	7.5	.87		
378000	207	630	548	1668	7.5	.87		
400000	264	879	347	1113	7.5	.87		
388000	281	915	287	929	7.6	.86	.11	.01
594000	242	816	253	854	7.6	.86		
536000	187	746	572	2280	7.6	.85		
512000	187	796	364	1552	7.6	.84		
416000	250	1126	240	1121	7.6			

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73608

October 81

Effluent Flow MGD	Influent COD mg/l	Influent COD #/day	Influent Susp Solids mg/l	Influent Susp Solids #/day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phenol mg/l
2.2000			732	2276	7.8	1.24	130	
1.8400	7012	22472	375	1200	7.5	1.45	130	
1.0300			448	497	7.6	1.31	127	
1.2900	5900	21162	928	3320	8.1	1.14	126	
1.2700			864	9342	7.1	1.27	130	2500
1.0000			272	1112	8.0	1.83	130	
1.2000	4550	18669	1540	6319	8.1	1.13	130	
.5600			1180	7440	8.2	1.62	129	
.5400	5675	21420	920	1590	7.9	1.74	129	
.2700			364	2207	8.0	1.72	129	
.7000	5317	24170	580	2370	7.9	1.34	134	
1.8900			172	701	7.8	1.21	129	9574
.5900			272	1041	7.8	1.44	129	
1.2600	4217	22172	200	1044	7.7	1.42	127	
1.0000			372	1324	7.8	1.57	122	
1.3700	5727	21574	128	627	7.5	2.01	130	
.5900			528	2621	7.0	1.60	130	
1.9900	6367	23186	308	1025	7.7	2.01	118	
.5100			420	1904	7.5	1.57	120	
.5700			920	4320	7.9	1.65	124	7700
1.2700	4800	18816	476	2212	7.8	1.74	124	9150
.5700			196	594	7.9	1.76	113	
1.1300	6167	21170	400	4371	7.8	1.67	116	
.4600			430	1600	7.8	1.70	119	
.9600	7133	13657	700	2874	8.0	1.42	117	
2.8900			552	3.9	7.7	1.61	109	
1.1400			1100	6541	7.8	1.37	118	
1.5900	2200	13119	388	2314	7.8	1.83	121	
2.8400			4340	24705	8.1	1.37	120	
2.3900	580	2477	720	3567	7.1	.56	117	
[illegible]			160	[illegible]	[illegible]	.62	118	

COD Flow MGD	COD mg/l	COD #/day	BOD mg/l	BOD #/day	Susp Solids mg/l	Susp Solids #/day	pH	Total Solids %	Ortho-P	NH3
462000	244	1032	261	1032	8.4			.76		
456000	264	1004	246	1004	8.5			.79		
460000	266	989	360	1271	7.5			.77		
488000	227	923	372	1594	8.5			.72		
460000	234	1084	352	1377	8.5			.86	.3	.1
432000	253	1365	324	1797	8.5			.82		.02
500000	204	991	204	895	8.5			.83		
392000	208	680	200	654	8.5			.83		
356000	226	790	212	629	8.5			.86		
516000	237	1278	268	1450	8.5			.96		
584000	320	1559	380	1851	8.4			.88		
576000	309	1484	352	1691	8.4			.87	.5	.1
524000	270	1267	236	921	8.4			.87		.22
500000	285	1426	340	1698	8.5			.88		
532000	284	1260	364	1452	8.4					
518000	324	1435	174	622	8.5			.87		
432000	264	951	326	1211	8.5			.88		
480000	242	1000	300	1441	8.4			.81		
850000	372	1605	300	2121	8.4			.88		
350000	412	1206	276	879	8.5			.81	.235	
424000	262	883	364	1226	8.5			.87		.1
472000	187	725	400	1574	8.4			.88		
550000	239	765	232	849	8.4			.87		
450000	189	712	400	1505	8.5			.87		
518000	207	630	534	1626	8.5			.82		
448000	264	982	342	1273	8.5			.87		
518000	221	845	287	1099	8.4			.86		
594000	232	916	252	995	8.4			.86		
536000	167	746	[illegible]	[illegible]	[illegible]			[illegible]		
512000	167	741	[illegible]	[illegible]	[illegible]			[illegible]		
516000	252	1126	320	1411	8.4					

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7310

November 1981

Influent Flow GPD	Influent BOD mg/l	Influent BOD #/Day	Influent Susp Solids mg/l	Influent Susp Solids #/Day	Influent pH	Influent Total Solids %	Influent Temp °F	Influent Phenol
98200	3450	15281	140	576	7.5	1.40	116	
154000			345	1227	7.5	1.42	112	6600
164000			387	2693	7.8	1.48	110	
442000	5267	19444	340	1327	7.5	1.44	115	
365000			448	1005	7.6	1.50	108	
134000	4467	15083	680	2497	7.3	1.39	124	
81000			540	1761	7.7	1.57	118	
30000	4236	17248	132	563	7.7	1.41	108	
11000			1147	4682	7.9	1.35	104	6440
5500			1830	11584	7.9	1.20	138	
47200	3267	11480	470	1360	7.7	1.20	112	
32000			564	1591	7.6	1.37	116	
37200	4150	20463	1070	5427		1.34	115	
30000			1067	5010	7.7	1.51	115	
15000	4533	12171	96	250	7.8	1.56	115	
37600			623	2525	7.6	1.62	118	8880
49900			198	524	7.3	1.56	118	
29200	3800	17207	626	2749	7.8	1.60	115	
15600			112	426	7.3	1.03	96	
43000	3500	24634	1000	6264	7.7	1.96	122	
32000			600	2667	7.6	1.06	114	
30000	3567	10650	1380	3850	7.8	1.19	124	
15300			1900	5921	7.6	1.00	124	
1000			676	2420	7.1	1.36	124	
5800	4692	22300	840	3267	7.5	1.41	122	
45000			168	592	7.8	1.65	111	
33000	6433	32807	693	3200	7.7	1.56	109	
2000			860	2663	7.8	1.56	116	
3600	4933	16664	600	2180	7.7	1.60	118	
2000			860	4271	7.6	1.58	112	

DOW Flow GPD	DOW BOD mg/l	DOW BOD #/Day	DOW Susp Solids mg/l	DOW Susp Solids #/Day	DOW pH	DOW Total Solids %	DOW Ortho-P	DOW NH_3
442000	178	780	330	1354	8.3			
572000	235	1141	305	1480	8.3	.81	3	
655000	227	1288	284	1621	8.3	.81		.02
684000	210	1122	255	1370	8.3	.80		
592000	276	1360	270	1328	8.4	.78		
430000	178	657	200	734	8.4	.79		
298000	179	570	225	565	8.3	.80		
400000	191	635	1602	1600	8.2	.80		
388000	185	598	272	873	8.3	.80	2	
500000	250	1042	342	1427	8.3	.81		.46
422000	200	702	313	1159	8.5	.78		
516000	66	281	322	1340	8.5	.77		
430000	183	645	222	989	8.4	.75		
472000	263	1035	335	1285	8.4	.77		
550000	168	633	285	1082	8.4	.77		
498000	171	639	307	1197	8.4	.77	3	
490000	222	812	320	1174	8.4	.77		.01
448000	212	791	315	1170	8.4	.76		
560000	139	612	290	1065	8.48	.78		
560000	186	860	402	1858	8.48	.78		
605000	182	896	267	1464	8.4	.72		
632000	182	961	277	1274	8.4	.80		
580000	132	621	347	1633	8.4	.69	3	
505000	229	962	340	1572	8.4	.80		
550000	240	1103	340	1561	8.5	.76		
600000	160	966	262	1583	8.4	.68		
570000	228	1152	262	1326	8.5	.80		
500000	218	907	252	1050	8.4	.81		
550000	160	734	262	1201	8.4	.74		
500000	242	1092	384	1732	8.4	.72	2	

MEN04374

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November 1981

COD Penal Date	Sec	Fina MLSS g/l	Final Effluent g/l	Final Sol	Final SVS	Final Air	Final Temp °F	Final Level	# NH_3	Monitoring hrs	Sludge Total Solids %	Sludge pumped Days From	Air Temp °F	Phosphorus to U.T. #/Day
		2867	2034	450	150	19	65	31	216	95	4.02	50000	47	—
20		2933	1964	440	167	3.2	63	27.5	162	96	4.15	37000	46	1582
		3000	2267	560	181	4.6	62	38.0	162	96	4.25	37000	92	—
		3067	2167	640	196	4.2	63	41	108	96	4.27	37000	49	—
		3100	1950	770	248	6.2	60	46	216	96	4.17	37000	96	—
		2567	1300	670	265	7.5	57	35.5	—	96	4.39	50000	25	—
		3000	2567	700	174	5.0		41.5	270	96	4.52	50000	34	—
		3333	2166	630	189	6.1	58	41.0	162	96	4.36	50000	38	—
23		1200	—	850	203	6.2	53	32.5	162	96	4.73	37000	24	—
		1600	2600	780	172	5.6	53	38.5	54	114	4.02	37000	30	—
		4800	2650	960	200	7.6	51	32.5	162	120	4.22	50000	27	24
		4800	2800	1930	184	6.5	50	32.5	108	103	4.21	50000	28	—
		4533	2633	680	150	3.1	50	36.0	162	96	6.0	50000	29	—
		4033	2333	560	139	5.1	52	35.5	162	96	5.21	50000	—	—
		3333	2166	680	187	5.2	53	35.5	216	96	5.14	37000	32	—
22		4000	2400	890	222	21.9	54	35.5	108	96	5.39	50000	43	—
		3567	2017	570	160	5.2	54	36.0	216	96	5.57	50000	38	—
		3900	2275	960	220	5.2	54	34.5	162	96	5.24	50000	29	—
		3767	1992	840	220	6.5	53	34	162	96	4.57	62000	33	—
		4067	2417	920	242	3.6	53	30.5	162	96	4.63	62000	34	—
		3433	1958	650	189	6.2	52	32	108	96	4.44	62000	30	—
		3900	2025	640	160	7.9	49	33	162	96	4.37	62000	30	—
21		3833	2183	580	147	4.4	49	35.5	54	96	4.94	62000	30	—
		4100	2335	600	146	7.8	47	41	—	96	4.30	62000	27	—
		3667	2033	570	152	5.4	49	49	—	96	4.44	62000	38	—
		3833	2667	530	154	5.7	50	47	216	96	4.104	62000	38	—
		3833	2233	500	150	4.3	50	41	54	96	4.52	62000	30	—
		4467	2267	570	152	5.0	50	45.5	216	96	4.57	62000	32	—
		3800	1950	470	128	6.2	48	43	216	96	4.47	62000	34	—
17		3500	1605	280	110	2.7	50	47	216	96	4.47	62000	35	1582

MEN04375

-82 - February

Fe 155
2110

Weir Phenol #AP CC	Pond Press mg/l	Pond Bior Ass mg/l	Pond SV	Pond SVI	Pond D.O.	Pond Temp °F	Pond level	# NH3	Aerators hrs.	Sludge Total Solids %	Sludge Hauled Dump (MGD)	Sludge Hauled Farms (MGD)	Air Temp
070	2947	2200	440	148	6.6	42	28 1/2	0	96	2.26	.041	.025	
	2800	1933	430	154	6.7	42	26 1/4	0	96	2.05	.032	.050	
	2900	2167	440	157	6.8	42	27 3/4	0	96	2.42	.036	.025	
	3350	2250	480	143	6.6	42	26 1/4	0	96	1.99	.097		
	2550	1800	480	188	7.1	44	24	0	96	N.T.	.168		
	1933	1233	410	212	5.4	42	27	0	96		.104		
	2767		490	177	6.2	43	28 1/2	0	94	Returned to Pond	.144		
02	3133		780	233	6.1	42	32 1/2	702	112	"			
	3200	2000	960	300	6.7	38	33	756	120	1.46		.012	
	3167	2367	850	265	3.2	39	36	648	67		.040		
50	3300	2400	920	279	1.3	41	33	540	52	1.23	.032		
	3033	2133	750	247	0.8	44	28	594	57	0.82		.025	
	3100	2400	690	223	.7	46	23 1/2	918	60	.92	.012	.025	
10	2767		950	336	.5	47	22	108	74	1.15		.025	
	3933	2233	970	247	1.0	48	23 1/2	0	78	1.41	.012	.025	
	3533	2233	920	260	0.5	50	21 1/2	918	78	1.51	.028	.025	
	3633	2533	990	273	0.8	50	24 1/4	1080	120	1.81	.050	.025	
	3733	2333	990	245	1.2	49	28 1/4	324	120	1.96	.024	.025	
	3467	2167	990	286	1.4	49	29 3/4	216	120	2.02			
	4200	2250	980	233	1.2	49	30	270	120	N.T.			

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February 1982

Effluent Flow GPD	Effluent BOD mg/l	Effluent BOD #/day	Effluent Susp. Solids mg/l	Effluent Susp. Solids #/day	Effluent pH	Effluent Total Solids %	Effluent temp °F	Effluent Fecal
549,000			124	341	7.3	1.14		
728,000			136	535	7.5	1.22		4160
513,000	4717	20470	693	3890	7.9	1.20		
528,000			500	2202	7.7	1.15		
820,000	4100	28888	1160	8117	7.9	.9684		
773,000			90	580	7.2	.85		
799,000	3483	23211	84	560	7.7	.86		
404,000			140	472	7.4	1.15		9925
440,000			104	382	7.1	1.0		
421,000	4285	16931	33	130	7.2	1.15		
439,000			148	542	7.2	1.20		
585,000	4483	21984	627	3075	7.6	1.30		
568,000			585	2771	7.6	1.13		
342,000	5400	15672	64	186	7.4	1.35		2160
483,000			148	596	7.4	1.08		
417,000			7610	26200	7.6	1.03		
418,000			132	460	7.2	1.13		
545,000			200	1076	7.6	.82		
544,000			1173	5322	8.4	.86		
563,000			152	712	7.4	1.01		

000 Wen Flow GPD	000 BOD mg/l	000 BOD #/day	000 Susp. Solids mg/l	000 Susp. Solids #/day	000 pH	000 Total Solids %	000 Ortho P	000 NH_3
676,000	445	2509	340	1917	8.1	.5771	6.30	1.19
648,000	455	2459	260	1405	8.6	.6422		
692,000	580	3485	720	4155	8.3	.6204		
520,000	458	1986	490	2082	8.2	.6631		
788,000	678	4117	625	3795	8.2	.6201		
860,000 x	1204	8606	2967	21279	8.0	.8772		
733,000 x	990	6044	1420	6227	8.1	.6794		
514,000 x	1050	7040	1880	18655	8.2	.7490		1.53
588,000	945	4634	1600	7846	8.1	.7503		
712,000 x	960	5700	1860	11045	8.0	.7847		
376,000	915	2869	640	2007	8.0	.6350		.03
432,000	930	3351	700	2539	7.9	.6503		
344,000	1035	2969	480	1377	7.9	.6837		
584,000	945	4603	520	2533	8.0	.6728		3.8
520,000	930	4033	660	2862	7.9	.6630		
704,000	940	5635	1040	6196	7.9	.7032		
864,000			580	4035	8.0	.6549		
1008,000			460	3867	8.0	.6397		
620,000			1280	6619	8.0	.7580		
668,000			620	3454	7.9	.6085		

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MEN04376

MEN04377

June 12	Flow Out (1,000 gal)	Sludge Out (gal)	BOD In (lbs)	BOD In (mg/L)	BOD Out (lbs)	BOD Out (mg/L)	Temp Out (weir °F)	Flow DO	Mixed SS (mg/L)	Eff. T.S. (%)	Eff. S.S. (mg/L)	Sludge T.S. (%)	Filter (%)	[illegible]
	460	37,000			1649	430	72	1.1	3,080	.76	136	5.0	1.65	1885
	476	37,000			1,388	408	75	0.3	[illegible]	.74	142	4.97	1.6	2045
	504	48,500	33,505	6,050	1,660	395	77	0.1	2,940	.75	168	[illegible]	1.25	[illegible]
	584	43,000			1,914	393	76	0.8	3,080	.77	240	[illegible]	[illegible]	1531
	576	37,000	23,493	6,417	1,816	378	77	0.6	3,000	.77	134	[illegible]	1.375	1890
	548	37,000			1,602	355	76	0.7	3,020	.75	130	[illegible]	1.55	1971
	500	43,000	31,375	9,500	1,772	425	75	1.2	2,880	.80	204	5.66	1.8	1313
	520	50,000			1,605	370	75	[illegible]	2,580	.79	156	[illegible]	1.575	1527
	504	50,000			1,618	385	75	1.6	2,620	.78	138	[illegible]	1.55	1756
	472	37,000	24,290	4,467	1,492	379	75	2.5	3,050	.79	284	—	—	—
	396	31,000			951	288	74	1.7	2,740	.77	204	5.24	1.425	1871
	388	37,000	22,536	5,583	1,113	344	74	2.2	2,380	.78	114	5.24	1.60	1529
	352	37,000			—	—	76	1.8	2,620	.76	130	4.74	1.45	1670
	556	37,000			—	—	80	2.2	1,940	.74	144	4.23	1.20	1235
	488	31,000			—	—	80	1.0	4,140	.74	[illegible]	4.53	[illegible]	3559
	516	31,000			—	—	76	2.3	2,580	.75	[illegible]	[illegible]	1.42	1631
		37,000						3.0					1.55	

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MEN04378

Flow Out (1,000 gal)	[1]Sludge Vol (gal)	[2]Pou (lbs)	[3]BOD (lbs)	[4]BOD OUT (lbs)	[5]BOD OUT (mg/L)	[6]Temp OUT (deg F)	[7]Total Co	[8] (mg/L)	[9]Eff. TS (%)	[10]Eff. SS (mg/L)	[11] TS (%)	[12]Fiber (%)	B. m (lbs)
576	50,000	31,124	4,000	1,239	258	64	3.1	2,820	.68	280	3.87	1.3	1,681
636	50,000			1,528	288	64	3.0	1,160	.70	170	3.18	1.2	935
640	50,000	16,654	4,967	1,281	240	67	0.9	3,160	.70	320	[illegible]	1.15	2,018
596	[illegible]	14,201	4,233	1,162	234	69	1.2	2,620	.67	190	4.41	1.4	1,652
452	50,000	15,637	2,500	206	60	68	1.0	2,050	.67	230	4.72	1.575	1,644
500	[illegible]	22,558	5,183	1,510	304	68	1.0	[illegible]	[illegible]	[illegible]	4.35	1.3	1,723
408	[illegible]			909	238	67	0.9	[illegible]	.68	300	—	—	—
400	32,000	34,514	4,533	917	275	67	1.1	[illegible]	[illegible]	233	4.57	1.375	1,959
648	45,000			1,314	253	67	1.2	2,840	.67	313	5.52	1.725	1,793
688	38,000			1,802	314	64	1.0	2,760	[illegible]	320	4.23	1.225	1,769
804	52,000			2,239	324	64	1.0	2,260	[illegible]	235	1.42	1.3	1,683
764	51,000			2,141	336	[illegible]	1.3	3,020	[illegible]	340	4.16	1.375	2,013
724	50,000	19,082	3,375	1,244	206	64	0.9	2,900	.67	213	4.79	1.375	1,937
668	[illegible]			1,382	248	64	1.1	3,200	.68	247	4.71	1.4	2,053
640	50,000	14,502	3,600	1,324	248	66	1.4	2,920	.69	300	4.68	1.3	1,976
624	50,000			1,670	321	67	1.4	[illegible]	[illegible]	300	4.66	[illegible]	1,622
556	43,000	15,311	3,511	[illegible]	311	66	[illegible]	[illegible]	[illegible]	267	[illegible]	1.3	1,834
472	50,000			1,330	[illegible]	[illegible]	.9	2,730	.74	247	—	—	—
534	37,000			2,167	445	66	1.0	[illegible]	[illegible]	370	4.90	[illegible]	1,355
[illegible]	[illegible]	17,415	4,[illegible]	1,115	520	67	1.0	[illegible]	[illegible]	[illegible]	[illegible]	1.3	1,616
408	37,000			[illegible]	528	69	1.0	[illegible]	[illegible]	160	4.88	[illegible]	1,614
456	[illegible]	[illegible]	4,850	[illegible]	[illegible]	70	[illegible]	[illegible]	.70	160	[illegible]	[illegible]	1,845
440	40,000			1,835	500	71	[illegible]	3,260	.81	130	[illegible]	[illegible]	2,265
484	42,000	13,841	[illegible]	1,555	378	73	[illegible]	3,040	.80	160	[illegible]	[illegible]	[illegible]
456	37,000			1,163	305	74	[illegible]	3,200	.79	270	[illegible]	[illegible]	2,139
492	37,000			1,518	370	74	1.5	4,140	.80	140	[illegible]	[illegible]	2,781
480	43,000	17,908	4,400	1,681	420	74	1.3	3,280	.79	200	4.52	[illegible]	2,074
484	31,000			1,737	350	73	[illegible]	[illegible]	.79	13	[illegible]	[illegible]	1,922
536	50,000	[illegible]	[illegible]	[illegible]	[illegible]	74	[illegible]	[illegible]	.77	240	[illegible]	[illegible]	2,020
[illegible]	[illegible]			[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]	[illegible]

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MEN04379

456	50,000	10,683	4,475	28	.44	61	1.1	4,367	.57	340	[illegible]	615	2,043
424	50,000			[illegible]	213	64	[illegible]	4,133	[illegible]	260	3.[illegible]	1.05	2,003
330	50,000	10,101	3,825	643	[illegible]	[illegible]	[illegible]	3,767	[illegible]	360	-	0.95	2,405
344	49,000			500	13	60	1.6	3,700	[illegible]	140	3.[illegible]	1.02	2,344
319	[illegible]	40,[illegible]	8,475	[illegible]	[illegible]	59	0.9	4,000	.88	[illegible]	[illegible]	0.935	2,574
460	[illegible]				[illegible]	59	3.7	[illegible]	.90	[illegible]	[illegible]	0.935	[illegible]
[illegible]	[illegible]				[illegible]	[illegible]	[illegible]	3,733	[illegible]	140		0.875	[illegible]
[illegible]	[illegible]	[illegible]	5,617		[illegible]	[illegible]	0.7	[illegible]	[illegible]	[illegible]	[illegible]	0.90	574
[illegible]	[illegible]				[illegible]	64	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	67	[illegible]	[illegible]	[illegible]	460	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	3.6	3,567	[illegible]	740	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	2,075	[illegible]	[illegible]	[illegible]	3.1	[illegible]	.79	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	147	64	4.8	[illegible]	.78	390	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	150	64	1.6	[illegible]	.70	310	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	14,[illegible]	3,283	[illegible]	214	65	4.4	4,561	.17	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	1.3	3,920	[illegible]	[illegible]	[illegible]	0.975	1,147
416	[illegible]	[illegible]	[illegible]	[illegible]	144	67	1.1	3,000	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	1.1	2,000	[illegible]	[illegible]	[illegible]	[illegible]	—
[illegible]		11,331	3,330	[illegible]	154	[illegible]	3.8	[illegible]	[illegible]	310	[illegible]	1.05	[illegible]
[illegible]	[illegible]			[illegible]	[illegible]		3.7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1,116
	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1.30	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		1.7	[illegible]	[illegible]		[illegible]	0.825	[illegible]
	[illegible]			[illegible]	[illegible]	[illegible]	4.0	[illegible]		[illegible]	[illegible]	1.05	1,330
[illegible]	[illegible]	11,[illegible]	3,261	[illegible]	30	[illegible]	1.4	[illegible]		140		1.17	[illegible]
	39,000			[illegible]	19	[illegible]	0.8	[illegible]	[illegible]	130		1.20	[illegible]
[illegible]	[illegible]	30,117	1,300	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		310		[illegible]	
[illegible]	63,000			[illegible]	[illegible]	[illegible]	1.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	70,000				[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	4,561	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]

7330

MEN04380

[illegible]

[illegible]	[illegible]	[illegible]	[illegible] #/D	Influent pH	Influent Total Solids %	Influent Phenol ppb	000 Weir Flow GPD	000 BOD mg/l	BOD #/D	000 Susp Solids mg/l	Susp Solids #/D	000 pH	000 Total Solids %	000 Ortho P	000 NH_3
[illegible]		16	527?	7.5	1.19	1556?	716,000	89	531	164	979	8.0	.5248		.15
[illegible]	[illegible]	[illegible]	[illegible]	7.8	1.22?		62?,000	76	403	168	891?	8.0	.5?5	7.88	
		[illegible]	[illegible]	7.8	1.2?		676,000	[illegible]	43?	156	927?	8.1	.5296		.08
[illegible]		[illegible]	[illegible]	[illegible]	1.?		352?,000	[illegible]	[illegible]	72	311?	8.2	.5??7		
[illegible]		[illegible]	[illegible]	7.6	1.50		?60,000	152	7??	7?	372	8.2	.5444		
[illegible]	[illegible]		773?	7.9	1.64	13600	?40,000	107	630?	84	518	8.2	.5634?	5.7?	
[illegible]		[illegible]	4950?	7.8	1.50		67?,000	129	727	108	609	8.?	.5869		.11
[illegible]	[illegible]		[illegible]	7.7	?.52		612,000	46?	745	152	776	8.0	.5941		
[illegible]	[illegible]	[illegible]	5467?	7.6	1.43		436,000	135	491	136	494	7.9	.6127	5.??	
[illegible]	[illegible]	[illegible]	554?	7.5	1.37		484,000	166	67?	144	581?	7.9	.6?91		.13
[illegible]	[illegible]	[illegible]	20052?	7.4	1.85		524,000	129	561	126?	59?	8.0	.6276		
[illegible]	[illegible]		709?	7.?	1.40		412,000	96?	467	200	687	7.9	.64??		
[illegible]	[illegible]	[illegible]	[illegible]	7.?	1.1?	9370	880,000	1??	114?	160	1068	8.2	.6559?	.52	
[illegible]	[illegible] 928?	[illegible]	747	7.2	1.08		920,000	86	660	200	1525	8.2	.6709		.10
[illegible]	[illegible]	[illegible]	19562	7.0	1.49		864,000	222	1600	244	1558?	8.2	.6605		
[illegible]	4851?	64?	17805	7.7	1.68		908,000	290	2176?	350	2650	7.8	.7039	.98	
[illegible]	[illegible]	[illegible]	855?	7.5	1.15		332,000	167	462	176?	587?	8.0	.6715?		.04
[illegible]	123? 21948?	[illegible]	1475	7.8	1.22		604,000	156	786	96	484?	8.?	.709?		
[illegible]	[illegible]	13?	745	7.6	1.?8		572,000	149	906	132	620	8.2	.674?		
15,000	2900? 2?533	12?	738	7.6?	1.08	4500	528,000	149	568	152	669	8.3	.6719	<.68	
.5??	1593 16244	80	84	7.5	1.25		572,000	156	744	164	782	8.2	.6714		<.02
[illegible]	4930? 3??6	2?71	1585	7.8	1.29		676,000	128	722?	200	1128	8.?	.6408		
?,000	1225 304	21	90	7.1	1.13		740,000	109	673	100	617?	8.2	.6418	<.68	
7,000	5817? 16240?	31?	2093	7.6	1.16		648,000	123	665	180	973	8.1	.660		.10
4,000	—	—	—				332,000			68	188	8.4	.6489		
2,???		86	511	7.3	1.80		772,000			96	[illegible]	8.4	.6548		
9,000		40?	369?	7.4	1.42		744,000			84	521	8.4	.6501		
45,000		[illegible]	27052?	7.2	1.90		496,000			132	546	8.4	.6337		

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				Inlet	Weir Flow GPD	mg/l		mg/l	#/day		Total Solids		P	
		7.2			518,000			220	1005	7.8	.6164			
					707,000						.6249	2.7		
					493,000			17		7.6	.6176			-.03
	83		.7					190		7.6	.6274			
	774	7.2	1.00		514,000			140	402	7.8	.6150			
			1.07		556,000			10	510		.6093			5.20
	.18		1.10		553,000	14		120	552	8.3	.6072			
			1.20		458,000			220	785		.6040			
	50		1.16	7260	424,000	123				7.9	.6665			
	.55	7.2	1.06		404,000	51	275	60	602	8.0	.5993			
			1.11		596,000	74	435	220	1277	8.2	.5998			12.1
			.94		700,000	60	350	110	642	8.2	.5987			
	1452	7.7	1.04		672,000	63	352	125	717	8.1	.5707			19.0
	790	7.3	.94		648,000	78	422	112	605	8.2	.5761			
	1204	7.5	.49		636,000	83	440	112	594	8.2	.5947			
		7.8	1.14	5140	660,000	51	255	120	600	8.1	.5687	7.22		
	614	7.9	.75		710,000	50	299	120		8.3	.5765			7.9
					408,000	85	289	152	517	8.2	.5457			
		7.0	2.18		550,000	78	359	124	571	8.3	.5576			
	110	7.3	.30		504,000	96	403	116	488	8.4	.5501			1.31
	10 150	7.5	.70		460,000	84	322	96	368	8.1	.5345			
	44 52	7.9	.23		368,000	79	242	88	270	8.2	.5170			
	8452	7.7	1.05		260,000	72	216	108	324	8.2	.5047		5.80	
	146	7.5	1.71	9652	792,000	58	343	64	422	8.1	.4808			1.34
	058	6.9	.72		660,000	50	275	104	572	8.1	.4951			
	160	7.6	1.51		660,000	50	275	128	705	8.1	.4936	6.78		
		7.9	1.52		444,000	51	189	116	430	7.9	.5052			5.8
1485	88 313	7.8	1.22		168,000	44	62	100	140	7.8	.5151			
	224	7.6	1.17		148,000	130	160	140	173	7.6	.5284			
		7.5	1.70		756,000	73	460	112	706	7.8	.5229			
151 000		7.4	.60		780,000	63	410	128	833	8.1	.5220	7.32		

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MEN04381

MEN04382

	[illegible]	T	D		[illegible]	Pond Temp °F	[illegible] Level in.	#NH3	[illegible] hrs	Sludge Total Sold	MGD Sludge wasted [illegible]	F/M Ratio	"	[illegible] Fed	[illegible] /DAY
	[illegible]	[illegible]	935	[illegible]	[illegible]	64	[illegible]	750	120	303			1		
	[illegible]	[illegible]	700	[illegible]	[illegible]	65	[illegible]	432	120	[illegible]			1		
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	64	[illegible]	Ø	120	300					
	[illegible]	[illegible]	580	[illegible]	[illegible]	66	37	810	120	257					
	[illegible]	[illegible]	[illegible]	187	[illegible]	67	57½	918	80	258					
	2730	[illegible]	420	[illegible]	1.3	67	[illegible]	918	100	252					
	2820	[illegible]	[illegible]	[illegible]	1.5	65	41½	810	108	260				Newtank	
	[illegible]	[illegible]	415	143	1.7	65	[illegible]	648	120	264					
25	2880	[illegible]	370	128	2.8	67	57	[illegible]	120	261					
	[illegible]	[illegible]	250	126	2.2	69	34¼	756	120	276					
	2890	[illegible]	300	104	3.2	69	[illegible]	756	120	259			[illegible]	1318	
	[illegible]	132	260	[illegible]	2.8	74	[illegible]	918	120	279			½	92	
	[illegible]	[illegible]	300	118	3.3	73	[illegible]	918	70	242			2½	1578	
	[illegible]	[illegible]	280	122	2.8	74	39½	756	120	242			1¼	1021	
	[illegible]		290	13	2.6	74	40	324	120	439			2	1485	
	[illegible]	[illegible]	[illegible]	[illegible]	2.1	74	29	1080	120	238			3½	2506	
	[illegible]						42½	860	70	207			2¾	[illegible]	
	2460	[illegible]	[illegible]	123	4.9	72	45	918	120	[illegible]			—	~~[illegible]~~	Newtank
	2160	[illegible]	330	124	1.6	71	44	810	120	[illegible]			—		
	2160	[illegible]	300	137	4.5	68	45½	432	120	208		200cc/[illegible]	—	109	
	[illegible]	[illegible]	1250	105	[illegible]	66	43	594	120	243		[illegible]		138	Newtank
	3240	[illegible]	[illegible]	219	4.8	65	42	648	120	256			¼	185	
26	3620	[illegible]	900	249	4.6	65	57	756	120	220			2¼	1578	
	3700	[illegible]	870	270	4.1	64	37½	648	120	224			2¾	1763	
	3980	[illegible]	900	266	[illegible]	64	40	594	120	289			2½	1578	
	3500	[illegible]	890	254	1.9	67	42	648	[illegible]	[illegible]			2¾	1763	
	[illegible]	[illegible]	[illegible]	218		[illegible]	38½	102	120	[illegible]			1½	835	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	70	21	Ø	120	355			1½	835	
	[illegible]		810	270	1.5	[illegible]	36½	702	120	276			1½	835	
	[illegible]	[illegible]	820	[illegible]	1.2	75	38½	702	120	268			1¼	928	
27	[illegible]	760	[illegible]	311	1.2	74	31	648	120	334			¾	650	

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MEN04383

				T °F	Level inches	# NH3		Total	F/M Ratio	Infl Cal Fed
	70	[illegible]		71	[illegible]	540	120	361		102
				70		540	120	288		1763
				[illegible]		648	120	304		(2048)
				66	[illegible]	[illegible]		283		
				67		432	120			
				69			120	371		
	670	170	0.7	72		864	120	352		
	590	13	0.8	73	34	756	120	309	.12	
		45		72	30	432	120	341	.12	
	450		10	70	31	756		339	.089	
			0.1	72	29	540	96	232	.16	
				72	26 1/4	540	96		.16	
			10			Ø			.44	
			0.6	73	28 1/4	Ø	96	389	.10	
			0.8	72	29 1/2	810		363	.16	
				70		648			.107	
						594	120		.06	
			14			756		357	.11	
						594	120	313	.14	
				72	28 1/4	702	130	183	.13	
				69	30 1/2	432		228	.08	
1900		205	35	68		810	120	283	.16	
	730		10	68	33	270	120	302	.26	
	840		0.5	72	34	540	120	288	.19	
	870	197	1.0	70		648	120	265		
	890	198	0.9	72	34 1/2	810	120	4.02		
	910	218	0.2	75	37 1/2	324	120	3.99		
	950	224	0.1	76	30	108	120	4.04		

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INFLUENT

MEN04384

	Influent Flow GPD	Influent BOD mg/l	Influent BOD #/D	Influent S.S. mg/l	Influent S.S. #/D	Influent PH	Influent Total Solids	Influent Phosphorus	Influent Phenol
1.	429,000	5567	19918	508	1818	7.2	143	4.58	
2.	931,000	3950	30,670	184	1429	7.1	1.02		
3.	668,000	4967	27612	1800	10,028	7.1	1.24		
4.	557,000	4917	22,941	248	1152	7.4	1.36		
5.	948,000	4567	36,107	452	3574	7.2	1.25		
6.	607,000	5260	26,626	432	2187	7.2	1.44		5400
7.	551,000	5217	23,974	620	2849	7.4	1.44		
8.	636,000	3700	19,626	160	849	7.9	1.45		
9.	457,000	3850	14,674	392	1494	7.5	1.32	6.24	
10.	608,000	4750	24,082	413	2093	7.7	1.34		
11.	679,000	4500	25,483	733	4151	7.3	1.25		
12.	287,000	4100	9881	432	1041	7.4	1.38		
13.	688,000	7133	42434	548	3144	7.2	1.31		
14.	649,000	4950	26,793	100	541	7.5	1.34		
15.	634,000	3267	17,273	1104	5837	7.1	1.08		
16.	923,000	3467	26,688	728	5604	7.4	1.11		
17.	812,000	3333	22,571	544	3684	7.2	.93		
18.	638,000	2600	13,834	640	3405	7.0	.76		
19.	573,000	3383	16,168	116	554	7.0	.92		
20.	713,000			108	642	7.0	.98		
21.	445,000			220	818	7.3	1.15		
	730,000			152	989	7.2	1.19		
	663,000			292	1614	7.3	1.31		
24.									
25.									
26.									
27.									
29.									
30.									
31.									

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MEN04385

	000 Weir Flow GPD	000 BOD mg/l	000 BOD #/D	000 S. S. mg/l	000 S. S. #/D	000 PH	000 Total Solids	000 Ortho-P. mg/l	000 Ortho-P. #/day	000 NH3 mg/l	000 NH3 #/day	000 Phenol
1.	396,000	250	826	580	1916	8.3	.75	.07	310		378	
2.	652,000	163	886	200	1092	8.2	.65		62		540	
3.	656,000	203	1111	640	3501	8.1	.68		60		540	
4	604,000	192	967	180	907	8.1	.68		52		486	
5.	648,000	207	1119	440	2378	8.2	.57		42		486	
6.	616,000	211	1084	510	2620	8.1	.68	.13	2437	.04	540	33
7.	624,000	188	978	320	1665	8.2	.67	99	140		432	
8.	600,000	131	656	320	1601	8.2	.66	97	136		486	
9.	604,000	154	776	240	1208	8.4	.67	.29	132	.02	432	
10.	480,000	180	720	340	1360	8.2	.67	89	125		270	
11.	332,000	204	565	610	1689	8.4	.69	78	110		540	
12.	234,000	176	417	460	1090	8.4	.68	74	106		216	
13.	124,000	209	216	440	455	8.6	.70	2.49	86 120		270	
14.	684,000	181	1033	240	1369	7.7	.69	100	140		270	
15.	664,000	150	831	320	1772	8.4	.68	94	132		432	
16.	632,000	184	970	580	3331	8.4	.67	4.27	94 132		378	
17.	696,000	180	1045	480	2786	8.5	.66	—	off		594	
18.	656,000	151	826	180	985	8.5	.64	—			594	
19	552,000	149	686	320	1473	8.5	.64	—			702	
20.	516,000			340	1463	8.4	.64				702	
21	480,000			360	1441	8.3	.63				702	
	412,000			500	1718	8.4	.64	2.34			486	
	492,000			440	1805	8.3	.64				648	
24.											594	
25.				398 ppm								
26.							.6782					
27.							.0398					
28.							.6384%	DS				
29.												
30.												
31.												

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MEN04386

	Pond MLSS mg/l	Pond Biomass mg/l	Pond SV	Pond SVI	Pond DO	Pond Temp.	Pond Level	Pond CO_3		Pond ZSU	Z
								100	Inf		
1.	5320	4020	900	169	1.7	58	48½			390	[illegible]
2.	4240	2478	880	208	2.4	63	43½				
3.	4720	2720	700	148	.7	62	42	3.5	2.2		
4.	2900	1100	850	293	2.0	60	43½				
5.	4600	2875	890	193	3.8	59	40½				
6.	4320	2520	930	215	4.5	58	43½				
7.	4280	2205	900	210	4.8	50	46½	3.8	2.9	350	8
8.	5480	3455	730	133	7.1	47	49				
9.	5700	3512	960	168	7.8	44	50			500	[illegible]
10.	5260	2910	950	181	7.8	46	51				
11.	5060	2860	780	154	7.4	40	49				
12.	4620	2420	960	207	8.7	40	45			450	[illegible]
	4700	2500	910	194	7.3	43	42½			400	8
14.	4580	2280	860	188	6.8	45	43	3.5	2.1		
15.	4360	2160	840	193	4.6	48	43			390	8
16.	4660	2660	900	193	5.2	47	41			330	[illegible]
17.	4320	2420	770	178	5.4	48	41				
18.	4340		820	189	6.1	48	45				
19.	4260	2660	900	211	5.5	47	48			290	[illegible]
20.	4200	2500	870	207	6.3	49	47½	–		280	6
	4240	2715	830	196	6.8	46	48½			270	6
	4300	2650	800	186	5.3	49	46			240	5
23.	4460	3010	810	182	4.0	54	41½			290	6
24.											
25.											
26.											
27.											
28.											
29.											
30.											
31.											

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MISCELLANEOUS December 1982

MEN04387

	Aerator Hours	Air Temp.	Sludge total Solids	Sludge Wasted F/ Clarifier Daily	F/M 5 day/ Average		Polymer to clarifier cc/min		Sludge Sprayed
1.	5-24	60	4.40	50,000 #33	.08	.12	17		24,000
2.	5-24	60	4.52	59,000 #33	.20	.14	—		24,000
3.	5-24	38	4.65	87,000 #33	.16	.14	28		24000
4.	5-24	46	4.33	93,000 #33	.34	.19	27		24,000
5.	5-24	40	4.30	49,000 #33	.20	.20	—		—
6.	5-24	32	4.58	87,000 #33	.17	.21	—		20,000
7.	5-24	30	4.45	74,000 #33	.18	.21	70		24,000
8.	5-24	16	4.37	81,000 #33	.10	.20	46		28,000
9.	5-24	24	4.33	68,000 #34 1	.07	.14	38		28,000
10.	5-24	24	4.73	93,000 #1	.15	.13	27		24,000
11.	5-24	—	—	62,000 #1	.15	.13	—		28,000
12.	5-24	19	4.87	56,000 #1	.07	.11	—		—
13.	5-24	31	4.08	56,000 #1	.26	.14	52		0
	5-24	39	3.41	56,000 #1	.19	.16	50		—
15.	5-24	30	4.28	25,000 #1	.13	.16	50		68,000
16.	5-24	18	4.31	68,000 #1	.16	.16	30		32,000
17.	5-24	32	3.85	93,000 #1	.15	.18	32		16,000
18.	5-24	37	4.25	87,000 #1	.09	.14	40		24,000
19.	5-24	29	4.12	62,000 #1	.10	.13	16		—
20.	5-24	31	4.18	62,000 #1			—		32,000
21.	5-24	26	4.26	87,000 #1			60		—
	5-24	37	4.80	43,000 #1			46		20,000
23.	5-24	46	4.27	62,000 #1			24		8,000
24.				53,000 #1					
25.									
26.									
27.									
28.									
29.									
30.									
31.									

MEN04388

memo / MENASHA CORPORATION

TO: Norm Johnstone

DATE: July 5, 1974

SUBJECT: Peak Load B.O.D. Study

FROM: Bruce Buchanan

cc R. Thorne
J. Scott
P. Vestal
E. Manders
A. Schenck

Introduction: During the months of January through March 1974, numerous variables were plotted with regard to B.O.D. These parameters were histogrammed in an effort to illuminate a cause-effect relationship. Many of the datum were found to be essentially independent of B.O.D., but five specific dependent variables were identified. The data plotted was as follows:

Clarifier: B.O.D., G.P.D., SVI, SS, Sludge consist, loads of sludge hauled;
Pond: SS, B.O.D., G.P.D., D.O., SVI, LBS NH_3, River seed G.P.D., Volume pulp washing & volume biocide.

Conclusion: It was found that the five critieria that could be directly correlated to the rise and fall in B.O.D. level from the clarifier during February and March were:

1. Rise in level of B.O.D. to the aeration pond.
2. Subsequent lack of D.O. due to insufficient aerator capacity.
3. Lack of NH_3 (nutrient) to pond.
4. Probably depletion of pond flora due to H-130 fresh water well biocide.
5. Introduction of river water as seed to renew flora.

Discussion: The most important single critieria affecting B.O.D. to the river was pond influent loading. The level of B.O.D. to the pond rose from an average of 24,500#/day before the incident to a three day high of 44,000#/day. This single factor, at constant pond efficiency, would amount to an 80% increase in B.O.D. to the river. There are many possible causes for this increased B.O.D. load, but the most probable would be spills and reduced pulp washing.

Because of the increased loading on the pond, the efficiency of the pond dropped during this peak. Since the aerator capacity is fixed, an increased load results in decreasing D.O. Low levels of D.O. produce a reduction in bacterial activity. The introduction of the H-130 biocide at this point in time may also have hurt pond flora. The running average %

5984

To: Norm Johnstone

From: Bruce Buchanan

Peak Load B.O.D. Study

Date: Jul , 1974

efficiency of the pond during January was 95.9%. During the B.O.D. rise the efficiency dropped to 93.6%. This 2.3% drop in efficiency amounted to about 700 ppm increase in B.O.D. to the river in addition to the loading contribution. On the downward slope of the B.O.D. curve beginning around February 27, after initiation of seeding and regain of Ammonia feed, efficiency rose to 94.92%. Additional aerator capacity could have increased the efficiency even further.

With present equipment and methodology, pond loading cannot be measured without the inherent five day lag. Knowledge of the B.O.D. to the pond is therefore currently of little practical use. However, knowledge on pond B.O.D. loading would be of practical value if.

1. If the information were available concerning current status and,
2. If we had the means with which to deal with increased loading should it occur.

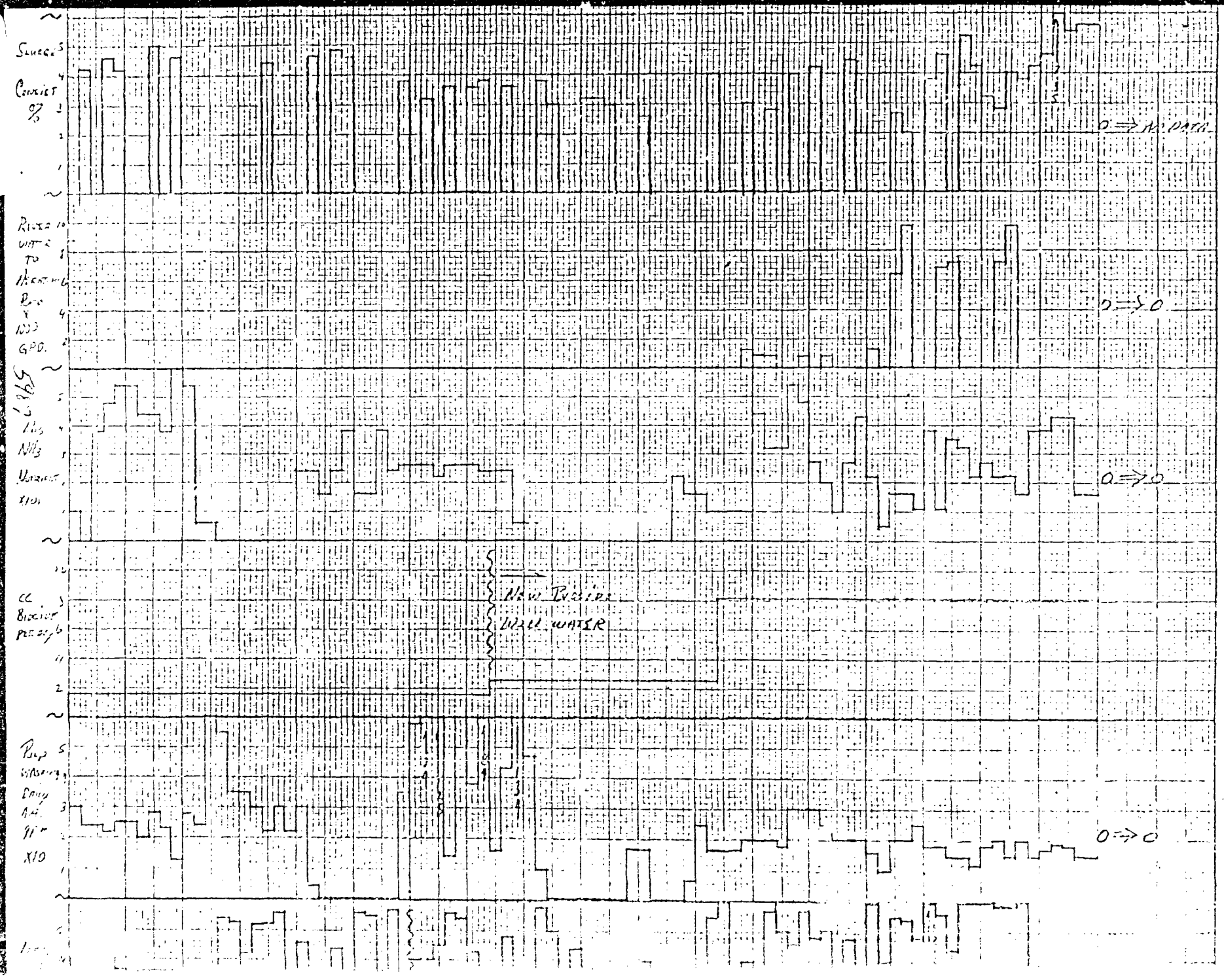
Conclusions:

A method and instrumentation has been developed which measures B.O.D. continuously and in "realtime." This rather new development will be covered in a report to follow along with means by which we could effectively deal with high load peaks.

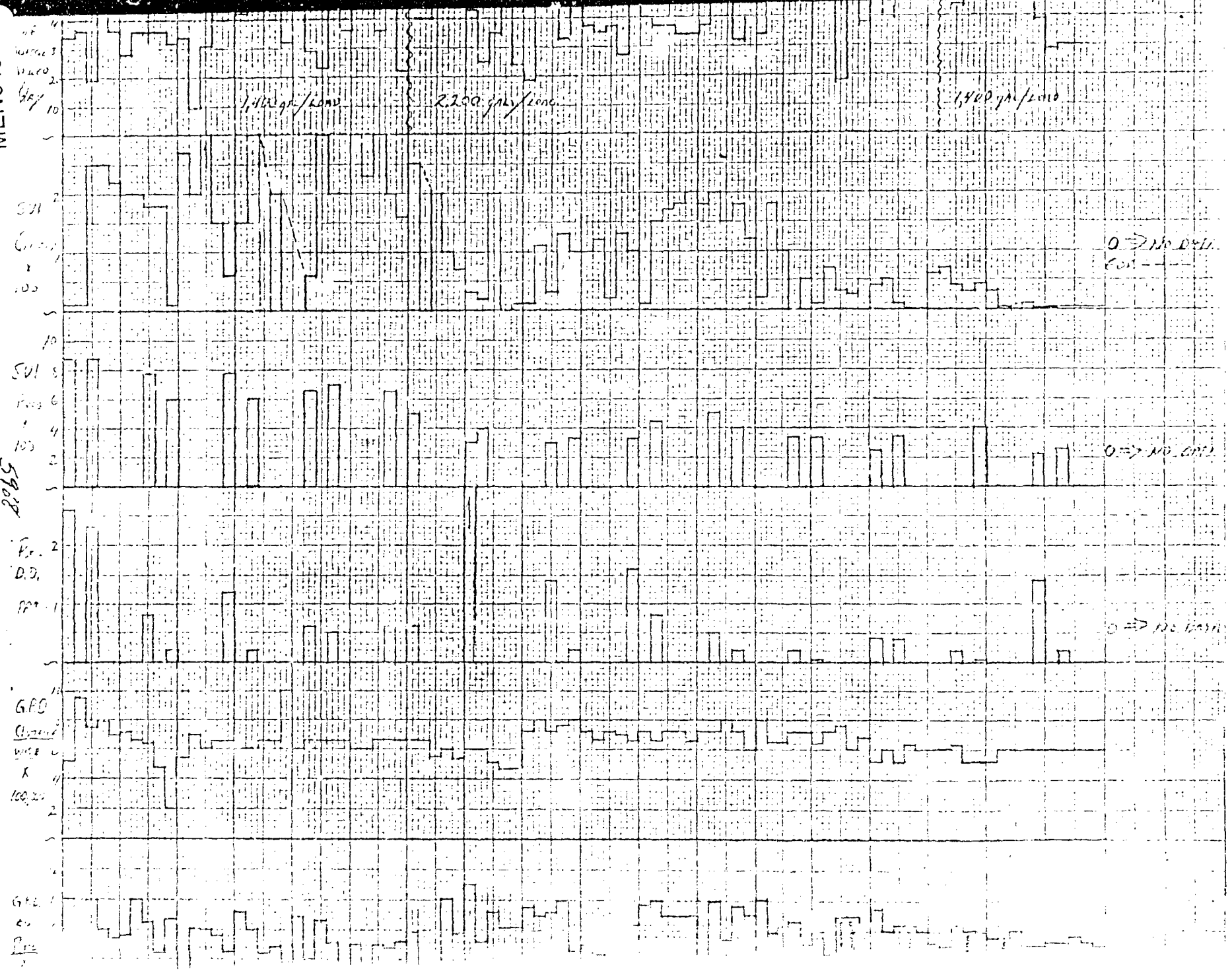
dd

5985

MEN04390

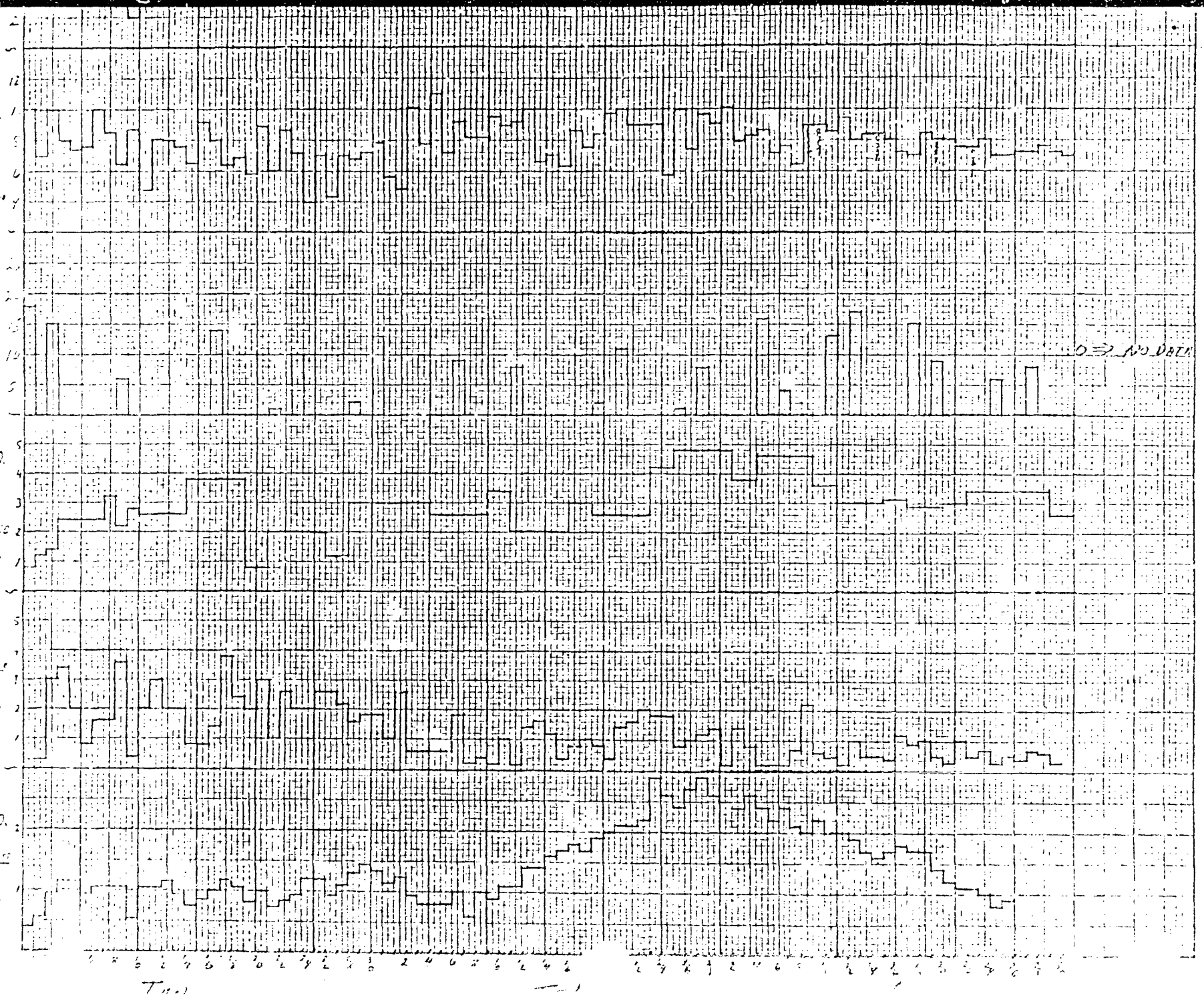

Sludge
Consist %
0 ⇒ No Data
Riverwater to Aeration Pond x 1000 GPD.
0 ⇒ 0
Lab NH3 Nitrogen x10
0 ⇒ 0
New Biocide
Well Water
CC Biocide per day
Pulp Washing Daily Ave. 9 ft x10
0 ⇒ 0

MEN04391



5968

MEN04392



MEN04393

Bruce

MENASHA CORPORATION

7 August 78

Chet Harvey
District Engineer
Water Quality Division
Department of Natural Resource
350 Ottawa Avenue, N.W.
Grand Rapids, MI 49503

Dear Chet,

The purpose of this letter is to record the chronology of events surrounding the liquor pond overflow during the morning of Monday June 26.

It first began to rain heavily around noon on Sunday the 25th and continued through about 4 P.M. From 4 P.M., only occasional skattered showers and light drizzle occurred until 11 P.M. Sunday. From 11 P.M. Sunday the 25th until approximately 11 A.M. Monday the 26th, heavy rain deluged the area. Official records record around 7 inches of rain during the period.

The mill shut down at 12:30 A.M. Monday the 26th due to a consumers power electrical outage. Without power, flooding occurred throughout the mill. Power house, secondary fiber prep.,refiner room and machine room basements were all flooded to a depth of approximately 2 feet. The main mill liquor holding pond located between the mill and the river, filled to overflowing and backed up into the mill to add to the already flooded conditions. Pond level continued to rise until it began to overflow the banks to the river.

Several portable pumps were set up to pump liquor to the river at about 9:00 A.M.. Hughs-Hemmelein contractors were brought in and bermed the road to prevent washout. A-1 disposal, our pollution emergency cleanup contractor was called and a 6,000 gallon per minute diesel pump was rented and brought on site at approximately 12 noon to begin pumping liquor over the dyke to prevent dyke washout. Pumping began at 12 noon and approximately 300,000 gallons of liquid were pumped to the river. Pump suction was set in order to insure that the most dilute material would be pumped. As your office had been advised of this emergency situation, Roger Przybysz arrived during the afternoon and observed the pumping operation. Samples of the liquid that was pumped to the river were obtained and split between Roger Przybysz and the mill.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616 692-2111

5131

Please find attached, a summary of test data both from your analytical laboratory and from Menasha. It is encouraging to see that the total combined BOD and suspended solids discharge from outfalls 002, 003 and liquor pumped did not exceed NPDES permits for that day.

If there are any questions please feel free to call.

Sincerely,

Menasha Corporation

Bruce Buchanan
Technical Superintendent

BB:kj

Attachment

MEN04395

TABLE I

Liquor Samples mg/l

	DNR	MENASHA
BOD	490	985
Suspended solids	87	51

TABLE II

COMBINED DISCHARGE 6/26/78

	BOD #/D	SUSPENDED SOLIDS #/D
002	20	14
003	722	2851
Liquor	2464*	128*
Total	3206	2993
Permit Max.	3725	3200

*Based on Menasha Test results and 300,000 gallon measured flow - (Level change in liquor pond).

MEN04396

MENASHA CORPORATION

10 August 1979

Mr. Robert F. Babcock
Water Quality Administrator
Michigan Water REsources Commission
Water Quality Division/ NPDES
Compliance Section
P.O. Box 30028
Lansing, MI 48909

I received your notice of compliance dated August 3, 1979 concerning NPDES Permit No. MI-0003824, WRC #: 8-79-05-3174. A problem exists and has been documented in numerous previous monthly reports concerning the phenol and phosphorous problems. The phenol problem is analytical methodology and the phosphorous problem is associated with the phosphorous tied up in the cell material of the suspended solids. The temperature excursion cause was identified and corrective action immediately taken.

The underlying factors contributing to excusions detailed in the notice of noncompliance, have been addressed in a number of ways. Firstly, the phenol results are not accurate since positive lignin interference has clearly been demonstrated in our effluent. The standard steam distilation proceedure with four amino-antipyrine colorimetric determination can not be demonstrated to show repeatable or adequate recovery. The inaccuracy of currently approved methodology has been demonstrated on our effluent by Clow Laboratories in Pontiac and Prein and Newhof Laboratory in Grand Rapids. Additionally, the National Council for Air and Stream Improvement has documented positive lignin interference in many pulp and paper mill wastes.[1]

In recognition of these problems, two actions have been taken. 1) our new NPDES permit phenol limit is based on the average of the monthly tests rather than a single test value and 2) a request for alternate test proceedure form is being submitted to the Chief Engineer, Water Resources Commission to improve the quality of the numbers generated.

An inequality has existed in the phosphorous specification during the entire life of this permit. Biological material (i.e. bacteria) contain phosphorous as a part of their

[1] N.C.A.S.I. Technical Bulletins 250 and 268.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692 6141

6320

MEN04396

MENASHA CORPORATION

10 August 1979

Mr. Robert F. Babcock
Water Quality Administrator
Michigan Water REsources Commission
Water Quality Division/ NPDES
Compliance Section
P.O. Box 30028
Lansing, MI 48909

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[1]N.C.A.S.I. Technical Bulletins 250 and 268.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692 6141

6370

MEN04399

to contact your district representative or myself.

Sincerely,

WATER QUALITY DIVISION

Robert F. Babcock

Robert F. Babcock, Chief
NPDES Effluent Compliance Unit

RFB:tkr
cc: F. Baldwin
C. Harvey
R. Przybysz

6363

MEN04399

to contact your district representative or myself.

Sincerely,

WATER QUALITY DIVISION

Robert F. Babcock

Robert F. Babcock, Chief
NPDES Effluent Compliance Unit

RFB:tkr
cc: F. Baldwin
C. Harvey
R. Przybysz

6363

The need for this testing is actually academic in that complex and sophisticated odor and taste panel work has already confirmed that pulping waste do not impart odor or taste even at unusually high levels. However, since it is apparent that this test is going to be required independent of its functional usefullness, the G.C. proceedure is probably the only useful one. I've spoken on several occasions with Craig Vote who has been assigned the project of determining analytical methodology for EPA's BAT standards and he confirms the interference problems with pulp mill waste streams. [redacted] If this interpretation is correct, the analysis will be straight forward and relatively easy to determine by gas chromatographic methods. [redacted]

In any case, the application for alternate test proceedure is being submitted for phenol determination at Menasha's Otsego Paperboard Mill. In the interim however, I am not aware of any proceedure which will improve the almost assuredly inaccurate results that are being generated now.

I concur and am quite sure that the review and approval process for the alternate test proceedure will indeed be lengthy and probably difficult. I would be receptive to any suggestions you may have to assist in the resolution of this stubborn problem.

Sincerely,

Menasha Corporation
Otsego Paperboard Div.

Bruce Buchanan

Bruce Buchanan
Acting Manager

BB/kj

6365

Hydro Research Services
Water Management Division
Clow Corporation

408 Auburn Avenue
Pontiac, MI 48058

313 334-1630
313 334-4747

MEN04402

March 11, 1980

Menasha Corporation
320 N. Farmer Street
Otsego, MI 49078
Attn: Mr. John Blauwkamp

CLOW

Dear Mr. Blauwkamp:

In reviewing the DNR's reply to your application for Alternate Test Procedure, it appears that the request for variance was denied on the basis that the already existing method 510 D will eliminate the tanning and lignin interference you were concerned with. Although this may be true to an extent, the inordinate levels of these species in your effluent still result in some of these interferences being unavoidably co-extracted. Also, this method still generates a value based on the reaction with 4-aap which represents the sum of all reactive phenolics quantified as 2,4 - Dichlorophenol.

The procedure we were asked to develop was one that would be specific for phenol (C_6H_5OH) without incorporationg other species. In order to accomplish this, a separation technique is required and chromatographic means seemed ideally suited. A prelimary separation of the bulk of the matrix by steam distillation (an accepted technique) was found necessary, since an attempt at extraction proved to be an exercise in masochism due to the formation of a most exasperating emulsification.

The concentrate was subsequently analyzed by gas chromatography and the result expressed as ug/l phenol (C_6H_5OH).

In denying your request for variance, the state has not based their decision on a rejection of the method submitted. Rather, there appears to be a problem in communication. An agreement as to what entities are to be incorporated in analytical data must be reached before discussion of procedures can take place. The comment in section 13 of the State's letter of denial is most pertinent of their view. "The proposed method is for the analysis of phenol (C_6H_5OH). Effluent limitations for the

6461

Menasha Corporation
Otsego, MI 49078
Attn: Mr. John Blauwkamp

March 11, 1980

permittee are specified as "phenols", it is defined as hydroxy derivatives of benzene and its condensed nuclei."

Based on this information, it is suggested that you consult with the DNR as to what phenolic compounds should be included. At this point, the procedure can be modified to incorporate the additional derivatives.

If you have any further questions or if we can be of additional service, please do not hesitate to call.

Very truly yours,

Larry Frantz/LC

Larry J. Frantz
Chief Chemist

LJF:sk

6462

MEN04404

memo / MENASHA CORPORATION

TO: Phosphorous Balance File - 8-04-12 & Alternate phenol test file

DATE: 29 April 1980

SUBJECT: Phone call from EPA Region V

FROM: John Blauwkamp

JRB

On April 24, 1980 Jim Pankanin of Region V, EPA in Chicago called in regards to our phenol violations at outfall 002 and our soluble orthophosphorous violations at outfall 000. On February 12 District III, Water Quality Staff of the Michigan DNR filed a report on our phenol and orthophosphorous violations. Mr. Pankanin was trying to determine what progress we were making in resolving these problems.

I informed Mr. Pankanin that the orthophosphorous problem had been resolved by the work we did on the testing methodology. He inquired as to what changes had been made in the testing methodology. I told him we were presently using methods identical used by the State EPB Lab.. He was satisfied with just a very general description of this testing method.

In regards to the phenol problem, I informed them of the current status of our alternate test proceedure. I informed them that the application for the alternate test proceedure had been submitted and rejected by the State Lab.. I also informed them that we were working with CH_2M-Hill, the local water quality representatives, and the Technical services section of the DNF in Lansing to resolve the discrepancies in the definition of what the phenol testing proceedure should actually test for. I informed him we had a meeting scheduled with the local DNR for 30 April 1980 and that this was one of the subjects on the agenda. This seemed to satify his curiosity for the present time.

cc: B. Buchanan
E. C. Manders
Ralph Peterson

JB/kj

6471

MEN04405

CLOW

HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation

408 Auburn Avenue
Pontiac, MI 48058

313 334 1630
313 334-4747

Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Mr. John Blauwkamp

Date: 9-25-80

Sample received 8-29-80

HYDRO NO:	41527
CUST. ID:	002780
Phenol, ug/l	100
2-Chlorophenol, ug/l	< 10
2,4 - Dichlorophenol, ug/l	< 5
2,6 - Dichlorophenol, ug/l	< 5

Linda Carey/Manager
Analytical Services

7153

B-19

MEN04406

ARCH SERVICES

408 Auburn Avenue
Pontiac, Michigan 480
Telephone 313/334-1
334-4747

WATER QUALITY ANALYSIS

TO: Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Mr. John Blauwkamp

Date: 9-30-80

Amended Copy

Sample received 8-29-80

HYDRO NO:	41527			
CUST. ID:	002780	002780 Spike		
		Concentration of Spike	Concentration Found	Recove %
Phenol, ug/l	100	89	75	84
2-Chlorophenol, ug/l	< 10	185	169	91
2,4-Dichlorophenol, ug/l	< 5	88	80	91
2,6-Dichlorophenol, ug/l	< 5	115	117	102

OCT 1980
RECEIVED

Linda Carey

Linda Carey/Manager
WATER MANAGEMENT
DOW CORPORAT

MEN04407

ARCH SERVICES

408 Auburn Avenue
Pontiac, Michigan 48058
Telephone 313/334-1630
334-4747

WATER QUALITY ANALYSIS

Kenasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Mr. John Blauwkamp

Date November 21, 1980

ple received 11-6-80

HYDRO NO:	43501	
CUST. ID:	Initial Survey	
	Run 1	Run 2
Phenol, ug/l 4 AAP	182	313
Phenol, ug/l	104	106
2-Chlorophenol, ug/l	< 2	< 2
2,4-Dichlorophenol, ug/l	< 2	< 2
2,6-Dichlorophenol, ug/l	< 2	< 2

Linda Carey/Manager

WATER MANAGEMENT DIVISION
DOW CORPORATION

MEN04408

ARCH SERVICES

406 Auburn Avenue
Pontiac, Michigan 480
Telephone 313/334-1
334-4747

WATER QUALITY ANALYSIS

Date November 21,

Menasha Corporation
320 N. Farmer St.
TO: Otsego, MI 49078
Attn: Mr. John Blauwkamp

Sample received 11-6-80

HYDRO NO:
CUST. ID:

43501
Initial Survey

	Run 1 Low Level Spike			Run 2 Low Level Spike		
	Spike	Amount Determined	Percent Recovery	Spike	Amount Determined	Percent Recovery
Phenol, ug/l	22.2	19	86%	22.2	19	86%
2-Chlorophenol, ug/l	46.0	22	48%	46.0	19	41%
2,4-Dichlorphenol, ug/l	28.6	14	49%	28.6	13	45%
2,6-Dichlorphenol, ug/l	21.8	11	50%	21.8	11	50%

Linda Carey/Manager
WATER MANAGEMENT DIVI
CLOW CORPORATION

MEN04409

ARCH SERVICES

408 Auburn Avenue
Pontiac, Michigan 48058
Telephone 313/334-1630
334-4747

WATER QUALITY ANALYSIS

Date November 21, 1980

enasha Corporation
20 N. Farmer St.
tsego, MI 49078
ttn: Mr. John Blauwkamp

ample received 11-6-80

YDRO NO: 43501
UST. ID: Initial Survey

	Run 1 High Level Spike			Run 2 High Level Spike		
	Spike	Amount Determined	Percent Recovery	Spike	Amount Determined	Percent Recovery
enol, ug/l	222	100	45%	222	192	86%
-Chlorophenol, ug/l	460	260	57%	460	390	85%
,4-Dichlorophenol, ug/l	286	176	62%	286	205	72%
,6-Dichlorophenol, ug/l	218	140	64%	218	183	84%

Linda Carey/Manager
WATER MANAGEMENT DIVISION
DOW CORPORATION

MEN04410

MENASHA CORPORATION

19 September 1984

Garth Aslakson
Water Quality Specialist
621 10th Gun Plaines
Plainwell, MI 49080

Dear Garth:

At about 7:30 A.M. on September 19, approximately 10,000 gallons of white water spilled over the bank of the surge pond into the river. This resulted in a discharge of about 300 lbs. of BOD and approximately 200 lbs. of suspended solids to the river. When these amounts are added to the discharges from outfalls 000 and 002, the total discharge would still be under the permit limits.

Sometime during the night, the main power supply to the effluent pumps shorted out. This caused the water from the mill to begin accumulating in the surge pond rather than being pumped to the aeration pond. Because we've had trouble with these pumps in the past, the level in the surge pond is checked periodically by mill personnel. At 6:30 A.M. we detected that the level in the surge pond was very high. However, when we tried to start the effluent pump, we found that neither the main pump nor the surge pump would operate. The maintenance crew immediately began working on the problem. By 7:00 A.M. the maintenance crew had determined that a temporary feed line would have to be run to the pumping station in order to get the pumps back in operation. It was estimated that this would take at least two hours. Therefore, we contacted someone to start hauling sand to fill in a few low spots in our dyke along the river and began making the preparations to shutdown both paper machines and leave the digester running as this would minimize the amount of water that went to the surge pond. Shortly before 7:30 there was a small amount of water running across the road into the river. At right around 7:30 the second load of sand arrived and was used to fill this low spot in the dyke. This ended the flow of white water to the river. By 8:20 we had both paper machines shutdown and the digester running. This greatly reduced the flow of water into the surge pond. At 8:45 the temporary power supply had been completed and the surge pond pump was back in operation. We kept both

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 692 6141

MEN04411

paper machines down until the level in the surge pond was back down to a safe level and it was obvious that the pumps would be able to keep up.

This incident was caused by a short in the main power supply line to the effluent pumps. This short occurred at a splice in an underground junction box. This power supply has been replaced with a continuous wire. This should essentially eliminate future shorts in this power supply line. If you have any further questions or comments concerning this matter, please contact the writer.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R. Blauwkamp P.E.

John R. Blauwkamp, P.E.
Corporate Environmental Manager

c Bruce Buchanan
R. L. Janda
Fred Morley
Gary Roys
Keith Kling
Bill Shepard

kj

MEN04412

MENASHA CORPORATION

[redacted] PAPERBOARD DIVISION OTSEGO MICHIGAN • 616 • 692 6141

May 23, 1969

Allegan County Health Departmenc
Allegan, Michigan 49010

Gentlemen:

We wish, hereby, to apply for permission to use as a dump site the northern-most portion of an 80 acre parcel owned by this company and described as follows:

The East half of the Southeast quarter of Section 14
Otsego Township, Allegan County.

The attached sketches will indicate the proposed location. The specific area to be used for dumping is a deep swale surrounded by hills of clay loam with underlying gravel. The material to be disposed of consists primarily of ashes with a smaller amount of scrap wire, banding metal and chemical bags, etc. It would be our plan periodically to bulldoze the ash over the other solid materials. A driveway has now been prepared to the site and it is available for your inspection at your convenience.

Sincerely yours,

MENASHA CORPORATION

George A. McConney

George A. McConney
Administrative Supt.
km

4522

MEN04413

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENGINEERING

chigan Department of Public Health
vision of Engineering
00 North Logan Street
nsing, Michigan 48914

DO NOT WRITE IN THIS SPACE
Bonding Co. Auto-Owners Insurance Company
Agent D. B. Hiebet Agency
Address Otsego, Michigan
License No. 70-028
Bond Value $2,500.00 (No. 697701 06180756)
Loc. Code

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

(See back of last copy for instructions)
(Fill out in triplicate)

☐ new ☒ renewal ☐ addition

ation is hereby made to the Director, Michigan Department of Public Health, for a license to operate a solid waste disposa nder the provisions of Act 87, P.A. 1965,

August 11, 1970

E OF DISPOSAL AREA Menasha Corp. Disposal Site Size 5 ACRES (acres)

ATION Allegan (county) Otsego Twp. (city, village or township) (section)

106th Avenue and Hill Street
(address or additional location description)

OF PROPERTY OWNER Menasha Corp. (individual, firm, township, city, etc.) Address P.O. Box 155, Otsego, Mich. 49078 (include zip code)

PERATOR Menasha Corp. Address " " " (include zip code)

ONSIBLE PERSON TO CONTACT (if other than operator)

lress (include zip code)

OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)
Sanitary Landfill ☐ Hog Feeding
Incineration ☒ Other [redacted] (specify

OF MATERIAL HANDLED: (check one or more)
General Refuse ☐ Garbage ☐ Industrial Waste ☐ Liquid Waste ☐ Rubbish ☒ Other Fly Ash (specify)

] The required annual license fee of $25.00 ☒ is ☐ is not attached.
(governments and agencies thereof exempt.)

] The power of attorney and bond in the amount of $2,500.00 is attached.
(bond of $500.00/acre, minimum bond $2500.00)

certify that the foregoing information is accurate and complete

Joseph Cutro, General Manager
(signature and title of applicant)

posal operation possibly involving the use of the waters of the State also requires the submission of a new or increased use it to the Water Resources Commission as provided by Act 245, P.A. 1929 as amended

edgment of receipt of annual $25.00 license fee received by me on

August 12, 1970

Mary Allen

[illegible]

4523

~~Leave This Space Blank~~
MICHIGAN DEPARTMENT OF PUBLIC HEALTH
ENGINEERING DIVISION
EXAMINED AND APPROVED
For Compliance with Act 87 P.A. 1965
SEP 1 1970

4 – 1/66

MEN04414

WILLIAM G. MILLIKEN, Governor

MAURICE S. REIZEN, M.D., Director

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

August 28, 1970

Mr. Joseph Cutro, General Manager
Menasha Corporation
Post Office Box 155
Otsego, Michigan 49078

Subject: Menasha Corporation Disposal Site
Allegan County

Dear Sir:

Your application for a license of the above solid waste disposal facility has been approved by this department.

Enclosed is your current license No. 70-028. This license is issued with the following stipulations:

1. Adequate controls must be available to prevent any blowing of fly ash off the site.

We solicit your cooperation in operating your facility in a sanitary manner in compliance with Act 87 Public Acts of 1965.

Very truly yours,

Fred B. Kellow, Chief
Section of Solid Waste Management
Division of Engineering

By: R. L. Hadfield
Environmental Sanitarian

RLH/BG
Enc.
cc: Michigan Water Resources Commission
Allegan County Health Department

MICHIGAN DEPARTMENT OF PUBLIC HEALTH
DIVISION OF ENGINEERING

MEN04415

TO:
Michigan Department of Public Health
Division of Engineering
3500 North Logan Street
Lansing, Michigan 48914

DO NOT WRITE IN THIS SPACE
Bonding Co. Auto-Owners Insurance Company
Agent [illegible] Agency
Address Otsego, Michigan
License No. [illegible] 1444
Bond Value $2,500.00 (No. 69770) 06180756
Loc. Code

APPLICATION FOR SOLID WASTE DISPOSAL AREA LICENSE

(See back of last copy for instructions)
(Fill out in triplicate)

☐ new ☒ renewal ☐ addition

Application is hereby made to the Director, Michigan Department of Public Health, for a license to operate a solid waste disposal area under the provisions of Act 87, P.A. 1965.

Date August 16, 1971

NAME OF DISPOSAL AREA Menasha Corp. Disposal Site Size 5 Acres (acres)

LOCATION Allegan (county) Otsego Twp. (city, village or township) (section)

106th Avenue and Mill Street (address or additional location description)

NAME OF PROPERTY OWNER Menasha Corp. (individual, firm, township, city, etc.) Address P.O. Box 155, Otsego, Mich. 49078 (include zip code)

NAME OF OPERATOR Menasha Corp. Address (include zip code)

RESPONSIBLE PERSON TO CONTACT (if other than operator)

Address (include zip code)

TYPE OF DISPOSAL OPERATION: (If more than one area involved file separate application for each)
☒ Sanitary Landfill ☐ Hog Feeding
☐ Incineration ☒ Other [illegible] (specify)

TYPE OF MATERIAL HANDLED: (check one or more)
☐ General Refuse ☐ Garbage ☐ Industrial Waste ☐ Liquid Waste ☐ Rubbish ☒ Other fly (specify)

FEE: The required annual license fee of $25.00 ☒ is ☐ is not attached.
(governments and agencies thereof exempt.)

BOND: The power of attorney and bond in the amount of $2,500.00 is attached.
(bond of $500.00/acre, minimum bond $2500.00)

I hereby certify that the foregoing information is accurate and complete

Joseph Cutro, General Manager
(signature and title of applicant)

Any disposal operation possibly involving the use of the waters of the State also requires the submission of a new or increased use statement to the Water Resources Commission as provided by Act 245, P.A. 1929 as amended

Acknowledgment of receipt of annual $25.00 license fee received by me on

September 1, 1971

Signature Shirley Goodrell

Title Secretary

Leave This Space Blank
MICHIGAN DEPARTMENT OF PUBLIC HEALTH
ENGINEERING [illegible]
EXAMINED AND APPROVED
For Compliance [illegible] P.A. [illegible]
DEC 13 1971

D55 2 - 2M - 1.66

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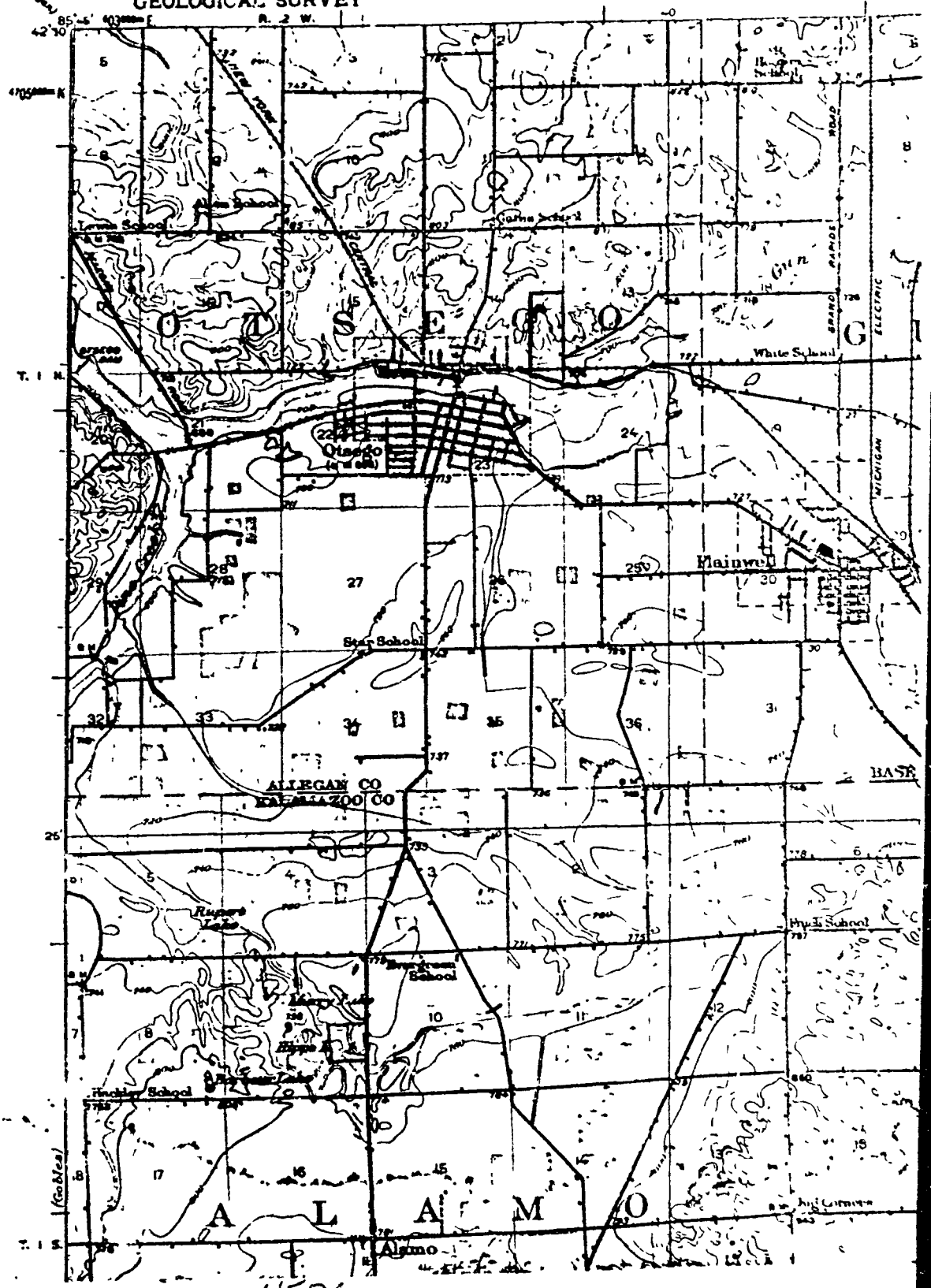
MEN04416

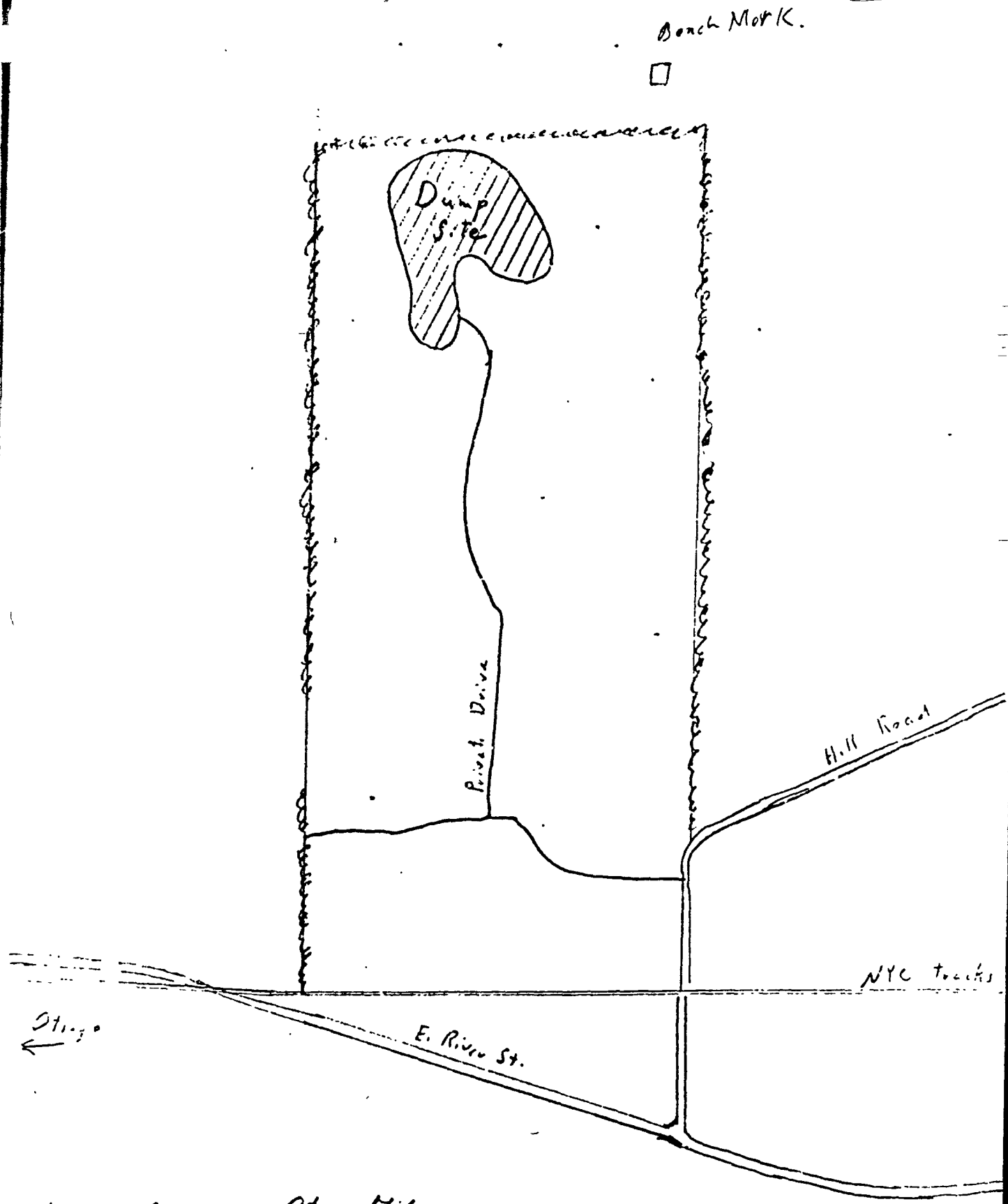
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE
REPRES
DEPARTMEN
GEOLOGICA



4526

MEN04417



Monarch Corporation Otsego, Mich.
New Dump Site

4527

MEN04418

WILLIAM G. MILLIKEN, Governor

MAURICE S. REIZEN, M.D., Director

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

December 13, 1971

Mr. Joseph Cutre, General Manager
Menasha Corp.
P. O. Box 155
Otsego, Michigan 49078

Subject: Menasha Corp. Disposal Site - Allegan County

Dear Sir:

Your application for a license of the above solid waste disposal area has been approved by this department.

Enclosed is your current license carrying No. 1444. This license has been issued for a solid waste disposal area and therefore must not receive liquid wastes without special approval from the Health Department. The stipulations on this license are as follows:

1. Maintain dikes.

We solicit your cooperation in operating your facility in a sanitary manner in compliance with Act 87, Public Acts of 1965, as amended.

Very truly yours,

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

By: R. L. Redfield
Environmental Sanitarian

RLR/pc
Enc.
cc: Michigan Water Resources Commission
Allegan County Health Department

"Equal Health Opportunity for All"

4528

WILLIAM G. MILLIKEN, Governor

MAURICE S. REIZEN, M.D., Director

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

Geo
make PC - for EM

MEN04419

January 15, 1973

Mr. George McCanney
Menasha Corporation
P. O. Box 155
Otsego, Michigan 49073

Subject: Menasha Corporation Sanitary Landfill

Dear Mr. McCanney:

This letter will reiterate our discussion of January 4, 1973 regarding the above captioned landfill operation.

The first step in evaluating a sanitary landfill site is of course determining its geological suitability for the land disposal of refuse. As you have indicated it would appear that the area in question does have the clay barrier that is essential for the necessary protection of the ground water.

Seeing that the geological conditions are adequate we now urge you to prepare and submit to this office engineering plans which shall include but not be limited to the following:

1. A topographical description of existing and final grades.
2. An operation procedure description (trench method, area method, berm etc.).
   a. barrow area and actual fill areas indicated.
3. Control of surface runoff diverting the same from the fill areas.
4. An indication of restricted access.
5. A statement that this site will be utilized by Menasha Corporation only.
6. A description and volume of the solid waste to be deposited at this site.

cc: C. Sage
Al Bickel

4533

MEN04420

North

ALLEGAN COUNTY HEALTH DEPARTMENT

ALLEGAN, MICHIGAN 49010

Director

TO: All Private Solid Waste Disposal Area Owners.

FROM: Marvin Johansen, R.S., Assistant Chief
Environmental Health Division

DATE: July 25, 1973

SUBJECT: Licensing of Solid Waste Disposal Areas.

The current license for your solid waste disposal area expires August 31, 1973 You should therefore complete the enclosed application and surety bond and return them to this office with a continuation certificate and check for license fee at your earliest convenience.

A member of this department will be making an inspection of the facility for compliance with Act 87, Public Acts of 1965.

If you have any questions regarding this matter, feel free to contact this department.

Sincerely,

Marvin Johansen R.S.

Marvin Johansen, R.S.

Encls.

Application Form
Surety Bond Form

4534

MEN04421

PAPERBOARD DIVISION

November 20, 1973

Leonard D. Zulewski
Environmental Sanitarian
Department of Public Health
3500 N. Logan
Lansing, Michigan 48914

Dear Mr. Zulewski:

In accordance with your instructions of January 15, 1973, we have prepared plans for improving our sanitary landfill operation. I will discuss the various facets of our program in the order that they were requested in your letter.

A topographical description of existing and final grades is attached. The large topographical map prepared by Williams and Works shows the existing topography of the fill area and adjoining areas. The small attached copy shows the fill area upon completion of fill.

The operation procedure will consist of bulldozing a road down into the southeastern part of fill area and moving fill into lowest lying areas first, using the area method. Refuse will be backfilled with cinders from steam plant daily. Successive layers will be built up until a level of 810 ft. is reached. 10 ft. high earthfill berm will be put across the northern end of the fill area to eliminate the possibility of fill contaminating collected water in the low lying area north of fill.

Surface water runoff into fill area should be non-existent. The east and west sides of fill area are lined with tall grass and trees which keep surface water from entering fill. The land to the south of fill slopes away from fill. Berm at north of fill will keep surface water runoff from entering fill from that direction.

Restricted access is already being maintained in area surrounding the fill site. Cords are strung across access roads from Hill Road at the east side of Menasha property. Cords are also strung across access roads from 106th Ave. to area south of fill area and to gravel pit. The above cords will be replaced with studs in the access roads from Hill Road and gates on the roads from 106th Ave.

Menasha Corporation alone will make use of fill area for solid waste. The waste to be deposited will consist of 65 yards/day of cinders and 35-40 yards/day of plastic, glass, and metal rejects from wastepaper pulping and miscellaneous metallic, glass, and dry fibrous refuse from the mill.

4535

MEN04422

I believe that the above information covers fully well what you requested.

Yours sincerely,

Norman E. Johnstone

Norman E. Johnstone
Technical Director

gb
encls.

cc: D. Thorne
G. McConney

MEN04423

[illegible]

Mr. [illegible]
Environmental Sanitarian
Michigan Dept. of Natural Resources
Stevens T. Mason Bldg.
Lansing, Michigan [illegible]

Dear Sir:

Enclosed herewith are the bond and power of attorney requested in connection with our application for a permit for our solid waste disposal area. I trust this completes the necessary documents but if not would appreciate your letting us know what is lacking.

Yours very truly,

[illegible] CORPORATION

G. A. McConney
Administrative Supt.

GMcA
Encls.
cc: [illegible]

[illegible]

4537

Solid waste file

MEN04424

STATE OF MICHIGAN

RESOURCES COMMISSION
L. T. JOHNSON
E. M. LAITALA
DEAN PRIDGEON
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 Division
905-C Southland Drive
Lansing, Michigan 48909
Box 30028

August 11, 1976

Mr. Bruce Buchanan
Menasha Corporation
Otsego, MI 49078

RE: Menasha Corporation Sanitary Landfill Expansion

Dear Mr. Buchanan:

This letter will confirm our discussion of July 20, 1976 regarding the proposed expansion of the Menasha Corporation Sanitary Landfill.

As you know, there are several progressive steps that must be followed prior to final licensure which involves geological evaluations, operational and engineering design. They are as follows:

1. Submit a series of soil borings (with elevations) approximately one per five acres of proposed landfill area through the Allegan County Health Department. These borings must be performed by someone knowledgeable in geological formations and must be accurately logged identifying the various soils encountered and the thickness of each, the elevation and direction of existing ground-water flow.

2. When the soil borings have been completed and submitted through the Allegan County Health Department, we will then review and notify you of our evaluation and provide you with our recommendations.

3. If geological approval is granted, we will urge you to contact a reputable engineering firm to develop operating-engineering plans for the new facility. These plans must also be submitted in triplicate through the Allegan County Health Department with a license application, bond and power of attorney. We will then review the engineering drawing and if found acceptable will grant Menasha Corporation a license to operate a sanitary landfill.

If there are any questions regarding these matters, please feel free to call on this office or the Allegan County Health Department.

Very truly yours,

Fred B. Kellow, Chief
Resource Recovery Division
Environmental Protection Bureau

L. D. Zulewski

By: Leonard D. Zulewski
Environmental Sanitarian

LDZ:nc
c: Allegan County Health Dept.

MICHIGAN

4538

DNR - permit file

MEN04425

September 10, 1976

Mr. Steve Johnson
747 N. 18th
Otsego, MI 49078

RE: Fly Ash Disposal Site

Dear Mr. Johnson:

This letter will confirm our survey and discussion regarding the disposal of fly ash on your property adjacent to 18th Avenue, Otsego, Michigan.

The area considered contained adequate amounts of clay to protect the groundwater and therefore we can approve the proposed area for fly ash disposal and inert materials.

Enclosed is a copy of Act 87, a license application and surety bond form to be submitted through the Allegan County Health Department. In addition to the application and bond please submit the following:

1. A legal description of the property.
2. A plan sketch showing the proposed fill area and property boundries.
3. A written statement that the material to be deposited at this facility will be fly ash from Menasha Corporation, wood and various inert materials.
4. Indicate on the sketch that all filling will meet existing grades and that there will be no trenching except for the acquisition of cover material.
5. Filling will be restricted exclusively to the small depression observed during our survey.

As you indicated the total operation should be completed in less than one year. Your license will expire August 31, 1977 which should give you adequate time to meet your completion date. Your surety bond must be continued for a period of two years after the official closing date of the fill area as provided for in Act 87.

If you have any questions regarding these matters, please feel free to call on this office.

Very truly yours,

Fred B. Kellow, Chief
Resource Recovery Division
Environmental Protection Bureau

By: Leonard D. Zulewski
Environmental Engineer

cc: Menasha Corporation
Allegan Co. Health Dept.

1539

MEN04426

ALLEGAN COUNTY HEALTH DEPARTMENT

ALLEGAN MICHIGAN 49010

Director

SOLID WASTE FILE

To: All Solid Waste Disposal Area Owners or Operators

From: Marvin Johansen, R.S. Director of Environmental Health

Subject: Licensing of Solid Waste Disposal Areas

Date: December 14, 1976

Enclosed you will find a license application for your solid waste disposal area. Please complete the enclosed application and return it to this office along with the license fee of $25.00 (governmental units are exempt) and the proper performance bond.

A member of this department will make an inspection of your site and we will forward the application to the Department of Natural Resources in Lansing for licensing.

If you have any questions, or require any additional information, feel free to contact this department.

6/79

1 year

G. Hunt

1-456-5071

4540

MEN04427

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
CIVIL J. JOHNSON
E. M. LA FALA
DEAN FRIEDSON
HENRY F. SKELL
HARRY H. WHITELEY
JOHN E. WOLFE
CHARLES O. YOUNGLOVE

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926
HOWARD A. TANNER, Director

March 8, 1977

Menasha Corporation
320 North Farmer
Otsego, MI 49078

Gentlemen:

Enclosed is a preliminary draft of a permit prepared under the provisions of Section 8(b), Act 245, Public Acts of 1929, as amended, for the disposal of wastes from an existing paper mill treatment plant located at 320 North Farmer, Trowbridge Township, Allegan County, Otsego, Michigan, described in your application dated August 12, 1976.

In accordance with Commission procedure, we are offering you and other interested parties, by copy of this letter and the draft permit, an opportunity to review the terms of the proposed Permit and to submit comments thereto, prior to its issuance in final form. Comments relative to the proposed discharge must be received within thirty days of the date of this letter.

You are cautioned not to proceed with the construction of treatment facilities until the permit is issued and plans for the facilities have been approved. You will be notified when the permit is issued and will be mailed a copy for your records.

Very truly yours,

WATER RESOURCES COMMISSION

Robert J. Courchaine

Robert J. Courchaine
Acting Assistant Executive Secretary

RJC:clp
cc: Otsego Township Clerk
Allegan County Health Department
C. Harvey, District Engineer
K. Zollner, Regional Engineer
Permits Section
Air Quality Division
Geology Division
Mr. Quackenbush

MICHIGAN

11026 1/75

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MEN04428

MENASHA CORPORATION

August 20, 1977

Mr. Leonard Zulewski
State of Michigan
Department of Natural Resources
Resource Recovery Division
Secondary Complex
Administration Bldg.
Diamondale, Michigan

Dear Mr. Zulewski,

Approximately a year ago, you and I and two members of the Allegan County Health Department made a preliminary site investigation of a thirty acre tract of land immediately North of Menasha Corporation's existing solid waste disposal area. The purpose of the inspection was to determine preliminary acceptability of this site as a solid waste disposal area. We continue to have interest in this land and its potential applicability as a disposal site. Please find attached herewith a Soils Investigation Report submitted by Shilts, Graves and Associates, Inc. on said tract of land. Property description to be found in first paragraph of attached report.

Menasha Corporation wishes to acquire this property for a solid waste disposal area following approval thru your department. Please advise, at your earliest convenience, approval and/or any further action required on the part of Menasha Corporation.

Sincerely,

Menasha Corporation

Bruce Buchanan

Bruce Buchanan
Technical Superintendent

cc: J. Adams
G. McConney

4542

OTSEGO PAPERBOARD MILL. FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

kj

MEN04429

STATE OF MICHIGAN

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

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926
HOWARD A. TANNER, Director

RESOURCE RECOVERY COMMISSION
THOMAS J. BLESSING, JR.
ALBERT M. BORKIN
WILLIAM A. CILLUFFO
PAMELA A. FRUCCI
C. ERNEST KEMP
JOHN W. LAYMAN
STUART B. PADNOS
JOHN M. ROBERTSON
THOMAS E. STRAATSMA
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING, MI 48909

517-373-8621

February 28, 1978

Mr. Bruce Buchanan
Technical Superintendent
Menasha Corporation
Farmer Street
Otsego, Mi 49078

Dear Mr. Buchanan:

SUBJECT: Proposed Sanitary Landfill Expansion

Attached is a copy of our geologist's evaluation relative to your proposed sanitary landfill. I am sorry to inform you that the site is not suitable for sanitary landfilling in its natural state and would require extensive examination and engineering modification to gain licensure. If you wish to discuss this matter with staff, please feel free to call on us.

My apologies for the delay in our reply to your request; bowever, this was unavoidable due to staff work load.

Very truly yours,

Fred B. Kellow, Chief
Resource Recovery Division

Leonard Zulewski

By: Leonard Zulewski
Environmental Sanitarian

LZ:df
Encl.
cc: Allegan County Health Department

4544

MEN04430

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION

February 27, 1978

TO: B. P. Shah, Supervisor, Environmental Geology Section

FROM: De Montgomery, Environmental Geologist D.M.

SUBJECT: Menasha Corporation Project, T1N, R12W, Section 14, Otsego Township, Allegan County

In review of the soils investigation by Shilts, Graves and Associates of the Menasha Corporation's proposed thirty acre waste disposal site, the following reasons indicate the site's unsuitability in its natural condition:

1. Within the site's location is a swamp along the south line, indicating a high perched water table.

2. The clay is not extensive throughout the site. The borings indicate spotty clay lenses, thus resulting the local perched swamp condition in the immediate area of the site.

3. The borings also show interbedded sand and gravel lenses with "pocket" water conditions. These conditions exist above and below the clay and silty clay lenses.

4. In general, the area consists of porous glacial outwash sediments with areas of impermeable clay lenses.

Therefore, from the limited soil boring data submitted to this office, the above landfill site, in its natural condition, is unfavorable for solid waste disposal. An extensive hydrogeologic investigation plus extensive engineering improvements would be required before the site is suitable for the protection of the environment.

DM:df

4543

MEN04431

MENASHA CORPORATION

March 3,1978

Mr. Fred B. Kellow,
Chief Resource Recovery Division
Environmental Protection Bureau
Department of Natural Resources
Secondary Complex, Administration Bldg.
Diamondale, Michigan

Dear Mr. Kellow:
This letter will confirm our phone discussion of March 1,1978 regarding the proposed expansion of the Menasha Corporation sanitary land fill. On 20 July 1976 Mr. Leonard Zulewski, Mr. Marvin Johansen, Mr. Joseph Crigier and the writer toured the proposed land fill site. Mr. Zulewski's letter of August 11,1976 itemized the requisite steps that must be followed prior to final licensure. Following that format, a geological survey report was submitted, with cover letter, on August 20, 1977.

Despite several phone conversations with Mr. Zulewski requesting this matter be expedited, no action is apparent. The company would sincerely appreciate your assistance in expediting the licensing procedure.

Sincerely,

MENASHA CORPORATION

Bruce Buchanan

Bruce Buchanan
Technical Superintendent

BB/vk

4546

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 692 6141

MEN04432

MENASHA CORPORATION

April 26,1978

Mr. Fred B. Kellow, Chief
Resource Recovery Division
Environmental Protection Bureau
Department of Natural Resources
Secondary Complex, Administration Bldg.
Diamondale, Michigan

Dear Mr. Kellow:

Attached is a copy of an April 10 letter from Leroy D. Graves of Shilts, Graves & Associates, Inc. This letter addresses objections to our proposed land fill expansion raised by your geologist's 27 February 1978 memo to B.P. Shaw. Your February 28 letter disapproving the proposed land fill expansion was indeed disappointing. Both preliminary investigations and the Consultant's interpretation of his hydro-geological survey indicated the site to be applicable to the above end use.

I phoned our Soil and Foundation Consultants, Shilts, Graves & Associates, on 28 March and 7 April to discuss your objections to the site based on D. Montgomery's interpretation of the Consultant's report. Both the Consultants and I strongly feel that a second DNR interpretation of the Consultant's report is warranted. This point is discussed in Mr. Graves' April 10 letter.

Would you please have the appropriate personnel review interpretation of this report referencing the April 10 letter from Mr. Graves? If you or your personnel wish to meet with Company personnel or Consultants, we will be glad to oblige.

I am interested in resolving these differences of opinion and interpretation as quickly as possible. Your prompt consideration of this matter will be sincerely appreciated.

Yours very truly,

MENASHA CORPORATION

Bruce T. Buchanan

Bruce T. Buchanan
Technical Superintendent

BB/vk

cc: Leonard Zulewski, Environmental Sanitarian
James S. Adams, General Manager

Enc.

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

4549

MEN04433

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

0478-091 10 April 1978

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

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

Attention: Mr. Bruce Buchanan

Gentlemen:

According to our telephone conversations of 28 March 1978 and 7 April 1978 with Mr. Buchanan, the Michigan Department of Natural Resources has objected to your planned use 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, for disposal and overland treatment of treated waste from your Otsego paper manufacturing operation. We understand that the Department of Natural Resources has read our report of 16 August 1977 and that they still cited the lack of a uniform continuous impervious soil barrier between the surface and the water table as an objection to your proposed use. They also objected to the open sandy gravelly soil, as well as standing water in the low spots.

We agree with the Department that the impervious soil between the surface and the water table is not of uniform thickness, but a careful rereading of our report will show them that impervious clays and silts of substantial thickness do exist in every boring in the range of job elevation 70 to 90 on the east side of the project and lowering to job elevation 50 to 60 on the low drainage path to the west. This substantial impervious layer and the 100 or more feet to the water table makes pollution of the water table from surface applications next to impossible. While that portion of the soil which is sand or sand and gravel is permeable, the great distance to the water table and the natural filtering and bacterial and chemical action of the soil will neutralize or remove pollutants before they reach the water table. The standing water in the low spots at the surface are not an indication of a water table but evidence that the soil at these points is too impervious at the surface to allow the surface water to percolate downward rapidly enough to keep up with rainfall. The water does evaporate and percolate enough to disappear in dry seasons. The two south depressions can easily be drained by an open ditch to the low ravine at the

4547

MEN04434

Menasha Corporation

west edge of the site. The north low spot could be drained by a pipe drain to the same low spot. So surface water need not stand on the site at all.

In summary, we reiterate our conclusions of 16 August 1977, that the site is excellent for your proposed purpose and that pollution of the groundwater from your operations is very unlikely. We believe that a careful review of our report will lead the Department of Natural Resources to the same conclusions.

Sincerely,

SHILES, GRAVES & ASSOCIATES, INC.

Leroy D. Graves

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

mjr

MEN04435

MENASHA CORPORATION

December 20, 1978

Mr. Fred B. Kellow, Chief
Resource Recovery Division
Environmental Protection Bureau
Department of Natural Resources
Secondary Complex, Administration Bldg.
Diamondale, MI

Dear Mr. Kellow;

In a letter date of 26 April 78, I requested a review of your environmental sanitarians interpretation of our Soil and Foundation Consultants' Hydrogeological Survey of a 30 acre tract of land located immediately North of Menasha Corporations' existing sanitary land fill site. To this date, I have received no response either by phone or in writing.

Would you please advise me of the status of this report as soon as possible?

Best regards,

Menasha Corporation

Bruce Buchanan
Technical Superintendent

BB:kj

4550

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616 692-6141

MEN04436

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

RESOURCES COMMISSION
T. JOHNSON
E. M. LAPALA
DEAN PRIDGEON
HILARY F. SNELL
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE

RESOURCE RECOVERY COMMISSION
THOMAS J. BLESSING, JR.
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C. ERNEST KEMP
JOHN W. LAYMAN
STUART B. PADNOS
JOHN M. ROBERTSON
THOMAS E. STRAATSMA
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING, MI 48909

517 322-1315

January 3, 1979

State Office Building
350 Ottawa Avenue, N. W.
Grand Rapids, MI 49503

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

Dear Mr. Buchanan:

After a thorough search of our files, I am unable to retrieve the letter referred to in your December 20, 1978 correspondence; therefore, I am unable to address your concerns.

Attached is a copy of our environmental geologist's evaluation of the submitted proposal which indicates the site's unsuitability as a sanitary landfill in its natural state. If you would like to discuss this evaluation in more detail, feel free to contact this office. I will set up a meeting and attempt to have our geologist available to answer any questions you may have.

If you have any questions, please feel free to call me at 616/456-6231.

456-8071

Very truly yours,

RESOURCE RECOVERY DIVISION

Gerard Heyt,
Environmental Sanitarian

GH/mc
Enclosure

cc: De Montgomery

MICHIGAN
THE
GRE
LAKE

4551

MEN04437

MENASHA CORPORATION

29 March 1979

Gerard Heyt
Environmental Sanitarian
State Office Building
350 Ottawa Avenue, N.W.
Grand Rapids, MI 49503

Mr. Heyt;

Referencing: Environmental Geologist's Evaluation

Have you had a chance to review and evaluate this literature? I would like to know your thoughts and viewpoints.

If you have any questions, please feel free to call me at 616-692-6141.

Sincerely,

Menasha Corporation

Bruce Buchanan

Bruce Buchanan
Technical Superintendent

BB:kj

4552

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

MEN04438

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

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

NATURAL RESOURCES COMMISSION
JOHNSON
ALA
JEAN FRIDGEON
MARY F. SHELL
HARRY H. WHITELEY
DAN L. WOLFE
CHARLES G. YOUNGLOVE

RESOURCE RECOVERY COMMISSION
THOMAS J. BLESSING, JR.
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C. ERNEST KEMP
JOHN W. LAYMAN
STUART B. PADNOS
JOHN M. ROBERTSON
THOMAS E. STRAATSMA
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING, MI 48909

517-322-1315

April 23, 1979

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

Dear Mr. Buchanan:

Your request for a re-evaluation of the geological characteristics of your proposed landfill site has been referred to this division's Environmental Geology Section. To date I have not received a reply relative to the concerns expressed.

As indicated in my January 3, 1979 letter addressed to you, I suggested that a meeting be established to discuss the evaluation. I feel that this may be the most practical method to adequately address the concerns raised. Please contact this office at your convenience if you concur. Department personnel will be available to answer any technical questions you may have.

If you have any questions, feel free to contact this office at 456-5071.

Very truly yours,

RESOURCE RECOVERY DIVISION

Gerard Heyt
Environmental Sanitarian

GH:bjc
cc: D. Montgomery

4553

MEN04439

B2

Solid Waste Landfill memo / MENASHA CORPORATION

Jim Adams

DATE: 16 May 1979

Meeting with DNR, Grand Rapids

FROM: Bruce Buchanan

BB

A meeting was held with Gerard Heyt, De Montgomery and Elain Brown of the Resource Recovery Division, Department of Natural Resources on 15 May 1979. The purpose of the meeting was to discuss the proposed extension of our solid waste landfill area and to resolve discrepancies between the Schultz, Graves and Associates interpretation of the soil investigation work on that area and the D.N.R.'s interpretation of the same report. The history is that our soils consultants felt the site should be suitable for landfill whereas the Resource Recovery Divisions' geologists felt otherwise.

After a few minutes of discussion, it became apparent that a significant change in regulatory involvement had recently occurred in the Resource Recovery Division. The change is associated with the passage of Act No. 641 of Public Acts of 1978 signed 1/11/79. This Act is embodied in enrolled House Bill No. 6314, State of Michigan, 79th Legislature, Regular Session of 1978. This Act is known as the "Solid Waste Management Act". A copy of the House Bill is attached.

he Resource Recovery Division has drafted guidelines based on Act 641. The guidelines are in draft form and under review. A copy is being mailed to this division.

Under the guidlines, solid waste is classified into one of four types with type I being the most toxic material. Examples would be type I-PCB containing waste, type II-general rubbish, type III-fly ash, type IV-broken cement. Because of the composition of materials in our landfill, we would be classified as type II. In order for a site to be applicable to type II landfills under their natural conditions, they must fall into one of two categories. Category I is a sandy site with a minimum of 40' vertical depth to the water table and a 2000' buffer zone in the direction of aquifer movement. The buffer zone land will require a restricted covenant of deed to prevent development during the use of the landfill and for 15 years thereafter. Category II sites require a minimum 20' depth of natural clay continuous throughout the landfill site, with a minimum 10 to the minus 7th cenimeters per second percolation rate. The proposed landfill expansion north of the existing site meets neither of the above criteria. Sites whose soil characteristics fall somehwere between category I and category II are not licensable under either category according to current guidelines for natural site selection criteria.

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Alternatives to natural site selection are engineered solutions. The alternatives for type II landfills are as follows;

1) depositing a 5' thick clay liner with density necessary to achieve a permeability of at least 10 to the minus 7th cenimeters per second,
2) 2' of clay with the same above criteria but with 20 mill pvc. liner and 2' of sand on top,
3) 30 mill pvc. liner, no clay and 2' of sand on top.

All of the above must have dyking or trenching with wall protection and must incorporate leachate collection systems with facilities for dealing with the leachate.

All landfills will need more extensive hydrogeological survey work and will require a minimum of three 2" O.D. monitoring wells with quarterly sampling. All landfills will also require engineering plans, operating plans and a 2' clay cover with a 3 or 4 to one slope with 15 years of monitoring after closure of the site.

Another alternative to this expensive approach is to request licensing for the extension based on type III solid waste only. Natural site selection criteria for type III waste are liberal enough that it is anticipated the proposed extension area would be suitable as is. Monitoring wells, engineering plans, operating plans, etc., etc. are still required but no leachate collection systems are needed. We will need to know the quantities of general rubbish versus fly ash that are generated each day to determine what advantage this approach might have. If this approach is saught, at least two different fly ash leachate quality tests will be needed. At that time, we may want to test some of the other components of the general rubbish category to see if they could also be licensed for type III disposal.

Gerard Heyt feels that monitoring of existing landfills for leachate quality and ground water contamination will become a requirement within the next four years. We can be looking forward to this and to the possibility that if leachate quality from the existing landfill is not good enough, our landfill could be closed. This would either force us to another private or municipal landfill or to application for an engineered type II landfill.

We should discuss the options and develop plans within the near future.

cc: A. Schenck
Department Heads
Technical Department Circ.

4555

kj

Bruce Buchanan
John Blauwkamp
Jim Cox
Tom Ray
Rod Kopish
Tom Williscroft

MEN04441

memo / AMERICAN ME CORPORATION

R. L. JOHNSON

DATE: January 10, 1980

SUBJECT: Otsego Meeting with Michigan DNR Regarding the "Notice of Violation" December 7th on our Solid Waste Dump Site

FROM: W. ALLAN SCHENCK

SUMMARY

Bruce Buchanan, John Blauwkamp and the writer met with Mr. Gerard Heyt of Michigan DNR on the above subject. Jerry Heyt is in the Resource Recovery Division of Michigan DNR based in Grand Rapids and has responsibility for solid waste in the southern half of the lower peninsula.

The notice of violation letter referred to some specific practices at our dump they want changed and also served as a basis to tell us what they want done to implement the intent of Michigan Law 641. The points made were:

1. Start applying six inches of clay, sand or gravel daily.

2. Install adequate barrier so an outsider will not have access to the dump when our operator is not there and the gate is locked. This does not necessarily mean fencing the complete area.

3. We need not formally reply to their notice of violation as other points are covered by the following.

4. Set a timetable and get approval by April 1 of this year (1980) for beginning monitoring the ground water through test wells for specified parameters. A letter giving these parameters is attached.

5. Set a timetable and get it approved by April 1, 1980 for a hydrogeological survey to be completed by the second quarter of 1981. We would commit now that this survey would be the basis for establishing a fully approved landfill by no later than April 1, 1984. This plan, which must be approved by April 1, would be in the form of a consent agreement (a suggested format attached).

6. This does assume tests on the ground water show nothing harmful.

7. Our present site will be full in about 18 to 24 months.

8. As the hydrogeological survey develops, we will have the following options to consider:

   a. Close up the landfill and haul to a regional site. Such a site is not yet available.

   b. Design, cost-out and appropriate funds for a Class II landfill. A Class II landfill can accept anything but toxic chemicals. It must have an impervious barrier bottom and sides a specified distance above the water table, have a leachate collection system and a place to treat the leachate such as an effluent treating plant.

4584

c. Design, cost out and approve funds for a Class III Landfill. A Class III landfill can only be used for inert material. A Class III landfill costs less to construct and operate. In this case our garbage (food waste) would have to be hauled to a Class II landfill. Our large volume solid waste, fly ash, ash, pulper screenings, and digester squeezings would have to be tested and proven "inert" and "no effect on ground water" proven.

d. Construct both a Class II and Class III Site.

9. Our next step is to retain an engineering firm to lay out what will have to be done in the hydrogeological survey and what test wells should be established for the monitoring. This program would then be submitted for approval prior to April 1. At this point CH_2M Hill seems most capable. Their proposal on these subjects as well as liquor storage and plant close up should be in within a day or two.

MISCELLANEOUS NOTES

10. The public hearings on the Rules for State Law 641, the new solid waste law for the State of Michigan, brought such a huge forceful response that the rules have been modified, reissued and currently are in the process of a second round of hearings. Mr. Heyt feels some significant changes will come out of this. Already they made an interesting but logical change in that the current administrative rules pull out Class I disposal site which deal with toxic chemicals. This is such a different more difficult subject, it seems like a good approach. To give some feel of the kind of problems, he indicated that there was very strong pressure from environmentalists not to permit any variances from the rules for Class II sites and while such variances are still in the rules, Heyt feels they may be cut before the final rules are promulgated.

10. a. Heyt pointed out that their office has absolutely nothing on our solid waste site; i.e. boundaries, accesses, geology of the area and so forth.

11. A quick way of distinguishing the three classes of sites is that Class I sites are for toxic chemicals, Class III for inert materials which cause "zero degradation of the ground water" and a Class II site takes all else.

We feel we have the potential of having our large volume waste classified as for a Class III site. However, the "zero degradation" requirement could be very difficult.

12. It is estimated that of all solid waste Class II Sites only 10% will have a satisfactory natural barrier. This means engineered barriers will have to be built in 90% of the cases.

13. They discourage putting an approved site on top of an existing unapproved site. The possibility of the old site's settling and breaking the barrier and problems with gas evolving are given as reasons.

13. a. When one considers alternatives there really are none. You either go into the program of ground water monitoring and construction of an approved site or you will be shut down.

4. e discussed the situation as far as regional or municipal sites operated in the Otsego area. It does not look good. Definitely Allegan County has indicated they do not want to get involved in a county site. Where three years ago Allegan had twenty-six solid waste disposal sites operated privately, there are now thirteen in operation. Heyt said there was a county planning report around 1970 which may have touches on solid waste. We should try to get a copy.

There is no indication of a major regional site in the Kalamazoo area. Unofficially some data is being collected in the Saugatuck area for a good large Class II site which would be owned by the Township of Saugatuck and operated by a private individual.

We should discuss solid waste with Mead and Plainwell Paper. Perhaps an industry oriented site would be the best course of action.

Heyt said that Kent County where Grand Rapids is located have had a fully approved site for about two or three years. The only other site in the lower peninsula which is approved currently is the Orchard Hills Solid Waste Disposal Site at Watervliet. This is a private operation. Hopefully this will be a good operation for Coloma.

. On the subject of what to do with leachate which is collected, the following points were made:

a. Keep the grade on top of the dump steep enough so very little surface water runs down through the dump. In other words keep leachate to a minimum.

Recycling leachate back through is discouraged. In Michigan the reduction in volume by evaporation is close to the amount the volume is increased by rainfall.

S:rp

tachment

MEN04444

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
DAVID J. JOHNSON
F. M. LAITALA
DEAN PRIDGEON
HILARY F. SNELL
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

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RESOURCE RECOVERY
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C. ERNEST KEMP
JOHN W. LAYMAN
STUART B. PADNO
JOHN M. ROBERTS
THOMAS E. STRAA
MICHAEL L. WALKY

RESOURCE RECOVERY
SECONDARY COMP
BOX 30028
LANSING, MI 48909
517-322-1315

TO: TYPE II LANDFILL OPERATORS

FROM: Tom Work, Resource Recovery Division

Rec'd from Gerard Heyt 1-7-80

The Resource Recovery Division of the Department of Natural Resources has established a set of parameters for quarterly and annual monitoring of Type II landfills. This list contains the minimum parameters to be tested. Additional parameters may be required on a site by site basis.

Quarterly Parameters: Chemical Oxygen Demand (COD), Iron, Chlorides, Specific Conductance, Total Organic Carbon (TOC), Sulfate, and pH. 7

Annual Parameters: Chemical Oxygen Demand (COD), Iron, Chlorides, Specific Conductance, Total Organic Carbon (TOC), Sulfate, pH, Calcium, Sodium, Magnesium, Bicarbonate, Nitrate Nitrogen, Nitrite Nitrogen, Ammonia Nitrogen, Lead, and Total Chromium. 1

Run also - Sulfite
PCB

Very truly yours,

RESOURCE RECOVERY DIVISION

Thomas O. Work

Thomas O. Work
Assistant Division Chief

TOW:kp

MICHIGAN
THE GREAT LAKE STATE

R1020-6 8/78

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MEN04445

CH2M HILL
engineers
planners
economists
scientists

L13351.D0

November 24, 1980

Ms. Ann Kovalchik, Geologist
Resource Recovery Division
Department of Natural Resources
State of Michigan
Box 30028
Lansing, Michigan 48909

Dear Ms. Kovalchik:

Subject: Menasha Corporation, Landfill in Otsego, Michigan

With reference to our telephone conversation of last week I would like to formally request an extension for the hydrogeologic investigation for the said site.

The reasons for this extension are as follows:

- At our October 28, 1980, meeting your recommendation to Menasha was to replace the upstream monitoring well which was clogged.
- Our initial approach was to unclog the existing upstream well; if this proved unsuccessful, we proposed to install a new monitoring well. This procedure was delayed since our meeting because of drill rig scheduling problems and the opening of hunting season locally.
- The flushing of the existing upstream monitoring well proved fruitless; it could not be activated.
- A new monitoring well is being constructed 100 feet north of the well in question.
- Our mutual concurrence of an approximate 30-day well stablization period prior to sampling.

On November 20, 1980, we began installation of a new well. Within a few days we should know whether this well will function. Taking into account a 30-day stabilization period and the short work weeks because of the upcoming holiday

4615

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

MEN04446

season, I would like to request an extension period of 45 days to submit the hydrogeologic report. This would extend the due date to January 15, 1981.

Your approval of this request would be greatly appreciated.

If you have any questions, please call me.

Sincerely,

Alfred Grimm

Alfred Grimm, P.E.
Director, Solid Waste Management

cc: Ms. Elizabeth A. Bols, DNR
Mr. John R. Blauwkamp, Menasha

MEN04447

December 4, 1980

Mr. Alfred Grimm, P.E.
Director Solid Waste Management
CH2M Hill
1500 114th Avenue, S.E.
Bellevue, Washington 98004

RE: Menasha Corporation Sanitary Landfill
Allegan County

Dear Mr. Grimm:

By this letter, consider your request for a 45 day extension period for submittal of the final hydrogeologic investigation concerning the Menasha Corporation Sanitary Landfill acknowledged and the extension granted.

Your written correspondence detailing reasons why this additional time is necessary is appreciated. If, in the future, any other schedule changes develop, please notify this office at once. At this time, we anticipate receipt of the hydrogeologic investigation on or before January 15, 1981.

If you have any questions, please do not hesitate to contact this office.

Very truly yours,

RESOURCE RECOVERY DIVISION

Ann Kovalchik
Geologist

AK:mm

cc: Liz Bols
Region III
Mr. John R. Blanchard

4617

CH2M HILL
engineers
planners
economists
scientists

MEN04448

January 7, 1981

L13351.D0

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

Dear Mr. Blauwkamp:

Pursuant to our conference call with you, Mr. Bruce Buchanan, Mr. Frank Pita, and me on December 29, 1980, and per your request, the attached memorandum details the status of the sanitary landfill hydrogeologic investigation at your Otsego site and the difficulties encountered in activating an upstream monitoring well.

On December 30, 1980, I spoke with Ann Kovalchik, the DNR geologist assigned to this project. Her assessment and opinion were that DNR would prefer all four wells to extend into the major regional aquifer. As you know, at this time wells No. 2 and 4 are into this aquifer; well No. 3 is located in a perched aquifer, and well No. 1 is dry but also extends into the perched aquifer. Our recommendation (see last paragraph, page 3 of attached memo) is that all the monitoring wells should extend to the same aquifer, but we are of the opinion that DNR may approve only the replacement of well No. 1 and leaving well No. 3 inactive at this time. Such an approval by DNR would require a letter of explanation.

In order to meet the DNR requirements, we have contacted two additional well drilling firms in the region. A total of four firms has been contacted; these are

- Mateko - Grand Rapids
- Raymer - Grand Rapids
- Rip Baker - Otsego
- Jim Wood - Battle Creek

Mateko had installed the original four wells at the site. They are not too costly, but slow and inefficient, requiring continuous supervision, and thus costly in an overall sense.

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MEN04449

Raymer charges $100 per hour, has drilled the well No. 1 replacement in November, is highly efficient with a powerful drill rig, and is thus quite costly. Does not require too much supervision except in the final well activation.

Rip Baker is local and has drilled most of the wells in the Otsego area. He uses no mud or liquid for drilling, and his quoted cost would be $12 per foot. The reason we did not use his services before was that this firm does not have the in-place soil sampling equipment as required by DNR as part of their requirements.

Jim Wood charges $9.75 per foot, uses liquid mud to drill, has similar equipment as Raymer, and is reluctant to work in Otsego as he claims Otsego is too far away to drive daily.

Since we do not need soil samples at this time but only a well, we would recommend using the Rip Baker firm out of Otsego.

The following outlines the project expenditures to date and the additional costs for replacement of well No. 1 to a depth of the river elevation in addition to replacing both wells No. 1 and 3 to the river elevation. We anticipate well depth not to exceed 150 feet in each case.

$47,007.18	spent through December 1980
41,000.00	project fee
$ 6,007.18	overspent

Cost to complete:

	Two Wells	One Well
Drilling with steel casing	$ 3,600.00	$ 1,800.00
Develop well, set PVC casing, and casing cost	2,500.00	1,250.00
Laboratory analysis of ground water (four wells)	1,500.00	1,500.00
CH2M HILL professional services and expenses covering well development and finalizing report	4,500.00	3,500.00
Over expenditure	6,007.18	6,007.18
Total cost to complete	$18,107.18	$14,057.18

As can be seen from above, there is a $4,000 differential between redrilling two wells compared to one well. I would recommend that, upon your approval to complete this project, we present our reasoning to DNR for the need of only one upstream well (well No. 1) immediately to satisfy permit requirements. In addition, we recommend that Menasha offer to redrill well No. 3 in the future if the need arises, based on the quarterly monitoring program.

If you are in agreement, please let me know and we shall send a letter to this effect to DNR, in addition to asking for a time extension.

Please call me if you have any questions.

Sincerely,

Alfred Grimm

Alfred Grimm, P.E.
Director, Solid Waste Management

pl

Enclosure

cc: Mike Harris/CH2M HILL, Milwaukee

4617

MEN04451

March 11, 1981

Mr. Steven R. Hoffman
CH2M Hill
1500 114th Avenue, S.E.
Bellevue, Washington 98004

RE: Menasha Corporation Sanitary Landfill
Allegan County

Dear Mr. Hoffman:

This letter should serve to clarify the status of the Menasha Corporation Sanitary Landfill site and outline a future course of action to be followed by the Menasha Corporation.

In order to facilitate progress towards completion of a hydrogeologic report for the Menasha Landfill site, well number four will serve to provide background water quality data. This decision is based on repeated and unsuccessful attempts to install a true upgradient monitoring well east of the site boundary. These attempts have failed due to difficult subsurface conditions in this area. It is essential that all subsurface information acquired from this drilling be fully described in the final report.

Since the resultant monitoring system will be less than that typically found at a Type II facility, I hope that Menasha Corporation will evaluate the possibility of excluding all but Type III wastes from the fill and seek reclassification as was once intended. Please inform me if this option is deemed undesirable or difficult to achieve. As an additional safeguard, close scrutiny of sampling results will be maintained to ascertain the need for action should water quality deteriorate significantly from results dated October 6, 1980.

In closing, I anticipate submittal of the final hydrogeologic report for the Menasha Corporation site during the month of April, 1981.

If questions or problems arise, please do not hesitate to contact this office.

Very truly yours,

RESOURCE RECOVERY DIVISION

Ann Stephens
Geologist

4627

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 26 March 81

SUBJECT: March 13th Meeting with Mike Knapp

FROM: John Blauwkamp

On March 13th, I had a meeting with Mike Knapp of Mead Corporation's Otsego Plant. The main topic of discussion was Meads renewal of the Class II license on their landfill. In summary, Mead obtained a Class II license for a landfill in spite of the fact it does not meet the requirements of Act 641. Mike explained that the landfill got a Class II license because the hydrogeologic study done in 1975 was for a Class II landfill. However, to get the license, Mead had to make an agreement with the DNR, to dispose of only a Class III materials at the landfill. When Mead finally closes the landfill (in one or two years) all of the materials in the landfill will have to be properly covered. Because it is operating as a Class III landfill, the DNR waived the daily cover requirement. Mike will have Derk Krauskop from Mead's central research division in Cincinnati, Ohio, send us the information on the tests they have done on their materials to get them classified as Class III materials. Mead is currently investigating the possibility of installing a coal fired boiler. If this becomes a reality, they will be even more interested then they are now in establishing a jointly operated Class III landfill with us and possibly some other industries in the Otsego area. Mike and I will be working on this possibility in the next few months.

cc: ✓New Class III landfill file.

JB/kj

MEN04453

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 18 December 1981

SUBJECT: December 15th meeting with Region III RCRA Staff.

FROM: John Blauwkamp

On December 15, 1981, we had a meeting with Elizabeth Boles from the Region III RCRA Staff and Ginney LaSalle, the geologist from Lansing. Also present at the meeting were Gary Roys, and the writer.

The main topic of conversation was the necessary monitoring of our landfill. Because our monitoring well system is essentially nonfunctional, the DNR proposed an alternate means of monitoring the landfill. The law requires at a Class II landfill have ground water samples taken quarterly but the law requires that a Class III landfill be monitored quarterly. The law does allow for monitoring of a Class III landfill by testing the materials going into the landfill rather than ground water monitoring. The DNR suggested that since our landfill will soon become a Class III we discontinue trying to use the test wells and establish a program of monitoring materials that would be going into the Class III landfill. When our Class II license expires in June of 1982, the license can be reissued only as a Class III landfill. The Class III landfill license would only be for specific materials that we have had classified as Class III material and would not be able to accept any material that others may have had classified as Class III material. For example, if we want to put our hydrapulper rejects into the Class III landfill, we must have them tested to determine they are suitable for a Class III landfill. The mere fact that Mead down the street may have had their hydrapulper rejects tested and found them suitable for a Class III landfill does not eliminate the need for us having to test our rejects. It also does not allow us to accept the Class III materials from Mead even though it has been tested.

When the Class III license is reissued in June, we would either have to have done the necessary engineering to develop the closure plans for the site or we will have to establish a schedule of compliance before the license can be reissued. The following time table was laid out for gathering the necessary information and establishing the testing program required to allow the landfill to be licensed as Class III landfill.

1. Menasha would immediately begin collecting composite samples of its hydrapulper rejects, its fly ash and its ash lime slurry so that when the testing parameters had been established, the necessary samples would be available.

2. By January 15, 1982, Menasha would submitt to the DNR a proposed list of parameters that we would have the leachate from the various materials for. This suggested list would then be either modifed

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MEN04454

or approved by the DNR before 30 January 1982.

3. As soon as the parameters to be tested for has been established the samples would be sent out for the required analysis.

4. By March 1, 1982, the results of the tests would be sent to the DNR.

5. By the 15th of March 1982, the DNR would send us their decision as to whether or not the various materials were acceptable for Class III landfill.

6. Early next year, Menasha should request a license renewal package and begin the necessary engineering work such that the new license can be reissued without the need for a schedule of compliance.

cc: Gary Roys
Tom Clemmons

JB/kj

MEN04455

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 21 June 1982

SUBJECT: Class II Waste Disposal

FROM: John Blauwkamp

The DNR has agreed to allow us to bring our Class II waste to our landfill for an additional 30 days. This will give us the time required to have the compactor installed and avoid the cost of having to load all of the Class II waste into the open top dumpster with a fork truck. To meet the 30 day limit, we will have to begin preparation for the installation of the compactor almost immediately.

We received two quotes on the cost of renting a compactor with box and carts for use in the mill. Dispos-o-waste from Kalamazoo gave us the low bid for this job. They also gave us the low bids on disposal of our Class III waste. The cost for disposal of our Class II waste if we lease all of the equipment will be $643.00 per month. The components of this cost are as follows:

1. Compactor and container rental - $379.00 per month.
2. Cost of dumping containers -$184.00 per month.
3. Cart rental - $80.00 per month.

Total $643.00 per month.

Recommendations:

We should immediately contact Dispos-o-waste and work out the final details of the rental agreement. We should also have engineering immediately begin preparations for installation of the compactor and container. This will envolve a small concrete pad, some minor electrical work and building a small ramp to go from the loading dock to the compactor. The concrete pad where the compactor is to be located, should be poured as soonas possible, so that the concrete has time to cure before we begin using the compactor. Technical and production must review the need for carts within the mill and get the proper number of 1 and 1-1/2 yard dumping carts on order, so that they are available when the compactor is operational. If you agree to these recommendations I will begin making the arrangements immediately.

JB/kj

4647

MEN04456

memo / MENASHA CORPORATION

TO: DNR Phone Call File - Resource / Recovery

DATE: 22 June 1982

SUBJECT: 21 June 1982 phone conversation with Elizabeth Bols and Jennie LaSelle

FROM: John Blauwkamp
JKB

The following subjects were discussed:

1. Continued operation of the landfill while the license is being processed.
2. Time table for installation of the required testing wells.
3. Time table for eliminating Class II waste from the landfill.

Elizabeth Bols said we could continue using the landfill as a Class III landfill while the license application was being processed.

Jennie LaSelle agreed to letting us purpose a time table for installation of the required test wells. This would give us the flexibility of establishing a time table and the dates established would not be as ridged as in a formal schedule of compliance. If there were any major differences between our proposed time table and when they thought it should be accomplished, we would work out a compromise at that time.

Originally, we had intended to have the materials going into the landfill tested rather than using monitoring wells. This was based on the assumption that the materials that had previously been placed in the landfill would meet the required leachate limits. Both the fly ash from our old high sulfur coal and the fly ash from the coal we are now using have concentrations of materials in the leachate that make installation of test wells necessary. Because of the large volumes of these materials that are in the landfill, we would have to install the test wells and monitor them even if we close the landfill down at this time.

Jennie LaSelle agreed to allow us to continue bringing our Class II waste to the landfill until such time as we can get the compactor installed providing we can get this accomplished within 30 days. This will allow us to avoid the additional expense of having a roll-off box brought in and having to dump everything into it with special boxes and fork lifts. I agreed to send Elizabeth a letter confirming the projected date we would have the compactor installed and a proposal for installation of the required test wells.

JB/kj

4648

MEN04457

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 9 September 1982

SUBJECT: New Landfill Test Wells

FROM: John Blauwkamp

JB

On September 9th, the installation of the two new down stream test wells at the landfill was completed. The new test wells were installed by Rip Baker, who was being supervised by CH2M-Hill. For the two new test wells, stainless steel pipe was used rather than PVC. We also installed four guardposts around each of the new test wells and around the upstream test wells on the North side of the landfill. These 4" guard-posts are approximately 15' in the ground and all four guardposts and the 4" casing around the test well are all held together by a 6" slab of concrete. The concrete was installed around the test wells for two reasons. First, the concrete is slopped, which insures that no water will run down along the casing to contaminate the test wells and second, the concrete ties the guardposts and test well casings together to give the test well maximum protection. All three test wells now have 4" casing approximately 15' in the ground around the 2" test well pipe and have locking covers to protect the test wells. Gary Roys will be responsible for sampling the test wells once each quarter and having the water samples analyzed for the appropriate parameters. The first set of sample will be taken next week.

We also had the boundries of the landfill re-established by the surveyors and new 4" posts were installed at each corner to be permanent markers for the boundry on the landfill. The new 4" corner posts have a concrete slab of approximately 4' square around each of them. All of the guardposts for the test wells and the corner boundries have been painted a florescent orange. There should no longer be an excuse for anyone running into and damaging any test wells or corner posts.

The old unused test wells were located by the surveyors and plugged by the well drillers. The well driller will also have the appropriate records changed to show that these wells have been plugged.

CC: G. Roys
T. Clemmons
J. Porter
M. Carlson

JB/kj

4650

memo / MENASHA CORPORATION

: DNR Meeting File - Ground Water Quality

DATE: 26 Augu 1983

SUBJECT: August 26th Meeting

FROM: John Blauwkamp

At 10 A.M. Rick Sadowski, and Sue Peelin from the DNR Ground Water Quality section and I discussed the possibility of disposing of our ash lime sludge in our landfill. The only concern they had was the relatively high arsenic concentration in the leachate test. Because the ash lime material is relatively impervious and the actual amount of arsenic that could be leached out of the material would be very very much less than that indicated by the shake test, it was decided that this material would not pose a problem in the landfill. In addition to the low impermeability, the fact that the landfill will be closed next summer, also greatly reduced the potential risk associated with this material. Sue and Rick agreed that our proposed method of spreading the ashlime sludge in the landfill and then bulldozing a layer of sand, fly ash, or wood fines on top of it until we obtain a relatively firm layer would be a satisfactory way of placing the material in the landfill. It was agreeable to them that we proceed with making the arrangements to have the ponds cleaned and they would send us a confirming letter next week.

Rick said they had also received several complaints associated with the truck wash station at 6 & 7 well. Apparently, enough trucks are washed in this area to cause a mess on the road. The mess is probably due to a combination of runn-off and tracking the material from the truck wash station to the road. They were also concerned that washing various types of material onto the ground in this area may eventually cause contamination in 6 & 7 well. We would then have to explain why this contamination was there and possibly prove that it was not coming from the tankfarm. Sue suggested that we install a impremeable slab for a truck wash station and take the runoff either to our waste treatment system or to the storm sewer.

They were also concerned with the remaining SLI product piles near the tankfarm. I explained the status and history of the salt cake accumulation. This discussion ended when I explained our intent to either reuse this material in the SLI or landfill it. A time table for accomplishing this, however, was not mentioned.

The bog north of the landfill, is also of some concern to them both because of its current condition and its potential impact on the landfill after closure. Samples of water taken from the bog indicated a high sodium concentration which would be indicative of leaching from the landfill or run-off from the water that was sprayed in this area several years ago. They believe the most likely possiblity is that some water from the landfill

MEN04459

is migrating through the road to the bog. After the landfill is closed, the clay cap would prevent water from getting into the landfill. However, standing water on the other side of the road could leach back into the landfill. To insure the integrity of the landfill after closure, it will be necessary to either insure the bog stays drained or install a clay isolation wall between the landfill and the bog. Obviously installing a drain in the bog would be much less expensive than the isolation wall. This avenue will be pursued.

They also said they are still getting a few complaints from people who are suspicious that we are contaminating the river with the empty chemical barrels. They suggested that keeping the number of barrels stored there to a minimum and keeping them neatly stacked would reduce the number of complaints and improve the Corporate immage in this respect.

FollowUp

Arrangements are currently being made to have the ash lime pond dipped as soon as possible. The DNR will be notified of the date that we will begin the dipping of the ponds so that they can observe the placement of the material on the landfill.

I will be working with Engineering on the changes necessary to either relocate or modify the truck washing station.

As yet no specific plans have been made for either trying to run the SLI through the crusher or for disposing of the material. I will be working Steve Rosenthal and Engineering to have an SLI crushing trial scheduled for the near future.

Arrangements have been made to have the empty chemical barrels picked up whenever a truckload of 60 has accumulated. All barrels will be washed and marked with a bright orange sticker to indicate that they have been washed before they are placed in the storage area. The barrels will also be kept stacked neatly in rows of no more than three high.

c B. Buchanan
T. Clemmons
S. Rosenthal
K. Kling
G. Roys
F. Katje
R. Thaxton
H. Smiley
J. Porter
M. Carlson

j

MEN04460

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

NATURAL RESOURCES COMMISSION
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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 LAKES STATE

R1026-6 9/79

4661-B

MENASHA CORPORATION
PAPERBOARD GROUP

November 8, 1984

Mr. Tom Newland
1442 108th Ave.
Otsego, MI 49078

Dear Mr. Newland:

On October 25, John Bonham and Ron Thaxton met with you as Menasha representatives to discuss closing the pond north of our landfill, the majority of which lies on your property. As you know, the Michigan Department of Natural Resources had instructed us to eliminate the ponding of water in this location in conjunction with the closing of our Class III landfill. We had proposed to install a clay cut-off ditch along the south end of the pond, and to cover the pond area with soil from the adjacent high ground on your property. This would have met our requirement for eliminating the standing water, as well as opening up an area of tillable soil for farming which was previously not available to you. The entire cost for this was to have been born by Menasha Corporation. From our perspective, you would have benefitted by allowing us to perform this work on your land. You indicated at this meeting, however, that you would not allow us to do this work until we agreed to perform a substantial amount of extra work to open up additional acreage on your property which is currently not in a condition to allow farming. This extra work included a great deal of site clearing, and the elimination of another separate pond. Your stated desire was to be able to farm across the entire southern edge of your property, an area which has never been suitable for farming before.

We do not feel that Menasha should be required to improve your land to this extent to obtain your permission for us to eliminate the pond in question. After discussing the situation with the MDNR, they have waived their requirement for us to eliminate the ponding of water north of our landfill. We still intend to install the clay cut-off trench, but it will be installed entirely on Menasha property at the south end of the pond. Construction on the clay cut-off trench should begin within a few weeks.

4679

OTSEGO MILL BOX 155 • 320 N FARMER STREET • OTSEGO MICHIGAN 49078 • PHONE 616-652-6141

MEN04462

11/8/84

At the previous meeting you also disputed the boundary between our respective properties, as indicated by the orange steel rods protruding from the ground. Enclosed is a copy of the boundary survey, which indicates that the steel rods are in fact the boundary markers between our properties.

We are sorry that we could not reach an agreement on our original proposal to close the pond. We intend to have both the landfill closure and the clay cut-off trench completed before the end of this year. Please contact John Bonham if you have any further questions or concerns.

Sincerely,

MENASHA CORPORATION

Bruce Buchanan

Bruce Buchanan
General Manager
Otsego Paperboard Division

4680

MEN04435

MENASHA CORPORATION

December 20, 1978

Mr. Fred B. Kellow, Chief
Resource Recovery Division
Environmental Protection Bureau
Department of Natural Resources
Secondary Complex, Administration Bldg.
Diamondale, MI

Dear Mr. Kellow;

In a letter date of 26 April 78, I requested a review of your environmental sanitarians interpretation of our Soil and Foundation Consultants' Hydrogeological Survey of a 30 acre tract of land located immediately North of Menasha Corporations' existing sanitary land fill site. To this date, I have received no response either by phone or in writing.

Would you please advise me of the status of this report as soon as possible?

Best regards,

Menasha Corporation

Bruce Buchanan
Technical Superintendent

BB:kj

4550

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MEN04436

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

RESOURCES COMMISSION
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E. M. LAPALA
DEAN PRIDGEON
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HARRY H. WHITELEY
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THOMAS E. STRAATSMA
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING MI 48909

517 322-1315

January 3, 1979

State Office Building
350 Ottawa Avenue, N. W.
Grand Rapids, MI 49503

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

Dear Mr. Buchanan:

After a thorough search of our files, I am unable to retrieve the letter referred to in your December 20, 1978 correspondence; therefore, I am unable to address your concerns.

Attached is a copy of our environmental geologist's evaluation of the submitted proposal which indicates the site's unsuitability as a sanitary landfill in its natural state. If you would like to discuss this evaluation in more detail, feel free to contact this office. I will set up a meeting and attempt to have our geologist available to answer any questions you may have.

If you have any questions, please feel free to call me at 616/456-6231.

456-8071

Very truly yours,

RESOURCE RECOVERY DIVISION

Gerard Heyt,
Environmental Sanitarian

GH/mc
Enclosure

cc: De Montgomery

MICHIGAN
THE
RE.
AIR

4551

MEN04437

MENASHA CORPORATION

29 March 1979

Gerard Heyt
Environmental Sanitarian
State Office Building
350 Ottawa Avenue, N.W.
Grand Rapids, MI 49503

Mr. Heyt;

Referencing: Environmental Geologist's Evaluation

Have you had a chance to review and evaluate this literature? I would like to know your thoughts and viewpoints.

If you have any questions, please feel free to call me at 616-692-6141.

Sincerely,

Menasha Corporation

Bruce Buchanan

Bruce Buchanan
Technical Superintendent

BB:kj

4552

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MEN04438

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

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

RESOURCES COMMISSION
ICHNSON
ALA
EAN PRIDGEON
ARY F. SNELL
ARRY H. WHITELEY
OAN L. WOLFE
HARLES G. YOUNGLOVE

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MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
SECONDARY COMPLEX
BOX 30028
LANSING MI 48909

517-322-1315

April 23, 1979

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

Dear Mr. Buchanan:

Your request for a re-evaluation of the geological characteristics of your proposed landfill site has been referred to this division's Environmental Geology Section. To date I have not received a reply relative to the concerns expressed.

As indicated in my January 3, 1979 letter addressed to you, I suggested that a meeting be established to discuss the evaluation. I feel that this may be the most practical method to adequately address the concerns raised. Please contact this office at your convenience if you concur. Department personnel will be available to answer any technical questions you may have.

If you have any questions, feel free to contact this office at 456-5071.

Very truly yours,

RESOURCE RECOVERY DIVISION

Gerard Heyt
Environmental Sanitarian

GH:bjc
cc: D. Montgomery

4553

MEN04439

B2

Solid Waste Landfill memo / MENASHA CORPORATION

Jim Adams

DATE: 16 May 1979

Meeting with DNR, Grand Rapids

FROM: Bruce Buchanan

BB

A meeting was held with Gerard Heyt, De Montgomery and Elain Brown of the Resource Recovery Division, Department of Natural Resources on 15 May 1979. The purpose of the meeting was to discuss the proposed extension of our solid waste landfill area and to resolve discrepancies between the Schultz, Graves and Associates interpretation of the soil investigation work on that area and the D.N.R.'s interpretation of the same report. The history is that our soils consultants felt the site should be suitable for landfill whereas the Resource Recovery Divisions' geologists felt otherwise.

After a few minutes of discussion, it became apparent that a significant change in regulatory involvement had recently occurred in the Resource Recovery Division. The change is associated with the passage of Act No. 641 of Public Acts of 1978 signed 1/11/79. This Act is embodied in enrolled House Bill No. 6314, State of Michigan, 79th Legislature, Regular Session of 1978. This Act is known as the "Solid Waste Management Act". A copy of the House Bill is attached.

he Resource Recovery Division has drafted guidelines based on Act 641. The guidelines are in draft form and under review. A copy is being mailed to this division.

Under the guidlines, solid waste is classified into one of four types with type I being the most toxic material. Examples would be type I-PCB containing waste, type II-general rubbish, type III-fly ash, type IV-broken cement. Because of the composition of materials in our landfill, we would be classified as type II. In order for a site to be applicable to type II landfills under their natural conditions, they must fall into one of two categories. Category I is a sandy site with a minimum of 40' vertical depth to the water table and a 2000' buffer zone in the direction of aquifer movement. The buffer zone land will require a restricted covenant of deed to prevent development during the use of the landfill and for 15 years thereafter. Category II sites require a minimum 20' depth of natural clay continuous throughout the landfill site, with a minimum 10 to the minus 7th cenimeters per second percolation rate. The proposed landfill expansion north of the existing site meets neither of the above criteria. Sites whose soil characteristics fall somehwere between category I and category II are not licensable under either category according to current guidelines for natural site selection criteria.

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Alternatives to natural site selection are engineered solutions. The alternatives for type II landfills are as follows;

1) depositing a 5' thick clay liner with density necessary to achieve a permeability of at least 10 to the minus 7th cenimeters per second,
2) 2' of clay with the same above criteria but with 20 mill pvc. liner and 2' of sand on top,
3) 30 mill pvc. liner, no clay and 2' of sand on top.

All of the above must have dyking or trenching with wall protection and must incorporate leachate collection systems with facilities for dealing with the leachate.

All landfills will need more extensive hydrogeological survey work and will require a minimum of three 2" O.D. monitoring wells with quarterly sampling. All landfills will also require engineering plans, operating plans and a 2' clay cover with a 3 or 4 to one slope with 15 years of monitoring after closure of the site.

Another alternative to this expensive approach is to request licensing for the extension based on type III solid waste only. Natural site selection criteria for type III waste are liberal enough that it is anticipated the proposed extension area would be suitable as is. Monitoring wells, engineering plans, operating plans, etc., etc. are still required but no leachate collection systems are needed. We will need to know the quantities of general rubbish versus fly ash that are generated each day to determine what advantage this approach might have. If this approach is saught, at least two different fly ash leachate quality tests will be needed. At that time, we may want to test some of the other components of the general rubbish category to see if they could also be licensed for type III disposal.

Gerard Heyt feels that monitoring of existing landfills for leachate quality and ground water contamination will become a requirement within the next four years. We can be looking forward to this and to the possibility that if leachate quality from the existing landfill is not good enough, our landfill could be closed. This would either force us to another private or municipal landfill or to application for an engineered type II landfill.

We should discuss the options and develop plans within the near future.

cc: A. Schenck
Department Heads
Technical Department Circ.

4555

kj

Bruce Buchanan
John Blauwkamp
Jim Cox
Tom Ray
Rod Kopish
Tom Williscroft

MEN04441

memo / AAME CORPORATION

R. L. JOHNSON

DATE: January 10, 1980

SUBJECT: Otsego Meeting with Michigan DNR Regarding the "Notice of Violation" December 7th on our Solid Waste Dump Site

FROM: W. ALLAN SCHENCK

SUMMARY

Bruce Buchanan, John Blauwkamp and the writer met with Mr. Gerard Heyt of Michigan DNR on the above subject. Jerry Heyt is in the Resource Recovery Division of Michigan DNR based in Grand Rapids and has responsibility for solid waste in the southern half of the lower peninsula.

The notice of violation letter referred to some specific practices at our dump they want changed and also served as a basis to tell us what they want done to implement the intent of Michigan Law 641. The points made were:

1. Start applying six inches of clay, sand or gravel daily.

2. Install adequate barrier so an outsider will not have access to the dump when our operator is not there and the gate is locked. This does not necessarily mean fencing the complete area.

3. We need not formally reply to their notice of violation as other points are covered by the following.

4. Set a timetable and get approval by April 1 of this year (1980) for beginning monitoring the ground water through test wells for specified parameters. A letter giving these parameters is attached.

5. Set a timetable and get it approved by April 1, 1980 for a hydrogeological survey to be completed by the second quarter of 1981. We would commit now that this survey would be the basis for establishing a fully approved landfill by no later than April 1, 1984. This plan, which must be approved by April 1, would be in the form of a consent agreement (a suggested format attached).

6. This does assume tests on the ground water show nothing harmful.

7. Our present site will be full in about 18 to 24 months.

8. As the hydrogeological survey develops, we will have the following options to consider:

   a. Close up the landfill and haul to a regional site. Such a site is not yet available.

   b. Design, cost-out and appropriate funds for a Class II landfill. A Class II landfill can accept anything but toxic chemicals. It must have an impervious barrier bottom and sides a specified distance above the water table, have a leachate collection system and a place to treat the leachate such as an effluent treating plant.

4584

c. Design, cost out and approve funds for a Class III Landfill. A Class III landfill can only be used for inert material. A Class III landfill costs less to construct and operate. In this case our garbage (food waste) would have to be hauled to a Class II landfill. Our large volume solid waste, fly ash, ash, pulper screenings, and digester squeezings would have to be tested and proven "inert" and "no effect on ground water" proven.

d. Construct both a Class II and Class III Site.

9. Our next step is to retain an engineering firm to lay out what will have to be done in the hydrogeological survey and what test wells should be established for the monitoring. This program would then be submitted for approval prior to April 1. At this point CH_2M Hill seems most capable. Their proposal on these subjects as well as liquor storage and plant close up should be in within a day or two.

MISCELLANEOUS NOTES

10. The public hearings on the Rules for State Law 641, the new solid waste law for the State of Michigan, brought such a huge forceful response that the rules have been modified, reissued and currently are in the process of a second round of hearings. Mr. Heyt feels some significant changes will come out of this. Already they made an interesting but logical change in that the current administrative rules pull out Class I disposal site which deal with toxic chemicals. This is such a different more difficult subject, it seems like a good approach. To give some feel of the kind of problems, he indicated that there was very strong pressure from environmentalists not to permit any variances from the rules for Class II sites and while such variances are still in the rules, Heyt feels they may be cut before the final rules are promulgated.

10. a. Heyt pointed out that their office has absolutely nothing on our solid waste site; i.e. boundaries, accesses, geology of the area and so forth.

11. A quick way of distinguishing the three classes of sites is that Class I sites are for toxic chemicals, Class III for inert materials which cause "zero degradation of the ground water" and a Class II site takes all else.

We feel we have the potential of having our large volume waste classified as for a Class III site. However, the "zero degradation" requirement could be very difficult.

12. It is estimated that of all solid waste Class II Sites only 10% will have a satisfactory natural barrier. This means engineered barriers will have to be built in 90% of the cases.

13. They discourage putting an approved site on top of an existing unapproved site. The possibility of the old site's settling and breaking the barrier and problems with gas evolving are given as reasons.

13. a. When one considers alternatives there really are none. You either go into the program of ground water monitoring and construction of an approved site or you will be shut down.

4. e discussed the situation as far as regional or municipal sites operated in the Otsego area. It does not look good. Definitely Allegan County has indicated they do not want to get involved in a county site. Where three years ago Allegan had twenty-six solid waste disposal sites operated privately, there are now thirteen in operation. Heyt said there was a county planning report around 1970 which may have touches on solid waste. We should try to get a copy.

There is no indication of a major regional site in the Kalamazoo area. Unofficially some data is being collected in the Saugatuck area for a good large Class II site which would be owned by the Township of Saugatuck and operated by a private individual.

We should discuss solid waste with Mead and Plainwell Paper. Perhaps an industry oriented site would be the best course of action.

Heyt said that Kent County where Grand Rapids is located have had a fully approved site for about two or three years. The only other site in the lower peninsula which is approved currently is the Orchard Hills Solid Waste Disposal Site at Watervliet. This is a private operation. Hopefully this will be a good operation for Coloma.

5. On the subject of what to do with leachate which is collected, the following points were made:

a. Keep the grade on top of the dump steep enough so very little surface water runs down through the dump. In other words keep leachate to a minimum.

Recycling leachate back through is discouraged. In Michigan the reduction in volume by evaporation is close to the amount the volume is increased by rainfall.

S:rp

tachment

MEN04444

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
GARY J. JOHNSON
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HILARY F. SNELL
HARRY H. WHITELEY
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WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

RESOURCE RECOVERY
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JOHN W. LAYMAN
STUART B. PADNO
JOHN M. ROBERTS
THOMAS E. STRAA
MICHAEL L. WALKY

RESOURCE RECOVERY
SECONDARY COMP
BOX 30028
LANSING, MI 48909
517-322-1315

TO: TYPE II LANDFILL OPERATORS

FROM: Tom Work, Resource Recovery Division

Rec'd from Gerard Heyt 1-7-80

The Resource Recovery Division of the Department of Natural Resources has established a set of parameters for quarterly and annual monitoring of Type II landfills. This list contains the minimum parameters to be tested. Additional parameters may be required on a site by site basis.

Quarterly Parameters: Chemical Oxygen Demand (COD), Iron, Chlorides, Specific Conductance, Total Organic Carbon (TOC), Sulfate, and pH. 7

Annual Parameters: Chemical Oxygen Demand (COD), Iron, Chlorides, Specific Conductance, Total Organic Carbon (TOC), Sulfate, pH, Calcium, Sodium, Magnesium, Bicarbonate, Nitrate Nitrogen, Nitrite Nitrogen, Ammonia Nitrogen, Lead, and Total Chromium. 12

Run also - Sulfite
PCB

Very truly yours,

RESOURCE RECOVERY DIVISION

Thomas O. Work

Thomas O. Work
Assistant Division Chief

TOW:kp

MICHIGAN
THE GREAT LAKE STATE

R1020-6 8/78

4587

MEN04445

CH2M HILL
engineers
planners
economists
scientists

L13351.D0

November 24, 1980

Ms. Ann Kovalchik, Geologist
Resource Recovery Division
Department of Natural Resources
State of Michigan
Box 30028
Lansing, Michigan 48909

Dear Ms. Kovalchik:

Subject: Menasha Corporation, Landfill in Otsego, Michigan

With reference to our telephone conversation of last week I would like to formally request an extension for the hydrogeologic investigation for the said site.

The reasons for this extension are as follows:

- At our October 28, 1980, meeting your recommendation to Menasha was to replace the upstream monitoring well which was clogged.
- Our initial approach was to unclog the existing upstream well; if this proved unsuccessful, we proposed to install a new monitoring well. This procedure was delayed since our meeting because of drill rig scheduling problems and the opening of hunting season locally.
- The flushing of the existing upstream monitoring well proved fruitless; it could not be activated.
- A new monitoring well is being constructed 100 feet north of the well in question.
- Our mutual concurrence of an approximate 30-day well stablization period prior to sampling.

On November 20, 1980, we began installation of a new well. Within a few days we should know whether this well will function. Taking into account a 30-day stabilization period and the short work weeks because of the upcoming holiday

4615

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

MEN04446

season, I would like to request an extension period of 45 days to submit the hydrogeologic report. This would extend the due date to January 15, 1981.

Your approval of this request would be greatly appreciated.

If you have any questions, please call me.

Sincerely,

Alfred Grimm

Alfred Grimm, P.E.
Director, Solid Waste Management

cc: Ms. Elizabeth A. Bols, DNR
Mr. John R. Blauwkamp, Menasha

4616

MEN04447

December 4, 1980

Mr. Alfred Grimm, P.E.
Director Solid Waste Management
CH2M Hill
1500 114th Avenue, S.E.
Bellevue, Washington 98004

RE: Menasha Corporation Sanitary Landfill
Allegan County

Dear Mr. Grimm:

By this letter, consider your request for a 45 day extension period for submittal of the final hydrogeologic investigation concerning the Menasha Corporation Sanitary Landfill acknowledged and the extension granted.

Your written correspondence detailing reasons why this additional time is necessary is appreciated. If, in the future, any other schedule changes develop, please notify this office at once. At this time, we anticipate receipt of the hydrogeologic investigation on or before January 15, 1981.

If you have any questions, please do not hesitate to contact this office.

Very truly yours,

RESOURCE RECOVERY DIVISION

Ann Kovalchik
Geologist

AK:xm

cc: Liz Bols
Region III
Mr. John R. Blanckamp

4617

CH2M HILL
engineers
planners
economists
scientists

MEN04448

January 7, 1981

L13351.D0

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

Dear Mr. Blauwkamp:

Pursuant to our conference call with you, Mr. Bruce Buchanan, Mr. Frank Pita, and me on December 29, 1980, and per your request, the attached memorandum details the status of the sanitary landfill hydrogeologic investigation at your Otsego site and the difficulties encountered in activating an upstream monitoring well.

On December 30, 1980, I spoke with Ann Kovalchik, the DNR geologist assigned to this project. Her assessment and opinion were that DNR would prefer all four wells to extend into the major regional aquifer. As you know, at this time wells No. 2 and 4 are into this aquifer; well No. 3 is located in a perched aquifer, and well No. 1 is dry but also extends into the perched aquifer. Our recommendation (see last paragraph, page 3 of attached memo) is that all the monitoring wells should extend to the same aquifer, but we are of the opinion that DNR may approve only the replacement of well No. 1 and leaving well No. 3 inactive at this time. Such an approval by DNR would require a letter of explanation.

In order to meet the DNR requirements, we have contacted two additional well drilling firms in the region. A total of four firms has been contacted; these are

- Mateko - Grand Rapids
- Raymer - Grand Rapids
- Rip Baker - Otsego
- Jim Wood - Battle Creek

Mateko had installed the original four wells at the site. They are not too costly, but slow and inefficient, requiring continuous supervision, and thus costly in an overall sense.

4618

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

MEN04449

Raymer charges $100 per hour, has drilled the well No. 1 replacement in November, is highly efficient with a powerful drill rig, and is thus quite costly. Does not require too much supervision except in the final well activation.

Rip Baker is local and has drilled most of the wells in the Otsego area. He uses no mud or liquid for drilling, and his quoted cost would be $12 per foot. The reason we did not use his services before was that this firm does not have the in-place soil sampling equipment as required by DNR as part of their requirements.

Jim Wood charges $9.75 per foot, uses liquid mud to drill, has similar equipment as Raymer, and is reluctant to work in Otsego as he claims Otsego is too far away to drive daily.

Since we do not need soil samples at this time but only a well, we would recommend using the Rip Baker firm out of Otsego.

The following outlines the project expenditures to date and the additional costs for replacement of well No. 1 to a depth of the river elevation in addition to replacing both wells No. 1 and 3 to the river elevation. We anticipate well depth not to exceed 150 feet in each case.

$47,007.18	spent through December 1980
41,000.00	project fee
$ 6,007.18	overspent

Cost to complete:

	Two Wells	One Well
Drilling with steel casing	$ 3,600.00	$ 1,800.00
Develop well, set PVC casing, and casing cost	2,500.00	1,250.00
Laboratory analysis of ground water (four wells)	1,500.00	1,500.00
CH2M HILL professional services and expenses covering well development and finalizing report	4,500.00	3,500.00
Over expenditure	6,007.18	6,007.18
Total cost to complete	$18,107.18	$14,057.18

MEN04450

As can be seen from above, there is a $4,000 differential between redrilling two wells compared to one well. I would recommend that, upon your approval to complete this project, we present our reasoning to DNR for the need of only one upstream well (well No. 1) immediately to satisfy permit requirements. In addition, we recommend that Menasha offer to redrill well No. 3 in the future if the need arises, based on the quarterly monitoring program.

If you are in agreement, please let me know and we shall send a letter to this effect to DNR, in addition to asking for a time extension.

Please call me if you have any questions.

Sincerely,

Alfred Grimm

Alfred Grimm, P.E.
Director, Solid Waste Management

ph

Enclosure

cc: Mike Harris/CH2M HILL, Milwaukee

MEN04451

March 11, 1981

Mr. Steven R. Hoffman
CH2M Hill
1500 114th Avenue, S.E.
Bellevue, Washington 98004

RE: Menasha Corporation Sanitary Landfill
Allegan County

Dear Mr. Hoffman:

This letter should serve to clarify the status of the Menasha Corporation Sanitary Landfill site and outline a future course of action to be followed by the Menasha Corporation.

In order to facilitate progress towards completion of a hydrogeologic report for the Menasha Landfill site, well number four will serve to provide background water quality data. This decision is based on repeated and unsuccessful attempts to install a true upgradient monitoring well east of the site boundary. These attempts have failed due to difficult subsurface conditions in this area. It is essential that all subsurface information acquired from this drilling be fully described in the final report.

Since the resultant monitoring system will be less than that typically found at a Type II facility, I hope that Menasha Corporation will evaluate the possibility of excluding all but Type III wastes from the fill and seek reclassification as was once intended. Please inform me if this option is deemed undesirable or difficult to achieve. As an additional safeguard, close scrutiny of sampling results will be maintained to ascertain the need for action should water quality deteriorate significantly from results dated October 6, 1980.

In closing, I anticipate submittal of the final hydrogeologic report for the Menasha Corporation site during the month of April, 1981.

If questions or problems arise, please do not hesitate to contact this office.

Very truly yours,

RESOURCE RECOVERY DIVISION

Ann Stephens
Geologist

4627

MEN04452

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 26 March 81

SUBJECT: March 13th Meeting with Mike Knapp

FROM: John Blauwkamp

On March 13th, I had a meeting with Mike Knapp of Mead Corporation's Otsego Plant. The main topic of discussion was Meads renewal of the Class II license on their landfill. In summary, Mead obtained a Class II license for a landfill in spite of the fact it does not meet the requirements of Act 641. Mike explained that the landfill got a Class II license because the hydrogeologic study done in 1975 was for a Class II landfill. However, to get the license, Mead had to make an agreement with the DNR, to dispose of only a Class III materials at the landfill. When Mead finally closes the landfill (in one or two years) all of the materials in the landfill will have to be properly covered. Because it is operating as a Class III landfill, the DNR waived the daily cover requirement. Mike will have Derk Krauskop from Mead's central research division in Cincinnati, Ohio, send us the information on the tests they have done on their materials to get them classified as Class III materials. Mead is currently investigating the possibility of installing a coal fired boiler. If this becomes a reality, they will be even more interested then they are now in establishing a jointly operated Class III landfill with us and possibly some other industries in the Otsego area. Mike and I will be working on this possibility in the next few months.

cc: ✓New Class III landfill file.

JB/kj

4632

MEN04453

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 16 December 1981

SUBJECT: December 15th meeting with Region III RCRA Staff.

FROM: John Blauwkamp

On December 15, 1981, we had a meeting with Elizabeth Boles from the Region III RCRA Staff and Ginney LaSalle, the geologist from Lansing. Also present at the meeting were Gary Roys, and the writer.

The main topic of conversation was the necessary monitoring of our landfill. Because our monitoring well system is essentially nonfunctional, the DNR proposed an alternate means of monitoring the landfill. The law requires at a Class II landfill have ground water samples taken quarterly but the law requires that a Class III landfill be monitored quarterly. The law does allow for monitoring of a Class III landfill by testing the materials going into the landfill rather than ground water monitoring. The DNR suggested that since our landfill will soon become a Class III we discontinue trying to use the test wells and establish a program of monitoring materials that would be going into the Class III landfill. When our Class II license expires in June of 1982, the license can be reissued only as a Class III landfill. The Class III landfill license would only be for specific materials that we have had classified as Class III material and would not be able to accept any material that others may have had classified as Class III material. For example, if we want to put our hydrapulper rejects into the Class III landfill, we must have them tested to determine they are suitable for a Class III landfill. The mere fact that Mead down the street may have had their hydrapulper rejects tested and found them suitable for a Class III landfill does not eliminate the need for us having to test our rejects. It also does not allow us to accept the Class III materials from Mead even though it has been tested.

When the Class III license is reissued in June, we would either have to done the necessary engineering to develop the closure plans for the site or we will have to establish a schedule of compliance before the license can be reissued. The following time table was laid out for gathering the necessary information and establishing the testing program required to allow the landfill to be licensed as Class III landfill.

1. Menasha would immediately begin collecting composite samples of its hydrapulper rejects, its fly ash and its ash lime slurry so that when the testing parameters had been established, the necessary samples would be available.

2. By January 15, 1982, Menasha would submitt to the DNR a proposed list of parameters that we would have the leachate from the various materials for. This suggested list would then be either modifed

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MEN04454

or approved by the DNR before 30 January 1982.

3. As soon as the parameters to be tested for has been established the samples would be sent out for the required analysis.

4. By March 1, 1982, the results of the tests would be sent to the DNR.

5. By the 15th of March 1982, the DNR would send us their decision as to whether or not the various materials were acceptable for Class III landfill.

6. Early next year, Menasha should request a license renewal package and begin the necessary engineering work such that the new license can be reissued without the need for a schedule of compliance.

cc: Gary Roys
Tom Clemmons

JB/kj

MEN04455

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 21 June 1982

SUBJECT: Class II Waste Disposal

FROM: John Blauwkamp

The DNR has agreed to allow us to bring our Class II waste to our landfill for an additional 30 days. This will give us the time required to have the compactor installed and avoid the cost of having to load all of the Class II waste into the open top dumpster with a fork truck. To meet the 30 day limit, we will have to begin preparation for the installation of the compactor almost immediately.

We received two quotes on the cost of renting a compactor with box and carts for use in the mill. Dispos-o-waste from Kalamazoo gave us the low bid for this job. They also gave us the low bids on disposal of our Class III waste. The cost for disposal of our Class II waste if we lease all of the equipment will be $643.00 per month. The components of this cost are as follows:

1. Compactor and container rental - $379.00 per month.
2. Cost of dumping containers -$184.00 per month.
3. Cart rental - $80.00 per month.

Total $643.00 per month.

Recommendations:

We should immediately contact Dispos-o-waste and work out the final details of the rental agreement. We should also have engineering immediately begin preparations for installation of the compactor and container. This will envolve a small concrete pad, some minor electrical work and building a small ramp to go from the loading dock to the compactor. The concrete pad where the compactor is to be located, should be poured as soonas possible, so that the concrete has time to cure before we begin using the compactor. Technical and production must review the need for carts within the mill and get the proper number of 1 and 1-1/2 yard dumping carts on order, so that they are available when the compactor is operational. If you agree to these recommendations I will begin making the arrangements immediately.

JB/kj

4647

MEN04456

memo / MENASHA CORPORATION

TO: DNR Phone Call File - Resource / Recovery

DATE: 22 June 1982

SUBJECT: 21 June 1982 phone conversation with Elizabeth Bols and Jennie LaSelle

FROM: John Blauwkamp

JKB

The following subjects were discussed:

1. Continued operation of the landfill while the license is being processed.
2. Time table for installation of the required testing wells.
3. Time table for eliminating Class II waste from the landfill.

Elizabeth Bols said we could continue using the landfill as a Class III landfill while the license application was being processed.

Jennie LaSelle agreed to letting us purpose a time table for installation of the required test wells. This would give us the flexibility of establishing a time table and the dates established would not be as ridged as in a formal schedule of compliance. If there were any major differences between our proposed time table and when they thought it should be accomplished, we would work out a compromise at that time.

Originally, we had intended to have the materials going into the landfill tested rather than using monitoring wells. This was based on the assumption that the materials that had previously been placed in the landfill would meet the required leachate limits. Both the fly ash from our old high sulfur coal and the fly ash from the coal we are now using have concentrations of materials in the leachate that make installation of test wells necessary. Because of the large volumes of these materials that are in the landfill, we would have to install the test wells and monitor them even if we close the landfill down at this time.

Jennie LaSelle agreed to allow us to continue bringing our Class II waste to the landfill until such time as we can get the compactor installed providing we can get this accomplished within 30 days. This will allow us to avoid the additional expense of having a roll-off box brought in and having to dump everything into it with special boxes and fork lifts. I agreed to send Elizabeth a letter confirming the projected date we would have the compactor installed and a proposal for installation of the required test wells.

JB/kj

4648

MEN04457

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 9 September 1982

SUBJECT: New Landfill Test Wells

FROM: John Blauwkamp

JB

On September 9th, the installation of the two new down stream test wells at the landfill was completed. The new test wells were installed by Rip Baker, who was being supervised by CH2M-Hill. For the two new test wells, stainless steel pipe was used rather than PVC. We also installed four guardposts around each of the new test wells and around the upstream test wells on the North side of the landfill. These 4" guard-posts are approximately 15' in the ground and all four guardposts and the 4" casing around the test well are all held together by a 6" slab of concrete. The concrete was installed around the test wells for two reasons. First, the concrete is slopped, which insures that no water will run down along the casing to contaminate the test wells and second, the concrete ties the guardposts and test well casings together to give the test well maximum protection. All three test wells now have 4" casing approximately 15' in the ground around the 2" test well pipe and have locking covers to protect the test wells. Gary Roys will be responsible for sampling the test wells once each quarter and having the water samples analyzed for the appropriate parameters. The first set of sample will be taken next week.

We also had the boundries of the landfill re-established by the surveyors and new 4" posts were installed at each corner to be permanent markers for the boundry on the landfill. The new 4" corner posts have a concrete slab of approximately 4' square around each of them. All of the guardposts for the test wells and the corner boundries have been painted a florescent orange. There should no longer be an excuse for anyone running into and damaging any test wells or corner posts.

The old unused test wells were located by the surveyors and plugged by the well drillers. The well driller will also have the appropriate records changed to show that these wells have been plugged.

CC: G. Roys
T. Clemmons
J. Porter
M. Carlson

JB/kj

4650

MEN04458

memo / MENASHA CORPORATION

DNR Meeting File -
Ground Water Quality

DATE: 26 Augu 1983

SUBJECT: August 26th Meeting

FROM: John Blauwkamp
JB

At 10 A.M. Rick Sadowski, and Sue Peelin from the DNR Ground Water Quality section and I discussed the possibility of disposing of our ash lime sludge in our landfill. The only concern they had was the relatively high arsenic concentration in the leachate test. Because the ash lime material is relatively impervious and the actual amount of arsenic that could be leached out of the material would be very very much less than that indicated by the shake test, it was decided that this material would not pose a problem in the landfill. In addition to the low impermeability, the fact that the landfill will be closed next summer, also greatly reduced the potential risk associated with this material. Sue and Rick agreed that our proposed method of spreading the ashlime sludge in the landfill and then bulldozing a layer of sand, fly ash, or wood fines on top of it until we obtain a relatively firm layer would be a satisfactory way of placing the material in the landfill. It was agreeable to them that we proceed with making the arrangements to have the ponds cleaned and they would send us a confirming letter next week.

Rick said they had also received several complaints associated with the truck wash station at 6 & 7 well. Apparently, enough trucks are washed in this area to cause a mess on the road. The mess is probably due to a combination of runn-off and tracking the material from the truck wash station to the road. They were also concerned that washing various types of material onto the ground in this area may eventually cause contamination in 6 & 7 well. We would then have to explain why this contamination was there and possibly prove that it was not coming from the tankfarm. Sue suggested that we install a impremeable slab for a truck wash station and take the runoff either to our waste treatment system or to the storm sewer.

They were also concerned with the remaining SLI product piles near the tankfarm. I explained the status and history of the salt cake accumulation. This discussion ended when I explained our intent to either reuse this material in the SLI or landfill it. A time table for accomplishing this, however, was not mentioned.

The bog north of the landfill, is also of some concern to them both because of its current condition and its potential impact on the landfill after closure. Samples of water taken from the bog indicated a high sodium concentration which would be indicative of leaching from the landfill or run-off from the water that was sprayed in this area several years ago. They believe the most likely possiblity is that some water from the landfill

4657

MEN04459

is migrating through the road to the bog. After the landfill is closed, the clay cap would prevent water from getting into the landfill. However, standing water on the other side of the road could leach back into the landfill. To insure the integrity of the landfill after closure, it will be necessary to either insure the bog stays drained or install a clay isolation wall between the landfill and the bog. Obviously installing a drain in the bog would be much less expensive than the isolation wall. This avenue will be pursued.

They also said they are still getting a few complaints from people who are suspicious that we are contaminating the river with the empty chemical barrels. They suggested that keeping the number of barrels stored there to a minimum and keeping them neatly stacked would reduce the number of complaints and improve the Corporate immage in this respect.

FollowUp

Arrangements are currently being made to have the ash lime pond dipped as soon as possible. The DNR will be notified of the date that we will begin the dipping of the ponds so that they can observe the placement of the material on the landfill.

I will be working with Engineering on the changes necessary to either relocate or modify the truck washing station.

As yet no specific plans have been made for either trying to run the SLI through the crusher or for disposing of the material. I will be working Steve Rosenthal and Engineering to have an SLI crushing trial scheduled for the near future.

Arrangements have been made to have the empty chemical barrels picked up whenever a truckload of 60 has accumulated. All barrels will be washed and marked with a bright orange sticker to indicate that they have been washed before they are placed in the storage area. The barrels will also be kept stacked neatly in rows of no more than three high.

c B. Buchanan
T. Clemmons
S. Rosenthal
K. Kling
G. Roys
F. Katje
R. Thaxton
H. Smiley
J. Porter
M. Carlson

j

MEN04460

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

HOWARD A. TANNER, Director

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

RESOURCE RECOVERY COMMISSION
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C. ERNEST KEMP
JOHN W. LAYMAN
CLIFFORD MILES
STUART B. PADNOS
ROGER RASMUSSEN
JAMES STORNANT
MICHAEL L. WALKINGTON

RESOURCE RECOVERY DIVISION
Peyton 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

MENASHA CORPORATION
PAPERBOARD GROUP

November 8, 1984

Mr. Tom Newland
1442 108th Ave.
Otsego, MI 49078

Dear Mr. Newland:

On October 25, John Bonham and Ron Thaxton met with you as Menasha representatives to discuss closing the pond north of our landfill, the majority of which lies on your property. As you know, the Michigan Department of Natural Resources had instructed us to eliminate the ponding of water in this location in conjunction with the closing of our Class III landfill. We had proposed to install a clay cut-off ditch along the south end of the pond, and to cover the pond area with soil from the adjacent high ground on your property. This would have met our requirement for eliminating the standing water, as well as opening up an area of tillable soil for farming which was previously not available to you. The entire cost for this was to have been born by Menasha Corporation. From our perspective, you would have benefitted by allowing us to perform this work on your land. You indicated at this meeting, however, that you would not allow us to do this work until we agreed to perform a substantial amount of extra work to open up additional acreage on your property which is currently not in a condition to allow farming. This extra work included a great deal of site clearing, and the elimination of another separate pond. Your stated desire was to be able to farm across the entire southern edge of your property, an area which has never been suitable for farming before.

We do not feel that Menasha should be required to improve your land to this extent to obtain your permission for us to eliminate the pond in question. After discussing the situation with the MDNR, they have waived their requirement for us to eliminate the ponding of water north of our landfill. We still intend to install the clay cut-off trench, but it will be installed entirely on Menasha property at the south end of the pond. Construction on the clay cut-off trench should begin within a few weeks.

4679

OTSEGO MILL BOX 155 • 320 N FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-652-6141

MEN04462

11/8/84

At the previous meeting you also disputed the boundary between our respective properties, as indicated by the orange steel rods protruding from the ground. Enclosed is a copy of the boundary survey, which indicates that the steel rods are in fact the boundary markers between our properties.

We are sorry that we could not reach an agreement on our original proposal to close the pond. We intend to have both the landfill closure and the clay cut-off trench completed before the end of this year. Please contact John Bonham if you have any further questions or concerns.

Sincerely,

MENASHA CORPORATION

Bruce Buchanan

Bruce Buchanan
General Manager
Otsego Paperboard Division

4680

MEN04463

RECEIVED APR 26 1969

SOIL ANALYSIS

PROPOSED AERATION LAGOON

ALLEGAN, MICHIGAN

FOR

R. C. BYCE ASSOCIATES

KALAMAZOO, MICHIGAN

BY:

H. M. STOLL
CONSULTING ENGINEER
ANN ARBOR, MICHIGAN

DATE:

APRIL 24, 1969

MEN04464

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LETTER, DATED APRIL 16, 1969

7438

MEN04465

ULRICH W. STOLL P.E.
SOIL MECHANICS AND FOUNDATION CONSULTANT
ANN ARBOR, MICHIGAN

April 25, 1969

Mr. James Ebert
R. C. Byce Associates
137 East Michigan Avenue
Kalamazoo, Michigan

Re: Proposed Aeration Lagoon
Menasha Corporation
Allegan, Michigan

Ref: Letter of April 16, 1969

Dear Sir:

This letter is to transmit results of several gradation tests of soils at the site of the proposed lagoon and to outline our findings and general recommendations concerning the design of the empounding dikes. Because of limited time, only the more critical aspects of the current lagoon concept will be discussed here, in hope that these factors will be considered by the responsible parties before construction proceeds further.

Appended sheets include a boring location plan, screen analysis summary, list of equivalent Unified Classification of each sample tested, with estimated permeability coefficients, and several flow net and creep ratio determinations of possible alternative dike sections.

The proposed lagoons are located along the shore of the Kalamazoo River, extending about 800 fee parallel and 200 feet back from the shore line. The most recent scheme involves excavating the main lagoon and two smaller, adjoining settling ponds to about elevation 596, (about 3 feet below river level)

MEN04466

and building necessary dikes to elevation 712, using excavated material where possible. Maximum operating level is elevation 711, outlet invert at 704, with control panels to regulate outflow.

A series of 15 relatively shallow soil borings were located over the site extending from 10 to 30 feet below ground surface as shown on Sheet A. Results are shown on Materials Testing Consultants, Inc., report dated April 10, 1969. In general the site is covered with variable sands, silts, and gravel with no apparent consistency in stratification.

To assess the suitability of the excavated material for dike construction and to make a rough estimate of permeability, twelve representative samples were analyzed for particle size distribution, with results indicated on Sheets B through G. A summary of pertinent factors is shown on Sheet H, and confirms the generally sandy, relatively poor particle size distribution, and a probable wide range of permeability. Note that with the exception of the sample from Boring 14, the soils have less than 16% passing the 200 mesh, with no evident plasticity. All of these soils are in the least desireable category with regard to resistance if used for a homogeneous empounding dike, particularly since it would be difficult to properly compact the finer fractions when dredged in a wet condition from below the current ground water level.

As was stated previously (our letter of April 16, 1969), if it is desired to use the excavated soils from the site, some form of positive cut-off blanket should be incorporated with the dike.

MEN04467

Although it will be possible to control the percolation through the dike in this manner there is still the problem of deeper flows to consider. Sheets 2 through 5 indicate approximate flow net patterns for various embankment sections. Rough estimates of outflows are also computed, based on the maximum permeability rates estimated from gradation tests (i.e., K from 10^{-2} to 10^{-3} feet/minute). On this basis, outflow could range from 30,000 to 600,000 gallons per day, for a dike without horizontal cut-off blanket, (Sheets 3 through 4). Based on our experience correlating field permeability tests and actual subsoil flow quantities in a similar flood plane on the Grand River near Ionia, the higher level of flows are likely to develop, unless otherwise cut off. These flows could possibly be substantially reduced by first laying an impermeable blanket over substantially the entire bottom of the lagoon.

Aside from the question of what rate of percolation might be accepted from a functional standpoint, there is also the possibility of piping failure to consider. This essentially involves the progressive errosion of the sands at the discharge surface, along the shoreline of the river. The critical zone corresponds to the terminal points of the flow lines, designated "zone of piping erosion" indicated on Sheet 3. As the percolating waters pass into the river, they carry the finer soil fractions causing a corresponding increase in permeability and discharge velocity, with correspondingly large soil particles displaced.

MEN04468

This continues, usually involving several concentration points and proceeds inevitably to failure (i.e., undermining of dike and ultimate collapse). Considerable empirical evidence (see for example "Security from Under Seepage - Masonry Dams on Earth Foundation", by E. W. Lane, Transactions American Society of Civil Engineers, 1935), shows that the ratio of the minimum flow path distance to effective head loss, must exceed certain limits dependent on the general texture of the subsoil. Specifically, for relatively fine sands, this so-called "creep ratio" should exceed 8 to guard against piping failures. Note that the proposed dike with a 70 feet base has creep ratio of only about 5. In this connection, experience on the Grand River showed some local piping occurred when creep ratios equalled about 8, (i.e., 7 feet head through about 60 feet minimum base width of dike.) Since the head difference at Allegan will be about 13 feet maximum, the writer recommends that minimum flow path distance of at least 160 feet with respect to the river be maintained at all locations. One possible means of achieving this is shown on Sheet 5, using a horizontal cut-off blanket.

Considering the general soil conditions, the location of the lagoon, and the desire to empound water up to 13 feet above the river level, the writer does not recommend proceeding with the current scheme without first providing a positive and permanent surface seal over the entire bottom and sides of the lagoon. Note that the minimum recommended blanket width of 160 feet is close to the planned width of the lagoon. The transverse dike sections should also incorporate a cut-off zone, to forstall "short circuiting".

MEN04469

There has been speculation that the particular sediments from the influent would seal the base and sides of the open lagoon over a period of time. The writer is not familiar with these sediments and cannot comment specifically in this regard. However, there are several aspects which would make such a scheme questionable. If the sediments are relatively heavy, they will settle out near the inlet, and the far end of the lagoon will not be covered. If the sediments are fairly light, they would tend to be swept from the bottom adjacent to the aerators, and at least in these areas, infiltration could continue undiminished over a considerable period.

The most direct way of resolving these uncertainties would be to perform a series of field permeability and sedimentation tests, simulating the anticipated conditions. This should involve working within the range of influent concentration anticipated, and simulating the influence of aerator agitation. We have sketched a possible layout for such a test scheme on Sheet 6. Test procedures should be established after further discussion.

This covers the main points discussed to date, and sets forth our main concerns and recommendations for alternate approaches to the lagoon design. If you desire to consider the field test scheme in more detail, we would be pleased to assist you in this. Also, if there are any questions or if clarification is desired, please do not hesitate to contact our office.

Very truly yours,

Ulrich W. Stoll

MEN04470

ULRICH W. STOLL, P.E.
SOIL MECHANICS AND FOUNDATION CONSULTANT
ANN ARBOR, MICHIGAN

April 16, 1969

Mr. James Ebert
R. C. Byce Associates
137 East Michigan Avenue
Kalamazoo, Michigan

Re: Proposed Aeration Lagoon
Menasha Corporation
Allegan, Michigan

Dear Jim:

Enclosed are several sheets on which we have indicated the preferred range of gradation and plasticity indices for the proposed lagoon dike. You will note that about 12% or more clay size fraction is required to achieve desired water tightness, but that plastic index should be limited to between 4 and 7 for reasonable ease of handing and compaction. Maximum compacted density and optimum moisture should be determined on the selected borrow before proceeding with embankment construction.

Although we are not prepared at this moment to forward results of recent gradation tests, it is apparent, on the basis of twelve determinations, that the sands from the lagoon area do not meet the indicated criteria for impermeable dike material. As we have discussed, the lagoon gravels and sands from the lagoon are stable enough to maintain a 2:1 slope for the proposed dike sections, but that a positive cut off blanket should extend over the base for the full width and up the inside face. One possibility is to construct a 3 to 4 feet thick base blanket of imported clayey sand and gravel, and to either extend a 5 feet mini-

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MEN04471

mum thickness up the front face of the dike, or to lay a 6 mil P.V.C. plastic blanket up the face, tucked into the clay sand blanket at the bottom. The enclosed sketch shows possible alternatives.

This responds to your most current questions. We shall complete our soils analysis and submit a covering report shortly.

If there are any other questions do not hesitate to contact our office.

Very truly yours,

Ulrich W. Stoll

UWS:slp

1457

MEN04472

Proposed Lagoon-D
Material

TABLE 1-4
Unified Soil Classification System

Primary divisions			Group symbol	Secondary divisions	Laboratory classification criteria		Supplementary cri visual identifica
Coarse grained soils. (More than half of material is larger than No. 200 sieve size.)	Gravels. (More than half of the coarse fraction is larger than No. 4 sieve size.)	Clean gravels. (Less than 5% of material smaller than No. 200 sieve size.)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3		Wide range in grain si substantial amounts intermediate particle
			GP	Poorly graded gravels, gravel sand mixtures, little or no fines.	Not meeting all gradation requirements for GW.		Predominantly one siz range of sizes with s termediate sizes mis
	... do	Gravels with fines. (More than 12% of material smaller than No. 200 sieve size.)[1]	GM	Silty gravels, and gravel-sand-silt mixtures, which may be poorly graded.	Atterberg limits below "A" line, or PI less than 4[2]	Atterberg limits above "A" line with PI between 4 and 7 is borderline case GM-GC	Non-plastic fines or fi low plasticity.
		1st choice	GC	Clayey gravels, and gravel-sand-clay mixtures, which may be poorly graded.	Atterberg limits above "A" line, with PI greater than 7		Plastic fines.
Do	Sands. (More than half of the coarse fraction is smaller than No. 4 sieve size.)	Clean sands. (Less than 5% of material smaller than No. 200 sieve size.)	SW	Well graded sands, gravelly sands, little or no fines.	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6 $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3		Wide range in grain siz substantial amounts o intermediate particle s
			SP	Poorly graded sands, gravelly sands, little or no fines.	Not meeting all gradation requirements for SW		Predominately one size range of sizes with so termediate sizes missi
	... do	Sands with fines. (More than 12% of material smaller than No. 200 sieve size.)[1]	SM	Silty sands, and sand-silt mixtures, which may be poorly graded.	Atterberg limits below "A" line, or PI less than 4	Atterberg limits above "A" line with PI between 4 and 7 is borderline case SM-SC	Non-plastic fines or fin low plasticity.
		2nd choice	SC	Clayey sands, and sand-clay mixtures, which may be poorly graded.	Atterberg limits above "A" line, with PI greater than 7		Plastic fines.

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TABLE 9-1
Typical Properties of Compacted Materials

Group symbol	Soil type	Range of maximum dry unit weight, p.c.f.	Range of optimum moisture, percent	Typical value of compression: At 1.4 t.s.f. (20 p.s.i.) percent of original height	Typical value of compression: At 3.6 t.s.f. (50 p.s.i.) percent of original height	Typical strength characteristics: Cohesion (as compacted) p.s.f.	Typical strength characteristics: Cohesion (saturated) p.s.f.	Typical strength characteristics: ϕ (Effective stress envelope) degrees	Typical strength characteristics: Tan ϕ	Typical coefficient of permeability ft./min.	Range of CBR values	Range of subgrade modulus k lb./cu. in.
GW	Well graded clean gravels, gravel-sand mixtures.	125 - 135	11 - 8	0.3	0.6	0	0	>38	>0.79	5×10^{-2}	40 - 80	300 - 500
GP	Poorly graded clean gravels, gravel-sand mix.	115 - 125	14 - 11	0.4	0.9	0	0	>37	>0.74	10^{-1}	30 - 60	250 - 400
GM	Silty gravels, poorly graded gravel-sand-silt.	120 - 135	12 - 8	0.5	1.1	.....	.....	>34	>0.67	$>10^{-6}$	20 - 60	100 - 400
GC	Clayey gravels, poorly graded gravel-sand-clay.	115 - 130	14 - 9	0.7	1.6	.....	.....	>31	>0.60	$>10^{-7}$	20 - 40	100 - 300
SW	Well graded clean sands, gravelly sands.	110 - 130	16 - 9	0.6	1.2	0	0	38	0.79	$>10^{-3}$	20 - 40	200 - 300
SP	Poorly graded clean sands, sand-gravel mix.	100 - 120	21 - 12	0.8	1.4	[illegible]	0	37	0.74	$>10^{-3}$	10 - 40	200 - 300
SM	Silty sands, poorly graded sand-silt mix.	110 - 125	16 - 11	0.8	1.6	1050	420	34	0.67	5×10^{-5}	10 - 40	100 - 300
SM-SC	Sand-silt clay mix with slightly plastic fines.	110 - 130	15 - 11	0.8	1.4	1050	300	33	0.66	2×10^{-6}	.....	
SC	Clayey sands, poorly graded sand-clay mix.	105 - 125	19 - 11	1.1	2.2	1550	230	31	0.60	5×10^{-7}	5 - 20	100 - 300
ML	Inorganic silts and clayey silts.	95 - 120	24 - 12	0.9	1.7	1400	190	32	0.62	10^{-5}	15 or less	100 - 200
ML-CL	Mixture of inorganic silt and clay	100 - 120	22 - 12	1.0	2.2	1350	460	32	0.62	5×10^{-7}	.....	
CL	Inorganic clays of low to med. plasticity.	95 - 120	24 - 12	1.3	2.5	1800	270	28	0.54	10^{-7}	15 or less	50 - 200
OL	Organic silts and silt-clays, low plasticity.	80 - 100	33 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	50 - 100
MH	Inorganic clayey silts, elastic silts.	70 - 95	40 - 24	2.0	3.8	1500	420	25	0.47	5×10^{-7}	10 or less	50 - 100
CH	Inorganic clays of high plasticity	75 - 105	36 - 19	2.6	3.9	2150	230	19	0.35	10^{-7}	15 or less	50 - 150
OH	Organic clays and silty clays ...	65 - 100	45 - 21	.....	.....	.....	.....	.....	.....	.....	5 or less	25 - 150

1st choice

2nd choice

Notes:
1. All properties are for condition of "standard Proctor" maximum density, except values of k and CBR which are for "modified Proctor" maximum density.
2. Typical strength characteristics are for effective strength envelopes and are obtained from CBR data.
3. Compression, values are for vertical loading with complete lateral confinement.
4. (>) indicates that typical property is greater than the value shown. (-) indicates insufficient data available for an estimate.

MEN04474

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

State Office Building
350 Ottawa Avenue, N. W.
Grand Rapids, Michigan 49503

August 5, 1981

Mr. Paul Hittle
Consumers Power Company
212 West Michigan Avenue
Jackson, Michigan 49201

Dear Mr. Hittle:

The plans, dated July 15, 1981, for the proposed substation of Menasha Corporation, Otsego, have been reviewed. Although neither the total volume of oil nor the total capacity of the oil collection system are given, subsequent conversations with Messrs. Whiting and Groulx have indicated the system is more than adequate to contain any losses which may occur (2 transformers with 1,320 gallons each, collection system capacity of 6,000 gallons). The proposed design, along with routine monitoring, should fulfill the requirements of the Part 5 regulations of the Water Resources Commission.

Regarding Menasha Corporation's N.P.D.E.S. Permit, no revisions are needed at this time. Any necessary changes could be incorporated during the permit reissuance process. The collected storm water would be discharged to the company's white water (or surge) pond. From here, the water would flow through the company's entire treatment system prior to being discharged to the Kalamazoo River. If an oil loss would escape the designed oil trap, it too would follow this same path and could be detected by company personnel conducting surveillance of the area.

With the addition of a monitoring program, the plans would be complete, and as such, are approved.

If you should have any questions regarding the above matters, feel free to contact me at this office (616-456-6231).

RECEIVED AUG 1981

Sincerely,

WATER QUALITY DIVISION

Marge Spruit

Marge Spruit,
Water Quality Specialist

MS/mc

cc: John Blauwkamp, Menasha Corp.
W.Q.D. Files, Lansing

JRB → cc: RVG
Tom Clemens 5026

R 026-1 1/80

MEN04475

STS Consultants Ltd.
3340 Ranger Road
Lansing, Michigan 48906
(517) 321-4964

January 28, 1983

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

Attn: Mr. Herb Smiley

RE: Hydrogeologic Report - New Tank and Ponds

STS Job No. 70875

Gentlemen:

We are pleased to present the results of our hydrogeologic study of the New Tank and Ponds at Menasha Corporation. The attached report contains monitoring well installation diagrams, soil boring logs, results of the initial chemical testing from the monitoring wells, as well as our interpretation of the soil and groundwater conditions at this site.

We should point out that chemical testing of the monitoring wells should be done on a quarterly basis, with results submitted to the DNR. We suggest that a testing program be established so that this testing is done in a timely fashion. We would be pleased to provide this service for you, should you desire.

We have appreciated this opportunity to provide additional 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

Timothy K. Dahlstrand, P.E.
Regional Vice President

RCR:lb

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MEN04476

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MEN04479

INTRODUCTION

Menasha Corporation has recently completed construction of new tanks and ponds for temporary storage of liquor and sludge. A copy of the plans for the construction was submitted to the Department of Natural Resources on June 21, 1982. A portion of this submittal contained the STS Plans and Specifications dated June 17, 1982. On page 15 of that report, it was noted that a hydrogeologic report would be prepared by STS Consultants for submittal to the DNR. This report contains the hydrogeologic information previously outlined.

MEN04480

PURPOSES AND SCOPE

The purpose of this study is to provide a hydrogeologic report and data including water quality results to be submitted to the Michigan Department of Natural Resources (MDNR). The scope of the study was to install three permanent monitoring wells, to determine the groundwater flow direction, and groundwater quality analyses.

MEN04481

PROJECT LOCATION AND SITE USE

The property is located in the southwest portion of the southeast quarter of Section 14, Township 1 North, Range 12 West, Otsego Township, Allegan County, Michigan. Figure 1 on the following page indicates the general site location, and Figure 2 indicates the areal topography as noted on the USGS quadrangle map of Otsego, Michigan.

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MEN04482

TOPOGRAPHY

The site topography was modified during construction for the tanks and ponds. A drawing showing the existing and proposed topography was submitted previously in the June 21, 1982 submittal. Briefly, the site descends from the north to south with existing ground surface elevations ranging from approximately 750 at the north portion of the site to elevations of approximately 720 at the south portion of the site.

FIELD PROCEDURES AND WELL CONSTRUCTION

The monitoring wells were installed on December 13 and 14, 1982. The boreholes were advanced using augering and rotary washed drilling techniques. Split spoon samples were obtained in the vicinity of the screens for the monitoring wells. Boring logs indicating the soil types encountered near the screen level are presented in this report. Copies of the soil boring logs completed previously are also included.

Monitoring wells were then installed in the boreholes. Construction diagrams showing the type of installation are included on Figures 3 through 5. Well construction consisted of two-inch diameter PVC pipe with a five foot, factory slotted PVC screen at the tip (10 slot). On-site sand backfill was used around and above the screen. Above the screen, a bentonite pellet seal was placed and a bentonite/cement slurry extended from the bentonite pellet seal to near the ground surface. The bentonite/cement slurry was mixed in the approximate proportions of 10 bags of cement, 1 bag of bentonite, and 60 gallons of water. Three bumper guards were installed around each well, and a steel protector casing with a locking top was installed over each well. A sloping concrete collar was then set around the steel protector pipe and the bumper guards to provide drainage of surface water away from the well casing. The keys to the wells were given to personnel of Menasha Corporation.

After the wells were installed, they were developed by using bailing techniques. After development, the three observation wells were sampled on December 16, 1982. Prior to sampling, the static water level in each well was measured using the tape and chalk method to the nearest 0.01 feet. Once the static water levels were

taken, the wells were bailed using a copper bailer until at least three times the standing volume of water in the well was removed. After that was accomplished, a water sample was obtained from each well. The sample was poured into sample bottles containing the appropriate preservatives, and the bottles were labeled for identification. The samples were also packaged in ice, and then taken to the laboratory for analyses.

In addition to obtaining water samples from the three monitoring wells, a water sample was also obtained from an existing production well located near the site. This well is housed in well house #7, which is a red building on the site.

Special precautions were taken to provide representative samples from each well. The bailer was washed with soap and water and rinsed with clean potable water at each well location to remove any material that may be foreign to the groundwater. At each well location, a new length of rope was used for bailing so that no foreign matter, which may have adhered to the rope, would be introduced to the groundwater at any location. Care was also taken to prevent human contact with the groundwater being poured into the sample jars.

On December 14, 1982, the wells were located in the field by an STS survey crew. The locations of the wells were determined by referencing angles and by using stadia measurements using a theodilite. Elevations of the ground surface at each well location, and the top of the well casing were obtained using an automatic level. The benchmark used for referencing elevations is the construction benchmark used for the project. This benchmark consists of a bolt on the flange

(painted yellow) on the fire hydrant adjacent to 106th Avenue, elevation equal to 715.22 (USGS elevation). A site map, Figure 6, was prepared showing the well locations, the previous boring locations, the well house locations, and the locations of the new tanks and ponds.

MEN04486

LABORATORY ANALYSES

The groundwater samples were delivered to Hydro Research Laboratory in Pontiac, Michigan. There, the samples were anslyzed for specific conductivity, calcium, sodium, magnesium, chemical oxygen demand, chloride, sulfate, bicarbonate alkalinity, pH, and phenol. These parameters were selected by Marge Spruitt of the DNR. The results of these analyses are presented in Table 1.

MEN04487

TABLE 1

GROUNDWATER QUALITY DATA

Parameter	WELL NUMBER 1	2	3	7
Specific Conductivity (umhos/cm)	490	830	1280	1010
pH	7.93	7.17	7.53	7.25
Chloride (mg/l)	2	11	27	7
Sulfate (mg/l)	27	92	54	82
Calcium (mg/l)	130	140	230	90
Sodium (mg/l)	40	29	25	120
Magnesium (mg/l)	42	53	100	40
Bicarbonate Alkalinity as $CaCO_3$ (mg/l)	220	340	650	470
Phenol (mg/l)	$\angle$0.002	0.002	$\angle$0.002	0.014
COD (mg/l)	20	20	76	68

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MEN04488

TABLE 2
SAFE DRINKING WATER STANDARDS

USEPA National Interim Primary and Secondary Drinking Water Regulations (from 40 CFR 141 and 143)

Parameter	Units	Standard	Form
COD	mg/l	50	preferred limit
TOC	mg/l	5	preferred limit
pH	S.U.	6.5-8.5	recommended limit
Chloride	mg/l	250	recommended limit
Sulfate	mg/l	250	recommended limit
Iron	mg/l	0.3	recommended limit
Lead	mg/l	0.05	mandatory limit
Hardness	mg/l	300	recommended limit
Chromium	mg/l	0.05	mandatory limit

Other Recognized Limits

Parameter	Units	Standard	Agency
Calcium	mg/l	75	World Health Organization
Sodium	mg/l	10	Generally accepted
Ammonia	mg/l	0.5	U.S. Public Health Service
Nitrate	mg/l	45	U.S. Public Health Service
Nitrite	mg/l	2	Generally accepted
Magnesium	mg/l	—	No limit set
Sp. Cond.	μmhos/cm	500	Recommended limit, MDNR

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GEOLOGY AND SOIL CONDITIONS

The site is located in an area which has been extensively glaciated. There are a number of glacial ridges or moraines made up of glacial till consisting of unsorted silts, clays, gravel and boulders. Adjacent to the moraines is an eroded outwash plain consisting of stratified silts, sands, and gravels that were deposited by glacial melt water.

The soil borings at this site indicate that the site is underlain by deposits of glacial outwash underlain and interbedded with glacial till. The soil borings encountered sands and silty sands, ranging from fine to coarse and containing traces to some gravel. Sandy silt and sandy clays were encountered in the lower portions of borings 2, 3 and 4. These silty and clayey deposits were also encountered during the installation of monitoring wells 1 and 2.

1837

MEN04490

GROUNDWATER CONDITIONS

Static water level elevations were taken in each well prior to sampling on December 16, 1982. Table 3 lists the wells and their respective static water levels. From these measurements, groundwater in this area flows in a southerly direction towards the Kalamazoo River. The groundwater gradient between monitoring well 1 and monitoring well 2, or between monitoring well 1 and monitoring well 3, is calculated to be approximately 1.2%. Approximate groundwater contours are shown on Figure 5. Note that the groundwater contours are likely affected by the two production wells located on the southeast portion of the site. We expect that large fluctuations in the groundwater levels at the site may occur.

1838

TABLE 3

MONITORING WELL WATER LEVELS

Well No.	Top of Casing Elevation	Water Elevation (12-16-82)
1	749.7	702.4
2	721.4	694.5
3	721.5	694.2

1839

WATER QUALITY DATA

The laboratory analysis data for the groundwater samples obtained on December 16, 1982 are shown in Table 1. This data provides information on the quality of groundwater at this site prior to use for liquor and sludge storage. A compilation of safe drinking water standards from the Environmental Protection Agency, World Health Organization, Michigan Department of Natural Resources, and U.S. Public Health Service is shown on Table 2. The specific conductivity, calcium and sodium were higher than typical safe drinking water standards, and the COD value in monitoring well 3 and in well 7 were higher than the preferred limit by the EPA. The remainder of the parameters tested indicated values less than typical safe drinking water standards. Water quality testing should be performed on a quarterly basis. The parameters should be reviewed over a long period of time to determine data trends.

1840

SUMMARY AND CONCLUSIONS

Three monitoring wells were installed as a portion of this study. The wells indicate that the groundwater is flowing to the south, at a gradient of approximately 1.2%. Previous soil borings performed at this site indicated predominantly sands underlain and interbedded with glacial till deposits. Water samples were obtained from the monitoring wells for groundwater quality. Groundwater samples should be obtained quarterly and analyzed for the MDNR requirements.

1841

GENERAL QUALIFICATIONS

This report has been prepared in order to assist the owner in the design and construction of this project. The scope is limited to the specific project and location described herein; the description of the project represents our understanding of the significant aspects relevant to the soil and groundwater characteristics.

The analyses submitted in this report are based upon the data obtained from the soil borings and monitoring wells at the locations indicated on the location diagram and from any other information discussed in this report. This report does not reflect any variations which may occur between these borings. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. However, it is a well known fact that variations in soil conditions exist on most sites between boring locations and also such situations as groundwater levels vary from time to time.

1842

MEN04495

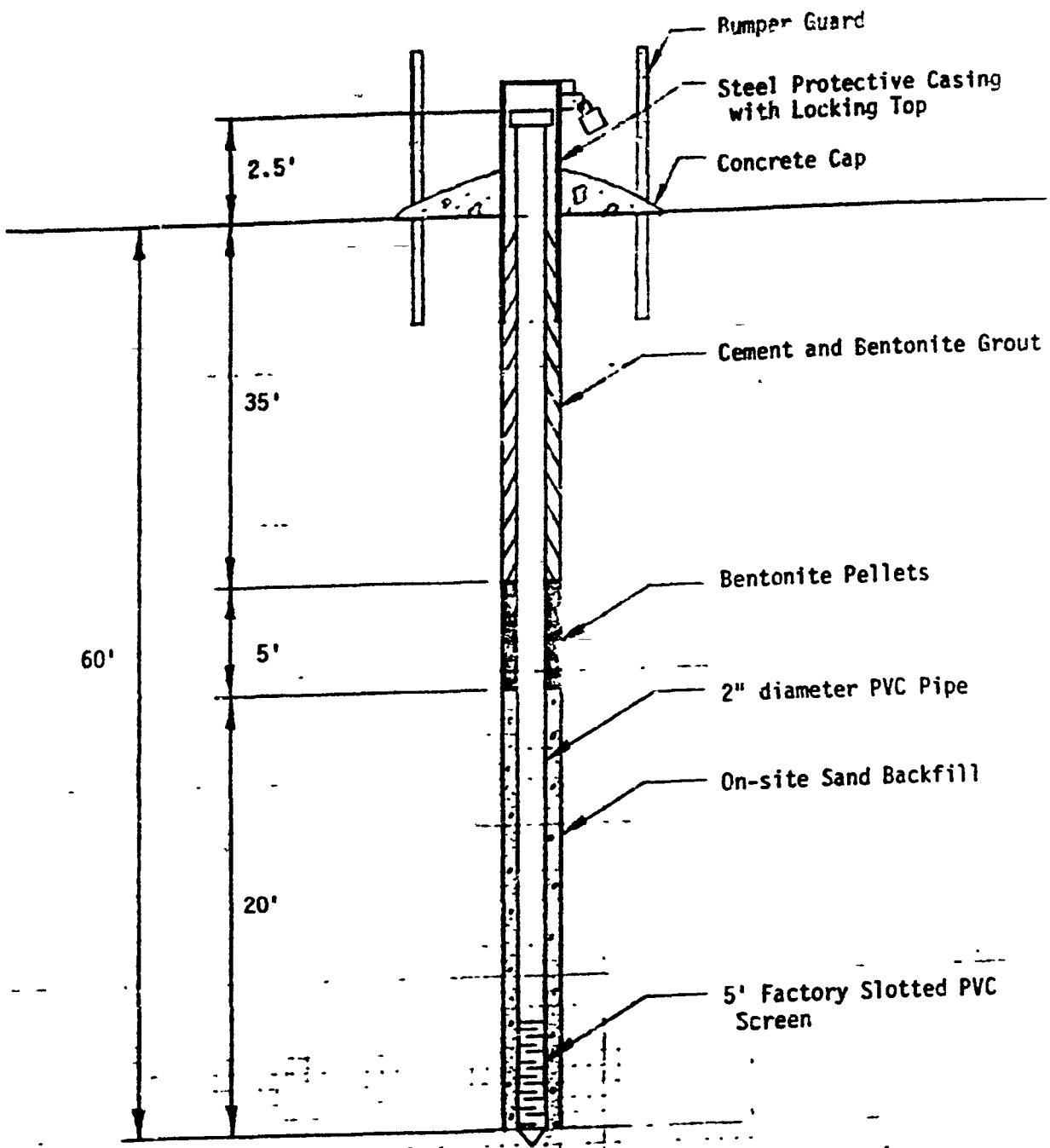

Figure 3.
nitoring Well Construction Diagram
itoring Well No. 1
asha Corporation

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

TDG		12-20-82	70875

1843

MEN04496

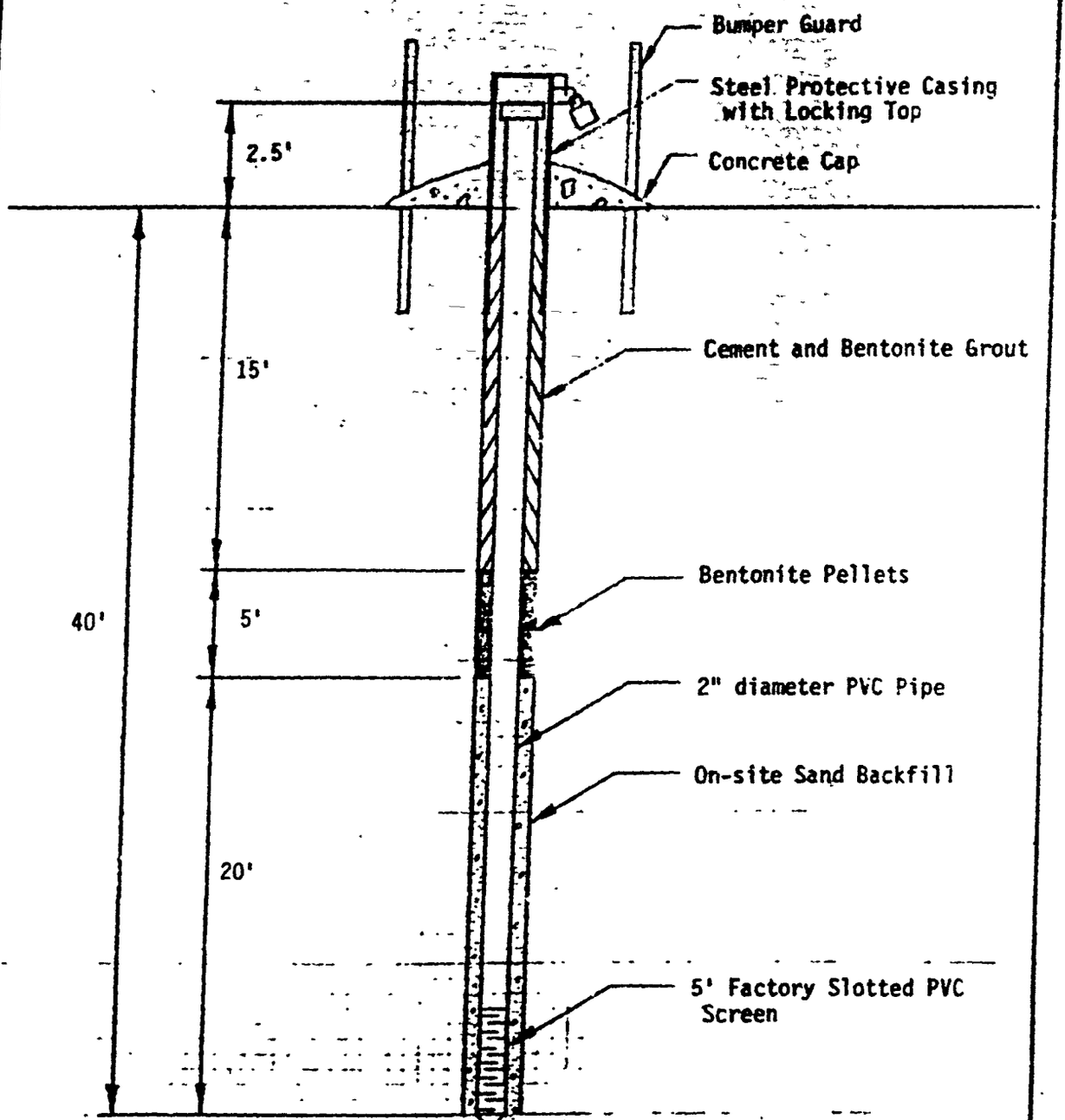

Figure 4.
Monitoring Well Construction Diagram
Monitoring Well No. 2
Menasha Corporation

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

TDG		12-20-82	70875

1844

MEN04497

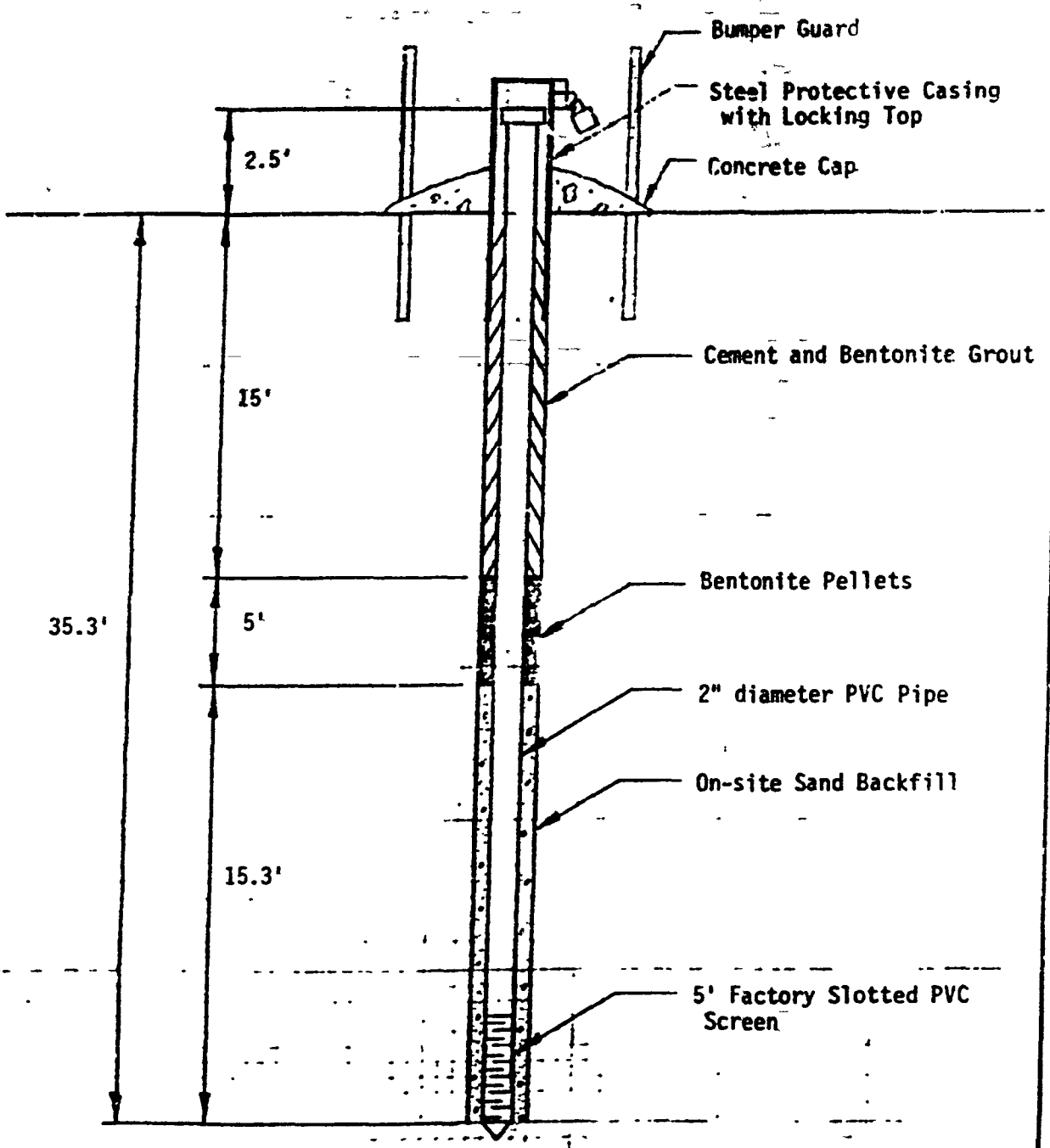

Figure 3.
Monitoring Well Construction Diagram
nitoring Well No. 3
nasha Corporation

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

DG.		12-20-82	70875

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MEN04498

LOG OF BORING NO. B-1

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 719.3

DEPTH	ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS FT 3	UNIFIED COMPRESSIVE STRENGTH	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT	STANDARD PENETRATION
		1	SS			Topsoil						
		2	SS			Brown silty medium and medium to coarse sand- trace to some gravel- moist- medium dense (trace organics in S-1) (SM)						
		3	SS									
		4	SS			Light brown fine and very fine sand- moist- medium dense (SP)						
10		5	SS			Brown silt- trace roots- moist- medium dense (ML)						
20		6	SS			Brown and gray medium to coarse sand and gravel- wet- extremely dense (GW)						
30		7	SS			Gray silty very fine sand- moist- extremely dense (SM)						
40						(continued)						

WATER LEVEL OBSERVATIONS				
W.L.				
W.L.	6.5'	B.C.R.	10.5'	A.C.R.
W.L.	22', 7 days	AB		

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/10/81
BORING COMPLETED	08/11/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 79672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1846

MEN04499

LOG OF BORING NO. B-1 continued

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL (SURFACE ELEVATION)	UNIT DRY WT LBS FT³	ALLOWED COMPRESSIVE STRENGTH TONS FT² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % / STANDARD PENETRATION BLOWS FT (10 20 30 40 50)
40	8	SS			Gray medium sand- some gravel- moist- extremely dense (SP)		
20	9	SS			End of boring. Boring advanced to 17.5' using solid stem auger. Boring advanced from 17.5' to 48.5' using washed drilling techniques. Casing used: 20' or HW. Borehole backfilled with soil cuttings.		

WATER LEVEL OBSERVATIONS					
W.L.					
W.L.	6.5'	B.C.R.	10.5'	A.C.R.	
W.L.	22', 7 days AB				

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/10/81
BORING COMPLETED	08/11/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1847

MEN04500

LOG OF BORING NO. B-2

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE ONLY RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TSF	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT	STANDARD PENETRATION BLOWS
				SURFACE ELEVATION: 725.9						
	1	SS		Topsoil						
				Dark brown silty fine sand with organics- trace gravel- moist- loose (SM)						
	2	SS		Brown silty medium to coarse sand- some gravel- moist medium dense (SM)						
	3	SS								
	4	SS		Brown fine sand with some coarse sand and gravel- moist- dense (SP)						
10										
	5	SS		Light brown fine sand- moist- dense (SP)						
20										
	6	SS					24%			
30	7	SS					13%			
				Gray brown sandy silt- trace clay- dense to extremely dense (ML)						
40										
				continued						

WATER LEVEL OBSERVATIONS				
W.L.				
W.L.	9.5	B.C.R.	13	A.C.R.
W.L.	24", 7 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/11/81
BORING COMPLETED	08/11/81
RIG Bomb	FOREMAN R.R.
DRAWN	APPROVED T.J.M.
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1848

MEN04501

LOG OF BORING NO. B-2 continued

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/ Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL (SURFACE ELEVATION)	UNIT DRY WT. LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TSF	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION
40											
	8	SS			Gray silty sandy clay- desiccated- hard (CL)				10.9		
					Gray very fine sand- trace silt- moist- extremely dense (SP)						
50	9	SS									

End of boring.
Boring advanced to 17.5' using solid stem auger.
Boring advanced from 17.5' to 48.5' using washed drilling techniques.
Casing used: 20' or HW.
Borehole backfilled with soil cuttings.

WATER LEVEL OBSERVATIONS					
W.L.					
W.I.	9.5	B.C.R.	13	A.C.R.	
W.L.	24', 7 days AB				

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/11/81
BORING COMPLETED	08/11/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1849

MEN04502

LOG OF BORING NO. B-1

OWNER: Menasha Corporation	ARCHITECT-ENGINEER:
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 730.4

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS. FT 3	UNCONFINED COMPRESSIVE STRENGTH TONS FT 1 2 3 4 5 / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % / STANDARD N PENETRATION BLOWS FT 10 20 30 40 50
	1	SS			Topsoil		
	2	SS			Brown fine, medium and coarse sand- some gravel and roots- moist- very loose to medium dense (SP)		
	3	SS					
	4	SS					
10	5	SS			Light brown fine and very fine sand- moist- medium dense to dense (SP)		
20	6	SS			Brown fine to medium sand- wet- extremely dense (SP)		
30	7	SS			Gray silty sandy clay- moist- hard (CL)		94%
40					continued		

WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	7.0	B.C.R.	A.C.P.
W.L.			
WCI 23.5', 7 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC

BORING STARTED	08/11/81
BORING COMPLETED	08/11/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1850

MEN04503

LOG OF BORING NO. B-3 continued

OWNER	Minnesha Corporation	ARCHITECT-ENGINEER	
SITE	N. of 106th Ave. and E. of Fairview St.	PROJECT NAME	Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL (SURFACE ELEVATION ft)	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5)	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD "N" PENETRATION BLOWS/FT (10 20 30 40 50)
10											
	8	SS			Gray silty sandy clay- moist- hard (CL)				23 %		
					Gray very fine sand- trace silt- moist- extremely dense (SP)						
20	9	SS									

End of boring.
Boring advanced to 17.5' using solid stem auger.
Boring advanced from 17.5' to 48.5' using washed drilling techniques.
Casing used: 20' or HW.
Borehole backfilled with soil cuttings.

WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	7.0	B.C.R.	A.C.R.
W.L.			
WCI 23.5', 7 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/11/81		
BORING COMPLETED	08/11/81		
RIG	Bomb	FOREMAN	RR
DRAWN		APPROVED	TJM
JOB #	70672	SHEET	1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1851

MEN04504

LOG OF BORING NO. B-4

OWNER Menasha Corporation	ARCHITECT-ENGINEER
SITE N. of 106th Ave. and E. of Fairview St.	PROJECT NAME Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TON/FT² (1 2 3 4)	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD "N" PENETRATION BLOWS/FT (10 20 30 40 50)
					SURFACE ELEVATION 738.6						
	1	SS			Topsoil						
					Brown fine to medium sand- trace gravel & roots- moist- loose (SP)						
	2	SS									
	3	SS									
	4	SS									
10	5	SS			Brown fine to coarse sand trace gravel & silt- moist- loose to dense (SW)						
20	6	SS			Light brown fine sand- moist- very dense (SP)						
30	7	SS			Gray silty sandy clay- trace gravel- moist- hard (CL)				14.2%		
40					continued						

WATER LEVEL OBSERVATIONS				
W.L.				
W.L.	6.0'	B.C.R.	10.0'	A.C.R.
W.L.				
WC1 28", 6 days AB				

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/11/81		
BORING COMPLETED	08/12/81		
RIG Bomb	FOREMAN R.R.		
DRAWN	APPROVED TJM		
JOB # 70672	SHEET 1 of 1		

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1852

MEN04505

LOG OF BORING NO. B-4 continued

OWNER	Menasha Corporation	ARCHITECT-ENGINEER	
SITE	N. of 106th Ave. and E. of Fairview St.	PROJECT NAME	Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL (SURFACE ELEVATION)	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT²	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
40											
	8	SS			Gray silty sandy clay- trace gravel- moist- hard (CL)				12.2%		
					Gray very fine sand- moist- extremely dense (SP)						
50	9	SS									

End of boring.
Boring advanced to 17.5' using solid stem auger.
Boring advanced from 17.5' to 48.5' using washed drilling techniques.
Casing used: 2" or HW.
Borehole backfilled with soil cuttings.

WATER LEVEL OBSERVATIONS						
W.L.						
W.L.	6.0'	B.C.R.	10.0'	A.C.R.		
W.L.						
WCI 28', 6 days AB						

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/11/81
BORING COMPLETED	08/12/81
RIG	Bomb
FOREMAN	R.R.
DRAWN	
APPROVED	TJM
JOB #	70672
SHEET	1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1853

MEN04506

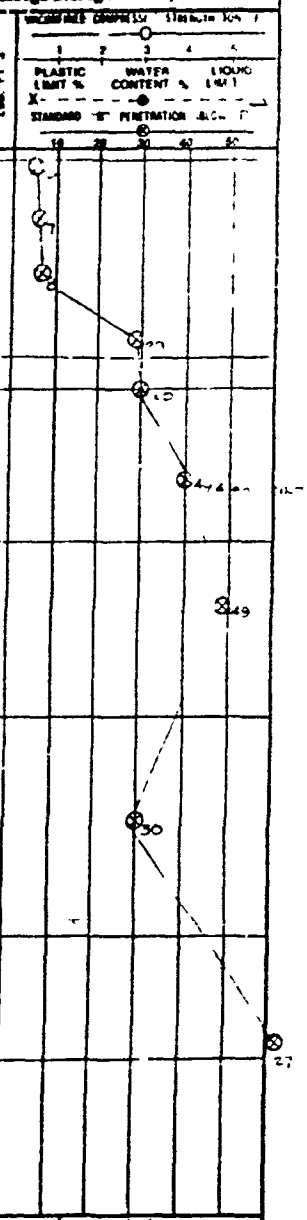
LOG OF BORING NO. B-5

OWNER: Menasha Corporation	ARCHITECT-ENGINEER:
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 716.8

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS. FT 3
	1	SS			Topsoil	
	2	SS			Brown silty fine to medium sand- trace gravel- moist- loose to medium dense (trace roots in 5-1) (SM)	
	3	SS				
	4	SS				
10	5	SS			Brown fine sand- moist- dense (SP)	
	6	SS			Brown silty fine to coarse sand with some gravel- moist- dense to extremely dense (SM)	
20	7	SS			Brown and gray medium to coarse sand and gravel- moist- dense to very dense (SW)	
30	8	SS			Gray and brown fine to medium gravel- moist- dense (GP)	
40					Gray fine to medium sand- moist- extremely dense (SP)	

End of boring.
Boring advanced to 17.5' using solid stem auger.
Boring advanced from 17.5' to 40.0' using washed drilling techniques.
Casing used: 37" or HW.
Borehole backfilled with soil cuttings.



WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	6'	B.C.R.	A.C.R.
W.L.			
WCI 24', 4 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/14/81
BORING COMPLETED	08/14/81
RIG: Bomb	FOREMAN: RR
DRAWN:	APPROVED: TJM
JOB #: 70672	SHEET: 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1854'

MEN04507

LOG OF BORING NO. B-6

OWNER: Menasha Corporation	ARCHITECT-ENGINEER:
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 723.6

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1 2 3 4 5)	PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT (10 20 30 40 50)
	1	SS			Topsoil				
	2	SS			Brown silty fine and fine to course sand- trace to some gravel- moist-loose (SM)				
	3	SS			Brown silty very fine sand- moist loose (SM)				
	4	SS							
10	5	SS			Brown fine and slightly silty fine to medium sand- moist- medium dense (SP-SM)				
20	6	SS			Brown silty fine to coarse sand and gravel- moist- extremely dense (SM-GM)				
30	7	SS							
40					continued				

WATER LEVEL OBSERVATIONS					
W.L.					
W.L.	6'	B.C.R.	12'	A.C.R.	
W.L.					
24.9', 6 days AB					

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/12/81
BORING COMPLETED	08/12/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual

1855

MEN04508

LOG OF BORING NO. H-6 continued

OWNER	ARCHITECT-ENGINEER
Monsanto Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TSF	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD "N" PENETRATION BLOWS/FT
					SURFACE ELEVATION						
40											
	8	SS									
					Gray silty fine to coarse sand and gravel- moist- extremely dense (SM-G 4)						
50	9	SS									
					End of boring. Boring advanced to 17.5 using solid stem auger. Boring advanced from 17.5 to 48.5 using washed drilling techniques. Casing used: 20' or 1"W Borehole backfilled with soil cuttings.						

WATER LEVEL OBSERVATIONS						
W.L.						
W.L.	6'	B.C.R.	12'	A.C.R.		
W.L.						
29.5', 6 days, AB						

SOIL TESTING SERVICES OF MICHIGAN, INC		
BORING STARTED	08/12/81	
BORING COMPLETED	08/12/81	
RIG Bomb	FOREMAN	RR
DRAWN	APPROVED	TJM
JOB # 70677	SHEET	1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1856

MEN04509

LOG OF BORING NO. B-7

OWNER: Manistee Corporation	ARCHITECT-ENGINEER
SITE: N. of 18th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 740.7

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH	PLASTIC LIMIT	WATER CONTENT	LIQUID LIMIT	STANDARD PENETRATION
					Topsoil						
	1	SS			Brown silty fine to very fine sand- trace roots, organics and gravel- moist- medium dense (SM)						
	2	SS									
	3	SS									
	4	SS									
10	5	SS			Brown fine to coarse sand with gravel- trace silt and roots- moist- medium dense to very dense (SW)						
	6	SS									
20					Brown very fine sand- moist- extremely dense (SP)						
	7	SS									
30					Brown fine to medium sand- moist to wet- very dense to extremely dense (SP)						
	8	SS									
					End of boring. Boring advanced to 13.5' using solid stem auger. Boring advanced from 13.5' to 35.0' using washed drilling techniques. Casing used: 15' or HW. Borehole backfilled with soil cuttings.						

WATER LEVEL OBSERVATIONS				
W.L.				
W.L.	B.C.R.	A.C.R.		
W.L.				
No water observed				

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/18/81
BORING COMPLETED	08/18/81
RIG	FOREMAN R.R.
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1857

MEN04510

LOG OF BORING NO. B-5

OWNER: Menasha Corporation	ARCHITECT-ENGINEER:
SITE: N. of 104th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 717.9

Depth	Elevation	Sample No.	Type Sample	Sample Dist.	Recovery	Description of Material	Unit Dry Wt.	Unconfined Compressive Strength	Plastic Limit %	Water Content %	Liquid Limit	Standard Penetration Blows
		1	SS			Topsoil						
						Brown silty fine sand- dry- medium dense (SM)						
		2	SS									
		3	SS			Brown silty fine to coarse sand- trace gravel- moist to wet- very loose to loose (SM)						
10		4	SS									
		5	SS			Brown fine to medium sand- moist- very loose (SP)						
20		6	SS			Brown silty very fine sand- moist- extremely dense (SM)						
30		7	SS			Brown changing to gray fine to coarse sand and gravel- moist to wet- very dense (SM)						
40						continued						

WATER LEVEL OBSERVATIONS				
W.L.				
W.L.	8'	B.C.R.	16'	A.C.R.
W.L.				
WCI 26', 6 days AB				

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/12/81
BORING COMPLETED	08/12/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1858

MEN04511

LOG OF BORING NO. B-8 continued

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of Wisconsin Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE EXT RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH (1 2 4) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT / STANDARD PENETRATION (10 20 30 40)
				SURFACE ELEVATION		
40	8	SS		Brown changing to gray fine to coarse sand and gravel- moist to wet- very dense (SM)		
				Gray fine to medium sand- moist- extremely dense (SP)		
50	9	SS				
				End of boring. Boring advanced to 17.5 using solid stem auger. Boring advanced from 17.5 to 48.5 using washed drilling techniques. Casing used: 20' or HW. Borehole backfilled with soil cuttings.		

WATER LEVEL OBSERVATIONS					
W.L.					
W.L.	2'	B.C.R.	18'	A.C.R.	
W.L.					
WCI 29', 6 days AB					

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/12/81
BORING COMPLETED	08/12/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1859

MEN04512

LOG OF BORING NO. B-8A

OWNER: Menasha Corporation

ARCHITECT-ENGINEER:

SITE: N. of 106th Ave. and E. of Fairview St.

PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE TYPE	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT.³	UNCONFINED COMPRESSIVE STRENGTH	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT	STANDARD PENETRATION
					SURFACE ELEVATION: 717.9						
					Brown sand						
	1	SS									
10	2	SS			Brown silty fine to medium and fine to coarse sand- trace gravel- moist- loose to medium dense (SM)						
					Brown medium to coarse sand and gravel- moist- extremely dense (SW)						
	3	SS									
20					End of boring. Boring advanced to 13.0' using solid stem auger. Borehole backfilled with soil cuttings.						

WATER LEVEL OBSERVATIONS

W.L. B.C.R. A.C.R.

W.L.

W.L.

No water observed

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/14/81
BORING COMPLETED	08/14/81
RIG Beach	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1860

MEN04513

LOG OF BORING NO. B-9

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

SURFACE ELEVATION: 719.8

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE TEST	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TSF	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT	STANDARD PENETRATION BLOWS/FT
	1	SS			Topsoil						
					Black and brown silty fine sand with roots and organics- moist- loose (SM)						
	2	SS									
	3	SS									
	4	SS									
10	5	SS			Brown silty fine to medium and medium to coarse sand- moist- very loose to loose						
	6	SS									
	7	SS									
20					Light brown medium to coarse sand and medium to coarse sand with some gravel- moist- dense to extremely dense (SP)						
	8	SS									
30					Brown medium to coarse sand- trace gravel- moist to wet- extremely dense (SP)						
					Gray fine to coarse angular gravel- wet- very dense (GW)						
	9	SS									
	10				End of boring. Boring advanced to 17.5' using solid stem auger. Boring advanced from 17.5' to 35.0' using washed drilling techniques. Casing used: 20" or HW. Borehole backfilled with soil cuttings.						

WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	5'	B.C.R.	A.C.R.
W.L.			
WCI 25', 3 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/13/81
BORING COMPLETED	08/13/81
RIG Bomb	FOREMAN BB
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1861

MEN04514

LOG OF BORING NO. [illegible]

OWNER: Monsanto Corporation	ARCHITECT-ENGINEER:
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS. FT.³	UNCONFINED COMPRESSIVE STRENGTH TON/FT² (1 2 3 4 5) / PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % / STANDARD "N" PENETRATION GLOW FT (10 20 30 40 50)
					SURFACE ELEVATION(*) 720.7		
	1	SS			Black fine to coarse sand- trace gravel- moist- loose (possible fill) (SP)		
	2	SS					
	3	SS			Brown and gray medium to coarse sand and gravel- moist- dense to very dense (SW)		
	4	SS					
10	5	SS					
20	6	SS			Brown fine sand with some coarse sand- moist- medium dense (SP)		
30	7	SS			Brown fine sand with some coarse sand- moist- medium dense (SP)		
40					continued		

WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	10'	B.C.R.	A.C.R.
W.L.			
WCL 29.5', 2 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/10/81
BORING COMPLETED	08/10/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1862

MEN04515

LOG OF BORING NO. B-10 continued

OWNER: Menasha Corporation	ARCHITECT-ENGINEER:
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE UNIT	RECOVERY	DESCRIPTION OF MATERIAL / SURFACE ELEVATION	UNIT DRY WT. LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TSF	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS/FT
10											
	8	SS			Brown medium sand- wet- extremely dense (SP)						
					Gray very fine sand - trace silt- moist- extremely dense (SP)						
20	9	SS									
					End of boring. Boring advanced to 17.5' using solid stem auger. Boring advanced from 17.5' to 48.5' using washed drilling techniques. Casing used: 20' or HP. Borehole backfilled with soil cuttings.						

WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	10'	B.C.R.	A.C.R.
W.L.			
WCI 29.5', 3 days AB			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/10/81
BORING COMPLETED	08/10/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 7067	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1863

MEN04516

LOG OF BORING NO. B-II

OWNER: Menasha Corporation	ARCHITECT-ENGINEER:
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage FAcility

SURFACE ELEVATION: 745.0

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS/FT³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT² (1, 2, 3, 4, 5) / PLASTIC LIMIT % X / WATER CONTENT % ● / LIQUID LIMIT % / STANDARD PENETRATION BLOWS/FT (10, 20, 30, 40, 50)
	1	SS			Topsoil		
					Brown medium sand- trace silt- moist- medium dense (SP)		
	2	SS					
	3	SS			Brown medium to coarse sand with fine and medium gravel- moist- medium dense to extremely dense (SW)		
	4	SS					
10	5	SS			Brown silt with very fine sand- moist- very dense (ML)		
20	6	SS					
30	7	SS			Brown fine to medium sand- moist- dense to extremely dense (SP)		
40					continued		

WATER LEVEL OBSERVATIONS			
W.L.			
W.L.	6'	B.C.R.	A.C.R.
W.L.			

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	08/15/81
BORING COMPLETED	08/15/81
RIG Bomb	FOREMAN RR
DRAWN	APPROVED TJM
JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1864

MEN04517

LOG OF BORING NO. B-11 continued

OWNER	ARCHITECT-ENGINEER
Menasha Corporation	
SITE: N. of 106th Ave. and E. of Fairview St.	PROJECT NAME: Spent Liquor/Sludge Storage Facility

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL (SURFACE ELEVATION)	UNIT DRY WT LBS FT 3	UNCONFINED COMPRESSIVE STRENGTH TON FT 1 2 3 4 5 / PLASTIC LIMIT % X — WATER CONTENT % ● — LIQUID LIMIT % △ / STANDARD PENETRATION BLOWS FT 10 20 30 40 50
40	8	SS					
					Brown very fine sand- wet- dense (SP)		
50	9	SS			Gray silty sandy clay- moist- hard (CL)		94%

End of boring.
Boring advanced to 13.5' using solid stem auger.
Boring advanced from 13.5' to 48.5' using washed drilling technique.
Casing used: 15' or HW.
Borehole backfilled with soil cuttings.

WATER LEVEL OBSERVATIONS				SOIL TESTING SERVICES OF MICHIGAN, INC.		
W.L.					BORING STARTED	08/15/81
W.L.	6'	B.C.R.	A.C.R.		BORING COMPLETED	08/15/81
W.L.					RIG Bomb	FOREMAN RR
					DRAWN	APPROVED TJM
					JOB # 70672	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual

1865

MEN04518

LOG OF BORING NO. M4-1

OWNER: Potash Corporation	ARCHITECT-ENGINEER:
SITE: Otsego, Michigan	PROJECT NAME: New Tanks and Ponds

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE INTERVAL	DESCRIPTION OF MATERIAL	UNIT DRY WT. LB/CU FT	UNCONFINED COMPRESS. STRENGTH	PLASTIC LIMIT	WATER CONTENT	LIQUID LIMIT
SURFACE ELEVATION:									
10									
20				No sampling					
30									
40									
50	1	SS	11"	Gray silty clayey sand - trace gravel - dense to extremely dense - damp - glacial till (SC-SM)					
	2	SS	18"						
60	3	SS	11"						
70				End of boring. Boring advanced to 50' using HW casing, cutting bit and wash water. Boring advanced to 61' using cutting bit and wash water. Installed monitoring well to 60'					

WATER LEVEL OBSERVATIONS		
W.L.	44.3' 60 12-14-82	
W.L.	B.C.R	A.C.R
W.L.	bailed well to 60'	

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	12-13-82		
BORING COMPLETED	12-14-82		
RIG	ATV	FOREMAN	RR
DRAWN		APPROVED	RCR
JOB # 70575		SHEET	1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual

1866

MEN04519

LOG OF BORING NO. MW-2

OWNER: Menasha Corporation	ARCHITECT-ENGINEER: —
SITE: Otsego, Michigan	PROJECT NAME: New Tanks and Ponds

DEPTH ELEVATION	SAMPLE NO	TYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION OF MATERIAL	DRY WT LBS FT 3	UNCONFINED COMPRESSIVE STRENGTH TSF	PLASTIC LIMIT %	WATER CONTENT %	LIQUID LIMIT %	STANDARD PENETRATION BLOWS FT
					SURFACE ELEVATION						
10					No sampling						
30											
40	1	SS			Gray silty clayey sand - trace gravel - extremely dense - damp - glacial till (SC-SM)						
	2	SS			Brown silty fine sand (SM) and fine to medium sand (SP) - extremely dense - wet						
	3	SS									
50					End of boring. Boring advanced to 35' using solid stem auger. hw casing installed to 15'. Boring advanced to 41' using cutting bit and wash water. Monitoring well installed to 40'.						

WATER LEVEL OBSERVATIONS			
W.L.	27' HO		
W.L.	B.C.R.	A.C.R.	
W.L.	35' after bailing		

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	12-14-82		
BORING COMPLETED	12-14-82		
RIG	ATV	FOREMAN	RR
DRAWN		APPROVED	RCR
JOB #	70875	SHEET	1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1867

MEN04520

LOG OF BORING NO. [illegible]

OWNER	ARCHITECT-ENGINEER
Nemasha Corporation	
SITE: Otsego, Michigan	PROJECT NAME: New Tanks and Ponds

DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS/FT.³	UNCONFINED COMPRESSIVE STRENGTH TONS/FT.² (1 2 3 4 5) / PLASTIC LIMIT % / WATER CONTENT % / LIQUID LIMIT % / STANDARD "N" PENETRATION BLOWS/FT. (10 20 30 40 50)
					SURFACE ELEVATION (ft)		
10					No sampling		
20							
30	1	SS			Brown silty fine to coarse sand and gravel - dense to very dense - wet (SM-GM)		37
	2	SS					70
40					End of boring. Boring advanced to 30' using solid stem auger. Boring advanced to 40' using HW casing, cutting bit and wash water. Monitoring well installed to 35.3'		
50							

WATER LEVEL OBSERVATIONS		
W.L.	26 - 27' NU	
W.L.	B.C.R.	A.C.R.
W.L.	well bailed at 25.5'	

SOIL TESTING SERVICES OF MICHIGAN, INC.

BORING STARTED	12-14-82
BORING COMPLETED	12-14-82
RIG ATV	FOREMAN RR
DRAWN	APPROVED RCR
JOB # 70875	SHEET 1 of 1

The stratification lines represent the approximate boundary between soil types and the transition may be gradual.

1868

MEN04521

NALCO CHEMICAL COMPANY
2901 BUTTERFIELD ROAD • OAK BROOK, ILLINOIS 60521 • AREA C 2-887-7500

April 4 1978

Gary E. Roys
Otsego Paperboard Mill
Farmer Street
Otsego, Michigan 49078

Dear Mr. Roys:

After reviewing the Michigan Critical Materials list published October 1, 1977 and the list of 129 priority water pollutants as listed in the NRDC v. Train consent decree, it can be said that Nalco 634 and Nalco 61G10 do not contain, by direct intent, any of the ingredients listed on either list.

Nalco 62F41, 7132 and 7763 do not contain, by direct intent, any of the ingredients on the priority pollutants list.

Nalco 7763 contains at most 0.005% ethylenediaminetetraacetic acid (EDTA). Based on a treatment level the amount present in your system would be practically nondetectable from the addition of our product.

Nalco 7132 contains a residual amount of unreacted dimethylamine which would be present in the parts per million range.

Nalco 62F41 contains chemicals from the CMR which are used in the manufacturing of this product, but they are not expected to be in the finished product.

If I can be of any further assistance, please contact me.

Sincerely,

John

John J. Kasper
Environmental Health and
Product Safety Department

JJK/cs

5499

MEN04522

SOLVOX

SOLVOX MFG. COMPANY

11725 W FAIRVIEW AVE • MILWAUKEE, WIS. 53226

TELEPHONE 414-774-5664

May 18, 1978

Mr. Gary E. Roys - Process Chemist
MENASHA CORPORATION
Farmer Street
Otsego, Michigan 49078

Dear Mr. Roys:

Regarding your letter of May 11, 1978, neither Solvox Special #699 or Solvox Special #909 contains any of the products included on the Critical Materials Register for the State of Michigan.

If you should have any further questions, please do not hesitate to contact us.

Yours very truly,

SOLVOX MFG. COMPANY

Kim Ireland

Mr. Kim Ireland,
Assistant Manager

KI/lw

cc:

5504

MEN04523

DuBois Chemicals
Division of Chemed Corporation

RESEARCH LABORATORY
3630 EAST KEMPER ROAD • SHARONVILLE, OHIO 45241 • (513) 769-4200

February 28, 1978

TO: W. R. Diemer (4891)

FROM: W. J. Corbett

RE: Menasha Corp.
Otsego, Michigan
C-1575A & EXTEND II

I can certify to you and to your customer that the DuBois products C-1575A and EXTEND II do not contain materials on the recently published Michigan Water Resources Commission - Critical Materials Register or in the list of materials recently published by the EPA in the Federal Register on page 4109 (1978).

If we can be of any further help, please feel free to call on us at any time.

W. J. Corbett

W. J. Corbett, Manager
Regulatory Compliance Services

WJC/dw

5505

Any technical advice or information, statements and recommendations contained herein are based upon technical data, experience and tests which we believe to be reliable but the accuracy or completeness thereof is not guaranteed. Modifications to meet your individual plant or application conditions may be required. We assume no responsibility for the results to be obtained or for consequential damages arising from the use of or reliance upon this submission to you. Nothing herein contained shall be taken as a license to operate under or intended to suggest infringement of any patent, copyright or trademark.

MEN04524

DEARBORN CHEMICAL (U.S.)

CHEMED CORPORATION

laboratory: 300 GENESEE STREET • LAKE ZURICH, ILLINOIS 60047 • TELEPHONE 312/438-8241

March 1, 1978

Mr. Gary E. Roys
Process Chemist
Menasha Corporation
Farmer St.
Otsego, MI 49078

Dear Mr. Roys:

In response to your letter of February 15, 1978 addressed to our facility in Ypsilanti, Michigan, I wish to certify that DEARBORN® 693 does not contain any of the materials listed in the Critical Materials Register published October 1, 1977 nor does it contain any of the materials listed on the Toxic Pollutants List from the Federal Register, Volume 43, No. 21.

If we can be of further assistance, please do not hesitate to let us know.

Sincerely,

Jean Surprenant

Jean Surprenant
Product Registration Assistant

/js

cc: J. H. Coffey

5506

MEN04525

President's E Star Award for Exports

Buckman Laboratories, Inc.

BUCKMAN LABORATORIES INTERNATIONAL, INC.

AUSTRALIA CANADA SOUTH AFRICA
BELGIUM JAPAN U.S. Memphis, Tenn.
BRAZIL MEXICO U.S. Cadet, Missouri

1256 NORTH McLEAN BOULEVARD / MEMPHIS, TENNESSEE 38108, U.S.A. / TELEPHONE (901) 276-0330 / TELEX 5-3868 / CABLE ADDRESS BULAB

February 27, 1978

Menasha Corporation
Otsego Paperboard Mill
Farmer Street
Otsego, Michigan 49078

Attention Mr. Gary E. Roys
Process Chemist

Dear Mr. Roys:

With regard to your letter of February 15, 1978, we are listing below the trace amount of materials on the Michigan Water Resource Commission Critical Material Register. None of the other compounds on the list are present except possibly as traces of impurities. The same applies to the EPA list of toxic substances.

	Busan 40	Busan 881M	Busan 90	Busperse 47	Busperse 49	Busperse 59
	parts per million					
Cadmium	<15	10	<10	1.2	<10	<10
Chromium	< 2	6	1	< 1	< 1	< 1
Copper	< 1	2	1	< 1	< 1	< 1
Lead	< 1	1	< 1	< 1	< 1	< 1
Mercury	0.032	.008	0.17	0.08	0.21	< 0.1
Manganese	< 1	--	< 1	< 1	< 1	--
Zinc	<15	10	<10	9	<10	<10

Sincerely yours,

BUCKMAN LABORATORIES, INC.

J. D. Pera

Vice President - Research

DR. J. D. PERA
ABT

5507

CREATIVITY FOR OUR CUSTOMERS

MEN04526

AMSCO Division
Union Oil Company of California
Region Office P O Box 7600
Schaumburg Illinois 60196
Telephone (312) 885-5200

ACK77-559

union 76
AMSCO

October 13, 1977

Mr. William H. Park
WOLVERINE SOLVENTS & CHEMICALS CO.
2940 Stafford Ave., S.W.
Grand Rapids, Michigan 49508

Dear Mr. Park:

Answering for our Detroit office, the new Critical Materials Register for the State of Michigan is divided into three catagories. Only catagories I and II would apply to the Aliphatics and Aromatics you purchase from AMSCO.

Catagory I lists inorganic material which theoretically could be found in trace quantities, though the quantities of these materials in our solvents are less than the detectable limit of our tests. The state feels these levels ($<$ 5 ppm) are below what they are concerned with.

Catagory II, organic materials, includes benzene so depending on the solvent we will have varying amounts. Our general statement on benzene is that all of our solvents contain less than 1% to comply with OSHA's Temporary Standard.

I believe this will answer both the GR Manufacturing Co. and Bennett Pump Company requests. If we can be of any further help, please call.

Very truly yours,

A. C. Koett
A. C. Koett
Technical Manager

ACK/lc
att

cc: J. A. Laurie

5508

MEN04527

OAKITE

LISTED NYSE...OKT

PROPRIETARY CHEMICAL PRODUCTS FOR INDUSTRIAL CLEANING AND METAL TREATING

TWX 710-984-5459
TEL. (201) 464-6900

OAKITE PRODUCTS, INC.

GENERAL OFFICES: 50 VALLEY ROAD, BERKELEY HEIGHTS, N.J. 07922

May 22, 1978

ID 0316869

Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Attention: Mr. Gary E. Roys
Process Chemist

Gentlemen:

In response to your inquiry forwarded to us by your local Oakite Technical Sales Representative, Mr. Doug McFarlen, none of the substances on the Michigan Critical Materials list or the Toxic Pollutants list (FR 43;21) are used in the formulation of the following products:

Oakite 8
Oakite 32
Oakite Penetrant

We trust this information will meet with your requirements. Please feel free to contact us again if we can be of further assistance.

Very truly yours,

OAKITE PRODUCTS, INC.

Geogi St. John

(Ms.) Geogi St. John
Asst. Technical Information Adm.

GS:lh

5512

MEN04528

EXXON COMPANY, U.S.A.
600 ENTERPRISE DRIVE • OAK BROOK, ILLINOIS 60521

MARKETING DEPARTMENT
INDUSTRIAL & CONSUMER BUSINESS

S. F. POOLE
CHICAGO ZONE MANAGER

May 15, 1978

Mr. Gary E. Roys
Menasha Corporation
Farmer St.
Otsego, MI 49078

Gentlemen:

The Chemical Abstract Service (CAS) numbers applicable to products you purchase from Exxon have not yet been assigned by the Environmental Protection Agency (EPA). The American Petroleum Institute (API) is working with the EPA in developing a standardized list of descriptions for petroleum products. Most petroleum products are complex combinations of hydrocarbons that cannot be listed as individual molecular structures or simple chemical substances. Accordingly, it is important to both the EPA and industry that the list of terms be standardized to the maximum degree possible. The list will be published in the Federal Register after acceptance and will include CAS numbers, applicable product terms and compositional descriptions.

We anticipate that regulations will be issued that will clarify any possible need for this type of information by those who use Exxon products. Based on information currently available from EPA, the original manufacturer of a chemical substance is the one responsible for listing that substance with EPA. Thus, since Exxon is listing with EPA the components of the products manufactured by it, customers who use those products will not be required to list those substances.

If, after these clarifying regulations have been issued, you still require this information, we will be pleased to provide it to you upon request.

Very truly yours,

C A Pittenger

C. A. Pittenger
Sr. Customer Service Rep.

CAP:dg

5513

MEN04529

SUBSIDIARY OF MERCK & CO., INC.

CALGON CORPORATION CALGON CENTER BOX 1346 PITTSBURGH, PA. 15230 (412) 923-2345

March 14, 1978

Mr. Gary E. Roys
Process Chemist
Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Dear Mr. Roys:

In reply to your request of February 15, 1978, the following Calgon products contain either Critical Materials or Toxic Pollutants:

Product	Critical/Toxic Chemical	Percentage by Weight
C-39	Zinc (as ZnO)	10
CL-68	Zinc (as $ZnCl_2$)	16

If I can be of any additional assistance, please do not hesitate to contact me.

Sincerely yours,

CALGON CORPORATION

Edward H. Jones

Edward H. Jones
Assistant
Regulatory and Trade Affairs

/dms

CL 361
CL 95
CL 4000

5514

Diamond Shamrock

Chemicals Division

August 9, 1978

Mr. Gerry Roys
Menasha Corp.
Otsego, Michigan

RE: Michigan Critical Materials Register

Dear Mr. Roys:

Bob Hayes has forwarded your request concerning the presence of chemicals listed in the Michigan Critical Materials Register in Nopcowet 160 to this department for reply. We can advise that although dodecylphenol is used as a raw material in the manufacture of Nopcowet 160, it is expected to be completely reacted with no residue remaining in the finished product.

We trust this information is sufficient for your present requirements. Please contact this department directly if you should need further information on this or any other Diamond products.

Sincerely,

W.M.Atkinson Manager
Technical Promotion Department

Enclosure: PA-91 Rev.

WMA/sml

5515

MEN04530

CALGON

SUBSIDIARY OF MERCK & CO., INC.

CALGON CORPORATION CALGON CENTER BOX 1346 PITTSBURGH, PA 15230 (412) 777-8000

September 12, 1978

Writer's Direct Dial Number
(412)777-8447

Mr. Gary E. Roys
Process Chemist
Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Mr. Roys:

In reply to your letter of September 1, 1978, the following Calgon products from your listing contain either "Critical Materials" or "Toxic Pollutants":

Product	Component	Percent by Weight
C-39	Zinc Oxide	9.6
CL-68	Zinc Chloride	34.0
CL-371	Naphthalene	27.0
SL-500	EDTA	9.5
K-91	Cobalt Sulfate	0.138

If I can be of any additional help, please contact me.

Sincerely yours,

CALGON CORPORATION

Edward H. Jones
Administrative Assistant
Regulatory and Trade Affairs

/dms

5516

MEN04531

DOWELL DIVISION OF DOW CHEMICAL U.S.A.

INDUSTRIAL SERVICES

August 14, 1978

Mr. Gary E. Roys
Process Chemist
Menasha Corporation, Paperboard Mill
W. Farmer Street
Otsego, Michigan 49078

Dear Mr. Roys:

I'm writing in reply to your inquiry regarding components in Vertan® 650 which may be on the Michigan Water Resource Commission Critical Material Register and or the Toxic Pollutants List from the Federal Register, Volume 43, No. 21. The only component of Vertan® 650 that appears on either list is sodium hydroxide. Vertan® 650 contains 1.0% by weight excess sodium hydroxide.

Mary Y. Kelly

Mary Y. Kelly
Industrial Services TS&D
2020 Dow Center
517-636-5473

cv

5517

MEN04532

OAKITE

LISTED NYSE OKT

PROPRIETARY CHEMICAL PRODUCTS FOR INDUSTRIAL CLEANING AND METAL TREATING

OAKITE PRODUCTS, INC.

TWX 710-984 5459
TEL (201) 464-6900

GENERAL OFFICES: 50 VALLEY ROAD BERKELEY HEIGHTS, N.J. 07922

May 22, 1978

ID 0316869

Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Attention: Mr. Gary E. Roys
Process Chemist

Gentlemen:

In response to your inquiry forwarded to us by your local Oakite Technical Sales Representative, Mr. Doug McFarlen, none of the substances on the Michigan Critical Materials list or the Toxic Pollutants list (FR 43;21) are used in the formulation of the following products:

Oakite 8
Oakite 32
Oakite Penetrant

We trust this information will meet with your requirements. Please feel free to contact us again if we can be of further assistance.

Very truly yours,

OAKITE PRODUCTS, INC.

Georgi St. John

(Ms.) Georgi St. John
Asst. Technical Information Adm.

GS:ln

5519

President's E Star Award for Exports

MEN04533

Buckman Laboratories, Inc.

BUCKMAN LABORATORIES INTERNATIONAL, INC

AUSTRALIA CANADA SOUTH AFRICA
BELGIUM JAPAN U.S.A. Memphis
BRAZIL MEXICO U.S.A. Cadet, Missouri

1256 NORTH McLEAN BOULEVARD / MEMPHIS TENNESSEE 38108 U.S.A. / TELEPHONE (901) 278 0330 / TELEX 5 3600 / CABLE ADDRESS BULAB

October 11, 1978

Menasha Corporation
Otsego Paperboard Mill
Farrer Street
Otsego, Michigan 49078

Attention Mr. Gary E. Roys
Process Chemist

Dear Mr. Roys:

With regard to your telephone call of October 11, 1978, we are listing the trace amount of materials on the Michigan Water Resource Commission Critical Material Register for Busperse 46. None of the other compounds on the list are present except possibly as traces of impurities. The same applies to the EPA list of toxic substances.

Busperse 46

Cadmium	less than 10 p.p.m.
Chromium	less than 1 p.p.m.
Copper	less than 1 p.p.m.
Lead	less than 1 p.p.m.
Mercury	0.1 p.p.m.
Manganese	less than 1 p.p.m.
Zinc	less than 10 p.p.m.
Ammonia	5 - 10 p.p.m.

Sincerely yours,

BUCKMAN LABORATORIES, INC.

J. D. Pera

Vice President - Research

DR. J. D. PERA
ABT

5522

CREATIVITY FOR OUR CUSTOMERS

MEN04534

INDUSTRIAL AND BIOCHEMICALS DEPARTMENT

DU PONT

E. I. DU PONT DE NEMOURS & CO. (INC.)

ALUMINUM SULFATE—IRON FREE

PRODUCT DATA SHEET

$Al_2(SO_4)_3 \cdot X H_2O$

Aluminum sulfate—iron free is supplied in three grades Technical Food Processing, and U.S.P. (Drug) It is a white water soluble crystalline material.

	Technical	Food Processing	USP (Drug)
Al_2O_3 combined as $Al_2(SO_4)_3$, %	56.0	56.0	56 0
$Al_2(SO_4)_3$ as $Al_2(SO_4)_3 \cdot 18 H_2O$, %	--	--	109.1
Al as Al_2O_3, water soluble, %	17 1	17.1	17 1
Basicity as Al_2O_3, %	0 40	0 40	0 40
Acidity as H_2SO_4, %	0.0	0 0	0 0
Water Insoluble Matter, %	0.010	0 010	0 010
Iron as Fe, ppm	13	13	13
Lead as Pb, ppm	0.5	0.2	0 5
Arsenic as As, ppm	--	0 01	--
Barium as Ba, ppm	--	1.0	--
Boron as B, ppm	--	1.0	--
Chromium as Cr, ppm	--	2 5	--
Copper as Cu, ppm	--	0 4	--
Fluorine as F, ppm	--	--	--
Heavy Metals as Pb, ppm	--	10	--
Manganese as Mn, ppm	--	0.2	--
Silver as Ag, ppm	--	0 5	--
Zinc as Zn, ppm	--	0 6	--

5523

MEN04535

CALGON
CORPORATION
SUBSIDIARY OF MERCK & CO., INC

CALGON CORPORATION CALGON CENTER BOX 1346 PITTSBURGH, PA 15230 (412) 777-8000

Writer's Direct Dial Number
(412)777-8447

October 11, 1978

Mr. Gary E. Roys
Process Chemist
Menasha Corporation
Farmer Street
Otsego, Michigan 49078

Mr. Roys:

As per our telephone conversation of 10/11/78, the following Calgon products from your letter of 9/1/78 contain neither "Critical Materials" nor "Toxic Pollutants:"

CL-504	NL-90
Metasol D3TA	Burlock Five
CL-361	BA-11
CL-95	Orlene M
CL-4000	Synoca 722
Orlene BT-2	

If I can be of any additional assistance, please contact me.

Sincerely yours,

CALGON CORPORATION

Edward H. Jones

Edward H. Jones
Administrative Assistant
Regulatory and Trade Affairs

/dms

5524

MEN04536

MICHIGAN MANDATORY REPORTING OF CRITICAL MATERIALS

MICHIGAN ACT 200, P.A. 1970 and MICHIGAN ACT 293, P.A. 1972
UPDATED LIST EFFECTIVE 10/1/77

PRODUCT: Caustic Soda Solution 50% (Sodium Hydroxide)

Contains NO Critical Materials

PHONE: (616) 361-6691

SUPPLIER: Haviland Products Co.

ADDRESS: 421 Ann Street
Grand Rapids, Mi. 49504

I. INORGANIC MATERIALS	WT. %		WT. %
Antimony		Selenium	
Arsenic		Silver	
Baryllium		Thallium	
Cadmium		Tin (Organic forms only)	
Chromium		Zinc	
Cobalt		Ammonia*	
Copper		Asbestos*	
Cyanides		Chlorine*	
Hypochlorite		Phosphorus (elemental)*	
Lead (organic forms only)		Phosphorus oxychloride*	
Lithium		Hydrogen sulfide*	
Mercury		Potassium sulfide*	
Nickel		Sodium sulfide*	
II. ORGANIC MATERIALS			
acetone cyanohydrin		brucine	
acridine		butynic acid	
acrolein		carbon disulfide	
acrylonitrile		carbon tetrachloride	
allyl chloride		chlorinated dibenzofurans	
aminoazobenzene		chlorinated dioxins	
2-aminobiphenyl and 4-aminobiphenyl		chloroalkyl ethers, including	
amitrole		bis (2-chloroethyl) ether	
aniline		bis (2-chloromethyl) ether	
aziridines, including		methyl (chloromethyl) ether	
ethyleneimine		2-chloroaniline	
N-(2-hydroxyethyl) ethyleneimine		2-chloroethanol	
propyleneimine		chloroprene	
benzene		crotonaldehyde	
benzidine		di-n-butyl phthalate	
benzo(a)pyrene		dichlorobenzenes	
benzyl chloride		3,3-dichlorobenzidine	

Please return completed form to: XXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

* Compounds need not be reported.

X 2282

5520

MEN04537

4-dichloro-2-butene		naphthenic acid	
chloropropanes		naphthol	
dimethylamine		1-naphthylamine and 2-naphthylamine	
dimethylaminoacetyl -2,4,6-trimethylaniline		nitrosoamines, including	
4-dimethylaminoazobenzene		N-nitroso-diethylamine	
dimethylbenzyl hydroperoxide		N-nitroso-dimethylamine	
dimethyl sulfate		N-nitroso-dimethylaniline	
epoxides, including		pentachloroethane	
1-chloro-2,3-epoxypropane		peroxyacetic acid	
ethylene oxide		phenolics, including (antioxidant)	
2,3-epoxy-1-propanal		2,3 and 4-chlorophenol	
2,3 epoxy-1-propanol		cresols	
ethyl acrylate		dichlorophenols	
ethylamine		2,3 and 4-nitrophenol	
ethylenediamine		pentachlorophenol (PCP)	
ethylenediaminetetraacetic acid (EDTA)		phenol	
ethylene dibromide		resorcinol	
formaldehyde		tetrachlorophenols	
furfural		trichlorophenols	
hexachlorobenzene (HCB)		xylenols	
hexachlorobutadiene (HCBD)		polybrominated biphenyls (PBB)	
hexachlorocyclohexane (lindane)		polychlorinated biphenyls (PCB)	
hexachlorocyclopentadiene		B-propiolactone	
hexamethylenetetramine		quinoline	
hydrazines, including		quinone	
diethylhydrazines		sodium azide	
dimethylhydrazines		styrene	
hydrazine		sultones, including	
hydrazobenzene		1,4-butane sultone	
semicarbazide		1,3-propane sultone	
hydroquinone		tetrachloroethanes	
hydroxylamines, including		thiourea	
hydroxylamine		triaryl phosphate esters	
methyl hydroxylamine		triazenes, including	
lactonitrile		1-(4-chlorophenyl)	
methylene(bis)-2-chloroaniline		-3,3-dimethyl triazene	
methyl iodide		3,3-dimethyl-1-phenyl triazene	
naphthalenes, including		tris (dibromopropyl) phosphate	
naphthalene		vinyl chloride	

DATE: 10-12-78 5521. SUBMITTED BY: M.S.

MEN04538

MICHIGAN MANDATORY REPORTING OF CRITICAL MATERIALS

MICHIGAN ACT 200, P.A. 1970 and MICHIGAN ACT 293, P.A. 1972
UPDATED LIST EFFECTIVE 10/1/77

PRODUCT: Nitric Acid 42° Be
Contains NO Critical Materials

SUPPLIER: Haviland Products Co.
ADDRESS: 421 Ann Street
Grand Rapids, Mi. 49504

PHONE: (616) 361-6691

I. INORGANIC MATERIALS	WT. %		WT. %
Antimony		Selenium	
Arsenic		Silver	
Beryllium		Thallium	
Cadmium		Tin (Organic forms only)	
Chromium		Zinc	
Cobalt		Ammonia*	
Copper		Asbestos*	
Cyanides		Chlorine*	
Hypochlorite		Phosphorus (elemental)*	
Lead (organic forms only)		Phosphorus oxychloride*	
Lithium		Hydrogen sulfide*	
Mercury		Potassium sulfide*	
Nickel		Sodium sulfide*	
II. ORGANIC MATERIALS			
acetone cyanohydrin		brucine	
acridine		butynic acid	
acrolein		carbon disulfide	
acrylonitrile		carbon tetrachloride	
alkyl chloride		chlorinated dibenzofurans	
aminoazobenzene		chlorinated dioxins	
2-aminobiphenyl and 4-aminobiphenyl		chloroalkyl ethers, including	
aniline		bis (2-chloroethyl) ether	
aniline		bis (2-chloromethyl) ether	
aziridines, including		methyl (chloromethyl) ether	
ethyleneimine		2-chloroaniline	
N-(2-hydroxyethyl) ethyleneimine		2-chloroethanol	
propyleneimine		chloroprene	
benzene		crotonaldehyde	
benzidine		di-n-butyl phthalate	
benzo(a)pyrene		dichlorobenzenes	
benzyl chloride		3,3-dichlorobenzidine	

Please return completed form to: [redacted]

* Compounds need not be reported.

X 2282 5525

MEN04539

1,4-dichloro-2-butene		naphthenic acid	
dichloropropanes		naphthol	
dimethylamine		1-naphthylamine and 2-naphthylamine	
dimethylaminoacetyl -2,4,6-trimethylaniline		nitrosoamines, including	
4-dimethylaminoazobenzene		N-nitroso-diethylamine	
dimethylbenzyl hydroperoxide		N-nitroso-dimethylamine	
dimethyl sulfate		N-nitroso-dimethylaniline	
epoxides, including		pentachloroethane	
1-chloro-2,3-epoxypropane		peroxyacetic acid	
ethylene oxide		phenolics, including (antioxidant)	
2,3-epoxy-1-propanal		2,3 and 4-chlorophenol	
2,3 epoxy-1-propanol		cresols	
ethyl acrylate		dichlorophenols	
ethylamine		2,3 and 4-nitrophenol	
ethylenediamine		pentachlorophenol (PCP)	
ethylenediaminetetraacetic acid (EDTA)		phenol	
ethylene dibromide		resorcinol	
formaldehyde		tetrachlorophenols	
furfural		trichlorophenols	
hexachlorobenzene (HCB)		xylenols	
hexachlorobutadiene (HCBD)		polybrominated biphenyls (PBB)	
hexachlorocyclohexane (lindane)		polychlorinated biphenyls (PCB)	
hexachlorocyclopentadiene		B-propiolactone	
hexamethylenetetramine		quinoline	
hydrazines, including		quinone	
diethylhydrazines		sodium azide	
dimethylhydrazines		styrene	
hydrazine		sultones, including	
hydrazobenzene		1,4-butane sultone	
semicarbazide		1,3-propane sultone	
hydroquinone		tetrachloroethanes	
hydroxylamines, including		thiourea	
hydroxylamine		triaryl phosphate esters	
methyl hydroxylamine		triazenes, including	
lactonitrile		1-(4-chlorophenyl)	
methylene(bis)-2-chloroaniline		-3,3-dimethyl triazene	
methyl iodide		3,3-dimethyl-1-phenyl triazene	
naphthalenes, including		tris (dibromopropyl) phosphate	
naphthalene		vinyl chloride	

DATE: 10-12-78 5526 SUBMITTED BY: M.S

MEN04540

Allied Chemical

Industrial Chemicals Division
P O Box 6
Solvay N Y 13209

October 12, 1978

Mr. Gary Roys
Menasha Corporation
P. O. Box 155
Otsego, MI 49078

Reference: Your telephone request on October 11, 1978.

Products: Soda Ash

Dear Mr. Roys:

In response to your inquiry, this is to advise you that none of the chemicals on the list of priority pollutants/critical materials submitted with your request are contained in the product(s) we supply you as listed above. None of the priority pollutants/critical materials are used as raw materials, additives, or components of these products; and if present at all, levels would not be expected to exceed trace impurity quantities such as might be introduced from raw materials or the general environment.

We trust that this information is helpful, and we regret delays in compiling the necessary information and transmitting it to you.

Very truly yours,

David K. Kennedy/clt

David K. Kennedy
Supervisor-Chemicals
Technical Service

DKK/clt

5527

All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty, or responsibility of any kind, express or implied. Statements or suggestions concerning possible use of our products are made without representation or warranty that any such use is free of patent infringement and are not recommendations to infringe any patent. The user should not assume that all safety measures are indicated or that other measures may not be required.

MEN04541

BASF Wyandotte Corporation

BASF

Wyandotte [illegible] 48192
313 282 3[illegible]
Telex 0230647 (BASFWYANA WYT[illegible])
TWX 810 231 6750 (BASFWYAN)

October 11, 1978

Mr. Gary Roys
Menasha
P. O. Box 115
Otsego, Mich. 49078

Dear Mr. Roys:

As we discussed in our telephone conversation of Wednesday, October 11, 1978, the typical heavy metal of BASF Wyandotte Soda Ash-Light is as follows:

Soda Ash-Light, 58%	
Antimony	< 1 PPM
Arsenic	<0.5 PPM
Cadmium	<0.1 PPM
Copper	< 1 PPM
Lead	<0.5 PPM
Mercury	<0.002 PPM
Nickel	< 1 PPM
Phosporus	< 1 PPM

Very truly yours,

D F Meyer

D. F. Meyer
Technical Service
Soda Chemicals Division

/ms

5528

MEN04542

FORM NO. 361

Allen Schuch

Perhaps you should discuss your problem w/ Rick.

memo / MENASHA CORPORATION

TO: Bruce Buchanan

DATE: 11/30/78

SUBJECT: Weekly Report

FROM: Rick Reames

RAR

PCB Capacitors

We received a storage barrel yesterday and they have been packed for holding until shipment, in about four weeks.

Laboratory Yield Studies

A preliminary experimental design has been proposed and is ready for review.

Substation #8

We received the necessary materials this week for installation of a spill containment threshold around this transformer. This is required by Federal Law. Drawings need to be completed.

Conductivity Probe SLI. Sump

More time will be spent this week working on the necessary drawings.

kj

2902

MEN04543

PCB

memo / MENASHA CORPORATION

TO: B. Buchanan - Otsego
P. Horris - MPM
T. Williscroft - North Bend

DATE: August 7, 1981

SUBJECT: PCB CONTAINING EQUIPMENT

FROM: Bob Junda

Several weeks ago, I sent you a memo outlining needed steps for handling PCB containing equipment and asbestos. In that memo I referenced the need to have in place an inspection procedure by August 10 for all PCB containing equipment. I believe I asked you to advise the status of the inspection process and asked for a list of all PCB containing equipment for Corporate files.

To date, I have not received anything. Although it is only August 7, these items could well be underway. I am writing this memo; A. to remind you of the August 10 deadline and B. to clarify the expectation that the first audit will be done as required by the law with appropriate records being maintained.

RJ:sc

SUSP 8/20 - RAE
if the responses haven't come in by 8/20 we will need to send a sort of NASH follow-up letter

bcc: L. Tweedie:

You were copied on previous correspondence on this matter and I would appreciate an inventory of PCB containing equipment from the Container Division.

2914

MEN04544

memo / MENASHA CORPORATION

TO: John Blauwkamp, Bob Gulbranson
Tom Clemmons, Ron VanNoord

DATE: 3 November 1982

FROM: Mark Reed

SUBJECT: PCB Capacitors

Under the new rules for PCB capacitors, small capacitors used in fluorescent light ballasts are not restricted. These capacitors can be put into the trash compactor unless there are a large number of them (100 or more).

The rules also call for all large capacitors to be phased out by October 1, 1988 unless they are located in a restricted access area. (Large is defined as a capacitor which has more than 3 lbs. of PCB fluid in it). All our large PCB capacitors are in restricted access areas.

There are two small (less than 3 lbs. fluid) PCB capacitors on the primary refiner surge packs that should probably be changed out before the above deadline. They are not in a restricted access area but are not considered large capacitors.

j

2903

MEN04545

FIBRE BOX ASSOCIATION
5725 EAST RIVER ROAD
CHICAGO, ILLINOIS 60631
(AREA 312) 693-9600

Al Hansen

Bob Janela
Suggest you discuss w/ Ernie & Len
Jack

August 4, 1981

TO: MEMBERS
Fibre Box Association

RE: PCB's

Gentlemen:

This is a reminder that all PCB transformers in your plant must have their first inspection by August 10, 1981. The major requirements, according to the March 10, 1981, Federal Register, are as follows:

1. PCB Transformers (those that contain 500 ppm PCBs or greater) and PCB-Contaminated Transformers (those that contain between 50 ppm and 500 ppm PCBs) posing an exposure risk to food and feed products must be inspected for leaks once every week.

2. All other PCB Transformers must be inspected for leaks at least once every three months.

3. Any "moderate leak" discovered by the inspection must be repaired and cleaned or the transformer replaced, beginning within 2 days from the time the leak is observed. Moderate leaks from transformers posing an exposure to food or feed products must be reported to EPA within 5 days from the date the leak is observed.

4. Records must be kept of the following:

(a) The location of each transformer subject to the Program.
(b) The date of each inspection and the name of the inspector.
(c) All leaks observed.
(d) A description of all servicing on the transformer after the date of the first inspection.

The term in paragraph 1. above "posing an exposure risk to food and feed products" specifically excludes "paperboard manufacturers whose products may be sold to food packagers"; so, the quarterly inspection provision in paragraph #2. governs transformers in and around corrugated box plants. If you do not own the transformer, notify the owner so he may perform the quarterly inspection.

2915

MEN04546

A "leak" means any instance where PCBs are detected on the external surface of the unit, and a "moderate leak" is one which results in any quantity of PCBs running off or about to run off the unit.

It is recommended that any transformer leak be reported to the nearest EPA Regional Office.

When reporting, EPA requests that the following be furnished:

1. The cause of the leak and the total amount of dielectric fluid spilled.

2. The proximity of the transformer to areas where food or feed products are handled.

3. A brief description of the possible pathways for dieletric fluid from the transformer to reach food or feed products.

4. The type and amount of food or feed products contaminated, if any.

5. The steps taken to repair and clean up the leak and to assure proper disposal of all contaminated materials.

Sincerely,

FIBRE BOX ASSOCIATION

Thomas J. Muldoon

Thomas J. Muldoon
Executive Vice President

/pm

2916

FORM 581

MEN04547

memo / MENASHA CORPORATION

TO: PCB File

DATE: May 6, 1986

SUBJECT: PCB Inventory as of 12/31/85

FROM: Gary Roys

GR

TRANSFORMERS

Substation #1 1 - 1000 KVA with 192 gallons (2495 lbs).
Substation #4 2 - 750 KVA with 175 gallons (5200 lbs).

CAPACITORS

Switchroom #1

2 - 300 KVAR @ 60 lbs. ea. = 180 lbs.
1 - 150 KVAR @ 30 lbs. = 30 lbs.
2 - 50 KVAR @ 10 lbs. ea. = 20 lbs.

cc: J. Blauwkamp

kj

2660

FORM 561

MEN04548

memo / MENASHA CORPORATION

TO: PCB File

DATE: January 28, 1987

SUBJECT: PCB Capacitor Removal
Switch Room #1

FROM: Gary Roys

On January 6, 1987, the seven (7) capacitors from Switch Room #1 were removed from service. These capacitors were as follows:

5 - 150 KVAR	4.9 Gal	30 Lbs. each
Serial Numbers:	122735	
	122736	
	122737	
	127722	
	046374	
2 - 50 KVAR	2.5 Gal	10 lbs. each
Serial Numbers	064256	
	104087	

All Contain: ASKAREL

cc: J. Blauwkamp
J. Bonham

/kj

2649

FORM 561

MEN04549

memo / MENASHA CORPORATION

TO: John Bonham

DATE: March 30, 1987

SUBJECT: Toxic Metals in 000 Weir

FROM: Keith Kling KBK.

On 3/24/87 John Bantjes, from the MDNR, called with some sample results from the September 1986 State survey. The results showed levels of copper, zinc and aluminum which put our discharge into the level of chronic toxicity. He stated that this would not be a problem if the mixture of 000 water with turbine cooling water was high enough to dilute the metals before they entered the river. Bill Diamond the MDNR biologist, feels that a mix of 4:1 would make the discharge acceptable. Rough measurements on 3/24 showed a total flow through 003 to be 1,414,000 gallons with 480,000 of this being 000 weir flow. This is only a 3:1 mixture. On 3/27, I make adjustments to the splitter box so more of the water going to 005 was diverted to 003. I redirected the maximum amount I could put to 003 without causing backpressure problems to 000 weir. Measurement of the flow now show a discharge of 2,476,000 gallons with 460,000 of this being 000 weir flow. This is a 5:1 mix. While this is acceptable, there are some built-in problems. As the flow at 000 weir is raised, more of the turbine cooling water would have to be put back into 005. This would quickly reduce the ratio below acceptable limits. Failure to do so would give falsely high readings at 000 weir, making permit violations likely.

I see two possible solutions to the problem. First, we may be able to consolidate all the weir discharges together when 002 weir is moved. The need for extra mixing may even help in getting quick approval of the weir consolidation. This will almost certainly require some changes in the line from the turbine to the river.

Second, the MDNR may be exceeding their authority in this matter. They are defining the area we are discharging into as a habitable zone in the river even though it is immediately below the dam. The levels of metals are quite low, meaning a fish would have to stay in the area of the discharge for days or weeks to be affected. At the rate the water in this area is moving, the fish would wear his fins off before he would be affected by our discharge. Past dealing with regulatory agencies has shown that they sometimes ask for changes that are not supported by their rules and regulations. My recommendation would be to check this before engineering any changes.

c: J. Blauwkamp

/kj

MEN04550

CLOW HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
408 Auburn Avenue
Pontiac, MI 48058
313 334-1630
313 334-4747

June 10, 1982

Menasha Corporation
320 North Farmer Street
Otsego, MI 49078
Attn: Mr. Gary Roys

Hydro number: HR 55768

Samples received: 5-25-82

Customer I.D.: ASTM D-3987
Leachate procedure on comp-ash

Selenium, Se, mg/l	0.020
Arsenic, As, mg/l	0.035

700 grams of sample were leached with 2800 mls of deionized water for 48 hours.

Linda Deans

Linda Deans
General Laboratory Manager

4284

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
313/334-4747

5-23-83

Menasha Corporation
320 North Farmer St.;
Otsego, MI 49078
Attn: Mr. Gary Roy.

Sample received: 5-10-83

Hydro Number: 64033

Client I.S. ASTM-D3987 Leachate procedure on #5683 Lime Ash

Leachate:

Lead, Pb, mg/l	<0.05
Arsenic, As, mg/l	0.18
Cadmium, Cd, mg/l	<0.01
Total Chromium, Cr, mg/l	<0.02
Selenium, Se, mg/l	<0.005
Iron, Fe, mg/l	<0.02
Zinc, Zn, mg/l	<0.02
Copper, Cu, mg/l	<0.02
Total Dissolved Solids, TDS, mg/l	256
Nitrogen Nitrate, N, mg/l	0.96
Sulfate, SO_4, mg/l	25
Chloride, Cl, mg/l	18

As received:

pH	7.7
Total Solids, TS %,	79.0
Calcium Carbonate, %	9.5

700 grams of solids were leached with 2800 mls of deionized water for 48 hours. The final pH was 7.7.

Linda Deans
Linda Deans
General Laboratory Manager

4315

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
408 Auburn Avenue
Pontiac, MI 48058
313 334 1630
313 334-4747

July 28, 1983

Menasha Corporation
320 North Farmer Street
Otsego, MI 49078
Attn: Mr. Gary Roys

Sample received: 7-20-83

Hydro Number: 66524

Client I.D. 71983 Lime Ash
ASTM-D 3987 Leachate Procedure

Arsenic, As, mg/l 0.19

700 grams of solids were leached with 2800 mls of deionized water for 48 hours.

Linda Deans

Linda Deans
General Laboratory Manager

4313

R 19

MEN04553

MENASHA CORPORATION

September 21, 1983

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

Dear Rick:

We have recently completed our annual leachate test on the fly ash being disposed of in our Class III landfill. The leachate test results are attached. We are currently collecting a composite sample of our secondary fiber system rejects. The leachate test results of this material should be available in 6 to 8 weeks.

Sincerely,

Menasha Corporation
Otsego Paperboard Division

John R Blauwkamp P.E.

John R. Blauwkamp, P.E.
Technical Manager

j

Attachment

4285

OTSEGO PAPERBOARD MILL FARMER STREET • OTSEGO, MICHIGAN 49078 • PHONE 616-692-6141

MEN04554

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
408 Auburn Avenue
Pontiac, MI 48056
313 334-1630
313 334-4747

9-6-83

Menasha Corporation
320 North Farmer Street
Otsego, MI 49078
Att: Mr. Roys

Sample received: 8-12-83

Hydro Number: 67451

Client I.D. ASTM D 3987 Leachate Procedure on Ash-8-83

Lead, Pb, mg/l	<0.05
Arsenic, As, mg/l	0.03
Cadmium, Cd, mg/l	<0.01
Selenium, Se, mg/l	<0.005
Iron, Fe, mg/l	<0.02
Zinc, Zn, mg/l	<0.02
Copper, Cu, mg/l	<0.02
Nitrogen Nitrate, N, mg/l	0.08
Sulfate, SO_4, mg/l	290
Chloride, Cl, mg/l	2
pH	7.7
Total Chromium, Cr, mg/l	<0.02
Total Dissolved Solids, mg/l	383

700 grams of solids were leached with 2800 mls of deionized water for 48 hours.

Linda Deans/pa
Linda Deans
General Laboratory Manager

4286

R-19

MEN04555

EVALUATION OF DEWATERABILITY
and
EP TOXICITY STUDY

of

MENASHA CORPORATION SLUDGE

for

WILKINS AND WHEATON TESTING LABORATORIES, INC.

KAR Project No. 84335

May 14, 1984

Performed by:

KAR Laboratories, Inc.
219 Peekstok Road
Kalamazoo, MI 49001

2181

MEN04556

INTRODUCTION

This project involved a study of sludge materials from Menasha Corporation of Otsego, Michigan. First, four samples of sludge were subjected to vacuum filtration testing in an effort to reduce the water content. This was followed by compositing the samples and subjecting the composite sample to the EP Toxicity Procedure as defined by the USEPA.

The samples were received on March 20, 1984. They were provided by Mr. William French of Wilkins and Wheaton, who also instructed that the EP Toxicity Procedure would include analysis of all metals specified by the USEPA and/or the Michigan Department of Natural Resources.

MEN04557

DESCRIPTION OF SAMPLES

Four samples were received that were labelled as composite samples from specified areas at Menasha Corporation of Otsego, Michigan. They were identified as:

Description	KAR #
Pond # 1, composite	84205- 2
Pond # 2, composite	84205- 5
Pond #10, composite	84205- 7
Pond #12, composite	84205-10

Each sample was contained in a one liter glass bottle. All samples appeared wet or damp. They were solid or semisolid material which was mixed easily and had a pasty appearance. All possessed odor, which was more or less unpleasant depending upon the person.

Each sample was thoroughly mixed prior to placement of about 50 grams on a 7 cm glass fiber filter. The sludge was formed into a flat layer of about 3/8 inch on the filter and vacuum applied for about 10 minutes. Each cake thus formed appeared dryer on the underside (approx. 1/16") to which the vacuum had been applied, but unchanged on the upper surface and in the middle of the cake. It appears that water does not flow easily through these sludges. The limited filtrate that was obtained was a very dark orange - brown liquid.

The approximate volume of filtrate generated by each sludge was as follows:

MEN04558

Area	Volume in mL
Pond # 1	none
Pond # 2	0.5
Pond #10	5
Pond #12	1

The sludge cakes thus produced were combined and mixed into a single sample for the EP Toxicity Extraction. The total solids of this sample were 43.59% of the sample. Volatile solids comprised 47.85% and non-combustible solids 52.15% of the total solids.

MEN04559

PROCEDURE

The Extraction Procedure (EP) followed "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods", SW-846, United States EPA.

A portion of the composited cake sample, weighing 99.4 grams, was placed in a clean extraction bottle. 1590 mL of distilled water was added and mixed thoroughly. The pH of this mixture was 8.6 initially. Acetic acid (0.5N) was added to bring the pH to 5.0 ± 0.2 units. The container was then placed on a rotary mixer per the EPA protocol. The pH was then monitored and adjusted as needed over the following twenty-four hours. The final pH was 4.8 units. The total volume of acid used was 225 mL compared to the maximum allowable volume of 398 mL.

After completion of mixing, 173 mL of distilled water was added to make the final volume equal to twenty times the weight of the sample. This was then filtered with great difficulty through a 0.45 micron filter to yield the leachate for analysis.

Analysis of the extraction liquid was performed in accordance with "Methods for Analysis of Water and Wastes" by the USEPA and "Standard Methods for the Examination of Water and Wastewater" by APHA-AWWA-WPCF. Mercury was analyzed by the cold vapor technique while all other metals were analyzed utilizing flame atomic absorption spectrometry.

TABLE I

Comparison of Extraction Procedure Concentrations from Menasha Corporation Sludge to the Maximum Allowable Concentrations.

(All in milligrams per liter)

Parameter	Extract Concentration	Maximum Allowable*
Arsenic	<0.2	5.0
Barium	<0.5	100.0
Cadmium	0.05	1.0
Chromium	<0.05	5.0
Copper	0.07	100.0
Lead	0.49	5.0
Mercury	<0.01	0.2
Selenium	<0.1	1.0
Silver	<0.05	5.0
Zinc	0.8	500.0

*Maximum Allowable Concentration as specified by the Michigan Department of Natural Resources.

MEN04561

KAR Laboratories, Inc.
219 Portuck Road
Kalamazoo, Michigan 49001
Telephone (616) 381-9666

ANALYTICAL REPORT

Date: May 15, 1984

To: Wilkins & Wheaton Testing
Laboratories, Inc.
171 Portage Road
Kalamazoo, MI

Attn: Mr. William French

Re: Additional analyses performed on EP toxicity leachate generated from composite Menasha Corporation Sludge (KAR Project # 84335).

Parameter	Concentration in mg/L
Calcium	131
Iron	18
Magnesium	25
Nickel	0.2
Sodium	960
Sulfur, Total	260

Respectfully submitted,
KAR Laboratories, Inc.

William H. Bouma

William H. Bouma, Ph.D
Director

WHB/mcm

MEN04562

#6 Well

NALCO

REPORT OF MICROBIOLOGICAL ANALYSIS

Company	MENASHA CORPORATION	Analysis No.	052353
Address	OTSEGO, MICHIGAN	Sampling Date	07/29/79
		Date Rec'd by NALCO	08/07/79
Sample Marked	NO. 6 WELL FILTER DEPOSIT		MANY

Physical Appearance

THIN BROWN DEPOSIT

(All counts express quantity of organisms per ML of sample)

BACTERIA

AEROBIC SLIME FORMING

Non-Sporeforming

Flavobacterium	1,500,000
Mucoids	(S)NEG IN 1/10,000
Aerobacter	NEG IN 1/1000
Pseudomonas	100,000

Sporeforming

B. subtilis	60,000
B. cereus	
B. megatherium	
B. mycoides	

ANAEROBIC CORROSIVE

Desulfovibrio	2,000
Clostridia	NEG IN 1/100

IRON DEPOSITING

Sphaerotilus	
Gallionella	— Many

OTHER BACTERIA

*FACULTATIVE	NEG IN 1/100
TOTAL COUNT	2,800,000

FUNGI

MOLDS

Aspergillus	NEG IN 1/100
Penicillium	
Trichoderma	
Alternaria	

YEASTS

Torula	NEG IN 1/100
Monilia	
Saccharomyces	
Rhodotorula	

ALGAE

BLUE GREEN	NONE
Oscillatoria	
GREEN	NONE
Chlorococcus	
DIATOMS	NONE

OTHER ORGANISMS

NONE

REMARKS:

George J. Zinkus

1646

*EITHER AEROBIC OR ANAEROBIC IN ORIGINAL SAMPLE

Head, Microbiological Laboratory

NALCO CHEMICAL COMPANY

6216 W [illegible] ACE • CHICAGO ILLIN[illegible] 138

MEN04563

GER

NALCO CHEMICAL COMPANY
5250 FAR HILLS AVE. • SUITE 217 • DAYTON, OHIO 45429 • AREA 513 4 33-7976

December 1, 1979

Mr. Richard Reames
Menasha Corporation
320 North Farmer Street
Otsego, Michigan 49078

Dear Rick:

Attached for your records, is the analysis of the Number 6 well filter deposit that we discussed some time back.

Microscopic examination in your lab showed the presence of a large amount of Gallionella (iron bacteria). Also present were slime forming and anaerobic corrosive bacteria.

Our recommendation was to increase the level of chlorine to the well. Certain microbiocides can neutralize the chlorine which is being fed. Nalco 7610, an organic amine microbiocide, will combine with and improve the killing action of chlorine and make that effect more persistent.

Nalco 7610 is unsurpassed for the treatment of fresh water contamination. A product bulletin is attached for your review. We would like to discuss this letter with you on my next visit.

Very truly yours,

A. S. Nigrelli

A. S. Nigrelli
Area Manager

cc: Mr. Gary Boys

Attachment: Nalco Analysis 052353, Nalco product bulletin 7610

ASN/gm

1645

CORPORATE OFFICES: 2901 BUTTERFIELD ROAD • OAK BROOK, ILLINOIS 60521 • AREA 312-887-7500

MEN04564

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

EPA Leachate Procedure

Sample received 2-1-80

		ppm	Hazardous Waste Limit.
HYDRO NO:	35765		
CUST. ID:	Fly Ash 1232580		
Nitrogen, Nitrate, N, mg/l	1.0	1.0	
Sulfate, SO_4, mg/l	22	22	
Chloride, Cl, mg/l	< 2	<2	
Lead, Pb, mg/l	< 0.05	<.05	5.0
Arsenic, As, ug/l	11	.011	5.0
Cadmium, Cd, mg/l	< 0.002	<.002	1.0
Chromium, Total, Cr, mg/l	< 0.002	<.002	5.0
Selenium, Se, ug/l	24	.024	1.0
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 acetic acid necessary to maintain the sample pH at 5.0 adds [illegible]

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

[illegible]

2421

MEN04565

CLOW
HYDRO RESEARCH SERVICES
Water Management Division
Clow Corporation
408 Auburn Avenue
Pontiac, MI 48058
313 334-1630
313 334-4747

Menasha Corporation
320 N. Farmer St.
Otsego, MI 49078
Attn: Mr. John Blauwkamp

Date: 11-21-80

Samples received11-13-80

HYDRO NO:		43617	43618
CUST. ID:		#1 Machine oil	#2 Machine oil
Arsenic, As, mg/kg	5.0	< 0.1	< 0.1
Barium, Ba, mg/kg	100	2000	93
Cadmium, Cd, mg/kg	1.0	< 0.4	< 0.4
Chromium, Total, Cr, mg/kg	5.0	24	22
Lead, Pb, mg/kg	5.0	< 4	< 4
Mercury, Hg, mg/kg	.2	< 0.1	0.11
Selenium, Se, mg/kg	1.0	< 0.1	0.29
Silver, Ag, mg/kg	5.0	< 0.4	< 0.4

Results reported on sample as received.

Linda Carey
Linda Carey/Manager
Analytical Services

2420

R-19

MEN04566

CALGON
SUBSIDIARY OF MERCK & CO., INC.

MEMO

TO R. DeRusha

FROM D. Tollis

SUBJECT Determination of Arsenic in Product and Slurry Samples
Menasha Corp., Otsego, Michigan
PJC No. 9437000
Lab Nos. M3936 - Sodium Nitrate
M3937 - L-675
M3938 - Hard Ash
M3939 - Soda Ash
M3940 - Lime Sludge
M3941 - Ash Water

DATE 10/26/83

Date Received: 9/29/83
Date Analyzed: 10/20/83
RE: 1) Custom Analysis Request Form
2) Memo: DeRusha to Devine dated 9/23/83

Purpose of Analysis and Conclusions

To determine if arsenic is present in any of the subject samples. Arsenic contamination suspected in the ash slurry at Menasha Corp.

Based on the detectable limits of the test, none of the prepared solutions contains arsenic (As).

Analytical Results

Following are the results of analyses of the subject samples:

Lab No.	Sample Identification	Arsenic (As), ppm
M3936	Sodium Nitrate	<25
M3937	L-675	<25
M3938	Hard Ash	<25
M3939	Soda Ash	<25
M3940	Lime Sludge	<25
M3941	Ash Water	<25

Results reported represent detection limit of the test (0.005 ppm) times 5000 dilutions (25 ppm).

4318

Experimental

ımple Preparation/Analysis

ırameter Tested	Method Description	Method Reference
senic (As)	Flameless Atomic Absorption (See Table I) Method of Standard Additions Used.	E2051-E (Modified)

mple Preparation: A weighed portion (1.0 g) of each sample dissolved in 500 ml of 1% (v/v) HNO_3. Nickel (50 mg/L) was added as a matrix modifier allowing the use of higher furnace temperatures as an aid in controlling some possible interferences. An additional 10-fold dilution on each prepared sample solution was necessary due to an unknown interference.

ılity Control

: instrument was calibrated with freshly prepared standard solutions containing the ıe matrix background added to the samples (Ni and HNO_3).

D.J. Tollis

D.J. Tollis

R.F. Devine

R.F. Devine

Y: D. Bassett
E. Henn

TE: J. Mosko
G. Partington
P. Reiser
D. Roberts
D. Tollis

4319

MEN04568

TABLE I
INSTRUMENTAL CONDITIONS FOR FLAMELESS ATOMIC ABSORPTION ANALYSIS

	ELEMENT(S)
SPECTROPHOTOMETER:	Arsenic (As)
INSTRUMENT (SERIAL NO.):	IL Model 551 AA (3846)
WAVELENGTH, nm:	193.7
BANDWITH. nm:	2.0
HIGH VOLTAGE, volts:	620
HOLLOW CATHODE LAMP, ma:	8
DEUTERIUM ARC, ma:	4
BEAM OPTION:	Double

HEATED GRAPHITE ATOMIZER:

TEMPERATURE PROGRAM STEPS:	Indicated Temp°C	Time Setting (x 5 Sec.)
	1. 70	4
	2. 100	7
	3. 135	1
	4. 1650	1
	5. 2650	0
	6. 2650	2

PURGE GAS:	Argon
PURGE GAS FLOW SETTING:	Slow Flush
TEMPERATURE FEEDBACK:	On
MODE:	Abs./Conc.
INTEGRATION:	Peak Height / 8 sec.
GRAPHITE TUBE TYPE:	Pyrolytically Coated
SAMPLE SIZE, ul:	10 ml
GRAPHITE TUBE CONDITIONING:	None
MATRIX MODIFIER:	50 mg/L Ni/1% HNO_3 (v/v)
SENSITIVITY/VERIFICATION: (absorbance/ug/l)	0.050 ug/L Std. (0.215/50)

Company Name/Lab ID Number: Menasha Corp/M3936-M3941

4320

MEN04569

SEP 2983M3936 SEP 2983M3941

WMD CUSTOM ANALYSIS REQUEST FORM

Co. Name Menasha Corp

Charge No. 9437000

Location Otsego, Mich.

Report Data To R. DeRusha

Submitted By R. DeRusha Ext.

Copy List

Date Submitted 9/28

Date Required

WMD Product Management Approval

Sample Identification

Cal Lab No.(s)

Sodium nitrate M3936
L-675 M3937
Hard Ash M3938
Soda Ash M3939
Lime Sludge M3940
Ash Water M3941

SEP 2983M3936

Purpose of Analysis/Sample History (Include treatment products if applicable/source of sample if a Calgon product/document analytical problem)

Arsenic Contamination?
in Ash Slurry.

SEP 2983M3941

QUANTITATIVE Information Desired

Arsenic

Special Handling Precautions

4321

MEN04570

CALGON CORPORATION

SUBSIDIARY OF MERCK & CO., INC.

WATER MANAGEMENT DIVISION CALGON CORPORATION 17251 W. 12 MILE ROAD SUITE 103 SOUTHFIELD, MICHIGAN 48076
(313) 557-5830, 5331, 5832

November 7, 1983

The Menasha Corporation
Otsego, Michigan 49078

Attention: Mr. Al Coleman

Subject: Determination of Arsenic in Product and Slurry Samples

Gentlemen:

During early October we sent a number of samples from the Power House to our Pittsburgh Laboratory for arsenic determination.

We are pleased to report that, based on the detectable limits of the test, none of the samples collected contained arsenic.

I am attaching the Lab data detailing identification of the samples as well as the method used in arriving at this conclusion. If you have any questions regarding any of this information, please feel free to contact me.

Very truly yours,

Water Management Division
CALGON CORPORATION

Richard L. DeRusha/cdk
Richard L. DeRusha

RLD/cdk

Att.

cc: +1
Mr. S. Rosenthal
Mr. G. Roys
Mr. J. Blaukamp

4317

PREIN & NEWHOF LABORATORY RESULTS

MENASHA MONITORING WELLS
SAMPLES RECEIVED 10/19/84

Parameter	Well 2A West	Well 3 South	Well 4 North	TF North Well	TF South Well	TF Southwest Well
pH	7.1	6.9	7.0	7.6	7.3	7.0
Specific Conductance, umhos/cm	550	2,400	1,260	305	1,130	675
Chloride, mg/L	2	16	11	<1	41	6
Sulfate, mg/L	54	300	222	21	56	53
Iron, mg/L	0.04	0.29	0.89	0.98	1.67	0.40
COD, mg/L	<5	63	41	< 5	54	<5
TOC, mg/L	1	22	13	< 1	18	<1
Calcium, mg/L	57.8	79.1	99.2	30.6	42.6	81.0
Sodium, mg/L	8.79	374	130	3.33	163	13.9
Magnesium, mg/L	24.4	46.1	36.2	11.3	22.7	30.0
Total Alkalinity, mg/L as $CaCO_3$ to pH 4.6	264	1,170	493	123	669	312
Nitrite, mg/L as N	<0.01	0.03	0.02	0.01	0.02	0.02
Nitrate, mg/L as N	0.02	2.27	0.12	0.41	0.04	0.95
Ammonia, mg/L as N	0.04	0.03	0.18	0.03	0.23	0.04
Total Lead, mg/L	<0.03	<0.03	<0.03	<0.03	< 0.03	< 0.03
Total Chromium, mg/L	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

MEN04572

Professional Service Industries, Inc.
Michigan Testing Engineers Division

February 23, 1984

Manasha Corporation
Otsego Mill
Post Office Box 155
320 North Farmer
Otsego, Michigan 49078

ATTN: Mr. John Barkel

Re: Soils Investigation
Proposed Storage Tank (NaOH)
Otsego, Michigan
PSI File No. 413-45011

Gentlemen:

In compliance with your instructions, we have conducted a soils exploration and foundation evaluation for the above referenced project.

The results of this investigation, together with our recommendations, are to be found in the accompanying report, two (2) copies of which are being transmitted herewith.

This report presents the results of a soils exploration and foundation analysis for a proposed 50,000 gallon caustic storage tank, conducted for Manasha Corporation.

Authorization to perform this exploration and analysis was in the form of a purchase order, Number 481532, dated February 20, 1984, to Professional Service Industries, Inc.

The purpose of this foundation exploration and analysis was to determine the various soil profile components, the engineering characteristics of the foundation materials and to provide criteria to aid the design engineers in preparing the foundation design.

The scope of the exploration and analysis included a reconnaissance of the immediate site, the subsurface exploration, field and laboratory testing, and an engineering

analysis and evaluation of the foundation materials.

This report has been prepared for the exclusive use of Manasha Corporation for the specific application to the proposed storage tank, in accordance with generally accepted soils and foundation engineering practices.

The site of the proposed construction upon which this soils exploration has been made, lies at 320 North Farmer Street, and is approximately one hundred and twenty (120) feet north of the adjacent Kalamazoo River and and approximately three hundred (300) feet east of Farmer Street, in Otsego, Michigan.

This site is fairly level, there being some estimated three (3) feet difference in elevation between the east and west ends of the immediate area of the proposed construction.

The existing ground surface is covered by gravel, and is free of surface vegetation.

At the time of the site exploration, surface drainage appeared to be very good, with runoff into the Kalamazoo River, adjacent to the site.

It was noted that there are several existing buildings on the site. Utilities consisting of underground sewer lines, and an abondoned spillway were pointed out to the drill crew, and these cross the site immediately east of the proposed tank location.

At the time the exploration was made, the surface of the site was firm and the drilling equipment experienced little difficulty in moving around the site.

The field exploration to determine the engineering characteristics of the foundation materials included a reconnaissance of the project site, making the boring, performing standard penetration tests and recovering undisturbed split-spoon samples.

In addition, several samples were secured for the purpose of performing moisture content tests in the laboratory.

The apparent groundwater level was recorded after completion.

One (1) soil test boring has been made, and it was drilled to a depth of thirty and one half (30½) feet below the existing ground surface. It was drilled in the location determined by Manasha Corporation as directed in the field.

After completion of the boring, the drill hole was backfilled with excavated soil.

The soil boring was performed with a drilling rig equipped with a rotary head. Conventional hollow-stem augers were used to advance the holes. Representative samples were obtained employing split-spoon sampling procedures in accordance with ASTM designation D-1586.

Undisturbed samples were identified according to boring number and depth, and encased in special glass containers to protect against moisture loss and transported to the laboratory.

During the sampling procedure, standard penetration tests were performed at regular intervals to obtain the standard penetration value of the soil. The standard penetration value (N) is defined as the number of blows of a 140 pound hammer, falling thirty (30) inches, required to advance the split-spoon sampler one (1) foot into the soil. The sampler is lowered to the bottom of the drill hole and the number of blows recorded for each of three (3) successive increments of six (6) inches penetration. (These three (3) values are reported on the boring log.) The "N" value is obtained by adding the second and third incremental numbers. The results of the standard penetration test indicate the relative density and comparative consistency of the soils, and thereby provide a basis for estimating the relative strength and compressibility of the soil profile components.

MEN04575

In addition to the field investigation, a brief supplemental laboratory testing program was conducted to determine additional pertinent engineering characteristics of the foundation materials necessary in analyzing the behavior of the proposed storage tank.

The laboratory testing program included supplementary visual classification and water content determinations on select samples.

The types of subsurface materials encountered have been visually classified and are described in detail on the attached boring log. The results of the field penetration tests, water level observation and laboratory tests are presented on the boring log in numerical form. Representative samples of the soils were placed in sample jars and are now stored in the laboratory for further analysis if desired. Unless notified to the contrary, all samples will be disposed of after three (3) months.

The stratification of the soils, as shown on the boring log, represents the soil conditions in the actual boring location, and other variations may occur away from the boring. Lines of demarcation represent the approximate boundary between the soil types, but the transition may be gradual.

It is to be noted that, while the test boring is drilled and sampled by experienced drillers, it is sometimes difficult to record changes in stratification within narrow limits, especially at great depths. In the absence of foreign substances, it is also difficult to distinguish between discolored soils and clean soil fill.

An idealized soil profile to be found upon this site consists of a 4 foot layer brown to black miscellaneous fill. This man-placed fill contains laminations of old paper and/or cardboard, silts, brick, and other miscellaneous debris. A slight chemical odor was noted. While Standard Penetration Test results are generally medium to high, the miscellaneous character of the fill could cause

erroneous values and therefore, are not indicative of the true stability of the deposit. The engineering characteristics of this material, such as strength and compressibility, are likely to be extremely variable.

A stratum of dark gray, moist to wet medium sand was encountered below the fill, and extends to a depth of approximately ten and one half (10½) feet. The relative density of this soil may be described as medium dense, with standard penetration resistances ranging from ten (10) to fourteen (14) blows per foot. The compressibility of these soils is generally considered low.

A stratum of fine to medium gray sand was encountered below the dark gray medium sand and extends to the full depth of our 30½ foot boring. The relative density of the soil may be described as ranging from medium dense to very dense, depending on depth, with standard penetration resistances ranging from ten (10) to over forty (40) blows per foot. The compressibility of these soils is also generally considered quite low.

Based on the information provided, it is understood that the proposed tank will be of steel skin construction, twenty (20) feet in diameter, and twenty (20) feet in height. It will be used for storage of approximately 50,000 gallons of fluid.

As an alternate to the use of deep spread or continuous wall footings, it may be economically feasible to remove the deposits of miscellaneous fill and other unstable soils, to the depth of the dark gray medium sand stratum of soils, encountered at four (4) feet below the existing surface. If the proposed footing grade will be at an elevation above the depth of the required excavation, the excavation can be backfilled with a select, clean, granular soil placed in layers of not more than nine (9) inches in thickness, with each layer being compacted to a minimum density of 95 percent, of the maximum dry density as determined by ASTM designation D-1557, AASHTO T-180 values. The area of the compacted

backfill must extend outside the perimeter of the foundation for a distance at least equal to the thickness of the fill between the bottom of the foundation and the underlying undisturbed soils. If this procedure is followed, it is expected that the fill will be capable of supporting loads of up to 2500 P.S.F., with the magnitude of any future settlements being within tolerable limits. All continuous footings placed upon the compacted backfill should be suitable reinforced to make them as rigid as possible. If it is elected to utilize a compacted backfill for the support of foundations, the excavations and the placing of the backfill should be monitored continuously by a qualified soils engineer so that the work is performed in accordance with these specifications.

The groundwater level, as measured in the boring, appeared to be at a depth of approximately four (4) feet below the existing ground surface immediately after completion of the boring operation. Because of the relatively high groundwater level, some difficulty during excavation and construction of the proposed foundation is possible.

A gravity drainage system, sump pump, or other conventional minor dewatering procedure should be sufficient for this purpose.

An extensive gravity drainage system, well points, or other comprehensive dewatering procedure may, however, be required for this purpose if excavations are to extend more than twelve (12) inches below the prevailing groundwater level.

It may be expedient to drill auger holes or excavate test pits adjacent to the building area immediately prior to construction of the foundation to determine the prevailing water table elevation.

It should be noted that groundwater levels on this site may vary due to seasonal conditions and recent rain-

MEN04578

fall, drought temperature effects, and fluctuations in the adjacent Kalamazoo River.

When the plans and specifications are more complete, or if significant changes are made in the character or location of the proposed tank, a consultation should be arranged to review them with respect to prevailing soil conditions. At that time, it may be necessary to submit supplementary recommendations.

Should you have any questions regarding this report, or if we may be of further service, do not hesitate to contact us at your convenience.

Very truly yours,

MICHIGAN TESTING ENGINEERS DIVISION

Patrick T. Hughes

Patrick T. Hughes
Branch Manager

Daniel M. Ahart

Daniel M. Ahart, P.E.
Division Manager

PTH/DMA/la

Attachments

MEN04579

Professional Service Industries, Inc.

SOIL BORING NO. 1 JOB NO. 413-45(

PROJECT Manasha- 20' Dia. Steel Skin Tank

SURFACE ELEV. * DATE 2-22-84 LOCATION Farmer Street, Otsego, Michigan

Depth	Legend	Soil Description	Penetration Blows Per 6"	Moisture %	Natural Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF
1	FILL	Medium brown, moist medium to coarse sand & gravel with some silt					
2	FILL	Medium brown, moist, medium to coarse sand & gravel with some silt, black w/chemical odor, saturated	14	21			
SS 3	FILL	Black, moist organic silty material w/some sand & gravel; lamination of old paper/cardboard		20			
4							
5	POSS. FILL	Dark gray, moist towet, medium sand with fine to medium gravel medium dense, with chemical odor.	3 7 4	25.0			
6							
7			3 7 7	62.2			
8							
9		Dark gray, moist towet, medium sand with fine to medium gravel medium dense					
10			2 6 4	17.6			
11		Gray, saturated, medium to fine sand with trace of silt, medium dense.					
12							
13							
14							
15			2 3 6				
16							
17							
18		Gray, saturated, medium to fine sand with trace of silt, very dense.					
19							
20			9 14 19	16.3			
21							
22							
23							
24							
25		Gray-White, saturated, medium sand, trace fine gravel, very dense	12 20				

* Approximately 8' above adjacent Kalamazoo River

TYPE OF SAMPLE
D - DISTURBED
U.L. - UNDIST. LINED
S.T. - SHELBY TUBE
S.S. - SPLIT SPOON
R.C. - ROCK CORE
( ) - PENETROMETER

REMARKS

Standard Penetration Test — Driving 2" OD Sampler 1' With 140# Hammer Falling 30", Count Made At 6" Intervals

GROUND WATER OBSERVATIONS

G.W. ENCOUNTERED AT 7 FT 3 INS
G.W. ENCOUNTERED AT FT INS
G.W. AFTER COMPLETION 3 FT 9 INS
G.W. AFTER HRS FT INS
G.W. VOLUMES very heavy

1798

MEN04580

SI

Regional Service Industries, Inc.

SURFACE ELEV. 6' above river DATE 2-22-84

SOIL BORING NO. 1 continued JOB NO. 413-45011

PROJECT Manasha- 20' Dia. Steel Skin Tank

LOCATION Farmer Street, Otsego, Michigan

Legend	Soil Description	Penetration Blows Per 6"	Moisture %	Output Wt. P.C.F.	Dry Den Wt. P.C.F.	Unc. Comp. Strength PSF.	Str. %
	Gray-White, saturated, medium sand, trace fine gravel, very dense.	2					
		13					
		20					
		26					
	End of Boring @ 30' - 6"						

SAMPLE TYPES LINER Y TYPE

REMARKS

Standard Penetration Test — Driving 2" OD Sampler 1' With 140# Hammer Falling 30"; Count Made At 6" Intervals

PLUGGING PROCEDURE

HOLE SEALED WITH excavated soil BETWEEN DEPTHS OF 0 AND 30½ feet.

1799

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System is used to identify the soil unless otherwise noted.

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch O.D. split-spoon.

Qu: Unconfined compressive strength, TSF

Qp: Penetrometer value, unconfined compressive strength, TSF

Mc: Water content, %

LL: Liquid limit, %

PI: Plasticity Index, %

δd: Natural dry density, PCF

▼: Apparent groundwater level at time noted after completion.

DRILLING AND SAMPLING SYMBOLS

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
AU: Auger Sample.
DB: Diamond Bit.
CB: Carbide Bit.
WS: Washed Sample.

RELATIVE DENSITY AND CONSISTENCY CLASSIFICATION

TERM (NON-COHESIVE SOILS)	STANDARD PENETRATION RESISTANCE
Very Loose	0 - 2
Loose	2 - 4
Slightly Compact	4 - 8
Medium Dense	8 - 16
Dense	16 - 26
Very Dense	Over 26

TERM (COHESIVE SOILS)	Qu - (TSF)
Very Soft	0 - 0.25
Soft	0.25 - 0.50
Firm (Medium)	0.50 - 1.00
Stiff	1.00 - 2.00
Very Stiff	2.00 - 4.00
Hard	4.00+

PARTICLE SIZE

Boulders	8 in. +	Coarse Sand	5mm-0.6mm	Silt	0.074mm-0.005mm
Cobbles	8 in.-3 in.	Medium Sand	0.6mm-0.2mm	Clay	-0.005mm
Gravel	3 in.-5mm	Fine Sand	0.2mm-0.074mm		

memo / MENASHA CORPORATION

MEN04582

TO: Dick Thorne

DATE: December 3, 1975

SUBJECT: 1974 Well Water Treatment Program, Calgon.

FROM: Bruce Buchanan

cc: E. C. Manders
K. Schenck
N. Johnstone
J. Scott
Lab (3)

what is problem

History of Contamination of the Aquifer

what summary from this information

The sand and gravel base aquifer from which we draw our water at No. 6 & 7 wells has a southwesterly travel of approximately one (1) foot per day. This aquifer seems also to be part of the source of No. 4 & 5 wells. To the east and northeast, several sources of contamination were established during 1973. The approximate chronolgy of events is as follows:

A. Sludge
1. Began shallow ponding of sludge early summer 1973.
2. Began deep diked ponding of sludge August 1973.

B. Liquor
1. Hauled about 1.4 mm gallons of liquor to southwest gravel liquor pond from mid March to mid April. *
   * During the time hauling was being done, it was noted that after the pond reached a certain level, it remained at that level even though approximately 50,000 gallons per day were being brought into pond. This type of leaching indicates a probable significant source of ground water contamination.
2. Hauled out of southwest gravel pond during June.
3. Hauled about 1.0 mm gallons of liquor to southwest gravel from mid November to mid December.
4. Subsequently, only intermittant hauling of liquor to southwest occured as demanded by lack of space in mill pond.

These two sources of contamination provide distinctly separate problems, which have no simple solution.

The liquor contamination causes increased organic loading of the well water in the form of lignosulfonates. Lignosulfonates are themselves sources of food for numerous bacteria. The decomposition and partial decomposition products do not have the excellent dispersant properties of the original lignosulfonates and tend to form deposits, especially in areas of reduced flow such as in seal water lines. Heat also accellerates biodegredation (approximately double for each 10°c) thus the accentuated problems in heat exchangers.

The sludge ponding and subsequent leaching results in the influx of inordinately high levels of bacteria into the aquifer. These bacteria are, of course, particularly well acclimated to reduction of NSSC biodegradables.

MEN04583

Well water contamination has increased over the last year, and due to the slow mass movement of the aquifer, well water quality will most probably continue to degrade for some time to come.

Initiation of 6 Month Trial with Calgon

During the later part of 1973, as the well water became increasingly unmanageable and the Naleo 236 then being used was taxed beyond its capability, both Buckman Labs and Calgon Corporation were brought in to submit proposals for treatment programs. The Calgon program was chosen and the trial began in February of 1974.

Chronology of Calgon Treatment Program

A. Treatment began with CL-14 dispersant and H-130 biocide on February 26, 1974 at No. 4 & 5 wells and on February 7, 1974 at No. 6 & 7 wells. Feed Rate * set at 25 ppm 1 hr. per shift on biocide (H-130) and 10 ppm continuous on dispersant (Cl-14).
* See chart on Paramaters Affecting 003 Effluent B.O.D. for pounds feed per day.

B. H-204 Biocide used as substitute for H-130 because of lack of availability of H-130. H-204 fed from August 7 - September 20.

C. Week of October 24. Longer duration of feed reduced rate.

D. Week of October 30. Synchronization of all H-130 timers.

E. Week of November 24. Continuous feed at 3ppm.

F. November 29 - December 2. High dosage shock feed of biocide.

G. December 4 to year end. Substitute Cl-14 with Cl-36 wetting agent.

Results of Various Phases of Extended Trial

During the first few months of the Calgon treatment program, results looked encouraging. No really dramatic improvement in slime problems was noticed, but a significant reduction of iron floc plugging of filters was verified. Overall slime problems seemed to be held in check, or at least did not worsen. However, during the latter part of the year, control of slime associated problems deteriorated and, as can be seen in the Chronology Table, numerous modifications were made to the treatment program in a futile attempt to regain control over the worsening situation. None of these attempts showed any dramatic improvement in conditions except for item F, and this approach could not be economically justified, and in light of plate counts, this approach should not need to be taken. Listed below are the percent kill of bacteria on the indicated dates.

DATE	WELL NUMBER	PERCENT KILL
March 4	4,5,6 & 7	>99
May 29	4,5,6 & 7	>99
June 18	4,5,6 & 7	>99
October 16	4,5,6 & 7	>95
December 8	5,6 & 7	>99

Because of the improvement seen over the weekend cited under item F in the Chronology, item G was initiated. The reasoning being that a wetting agent fed just prior to biocide feed would help wet out the slime masses and allow the biocide more effective penetration. This approach needs more time to determine its efficacy.

MEN04584

Cost of Calgon Well Water Treatment Program

Listed below is the year's total and monthly average costs.

H-130	$1900.00/mo.
Cl-14	$1750.00/mo.
TOTAL	$3650.00/mo. or $44,000.00/year.

Conclusions and Recommendations

In view of the continuing deterioration of our current aquifer along with the inordinate costs incurred in this and most probably any other treatment program, an alternate source of water supply should be sought. River water, which is even now of far better quality than our well water may prove the most attractive alternate. Tests are currently being run by both Calgon and Buckman Labs to reveal the difference between well and river water with respect to both initial quality and overall treatment costs.

During the next few months a short extension of the Calgon program should be granted to fully evaluate the wetting agent approach. In the event this fails, a short trial should be made with the Buckman materials with a long term eye, however, toward an alternate source of supply, i.e. river water and chlorination.

BB/aa

8/1/78

T O WILLIAMS 1861 1941
F D WORKS 1880-1931
W B Williams 1895-1974

DIRECTORS:

T C WILLIAMS
E S THOMPSON
K W ANDERSON
M M CHAMBERS
Z R MILLER
R L ELLIOTT
J A MERDZINSKI
E SPICER
A O HUSTVEDT
L VAN [illegible] HORST
J R CAHR
E M FLEIS
C J OLSON
S D ELMORE
H W MYERS

WILLIAMS & WORKS
ENGINEERS / SURVEYORS / PLANNERS / GEOLOGISTS
611 CASCADE WEST PARKWAY, S.E., GRAND RAPIDS, MICHIGAN 49506
TELEPHONE (616) 942-9600

August 1, 1975
P-82685

MEN04585

Menasha Paper Board Division
320 North Farmer
Otsego, Michigan 49078

Attention: Dr. Allen Schenk

Gentlemen:

Subject: Ground water testing program, vicinity of liquor-holding ponds

Work in this program was interrupted on July 11. By that date two separate attempts to obtain ground water samples had been made: Late in June our efforts with a light drilling rig failed to penetrate coarse gravel at all locations.

In the week of July 7, drilling with a heavier, truck mounted auger proved feasible. A sample of ground water was bailed from a well located south of the smaller liquor pond (Well A), from near the water table at 38 ft. depth. Although slight dilution of this water with drilling water (from the Kalamazoo River) is possible, the black color and excessive amounts of Na (3,800 mg/l) and alkalinity (8,500 mg/l) indicate the smaller liquor holding pond as the source of this ground water.

A well drilled west of the larger pond (Well B) encountered water of clear appearance near the water table at 24.5 ft. Attempts at pumping a sample from 5-8 ft. below the water table failed.

We feel information at hand is sufficient to confirm the smaller pond as a source of Na lignosulfonate degradation products.

1405

MEN04586

Work with the existing temporary well west of the larger pond, drilling one more well south of the larger pond, and sampling and analyzing suspect ground water, remain to be done. We propose to continue, this time using rods and check valve to pump wells and obtain samples.

Costs to date are as follow: June: $450, involved with first attempts to penetrate to ground water depths. July: $540, involved with July field work to the present plus $40 in analysis of four chemicals from Well A (total organic carbon not finished yet), plus $100 of reporting time. Total costs at this point are approximately $1130.

Our estimate for the remaining work is $650 field time plus $80 for analyses of two samples plus $100 for coordination and report. If these costs are met the total project costs will have come to $1,960. This is $950 in excess of our estimate of April 29. Drilling difficulties were not known to us at that time. The estimate was based upon expectation of the normal range of site conditions.

We will be pleased to discuss these matters with you.

Very truly yours,

WILLIAMS & WORKS, INC.

Jeffrey C. Sutherland

Jeffrey C. Sutherland

jam

1406

3/13/73

memo / MENASHA CORPORATION

MEN04587

TO: Dick Thorne

DATE: 3/13/73

SUBJECT: Wright's Well - Meeting with County Public Health Department.

FROM: K. E. Lowe

1. An informal meeting was held with Mr. Jeff Lubbers of the Allegan County Public Health Department to discuss the contamination problems with the Wright's Well. The following attended: D. Thorne
N. Johnstone
K. E. Lowe

2. The Company told Mr. Lubbers that it was our intent to provide the Wright's with a safe water supply. This satisfied the County man and we agreed to work directly with the Wrights but keep the County informed on what approaches are taken. Two approaches are planned:

   - Short Term: To provide water to the house from Wright's barn well. This is now being done and should be complete by March 16, 1973. A Culligan color removal unit is also being installed on this well.

   - Long Term: To provide City well to the Wright's house. This means running a water main under the Penn Central lines and for a distance of about 1000 feet. The approval of City and County agencies is required for this approach.

3. Mr. Lubbers also asked if we knew of any other contaminated wells in this area and if we had sampled any of the private wells on 106th Street. We replied no to both questions. He felt we should periodically monitor the other private wells for contamination. We told him that part of the Williams and Works Survey was to make recommendations on water monitoring and we would probably be monitoring the ground water in this area.

4. It is important to realize in analyzing these problems that liquor and white water seepage has been occurring for a number of years. Contamination has been picked up in #3, #6, and #7 wells for at least 3 years. Therefore, it is likely that the ground water at the houses on 106th Street could be contaminated. If this occurs we will be obligated to pipe City water to these homes.

cc: N. Johnstone
A. Brindley

js

1423

WILLIAMS & WORKS

ENGINEERS — SURVEYORS — PLANNERS

MEN04588

LABORATORY DEPARTMENT

Water - Waste Water - Soils

Client: Menasha

Monitoring Wells

7/6/73

Project No. P 79747

Date: 16 July 1973

Chemist: FLK & AES

SAMPLE

	Well #1	Well #2	Well #3			
Alkalinity	290 mg/l	906 mg/l	330 mg/l			
Chloride	2 mg/l	10 mg/l	5 mg/l			
rdness	330 mg/l	360 mg/l	300 mg/l			
monia nitrogen	0.0 mg/l	2.1 mg/l	0.0 mg/l			
Nitrate Nitrogen	1.5 mg/l	6.8 mg/l	0.8 mg/l			
Total Kjeldahl Nitrogen	1.1 mg/l	4.2 mg/l	1.4 mg/l			
Chemical Oxygen Demand	8.0 mg/l	360 mg/l	44 mg/l			
pH	7.7	7.6	7.7			
Phosphorus, Total	0.26 mg/l	0.16 mg/l	0.32 mg/l			
Specific Conductance	560 umhos	1650 umhos	520 umhos			
Sulfate	35 mg/l	13 mg/l	20 mg/l			

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WILLIAMS & WORKS

ENGINEERS — SURVEYORS — PLANNERS

MEN04589

LABORATORY DEPARTMENT

Water - Waste Water - Soils

Client: Menasha

Monitoring Wells

7/6/73

Project No. P 79747

Date: 16 July 1973

Chemist: FLK & AES

SAMPLE

	Well #1	Well #2	Well #3			
Alkalinity	290 mg/l	906 mg/l	330 mg/l			
Chloride	2 mg/l	10 mg/l	5 mg/l			
Hardness	330 mg/l	360 mg/l	300 mg/l			
Ammonia Nitrogen	0.0 mg/l	2.1 mg/l	0.0 mg/l			
Nitrate Nitrogen	1.5 mg/l	6.8 mg/l	0.8 mg/l			
Total Kjeldahl Nitrogen	1.1 mg/l	4.2 mg/l	1.4 mg/l			
Chemical Oxygen Demand	8.0 mg/l	360 mg/l	44 mg/l			
pH	7.7	7.6	7.7			
Phosphorus, Total	0.26 mg/l	0.16 mg/l	0.32 mg/l			
Specific Conductance	560 umhos	1650 umhos	520 umhos			
Sulfate	35 mg/l	13 mg/l	20 mg/l			

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MEN04590

NATURAL RESOURCES COMMISSION
HILARY F. SNELL
Chairman
E. M. LAITALA
ROBERT M. BOUDEMAN
CARL T. JOHNSON
HARRY H. WHITELEY
JOAN L. WOLFE
CHARLES G. YOUNGLOVE

STATE OF MICHIGAN

WILLIAM G. MILLIKEN, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

A. GENE GAZLAY, Director

WATER RESOURCES COMMISSION
CHARLES D. HARRIS
Chairman
JOHN E. VOGT
Vice-Chairman
STANLEY QUACKENBUSH
JOHN P. WOODFORD
JOHN H. KITCHEL, M.D.
C. WILLIAM COLBURN
CLEAMON E. LAY

WATER RESOURCES COMMISSION
4056 Plainfield Avenue, N. E.
Grand Rapids, Michigan 49505

June 4, 1974

Mr. Norman Johnstone,
Technical Supervisor
Menasha Corporation
Otsego, Michigan 49078

Dear Mr. Johnstone:

Listed below are the analytical results of samples taken on May 22, 1974 from the suspected contaminated wells on 106th Avenue:

	Menasha Corp. Sludge Supernatant	Gren Well	Thornton Well	Dayton Well
Tannin & Lignin	≈5	≈2	≈0.2	≈0.1
SO4	Interference	470	84	36
Mg	13	67	28	28
Fe	28	8.0	0.50	1.5
Zn	0.30	2.7	0.70	0.60
Color	6500	2000	75	10
pH	8.3	7.6	7.7	7.6

(Concentrations are expressed in mg/l, except pH and color)

The sample results support our previous conclusions. Your letter of May 13, 1974 outlined Menasha's course of action to solve this well water degradation.

I am sure you will keep us informed regarding the developments on the installation of city water down 106th Avenue.

Very truly yours,

WATER RESOURCES COMMISSION

Roger Przybysz

Roger Przybysz,
Water Quality Investigator

RP/mc
cc: Karl Zollner

MICHIGAN
THE GREAT LAKES STATE

1419

MENASHA CORPORATION

5/13/74

MEN04591

PAPERBOARD DIVISION OTSEGO, MICHIGAN 49078 • 616 • 692-6141

May 13, 1974

Roger Przbyse
Basin Water Quality Investigator
Water Resources Commission
4056 Plainfield Ave. N.E.
Grand Rapids, Michigan 49505

Dear Roger:

In response to your inquiry regarding Menasha's approach to solving well water contamination problem on 106th Ave, I am submitting the following outline of action.

1. In the short term, activated charcoal filtration unit is being installed on Geren's residence well water to improve condition so that it may be used for washing purposes. Water cooler is being provided to hold drinking water. These two improvements should be completed today.

2. Menasha has sent inquiry to Wes Clark of City of Otsego regarding installing city water down 106th Ave.

3. We are contacting those residences which may have a well water discoloration problem to sample their water.

4. Spray disposal of Clarifier sludge is being implemented as quickly as possible to improve dispersion of sludge and eliminate possible seepage into the aquifer of liquid from sludge.

I believe that the above outline covers what you require.

Yours Sincerely,

Norman E. Johnstone

Norman E. Johnstone
Technical Superintendent W-792

jm

cc: Dick Thorne
Allen Schenck
E. C. Manders

FOUNDED 1849

1418

MEN04592

WILLIAMS & WORKS

ENGINEERS / SURVEYORS / PLANNERS / GEOLOGISTS

611 CASCADE WEST PARKWAY, S.E., GRAND RAPIDS, MICHIGAN 49506

TELEPHONE (616) 949-8800

SOILS DEPARTMENT

Project Location: MENASHA CORP - OTSEGO

Client: MENASHA

Equipment & Operator: W/S W

Project No.:

Technician: ELC & E.P.

Date: 6-26-75

Equipment Description: JOHNSON MB-2d-4

Mineral Well Permit No.:

Boring No.: #1

Approx. Ground Elev.:

Boring Location: AS STAKED IN FIELD

Penetration Tests are made with a 2" dia. split spoon, 140# hammer and 30" free-fall unless noted otherwise

Plugging Method:

In accordance with the Mineral Well Act, Act No. 315 (Mich, 1969), a copy of this boring log without blow counts will be sent to the Dept. of Natural Resources, Geological Survey Division.

Boring Depth From	Boring Depth To		No. Blows last 12"	No. Blows 3rd 6"	No. Blows 2nd 6"	No. Blows 1st 6"	Depth of Test
0.0	1.0	SAND - FINE TO MED - BROWN					
1.0	7.5	SAND - FINE - MED - GRAVEL					
7.5		REFUSAL - HEAVY GRAVEL					
0.0	7.0	SAND - FINE - BROWN					
7.0	10.0	SAND - FINE TO MED - GRAVELLY					
10.0		REFUSAL - HEAVY GRAVEL					
0.0	5.0	SAND - FINE TO MED - BROWN					
5.0	21.0	SAND - FINE TO MED - GRAVELLY					
21.0		REFUSAL - HEAVY GRAVEL					
		SAME AS THIRD ATTEMPT					
		REFUSAL AT 24					

Casing Used: Diameter: Length:

Water at ft. hrs after termination of boring. Sheet 1 of 1

MEN04593

WILLIAMS & WORKS

ENGINEERS / SURVEYORS / PLANNERS / GEOLOGISTS

811 CASCADE WEST PARKWAY S.E. GRAND RAPIDS, MICHIGAN 49506

TELEPHONE (616) 942-8000

SOILS DEPARTMENT

ect Location MENASHA CORP - OTSEGO Client MENASHA

pment & Operator W&W Project No.

nician ELC & E.P. Date 6-26-75

pment Description JOHNSON MTR-2d- d"

g No. #2 Approx. Ground Elev. Mineral Well Permit No.

g Location AS STAKED IN FIELD

Penetration Tests are made with a 2" dia. split spoon, 140# hammer and 30" free-fall, unless noted otherwise

ing Method

cordance with the Mineral Well Act, Act No. 315 (Mich, 1969), a copy of this boring thout blow counts will be sent to the Dept. of Natural Resources, Geological Survey on.

		No. Blows last 12"	No. Blows 3rd 6"	No. Blows 2nd 6"	No. Blows 1st 6"	Depth of Test
15.0	SAND FINE TO MED BROWN GRAVELLY					
	REFUSAL HEAVY GRAVEL					

Diameter Length

ft. hrs. after termination of boring Sheet of

1/15

MEN04594

WILLIAMS & WORKS

ENGINEERS / SURVEYORS / PLANNERS / GEOLOGISTS

811 CASCADE WEST PARKWAY, S.E., GRAND RAPIDS, MICHIGAN

TELEPHONE

SOILS DEPARTMENT

Project Location MENASHA CORP - OTSEGO Client MENASHA

Equipment & Operator W&W Project No.

Technician ELC & ER Date 6-26-75

Equipment Description JOHNSON MR-24 4"

Boring No. #3 Approx. Ground Elev. Mineral Well Permit No.

Boring Location AS STAKED IN FIELD

Penetration Tests are made with a 2" dia. split spoon, 140# hammer and 30" free-fall, unless noted otherwise.

Plugging Method NATURAL SOIL

In accordance with the Mineral Well Act, Act No. 315 (Mich, 1969), a copy of this boring log without blow counts will be sent to the Dept. of Natural Resources, Geological Survey Division.

Boring Depth From	Boring Depth To		No. Blows last 12"	No. Blows 3rd 6"	No. Blows 2nd 6"	No. Blows 1st 6"	Depth of Test
0.0	4.0	SAND - FINE TO MED - BLACK GRAVELLY - SOME RUBBLE					
4.0	14.0	SAND - FINE TO MED - GRAVELLY BROWN					
14.0		REFUSAL (HEAVY GRAVEL)					
0.0	1.5	GRAVEL - MED - DIRTY					
1.5	2.0	SAND - FINE - BLACK					
2.0	3.5	SAND - MED TO COARSE - BROWN GRAVELLY					
3.5	5.5	GRAVEL - MED TO COARSE					
5.5		REFUSAL (HEAVY GRAVEL)					

Casing Used Diameter Length

W.T. at ft. hrs. after termination of boring. Sheet of

1415

MEN04595

WILLIAMS & WORKS

ENGINEERS / SURVEYORS / PLANNERS / GEOLOGISTS
811 CASCADE WEST PARKWAY, S.E. GRAND RAPIDS, MICHIGAN 49506
TELEPHONE (616) 942-9600

SOILS DEPARTMENT

Project Location MENASHA CORP - OTSEGO Client MENASHA

Equipment & Operator W&W Project No.

Technician ELC & F.P. Date 6-26-75

Equipment Description JOHNSON MR-24 4"

Boring No. #4 Approx. Ground Elev. Mineral Well Permit No.

Boring Location 200 ± NW OF ORIGINAL LOCATION AS STAKED IN FIELD

Penetration Tests are made with a 2" dia. split spoon, 140# hammer and 30" free-fall, unless noted otherwise

Plugging Method

In accordance with the Mineral Well Act, Act No. 315 (Mich, 1969), a copy of this boring log without blow counts will be sent to the Dept. of Natural Resources, Geological Survey Division.

Boring Depth From	Boring Depth To		No. Blows last 12"	No. Blows 3rd 6"	No. Blows 2nd 6"	No. Blows 1st 6"	Depth of Test
0.0	5.0	SAND FINE TO MED - GRAVELLY BROWN					
5.0	7.0	CLAY - BROWN - VERY SANDY - MOIST					
7.0	9.0	SAND - FINE - BROWN					
9.0	10.0	GRAVEL - COARSE -					
10.0		REFUSAL - (HEAVY GRAVEL)					

Casing Used Diameter Length

W.T. at ft. hrs. after termination of boring. Sheet of

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WILLIAMS & WORKS
ENGINEERS / SURVEYORS / PLANNERS / GEOLOGISTS
GRAND RAPIDS, MICHIGAN

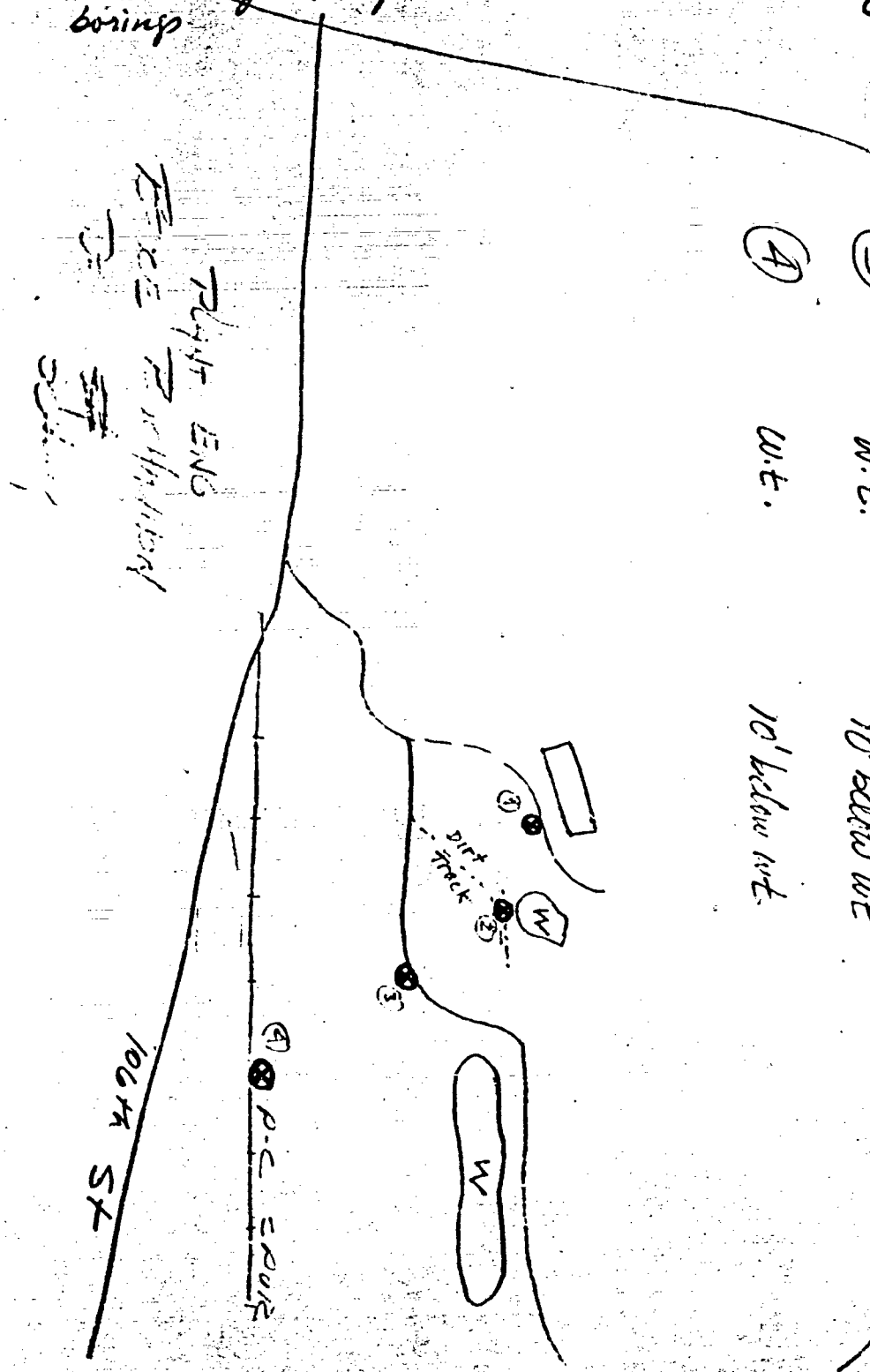
Calculation Sheet

Computed by ____ Checked by ____ | Subject ____ Client MENASHA | Sheet ____ of ____ Job No. ____ Date ____

Dr. Schenk.
This map is a little crude but identifies locations of attempted borings

Soils DEPT. COPY

MEN04596



①	W.t.	5' below wt
②	W.t.	5' below wt
③	W.t.	10' below wt
④	W.t.	10' below wt

if not under-colored and time permits go 5' deeper.

1417

MEN04597

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.

Laboratory located at
1119 South Bend Ave.
Phone 233-6820
1-214

Foundation Consultants
Testing Services

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

MEN04598

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

MEN04599

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,

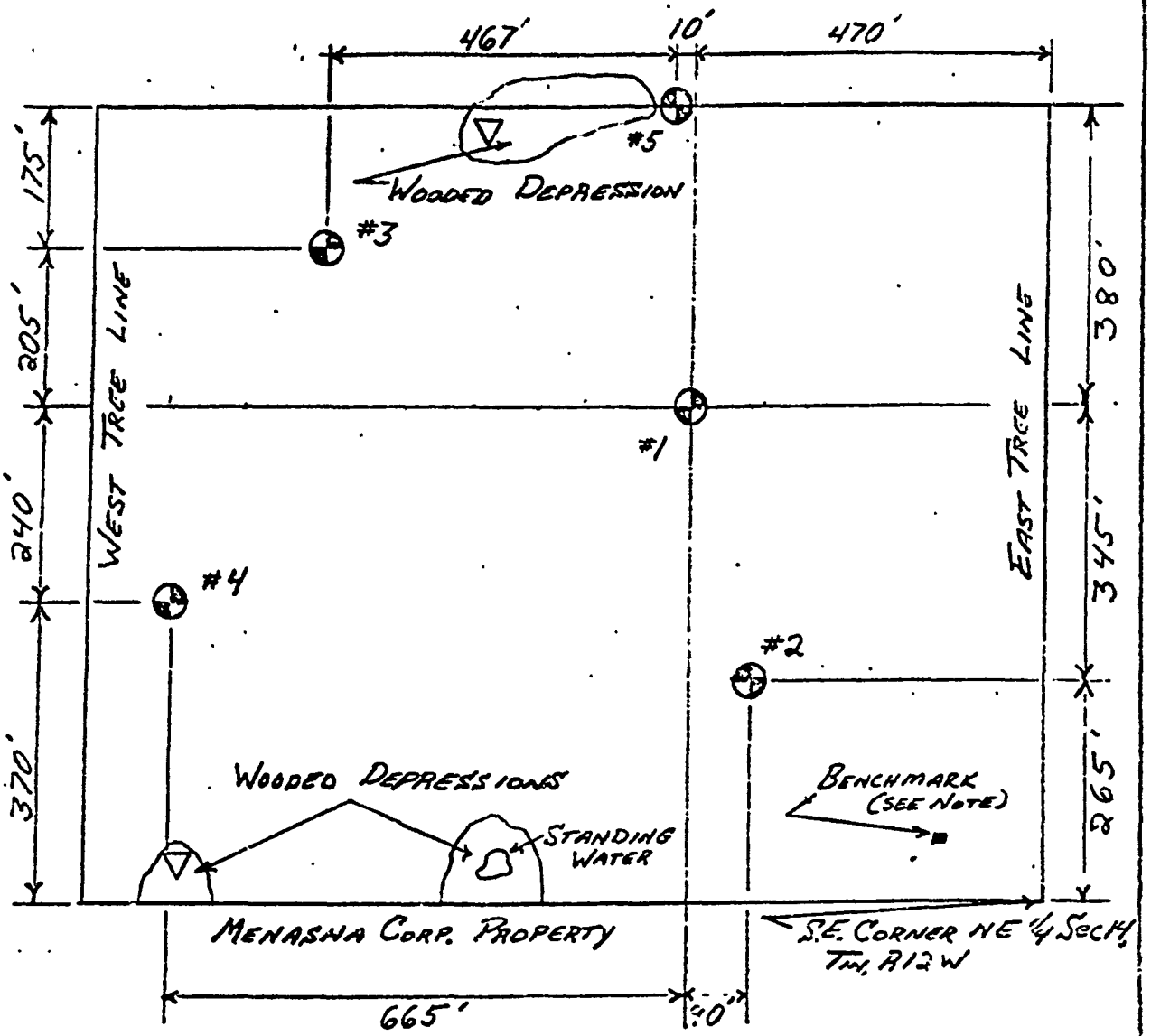
SHILTS, GRAVES & ASSOCIATES, INC.

Leroy D. Graves

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

mjr

MEN04600



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 27-118

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

SHILTS, GRAVES AND ASSOCIATES, INC.

TEST BORING LOG

Boring No. 3
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'

MEN04601

NOTES:

1435

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

SHILTS, GRAVES AND ASSOCIATES, INC.

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'

MEN04602

1434

MEN04603

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

SHILTS, GRAVES AND ASSOCIATES, INC.

TEST BORING LOG

Boring No. 4
Sheet 1 of 2
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 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.
.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:

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

SHILTS, GRAVES AND ASSOCIATES, INC.

TEST BORING LOG

Boring No. 3
Sheet 1 of 1
Job No. 77-118

PROJECT: Menashe 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: 91.2

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

At Completion: none Ft.

With Casing Removed: Ft.

After: Hours: Ft.

Soil Layer Limits From	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, INC.

TEST BORING LOG

Boring No. 2
Sheet 1 of 1
Job No. 77-118

MEN04605

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	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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MEN04606

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

SHILTS, GRAVES AND ASSOCIATES, INC.

TEST BORING LOG

Boring No. 1
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'

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NOTES:

MEN04607

[illegible] MICHIGAN

SPECIALISTS

GROUNDWATER
INSTRUMENTATION
RESEARCH

[illegible] 9, 1962

OFFICES
[illegible]
TEL. [illegible]

Mr. Joseph Cutro
Plant Engineer
Menasha Corporation
Otsego, Michigan

Dear Mr. Cutro:

Upon returning from my recent visit to your plant I have pondered further the problem, taking into account what I saw with regard to the property location, the City Well location and the like. Some modification of my plan of action has resulted.

Foremost in my mind as I considered the problem was the fact that what I saw as we travelled to the north end of the property caused me to suspect that we were climbing up on a moraine, not just an outwash terrace. Checking more closely on the glacial map I find that this suspicion is very likely to be right. This being so, we need to know the depth of the sandy cover on the upland area since it influences both the ability to have the water infiltrate the ground and also its effective transmissibility.

On a sketch map I have shown the approximate geography of the property and its relationship to the City Wells. What I propose is to drill 5 small diameter wells as the first step in the investigation. The first of these will be about 200 ft due east of the City Wells. The third would be on this same line and 200 ft west of the east property line. The second would be midway between 1 and 3.

These three wells will probably encounter much the same formation as did the City Wells and they should be screened at about the same depth as the City Wells. An ordinary well

MEN04608

[illegible] ft long is sufficient. It should be [illegible] placed in clean sand or gravel. In [illegible] formations do change as we proceed [illegible] the driller should be instructed that he should be on the look-out for any sizeable thickness of clay or sandy or gravelly clay. If he encounters such material short of 80-100 ft, he should drill into it at least 10 ft. If he finds an unbroken thickness of 10 ft of clay-bound formation he should stop. If he finds less than this thickness and then again goes into sand and gravel, he should continue until again he reaches a 10 ft thickness of clay or goes to 80-100 ft, whichever comes first. If he finds a condition of a high clay layer, the screen should be placed a few feet above the clay in clean formation. The driller should be instructed to see to it that the screen is positively "open" and the test for this is to fill the pipe with water and watch how the water level declines. If it takes more than 5-10 minutes for the water to find its original level, he should spend time "developing" the screen.

After completing the first three wells he will of course go to Nos 4 and 5 and here I would not be surprised if clay is found at shallower depth. However the same general instructions pertain here as given in the paragraph above.

Upon completion of the five wells, we want to run elevations, to any convenient datum (though if a USGS benchmark is available in the vicinity, it would be preferred) on the tops of the pipes and upon a gage in the River.

Not mentioned above is the diameter of these wells. If your driller can get the depth we require and can install screens properly, there is no need for wells larger than two-inch. I doubt whether anything smaller than 2-inch will work.

These five wells are to be used in conjunction with a program of controlled pumpage of the two City Wells. The details of this will have to be worked out with the City but in general the test will consist in pumping the wells at approximately their average pumping rate on a continuous basis for about a week and taking readings on all observation wells about twice a day. The wells would then be pumped up near their maximum capacity for about a week with the same schedule of readings in the observation wells. During this latter phase, water may have to be voided from the City Wells and it should be to the sewer, not out upon the ground anywhere near the area we are concerned about.

MEN04609

[illegible] informed concerning the findings [illegible] drilling [illegible] so that if something quite [illegible] the ordinary [illegible], I can make appropriate [illegible]. I will want to review the details of the [illegible] test involving the City wells just prior to going into such a test. I feel that with a proper sheet of instructions you and the City can carry out such a test without my help.

Upon completion of the pumping test I will analyze the results and if what I see makes me feel that we have a satisfactory answer to you question, I will then want permission to contact the Water Resources Commission to get an informal expression of their opinion whether what we have done is sufficient. If I do not think the above enables me to answer the question, then I will propose such further tests as seem necessary. As I now view the problem, such additional work would be to install a temporary pumping well near the location of TW 3 described above. This pumping well would be at least 6-inch in diameter but might be 10-inch, depending upon what our test with the City wells tells us about the rate at which we need to pump in order to get measurable drawdowns in the observation wells. It would be located about 50-100 ft from TW 3 and in so locating it, we could use the already drilled wells as observation wells for this test.

This well would have to be drilled by a contractor who is familiar with aquifer test procedures and you should get prices for drilling the well and conducting an aquifer test involving a 12-hour rest period, a 24-hour pumpage period and a 12-hour recovery period.

This deviates somewhat from the plan I originally offered but it has the advantage that we can terminate the tests if we find conditions which are extremely favorable or unfavorable. It does not provide talking with the Water Resources people prior to drilling the observation wells since these are the minimum they would probably accept anyway. I would however approach them if you so desire, prior to starting any work, to get a general expression of opinion from them.

I trust that this will permit you to get the price estimates you need and will await your further instruction.

wgk/s

William G. Kock
W. G. Kock

MEN04610

Layne Northern Company, Inc.

WATER SUPPLY CONTRACTORS

WATER WELLS · VERTICAL PUMPS · WATER TREATMENT PLANTS

Offices
LANSING MICHIGAN
MISHAWAKA INDIANA
INDIANAPOLIS INDIANA

P. O. BOX 289
401 S. DELORENZI AVE.
MISHAWAKA, INDIANA
PHONE BLACKBURN 9-5234

October 15, 1962

RW Utzinger
Muskegon

BJ Lewis
Cassopolis

Menasha Corporation
PaperBoard Division
Otsego, Michigan

Att: Mr. Joseph Cutro, Plant Engineer

Re: Testing Program for proposed liquor disposal

Newman

Dear Mr. Cutro:

Thank you for your letter of October 10th, 1962 along with a copy of Dr. Keck's suggested procedure of aquifer testing necessary to determine if your proposed disposal of pulp mill liquor will endanger the ground water supply in your area.

We believe the first phase of this program can be handled very satisfactorily by you working direct with a local driller and your own plant personnel. What is involved here is simply putting down five 2" test wells approximately 80 to 100 feet deep, and you should be able to obtain this from a local driller at a price of somewhere between $2 and $2.50 per foot. This price should include the ~~laying~~ driving of the pipe with a 3' long point in the hole. Once these are installed, it will be necessary to obtain the requested elevational data and if you do not have surveying equipment at the plant, I am fairly sure the City has it and would be pleased to run these elevations for you. The only additional item would then be to take twice daily readings on these points for a period of two weeks, and this could be done by your own plant personnel.

We would be pleased to meet with your selected driller to explain the proper procedure to him and also provide him with a supply of sample bags to take the necessary samples for analysis. We would also be happy to run analysis on any of these samples that Dr. Keck would require. Since there is nothing involved here outside of my time, which is practically worthless, there would be no charge for any of our services on this phase of the program.

The first phase of the program would therefore cost you approximatly $1250.00 for test drilling plus Dr. Keck's report, plus the time of your plant personnel to run elevations and take the required readings on the observation wells.

We doubt seriously whether or not the second phase of the program as outlined by Dr. Keck will be required, and the above described first phase should certainly provide him with all of the information necessary to make the required report. If, however, unusual or unexpected conditions are encountered, and it is

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necessary to install the producing well and run a second aquiferperformance test, we would provide the drilling machine with all necessary pumping equipment at a rate of $13.50 per hour. It would be our estimate that approximately 3 weeks time or 150 hours would be required to install a well and pump, run the required aquifer test, and then remove the well and pump. Total estimated cost for this phase would therefore be around $2,025.00 plus of course the second report from Dr. Keck.

I am planning to stop in at your plant sometime in the coming few days, and will plan on discussing this in more detail with you at that time.

Very truly yours,

LAYNE NORTHERN COMPANY, INC.

R. J. Williams

R. J. Williams

RJW:c

[illegible] & Associates, Inc.
CONSULTANTS IN GEOPHYSICS
BOX [illegible]
EAST LANSING, MICHIGAN

MEN04612

OFFICES
[illegible]
TEL. [illegible]

February 25, 1963

Mr. Joseph Cutro
Plant Engineer
Menasha Corporation
Otsego, Michigan

Groundwater Study

Dear Mr. Cutro:

We have received the map showing test hole locations and the logs of the 5 test holes drilled NE of the two City of Otsego wells.

Lacking elevations, we have made estimate of them from the USGS topographic map. Judging by the reported statics, we have not gotten the elevations very accurately. This then should be your next step. To obtain the elevations of the ground surface and the tops of the 2-inch casings for each of these test holes.

I want then that you observe the water levels in these wells over a period of time. If you can get the City to accomodate the following sort of schedule, it would be fine:

(a) Arrange to have the 2 City Wells pump for the longest sustained period they can tolerate. I assume they have storage and could arrange to pump for say 6 or 8 hours continuously, each day. This would presumably fill the storage and they could rest for a period of time. I would want you to read the water levels in the wells toward the end of a given pumpage period and again at the end of the rest period. I'd like to have this done over a period of about a week or two. Actually anything the City can do to lengthen the period of the pumpage cycle and the rest cycle would be appreciated.

(b) Along with the above should go a knowledge of how much water is pumped, at least approximately.

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MEN04613

[illegible] has a third well and it seems likely that [illegible] it to give us the desired schedule at the [illegible] of our concern.

[illegible] the more elaborate test which I outlined in my letter of October 9 but it might replace that test, if the results justify it.

As you can see from the columnar sections which I have made, the whole property is underlain with sand and gravel. There will be very little to prevent fluids spread on the ground surface from getting into the water table. Our best chance is to show that there will be a large amount of dilution.

Incidentally, there will be no need to have a perfectly continuous record of the water level readings, day by day. I'm thinking in terms of the possibility of bad weather preventing getting them. It would be good however if the pumping cycle were maintained.

If the City can't cooperate with such a schedule, then have them put the wells on as nearly a continuous pumpage basis as they can and take daily readings for a week or two.

To make the readings you'd better obtain a tape at least 125 ft long. Use carperters chalk and use the "wetted tape" method of measuring depth to water. Have your ment be careful to let the tape enter the well casing vertically to avoid error. I've seen drillers just pull the tape out horizontally to make it easier to read. We need these water levels to the nearest 0.01 ft.

If there are questions, you might want to give me a call.

Regards William G. Keck

W. G. Keck

WGK/s

PS: I'm enclosing a reprint of an article which appeared in the Water Well Journal. It is informative with regard to the generalities of the contamination problem. When you and your people have finished reading it I would appreciate its return.

1476

Client: Menasha Corp.

Job No.: P-82670 File

Code: 1

MEN04614

MEMORANDUM

TO: File, FAW

FROM: JCS

RE: Menasha Corporation: Meeting of Dr. Alan Schenck and Bruce Buchanan of Menasha Corporation, and Forrest Winchester and Jeff Sutherland of Williams & Works to discuss identification of groundwater pollution sources and study for feasibility of expansion area for irrigation

DATE: April 25, 1975

Groundwaters in the area between Hill Road and Farmer Road, north and south of 106th Street, have shown contamination with sodium lignosulfonate. This material has shown up in the form of total organic carbon values since early in 1973. In the first half of 1973, the company began biocide treatment; treatment continues today and the problem is becoming worse. In mid-1973, total organic carbon read 40 mg/l. In April, 1975, total organic carbon reads 600 mg/l. These values are from the process water wells. Process water wells No. 4, 5, 6, and 7 are contaminated with this stuff. Process well No. 3 has not shown contamination so far. Dwellings along 106th Street west of Hill Road, but not quite to the Otsego City Limits, have shown some tainted condition since 1973.

Early in 1973, the company put two liquor holding ponds into service. These are as shown on the accompanying map. Perhaps 500,000 gallons of concentrated waste materials were put into the smaller of these two ponds over a period of four months time. This would have been in the first half of 1973. Quantities of liquor were also added to the larger holding pond at that time. The liquor dumping operation was stopped in 1973 when it was realized that water is not held in the ponds but continues to seep through. Since that time, runoff has collected in these ponds but has not been observed to discharge, consequently, the stuff is leaking into the ground and perhaps leaching contaminants from within and below the pond into the water table.

The Menasha people feel that these ponds are the most likely culprit as the source for lignosulfonate contaminants. However, for a number of years sludge materials had been dumped in low spots in the upland area north of 106th Street (east half, southeast quarter, Section 14), and may be leaching still.

The problem is to put a definite identification on the source of the pollution described. Williams & Works has a monitoring well (No. 2) just west of Hill Street, approximately one-eighth mile north of 106th Street, that was pumped and

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MEN04615

the water tested in July of 1973. Our wells No. 1 and No. 3 were tested at the same time. Wells No. 1 and 3 showed no particular problem with water quality; however, well No. 2 showed 900 mg/l of alkalinity, approximately 1,700 mm conductivity, and 300 mg/l total organic carbon. It seems to me that well No. 2 might have intercepted some contaminated water. It is certainly more favorably located to receive such water than our monitoring wells No. 1 and No. 3. I suggested to Bruce that, to identify the source of pollution, we could install 4-inch holes around these ponds, using the cable tool drilling method and taking bailer samples, letting the water settle, pouring it off, and measuring the conductivity right at the Menasha Corporation. I haven't worked this out in detail with Bruce but this seems to be a fairly straightforward way to go about it, and they could save the samples and then run one of the more definite indicator materials in their good time. I'm going to work out a proposal on this.

We looked at the site that was used for irrigation for the first time in October of 1974. It looks as if the shallow soils are too tight to permit percolation. Standing water and runoff are the particular characteristics of this irrigation area. The texture of the soils is clayey with a good amount of sand as well. emarked to Bruce that, depending upon the levels of sodium in the effluent they're irrigating, aggravation of a potentially tight soil situation could occur. They are thinking of picking up additional land in Section 14, northwest of the present irrigation area. This land is the southwest quarter of the northeast quarter plus the northwest quarter of the southeast quarter, plus land west of these 40 acre parcels to Farmer Road. An additional 40 acre parcel west of Farmer Road, but within three-eighths of a mile of Farmer Road is also being considered. We do not yet have good property descriptions of this land.

Win and I measured the depth to water table in our three monitoring wells: Well No. 1 showed depth of 10.2 feet below ground. No. 2 showed depth of 1.5 feet below ground, and No. 3 showed depth 18.7 feet below ground.

Bruce Buchanan is going to send the following information:

1. Logs of the Menasha Corporation production wells No. 3, 4, 5, 6, and 7 with information as to depth of the well, soils penetrated, capacity of the wells, and water quality history.

2. Copies of analyses of any other environmental waters on the property that may have been taken from our monitoring wells No. 1, 2, or 3; or any other sources on the property.

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MEN04616

3. Descriptions of the property northwest of the existing irrigation area, to be investigated for infiltration and permeability ratings in the shallow soils, plus one or two deep borings.

JCS:ph

MEN04617

PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD / GRANGER, INDIANA 46530 / 219 272-9050

September 23, 1981

Menasha Corporation
Otsego Paperboard Mill
Farmer Street
Otsego, Michigan 49078

Attention: Mr. Ron Thaxton
Project Engineer

Dear Ron:

Re: Well #8

This will review our discussion of September 22, 1981 regarding the above subject well. This well was new in January 1978 and had a capacity of 800 GPM with specific yield of 19.5 GPFDD. By July 1981, it had fallen to 195 GPM with specific yield of 4.2 GPFDD. It was cleaned at that time and production restored to 425 GPM with 9.6 GPFDD specific capacity.

Well #8 replaced well #3 which was installed in 1962 and provided reasonable service with ordinary cleaning at proper intervals until 1978.

The question, therefore, becomes why this 3-1/2 year old well dropped in capacity so rapidly and further, why cleaning only restored it to approximately 1/2 of capacity.

You have submitted to us various water analysis and several items stand out quite noticeable as not indigenous to ground water in your area and not present when analysis was conducted on the well water in February of 1979.

The most notable is suspended solids of 3,860 ppm and sulfates of 80 ppm. There is also a report indicating gallionella which is a sulfur reducing bacteria similar to the iron reducing bacteria crenothrix. Finally, there are some trace amounts of lead and chrome.

All of the above indicate the introduction of contaminates and the most logical source would be the white water ponds up-stream of the well. These have cement walls and open bottoms.

Several items must be considered in conjunction with this apparent leachate introduction into the ground water supply. First, if well #8 were to be abandoned, you run the high risk of having the leachate migrate or become

MEN04618

induced into other wells on the property. Secondly, there is the possibility of leachate migration down the Kalamazoo alluvium onto neighbor's property.

It would be our recommendation that well #8 be kept in service as an interceptor well against these two possibilities even though it is quite apparent that it will be expensive to maintain. This expense will consist primarily of cleaning on at least an annual basis and perhaps some chemical injection through 2" injection wells. The latter technique will be examined more thoroughly after we have experimented with some special cleaning chemicals suited to the foreign matter which we now know to exist in the aquifer.

At this time, we would like to recommend that weekly specific capacity readings be taken on the well to determine how rapidly it will deteriorate after the July 1981 cleaning and then after approximately two month's time, we would appreciate the opportunity of meeting with you to discuss the problem in more detail. In the meantime, we will be investigating possible special chemicals and cleaning techniques for this particular well.

Very truly yours,

PEERLESS-MIDWEST, INC.

Bob Williams

R. J. Williams

RJW:nls

MEN04619

PEERLESS-MIDWEST, INC. *Water Supply Contractors*
51255 BITTERSWEET ROAD / GRANGER, INDIANA 46530 / 219 272-9050

May 13, 1974

Mr. Ron Thaxton
Menasha Corporation
Otsego, Michigan 49078

Dear Mr. Thaxton:

Enclosed with this letter you will find the Well and Pump Inspection Reports on your five (5) wells and pumps that we tested and serviced.

Well #3 has fallen off in specific capacity to about half of what it was when new and should be chemically cleaned and treated for iron bacteria. The pump was last pulled and overhauled in 1966 and should be pulled and the wearing parts replaced. The motor on this pump is leaking oil and should also be serviced at the time the pump is pulled and overhauled.

Well #4 had an original specific capacity of 21.7 and now has 17.5. We would recommend at least two to three days cleaning and treating for iron bacteria. This pump was installed in 1968 and has never been pulled for overhaul and we recommend that it be pulled and overhauled also.

Well #5 has fallen off in specific capacity from 11.6 to 8.4 and should be cleaned and treated for iron bacteria. The pump in this well is functioning properly so there is no need for work on it.

Wells #6 and #7 are functioning properly, however, there is a need for an airline to be installed in well #6 and when the above maintenance work is completed we will install an airline so that future testing will be correct. Also the well in the boiler room should be serviced. At the time we were there it was in use and we were unable to service it.

We certainly appreciate very much the opportunity of submitting this set of inspection sheets to you and to review, recommend that wells #3, #4 and #5 be cleaned and treated for iron bacteria. The pumps from wells #3 and #4 be pulled and overhauled and an airline installed in well #6. Due to the iron bacteria problem that you have in your area, it is critical to the life of the wells that they be treated properly and with the proper chemicals. If you have any questions, we will be more than glad to discuss this with you at your convenience.

Also enclosed is the invoice for the tests on the wells and pumps.

Very truly yours,

PEERLESS-MIDWEST, INC.

T. Chidister

T. Chidister

1991

Enc.

MEN04620

Bruce Buchanan

PEERLESS-MIDWEST, INC. *Water Supply Contractors*
51235 BITTERSWEET ROAD / GRANGER, INDIANA 46530 / 219 272-9050

June 24, 1975

Mr. Ron Thaxton
Menasha Corporation
Paperboard Division
Otsego, Michigan 49078

Dear Mr. Thaxton:

Enclosed with this letter you will find our invoice for the testing and servicing of five (5) of your wells and pumps and the replacement of one set of gland bolts on the #7 pump. We did not test and service the #2 pump as this was completed in 1974 and at that time we recommended that the well be chemically cleaned and the pump pulled and overhauled. This pump does have solid piping above it that would have to be removed before any work could be done on the pump. As we understand it you may care to have this pump serviced and the well cleaned this year but due to the knowledge of the work needed it was not completed this time.

Well #3, as you know, we just pulled the pump, replaced the defective column, re-installed the pump and a copper airline that will not break but due to the emergency of getting this pump back on the line we did not run a test on the well and pump. When we come up to complete some of the maintenance work that we are going to recommend we will test this wall at that time.

Well #4 has a specific capacity very near to what it was when cleaned in 1974, so we recommend no cleaning work on it. The pump is producing near enough to its rated capacity that it is in good shape, so we recommend no work on the pump.

Well #5 is near enough to what it was when cleaned in 1974 that we recommend no work on it. The pump has never been pulled and overhauled since it was installed in 1970, so we recommend that the pump be pulled and the wearing parts replaced.

The #6 well has fallen off in capacity and should be cleaned and treated for iron bacteria. The pump is producing near enough to its rated capacity that we recommend no work on it. We noticed that you are feeding something down this well and we are wondering what this was?

Well #7 has fallen off in capacity and should be treated for iron bacteria and cleaned. The pump has fallen off some in total dynamic head but we anticipate that this is build up in the bowl assembly and when the well is cleaned this no doubt will be corrected. There is a pipe broken off that you normally grease the pump through and this should be replaced the next time we are in your area so that in the future the pump can be greased.

To review, we recommend that the #2 well be cleaned and the pump pulled and overhauled, the #5 pump be pulled and overhauled and the #6 and #7 wells be treated and cleaned.

We certainly appreciate very much the opportunity of completing these tests for you and will be anxiously awaiting your decision on the maintenance work recommended.

Very truly yours,

J. T. Chidister

J. T. Chidister
Enc.

1997

Bruce Buchanan

MEN04621

PEERLESS-MIDWEST, INC. Water Supply Contractors
51255 BITTERSWEET ROAD / GRANGER, INDIANA 46530 / 219 272-9050

November 3, 1978

Manasha Corporation
Otsego, Michigan 49078

Attention: Mr. Ron Thaxton
Assistant Engineer

Dear Mr. Thaxton:

Confirming our phone discussion on the cost of reconditioning well #3 versus the cost of a new well.

It is our feeling that as far as dollars invested you would have approximately the same amount invested in trying to recondition #3 well versus the installation of a new well. In order to try and recondition your present #3 well we would have to remove the pump completely, break out the concrete foundation around the casing in order to open up to the original 26" diameter, remove the 3" filler pipe that is installed in this casing, break out the concrete seal between the casing and the present blank installed on the screen, lower our tools into the screen and sandlock to the screens so we could pull this out. We would have to order a special 12" screen with a bail-in fitting and a cone attached to the screen to go from the 12" diameter to approximately 24-1/2" O.D. and bail the screen into the well. This is not an easy job to do even though it can be done. One of the main problems when the work is completed is that there is no way we can remove the present formation outside of the screen area in order to get clean material into this area. As you are well aware, the formation is partially plugged in this area and this is the reason that we have had considerable problems in trying to clean and treat the area in order to produce a larger capacity from this well. Therefore, you would still not have an efficient well, however, you would have approximately the same investment that you would in drilling a new well.

You also asked a question as to what guarantee we could give on the quality of the water if we moved over and installed a new well. There is no way that we could really guarantee that the quality of the water would be the same. You could install a 2" diameter test well and run a small test to obtain samples of the water but this would not be of any assistance. You could install a 6" or even an 8" and pump this well to obtain a good sample of water but still we don't feel that this would really give you the answer as to the quality of water. If you install a new well you are going for maximum capacity from the new well that you can obtain. When you start pumping a large capacity from the well your cone of depression extends farther out into the well field. There is no way of installing a smaller well and pumping a low capacity that is going to extend the cone out into the area you would be pumping at a larger capacity. If in fact you install a new well and start pumping at the maximum capacity and the quality of water should change, the only recommendation we could give you would be to throttle the pump back to reduce the capacity thereby reducing the cone of depression until you obtain the quality of water that is suitable for your use.

MEN04622

Menasha Corporation
Otsego, Michigan 49078
Attention: Mr. Ron Thornton
Assistant Engineer

November 3, 1978

We hope that the above has answered your questions that you had pertaining to the installation of a new well versus reconditioning of the present well. As we mentioned to you on the phone, we will be more than happy to come up to a meeting and go over this with you if you will advise us the date and time if you desire us to be present, we will adjust our schedule accordingly and go over the entire project with you.

Very truly yours,

PEERLESS-MIDWEST, INC.

Don Huber

Don Huber

DH/1

2004

MEN04623

PEERLESS-MIDWEST, INC. *Water Supply Contractors*
51255 BITTERSWEET ROAD / P. O. BOX 26 / GRANGER, INDIANA 46530 / 219 272-9050

March 9, 1962

Menasha Corporation
320 North Farmer Street
Otsego, Michigan 49078

Attention: Mr. Ron Thaxton

Dear Mr. Thaxton:

Enclosed, please find our invoice covering the tests and service on wells #4, 5, 6, 7 and 8 as covered on your Purchase Order #26809. Also enclosed, are your copies of the Well and Pump Inspection Reports.

The specific capacity on well #4 has dropped from 12.1, when last cleaned in 1980, to 9.2 and we recommend that this well be chemically cleaned and treated for iron bacteria. We would estimate the labor and material required to properly do this job to take approximately $4,000.00 to $4,500.00. The pump is maintaining its overall efficiency and we do not recommend any work be considered on this unit.

Well #5 has dropped from 9.0 on specific capacity, since last cleaned in 1980, to 6.5. Also, the pump has dropped considerably on overall efficiency. We recommend that this well be chemically cleaned and treated for iron bacteria and it is our feeling that this drop in efficiency on the pump is due to plugging with iron. When chemically cleaning the well, this should alleviate that problem. We would estimate the cost on chemically cleaning and treating this well to run between $4,000.00 to $4,500.00.

Well #6's specific capacity has also lowered since cleaning in 1981 and we recommend treating this well for iron bacteria only. The pump is maintaining its overall efficiency. We would estimate the cost of treating for iron bacteria to run between $2,500.00 to $3,000.00.

Well #7 we recommend be treated for iron bacteria only. Again, we estimate the cost of this to be in the neighborhood of $2,500.00 to $3,000.00. The air line installed in this well is not functioning and we could not get it out in order to replace it. At the time we are treating for iron bacteria, we recommend that a new air line be installed in this installation. The pump has not been serviced for five years and we do have a report that it does have a bad vibration. We recommend the pump be removed, serviced, and would estimate the cost on this to run between $3,500.00 to $4,000.00.

Well #8 we recommend be chemically cleaned and treated. This was covered by letter of Mr. Bob Williams to Menasha on November 24, 1981.

MEN04624

It certainly was our pleasure to have conducted the tests and service on your installations and if you should have any questions on the above, please advise.

Very truly yours,

PEERLESS-MIDWEST, INC.

Don Huber

Don Huber

DH:nls

Enclosures

Ken
given me 2 copies

MEN04625

STATE OF MICHIGAN

NATURAL RESOURCES COMMISSION
RY H. WHITELEY
airman
CARL T. JOHNSON
E. M. LAITALA
ROBERT C. McLAUGHLIN
AUGUST SCHOLLE

ROBERT J. FURLONG
Secretary to the Commission

GEORGE ROMNEY, Governor

DEPARTMENT OF NATURAL RESOURCES

STEVENS T. MASON BUILDING, LANSING, MICHIGAN 48926

RALPH A. MAC MULLAN, Director

WATER RESOURCES COMMISSION
JOHN E. VOGT
Chairman
STANLEY QUACKENBUSH
Vice Chairman
GERALD E. EDDY
JOHN P. WOODFORD
LYNN F. BALDWIN
JIM GILMORE
GEORGE F. LIDDLE

4056 Plainfield, N. E.
Grand Rapids, Michigan 49505

January 22, 1969

Menasha Corporation
Paper Board Division
Otsego, Michigan

Attention: Mr. Ken Lowe

Dear Ken:

In our meeting with you and Joe Cutro in December, I believe we left a copy of our September survey which had not been sent to your company. However, I am now enclosing a revised copy of that survey for your files.

Very truly yours,

WATER RESOURCES COMMISSION

Chester Harvey

Chester Harvey
District Engineer

CH:as

Enclosure

MICHIGAN
THE GREAT LAKE STATE

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MEN04626

MICHIGAN WATER RESOURCES COMMISSION

Wastewater Survey
Menasha Corporation - Paperboard Division
Otsego, Michigan

September 11 to 13, 1968

A 43 hour wastewater survey was conducted at the Menasha Corporation in Otsego, Michigan to determine the quantity and quality of waste waters being discharged by this plant to the Kalamazoo River and to provide the Comprehensive Study Unit with waste loads from this plant during their Kalamazoo River survey. The results of this survey are to be compared with the restrictions of the Final Order of Determination dated October 24, 1951 and the restrictions agreed upon in a stipulated agreement negotiated in 1951.

Plant Processes and Waste Sources

The Menasha Corporation is engaged in the manufacturing of corrugating medium from hardwoods. The wood chips are reduced to useable fibers using the semi-chemical neutral sulfite process. After cooking, the black liquor is squeezed from the pulp and sent to an evaporator to reduce the volume and moisture content. The evaporator is capable of complete destruction of the black liquor by complete combustion. Normally the excess concentrated black liquor is stored in a holding pond or tank and used as a road binder in the area. At certain times under controlled conditions a portion of the concentrated black liquor can be released to the Kalamazoo River. Since the stock is not washed, the white water becomes contaminated with black liquor. The excess white water from the paper machine is collected in a storage chest, and used as make-up water in the plant. A portion of the white water is routed through a save-all to reclaim the fiber with the clear water being used as make-up water on the paper machine. The excess water from the save-all is discharged to a holding pond adjacent to the building. All floor washing, machine clean up, and spill clean up is accomplished with white water from the save-all. Also, all the floor drains throughout the plant go to the holding pond. The waste from the pond enters a box equipped with a 24 inch rectangular weir which is used for measurement purposes by the company. The waste is then released from the box to the center of the Kalamazoo River via a submerged pipe. This weir is referred to as weir #2 in this report.

A second source of waste water, which is released directly to the Kalamazoo River, is the sealwater from the vacuum pumps. This water by-passes the holding ponds and is discharged to a box containing a 24 inch rectangular weir and then to the center of the river via a submerged pipe. The weir, which is used by the company for flow measurement purposes, will be called weir #1 in this report.

Survey Results

Table 1 Survey periods, flows, and production

	Survey period From		To			Flow
Weir #1	0900	11 Sept.	0900	12 Sept. 1988	(1st 24)	0.25 mgd
	0930	12 Sept.	0930	13 Sept. 1988	(2nd 24)	0.2[illegible] mgd
Weir #2	0845	11 Sept.	0845	12 Sept. 1988	(1st 24)	0.13 mgd
	0915	12 Sept.	0915	13 Sept. 1988	(2nd 24)	0.13 mgd

Total plant production was 212.4 tons during the first 24-hour period and 202.4 tons during the second 24-hour period.

MEN04628

1.67% 1.87%

Table 2. Concentration and Lbs/day of waste constituents discharged to the Kalamazoo River by Benasha Corporation, Otsego

Parameter	First 24 hours Weir #1 Conc.*	Weir #1 Lbs/day**	Weir #2 Conc.	Weir #2 Lbs/day	Second 24 hours Weir #1 Conc.	Weir #1 Lbs/day	Weir #2 Conc.	Weir #2 Lbs/day
Five-day BOD	290	605	5,800	6,287	410	821	6,500	7,046
Total solids	1,444	3,011	16,600	17,994	1,709	3,423	18,700	20,271
Total vol. solids	764	1,593	9,290	10,070	1,076	2,154	13,200	14,309
Suspended solids	134	279	488	529	44	88	480	520
Suspended vol. solids	134	279	452	490	44	88	450	488
COD	1,120	2,335	17,000	18,428	1,600	3,203	20,000	21,680
Settleable solids	116	242	0.0	0.0	------	------	------	------
SO_4	150	313	900	976	150	300	1,100	1,192
NO_3-N	0.0	0.0	------	------	------	------	------	------
NH_3-N	0.0	0.0	0.0	0.0	------	------	------	------
Org. N-N	3.8	7.9	54	58.5	------	------	------	------
Sol. ortho PO_4-P	0.0	0.0	0.0	0.0	------	------	------	------
Total PO_4-P	0.3	0.6	7.5	8.1	0.35	0.7	5.0	5.4
phenols	6.5	13.6	59	63.96	6.4	12.8	60	65.04
pH	7.8		7.0		7.0		6.7	

* All concentrations except pH are expressed as mg/l

** Lbs/day were computed using the following formula: Lbs/day = Flow(mgd) x conc.(mg/l) x unit wt. of water (8.34 lbs/gals

Note: Phenol analyses was based on a 250 ml sample collected at the end of each survey period.

MEN04629

Table 3. Total waste loads in lbs/day discharged to the Kalamazoo River per ton of paper produced.

Parameter	First 24 hours Total lbs/day	Lbs/day/ton	Second 24 hours Total lbs/day	Lbs/day ton
Five-day BOD	6,892	32.5	7,867	38.9
Total solids	21,005	98.99	23,674	116.97
Suspended solids	808	3.81	608	3.0
Suspended volatile solids	769	3.62	576	2.85
Settleable solids	242	1.14	-------	-------
COD	20,763	97.8	24,883	112.9
SO_4	1,289	6.07	1,492	7.37
phenols	77.56	0.37	67.84	0.34

Survey Procedure

The 48 hour survey was conducted in two 24 hour segments referred to as first 24 and second 24 respectively. Each of the 24 inch rectangular weirs in the effluent boxes were equipped with an automatic sampler and a Stevens Type F water level recorder. The automatic sampler took samples proportional to the instantaneous flow every fifteen minutes, and composited these samples in a clean glass container. These composites samples were then transported to the Water Resources Commission laboratory in Lansing for analysis. The water level recorder furnished a continuous record of the liquid head flowing over the weir crest from which the total flow during the survey period was calculated.

Discussion

According to the conditions of the Final Order of Determination of 1951 and the stipulation of the 1961 agreement, the company is limited to a five-day BOD discharge of 7,375 pounds per day, and a maximum suspended solids discharge of 10 pounds of solids per ton of paper produced. These restrictions would limit the suspended solids discharge to 2,122 lbs. during the first survey period; and 2,024 lbs., during the second. During the two survey periods, the company discharged 808 and 608 pounds of suspended solids respectively, and were hence within the restrictions placed upon them. There was 6,892 pounds of BOD discharged during the first period; and 7,867 unds, during the second period. This means that they were 583 pounds under the "striction during the first 24 hours, but were over by 492 pounds during the second survey period. Although the company exceeds the stipulation in this one aspect, there has been improvement since the September 1967 survey in which it was determined that the company was discharging about double the allowable load of both solids and BOD.

In addition to the above, it should be noted that the discharges from this plant are a very dark brown color, which discolors the river downstream for about 150 yards. The quantity of COD and phenols discharged is also high, and the suspended solids discharged from weir #1 are about 87% settleable. The suspended solids from weir #1 are 100% volatile, and those from weir #2 were about 93% volatile. The average temperatures of the discharges were 43 degrees centigrade from weir #1, and 35.5 degrees centigrade from weir #2.

Survey by:	R. Schrameck, Sanitary Engineer L. Vahovick, Water Pollution Investigator
Analyses by:	R. Krueger, Chemist
Management contact:	K. Lowe
Report by:	Roy Schrameck, Sanitary Engineer Water Quality Appraisal Unit MICHIGAN WATER RESOURCES COMMISSION Department of Conservation

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10/1/68

MEN04631

MEMO

PAPERBOARD DIVISION

MENASHA CORPORATION

TO: Dave Merkel

FROM: Keith Kling KBK

DATE: August 7, 1996

SUBJECT: Transformer Testing

Over the last year we have been auditing our electrical systems to confirm our belief that this mill no longer has any PCB containing equipment. Testing was recently completed on the final six of 41 in-use transformers. Four of the six tested positive for PCBs with three of them being above the 50 ppm level requiring an inspection program. The three regulated units are in the chipyard on a platform. They are surrounded by wood chips and fines on an asphalt surface. I have discussed the units with Bob Gulbranson and due to their age they have been scheduled for replacement in 1997. My initial thought was to change the oil in order to drop the PCB content to a non-regulated level, however due to their design, Bob said that would not be practical. Given this fact, I believe the following steps should be taken:

- Put appropriate PCB labels on the three regulated transformers.
- Conduct a monthly inspection of each unit containing PCBs. This will include the one with 19 ppm and the one recently removed from the digester, which contains 17 ppm.
- Budget capital money to replace at least the four PCB containing units and do so as soon as 19967 spring weather allows.
- Budget money to dispose of all units through Aptus, Inc. at their incinerator.
- Schedule on Groupwise to write a 1996 and a 1997 Annual PCB Report.

A copy of the report and test results by Dynex is attached for your review. Let me know if you have any questions or comments.

c: Jeff Volker
Bob Gulbranson
Jim Szaroletta
Luke Arendash
Al Coleman
Ron VanNoord
Pete DeRossi

MEN04632

DYNEX

DYNEX Industries, Inc.
23460 Industrial Park Drive • Farmington Hills, MI 48335 • (810) 477-6066
FAX (810) 477-6069

August 5, 1996

Mr. Ron Vannord
Menasha Corporation
Box 155
Otsego, MI 49078

Dear Mr. Vannord:

Please find below the PCB test results for the samples we took on June 11th, 1996, under DYNEX Job #Z-51527. The samples were taken from six (6) mineral oil filled transformers located at your facility.

Analysis was performed in accordance to EPA approved methodologies. The detection limit for PCBs is 2 parts per million (ppm).

PCB Classification

0 - 49	Non-PCB
50 - 499	PCB Contaminated
500 and over	Contains PCBs
N/D	Non Detectable

Sample Number	Manufacturer	KVA	Serial NO.	Gallons	Substation Location	PCB ppm
1	Pennsylvania	100	25236-1	57	Sub #12	ND
2	Pennsylvania	100	25236-2	57	Sub #12	<2
3	Pennsylvania	100	25236-3	57	Sub #12	19
4	General Electric	100	3973446		Sub #13	158
5	General Electric	100	3973618		Sub #13	177
6	General Electric	100	2972875		Sub #13	155

We appreciate this opportunity to be of service to you, and we hope we can be of service to you again in the future.

Sincerely,
DYNEX Industries Inc.

Ron Cuthbert
Project Manager

RC/pm

CC: Keith Kling

enclosure

MEN04633

Physical, Chemical and Biological Monitoring Results From the Kalamazoo River, Comstock to Plainwell 1984

by
John D. Suppnick and William Creal
Michigan Department of Natural Resources
Environmental Protection Bureau
Surface Water Quality Division
February, 1986

7554

MEN04634

DISSOLVED OXYGEN IMPACTS OF HYDROPOWER DAM RESTORATION AT PLAINWELL, OTSEGO AND TROWBRIDGE DAMS ON THE KALAMAZOO RIVER

By

John D. Suppnick
Michigan Department of Natural Resources
Environmental Protection Bureau
Surface Water Quality Division
February 13, 1984

7629

MEN04635

MICHIGAN ENVIRONMENTAL PROTECTION REPORT

Kalamazoo River PCB Project
Feasibility Study of Alternatives

March, 1986

Contact: William Creal
Department of Natural Resources
Surface Water Quality Division
P. O. Box 30028
Lansing, Michigan 48909
517/373-2867

The Michigan Department of Natural Resources has completed a Feasibility Study under Act 307, the Michigan Environmental Response Act, on the Kalamazoo River and Portage Creek. The objective was to determine cost-effective, technically feasible and environmentally sound alternatives to minimize the release of Polychlorinated Biphenyl (PCB) contaminated sediment, reduce human exposure to PCBs, and, as a minimum, to reduce PCB concentrations in fish to less than 2 mg/kg. The relative environmental effectiveness of the proposed alternatives was evaluated through the use of a mathematically-based water quality model.

Based on results of the model and preliminary cost estimates for the alternatives, the following recommendations were made to the Department by NUS, its technical contractors:

1. Some remedial action should be taken at Portage Creek/ Bryant Mill Pond. The primary focus of this action should be to contain and/or isolate the PCB contaminated sediments from the river system. This will have the greatest effect in reducing human exposure to PCBs via fish tissue.

2. The practice of periodically drawing down Allegan City Dam should be discontinued since an uncontrolled release of PCBs to Lake Allegan and downstream reaches results.

3. The removal of the remnant dam structures at the Plainwell, Otsego and Trowbridge Dams is a low priority recommendation. This action would have beneficial environmental effects since the exposed sediments above the river banks would be further isolated from the river.

Department of Natural Resources
Environmental Protection Bureau
Box 30028
Lansing, Michigan 48909

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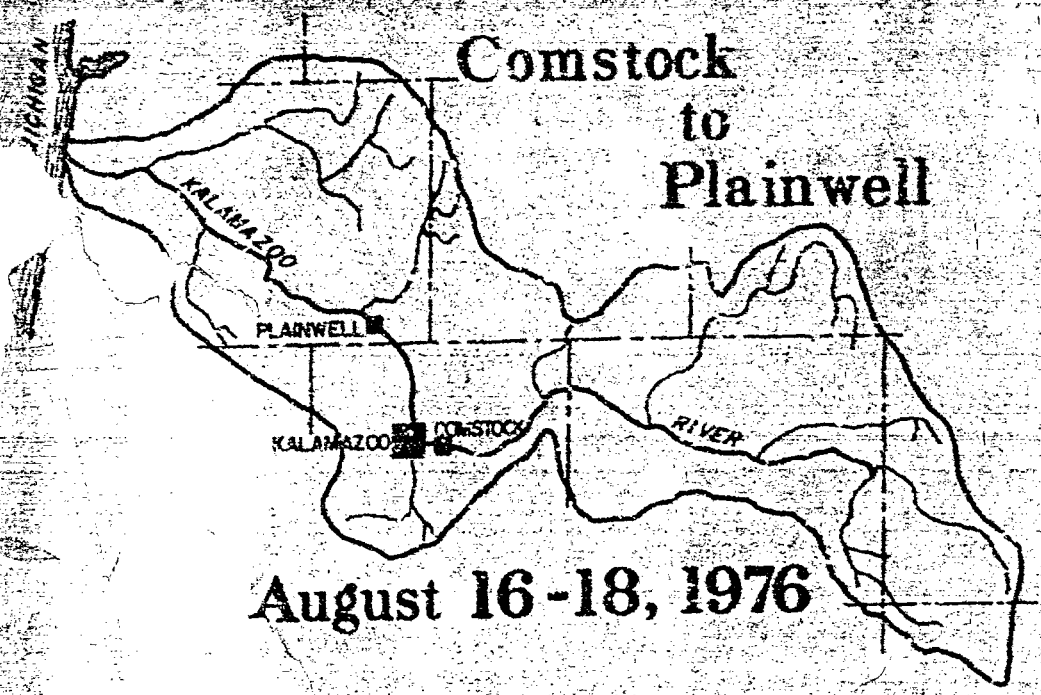
MEN04636

KALAMAZOO RIVER STUDY



Comstock to Plainwell

August 16-18, 1976

State of Michigan
Department of Natural Resources
Environmental Services Division
April 1978

7666