Gray, Jane K - DNR

From: Mark Nelson <mnelson@enviroanalyticsgroup.com>
Sent: Wednesday, July 9, 2025 10:39 AM
To: Gray, Jane K - DNR; Thompson, Matthew A - DNR
Cc: Russ Becker
Subject: Former Wauleco Site-Rosecrans Properties
Attachments: 1985.SNE SIR.Rosecrans.pdf; 1987 Keystone 1987 Sampling of Wisconsin River.pdf; 2025.07.09.Rosecrans Sed. Response.pdf

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Jane-
Good morning, hope your week is going well. I am finally getting all caught up with addressing the WDNR request for additional sediment and surface water sampling in the Wisconsin River to evaluate the effects of the current groundwater plume at the former Wauleco site. Rosecrans properties does not concur that additional sampling of the sediment or surface water is necessary. Rosecrans believes the sampling results previously submitted, the reduction of dissolved concentrations in groundwater and reduction of the impacts in the source area are sufficient to show that the current groundwater plume does not pose a significant risk to the sediment and surface water quality of the Wisconsin river. Attached is an informal letter report summarizing the data and the position of Rosecrans Properties, LLC along with two sources that may not be readily available in your files. I look forward to further discussions regarding the site and reasonable path to closure. Please do not hesitate to contact me if you have any questions regarding the attached report.

Regards,

Mark

Mark Nelson
Senior Project Manager
EnviroAnalytics Group
mnelson@enviroanalyticsgroup.com
651.261.6540 Mobile

Rosecrans Properties, LLC

July 9, 2025

Transmitted via email

Rosecrans Properties, LLC
1515 Des Peres Road STE 300
St. Louis, Missouri 63131

Ms. Jane Gray
Wisconsin Department of Natural Resources
Remediation and Redevelopment
1701 N 4th Street
Superior, WI 54880

Re: Sediment and surface water sampling request
Former Wauleco Site
BRRTS # 02-37-000006

Dear Ms. Grey:

The following is the response of Rosecrans Properties regarding the request to complete additional surface water and sediment sampling within the Wisconsin River. This request came verbally during our conference call on May 8, 2025 in a follow-up e-mail received on May 8, 2025.

The WDNR has requested that Rosecrans Properties, LLC (Rosecrans) prepare a site investigation workplan (SIWP) per Wisconsin Administrative Code NR 716.09 to assess "the potential current sediment and surface water impacts to the Wisconsin River from the groundwater contamination plume." Our understanding is that the Wisconsin River is the remaining potential receptor of impacted groundwater from the former SNE Enterprises of Wausau (SNE) facility.

Rosecrans does not concur that sediment or surface water sampling will provide data that would alter the current site conceptual model or the site remedial approach. The data that supports our position has been submitted to the WDNR in previous reports and was summarized in the presentation provided for the meeting held between TRC, Rosecrans and the WDNR on May 8, 2025. The data includes the following:

- Significant reduction in source area impacts where the amount of NAPL from the release has declined to residual concentrations with only trace amounts of NAPL measured in a limited number of wells located on site. No NAPL is measured in off-site wells.

  Further, the concentration of pentachlorophenol found in the NAPL has declined 99%, from an initial, assumed concentration of 5% to a range of 0.05% to 0.96% in 2018.

This data was provided to the WDNR in a report titled Technical Memorandum Residual Phase LNAPL Investigation dated December 2019.

- Evaluation of the dissolved PCP concentrations along several flow paths between the site and downgradient monitoring wells. This evaluation supported conclusions that the dissolved PCP is being mineralized through microbial activity that is both aerobic and anerobic and that the attenuation occurs and will continue to occur under both pumping and non-pumping conditions.

  This data was provided to the WDNR in a report titled Technical Memorandum Lines of Evidence of PCP Degradation dated August 2020.

  It is noted that the WDNR did not initially concur with the conclusion that the attenuation of the PCP was attenuating through microbial mediated degradation. In response Wauleco proposed and completed a Microbial Insights Biotrap study to definitively prove that biodegradation of PCP does occur. The results of this study confirmed microbial mediated PCP degradation was occurring through both aerobic and anerobic metabolism by naturally occurring bacteria in the aquifer.

  This data was provided to the WDNR in a report titled Technical Memorandum Bio-Trap Study Results Regarding PCP Degradation, dated January 2022.

- Data from the 2024 Annual Monitoring report confirms attenuation of the dissolved PCP plume between monitoring wells located within the source area compared with wells installed near the Wisconsin River. The highest dissolved PCP concentration measured in the source area was 3200 ug/L at W40R in July of 2024. On the same date, the wells down and side gradient from W40R had significantly less dissolved PCP. These wells included W26R at 8.4 ug/L, W11 at 41 ug/L, W29R at 74 ug/L and W32 at <3 ug/L. The distances between W40R and W26R, W11, W29 and W32 is 329-ft, 413-ft, 674-ft, 1,427-ft respectively.

- In 2014 Wauleco's consultant completed an In-Stream Waste Concentration (IWC) calculation to evaluate the potential for the groundwater plume to adversely affect the water quality of the Wisconsin River. At the time this calculation was completed a plume width with concentrations 50 ug/L and above was used to establish the seep rate of the impacted water into the river. The width in 2014 was approximately 1,000 feet. The seepage rate was calculated using site specific parameters under **non-pumping conditions** and calculated to equal 0.034 cfs over 1000 ft of river bank. This corresponds to a flow rate of 0.0153 gallons per minute per foot or 15.3 gpm over the entire 1,000 foot river bank.

  As calculated using a conservative stream flow of 106.25 cfs for the river channel directly adjacent to the bank where the seepage would occur the ICW is 0.032% with a Qs (stream flow) to Qe (seepage flow) ratio of 3,126:1. In e-mail correspondence between Kari Fleming and Lisa Gutknecht, both with the WDNR, dated August 13, 2014 the following was confirmed:

- The calculation was more conservative than necessary and her calculation of the Qe:Qs ratio is 12,500:1.
- The risk of exceeding acute or chronic toxicity in the river is extremely low.

In an e-mail between the same parties dated October 7, 2014 Ms. Fleming states "Does your program need anything more from us in order to close out this remediation site? Or is our opinion that there is no **reasonable potential for surface water quality standard exceedances enough?"**

In an e-mail sent on November 03, 2014 between Kari Fleming (WDNR) and Bruce Iverson (TRC) with Lisa Gutknecht (WDNR) copied, Kari says "It is our opinion that NR 105 criteria (both acute and chronic) are not likely to be exceeded therefor no WPDES permit **or NR 105-based limits are necessary**."

These e-mails strongly suggest that the seeps into the river from the impacted groundwater plume was not of sufficient volume to have a significant effect on the river even with the dissolved concentrations found in groundwater in 2014.

- Since 2014, when the above analysis was completed, the dissolved PCP concentration in the groundwater has had significant attenuation due to source removal and biodegradation. The table below presents the concentration of PCP in the monitoring wells closest to the Wisconsin River in 2014 and 2024.

Monitor Well	2014 PCP Conc. (ug/L)	2024 PCP Conc. (ug/L)	Decline (%)
W09	<3.0	<3.0	-
W10A	3400	45	98.6%
W10B	87	4	95.2%
W18	2.6	<3.0	-
W28	NA	<3.0	-
W29(R)	1800	74	95.9%
W32	<3.0	<3.0	-
DFOM11	4200	350	90.9%

As shown, the PCP concentration in groundwater has declined between 91% and 99% in 4 of 8 wells. The only wells that did not show a decline were those that were already exhibited low or non-detectable concentrations in 2014 AND 2024. The resulting reduction in mass of dissolved PCP that could potentially enter the river has been reduced by 99% since 2014.

In 2014 the width of the plume that may have been entering the Wisconsin River that had a dissolved PCP concentration that exceeded 50 ug/L was approximately 1,000 feet wide, the plume width that exceeded 1,000 ug/L was 800 feet and the width of the plume that exceeded 3,000 ug/L was approximately 100 ft. From similar data taken from the 2024 annual report, a very conservative estimate of the width of the plume that could potentially exceed 50 ug/L but less than 74 ug/L was approximately 500-ft. Analysis of this same source indicates that there are no open iso-concentration lines that suggest that concentrations above 74 ug/L are entering the river. This strongly suggests that the volume of water impacted with PCP is now at least half of the volume calculated in 2014, or 7.65 gpm corresponding to 0.017 cfs. More significantly, the mass of PCP in the groundwater entering the river has been reduced by approximately 99%. These data strongly support a current position that substantially less mass of any of the constituents contained within the groundwater plume are entering the river currently as compared to 2014.

- The sediments of the Wisconsin River were sampled twice early in the investigation, with one sampling event completed in June of 1986 and a second event completed in May 1987. The results from these samples is summarized in the Keystone Report titled Sampling the Wisconsin River, dated July 23, 1987. (attached) During the initial sediment sampling event 10 sediment samples were obtained from locations both up and downstream from the SNE location. Four more samples, from similar locations, were taken in May, 1987. Twelve of the 14 sediment samples had detectable PCP concentrations ranging from 6.7 ug/L to 88.7 ug/L suggesting that there were multiple PCP inputs into the river, some that were unrelated to the SNE operation.

  These sediment sampling results were evaluated using the WDNR Consensus Based Sediment Quality Guidelines spreadsheet (attached) that adjusts the observed PCP concentrations based on the percent of Total Organic Carbon (TOC) in the sediment. For the samples obtained in May 1986, TOC concentrations were not available. For these samples the lowest TOC observed during 1987 sediment sampling, 0.3%, was used in the CBSQG analysis. The adjusted values have been compared to concentration criteria at three levels, Threshold Effect Concentration (TEC), Midpoint Effect Concentration (MEC) and Probable Effect Concentration (PEC). If the PCP concentration is less or equal to the TEC the PCP is unlikely to adversely affect the benthic zone within the sediments. If the PCP concentration is equal to or exceeds the PEC, a deleterious effect on benthic organisms is likely. Of the 14 sediment samples taken during the two river sediment sampling events only one adjusted sample result exceeded the PEC for PCP,200 ug/kg. This sample, WSS-2, was taken from the east bank of Isle of Fern Park which is located upstream and on the side of the island opposite of where the SNE operation was located. This location would not have been impacted from the SNE release. There was only one additional sample that exceeded the TEC for PCP. The adjusted concentration WSS-7 exceeded the TEC but was less than the PEC. This sample was taken down stream of the site and the Thomas Avenue bridge.

  These results, where only one sample of the 14 sediments samples taken from the Wisconsin River exceeded the PEC for PCP and the source of the PCP found in this sediment sample could not be from the SNE operation, along with the significant reductions in dissolved PCP found in

the groundwater since these samples were obtained, supports Rosecrans position that further sediment sampling is not necessary.

- Review of available reports identified at least three events where surface water samples were taken from the Wisconsin River, September-1985, June-1986 and May-1987. Eight (8) samples were taken in September-1985 designated RW-1 through RW-8, five (5) samples were taken in June-1986, designated WSW-1 through WSW-5, and twelve (12) samples were taken in May-1987, designated WSS-1S through WSS-4B.

  The samples for the first event were obtained by tossing a Teflon bailer from the river bank from locations in the immediate vicinity of where the groundwater plume may have been entering the river. None of these eight samples had PCP concentrations above the laboratory detection limit of 0.02 mg/L. The sampling methods, locations and results were provided to the WDNR in a report "Engineer Report Summarizing Site Investigation for Pentachlorophenol" dated November 1985. (attached)

  Three (3) of the five (5) samples from the sampling event completed in June 1986 had detectable PCP. The surface water samples were obtained from upstream, adjacent and downstream of the site. Samples with detectable PCP were WSW-2, WSW-3 and WSW-4. These were taken at, or just downgradient from where it is likely that ground water from the plume would enter the river. The concentrations of PCP were 3.1 ug/L, 1.2 ug/L, and 1.1 ug/L respectively.

  The sampling event completed in June of 1987 consisted of samples from four locations from three depths from each location, surface bottom and midpoint. None of these samples had detectable concentrations of PCP. The sample designated as WW-2 was taken at approximately the same location as the previously taken sample WSW-2 and WW-3 was taken in approximately the same location as WSW-4. Both WSW-2 and WSW-4 taken in June of 1986 had detectable concentration of PCP but subsequent samples taken in May of 1987 did not have a detectable concentration of PCP.

  The chronic toxicity criteria for PCP from Table 6 in the NR 105.06, Surface Water Quality Criteria and Secondary Values for Toxic Substances, has different values dependent on the water temperature classification and pH of the surface water. The lowest of these values for PCP, corresponding to cold water at pH of 6.5 is 4.43 ug/L. None of the surface water samples taken to date has had PCP concentrations that equal or exceed this value.

  It is important to note that the surface water sampling described above was completed when the concentrations of PCP in groundwater measured near the river was far higher than the current concentrations, with the mass of PCP potentially entering the river reduced by approximately 99% between then and now. With this reduction of mass contained within the groundwater, it is technically unreasonable to expect that any surface water sample will have a

detectable PCP concentration and particularly unreasonable to expect any surface water sample to have concentrations that approach either the acute or chronic surface water standards for PCP from the groundwater that may be seeping into the river. Additional surface water sampling would likely not add any additional data other than confirmation of non-detects.

The WDNR has requested that Rosecrans provide a Site Investigation Work Plan (SIWP) to perform sediment and surface water sampling to evaluate the potential effects of the "current groundwater plume" on the Wisconsin River. It is Rosecrans position that this is not necessary since there is sufficient data from previous investigations to show that the PCP concentrations in surface water or sediment exceeds their respective criteria. All of the data generated to date has supported the position that the groundwater plume from the release is not a source of contamination of the Wisconsin River that results in impacts to the sediments or surface water that exceeds the relevant criteria for PCP. With the exception of one sediment sample, a sample taken from a location that could not have been affected by the release at the SNE site, no samples have exceeded relevant criteria PCP concentration for sediment or surface water. The surface water and sediment sampling were completed during the early investigations of the extent and threats posed by the release at SNE. Since these samples were taken it has been demonstrated that:

1. The mass of mineral oil NAPL and the mass of PCP contained within the NAPL has declined by over 99%.
2. The PCP concentration in the groundwater has declined by up to 98% in the wells closest to the river.
3. The mass of PCP that could potentially entering river has declined by over 99%

Given this demonstrated reductions in dissolved PCP in the current groundwater plume and the data provided to the WDNR in previous reports. Rosecrans respectfully does not believe that any additional sampling of sediments and surface water from the Wisconsin River is necessary and that the plume, as it is now defined, does not pose a risk to the Wisconsin River.

Please contact me at 651-261-6540 or mnelson@enviroanalyticsgroup.com with any questions.

Sincerely,

Mark Nelson
Senior Project Manager
Cc: Matthew Thompson-WDNR
Russ Becker-EAG

Attachments

12/26/85

CORRESPONDENCE / MEMORANDUM — STATE OF WISCONSIN

RECEIVED
Wis. Dept. of Natural Resources
DEC 26 1985
N. C. Dist. Hdqtrs.
RHINELANDER, WI

DATE: December 19, 1985

FILE REF: 4430

TO: Gary Kulibert - NC
Ed Kruel - NC

FROM: Terry Evanson - SW/3 TAE

SUBJECT: SNE Engineering Report

The following are comments on the SNE Corporation report titled "Engineering Report Summarizing Site Investigation for Pentachlorophenol" by Eder Associates and dated November, 1985.

Field Investigation

1. On page 11, the report states that there was a "possibility . . . of Penta moving in a direction other than downgradient." Yet, the 9/26/85 water table map indicates that the spread of the floating layer of PCP is consistent with the direction of groundwater flow. More permeable layers in the sand and gravel may also affect the movement of the PCP layer.

2. The report should include a discussion of how the thickness of the floating PCP layer is actually measured in the field. The 9/26/85 water table map shows water levels adjusted for the floating layer--how is the adjustment computed?

3. Page 36 of the report states that the source of the VOCs is unknown, but the compounds are commonly used in the mill working industry. Does this mean that the SNE Corporation is the likely source of VOCs or that one of the other local industries is the source of VOCs?

4. Can studies be designed and conducted to determine the actual biological degradation rate for PCP occurring at the site? Is the sand and gravel aquifer a good or poor medium for biological activity? Will the floating product be affected by microbes or only the dissolved constituents? I think these questions are important in determining the extent of a long-term monitoring program and whether the contaminants will continue to move downgradient. Also, can the dioxins be expected to biodegrade?

5. It seems premature to conclude that the floating PCP is no longer moving when the actual extent of the layer is unknown and monitoring of the layer has only been conducted for a short time.

6. The possibility of volatilization of PCP and other contaminants into nearby homes must be investigated. SNE should monitor airborn contaminant levels in basements of selected homes or place soil gas probes (if they will work in this case) near homes.

Remedial Action Alternatives

7. The company's prefered alternative is to allow PCP to naturally degrade and install additional monitoring wells to determine movement of the PCP plume. Most of the issues listed above will have to be addressed before this alternative can be evaluated--namely, degradation time for PCP and the dioxin, volatilization of contaminants into residential areas, and further environmental risk assessment. In any scenario, SNE would have to insure that all sources of PCP to the environment have been eliminated.

8. The second alternative, passive removal of PCP through bailing, seems the least viable of the alternatives. There would be little effect on the volume of PCP in the environment.

9. Installation of one or more depression pumps/skimming systems to remove the floating PCP is the third alternative. SNE claims there are no approved PCP disposal facilities in this country. If this is true, then it is unlikely that PCP removal will be possible. SNE should be required to prove that PCP-contaminated carbon could not be disposed of safely. Carbon from filtration systems is often regenerated by burning. Would the PCP be destroyed in such a process? Results of the carbon adsorption tests being conducted by SNE should be submitted to the Department.

If you have any questions, please call me at (608) 266-0941.

TE:jah
8611S

cc: Bill Dobbins - NC
Rich O'Hara/Mark Giesfeldt - SW/3

12/6/85

SNE Corporation

A Sentry Enterprise

910 Cleveland Avenue
P.O. Box 1007
Wausau, WI 54401

715 845-1161

December 6, 1985

Mr. Kenneth Markart
Department of Natural Resources
Box 310
Antigo, WI 54409

Certified Mail

Dear Ken:

This letter confirms our conversation regarding a waste storage extension. As discussed, we have contacted numerous storage facilities and have been unsuccessful in finding anyone who would store our PCP waste until a disposal means was found. We have since pulled together information required to apply for a Waste Storage Variance. This information has been sent to Gregory Rorech of Eder Associates for the purpose of preparing a formal variance application. Gregory has indicated that we will be able to apply for the variance within 30 days. Our current extension will end December 11, 1985.

Please acknowledge the DNR's position to this extension request. If you need additional information, contact me at (715) 845-1161.

Sincerely,

Patrick J. Wierzba
Plant Engineer Manager

PJW/11

cc: Howard Dolce
Gregory Rorech
Gary Kulibert

Nov, 1985

SNE CORPORATION

WAUSAU, WISCONSIN

ENGINEERING REPORT SUMMARIZING SITE INVESTIGATION FOR PENTACHLOROPHENOL

NOVEMBER 1985

PROJECT #509-1

EDER ASSOCIATES

CONSULTING ENGINEERS, P.C.

85 Forest Avenue

Locust Valley, New York 11560

November 26, 1985
File #509-1

eder associates
consulting engineers, p.c.

Mr. Gary Kulibert
Wisconsin Department of Natural Resources
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501

Re: SNE Corporation
Wausau, Wisconsin

Dear Mr. Kulibert:

Pursuant to my letter of November 13, 1985 and our recent telephone conversation, enclosed are three copies of our report summarizing the work done to date at SNE Corporation.

In addition to the hydrogeological studies described in the report, we are undertaking the following work which you have requested.

1. An assessment of the impact of vapors, if any, from the floating layer on surrounding homes; and

2. A detailed analysis of the remedial alternatives discussed in Chapter V of this Report.

We hope to have our report on remedial alternatives completed by the middle of December and would like to meet with you in Madison at that time to review our findings.

The study on mineral spirits vapor will be completed as soon as possible.

The drainage improvements have been completed for the courtyard next to the dip line area. An as-built drawing of the changes made will be sent to you shortly. The drainage improvements should prevent any further rainwater from entering the crawl space area near the dip line.

Please call either myself or Bill Warren if you have any questions.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.
LJE/nf
Enc.

cc: H. Handzel P. Wierzba
S. Kroll J. Noonan
H. Dolce T. Jirous

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440

LEONARD J. EDER, P. E. • FREDERICK H. INYARD, P. E. • STEPHEN J. OSMUNDSEN, P. E. • GARY A. ROZMUS, P. E.
JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

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I. FIELD INVESTIGATION

Introduction

This section describes the monitor well installation and sampling procedures carried out during the spring, summer and fall of 1985 at SNE Corporation, Wausau, Wisconsin. For a further discussion of current and historical plant operations, the reader is referred to the Eder Associates' report of March 1985. That report also contains descriptions of the installation of Monitor Wells W-1 through W-4 and the results of the initial groundwater sample analyses.

Monitor Well Installation

With the exception of W-1 through W-4, all monitor wells installed at and near SNE Corporation (locations are shown on Figure 1) were installed by Wisconsin Test Drilling, Inc., Schofield, Wisconsin, under the supervision of W.M. Warren, Senior Hydrogeologist of Eder Associates. Monitor Wells W-1 through W-4 were installed by Warzyn Test Drilling of Madison, Wisconsin, under the supervision of Joseph Hellmann, P.E. of Eder Associates. The Wisconsin DNR "Guidelines for Monitor Well Installation" (April 9, 1985) were followed during drilling and installation of all monitor wells with hollow stem augers. Strict protocols were followed to prevent cross contamination of monitor wells by drilling and sampling equipment and well materials; and in order to obtain representative samples of the subsoil by split spoon sampling (at five foot intervals).

Four phases of monitor well installation were carried out during the period of May 20 through August 22, 1985. These phases may be characterized as shown in Table 1. Monitor well construction data are presented in Table 2.

SNE CORPORATION
WAUSAU, WISCONSIN

TABLE 1

PHASES OF MONITOR WELL INSTALLATION

Well Numbers	Date Installed	Purpose
W-5 through W-7	May 21-24, 1985	Definition of floating layer of penta on water table in plant area.
W-8 through W-14	May 20-24, 1985	Definition of plume of dissolved penta downgradient and an upgradient background monitor well.
W-1B, W-3B & W-10B	July 23-24, 1985	Definition of vertical extent of dissolved penta at the plant site and downgradient.
W-15 & W-16	July 24th & August 22, 1985, respectively	Definition of floating layer of penta on water table off property to the southeast.

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 2

MONITOR WELL CONSTRUCTION DATA

Monitor Well No.	Total Depth	Screened Interval	Date Installed
1	43	28-43	December 19, 1984
1B	60	50-60	July 25, 1985
2	42	27-42	December 19, 1984
3	39	24-39	December 20, 1984
3B	60	50-60	July 26, 1985
4	40	25-40	December 20, 1984
5	36	19-37	May 21, 1985
6	40	22-41	May 22, 1985
7	40	22-40	May 23, 1985
8	40	25-40	May 20, 1985
9	23	8-23	May 20, 1985
10	35	20-35	May 21, 1985
10B	58	48-58	July 24, 1985
11	23	8-23	May 21, 1985
12	22	7-22	May 20, 1985
13	40	25-40	May 22, 1985
14	21	6-21	May 23, 1985
15	35	17-35	July 24, 1985
16	29	14-29	August 22, 1985

Table 2 continued . . .

NOTES:

1) All depths are feet below grade - rounded off to nearest foot.

2) All wells, except W-5, W-6, W-7 and W-15, are constructed of two inch diameter, schedule 80 PVC, flush jointed threaded and coupled pipe with machine perforated (0.01 inch) slots.

3) Wells W-5, W-6, W-7, W-8 and W-15 are constructed of two inch diameter black steel threaded and coupled pipe with wire wound galvanized steel well screen (0.01 inch slots).

Plant Area - Floating Layer Monitor Wells

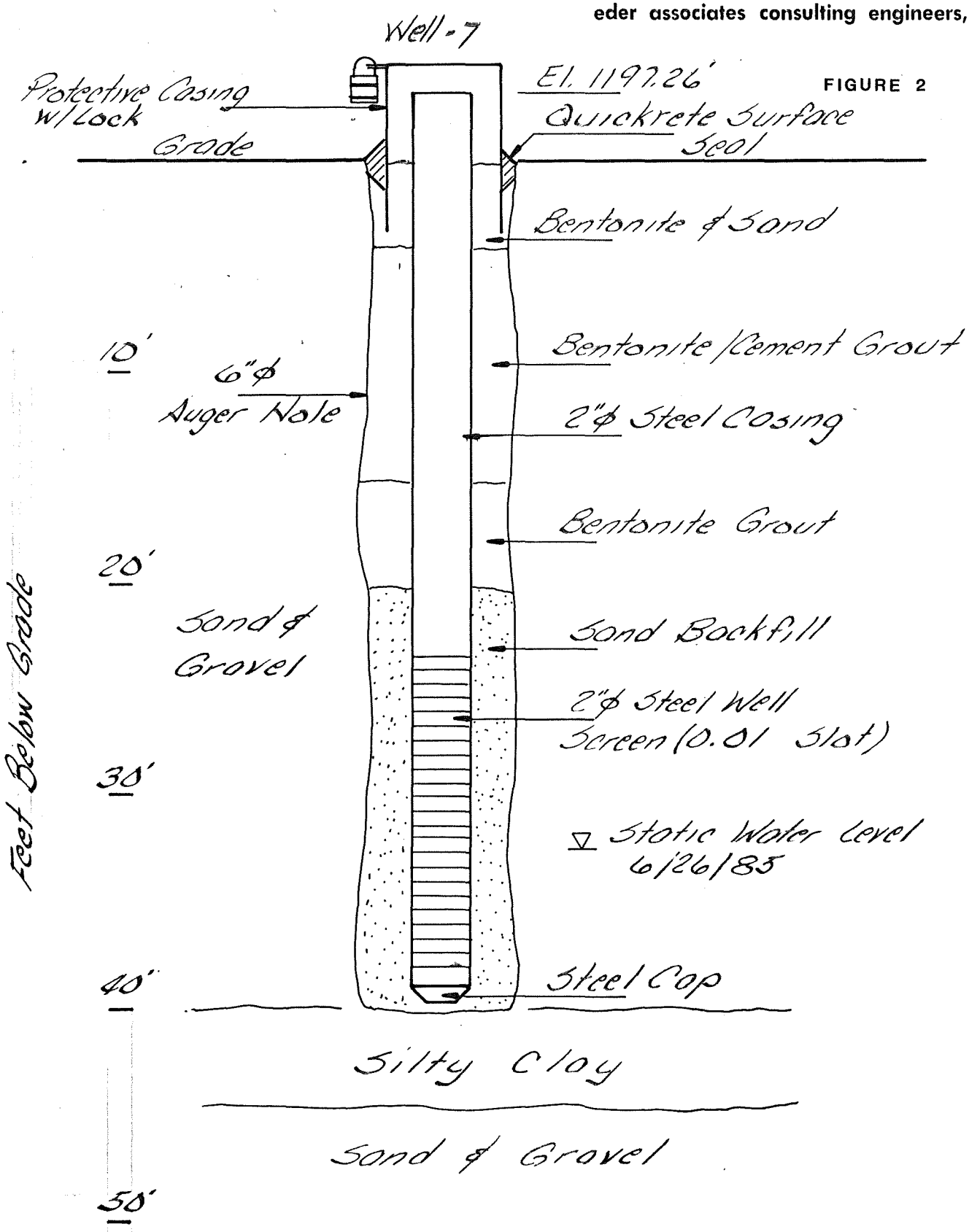
Based on Monitor Wells W-1 through W-4, it was assumed that the floating layer of penta was mostly confined to SNE property. This was assumed on the basis of no floating layer being present downgradient at W-3. Previous experience and published accounts of floating layers indicated that movement, if any, and spreading occurs on the water table, in the downgradient direction. Therefore, the floating layer in the sidegradient monitor well, W-4, was thought to be very near the edge of the spreading floating layer.

Monitor Wells W-5, W-6 and W-7 were installed at locations that would define the floating layer of penta downgradient, sidegradient, and at the source, respectively. These monitor wells were designed in a manner that would allow floating penta to enter the well screen. This was accomplished by placing the 15-foot length of well screen at a depth where five feet of screen was above the water table (as nearly as possible considering the difficulty of determining the static water level while drilling with hollow stem augers). The five feet of screen above the water table allows for a rise in water level after the spring recharge period. Galvanized steel wire-wound well screens were installed in Monitor Wells W-5, W-6 and W-7 to prevent deterioration by the expected solvent nature of penta. Figure 2 shows the typical construction of the floating layer detection wells.

Dissolved Penta Monitor Wells (Upper Water Table)

Groundwater flow directions downgradient of SNE had not been previously defined, although flow toward the discharge point at the Wisconsin River to the east was assumed. Some deviation from the eastward flow direction was expected due to configuration of the River shoreline. In order to intercept all possible groundwater flow paths between the plant and River, a north-south line of monitor wells was installed at right angles to the assumed direction of groundwater flow. The possible changes in groundwater flow directions due to

FIGURE 2



TYPICAL MONITOR WELL – FLOATING LAYER DETECTION

seasonal water level fluctuations were also considered in determining the spatial array of the monitor wells.

Monitor Wells W-8 through W-14 were installed for monitoring the upper 10 feet of the water table with five feet of well screen above the water table to allow for fluctuation. PVC well casing and machine slotted PVC monitor well screen were used in these wells because there was no indication of high concentrations of penta solvents which would attack the PVC. Figure 3 shows a typical dissolved penta plume monitor well.

Dissolved Penta Monitor Wells (Lower Water Table Zone)

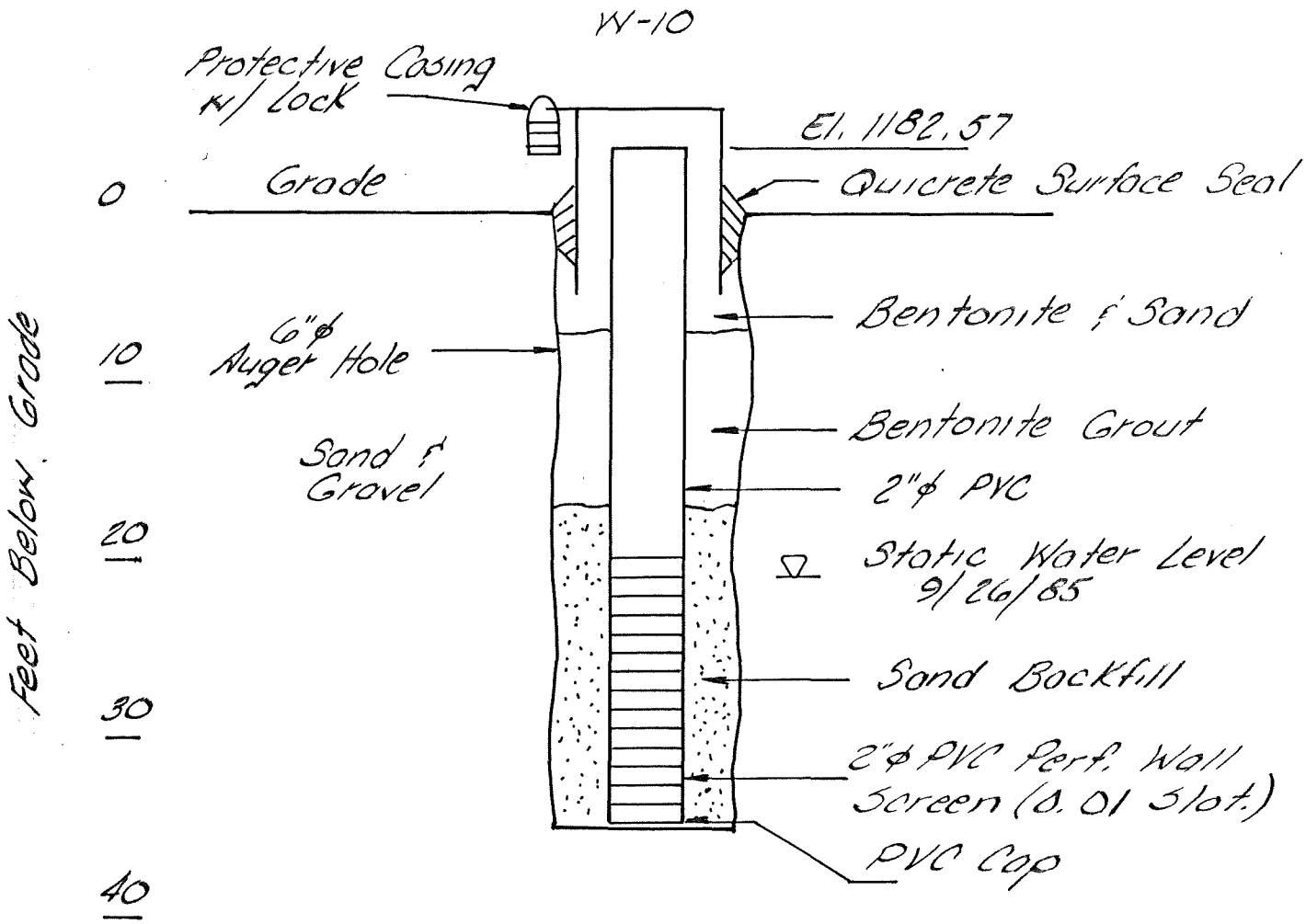
In order to define the vertical extent of dissolved penta in groundwater, three monitor wells (W-1B, W-3B and W-10B) were installed next to existing Monitor Well Nos. W-1, W-3 and W-10. These locations were chosen after receipt of groundwater sample analyses results which revealed the areas where the bulk of dissolved penta was moving with groundwater flow to the Wisconsin River. The on-property upgradient location of W-1 was chosen to determine the amount of upgradient dispersal of penta in the lower zone because penta was detected in the upper water table zone.

Test drilling to the lower zones (below 40 feet) revealed changes in geology to lower permeability clay and sand deposits and bedrock. These PVC wells were installed to monitor the 50 to 60 foot zone and provide groundwater data on the entire saturated thickness of unconsolidated deposits when compared with the adjacent upper water table monitor well (25 to 40 foot zone). Figure 4 shows the typical construction of the lower water table zone monitor wells and the annular seal to isolate the well screen from the shallow water table zone.

Off Property Floating Layer Monitor Wells

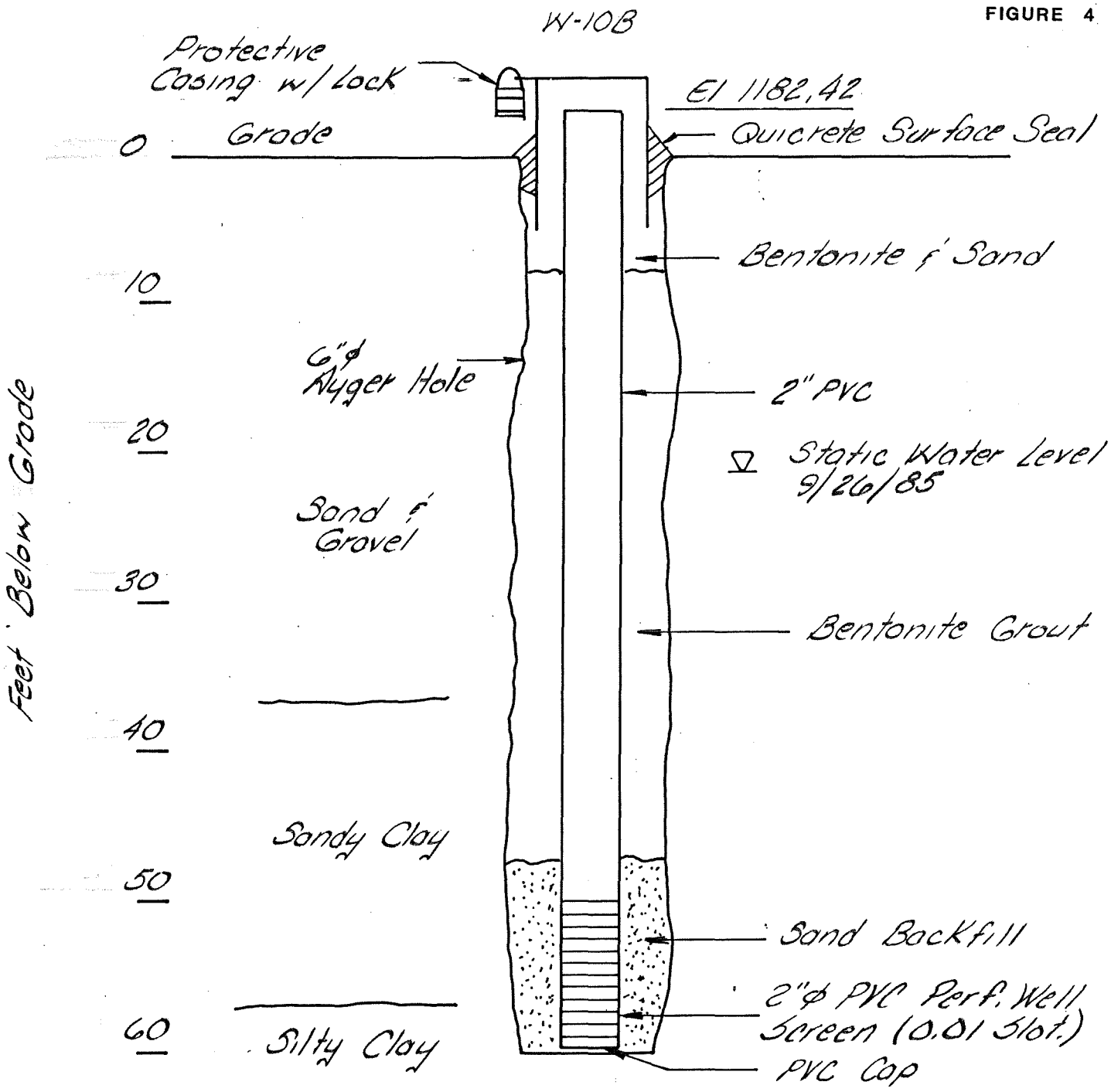
After installation of monitor wells for floating layer and

FIGURE 3



TYPICAL MONITOR WELL - DISSOLVED PENTA DETECTION

FIGURE 4



TYPICAL MONITOR WELL – DISSOLVED PENTA DETECTION

(LOWER WATER TABLE)

dissolved penta plume definition, the possibility of some penta moving in a direction other than downgradient was determined to be a possibility. A location about 300 feet southeast of Monitor Well W-4 was chosen for W-15. A steel well was installed in a similar manner as the other floating layer detection wells. Discovery of a floating layer at W-15 prompted the installation of W-16 which was located by extending a straight line from W-4 through W-15 to a site 250 feet southeast of W-15 (see Figure 1). A PVC well was installed when no penta was discovered at W-16. The upper water table zone is being monitored by Monitor Well W-16.

Monitor Well Sampling

Following the May 1985 drilling program, water samples were collected and analyzed for PCP. Water samples were also collected In June and August 1985 for determination of dissolved concentrations of PCP and VOCs (volatile organic compounds). Mineral spirits concentrations were also quantified for all monitor well samples collected in the August round of samples. Monitor well sampling protocol followed established methods for the prevention of cross contamination and collection of representative groundwater samples. The protocol followed for each monitor well sampling is presented in Appendix A. Chain of custody forms were maintained and the completed forms are also presented in Appendix A.

Water samples were analyzed by Zimpro, Inc., Rothschild, Wisconsin, and by Parker Services, Inc., Stevens Point, Wisconsin. PCP, mineral spirits, and VOC analyses were performed by Zimpro and PCP analyses were performed by Parker Services. Appendix B contains the analytical methods and protocols used by the laboratories.

Tables 3, 4 and 5 present pertinent data on sampling dates, constituents determined, and laboratory used for each monitor well sampling round.

Referring to Table 5, the August 16, 1985, sampling round included

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 3

MONITOR WELL SAMPLING & ANALYSES DATA

MAY 25, 1985, SAMPLE ROUND

Monitor Well No.	Sample No.	Analyte	Laboratory
W-1	16	PCP	Parker Services, Inc.
W-2	14	PCP	Parker Services, Inc.
W-2*	15	PCP	Parker Services, Inc.
W-3	13	PCP	Parker Services, Inc.
W-8	12	PCP	Parker Services, Inc.
W-9	7	PCP	Parker Services, Inc.
W-10	5	PCP	Parker Services, Inc.
W-10*	6	PCP	Parker Services, Inc.
W-11	4	PCP	Parker Services, Inc.
W-12	3	PCP	Parker Services, Inc.
W-14*	2	PCP	Parker Services, Inc.
W-14*	1	PCP	Parker Services, Inc.
W-13	21	PCP	Parker Services, Inc.
Field Blank**	17	PCP	Parker Services, Inc.
Trip Blank**	18	PCP	Parker Services, Inc.
Quality Control Sample***	CS-1	PCP	Parker Services, Inc.
Quality Control Sample****	CS-2	PCP	Parker Services, Inc.

Table 3 continued . . .

* Blind replicate sample for laboratory quality control.

** Blind field and trip blanks (distilled water) for laboratory quality control.

*** Sample of distilled water used to clean split spoon samplers.

**** Sample of drilling water - Wausau City Water.

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WAUSAU, WISCONSIN

TABLE 4

MONITOR WELL SAMPLING & ANALYSES DATA

JUNE 25, 1985, SAMPLE ROUND

Monitor Well No.	Sample No.	Analytes	Laboratory
W-1	6	PCP/VOCs	Parker/Zimpro
W-2	2	PCP/VOCs	Parker/Zimpro
W-3	4	PCP/VOCs	Parker/Zimpro
W-8	1	PCP/VOCs	Parker/Zimpro
W-9	9	PCP/VOCs	Parker/Zimpro
W-10	8	PCP/VOCs	Parker/Zimpro
W-11	7	PCP/VOCs	Parker/Zimpro
W-12	5	PCP/VOCs	Parker/Zimpro
W-13	10	PCP/VOCs	Parker/Zimpro
W-14	3	PCP/VOCs	Parker/Zimpro

Notes: PCP analysis by Parker Services, Inc. and VOC analysis by Zimpro, Inc.

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WAUSAU, WISCONSIN

TABLE 5

MONITOR WELL SAMPLING & ANALYSES DATA

AUGUST 16, 1985, SAMPLE ROUND

Monitor Well No.	Sample No.	Analytes	Laboratory
W-1	10	VOCs, MS & PCP	Zimpro
W-1B	8 & 9	VOCs, MS & PCP	Zimpro
W-2	18	VOCs, MS & PCP	Zimpro
W-3	24 & 25	PCP	Parker
W-3B	22 & 23	VOCs, MS & PCP	Zimpro/Parker
W-8	1, 2, 3 & 4	VOCs, MS & PCP	Zimpro/Parker
W-9	11	VOCs, MS & PCP	Zimpro
W-10	26, 27, 28 & 29	VOCs, MS & PCP	Zimpro/Parker
W-10B	19 & 20	VOCs, MS & PCP	Zimpro/Parker
W-11	16 & 17	VOCs, MS & PCP	Zimpro/Parker
W-12	12 & 13	VOCs, MS & PCP	Zimpro/Parker
W-13	14 & 15	VOCs, MS & PCP	Zimpro/Parker
W-14	5, 6 & 7	VOCs, MS & PCP	Zimpro/Parker
Field Blank (distilled water)	21	PCP	Parker
Field Blank (distilled water)	30	VOCs, MS & PCP	Zimpro

NOTES:

1) PCP analysis by Parker Services, Inc.; and mineral spirits (MS) and VOCs analyses by Zimpro.

2) Where two or four sample numbers are indicated, the samples were replicated for quality control.

several replicate samples for quality control. This was done because PCP was detected by Parker Services in the June 26, 1985 sample from the upgradient well, W-8. The results of analyses are discussed in a later section of this report.

Wisconsin River Sampling

On September 26, 1985, the Wisconsin River was sampled at the locations shown on Figure 5. The sampling technique consisted of the use of a teflon bailer on a line which was cast out about 20 feet from the Riverbank. These samples were submitted to Parker Services, Inc. for determination of dissolved PCP concentrations.

The purpose of the Wisconsin River water sampling was to determine whether the low concentrations of PCP in groundwater discharge could be detected in the River.

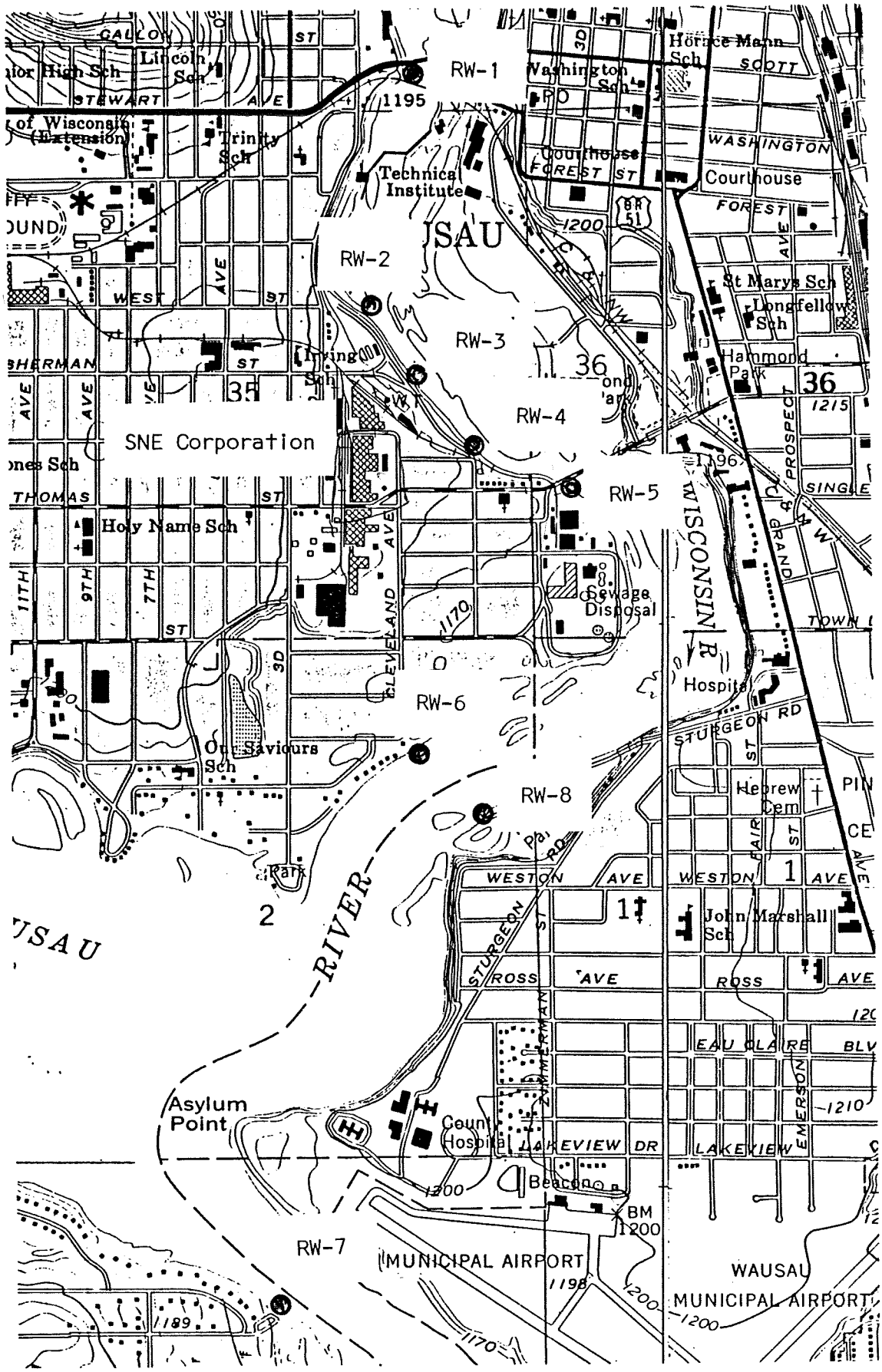
Additional Data Collection

The elevations of monitor well measuring reference points (top of casing) were surveyed and referenced to United States Geological Survey (USGS) benchmark elevation by Edwin R. Abendroth, Registered Land Surveyor, Wausau, Wisconsin (RLS no. 5-798). All water level measurements are referenced to the surveyed elevations. Water level elevations were measured prior to each sample collection event and at other times during the period of May through September, 1985.

Additional field measurements consisted of determining the thickness of floating layers in monitor wells for comparison with water levels and previous layer measurements.

Subsoil borings were also performed next to the 8,000 gallon buried penta storage tank and in the dip line room. The latter boring was attempted with a hand auger because of the very limited access to the room. The subsoil samples collected from these borings and Monitor Wells W-5 through W-16 (and all subsoil samples) are stored under refrigeration at the Parker Services, Inc. laboratory.

FIGURE 5



LOCATION OF WISCONSIN RIVER

SAMPLING POINTS - SEPTEMBER 26, 1985

SNE CORPORATION

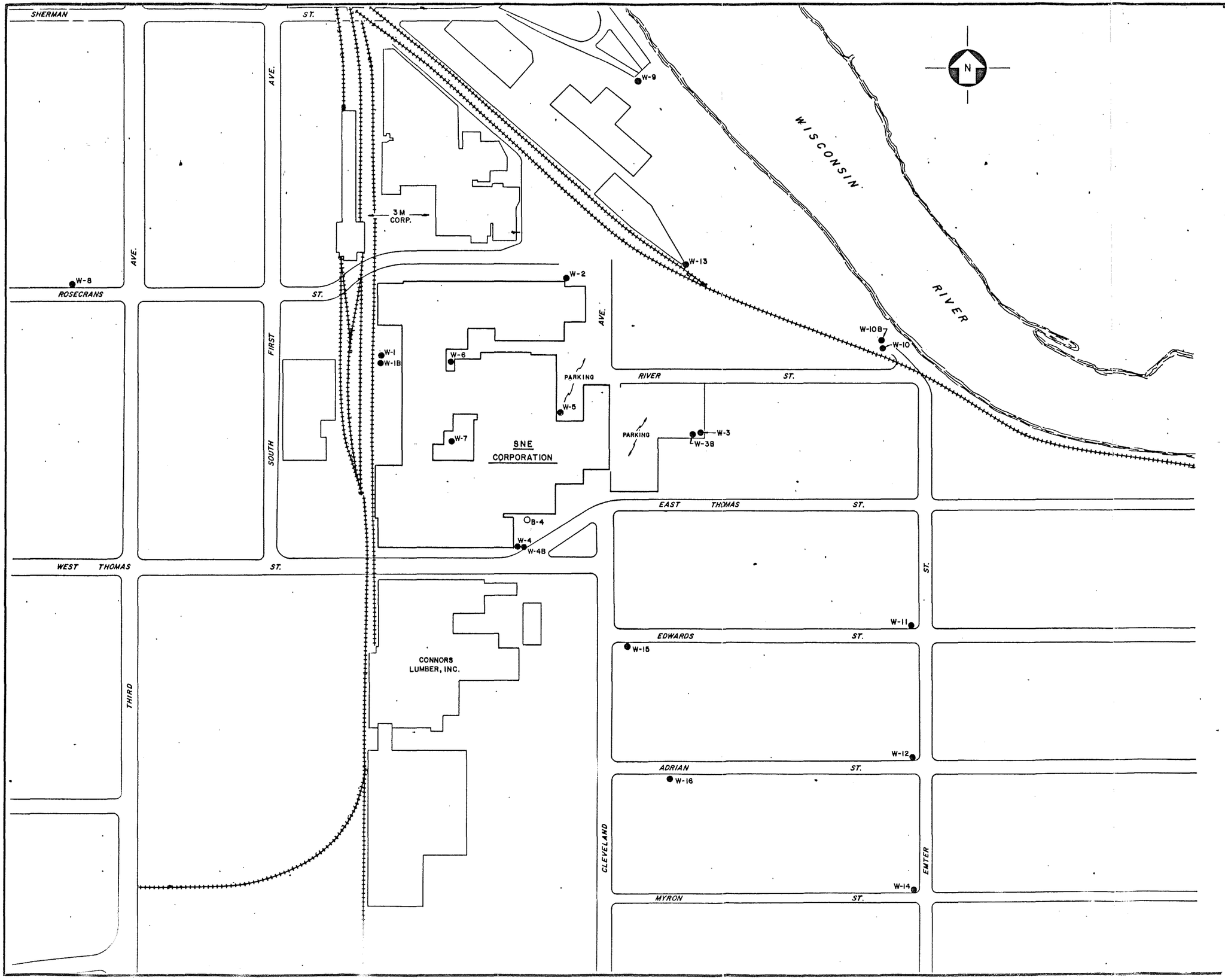
WAUSAU, WISCONSIN

II. RESULTS OF FIELD INVESTIGATION

Geologic Conditions

The results of test drilling indicate a general agreement with published accounts by the USGS and the Wisconsin Geological Survey. The geology of the general area, mapped on a large scale (1:125000), is presented in the USGS Water Supply Paper 2022, "Water Availability in Central Wisconsin - An Area of Near Surface Crystaline Rock". Descriptions of the bedrock geology are provided in the Wisconsin Geological Survey Information Circular Number 45, "Precambrian Geology of Marathon County, Wisconsin". The latter report is of limited value because the site is underlain by unconsolidated deposits of glacio-fluvial origin that blanket the Precambrian bedrock along the Wisconsin River. Water Supply Paper 2022 indicates that the site is located at or near the contact of glacial outwash deposits and alluvium of the Wisconsin River. The distinction between the two types of deposit is minimal since each is comprised of unconsolidated deposits of sand and gravel, with varying amounts of clay and silt occurring as either lenses or in the sand and gravel matrix. Published data indicated that bedrock at the site may be 80 to 100 feet below land surface and probably a syenite rock type. A shallow house well located about 2,000 feet southeast of the site on Chellis Street reportedly penetrated the bedrock surface at a depth of 20 feet. There are reportedly no wells or well records available for the immediate vicinity of the SNE site, and City well inventories indicate that it is doubtful that any wells are located within a one-quarter mile radius of the site. Private wells are prohibited by city ordinance where there is a municipal supply.

The geologic cross sections are located in Figure 6 and presented in Figures 7 and 8. The sections are based on geologic sampling data collected during the installation of monitor wells at and near the SNE



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

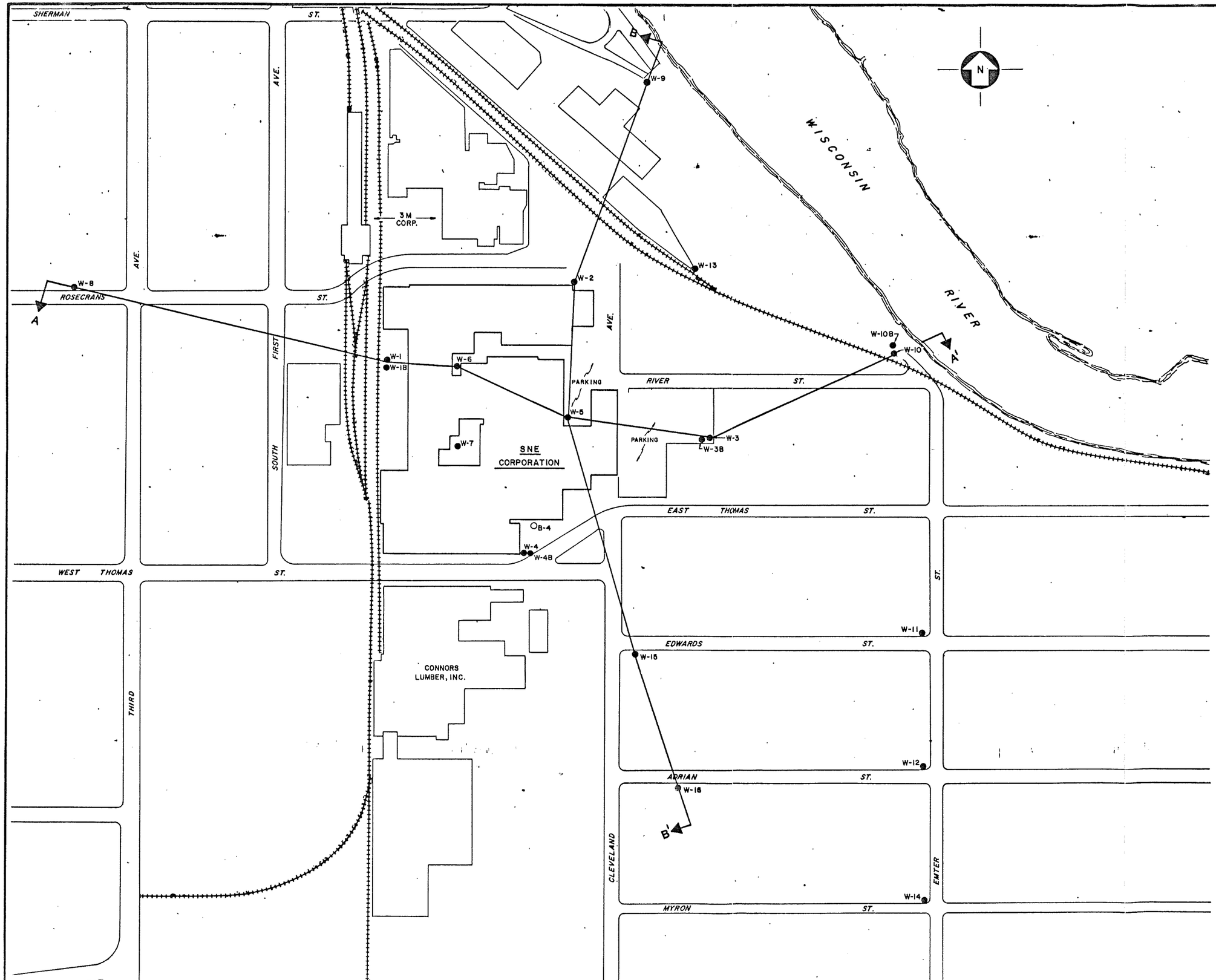
eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
LOCATION OF MONITOR WELLS

eder associates consulting engineers, p.c.
88 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FRO	SCALE 1"=200'
DESIGNED BY NPW	PROJECT Nº 509-1
APPROVED BY LE	DWG. Nº 1
DATE	



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

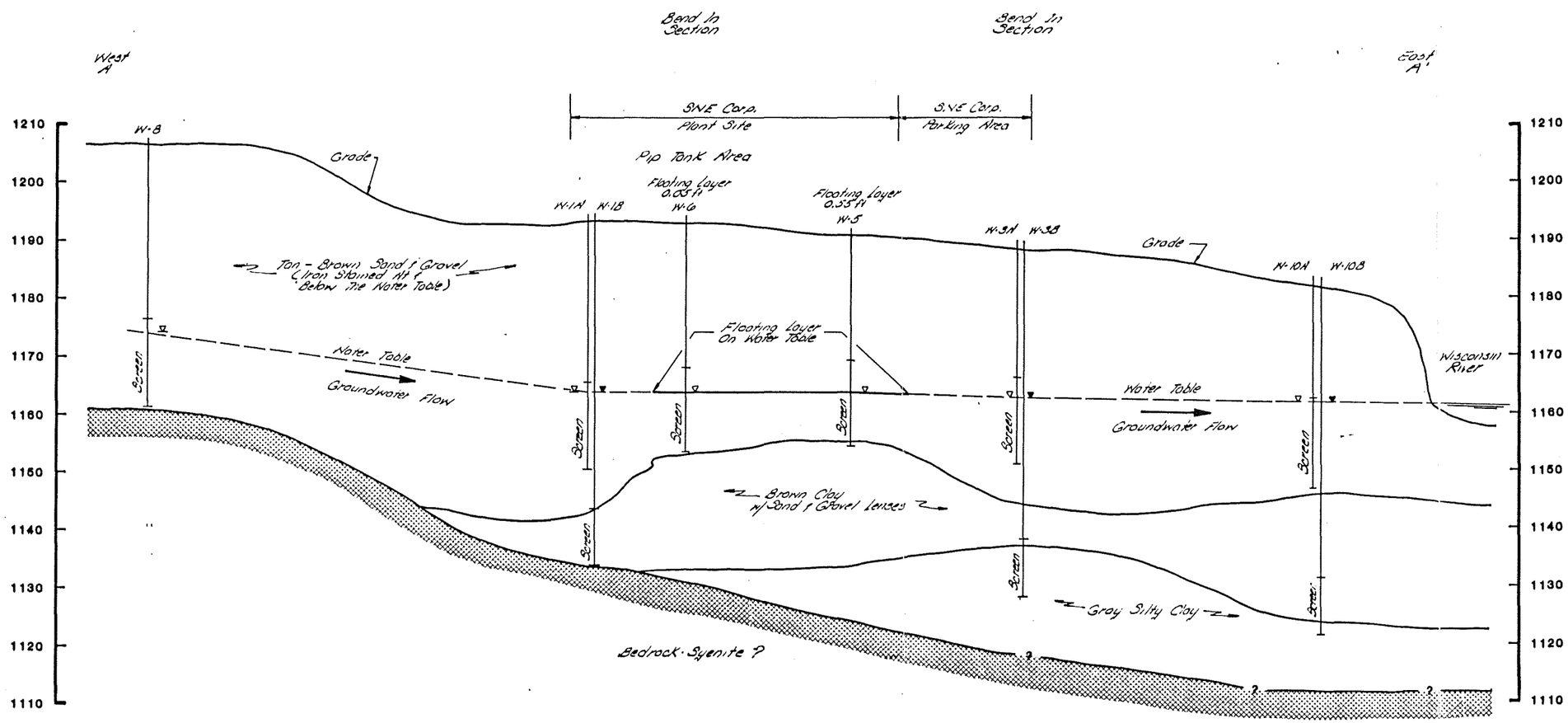
eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
LOCATION OF HYDROGEOLOGIC CROSS SECTION PROFILES

eder associates consulting engineers, p.c.
66 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FAD	SCALE 1"=200'
DESIGNED BY NYW	PROJECT Nº 509-1.
APPROVED BY LVE	DWG. Nº 6
DATE November 1985	



LEGEND

▽ Water Level - Water Table Zone
▼ Water Level - Lower Zone
} Meas. 9/26/85

Vertical Exag. = 10x

Note:
Elevations - Feet Above Mean Sea Level

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION
WAUSAU, WISCONSIN

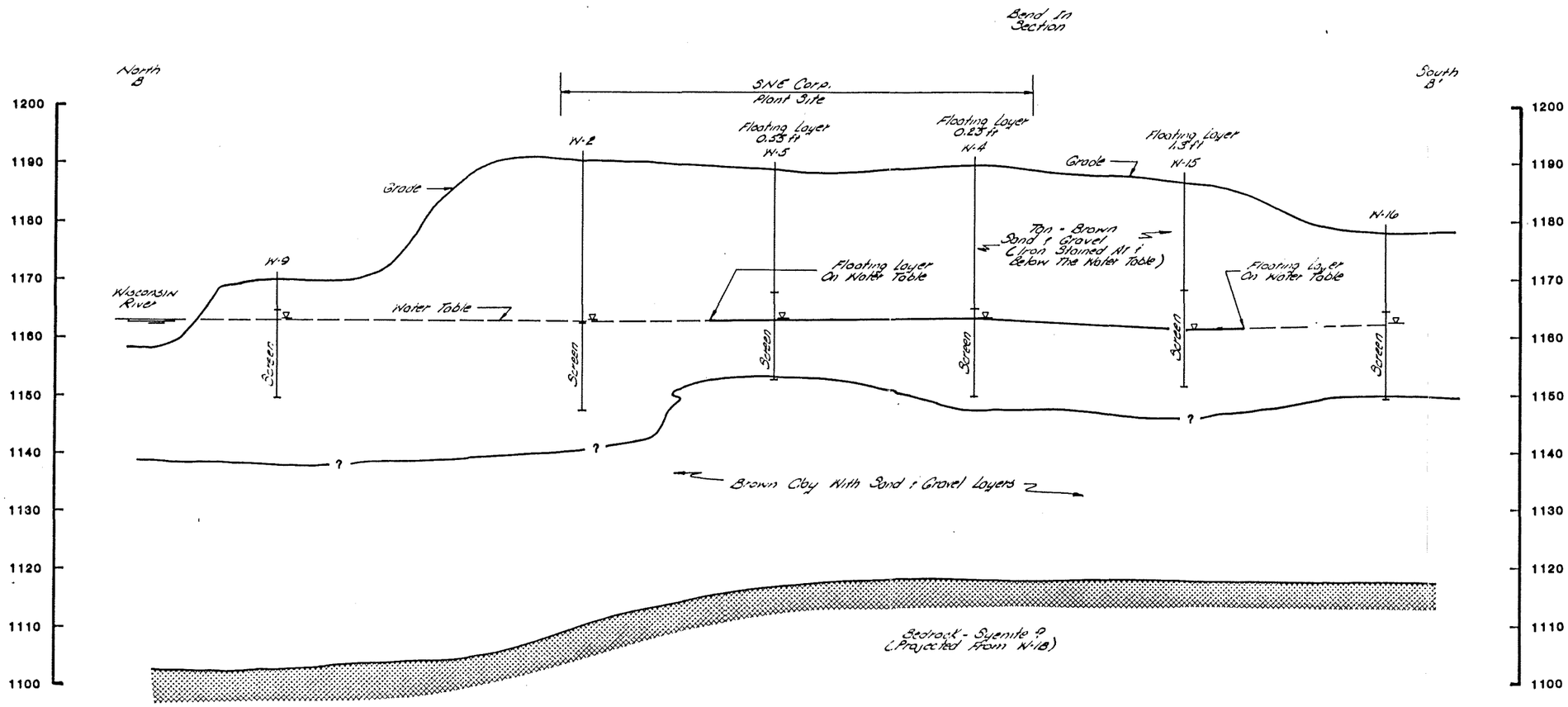
eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
HYDROGEOLOGIC CROSS SECTION A-A'

eder associates consulting engineers, p.c.
55 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE Vert. 1"=20' Hor. 1"=200'
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG. Nº 7
DATE	



LEGEND

▽ Water level - Water Table Zone (Mess. 9/26/85)
Vertical Exag. = 10x

Note-
Elevations - Feet Above Mean Sea Level

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION
WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
HYDROGEOLOGIC CROSS SECTION B-B'

eder associates consulting engineers, p.c.
55 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY HFG	SCALE Hor 1"=20' Vert 1"=200'
DESIGNED BY MMN	PROJECT Nº 509-1
APPROVED BY SJO	DWG. Nº 8
DATE November 1985	

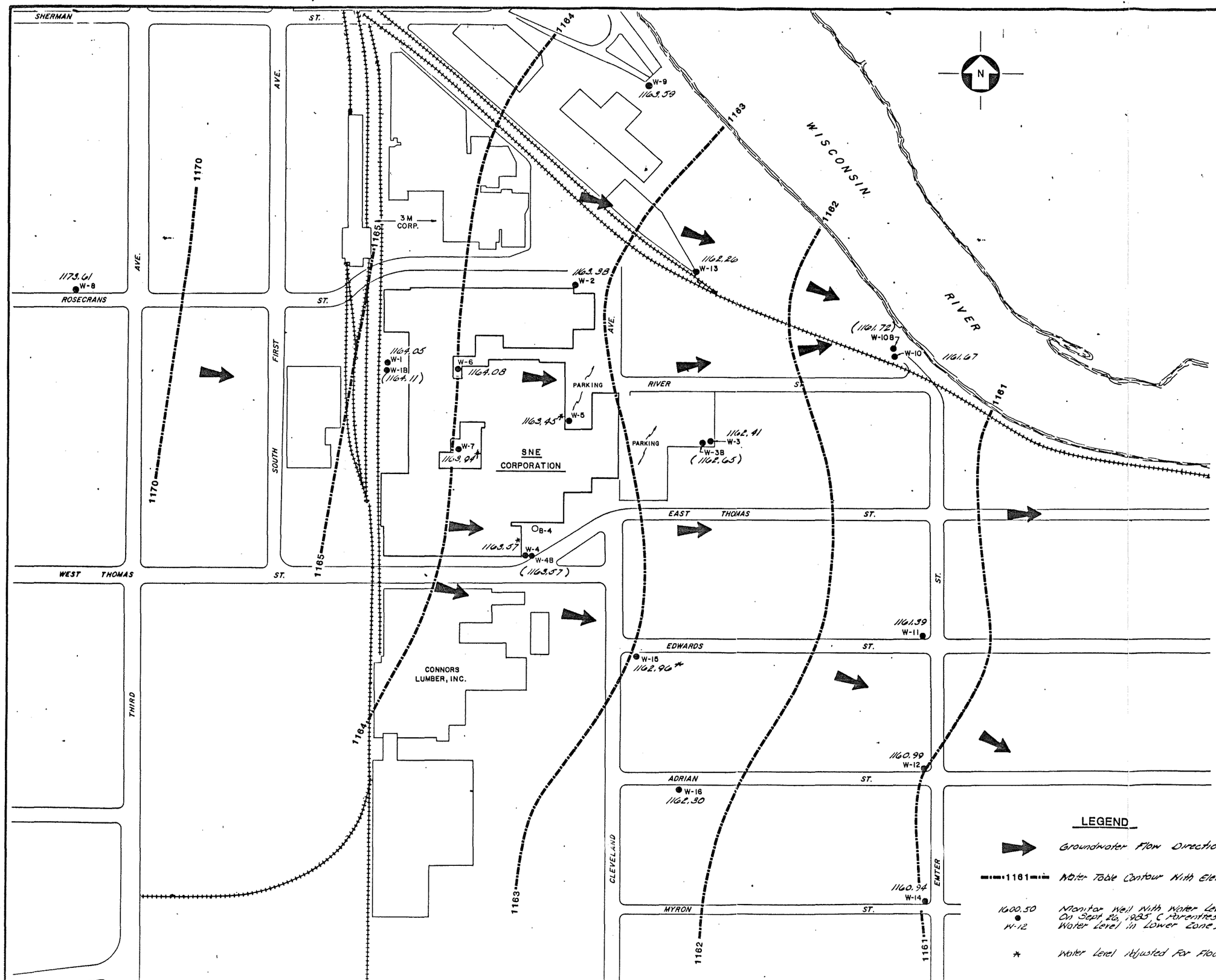
plant site. As shown, bedrock (probably syenite) at SNE is overlain by about 60 to 70 feet of unconsolidated deposits. Figures 7 and 8 show that the upper unconsolidated deposits consist of sand and gravel overlying sandy clay which is in turn underlain by silty clay. Descriptions of geologic samples are presented in Appendix C.

Groundwater Conditions

Water table maps were prepared from water level measurements made on May 25th and September 26, 1985, and are presented on Figures 9 and 10. Water level measurements and measuring point elevations are presented in Appendix D. The September map includes additional measurements made at W-15 and W-16. A comparison of the two maps reveals similar flow patterns except near the Wisconsin River. Above normal rainfall and high River levels in September caused higher groundwater levels along the River and a resultant groundwater flow component more parallel to the River compared to May. The normal range of seasonal water table fluctuations is from lowest levels during February through March to highest levels during April through July. In 1985, groundwater levels were still rising in September as a result of record rainfall amounts through the late summer and fall.

Groundwater flow directions shown on Figure 10 verify a generally easterly flow path from the SNE property to the Wisconsin River. Variations occur near the River as discussed above and southeast of SNE where flow is in a southeasterly direction.

The bulk of groundwater flow occurs in the more permeable near surface sand and gravel, which is shown on the hydrogeologic cross sections (Figures 7 and 8). The average thickness of the sand and gravel is about 35 feet and the lower 10 to 20 feet is saturated. Groundwater flow in the underlying sandy clay and silty clay is much lower than in the sand and gravel due to the lower permeability of these lower zones. The permeability of the sand and gravel is estimated at 10^{-2} cm/sec, compared to 10^{-4} to 10^{-5} cm/sec is estimated for the lower zones.



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

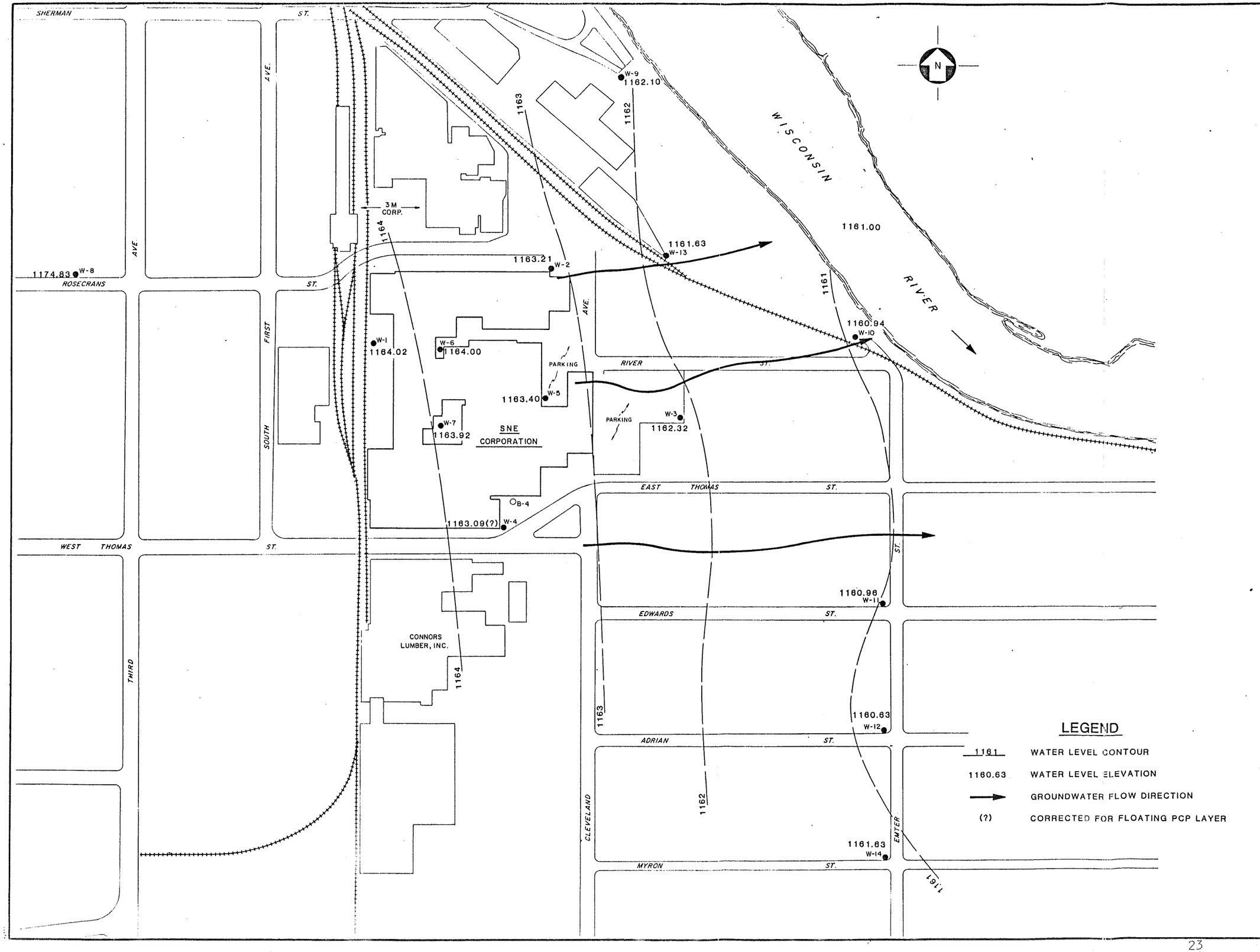
TITLE
WATER-TABLE MAP
9/26/85

eder associates consulting engineers, p.c.
88 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FAD	SCALE 1"=200'
DESIGNED BY N.P.W.	PROJECT Nº 509-1
APPROVED BY LEE	DWG. Nº 10
DATE [illegible]	

LEGEND

- Groundwater Flow Direction
- 1161 — Water Table Contour With Elevation
- 1600.50 / W-12 — Monitor Well With Water Level Elevation On Sept. 26, 1985 (Parentheses Indicates Water Level in Lower Zone)
- * — Water Level Adjusted For Floating Layer



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
PRELIMINARY
WATERTABLE MAP
5/25/85

eder associates consulting engineers, p.c.
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE 1"=800'
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG. Nº 9
DATE	

A groundwater flow velocity for the SNE area may be calculated by the following equation (based on Darcy's Law):

$$\text{Average Velocity} = V = \frac{Kdh/dl}{.20}$$

Where:

K = permeability, ft/day (maximum)
dh = change in hydraulic head, ft
dl = length of flow segment, ft
.20 = effective porosity, 20%

For the SNE area:

K = assumed 28 ft/day (10^{-2} cm/sec)
dh = 2 feet
dl = 800 feet

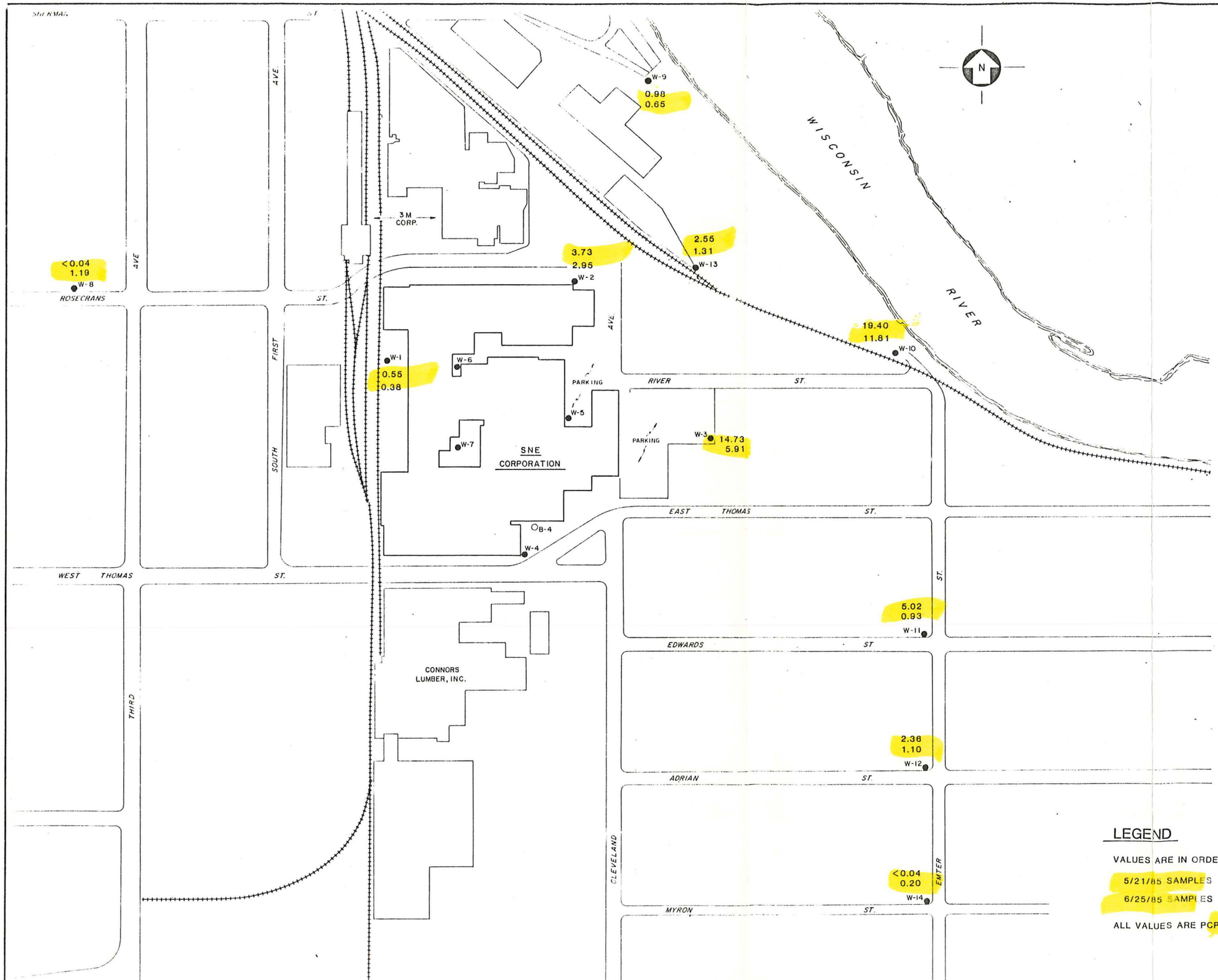
$$V = \frac{(28 \text{ ft/day})(.003)}{0.2}$$

V = 5 inches/day

Groundwater Quality

Dissolved Compounds

Analytical results for PCP are presented in Figures 11 (May and June) and 12 (August), and the results for indicator VOCs are presented in Figures 13 (June) and 14 (August). The complete results of analyses are presented in Appendix E. A comparison of distributions of PCP and VOCs on the four maps reveal that these compounds overlapped in areal distribution and concentration on each of the sampling dates. For example, the highest downgradient concentrations of PCP and TCE (trichloroethylene) are at Monitor Wells



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF
5/21/85 & 6/25/85
PCP ANALYSES

eder associates consulting engineers, p.c
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG Nº 11
DATE	

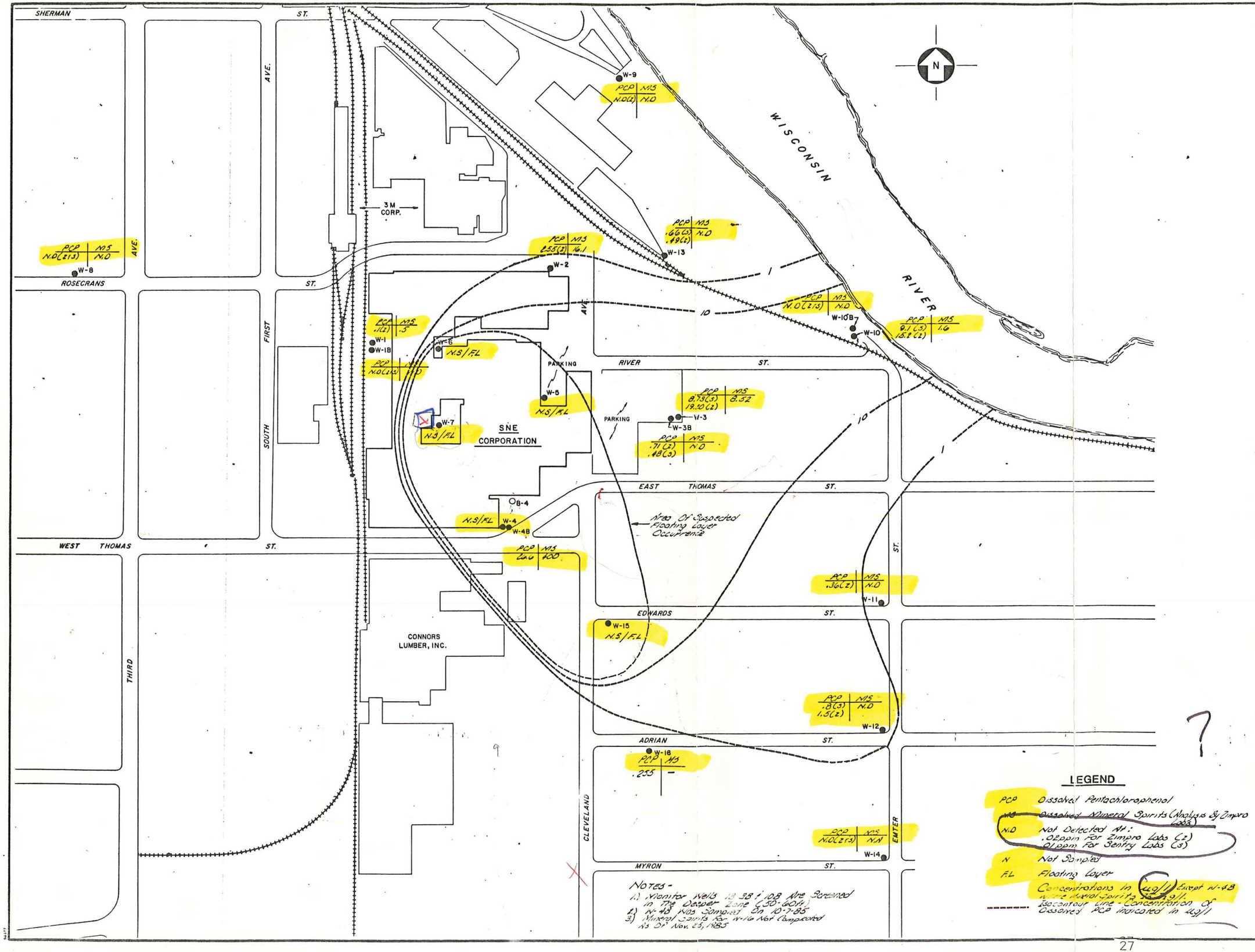
LEGEND

VALUES ARE IN ORDER

5/21/85 SAMPLES

6/25/85 SAMPLES

ALL VALUES ARE PCP IN mg/l



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

LEGEND

PCP — Dissolved Pentachlorophenol

~~NS — Dissolved Mineral Spirits (Analysis By Zimpro Labs)~~

N.D — Not Detected At: .02ppm For Zimpro Labs (2) .01ppm For Sentry Labs (3)

N — Not Sampled

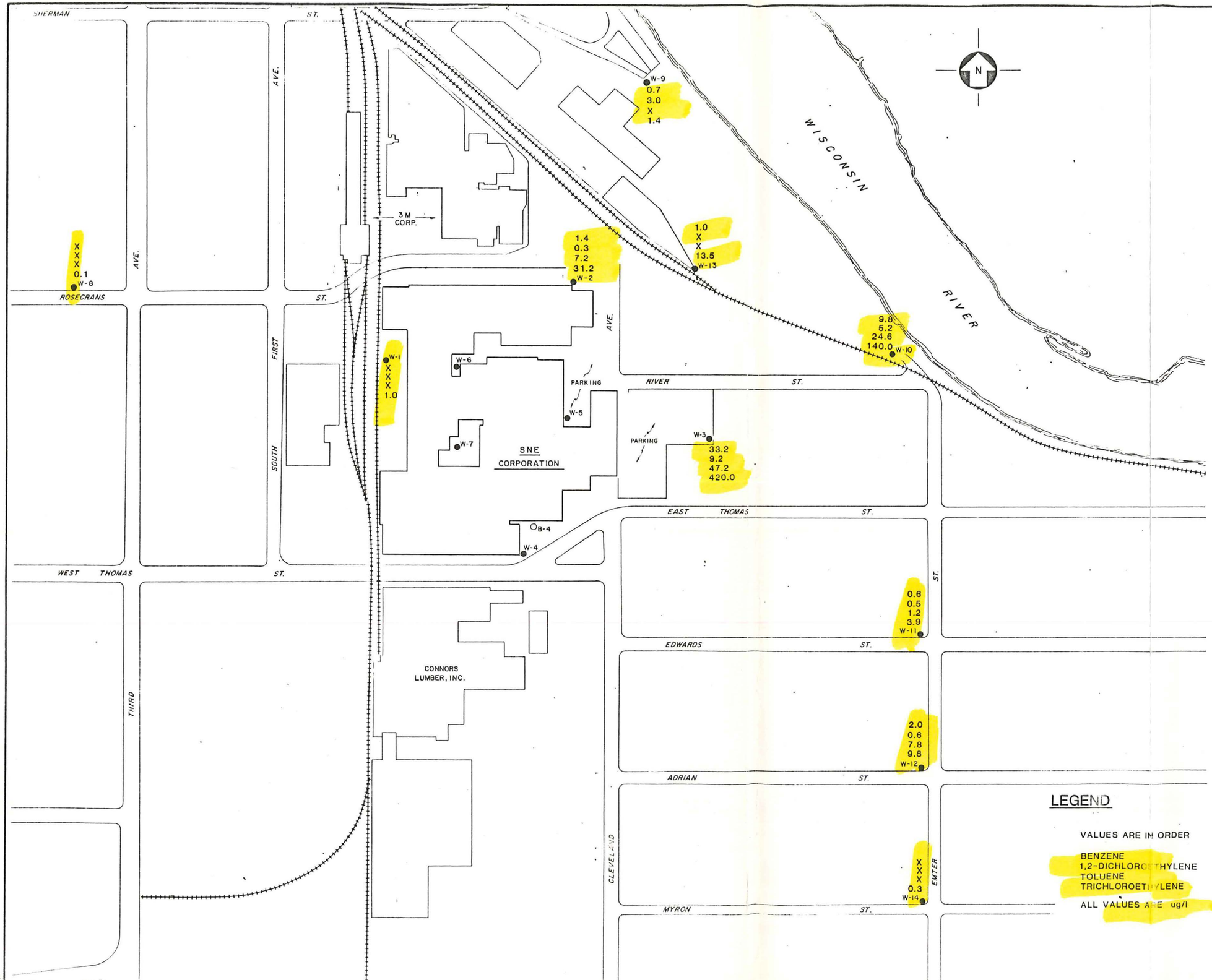
F.L — Floating Layer

Concentrations In ug/l Except W-4B Where Mineral Spirits Are mg/l.

------ Isocontour Line - Concentration Of Dissolved PCP Indicated In ug/l

NOTES -
1.) Monitor Wells W-3B & W-10B Are Screened In The Deeper Zone (30-60ft)
2.) W-4B Was Sampled On 10-7-85
3.) Mineral Spirits For W-16 Not Computed As Of Nov. 25, 1985

PROJECT	GROUNDWATER SAMPLING PROGRAM SNE CORPORATION WAUSAU, WISCONSIN
TITLE	SUMMARY OF 8/16/85 PCP & MINERAL SPIRITS ANALYSES
	eder associates consulting engineers, p.c. 86 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560
DRAWN BY FAD	SCALE 1"=100'
DESIGNED BY NNW	PROJECT Nº 509-1
APPROVED BY JE	DWG. Nº 12
DATE November 1985	



Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION
WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 6/25/85 VOC ANALYSES

eder associates consulting engineers, p.c.
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG Nº 13
DATE	

W-3 and W-10. TCE appears to be the most prevalent VOC detected, both in concentration and distribution in groundwater. Other VOCs, such as benzene and toluene, are found in lower concentrations and in the same monitor wells where PCP and TCE are present.

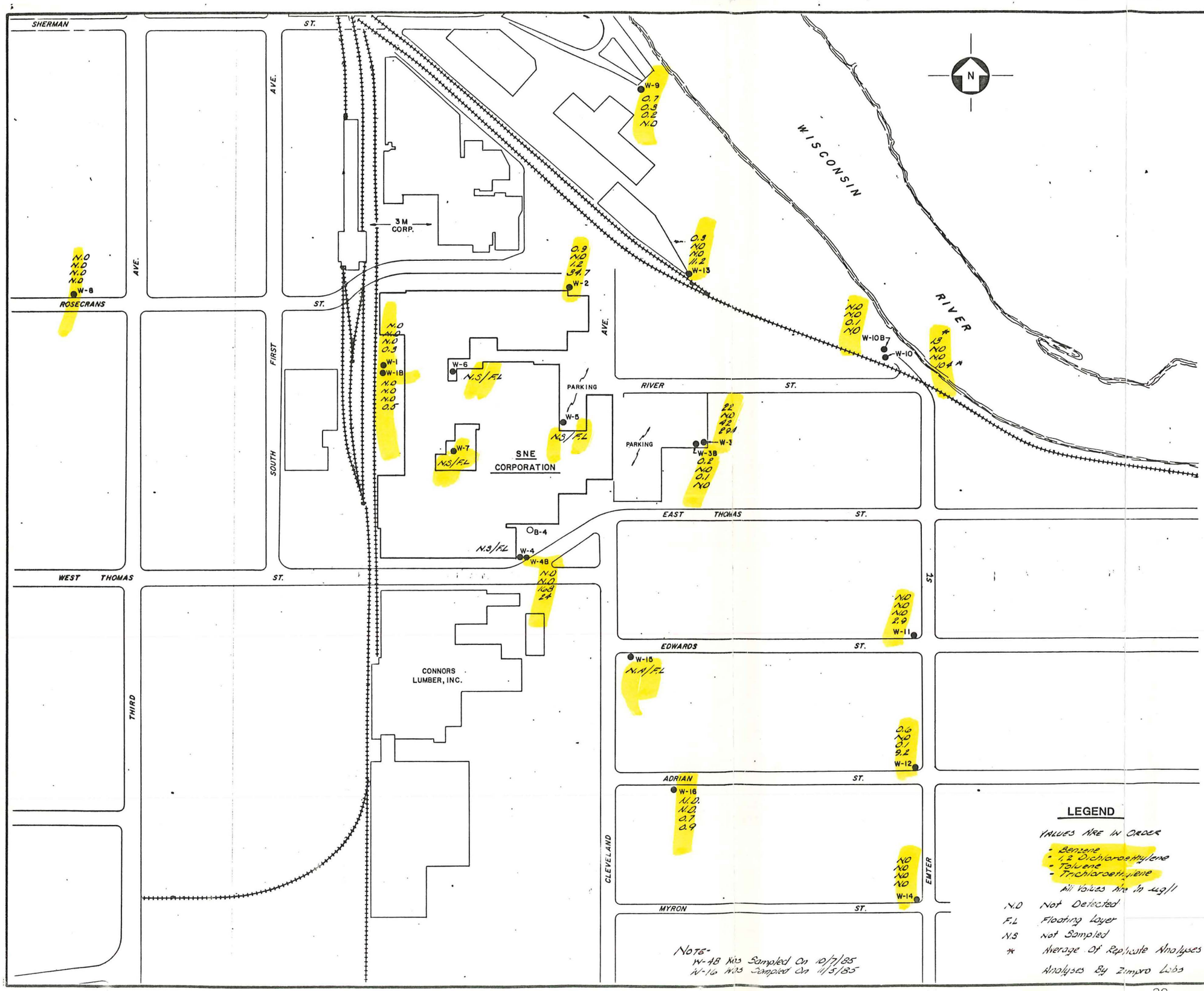
The iso-contour lines on Figure 12 for PCP concentrations illustrate the extent of dissolved PCP in groundwater downgradient of SNE. The iso-contours also define the area where dissolved mineral spirits, TCE, toluene, and benzene are present in groundwater.

The compound 1,2 dichloroethylene was detected only at Monitor Well W-9 and at a concentration at the detection limit (0.3 ug/l). This is in contrast to the analytical results of June 26, 1985, samples, as shown on Figure 13. Concentrations of 1,2 dichloroethylene ranged as high as 9.2 ug/l at W-3 in June 1985, but the August results indicated the disappearance of this compound. Overall, the August monitor well samples contained lower concentrations of VOCs.

Changes in PCP concentrations between June and August indicate overall lower concentrations in August compared to June which were lower than the May results. VOCs were also lower in August than June. Exceptions to this overall downward trend is noted for dissolved PCP concentrations at W-3 and W-10 which appear to be in the primary flow path from SNE to the Wisconsin River.

Samples taken from the lower water table zone in Monitor Wells W-1B, W-3B and W-10B only revealed the presence of PCP and VOCs at W-3B. This monitor well is next to W-3 which contains the highest concentrations of PCP and VOCs gradient of the site.

Replication of samples analyses for PCP revealed consistent results in each laboratory, but showed substantial variation between Parker Services, Inc. and Zimpro, Inc. Neither laboratory failed to detect PCP, if present, although Parker Services consistently reported



NOTE-
W-4B Was Sampled On 10/7/85
W-16 Was Sampled On 11/5/85

LEGEND

VALUES ARE IN ORDER
- Benzene
- 1,2 Dichloroethylene
- Toluene
- Trichloroethylene

All Values Are In ug/l

N.D	Not Detected
F.L	Floating Layer
N.S	Not Sampled
*	Average Of Replicate Analyses

Analyses By Zimpro Labs

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 8/16/85 VOC ANALYSES

eder associates consulting engineers, p.c.
68 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FNO	SCALE 1"=100'
DESIGNED BY NDN	PROJECT Nº 509-1
APPROVED BY LJE	DWG. Nº 14
DATE [illegible]	

Sentry

detected - pcp

(9-9-85)

PARKER SERVICES, INC.

Environmental Health Division

Aug. 16, 1985 = Sample Collection

page 1 of 2

Laboratory Use Only

Client SNE CORP.

Project Number 85-424

Address

Date Received 8-19-85

City State Zip

Date Analyzed 8-21 Analyst Rel

Contact Pat Wiezga Tel.

Data Authorized By Bob Vobrosky

Analytical Request

P.O.#

Analytical Results

Sample No. Well #	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method
1-1,2 W8	PCP	500cc	Pentachlorophenol	4472	BDL	EPA 3510/8040
	Min. Sp.		Mineral Spirits		BDL	
2-1,2 W8	PCP			4473	BDL	
	Min. Sp.				BDL	
5-1,2 W4	PCP			4474	BDL	
	Min. Sp.				BDL	
12-1,2 W12	PCP			4475	0.80	
	Min. Sp.				2.86	
14-1,2 W13	PCP			4476	0.66	
	Min. Sp.				7.14	
16-1,2 W11	PCP			4477	0.33	
	Min. Sp.				2.86	
19-1,2 W10B	PCP			4478	BDL	
	Min. Sp.				BDL	
21-1,2 Dist. H_2O	PCP			4479	BDL	
	Min Sp.				BDL	

Parker Services, Inc.
1800 North Point Dr.
Stevens Point, WI 54481
715 346-7786

.01 = DL(ppm)

White Copy — Client Report
Green Copy — Laboratory File

Sentry.

PARKER SERVICES, INC.

Environmental Health Division

Laboratory Use Only

Client SNE (Eder Associates)

Project Number 85-001-B

Address

Date Received 5-21-85

City State Zip

Date Analyzed 6-20 Analyst BD

Contact Pat Wierzba Tel. 1-845-1161

Data Authorized By Robert Vobornik

Analytical Request / Analytical Results

Sample No	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method	
CS-1	Pentachlorophenol		250 mL Vol.	2059	< 0.04	EPA 8040	
CS-2	"		"	2060	< 0.04		
W-11-1	"		"	2061	0.55	W-11	Wel #
1	"		"	2062	< 0.04		14
2	"		"	2063	< 0.04		14
3	"		"	2064	2.36		12
4	"		"	2065	5.02		11
5	"		"	2066	23.64		10
6	"		150 ml Vol	2067	15.15		6
7	"		250 mL Vol	2068	0.98		9
12	"		"	2069	< 0.04		8
13	"		"	2070	14.73		3
14	"		"	2071	5.82		2
15	"		"	2072	1.64		2
16	"		"	2073	0.55		1
17	"		"	2074	< 0.04		6
18	"		"	2075	< 0.04		11
21			"	2076	2.55		13

Parker Services, Inc.
1800 North Point Dr.

SNE Corp.
VOC Analysis (ug/l)
June 25, 1985

	Detection Limit	1	2	3	4	5
Benzene	0.2	X	1.4	X	33.2	2.0
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	1.5	X	X	X
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	0.4	5.3	0.5	4.5	3.7
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	0.2	X	X	X
1,1-Dichloroethane	0.1	X	X	0.1	0.2	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	0.3	X	9.2	0.6
Dichloromethane	0.2	X	X	X	0.2	X
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.1	1.3	1.8	1.9	1.1
Toluene	0.1	X	7.2	X	47.2	7.8
1,1,1-Trichloroethane	0.1	0.1	0.1	0.3	1.8	0.1
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	0.1	31.2	0.3	420.	9.8
Vinyl Chloride	0.5	0.9	X	0.6	X	X
Zimpro Analytical No.		11508	11509	11510	11511	11512

X = Analyzed but not detected

SNE Corp.
VOC Analysis (ug/l)
June 25, 1985

	Detection Limit	6	7	8	9	10
Benzene	0.2	X	0.6	9.8	0.7	1.0
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	1.6	X	X	X	2.8
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	2.0	0.9	2.7	0.4	3.8
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	0.2	X	X	X	0.3
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	0.6
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	0.5	5.2	3.0	X
Dichloromethane	0.2	X	X	X	X	X
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.4	0.2	1.3	0.1	1.8
Toluene	0.1	X	1.2	24.6	X	X
1,1,1-Trichloroethane	0.1	X	0.1	1.0	0.2	5.6
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	1.0	3.9	140.	1.4	13.5
Vinyl Chloride	0.5	X	X	X	X	X
Zimpro Analytical No.		11513	11514	11515	11516	11517

X = Analyzed but not detected

lower concentrations. For example, Parker Services reported 8.73 ug/l at W-3, while Zimpro reported 19.2 ug/l in the split sample. Averages were used for the PCP iso-contour lines and both values are presented in Appendix E and Figure 12.

Floating Layer

An estimation of the areal extent of the floating layer of penta is presented on the August 16, 1985, PCP and mineral spirits concentrations map (Figure 12). This is only an estimation because the existing monitor wells do not completely define the area where a floating layer may be present. As shown on Figure 12, part of the floating layer is apparently under property owned by Connors' Lumber, Inc. Access to this area is not available at present.

The thickness of floating layers in Monitor Wells W-4, W-5, W-6, W-7 and W-15 (shown on Figures 6 and 7 for September 26, 1985) is not the actual thickness of the floating layer on the water table. This has been well documented by studies and experiments on floating layers on water tables. The reason for this phenomena has been related to depression of the well water level by the incoming floating layer and subsequent filling by the liquid. Capillary action in the small diameter monitor wells may also wick the liquid into the well. The thicknesses of floating layers have fluctuated considerably during the period since installation in May 1985. The changes in thickness can be directly related to rainfall (groundwater recharge) and changing water levels in monitor wells. This phenomena adds to the probability that the actual floating layer thickness on the water table is less than that found in monitor wells. Table 6 contains floating layer thicknesses and water levels measured in monitor wells during the first week of October 1985.

The data in Table 6 indicates that the floating layer in monitor wells is subject to considerable variations under static conditions. Any attempt to quantify the actual thickness of floating penta on the

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WAUSAU, WISCONSIN

TABLE 6

What about earlier samples.

FLOATING LAYER THICKNESS AND WATER LEVEL MEASUREMENTS

OCTOBER 3 to 9, 1985

Monitor Well No.	Beginning Floating Layer	Ending Floating Layer	Beginning Water Level*	Ending Water Level*
W-4	1/2"	1/8"	28'6"	28' ~~1.4~~ 6
W-5	3-1/2"	0"	26'10"	26'7" 3"
W-7	1-1/4"	1/2"	33'1"	32'9" 4"

w. 11's 6, 15 Fl levels?

*Below grade.

why

water table (such as a factor applied to measured layers in wells) would not provide an accurate estimate of the volume of penta. Floating penta in monitor wells may only be used to state the presence of a floating layer on the water table, but not the actual thickness on the water table.

Wisconsin River Quality

Table 7 presents the results of analyses of River water samples collected on September 26, 1985. As indicated, the water samples did not contain detectable (less than 0.02 ppm) amounts of PCP.

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WAUSAU, WISCONSIN

TABLE 7

RESULTS OF WISCONSIN RIVER SAMPLING

SEPTEMBER 26, 1985

(Analyses by Parker Services, Inc.)

Sample No.	PCP (ppm)
RW-1	< 0.02
RW-2	< 0.02
RW-3	< 0.02
RW-4	< 0.02
RW-5	< 0.02
RW-6	< 0.02
RW-7	< 0.02
RW-8	< 0.02

III. DISCUSSION OF RESULTS

Groundwater

The floating layer is found at a depth of about 25 feet (depth to the water table) in the vicinity of the SNE property. The estimated area of the floating penta layer is about 1,000 feet long and 400 feet wide. About one-third of this area lies outside of SNE property to the southeast. As previously noted, the exact thickness of the floating layer cannot be determined and it follows that the total volume of penta on the water table may not be accurately calculated.

The movement of the floating layer is critical to an assessment of the hazard presented to the environment. For example, the discharge of undissolved penta to the Wisconsin River would be hazard to the environment, but a stationery floating layer of penta on groundwater not utilized for supply may not be an environmental hazard.

A review of published reports reveals two points of view on the movement of a floating layer once the driving force has been stopped. One way that the layer may move is by a head differential across the layer. Assuming the layer spreads evenly, this head differential would be the water table gradient. At SNE, this would be about one foot. A second school of thought argues that there is no driving force to make the layer move. This relates to various thicknesses which might be present in the floating layer, possibly compensating for the head differential of the water table slope. In both of these cases, the viscosity of the fluid must be also considered. Penta would not behave like the well documented cases of gasoline floating layers which move readily along the water table. The empirical proof of the floating penta's lack of movement is presented on Figure 12 which shows the current extent of the floating layer of penta. If penta had been spilled on the site for 40 years, then the layer apparently has not moved beyond what may be expected by spreading.

The presence of the layer to the south is probably related to spreading as new penta was spilled and forced the layer out along a path of least resistance (a more permeable zone oriented to the south).

Downgradient of the SNE plant and floating layer, groundwater contains dissolved PCP and mineral spirits. The primary source of these dissolved components is the floating penta. The source of the VOCs in groundwater at and downgradient of SNE is not known. These compounds (such as solvents) are not commonly used in the mill working industry.

The flow of groundwater containing dissolved PCP, mineral spirits and VOCs is along a path which has been defined by the monitor wells (water table map and results of analyses). The groundwater in this flow path moves primarily through the lower 10 to 20 feet of the sand and gravel deposits. The bottom of this zone is defined by the lower permeability sandy clay zone. PCP, mineral spirits and VOCs were not found in the downgradient lower zone monitor wells. Groundwater in both zones discharge to the Wisconsin River which is about 800 feet east of SNE.

Wisconsin River

The absence of detectable concentrations of PCP in the Wisconsin River indicates that the low concentrations of PCP that is discharged (in groundwater) flow is not affecting the quality of the River.

The concentration of PCP anticipated in the Wisconsin River may be calculated based on the total PCP discharged with groundwater and dilution by the River flow. The following calculation factors are maximum concentrations of PCP detected in Monitor Well W-10 (15.2 mg/l) and low flow conditions (10 year, 7 day drought flow) in the River.

Groundwater Discharge: $Q = KA\ dh/dl$

Where:

Q = groundwater discharge, ft^3/day
K = permeability, ft^2/day (maximum)
dh = change in hydraulic head, ft
dl = length of flow segment, ft
A = cross sectional area of flow segment, ft^2

For the SNE site:

K = assumed 28 ft/day (10^{-2} cm/sec)
dh = 2 feet
dl = 1,000 feet
A = 20 feet saturated thickness x 600 feet width of flow zone = 12,000 ft^2 (sand and gravel zone)

And:

$Q = (28\ ft/day)(12{,}000\ ft^2)(.002)$
$Q = 672\ ft^3/day$
or 22,823 liters/day

Daily discharge of PCP to River:

Q,PCP = (22,823 liters/day)(15.2 mg/l)
Q,PCP = 347 grams/day = 4 mg/sec

Dilution by Wisconsin River (1,000 cfs, 7 day Q_{10})

$$\frac{Q,PCP\ (mg/sec)}{River\ flow,\ (l/sec)} = \frac{4\ mg/sec}{33{,}960\ l/sec} = .00012\ mg/l$$

The calculated dilution by River water of PCP discharged in groundwater represents five orders of magnitude decrease in the concentration of PCP detected in the groundwater at the River's edge.

IV. ENVIRONMENTAL ASSESSMENT

Characteristics of Penta

Penta has a specific gravity of 0.79 and is immiscible with, and only very slightly soluble in, water. PCP (5% of penta) is a solid at room temperature and has a specific gravity of 1.9. It is highly soluble in mineral spirits, and relatively insoluble in water (80 mg/l).

The chemical processes commonly used for PCP production consists of chlorination of phenol to yield isomers of tri- and tetrachlorophenol. Second stage chlorination yields pentachlorophenol (PCP). Normally, the reaction is not complete and tri- and tetrachlorophenols remain in the product. The reported amount of the precursor compounds is from 4% to 12%. The second stage of processing also yields hexa, hepta, octachlorodibenzo-p-dioxins and dibenzofurans by the condensation of tri- and tetrachlorophenols. United States (USEPA) research on the dioxins in PCP revealed that the extremely toxic 2,3,7,8 isomer is not present.

PCP has been shown to be absorbed by most soil types, especially acidic soils containing organic matter. PCP is biodegradable by microbiological activity in the soil. Bacteria and fungi have been isolated which use PCP as a sole source of carbon. The persistence of PCP in soils reportedly ranges from 21 days to five years depending on the microbiological activity.

Standards for Penta Exposure

At present, there is no known human exposure to undissolved or dissolved penta in groundwater at SNE. That is, there are no known wells in the SNE area where there is a floating layer or downgradient

between SNE and the Wisconsin River. Therefore, the following discussion is presented for reference on possible health effects if groundwater containing PCP was consumed, and based on the assumption that there are no illegal wells.

The presence of the floating layer under houses on Cleveland Avenue presents the possibility of exposure to airborne PCP in a nonoccupational setting and this will be discussed.

There are no regulations specifying the maximum permissable concentrations of PCP in drinking water established by either the USEPA or the Wisconsin DNR. The USEPA has established a risk criteria of 1 mg/l relating to teratogenic/fetotoxic effects based on toxicity data. The National Academy of Science/National Research Council has suggested a no adverse impact level (SNARL) of .021 mg/l. The State of New York standards for groundwater (drinking water) also specifies a limit of .021 mg/l. Water containing .03 mg/l PCP exhibits detectable taste and odor.

Exposure to airborne PCP has been documented in case studies in which penta or penta-treated wood were used indoors. There were several cases in California where human illness was associated with the use of penta indoors. In these cases, penta concentrations in the air ranged from 0.5 to 30 ug/m^3.

Discussion

Based on these data and the presence of penta in groundwater at and near SNE, there appears to be no imminent hazard to human health by ingestion of PCP. The absence of PCP in the Wisconsin River water samples and the calculated dilution indicate that the discharge of PCP in groundwater along the River bank will not harm aquatic life or be a hazard to human contact with, or by ingestion of, River water. Additionally, the floating layer of penta on the water table has not exhibited movement.

The matter of PCP vapors rising from the floating layer (through 15 feet of subsoils) will be assessed. It is noted that the low odor threshold of .03 mg/l for PCP dissolved in water indicates that the presence of excessive concentrations in the air should be noticeable. The term excessive is used because there may be other sources of PCP in these houses if, for example, the structural wood has been treated with a fungicide containing PCP; or if a penta product, such as Woodtox, is stored in basement storage area. Penta would not be considered extremely volatile and has a high boiling plant when compared to volatile formulations such as gasoline.

V. ANALYSIS OF REMEDIAL ALTERNATIVES

Based on the information collected during the study, the following courses of action should be evaluated in detail to allow selection of the most environmentally sound and cost-effective solution to the problem.

1. Monitoring and Natural Attenuation In-Place

   Under this alternative, a series of additional monitor wells would be installed and sampled periodically to keep track of both the floating and dissolved compounds of the PCP plume over time. Provided that the dissolved plume did not shift direction or that the floating component did not migrate towards the River, the PCP would be allowed to naturally attenuate and biodegrade to background levels in-place.

2. Continued Passive Floating Layer Removal

   This alternative, intended as a supplement to Alternative 1, would continue efforts at floating layer removal through bailing at existing wells and new wells at locations currently not accessible, such as the Connors' property, in the early spring when the water table stabilizes.

3. Installation of One or More Depression Pump/Skimming Systems to Attempt to Accelerate the Rate of Floating Layer Removal - This Alternative has Several Severe Practical Limitations, such as:

   (a) Treatability of the groundwater using carbon adsorption technology must be confirmed. Bench scale carbon isotherm testing to confirm process design criteria is currently underway.

(b) The collected penta-groundwater mixture and the spent carbon used to treat the groundwater would have to be stored for ultimate disposal some time in the future. There is currently no disposal facility in the United States licensed to dispose of PCP wastes.

(c) Treated groundwater would have to be discharged to the City of Wausau municipal sewage treatment plant in accordance with newly issued EPA pretreatment standards. An unnoticed PCP breakthrough at the carbon treatment system could cause contamination of the City's waste sludge.

The environmental consequences, ultimate disposal problems, potential social benefits, capital and operating costs, and potential long-term liability of each should be fully evaluated before a final decision is reached.

APPENDIX A

MONITOR WELL SAMPLING PROTOCOL

AND COMPLETED CHAIN OF CUSTODY FORMS

SNE CORPORATION
WAUSAU, WISCONSIN

MONITOR WELL SAMPLING PROTOCOL

1. Unlock the protective well cap.

2. Measure depth to water below top of PVC casing at reference point. Record monitor well number and water level measurement in log book (to the nearest .01 foot).

3. Calculate standing water as follows:
   (well depth*-water depth) x .16 gals/ft. x 3
   - gallons of water to be bailed
   *Well depths are given in the attached table.

4. Place new plastic sheeting around the well.

5. Evacuate three well volumes of water (as calculated above) using a clean teflon bailer and heavy cotton rope.

6. Remove a bailer of water from the well and fill a 500 ml. glass sample bottle from the bailer. Seal the cap with plastic tape.

7. Immediately label sample with date, time, sample identification number, and collector's initials. Place sample in refrigerated storage.

8. Remove one bailer of water from the well and carry out tests for temperature, specific conductance, and pH. Record measurements in log book.

9. Lock the protective well cap.

10. Deliver sample to laboratory within 24 hours of collection while maintaining chain custody forms and sample security.

SNE CORPORATION

WAUSAU, WISCONSIN

SAMPLING SPLITTING PROCEDURES (SENTRY & ZIMPRO LABS)

(1) After well evacuation (item 5 on the monitor well sampling protocol), remove a sufficient volume of water to fill all sample bottles and pour into a suitable glass intermediate container.

(2) Pour water samples directly from the intermediate glass container into the sample bottles and seal the bottles with plastic tape.

(3) Resume sampling procedure at item 7 of the protocol.

(4) Thoroughly clean the intermediate container prior to sampling the next monitor well.

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground Water

Parker Services, Inc.

CONTAINER	FIELD COLLECTED	FIELD INITIAL	TRANSPORT RECEIVED	TRANSPORT INITIAL	LABORATORY RECEIVED	LABORATORY INITIAL	ANALYSIS	INITIAL
1-1	6-25	PJW	6-25	PJW	6-25	DG	7-9	R.V.
1-2	"	PJW	"	PJW	"	DG	7-9	R.V.
2-1	"	PJW	"	PJW	"	DG	7-9	R.V.
2-2	"	PJW	"	PJW	"	DG	7-9	R.V.
3-1	"	PJW	"	PJW	"	DG	7-9	R.V.
3-2	"	PJW	"	PJW	"	DG	7-9	R.V.
4-1	"	PJW	"	PJW	"	DG	7-9	R.V.
4-2	"	PJW	"	PJW	"	DG	7-9	R.V.
5-1	"	PJW	"	PJW	"	DG	7-9	R.V.
5-2	"	PJW	"	PJW	"	DG	7-9	R.V.
6-1	"	PJW	"	PJW	"	DG	7-9	R.V.
6-2	"	PJW	"	PJW	"	DG	7-10	R.V.
7-1	"	PJW	"	PJW	"	DG	7-10	R.V.
7-2	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground Water

Parker Services, Inc.

	FIELD		TRANSPORT		LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
① 1-1	8-16-85	PJW	8-16-85	PJW	8-16-85	DG	8-19-85	R.C.V.
1-2	"	PJW	"	PJW	"	DG		
② 2-1	"	PJW	"	PJW	"	DG	8-19-85	R.C.V.
2-2	"	PJW	"	PJW	"	DG		
③ 5-1	"	PJW	"	PJW	"	DG	8-19-85	R.C.V.
5-2	"	PJW	"	PJW	"	DG		
④ 24-1	"	PJW	"	PJW	"	DG	8-19-85	R.C.V.
24-2	"	PJW	"	PJW	"	DG		
⑤ 22-1	"	PJW	"	PJW	"	DG	8-20-85	R.C.V.
22-2	"	PJW	"	PJW	"	DG		
⑥ 12-1	"	PJW	"	PJW	"	DG	8-20-85	R.C.V.
12-2	"	PJW	"	PJW	"	DG		

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground Water

Parker Services, Inc.

		FIELD		TRANSPORT		LABORATORY			
	CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
7	16-1	8-16-85	PJW	8-16-85	PJW	8-16-85	DG	8-20-85	R.C.V.
	16-2	"	PJW	"	PJW	"	DG		
8	26-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
	26-2	"	PJW	"	PJW	"	DG		
9	27-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
	27-2	"	PJW	"	PJW	"	DG		
10	19-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
	19-2	"	PJW	"	PJW	"	DG		
11	14-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
	14-2	"	PJW	"	PJW	"	DG		
12	21-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
	21-2	"	PJW	"	PJW	"	DG		

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground Water

	FIELD		TRANSPORT		Zimpro, Inc. LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
3-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
3-2	"	PJW	"	PJW				
3-3	"	PJW	"	PJW				
4-1	"	PJW	"	PJW				
4-2	"	PJW	"	PJW				
4-3	"	PJW	"	PJW				
18-1	"	PJW	"	PJW				
18-2	"	PJW	"	PJW				
18-3	"	PJW	"	PJW				
6-1	"	PJW	"	PJW				
6-2	"	PJW	"	PJW				
6-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground water

	FIELD		TRANSPORT		Zimpro, Inc. LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
28-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
28-2	"	PJW	"	PJW				
28-3	"	PJW	"	PJW				
29-1	"	PJW	"	PJW				
29-2	"	PJW	"	PJW				
29-3	"	PJW	"	PJW				
20-1	"	PJW	"	PJW				
20-2	"	PJW	"	PJW				
20-3	"	PJW	"	PJW				
11-1	"	PJW	"	PJW				
11-2	"	PJW	"	PJW				
11-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Grand water

	FIELD		TRANSPORT		Zympro, Inc. LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
7-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
7-2	"	PJW	"	PJW				
7-3	"	PJW	"	PJW				
25-1	"	PJW	"	PJW				
25-2	"	PJW	"	PJW				
25-3	"	PJW	"	PJW				
23-1	"	PJW	"	PJW				
23-2	"	PJW	"	PJW				
23-3	"	PJW	"	PJW				
13-1	"	PJW	"	PJW				
13-2	"	PJW	"	PJW				
13-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground water

	FIELD		TRANSPORT		Zimpro, Inc. LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
15-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
15-2	"	PJW	"	PJW				
15-3	"	PJW	"	PJW				
30-1	8-17-85	PJW	"	PJW				
30-2	"	PJW	"	PJW				
30-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Groundwater

	FIELD		TRANSPORT		Zimpro, Inc. LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
10-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
10-2	"	PJW	"	PJW				
10-3	"	PJW	"	PJW				
8-1	"	PJW	"	PJW				
8-2	"	PJW	"	PJW				
8-3	"	PJW	"	PJW				
9-1	"	PJW	"	PJW				
9-2	"	PJW	"	PJW				
9-3	"	PJW	"	PJW				
17-1	"	PJW	"	PJW				
17-2	"	PJW	"	PJW				
17-3	"	PJW	"	PJW				

REQ FOR
- PCP
- MINERAL SPARETS
- V.O.C.'s

CHAIN OF CUSTODY LOG
SNE CORPORATION

Zympo, Inc.

SAMPLE IDENTIFICATION	FIELD DATE COLLECTED	FIELD INITIAL	TRANSPORT DATE RECEIVED	TRANSPORT INITIAL	LABORATORY DATE RECEIVED	LABORATORY INITIAL	DATE ANALYZED	INITIAL
4(1)6	10-7-85	PJW	10-7-85	PJW	10-7-85	SB.		
4(2)6	10-7-85	PJW	"	PJW	10-7-85	SB		
4(3)6	10-7-85	PJW	"	PJW	10-7-85	SB		

APPENDIX B

ANALYTICAL METHODS AND PROTOCOLS

Bill Ham

ZIMPRO INC.

ENGINEERING & CONTROL SYSTEMS

July 8, 1985

Mr. Pat Wierzba
SNE Corp.
910 Cleveland Ave.
Wausua, WI 54401

Dear Mr. Wierzba:

Attached are the VOC results for the samples you submitted June 26, 1985. The samples were analyzed according to EPA method 601. PID (10.2 eV) and Hall detectors in series were used for identification and quantitation of the compounds present.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie

Mary C. Christie
Instrumentation Chemist

MCC/ls

cc: J.W. Barr
J.R. Salkowski

Sentry®

PARKER SERVICES, INC.

Risk Management Services

RECEIVED AT EA
AUG 01 1985
FILE NO.
LJE FHI
SJO GAR
WJC
OTHER

July 29, 1985

Bill Warren
Eder Associates
85 Forest Avenue
Locust Valley, NY 11560

ANALYTICAL PROTOCOL - PENTACHLOROPHENOL

The enclosed information describes the sample handling procedure used by Parker Services, Inc. with regard to analyzing the SNE well water samples for pentachlorophenol. The analytical protocol describes the sample preservation, sample extraction, sample analysis, and quality control of the analysis of pentachlorophenol in our laboratory.

If you have any questions concerning pentachlorophenol analyses, please do not hesitate to call.

Robert C. Voborsky

Robert C. Voborsky, CIH
Industrial Hygiene Laboratory Supervisor

RCV:ljl

Environmental Health Division
1800 North Point Drive
Stevens Point, WI 54481

715 346 7786

Sentry®

PARKER
SERVICES, INC.

Risk Management Services

SAMPLE HANDLING PROCEDURE - SNE CORPORATION

Water samples are collected in Wheaton glass bottles with a teflon seal and transported to the Parker Services, Inc, (PSI) Laboratory the day of collection. The SNE Corporation Chain of Custody Log accompanies each set of samples. The Chain of Custody Log is signed and dated by the person(s) collecting, transporting, receiving, and analyzing the samples.

ANALYTICAL PROTOCOL - PARKER SERVICES, INC.

I. Sample Preservation

The samples are entered in the laboratory log and assigned a sample number and analyte designation which is pentachlorophenol. Each sample is checked for pH and is acidified with 1 to 1 Sulfuric Acid to a pH equalling 2, and immediately refrigerated at 44° F.

II. Sample Extraction

Samples are extracted with Baker-"Resi Analyzed" grade Methylene Chloride, according to EPA Method 3510 - SEPARATORY FUNNEL LIQUID - LIQUID EXTRACTION.

III. Sample Analysis

The extracted samples are analyzed by Gas Chromatography, with Flame Ionization Detection (Perkin-Elmer Model SIGMA-3B). The samples are analyzed according to EPA Method 8040 "Phenols". The analytical column used for separation of pentachlorophenol is a 6' x 2 millimeter glass column packed with SP-1240-DA on Supelcoport 80/100.

Environmental Health Division
1800 North Point Drive
Stevens Point, WI 54481

715 346 7786

IV. Quality Control

A reagent blank accompanies each set of samples submitted to the laboratory for analysis. During the extraction phase, a spike containing a known amount of PCP is processed, along with field samples. The gas chromatograph is calibrated with a series of dilutions of a PCP standard purchased from Supelco, Inc. (Standard #4-8692, Lot #LA-12639, 500 µg/ml). The detection limit for the analytical procedure is 1 µg/ml of extracted sample. The overall detection limit varies, depending upon the total amount of water sample submitted for analysis (Example - 0.02 PPM for 500 ml water sample).

ZIMPRO INC.
A SUBSIDIARY OF STERLING DRUG INC.
POLLUTION CONTROL SYSTEMS

RECEIVED AT EA
OCT 09 1985
FILE NO.
LJE FHI
SJO GAR
WJC
OTHER BW

October 7, 1985

Mr. Pat Wierzba
SNE Corportion
910 Cleveland Ave.
Wausau, WI 54401

Dear Pat:

Attached are the results for the monitoring well samples collected on August 16, 1985. The VOC results were determined using EPA Method 601 with PID (9.5 eV) and Hall detectors in series. Due to interferences, a few samples (25, 28, and 29) had to be diluted with organic free water before analysis. This dilution changed the VOC detection limits and are so noted in their respective tables. The interferences also prevented quantitation toluene and ethylbenzene in a few cases.

Pentachlorophenol was determined by HPLC using a UV detector at 303 nm. Samples were concentrated with a C_{18} Sep Pak cartridge prior to analysis. The mineral spirits were extracted with methylene chloride solvent and concentrated. A gas chromatograph equipped with an FID detector was used quantitate the mineral spirits. Quantitation of the mineral spirits was based upon an average of several peaks since it is composed of several compounds.

There were three samples (10, 28, and 29) where the identification of mineral spirits was somewhat questionable. The profile of these samples appeared to be somewhat different from the mineral spirits detected in samples 18 and 25. This difference may be a result of stratification or decomposition of the mineral spirits. A more likely possibility is contamination due to a different source. The three samples in question were quantitated as mineral spirits in order to give you an idea of the contamination levels.

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359 7211 TELEX 29 0495

If you have any questions concerning these results, please give me a call.

Sincerely,

ZIMPRO INC.

David L. Schumacher
Instrumentation Chemist

DLS/ls

cc: J.W. Barr
J.R. Salkowski
Bill Warren - Edder Associates

APPENDIX C

DESCRIPTIONS OF GEOLOGIC SAMPLES

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. 1
Surface Elevation
Job No. C 810433
Sheet 1 of 2

1402 EMIL STREET • P.O. BOX 9404 MADISON, WIS. 53715 • TEL • (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Recovery ↓	Moisture ↓	N	Depth		q_u	W	LL	PL	D
						2" ASPHALT					
						6" Black Fine to Medium SAND and GRAVEL					
						Brown Fine to Medium SAND and GRAVEL, Trace Silt					
1	SS	X	M	59	5						
						Less Silt					
2	SS	X	M	34	10						
3	SS	X	M	19	15						
						Less Gravel					
4	SS	X	M	27	20						
						More Gravel					
5	SS	X	M	41	25						
6	SS	X	W	41	30						
						Sand in Auger 1.5' Decided to Auger to 45' Pull Back 3' Drive Out Plug					
					35						
					40						
					45						

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausua, Wisconsin

Boring No. 1
Surface Elevation
Job No. C 810433
Sheet 2 of 2

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
		Recovery	Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
						Brown Fine to Medium SAND and GRAVEL, Trace Silt					
					50	End Boring at 50'					
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling 30'
Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave In

GENERAL NOTES

Start 12/19/84 Complete 12/19/84
Crew Chief JHR Rig 9120
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No.: W-2
Surface Elevation:
Job No.: C 810433
Sheet 1 of 2

1402 EMIL STREET • P.O. BOX 9404 MADISON, WIS. 53715 • TEL • (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Recovery	Moisture	N	Depth		qu	W	LL	PL	B
						ASPHALT					
						Rotten GRANITE (FILL)					
						Dark Brown Silty Coarse to Fine SAND with Gravel (FILL					
1	SS	X	M	48	5	CONCRETE FILL					
						Dark Brown SAND, Very Coarse to Medium with Gravel & Cobbles (FILL)					
2	SS	X	M	50	10						
						Brown Coarse to Fine SAND, Trace Silt, Trace Gravel					
3	SS	X	M	24	15						
4	SS	X	M	71	20	Brown Coarse to Fine SAND Trace Silt with Gravel					
5	SS	X	M	64	25						
6	SS	X	W	148	30						
						*					
						Brown Very Coarse to Fine SAND, Some Silt with Gravel					
					35						
						*Black Very Coarse to Medium SAND with Gravel					
					40						
						Well at 43'					
					45						
						End Boring at 45'					

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No.: W-2
Surface Elevation:
Job No.: C 810433
Sheet: 2 of 2

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
		Recovery	Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
					50						
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling
Depth to Water

GENERAL NOTES

Start 12/19/84 Complete 12/19/84
Crew Chief RL Rig 45-C
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No.: W-3
Surface Elevation:
Job No.: C 810433
Sheet: 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qu	W	LL	PL	D
						ASPHALT					
1	SS	X	M	19	5	Dark Brown Coarse to Fine SAND, SomeSilt with Cobbles and Gravel Fill					
2	SS	X	M	27	10	Brown, Coarse to Fine SAND, Trace Silt, Occasional Gravel					
3	SS	X	M	41	15						
4	SS	X	M	40	20						
5	SS	X	W	41	25						
					30						
					35	Well at 37'					
						Brown Clayey Silty SAND with Some Clay					
					40	End Boring at 40'					

WATER LEVEL OBSERVATIONS

While Drilling: 25'
Upon Completion of Drilling:
Time After Drilling: 1/4 hour
Depth to Water: 25'
Depth to Cave In:

GENERAL NOTES

Start: 12/20/84 Complete: 12/20/84
Crew Chief: RL Rig: 45-C
Drilling Method:

W-1

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. 4
Surface Elevation
Job No. C 810433
Sheet 1 of 2

1402 EMIL STREET • P.O. BOX 9404 MADISON, WIS. 53715 • TEL • (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
No.	Type	Recovery ↓	Moisture ↓	N	Depth		q_u	W	LL	PL	D
						2" ASPHALT					
						6" GRAVEL					
						12" Black Fine to Medium SAND					
1	SS	X	M	17	5	Brown Fine to Medium SAND and GRAVEL, Trace Silt					
2	SS	X	M	60	10						
3	SS	X	M	49	15						
4	SS	X	M	29	20						
5	SS	X	M	41	25						
6	SS	X	W	54	30						
7	SS	X	W	81/6"	35						
					40	Install Well at 40'					
						Dense CLAY					
					45	End Boring at 45'					

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. 4
Surface Elevation
Job No. C 810433
Sheet 2 of 2

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
					50						
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling 28'
Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave In

GENERAL NOTES

Start 12/20/84 Complete 12/20/84
Crew Chief JHR Rig Bomb
Drilling Method

SNE CORPORATION
Wausau, Wisconsin

Descriptive Logs

W-5

Sample No.	Depth Interval	Description
1	2 - 3.5	Sand & gravel, fine to medium, clayey; pebbles brown to dark brown, staining (fill).
2	5 - 6.5	Sand & gravel, as above, tan; pebbles.
3	10-11.5	Sand & gravel; sand, medium, (uniform), tan
4	15-16.5	As above
6 (2 samples)	25-26.5	As above, coarser, orange-tan
7	30-31.5	As above, silty (pcp odor)
8	35-36.5	As above; clay, silty, dense, with gravel, tan (pep odor)
9	40-41.5	Clay, as above (very slight or no pcp odor)

Descriptive Logs

W-6

Sample No.	Depth Interval	Description
1	1-2.5	Sand & gravel fill and asphalt
2	5-6.5	Sand & gravel medium-uniform, tan; pebbles
3	10-11.5	Sand, medium-uniform, tan
4	15-16.5	As above; gravel, trace
5(6)	20-21.5	Sand & gravel, fine csc, brown; pebbles
7	25-26.5	Sand, medium-uniform, tan; pebbles; silty clay, brown trace
8	35-36.5	Sand & gravel, fine csc, brown; pebbles silty (pcp odor)
9	40-41.5	As above (pcp odor, less)
10	45-46.5	As above; clayey; (pcp odor, less)

Descriptive Logs

W-7

Sample No.	Depth Interval	Description
	no sample 1-3	
4	15-16.5	Sand & gravel, fine tan to brown; pebbles
5	20-21.5	Sand, fine, tan
6	25-26.5	Sand & gravel, fine csc, orange-brown
7	30-31.5	As above; silty; pebbles
8	35-36.5	Sand, fine-coarse, tan-brown (pcp odor)
9	40-41.5	Clay, silty, with gravel, dense, tan (slight or no pcp odor)
10	45-46.5	Sand & gravel, fine-coarse, silty orange-brown (no pcp odor)

Descriptive Logs

W-8

Sample No.	Depth Interval	Description
1	5-6.5	Sand, fine, tan; silt brown, trace; pebbles
	no sample number 2	
3	15-16.5	Sand & gravel, medium-coarse, brown; pebbles
4	20-21.5	Sand, fine-medium, tan-brown
5	25-26.5	Sand, fine, tan
6	30-31.5	Sand & gravel, medium-coarse, brown; clay, brown, silty with fine gravel, dense
7	35-36.5	As above
8	40-41.5	Sand & gravel, as above; clay, as above, trace

Descriptive Logs

W-9

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-medium, tan; pebbles
2	10-11.5	Sand & gravel, fine-coarse, silty, red-brown
3	15-16.5	As above, clayey
4	20-21.5	As above, no clay, silty

Descriptive Logs

W-10

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarser, tan, pebbles
2	10-11.5	As above, coarser
3	15-16.5	As above, iron staining
4	20-21.5	As above; silty
5	25-26.5	As above

Descriptive Logs

W-11

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarse, tan
2	10-11.5	As above
3	15-16.5	As above, iron stained
4	20-21.5	As above, brown, less staining

Descriptive Logs

W-12

Sample No.	Depth Interval	Description
	no sample number 1	
2	10-11.5	Sand & gravel, fine-coarse, dark brown; pebbles
3	15-16.5	As above, silty iron, stained
4	20-21.5	As above, tan-red

Descriptive Logs

W-13

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarse, silty, dark brown; pebbles
2	10-11.5	Sand & gravel, fine-coarse, tan-red; sand, medium-unif, red-tan; pebbles
3	15-16.5	As above, iron stained
4	20-21.5	As above
5	25-26.5	As above, silty
6	30-31.5	As above
7	35-36.5	As above

Descriptive Logs

W-14

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarse, silty iron stained; pebbles
2	10-11.5	As above, dark brown, no staining
3	15-16.5	Sand, fine-coarse, iron stained
4	20-21.5	Sand & gravel, medium-coarse, iron stained

Descriptive Logs

W-15

Sample No.	Depth Interval	Description
1	5-6.5	Sand, fine, brown; and gravel (fill)
2	10-11.5	Sand, fine-medium, tan
3	15-16.5	No recovery
4	20-21.5	Sand, fine-medium, tan; and pebbles
5	25-26.5	Sand, fine-coarse, dark brown; and pebbles (lower 4" black stained, PCP odor)
6	30-31.5	Sand and gravel, fine-coarse; and pebbles (iron stained, PCP odor)
7	35-36.5	Sand and gravel, coarse; and clay (bottom 4" of sample)

W-16

Sample No.	Depth Interval	Description
1	5-6.5	Sand, fine-coarse, brown; and gravel, trace
2	10-11.5	Sand and gravel, coarse, tan
3	15-16.5	Same as above
4	20-21.5	Same
5	25-26.5	Same
6	30-31.5	Clay, sandy, brown, with gravel

Descriptive Logs

W-1B

Sample No.	Depth Interval	Description
(See boring log for W-1 for 0-50 feet descriptions)		
1	45-46.5	Sand, fine-coarse, silty, brown
2	50-51.5	As above, dense, trace clay
3	55-56.5	No recovery

Bedrock at 58 feet = Syenite

W-3B

Sample No.	Depth Interval	Description
(See boring log for W-3 for 0-40 feet descriptions)		
1	45-46.5	Sand, fine, clayey, tan; and clayey sand and gravel
2	50-51.5	Clay, silty-sandy, brown, compact
3	55-56.5	Clay, gray, compact

No sample at 60 and 65 feet, still in clay and peat

4	70-71.5	Clay, sandy, gray; and clay, gravelly (hard pan)

Descriptive Logs

W-10B

Sample No.	Depth Interval	Description
(See sample descriptions for W-10 for 0 to 26.5 feet descriptions)		
1	40-41.5	No recovery (clay)
2	42-43.5	Clay, tan; and sand, medium, tan
3	50-51.5	Clay, tan, sandy
4	55-56.5	Sand, fine-medium, tan; and clay, layers, tan
5	60-61.5	Clay, silty, gray, dense, and clay,
6	65-66.5	Clay, silty, gray; and peat, 6" layer

APPENDIX D

WATER LEVEL MEASUREMENTS AND ELEVATIONS

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 1

WATER LEVEL ELEVATIONS

SNE MONITOR WELLS

SEPTEMBER 26, 1985

Well No.	Depth to Water[1]	Elevation of Measured Point[2]	Water Level Elevations[2]
W-1A	29.98	1194.03	1164.05
W-1B	30.70	1194.81	1164.11
W-2	30.08	1193.46	1163.38
W-3A	25.30	1187.71	1162.41
W-3B	25.10	1187.75	1162.65
W-4	28.74	1192.27	1163.53
W-5	27.07	1190.60	1163.53
W-6	29.27	1193.35	1164.08
W-7	33.28	1197.26	1163.98
W-8	33.02	1206.63	1173.61
W-9	9.18	1172.77	1163.59
W-10A	20.90	1182.57	1161.67
W-10B	20.70	1182.42	1161.72
W-11	13.86	1175.25	1161.39
W-12	12.96	1173.95	1160-99
W-13	26.49	1188.75	1162.26
W-14	11.47	1172.41	1160.94
W-15	25.87	1189.04	1163.17
W-16	18.28	1180.58	1162.30

1. Feet below top of pvc casing
2. Feet above mean sea level

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 2

WATER LEVEL ELEVATIONS

SNE MONITOR WELLS

MAY 25, 1985

Well No.	Depth to Water[1]	Elevation of Measured Point[2]	Water Level Elevations[2]
W-1	30.10	1194.12	1164.02
W-2	30.38	1193.59	1163.21
W-3	25.46	1187.78	1162.32
W-4	--	1192.78	--
W-5	27.27	1190.67	1163.40
W-6	29.37	1193.37	1164.00
W-7	33.37	1197.29	1163.92
W-8	31.82	1206.65	1174.83
W-9	10.71	1172.81	1162.10
W-10	21.70	1182.64	1160.94
W-11	14.32	1175.28	1160.96
W-12	13.28	1174.01	1160.63
W-13	27.17	1188.80	1161.63
W-14	10.83	1172.46	1161.63

1. Feet below top of pvc casing
2. Feet above mean sea level

APPENDIX E

RESULTS OF ANALYSES

SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	W-1B 9	W-1 10	W-9 11	W-12 13	W-13 15
Benzene	0.2	X	X	0.7	0.6	0.3
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	1.5	X	X	2.5
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	5.1	2.7	0.2	3.7	2.8
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	0.2	0.1	X	X	X
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	0.3	X	X
Dichloromethane	0.2	X	X	X	0.2	X
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	0.8	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.7	0.6	X	1.1	1.6
Toluene	0.1	X	X	0.2	0.1	X
1,1,1-Trichloroethane	0.1	X	X	0.3	0.2	4.8
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	0.5	0.3	X	9.2	11.2
Vinyl Chloride	0.5	X	X	X	X	X
Pentachlorophenol	20.0	X	100	X	1500	490
Mineral Spirits	20.0	X	500	X	X	X
Zimpro Analytical No.		12923	12924	12925	12926	12927

X = Analyzed but not detected

SNE Corp. Analysis (ug/l)
November 5, 1985

	Detection Limit	Well 16
Benzene	0.2	X
Bromoform	0.5	X
Bromomethane	1.0	X
Carbon Tetrachloride	0.1	X
Chlorobenzene	0.1	X
Chloroethane	1.0	X
2-Chloroethylvinyl Ether	2.0	X
Chloroform	0.1	0.2
Chloromethane	6.0	X
Dibromochloromethane	0.1	X
1,2-Dichlorobenzene	0.3	X
1,3-Dichlorobenzene	0.3	X
1,4-Dichlorobenzene	0.3	X
Dichlorobromomethane	0.1	X
1,1-Dichloroethane	0.1	X
1,2-Dichloroethane	0.3	X
1,1-Dichloroethylene	0.5	X
1,2-Dichloroethylene	0.3	X
Dichloromethane	0.2	0.5
1,2-Dichloropropane	0.5	X
cis-1,3-Dichloropropene	0.3	X
trans-1,3-Dichloropropene	1.0	X
Ethylbenzene	0.2	X
1,1,2,2-Tetrachloroethane	0.1	X
Tetrachloroethylene	0.1	0.4
Toluene	0.1	0.7
1,1,1-Trichloroethane	0.1	X
1,1,2-Trichloroethane	0.1	X
Trichloroethylene	0.1	0.9
Vinyl Chloride	0.5	X
Pentachlorophenol	20.0	255
Mineral Spirits	20.0	Not Completed
Zimpro Analytical No.		14797

X = Analyzed but not detected

Sentry

Rec'd 10/9/85

PARKER SERVICES, INC.

Environmental Health Division

Laboratory Use Only

Client SNE CORP

Project Number 85-498

Address

Date Received 9-27

City Warner State Zip

Date Analyzed 10-3 Analyst

Contact P. Wierzba Tel.

Data Authorized By Robert Vobsky

Analytical Request

P.O.#

Analytical Results

Sample No.	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method
WR-1	PCP			5025	BDL	EPA 8040
WR-2	"			5026	BDL	
WR-3	"			5027	BDL	
WR-4	"			5028	BDL	
WR-5	"			5029	BDL	
WR-6	"			5030	BDL	
WR-7	"			5031	BDL	
WR-8	"			5032	BDL	
WR-9(1)	"			5033	BDL	
WR-10(2)						

Detection Limit: 0.02

Parker Services, Inc.
1800 North Point Dr.
Stevens Point, WI 54481
715-346-7786

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SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	Trip Blank	W-8 3	W-8 4	W-14 6	W-14 7	W-1B 8
Benzene	0.2	X	X	X	X	X	X
Bromoform	0.5	X	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X	X
Carbon Tetrachloride	0.1	X	X	X	X	X	X
Chlorobenzene	0.1	X	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X	X
Chloroform	0.1	X	0.2	0.2	0.6	0.6	5.3
Chloromethane	6.0	X	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X	X
Dichlorobromomethane	0.1	X	X	X	X	X	0.2
1,1-Dichloroethane	0.1	X	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	X	X	X
Dichloromethane	0.2	X	X	X	X	X	X
1,2-Dichloropropane	0.5	X	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X	X
Tetrachloroethylene	0.1	X	0.2	X	1.6	1.5	0.8
Toluene	0.1	X	X	X	0.1	X	X
1,1,1-Trichloroethane	0.1	X	X	X	0.2	0.2	X
1,1,2-Trichloroethane	0.1	X	X	X	X	X	X
Trichloroethylene	0.1	X	X	X	X	X	0.4
Vinyl Chloride	0.5	X	X	X	X	X	X
Pentachlorophenol	20.0	*	20	70	X	X	X
Mineral Spirits	20.0	*	X	X	X	X	X
Zimpro Analytical No.		12936	12918	12919	12920	12921	12922

X = Analyzed but not detected
* Not analyzed

SNE Corp. Analysis (ug/l)
August 16, 1985

Field Blank
Dist. H_2O

	Detection Limit	W-11 17	W-2 18	W-10B 20	W-3B 23	30
Benzene	0.2	X	0.9	X	0.2	X
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	1.5	X	X	X
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	0.5	4.8	0.5	1.1	X
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	0.1	X	X	X
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	X	X
Dichloromethane	0.2	X	0.7	X	0.2	0.5
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	*
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.9	1.2	X	X	0.2
Toluene	0.1	X	2.5	0.1	0.1	*
1,1,1-Trichloroethane	0.1	X	0.1	X	X	0.1
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	2.9	34.7	X	X	X
Vinyl Chloride	0.5	X	X	X	X	X
Pentachlorophenol	20.0	380	2550	X	710	X
Mineral Spirits	20.0	X	16,100	X	X	X
Zimpro Analytical No.		12928	12929	12930	12931	12935

X = Analyzed but not detected
* Interferences around these compounds

SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	W-10 28	W-10 29
Benzene	2.0	18.0	8.0
Bromoform	5.0	X	X
Bromomethane	10.0	X	X
Carbon Tetrachloride	1.0	X	X
Chlorobenzene	1.0	X	X
Chloroethane	10.0	X	X
2-Chloroethylvinyl Ether	20.0	X	X
Chloroform	1.0	2.0	2.0
Chloromethane	60.0	X	X
Dibromochloromethane	1.0	X	X
1,2-Dichlorobenzene	3.0	X	X
1,3-Dichlorobenzene	3.0	X	X
1,4-Dichlorobenzene	3.0	X	X
Dichlorobromomethane	1.0	X	X
1,1-Dichloroethane	1.0	X	X
1,2-Dichloroethane	3.0	X	X
1,1-Dichloroethylene	5.0	X	X
1,2-Dichloroethylene	3.0	X	X
Dichloromethane	2.0	2.0	2.0
1,2-Dichloropropane	5.0	X	X
cis-1,3-Dichloropropene	3.0	X	X
trans-1,3-Dichloropropene	10.0	X	X
Ethylbenzene	2.0	**	**
1,1,2,2-Tetrachloroethane	1.0	X	X
Tetrachloroethylene	1.0	2.0	2.0
Toluene	1.0	**	**
1,1,1-Trichloroethane	1.0	1.0	X
1,1,2-Trichloroethane	1.0	X	X
Trichloroethylene	1.0	106.	102.
Vinyl Chloride	5.0	X	X
Pentachlorophenol	20.0	15,200	15,200
Mineral Spirits	20.0	1,600	1,600
Zimpro Analytical No.		12933	12934

X = Analyzed but not detected

** Interferences around these compounds

SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	W-3 25
Benzene	4.0	22.0
Bromoform	10.0	X
Bromomethane	20.0	X
Carbon Tetrachloride	2.0	X
Chlorobenzene	2.0	X
Chloroethane	20.0	X
2-Chloroethylvinyl Ether	40.0	X
Chloroform	2.0	4.0
Chloromethane	120.0	X
Dibromochloromethane	2.0	X
1,2-Dichlorobenzene	6.0	X
1,3-Dichlorobenzene	6.0	X
1,4-Dichlorobenzene	6.0	X
Dichlorobromomethane	2.0	X
1,1-Dichloroethane	2.0	X
1,2-Dichloroethane	6.0	X
1,1-Dichloroethylene	10.0	X
1,2-Dichloroethylene	6.0	X
Dichloromethane	4.0	4.0
1,2-Dichloropropane	10.0	X
cis-1,3-Dichloropropene	6.0	X
trans-1,3-Dichloropropene	20.0	X
Ethylbenzene	4.0	**
1,1,2,2-Tetrachloroethane	2.0	X
Tetrachloroethylene	2.0	X
Toluene	2.0	42.0
1,1,1-Trichloroethane	2.0	X
1,1,2-Trichloroethane	2.0	X
Trichloroethylene	2.0	294.
Vinyl Chloride	10.0	X
Pentachlorophenol	20.0	19,200
Mineral Spirits	20.0	8,520

Zimpro Analytical No. 12932

X = Analyzed but not detected

** Interferences around these compounds

Sentry

PARKER SERVICES, INC.

Environmental Health Division

page 2 of 2

Laboratory Use Only

Client _____

Address _____

City _____ State _____ Zip _____

Contact _____ Tel. _____

Project Number 85-424

Date Received 8-19-85

Date Analyzed 8-21 Analyst RW

Data Authorized By Bob Udovady

P.O.# _____

Analytical Request / Analytical Results

Sample No. well #	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method
22-1,2 W3B	PCP			4480	0.48	
	Min. Sp.				4.28	
24-1,2 W3	PCP			4481	8.73	
	Min. Sp.				278.00	
26-1,2 W10	PCP			4482	9.60	
	Min. Sp.				317.00	
27-1,2 W10	PCP			4483	8.70	
	Min. Sp				280.00	
	Detection limit:					
	PCP	0.01 PPM (500cc sample)				
	Min. Sp.	0.5 PPM	"			

Parker Services, Inc.
1800 North Point Dr.
Stevens Point, WI 54481
715 346-7786

White Copy — Client Report
Green Copy — Laboratory File

11/26/85

eder associates
consulting engineers, p.c.

SNE file

November 26, 1985
File #509-1

Mr. Gary Kulibert
Wisconsin Department of Natural Resources
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501

Re: SNE Corporation
Wausau, Wisconsin

Dear Gary:

Enclosed are three copies of our report entitled "Engineering Report Summarizing Site Investigation for Pentachlorophenol".

Please call either myself or Bill Warren if you have any questions.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.

LJE/nf
Enc.

cc w/enc.: H. Handzel
S. Kroll
H. Dolce
P. Wierzba
J. Noonan
T. Jirous

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440

LEONARD J. EDER, P. E. • FREDERICK H. INYARD, P. E. • STEPHEN J. OSMUNDSEN, P. E. • GARY A. ROZMUS, P. E.
JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

File

J. Noonan

Iverson

KEYSTONE
ENVIRONMENTAL RESOURCES, INC.

440 College Park Dr., Monroeville, PA 15146

July 23, 1987

State of Wisconsin
Department of Natural Resources
Box 818
107 Sutcliff Avenue
Rhinelander, WI 54501

Attention: Gary Kulibert

RE: Sampling of Wisconsin River

Dear Gary:

Water and sediment samples were collected from the Wisconsin River as per the sampling plan agreed to by WAULECO (formerly SNE Corporation) and the Wisconsin Department of Natural Resources. The sample locations from this round of sampling and also the previous round of sampling are shown in the attached figure. Three samples were collected at each location shown, a sample was taken from just below the water's surface (WW-S), at a point mid depth between the surface and the river bottom (WW-M) and at the river bottom (WW-B).

Table 1 summarizes the surface water analytical data, Table 2 summarizes the river sediment analytical data, and Table 3 and Table 4 show the results from the previous round of sampling. Not listed in any tables are the purgeable halocarbons and purgeable aromatics. Only the sediment samples were submitted for analyses of purgeable halocarbons and aromatics, none of which contained any detectable concentrations of these constituents. Only one of the sediment samples (PSS-1) had a detectable concentration of octa dioxin, at 0.96 ng/g. None of the surface water samples had any detectable concentrations of dioxins or furans. These results are shown in tables 5 and 6.

The other constituent of concern pentachlorophenol (PCP) was not detected in any of the water samples during this round of sampling. Three water samples from the initial round of sampling showed detectable concentrations of PCP. Two of these locations were duplicated during the second round of sampling with no PCP being detected in any of the water samples.

Only the upstream sediment sampling location from the west branch was duplicated during the second round of sampling for sediments. The other locations were selected based on input from Bob Martinez of the WDNR. Two of the new sampling locations PSS-2 and PSS-4 had less than 10.0 ppb PCP and PSS-3 had the same concentration (12.9 ppb) as the upstream sampling location. The detectable quantities of PCP in the sediments were consistent with those identified during the initial sampling round.

The results of both rounds of sampling indicate that present and past operations at the SNE facility did and are not having an adverse impact on the Wisconsin River. The initial endangerment assessment indicated that the risk to human health from exposure via the Wisconsin River was extremely remote. Additional data which became available after the initial assessment had been performed would make the likelihood of exposure from this source even more unlikely.

The data presented with this letter seems to indicate that PCP found in sediment samples collected from the Wisconsin River is not a result of the activities conducted at the former SNE facility. Data from analysis of fish samples collected and submitted from this portion of the Wisconsin River by the WDNR will allow for a more accurate assessment of exposure to the constituents of concern via fish consumption from this area.

If you have any questions or comments regarding these matters, please feel free to give me a call at (412) 733-9500.

Sincerely,

Ron O'Toole

Ron O'Toole

RO/nw

Enclosures

TABLE 1

ANALYTICAL DATA FROM SURFACE WATER SAMPLES
COLLECTED AT THE WISCONSIN RIVER
MAY 14, 1987

	WW-1B	WW-1M	WW-1S	WW-2B	WW-2M	WW-2S	WW-3B	WW-3M	WW-3S	WW-4B	WW-4M	WW-4S	TB	FB
Cond. (umhos)	140	145	111	158	153	150	110	130	148	150	150	140	3.0	5.0
PCP (ug/l)	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
TOC (mg/l)	<1	9.56	8.94	9.85	10.6	9.35	9.52	9.81	9.20	9.88	9.64	9.61	<1	<1
pH	7.3	7.2	7.0	7.5	7.3	7.1	7.2	7.1	7.1	7.4	7.3	7.4	7.5	8.8

TABLE 2

ANALYTICAL DATA FROM SEDIMENT SAMPLES
COLLECTED MAY 14, 1987 AT THE WISCONSIN RIVER

	PSS-1	PSS-2	PSS-3	PSS-4
%Solids	52.9	60.7	72.0	60.0
%TOC	1.05	1.13	0.28	0.64
PCP ug/kg	12.9	<10	12.9	<10
Grain* Size US Std. Sieve				
10	6.9	2.6	0.2	0.2
35	5.0	10.7	4.1	1.5
60	10.1	42.0	72.2	7.8
100	47.2	34.4	21.4	62.6
120	11.1	3.8	0.8	12.7
200	14.3	4.7	0.8	13.0
Pan	5.4	1.8	0.5	2.2

*Percent Retained.

TABLE 3

ANALYTICAL DATA FROM SURFACE WATER SAMPLES
COLLECTED JUNE 19, 1986 AT THE WISCONSIN RIVER

	WSW-1	WSW-2	WSW-3	WSW-4	WSW-5	TB	FB
O & G	ND*	ND	ND	ND	ND	ND	ND
PCP (ug/l)	ND	3.1	1.2	1.1	ND	ND	ND
Dioxins(ug/l)							
Tetra	ND	ND	ND	ND	ND	ND	ND
Penta	ND	ND	ND	ND	ND	ND	ND
Hexa	ND	ND	ND	1.5	ND	ND	ND
Hepta	ND	ND	ND	18.5	1.8	ND	ND
Octa	ND	ND	ND	43.5	ND	ND	ND
Furans(ugl)							
Tetra	ND	ND	ND	ND	ND	ND	ND
Penta	ND	ND	ND	ND	ND	ND	ND
Hexa	ND	ND	ND	ND	ND	ND	ND
Hepta	ND	ND	ND	ND	ND	ND	ND
Octa	ND	ND	ND	ND	ND	ND	ND

*ND - Not detected.

TABLE 4

ANALYTICAL DATA FROM SEDIMENT SAMPLES
COLLECTED JUNE 19, 1986 AT THE WISCONSIN RIVER

	WSS-1	WSS-2	WSS-3	WSS-3A	WSS-3B	WSS-3C	WSS-4	WSS-5	WSS-6	WSS-7
O & G (mg/l)	106.6	166.6	119.9	NA*	NA	NA	73.3	93.3	100.0	53.3
PCP (ug/l)	10.7	88.7	7.3	6.7	8.0	9.3	12.7	8.7	49.0	13.3
Dioxins (ng/l)										
Tetra	ND**	ND	ND	NA	NA	NA	ND	ND	ND	ND
Penta	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Hexa	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Hepta	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Octa	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Furans (ng/l)										
Tetra	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Penta	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Hexa	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Hepta	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND
Octa	ND	ND	ND	NA	NA	NA	ND	ND	ND	ND

* NA - No data available.

** ND - Not detected.

TABLE 5

ANALYTICAL DATA FROM SEDIMENT SAMPLES
COLLECTED MAY 14, 1987 AT THE WISCONSIN RIVER

	PSS-1	PSS-2	PSS-3	PSS-4
Dioxins (ng/g)				
Tetra	ND*	ND	ND	ND
Penta	ND	ND	ND	ND
Hexa	ND	ND	ND	ND
Hepta	ND	ND	ND	ND
Octa	0.96	ND	ND	ND
Furans (ng/g)				
Tetra	ND	ND	ND	ND
Penta	ND	ND	ND	ND
Hexa	ND	ND	ND	ND
Hepta	ND	ND	ND	ND
Octa	ND	ND	ND	ND

* ND - Not Detected.

TABLE 6

ANALYTICAL DATA FROM SURFACE WATER SAMPLES
COLLECTED AT THE WISCONSIN RIVER
MAY 14, 1987

	WW-1B	WW-1M	WW-1S	WW-2B	WW-2M	WW-2S	WW-3B	WW-3M	WW-3S	WW-4B	WW-4M	WW-4S	TB	FB
Dioxins (ng/l)														
Tetra	ND*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Penta	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexa	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hepta	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Octa	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Furans (ng/l)														
Tetra	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Penta	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexa	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hepta	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Octa	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

*[illegible]ected.

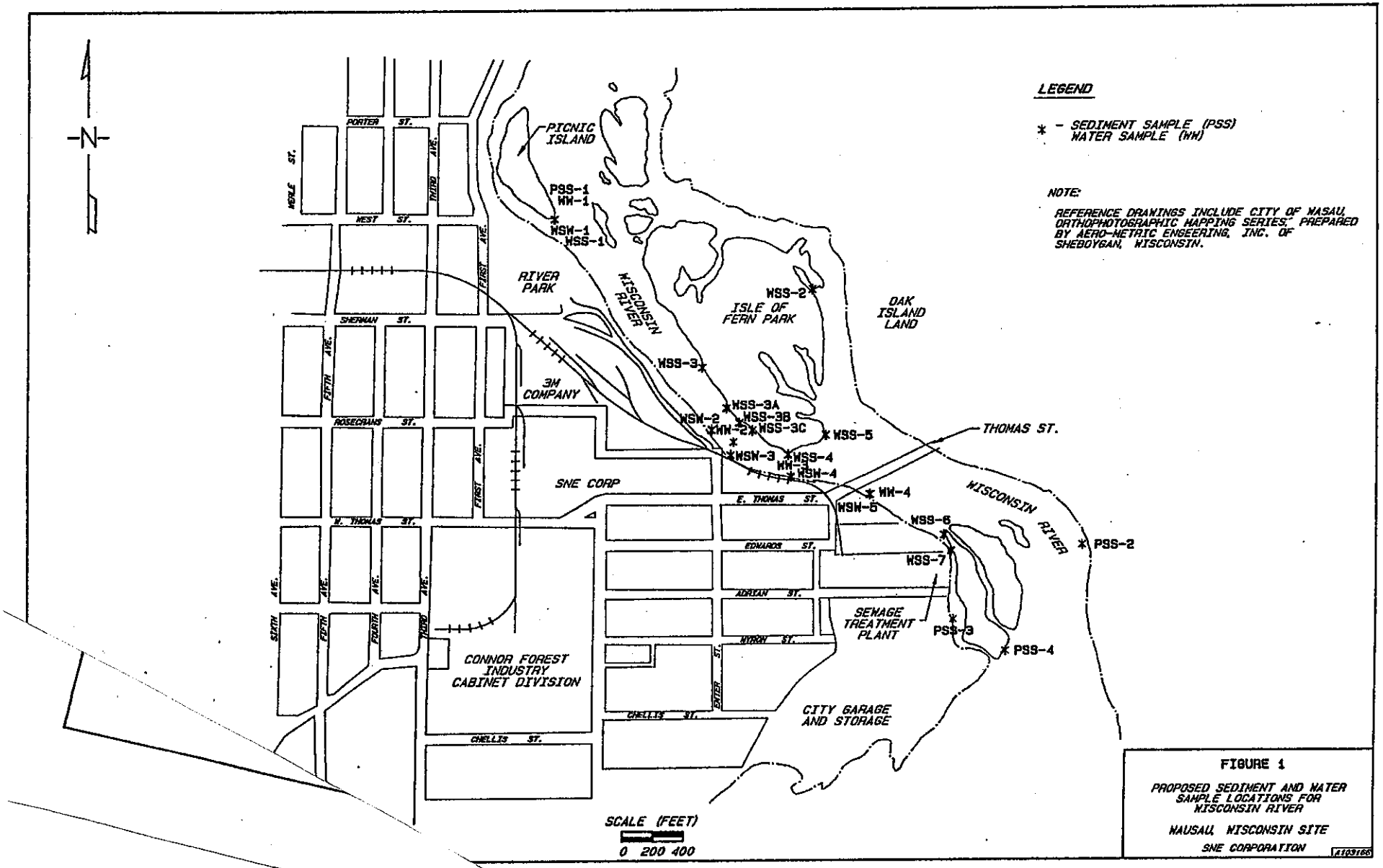

FIGURE 1

PROPOSED SEDIMENT AND WATER SAMPLE LOCATIONS FOR WISCONSIN RIVER

WAUSAU, WISCONSIN SITE

SNE CORPORATION

A109166