# IN-FIELD CONDITIONS REPORT

## **CITY OF WAUSAU** MARATHON COUNTY, WISCONSIN

Site of Fill at the Wausau Wastewater Treatment Plant and City Garage and Public Works Property

September 1989

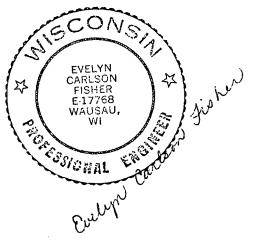
Prepared for: City of Wausau by: Becher-Hoppe, Inc., Wausau, Wisconsin SITE OF FILL AT THE WAUSAU WASTEWATER TREATMENT PLANT AND CITY GARAGE AND PUBLIC WORKS PROPERTY CITY OF WAUSAU, MARATHON COUNTY, WISCONSIN

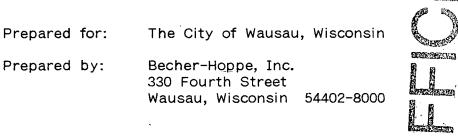
INTERIM IN-FIELD CONDITIONS REPORT

September 1989

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BUREAU OF SOLID -HAZARDOUS WASTE MANAGEMENT





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September 19, 1989

I. Vladimir Wojnar have reviewed the enclosed interim In-field Conditions Report with the knowledge that the final and updated version will be submitted to the Wisconsin Department of Natural Resources at a later date as stated by Becher-Hoppe, Inc. Furthermore, it is my understanding that the final report will also be reviewed by the Certified Hydrogeologist.

Hydrogeologist's Certification Based upon my education and experience, I Wood, We We We TVladimir Wojnar), hereby certify that I am a Hydrogeologist meeting the requirements of NR 500.03(64), Wisconsin Administrative Code.

> STS Consultants Ltd. Consulting Engineers

540 Lembeau Street Green Bay, Wisconsin 54303 414,494,9656/Fax 414,494,0851

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#### I. GENERAL FACILITY INFORMATION

This In-field Conditions Report was requested by the Wisconsin DNR in accordance with Wisconsin Administrative Code NR  $508.20^{(1)}$ . The purpose of the report is to help determine whether material used as fill on the property in question has a potential to impact the health, safety and welfare of the public or the environment.

The property is owned by the City of Wausau, Marathon County, Wisconsin and is used for the facilities of the Wausau Wastewater Treatment Plant and the City of Wausau Garage and Public Works. Primary contacts include Mayor John Robinson, Water and Sewerage Director Joseph Gehin, and City Engineer David Koch at the address and phone number shown below.

City Hall

407 Grant Street

Wausau, Wisconsin 54401

715/845-5279

The City has retained the engineering services of Becher-Hoppe, Inc. to prepare this report. The Engineer has also been involved with the rehabilitation of the Wausau Wastewater Treatment Plant. The address of the Engineer is as follows:

Gerald Bizjak, P.E., Evelyn Fisher, P.E.,

and Patrice Schaepe, EIT

Becher-Hoppe, Inc.

330 Fourth Street

P.O. Box 8000

Wausau, Wisconsin 54402-8000

715/845-8000

This study has had hydrogeological input from Becher-Hoppe, Inc. and has also been reviewed by a certified hydrogeologist who meets the qualifications of the State of Wisconsin. The hydrogeologist has also been involved with pump tests done at the site earlier this year.

Vladimir Wojnar

STS Consultants Ltd.

540 Lambeau Street

Green Bay, Wisconsin 54303

414/494-9656

The property is located on the west bank of the Wisconsin River in the City of Wausau, to the south of Thomas Street as shown on Plan Sheet 2. It lies at the intersection of Sections 35 and 36 of T29N, R7E and Sections 1 and 2 of T28N, R7E. The majority of the property lies in the SW 1/4 of the SW 1/4 of Section 36. The property is bounded to the north by Adrian Street, to the east and south by the Wisconsin River, and to the west by private property. The total acreage of the City property is approximately 25.8 acres.

No public or private water supply wells lie within one-half mile of the fill area. A number of private wells were in use in the area south of Chellis Street (then part of the Town of Rib Mountain) before it was annexed to the City in 1983. City water was provided to the area after the time of annexation and all the property owners are currently hooked up to City water; no private wells remain connected for domestic use. Well logs have been obtained from the Wisconsin Geological and Natural History Survey for private wells in the annexed area and are shown in Appendix A. The location of those lying within 1200 feet of the believed limits of fill are also shown in the appendix.

#### II. FACILITY HISTORY

The property owned by the City of Wausau is currently used for the community wastewater treatment plant on the eastern half and also houses the City of Wausau Garage and Public Works Department on the western half. The treatment plant and an incinerator were built in 1939-40 at the site to serve the City of Wausau. Rehabilitation of the plant occurred in 1969-70 at which time most of the incinerator was dismantled. The smokestack, however, still stands over the north end of the site. The public works land now has some buildings, garages, and areas used to store equipment and piles of sand.

Sloughs of the Wisconsin River were present at the site before the wastewater treatment plant was constructed. Aerial photographs taken of the area in 1938, 1948, and 1958 show the sloughs during the progression of filling. The 1938 photograph (Appendix B) shows what is believed to be the undisturbed original topography of the site. A diagram from 1947 (Plan Sheet 3) shows the slough contours from that time and the proposed fill area for a new shoreline. By 1958 the fill had been extended to contours which were close to those observed most recently. It is believed that the area has not accepted fill since 1968-69 when the incinerator was taken out of commission. There are no active fill areas.

Three main types of fill are believed to have been placed at the site: 1) waste sand from the nearby Minnesota Mining and Manufacturing Company (3M) plant, 2) ashes from the incinerator that was in operation at the site, and 3) municipal refuse. The City of Wausau has not been able to find any records concerning the waste volumes, base grades, extent of fill, or the fill practices at the site. Consequently, a

number of test pits were dug as shown on Plan Sheet 2. Excavation done for the current rehabilitation of the treatment plant has also proved helpful in determining how the site was filled and the vertical and horizontal extents of the filling.

The 3M sand has been used for fill over much of the site. This material is relatively inert and when properly compacted is considered a good fill material in the local area. It is generally light colored with patches of darker colors, usually green and blue. Ashy material from the incinerator may have also been used as fill. Fine black or gray material has been found at several locations at the site. Reports from area landowners indicate that in some areas municipal refuse was placed directly into the sloughs before being covered and leveled off with 3M sand. The municipal refuse fill encountered in excavations has generally consisted of bottles, cans, ceramic pieces, newspapers, leather items, etc, in a dark, soil layer. The lateral extent of the refuse seems to be confined to the area of the original sloughs as shown on Plan Sheet 2 and in Figure 1. The outline of the sloughs was taken from the 1938 aerial photograph of the region. Some of the test pits and excavations have also shown that refuse lies in rather thin layers in areas such as around the proposed secondary clarifier. East of the proposed secondary digesters and south of the proposed filtration and disinfection building, however, the refuse has been found to be about ten feet thick, at five to six feet below ground surface. A thick layer of refuse was also found to the south of the proposed sludge storage building.

Gas generation and migration is thought to be somewhat limited at the site since a large amount of the fill appears to be 3M sand which is generally low in organics and not likely to generate large quantities of

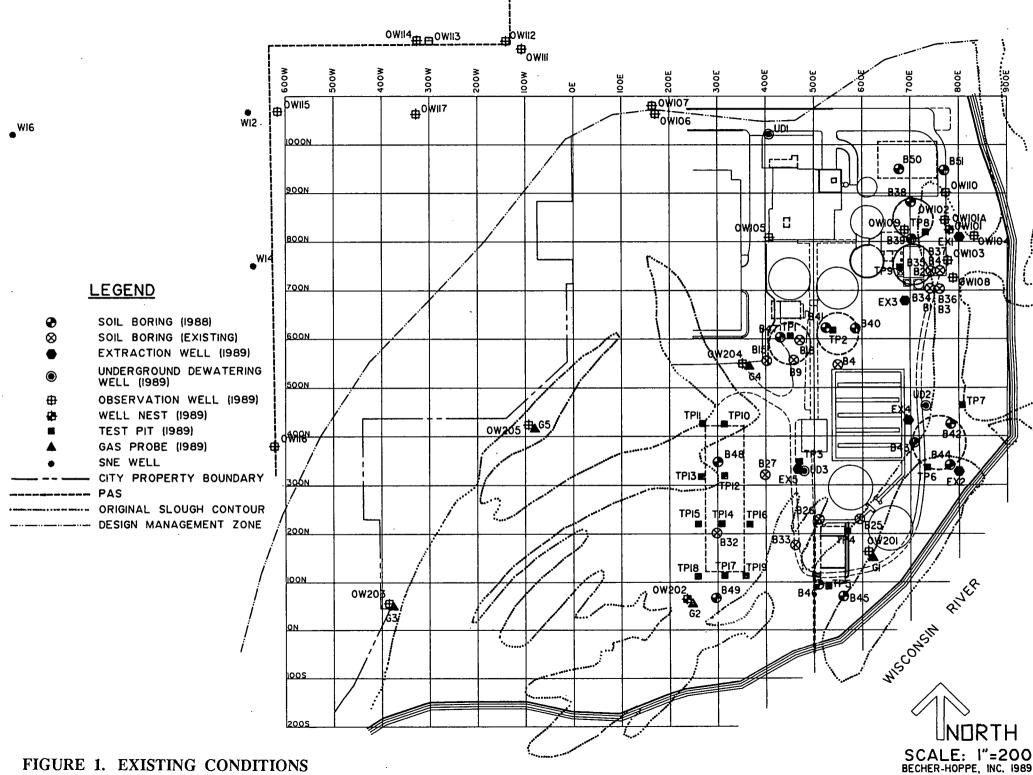


FIGURE 1. EXISTING CONDITIONS

gases. The municipal refuse, however, has more potential to generate methane and carbon dioxide during the decomposition process. A series of gas probes have been installed around the site in order to measure the gas concentrations. The locations of the five gas probes can be found on Plan Sheet 2. Due to the generally sandy nature of the soils, if gas is or was generated, it has potential for migration.

#### III. LAND USE INFORMATION

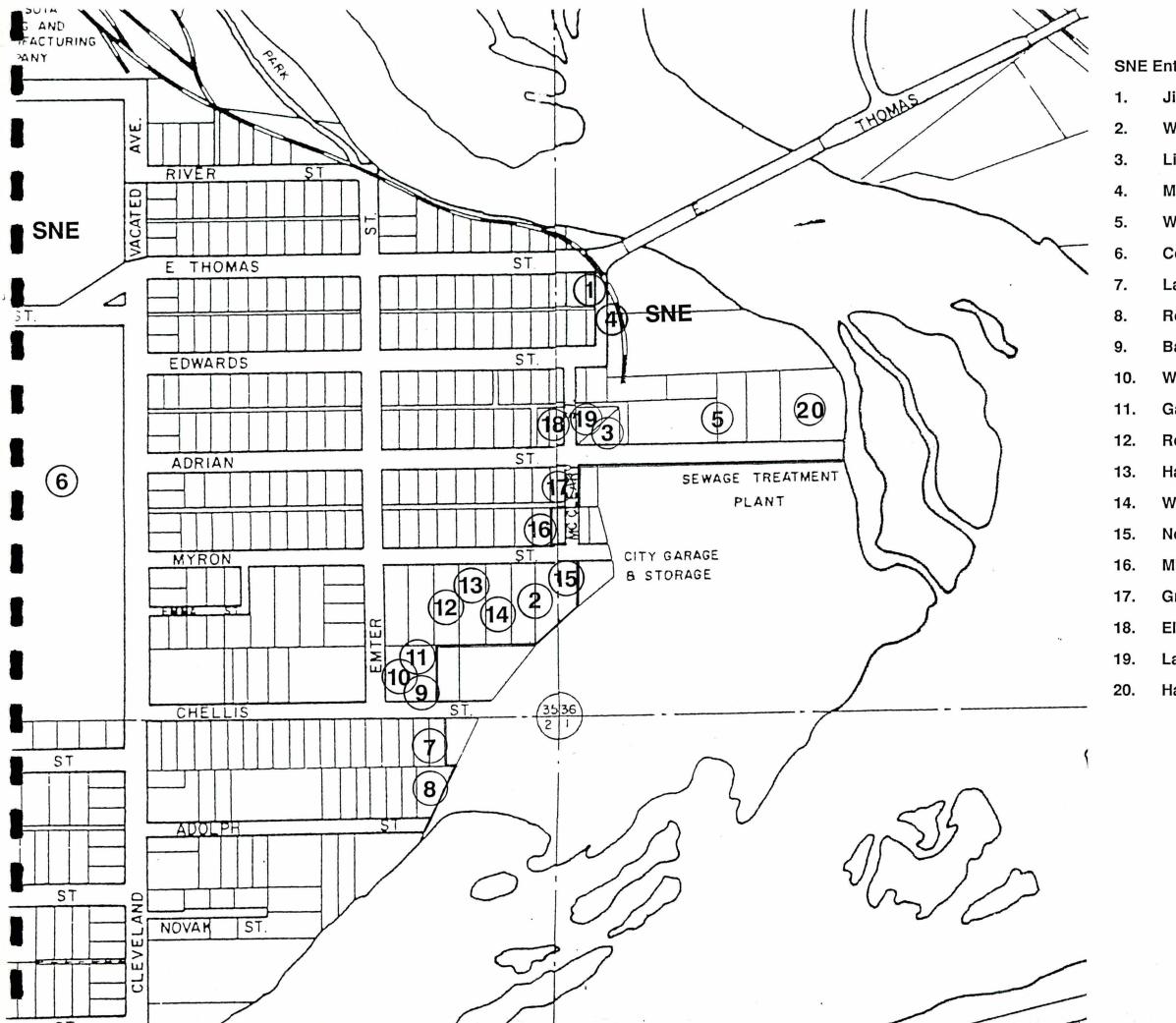
The area around the fill property is developed and has consequently seen varied uses for many years. A general zoning map for the region within a mile of the area of fill is shown on Plan Sheet 4. It shows the areas used for residential, industrial, and commercial activities (2). The area south of Chellis Street was not sewered until after annexation probably in 1985, so there may belocally impacted groundwater areas where septic systems were densely located or not working properly.

Several industries are located in the area of the City of Wausau property. At least one of these operations is known to have affected the groundwater in the region; SNE Enterprises (formerly Crestline), 910 Cleveland Avenue, Wausau, is responsible for contaminating groundwater with a plume of pentachlorophenol (PCP). Other businesses in the area which are located on Figure 2 include:

- 1. Jim's Mobil Service at 249 Thomas Street
- 2. Wausau Crankshaft at 233 Myron Street
- 3. Linder Electric Motors at 308 Adrian Street
- 4. Miller Machine and Supply at 1109 McCleary Street
- 5. Wausau Supply Company at 320 Adrian Street

6. Connor Forest Industries at Thomas and Cleveland (major building closed and demolished, Connor Toy still operating).

The quality of the Wisconsin River in the area is affected by municipalities and industry within and outside of Marathon County and by improper agricultural practices (3). A number of industries located more than one mile upstream of the site may have affected the quality of the water over the years. Some major plants bordering the Wisconsin River



SNE Enterprises (formly Crestline) - 910 Cleveland Avenue Jim's Mobil Service - 249 Thomas Street Wausau Crankshaft - 233 Myron Street Linder Electric Motors - 308 Adrian Street Miller Machine and Supply - 1109 McCleary Street Wausau Supply Company - 320 Adrian Street **Connor Forest Industries - Thomas and Cleveland** Lawrence Andreas - 109 Chellis Street Robert F. Sachse & Paula Gourdoux - 104 Adolph Street Barbara L. Guenther - 1429 Emter Street William J. Bergs - 1423 Emter Street Gary J. Seubert - 1419 Emter Street Roger A.Kittel - 213 Myron Harvey H. Rusch - 219 Myron William J. Evenson Jr. - 225 Myron Norman F. Knoblock - 239 Myron Michael M. Savola - 236 Myron Gregory D. Jesse - 239 Adrian Elsie P. Schewe - 240 Adrian Street Larry G. Gibson - 1215 McCleary Harold Steinagel - 336 Adrian



FIGURE 2. ADJACENT PROPERTY OWNERS

upstream of the fill area include Marathon Electric Manufacturing Corp., Wausau Chemical Corp., James River Corp. (formerly American Can Co.) and Wausau Paper Mills Co. in Brokaw.

Property owners adjacent to the fill area are identified in Figure 2. Ownership of these properties was verified in September 1989 at the Marathon County Courthouse.

A number of recreational areas are located in the region of the treatment plant, the most prominent of which are Oak Island and Isle of Ferns City parks. A letter from the DNR Bureau of Endangered Resources identifies the flora and fauna of concern in this area and is included in Appendix C. No endangered species, critical habitats, or unique natural or scientific areas have been identified in the immediate area of the treatment plant.

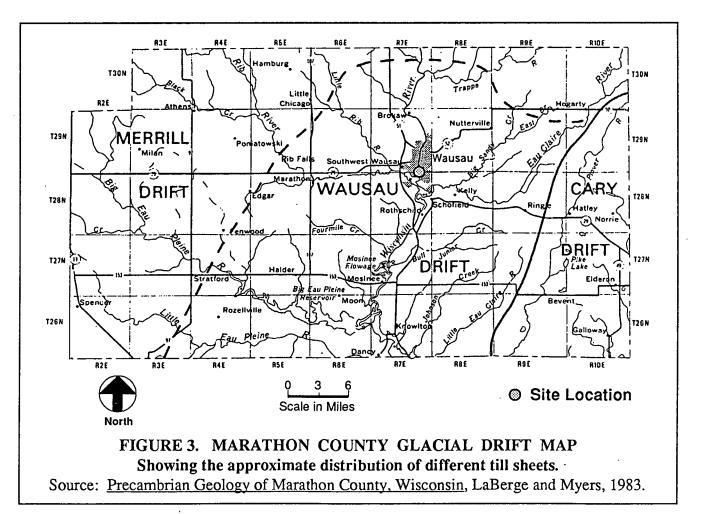
The State Historical Society has also been contacted to determine whether any historical or archaeological areas exist in the region. A letter from Richard Dexter (Appendix C) indicates that no historical sites are known in the area. In a phone conversation with Jennifer Kold of the Society a concern was expressed for any deep archaeological sites which would be directly affected by excavation and construction deeper than the depth of the existing fill. The deepest excavation for the rehabilitation of the treatment plant will not extend much deeper than the original fill so any potential deep sites would not be affected.

Since the site is not proposed for additional landfill purposes, the need to address transportation routes, access roads and weight limits does not seem to apply. Local roads are shown on the plan sheets.

#### IV. REGIONAL GEOTECHNICAL INFORMATION

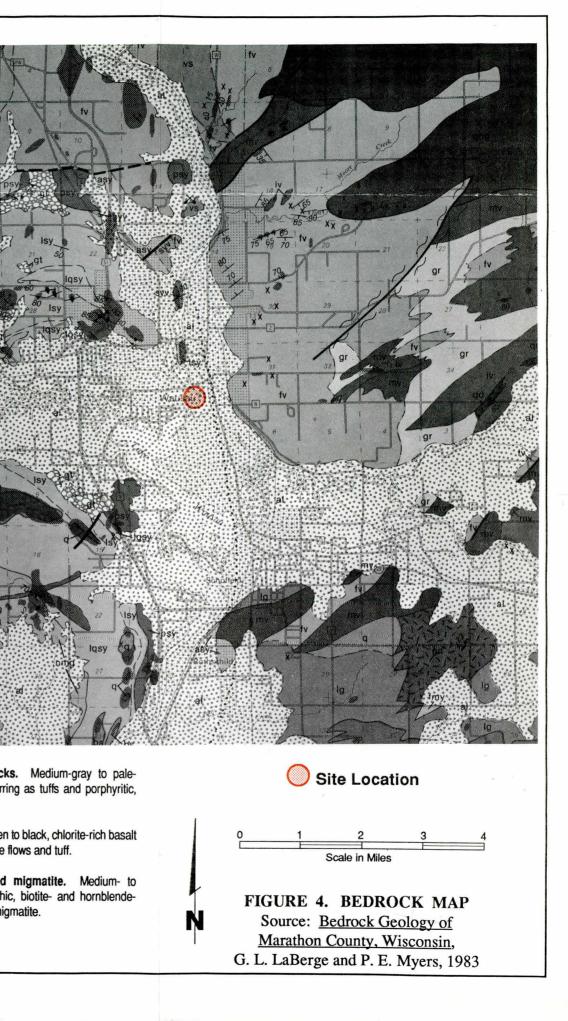
#### A. Existing Topography

The regional topography of this section of Marathon County is dominated by Rib Mountain, an inclusion of quartzite rising to the southwest of the City of Wausau. Several other bedrock hills are present in the area. Glacial activity that entered the county during three different periods (as shown in Figure 3) and the erosion caused by the Wisconsin River have been important in determining the topography of the region (4). In general, the topography ranges from rather flat to somewhat rolling as shown on the USGS quadrangle maps of the area presented on Plan Sheet 5.



al	Alluvium. Stream-deposited sand and gravel.	MAP SYMBOLS	A A A
	Glacial Deposits. Till and outwash; shown only in areas where geology of underlying units cannot be determined.		nsy nsy syv
	Diabase dikes. Microgabbro with or without olivine occurring as dikes.	contact - dashed where approximately located - dotted where concealed	syv tsy tv
ning	Granite and quartz monzonite. Moderate orange to pink, coarse-grained granite and quartz monzonite near Nine Mile Swamp consisting of alkali feldspars, quartz, and biotite (s21,T28,R7).	fault - dashed where approximately located	ayu - Ali -
isy	Tabular syenite. Pyroxene- and amphibole-bearing syenite with alkali feldspar laths and lensoidal mafic inclusions forming a tabular fabric (SE <sup>1</sup> / <sub>4</sub> s22,T29,R6).	Strike and dip of beds	tsy disk cgt at
	<b>Nepheline syenite.</b> Coarse-grained to pegmatitic gneissic amphibole-biotite-nepheline syenite (SE <sup>1</sup> /4 s22, T29, R6).	$\frac{10}{2}$ + $\frac{80}{2}$ P inclined vertical overturned top of pillow	
	<b>Amphibole syenite.</b> Pink to gray, amphibole-bearing syenite with texture varying from aplitic to pegmatitic (s23,T29,R6).	Strike and dip of foliation $\frac{70}{2}$	
	<b>Pyroxene syenite.</b> Moderate olive gray, coarse-grained, flow- lineated, pyroxene-bearing syenite (s14, T29, R6).	inclined vertical	
	Lensoidal syenite. Pyroxene- and amphibole-bearing syenite with flow-oriented lensoidal xenoliths (s27, T29, R7).	Bearing and plunge of lineation	at esy ang
	Quartz syenite. Quartz syenite with abundant flow-oriented metasedimentary and metavolcanic xenoliths (s7, T28, R7).	inclined	TX4 g
Syv	Syenitized metavolcanics. Fine- to medium-grained metavol- canics with masses and veinlets of potassium feldspar and biotite (s30, T30, R7).	Note: Planar symbols (strike and dip of beds, foliation or schistocity) may be combined with linear symbols to record data observed at same locality by superimposed symbols at point of observation.	lqsy 13 x x x x x x 17 lsy x x x x x x x 17 15 x x x x x x x x x x x x x x x x x x x
Ч	Quartzite. White to gray, coarse-grained quartzite which locally shows relict stratification, ripple marks, and cross bedding. This unit occurs as xenoliths in the Wausau syenite and its age is unknown (s8,T28, R7).	n 🛠 X shaft quarry gravel pit	
Ig	<b>Leucogranite.</b> Leucogranite with texture varying from aplitic to pegmatitic with common graphic granite texture and consisting mainly of potassium feldspar and quartz.	Area of outcrop x large small, isolated	x X 75 nmg
gng	<b>Granite.</b> Brownish red, medium-grained leucocratic granite near Granite Heights with a homogeneous, allotriomorphic granular texture and consisting of 25 to 35 percent quartz, 45 to 60 percent perthitic microcline, 15 to 20 percent plagioclase $(An_{s-10})$ , and less than 5 percent green biotite (s26, T30, R7).	Volcanogenic metasedimentary rocks.         Argillite, graywacke, iv foliated.	Intermediate metavolcanic roc green, andesite and dacite occur massive, and pillowed flows.
	Granite. Pink, medium-grained leucocratic granite east of Abbotsford. Similar to Irg (s11, T28, R2).	fv Felsic metavolcanic rocks. Rhyolite to dacite occurring as mv welded and non-welded felsic tuff, bedded tuff, volcanic breccia, and lava flows with subordinate interstratified metacodimentary	Mafic metavolcanic rocks. Gree occurring as pillowed and massive
qu	<b>Quartz diorite.</b> Quartz diorite occurring as intrusion breccias consisting of chaotic mixtures of felsic intrusive rock and metavolcanic country rock. The rock consists of 20 to 30 percent quartz, 40 to 60 percent strongly zoned plagioclase (AN <sub>35</sub> , average), and 10 to 30 percent hornblende and biotite.	and lava flows, with subordinate interstratified metasedimentary rocks, pyroclastic breccia, flow breccia, massive and flow-banded flows, and conglomerates.	Quartzofeldspathic gneiss and coarse-grained, quartzofeld spath bearing gneiss, amphibole, and mi

Mafic metavolcanic rocks. Green to black, chlorite-rich basalt occurring as pillowed and massive flows and tuff. Quartzofeldspathic gneiss and migmatite. Medium- to coarse-grained, quartzofeld spathic, biotite- and hornblende-bearing gneiss, amphibole, and migmatite.



The USGS topographic maps also show that the major surface water drainage features in the region are the Wisconsin River in the general vicinity of the site, and two tributaries of the Wisconsin River to the south of the site: the Rib River (and Little Rib) to the west; and the Eau Claire River (and Big Sandy Creek) to the east. Run off in the metropolitan area of Wausau is generally directed into storm sewers which conduct the flow eventually into the Wisconsin River. The site is located between two dams on the river. The upstream dam is about one mile north of the site, the other is about five miles downstream which creates Lake Wausau.

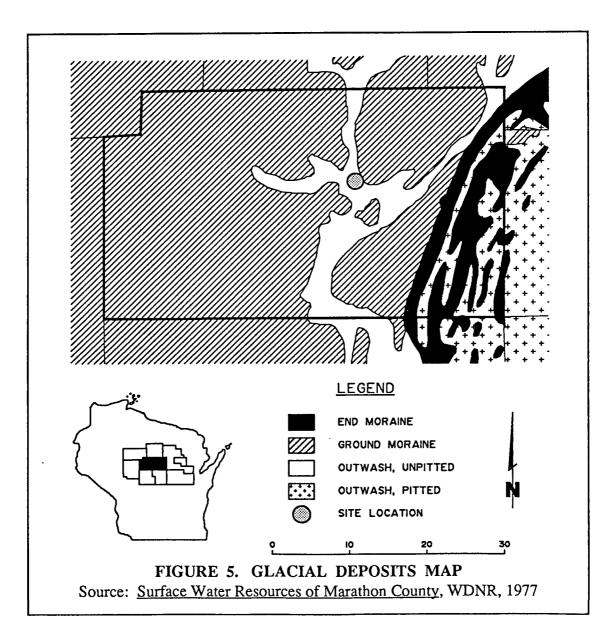
B. Geology

The geology of Marathon County has been examined by LaBerge and Myers (4). Part of their bedrock map has been reproduced in Figure 4. A more general account of the geology of the region is given by Kendy and Bradbury in their report on the Wausau Aquifer (5) which is recounted here.

The Precambrian units consist of Early Proterozoic metavolcanic and granitic rock that were intruded by Middle Proterozoic syenite and associated granitic bodies including the Wausau and Stettin syenite and the Ninemile granite. The Wausau syenite outcrops are found west of the Wisconsin River. The Ninemile granite forms most of Rib Mountain; the tops of Rib Mountain and Mosinee and Harwood Hills are large guartzite inclusions.

The Ninemile granite is often found weathered to a poorly sorted, clayey residuum directly over unweathered bedrock. This is called grus, weathered bedrock, or rotten granite, and has a high silt and clay content and low sand content. It often contains angular granitic rock

fragments including angular feldspar fragments that rarely occur in the outwash. The bedrock weathered zone is several orders of magnitude less permeable than the over laying sand and gravel, and acts as the lower boundary of the unconfined aquifer.



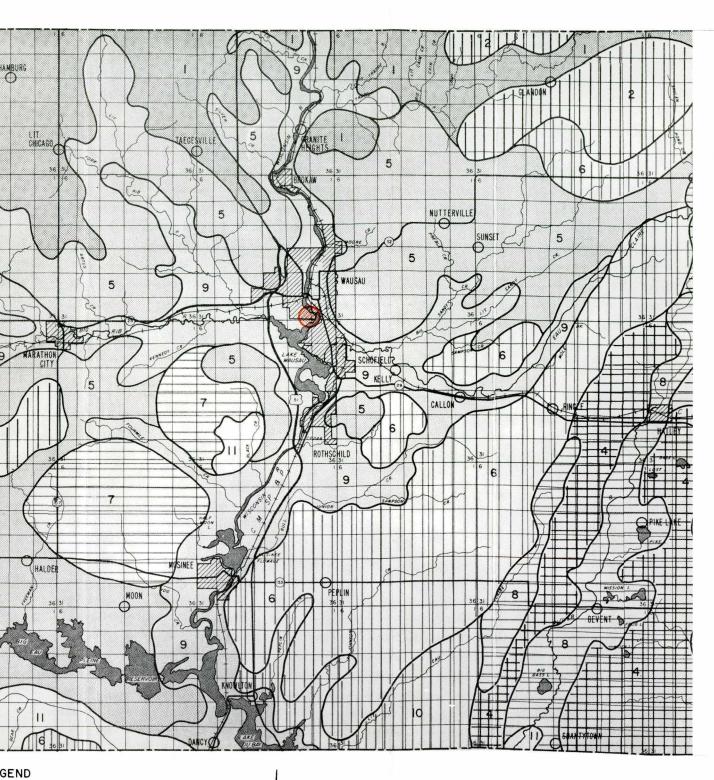
Surrounding the Wausau Aquifer is an eroded upland, partly covered by Pleistocene glacial sediment derived from late Wisconsin terminal moraines of the three separate glacial lobes. The glaciers that contributed outwash traversed a complex of Precambrian rocks. Although no till has been found in the Wisconsin River Valley itself, a variety of lithologies occurs in the moraines surrounding the Wausau aquifer. Figure 5 shows the general location of glacial deposits in Marathon County.

The Wisconsin River and its tributaries, which were probably formed in Precambrian fault zones, carried away large loads of outwash at highly variable discharges from the ice margin of the glacial lobes. This resulted in the formation of braided stream channels in the valleys. The deposits are stratified, often cross-bedded, well rounded to angular sand and gravel. Lateral correlation of stratigraphic units is virtually impossible due to the extremely heterogeneous nature of the depositional bedding.

#### C. Surficial Soils

The soils found in the Wisconsin River Valley near the site are generally sandy soils with sandy subsoils and substrata, and are found on outwash plains. More specifically the soils belong to the Mahtomedi-Manahga-Kronen Association (6) as shown in Figure 6. The only other general soil type within a five-mile radius of the site is the Fenwood-Milladore-Rozellville Association: gently sloping to steep, well to somewhat poorly drained loamy soils (6). More specific soils maps from the Marathon County Soil Survey Report which is being prepared by the Marathon County Land Conservation Dept and the U.S. Dept. of Agriculture -- Soil Conservation Service are included in Appendix D. These maps show the majority of the property to be Dunnville fine sandy loam.

U. S. DEPARTMENT O	DF AGRICULTURE LEGEND FOR GENERAL SOIL MAP OF MARATHON COUNTY Revised 1/81	
A. L	Loamy soils developed in glacial drift	
		T
	I. Magnor - Freeon - Cable Association Nearly level to sloping, poorly to moderately well drained, silty soils with loamy subsoils and reddish brown sandy loam substrata; on uplands.	HAMBU O
	<ol> <li>Withee- Marshfield - Angelica Association Nearly level and gently sloping, somewhat poorly to very poorly drained, silty soils with loam to clay loam subsoils and substrata; on uplands.</li> </ol>	
3	3. Kennan - Rosholt Association Nearly level to moderately steep, well drained silty and loamy soils with sandy loam to loam subsoils and substrata of brown sandy loam to loamy sand glacial till or stratified sand and gravel; on uplands and outwash plains.	
4	4. Same as 3.	
B. L	.oamy soils developed in residuum weathered from bedrock.	×
5	5. Fenwood - Milladore - Rozellville Association Gently sloping to steep, well to somewhat poorly drained loamy soils with loam to clay loam subsoils and substrata weathered from granitic and gneissic rocks; on uplands.	A IC
	5. Point - Mosinee - Dancy Association Gently sloping, well to poorly drained loamy soils with sandy loam subsoils and loam to gravelly loam substrata weathered from gneissic rocks; on uplands.	2
	7. Marathon - Moberg - Mylrea Association Gently sloping to moderately steep, well to somewhat poorly drained loamy and silty soils with very gravelly sandy loam and gravelly loamy sand subsoils and substrata weathered from coarse-grained granitic rock; on uplands.	
<b>C.</b> L	_oamy and sandy soils developed in sandy and gravelly outwash	4
۶ 	B. Rosholt - Oesterle - Scott Lake Association Nearly level and gently sloping, somewhat poorly to well drained silty and loamy soils with sandy loam to loam subsoils and substrata of sand and gravel; on outwash plains.	
g	9. Mahtomedi - Menahga - Kronen Association Nearly level to sloping, moderately well to excessively drained, sandy soils with sandy subsoils and substrata; on outwash plains.	
	D. Same as 6.	~
D. (	Organic soils	7
	<ol> <li>Markey - Rifle - Kinross Association Nearly level, very poorly drained organic soils over sand, deep organic soils, and poorly drained sandy soils with sandy subsoils and substrata; in basins or depressions and outwash plains.</li> </ol>	1110
	J~~~	GEI
•	COUNTY BOUNDARY	
JO,		



N

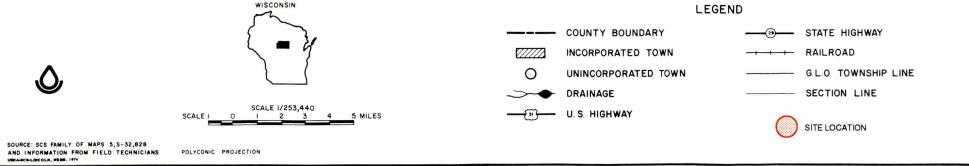


FIGURE 6. SOIL ASSOCIATION MAP OF CENTRAL MARATHON COUNTY Source: <u>Marathon County Solid Waste</u> <u>Management Plan Update</u>, Marathon County Planning Commission, 1980

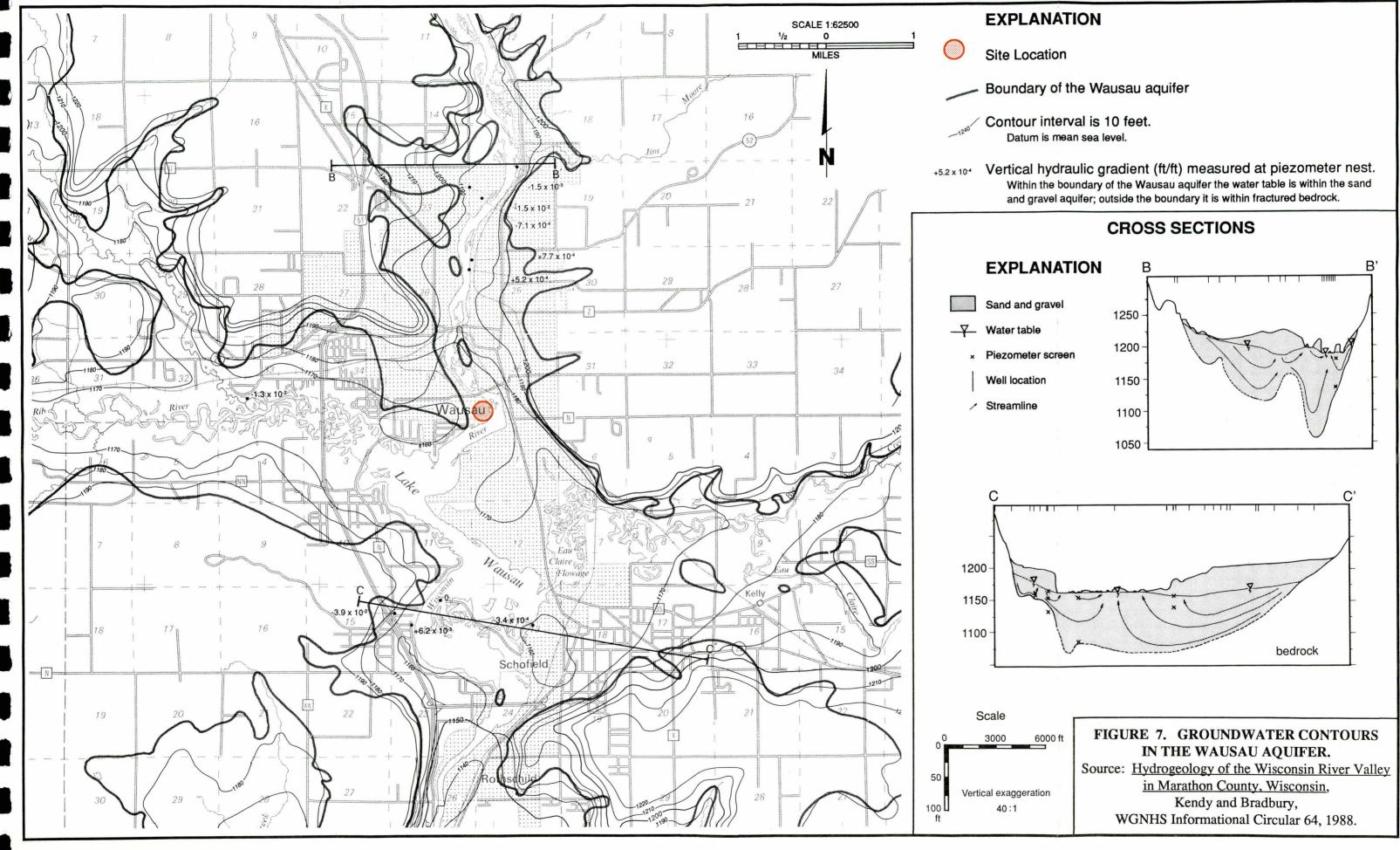
SOIL CONSERVATION SERVICE

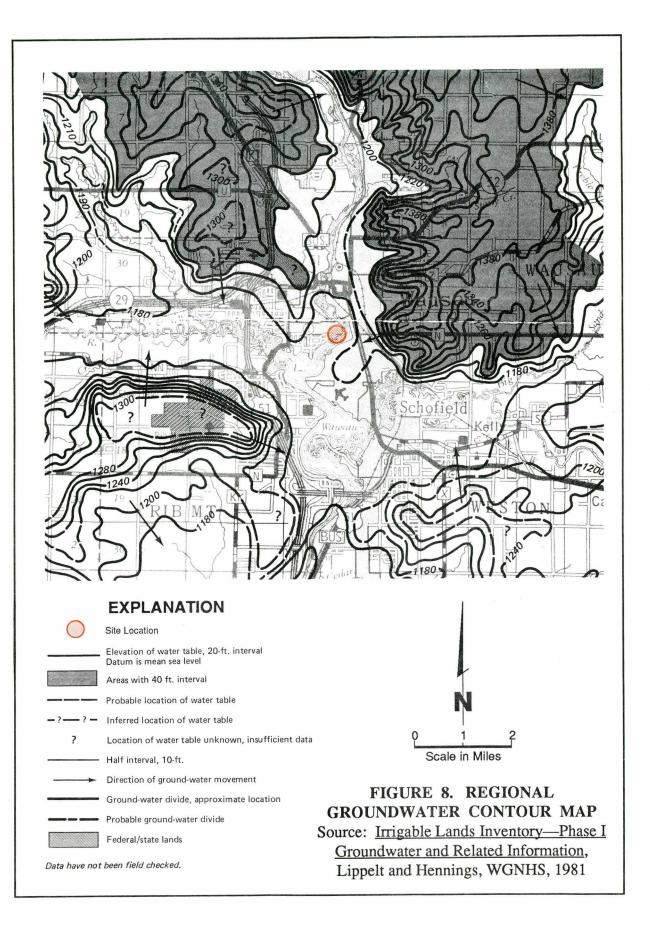
This series has bedrock deeper than 5 feet and "apparent" groundwater from 3 to 6 feet, November through May. The soil Interpretations Records for the soil types found on and adjacent to the site are included in Appendix D also.

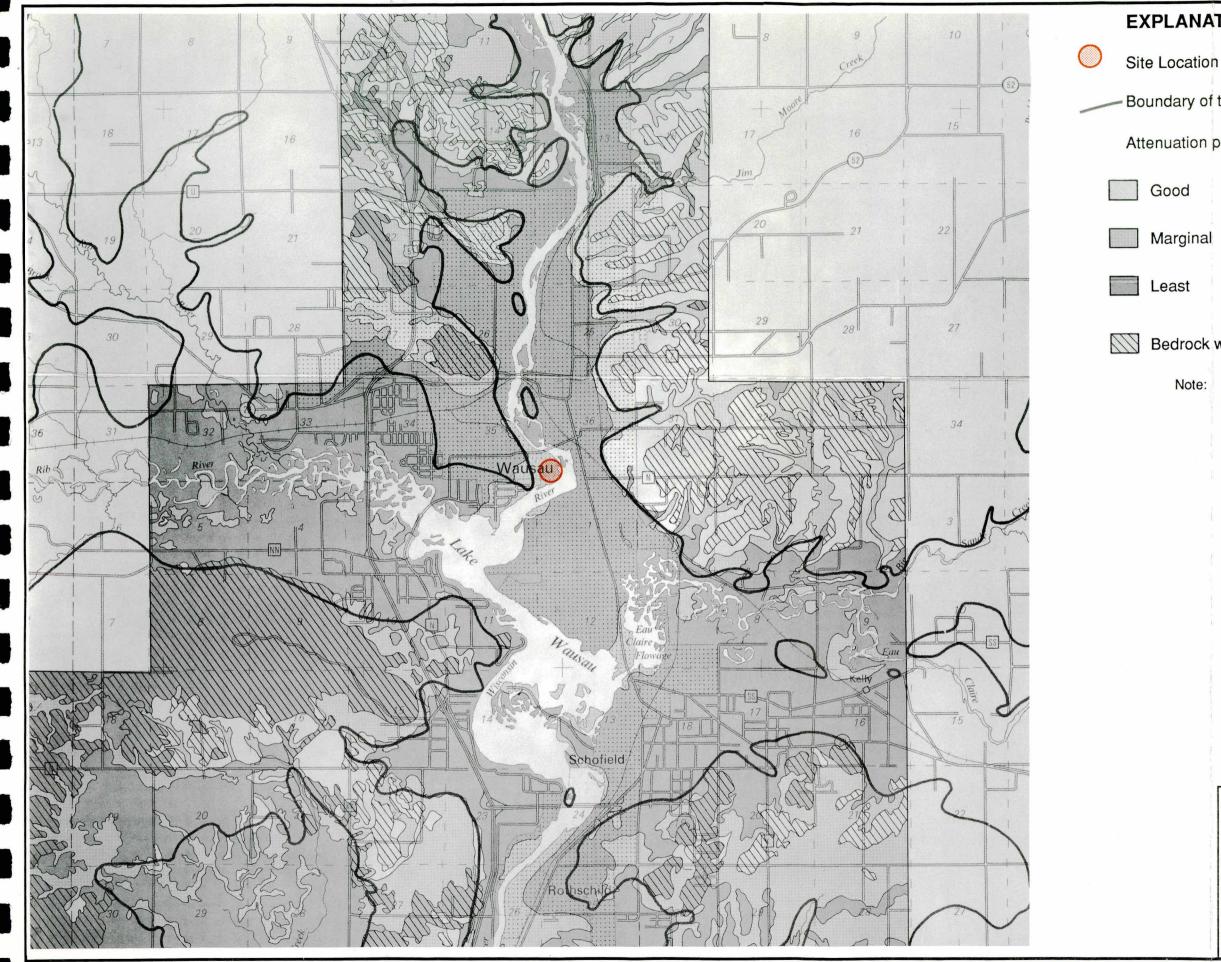
#### D. Groundwater

The groundwater in the region near the site can be thought of as belonging to two aquifers: the Wausau Aquifer (5) consisting of sand and gravel deposits which fill the lower part of the Wisconsin River valley. It is extremely heterogeneous and rests on bedrock or clay. Aquifer thickness ranges from about 160 feet in the north to 40 feet in the south (5). The confined aquifer in the region consists of fractured granitic bedrock. The old wells in the area south of Chellis Street are either shallow in the sand and gravel, or deeper – often more than a hundred feet – into granitic rock. Well logs appear in Appendix A. The sand and gravel Wausau Aquifer is the more important supply for providing drinking water, and water for irrigation and industrial purposes near the Wisconsin River.

Groundwater contours in the Wausau Aquifer have been calculated by Kendy and Bradbury as shown in Figure 7. Contours for the surrounding area have been calculated by Lippelt and Hennings (7) as shown in Figure 8. According to Kendy and Bradbury the groundwater flow direction can be greatly influenced by the localized deposit in that less permeable beds will inhibit flow which could be directed through more permeable deposits; well sorted, coarse-grained material. Variations in hydraulic gradients can also occur in localized areas due to pumping, geology, river level fluctuations, and infiltration events. In general, however, flow is southward and toward the river, with large gradients







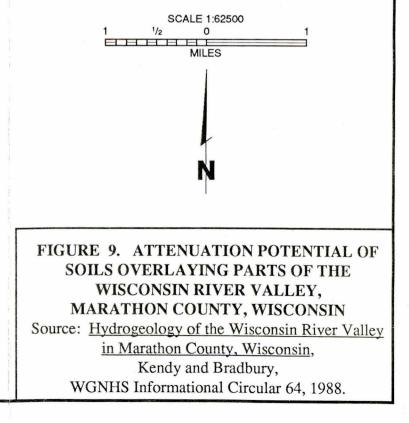
### **EXPLANATION**

Boundary of the Wausau aquifer

Attenuation potential

Bedrock within 5 feet of surface.

Note: No soils in this area of Marathon County fall into the category "*best*" attenuation potential.



existing where the topographic relief is greatest, to the east and southwest of the site.

The depth to groundwater varies across the region. Kendy and Bradbury have compiled data from about 500 wells in the Wausau Aquifer. Their data show that the depth to groundwater generally extends from 0 to 58 feet; the majority of wells have water at depths of 20 to 30 feet. The relatively shallow depth to the groundwater affects the ability of the soil to act as a buffer to potential contamination. Kendy and Bradbury have also published a potential groundwater contamination map. As shown in Figure 9, the Wausau Aquifer has generally low contaminant attenuation potential because of the shallow depth to groundwater and the relatively high permeability of the sand and gravel deposits. The study site is shown as having marginal potential.

E. Water Quality

The Wisconsin River quality has been studied and modeled for a number of years; much detailed testing information has been collected by the Wisconsin DNR. The hard-working Wisconsin River receives treated effluent from a number of sources, both municipal and industrial, upstream of this site. The Wausau Wastewater Treatment Plant typically discharges on the order of six million gallons per day (MGD) into the Wisconsin River just east of the study area. The current reconstruction work at the plant, 1989-90, will result in better quality effluent from this facility.

The Hydrologic Atlas (HA-367) for the Central Wisconsin River Basin (8) indicates large fluctuations in values of dissolved oxygen and BOD in samples collected from the Wisconsin River near the Wausau dam. The total dissolved solids also varies throughout the year. These values

are dependent upon several factors - river flow, precipitation, and temperature, among others.

The hydrologic atlas describes the groundwater as "generally good" with local problems due to high iron, hardness, and total dissolved solids. Also it must be noted that human activities have negatively affected the groundwater in many areas. The <u>Marathon County</u> <u>Groundwater Plan</u> (January 1988) (9) presents many examples of groundwater contamination problems which have occurred in the County. Some of the known causes of groundwater contamination problems include leaking underground fuel tanks, chemical spills or leaks, improper septic systems, old landfills, pesticides, and others. The Kendy and Bradbury report (5) mentioned the high potential for groundwater contamination in the Wausau Aquifer and many problem cases were also reported.

Within one mile of the study area contamination problems have been identified. The SNE Corporation (formerly Crestline) on Cleveland Avenue is responsible for an underground plume of pentachlorophenol (PCP). Concentrations of PCP have been measured in monitoring wells up to levels above 30,000 micrograms per liter. The plant is located about 2,000 feet northwest of the study area. The Wisconsin DNR has stated that the extent of the plume has stabilized and is not believed to be moving away from its current position. The distance from the City property to the nearest part of the plume is less than 1,000 feet.

Also directly west and southwest of the City fill area, there were many homes with private wells and septic systems. In 1984 several residents contacted the Wisconsin DNR and requested assistance. The Department began its "Adolph Street" file which documents water quality testing in several private wells. In their research a number of possible

sources of contamination were also suggested – underground gasoline tanks in the 100 block between Chellis and Adolph Streets, a possible fuel oil spill, and the old municipal fill area. Of six well tests reviewed, nearly all owners reported bad taste. In the same block one well had measured levels of benzene and xylene and another had benzene and tetrachloroethylene. Soon after these problems were found, the area was annexed to the City of Wausau and municipal water and sewerage were provided. The well construction information for the private wells in this area are included in Appendix A.

#### V. SPECIFIC FACILITY INVESTIGATIONS AND DATA PRESENTATION

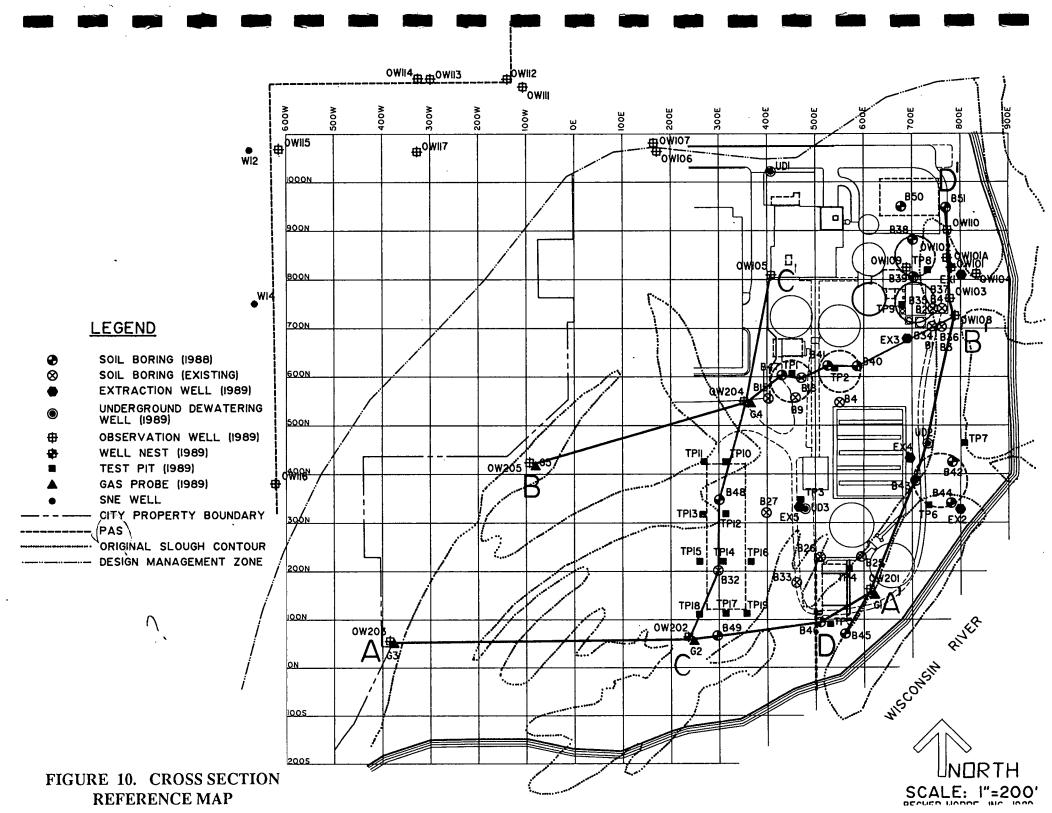
A. Site Topography

Plan Sheet 2 shows the Existing Conditions at the City property. It can be seen from the two-foot contours shown on this diagram that the topography of the site is rather gentle; the surface elevations range from 1166 feet MSL in the southwest corner to about 1173 feet MSL in the center of the wastewater treatment facility.

#### B. Subsurface Conditions

Subsurface investigations have been done at the site throughout the history of the treatment plant, and are summarized below. Plan Sheet 2 and Figure 1 show the locations of the monitoring devices and facility boundaries. Soil boring logs and well construction diagrams are provided in Appendices E and F. These data have been used to prepare the Geological Cross Sections as located on Figure 10 and shown on Plan Sheets 8 through 11.

1. Twenty-six soil borings (B-1 to B-26) were made at the site in 1967 by Soil Testing Services of Wisconsin for the subsurface investigation for the proposed sewage treatment facilities rehabilitation (10). The findings from the drilling indicated that there was an average of 9 to 10 feet of sand fill over the entire site which was underlain by 2 to 5 feet of organic silt at all but three borehole locations. At one location (B-25) ash-type fill was noted from 0 to 21.5 feet. A medium dense sand deposit was found below the fill and organic soil.



In some boreholes, organic silt was found under the fill at 1155 to 1158 feet MSL; down to 1153.5 ft. MSL in B-21. These organic silts or slightly organic silty fine sands range in thickness from 2 to 5 feet.

- 2. Seven more boreholes were drilled in June 1967 (10) (B-27 to B-33). 3M fill extended from 6 to 15 feet in depth. The fill tended to be slightly deeper in areas closer to the river. No organic silty soil layer was reported beneath the fill. B-29 had fill consisting of wood, cinders and metals to a depth of 17 feet.
- 3. Four borings were made in 1974 (10) (B-1 to B-4, or B-34 to B-37) to explore the foundation for the filter press building. Fill consisting of topsoil, sands, cinders, ash, brick, and glass extended to depths of 10 to 16 feet. Some 3M sand was also noted. Below the fill were granular soils consisting of silty sands and gravels, well graded sands and uniformly graded fine sands which were medium dense to very dense in relative density.
- 4. Four more borings were made in 1975 (10) (B-1 to B-4) at another location on the site for foundation purposes. Results
- 5. Fourteen soil borings were also made in 1988 (B-38 to B-51) by Twin City Testing Corp. (11) for design of the current treatment plant renovations. Sandy fill was found at all the borings and extended below the surface 7 to 17 feet. Organic silt was found in Borings 41, 45 and 49 ranging from 2 to 8 feet deep. Cinders were found in Borings 44,

49 and 50 while glass and other materials were found in Borings 45, 46, 47 and 49.

- 6. Many borings and wells were installed in 1989 for the City of Wausau to evaluate groundwater flow (OW-101 to OW-110 and piezometer OW-101A) and to project and monitor the effects of dewatering for construction and the groundwater recharge system (OW-111 to OW-117) described below (10).
- 7. Five more borings, five observation wells (OW-201 through OW-205) and one piezometer (OW-202A) were installed on the south and west ends of the City property to better define the overall groundwater movement at this site. Well information forms (WIF) will also be provided. A hydrogeologist meeting the requirements of NR 500 supervised the well installations at this site.
- 8. During summer 1989 numerous test pits were excavated during construction at the site to evaluate the type, thick-ness and extent of fill.
- 9. Numerous borings and wells were installed by others in this area to monitor the PCP in the groundwater for the SNE Corporation. The wells are numbered with a "W" prefix (e.g. W-29). These logs are not included in the appendix.

Several deep boreholes were drilled in the past year at the site. The borehole for Well OW-102 was extended to 95.5 feet where weathered granitic bedrock was encountered. The borehole extended down to 83.5 feet at Well OW-107 did not show signs of bedrock. At OW-202, the borehole was drilled down to 75 feet where a silty-clayey fine sand was found which was believed to be a weathered surface just above bedrock.

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Bedrock was encountered at 21 feet at well OW-203. A five-foot rock core sample was identified as dark green mafic rock, most likely pyroxinite. (More specific rock classification was not possible without analysis of a polished thin section which was not in the scope of this report.) Several fractures were found in the core sample.

The private well logs also show bedrock to be rather shallow south of Chellis Street; at 12 to 41 feet blue, brown, red and gray "granite" was encountered. In general, the bedrock drops quite rapidly to the east from the southwest corner of the property

C. Laboratory and Field Analysis

The soil samples collected have been described and classified on the boring logs. Grain size analyses are being run on a number of samples per NR 512.11(4). In-field hydraulic conductivity has been determined to have values of 4 x  $10^{-2}$  to 7 x  $10^{-2}$  cm/sec (10) based on the pumping tests conducted at this site.

D. Groundwater

The depth to groundwater, groundwater flow direction and gradients, have been defined from the monitoring wells which were constructed over the past year. The elevation of the water table across the site has been monitored frequently since July 1989 when dewatering for the treatment plant rehabilitation construction began. One requirement prior to the start of dewatering was the installation and use of a groundwater recharge system designed to prevent the dewatering activities from affecting the PCP plume to the north and west of the site. A total of five extraction wells (EX-1 through EX-5) have been installed by the dewatering consultant, Underground Dewatering, to dewater the site during the current rehabilitation construction.

Groundwater elevations have been monitored during the dewatering at the following wells: those drilled for SNE (W-11, W-12, W-14, W-16, W-21, W-27, W-29 and W-31); new wells related to the pump test at the site (OW-101 through OW-110 and piezometer OW-101A); and seven rather shallow wells related to the groundwater recharge system (OW-111 through OW-117). In addition, five new wells (OW-201 through OW-205) and one piezometer (OW-202A) were recently installed on the south and west ends of the City property. These same wells are proposed to be checked for future rounds of measuring water levels.

STS Consultants Ltd. has reviewed groundwater data measured by Keystone Environmental for SNE and prepared groundwater contour maps of recent groundwater elevation measurements (10). These contour maps show that groundwater movement from the SNE property is generally eastward, perpendicular to the contours. At Emter Street, however, the contours flatten out and the water table remains horizontal eastward to the Wisconsin River. The river will generally control the water levels in the area around the treatment plant; although the flow is generally from west to east, flow may take on a more southerly direction when the river elevation is relatively high. Groundwater elevations are variable; the levels were more than one foot higher in January 1989 than three months earlier.

Groundwater elevations measured at the wells around the treatment plant before dewatering pumping began show no groundwater contours (Plan Sheet 6). A current water table contour map drawn from groundwater elevations measured September 12, 1989, is shown on Plan Sheet 7. Due to the pumping in extraction wells EX-1 through EX-5, the usually flat water table has taken on quite steep gradients and flow in

the system is directed towards the extraction pumps. The gradients are steepest on the east side of the site between the dewatering pumps and the river.

E. Groundwater Monitoring Plan

The five new wells and new piezometer have been designated, along with some of the old wells, as the water quality monitoring wells for this In-Field Conditions Report. New data will be collected to supplement the existing water quality data and to determine the background water quality. The designated wells include observation wells 201 through 205, 101, 105 and 107 and piezometers 101A and 202A. Since there are no longer any private water supply wells within 1200 feet of the site, none are proposed for sampling. Once the water quality assessment has been made from the designated site wells, the remaining wells may be abandoned in accordance with NR 141.

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When the designated wells have been property developed, at least three rounds of water quality sampling will be performed in accordance with NR 508.20(5)(e). We propose to collect the samples (1.) in late September-early October 1989, (2.) in early to mid-November 1989, and (3.) in mid-to-late December 1989, allowing at least 30 days between rounds. The parameters to be tested include field conductivity, field pH, chloride, COD, hardness, alkalinity, dissolved iron, and the Table 2 (1) public health and welfare parameters. A VOC scan including xylenes will also be run for the first round at all designated water quality wells, and for the second and third rounds at the wells which may have had detections. We intend to have Enviroscan of Rothschild collect and analyze these samples. We will then tabulate and analyze the results.

Based on the three rounds of water quality analyses, at least three iso-concentration maps will be prepared for the site.

F. Gas Monitoring

Gas generation and migration will be monitored through the use of five gas probes located around the site. Gas probes were installed above the water table in September 1989. Initial gas readings using a Bacharach Model HPK taken on September 15, 1989, shown on Table 1, indicate that the methane concentrations are relatively low for a fill site, but that oxygen has also been depleted from the soil atmosphere. More readings are necessary to fully define the gas characteristics and the potential for gas migration.

#### Table 1

GAS PROBE READINGS - September 15, 1989

Probe	Oxygen (% by volume)	Methane (% by volume)
G-1 G-2	1.5 <1	0.25 <1
G−3 G−4 G−5	 13 3	1.25 0

Note: Probe G-3 did not allow enough gas flow for readings.

### VI. DATA ANALYSIS AND RECOMMENDATIONS

A number of items remain to be completed for this In-Field Conditions Report. We recommend that the following be done:

- Take three rounds of water level measurements and groundwater samples for the designated wells and perform the analyses for background water quality as described in the Groundwater Monitoring Plan. This is scheduled to be done September through December 1989.
- 2. Collect at least three more rounds of gas monitoring data for the five probes at approximately the same schedule. We will analyze the results with regard to the site conditions and potential for migration.
- Review soil test information and groundwater flow data.
   Summarize findings with regard to fill materials on-site.
   Complete the site water budget (12) including these.
- 4. Thoroughly analyze the water quality information to determine the degree and extent of contamination if any.
- 5. Make recommendations for future long-term groundwater monitoring, perhaps changing to a quarterly schedule corresponding with other solid waste facilities. Make recommendations for remedial actions at this site if necessary.

### REFERENCES

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- 2. City of Wausau Zoning Ordinance, Wausau, June 6, 1989.
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- 4. LaBerge, G.L. and Myers, P.E. <u>Precambrian Geology of Marathon</u> <u>County, Wisconsin</u>, Information Circular Number 45, WGNHS, Madison, 1983.
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- 8. Levaul, R.W. and Green, J.H., <u>Water Resources of Wisconsin, Central</u> <u>Wisconsin River Basin</u>, Hydrologic Investigations Atlas HA-367, USGS, Washington, D.C., 1971.
- 9. Marathon County Planning Department, <u>Marathon County Ground-water Plan</u>, January 1988.
- 10. STS Consultants Ltd., <u>Analysis of Construction Dewatering</u>, <u>Addi-</u> <u>tions to Wastewater Treatment Plant</u>, <u>Wausau</u>, <u>Wisconsin</u>, Green Bay, July 1989, and many previous geotechnical reports, 1967-present.
- 11. Twin City Testing Corp., <u>Geotechnical Exploration Program for Pro-</u> posed Wastewater Treatment Facilities, Wausau, Wis., May 1988.
- 12. Scharch, J.F., <u>Water Balance Analysis Program</u>, WDNR, Madison, May 1985.

# Appendix A

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Alan	Lang	werr	œ	rump,	TUC.
7517	Stet	tin I	Dr.	Wausa	11 WT
() - 4	0000	OTTI 1	<b>JT •</b>	wausa	.ug 11.1

						E OF WISCONSIN				
WELL CON	STRUCTOR	'S REPORT	1	DEPARTM	ENT OF	RESOURCE I	DEVELOPMENT			Wel
1. COUNTY			·····	CHECK C	DNE	NAME				**
	Mar	athon		🕅 Town			Rib Mountai			
2. LOCATIO	N (Number an	d Street or 1/4	section, secti	on, township a	nd range. Also	give_subdivision_nam	a T 28 P 7	xera when avai	lable.)	
3. OWNER	T TIME OF	120 Now	ak St.	Wausau	, Wis.	NENESEL	2_T28 R70	- : 		
3. OWNER /	AT TIME OF		Edwin 3	Engman				م		
4. OWNER'S	COMPLETE	MAIL ADDR								
			120 N	owak St	• Waus	au, Wis. 54	ــــــــــــــــــــــــــــــــــــــ	من المعني الم		
5. Distance	e in feet fro	om well to r	nearest:   <sup>BI</sup>		ITARY SEWE	C. I.   TILE SE	FOUNDATION-D WER CONNECTED		C. I.	TER DRAI
•	nswer in appro	•		9'10" 1	' 1	50	)			
CLEAR WAT C. I.	TILE	SEPTIC TANK	C PRIVY S		ABSORPTIC	DN FIELD BARN	SILO ABANDON	ED WELL SI	NK HOLE	
-		50		75						
OTHER POL	LUTION SOL	JRCES (Give	description an	uch as dump,	quarry, drains	ige well, stream, ponc	i, lake, etc.)			
6. Well is	intended	to supply v	water for:							
				Hom	0	10 500447101	10			
7. DRILLHO	DLE From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	10. FORMATION	15 Ind	1	From (ft.)	To (ft.)
 			Dia. (11.)						Surface	
6	Surface	34				Sand & Gra	avel			21
	Ì					Clay & Gra	avel		21	34
8 CASINO	I G. LINER, C	URBING, AI	ND SCREE	<u> </u> N	·					
Dia. (in.)		Kind and Weigh		From (ft.)	To (ft.)					
6		ack std	steel	Surface	34		•			
	<u>T&amp;C 19</u>	-45#				·		·		
				-						-
9. GROUT	OR OTHE	R SEALING	MATERIA	Ļ						
	ĸ	ind		From (ft.)	To (ft.)					
	No	ne		Surface						
						Well construction	on completed on	Aug	. 1	1966
11. MISCE		DATA	<u></u>		<u> </u>			<u></u>	<b>C</b> above	
Yield test	<u> </u>		Hrs.	at 15	GPM	Well is termina		inches	below	final grad
Depth fro	m surface ·	to normal v	vater level	6	ft.	Well disinfecte	d upon completio	n	X Ye	es 🗌 N
Depth to y	water level	when pum	ning	18	ft.	Well sealed w	atertight upon cor	npletion <sup>.</sup>	X. Ye	es 🗌 N
	mple sent				ison, W		laboratory or	 ו: Aו	1g. 1	196{
							iculties encountere	·······		
TOUR ODI	non conce	rning other	nonnnon	nazaros I	mornation	concerning all	icomes encouniere	בער מווע נופ	na reidiiil(	

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to near wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, su surface pumprooms, access pits, etc., should be given on reverse side.

SIGNATURE	Hubert J.			COMPLETE MAIL ADDRESS							
	Hubert J. Lang	Registered Well D	riller	Marathon	Wis. 54418						
	Please do not write in space below										
COLIFORM TE	ST RESULT	GAS — 24 HRS.	GAS — 48 HRS.	CONFIRMED	REMARKS						

WELL CONSTRUCTOR'S REPORT TO W See Instructions	ISCONSIN STATE BOARD OF on Reverse Side	HEALTH					
1. County <u>Marathon</u> T28 R7E NENE Sec 2	Town Town Rib Mountai Village City Check one and	n give name					
2. Location <u>115 Adolph St.</u> , Wausau, Name of street and number of premise	Nig.						
3. Owner 区 or Agent Lawrence Schul: Name of individual.	Z partnership or firm						
4. Mail Address 230 N. Sixth Ave., Complete add	Wausau, Wis.						
5. From well to nearest: Building6ft; sewer	ft; drainft; septic ta	nkft;					
dry well or filter bedft; abandoned well	<b></b> ft						
6. Well is intended to supply water for:	Private Home						
7. DRILLHOLE:	10. FORMATIONS:	From   To					
Dia. (in.)         From (ft.)         To (ft.)         Dia. (in.)         From (ft.)         To (ft.)	Kind	From To (It.) (It.)					
<u>    6    0    26                       </u>	Sand & Gravel	0 16					
	Granite	16 26					
8. CASING AND LINER PIPE OR CURBING: Dia. (in.)   Kind and Weight   From (lt.)   To (lt.)	·						
6 Standard Weight							
Steel Pipe 0 16							
9. GROUT:							
Kind To (ft.) To (ft.)	······································						
None							
	Construction of the well was o						
11. MISCELLANEOUS DATA:	<u>May 19,</u>	19_53					
Yield test:2 Hrs. at3 GPM.	The well is terminated $\underline{8}$ above, below $\Box$ the perman						
Depth from surface to water-level:6ft.		-					
Water-level when pumping:Oft.	Was the well disinfected upor Yes	$x_{1} = \frac{x}{No}$					
Water sample was sent to the state laboratory at:	Was the well sealed watertig						
Wausau, Wis. on May 20, 19 53 City	-	X_ No					
Signature Augo N. Land Registered Well Driller Please do not wr	903 So. 20th Ave., Complete Mail A						
5-2153 No. 3584	10 ml 10 ml 10	0 ml 10 ml 10 ml					
Ans'd	Gas-24 hrs. 0	0 0 8					
Interpretation	48 hrs	F 4 4					
	Confirm						
γ÷ γ	B. Coli						
·							
	Examiner	mand in Sant					

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Vorgent in Sand

WELL CONSTRUCTOR'S REPORT TO W See Instructions		HEALTH	l
1. County MABATHON T28 RTE NEARES 21 1 22 01	Town I Or VII	3 11.7	
T28 RTE NENES 21 100 01	(City Chick one and gi	ve name	N/
2 Location 12,102, See 2 138 HOOLE	OH JN e or Section, Town and Range numbers		Part &
3. Owner For Agent CHARLES			1957 C
4. Mail Address 138 Address Complete add	PH St. (LAUS)	au,h	115
5. From well to nearest: Buildingft; sewer	<b>^</b>	ít	;
dry well or filter bed_55ft; abandoned well	•		
6. Well is intended to supply water for:	e Use		
7. DRILLHOLE:	10. FORMATIONS:		•
Dla. (in.) From (ft.) To (ft.) Din. (in.) From (ft.) To (ft.)	Kind	From (ft.)	To (it.)
8 0 26	SAND	0	18
	GRAVEL	10	16
8. CASING AND LINER PIPE OR CURBING:	CLAY	16	17
Dla. (in.) Kind and Weight From (it.) To (it.)	BROWN GRANITE	17	26
8" STD WHT 0 18	· ·		
9. GROUT:		· · · · · · · · · · · · · · · · · · ·	
Kind From (it.) To (it.)			
NONE			
	Construction of the well was con	npleted o	n:
11. MISCELLANEOUS DATA:	DEC	10	_ 19_5_/
Yield test:/0_ Hrs. at GPM.	The well is terminated	48	inches
	☐ above, below ⊡ the permanen	nt ground	
Depth from surface to water-level: ft.	Was the well disinfected upon c	ompletio	n ?
Water-level when pumping:ft.			
Water sample was sent to the state laboratory at:			
WAUSAN DEC 13 1951	Was the well sealed watertight	_	
City	Yes	No	
The force of fame.	1708 W. Sarlield	Ine, "	Vanson,
Signature <u>Vrederick H. Lang</u> Registered Well Driller	Complete Mail Add		jan nu,
Please do not wr	ite in space below 7		
Rec'd12-13-51 No. \$716	10 ml 10 ml 10 m	nl 10 m	l 10 ml
Ans'd 12 -17 _ 51	Gas-24 hrs	<u>_</u>	Y
Interpretation	48 hrs	<u>ð</u>	( <u>(</u>
	Confirm		
		$\frac{1}{2}$	, On
·V	B. Coli $$	and the second	STRE.
	Examiner	<u>u</u>	
	1		

WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH See Instructions on Reverse Side

,

	Town X Rib Mountain							
-	City Check one and give name							
2. Location <u>1531 Cleveland Ave</u> , Name of street and number of premise	AUSEU, Wiso SENENE Secz 728 R7E or Section, Town and Range numbers							
3. Owner 🖾 or Agent 🗌 Williem Lutzk Name of individual.								
4. Mail Address <u>1531 Cleveland Ave</u> Complete add	ress required							
5. From well to nearest: Building_ <u>10_ft;</u> sewer								
	Home							
6. Well is intended to supply water for:								
7. DRILLHOLE:	10. FORMATIONS:							
Dia. (in.) From (ft.) To (ft.) Dia. (in.) From (ft.) To (ft.)	Kind (ft.) (ft.)							
6 0 22	Senà & Gravel O 22							
	(Packed gravel on hottom							
CLERKE LINER DIRE OF CUPPINC:	and does not cave in)							
8. CASING AND LINER PIPE OR CURBING:	RECEIVED							
6 Std steel 0 21								
	SEP 21 1961							
	SANITARY SANITARY							
9. GROUT: Kind   From (1t.)   To (1t.)	ENGINEETING							
Kind From (it.) To (it.)								
	Construction of the well was completed on:							
11. MISCELLANEOUS DATA:	September 8 1961							
Yield test: Hrs. at GBM.	The well is terminated8 inches							
Depth from surface to water-level: ft.	🛛 above, below 🗋 the permanent ground surface.							
Water level when numning: $12$ ft.	Was the well disinfected upon completion?							
Water-level when pumping:ft.	Yes No							
Water sample was sent to the state laboratory at:	Was the well sealed watertight upon completion?							
Wausau, Wis. on <u>9-11</u> 1962	Yes No							
Send tripl.								
Signature Hubert J. Lang	Marathon, W15.							
Bogistered Well Driller	Complete Mail Address							
Rec'd (j-11-64 No 16.67								
Ans'd	$C_{00} = 24 \text{ hrs}$							
Interpretation								
	Confirm							
	B. Coli							
•								
	·   :::::::::::::::::::::::::::::::::::							

	0					JUN 1 5 1970.	TATE OF WISCO	лізис	
WELL ( Wel-6	CONSTRUC	CTOR'S RE	PORT	WHITE Green Yello	COPY - DIV COPY - DR W COPY - O		ENT OF NATUR, Box 450 Idison, Wisconsin		JRCES
1. COUNTY	Marathe	2n		CHECK (		NAME City Rib Mountain	/		
2. LOCATIC	ON (Number a			ion, township a	nd range. Als	p give subdivision name, lot and block num			
3. OWNER	AT TIME OF			elani Ave	• wausa	u, Wis. SENENE Sec 2	728 JR1E		
				nold Hofi	man	·····			
4. OWNER	S COMPLETE	MAIL ADDR		05 Poppy	Lane Wa	usau, Wis. 54401	a de la companya de la company		
5. Distanc	e in feet fro	om well to	nearest: B		ITARY SEWI	C. I.   TILE SEWER CONNECTED IN		STE WATE C. I.	ER DRA
	nswer in appr			1	.5				
CLEAR WAT	TER DRAIN	SEPTIC TANI	K PRIVY S	SEEPAGE PIT	ABSORPTIC	DN FIELD BARN SILO ABANDON	ED WELL SINK	HOLE	
		4ii			64				
OTHER POI	LLUTION SOL	URCES (Give	description s	uch as dump,	quarry, drain	age well, stream, pond, lake, etc.)			
6. Well is	intended	to supply	water for:						•
7. DRILLH	OLE			1		10. FORMATIONS		<u></u>	
Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	Kind	Fro	m (ft.)	To (ft.)
8	Surface	40				Coarse Gravel	Su	rface	15
6	40	50				Clay		15	21
8. CASIN	1	URBING, A				Dad Cuanita	,	21	50
		Kind and Weigh ack std s		From (ft.)	To (ft.)	Red Granite			50
		PE 18.97#		Surface	32				
						Most of the water came			oot
	-					<u>level and that was come</u> still is enough for the		<del>st ther</del>	<del></del>
				-					
							·		<u> </u>
9 GROUT		R SEALING	MATERIA	<u> </u>					<u> </u>
	ĸ	ind		From (ft.)	To (ft.)	· 			
	ssure cer SSHRAXES			Surface	32				
				-		Well construction completed on	Jun	ə 12	197(
	ELLANEOUS	DATA		at 2 <sup>1</sup> / <sub>2</sub>	GPM		inches 🕅 abo	ove fim	al grac
Yield test		. 2	Hrs.			Well disinfected upon completio		low <sup>rin</sup> Ā Yes	1 []
Depth fro	m surface f	to normal v	vater level	5	ft.				
Depth to	water level	when pum	ping	50	ft.	Well sealed watertight upon cor	· · · · · · · · · · · · · · · · · · ·	I Yes	
Water sar	mple sent i	to		Ma	adison, N	Vis. laboratory or	1: Jui	ne 12	19 7
wells, scr	reens, seals	rning other , type of access pits	casing join	nts, method	d of finish	concerning difficulties encountere ing the well, amount of cement rse side.	d, and data r used in grouti	elating t ng, blas <sup>4</sup>	to nea: ting, s
SIGNATURI		6 Lev				COMPLETE MAIL ADDRESS	•	<b></b>	
94 Lan	Well n	G. Len rilling (		egistered W	All Drillor	1708 W. Garfield Ave.	Nancan Min	SILIOT	ł
[] For	P WELT D	r tr tíuk (	// K	egisterea M	ren urmer	TINO M. JALITETO ANG.	ausau, WIS	<u></u>	<u> </u>

Please do not write in space below									
COLLFORM TEST RESULT	GAS 24 HRS.	GAS — 48 HRS.	CONFIRMED	REMARKS SEE 4/12/					
	•	•	•	•					

					STAT	E OF WISCONSIN	l			
WELL CON	ISTRUCTOR	S REPORT		DEPARTM	ENT OF	RESOURCE	DEVELOPME	NT		Wei
I. COUNTY				CHECK (	ONE	NAME		<u> </u>		
	arathor			🕅 Town			Rib Mount			
2. LOCATIO						o give_subdivision_na			ailable.)	
	•	ellis St	• ····	usau, 🗄	lis./NW	NENE Sec 2	2 T28 R7	E		
3. OWNER	AT TIME OF		Tohne				*** * * * * * * * * *			
A OWNER	COMPLETE	ALLEII MAIL ADDRI	Johns	3011						
4. OWNER	5 COMPLETE			ed St.	Los An	geles, Cal.	90002			
5 Distance	e in feet fr	om well to n	earest:  B	UILDING SAN	ITARY SEW	ERIFLOOR DRAIN	FOUNDATIO	N DRAIN	WASTE WA	TER DRAI
		opriate block)			25	c. i. Tile si 25	ewer connectei	DINDEPENDEN	Г С. І.	TILE
CLEAR WAT	ER DRAIN	SEPTIC TANK	PRIVY	SEEPAGE PIT	ABSORPTI	ON FIELD   BARN	SILO ABAN	DONED WELL	SINK HOLE	
C. I.	TILE	60		75						
OTHER POI	LUTION SOI	URCES (Give o	description a	ruch as dump,	quarry, drain	age well, stream, pon	nd, lake, etc.)			
6. Well is	intended	to supply v	vater for:				•	<u></u>		
				Hon	10				<u></u>	<u></u>
7. DRILLH	4	T- (6)		1 E (4)	T	10. FORMATIO	NS (ind		E (64.)	To (61)
Dia. (in.)	From (ft.)	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)				From (ft.)	<u> </u>
8	Surface	40				Coarse gr	Surface	17		
6	40	47				Blue Grar	nite	<u>.</u> .	17	38
8. CASING	G, LINER, C	URBING, AN	ND SCREE	Ņ	,	Pod Chang	. + ~		38	1.7
Dia. (in.)	-1	Kind and Weight		From (ft.)	To (ft.)	Red Grani	Lue			47
6	Std ste PE 18	eel new •97#	black	Surface	40					
	-									
				-						
	-			-		· · · · · · · · · · · · · · · · · · ·			-	
•										
9. GROUT		R SEALING	MATERIA	L From (ft.)	To (ft.)					
Dril	l cutt: ssure ce	ings ement		Surface	6 40					
						Well constructi	ion completed	on .	Aug. 22.	1967
	ELLANEOUS					Well is termin	<u>,</u>	inches X	] above _	inal grad
Yield test		2	Hrs.	at <u>6</u>	GPM				] below '	
Depth fro	m surface	to normal w	ater leve	1 6	b ft.	Well disinfecte	ed upon compl	etion	X Ye:	s [] l
Depth to	water level	when pump	ping	40	ft.	Well sealed w	vatertight upon	completion	[X] Ye:	1 🗌 z
Water sar	nple sent	to		I	Madison	, Wis.	laboratory	on: Ai	ug. 22	19 6
Your opin	nion conce	rning other	pollution	hazards, i	nformation	concerning_diff	ficulties encoun	tered, and d	ata relating	to near

Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to near wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, su surface pumprooms, access pits, etc., should be given on reverse side.

SIGNATURE Lubert J. Kan Hubert J. Lang	1	COMPLETE MAIL	ADDRESS	<b></b>
Hubert J. Lang	Registered Well Dri	ler Ma	rathon, Wis.	54448
	Please do no	t write in space bel	ow	
COLLFORM TEST RESULT	GAS — 24 HRS.	GAS 48 HRS.	CONFIRMED	REMARKS
	I	• •	l	1

### WELL CONSTRUCTOR'S REPORT TO WISCONSIN STATE BOARD OF HEALTH <sup>Wel 6</sup> See Instructions on Reverse Side

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	-	on neverse side	la contra c
1. County Marathon N 2 NENE Sec 2 728 R 72 2. Location 112 Adolph S		(Town X Village Rib Mountai	n /
N 2 NENE Sec 2 T28 R7E	)	(City Check one and g	tya name - IAI
2. Location <u>112 Adolph S</u>	number of premise	U, Dis. e or Section, Town and Range numbers	I have been for the line with
	mand Bassa		JUN 1-0-1963
<ol> <li>Winer X or Agent □Or</li> <li>Mail Address112 Adol</li> <li>Energy Water and Pailling 5</li> </ol>	ph St. W	ausau. Wis.	S ANT A DAY
Man Muress	Complete add	iress required	NGINFFRN
5. From well to nearest: Building	2_It; sewer	±2it; drain_==_it; septic tan	k491t;
dry well or filter bed_ <u>55</u> _ft; aba	ndoned well	<b></b> ft	
6. Well is intended to supply water f	or:	Home	
7. DRILLHOLE:		10. FORMATIONS:	
Dia. (in.) From (ft.) To (ft.) Dia. (in.) From	(ft.) To (ft.)	Kind	From To ((t.) ((t.)
8 0 40		Sand, Gravel & Clay	0 12
6 40 128		Gray Granite	12 125
8. CASING AND LINER PIPE OR	CURBING:	Red Granite	125 128
Dia. (in.) Kind and Weight From	(ft.) To (ft.)		
6 Std steel 0	40		
			<u></u>
9. GROUT: Kind   From (	ft.)   To (ft.)		
Drill Cuttings 0	6	·	
		Construction of the well was co	mpleted on .
	40		
11. MISCELLANEOUS DATA:		May_3	
Yield test:2 Hrs. at1	8 GPM.	The well is terminated	
Depth from surface to water-level:	止금 ft	🕅 above, below 🗋 the permane	ent ground surface.
		Was the well disinfected upon	completion?
Water-level when pumping:	ft.	Yes	X No
Water sample was sent to the state la	boratory at:		
Wausau, Wis. on 6-3		Was the well sealed watertight	
City	10	Yes	X_ No
Frederick A. Jana	Send ·	tripl.	
Signature Frederick A. Lang Registered Well Driller	)	1708 W. Garfield Ave Complete Mail Add	
Registered wen Dimer	Please do not wr	ite in space below	11636
JUN 3 1963	157.56	10 ml 10 ml 10 m	ml 10 ml 10 ml
		Gas-24 hrs. 0 0	0 0
Ans'd		2 2 2	_
Interpretation		48 hrs	$\mathcal{O} \ \mathcal{O} \ \mathcal{O}$
$\Delta \mu$		Confirm	· · · · · · · · · · · · · · · · · · ·
		B. Coli	
		Examiner_	

State of Wisconsin Department of Natural Resources Box 7921 Madison, Wisconsin 53707

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• • • • • WELL CONSTRUCTOR'S REPORT Form 3300-15 Rev. 12-76

	ment of Natu		ces		White Copy		Division's Co		Form	3300-15		Rev.	12-76
Mad		ox 7921 Green Copy – Driller's Copy Visconsin 53707 Yellow Copy – Owner's Copy											
1. COUNT	Y Maratho	<u></u>		CHECK (/)		1209		Nar City		o Mount	ain		
	Mara Und		Section	Township	Range	Y						NG CHF	
2. LOCAT		Æ	2	28N	7E			John Mroo					
OR -	- Grid or St		Street Name			A	DDRESS	1106 So.	17+h	Are			
AND -	- If available		ACIOLPI	St. Wausa & block No.	u, wi.	<u>р</u>	OST OFF			<u> </u>			
			,					Wausau, N	Ni. 544	401			
4. Distance	e in feet from	n well B	uilding Sa	initary Bldg. Dr	ain Sanitary	Bldg	. Sewer	Floor Dr. Connected	ain I To:	Storm Blo	dg. Drain	Sto	rm Bldg, S
to neare answer i block)	in appropriat	e			her C.I.		Other _	C.I. Sewer OI		С.І.	Other -	C.I. -	Othe –
Street Sev			·····	Drain Connecte		mp her	Clearwai   Sump	ter Septic H Tank 1	<b>r</b> a a la C 🖵	ewage Absor	rption Ur	nit	
San. Sto	orm C.I.	ŀ	Sewer Clearwater	Sump Clearwater			_		Se	epage Bed			····
Privy Pet	t Pit: N		Dr	Sump Subsurface Pr		Barn	Animal /		Glass L	ined Silo	Farthe	n∙Silage	
Wa Pit	t Well			Nonconformi		utter	Barn Pen	Yard With	Glass L Storag Facilit	e w/o y Pit	Storag Pit	e Trench	Or
-	- Tank			-		-	_		-			-	-
Temporary Manure	Liquid	Manure  St	olid Manure torage	Gasoline or	Waste Pond or L Disposal Unit	and	Other (Gi	ve Description	)	A. C. S.			
Stack	Tank	S	tructure	Oil Tank	(Specify Type)	_		_		Martine			
5. Well is i	ntended to s	upply wate	er for:	†		9.	FORMATI	IONS	<u>,</u>	<u> </u>			
				Home				Kind			From (	ft.)	To (ft.
6. DRILL					T- (64.)	,	Fill		2.		~ ~		2
Dia. (in.)	From (tt.)	10 (11.)	Dia. (in.)	From (ft.)	To (ft.)				•		Surface		~
10	Surface	19	6	40	68	(	Clay				2		14
8	19	40				1 5	Shale,	, it is a second se			14		18
7. CASIN	G, LINER, C Material, W	URBING A	AND SCREE	N	· · · · ·		and a second second						
Dia. (in.)	& Meth USS AST	nod of Asse	embly	From (ft.)	To (ft.)		<u>Brówn G</u>	ranite			18	<u> </u>	38
		PE 18.		Surface	40	, <sup>2</sup>	Gray Gr	anite			38	3	68
					المتو.	<i>.</i>							
					Jar								
				·····	A REAL								
	. <u> </u>				1	10	TVPF OF	F DRILLING	MACHINE	USED			
					< <sup>*</sup>			211001101	I Rota	ry-hammer illing	ł	_	
8. GROUT			G MATERIA	1 4				le Tool	L_l mud	& air		Jett ل_	ing with
	Ki	nd		From (ft.)	To (ft.)	4		ary-air rilling mud	X & air	ry-hammer			Air Water
				Surface	6		Rota mud	ary-w/drilling	D Reve	erse Rotary	Ì	L	
Ľ	Drill cu	ttings				_					<b>.</b>	0	19 79
·				,	1.0						Mare 7	~	19 <u>7</u>
F	Pressure	cemen	t	6	40	We	ll construct	tion completed	1 on	 ריצו	May ]		
F 11. MI		cemen EOUS DA	t	6	40 13 GPM		Il construct	•	1 on 12 inch		May ] above below	final gr	ade
F 11. MI Yie	Pressure SCELLAN eld Test:	cemen EOUS DA	t ATA	Hrs. at	10	We	ll is termin:	•	12 inch	ies 🗖	above		ade
F 11. MI Yie Dep Dep	Pressure SCELLAN eld Test:	cemen EOUS DA face to nor level	t ATA 2	Hrs. at vel1	13 GPM	We Wel	<u>II is termina</u> II disinfecte	ated	<u>12</u> incl		above below	final gr No	ade
F 11. MI Yie Dey Dey Wa	Pressure (SCELLAN eld Test:	cemen EOUS DA face to nor level g	t ATA 2 	Hrs. at vel Stabilized Z	<u>13</u> GPM L <sup>1</sup> /2 Ft. C Yes C N Wausau, W	We Wel b Wel	II is termin: II disinfecte II sealed wa	atedd upon compl tertight upon a laborato	<u>12</u> incl etion completion	nes 🛄 XI n XI	above below Yes Yes May	final gr No No 18	19 <u>79</u>
F 11. MI Yie Dey Dey Wa Your onio	Pressure (SCELLAN eld Test: pth from sur pth of water when pumpin ater sample se	cemen EOUS DA face to nor level g	t ATA 2 	Hrs. at vel Stabilized Z	<u>13</u> GPM L <u>1</u> Ft.	We Wel Wel	Il is termina Il disinfecte Il sealed wa ies encount	ated d upon compl tertight upon laborato tered, and data	<u>12</u> incl etion completion	nes 🛄 XI n XI	above below Yes Yes May	final gr No No 18	19 <u>79</u>
F 11. MI Yie Dej Dej Wa Your opin finishing t	Pressure (SCELLAN eld Test: pth from sur pth of water when pumpin ater sample se nion concern the well, amo	cemen EOUS DA face to nor level g ent to ing other p point of cen	t ATA 2 	Hrs. at vel Stabilized Z ards, informatio grouting, blastin	<u>13</u> <u>GPM</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u> <u>1</u>	We Wel Wel	Il is termina Il disinfecte Il sealed wa ies encount	ated d upon compl tertight upon laborato tered, and data e side.	<u>12</u> incl etion completion	nes 🛄 XI n XI	above below Yes Yes May	final gr No No 18	19 <u>79</u>

State of Wisconsin Department of Natural Resources Box 7921 Madison, Wisconsin 53707

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WELL CONSTRUCTOR'S	
Form 3300-15	Rev. 12-76

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Depar		of Natu 30x 792	iral Resour	ces		White Cop Green Cop	y _ y _	Division's C Driller's Co	ору		Form				Re	ev. 12-7	
Ma			sin 53707			Yellow Co	у — ру —	Owner's Co	ру ру								
1. COUN		Marat	thon		CHECK (		] Village		City	Name	Rib	Mar	inta	in			
		1% Sec		Section	Township	Range									LING CH	HECK (	
2. LOCA			NE	2	28N	7E			Anthor	ny Mag	recl	<u>ci</u>					
OR	- Gri	d or Str	1	Street Name	st. Waus	an Wi		ADDRESS	א מרר	3.07mh	C+						
AND	– If a	vailable			& block No.	au, wi.		POST OFF	117 Ac	10101	50.					·	
			· • • •						Wausau	ı, Wi.	541	+01					
4. Distand to near		et from (Reco		uilding S	C.1.		itary Bld	g. Sewer Other		or Drain ected To				ig. Dra			Idg. Sew
answer block)	in app	ropriate	e	10	C.I. (		45	Other	C.I. Sewe	er Other	Sewer	C.	.1.	Oth	er C	J.	Other
Street Se	ewer   torm			Foundation Sewer	Drain Connect	ted to: Sewag	e Sump Other	Clearwa Sump			ing Se Se	wage epage		ption	Unit 51		
301, 3		C.I.	h	Clearwater Dr.	Sump Clearwate	er :			4	5	Se	epage	Bed		<u></u>		
	et   Vaste	Pit: No		ing Existing			Barn		Animal	Silo (	Glass L	ined		Fart	hen Silag	e	
P	it <u>L</u>	Well Pump			Nonconfor	ning Existing	Gutte	er Barn Pen	Yard V	With Pit	Storage Facility	e /	w/o Pit	Pit	age Trend	h Or	
Temporar		Tank Vatertig	ubt IS	olid Manure	Subsurface	Waste Pond		Other (Gi			<sup>:</sup>						
Manure Stack	í   ι	_iquid N Fank	Manure St	orage ructure	Gasoline or Oil Tank	Disposal Un (Specify Ty	it		ve Descrip	ption):							
	<u> </u>									·'							
5. Well is	intend	ed to su	ipply wate	r for:	Home		9.	FORMAT		ind			I	From	(6+)	I т.	~ (ft )
6. DRILI	LHOLE	5							· · · ·	<u></u>				From	(11.)		o (ft.)
Dia. (in.)	Fron	n (tt.)	To (ft.)	Dia. (in.)	From (ft.)	+ To (ft.)		Top So	il					Surfa	:e	ļ	1
_10	Sur	face	24	6	41			Fill		•				1			3
8		24	41	<u> </u>		:		Sand,	Gravel	L & C1	ay				3		24
7. CASIN Dia. (in.)	G, LIN Mate	VER, CU erial, Wo & Meth	URBING A eight, Spec od of Asse	ND SCREE	EN From (ft.)	' To (ft.)		Soft R	ock					2	4	,	41
6		S AST	M A53	Gr. B	110(11.)		<u> </u>	0010 1	OCK			•.••			¥		<u>+1</u>
<u></u>		F	<u>E 18.9</u>	7#	Surface	41		Grey G	ranite	)				4	1	<u> </u>	<u>85</u>
	<u> </u>							Red	11					8	5		<u>98</u>
					1												<u></u>
							10	. TYPE OF	DRILLI	NG MAC	HINE	USEL	; ;			<u> </u>	
0 0000									e Tool		Rotar w/dri	Íling	nmer				
8. GROU	TOR	OTHER Kin		G MATERIA	AL From (ft.)	To (ft.)		Pate			mud a Rotar		nmer			tting w 7 Air	
				-					illing muc iry-w/drill		& air					] Wa	
	Dri	<u>11 c</u>	utting	s	Surface	6		mud			Rever	se Ro	otary				
<u> </u>	Pre	<u>ss</u> ur	e ceme	nt	6	加重し	41 W	ell construct	ion comp	leted on			May	<u>r 15</u>		19	79
11. M			EOUS DA			٦.							- 34	above	final g		
Yi	eld Tes	it:	ــــــــــــــــــــــــــــــــــــــ		Hrs. at	<u>G</u>	PM We	ell is termina	ted	24	inche	S	<u> </u>	below			+
De	epth fro	om surf:	ace to nori	nal water le	vel	$+\frac{1}{2}$ F	t. We	ll disinfecte	d upon co	mpletion				Yes 🗆	□ No		
	•	water l umping	u u	8 Ft.	Stabilized	🛣 Yes 🗆	No We	ll sealed wat	ertight up	oon comp	letion			Yes 🗆	] No		
		nple ser				Wausau				ratory on				May		19	
Your opin finishing	nion co the we	oncernir II, amou	ng other po unt of cem	ollution haz	ards, informati grouting, blast	on concerning ing, etc., shou	difficult ld be give	ties encount en on reverse	ered, and e side.	data relat	ting to	neart	oy wel	ls, scre	ens, seals	, metho	od of
								omplete Mail									
La	ng W	lell ]	Drilli	hang co.	Register	ed Well Driller		1708 V	V. Gar	field	Ave	• Wa	<u>aus</u> a	. <u>u,</u> 1	<b>√i.</b> 54	401	

State of Wisconsin Department of Natural Resources Box 7921 Madison, Wisconsin 53707

NOTE	:		
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WELL CONSTRUCTOR'S REPORT Form 3300-15 Rev. 12-76

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Departr	ment of Natur Box 792	ral Resourc 1	es		White C Green C	Copy -	- D	riller's Co	py	<ul> <li>Driller's Copy</li> </ul>					. 12-76
Mad 1. COUNT	lison, Wiscons			CHECK (			- 0	wner's Cc		Name ,					
	Mara			Town					City		Rib				
2. LOCAT	ION NE		ection 2	Township 28N	Range 7E	4	3. N	AME 🗶		LAGENT				ING CHE	ECK () ONE
OR -	- Grid or Str		treet Name	;			A	DDRESS	15	13 Cl	evel	and	St.		
	513 - If available	subdivision		eland St & block No.	•		P(	OST OF		usau,					
				<u>.</u>										<u> </u>	
4. Distance to neare	e in feet from est: (Reco		rilding s 12	C.I.	rain :	Sanitary I		Sewer Other	Connec Connec C.I. Sewer	Drain ted To: Other Sev		I.	lg. Drai Othe		orm Bldg. Sewe
	in appropriate			-	-	_		-		-	-			•	
Street Sev San. Sto			oundation Sewer	Drain Connect	ed to Se	wage Sun I. Oth		Clearwa		Holding Tank	Sewage Seepag		ption L	79	
		- 1	Clearwater Dr.	Sump Clearwate Sump			-	-	69	-	Seepag Seepag		:h		
	aste	nconformi	ing Existing	Subsurface F		C	larn utter	Animal Barn	Animal Sil Yard Wi	th Pit  Sto	is Lined rage	w/o	Earth Stora Pit	en Silage ge Trench	ı Or
-   -	- Pump						-	Pen 🗕	┝ │	Fac	<b>—</b>	Pit   <b>-</b>			
Temporary Manure	y Watertig		lid Manure orage	Subsurface   Gasoline or	Waste Po Disposal	ind or La Unit	nd	Other (G	l live Descript	ion)	<u> </u>	<u> </u>		··· .	
Stack	Tank 🗕	St	ructure ••	Oil Tank	(Specify	Туре) —			none						
5. Well is i	intended to su	ipply water	r for:				9.	FORMA	FIONS				•		
6. DRILL	UOLE		F1	iture Ho	me			<u> </u>	Kin	d			From	(ft.)	To (ft.)
• ·	From (tt.)	To (ft.)	Dia. (in.)	From (ft.)	To	(ft.)	S	and 8	& Grave	el			Surfac	e	7
10	Surface	20	6	40	2	02	C	ourse	e Grave	el & C	lay		7		16
8	20	40					D	ecom	posed (	Franit	e		16		20
7. CASIN Dia. (in.)	G, LINER, C Material, W & Meth	URBING A eight, Spec nod of Asse		EN From (ft.)	<u>  To (</u>	(ft.)	G	ray (	Granite	<u> </u>			20	o o	202
6	18.97	# new	blac	Surface		4O									
steel	P.E. c	asing	ASTM												
A-53 (	rade B	Mfg.	LaBa	rge,			1			·					
Ine				-			<u> </u>								
							10.	TYPE (	OF DRILLIN		NE USE otary-ha		(14	W )	
8 GROU	T OR OTHE	R SEALIN	GMATER	L IAL	<u> </u>		1	🗖 Ca	ble Tool	/ w	/drilling ud & ai			🗖 Jet	ting with
	Кі			From (ft.)	To	(ft.)	-		otary-air drilling mud		otary-ha air	ammer			] Air ] Water
pressi	<u>ire cem</u>	ent g	rout	Surface		+0			otary-w/drilli ud		everse F	Rotary			
							We	ll constru	ction compl	eted on		8	/14		<u>19</u> 78
11. M	ISCELLAN	EOUS DA	TA 1		4		1			8.		_	above below	final g	rade
Yi	ield Test:			Hrs. at		<u> </u>		<u>ll is termi</u>			nches		Yes [	 □ No	
	epth from sur			level		Ft	We	I disinfec	ted upon cor	npietion	<u></u> .				
	epth of water when pumpin	g202	Ft	. Stabilized	Yes		We	l sealed w	vatertight up	on comple	tion	×ě	Yes [	] No	<u></u>
w	ater sample se	ent to		Wausau,						atory on _	6	3/14			<sup>19</sup> -78
Your opi finishing	inion concern the well, amo	ing other p ount of cen	ollution ha	zards, informat n grouting, blas	ion conce ing, etc.,	rning diff should b	ficult e give	ies encou n on reve	ntered, and or service side.	lata relatir	ig to nea	uby we	ells, scro	eens, seals	, method of
Signature	1		/						ail Address	 	חאתוס		NO		
A.	la =	R	tre	Register	red Well I	Driller			LANG WI Stettii					ïs.	
6	- C <sup>**</sup> - C <sup>*</sup>	6					<u> </u>								

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Narston       [1] [3] Town [] Village       City       Rib Mountain         2       LOCATION (Number and Storet or 14 section, section, provide stama, but an advertige stam, but an advert advertige stam, but an advert advertige stam, but advert advertige stam, but advertige stam, but a	Wel-6		CTOR'S RE	PORT	YELLO	W COPY -	ALIC IVISION'S C DRILLER'S C OWNER'S C	OPY COPY	įġ (		AENT OF Bo	OF WISCONS NATURAL × 450 Visconsin 5	RESO	URCE
E IDEXAMON INUMER and Server of y server, were yearship and rates. by and head subject were yearship and rates. by and yearship	1. COUNTY		rathon	· · · [			ae 🗆 Ci		Rib M	lountai	n			
6 OWNER AT THE OF PAULING       Henry Lutzke         1523 Cleveland Ave, Wausau, Wis, 5/401         5. Distance in feet from well to nearest.       BUILDING BARYTARY SEWERFUCOR DRAIN       WARTE WARTE OF         10 Provide answer in appropriate back)       0.1 THE       0.1 THE       C.I.       THE         1017/1       33       1017/1       BARN       SULOA DARNOT DRAIN       WARTE WARTE OF         CLAW WARTE NOLIN SEPTIC TANK (PRUY)       SEPAGE FIT ABSORPTION FIELD       BARN       SULO_ADAROORED WELL SERVE HOLES       C.I.       THE         C.I.       THE       0.5       Interference fit       BARN       SULO_ADAROORED WELL SERVE HOLES       C.I.       THE         C.I.       THE       0.5       Interference       THE       C.I.       THE       C.I.       THE         C.I.       THE       0.5       Frem (ft)       Testing       SULO_ADAROORED WELL SERVE (STARE BE       C.I.       THE         C.I.       THE       C.I.       THE       C.I.       THE       C.I.       THE         C.I.       THE       SULO       ADAROORED WELL SERVE (STARE BE       SULO       SULO       SULO       SULO       SULO         C.G.I.       THE       SULO       SULO       SULO       SULO       SULO	2. LOCATIO			section, sect	tion, township a	nd range.	Leo give sub	division nam						
4 OWNER'S CONFLETE MAIL ADDRESS       1523 Cleveland Ave. Wausau, Wis. 54401         5. Distance in feet from well to nearest:       BUILDING SANTARY SEVERIFUED FRANK       PUININGFOR DRUIN         6. Line of the feet from well to nearest:       BUILDING SANTARY SEVERIFUED FRANK       PUININGFOR DRUIN         C.L.       TILE       C.L.       TILE       SEVER CONNECTEDINEDERDENT       C.L.         C.L.       TUS       SEVER CONNECTEDINEDERDENT       C.L.       TILE         C.L.       TUS       SEVER CONNECTEDINEDERDENT       SEVER CONNECTEDINEDERDENT       TILE         C.L.       TUS       SEVER CONNECTEDINEDERDENT       TILE       C.L.       TILE         C.L.       TUS       SEVER CONNECTEDINEDERDENT       SEVER CONNECTEDINEDERDENT       SEVER CONNECTEDINEDERDENT         C.L.       TUS       SEVER CONNECTEDINEDERDENT       SEVER CONNECTEDINEDERDENT       SEVER CONNECTEDINEDERDENT         C.L.       TUS       SEVER CONNECTEDINEDERDENT       SEVER CONNECTEDINEDERDENT <td< td=""><td>3. OWNER</td><td>AT TIME OF</td><td>DRILLING</td><td>15</td><td>23 Clevel</td><td>and Ave</td><td>. waus</td><td>au, Wis</td><td>• / SE</td><td>NENE</td><td>Sec 1</td><td>2 / ~ 8</td><td><u>R / C</u></td><td><u> </u></td></td<>	3. OWNER	AT TIME OF	DRILLING	15	23 Clevel	and Ave	. waus	au, Wis	• / SE	NENE	Sec 1	2 / ~ 8	<u>R / C</u>	<u> </u>
1523 Cleveland Ave. Wausau, Wis. 54401         S. Distance in feet from well to nearest:         SUBJOR FAMILY REPERTION DEALING FORMATION DEALING CONTRACTOR DEALING CL. THE SEVER CONNECTED INDERSON TO THE CL. THE SEVER CONNECTED INDERSON TO THE SEVER CONNECTED INDERSON TO CL. THE SEVER CONNECTED INDERSON TO THE SEVER CONNECTED INTERSON TO THE S					Henry Lut	zke					Art and a second			
5. Distance in feet from well to nearest:       BUILDING CAMPTARY SEVERIPLOOR DEALN C. I. TILE       FOUNDATION DEALN C. I. TILE       FOUNDATION DEALN C. I. TILE       WATES WATER ON C. I. TILE       TILE       C. I. TILE       Sufface       C. I. TILE       C. I. TILE       Sufface       C. I. TILE	4. OWNER'S	S COMPLETE	E MAIL ADDR		<b>1</b> 523 Clev	eland A	ve. Wa	usau. W	ïs. 54	401	F			
(Record answer in appropriate block)       1017 33         CLEAR WATER DRAIN       SEPTIO TANK [PHUY] SEEFACE FIT       ABORPTON FEELD       BARN       SLEQ       ABANDONED WELL SLIKE HOLE         C. I       T.J.       68       95	5. Distance	e in feet fr	om well to		UILDING SAN	NITARY SE	WERFLOOR	DRAIN	FOU	NDATION				
CLEAR WATER DRAIN SEPTIC TANK PRUVY SERFACE PIT ABSORPTION FIELD BARN       SLEAR ADAMCOVED WELL SURK HOLE         C. T       TLE       68       95         OTHER FOLLUTION SOURCES (Give description mode as dump, quarry, damage well, steam, pad, tak, oc.)	(Record a	nswer in appr	opriate block)						WER CON		NDEFEND			111.
68     95       OTHER FOLUTION SOURCES (Give description and as dues, quarry, drainage well, stream, pool, law, etc.)			SEPTIC TANK			- I	TION FIELD	BARN	SILO	ABANDO	NED WEL	L SINK HOI	.E	
OTHER FOLLUTION SOURCES (Give description such as dump, unry, drahage will, stream, ped, Max, ec)       -         6. Well is intended to supply water for:       -         7. DRILLHOLE       -         0. FORMATIONS       -         6. Well is intended to supply water for:       -         7. DRILLHOLE       -         0. Surface       30         8. CASING, LINER, CUBBING, AND SCREEN       Surface         5. GROUT CR OTHER SEALING MATERIAL       From (ft.)       To (ft.)         7. SRULHOUS       -         9. GROUT OR OTHER SEALING MATERIAL       From (ft.)       To (ft.)         8. CASING LINER, CUBBING, AND SCREEN       -         5. GROUT OR OTHER SEALING MATERIAL       From (ft.)       To (ft.)         8. GROUT OR OTHER SEALING MATERIAL       From (ft.)       To (ft.)         None       Surface       -         9. GROUT OR OTHER SEALING MATERIAL       From (ft.)       To (ft.)         None       Surface       -       -         11. MISCELLANEOUS DATA       Hrs. at 10       GPM       Well is terminated       9       inches       Bebowe final gr.         Depth from surface to normal water level & ft.       Well disinfected upon completion       IX Yes       -         Yeas sample sent to	0.1.	111-6	68		95				a de la compañía					
Home         T. DRILHOLE         Dis. (in.)       Te (ft.)       Dis. (in.)       From (ft.)       To (ft.)       To (ft.)       Kind       From (ft.)       To (ft.)         6       Surface       30	OTHER POL	LUTION SO		description a		 quarry, dra	unage well,	i stream, pond	, lake, etc	 :.)			,	····
Home         T. DRILHOLE         Dis. (in.)       Te (ft.)       Dis. (in.)       From (ft.)       To (ft.)       To (ft.)       Kind       From (ft.)       To (ft.)         6       Surface       30	·····		-	-	<b>_</b> `		·······		/					
Dis. (in.)       From (ft.)       To (ft.)       Dis. (in.)       From (ft.)       To (ft.)       Sand. & Gravel       Surface       30         6       Surface       30       Sand. & Gravel       Surface       30         8. CASING, LINER, CURBING, AND SCREEN       Kind and Weight       From (ft.)       To (ft.)       Surface       25         6       New black Std stdel       Surface       25       Staface       25         5½       Stainless steel screen       25       30       Surface       9         9. GROUT OR OTHER SEALING MATERIAL       Kind       From (ft.)       To (ft.)       To (ft.)         None       Surface       9       Well construction completed on       Aug., 12       19         11. MISCELLANEOUS DATA       'S above       Below       final gr.         Yield test:       '3       Hrs. at       10       GPM       Well sealed waterlight upon completion       I Yes       I         Depth from surface to normal water level       8       ft.       Well sealed waterlight upon completion       I Yes       I         Water sample sent to       Madison, Wis.       Iaboratory on:       Aug., 12       19         Your opinion concerning other pollution hazards, information concerning difficulties encountere	6. Well is	intended	to supply v	water for	:	Ho	me	1						
6       Surface       30       Sand & Gravel       Surface       30         8. CASING, LINER, CURBING, AND SCREEN Det. (in.)       Kind and Weight       From (ft.)       To (ft.)       Surface       25         5       New black std stdeel T&C 19,45#       From (ft.)       Surface       25       Image: Stainless steel screen       1mage: Stainless steel screen       1mage: Stainless steel screen       25       Image: Stainless steel screen       25	7. DRILLH	OLE		•			10. FO	RMATION	S					
5       30       Sama & Grave1       Suma & G	Dia. (in.)	· · · ·	To (ft.)	Dia. (in.)	From (ft.)	To (ft.)	_	Kir F	nd			From (f	<u>.)</u>	To (ft
Dis. (in.)       Kind and weight New black std steel T&C 19, 45#       From (ft.)       To (ft.)         5       New black std steel T&C 19, 45#       Surface       25         5 <sup>1</sup> / <sub>2</sub> Stainless steel screen       25       30         5 <sup>1</sup> / <sub>2</sub> Stainless steel screen       25       30         9       GROUT OR OTHER SEALING MATERIAL Kind       From (ft.)       To (ft.)         9       None       Surface       9         9       None       Surface       9       inches         10       Mell is terminated       9       inches       above below         11. MISCELLANEOUS DATA Yield test:       3       Hrs. at       10       GPM         Well is terminated       9       inches       above below       final gr.         10       GPM       Well disinfected upon completion       X       Yes         10       Madison, Wis.       laboratory on:       Aug. 12       19         Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to ne wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, surface pumprooms, access pils, etc., should be given on reverse side.         SIGNATURE       COMPLETE MAIL ADDRESS         Lang Well Dril	6	Surface	30				Sand	& Grav	el			Surfac	e	30
Dis. (in.)       Kind and weight New black std steel T&C 19, 45#       From (ft.)       To (ft.)         5       New black std steel T&C 19, 45#       Surface       25         5 <sup>1</sup> / <sub>2</sub> Stainless steel screen       25       30         5 <sup>1</sup> / <sub>2</sub> Stainless steel screen       25       30         9       GROUT OR OTHER SEALING MATERIAL Kind       From (ft.)       To (ft.)         9       None       Surface       9         9       None       Surface       9       inches         10       Mell is terminated       9       inches       above below         11. MISCELLANEOUS DATA Yield test:       3       Hrs. at       10       GPM         Well is terminated       9       inches       above below       final gr.         10       GPM       Well disinfected upon completion       X       Yes         10       Madison, Wis.       laboratory on:       Aug. 12       19         Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to ne wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, surface pumprooms, access pils, etc., should be given on reverse side.         SIGNATURE       COMPLETE MAIL ADDRESS         Lang Well Dril				·										
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T&C 19,45#       Surface       25         5½       Stainless steel screen       25       30         5½       Stainless steel screen       25       30         9.       GROUT OR OTHER SEALING MATERIAL Kind       From (ft.)       To (ft.)         9.       GROUT OR OTHER SEALING MATERIAL Kind       From (ft.)       To (ft.)         9.       GROUT OR OTHER SEALING MATERIAL Kind       From (ft.)       To (ft.)         9.       None       Surface       Image: Surface         11.       MISCELLANEOUS DATA Yield test:       3       Hrs. at       10       GPM         Pepth from surface to normal water level       8       ft.       Well disinfected upon completion       Image: Sealed waterlight upon completion         10.       Madison, Wis.       Iaboratory on:       Aug. 12       19         Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to ne wells, surface pumprooms, access pits, etc., should be given on reverse side.       SIGNATURE         Lang Well Drilling Co.       Registered Well Driller       1708 W. Garfield Ave., Wausau, Wis. 54401         Please do not write in space below	Dia. (in.)		Kind and Weigh	t		To (ft.)	_	·						
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Depth from surface to normal water level       8       ft.       Well disinfected upon completion       Image: Presson         Depth to water level when pumping       12       ft.       Well sealed watertight upon completion       Image: Presson       Image: Presson         Water sample sent to       Madison, Wis.       Iaboratory on:       Aug. 12       19         Your opinion concerning other pollution hazards, information concerning difficulties encountered, and data relating to new wells, screens, seals, type of casing joints, method of finishing the well, amount of cement used in grouting, blasting, surface pumprooms, access pits, etc., should be given on reverse side.         SIGNATURE       COMPLETE MAIL ADDRESS         Lang Well Drilling Co.       Registered Well Driller       1708 W. Garfield Ave. Wausau, Wis. 54401         Please do not write in space below       Please below				Hrs.	at 10	) GPA	Well i	s terminat	ted	9	inches		+ in	al gra
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# Appendix B



# Appendix C

# State of Wisconsin CEPARTMENT OF NATURAL RESOURCES



Carroll D. Besadny Secretary

BOX 7921 MADISON, WISCONSIN 53707

File Ref: 1650

August 2, 1989

Evelyn L. Fisher Becher - Hoppe P.O. Box 8000

Wausau, WI 54402-8000

RECEIVED MIC 1 8 1989

Dear Ms. Fisher:

The Bureau of Endangered Resources has reviewed the project area described in your letter of July 18, 1989 regarding the Wausau Waste Water Treatment Facility, Marathon County.

Our data files contain the following information for this site: <u>Potamogeton vaseyi</u> (Vasey pondweed) a Special Concern plant occurs at Fern Island Park and is common in the shallow waters of quiet bays in the south end of the island in the Wisconsin River. <u>P. vaseyi</u> occurs in the NE1/4 of the SE1/4 of Section 35 and last observed on July 2, 1976. It was also found in Section 36. <u>P.</u> <u>vaseyi</u> has been found in only a few lakes scattered throughout WI.

Special Concern (Watch) List species are species about which some problem of abundance or distribution is suspected but not yet proven. The main purpose of this category is to focus attention on certain species <u>before</u> they become endangered or threatened.

Comprehensive endangered resource surveys may not have been completed for this project area. As a result, our data files may be incomplete. The absence of known occurrences does not preclude the possibility of their presence.

Sincerely, nald J. nicotera

Ronald F. Nicotera Director, Bureau of Endangered Resources

cc: Gary Birch - EA/6 Terrence McKnight - NCD Arlyn Loomans - NCD



### THE STATE HISTORICAL SOCIETY OF WISCONSIN

H. Nicholas Muller III, Director

816 State Street Madison, Wisconsin 53706 608/262-3266

September 13, 1989

627 7 358 1 4 1000

Ms. Evelyn L. Fisher Becher-Hoppe Engineers Architects Planners 330 Fourth Street/P.O. Box 8000 Wausau, Wisconsin 54402-8000

> SHSW: #89-1397 RE: Wausau Wastewater Treatment Facility

Dear Ms. Fisher:

We have reviewed the above-referenced project as required for compliance with Section 106 of the National Historic Preservation Act and 36 CFR Part 800: Protection of Historic Properties, the regulations of the Advisory Council on Historic Preservation governing the Section 106 review process.

There are no properties listed in the National Register of Historic Places located within the area of potential effect of the proposed undertaking. Furthermore, we are not aware of any properties that may be eligible for the National Register in this area.

We have no further knowledge of historic properties in the project area, and therefore no further concerns at this time. Information may exist, however, which has not come to our attention. We remind you that 36 CFR 800.4 includes the requirement that you seek information, as appropriate to the undertaking, from parties likely to have knowledge of or concerns with historic properties in the project area - such as Indian tribes, local governments, and public and private organizations.

If there are any questions concerning this matter, please contact Judy Patton of my staff at (608) 262-2732.

Sincerely,

Richard W. Dexter / Chief, Compliance Section DIVISION OF HISTORIC PRESERVATION

RWD:1kr

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# **Appendix D**





# ALPHABETICAL SOIL SURVEY LEGEND FOR MARATHON COUNTY

Alphabetical Symbol	Numerical Symbol	Soil Mapping Unit Name
АЬВ	68B	Alban loam, 1 to 6 percent slopes
Ad	241	Altdorf mucky silt loam, 0 to 2 percent slopes
AmC	64C	Amery silt loam, 5 to 15 percent slopes
СЪА	45A	Cable silt loam, 0 to 3 percent slopes, stony
Ch	02L	Cathro muck, 0 to 1 percent slopes
CkA	84A	Chetek sandy loam, 0 to 2 percent slopes
CkB	84B	Chetek sandy loam, 2 to 6 percent slopes
CkC	80C	Chetek sandy loam, 6 to 15 percent slopes
CkE	80E	Chetek sandy loam, 15 to 30 percent slopes
Da	152	Dancy sandy loam, 0 to 2 percent slopes
DoA	242A	Dolph silt loam, 0 to 3 percent slopes
DuB	21 <i>6</i> B	Dunnville fine sandy loam, 1 to 4 percent slopes
FeC	20 <b>C</b> ·	Fenwood silt loam, 6 to 12 percent slopes
FeD	200	Fenwood silt loam, 12 to 20 percent slopes
FfC	22C	Fenwood silt loam, 2 to 15 percent slopes, stony
FfE.	22E	Fenwood silt loam, 15 to 30 percent slopes, stony
FgB	308	Fenwood-Rozellville silt loams, 2 to 6 % slopes
Fh	2	Fordum silt loam, 0 to 1 percent slopes
FnC	633C	Freeon silt loam, 6 to 12 percent slopes

Alphabetical Symbol	Numeric Symbo	
GcB	681B	Graycalm loamy sand, 2 to 6 percent slopes
Gin	684	Graycalm loamy sand, moderately well drained, 0 to 2 percent slopes
Gr	03	Greenwood peat, 0 to 1 percent slopes
GuB	475B	Guenther loamy sand, 2 to 6 percent slopes
HtB	236B	Hatley silt loam, 1 to 6 percent slopes
НуВ	196B	Hatley silt loam, 1 to 6 percent slopes, bouldery
KaB	135B	Kennan sandy loam, 2 to 8 percent slopes
KaC	135C	Kennan sandy loam, 8 to 15 percent slopes
KaD2	135D2	Kennan sandy loam, 15 to 30 percent slopes, eroded
KeB	691B	Kennan sandy loam, 2 to 8 percent slopes, bouldery
KeC	961C	Kennan sandy loam, 8 to 15 percent slopes, bouldery
KeE	691E	Kennan sandy loam, 15 to 30 percent slopes, bouldery
MaB	632B	Magnor silt loam, 1 to 6 percent slopes
мбв	83B	Mahtomedi loamy sand, O to 6 percent slopes
МЬС	83C	Mahtomedi loamy sand, 6 to 15 percent slopes
MDE	18E	Mahtomedi loamy sand, 15 to 45 percent slopes
МсА	18 <b>4</b> A	Mahtomedi loamy sand, moderately well drained, O to 3 percent slopes
MdB	10B	Marathon silt loam, 2 to 6 percent slopes
MdC	10C	Marathon silt loam, 6 to 12 percent slopes

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Alphabetical Symbol	Numeric	
	Symbo	Soil Mapping Unit Name
MeC	13C	Marathon silt loam, 2 to 15 percent slopes, stony
MfA	51	Marshfield silt loam, 0 to 3 percent slopes
MgA	274A	Meadland loam, O to 3 percent slopes
MhA	273A	Meadland loam, 0 to 3 percent slopes, stony
Mm	126	Meehan loamy sand, U to 2 percent slopes
Mn	195	Minocqua sandy loam, 0 to 2 percent slopes
МоВ	12B	Moberg gravelly silt loam, 2 to 6 percent slope
MoC	12C	Moberg gravelly silt loam, 6 to 15 percent slopes
MsB	14B	Mosinee sandy loam, 2 to 6 percent slopes
MsC	14C	Mosinee sandy loam, 6 to 12 percent slopes
MsD	14D	Mosinee sandy loam, 12 to 20 percent slopes
MtC	19C	Mosinee sandy loam, 2 to 15 percent slopes, stony
МуВ	102B	Mylrea silt loam, 1 to 6 percent slopes
MzB	123B	Mylrea silt loam, 1 to 6 percent slopes, stony
Ne	90	Newson mucky loamy sand, 0 to 1 percent slopes
Ue	88	Oesterle loam, 0 to 2 percent slopes
Py	GP	Pits, gravel
Ph	QU	Pits, quarries
Po ···	682	Plover sandy loam, O to 2 percent slopes
RbC	28 <b>C</b>	Ribhill silt loam, 6 to 15 percent slopes, stony

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Alphabetical Symbol	Numerical Symbol	Soil Mapping Unit Name
RÞE	28E	Ribhill silt loam, 15 to 30 percent slopes, stony
RcB	202B	Rietbrock silt loam, 1 to 8 percent slopes
ReB	2228	Rietbrock silt loam, 1 to 8 percents slopes, stony
RhA	275A	Rockers loamy sand, 0 to 3 percent slopes
RoA	80A	Rosholt sandy loam, 0 to 2 percent slopes
RoB	80B	Rosholt sandy loam, 2 to 6 percent slopes
RsA	81 <b>A</b>	Rosholt silt loam, 0 to 2 percent slopes
RsB	81B	Rosholt silt loam, 2 to 6 percent slopes
ScA	180A	Scott Lake sandy loam, 0 to 3 percent slopes
SdA	181A	Scott Lake silt loam, 0 to 3 percent slopes
Se	02	Seelyeville muck, 0 to 1 percent slopes
ShA	447A	Sherry silt loam, 0 to 3 percent slopes
St	1A	Sturyeon silt loam, O to 2 percent slopes
UoB	558	Udorthents, loamy, gently sloping
WtB	43B	Withee silt loam, 1 to 6 percent slopes

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SOIL<br/>NO.SOIL NAME02Seelyeville muck447Sherry silt loam1ASturgeon silt loam55 (3)Udorthents, loamy (cut and fill made land)43Withee silt loamGP (3)Gravel pits

QU (3) Quarries

- (1) The interpretations for these 2 soils are on the same sheet. Most interpretations are the same except where SIL refers to silt loam and SL refers to sandy loam.
- (2) This soil is only mapped as a complex with Fenwood on 2 to 6 percent slopes.
- (3) Interpretation sheets are not available for these soils. Soil properties are too variable to rate. Soils require onsite investigations to determine suitability for use.

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## PLRA(S): 50, 51, 105 REV. NRB+FLA, 2-87 LDIC HAFLGEORCLLS, CCAFSE-LCAPY, PIXEC

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0-12;L 0-12;SL, FSL	• VFSL	IPL. CL-PL ISM. ML	:A-4 :A-2. A 4	·	PC1): 4 : 10 : 40 : 200 : :INCEX 0 :55-100 90-100 80-95 55 75 : <25 : 2-7 0 :95-100 90-100 55-95 30-65 : <20 :NP-4
2-2011. SL. 0-24151. FSL 4-6015. GR-S	FSL • LFS • FS	ICL, CL-PL, SL, SH-SC ISM, ML ISP, SM, GP, GM	A-2, A 4 A-2, A 4 A-2, A 3,	A 1	PC1):       4       I       8       40       :       200       :       INDE;         0       155-100       90-100       80-95       55       75       :       <25
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SANITARY F LANCFILL F (TRENCH)	GCCAS: SEVERE	SEEPAGE, WETNESS -FL CODING, SEEFAGE, VET	NESS :	GRAVEL	FRCBAELE
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### MLRA(S): 96. 93. 94A. 95A. 105 BEV. WOF.FLA. 1-87 Mollic Fluvaguents. Cuarse-Loany. Mixed, Nonacid. Frigid

THE FORDUM SERIES CONSISTS OF POORLY AND VERY POORLY CRAINED SOILS FORMED IN RECENT ALLUVIUM ON FLOOD PLAINS. THE SURFICE LAVER IS VENY CARK BROWN SILT LOAM & INCHES THICK. THE SUBSTRATUM IS 12 INCHES OF DARK GRAY MOTTLED SILT LOAM OVER 17 INCHES OF DARK GRAY MOTTLED FINE SANDY LOAM OVER GRAY SAND WITH A FEW STRATA OF SILT LOAM. SLOPES ARE 0 TO 2 PERCENT. WOODLAND IS THE MAIN USE. SOME AREAS ARE USED FOR PASTURELAND OR NATIVE MARSH MAYLAND.

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MK-SIL MK-VFSL					11021	[ <u>]; 4 i 10 i 40 i 210 ; 1</u> [5/80-100 75-100 65-100 45-95 ; 20-35 ;	<u>INDEX</u> 3-15
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CLASS- CETERMINING       POTENTIAL FOR HABITAT SLEMENTS       I POTENTIAL AS MABITAT FOR: CETERMINING         PHASE       I GRAIN ALGRASS EL JILU INANGUO CONIFERISMAURS INETLANDISMALLONIOPENLO INCOLO INETLANDIRANGE         PHASE       I SEEC LEGUME INERNI INEES PLANTS I INTERIMINOPENLO INCOLO INETLANDIRANGE         PHASE       I SEEC LEGUME INEEN I TREES PLANTS I INCOLO INCOLO INETLANDIRANGE         PHASE       I SEEC LEGUME INEEN I TREES PLANTS I INCOLO INCOLO INCOLO INETLANDIRANGE         PHASE       I SEEC LEGUME INCOLO INCOL	CLASS- CETERMINING       IGRAIN GIGRASS GI JLC IMAQUU (CONIFERISMUS INCLANDISMALLOWIOPENLD INCLANDIRANG PHASE       ISEC ILGUME INCLANDI HERANG ISEC ILGUME INCLANDI HERANG ISEC ILGUME INCLANDI FAIR I PLANTS INCLAINS INCLESSION INCLESSION INCLANDI FAIR I FAIR I ISEC INCLUENT INCLESSION INCLESSION INCLANDI FAIR I INCLANDING INCLANDI FAIR I PLANTS INCLESSION INCLANDI FAIR I FAIR I ISEC INCLUENT INCLANDI FAIR I FAIR I ISEC INCLUENT INCLUENTIAL NATIVE PLANT COMMUNITY (RENGELAND OR FOREST UNDERSTORY VEGETATION)         POIENTIAL NATIVE PLANT COMMUNITY (RENGELAND OR FOREST UNDERSTORY VEGETATION)         POIENTIAL NATIVE PLANT COMMUNITY (RENGELAND OR FOREST UNDERSTORY VEGETATION)         POIENTIAL NATIVE PLANT I PERCENTAGE COMPOSITION (CRY NEIGHT) BY CLASS DETERMINING PHASE         INT INGING NETTLE       INT INCLANDI I	LASS-SETERMINIG_PHASE		: 2501ES						SPECIE	<u>.</u>		     	SPECIES	
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THE MANTONEDI SERIES CONSISTS OF DEEP. EXCESSIVELY ORAINED SOILS FORMED IN SAMOY OUTWASM UNDER MIXED MARDWOOD FORESTS ON UPLANDS AND DUTWASM PLAINS. THE SURFACE LATER IS VERY DARK GRAY LOAMY SAND 5 INCHES THICK. THE SUBSURFACE LATER IS BROWN SAND 3 INCHES THICK. THE SUBSOIL IS DARK BROWN AND REDIISM BROWN GRAVELLY COARSE SAND AND GRAVELLY SAND 22 INCHES THICK. THE SUBSTRATUM IS REDOISH BROWN AND LIGHT REDOISM BROWN GRAVELLY SAND. SLOPES RANGE FROM 0 TO 45 PERCENT. AREAS ARE USED FOR WOODLAND AND PASTURE.

HANTONEDI SERIES

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+[GH P9T	INSNYFLA	L COTONE. Randerry	ASTER Eusm	141845514 15 16844 0 11014848 8 12314468 2	054600 APLE	18 1. 1101	SIBERIAN CR. Silxy Odgao Lilac <u>Rej Pine</u>	00 :a 11	21SIBERTAN ELM ISIBERTAN PEASHRUB IISASTERN REDCEDAR IISASTERN REDCEDAR
CLASS-			2015	HILDLIFE -	<u>46(711 30</u> 945/717 2	ITAGILITY			STIAL AS HABITAT FTR
DETERMINING	GRAIN I	GRASS	61 -166	O INAROWO	CONIFER	ISHRUBS 4	ETLAND : SHAL	LEGUIOPENLO	:WOODLO :WETLAND:RANG
PHASE 1+12% LS+LCOS+LFS	: POOR	TEL GUPE	<u>: HEAD</u>	He I TREES	IPLANTS	1	PLANTS : AA	IEP IVILOLE	INTROPE INTROPE INTER
12+1 1-127 S+CJS+FS	:V. POGA IV. Poga : :	POOR	I FAIF I FAIF	R : POOR	POCA POCA	1 - 1	V. POORIV. S V. POORIV. S I	POOR I POOR	I POOR IV. POOR: - POOR IV. POOR! - POOR IV. POOR! - I I I I I
	POTENTIAL N	L DIATEVE DI	ANT ST	t Samua TY 7	ANGEL LAID	1 10055	1		<u> </u>
		1 26	INT I		ETTAGE C	017120940	N CORY WEIGH	T VEGETATION	DETERMINING PHASE
COMMON PLA		t \$7) 1_(Ni	180L :	: !	:			1	

A RATINGS BASED ON LIB. DATA FROM 2 PEDONS IN JASHINGTON COUNTY. MINNESOTA. SEE MAES CFC 2006 AND 2008. 9 JINOBREAK GROUP 7 •

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REGIONAL INTERPRETATIONS

## MLRA(S): 90, 91 REV. FLA,WDF, 8-87 TYPIC UDIPSAMMENTS, MIXED, FRIGID

THE MANTOMEDI SERIES, MODERATELY WET, CONSISTS OF MODERATELY WELL DRAINED SOILS FORMED IN SANDY DEPOSITS ON OUTWASH PLAINS AND STREAM TERRACES. THE SURFACE LAYER IS VERY DARK GRAYISH BROWN LOAMY SAND 7 INCHES THICK. THE SUBSJL IS 12 INCHES OF DARK YELLOWISH BROWN AND DARK BROWN LOAMY COARSE SAND AND 7 INCHES OF DARK BROWN GRAVELLY COARSE SAND. THE SUBSTRATUM IS 11 INCHES OF STRONG BROWN GRAVELLY COARSE SAND OVER LIGHT YELLOWISH BROWN MOTTLED SAND STRATIFIED WITH GRAVEL. SLOPES RANGE FROM 0 10 3 PERCENTA AREA SAND AND FOR DARL DAND AND PASTURELAND.

DE PTH 1		IATED SOLL PROPERTIES	IFRACTIPERCENT OF MATERIAL LESS ILIQUID IPLAS
IN.): USDA TEXTURE	: UNIFIED	: AASHTO	1>3 IN1 THAN 3" PASSING SIEVE NO. ! LIMIT ITIC:
			<u>1(PCT)1 4 1 10 1 40 1 200 1 11NDE</u>
0-7 ILS, LCOS	ISM, SP-SH	:A-2, A 1	1 0 2 195-100 60-90 30-70 10 25 1 <20 INP-4
7-19ILCOS, LS, GR-LS	ISM, SP-SM	:A-2, A 1	: 0 2 : 75-100 60-90 30-70 10-25 : <20 INP-4
19-37:GR-COS, COS, S	ISP-SM, SM	:A-2, A-3, A-1	1 0 15170-95 50-90 30-70 5-15 ( <20   NF
7-60:GR-S. GR-COS. COS	ISP, SM, SP-SM	:A-2, A-3, A-1	: 0-15:55-95 50-90 30 70 2 15   <20   Ni
	. 1		
-1	1	1	
EPTHICLAY INDIST BULK:	PERMEA- : AVAILABLE	: SOIL : SALINITY	I SHRINK IEROSION:WIND :ORGANIC: CORROSIVITY
(IN.):(PCT): DENSITY :		Y:REACTION:(MMHOS/CM)	: SWELL IFACTORS EROD. HATTER I
1 1 (G/CM3) 1	(IN/HR) (IN/IN)	(PH) 1	POTENTIALI K I I IGROUP! (PCI) I STEEL ICONCRE
0-7 : 2-15:1.40-1.60 :	6.0-20   0.07 0.11	15.1-6.5 1 -	1 LOW 1.171 5 2 2 41 1 LOW 1 HIG
7-191 2-1511.45-1.75 1	6.0-20 1 0.06 0.10	15.1-6.5 -	: LDW :.171 : : :
19-371 0-1011.45-1.75 1		15.1-7.8 : - :	t LOW - t.101tt
37-60: 0-10:1.45-1.75 :	6.0-20 1 0.03 0.06	:5.1-7.8 : -	: LOW :.10:
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FLOODING	I HIGH	WATER TABLE I CEMEN	NTED PAN : BEDROCK ISUBSIDENCE HYDIPOTEN
. 200010			HARDNESS: DEPTH HARDNESS IN 1T .: TOTAL IGRPI FROST
FREQUENCY I DURAL			: (IN) : : :(IN) :(IN) : : I ACII
		PPARENTINOV-APRI -	

	<u>SANITARY FACILITIES</u> SEVERE-WETNESS.POOR FILTER		CONSIRUCTION_MATERIAL
SEPTIC TANK : ABSORPTION : FIELDS :		II ROADFILL	: : : :
SE WAGE	SEVERE - SEEPAGE, WE THE SS	SAND	PROBABLE     
SANITARY : LANDFILL : (TRENCH) :		II II II GRAVEL II	F PROBABLE
SANITARY : LANDFILL : (AREA) :			POOR-SMALL STONES, AREA RECLAIM
	POOR-SEEPAGE, TOO SANDY, SMALL STONES		<u></u>
DAILY 1 COVER FOR 1 LANDFILL 1			: SEVERE SEEPAGE ;
	BUILDING SITE DEVELOPMENT		I SE VERE SEE PAGE
SHALLOW SHALLOW		IIEMBANKMENTS II DIKES AND II LEVEES	1 1 1
DWELLINGS WITHOUT BASEMENTS		II II EXCAVATED II PONDS IIAQUIFER FED	1
DWELLINGS WITH BASEMENTS			CUTBANKS CAVE
SMALL COMMERCIAL BUILDINGS	•	II II II IRRIGATION	VETNESSORCUGHTY, FAST INTAKE
LOCAL ROADS AND STREETS		II II TERRACES II AND II DIVERSIONS	1

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MAHTOMEDI SERIES MODERATELY WET MAHTOMEDI SERIES

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	MODERATE	-SMALL	STONE	S. TOO .	SANDY	_0530		11	LOPMENT	: SE	VERE S	MALL S	TONES				
CAMP AREAS	I ; ; ;							11 11PLAY 11	GROUNDS								
	MODERATE	-SMALL	STONE	S.TOO S	SANDY			11 11 P	ATHS	I MO	DERATE	-T00 S	ANDY				
PICNIC AREAS	:				•••			11	AND								
		ABILITY		YIELOS						(HIG	H LEVL		GEMENT	) I TIMO	THY		
CLASS DETERMI	INING	: BIL		1		: S.I	LAGE	:	1	ALFAL	FA HAY	I BLUE	GRASS	IRD CLC	V HAY	1	
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DETERMI PHASE				NIEQUIA	• I SEE	DL.IW	INDTHIA AZARD10	LANT I	COM	IMON T	REES	:\$17	EIPROD Xiclas		EES TO	) PLANT	
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		ISIBERI. !	AN PE	ASHRUB	18 1	ISILK	Y DOGWO	00	18 1	IGRAY I	D06 ¥ 001	D	18	IMANYFL 1	R COTO	DNEASTE	R 1
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		<b></b>							ABILITY					<b></b>			
CLASS DETERM		GRAIN	8   GRA						HENTS :	WETLA	NDISHA	LLOWIO	PENLD	INCODED	IWETI	AND: RA	NGE
PHASE		SEED	LLEG	UNE_1_	ERB.	LIRE.	ES_IPL/	NTS :		PLANT	S I WA	TER 1	ILDLE	INILDLE	THIL	DLE_1MI	LOL
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	PQ1	ENILAL		E PLANT	COMM	UNITY	(RANGE	GE COM	R FORES	T UND	ERSIOR	Y <u>VEGE</u> HT) by	CLASS	DETERM	INING	PHASE	
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#### MLRA(S): 90+ 92+ 93 REV+ DPR+LWB+ 8+87

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AQUIC UDIFLUVENTS, COARSE-SILTY OVER SANDY OR SANDY-SKELETAL, MIXED, NONACID, FRIGID

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THE STURGEON SERIES CONSISTS OF SOMEWHAT POORLY DRAINED SOILS FORMED IN LOAMY OVER SANDY ALLUYIUM ON FLOOD PLAINS. THE SURFACE LAYER IS REDDISH BROWN SILT LOAM & INCHES THICK. THE NEXT 22 INCHES IS REDDISH BROWN SILT LOAM. THE SUBSTRATUM IS BROWN FINE SAND. SLOPES ARE 0 TO 2 PERCENT. AREAS ARE USED FOR WOODLAND, CROPLAND AND PASTURELAND.

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DEPTHI		1	TED SOIL P		FRACTIPERCENT OF MATERIAL LESS ILIQUID IPLAS-
(IN.): US	DA TEXTURE	I UNIFIED	1 44	SHTO	I>3 INI <u>THAN 3" PASSING SIEVE NU.</u> LIMIT ITICIT <u>L(PCT)I 4 I 10 I 40 I 200 I IINDEX</u>
0-8 :SIL		INL. CL-ML	14-4		1 0 1 100 95-100 85-100 60-90 1 <25 1 2-7
0-8 IFSL 0-8 IVFSL		ISN. SH-SC IML. SH. SH-SC. CL-HL	: A-4		0   100 95-100 65-85 35-50 ; <25 !\P-6   0 ! 100 95-100 75-95 45-65 : <25 !\P-6
8-301SIL, V	SL, LVFS	INL, SM, SC, CL	14-4		¦ 0 ¦ 100  95−100 75−95 45·65 ; <25 ;NP+6 ¦ 0 ¦ 100  95−100 85−100 35 95 ; <3C ;NP+10
30-6015, FS		ISN. SP-SM	1A-2+ A 1	•	1 0 195-100 75-100 35-50 5-35 1 - 1 NP
DEPTHICLAY I	OIST BULKI PE	RMEA- : AVAILABLE	SOIL I	SALINITY I	SHRINK IEROSIONIWIND IORGANIC: CORROSIVITY
	DENSITY 1 BI (G/CM3) 1 (I	LITY IWATER CAPACITY N/HR)_ 1(IN/IN)	(IREACTION:	(MMHOS/CM)I	SWELL IFACIORSIEROD.IMATTER I
a de la constant de l	.40-1.65 1 0.4		14.5-6.5 1		POTENTIALI K I T IGROUPI (PCT) I STEEL ICONCRET LOW 1.371 4 1 5 1 2 3 IMODERATEIMODERAT
	L•40-1•65   0•4 L•40-1•65   0•4		14.5-6.5 1		LOW 1.281 4 1 3 1 2-3 1
	.50-1.70 1 0.		14.5-6.5 1		LOW 1.371 <u>4 1 3 1 2-3 ;</u> LOW 1.281
30-60: 0-10:1	.50-1.65 1 6.0	0-20 1 0.05 0.07	14.5-6.5 1	- !	LOW 1.151
~~~ <u>~</u>	FLOODING	I HIGH Y	ATER TALLE	L CEMEN	TED PAN I BEDROCK ISUBSIDENCE THYD POTENT
FREQUENCY	DURATION	! DEPTH : 	KIND IMON	THS IDEPTHIN	ARUNESSIDEPTH HARONESSINIT.ITOTALIGRP: FROST
OCCASIONAL	18R1EF	1MAR-MAY10.2-1.51AP	PARENTINOV	-MAY11	
•	SANITARY	FACILITIES		•	CONSTRUCTION MATERIAL
	SEVERE-FLOOD	ING, WETNESS, POOR FILTE		11	POOR-WETNESS
SEPTIC TANK I Absorption				t: 11 ROADFILI	
FIELOS				11	
	SEVERE-SEEPAG	GE,FLOODING, WETNESS		<u>  </u>	PROBABLE
SEWAGE	•	•		::	
LAGOON AREAS .				II SAND	
				11	· · · · · · · · · · · · · · · · · · ·
SANITARY 1	SEVERE-FLOOD	ING, SEEPAGE, WETNESS		1 1 1 1	IMPROBABLE TOO SANDY
LANDFILL				II GRAVEL	
(TRENCH)				::	1
	SEVERE-FLOOD	ING, SEEPAGE, WETNESS		11	I POOR-VETNESS
SANITARY I LANDFILL 1				II II TOPSOIL	
(AREA)				11 10-3010	1
	POOR-SEEPAGE	TOO SANDY WETHESS		Li !	
DAILY :					WATER MANAGEMENT
COVER FOR : LANDFILL :				II II POND	I SEVERE SEEPAGE
1				II RESERVOIR	
	BUILDING SI	ITE_DEVELOPMENT		II AREA	
		KS CAVE, WETNESS		11	I SEVERE SEEPAGE .PIPING .WETNESS
SHALLOW 1 EXCAVATIONS 1				IEMBANKMENT II DIKES ANG	
1				LEVEES	
	SEVERE-FLOODI	ING . WE THE SS		LL	SEVERE CUTBANKS CAVE
DWELLINGS I			1	II EXCAVATED	
WITHOUT I BASEMENTS I				II PONDS	
ł			ء است	11	
DWELLINGS I	SEVERE-FLOUDI	INGOUETNESS			FLOODING, FROST ACTION, CUTBANKS CAVE
WITH . :				II DRAINAGE	• •
BASEMENTS :					:
	SEVERE - FLOUDI	ING .WETNESS		1	I SIL . VF SL : WETNESS . FLOODING
SMALL I COMMERCIAL I					I FSL: WETNESS, FLOODING, SOIL BLOWING
BUILDINGS 1				II IRRIGATIO	
	SEVERE - HETHER	SS.FLOODING.FROST ACTI		1	
LOCAL	GEFERE - WEINES	JUST COOLING OF RUST ACTIN			I FSL: WETNESS,TOO SANDY I SIL,VFSL: ERODES EASILY,WETNESS,TOO SANDY
ROADS AND :			1	AND	1
STREETS I				I DIVERSION	٠ ، _ <u>ا</u>
	SEVERE - WE THES	ss		1	FSL: WETNESS
ANDSCAPING 1 AND GOLF 1				STASSED	I SIL,VFSL: WETNESS,ERODES EASILY
FAIRWAYS				1 PATENDAT	
Å	REGIONAL	NTERPRETATIONS	4		
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STURGEON SERIES

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	<u></u>	SEVERE - VE	TNESS						- <u>  </u>		-1 SF	VERE W	TNESS				
	1	327282-46	-14633							PATHS	1						
PICNIC	AREAS								11	AND	r				•		
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		CAP	BILITY	ANO )	IELDS	PER							MANA	EMENT	2		
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SUGAR YELLOW WHITE SPINUL	MAPLE BIRCH Spruce OSE WOO			1	DRSP4				•		•						
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A WINDBREAK GROUP 1.

### April, 1986 - WDF

### (This information subject to change)

<u>Alban loam</u> - Moderately well drained, nearly level and gently sloping soils with loamy surface layers and loamy subsoils underlain by stratified loamy and sandy lacustrine deposits. These soils have moderate permeability and high available water capacity.

<u>Altdorf mucky silt loam</u> - Poorly drained, nearly level soils with silty and mucky surface layers and clayey subscils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have slow permeability and high available water capacity.

<u>Amery silt loam</u> - Well drained, gently sloping to moderately steep soils with silty surface layers and loamy and gravelly subsoils underlain by loamy and gravelly glacial till. These soils have moderate permeability and moderate avialable water capacity.

<u>Cable silt loam, stony</u> - Poorly and very poorly drained, nearly level soils with stony and silty surface layers and loamy subsoils underlain by loamy glacial till. These soils have moderate or moderately slow over moderatley slow to moderately rapid permeability and moderate available water capacity.

<u>Cathro muck</u> - Very poorly drained, nearly level soils formed in organic deposits underlain by loamy materials. These soils have moderately rapid over moderately slow permeability and very high available water capacity.

<u>Chetek sandy loam</u> - Somewhat excessively drained, nearly level to steep soils with loamy surface layers and loamy, sandy and gravelly subsoils underlain by sandy and gravelly outwash. These soils have moderately rapid over rapid or very rapid permeability and low available water capacity.

Dancy sandy loam - Poorly drained, nearly level soils with loamy surface layers and loamy subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have moderate permeability and moderate available water capacity.

Dolph silt loam - Somewhat poorly drained, nearly level and gently sloping soils with silty surface layers and silty and clayey subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have slow permeability and high available water capacity. Dunnville fine sandy loam - Moderately well drained, nearly level and gently sloping soils with loamy surface layers and loamy and sandy subsoils underlain by sandy alluvial materials. These soils have moderate or moderately rapid over rapid or very rapid permeability and low available water capacity.

<u>Fenwood silt loam</u> - Well drained, sloping to moderately steep soils with silty surface layers and loamy, gravelly and cobbly subsoils underlain by bedrock at a depth of 40 to 60 inches. These soils have moderate permeability and moderate available water capacity.

Fenwood silt loam, stony - Well drained, gently sloping to steep soils with stony and silty surface layers and loamy, cobbly and gravelly subsoils underlain by bedrock at a depth of 40 to 60 inches. These soils have moderate permeability and moderate available water capacity.

<u>Fenwood - Rozellville silt loams</u> - Well drained, gently sloping soils with silty surface layers and loamy subsoils underlain by cobbly, gravelly, and loamy glacial till, and residuum weathered from bedrock. The depth of bedrock ranges from 40 to greater than 60 inches. These soils have moderate permeability and moderate available water capacity.

Fordum silt loam - Poorly and very poorly drained, nearly level soils formed in silty, loamy, and sandy alluvial deposits. These soils have moderate or moderately rapid over rapid or very rapid permeability and moderate available water capacity.

<u>Freeon silt loam</u> - Moderately well drained, sloping soils with silty surface layers and loamy subsoils underlain by loamy glacial till. These soils have moderate over very slow permeability and moderate available water capacity.

<u>Graycalm loamy sand</u> - Somewhat excessively drained, gently sloping soils with sandy surface layers and sandy subsoils underlain by stratified sandy lacustrine deposits. These soils have rapid permeability and low available water capacity.

Graycalm loamy sand, moderately well drained - Moderately well drained, nearly level soils with sandy surface layers and sandy subsoils underlain by stratified sandy lacustrine deposits. These soils have rapid permeability and low available water capacity.

<u>Greenwood peat</u> - Very poorly drained, nearly level soils formed in acid organic materials. These soils have moderately rapid permeability and very high available water capacity.

<u>Guenther loamy sand</u> - Moderately well drained, gently sloping soils with sandy surface layers and sandy and loamy subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have rapid over moderate permeability and moderate available water capacity. <u>Hatley silt loam</u> - Somewhat poorly drained, nearly level and gently sloping soils with silty surface layers and loamy subsoils underlain by sandy glacial till. These soils have moderate permeability and moderate available water capacity.

Hatley silt loam, bouldery - Somewhat poorly drained, nearly level and gently sloping soils with bouldery and silty surface layers and loamy subsoils underlain by sandy glacial till. These soils have moderate permeability and moderate available water capacity.

<u>Kennan sandy loam</u> - Well drained, gently sloping to steep soils with loamy surface layers and loamy subsoils underlain by sandy glacial till. These soils have moderate permeability and moderate available water capacity.

Kennan sandy loam, bouldery - Well drained, gently sloping to steep soils with bouldery and loamy surface layers and loamy subsoils underlain by sandy glacial till. These soils have moderate permeability and moderate available water capacity.

<u>Magnor silt loam</u> - Somewhat poorly drained, nearly level and gently sloping soils with silty surface layers and loamy subsoils underlain by loamy glacial till. These soils have moderate over very slow permeability and moderate available water capacity.

<u>Mahtomedi loamy sand</u> - Excessively drained, nearly level to very steep soils with sandy surface layers and sandy and gravelly subsoils underlain by sandy and gravelly outwash. These soils have rapid permeability and low available water capacity.

<u>Mahtomedi loamy sand, moderately well drained</u> - Moderately well drained, nearly level soils with sandy surface layers and sandy and gravelly subsoils underlain by sandy and gravelly outwash. These soils have rapid permeability and low available water capacity.

<u>Marathon silt loam</u> - Well drained, gently sloping and sloping soils with silty surface layers and silty, loamy, sandy, and gravelly subsoils underlain by gravelly and sandy residuum weathered from granite. These soils have moderate and moderately rapid over rapid or very rapid permeability and moderate available water capacity.

<u>Marathon silt loam, stony</u> - Well drained, gently sloping to moderately steep soils with stony and silty surface layers and silty, loamy, sandy and gravelly subsoils underlain by gravelly and sandy residuum weathered from granite. These soils have moderate and moderately rapid over rapid or very rapid permeability and moderate available water capacity. <u>Marshfield silt loam</u> - Poorly drained, nearly level and gently sloping soils with silty surface layers and silty and loamy subsoils underlain by loamy glacial till. These soils have moderately slow permeability and high available water capacity.

<u>Meadland loam</u> - Somewhat poorly drained, nearly level and gently sloping soils with loamy surface layers and loamy subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have moderate or moderately slow permeability and high available water capacity.

<u>Meadland loam, stony</u> - somewhat poorly drained, nearly level and gently sloping soils with loamy and stony surface layers and loamy subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have moderate or moderately slow permeability and high available water capacity.

<u>Meehan loamy sand</u> - Somewhat poorly drained, nearly level soils with sandy surface layers and sandy subsoils underlain by sandy outwash. These soils have rapid permeability and low available water capacity.

<u>Minocqua sandy loam</u> - Very poorly and poorly drained, nearly level soils with loamy surface layers and loamy, sandy and gravelly subsoils, underlain by sandy and gravelly outwash. These soils have moderate over rapid or very rapid permeability and low available water capacity.

<u>Moberg gravelly silt loam</u> - Somehwat excessively drained, gently sloping to moderately steep soils, with gravelly and silty surface layers and gravelly, loamy, and sandy subsoils underlain by gravelly and sandy residuum weathered from granite. These soils have moderately rapid over very rapid permeability and low available water capacity.

Mosinee sandy loam - Well drained, gently sloping to moderately steep soils, with loamy surface layers and loamy and cobbly subsoils underlain by bedrock at a depth of 40 to 60 inches. These soils have moderate or moderately rapid permeability and low available water capacity.

<u>Mosinee sandy loam, stony</u> - Well drained, gently sloping to moderately steep soils with stony and loamy surface layers and loamy and cobbly subsoils underlain by bedrock at a depth of 40 to 60 inches. These soils have moderate or moderately rapid permeability and low available water capacity.

<u>Mylrea silt loam</u> - Somewhat poorly drained, nearly level and gently sloping soils with silty surface layers and silty, loamy and gravelly subsoils underlain by gravelly and sandy residuum weathered from granite. These soils have moderate over rapid or very rapid permeability and moderate available water capacity.

<u>Mylrea silt loam, stony</u> - Somewhat poorly drained, nearly level and gently sloping soils with stony and silty surface layers and silty, loamy, and gravelly subsoils underlain by gravelly and sandy residuum weathered from granite. These soils have moderate over rapid or very rapid permeability and moderate available water capacity.

<u>Newson mucky loamy sand</u> - Poorly and very poorly drained, nearly level soils with mucky and sandy surface layers and sandy subsoils underlain by sandy outwash. These soils have rapid permeability and low available water capacity.

<u>Oesterle loam</u> - Somewhat poorly drained, nearly level soils with loamy surface layers and loamy subsoils, underlain by sandy and gravelly outwash. These soils have moderate over rapid or very rapid permeability and low available water capacity.

<u>Pits, gravel</u> - Areas where sand and gravel or weathered bedrock, either rotten granite or soft sandstone, are or have been excavation for roadfill and other uses.

<u>Pits, quarries</u> - Areas where hard bedrock is being or has been quarried for monuments, building stone, and other uses.

<u>Plover sandy loam</u> - Somewhat poorly drained, nearly level soils with loamy surface layers and loamy subsoils underlain by stratified silty, loamy and sandy lacustrine deposits. These soils have moderate permeability and moderate available water capacity.

<u>Ribhill silt loam, stony</u> - Well drained, sloping to steep soils with stony and silty surface layers and silty and cobbly subsoils underlain by quartzite bedrock at a depth of 20 to 40 inches. These soils have moderate permeability and low available water capacity.

<u>Rietbrock silt loam</u> - Somewhat poorly drained, nearly level to sloping soils with silty surface layers and loamy, gravelly and cobbly subsoils underlain by bedrock at a depth of 40 to 60 inches. These soils have moderate or moderately slow permeability and moderate available water capacity.

<u>Rietbrock silt loam, stony</u> - Somewhat poorly drained, nearly level to sloping soils with stony and silty surface layers and silty, loamy and cobbly subsoils underlain by bedrock at a depth of 40 to 60 inches. These soils have moderate or moderately slow permeability and moderate available water capacity.

<u>Rockers loamy sand</u> - Somewhat poorly drained, nearly level and gently sloping soils with sandy surface layers and sandy, loamy and gravelly subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have moderately rapid over moderately slow permeability and moderate available water capacity.

<u>Rosholt sandy loam</u> - Well drained, nearly level and gently sloping soils with loamy surface layers and loamy, sandy and gravelly subsoils underlain by sandy and gravelly outwash. These soils have moderate or moderately rapid over rapid or very rapid permeability and low available water capacity.

<u>Rosholt silt loam</u> - Well drained, nearly level and gently sloping soils with silty surface layers and loamy and gravelly subsoils underlain by sandy and gravelly outwash. These soils have moderate over rapid or very rapid permeability and moderate available water capacity.

<u>Scott Lake sandy loam</u> - Moderately well drained, nearly level and gently sloping soils with loamy surface layers and loamy and sandy subsoils underlain by sandy and gravelly outwash. These soils have moderate or moderately rapid over rapid or very rapid permeability and low available water capacity.

<u>Scott Lake silt loam</u> - Moderately well drained, nearly level and gently sloping soils with silty surface layers and loamy subsoils underlain by gravelly and sandy outwash. These soils have moderate orver rapid or very rapid permeability and moderate available water capacity.

<u>Seelyeville muck</u> - Very poorly drained, nearly level soils formed in non-acid organic materials. These soils have moderately rapid permeability and very high available water capacity.

<u>Sherry silt loam</u> - Poorly and very poorly drained, nearly level soils with silty surface layers and silty and loamy subsoils underlain by loamy glacial till, and residuum weathered from bedrock. These soils have moderately slow permeability and high available water capacity.

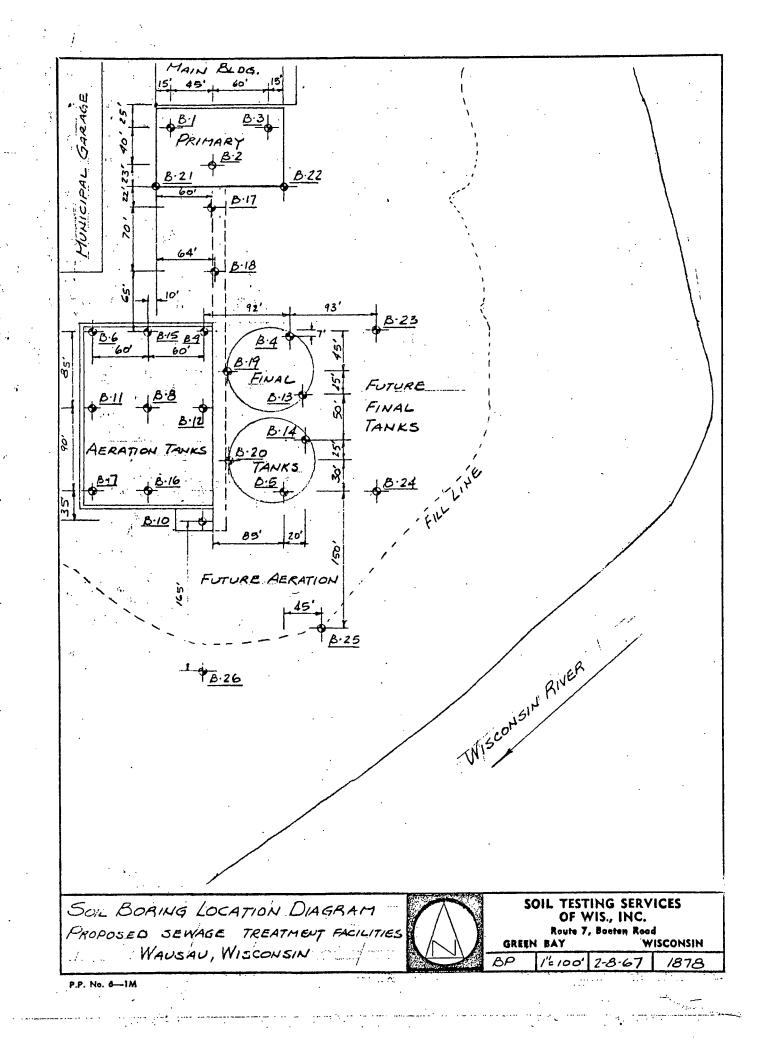
<u>Sturgeon silt loam</u> - Somewhat poorly drained, nearly level soils formed in silty, loamy, and sandy alluvial deposits. These soils have moderate over rapid permeability and moderate available water capacity.

<u>Udorthents, loamy</u> - Areas with the upper 3 feet or more disturbed (cut & fill), non-soil material (made land), or excavations in non-sandy or non-gravelly soils (borrow pit). Original soil generally not recognizeable. These soils have slow to rapid permeability and low to high available water capacity.

<u>Withee silt loam</u> - Somewhat poorly drained, nearly level and gently sloping soils with silty surface layers and silty and loamy subsoils underlain by glacial till. These soils have moderate over very slow permeability and moderate available water capacity.

# Appendix E

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## GENERAL NOTES

# 1950 Chicago Building Code Soil Classifications are Used Except Where Noted

#### DRILLING & SAMPLING SYMBOLS

- SS : Split-Spoon 13/s" I. D., 2" O. D., except where noted
- ST : Shelby Tube 2" O. D., except where noted
- PA : Power Auger Sample
- DB : Diamond Bit-NX: BX: AX:
- CB : Carboloy Bit NX: BX: AX:
- OS : Osterberg Sampler 3" Shelby Tube
- HS : Housel Sampler
- WS : Wash Sample
- FT : Fish Tail
- **RB** : Rock Bit
- WO: Wash Out

Standard "N" Penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch OD split spoon, except where noted.

#### WATER LEVEL MEASUREMENT SYMBOLS

WL : Water Level WCI : Wet Cave In DCI : Dry Cave In WS : While Sampling WD : While Drilling BCR : Before Casing Removal ACR : After Casing Removal AB : After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable ground water levels. In impervious soils, the accurate determination of ground water elevations is not possible in even several days observation, and additional evidence on ground water elevations must be sought.

## CLASSIFICATION

#### COHESIONLESS SOILS

"Trace"	:	1% to 10%	
"Trace to some"	:	10% to 20%	
"Some"	:	20% to 35%	
"And"	:	35% to 50%	
Loose	:	O to 9 Blows	١
Medium Dense	:	10 to 29 Blows	or
Dense	:	30 to 59 Blows	equivalent
Very Dense	:	30 to 59 Blows ≥ 60 Blows	,

#### COHESIVE SOILS

If clay content is sufficient so that clay dominates soil properties, then clay becomes the principle noun with the other major soil constituent as modifier; i.e., silty clay. Other minor soil constituents may be added according to classification breakdown for cohesionless soils; i.e., silty clay, trace to some sand, trace gravel.

Soft	:	0.00 — 0.59 tons/ft <sup>2</sup>
Stiff	:	0.60 — 0.99 tons/ft <sup>2</sup>
Tough	:	1.00 - 1.99 tons/ft <sup>2</sup>
Very tough	:	2.00 - 3.99 tons/ft <sup>2</sup>
Hard	:	≥ 4.00 tons/ft <sup>2</sup>

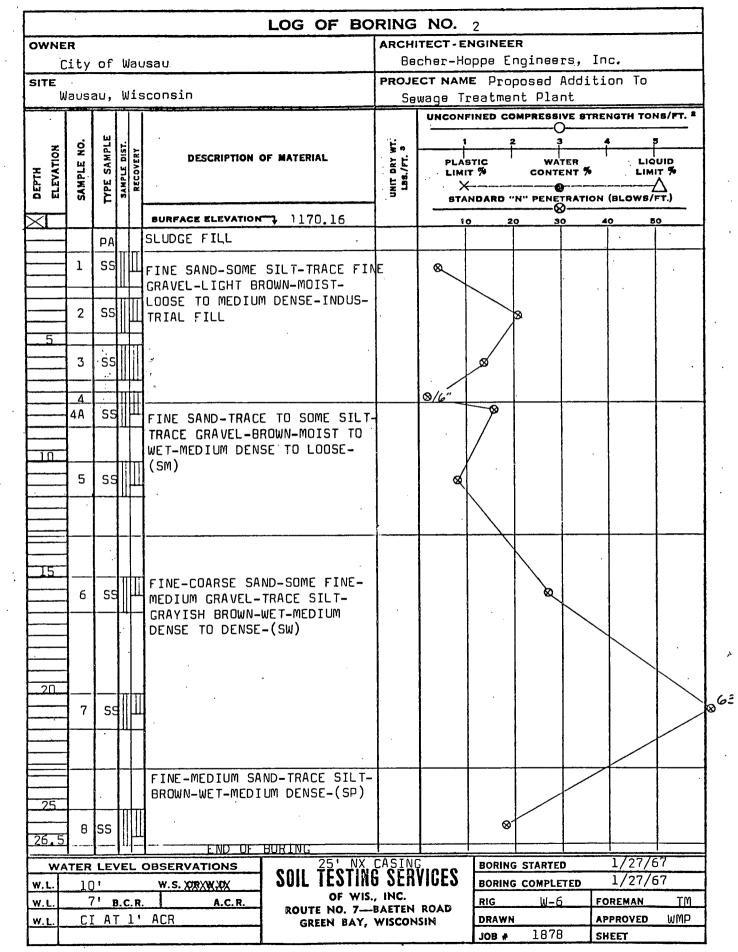
GENERAL NOTES

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		<u> </u>			FINE SAND-SOME SILT-WHITE TRACE LIGHT BROWN AND GREEN-			$\sim$			·	
			$\frac{1}{11}$	22	MOIST-MEDIUM DENSE TO LOOSE-		.					
مىمەخىيىتىم مەم يەشلەيلىمىر	2	SS			ÎNDUSTRIAL FILL					•	1	ł
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	1 3	SS						<b>)</b> 8				1
		ļ	Τ.	$\prod$				· ·				
	4	ss					Ø					
	<u>4</u> A		.†#	μ±	FINE SAND-TRACE TO SOME TOP- SOIL-BROWN-LOOSE-(SM-OL)		\$16'					
	<b>1</b>		-		<u>SOIL-BROWN-LOUSE-(SM-OL)</u> SILT-TRACE CLAY AND SAND-				}			
- 10	5	SS	$-1\pi$	$\frac{1}{1}$	BROWN-LOOSE-(ML)							
	5A		-		SILT-TRACE TO SOME FINE SAND		9 9/6"					+
	1	—	+		GRAY-MODERATELY ORGANIC-		-76					
	]				LOOSE-(ML-OL)							
	1		-		<u> </u>							
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	]		Щ		FINE-COARSE SAND-SOME GRAVEL	Ļ		`				
	-				TRACE SILT-BROWN-WET-DENSE	ł						N
·	-				TO MEDIUM DENSE-(SW)				×			$  \rangle$
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w	ATER	LE	VE	L	W.S. OR W.D.	SING	VICEC		G STARTED		1/26/	
W.L.							AIRE9	BORIN	G COMPLE	TED	1/26/	67
W.L.	9	1	<u>B.C</u>	:.R.	9' A.C.R. OF WIS. ROUTE NO. 7		ROAD	RIG	<u>W-6</u>		OREMAN	
W. L.					GREEN BAY,			DRAW	the second s		PPROVED	W
			-					JOB #	1878	S	HEET	

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			Γ		·			UNCON	FINED CO	MPRESSI	VE STRE	NGTH TOP	15/FT. *
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DEPTH ELEVATION	SAMPLE N	SAME	SAMPLE DIST.	OVER	DESCRIPTION	OF MATERIAL	UNIT DRY V	PLA LIMI		WAT CONTE		LIQ LIMI	UID IT 🎋
DEPTH	SAM	TYPE	SAMS	RE(			UNIT LB:	) Вта	NDARD "	N" PENET	RATION	(BLOWS/I	<u>∆</u> ₽т.) .
					SURFACE ELEVATION	1168.63		1	0 2			0 5	<u>o</u> ,
			ĪI	$\square$	•	SILT-TRACE GRA-					•••		
	1	ÞΑ			VEL-DARK BROWN	-FILL							
	2	SS	╢		FINE SAND-SOME	SILT-LIGHT			×		<u> </u>		
	2A	<u> </u>	╢		DENSE-FILL	SILT-LIGHT E-MOIST-MEDIUM		\$76"					
·		-	-	$\square$									
-5	3	SS		Щ	FINE-MEDIUM SA SAND-SOME SILT			×.					
			1		LIGHT BROWN-WE	T-LOOSE-INDUS-							с.
	4	SS		Ш	TRIAL FILL			\$					
			111					$  \rangle$					
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-10-	1		$\uparrow$		SILT-TRACE CLA	Y AND SAND-							
			$\Pi$	ΙT		GHTLY ORGANIC-	1						
	5	SS		Ш	MEDIUM DENSE-(	ML-OL)	ļ						÷
			T					· ·					
·	]		-										
·	1				FINE-MEDIUM SA	ND-TRACE TO							
15	1		<b> </b>			UM DARK GRAYIS	1						
	6	ss			BROWN-WET-MEDI	UM DENSE-(SM)		¢	•				
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	1				FINE-COARSE SA AND FINE GRAVE								
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w/	ATER	LE	VE	L (	OBSERVATIONS	CON TROTING		VIOTO	BORING	S STARTED	)	1/26/6	
W. L.	8	3'			w.s.XXXXXXXXXXX	SOIL TESTING		VIGES		COMPLE		<u>1/26/6</u>	
W.L.			B.C	<u>. R</u>	A.C.R.	ROUTE NO. 7	BAETEN		RIG	<u>W-6</u>		REMAN	
W.L.		<u>, ינ</u>		<b>D</b> 0		GREEN BAY,	WISCON	SIN	DRAWN	1878		PROVED	WMP_
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4 IIO		9	SAM	Б ч	N S	DESCRIPTION OF	MATERIAL	ряу 1./гт	PLA LIM	sтіс ́ іт %і	CONTE		LIMIT	
DEPTH ELEVATION		SAMPLE NO.	TYPE SAMPLE	AMPI	REC			UNIT DRY V LBS./FT.	>	<u> </u>	@		(BLOWS/F	7
а w		N,	7	ő	ł									
$\boxtimes$	1			-	-	SURFACE ELEVATION	1168.50 TIT TRACE FIN	F	ļ'	0 20	<u> </u>	<u>4</u>	<u> </u>	
	-					GRAVEL-DARK BROW	N-FILL							
	1	1	PA			· ·								
					$\blacksquare$	FINE-MEDIUM SAND	D-TRACE TO		[	0			. ]	
	-	2	SS		1	SOME SILT-LIGHT	BROWN-MOIST-			ø				
=	╞			Ħ		INDUSTRIAL FILL FINE SAND-SOME	SILT-LIGHT	<u> </u>	/	1				
5		3	SS		щ	BROWN-MOIST-LOO	SE-INDUSTRIAL		p p					
				Щ		FILL			./					
	1	4	SS	M	Ш			1	ø					
	- z	4A				FINE-MEDIUM SAN	D-SOME SILT-		\$16.					
·	4					GRAY BROWN TRAC	E GREEN-WET- ·						1	
				L		LOOSE-INDUSTRIA ORGANIC SILT-TR	L FILL		+-				┼───┤	
10	-					FINE ROOTS-GRAY	-MEDILIM DENSE							
	-	5	SS		Ш	(OL)				8			•	
		5A		1#	Ш			•		\$16"				
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						FINE-COARSE SAN AND SILT-GRAY-		·Ч		`	N.		· .	
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<u>├</u>	w A			 :VI	<u></u> El	OBSERVATIONS				BORIN	IG STARTE	D	1/27/6	
W.L	-		<u>,                                    </u>			W.S.XXXXXXXXX	SOIL TESTIN	16 SE	KVIGES	BORIN	G COMPL	ETED	1/27/0	67
W.L	-1-			B.	<b>c</b> .1		OF WI ROUTE NO. 7-	S., INC.	N ROAD	RIG	W-6	<u> </u>	FOREMAN	
W.L		7	.5'				GREEN BAY	, WISCO	NSIN	DRAW	and the second design of the s		APPROVED	V
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<u>`</u>		,		1		<u> </u>							ENGTH TOP	15/FT. <sup>2</sup>
		ω									0	)		
N	NO.	SAMPLE	DIST.	ž	DESCRIPTION OF	MATERIAL	En			2			- <b>Î</b> Î	, <u> </u>
DEPTH ELEVATION	SAMPLE NO.	SAI	37	S			UNIT DRY WT. LBS./FT. 3		.AST MIT		CONT	TER ENT 🎋	LIQ	
DEPTH	SAM	TΥΡΕ	SAMPLE DIST.	2			59	A				TRATIO	N (BLOWS/I	<u>`</u>
				ľ	SURFACE ELEVATION	1167.77	1		·	20	6	o	40 5	
			$\mathbb{H}$	$\Pi$	FINE-MEDIUM SAND				<u>-10</u>	2	<u> </u>			<u> </u>
	1	SS			GRAVEL AND SILT-									
				井	FINE SAND-TRACE		<u> </u>		┽	+				
	2	ss			LIGHT BROWN-MOIS					Ø				
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	4	SS		Щ				Ĩ						
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					WET-LOOSE TO DEN							$\wedge$		ł
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WA	TER	LE	/E	L (	DESERVATIONS	COU TECTIM	0 000	IILES	2		STARTE		2/8/	
W.L.				<u> </u>	W.S. OR W.D.	SOIL TESTIN		IUE	נ		COMPLE		2/8/	
W. L.	6'	<b>I</b>	3.C	. R.	A.C.R	ROUTE NO. 7-	BAETEN			RIG	W-6		FOREMAN	
W.L.						GREEN BAY,	WISCON	N		DRAWN	1878		SHEET	11°1E

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SITE	Wau	ายอา	J,	W:	isconsin					tment F			
			Ī	ī				UNCON	FINED	COMPRESS	IVE STRI	ENGTH TON	9/FT. *
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	й Н	SAMPLE	C DIS	121	DESCRIPTION O	F MATERIAL	7 K		STIC		TER	1   1.1Q1 LIMI	
DEPTH ELEVATION	SAMPLE NO.	TYPE S	SAMPLE DIST.	3		· .	UNIT DRY WT. Las./Ft. <sup>8</sup>		нт % Х		<b>6</b>		7
	S	Y	8	┝			3.	ST	ANDARI		8	I (BLOWS/F	
$\mathbf{X}$			<b></b> -	╀	SURFACE ELEVATION				10	20 :	30	40 5	<u> </u>
	1	PA		TE TE	BLACK SANDY TOP	SUIL							
	1	SS							6	<u>}-</u>			
				Ц						N			
	2	SS					•,						
5		<u> </u>			FINE SAND-SOME				/	1			
	3	ss			GRAVEL-WHITE TR MOIST BECOMING		N .		ø				
	1		ШЦ	Щ	MEDIUM DENSE TO			/					
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	<u> </u>		14		FINE-MEDIUM SAN GRAVEL-AND SILT					\			
	-				DENSE TO LOOSE-						V	1	
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26.5		SS						8					
			<u>-1''</u>	_		URING 25' NX CA	I	L		ING START	ED	1/27	<u>.</u> /67
W.L.	ATER	10			W.S. MRXXX M.	SOIL TESTIN	g ser	VICES	BOR	ING COMPI		$\frac{1}{27}$	
W.L.	7		B.C.	. R.		OF WIS. ROUTE NO. 7-	, INC.		RIG			FOREMAN	тм
W.L.	· · ·			_		GREEN BAY,			DRA			APPROVED	WMP
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SITE						PRO.	C م		E Prop Treatm	osed Ad ent Pla	oiti ot	3N TO	
	Wai	isau	<u>, , , , , , , , , , , , , , , , , , , </u>	W	isconsin				the second s			NGTH TONS	/FT. *
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DEPTH ELEVATION	Ē	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. 188./FT. <sup>3</sup>		PLA'S Limit		WATE CONTEN	п т%∕		
DEPTH	SAMPLE	γPE	AMP.	REC		UNIT		X					
	Ś	F	"	ŀ									-,
$\times$			$\left  \right $	$\mathbf{H}$	BURFACE ELEVATION 1169.08		┼	<u>10</u> 	20	<u> </u>	4	<u>o 50</u>	
	1	ΡA			GRAVEL-BROWN-FILL	·-							
			ĮШ									-	
	2	SS		Щ	FINE SAND-SOME SILT-WHITE						ę	4	
			Ш	_	AND LIGHT BROWN-FILL							<b> </b>  -	
	3	SS	T		FINE-COARSE SAND-SOME GRAV	/LL -							
_5_	-3A		╢	Ш	BROWN-FILL FINE SAND-SOME SILT-WHITE-		+	¢	16"				<u> </u>
			Π		MOIST-MEDIUM DENSE TO LOOS	6E-							
	4	SS	╢	1	INDUSTRIAL FILL		+	8 16"				┼───┼	
	<u>4</u> A		1ª		FINE SAND-SOME SILT-GRAY- MOIST-LOOSE-INDUSTRIAL FIL			10					
					· · · · · · · · · · · · · · · · · · ·							<u> </u>	
10			Γ	Γ	ORGANIC SILT-TRACE TO SOME	Ξ							
	5	SS	1	Ш	FINE SAND-GRAY-LOOSE-(OL)	1		à				•	
. <u></u>	5A		1.11	Ш			+	0/6'				<u> </u>  -	
								$\overline{\mathbf{x}}$					
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	1 ·				FINE-MEDIUM SAND-TRACE TO SOME GRAVEL-TRACE SILT-ME	DIUM							
15	1		<b> </b>		DADY DROWN CHANCING TO BR	οω <i>Ν</i> _Ι							·
	6	s		lμ	WET-MEDIUM DENSE TO DENSE	-			: V			Į.	
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	1		<u> </u>	<u> </u>					BORIN	G STARTED	<u></u>	1/27/67	,
			. <u>v</u> e	<u> </u>	W.S. STRANS	TING SI	RV	ICES		G COMPLET	ED	1/27/67	,
W.L. W.L.	1(		<b>B</b> .(	C. R	OF	WIS., INC	•		RIG	ш-б.		OREMAN	Τſ
W.L.	Ċ			_	KOUIE NU.	. 7BAET BAY, WISC	en i ONS	IN	DRAWN		A	PPROVED	WMF
									JOB #	1878	ls	HEET	

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Image: Start Star	
SITE     PROJECT NAME     Proposed Addition       Site     Wausau, Wisconsin     Sewage Treatment Plant       Viewage     Treatment       Viewage     Treatment       Viewage     Treatment       Viewage     Treatment       Viewage     Treatment       Viewage     Treatment <tr< td=""><td></td></tr<>	
Wausau, Wisconsin     Sewage Treatment Plant       Wold with the second of the s	
NOT WAY SHOW SHOW SHOW STRENGT       NOT WAY SHOW SHOW SHOW STRENGT       DESCRIPTION OF MATERIAL       Image: Strength Strengt	to
NO     NO     NO     NO     NO     DESCRIPTION 'OF MATERIAL     NO	TONS/FT \$
BURFACE ELEVATION     1168.64     10     20     30     40       1     PA     FINE SAND-SOME SILT-WHITE AND     Indextor of the second se	
BURFACE ELEVATION     1168.64       1     BLACK TOPSOIL       1     PA       1     PA       2     SS       IGHT BROWN-MOIST-LOOSE-       INDUSTRIAL FILL       5     3       4     SS       1     ORGANIC SILT-TRACE SAND-GRAY-       LOOSE-(OL)-SILTY SAND SEAMS       SOME SILT-BROWN-MOIST-MEDIUM       DENSE-(SM)	
BURFACE ELEVATION     1168.64       1     BLACK TOPSOIL       1     PA       1     PA       2     SS       IGHT BROWN-MOIST-LOOSE-       INDUSTRIAL FILL       5     3       4     SS       4     SS       0     ORGANIC SILT-TRACE SAND-GRAY-       LOOSE-(OL)-SILTY SAND SEAMS       SOME       5     SS       4     SS       5     SS       4     SS       0     SILT-MEDIUM SAND-TRACE TO       SOME     SILT-BROWN-MOIST-MEDIUM       DENSE-(SM)	LIQUID
BURFACE ELEVATION     1168.64       1     BLACK TOPSOIL       1     PA       1     PA       2     SS       IGHT BROWN-MOIST-LOOSE-       INDUSTRIAL FILL       5     3       4     SS       4     SS       0     ORGANIC SILT-TRACE SAND-GRAY-       LOOSE-(OL)-SILTY SAND SEAMS       SOME       5     SS       4     SS       5     SS       4     SS       0     SILT-MEDIUM SAND-TRACE TO       SOME     SILT-BROWN-MOIST-MEDIUM       DENSE-(SM)	<u> </u>
1       PA         1       PA         1       PA         2       SS         IGHT       BROWN-MOIST-LOOSE-         INDUSTRIAL       FILL         5       3         4       SS         4       SS         0       ORGANIC         SILT-TRACE       SAND-GRAY-         LOOSE-(OL)-SILTY       SAND SEAMS         5A       SS         5A       SS         FINE-MEDIUM       SAND-TRACE         DENSE-(SM)	
1       PA         2       SS         1       FINE SAND-SOME SILT-WHITE AND LIGHT BROWN-MOIST-LOOSE- INDUSTRIAL FILL         5       3         4       SS         4       SS         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0         5       0	<u> </u>
2 SS       FINE SAND-SOME SILT-WHITE AND LIGHT BROWN-MOIST-LOOSE- INDUSTRIAL FILL         5 3 SS       4         4 SS       4         5 3 SS       4         6       6         7       7         7       7         7       7         8       7         9       7         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10	
2 SS LIGHT BROWN-MOIST-LOOSE- INDUSTRIAL FILL 5 3 SS L 4 SS L 0 RGANIC SILT-TRACE SAND-GRAY- LOOSE-(OL)-SILTY SAND SEAMS 5 SA SS L FINE-MEDIUM SAND-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
INDUSTRIAL FILL         5       3         4       55         0       0RGANIC SILT-TRACE SAND-GRAY- LOOSE-(OL)-SILTY SAND SEAMS         5       0RGANIC SILT-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	. 
5     3     SS       4     SS     4       0     0RGANIC SILT-TRACE SAND-GRAY- LOOSE-(OL)-SILTY SAND SEAMS       5     1       5A     SS       FINE-MEDIUM SAND-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
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IU     ORGANIC SILT-TRACE SAND-GRAY- LOOSE-(OL)-SILTY SAND SEAMS       5     HELOOSE-(OL)-SILTY SAND SEAMS       5A     SS       FINE-MEDIUM SAND-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
IU     ORGANIC SILT-TRACE SAND-GRAY- LOOSE-(OL)-SILTY SAND SEAMS       5     HELOOSE-(OL)-SILTY SAND SEAMS       5A     SS       FINE-MEDIUM SAND-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
IU     ORGANIC SILT-TRACE SAND-GRAY- LOOSE-(OL)-SILTY SAND SEAMS       5     HELOOSE-(OL)-SILTY SAND SEAMS       5A     SS       FINE-MEDIUM SAND-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
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5A     SS     FINE-MEDIUM SAND-TRACE TO SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
SOME SILT-BROWN-MOIST-MEDIUM DENSE-(SM)	
FINE-COARSE SAND-SOME FINE	
6 SS GRAVEL-TRACE SILT-BROWN-WET-	·
medium dense to dense-(SW)	
7 SS 8	
END OF BORING	
	<u>′27/67</u> ′27/67
OF WIS, INC.	
W.L. B.C.R. ROUTE NO. 7-BAETEN ROAD	
W.L. 8' AB GREEN BAY, WISCONSIN DRAWN APPROV JOB # 1878 SHEET	
P.P. No. 8—1M	

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DEPTH ELEVATION	SAMPLE NO	LYPE SAMPLE	SAMPLE DIST	RECOVERY	DESCRIPTION	OF MATERIAL	UNIT DRY LBS./FT.		sтіс ′ іт %			ี่ เมื่อ เมตา	
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DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY			UNIT DRY WT. Lbs./ft. <sup>3</sup>	LIM	IT 94	CONTENT		LIMIT	
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W.L.	9		<u>B.C</u>	. R.	11' A.C.R.	OF WIS. ROUTE NO. 7	BAETEN		RIG	W-6		EMAN	<u>TM</u> WMP
<u>W.L.</u>					<u></u>	GREEN BAY,			JOB #	1878	APPI SHE		wir(#**
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	W.L.	12	1		W.S. DR W.D. R. 5' A.C.R.	OF WIS			RIG	W-6		Z/J/O	TM.
	W.L.L	_ <b>⊥</b> ∠	_	B. C.	R. 5' A.C.R.			0040	<u> </u>	<u>`</u> Y`			
	W.L.					ROUTE NO. 7 GREEN BAY,			DRAWN	I	AF	PROVED	WMP_

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DEPTH ELEVATION SAMPLE NO.	TYPE SAMPLE	DIST.	DESCRIPTION OF MATERIAL	UNIT DRY WT. LB3./FT. 3	PLAS		WATE	<u></u>		10
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1	RLE	VEL	W.S. OR W.D. SOIL TESTI	NG SER	VICES		G COMPLET		2/4/	
W.L.	9'	B.C.	DISTACE OF WI	S., INC.		RIG	W-6	FOI	REMAN	
			ROUTE NO. 7-			DRAW	N 1878		ROVED	
. W.L.						1.00	1 14 / 14	1 581	E E T	
P.P. No. 8-						100.4	1070			

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	ATIO	LE N	SAMP	E DIS	RECOVERY	DESCRIPTION	OF MATERIA	NL	RY W (FT. 3	PLA	STIC		TER		ບເມ
	DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	REC	•			UNIT DRY WT. L89./FT. <sup>3</sup>		וז % ←———	CONTI	)		тт% 
		s	1 6	Ĩ		SURFACE ELEVATIO	<b>1168</b>	32					)	I (BLOWS	- <u>i-</u> -
	35		SS	$\mathbf{H}$			•			1	<u>o2</u>	<u>∘</u> •	0	40 5	0
		9	55			•								·	
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	WA	TER	LEV	εL	. 0	BSERVATIONS	0.011 -	<b>FOF</b> 1010	0.52		BORING	STARTED		2/3/6	7
	W. L.					W.S. OR W.D.	SUIL T	ESTING		IUES	1	COMPLET		2/4/6	
	<u>W.L.</u>	<u>91</u>	<u> </u>	<u>.</u> C.	R.	5' A.C.R.	ROUTE	OF WIS., NO. 7B		ROAD	RIG	W-6		DREMAN	TM
	<u>W.L.</u>	· · · · · · ·						N BAY, V			DRAWN	1050		PROVED	WMP
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						1. Martin Carrier Ing				ent Pla	_	ENGTH TO	NG/FT
	•									C	)		
NO	o v	SAMPLE	IST.	2			MT.		l :	2 3	·	4	5
H ATIC	ш	SAN	D H	Š	DESCRIPTION OF MATERIA	IL I	DRY / <b>F</b> 1.		STIC				ວ່ບເວ 417 %
DEPTH Elevation	SAMPLE NO.	TYPE	SAMPLE DIST.	ä			UNIT DRY WT. LBS./FT. <sup>3</sup>		<u> </u>				-
	S	<u>م</u>	5	ł			5	STA	NDARD '	'N" PENET		N (BLOWS	/FT.)
$\times$	ļ			$\downarrow$		9.78		1	<u>o ,                                   </u>	<u>0 30</u>		40	50
	1	РА			INE-MEDIUM SAND-SOME	SILT-							
	-				BROWN-FROZEN FILL								
	2	SS		ήĦ	TINE SAND-SOME SILT-LI	CHT						-	
	2	55		111	BROWN AND WHITE-MEDIUM				×				
			Ĥ		INDUSTRIAL FILL	1							
5	3	SS		Ш					ø				
			Щ		·····								
	4	SS	$\Pi$		FINE SAND-SOME SILT-TR								
					CLAY-LIGHT BROWN-LOOSE	-FILL		۳ ۲					
	1									ΎΞ.			
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·	5	SS		Щ	FINE SAND-TRACE TO SOM	E SILT-			l.				
		- 3-3	Ш		RUSTY BROWN CHANGING T								
				1	IUM DARK BROWN-MEDIUM	DENSE							
				ĺ	TO DENSE-(SM)				. `				1
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	7	SS	Ш	156	FINĖ-COARSE SAND-TRACE SOME FINE-COARSE GRAVE					{			1
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					DENSE TO MEDIUM DENSE-							4	1
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26.5	8	SS								Ø			1
			-4		END OF BORING					<u> </u>			1
			Έl	<u> </u>		ESTING	ASING	11050		STARTED		2/1/6	
<u>N.L.</u>	8					OF WIS.,		IULJ		COMPLET		2/1/6	
<u>W.L.</u>	10	<u>'</u> B	. <u>c</u> .	<u>R.</u>		NO. 7B	AETEN		RIG	ACKER		OREMAN	DK
N.L.					1	EN BAY, V		1.1	DRAWN			PPROVED	WMP

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OWNE	R					LOG OF BO					<u> </u>		
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	Wa	usa	u,	W	isconsin					ent Pl			
			T	1			1	UNCON	IFINED CO	MPRESSI	VE STRE	NGTH TO	NS/FT. #
		ш					1.			C	)		
Ю	or N	Tal	DIST.	ž	DESCRIPTION	OF MATERIAL	N.			2 3		F	<b></b>
H	ы БГЕ	SA	LE L	S			NIT DRY LBS./FT.		ізтіс іт %	WA" CONTE	FER ENT %		סוט דו <b>%</b>
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMF	ž			UNIT DRY WT. LBS./FT. <sup>3</sup>		<b>←</b>	6			$\Delta_{i}$
		-		ŀ			-	9T.	ANDARD '	'N" PENE		(BLOWS/	FT.)
$\times \square$				$\frac{1}{1}$	SURFACE ELEVATION			<u> </u>	0 2	0 30	04	10 E	io
	1	bΔ			FINE-COARȘE SA MEDIUM GRAVEL-								
	-	<b>Г</b> ^			GRAYISH BROWN-			Ì					
					FINE SAND-SOME			<u> </u>				<u> </u>	
	2	SS			BROWN-DENSE-IN						S S		
								ļ				¥	
5	_		Ш		FINE-COARSE SA MEDIUM GRAVEL-				ł			A	
	3	SS			MEDIUM GRAVEL-	GRATION BRUWN-		1				ſ	
			H		MEDIUM SAND-TR	ACE GRAVEL-CRA	1		$\vdash$			<u> </u>	
	4	SS		111	AND GREEN-LOOS		1	8	T.				ł
			Щ		FILL	-	·	[ \					
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					FINE SAND-SOME								
IU					SOIL-BROWN TRA	CE BLACK-LOOSE	4						
			Π	Ī	(SM-OL)				1				
	5	SS		٦			1	8				ļ	
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15.				┯	FINE-MEDIUM SA	ND-TRACE TO	1	}	$  \rangle$				1
	6	SS			SOME SILT-TRAC	É GRAVEL-GRAY-					(		
			Ш		MEDIUM DENSE T	O DENSE-(SM)							
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					FINE-COARSE SA								/
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			$ _{\Pi} $	$\mathbf{H}$	TRACE SILT-GRA	YISH BROWN-			1			/	ľ
	8	SS		Щ	DENSE-(SW)			]	ļ			&	1
26.5			μ	-	END OF	BORING			<b> </b>				
WA	TER	LEV	/E1		BSERVATIONS	25' N)	CASIN	I <u>C</u>	BORING	S STARTED	)	1/30/	/67
W.L.	10				W.S.XXXXXXXXXX	SOIL TESTIN	<b>G</b> SER	VICES		COMPLE			
W.L.		' B	. c	Ð		OF WIS			RIG	ACKE		REMAN	DK
		E		<u>r</u> (,	<u> </u>	ROUTE NO. 7-	BAETEN			·			
<u>W.L.</u>						GREEN BAY,	WISCON	SIN	DRAWN	187		PROVED	MINE

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OWNE	R						ARCH	ITECT - E	NGINEE	R			
	Ci	ty (	<u>of</u>	W	ausau			Becher					
SITE	Wai	Isai		h.	isconsin			e <b>ct nam</b> Sewage				ition To	)
						· · · · ·						RENGTH TO	NS/FT. *
		щ									)		
NOL	N N	IMPL	DIST	£RΥ	DESCRIPTION	OF MATERIAL	7 WT.		STIC		TER		 סוטג
DEPTH ELEVATION	SAMPLE NO.	E St	SAMPLE DIST.	RECOVERY	*		UNIT DRY V LBS./FT.	LIM	т %	CONTI	ENT %		ит % Л
DE	SAI	٩۲	SA	۳Ì		•	5	STA		'N" PENE	TRATIO	N (BLOWS	Z /FT.)
$\mathbf{X}$					BURFACE ELEVATION	1169.76		1	02	-	o	40 1	50
	1	PA		$\ $	FINE SAND-SOM							· ·	
	-				FINE GRAVEL-M BROWN-FROZEN							ł	
	2	SS		$\parallel$	BROWN TROZEN					8			
				Ш		CE TO SOME SIL	T-			8			
	7		$\left  \right  $	$\mathbf{T}$	GREEN-MOIST-M	IGHT BROWN AND						+	
5	3	SS		Ш	INDUSTRIAL FI								
			H	$\overline{\Pi}$									
	4	SS							8				
			ŀ	٦		,							
								/					
10					FINE SAND-SOM				i .				
	5	SS		Щ	TOPSOIL-BROWN LOOSE-(SM-OL)	I AND DARK BROW	M-						1
			Щ	4	20032-(3/1-02)								
			$\left  \cdot \right $	_					<u> </u>				
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15													
	6	SS	hi	Ш	FINE-MEDIUM S. VEL AND SILT-	SAND-TRACE GRA-							
					CHANGING TO G					٩			
					AT 20'-WET-ME	DIUM DENSE TO			•		$\mathbf{i}$		
					DENSE-(SP)				С. Хэл				
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	7	SS		"						:			ø
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	8	SS		Π									
26.5	0	33		Щ							8		
WA	TER		/EI	 . c	END THE	BORING 25' NX C	ASING	<u> </u>	BORING	STARTED	)	1/31/	67
W.L.	8				W.S. 017 WX0.	SOIL TESTIN	g Seri	/ICES		COMPLE		1/31/	
W.L.	8		.c.	R.	9' A.C.R.	OF WIS. ROUTE NO. 7		RUAD	RIG			FOREMAN	DK
W. L.	•					GREEN BAY,			DRAWN			APPROVED	WMP
	9	<u>' 4</u>	D	AY	S AB	1			JOB #	18'	78	SHEET	

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.P.P. No. 8-1M

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	Cit	<u> y</u>	of	Wa	ausau	•				Engineer			
SITE	1.1 -			5.1						oposed A		n lo	
	wau	JSa	」, ——	W	isconsin		<u> </u>			ent Plan			
								UNCON	FINED CO	MPRESSIVE	STRENG	TH TON	(S/PT. *
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DEPTH ELEVATION	SAMPLE NO.	SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION	OF MATERIAL	UNIT DRY WT. LBS./FT. 9		STIC	WATER			
DEPTH ELEVAT	d Ki	TYPE :	L M PL	ŭ			NIT DRY LBS./FT.			CONTENT		5 LIMIT 5	
	ŝ	7	9 S	+			5	BTA	NDARD '	'N" PENETRA	TION (BL	.ows/i	т.)
$\times$					BURFACE ELEVATION	1168.62	<u> </u>	1	0 2	0 30	40	5	0
	1	PA											i
			₩			E TO SOME SILT- ACE DARK BROWN	1				·		
	2	SS			TO 2'-MOIST-ME				3		1	.	
		<u> </u>	Щ			AL FILL FROZEN							-
5	3	SS			TO 2'								:
								IĬI					
									1				
	4	SS											
<del></del>	-4A	=	丗	#	DARK BROWN SIL	TY TOPSOIL-		9/6					
	1			_	LOOSE-(OL)		<b> </b>	ļ.					
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	5	ss						l &					
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					FINE-MEDIUM SA								
	1				AND GRAVEL-DAR					K I			
15													
	6	cc	T	Ш	BROWN-WET-LOOS	E TO DENSE-(SP	X						
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26.5	4	<u> </u>					ļ	1		ļļ.			
	1	<u> </u>	<u> </u>			BORING 25' NX C	ASTNC	1	BODING			/31/	67
1			E)	<u>. c</u>	BSERVATIONS	SOIL TESTIN	SEN	VIGES		S STARTED		2/1/6	
W.L.	8				₩X\$XXXR W.D. 8' A.C.R.	OF WIS.				ACKEP	1		DK
<u>W.L. </u>	<u>_</u>	<u>' B</u>	<u>. C</u>	к.	8' A.C.R.	ROUTE NO. 7-	BAETEN		RIG	ACKER	FORE		
<u>W.L.</u>			••			GREEN BAY,	WISCON	SIN	DRAWN	1878	APPR		WMP

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P.P. No. 8-1M

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OWNE	R					LOG OF BC		ITECT - E						
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SITE							PROJE	ECT NAM	E Pro	oposed	Addit		)	
	Waus	au,	1	Vi:	sconsin		Sewage Treatment Plant							
								UNCON	FINED CO	MPRESS	VE STRE	NGTH TO	NB/FT. *	
z	<u>i</u> o.	μE					Ę.	ļ		2	3	4	5	
H ATIO	ГE	SAMPLE	Ō	VER	DESCRIPTION	OF MATERIAL	PRV /TT.		sтіс іт %	. WA	TER ENT %		םטום אוד %	
DEPTH ELEVATION	SAMPLE NO.	TYPE :	SAMPLE DIST.	ŭ	•	· .	UNIT DRY WT. LBS./FT. 3		<u> </u>		<u>}</u>		-^	
	S	1 2	S	┢		1160.24		STA	NDARD '	'N" PENE	TRATION	BLOWS	/FT.)	
				$\frac{1}{n!}$	BURFACE ELEVATION			· · ·	02	<u>о з</u>	0	<u>40</u>	<u>50</u>	
	1	PA			FINE SAND-SOME GRAVEL-MEDIUM [									
	_		1111		FROZEN FILL					·				
	2	SS												
			Щ		FINE SAND-TRAC		-}							
5	3	SS	IT		LIGHT BROWN-MO DENSE-INDUSTRI						0	T	1	
			Ш	Щ		ML FILL								
	<u> </u>			Π						F			1	
	4	SS		Щ				e e	F					
······	<u> </u>			-	FINE SAND-TRAC							·	1	
10					TRACE DARK BRO					l				
	5	ss			WOOD-BROWN-MED			Q	5					
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	ļ									 				
					ORGANIC SILT-T	DACE STREPS_								
15		-		Π	BLACK-LOOSE-(0	L)						·		
	6	55		Щ		-,		¢						
	<u> </u>		μ		•					1			·	
	<u> </u>		┝	-			+	·		<u> </u>			+	
·						ND-TRACE SILT-		_: \						
20	1				GRAY-WET-MEDIUM SA		1		Ν	1				
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	7	SS							l °		· ·			
		·	Π			•								
	<b> </b>		Ц					<b> </b>	\	<u> </u>		·	· .	
<u></u>	1				FINE-COARSE SA	ND-TRACE TU /EL-TRACE SILT-								
25					GRAYISH BROWN-					$  \rangle$				
	8	ss	$\Pi$		DENSE-(SW)									
26.5		<u> </u>	Щ			BURING			<b> </b>	ļ	<b> </b>			
wA	TER		/EI		DBSERVATIONS	25' NX	CASIN	G	BORING	S STARTE	D	1/31	/67	
W. L.	12				W.S. XXXXX.D.	SOIL TESTIN		VICES	BORING	G COMPLE		1/31	/67	
W.L.	12	5	. C.	. R.		OF WIS ROUTE NO. 7-	, INC. BAETEN	ROAD	RIG	ACK	ER F	OREMAN	DK	
<u>w.l.</u>	·					GREEN BAY,			DRAWN		70	PPROVED	WMP	
	10	4	D	ĄΥ	S AB	L			JOB #	18	(0 S	HEET		

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'P.P. No. 8-1M

<u> </u>						LOG OF BO	RING	NO.	22						
OWNE	OWNER							ARCHITECT - ENGINEER							
	Ci	ty	of	<u> </u>	lausau		Becher-Hoppe Engineers, Inc.								
SITE	Wa	usa	u,	u	lisconsin		PROJECT NAME Proposed Addition To Sewage Treatment Plant								
							1	UNCONF	INED CO	MPRESSI	VE STRE	NGTH TON	19/FT. *		
	NO.	ň	Т.				1 5	1	2	2 3		4 5	;		
H ATIO	и Ц	SAMPLE	E DIS	RECOVERY	DESCRIPTION	OF MATERIAL	0RY V /FT.	PLAS		WAT CONTE		   LIQ   LIM			
DEPTH ELEVATION	SAMPLE	TYPE	SAMPLE DIST.	REC			UNIT DRY WT. LBS./FT. 3	×				RATION (BLOWS/FT.)			
$\times$					SURFACE ELEVATION	1170.02				®	)	40 5			
			Π	$\square$	DARK BROWN SIL			·	·	1		Ī			
	1	PA			TOPSOIL-FROZEN										
	2	ss		Щ							ø				
					ETNE SAND-TRAC	E TO SOME SILT-									
5	3	ss		Щ		ANGING TO WHITE									
						'-MOIST-BECOM-									
	4	SS			INDUSTRIAL FIL	-MEDIUM DENSE-			\$						
		<u> </u>	μ	Щ											
·····															
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					FINE-MEDIUM SA SOME SILT-RUST										
15			╢	Π	DENSE-(SM)		ļ		۰.						
	6	SS		Ш						6	<b>,</b>	1.			
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	7	SS	T	щ	FINE-COARSE SA MEDIUM GRAVEL-						Ţ				
		33	Ш		BROWN-WET-DENS						8				
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25		┣	 	닖											
26.5	8	SS											. 8		
	TEP				END UE DESERVATIONS	BURING 25' NX C	ASING		BORING	STARTE	)	2/1/6	57		
W. L.	10			<u> </u>	W.S. XXXXXXXXX	SOIL TESTING		VICES		G COMPLE		$2/1/\epsilon$			
W.L.	ç	)' I	3.C	. R.	7' A.C.R.	OF WIS., ROUTE NO. 7—1		ROAD	RIG	ACKER		OREMAN	DK		
<u>W.L.</u>						GREEN BAY,			DRAWN	1878		PPROVED	WMP		
1	- 8	' 3	) (	JA۱	SAB						I S	HEET			

OWNER	LOG OF BO	RING NO. 23						
City of Wausau		Secher.	-Норре Елд		the second second second second second second second second second second second second second second second s			
SITE Wausau, Wiscons	in			ME Proposed Addition To Treatment Plant				
					ENGTH TONS/FT.			
		5.	1 2	3	4 P			
DEPTH ELEVATION SAMPLE NO. SAMPLE DIST. RECOVERY	ESCRIPTION OF MATERIAL		LASTIC	WATER CONTENT %				
DEPTH DEPTH ELEVATION ELEVATION SAMPLE NO. SAMPLE NO. SAMPLE DIST. RECOVERY			X		∆			
	E ELEVATION 1170,16		10 20		40 50			
	AND-TRACE TO SOME SILT DIUM SAND-LIGHT BROWN		P					
TRACE	GREEN-MOIST-MEDIUM							
	TO LOOSE-INDUSTRIAL		\$					
			/					
3 SS		6						
<u>┣───</u> ┠──┠──┠ <sup></sup>								
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	ERS OF GRAY FINE-MED-							
	IND AND DARK GRAY ORGAN- .T-LOOSE	l é						
			$\mathbb{N}$					
			$ $ $\uparrow$					
		<u>}</u>		$\rightarrow$				
	COARSE SAND-TRACE TO							
	SILT-BROWN AND GRAYISH -DENSE TO MEDIUM DENSE-							
6 SS			9					
7 SS								
			<b>P</b>					
	MEDIUM SAND-TRACE SILT- -WET-MEDIUM DENSE-(SP)							
8 55			0					
				.				
. 35	:							
9 SS			6					
	END OF BORING							
	35' NX CASING							
WATER LEVEL OBSERV	ATIONS	<u> </u>	BORING S	TARTED	2/4/67			
······································	RXY.OX SUIL IESTIM		S BORING C	OMPLETED	2/4/67			
W.L. 9' B.C.R.	A.C.R. OF WIS., ROUTE NO. 7-1	BAETEN ROAD	RIG		FOREMAN TM APPROVED WMP			
W.L. CIAT 8' ACR	GREEN BAY,	WISCONSIN	JOB +		SHEET			
P.P. No. 8—1M.			•					

WNE	R					LOG OF BO	ARCHI	таст	- EN	GINEE				
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DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY		DESCRIPTION OF MATERIAL	UNIT DRY WT. L89./FT. <sup>3</sup>		PLAS	· %	3 WAT CONTE	NT %		%
	SA	Ĭ	1×						BTAN	DARO "I	*** PENET	RATION	BLOWS/FT	·.)
<	1	L PA			FS	URFACE ELEVATION 1168.64 INE SAND-SOME SILT AND TOP- DIL-BROWN AND DARK BROWN-		   		20	30	4	<u> </u>	
	2	ss	-		F W	ROZEN FILL INE SAND-TRACE TO SOME SILT HITE-MEDIUM DENSE-INDUSTRIA ILL	 			ø				
	3	SS		Ī	M	EDIUM SAND-GREEN-LOOSE- NDUSTRIAL FILL	·	8						
	4	SS			F	INE SAND-SOME SILT-BROWN RACE GREEN-WET-LOOSE-FILL		8						
19.	5	ss			10	INE SAND-SOME SILT-TRACE OOD-DARK GRAYISH BROWN- LIGHTLY ORGANIC-WET-LOOSE- SM-OL)		0				•		
	1		╉	+	1	· ······				$\overline{}$				
<u>15</u> 		59			0.0	INE-COARSE SAND-TRACE TO SOME FINE-MEDIUM CRAVEL-TRA SILT-BROWN-WET-MEDIUM DENSE SW)	JE -			8		2		
25		5	6											
70		- 6	5			FINE-MEDIUM SAND-TRACE SILT BROWN-MEDIUM DENSE-(SP)	-							
35			55								8			
					**	END OF BORING								
F						35' NX CASING						<u> </u>	·	
v V	VATE	281	.E\	/E	_ (	W.S. OT WELL	10 95	BAR	255		G START		2/4/ 2/4/	67 67
W.L.		7	۱ ۲	3.0	R	OF W	IS., INC.	,		RIG	IG COMPL		FOREMAN	I
J	<u>-</u>		_			T J A.C.R. ROUTE NO. 7 GREEN BA	-BAELE			DRAV	N	1.	APPROVED	ωM

P.P. No. 8-1M.

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ŀ		wa	usa	1U,		Visconsin					MPRESSIVI		GTH TON	S/FT. *
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	NO	NO.	1PLE	IST.	ž	DESCRIPTION	OF MATERIAL	¥•.		2	3			
	DEPTH ELEVATION	SAMPLE	TYPE SAMPLE	LED	3VO:	DESCRIPTION	OF MATERIAL	UNIT DRY \ LB3./FT.	PLAS LIMI		WATE CONTEN		LIQU	
	DEPTH	SAM	ΥΡΕ	SAMP	ä			L S	×					$\vec{7}$
L						SURFACE ELEVATION	1169.52		·			·····		<u>`</u>
ł	$\times$		1	╢		FINE SAND-SOME	+		<u> </u>	<u> </u>	<u> </u>	40	<u> </u>	)
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ł		2	SS		4	SAND, SILT, AS	HES, AND CIN-		8			ļ		
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ļ	5	7	SS	TT.	Ш	LOOSE-FILL			8					
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}		6	ss			FINE-COARSE SA MEDIUM GRAVEL-		1				Ø		
Ì		]			11		BROWN AND DAR	k						
		1				GRAYISH BROWN-	-DENSE-FILL						:	
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				VE	L_(	OBSERVATIONS	SOIL TESTIN	g sfr	VICES		COMPLET	FD	$\frac{1/27}{1/27}$	
	W.L. W.L.		<u>  '</u>	R (	. R.	W.S.XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	OF WIS.	, INC.		RIG	W-6		REMAN	TM
	W.L.	 . (		_		<u> </u>	ROUTE NO. 7- GREEN BAY,			DRAWN			PROVED	WMP
				<u></u>			GREAT MAL			JOB #			EET	

P.P. No. 8-1M

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OWNER	Cit	: v	of	• 1	lausau				NGINEEF		s, Inc		
SITE					lisconsin				E Prop reatmer			n To	
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DEPTH Elevation	SANPLE NO	TYPE SAMPLI	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATE	RIAL	UNIT DRY WT. LBS./FT. 3	LIMI		CONTE	ER NT %		
DEPTH	SAN	TYPE	SAM	ä			5		NDARD "	*** PENET	RATION (I	BLOWS/F	<u>л</u> т.)
					SURFACE ELEVATION 1	168.23		1	0 20	-			
					FINE SAND-TRACE TO LIGHT BROWN-MEDIUM		-						
					INDUSTRIAL FILL								
	1	SS							Î				
-5	2	SS	Ī		FINE-MEDIUM SAND-GR			_	ø				
	2 <u>A</u> _		Ŀ		FINE SAND-TRACE TO WHITE-INDUSTRIAL FI	SOME SILT	-	\$16"					
	3	ss		1	FINE-MEDIUM SAND-TR GRAY-WET-LODSE-FILL			ę					
	Ť		111										
	-		1-		DRGANIC SANDY SILT-	DARK CRAY							
10				T	-LOOSE-(OL)							•	
	4	SS	Ш					2				-	
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					FINE-MEDIUM SAND-TF GRAY-WET-MEDIUM DEN				$  \setminus  $				
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					FINE-COARSE SAND-SO	DME FINE-							
		ss	- 116	F	COARSE GRAVEL-TRACE BROWN-WET-DENSE-(SL								
		133	4	Ц		-							
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25		<b> </b>	+										
	7	SS	;		FINE-MEDIUM SAND-TH	RACE SILT.	_		1			•	
		·	T		BROWN-WET-MEDIUM DI	ENSE-(SP)			.				
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35.5		_	_	4					+				
					END OF BORI	NG							
					35' NX CASI	NG							
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WA.	7217	LE	<u>EV</u> I	ΞĻ	OBSERVATIONS W.S. OR W.D. SU	IL TESTIN		VICES	BORIN	G STARTE		2/3/67	
W.L.	1	1'	8.	C.F	31 408	07 WIS	INC.		RIG	W-6		DREMAN	<u>TM</u>
<u>w.c.</u>						GREEN BAY,			JOB #			PROVED	WMP
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P.P. No. 8-1M.

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OWNE		ty :	of	u	lausau		1	TECT-E		R gineers	, Inc	•	
SITE	Wai	JSa		u	isconsin			CT NAM		reatmen	t ola		
1			Π	1								NGTH TON	8/FT. <sup>2</sup>
z	o.	°LΕ					1 n	1	2	O3	4	i p	
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	IPLE DI	RECOVERY	DESCRIPTION (	OF MATERIAL	UNIT DRY V LBS./FT.	PLAS	т %	WATE			
DET	SAħ	ТҮРІ	SAM	Ĩ				Х БТА		••• PENET	RATION	(BLOWS/F	<u></u>
		7 v j	$\prod_{i=1}^{n}$		BURFACE ELEVATION			10	<u>, '20</u>	-	4	o <u>s</u> o	)
	1	,SS			} <sup>™</sup> •   •			8					
				.t									
	2	SS			SILTY FINE SAND					<b>'</b>	. •		
	3			Ti	AT 6'-GRAY AND DENSE TO LOOSE-								
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10	5	SS	Π	Π				$\diamond$					•
	<u>5</u> A			Ш	FINE-MEDIUM SAN	D-SOME SILT-	<u> </u>	\$2/6"					
					TRACE CLAY-BROW								
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15					MEDIUM-COARSE S VEL AND SILT-BR				$\setminus$				
	6	ss	Ш	Π	DENSE-(SP)				ø				
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	1				15' NX	CASING		<u> </u>				<u> </u>	
	TER		VE	L	OBSERVATIONS	SOIL TESTIN	g sfr	VICES		STARTED		6/22, 6/22,	
W.L. W.L.	8		B. C	. R	W.S. ฟิที่XXX . 8' A.C.R.	OF WIS.	, INC.		BORING	COMPLET	-6 FC	DREMAN	TM
W.L.		······				ROUTE NO. 7			DRAWN	•		PROVED	
No.									JOB #	187		IEET	

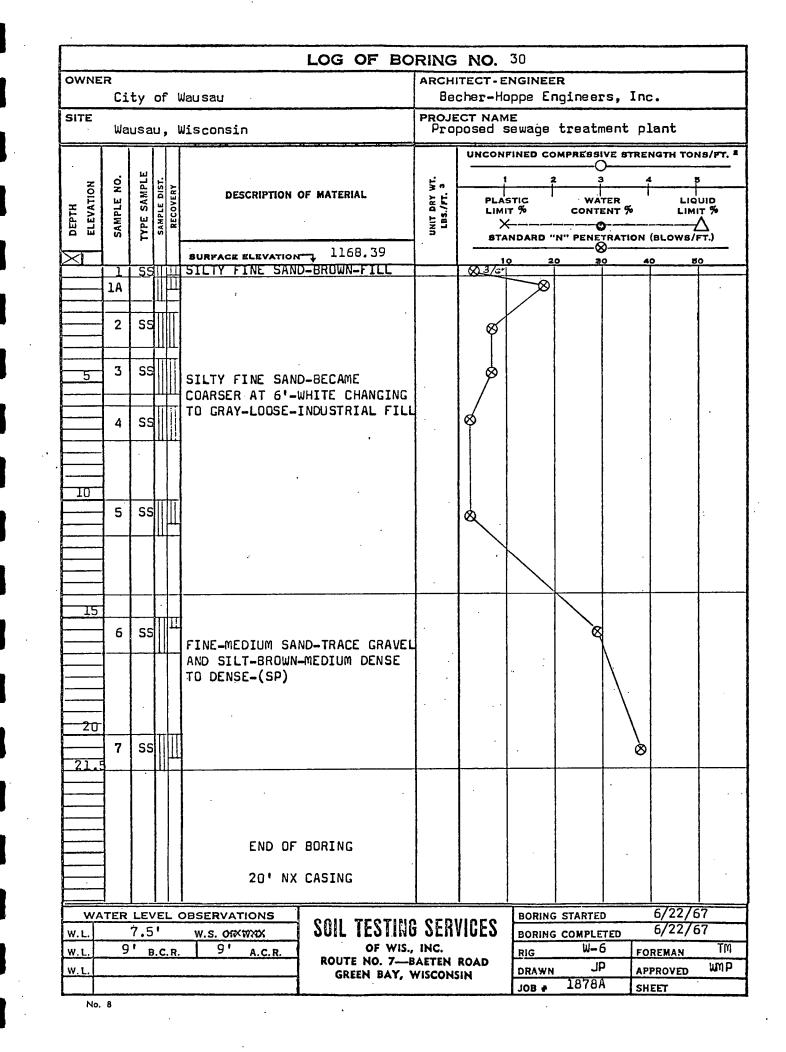
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OWNE		ty	of	'u''	ausau			TECT-EI Der-Hop		R ineers, I	nc.	•
SITE			_		lisconsin		PROJE	CT NAM	Ē	treatment		
1	wai i		с, П								TRENGTH TOP	15/FT. #
		щ							2	O 3	4 1	5
I	ы. М	SAMPLE	E DIST	RECOVERY	DESCRIPTION OF MATERIAL		RY W1	PLAS		WATER		
DEPTH ELEVATION	SAMPLE NO.	TYPE S	SAMPLE DIST.	RECO			UNIT DRY WT. LBS./FT. <sup>3</sup>			CONTENT 9		Δ
	s	F		ł	SURFACE ELEVATION		-				ION (BLOWS/I	
	그	<u></u>	$\square$	Ţ	BLACK SILTY TOPSUIL-(OL)			<u>02/6^</u>	20	30	40 5	•
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	2	SS	I	Π								
			Ш	Щ								
	3	55	Π	Π	SILTY FINE SAND-TRACE WOOD			ø				
	_		Ш	Щ	AT 4' AND 10'-GRAY-MEDIUM			T I				
	4	SS		Π	DENSE TO LOOSE-INDUSTRIAL FILL			.0				
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					FINE-COARSE SAND-TRACE TO		×. •					
					SOME FINE-MEDIUM GRAVEL-TR SILT-BROWN-WET-MEDIUM DENS							
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	8	ss		ĪT					Ø			. 
. 26.5	<b> </b>		Ш		END OF BORING				\$			
WA			VE	Ľ	W.S. OFFWAR	NX (	ASIN		BORING	STARTED	6/22/6	
W.L.	7.					HNG wis.,		VIUES		COMPLETED	6/22/6	57 TM
W.L.	0.		<u>з. с</u>	. R.	ROUTE NO.	7—B/	AETEN		RIG DRAWN	JP	FOREMAN APPROVED	WMP
┝╨┶╩┾╸		· · · ·			GREEN B	AT, W	ISCON	51N	JOB +	1878A	SHEET	

No. 8

						LOG OF BO	RING	NO.	29				
OWNE		City	/ C	of	Wausau			rect-el cher-Ho		R Igineers	s, Ind	S.	
SITE	ļ,	laus	ອອບ	١,	Wisconsin		PROJE	CT NAM	E sewage	treatme	ent pl	lant	
			Π	Т				UNCONF	INED CO		STREN	IGTH TON	S/FT. *
TION	E NO.	SAMPLE	DIST.	/ERY	DESCRIPTION (	OF MATERIAL	RY WT. FT. <sup>3</sup>	1 PLAS	2 ;TIC	3 WATE	4 R	LIQU	
DEPTH ELEVATION	SAMPLE 1	TYPE SI	SAMPLE DIST.	RECOVERY			UNIT DRY WT. LBS./FT. <sup>3</sup>			CONTEN		LIMI 	7
$\times$				ſ	BURFACE ELEVATION	1169.69		10					
	1 1A	55		Ē	NUTE A SILTY FINE SAN TRIAL FILL	D-GRAY-INDUS-		D'LE"					
	2	SS						8					
				_	SILTY SAND-TRA		ł						
5	3	SS		Π	PETROLEUM ODOR								
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	4	SS	Ш		NOTE A								•
					FINE-MEDIUM SA BROWN-FILL	ND-TRACE GRAVE	H						
10	1												
<u> </u>	5	ss						\$					
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15					FINE-MEDIUM SA SOME SILT-TRAC METAL-BROWN TR	E RODTS AND							
	6	ss		Щ	LOOSE-FILL			8					
		-					· · · ·						
- 20					FINE-COARSE SA				$\backslash$				
	7	βS			SOME FINE-MEDIN MEDIUM DENSE-(				Ø				
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25													
	8	S	5	Ш						3			
26.5	<u> </u>		- 14-		END D	FBORING		<u> </u>		<u> </u>  -			
w/	TER	LE	VE	Ļ	DBSERVATIONS	OGH TEOTING	0 0	VI050	BORING	STARTED		6/22/	
W.L.	8				W.S. ORKWADK	SOIL TESTIN		AIRE2	BORING	COMPLET		6/22/	
W. L.	8		в, C	. R.	8' A.C.R.	OF WIS. ROUTE NO. 7—		ROAD	RIG	W-6		REMAN	JC
W.L.						GREEN BAY,			DRAWN			PROVED	Wh
						l			JOB #	1878	` SH	EET	

No. 8



						LOG	OF BO	DRING	; NO.	31				
OWN	ER					<del> </del>		ARCH	ITECT -	ENGINE	ER			
	Ci	ty i	of	Wausau				E	Becher	-Норре	Engine	ers,	Inc.	
SITE	Wa	usau	, ا	Wiscon	sin			PROJ	ECT NA	ME ed Sewa	age tre	eatmei	nt plant	 :
	1	1	Π					1					RENGTH TO	
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10	E NO.	AMP	DIS	/ERY	DESCRIPTION	N OF MATE	RIAL	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		ASTIC	Î ·		- <b>Î</b>	╞
DEPTH ELEVATION	SAMPLE	TYPE SAMPLE	SAMPLE DIST.	RECOVERY				UNIT DRY WT. LBS./FT. 3	LIP	иіт % X————		TENT %		
						1	160 51		51	ANDARD	"N" PEN		N (BLOWS	/FT
$\times$		1			ACE ELEVATION		168.51		836	<u>10</u>	20	30	40	80
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	5	SS		BROWN	N AND GRA CAM OF SL	Y-WET-L	OOSE-(SP)		R					
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15														
	6	ss		FINE-	COARSE S	AND-TRA	CE TO				8			Γ
			Ш-		GRAVEL-B	ROWN-ME	DIUM			1	ſ			
				DENSE	:-(SW)					/		{		
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-20-				BROWN	MEDIUM SI I-MEDIUM I	AND-TRAI	CE SILT-				Ì			
	7	SS	而				-:/							
21.5			ШĽ	Ц. 		· · · · · · · · · · · · · · · · · · ·				ļ				
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					END OF	F BORING	3	.						
				1	20' N	CASIN	:							
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	TER	LEV	EL	OBSERV	ATIONS	0011	TEOTINO	0501	1000	BORING	STARTE	D	6/22/6	
W. L.	8.5 91	5'		6	DRXW.D.	J SUIL	TESTING		1059		COMPLE		6/22/6	
W.L.		B.	<u>.C.</u> R		A.C.R.		OF WIS., E NO. 7-B	AETEN F		RIG	) – W ال	[ [	VILLAN	TM M D
<u></u>		·····				-j GR	EEN BAY, V	VISCONS	IN	DRAWN	J.	A	PPROVED W	111

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OWNE		<b>L</b>	- 6	1.1				TECT-E				Tee	
SITE	Li	<u>ty</u> i	<u>)</u>	10	ausau			CT NAM		nginee	rs,	inc.	
0176	Wau	Jsau	1,	W	isconsin			osed s		treatm	ent	plant	
			Τ	T				UNCON	FINED CO	MPRESSI	VE ST	RENGTH TO	DN8/FT.
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TION	ž u	AMP	BISI	ERY	DESCRIPTION OF MATERIA	L I	an ≿Ľ	PLAS	STIC	WAT	TER		
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	MPLE	ECO			UNIT DRY WT. LBS./FT. <sup>3</sup>		т %	CONTE	ENT %	LI	міт % Л
	SA	TYF	SA	"			E E		•	N" PENET	RATIO	ON (BLOWS	7 /ft.)
$\times$					SURFACE ELEVATION			10	0 20	<u> </u>		40	50
	1 1A	55	ŦŦ	╢	DARK BRUWN SILTY TUPSU.	IL-(UL)							
	17		14	Щ	· · · · · · · · · · · · · · · · · · ·								
	2	SS	T		SILTY FINE SAND-GRAY AN WHITE-LOOSE-INDUSTRIAL							·	
	~				WAIIC-LUUSC-INDUSTAIRE	r ILL							
			Π	Π									1
5	3	SS		Щ									
								x '6"					
	4 4 A	55	Π		SILTY FINE SAND-TRACE	ROOTS-							-
	44		Щ	Щ	BROWN-WET-LOOSE-(SM)	, ·		7					
				_									
1					FINE-MEDIUM SAND-TRACE	SILT-							
10	<u>-</u>			пl	BROWN-WET-LOOSE-(SP)			· /					
	5	SS		Щ		·		Ø					
			-11	-									
										$\geq$			
				- 1	FINE-COARSE SAND-SOME (								
15					TRACE SILT-BROWN-DENSE	-(SW)						$\searrow$	
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	1				END OF BORING		· ·						
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	1				15! NX CASING								
- WA		_	Έl	. 0	BSERVATIONS COLL 7	ECTING	CEDI		BORING	STARTED	)		2/67
W. L.		71			71	<b>ESTING</b>		1023		COMPLE			2/67
W.L.		з'в	<u>.c.</u>	R.		OF WIS., NO. 7B	AETEN	ROAD	RIG DRAWN	-W-		FOREMAN APPROVED	TM
						N BAY, V					~		MATE 14

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OWNE		;y c	of	Wa	ausau			TECT-E Becher			eers	, Inc	•	
SITE				1.1.				CT NAM				_		
	wat	isat	, 	w:	isconsin		Pro	posed :	sewage	treat	ment	plan	t 	
					,			UNCONI	INED CO	MPRESS	IVE BT	RENGT	1 TON	S/F
x	NO.	ЧE	Ŀ.				5.	1	2		á	4	5	í
	и Ц	AMF	510 3	VER)	DESCRIPTION OF	MATERIAL	RY V	PLAS		WA	TER	т, .	LIQ	
DEPTH ELEVATION	SAMPLE	TYPE SAMPLE	SAMPLE DIST.	RECOVERY			UNIT DRY WT. LBS./FT. <sup>3</sup>			CONT	ENT %	) 	LIMI	т 74 Л
E D	SA	1X	s				5-	•	NDARD "	N" PENE	TRATI	ON (BLC	W5/F	
$\times$					SURFACE ELEVATION			1	2	<u>ب</u>	ر م	40	80	o .
		SS.	₽		BLACK SANDY TOPS			× Corr	-82					
	1A		III	Ш					~					
	2	SS	Π	T							R			1
·	1							-	,		Μ.			
	1		Ľ		SILTY FINE SAND-	CDARSE AT 6'								
5	3	SS			GRAY CHANGING TO IUM DENSE TO LOO				ø		ļ			ļ
	<b> </b>		-	$\left  - \right $	FILL									i
	4	ss	T	IT										
	4	33				7		ا.   ۲						
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	1										1			
10-	1													
	5	SS	$\Pi$	$\prod$	e e			. 83			ļ			
	1			Ш				T						l
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	1				I State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State State Stat									
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15						·		1/51						<b> </b>
		SS		##	NOTE A	TPACE STIT		8						
	6A	<u> </u>	Ш	Ш	GRAY-MEDIUM DENS				Teo I					
			ł			• •								
			┢	$\vdash$			·							<u> </u>
	-		ľ		FINE-COARSE SAND TRACE SILT-BROWN									
20	-	<u> </u>		 	(SW)						1		ļ	
<b> </b>		ss		μ	· · ·				8					
21,5	1-	<u> .</u>	╢	₋	NOTE A									
	1				SILTY FINE SAND-	TRACE FINE					.		ľ	
}	-			ŀ	GRAVEL AND WOOD	STEMS-DARK	<b>\</b>							
	-				BROWN-SLIGHTLY O	пьямт <b>с-(</b> 30-0L					1			l
					END OF	BORING								
	-				001	CACTNE					1			
	]				20' NX	LASING					1			1
		<u>.                                    </u>		<u></u>	DBSERVATIONS			<u>I</u>	BORING	STARTE	<u> </u>	 	/22/	167
W.L.		.5'	* C	- '	W.S. ORXWXX	SOIL TESTING	SER	VICES		COMPLE			/22/	
W.L.	9		9.C	. R.		OF WIS.,	INC.		RIG	W-	the second second second second second second second second second second second second second second second s	FOREM	· · ·	TM
W.L.						ROUTE NO. 7-B GREEN BAY, V			DRAWN	J	P	APPRO		m P
						WILLIN DALLY			ЈОВ 🕈	1878	A	SHEET		

OWNE	a ity	of	W	au	sau			TECT-Z	NGINEE				
SITE W	aus	au	Se	wa	ge Treatment Plant			CT NAM					
			Π	T				UNCONF	INED CO	MPRESSI	Z STREP	IGTH TON	5/PT.
DEPTH ELEVATION	SAMPLE NO.	TYPE SAMPLE	SAMPLE DIST.	RECOVERY	DESCRIPTION OF MATERI	AL	UNIT DAY NT. LBS./FT. <sup>3</sup>		т % 	S WAT CONTE	NT %		7
	S	4		ł	BURFACE ELEVATION - 99	. 4		5TA				0 50	
	1	\$5			Dark brown to black sa gravel fill with glass and cinders-loose to r	s,brick		9.0		×25			
	2	SS			dense			8B 1					
_5	3	SS		:::	Dark brown silty fine roots and fine gravel fill-loose-(SM)			\$5					
	4	SS			White fine sand-trace definite chemical odo fill-loose-(SP)		le	8×8 /					
10	5	ss				ता जम		⊗ <sup>3</sup> \					
	6	ss			Dark brown silty tops roots trace to some s Il feet-slight chemic wet at 10.0 feet-loos	and at al odor- e		<u>ଞ୍</u>					
15	7	ss			Dark brown to black s fine to coarse sand a to medium gravel-medi to dense-wet-(GM)	nd fine				27 X			
20	8	ss									/		.×
25	9	ss	: : :		Brown fine to medium trace coarse sand,fin and silt-medium dense	e gravel	) 2)		×13				
30	1	s		~					×14	e.			
31.	7	$\uparrow$	ľ	f	End of Boring		+	1	<u> </u> -			1	
					30 feet of NX Auger boring t Wash water use	o 20.0 1	feet	eet					
						<u></u>						0-3-74	
W.L. W.L.	10	) <sup>1</sup> 11	8.	C. F	9' A.C.R.	TESTII	., INC.	10.10.4C	BORIN PIG 2			0-3-74 10-3-7 OREMAN	
	7.8	)	10			REEN BAY, 540 LAM			DRAW	м	1 A	UT Y D'R Y NOVED	

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	Ci	ty	0	f 1	Wausau	Bed	her-Ho		ngineer	5		
SITE	Wa	usa	บ	S	ewage Treatment Plant		ect NA ant Add					
٤.						1	UNCO	NFINED C	OMPRESS	VE STRI	ENGTH TO	ю
NO	NO.		5.57.	2	DESCRIPTION OF MATERIAL	5 m	ļ	!	2 .		4	ŗ.
DEPTH ÉLEVATION	SAMPLE	TYPE SAMPLE	d b f C	RECOVEL	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	LIN	ASTIC		TER ENT %		
	SAJ	ΥP	SAJ	Ē		IN S	,	X	"N" PENE	TRATION	BLOWS	- <u>∕</u> -
			Ļ		SURFACE ELEVATION 99.6	ļ		10	20 3	o	40	50
	1	SS			Dark brown and gray silty fi sand fill with brick,glass a		1		$\otimes^{2'}$			T
				E	cinders	ľ.	0	3/6				
	 2 A	<u>\$\$</u> \$\$				·	<u></u>	0 10	<del> </del>			+
								Ĩ				
5_	3	SS		h	White fine sand-trace silt-d at 8.0 feet-probable fill-(S	amp	8 g					
	_				loose	ľ						ł
	4	SS					85					
			$\vdash$									
	5	ss			-		83					
. 1-0	_		┝┥									1
	6	<u>'S'S</u>	1		Black topsoil with roots-trac	f	<u> N</u> 75					‡
	6A	SS	-	_	sand-wet			10/3				
					Dark brown to black fine sand trace roots, silt and gravel- wet~(SP)	<u>}-</u>						
					wet-(5r)			\`				
15	·				Gray brown silty fine to medi	um			k l			
					sand-trace fine to medium				×23			
	7 '	SS			gravel-wet-(SM)				N.			
										•		
					Dark brown silty fine to coar	<b>6</b> 0				$\backslash$		Γ
20	8				sand and gravel-wet-(GM)						39	
	<u> </u>	SS		-						× /	-	ł
												ł
									1			
					Gray brown fine to coarse san	<b>4</b> -			/			Γ
25				_	trace fine to medium gravel and silt-wet-(SW)			16 - 1	r I			
	9	SS	•		and still wet (Sw)			163			}	
	-		Ŧ	7				- <u>'</u>		<u> </u>		Ļ
					Brown fine sand-trace silt-							
				ł	medium dense-wet-(SP)		·					
30		_	-									
31.5	0	SS						\$12				
	T		T	T	End of Boring							t
					30 feet NX Casing used							
					Auger boring to 15.0 fe Wash water used below 1	et 5.0 fø	et					
		ĺ										l
		ĺ										l
					· · · · · · · · · · · · · · · · · · ·							[
	<u>er</u> 9.0		εL	. c	WESERVATIONS SOIL TESTING	SERV	/16ES		STARTED		10-4-	7
	0.5		с.	R.	10.5' A.C.R. OF WIS.,	INC.	•	BORING	COMPLET		REMAN	
	0.5				GREEN BAY, %			DRAWN				T
					540 LAM8	EAU ST.	-	108 +	6348	58	EET	

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•	LOG OF BC	RING	NO. 3	(36)		
OWNER City of Wausau			-Hoppe Eng			
site Wausau Sewage Treatment	Plant	PROJEC <sup>®</sup> Plant	T NAME Addition			
C. W			JNCONFINED C	OMPRESSIV	E STRENGTH	TONS/PT.
DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DE TH DEPTH DE TH DEPTH DEPTH DE TH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH DEPTH	N OF MATERIAL	UNIT DAY WT. LBS./FT. 3	PLASTIC	2 3 		
DESCRIPTIO		LBS./	LIMIT %	CONTEN	IT %	LIMIT 5
SURFACE ELEVATI	99.0			"N" PENETR 	ATION (BLO)	WS/FT.)
1 SS						346
			8⊗	$\vdash$	_	
2 SS			/			
	fill composed l,glass,brick,	5	32			
cinders, etc	wet and definite					
4 SS loose to dens	at 10.0 feet- e	Ž	<u>Ş</u> 2			
			2			
5 SS						
6 SS		N N	53			
			$\mathbf{N}$			
7. SS				- 7 24		
7A_SS			115" 5-			
	black fine to nd gravel-trace					
shells at 16.	0 feet-trace			$\mathbb{N}$		
8 SS	un dense to				333	
				/ 		
				\$	30	
9 SS Brown fine sa	nd-trace silt-					
wet-medium der	nse-(SP)					
10 SS					30	
				V		
11 SS 😤						
36.5 End of E	Poring		<u>¥.15</u>			
35 feet	of NX Casing use	d				
Auger bo	oring to 15.0 fee er used below 15	t 5.0 feet				
WATER LEVEL OBSERVATIONS	!	<u> </u>		STARTED	<u> </u>	<u> </u> 4
W.L. 9.5' W.S. & XX.8.	SOIL TESTING		ES BORING	COMPLETE	<u> </u>	74
W.L. 10.2' B.C.R. 5' A.C.R. W.L. WCI 7.6' AB	OF WIS.,	1 TISIASIAS	RIG DRAWN		APPROVE	740
	GREEN BAY, W 540 LAMBE	AU ST.	• EOL	6348	SHEET	<u>-</u>

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						LOG OF BO				(31	1)		
OWNI		tv r	5 f	Wa	usau		1		ENGINE				
SITE				_				ECT NA	Hoppe 8	ngine			
	Wau	Isau	ג ו 	iew	age Treatment Pl	ant	P1	ant A	ddition	ו 			
5	1							UNCO	NFINED C	OMPRES	SIVE STR	ENGTH TO	DNS/I
NCI	2 2	TYPE SAMPLE	1510		DESCRIPTION OF	MATERIAL	5.	ļ	1	2	3	4	7
DEPTH ELEVATION	SAMPLE NO	SA SA	SAMPLE DIST.	COVI			UNIT DRY LB3.//T.		ASTIC MIT %		ATER		о 1010 МІТ 7
DEI	SAL	1 I	SAH	ä			IN S		X		•		-^
					SURFACE ELEVATION	99.0		—			8	40	
	1,	ss					1		1	1	1	1.8'	17
	}		$\left\{ + \right\}$	=			1					TŬ	-
	2	ss					[		198	;			
				=			ŀ						
	3	ss			Miscellaneous fi	11 composed a	L_	34	1				
	┨	<b> </b>	<u> :.</u>	4	sand,gravel,glas	s,brick,cinde	rs,	ĬĬ					
	4	ss		;; e	etcwet at 10.0	feet		Śz					
		ļ						Ň					1
	5	ss						35					
10		<u> </u>	-	-				Ĩ	1				
				-			.	\$4					
	6	SS						Ĩ					
15													
	Z	55						37	16"	、			
	7A	SS			rown fine to coa ravel-trace silt	arse sand and :-wet∹medium				$\Box_{\mathcal{X}}$	28		
					lense to dense-(G					\	X		
			_	_ _							1		
-20-				D	ark brown to bla	ick silty					$  \rangle$		
20	8				ine sand and gra ense-(GM)	ivel-wet-					1	1	
	°	SS	1	1							35		
									{		V		ł
		· .								/			
										1			
25				7						V			
	9	SS							198				
				в	rown fine sand-t	race silt							
				a	nd gravel-wet-me	dium dense- (SP)							
						(38)							
30	-		+							20			
	10	SS	<u>.   :</u>										
									/				
									/				ļ
7									/				1
	11	55	Ţ.						/			1	
36_5			4						×,10				
					End of Bor	ing							Γ
				-	35 feet of	NX Casing u	ed						
					Auger bori Wash water	ng to 15.0 fe used below	et	oot					
			!	1		USCU DETOW			<u>   </u>	<u> </u>	10.5		!
WA1	9.1		<u> </u>		W.S. XXXXXXX	OIL TESTING	SERV	ICES		COMPLE		1-74 0-3-74	
W.L.	9.5	' e.		٢.	A.C.R.	OF WIS.,	INC.		RIG	22			JG
<u>w. l.  </u> W		8.0			3 24 hrs. AB	GREEN BAY, W 540 LAMBE			DRAWN	7.51.6		PROVED	ТК
		<u> </u>			The	340 LAMBE	AU 31.		108 +	6348		EET	

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OWNER	<b>C</b> : <b>b</b>		Mayoay	1	r <b>ect</b> -en		neers	. Inc.	
SITE	LIT	y or	Wausau	PROIF					
5112	Wau	sau,	Wisconsin	Pro	oposed	Incinera	ator B	uilding A	ddit
	1	TT			UNCONFI	INED COMP	RESSIVE	STRENGTH	rons/
z	NO.	۲. ۲		Ľ,	1	2	3	4	5
ATIO	SAMI	-E DIS	DESCRIPTION OF MATERIAL	DRY ./T.	PLAS		WATEI		ן גוםטום אוד 1.
DEPTH ELEVATION	SAMPLE	SAMPLE DIST. Recovery		UNIT DRY LBS./FT.	×		6		$-\Delta$
	s   F		BURFACE ELEVATION 1169.4					ATION (BLOW	
	FI			le.	10	20	30	40.	
1	SS		Light yellow fine to very fin sand-trace silt-loose-(SP-Fi	lī)	⊗{ <sup>8</sup>				
		-				311			
<sup>2</sup>	2   SS		Gray brown fine sand fill,tra silt-medium dense to loose-	ce	X	S			
			(SP-Fill)						
-5-3	3   SS				⊗7				
	+ SS	1144			<u>Ø</u> 7				
[	<u>+A SS</u> 5 SS		Gray brown to brown silty fin sand,trace clay,roots-loose-	le	846"				
1 1	5A   S S	1 1 1 1	saturated-(SM-ML-Fill)		86/8	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
10			White fine to medium sand fi	11,	I I I				·
	5 ISS		trace silt, roots-loose-(SP-F	111)	84				
`									
	7 55					SIZ			
	·	<u>  U </u> -	Brown to gray brown fine to	medium					
15	<u>8 55</u>		Brown to gray brown fine to sand,trace silt-slightly org loose-(SP)	anic	× 2/6"		0		
	8A S 8B S		Gray brown sandy slightly or silt,trace roots,clay-medium	<u>anic</u>	V286/6 86/6	"			2
			Brown fine to medium sand,tr fine to medium gravel,silt-m dense-saturated-(SP)	edium		$\geq$			
20			Brown fine to coarse sand,tr fine to medium gravel,silt-				$\mathbf{A}$		
-21.5	9 59	5	dense-saturated-(SW)					88	
-21.21									
	·		End of Boring			ganicc	ontent	., % of d	ry  w
			Power auger used for entire	boring		· · ·			
			) 	1	<u> </u>				
	ER LI		OBSERVATIONS SOIL TESTIN	G SER	VICES	BORING S		$-\frac{1}{4-14}$	
W.L.	14.5	B.C.F				RIG W-		FOREMA	
W.L. 1		24 h	DUITS AB 540 LAMBE			DRAWN	ННН	APPROVI	ר מ:
	6' c	ave	in AB GREEN BAY,	VVID. 54		9 TOL	6600	SHEET	

OWNE	R					ARCH	ITECT - EN	IGINEE	R			
		Ci	ty	0	f Wausau	Bech	ner-Hopp	e Eng	ineers	, Inc.		
SITE		Wa	usa	au	, Wisconsin		osed In		ator B	uildir	ıg Addi	tio
1			Π	T			UNCONF	INED CO	MPREBBI	VE STRE	NGTH TOP	19/F
z	чо.	ЦE	Ŀ.			1. 1. 1.	1		: 3		4	5
DEPTH ELEVATION	SAMPLE N	TYPE SAMPL	SAMPLE DIST.	COVERY	DESCRIPTION OF MATERIAL	UNIT DRY WT. LBS./FT. 3	PLAS LIMIT	%	WAT CONTE			UID
DEPTH	SAM	TYPE	SAM	삐			1	IDARD "		RATION	(BLOWS/	( <u>)</u> FT.)
$\ge \Box$					BURFACE ELEVATION 1169.1		10	2	& озо	•	io 5	0
		FT	$\left\{ r \right\}$	T	Topsoil-no sample obtained White fine to very fine sand trace silt-medium dense-(SP-	Lf (I)	, 00					
	1	SS					<b>⊗</b> ₹	<u> </u>				
	2	SS			Gray brown fine to medium sa trace silt-medium dense to	hd,		$\geqslant$	19			
					loose-(SP-Fill)							
- 5 -	3	SS					86					
		-		Ш								
	4A			Ţ	Light brown sandy silt fill, roots,clay-sațurated-loose-	race	Ø 3/6" Ø 4/6"	C				
	4B	SS			roots,clay-saturated-loose- (ML-Fill)	4	× 4/6"					
	5	SS			White fine to very fine sand	•						
					trace silt-loose-(SP-Fill)							
	6			Ц	Dark brown fine to medium sa	hd	₩6°®	-1014				
	6A	SS		긔	with trace to some dark brow	/P						
			,		silty sandy topsoil,trace ro medium dense-(SP)	oots-	1×2/6"			2		
	ZA	55			Brown to gray brown sandy si trace roots-slightly organic loose-(ML)	_t.,	X:3/6"			<b>9</b>	(2)	
	/.B	1.2.5	4 Li	<u>.</u>	100se-(ML)	1						
_15	8	ss	П	Π	Brown fine to medium sand,tr fine to medium gravel and s loose to medium dense-satura	t-		Ø 15	+			
				::: :   :	loose to medium dense-satura (SP)			- \				
		┣	+		Brown fine to coarse sand,t	ace					$\leftarrow$	
<u> </u>					fine to medium gravel, silt-							K
20	. 9	ss		Π	very dense-saturated-(SW)							
21.5									ļ	·		·
					End of Boring	1		anic c	ontent	20	f dry w	
<b></b>							, , , ,			, ~ 0		
	]				Power auger used for entire	þorin	pi					
<b></b>	1					1						
	1											
	1				<u> </u>	<u> </u>						
		· · · · ·		L	W.S. OXXXXX SOIL TESTIN	g sfa	VICES		G STARTE		5-75	
W.L.		3.5	н В.С				IIULU	BORIN	G COMPLE		<u>4-15-</u> OREMAN	7 <u>5</u> 'SN
W.L.	_	3' /	AB		540 LAMBE	AU STR		DRAWI			PPROVED	T
		1.5	2	24	hours AB GREEN BAY,	WIS. 5	4303	4 BOL	6600	) s	HEET	

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						LOG OF BO	RING	NO.	3				
OWN		Cit	у (	of	Wausau				nginee ppe En		s, Ind		
SITE		Wau	sa	u,	Wisconsin		PROJE	CT NAM	ie Incine	rator	Buildi	ng Add	ition
			$\left[ \right]$	T				UNCON	FINED CO	MPRESSI	VE STRE	NGTH TON	15/FT. #
NO	No.	SAMPLE	DIST.	RY	DESCRIPTION	OF MATERIAL	, ₩ T	PLA	2	3			
DEPTH ELEVATION	SAMPLE NO.	TYPE SA	SAMPLE DIST.	RECOVERY			UNIT DRY WT. LBS./FT. <sup>3</sup>	LIMI		CONTE		LIQ LIM:	
	ŝ	1	S		SURFACE ELEVATION	1169.1	5				)	(BLOWS/	
		I FT			Topsoil-no samp	ole obtained		1	0 20	<u> </u>	<u> </u>	10 <u>5</u>	o
	11	ss			White fine to v fill-trace silt	very fine sand -loose-(SP-Fil	1)	⊗° \					
	2	SS						⊗e ⊗4/6″					
	2A			:Ц) ПП	Grav brown fine fill,trace silt	to medium san -loose-(SP-Fil	1)						
	- 3 - 3A	SS   SS						<u>⊗</u> 3 ≫1/⊾"		0			
	4	SS		Π	Light brown sar trace roots-sat	(ML-Fill)		⊗5		-			-
	<u>4</u> A	<u> </u>				<u></u>		86/	s"				
<b> </b>	- 5	ss		T	White fine sand silt-loose-mois	fill,trace st-(SP-Fill)		8					
10	] ^	33											
	6	ss						84					
<b> </b>				_	Brown fine to r	nedium sand,tra	re	\\					
	7	ss			silt,gravel-med loose-saturated	dium dense to	ſ		⊗13				
15	-		<u>l</u> i										
	- 8	ss						87 85					
	84	SS	<u>ii</u> i	Ш	Brown fine to	coarse sand,tra	ce	N N	ь"				
						to medium grave o dense-saturat							
	-					(SW)				$\overline{\ }$			
20	+										$\searrow$		
21.5	9	SS									<u> </u>	39	
	-				End of	Boring							
					Power auger us	ed for entire b	bring		· .				
	4												
	1												
		<u> </u>	<u> </u>			1	1	<u> </u>		STARTE	 		
W.L.		3 '	VE	<u> </u>	W.S.XOR W.D.	SOIL TESTING	g ser'	VICES		COMPLE		4-15-75 -15-75	
W.L.			B.C	. R.		OF WIS.			RIG	W-15		DREMAN	SN
W. L.		2.5				540 LAMBEA GREEN BAY,			DRAWN	ННН		PROVED	TKD
		<u>3.9</u>	I 	2	4 hours AB	3			JOB #	6600		IEET	
						The stratifica ary between so							

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OWNERARCHITECT-ENGINEERCity of WausauBecher-Hoppe Engineers	, inc.
SITE Wausau, Wisconsin Project NAME Proposed Incinerator B	uilding Addition
	/E STRENGTH TONS/FT. 2
NOT HATERIAL	4 B
DESCRIPTION OF MATERIAL	ER LIQUID NT % LIMIT % A
A A A A A A A A A A A A A A A A A A A	
SURFACE ELEVATION 1168.8 10 20 30	
Image: Second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	
2 SS Gray brown fine sand fill, trace silt-medium dense-(SP-Fill)	
2A SS 11 11 866 "	
-5 3 SS White fine sand fill,trace	
SP-Fill)	
4 SS 8 9	
5 SS	
$ \begin{array}{c c} \hline & & & & & & & \\ \hline & & & & & & \\ \hline & & & &$	
Brown fine to medium sand, trace	
7 SS silt and fine to medium gravel-	
8 SS Brown fine to coarse sand, trace	
9 SS 8 /5	
End of Boring	
Power auger used for entire boring	
WATER LEVEL OBSERVATIONS COLL TECTING OF DUIDER BORING STARTED	
W.L. 13' W.S. XXXXD. SOIL TESTING SERVICES OF WIS., INC. BIG W-15	
W.L. B.C.R. A.C.R. 540 LAMBEAU STREET	FOREMAN SN
W.L. DRAW WIS 54202	APPROVED SHEET
13' Cave in AB     GREEN BAT, WIS. 54303     JOB #     6600       7      The stratification lines represent the	
ary between soil types and the transiti	

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					· L	.0G OF 1	EST	BORING								
	JOB N		00-88-06			VERTIC	CAL SCA	LE1'	= 5'		. в	ORING	NO	38	3	
=	PROJE	<u>стР</u>				TMENT_PI		FACILITI	<u>ES, W</u>	AUS						
	DEPTH IN			IPTION OF M			GE	OLOGIC			<u> </u>	MPLE		BORA	TORY TE	
-	FEET		CE ELEVATI	ON	1171.2	26'		RIGIN	N	WL	NO.	TYPE	W	D	P.L.	Qu
	2	FILL, gravel layers	Sand, wi , fine g of silt	ith silt grained, ty sand	, a litt brown, (see #1)	le moist,	FIL	Ĺ	20	:	1	SB				
	4	FILL, white,	Sand, fi	ine grai lenses	ned, bro of silty	wnish			- 13		2	SB				
	-								6		3	SB		:		МА
	7 <sup>1</sup> /2		Sand, fi moist	ine to m	edium gr	ained,			- 5		4	SB				
	10 -		SAND, fi earing,		ned, bro	wn,	COAT			¥	5	SB				
	4	- waterb	earing,	very to	ose	(SM)	ALL	JVIUM	- 3		6	SB				MA
	14½				a little um grain	gravel,			8		7	SB				
	-		to gray, y dense	waterb	earing,	loose (SP)										
	_								38		8	SB				
	-								-							
	-								19		9	SB				
	-								-							
	31 -		END OF	BORING					16		10	SB				
	-		t ½ to l sphalt a		a 3″ lay urface	er of			-							
	-								- -							
	-								-							
	_								-							
			w	ATER LEVEL	MEASUREME	NTS			START	5 -	5-8	8	COMP	PLETE	5-5-	88
	D/ ==		SAMPLED	CASING	CAVE-IN			WATER	METHOD						_13	:06
	DATE 5 - 5	тіме 12:10	DEPTH	DEPTH	DEPTH	BAILED D	EPIRS	LEVEL		1,11	HSA	0'	to 1	 2 '	<u> </u>	
	5-5	13:06	31'	12'	31'	10		NMR				to 2		L		
						to to			CREW CH		<u> </u>		2 <u>~2</u> 11ne:	 r		

# twin city testing

1	LOG OF T	EST BORING								
JOB NC	<u>8100-88-0640</u> vertic	CAL SCALE1"	= 5'		_ В		NO			
PROJEC		ANT_FACILITI	<u>S, WA</u>		7					
DEPTH IN		GEOLOGIC				MPLE			TORY TE	Γ
FEET	FILL, Silty Sand, with gravel, brown	ORIGIN	N	WL	NO.	TYPE	W	D	P.L.	Qu
	and black, a 3" layer (see #1)	FILL	- 21		1	SB				ĺ
	FILL, Sand, a little gravel at $4\frac{1}{2}$ to		-							
1 1	6 feet, fine grained, brownish white, moist		- 7		2	SB				
			F							
			23		3	SB				
]			[							
			- 4		4	SB				
9 <sup>1</sup> 2			} ⁴		4	20				
-	SILTY SAND, a little gravel and	COARSE	<u> </u>		-					
1 1	organic material, brown and black,	ALLUVIUM	5	V	5	SB				
	moist to waterbearing, loose (SN) SAND, with organic silt, with gravel		-							
1 1	at $14\frac{1}{2}$ to 16 feet, fine to medium		f 2		6	SB				
	grained, grayish brown and black, waterbearing, very loose, layers of		Ľ							
	silty sand at $14\frac{1}{2}$ to 16 feet		1	Ì	7	SB				
17 +	(SP-SM)	-	-							
	SILTY SAND, with gravel, cobbles,		F							
	medium to coarse grained, gray and black, waterbearing, dense		F							
	(SM)		16		8	SB				
			F							
			Ę							
2/1			-							
24 2	GRAVEL, with sand, cobbles, gray,	•	12			0.7				
	waterbearing, medium dense (GP) SAND, with gravel, medium to coarse				9	SB				
	grained, brown, waterbearing,		F							
ן ]י	medium dense (SP)		[							
			[							
31 -			10		10	SB				
	END OF BORING		-							
	#1 - of asphalt at the surface		-							
			-							
	· · ·		-							
						l				
			-							i
			F							
			-							
	WATER LEVEL MEASUREMENTS		START		5-5	-88	_ СОМ	PLETE	5 - 5	-88
	SAMPLED CASING CAVE IN	WATER	METHOD						] _1	1:12
DATE	TIME         DEPTH         DEPTH         DEPTH         DEPTH         BAILED D           10:30         13 <sup>1</sup> / <sub>2</sub> '         12'         12'         11'         10'	EPTHS LEVEL			ISA	0''	:o 12	. 1	·	
5-5	11:12 31' 12' 31' to	2010			•••	<u>:o 29</u>				
			CREW CH		(					
···-		u tostinc				V	Vellr	ier		· ·····

## corporation

JOB NO					VERTIC	AL SCAL	е <u> </u>	<u>= 5'</u> . WAII	SAU					0	
PROJEC								, <u></u>			MPLE			TORY TE	
DEPTH IN FEET	SURFACE		TION OF MA	1171.19	)'		-OGIC IGIN	N	WL		TYPE		D	<u>L.L.</u> P.L.	Qu
4	FILL, Sil brown, mo sand, wit <u>surface</u>	ist, a	3" laye	er of sil	lty	FILL		- 11 25		1	SB SB				
	FILL, San white, mo		e graine	ed, brown	nish			- 14		3	SB				
	FILL, Sil moist to	•	d, with	gravel,	brown,			- 13		4	SB	•			
								5	Y	5	SB				
4	SAND, a t fine grai very loos	ned, b				COAF ALLU	SE VIUM	2		6	SB				
1	SAND, wit medium gr dense									7	SB				
								16		8	SB				
26								19		9	SB				
	SAND, fir brown, wa				(SP)			-							
31 <sup>1</sup> 2		END OF	BORING					18		10	SB				
-															
-															
-								-  -							
		WA	TER LEVEL N	AEASUREMEN			•	START	5-	-5-8	8	_ COM	IPLETE		5-88
DATE 5 - 5 5 - 5	$08:07$ $13^{1}2'$ $12'$ $12'$						WATER LEVEL 11 <sup>1</sup> 2' NMR	1	3'2''		0' to 2	t <u>o</u> l	2'	( 	0 <b>9:</b> ]
	_				to			CREW C			Well				

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				L	OG OF T										
JOB NO	o	0-88-064					LE1"				ORING				<u> </u>
PROJE	CT <u>PRU</u>				MENT_PLA	NT_FA	CILITIE	<u>S,WA</u>	USA	1	T				
DEPTH IN			IPTION OF M			GEO	LOGIC			SA	MPLE	L/	ABOHA I	TORY TI	
FEET				1174.8				N	WL	NO.	TYPE	w	D	P.L.	Qu
	FILL, moist, with o	Silty Sa a 3" la rganic d	and, wit ayer of fines at	h gravel silty sa the sur	, brown, nd face	FILI		- 9		1	SB				
2				ned, bro				F							
-			to water							2	SB				
-								15		3	SB				
7			ine grain to water	ned, bro bearing	wnish	•		- 31		4	SB				
-								19		5	SB				
12 <sup>1</sup> /2	ORGANI	C SILT,	black,		OL)	FINE	: IV I UM	2		6	SB				
14 <sup>1</sup> 2				nic fine very loo		COAF	SE IV I UM	- - - - -		7	SB				
-					SM)										
19 <sup>1</sup> /2	SILTY	SAND re		rown, wa	ter-										
-		g, very		-	SM)			- 4 -		8	SB				
25	medium		se grai	el, cobb ned, bro (	- 1			20		9	SB				
29 <sup>1</sup> 2	-			grained,	brown,			- - 18		10	CD				
31½	waterbo	earing, END OF	dense BORING	(	SP)					10	30				
-								-							
-								-							
-								F							
-				<u>    .                                </u>				<u> </u>							- <u></u>
		w	ATER LEVEL	MEASUREME	NTS			START	_5-	4-8	8	СОМ	PLETE		-88_
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	BAILED D	EPTHS	WATER LEVEL	METHOD						<u>@1</u>	9:04
5-4 5-4	18:40 19:04	16' 31 <sup>1</sup> 2'	$14\frac{1}{2}$ ' $14\frac{1}{2}$ '	$\frac{14^{1}2'}{31^{1}2'}$	to 10		None NMR	1	•		0't :029		·*2'		
			·		. <u>10</u> Io			CREW CH	HIEF	И	lelln	er			
			1	P	uun cit		stinc	]							

### corporation

SE-2 (77-8)-5

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	LOG OF	TEST BORING								
JOB NO. PROJEC			$\frac{1}{2} = 5'$					42		
DEPTH	DESCRIPTION OF MATERIAL			1		MPLE		BORA	TORY TI	STS
IN	SURFACE ELEVATION 1170.92'	GEOLOGIC ORIGIN	N			TYPE	w	D	<u>L.L.</u>	Qu
FEET	FILL, Silty Sand, with organic fines				140.	TIFE			P.L.	
1 +	and gravel, brown, moist FILL, Silty Sand, fine grained, gray moist	FILL	- 8		1	SB				
	FILL, Silty Sand, with gravel, brown		F							
_	moist	\$	- 2		2	SB				
41		-	<u>}</u>							
	FILL, Silty Sand, with gravel, organic material, glass, brown, gray		16		3	SB				
	and black, organic odor, moist to									
	waterbearing				4					
-1			- 8		4	SB				
1										1
10 +	SILTY SAND, with organic fines,	COARSE	9	<b>Y</b>	5	SB				
	dark gray, waterbearing, medium	ALLUVIUM	-							
	dense to very loose, layers of sandy		- 3		6	SB				ма
4	organic silt at 9½' to 11' (SM)		$\downarrow$							
	(		- 4		-	<b>CP</b>				
4			- 4		7	SB				
L7 🕂			F							
	SILTY SAND, with gravel, cobbles,		F							
	medium to coarse grained, grayish brown, waterbearing, dense		F							
-	(SM)		22		8	SB				
-			F							
1			Ţ							
]			[							
24 <sup>1</sup> /2	SAND, with gravel at $24\frac{1}{2}$ ' to 26',	-								
	fine to medium grained, brown,		12		9	SB				
	waterbearing, medium dense		-							
-	(SP)		-							
4			$\mathbf{F}$							
4			+							
31½					10	SB				
J1-2	END OF BORING		-							
-			-							
-			F							
-			F							
-			Ē.							
]										
1	WATER LEVEL MEASUREMENTS	······································	START	5-	4-8	8	_ сом	PLETE	5-4-	-88
··········	SAMPLED CASING CAVE-IN	WATER							7	
DATE	TIME DEPTH DEPTH DEPTH BAILED	DEPTHS LEVEL					·			4:2
5-4 5-4		9 <sup>1</sup> ź'						12'		•
<u> </u>		0 NFIK				to				
		io	CREW C	HIEF	W	elln	er		···-	

### - twin city testing corporation

	LOG OF T	TEST BORING								
JOB N			' = 5' ES, W	AUS				43 [N	3	
DEPTH	DESCRIPTION OF MATERIAL		1	1	SA	MPLE	LA	BORA	TORY T	ESTS
IN FEET	SURFACE ELEVATION 1172.54'	GEOLOGIC ORIGIN	N			TYPE		D	<u>L.L.</u>	Q
	FILL, Silty Sand, a little gravel, brown and black to grayish brown, moist, a 5 layer of silty (see #1)	FILL	-		1	SB			P.L.	
2 -	FILL, Silty Sand, a little gravel, brown, moist		- 14		2	SB				
4 <sup>1</sup> /2		+	-	1						
-	FILL, Sand, fine grained, brownish white, moist				3	SB				
71/2	FILL, Sand, fine to medium grained, brownish white to green, moist		- 10		4	SB				
10 <sup>1</sup> 2			┢							
-	SILTY SAND, gray, wet to water- bearing, loose, layers of lean clay with roots	COARSE ALLUVIUM	- 6	<b>V</b>	5	SB				
14 <sup>1</sup> /2	(SM)		- 7		6	SB				
14~2 	SILT, roots, black, soft (ML)	FINE ALLUVIUM	1		7	SB				
17 -	SILTY SAND, with gravel, cobbles, medium to coarse grained, brown	COARSE	+					]		
-	and gray, waterbearing, very dense (SM)		36		8	SB				
-			  -  -							
-			-		9	SB				
26½ - - -	SAND, a little gravel, fine to medium grained, grayish brown,		-							
1	waterbearing, medium dense (SP)		ŀ							
			12		10	SB				I
31½	END OF BORING		÷ }							
-	#l - sand with organic fines at the surface		F							
-			F							
· _										
-			- 							
	WATER LEVEL MEASUREMENTS	1	START	5	 j - 4 -	<u>ll</u> •88	1 СОМІ	PLETE	5-4	-88
· .·	SAMPLED CASING CAVE-IN	WATER							1	
<sub>DATE</sub> 5-4 5-4	TIME         DEPTH         DEPTH         DEPTH         DEPTH         BAILED I $11:23$ $13^{1}2'$ $12'$ $12'$ $12'$ $12'$ $12'$ $12:24$ $31^{1}2'$ $12'$ $31^{1}2'$ $12'$ $12'$ $12'$		METHOD	31/2		ISA 0			<u>1</u> 2	- : 2
<u>, , , , , , , , , , , , , , , , , , , </u>						' to			<u> </u>	
		,   ty tostinc	CREW CI	HEF		Well	ner			

# cwin city testing

JOB NO		AL SCAL	E <u>1"</u>	= 5' S. WA	USA					4	
PROJEC	DESCRIPTION OF MATERIAL				I		MPLE			TORY T	FSTS
IN	1170 20'		LOGIC							L.L.	
FEET	SURFACE ELEVATION	FIL		N	WL	NO.	TYPE	W	D	P.L.	
8"	<pre>FILL, Silty Sand, (see #1) FILL, Silty Sand, with gravel,</pre>		L	6		1	SB				
-	cinders, wood, gray, brown and			-							
4	black, moist			- 4	:	2	SB				
-				-							
-				5		3	SB				
-											
1				İ,							
1				- 6		4	SB				
9 <sup>1</sup> /2	CTITY CAND with excepte fines		DCF	-	<b>.</b>						
	SILTY SAND, with organic fines, a little gravel, black, waterbearing,		RSE UVIUM	[ 4		5	SB				
]	very loose, layers of sandy organic										
	silt at $9\frac{1}{2}$ ' to 11'	l		4		6	SB				
	(SM)			·							
14½	SILTY SAND, with gravel, cobbles,			+ 10		_					
-	medium to coarse grained, gray and			18		7	SB				
-	black, waterbearing, dense (SM)			-							
-				F							
-				$\mathbf{F}$					]		
-				23		8	SB				MA
1				F							
23 -				[							
<sup>23</sup> ]	SAND, a little gravel, fine to										
_	medium grained, brown, waterbearing, dense to medium dense			L							
4	(SP)			19		9	SB				
4				-							
4		   		╞							
				F							
-				13		10	SB				ма
311/2	END OF BORING			F							
]	END OF BORING										
]	<pre>#1 - with organic fines, a little</pre>			[ ·							
_	gravel, gray and black, moist			L							
-				-							
4				-							
-				-							
-				-							
-				-							
	WATER LEVEL MEASUREMENTS			START	<u>5-4</u>	-88	3	_ сом	PLETE	5-4-	88
	SAMPLED CASING CAVE-IN		WATER	METHOD						] <sub>໑1</sub>	<u>6:0</u>
DATE	TIME         DEPTH         DEPTH         DEPTH         DEPTH         BAILED D           15:11         11'         9!2'         9!2'         10'	·	9121			HSA	\ 0'	to	121	J	
5-4	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	1	12'						14		
5-4	16:05 31 <sup>1</sup> 2' 12' 31 <sup>1</sup> 2' to		NMR				<u>to 2</u>				
····				CREW CH	IIEF	We	<u>11ne</u>	<u>r</u>			

cwin city cesting

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	•	LOG OF T	EST BORING								
•	JOB NO		CAL SCALE1"								
-	PROJE	CT PROPOSED WASTE WATER TREATMENT F	LANT FACILIT	IES,	WAU						
	DEPTH IN	DESCRIPTION OF MATERIAL	GEOLOGIC			SA	MPLE	L/	ABORA	TORY TI	ESTS
	FEET	SURFACE ELEVATION1170.65	ORIGIN	N	WL	NO.	TYPE	w	U	P.L.	Qu
	2	FILL, Silty Sand, a little gravel, brown and black, moist, a 2" layer of silty sand with organic (see #1)	FILL	4		1	SB				
	-	FILL, Silty Sand, with gravel, concrete, glass, moist to water- bearing		- 40	v	2	SB				
				14		3	SB				
	, <b>1</b>	SANDY ORGANIC SILT, a little gravel at 12' to 13½', roots, organic odor, black, soft to medium	FINE ALLUVIUM	- 1		4	SB				
	-	(OL)		- 1		5	SB				
	-			- 8		6	SB				
	15 -	SILTY SAND, with organic fines and gravel, gray and black, (see #2)	COARSE ALLUVIUM	4		7	SB				
	17 -	SILTY SAND, with gravel, cobbles, medium to coarse grained, grayish brown, waterbearing, dense		-				- - - -			
	-	(SM)		18		8	SB				
	24 <sup>1</sup> 2	,		-							
		SAND, fine to medium grained, grayish brown, waterbearing, dense to medium dense (SP)		16		9	SB				
	31			13		10					
	-	END OF BORING #1 - fines at the surface #2 - waterbearing, very loose (SM)					NSR				- - -
		<i>"</i>		-							
	-			<u> </u>							<u>.</u>
		WATER LEVEL MEASUREMENTS		START		4-8	38	_ сом	PLETE	5-4	-88
-	D.477	TIME DEPTH DEPTH DEPTH BAILED D	WATER EPTHS LEVEL	METHOD	)					<i>"</i> 1	0:29
╞	DATE 5-4	TIME         DEPTH         DEPTH         DEPTH         BAILED D           09:10         6'         4 <sup>1</sup> / <sub>2</sub> '         4 <sup>1</sup> / <sub>2</sub> '         10				' нс	SA 0'	to	12'	4. <u></u>	
ŀ	5-4	09:41 13 <sup>1</sup> 2' 12' 12' 10	1112'								
-	5-4	<u>10:29 31' 12' 31'</u> to	NMR								
			-u tectine	CREW CI	HIEF	we	: i i u e	r			

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corporation

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	LOG OF T	EST BORING								
JOB NO			= 5'			ORING			·	
PROJE		LANT FACILITI	[ES,_W	AUS						
DEPTH IN	DESCRIPTION OF MATERIAL	GEOLOGIC			SA	MPLE	<u> </u>	ABORA	TORY TI	<u>ests</u> I
FEET	SURFACE ELEVATION	ORIGIN	N	WL	NO.	TYPE	w	D	P.L.	Qu
	FILL, Silty Sand, with gravel, brown and black, moist, a 3" layer of silty sand with organic fines at the surface	FILL	- 10		1	SB				
2	FILL, Silty Sand, with gravel, glass, gray and black, moist to waterbearing		- 31		2	SB				
-			13		3	SB				
-					4	SB				
1				<b>V</b> _		30				
					5	SB NSR				
12	FILL, Silty Sand, a little gravel to with gravel, wood, metal, organic		- 5		6	SB				
-	odor, black, waterbearing		2		7	SB				
17 -	SILTY SAND, with gravel, cobbles, medium to coarse grained, grayish brown, waterbearing, dense (SM)	COARSE ALLUVIUM	- 16		8	SB				
- 24 <sup>1</sup> 2 - -	SAND, with organic silt, a little gravel, gray, waterbearing, medium dense (SP-SM)		9		9	SB				
			- - 11 - -		10	SB NSR				
34 <sup>1</sup> 2	SAND, a little gravel, fine to medium grained, gray, waterbearing, medium dense (SP) END OF BORING	-	- 12		11	SB NSR				
-	END OF DORING									
 	1		<b>F</b>	5 -	3-9		<u> </u>		5-4	-88
	WATER LEVEL MEASUREMENTS		START		5-6			IPLETE	۹	
DATE	TIME         SAMPLED DEPTH         CASING DEPTH         CAVE-IN DEPTH           1.7:50         1.1'         9 <sup>1</sup> / <sub>2</sub> '         9 <sup>1</sup> / <sub>2</sub> '         9 <sup>1</sup> / <sub>2</sub> '		метнор 3 <sup>1</sup> 4	Ч	S۸	0' t	o 12	1.	@	)8 :
5-4 5-4	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	10 <sup>1</sup> 2'	1			o 34				
			CREW CH	IIEF		Well	<u>ner</u>		<u></u>	

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l	LOG OF 1	EST BORING	ì							
JOB N		CAL SCALE	" = 5'		F	BORING	NO	47	,	
PROJE		LANT FACILI	CIES, V	VAUS	AU,	WIS	CONS	IN		•
DEPTH	DESCRIPTION OF MATERIAL	· ···· ····	.	T	SA	MPLE		ABORA	TORY T	ESTS
IN FEET	SURFACE ELEVATION1173.68	GEOLOGIC ORIGIN	1						<u>L.L.</u>	1
	FILL, Silty Sand, with organic	FILL	• N	WL	NO.	TYPE	W	D	P.L.	Qu
-	fines and gravel, brown, moist		10		1	SB				
2 -		ļ								
	FILL, Silty Sand, a little gravel,		- 19		2					
	cinders, brown, moist				2	SB			Í	
4 <sup>1</sup> / <sub>2</sub>		ł	T .							
	FILL, Sand, fine grained, brownish		18		3	SB				
	white, moist		F.							
]			- 35		4	SB				
]			-							
			- 12		5	SB				
		1			1					
12	SAND, a trace of organic material,	COARSE	+							
13 <sup>1</sup> / <sub>2</sub>		ALLUVIUM	- 3		6	SB				
	SILTY SAND, with organic fines,		-							
-	black, waterbearing, very loose,		- ,		_					
1	layers of sandy organic silt at $14\frac{1}{2}$ to 16 feet		4		7	SB				MA
175	(SM)		-							
	SILTY SAND, with gravel, cobbles		-							
-	at 23 to 31 feet, grayish brown,		-							
-	waterbearing, loose to dense		$\left  - \right $	Í						
	(SM)		6		8	SB				
-										
-										
-										
			18		9	SB				
29 <sup>1</sup> 2	SAND, fine to medium grained, brown,									
31 +	waterbearing, dense (SP)		19	1	0	SB				MA
	END OF BORING									
-	<pre>#1 - waterbearing, very loose (SP)</pre>									
	a waterbearing, very foose (Sr)									
	· ·									
_										
'			[							
······		···								
	WATER LEVEL MEASUREMENTS		START _	5-4	-88		COMPL	.ETE	5-4-8	38
DATE	SAMPLED CASING CAVE-IN TIME DEPTH DEPTH RAILED DEF	WATER							""17 <b>:</b>	1.2
5-4			METHOD	•• -		•		, I	(() L / :	+2
5-4	17:42 $31'$ $12'$ $12'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10'$ $10$			HS	<u>a</u> 0	<u>' to</u>	12'			
		<u></u>	DM	<u>12'</u>	to	29 <sup>1</sup> ⁄2	I			
			CREW CHIE	F	W	elln	er			

twin city testing

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FILL, Silty Sand, with organic fines and gravel, brown and black, moist FILL, Sand, fine to medium grained, gray to reddish brown, moist 4 <sup>1</sup> / <sub>2</sub> FILL, Sand, fine grained, brownish		LOG OF	TEST	BORING								
DESCRIPTION OF MATERIAL.     COLORC OPRIGN     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N <t< td=""><td></td><td></td><td></td><td></td><td></td><td>WAII</td><td></td><td></td><td></td><td></td><td>48</td><td></td></t<>						WAII					48	
INDEE     FULL, Sand, with organic fines and gravel, brown and black, moist moist     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N     N <td></td> <td></td> <td></td> <td></td> <td><u></u></td> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>ESTS</td>					<u></u>	1						ESTS
215     fines and gravel, brown and black, gray to reddish brown, moist     11     1     1     1     1     1       41     FILL, Sand, fine to medium grained, white, brown and green, moist     7     3     5     2     53       71     SILTY SAND, with organic fines, roots, black, moist to waterbearing, wery loose     COARSE (SM)     1     5     5     2     53       12     SILTY SAND, a little gravel, gray to brown, waterbearing, nose (SN)     11     6     58       13     SAND, cobbles, fine grained, brown and gray, waterbearing, loose (SP)     7     7     58       194     SAND, with gravel, fine to medium grained, grayish brown, (sce #1)     27     8     58       21     END OF BORING     7     7     53     58       641 - waterbearing, dense     7     7     8     58       947     Start _5-3-88     cowelert 5-3-58     cowelert 5-3-58       947     Start _5-3-78     cowelert 5-3-58     cowelert 5-3-58       947	IN	SURFACE ELEVATION1168.79'			N	WL					<u>L.L.</u>	Qu
etal       gray to reddish brown, moist         PILL, Sand, fine grained, brownish white, brown and green, moist       7         71       3 SB         71       SILTY SAND, with organic fines, roots, black, moist to waterbearing, dense       ALLUVIUM         12       SILTY SAND, a little gravel, gray to brown, waterbearing, dense       11       6 SB         13       SAND, cobbles, fine grained, brown and gray, waterbearing, loss       7       7       7 SB         14       SAND, cobbles, fine grained, brown and gray, waterbearing, loss       7       7 SB       8 SB         14       SAND, with gravel, fine to medium grained, grayish brown, (see #1)       27       8 SB       8         21       END OF BORINC       -       -       -       -         41 - waterbearing, dense       -       -       -       -       -         21       END OF BORINC       -       -       -       -       -       -         41 - waterbearing, dense       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	2 <sup>1</sup> 2	fines and gravel, brown and black, moist FILL, Sand, fine to medium grained,		L	F							
SILTY SAND, with organic fines, roots, black, moist to vaterbearing, very loose (SM) 12 SILTY SAND, a little gravel, gray to brown, waterbearing, medium dense (SM) 13 SAND, cobbles, fine grained, brown and gray, waterbearing, loose (SP) 19 SAND, with gravel, fine to medium grained, grayish brown, (see #1) 21 END OF BORING #1 - waterbearing, dense 41 - waterbearing, dense 5-3 16:10 5-3 16:10 5-3 17:00 21' 12' 21' to Part 5-3 17:00 21' 12' 21' to Part EUNO CICY CESLICO	4 <sup>1</sup> 2	FILL, Sand, fine grained, brownish			- 7		3					МА
12       SILTY SAND, a little gravel, gray to brown, waterbearing, medium dense (SN)       11       6 SB         15       SAND, cobbles, fine grained, brown and gray, waterbearing, loose (SP)       7       7 SB         19 <sup>1</sup> / <sub>2</sub> SAND, with gravel, fine to medium grained, grayish brown, (see #1)       27       8 SB         21       END OF BORING #1 - waterbearing, dense       27       8 SB         #1 - waterbearing, dense       -       -       -                 5-3       16:10       -       -       -       -       -         5-3       16:10       -       -       -       -       -       -         5-3       16:10       -       12'       -       -       NNR       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -	7 <sup>1</sup> 2	roots, black, moist to waterbearing			- 2	V						
SILTY SAND, a little gravel, gray to brown, waterbearing, medium dense (SN)         15       SAND, cobbles, fine grained, brown and gray, waterbearing, loose (SP)       7       7       SB         194:       SAND, with gravel, fine to medium grained, grayish brown, (see #1)       27       8       SB         21       END OF BORINC #1 - waterbearing, dense       -       -       -       -         #1 - waterbearing, dense       -       -       -       -       -         #1 - waterbearing, dense       -       -       -       -       -         -       -       -       -       -       -       -       -         -       END OF BORINC #1 - waterbearing, dense       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <td>12</td> <td>(SM)</td> <td></td>	12	(SM)										
SAND, cobbles, fine grained, brown and gray, waterbearing, loose (SP)       7       7       58         19½       SAND, with gravel, fine to medium grained, grayish brown, (see #1)       27       8       SB         21       END OF BORING #1 - waterbearing, dense       27       8       SB         #1 - waterbearing, dense       -       -       -       -         -       -       -       -       -       -         -       -       -       -       -       -       -         -       -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       - <t< td=""><td>-</td><td>brown, waterbearing, medium dense</td><td>:0</td><td></td><td>- 11</td><td></td><td>6</td><td>SB</td><td></td><td></td><td></td><td></td></t<>	-	brown, waterbearing, medium dense	:0		- 11		6	SB				
SAND, with gravel, fine to medium       27       8       SB         21       END OF BORING       27       8       SB         #1 - waterbearing, dense       -       -       -       -         #1 - waterbearing, dense       -       -       -       -         waterbearing, dense       -       -       -       -       -         -       -       -       -       -       -       -         -       -       -       -       -       -       -       -         -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -       -		and gray, waterbearing, loose			- - -		7	SB				
#1 - waterbearing, dense       #1 - waterbearing, dense         #1 - waterbearing, dense	-	SAND, with gravel, fine to medium grained, grayish brown, (see #1)			27		8	SB				
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	-				-							
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	-				- 							
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	-											
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	-											
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner												
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	-				-							
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner												
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	_											
DATE         TIME         SAMPLED         CASING         CAVE-IN         WATER           5-3         16:10         11'         9½'         9½'         10'         9½'         3½'''         METHOD         3½''' HSA 0' to 12'           5-3         17:00         21'         12'         21'         10         NMR         DM 12' to 19½'         DM 12' to 19½'           10         10         10         10         CREW CHIEF         Wellner	4	WATER LEVEL MEASUREMENTS			START	5	-3-8	38	_ сом	PLETE	5-3-	88
5-3     17:00     21'     12'     21'     10     NMR     DM 12'     10'       to		TIME DEPTH DEPTH DEPTH BAILE		LEVEL		<u>ل</u> ر ال	HSA	0'		:	1	
twincity testing	5-3	17:00 21' 12' 21'	10	NMR		•	-	· · · ·	•••	· ·		
twin city testing												
				estinc	J							•

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	corporation		

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				L	OG OF T									_	
JOB NO	·	0-88-064					LE <u>1"</u>			-	ORING		2	+9	
PROJEC	<u> </u>		STE_WATE		MENT_PLA	NT_FA	CILITY,	WAUS	AU,						
DEPTH IN FEET	SURFA		IPTION OF MA		<u> 30 '</u>			N	WL	<u> </u>	MPLE TYPE		D	TORY <u>TE</u> L.L. P.L.	Qu
			and, wit a 3" la anic fine			FIL	L .	- 15		1	SB				
2+	FILL, cinde:	Silty S	and, wit s, black	h grave	1,			- 10		2	SB				
								2		3	SB				
7 + 9 <sup>1</sup> / <sub>7</sub>	ORGAN soft	IC SILT,	black a		n, (OL)	FIN ALL	E UVIUM	- 2		4	SB				
			ith orga waterbe			COA ALL	RSE UVIUM	- 1	V	5	SB				
13 - 14 <sup>1</sup> / <sub>2</sub> -		with or l, fine	ganic si grained,		(SM) ittle 1)			- 5		6	SB				
	SILTY	SAND, w e graine	ith grav d, grayi dense t	el, med sh brow o very (	ium to n,			20		7	SB				
21								34		8	SB				
		END	OF BORIN	G											
	#1 <del>-</del> c	lark gra	y, water	-	, loose (SP-SM)										i T
								<b>F</b> F							
									- - -				-	•	
								-							
								╞							
		w	ATER LEVEL N	IEASUREME	NTS			START	5	5-3-	88	_ сом	PLETE	5-3	8-88
DATE	TIME	SAMPLED DEPTH 13 <sup>1</sup> 2'	CASING DEPTH 12'	CAVE IN DEPTH 12'	BAILED D	EPTHS	WATER LEVEL	METHOD		ue •	0'_		121	<u>_@15</u>	5:35
5-3 5-3	15:00 15:35	<u> </u>	12 19 <sup>1</sup> _2'	21'	10 		NMR			2'	to 1	9½'	12		
				t		:Y te	estinc		HIEF	We	llne	r			

corporation

.	LOG OF 1	EST BORING								
	8100-88-0640 VERTIL	CAL SCALE1"	= 5'		_ В	ORING			50	
PROJEC		PLANT FACILIT	IES,	WAU						
DEPTH IN	DESCRIPTION OF MATERIAL	GEOLOGIC			SA	MPLE	/	ABORA [	TORY TE	<u>ists</u>
FEET	SURFACE ELEVATION 1170.64	ORIGIN	N	WL	NO.	TYPE	w	D	P.L.	Qu
	FILL, Silty Sand, (see #1) FILL, Silty Sand, (see #2)	FILL	  - 18			on				
	FILL, Sand, fine grained, brownish				1	SB				
- T	white, moist, lenses of gravel and		[ 10			an				
1	cinders at 5½'	r	10		2	SB				
			4		3	SB				
	SILTY SAND, with gravel, dark	COARSE	t,		,					
	brown, moist, very loose	COARDE	4		4	SB				
1012	SAND, fine to medium grained, brown,		7	T	5	SB				
	waterbearing, loose		-							
	(SP)		- 6		6	SB				
						30				
			L			i i				
16 +		+	29		7	SB				
1 4	SAND, with silt and gravel, cobbles,		$\left  \right $							
	nedium to coarse grained, brown, vaterbearing, dense		ŀ							
1912	(SP-SM)		-							
	SAND, with gravel, fine to medium grained, brown, waterbearing, medium		-							
212	grained, brown, waterbearing, medium lense (SP)		11		8	SB				
21-2	END OF BORING		$\mathbf{F}$							
	1 - with organic fines, black, moist		┝							
1	42 - with gravel, brown, moist		-							
-			-							
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1										
			<b>F</b>							
		······	START		5-5	-88_	_ СОМ	PLETE	<u>5-5</u> -	-88
DATE	SAMPLED CASING CAVE-IN TIME DEPTH DEPTH DEPTH BAILED C	WATER LEVEL	METHOD						]	14:50
5-5	$14:30$ $13\frac{1}{2}$ $12$ $12$ $12$			1,11	HSA	0'	to	12'		
5-5	$14:50$ $21\frac{1}{2}$ $12^{1}$ $21\frac{1}{2}$ to	NMD				<u>to l</u>		••	···· .· ···	
5-5	14:50 21 <sup>1</sup> 2' PVC 18' 18' 10					<u>11në</u>				
			CREW CH	IEF	we		L			

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		LOG OF T	EST BORING								
:	JOB NO			= 5'			ORING		51		
			PLANT FACILIT	IES,							
	DEPTH IN		GEOLOGIC				MPLE			TORY TE	
PROJECT DESCRIPTION OF MATERIAL DESCRIPTION OF MATERIAL IN FEET		ORIGIN	N	WL	NO.	TYPE	w	D	P.L.	Qu	
			FILL	- 8		1	SB				
				-							
	_			- 4		2	SB				
	41/2			ŀ							
	-			35		3	SB				
		grained,, gray, moist									
		FILL, Silty Sand, fine grained,	-								
	_	brownish white, wet to waterbearing		- 3		4	SB				
	. 9 <sup>1</sup> <sub>2</sub> ]	SAND with silt and gravel roots	COARSE								
			ALLUVIUM	10	Y.	5	SB				
	12			}				2			
	4			- 9		<sup>.</sup> 6	SB				
	1/1-	(SP)		F							
	1 + 2			4	-	7	SB				
	$16^{\frac{1}{2}}$	<u>(SP-SM)</u>		F.							
	1										
	]										
	21-			25		8	SB				
		END OF BORING		-	ĺ						
	-			F							
	4			} <i>.</i>							
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				$\vdash$							
		WATER LEVEL MEASUREMENTS	L	START	•	5-5	-88	_ сом	PLETE	_5-5	-88
			WATER		· <u>·····</u>				<u>.</u>	] ຼາ	6:20
	 5-5	TIME DEPTH DEPTH DEPTH BAILED D	111	METHOD		н н	SA 0	t o	191/2		
	ر <sub>– ر</sub>				54	11	un U		17.5		
											<u>, ,</u>
					HIEF	W	elln	er			
				-							

### **GENERAL NOTES**

### DRILLING AND SAMPLING SYMBOLS

		•
SYMBOL	DEFINITION	:
HSA	3 1/4" I.D. Hollow Stem Auger	١
FA	4", 6" or 10" Diameter Flight Auger	1
_HA	2", 4" or 6" Hand Auger	1
_DC	2 1/2", 4", 5" or 6" Steel Drive Casing	
RC	Size A, B, or N Rotary Casing	
PD	Pipe Drill or Cleanout Tube	(
CS	Continuous Split Barrel Sampling	
DM ·	Drilling Mud	
jw .	Jetting Water	(
SB	2" O.D. Split Barrel Sample	-
L	2 1/2" or 3 1/2" O.D. SB Liner Sample	(
_T	2" or 3" Thin Walled Tube Sample	-
ЗТР	3" Thin Walled Tube (Pitcher Sampler)	
_TO	2" or 3" Thin Walled Tube (Osterberg Sampler)	1
w	Wash Sample	1
В	Bag Sample	-
P	Test Pit Sample	1
_Q	BQ, NQ, or PQ Wireline System	(
_x	AX, BX, or NX Double Tube Barrel	1
CR	Core Recovery - Percent	1
NSR	No Sample Recovered, classification based on action of	1
	drilling equipment and/or material noted in drilling fluid	1
	or on sampling bit.	ł
NMR	No Measurement Recorded, primarily due to presence	1
	of drilling or coring fluid.	
-		
<b>_</b>	Water Level Symbol	,

#### TEST SYMBOLS

		IESI STMBULS
	SYMBOL	DEFINITION
	w	Water Content - % of Dry Wt ASTM D 2216
	D	Dry Density - Pounds Per Cubic Foot
	LL, PL	Liquid and Plastic Limit - ASTM D 4318
	Additi	onal Insertions in Last Column
	Qu	Unconfined Comp. Strength-psf - ASTM D 2166
	Pq	Penetrometer Reading - Tons/Square Foot
	Ts	Torvane Reading - Tons/Square Foot
	C	Specific Gravity - ASTM D 854
	SL	Shrinkage Limits - ASTM D 427
	oc	Organic Content - Combustion Method
	SP	Swell Pressure - Tons/Square Foot
	PS	Percent Swell
	FS	Free Swell - Percent
	pН	Hydrogen Ion Content, Meter Method
	SC	Sulfate Content - Parts/Million, same as mg/L
	сс	Chloride Content - Parts/Million, same as mg/L
	C•	One Dimensional Consolidation - ASTM D 2435
	Qc*	Triaxial Compression
	D.5.*	Direct Shear - ASTM D 3080
	К*	Coefficient of Permeability - cm/sec
,	D•	Dispersion Test
	DH-	Double Hydrometer - ASTM D 4221
	MA*	Particle Size Analysis - ASTM D 422
	R .	Laboratory Resistivity, in ohm - cm - ASTM G 57
	E•	Pressuremeter Deformation Modulus - TSF
	PM*	Pressuremeter Test
	V5 <b>*</b>	Field Vane Shear - ASTM D 2573
	IR•	Infiltrometer Test - ASTM D 3385
	RQD	Rock Quality Designation - Percent

\* See attached data sheet or graph

#### WATER LEVEL

Water levels shown on the boring logs are the levels measured in the borings at the time and under the conditions indicated. In sand, the indicated levels may be considered reliable ground water levels. In clay soil, it may not be possible to determine the ground water level within the normal time required for test borings, except where lenses or layers of more pervious waterbearing soil are present. Even then, an extended period of time may be necessary to reach equilibrium. Therefore, the position of the water level symbol for cohesive or mixed texture soils may not indicate the true level of the ground water table. Perched water refers to water above an impervious layer, thus impeded in reaching the water table. The available water level information is given at the bottom of the log sheet.

		DESCRIPTIVI	E TERMINOLOGY	Y	•
Very Loose Loose Medium Dense Dense Very Dense	"N" VALUE 0-4 Soft 5-8 Mer 9-15 Rati 16-30 Stiff Over 30 Ver tion: Blows Per Foot of	dium ner Stiff y Stiff	Lamination Layer Lens Varved Dry Moist Wet Waterbearing	1/2" to 6 1/2" to 6 Alternatir grained s Powdery Below sa Saturated	2" thick stratum " thick stratum " discontinous stratum, pocket ng laminations of clay, silt and /or fine and, or colors thereof , no noticeable water turation I, above liquid limit soil below water
RELATIV	E GRAVEL PROPO	RTIONS		REI	ATIVE SIZES
CONDITION Coarse Grained So Fine Grained Soil 15-29% + No. 15-29% + No.	ils A little gravel With gravel s 200 A little gravel	RANGE 2 - 14% 15 - 49% 2 - 7% 8 - 29%	Bou Cob Grav Co Fin Sanc Co	Over 12'' 3'' - 12'' 3/4'' - 3'' #4 - 3/4'' #4 - #10	
30% + No. 200 A little gravel 2 - 14% 30% + No. 200 With gravel 15 - 24%	edium ne & Clay	#10 - #40 #40 - #200 — #200, Based on Plasticity			

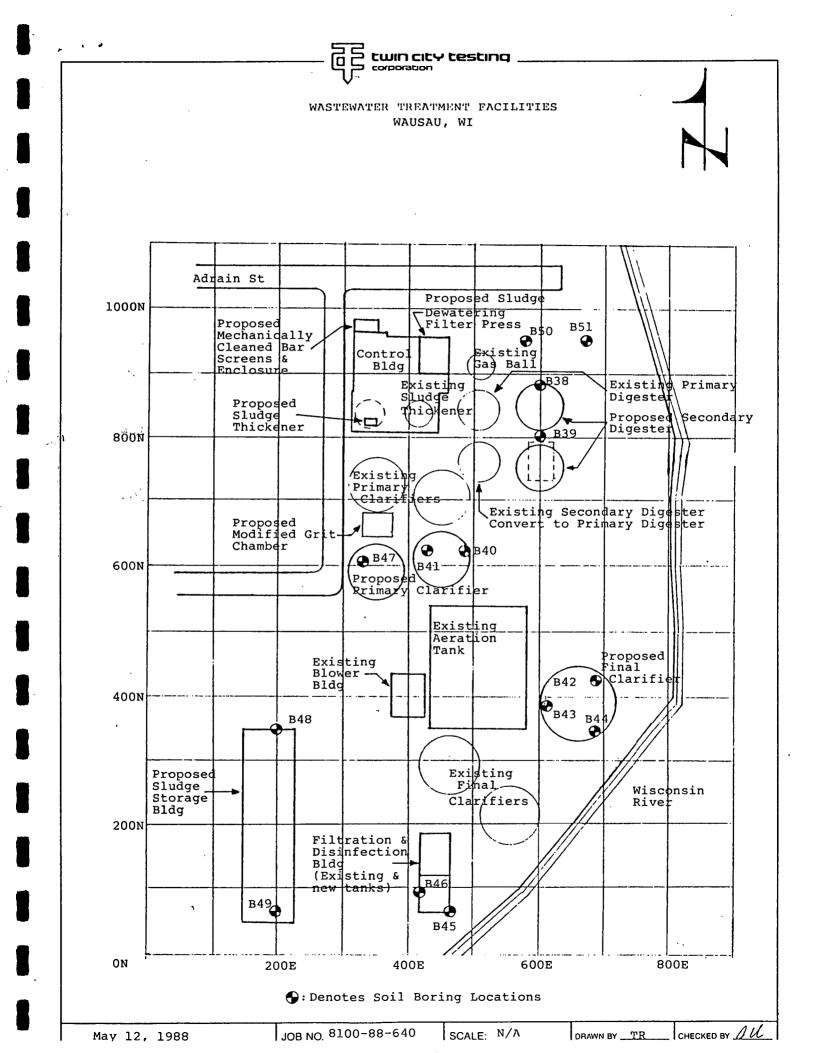
### CLASSIFICATION OF SOILS FOR ENGINEERING PURPOSES ASTM Designation: D 2487 - 83

(Based on Unified Soil Classification System)

	Criteria for Assigning Gr	up Symbols and Group Na	mes Using Laboratory Tests <sup>4</sup>	Soil Classification	
	Criteria for Assigning Gro			Group Symbol	Group Name <sup>8</sup>
Coarse-Grained Soils More than 50% retained on	Gravels More than 50% coarse fraction retained on No. 4 sieve	Clean Gravels Less than 5% fines <sup>C</sup>	Cu≥4 and 1≤Cc≤3 <sup>£</sup>	GW	Well graded grave
No. 200 sieve			Cu<4 and/or 1>Cc>3 <sup>£</sup>	GP	Poorly graded grav
		Gravels with Fines More than 12% fines <sup>C</sup>	Fines classify as ML or MH	GM	Silty gravel <sup>F,G,H</sup>
			Fines classify as CL or CH	GC	Clayey gravel <sup>F.G H</sup>
	Sands 50% or more of coarse fraction passes No. 4 sieve	Clean Sands Less than 5% fines <sup>D</sup>	Cu≥6 and 1≤ Cc≤3 <sup>£</sup>	sw	Well-graded sand
			$Cu < 6$ and/or $1 > Cc > 3^{f}$	SP	Poorly graded san
	1	Sands with Fines More than 12% fines <sup>D</sup>	Fines classify as ML or MH	SM	Sitty sand <sup>G.H.I</sup>
	· · · · · · · · · · · · · · · · · · ·		Fines classify as CL or CH	sc	Clayey sand <sup>G H,I</sup>
Fine-Grained Soils 50% or more passes the No. 200 sieve	Silts and Clays Liquid limit less than 50	inorganic	PI>7 and plots on or above "A" line"	CL	Lean clay <sup>K,L,M</sup>
			PI<4 or plots below "A"	ML	Sitt <sup>K,L,M</sup>
		organic .	Liquid limit - oven dried Liquid limit - not dried	OL	Organic clay <sup>K.L.M.N</sup> Organic silt <sup>K.L.M.D</sup>
	Silts and Clays	inorganic	PI plots on or above "A" line	СН	Fat clay <sup>K,L,M</sup>
	Liquid limit 50 or more		PI plots below "A" line	мн	Elastic sitt <sup>K.L.M</sup>
		organic	Liquid limit - oven dried	Он	Organic clay <sup>K,L,M,P</sup>
			Liquid limit - not dried		Organic silt <sup>K.L.M.O</sup>
ghly organic soils	Brimosilu or	ganic matter, dark in color,		PT	Peat
<sup>B</sup> It field sample contained cobble fith cobbles or boulders, or both" t <sup>C</sup> Gravets with 5 to 12% fines req GW-GM well-graded gravel with GW-GC well-graded gravel with GP-GM poorty graded gravel w <sup>D</sup> Sands with 5 to 12% fines requ DV M	o group name. puire dual symbols: <sup>F</sup> if soil co h silt name. h clay <sup>G</sup> if fines i vith silt SC-SM. rith clay <sup>M</sup> if fines i uire dual symbols: name.	$_{60}^{}$ /D <sub>10</sub> Cc = $\frac{(D_{30})^2}{D_{10} \times D_{60}}$ entains ≥15% sand, add "with s classify as CL-ML, use dual syn are organic, add "with organic f	and" to group or "with gravel," w <sup>1</sup> If soil contains≥ nbol GC-GM, or add "sandy" to to <sup>M</sup> If soil containsi ines" to group gravel, add "grave <sup>N</sup> PI≥4 and plots	thichever is pro 30% plus no. group name. 230% plus No Ily" to group n	200, predominantly sand . 200, predominantly ame.
SW-SM well-graded sand with		ntains≥15% gravel, add *with	gravel" to group OPI=r4 or plots b	elow "A" line.	A" line.
SW-SC well-graded sand with SP-SM poorly graded sand with SP-SC poorly graded sand with -SIEVE ANALY SCREEN-IN S	clay name. h sitt h clay YSIS	ntains≥15% gravel, add 'with 50 For clossification of and fine-groined fract 50 IS.	gravel" to group <sup>O</sup> PI«4 or plots b <sup>P</sup> PI plots on or a <sup>O</sup> PI plots below <sup>1</sup>	elow "A" line. bove "A" line.	A" line.

SE-1 (84-B)

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REI	PORT OF MECH/	NICAL ANALY	515	
PROJECT: WASTEN				
INVOICE NO: 8100-8	38-640			
Boring No.	48	38	42	47
Sample No.	3	6	6	7
Sample Type	SB	SB	SB	SB
Depth (ft)	4½-6	12-13 <sup>1</sup> 2	12-13 <sup>1</sup> 2	14½-16
Unified Soil Classification	SILTY SAND	SILTY SAND	SILTY SAND	SILTY SAND
USCS Symbol	SM	SM	SM	SM
Sieve Size	PERCENT PASSING			
1 <u>5</u> "				
3/8"		100		
#4		100	100	•
#10	100	98	100	100
#40	86	92	76	97
#100	38	26	28	51
#200	18	13	16	29

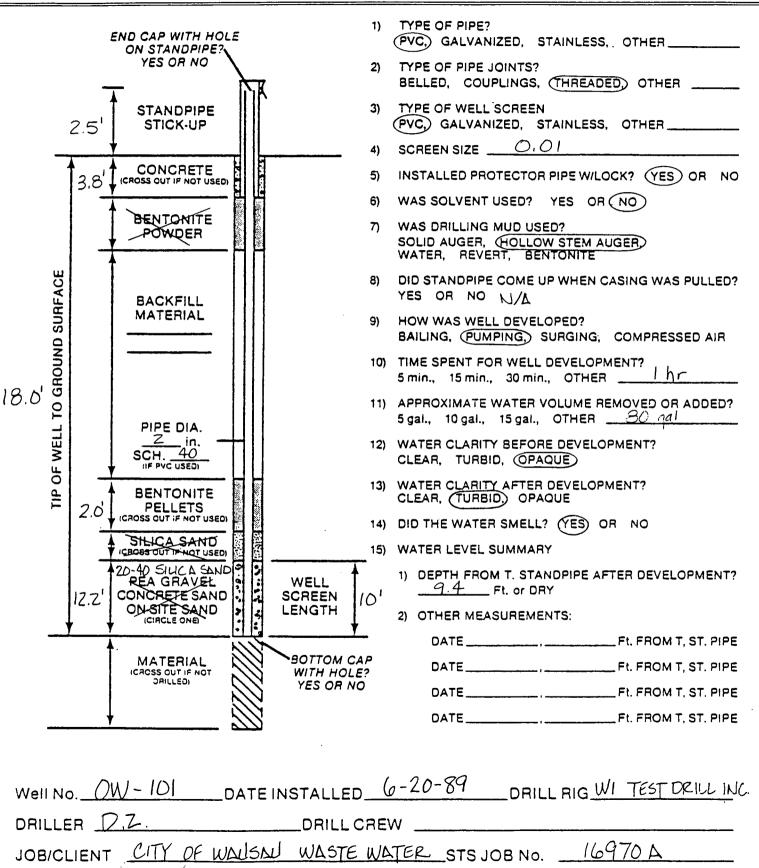
ROJECT: WASTEW	TER TREATMEN	T FACILITIES		
WAUSAU	, WI			
NVOICE NO:8100	)-88-640			<b>.</b>
Boring No.	38	44	44	47
Sample No.	3	8	10	10
Sample Type	SP	SP	SP	SP
Depth (ft)	4 <sup>1</sup> 2-6	19½-21	39 <sup>1</sup> <sub>2</sub> -31 <sup>1</sup> <sub>2</sub>	29 <sup>1</sup> 2-31 <sup>1</sup> 2
Unified Soil Classification	SILTY SAND fine grained	GRAVEL w/ SAND	SAND, Fine to Medium grained	SAND, Fine to Medium grained
USCS Symbol	SM ·	GP	SP	SP
Sieve Size		PERCENT PASS	SING	
		100 81 61 47		
3/8"		42	100	
#4		26	100	
#10	100	14	99	199
#40	83	5	64	64
#100	32	2.3	3	4.7
#200	13	1.9	1.6	2.0

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# Appendix F

						OWNEF						•	BORING	NUME	ER			
	5		<b>,</b>			_	of Wausau					OW-101				<u> </u>		
		onsu	Itan	teli	ы	1		er Treat	ment Plant	Expansion			-Hoppe,	Inc.		•		
	_	LOC	_			1					1	·		T	<u> </u>	T	<u> </u>	<u> </u>
				T	1	Wausau	1, Wiscons	in				TION	SSIVE	%				
				NCE					TOP STAI	STALLATION NOPIPE EL. + <u>11</u>	172.23	STANDARD PENETRATION	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT*)	TENT,	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY. K (CM/SEC)
3	ELEVATION	NO.	TYPE	DISTAI	٩٧	-	DES	SCRIPTION OF	MATERIAL			ARD PE	TINED C	WATER CONTENT,	IT DRY (LBS/F	D/PLAS	CENT P	RMEABII (CM/SI
ОЕРТН	ELEV	SAMPLE NO.	SAMPLE TYPE	SAMPLE	RECOVERY	SUBFACE	ELEVATION	+1169.98	<u></u>	·		STAND	INCONF	WAT	NN	rionii	PER	PER
	_														ļ			<u> </u>
	5					See Log	of Borin	g OW-101A	for soil	description							-	
	0																	
18					,													
						auger	advanced t			ollow stem ed at 18.0 fe	eet							
																		-
								·										
The WL	strati	ficatio	n line	10	neae		nate boundary b	stween soll type		nsition may be gradu			sured at the					sonally.
WL-T	PIPE	ΞT	DA	TE		BCR TIME	WL-T, PIPE	DATE	TIME	BORING STARTED			STS OFFIC		Lambe en Bay			
			-28		-					BORING COMPLET RIG WI Test			DRAWN B				F 1	
										FOREMAN DZ			APP'D. BY	RCK	STS JOB	<b>NO</b> . 16	970A	
BL 598	3																	



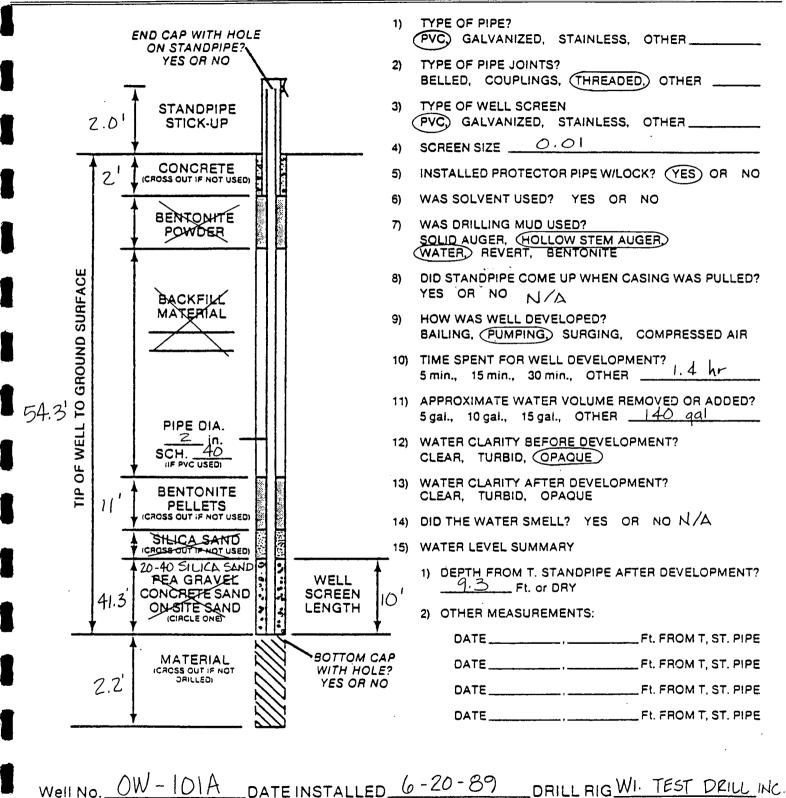


TREATMENT PLANT EXPANSION

C	-				OWNER					LOG	OFB	ORING	NUMB	BER			
	I N					Wausau					-101A						
	<b>_</b>								<b>D</b>		INEER						
STS C					wausau	Wastewate:		ent Plant	Expansion	ве	Cher-Ho	oppe, I	nc.				
SITE				N 	Wausau,	Wisconsi	n				NO	Tr)					
								WELL INS	TALLATION IDPIPE EL. + <u>1171</u>	.94	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, OP (TONS/FT <sup>3</sup> )	NT. %	UNIT DRY WEIGHT (LBS/FT <sup>1</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	X.
~			SAMPLE DISTANCE								PEN6		WATER CONTENT.	N WE	P STIC	PAS	PERMEABILITY.
DEPTH ELEVATION	2 N	SAMPLE TYPE	DIST	≥		DES	CRIPTION OF	FMATERIAL			ARD ST.	TH.	B CC	LBS	LL/PL/	200	MEA
DEPTH	SAMPLE NO.	믭	PE	RECOVERY							AND	ONFI ENG	VATE	INN	OIND	PERC	PER
	SAM	SAN	SAM	L E E E E E	SURFACE	ELEVATION	+1169.89			ן ר	ST	STR			5		
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		1															
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	1	ss									3						
									e of glass '								
10		 	<b> </b>	Ш	fragmen	ts - trace	e of orga	nics - tra	ace of gravel very loose to								
	2	ss			medium		- MOISC	to wet - '	ery roose to		3						
		<u> </u>	1	$\square$													
15																	
	3	ss	Ш	M							17						
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20																	
	4	ss	fπ	Ш					(GP) - trace of								
	4	33	μι	Ħ	SIIC - 1	wet - dens	e - tiil				36						
										╞╌╏┫							
75																	
23			$\mathbf{h}$	Ш													
	5	SS	μ	-							11						
		i														ŀ	
-30			$ _{rr}$	$\left  \right $	<b>-</b>			(85)									
	6	SS		Щ					ace of coarse		15						
					28.0 fe	et, 38.0-4	3.0 feet	) - wet -	medium dense								
	ĺ				to extre	emely dens	se - outw	ash									
35																	
	7	SS	$ \Pi $	Щ							11						
				H.													
-									•								ĺ
40						•											
	8	SS	μų								60						
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45			ľ														
45				+			Conti	nued			·	┝┤					
The strat	lificati	on lin	188 F	prese	nt the approxim BCR	nate boundary be	6-20-8			54(	cated. Wate			sonal			
WL.T. PIP	E	DA	ATE		TIME	WL-T. PIPE	DATE			STS OFFIC	JE .	een Bay					
				Ţ					6-20-8		DRAWN B	TLL Y	SHEET	1 '0	DF 2		
	$\square$			$\rightarrow$				ļ	RIG WI Test Dr	illing	Ľ	APP'O. BY		STS JOE			
						1 1		1	FOREMAN DZ			A. F U. 01	RAM	1 313 308		L6970A	

			OWNER					1			RING N		- F1			
			City of Wau	isau							tinue	1				
<b>)</b>	I		PROJECT N	AME					INEE		- <del>-</del> -					
		مرو	Wausau Wast	tewater Tr	eatment I	Plant Expa	nsion	Be	cher-	нор	pe, Ind		<b>,</b>	<b>r</b>	<b></b>	
TS Consulta														}		
		1.1	Wausau, Wis	sconsin					NO		SIVE	-0		E		
	- 1-	<b>—</b>			V	VELL INSTAL	ATION E EL. + 1171	04	STANDARD PENETRATION	<u>-</u>	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>3</sup> )	r, %	THE	LIQUID/PLASTIC LIMIT	<b>DNI</b>	×.
					1	OP STANDPIP	E EL. + <u>11/1</u>	<u>. 74</u>	NET	1 <u></u>	MO IO	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIC	PERCENT PASSING #200 SIEVE	PERMEABILITY, K (CM/SEC)
		RECOVERY							- H	z	28	CON	S/F	L/P	NT F	EABI M/S
NO O				DESCRIP	TION OF MA	TERIAL			ARD	EST	INE.	ER			ACE! #20	CI RMI
ELEVATION SAMPLE NO.	SAMPLE TYPE	RECOVERY							AND	F	ENG	NAT	N N		PEF	3
ELEVA1 MPLE N	d N	퇴장						-	ST		STR	-		L _		
ताचि≶	A S	8 2	SURFACE ELEV	VATION +11	<u> </u>			┽╌╁╸		+						
	ss	TШ							2	23						
		4-	4											·		
							-							1		
=			Brown fine	to mediu	m sand (S	P) - trac	e of coarse			l						
50	h		sand (43.0	)-48.0 fee . 38 0-43	τ, - τrac Ο feet) -	· wet - me	dium dense		9	95						
10	ss	LS	to extreme	ely dense	- outwash	1								1		
																ļ
===																
55															ļ	
	ss									23			l	.	<u> </u>	<b> </b>
56.5111		ЧË														1
			End of Bon	ring	18.5 feet	t using ha	llow stem		1							
			auger													1
			Boring ad	vanced fro	om 18.5 to	o 56.5 fee	t using	1					1			1
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			2 inch PV	C monitori	ing well	installed	at 54.3 fe	et	1			l		1		
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The stratifier		lines r	epresent the approxin	nate boundary be	tween soll type	s. In situ, the tra	sition may be grad	uel. Water	levels w	ere m	esured at	the times	indicated	Water leve	is may vary	season
WL		1183 (	BCR	<u>, , , , , , , , , , , , , , , , , </u>		9.0' ACR	BORING STARTE	<b>6</b> -	20-89		STS OF	FICE	540 La	mbeau Bay W	Street I 5430	3
WL-T. PIPE	<u> </u>	DATE		WL-T. PIPE	DATE	TIME	BORING COMPL	TED 6-	20-89		<b>}</b>				0F	
	†										DRAW	18Y J	JT SH	EET 2		2
L	+						RIG WI Tes		rrud		APP'D	8Y ,	RAM ST	S JOB NO.	1697	AO
							FOREMAN D									





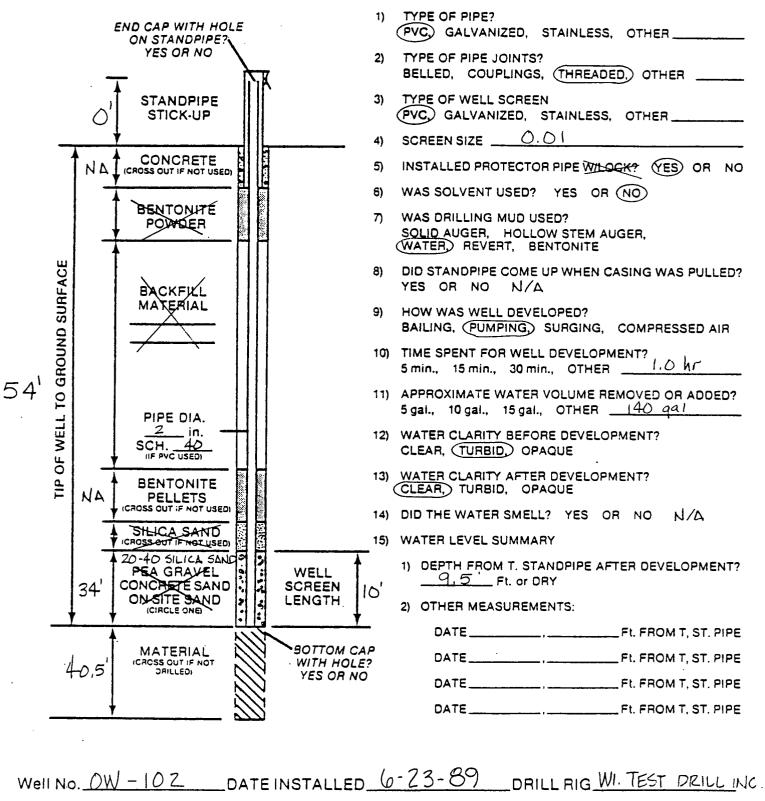
DRILLER <u>DZ</u> JOB/CLIENT <u>CITY OF WAUSAU WASTE WATER</u> STSJOBNO. <u>16970A</u> TREATMENT PLANT EXPANSION

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				╞		Wausau					-102				-		
						T NAME	• Teaster-	n+ 01	Funancion	-	INEER						
STSC			_		wausau	mastewate		ant Fiant	Expansion	Вес	cher-Ho	ppe, I	nc.	T	γ <u> </u>		Т
SITE	LO(		0	l 	Wausau,	Wisconsi	n				NO	SIVE FT <sup>1</sup> )	_		_		
								WELL INS	TALLATION DPIPE EL. + <u>1169.</u>	61	L STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT*)	% -	GHT	LIQUID/PLASTIC LIMIT	ING	
			NCE					TOT STAN		 	B/F	OMP (TO	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )		PERCENT PASSING #200 SIEVE	
N	Ċ	۲ ۲	SAMPLE DISTANCE			DES	CRIPTION OF	MATERIAL			9 0 .	2 d 0.	CON	BS/F	L/P		
DEPTH Elevation	SAMPLE NO.	SAMPLE TYPE	E 01	¥							DAR	GIE	ſER		4/0	#20 #20	
DEPTH ELEVA	MPL	APLI	MPL	RECOVERY							TAN	REN	WA.	5	nor	E	
ਸ਼	SAI	SAI	SAI	Ξľ	SURFACE	ELEVATION	1170.31			] [	S	NN ST					
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					<b>-</b>												
				Щ					nd - trace of		.						
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10			┯┦	┯┥	•												
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-15																	
	3	ss	$\Pi$	Щ	Fill:	Dark grav	silty co	arse sand	and fine .		13						
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-30	_		┯╋				1 (SP) -	moist to v	et - loose to								
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45	+	$\rightarrow$	+	+			Continu				┝─ ─┤						
The strat	ficatio	on line	na ( <del>o</del> g	1058	nt the approxim BCR	nate boundary be			nsition may be gradual. W			ured at the					8.50
WL.T. PIPI	εT	DA	TE	-		WL-T. PIPE	DATE	9.5' ACR	BORING STARTED	6-21-		STS OFFIC	E	) Lambe en Bay			
8.90		5-28		5				11776	BORING COMPLETED	6-21-	89	DRAWN BY		SHEET		DF 3	
	+			+					RIG WI Test Dr.	illing					-	ر 	
						*			FOREMAN DZ			APP'D. BY		STS JOE		L6970A	

	_	7			OWNER	3					LOG	OF	BORING	NUM	BER			=
	۱Ľ				City o	f Wausau					OW-	-102 (	Continue	ed				
	۳.				PROJE	CT NAME					ENG	INEE	R					
STSC		uitan	ts Li	ld.	Wausau	Wastewate	er Treatm	ent Plant	Expans	ion			Hoppe, I	inc.				
SITE	_	_			A							1		<u> </u>	T	T	T	T
					Wausau	, Wisconsi	in					z	30					
			ANCE					WELL IN TOP STA	STALLAT NDPIPE E	ION L. + 1169.	61	STANDARD PENETRATION TFST N / R/FT	UNCONFINED COMPRESSIVE STRENGTH, OP (TONS/F1*)	WATER CONTENT, %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY, K (CM/SEC)
DEPTH ELEVATION	E NO.	E TYPE	E DIST	ERY		DE	SCRIPTION O	F MATERIAL				DARD	FINED GTH. C	TER CO	IT DRY (LBS,	D/PLA	CENT #200	RMEAB (CM/:
DEPTH	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	SURFACE	ELEVATION	1170 31			<u> </u>	-	STAN	JNCON	WAI	n n	LIQUI	PEF	BE
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	9	SS	Ш	LS								. 16						
50	10	SS										8						
55	11	ss		LS								18						
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-60						edium san outwash	d (SP) -	moist to	wet -	loose to								
	12	SS		LS								<sup>·</sup> 18						
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	17	ss	Π	s	of silt	- wet - •	very dens	e - outwa	sh		-	56						
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30		-+	+	╋	•	C	ontinued						┼──┤					
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The strati WL	ificatio	n line	s rep	1636		nate boundary b							sured at the					ionally.
WL-T. PIPE	Ē	DA	TF	Т	BCR	WL-T. PIPE	DATE	9.5' ACR	BORING	STARTED	6-21-8	59	STS OFFIC		) Lambe en Bay			
8.90		-28		+		WCI. PIPE	DAIE	TIME	BORING	COMPLETED	6-22-8	39	DRAWN BI		SHEET			
	-†-			+				<u> </u>	RIG WI	Test Dr	illing				ancel	~ 0	, J 	
								<u>↓</u>	FOREMA	N DZ			APP'D. BY	RCK	STS JOB	NO. 16	970A	
BL: 5-983								<u> </u>										

C			OWNER City of Wausau										DRING		BER			
										0	W-1	02 Co	ntinue	d				
						CT NAME				EN	IGI	NEER						
STSC	onsu	ltan	ts L	td.	Wausau	Wastewate	er Treatm	ent Plant	Expansion	В	lech	er-Ho	ppe, I	nc.				
SITE	LOC	CAT	101	N	tile v e e v	Witcome											1	Τ
		r —	<del></del>	<u> </u>	wausau,	, Wiscons:	1n 					NOI	SIVE (11)					
								WELL IN	STALLATION NDPIPE EL. + 1169.	.61		STANDARD PENETRATION TEST, N (B/FT)	RES:	~ ~	Ŧ	LIQUID/PLASTIC LIMIT	NG	×
			벙					TUP STA	WOFIFE EL. +	<u> </u>		B/F	MPI(TOI	WATER CONTENT,	UNIT DRY WEIGHT (LBŞ/FT <sup>1</sup> )	2	PERCENT PASSING #200 SIEVE	PERMEABILITY, K
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<u>~</u>	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	SURFACE	ELEVATION	1170 21			-		ST/	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>3</sup> )	3			<b>–</b>	-
$\sim$	_	SS	<b>├</b>	$\mathbf{H}$						┿╸┽	-+-			<u> </u>	+		 	<b> </b>
			Ш.	ĽЧ	Light g	gray fine	to coars	e sand (SE	) - trace of dense - outwash			140			1			
					SIIC al	iu graver	- wet -	extremely	dense - outwash	1						•		
					Brown f	fine to co	arse san	dy gravel	(GP) - trace of		-							
-95					silt -	wet - ext	remely d	ense - wea	thered granitic									[
95.5	19	55	ш		bedrock	<u> </u>				+	<u> </u>	00/6"		<u> </u>				
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				9.				ACR						540				sonally.
L-T. PIPE	T	DAT	re	Ť	TIME	WL.T. PIPE	DATE	TIME	BORING STARTED	6-21	-89	s	TS OFFIC	<b>C</b>	) Lambe en Bay			
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	+			+					RIG WI Test Dr FOREMAN DZ		ng		PP'D. BY	RCK	STS JOB	NO. 1	6970A	



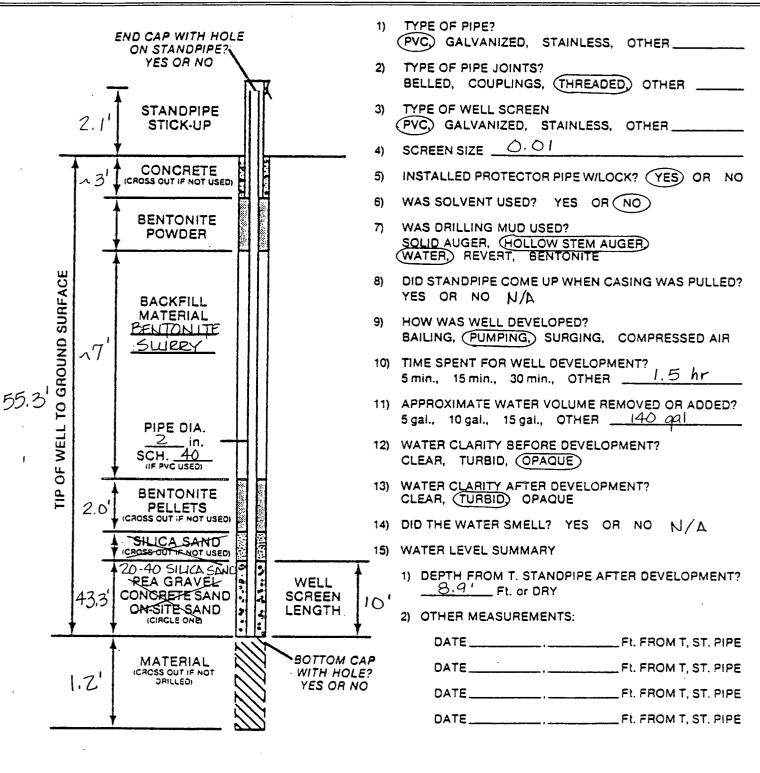


DRILLER D.Z.	DRILLCREW		
JOBICLIENT CITY OF WAUSAU	WASTE WATER	STS JOB No.	16970A
TREATMENT PL	ANT EXPANSION		

City of Kausau     On-103       PROJECT NAME     Bussau Mastewater Treatment Plant Expansion     Edition ER Backer-Hoppe, Inc.       SITE LOCATION     Mussau, Misconsin     Mussau, Misconsin       Will MSTALLATON (VP STANDPFE LL + 1169.92     Misconsin     Misconsin       Will MSTALLATON (VP STANDPFE LL + 1169.92     Misconsin     Misconsin       Will MSTALLATON (VP STANDPFE LL + 1169.92     Misconsin     Misconsin       Misconsin     Misconsin     Misconsin     Misconsin <th></th> <th></th> <th></th> <th></th> <th></th> <th>OWNER</th> <th></th> <th></th> <th></th> <th></th> <th>1</th> <th>GOFI</th> <th>BORING</th> <th>NUM</th> <th>BER</th> <th></th> <th></th> <th></th>						OWNER					1	GOFI	BORING	NUM	BER				
Site construction     Measure Massewarer Treatment Plant Expansion     Bechar-Moppe, Inc.       SITE LOCATION     Measure, Miscowarer Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LoCATION     Measure, Miscowarer Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LoCATION     Measure, Miscoware Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LoCATION     Measure, Miscoware Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LoCATION     Measure, Miscoware Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LoCATION     Measure, Miscoware Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LocATION     Measure, Miscoware Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LocATION     Measure, Miscoware Treatment Plant Expansion     Bechar-Moppe, Inc.       Site LocATION     Site LocATION     Site LocATION       Site LocATION     Site LocATION       Site LocATION     Site LocATION       Site LocATION     Site LocATION       Site LocATION     Site LocATION <th colspan<="" td=""><td>~  </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>·</td><td></td><td>_</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></th>	<td>~  </td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>·</td> <td></td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	~								·		_							
SISE DOCATION       Neusau, Misconsin       Will INSTALLATION TOP STANDME EL.* 1169.92       Will NSTALLATION TOP STANDME EL.* 1169.92         Notes and the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state of the second state second state second state of the										<b>P</b>				_					
Wausau, Misconsin       Will NSTALLATION TOP STANDMPE EL + 1109.92       Will NSTALLATION TOP STANDMPE EL + 1109.92         Will NSTALLATION TOP STANDMPE EL + 1109.92       Will NSTALLATION TOP STANDMPE EL + 1109.92       Will NSTALLATION TOP STANDMPE EL + 1109.92         Will NSTALLATION TOP STANDMPE EL + 1109.92       DESCRIPTION OF MATERIAL       Will NSTALLATION TOP STANDMPE EL + 1109.92         Will NSTALLATION TOP STANDME EL + 1109.92       DESCRIPTION OF MATERIAL       Will NSTALLATION TOP STANDMPE EL + 1109.92         NSTAL STANDMPE EL + 1109.92       DESCRIPTION OF MATERIAL       Will NSTALLATION TOP STANDMPE EL + 1109.92         NSTAL STANDMPE EL + 1000.92       DESCRIPTION OF MATERIAL       Will NSTALLATION TOP STANDMPE EL + 1109.92         NSTAL STANDMPE EL + 1000.92       DESCRIPTION OF MATERIAL       TOP STANDMPE EL + 1000.92         10 STANDMPE EL + 1000.92       PILL STALLATION TOP STANDMPE EL + 1000.92       International Standme EL + 1000.92         11 STANDMPE EL + 1000.92       PILL STALLATION TITL 76       International Standme EL + 1000.92         12 SSTANDMPE EL + 1000.92       PILL STALLATION TITL 76       International Standme EL + 1000.92         13 SSTANDMPE EL + 1000.92       PILL STALLATION TITL 76       International Standme EL + 1000.92         13 STANDMPE EL + 1000.92       PILL STANDMPE EL + 1000.92       International Standme EL + 1000.92         14 SSTANDMPE EL + 1000.92       PILL STANDMPE EL + 1000.92       I						wausau	wastewate	r Treatme	ent Plant	Lxpansion	B	ecner-H	ioppe,	inc.					
Pill: Dark gray silty sand - trace fragments of glass and cinders - moist - very loose       1         1       SS       T         2       SS       T         3       SS       T         3       SS       T         3       SS       T         4       SS       T         3       SS       T         4       SS       T         5       SS       T         5       SS       T         5       SS       T         6       SS       T         7       SS       T         5       SS	ELO	oc	AT	101	4	Wausau	, Wisconsi	n				S	13) 13)						
Pill: Dark gray silty sand - trace fragments of glass and cinders - moist - very loose       1         1       SS       Fill: Black organic silt and sand mixeuse - moist - looge (0.2 feet of peat at 11.3 feet)       4         2       SS       Fill: Dark grayish brown fine to coarse sand - a little gravel - trace of masonry fragments - wet - medium dense       22         20       4       SS       Fill: Grayish brown fine to medium sand - a little gravel - trace of slit - moist to wet - dense       37         2       SS       Fill: Grayish brown fine to medium sand - a little gravel - trace of slit - moist to wet - dense       6         25       SS       Fill: Grayish brown fine to medium sand (SP) - moist to wet - loose to very dense - outwash       7         33       7       SS       Fill: and trace of glass fragments-wet-very dense       7         33       I and trace of glass fragments-wet-very dense       7       13         33       I and trace of glass fragments-wet-very dense       7       13         33       I and trace of glass fragments- wet-very dense       13       13         34       SS       II       13       13         35       SS       II       13       13       13         36       SS       II       II       13       13         37       S				س					WELL INS	STALLATION NOPIPE EL. + 1169.	92	ETRATIC	APRESS ONS/F	NT. %	(		SING	× ×	
Pill: Dark gray silty sand - trace fragments of glass and cinders - moist - very loose       1         1       SS       Fill: Black organic silt and sand mixeuse - moist - looge (0.2 feet of peat at 11.3 feet)       4         2       SS       Fill: Dark grayish brown fine to coarse sand - a little gravel - trace of masonry fragments - wet - medium dense       22         20       4       SS       Fill: Grayish brown fine to medium sand - a little gravel - trace of slit - moist to wet - dense       37         2       SS       Fill: Grayish brown fine to medium sand - a little gravel - trace of slit - moist to wet - dense       6         25       SS       Fill: Grayish brown fine to medium sand (SP) - moist to wet - loose to very dense - outwash       7         33       7       SS       Fill: and trace of glass fragments-wet-very dense       7         33       I and trace of glass fragments-wet-very dense       7       13         33       I and trace of glass fragments-wet-very dense       7       13         33       I and trace of glass fragments- wet-very dense       13       13         34       SS       II       13       13         35       SS       II       13       13       13         36       SS       II       II       13       13         37       S	z		س	TANC								PEN		DNTE	Y WE	ASTIC /PL	PAS	PERMEABILITY,	
Al     Fill: Dark gray silty sand - trace fragments of glass and cinders - moist - very loose     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1	NO ATO	2	TYP	DISI			DES	CRIPTION O	F MATERIAL			ARD	TH.	B C(	T DR (LBS	VPL/	200	MEAL	
Pill: Dark gray silty sand - trace fragments of glass and cinders - moist - very loose       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         1       1       1         2       1       1         2       1       1         2       1       1         2       1       1         2       1       1         3       1       1         2       1       1         3       1       1 <t< td=""><td>PLE   EV</td><td>2</td><td>PLE</td><td>PLE</td><td>OVEF</td><td></td><td></td><td></td><td></td><td></td><td></td><td>AND</td><td>ONF</td><td>VATE</td><td>INN</td><td>ana</td><td>PERC</td><td>L BE</td></t<>	PLE   EV	2	PLE	PLE	OVEF							AND	ONF	VATE	INN	ana	PERC	L BE	
Al     Fill: Dark gray silty sand - trace fragments of glass and cinders - moist - very loose     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1     1     1     1       1	SAM	NAS	SAM	SAM	REC	SURFACE	ELEVATION	1171.76	·····			ST	STR			5			
1       SS       1       SS       1         1       SS       1       1       SS       1         10		$\rightarrow$	-		┝╼┥						++	·					<u> </u>	<u> </u>	
1       SS       1       SS       1         10       SS       Fill:       Black organic silt and sand mixture - moist - loose (0.2 feet of peat at 11.3 feet)       4         10       SS       Fill:       Dark gravish brown fine to coarse sand - a little gravel - trace of masonry fragments - wet - medium dense       22         20       Fill:       Gravish brown fine to medium sand - a little gravel - trace of silt - moist to wet - dense       37         2       SS       Fill:       Gravish brown fine to medium sand - a little gravel - trace of silt - moist to wet - dense       63         30       6       SS       Fill:       Grav medium to coarse sand - trace of glass fragments-wet-very dense       63         30       6       SS       Fill:       Grav medium to coarse sand - trace of glass fragments-wet-very dense       7         30       6       SS       Fill:       Grav medium to coarse sand - trace of glass fragments-wet-very dense       7         32       7       SS       Fill:       Grav medium sand (SP) - moist to wet - loose to very dense - outwash       13         33       22       Continued       12       13       13         33       22       SA       SA       13       13         34       SS       SA       SA       SA	=																		
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300       silt and trace of glass fragments-wet-very dense       63         30       6       ssilt and trace of glass fragments-wet-very dense       7         30       6       ssilt       7         4       Light brown fine to medium sand (SP) - moist to wet - loose to very dense - outwash       13         7       SS       11         30       8       SS         40       8       SS         31       13         32       Continued         Statification lines represent the appointmate boundary batween soil types. In situ, the transition may be graduat. Water levels were measured at the lines indicated. Water levels were measured at the lines indicated. Water levels were measured at the lines indicated. Water levels were measured at the lines indicated. Water levels were measured at the lines indicated. Water levels were measured at the lines indicated. Water levels were graduat. Water levels were measured at the lines indicated. Water levels may very as the state with the state indicated. Water levels were graduat. Water levels were measured at the lines indicated. Water levels may very as the state with the state indicated. Water levels were measured at the lines indicated. Water levels were graduat. Water levels were measured at the lines indicated. Water levels were state with the state indicated water levels may very as the state with the state indicated. Water levels may very as the state with the state indicated. Water levels may very as the state with the state indicated. Water levels may very as the state with the state inding state tevels.         W1.<	<u> </u>	+		$\Pi^{\dagger}$	╓┝		Grav media		rse sand	- trace of	┼╌╋╴		+					-	
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FOREMAN PD APP'D. BY RCK STS JOB NO. 16970A		├-			+		<u> </u>		<u> </u>				APP'D. B	Y RCK	STS JOE	NO. 16	5970A		

				OWNER						OFB			ER			
				City of						-103 Co		đ				
					TNAME	<b>_</b> .				SINEER						
STS Con	_			Wausau	Wastewate	r Treatme	ent Plant	Expansion	Be	cher-Ho	ppe, I	nc.				
SITE LO	DCA.	гю	N													
f=			<b>.</b>	Wausau,	Wisconsi	n 				_ s	SIVE [11]	_		<u>_</u>		
							WELL INS	TALLATION DPIPE EL. + 1169	92	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH. Qp (TONS/FT*)	~	H	LIQUID/PLASTIC LIMIT	ŊĊ	×
		15					TUP STAP	UPIPE EL. + 1103	1	B/F	I OI	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>1</sup> )	10	PERCENT PASSING #200 SIEVE	PERMEABILITY.
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VL·T. PIPE	+			TIME	WL-T, PIPE	DATE	TIME	BORING COMPLETED								
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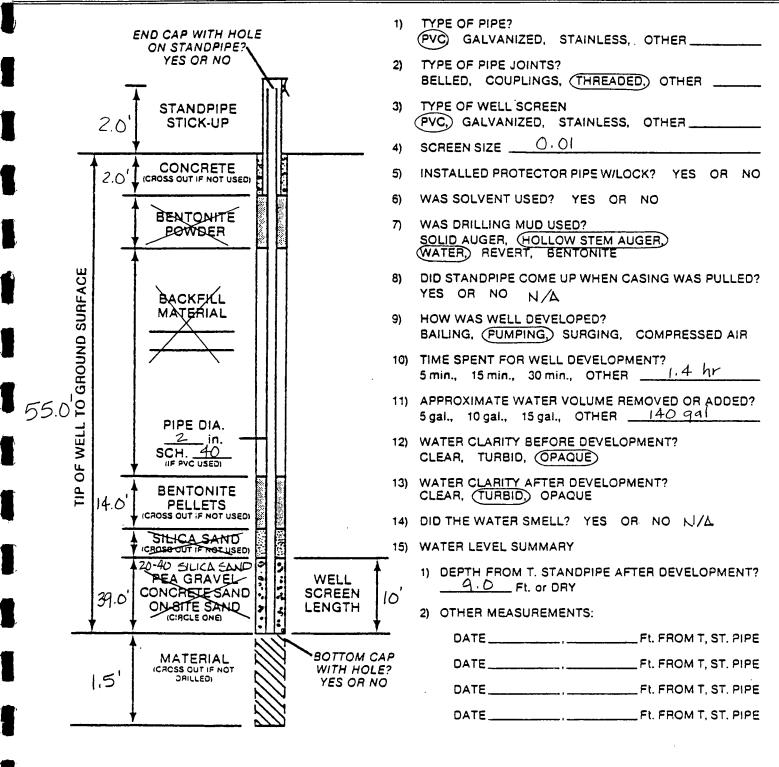


Well NO. <u>OW-103</u> DATE INSTALLED <u>6-21-89</u> DRILL RIG<u>WI. TEST DRILL INC.</u> DRILLER <u>P.D.</u> JOBICLIENT <u>CITY OF WAJGAL WASTE WATER</u> STS JOB NO. <u>16970 A</u> TREATMENT PLANT EXPANSION

C					OWNER	1				L	ŌG	OF B	ORING	NUMB	ER			•
					·	. Wausau			·			104	<u>.</u>					
	<u> </u>				1		r Treatm	ent Plant	Francian			INEER						
STSC					wausau	Mascewale				1	Бес	T	ppe, I	1	T	<u></u>	<u>γ</u>	T
SITE			10r	•	Wausau,	Wisconsi	n					NO	SSIVE (FT1)	%		E		
			NCE					TOP STAN	TALLATION IOPIPE EL. + <u>1171.</u>	41		STANDARD PENETRATION TEȘT, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>3</sup> )	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>1</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY, K (CM/SEC)
TION	NO.	LYPE	SAMPLE DISTANCE	~		DES	CRIPTION O	F MATERIAL				KRD PI ST. N	NED C H. Op	R CON	DRY LBS/J	/PLAS	ENT P 200 Si	AEABI CM/S
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	PLE	RECOVERY								AND	CONFI	NATE	LINU (	0ND	PERC	PERN
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WL-T. PIPI	E	DA	TE		TIME	WL-T. PIPE	DATE	TIME	BORING STARTED BORING COMPLETED		21-8		STS OFFIC		en Bay			
	_			_					RIG WI Test Dr	6-2	_		DRAWN B	' JJT	SHEET	1 0	OF 2	
		<u> </u>		+				<u> </u>	FOREMAN PD				APP'D. BY	RAM	STS JOE	NO. 16	5790A	
L: 5-963					<u> </u>	L	L <u> </u>	.I							1			

C					OWNE	R				<u> </u>	T	.0G	OF B	ORING	NUM	BER			
						of Wausau			_			OW-	104 Co	ntinue	d				
	<u> </u>					CT NAME							INEER						
STS Co			-		Wausau	wastewat	er Treati	ment Plant	Expansio	n		Bec	her-Ho	ppe, I	nc.				
SITE	LOC	CAT	101	N	Wausau	, Wiscons	sin						z	5-					
	-							WELL I	NSTALLATION ANDPIPE EL. +	· 1171	. 41		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>1</sup> )	r, %	H	LIQUID/PLASTIC LIMIT	ŊŊ	×
			SAMPLE DISTANCE										ENET (B/F	0MP (T0	WATER CONTENT,	UNIT DRY WEIGHT (LBS/FT3)		PERCENT PASSING #200 SIEVE	PERMEABILITY, I
ELEVATION	NO.	SAMPLE TYPE	DIST	<sub>&gt;</sub>		D	ESCRIPTION	OF MATERIAL					RD P		co	DRY BS/	PLAS		EABI M/S
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			<del>h.,</del>		JUNFACI	ELEVATION	+1169.5							20					
	9	SS	Ш										32						
50	-				Brown	fine to m	edium san	d (SP) -	trace of c	oarse									
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-55																			
56.51	1	ss		LS								•	33						
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						Boring advanced	to 20.0	feet usin	g hollow s	tom									
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					Boring	advanced	from 20. wash wate:	0 to 56.5	feet usin	g									
					55.0 fe	et of HW	casing u	sed											
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L.T. PIPE	<u> </u>				ВСЯ			ACR	BORING STAR		-21-		1	S OFFICE	540	Lambea	u Stre	et	
L.I. PIPE		DAT	E	╋	TIME	WL-T. PIPE	DATE	TIME	BORING COM	LETED 6	-21-	-89			Gree	en Bay,	WI 54	303	
<u> </u>	<u> </u>			╉					RIG WI Te				마	RAWN BY	JJT	SHEET	2 OF	2	
	-			+			<u> </u>			PD				PP'D. BY	RAM	STS JOB N	0. 167	90A	-
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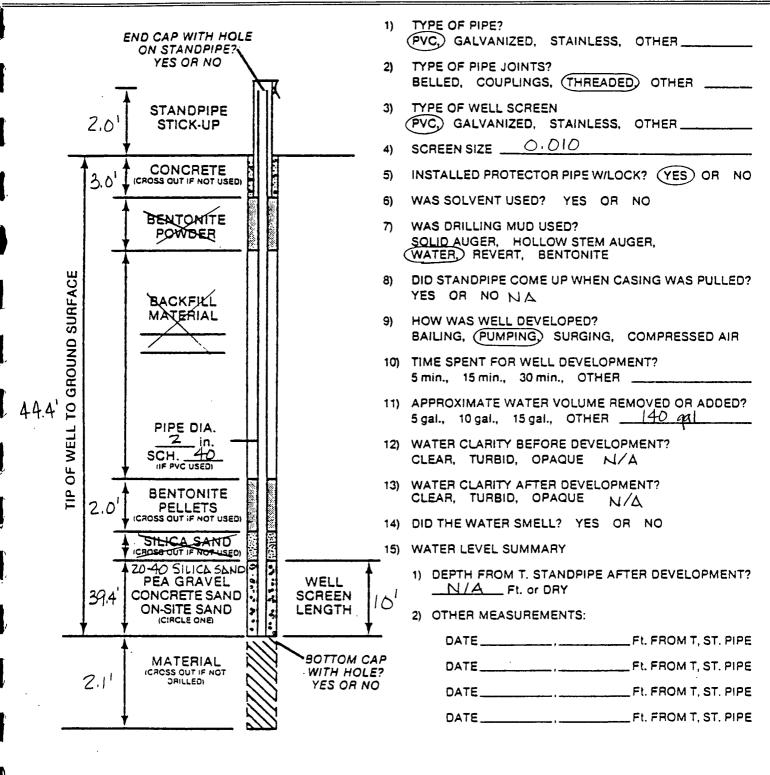


Well NO. <u>OW-104</u> DATE INSTALLED <u>6-22-89</u> DRILL RIG <u>WI TEST DRILL INC</u> DRILLER <u>P.D.</u> JOBICLIENT <u>CITY OF WALLSAL WASTEWATER</u> STS JOB NO. <u>16970 A</u> TREATMENT PLANT EXPANSION

C					OWNER					LOG	OF B	ORING	NUMB	ER			
					City o	f Wausau				+	-105						
			•		PROJEC	T NAME				ENG	INEER						
STSC	onsu	Itan	sLt	d.	Wausau	Wastewate	er Treatm	ent Plant	Expansion	Be	cher-H	oppe,	Inc.				
SITE	LOC	CAT	101	1	Wausau	, Wiscons:	in				z	3 <u>5</u>					
								WELL INS TOP STAN	TALLATION DPIPE EL. + 1172.	53	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT*)	WATER CONTENT, %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	×.
			SAMPLE DISTANCE								I (B)	D COM	NTEI	ME L	PL STIC	PAS	PERMEABILITY.
NO NO	0	γPE	IST/			DES	CRIPTION OF	MATERIAL			8.1		0	BS	LL PLA	128	EAB
DEPTH Elevation	SAMPLE NO.	SAMPLE TYPE	Ē	RECOVERY							TES	NFIN	ATEF	LN _	) din	ERC!	ERV
83	MP	MPI	MP	00					· · ·	<b>,</b> Í	STA	NCO TRE	Š		Ē	ā	1
$\boxtimes$	S	Š	ŝ	æ		ELEVATION						30					
					0.1' as	phalt - 0.	.1-0.2' g	ravelly ba	ise course					[			
					Fill: N	White fine	sand - I	moist - lo	ose								
																	[
	1	ss	$\prod$	$\square$							4						
				щ													
						· · · · · · · · · ·											
10					Densible	- <b>5411</b> 5 - 5			ne to medium.								
			Π	П		wet - loos		n slity li	ne to medium								
	2	SS	Ш	Щ						,	3						
											ļ	 					
15			Ш	Щ				(SP) - a - outwash	little coarse								
	3	SS	Щ	Щ	Sana	wet medi	Lum dense	Outwasi	L		10						
				$\mathbf{T}$			-		GP) - trace of								
	4	SS			silt - v	wet - medi	um dense	- till			19						
25			-	_				nd (SP) - - outwash	trace of fine								
	5	ss		щ	Sund	wee mear	ucinse	oucrasi	•		14						
										2							
				-													
30																	
	6	ss	$\prod$	$\prod$						1	4						
	_		Щ	7	Brown f	ine to med	lium sand	(SP) - 2	little coarse								
					sand (28	8.0-43.0 f		et - mediu									
35					outwash									4			
	7		$\Pi^{\dagger}$	Щ													
	-	SS	Щ	Щ.							21						
40			π	Щ													
	8	SS	Щ	Щ							22					•	
					•												
																	·
45																	
							Continue	ed	<u> </u>		·						L
	tificati	on lin	es re	pres		mate boundary be	etween soll type		nsition may be gradual. W	ater levels	were meas	ured at the		Lambe			asona
WL DID					BCR			ACR	BORING STARTED	6-23-	89	STS OFFIC		en Bay			
WL-T. PIP		04	TE	-	TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED	6-23-	89	DRAWN B		SHEET			
				L		1	ļ	<u> </u>	RIG WI Test Dr:	illing		OLIVIAL D	۲ JJT	I STREET	T .	2	
	+			Т					ANG WI TESC DI					<u>+</u>	<u> </u>		

C				Ţ	OWNER						OF BC			ER			
				Ļ	City of				· · · · · · · · · · · · · · · · · · ·		-105 C	ontinue	ed				
					PROJECT		_				INEER		• • •				
STSC	nsul	tants	s Lto	I.	Wausau W	Vastewater	Treatmen	it Plant I	xpansion	Бе	cher-H	oppe, . I	lnc.	<u> </u>	<u> </u>	T	<del></del>
SITE	LOC	ATI	ON		Ma	Wiccorti					_	μ_		1			
					Wausau,	Wisconsin					LION	SSIV	8	1.	1		
								WELL INST TOP STAND	ALLATION PIPE EL. + <u>1172.</u>	53_	STANDARD PENETRATION TEST. N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>1</sup> )	4.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	×.
			핑								(B/	WOC C	WATER CONTENT,	ET3	STIC	PAS	PERMEABILITY. I
N		ж	STAN			DESC	RIPTION OF M	IATERIAL			G N .		Ö	BS/	LL/	LN0	EB
H (AT	2	ž	ă	₹							TES	4FIN 1GTH	TER		ÌÌ	#2	ERM
DEPTH Elevation	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY							STAN	LEG	Ň			a	<u>م</u>
	SAA	SAA	SAN	۳Ļ		EVATION +11						N S					
	9	ss	$\Pi^{\dagger}$	$\Pi^{\dagger}$	Brown fin	ne to medi	um sand	(SP)-a lit	tle coarse		33						
46_5		33	Щ	4	sand (28.	.0-43.0 fe	et)-wet-r	nedium dei	ise-outwash							<u> </u>	
					End of Bo	oring											
						dvanced to water .	9 46.5 fee	et using 1	coller bit								
					45.0 feet	t of HW ca	sing used	i									
					2 inch P	VC monitor	ing well	installe	at 44.4 feet								
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								In also the i	naition may be gradual. V	Vater Imer	a were mer	Bured at th	e times inc	dicated. W	ater levels	may vary se	eason
WL	atificat	tion III	188 (	pres	ent the approxim BCR	nate poundary be	tween soil type	L in situ, the tra ACR	BORING STARTED				54	O Lamb			
WL-T, PI			ATE		TIME	WL-T. PIPE	DATE	TIME		6-23-	-	STS OFF	ICE	een Ba			
<b></b>	+								BORING COMPLETED			DRAWN	вү ЈЈТ	SHEET	2	OF 2	2
<b></b>									RIG WI Test Dr	illing	g	40010	v				
	•								FOREMAN PD			APP'D. E	iy ram	4 1 STS J(	DB NO.	169707	۹.

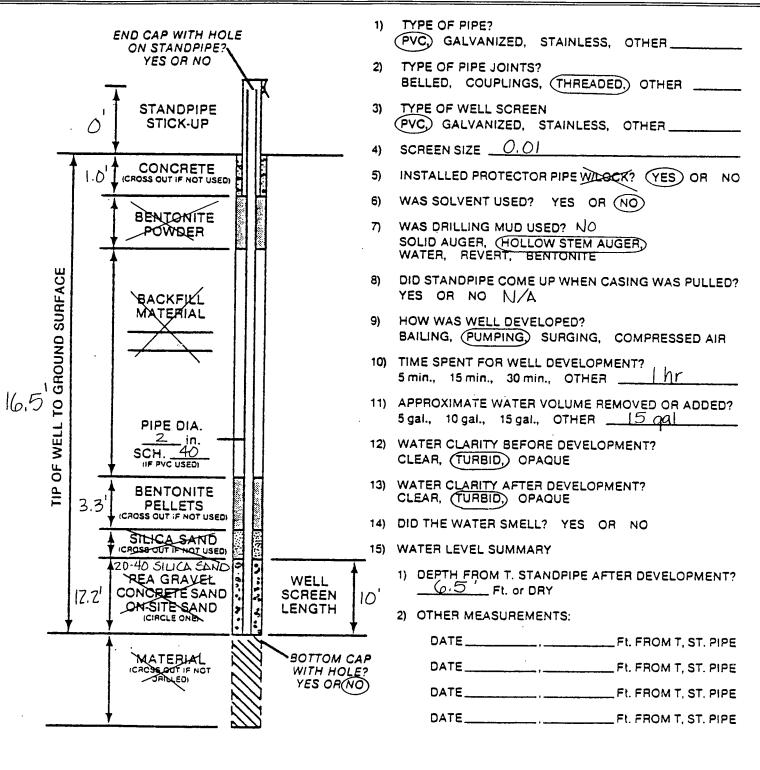




Well NO. <u>OW-105</u> DATE INSTALLED <u>6-23-89</u> DRILL RIG <u>WI. TEST DRILL</u> INC. DRILLER <u>P.D.</u> JOB/CLIENT <u>CITY OF WALSAU WASTE WATER</u> STS JOB NO. <u>16970 A</u> TREATMENT PLANT EXPANSION

	OWNER	LOG	OF B	ORING	NUMB	ER			
	City of Wausau	OW	-106			_			
	PROJECT NAME	ENG	INEER						·
STS Consultants Ltd.	Wausau Wastewater Treatment Plant Expansion	Bee	cher-Ho	oppe, 1	inc.				
SITE LOCATION	Wausau, Wisconsin		z	<u>ت</u> لا					
	WELL INSTALLATION	42	STANDARD PENETRATION TEST. N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>3</sup> )	%	F	IMIT	9	×
5	TOP STANDPIPE EL. + 1166	.43	NETF (B/F	TON TON	WATER CONTENT.	UNIT ORY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY. (CM/SEC)
DEPTH ELEVATION SAMPLE NO. SAMPLE TYPE SAMPLE DISTANCE RECOVERY	DESCRIPTION OF MATERIAL		N.	29	NOS	RY V S/F	L/PI		ABIL
DEPTH ELEVATION SAMPLE NO. SAMPLE TYPE SAMPLE DISTA RECOVERY			DARI	STH.	ER		D/PI ۲	CEN #20	RME (CV
DEPTH ELEVA MPLE N MPLE T MPLE T COVERY			ANI	ENCON E	WAT	N N	IND	PER	E
DEPTH ELEVATI SAMPLE NC SAMPLE TY SAMPLE DI RECOVERY	SURFACE ELEVATION		S	STE					
	\0.1' asphalt - 0.1' gravelly base course	7===							
1 <u>ss</u> ]]]]		/   🛔	34						
2 SS	Fill: White fine sand - moist - loose to dense	1	9						
3 SS			12						
3A 55	Possible fill: Brown fine to medium sand, trace								
4 SS 11			4						
4 33	Grayish black organic silt (OL) - trace of fine		4						
	to coarse sand, trace of gravel - wet - loose								
5 SS			31						
	Brown fine to coarse sandy gravel (GP) - trace o silt - wet - dense - till	f							
6 SS 11			56						
15									
16.5 7 SS			40						
	End of Boring								
	Boring advanced to 16.5 feet using hollow stem								
	auger 2 inch PVC monitoring well installed at 16.5 fee	E	· .						
	· ·								
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		]							
The stratification lines report	ent the approximate boundary between soil types. In situ, the transition may be gradual.	Water levela	were meas	ured at the	times indi	cated. Wate	r leveis ma	у улу зеа	sonally
the strathballoff hilds reproc	BCR 6.3' ACR BORING STARTED	6-22-8	19	STS OFFIC	540	Lambea	au Stro	eet	
WL	Boning Stantes		1		Gre	en Bav	, WI 5-	4303	
	TIME WLT. PIPE DATE TIME BORING COMPLETEI	6-22-8	39			<u>-</u>			
WL	TIME WL-T. PIPE DATE TIME BORING COMPLETE			DRAWN B		SHEET		DF 1	
WL				DRAWN B	r JJT		1 0		



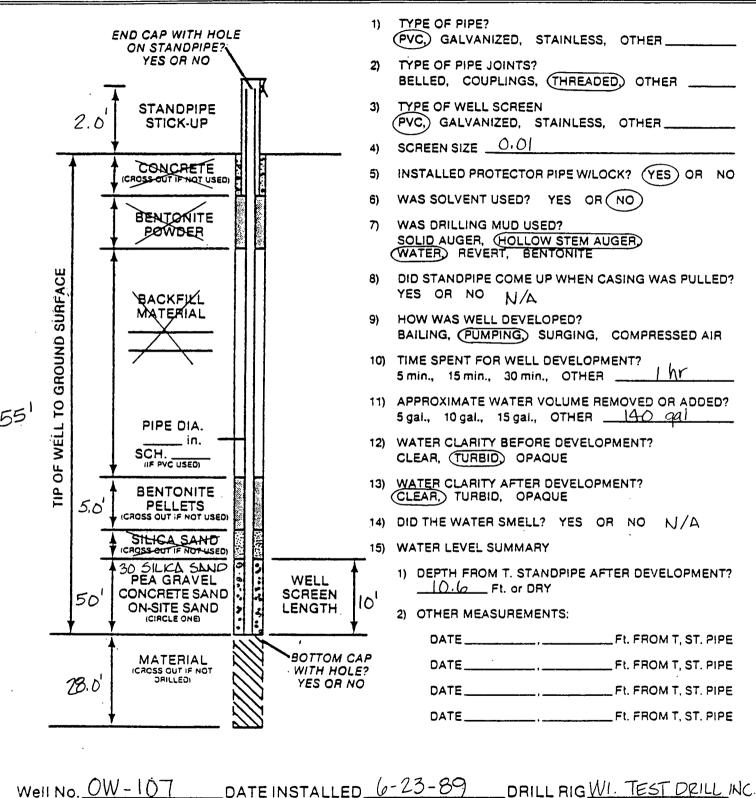


Well NO. <u>OW-106</u> DATE INSTALLED <u>6-22-89</u> DRILL RIG<u>WI. TEST DRILL INC.</u> DRILLER <u>P.D.</u> DRILL CREW \_\_\_\_\_\_ JOB/CLIENT <u>CITY OF WAUSAU WASTE WATER</u> STS JOB NO. <u>16970 A</u> TREATMENT PLANT EXPANSION

					OWNE	: <b>H</b> of Wausau					OG ( ow-1		DRING	NUMI	BER			
		<b>*</b>								╞		IEER				<u> </u>	<u> </u>	
STSC	onsu	ltan	tsii	d.			ter Treat	ment Plan	t Expansion				oppe,	Inc.				
SITE					Waiter	u, Wiscon	sin								Ţ	<u> </u>	1	Т
		Γ	Г		mausa			WELL	STALLATION			STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT2)	%		AIT AIT		
			ш					TOP ST	NOPIPE EL. + 1169	. 40		IETRA 3/FT)	MPRE		UNIT DRY WEIGHT (LBS/FT3)	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	
R		۳	SAMPLE DISTANCE			<b>n</b> t	SCRIPTION /	OF MATERIAL				N (E	0 CO	WATER CONTENT.	IV WI	ASTII /PL	r PAS SIEV	
DEPTH ELEVATION	E NO	Σ	ы В	Ϋ́								DARD EST,	INE.	EBC	LB: (LB:		CEN1	
DEPTH Elevai	SAMPLE NO.	MPL	MPL	S						ĺ			RENC	WAT	NN	Ing	PER	
$\mathbf{X}$	SA	SA	SA	ä		E ELEVATION	1167.4	0				S	UN					
					\2" top	soil				T					1			ŧ
					Possib	le fill:	White to	light bro	own fine to									
					medium	sand - di	ry - medi	um dense										
	1	SS	$\mathbf{H}$	т										l .				l
	-		Ш									16						
10					Fill:	Brown fir	ne to med	ium sand (	SP) a little									
	2	ss	$\Pi^{\dagger}$	Щ	gravel	- trace o	of silt -	wet - med	lium dense									
	-	55	-11	4								23						
	$\dashv$	-	$\rightarrow$	+			-											L
-15-					Fill:	White bro	wn and bl	lack mottl	ed fine to									
	3	ss	$\prod$	$\Pi$	medium fragme	sañd (SP nts - wet	) a littl - verv d	e gravel – ense	<ul> <li>trace of bric</li> </ul>	d .		20						ĺ
			·		j		icry d			7 - E.								
	$\neg$			+														┝
-20	4		┯╂	$\Pi$	Brown	fine to co	arse sand	d (SP) - t	race of			·						
	-	ss	Щ	Щ	gravel	- wet - d	lense - ou	utwash	. •			37						
	_																	
														-				
25-	5	ss	Пþ	푀						1		10						
		-	Щ.	-						•		-						
				·														
30-																		
	6	ss	I	.s	Brown m	nedium san	d (SP) -	trace of	coarse sand			12						
	_	7	+	1		43.0 feet) – wet – me			(38.0-43.0 sh							j		
					·	•												
35	_		+	$\mathbf{H}$														
	7	ss	ЦĽ							5 1 5		23						
										3-						.		
										1								
<u>40</u>	8	ss	$\frac{1}{1}$	Ц						с. 6								
			4	-								24					•	
		+		+	Brown	adjum	d (cp)	+*	fine eral									
45-						nedium san nedium den		LIACE OI	fine sand -							T	T	
			T	1		·	Conti	nued				-+	+		<del> </del> -			
The stratifi	cation	lines	repr	1 8500	t the approxi	mate boundary b	etween soil typ	es. In situ, the tr	nsition may be gradual. We	tor leve	els were	measure	ed at the ti	Imes indic	ated. Water	r levels may	y vary seas	301
VL				-	BCR	ļ	<del></del>	10.7' ACR		6-23-			S OFFICE	540	) Lambe en Bay	au Str	eet	
HEIL PIPE	+	DAT	E	╉	TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED	6-23-	-89		RAWN BY	T	еп вау SHEET		4303 F 2	
						1		<u> </u>	RIG WI Test D	rill:	ing				JHEEI	- 0		
	1			T		T	· ·	T	FOREMAN MM			A	PP'D. BY	RAM	STS JOB	NO. 16	970A	

C					OWNER					LOG	OF BO	ORING	NUMB	ER	<u> </u>	<u></u>	
	1				City o	of Wausau				OW	-107 C	ontinu	ed				
P		) '				T NAME	_			ENG	INEER						
STSC	nsu	iltani	is Lt	d.	Wausau	Wastewate	er Treatm	ment Plant	Expansion	Be	cher-H	oppe,	Inc.				
SITE				_	Wausau	, Wisconsi	in				z	3 2 13					
								WELL INS	TALLATION DPIPE EL. +1169.	40	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT*)	WATER CONTENT, %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	х.
_			SAMPLE DISTANCE								PEN N (B	No d	ONTE	IN I	PL N	PAS	PERMEABILITY.
DEPTH ELEVATION	ġ	SAMPLE TYPE	ISI			DES	CRIPTION O	F MATERIAL			a s	문 문	L CC	LBS	L'PL	200 ENT	AEA
DEPTH Eleval	SAMPLE NO.	E -	5	RECOVERY							NDA	E S S	ATE	IN O	- an	EBC	EBN
E E	AMP	MP	M	Ś.			<u></u>			- Í	STA	Laco Laco	Š		2	٩	
$\mathbf{X}$	Š	ŝ	ŝ	æ	SURFACE	ELEVATION	1167.40					n n					
	9	ss		Ш							29						
		<u> </u>															
											1						
50	~	<b> </b>		$\mathbf{T}$													
	10	ss		<u> </u>					ine sand -		23						
					wet - me	edium dens	e outwasi	r									
-55																	
			Πİ														
	τı	SS	Щ	LS							10						
										1							
-60																	
	12	ss		Ls							18						
				-							10						
				_										<b> </b>			
					Gray si	lty clay (	CL) - tr	ace of fir	e sand -		. 1						
- 65			╖┤	П		ard - till					· ·					[	
	13	SS									55						
			1	٦													
		_	-+	+							├						
70					Grayish	brown fin	e to coa	rse sandy	silty								
			πt	Щ	gravel (	(GM) - wet	- extre	mely dense	- till						1		
	14	SS	Щ	_							103						
75																	
	15	ss	Π	Ш							99						
			Чſ	$\neg$					(SP-SM) -								
					a little	e gravel -	extreme	iy dense -	. 2111								
80			$\frac{1}{1}$												ļ		
	16	ss	Ш								108						
		T	T	Ī													
83 5								•									
					End of T	Pori					II					Ī	
					End of H Boring a		o 20.0 f	eet using	hollow stem						1		
		ļ			auger	•		-									
						advanced f			eet using			ſ					
					roller h	bit and wa	sh water	•								1	
The strat	ificati	on line		( prese	nt the approxin	mate boundary be	tween soll typ	es. In situ, the tra	nsition may be gradual. W	ater levels	were measu	ured at the	times indi	cated. Wate	ar levels ma	iy vary sea	sonal
/L					BCR	, <u>~</u>		10.7' ACR	BORING STARTED	6-23-1			540	) Lambe			
VL.T. PIP	εŢ	DA	TE	Т	TIME	WL-T. PIPE	DATE	TIME				STS OFFIC	JE .	en Bay			
	-+			1		<u> </u>		1	BORING COMPLETED	6-23-	89	DRAWN B	¥ ၂.፲፹	SHEET	2 0	<sup>DF</sup> 2	
															-	-	
									RIG WI Test Dr	illing		APP'D. BY		STS JOE			

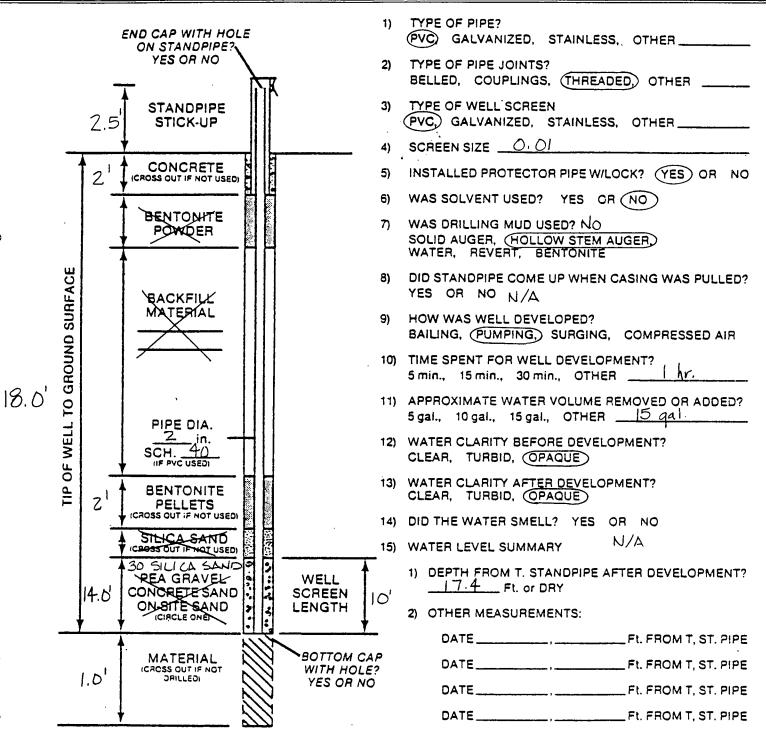




DRILLER D.Z.	DRILL CREW	•	, 	
	WALLSAU WASTE WATER	STS JOB No.	169704	
TREATME	ENT PLANT			

	77				OWNER	3		<u> </u>		LC	G OF	BORIN	O NUME	BER			
	I K				City o	f Wausau					OW-108						
	▲					CT NAME	_				GINE						
STSC					Wausau	Wastewat	er Treatm	ent Plant	Expansion		Becher	-Hoppe,	Inc.	·	·		
SITE	LO:			•	Wausau	, Wiscons	in		<u> </u>		N						
			ANCE					WELL IN TOP STAI	STALLATION NDPIPE EL. + <u>1171.</u>	<u>68</u>	STANDARD PENETRATION	IESI, N (B/FI) UNCONFINED COMPRESSIVE STRENGTH, QD (TONS/FT?)	NTENT, %	WEIGHT FT3)	LIQUID/PLASTIC LIMIT LL/PL	PASSING	PERMEABILITY, K (CM/SEC)
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	PLE DIST	DVERY		DES	SCRIPTION OF	F MATERIAL			ANDARD	DNFINED SNFINED ENGTH, Q	WATER CONTENT	UNIT DRY WEIGHT (LBS/FT)		PERCENT PASSING #200 SIEVE	PERMEAB (CM/S
	SAM	SAM	SAM	RECC	SURFACE	ELEVATION	+1169.82		··· ··· · · · · · · · · · · · · · · ·		ST	UNCC	5				
	1				Topsoil					$\vdash$	_						·
	1	SS		<u> </u>	glass,	trace of v			silt - trace of vel (4.5-7.0			2					
	2	ss	$\Pi$	Π	feet) -	•					:	3					
	3	ss	Π	Π	trace o	Black fine f gravel, um odor	e to coar trace of	se sandy glass fr	silty clay - agments -			3					
10-	4	ss	Π	Π	Fill: I trace o	Mottled bind f silt, to	race of g		e to coarse sand ace of rubber	,		,					
	5	ss		Ш	Fill: 1 of organ		e to coar		gravel - trace nts - wet -			,					
15	6	SS		П	_loose Fill: 1	Mottled b	lack and	brown sil	ty gravelly		10	)					
19						a little o fragments			f metal and nse	<b>BERTELMITHEARE</b>							
					End of Boring		to 19.0 f	eet using	hollow stem								
					auger 2 inch 1	PVC monito	oring wel	l install	ed at 18.0 feet								
	·																
										•							
									·							·	
The strat WL	lficati	on line	s rep	01880	ent the approxim BCR	mate boundary b	etween soil type	8.5' ACR	insition may be gradual. Wa	iter leve		asured at th					sonaliy.
WL-T. PIP	E	DA	TE	Т	TIME	WL-T. PIPE	DATE	TIME				STS OFF	ICE 540	0 Lambe	au str	eet	
					·······				BORING COMPLETED 6 RIG WI Test Dri			DRAWN		SHEET	-	OF 1	
BL: 5-963									FOREMAN MK		·	APP'D. E	IY RAM	STS JOB	NO.	16970A	





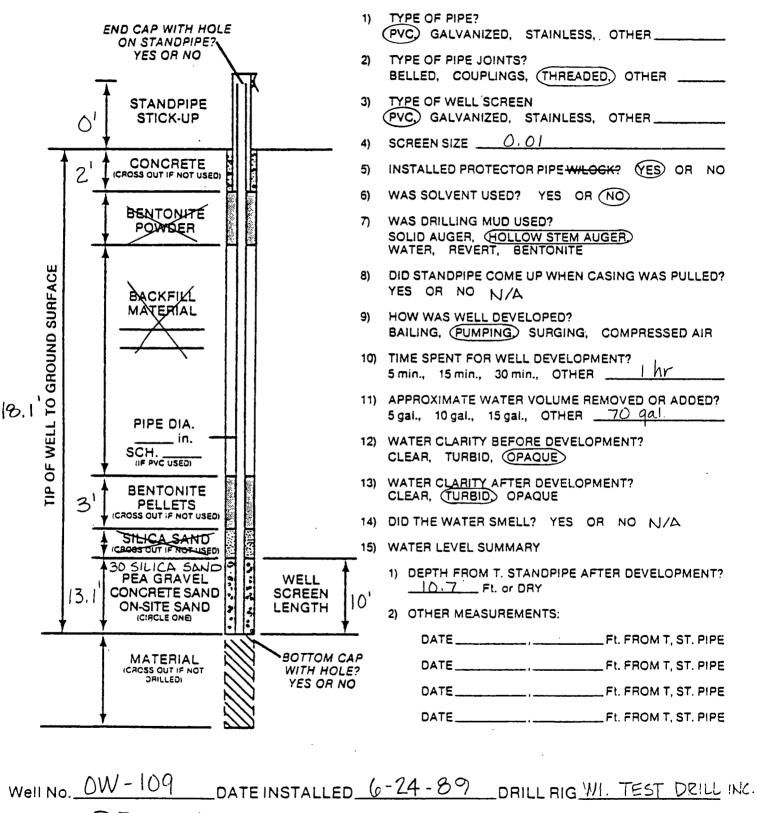
Well NO. <u>OW-108</u> DATE INSTALLED <u>6-24-89</u> DRILL RIG<u>WI. TEST DRILL</u>INK. DRILLER <u>D.Z.</u> DRILLCREW \_\_\_\_\_\_ JOB/CLIENT <u>CITY OF WAUSAU WASTE WATER</u> STS JOB NO. <u>16970A</u> TREATMENT PLANT EXPANSION

<b>–</b> í						OWNER					LO	GOFB	ORING	NUMB	ER			
,						City of	f Wausau				0	W-109						
						PROJEC					EN	GINEEF	1					· · · · ·
_	STSC		iltant	sLt	d.	Wausau	Wastewate	er Treatm	nent Plant	Expansion	j e	echer-H	loppe ,	Inc.				
	SITE					4							Т			Γ	r	<u> </u>
							, Wiscons:	in				z	≝≘					
		Γ	Γ	Γ					WELL INS	STALLATION	÷	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>2</sup> )	8		MIT	9	×
				ω					TOP STAN	DPIPE EL. + 1170.	70	/FT	APRI ON:	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT LL/PL	PERCENT PASSING #200 SIEVE	PERMEABILITY, K (CM/SEC)
				ANC									NO d	NTE	ET.	PL STIC	PAS	SEC
	NOI NOI	0	ΥPE	IS1			DES	CRIPTION O	F MATERIAL			l a -		8	DRY BS.	LL PL	100	EAB M/:
	DEPTH ELEVATION	и Ш	L L	ц Ш	'ERY							TES	4FIN		Ī		#2	EBW CC
	ELE BEI	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY							IAN	REC O	M N	5	רוסר	βł	ē.
-	$\mathbf{X}^{-}$	S	SA	SA	RE	SURFACE I	ELEVATION						130					
	_		[			Asphalt												
			. 										1					
•		1	ss	Π	Ш				wn fine s	and - wet at		24						
_ 1				Щ		4.5 Ieet	t - mediur	n dense					·					
		-	<u> </u>	$\mathbf{H}$	$\mathbf{H}$													
		2	SS	Ш	Щ							16						
k				H		Dark bro	own fine f	to medium	sand (SM	) - some organic	╞╌┨		+					
		3	ss		Щ	silt - m	noist - la	pose - al	luvium	organit		3		[				
	10					Dalata		<b>6</b> :				+	1	<u>†                                    </u>				
- E		4	ss	$\prod$	$\prod$	Dark bro alluvium		rine san	ia (SM) - 1	wet - loose -		2	}					
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		5	ss	Π	Щ					,				1				
■ }			55	Щ	픡	Brown fi	ine to coa	arse sand	v gravel	(GP) - trace of		2						
_ [	13			$\mathbf{H}$	Щ	silt - w	wet - 1009	se to den	se - till									
		6	SS		Щ							31						
				·														
þ	19										1							
				•	+													
						End of E Boring a	-	-o 19.0 f	eet using	hollow stem								
- 6						auger	avancea (	.0 19.0 1	cee using	noriow stem								
						2 inch F	PVC_monito	oring wel	l installe	ed at 18.1 feet								
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F		lificati	on line	es reg	01886	int the approxim	nate boundary b	etween soil typ	es. In situ, the tra	nsition may be gradual. We	ter leve	s were mea	sured at the					sonally.
	WL					BCR		γ	.0' ACR	BORING STARTED	5-24-	89	STS OFFIC	°E	) Lambe en Bay			
∎∕⊦	WL-T. PIP	" <u></u>	DA	TE	-+	TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED	5-24-	89						
_  -					+					RIG WI Test Dr	i11i	na	DRAWN B	Y JJT	SHEET	1 9	DF 1	
▰┞		+			+				+			·· 3	APP'D. BY	RAM	STS JOB	NO. ,	.6970A	
	L: 5-983				_		L	l	L	FOREMAN MK				- CAM	1	1	.0970A	

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DRILLER D	.Z.	DRILL CREW		
JOB/CLIENT	CITY OF WALLSAU	WASTE WATER	STS JOB No.	16970A
	TREATMENT PL	LANT EXPANSION	1	

G		3			OWNER	f Wausau	<del></del>		·····	LC	<b>G O</b> OW-13		RING	NUMB	ER			
		<b>I</b>			PROJEC	TNAME			· · · · · · · · · · · · · · · · · · ·		IGINE							
STSC					Wausau	Wastewat	er Treat	ment Plant	Expansion		Beche	≥r-Ho	oppe,	Inc.	<del></del>	<u>г</u>		<b></b>
SITE		САТ Т			Wausau	, Wiscons	in				3	ND NO	SIVE FT')			-		
			ы					WELL INS	TALLATION IDPIPE EL. + <u>1172.</u>	21	10101	(B/FT)	OMPRES (TONS/	TENT. %	VEIGHT T <sup>3</sup> )		ASSING	ITY, K
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY		DES	CRIPTION O	F MATERIAL				TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT')	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LL/PL LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY, I
ы М	SAM	SAMF	SAMF	RECO	SURFACE	ELEVATION	+1170.32		·····	ר	CT A		UNCO	3				
		1	t							+							+	
	1	ss			trace o	f glass, d	cinders a	and brick	coarse sand - - moist - wet			16				•		
5	2	ss			at 6.5	feet - ve	ry loose	to medium	dense			4						
	3	ss										3						
- 10																<b></b>		
	4	SS					:1.					5						
15						ganics - 3		ieurum to (	coarse sand -									
	5	ss										7						
18.6				_														
					End of 1 Boring a auger	Boring advanced t	:0 18.6 f	eet using	hollow stem									
						PVC monito	oring wel	l installe	ed at 18.6 feet	:								
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	ificati	on lin	95 F9	prese		nate boundary be	atween soil typ		nsition may be gradual. V			measu	red at the					sonally
WL-T. PIPI	E	DA	TE	T	BCR	WL-T. PIPE	DATE	8.0' ACR	BORING STARTED	6-24	1-89	'	STS OFFIC		Lambe en Bay			
	-								BORING COMPLETED RIG WI Test D	6-24 rilli		[-	DRAWN B		SHEET		OF 1	_
	+			+		·····		<del> </del>	FOREMAN CB			[	APP'D. BY	RAM	STS JOE	NO.	16970A	

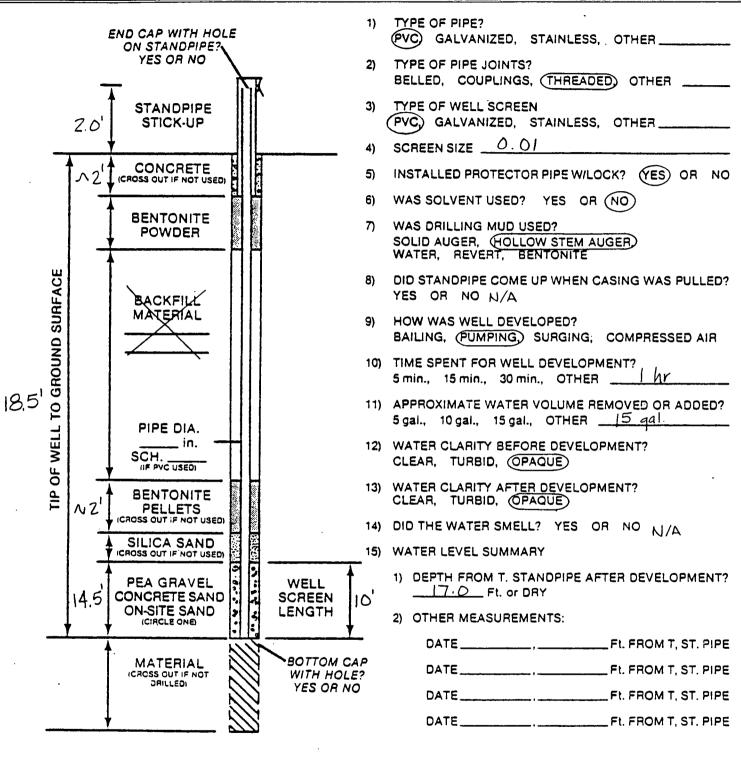
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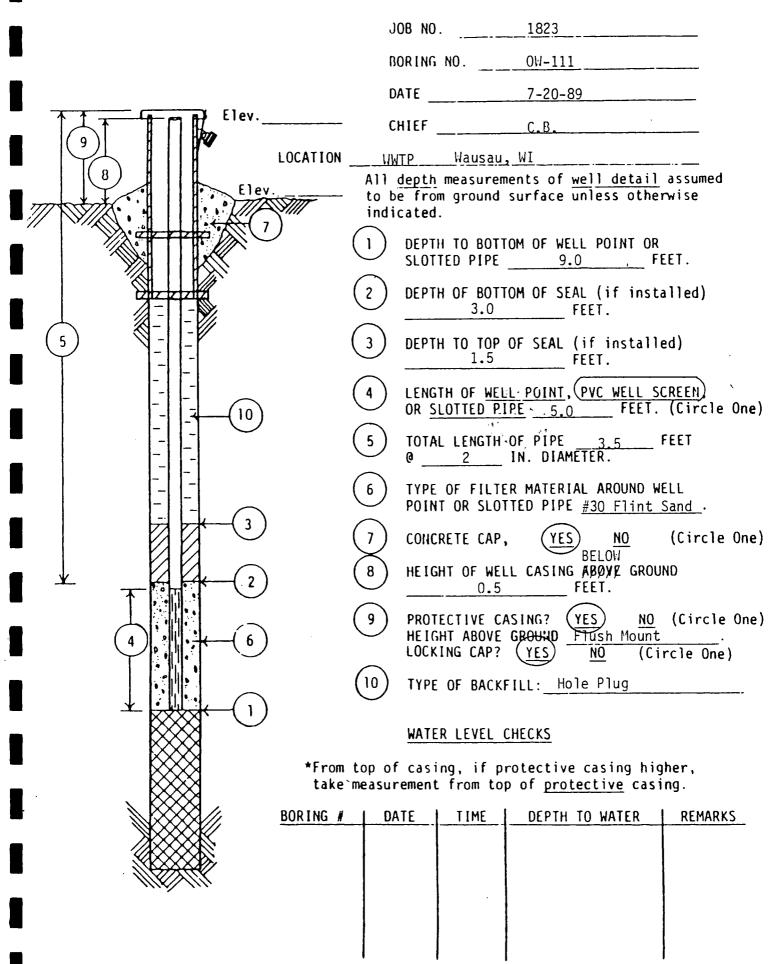




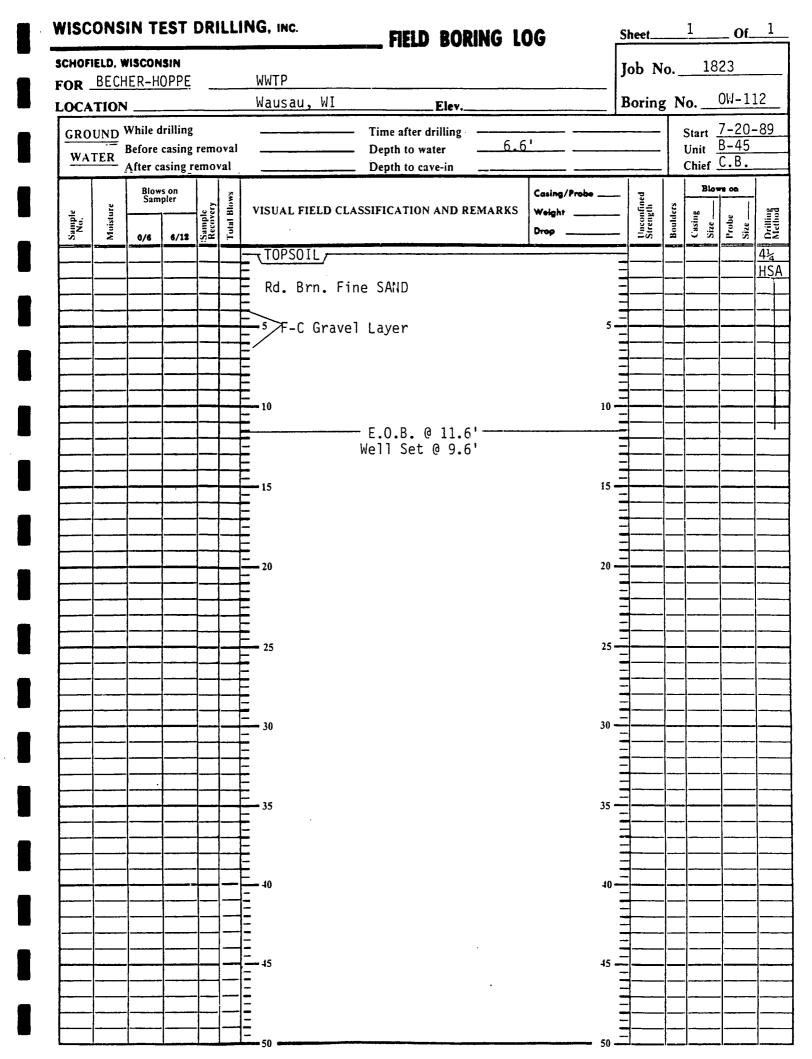
Well NO. <u>OW-110</u> DATE INSTALLED <u>6-24-89</u> DRILL RIG <u>WI. TEST DRILL</u> INC. DRILLER <u>C.B.</u> JOB/CLIENT <u>CITY OF WAUGAU WASTE WATER</u> STS JOB NO. <u>16970A</u> TREATMENT PLANT EXPANSION

CHOF	IELD, V	HER-H	ISIN OPPF			WWTP	]]	lob N	lo	18	323	
		1 <u></u>		-		Wausau, WI Elev		Boring				11
GRO	UND	While d Before <u>A</u> fter c:	lrilling casing	rem		9.0'         Time after drilling            Depth to water             Depth to cave-in	/ *			Start . Unit . Chief .	7-22 B-45	-89
Sumple No.	Moisture	Blow Sam	s on pler	:Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS Weight	•	Unconfined Strength	Boulders		<b>viii 00</b>	ine
Sun No	Moi	0/6	6/12	Sam: Rec	Tota	Drop		Unc	Bou	Casing Size	Probe Size	
						TOPSOIL						<u>н</u>
						Rd. Brn. Fine SAND	-					
	<u> </u>						-					
						- 5	5 _		<u> </u>			
					1		-		<u> </u>			
						- Hit Some M-Gravel	-	·				
						:	-	·				
						- 10 F-M Brn. SAND w/F-C Gravels	10 -	<u> </u>				
					1	, I-M DIN. SAND W/F-C Gravels		<b></b>				-
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					<u> </u>							
						- 15	15 —					
						E.O.B. @ 16.0'						-
						Well Set @ 9.0'	-					
								· · · ·		<u> </u>		
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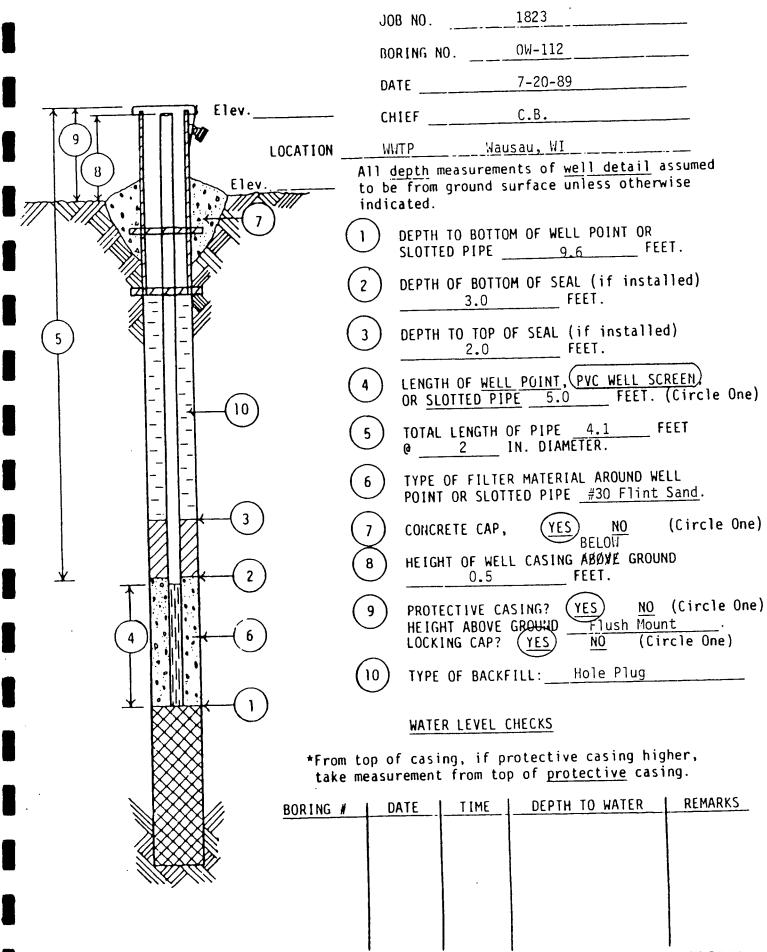
#### WELL DETAIL INFORMATION SHEET



WISCONSIN TEST DRILLING



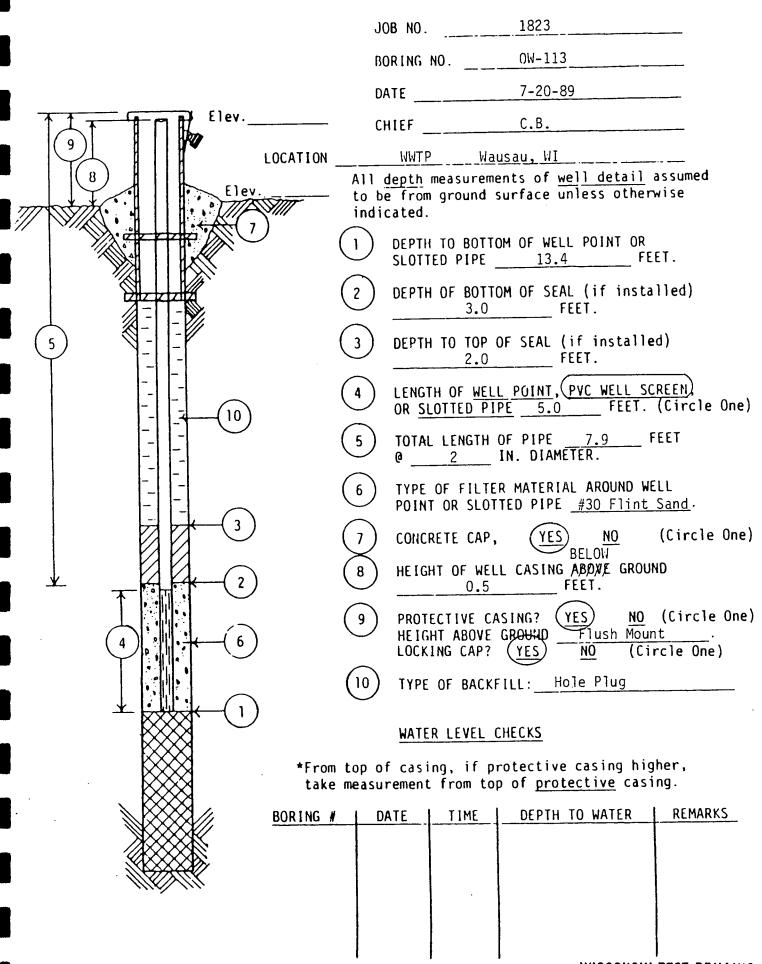
# WELL DETAIL INFORMATION SHEET



WISCONSIN TEST DRILLING

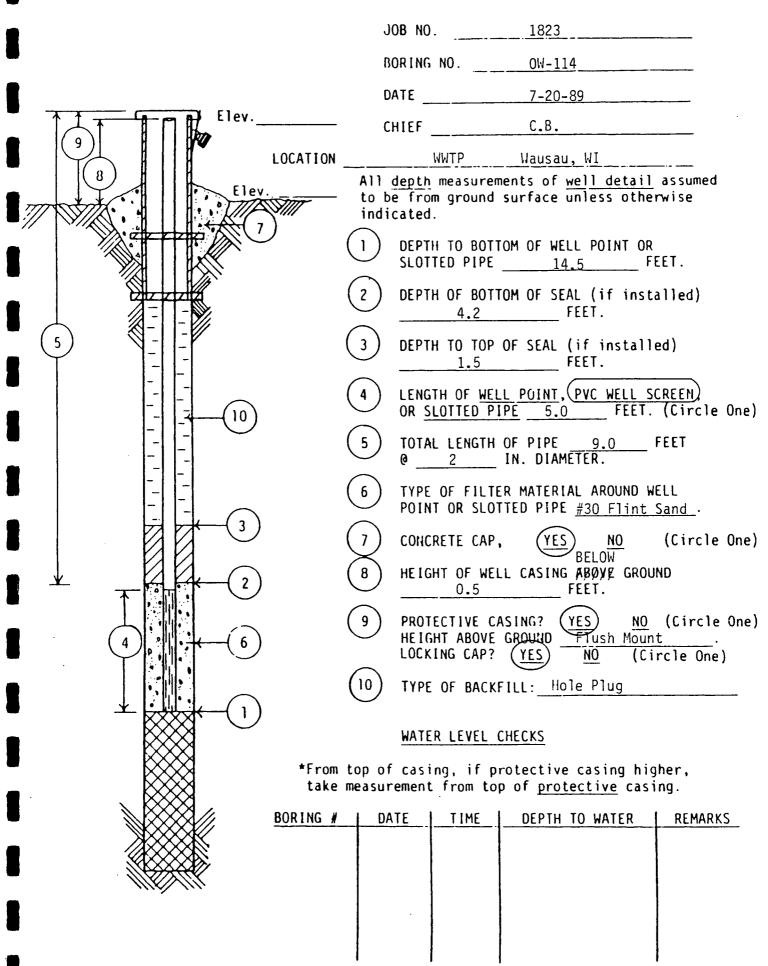
CHOF	IELD, V	VISCON	ISIN				FIELD BORIN			Ţ,	oh N		10	22	
OR .	BECH	IER-H	OPPE	_		WWTP	·			_ ] '	ob N	0	18	<u> 23</u>	
	TION					Wausau, WI	Elev			_   B	oring				
GRO WA	т <b>гр</b>	While d Before <u>A</u> fter c	casing	rem	oval val	Dep	ne after drilling pth to water pth to cave-in	10.	3'			1	Start _ Unit _ Chief _	7-20 B-49 C.B	5
		Blow Sam	s on		s		à- <del></del>		Casing/Probe		bed		Blow		
Sample No.	Moisture	0/6	6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFI	ICATION AND REM	ARKS	Weight Drop		Unconfined Strength	Boulders	Casing Size	Probe Size	
						Rotten GRANITE				11					4 H
						F-C Brn. SAND				111					
										11				<u> </u>	
					┼──-	- F-C Brn. SAND w,	/F-C Gravels	& Cob	bles	5					
										11					
					<u> </u>	- 10				. 1					-
						10				10 -					
						-									_
					┣──										-
						E.(	0.B. @ 14.0'-			15 -					
						wei	l Set @ 13.4'								
						-				111					-
															-
						20				20					
										1					_
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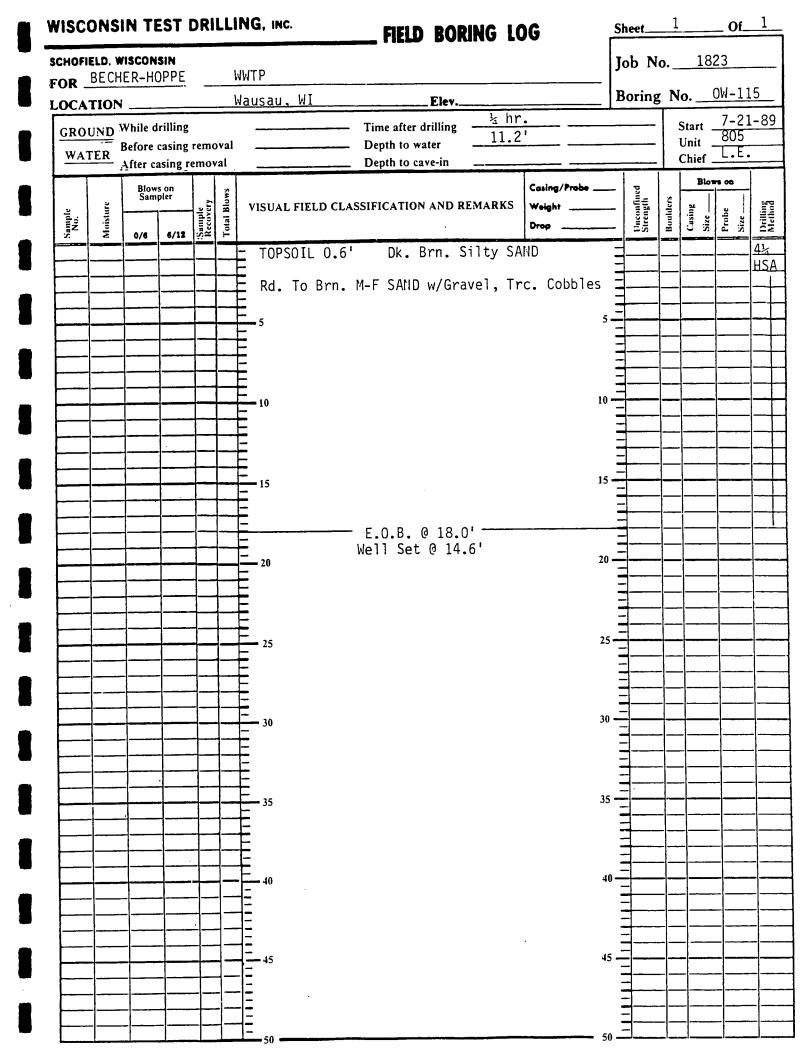
#### WELL DETAIL INFORMATION SHLET



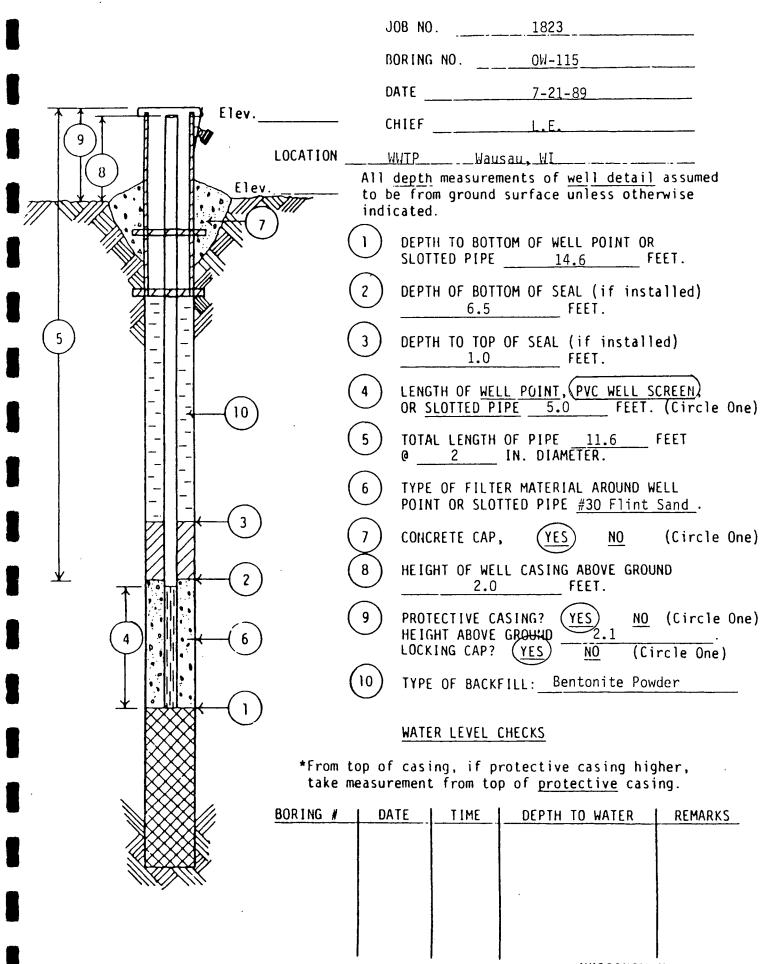
HOF	ELD W	ISCON	SIN			FIELD BORING LOG	<b>.</b>	<u></u>	10	222	
		<u>ER-H(</u>		_		WWTP			<b>).</b> 18		
		·				Wausau, WI Elev.	Bor	ring	No	OW-11	.4
GRO WAT	TED	While d Before After c:	casing	reme	oval val	11.0' Time after drilling			Start Unit Chief	<u>7-20</u> <u>B-45</u> <u>C.B.</u>	)_; 5 ,
ple .	Moisture	Blow Sam	s on pler 6/12	ple ivery	l Blows	VISUAL FIELD CLASSIFICATION AND REMARKS Weight		Strength		Prube go wa	1
Sample No.	Mui	0/6	6/12	:Sam Rec	Tota	Drop		J.S.	Bou Cas Size		
						Brn. F-M SAND	=-	-		•	4 H
						Rd. Brn. F-SAND					
					-	5	5		-	-	-
						F-C GRAVEL w/Cobbles					_
			<u></u>						_	-	
						10.0'					
							· -			-	-
	·					Lt. Brn. F-M SAND, Trc. Gravel		-		•	-
							1				
			<u> </u>				15	<u> </u>		-	
			<u> </u>			E.O.B. @ 15.6' Well Set @ 14.5'		-		-	-
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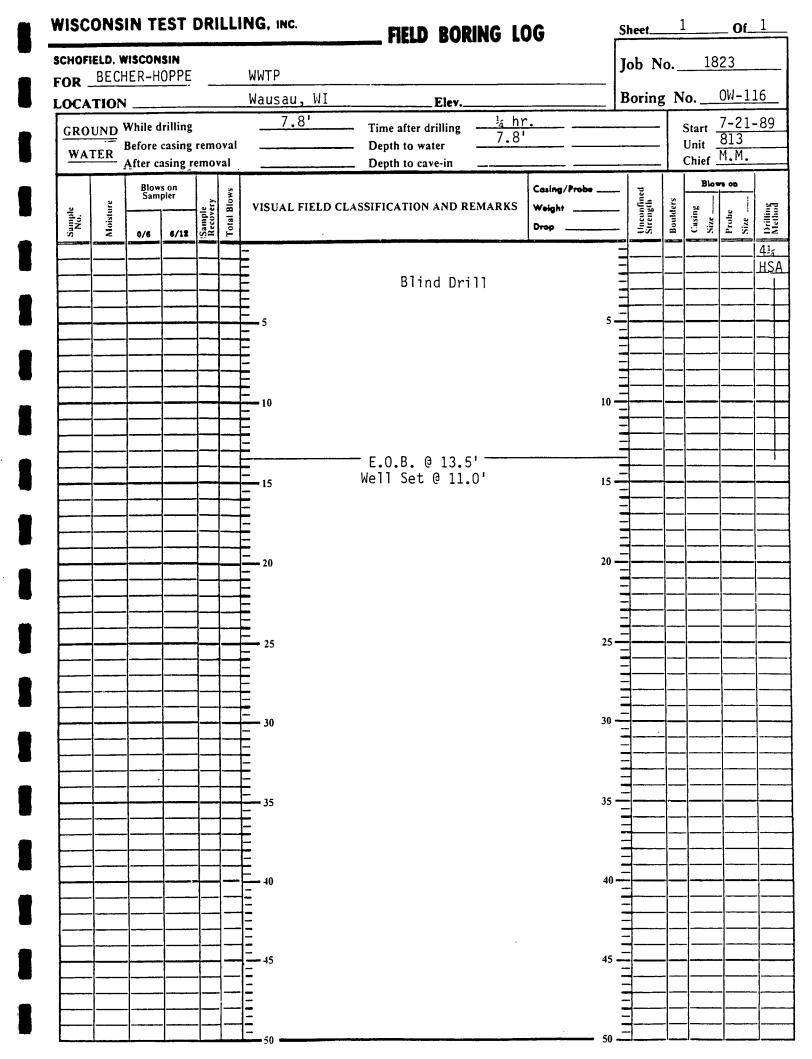
### WELL DETAIL INFORMATION SHEET



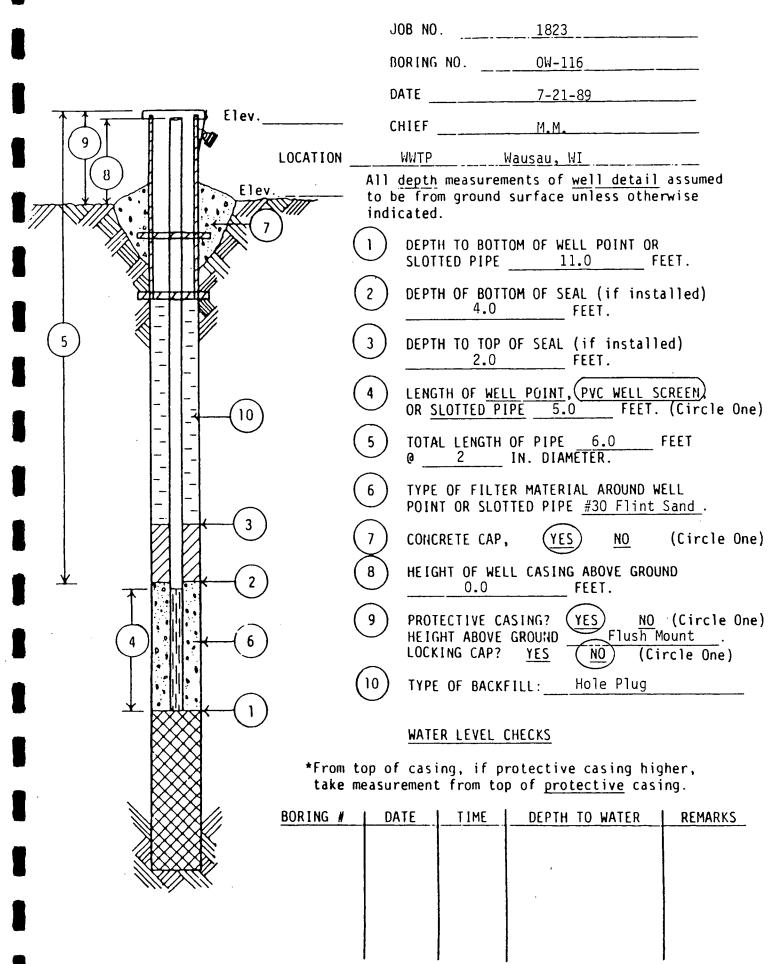


### WELL DETAIL INFORMATION SHEET

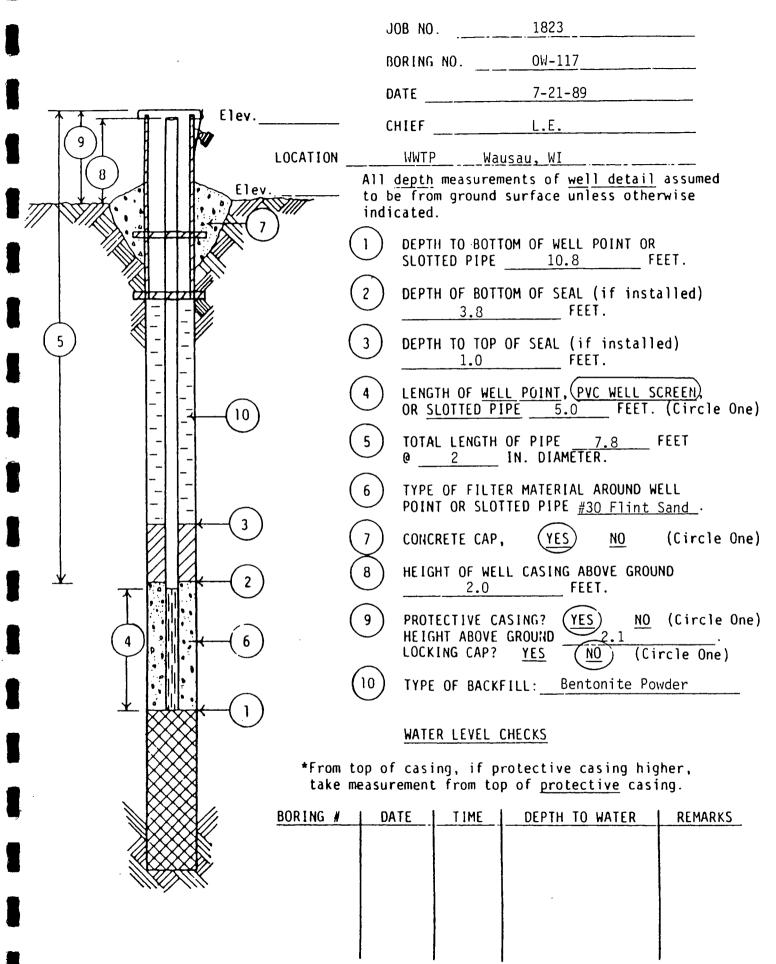




## WELL DETAIL INFORMATION SHLET



		VISCON				FIELD BORING LOG	,	Job N	<b>o</b> .	18	23_	
DR.	BECH	IER-H	OPPE	-		WWTP						7
		<u>ا</u>				Wausau, WI Elev. ½ hr.		Boring	. I			
GRO WA	TFD	While d Before <u>A</u> fter ca	casing	rem	oval val	Time after drilling <u>3.0'</u> Depth to water <u>8.0'</u>	7.	hr 8'		Start _ Unit Chief _	805	
		Blow Sam	s on	Ī	2	Casing/Pro	be	ned	- -			
Sample No.	Moisture	0/6	6/12	Sample Recovery	Total Blows	VISUAL FIELD CLASSIFICATION AND REMARKS Weight		Unconfined Strength	Boulders	Casing Size	Probe Size	Drilling
							-					41
							-					H.
					{—	Rd. to Brn. M-F SAND	-	d				
				1	1		5 -	-				
							-	-				
							-					
					┨	Cobble Area 8.5'			·			
					╂──	_	-	╡				-
<u> </u>				1	1-	Rd. to Brn. M-F SAND w/Gravel	10 -	-	1			-
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		.			<u> </u>	E.O.B. @ 15.0'						
		<u> </u>			┨──-	Well Set @ 10.8'	-					
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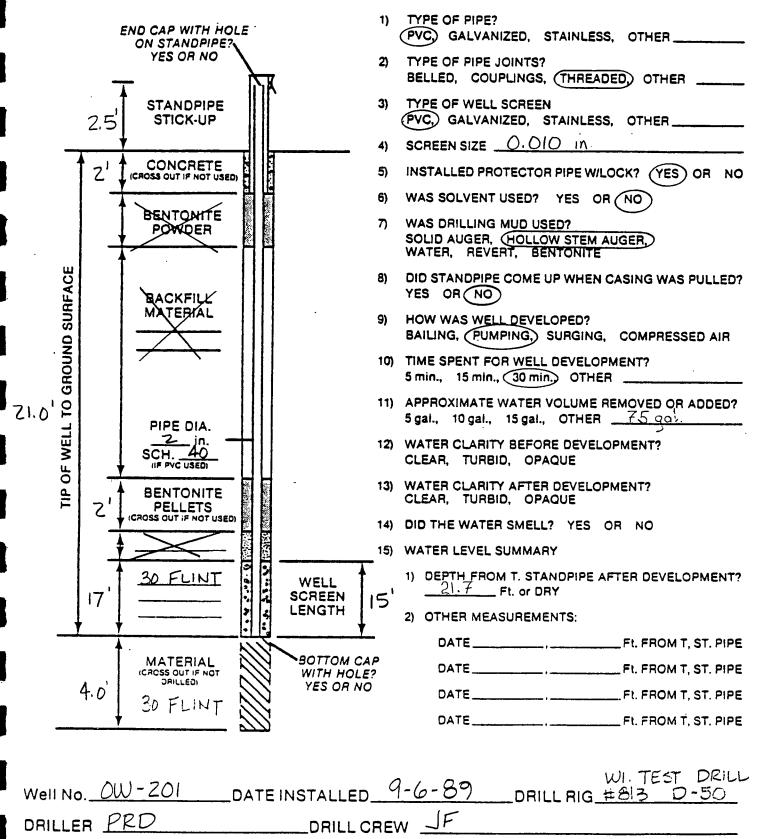
C					OWNER							ORING	NUMB	IER			
						f Wausau					W-201	·					
Ľ						CT NAME nstallatic	ns				GINEEF	{ loppe,	Inc				
STSC			_		Merr 1								<u> </u>	T	T	·····	<u> </u>
SHE			10					ent Plant			NO	SIVE FT3)					
								WELL IN: TOP STA	STALLATION NDPIPE EL. + <u>1173.</u>	<u>59</u>	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>3</sup> )	NT, %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	×
		Wausau, Wisconsin         WELL INST. TOP STAND         DESCRIPTION OF MATERIAL         UNATERIAL         UN							I (B	WOO d	WATER CONTENT,	ET <sup>3</sup>	PL	PAS	PERMEABILITY, I		
LION	ġ	Wausau, Wisconsin         WELL INSTAL TOP STANDPI         UNK       UNK         UNK       UNK </td <td></td> <td></td> <td></td> <td><u> </u></td> <td>ខ</td> <td>BS</td> <td></td> <td>1100</td> <td>EAB</td>						<u> </u>	ខ	BS		1100	EAB				
depth elevai	LE N						TES	VEIN	TER	I I	) di	#2	ERM				
찔끔	MP	Wausau, Wisconsin         Well INSTAL TOP STANDPI         USX         USX </td <td></td> <td></td> <td>STAI</td> <td>LEC</td> <td>Ň</td> <td>2</td> <td></td> <td>đ</td> <td><u>م</u></td>						STAI	LEC	Ň	2		đ	<u>م</u>			
$\times$	s.	Š	S	Ē	SURFACE	ELEVATION 1	.171.1					S III					
	L	·															
	1       SS       Fill: Dark brown (7.5 3/4) to v grayish brown (10YR 3/2) silty s cinders - trace of gravel, metal fragments - very loose to medium         2       SS       Fill: Brown to dark brown (10YR 3/2)         3       SS       Fill: Brown to dark brown (10YR 3/2)         4       SS       Fill: Brown to dark brown (10YR 3/2)         5       SS       Fill: Very dark gray (10YR 3/1)         gravel (GM) and glass fragments       Fill: Very dark gray (10YR 3/1)		(4) +		<b>F</b>	10											
- 5		†·															
	2	ss	Ш	Ш	cinders	s - trace	of grave	l, metal	and glass		4						
			╨	┿┤	fragme	nts - very	loose t	o medium	dense	I							
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	ર	55	İΠ	Щ							2						
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	5	SS	Ш	Ш	graver	(GH) and	yiass II	agments -	medium dense	I	24						
		-			Fill:	Verv dark	grav (1	OVR 3/1)	silty cand	<u> </u>	+						
-25																	
26.5	6	ss		Щ							18						
					End of	Boring			· · · · · · · · · · · · · · · · · · ·								
							from 0.0	to 25.0 :	eet with 4.25"								
					feet wi	ith protec	for pipe	icoring we	eii at 21.0		ĺ						
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										-							
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	ificati	on lin	es re	prese	nt the approxim	nate boundary be	tween soil type	es. In situ, the tra	insition may be gradual. W	ater levels	s were mea	sured at the					sona
VL NL·T. PIP	FT		TE	T	TIME	WI T DIOF	<b>D</b> 475		BORING STARTED	9-5-8	39	STS OFFIC	3 F	640 Lam Green B			
	-+-			-+	TIME	WL.T. PIPE	DATE	TIME	BORING COMPLETED	9-5-8	39	0841411					
				-+		<u> </u>			RIG WTD D-50			DRAWN B	T UUT	SHEET	T C	DF 1	
												APP'D. BY		1			

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R	2			OWNE							ORING	NUME	BER			
					of Wausau					201					· · · · ·	
STS Con	sulta	nts	t tri		Installati	ions			1		N Hoppe, 1	Inc.				
SITE LO				-						1		<u> </u>		<u> </u>	1	<u> </u>
	···		<u> </u>		au Wastewat au, Wiscons		ment Plan	t		Z	ĭ≧					
							WELL II	STALLATION		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>2</sup> )	. %	H	TIMI	ŊŊ	¥
			NCE							B/F	OMPI (TOP	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY K
NOL					DE	SCRIPTION (	OF MATERIAL			ВЧ ВЧ	ЪС ОС	CON	IRY /	L/PI	UT P.	ABII
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he stratificat	ion lin	es re	prese	int the approx	kimate boundary be	etween soil type	es. In situ, the tra	insition may be gradual. W	ater levels w	ere measu	ired at the ti	mes indic	ated Water	levels mar	vary see	0021
·		_							)-5-89		STS OFFICE	54	0 Lamb	eau St	reet	Judi
L-T. PIPE	DA	TE	-+	TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED				Gr	een Ba			
		_					<u> </u>				DRAWN BY	JJT	SHEET	1 08	• 1	
								RIG WTD D-50						-	-	

C					OWNER								RING		ER			
						f Wausau					_		ntinued	1				
					PROJEC	T NAME						NEER						
STS Co					Well I	nstallatio	ns				Bec	cher-Ho	oppe, 1	inc.				
SITE			101	1		Wastewate , Wisconsi		ent Plant				NO	SIVE (172)					
			ų.					WELL INS	TALLATION IDPIPE EL. +		1	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>3</sup> )	WATER CONTENT. %	UNIT DRY WEIGHT (LBS/FT)	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	× ,×
z		ш	AN									N (EN	00	ONTI	× ×	ASTI /PL	SIE	BIL
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DEPTH ELEVAT	SAMPLE NO.	Г.	Ĩ	RECOVERY								NDV TE	NG1	ATE		an	ERC #	PER
ت ¤	AMF	AMF	AMF	ដ្ឋ	CUREADE							STA	NCO	3		2	<u>م</u>	-
$\times$	s	Ś	-N	<u>~</u>	SURFACE	ELEVATION							_⊃∽	ļ	Ļ			
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51.5			μι	┝─┤				<u> </u>	<u> </u>			ر.						
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The strati	ficatio	n line		prese	nt the approxim	nate boundary he	tween soil type	s. In situ the ter	nsition may be gradu	al. Water In	vele		ired at the	limes ind	cated Moto	r levele -	AV V201 000	SOAC
			TE		TIME	WL-T. PIPE		+	BORING STARTED				STS OFFIC	- 5	40 Lam reen B	beau S	treet	
VL					1 1 M I C.	THE FIPE	DATE	TIME	BORING COMPLET	ED 9-5-	89							· · · · ·
VL	-			$\neg$										ייד.ד	SHEET	· ·	DF n	
VL WL·T. PIPE									RIG WTD D-			i	DRAWN BY		SHEET	2 0	OF 2	





JOBICLIENT WAUGAL WASTEWATER TREATMENT STS JOB NO. 17289 XF

C					OWNER							OF BC	RING	NUMB	ER			
				ļ		Wausau						-202						
					PROJEC	T NAME stallatio	ns					NEER	oppe. I	nc.				
SITE									. <del>.</del>						<u> </u>	r		<u> </u>
501L	200			•		Wastewate Wisconsi		ent Plant				z	IJ N €					
		<u> </u>		Т				WELL INS	TALLATION			STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>2</sup> )	*	F	TIM	5	<u>×</u>
			ы					TOP STAN	IDPIPE EL. +	170.	<u>51</u>	B/FT	MPR	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT)	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY, H
z		_ب	SAMPLE DISTANCE			050	CRIPTION OF					N DEV	29	ONT	S/FI	AST /PL	T PA	ABIL
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DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	APLE	RECOVERY								TAND	SONE	WAT	NA ·	inoi	PER	E
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5				-	medium	dense												
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	3	SS							ilt (OL) ar avel - very			2						
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	4	SS		]							<u> </u> _ <u></u>	38						
						own (10YF) a little			medium sar	d								
-19-											L							
					End of	Boring												
					-			to 19.0	feet with 4	.25"								
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			es re	rese	nt the approxim	nate boundary b	etween soil typ	es. In situ, the tr	ansition may be gr	adual. W	ater levels	were meas	ured at the	times indi	cated. Wat	er levels m	lay vary sea	asona
WL 11.			Te	- T	TIME		0.175		BORING START	ED	9-6-89	)	STS ÓFFIC	CE	40 Lam Green E		Street 54303	3
**E*1. PiP	-		TE	+	TIME	WL-T. PIPE	DATE	TIME	BORING COMP	LETED	9-7-89	) 	DRAWN B		SHEET		OF 1	
	1								RIG WTD D	-50								
							I	· · · · · · · · · · · · · · · · · · ·	1				APP'D. BY	MDS	STS JOI		L7289XE	

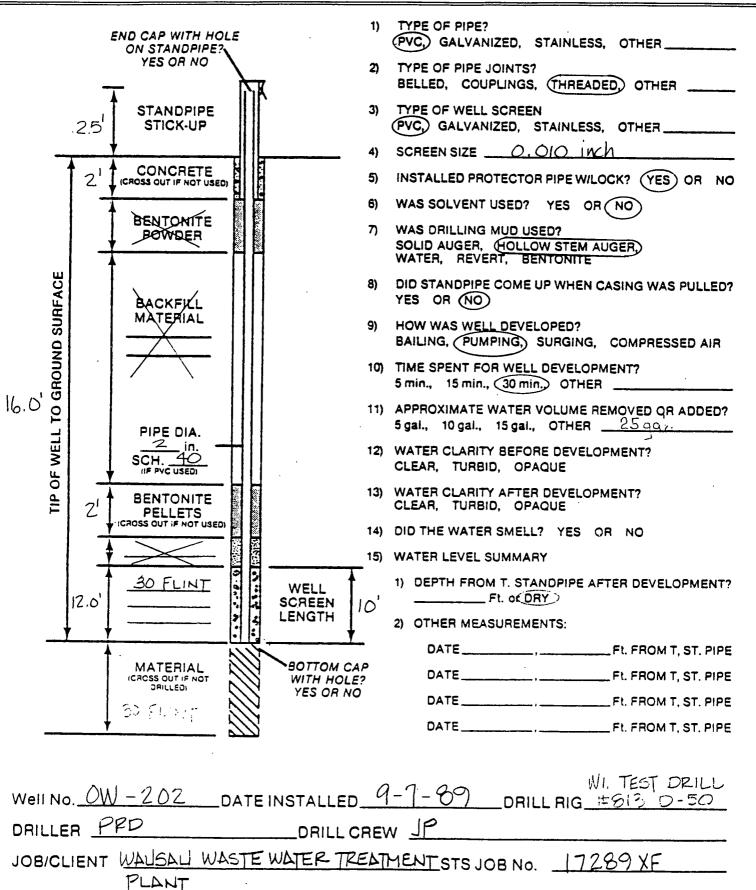
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Signature     No.11 Installation     Becher-Rope, Inc.       STEELUCATION Number Westwarder Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plant Number, Missoner Treatment Plante Number, Missoner Treatment Plantent Decker, Number, Missoner Streat Number, Missoner Treatment, Missoner Streat Number, Missoner Treatment, Missoner Streat Number, Missoner Treatment, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Missoner Streat Number, Mi		City of Wausau	OW-202A
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NUMBER         Non-state         No-state         Non-state         Non-state         Non-state         Non-state         Non-state         Non-state         Non-state         No-state         No-sta	STS Consultants Ltd.	Well Installations	Becher-Hoppe, Inc.
A      A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A     A	SITE LOCATION		¥ ¥(:
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No     sampling - see Boring 04-202 and B-202 logs       10     For soil description       20     Rotation has reproduint description       20     Continued       20     Continued       20     Continued       21     Storrice       23     Storrice       30     Continued       11.0' VD     Continued       Nr. Fre     Oxte       11.0' VD     Total description	DEPLI ELEV SAMPLE SAMPLE	SUBFACE FLEVATION 1167 9	PER PER PER PER PER PER PER PER PER PER
30         No sampling - see Boring OM-202 and B-202 logs         For soil description           20         For soil description         B-202 logs           20         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           20         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           20         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           20         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           20         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           20         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           21         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           22         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           23         Go sampling - see Boring OM-202 and B-202 logs         B-202 logs           23         Go sampling - see Boring OM-202 and B-202 logs         Go sampling - see Boring OM-202 logs           23         Go sampling - see Boring OM-202 and B-202 logs         Go sampling - see Boring OM-202 logs           24         Foreward Boring Commute Boring - See Boring OM-202 logs         Sis OFACC         Sis OFACC           25         Foreward Boring Commute Boring - Sis OFACC         Sis OFACC         Sis OFACC </td <td></td> <td></td> <td></td>			
WLT. PIPE     DATE     TIME     WLT. PIPE     DATE     TIME       BORING COMPLETED     9-18-89     STS OFFICE     Green Bay, WI 54303       BORING COMPLETED     9-18-89     DRAWN BY JJB     SHEET 1     OF 2       PRIG     WTD D-50     POREMAN     PD     APP'D. BY     VW     STS JOB NO.     17289XF	15       20       20       20       30       30       30       30       31       40       40       41       42       43	for soil description Continued Continued	E40 Jambany Street
WL1. PIPE     DATE     TIME     WL.T. PIPE     DATE     TIME     BORING COMPLETED     9-18-89     DRAWN BY     JJB     SHEET     1     OF     2       Image: Stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of the stream of t		BORING STARTED	9 18 8 8 9 1 S IS OFFICE
FOREMAN PD APP'D. BY VW STS JOB NO. 17289XF	NL-T. PIPE DATE	TIME WL-T. PIPE DATE TIME BORING COMPLETED	9-18-89 Green Bay, w1 54505
1/203AF		RIG WTD D-50	
	5-983	FOREMAN PD	APP'D. BY VW STS JOB NO. 17289XF

		5			OWNER					LOG	OF BC	RING	NUMB	ER			
	1				City of	Wausau			<u> </u>	OW-	202A Co	wer-Hoppe, Inc.         were measured at the times indicated. Water levels may vary         were measured at the times indicated. Water levels may vary         association         astructure					
					PROJEC	T NAME				ENG	INEER				Water levels may vary s imbeau Street Bay, WI 54303 ET 1 OF 2		
STS Co	► nsul	itant	sLt	d.		tallation	s			Bec	her-Hop	ppe, In	nc.				
SITE L					Wausau W	astewater	Treatmen	t Plant		-		1					
						Wisconsin			TALLATION	<u></u>	ATION	SSIVE (S/FT <sup>3</sup> )	%	<u>-</u>	MIT	5	×
	}		u :					TOP STAN	DPIPE EL. +1170	.51	ETR/ 3/FT	TONS	ENT,	EIGH	C L	SSIN	PERMEABILITY, K (CM/SEC)
			SAMPLE DISTANCE			•					N (B	CO CO CO	NTE	L N	PL PL	PAS	SEC
NOL	<u>o</u>	ΥPE	IST/			DES	CRIPTION OF	MATERIAL			BR.	- H H	00 6	LBS		ENT 200	CM A
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	ш	′ERγ							TES	NFIN	ATEF	LIN C	n	ERC #	ERN (
	MPI	MPI	MPI	S S		_				_	STA	NCO TRE	Ň		F1	4	-
$\mathbf{X}$	S₽	SA	S۵	æ	SURFACE E	EVATION	1167.9					Ξs					
					No compl	ing - 600	Boring (	W-202 and	B-202 logs								
						.ing - see . descript		M-202 and	D-202 1093		[						
50						-											
														1			
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					End of E												
					Boring a	dvanced f		:o 55.0 fe	et with 4.25"								
						tem auger		alled at	53.0 feet								
					Z INCH F	ve prezon	ecer inst	arrea ac	53.0 1000								
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WL 11.									r				5	······································			
WL-T. PIP			ATE		TIME	WL-T. PIPE	DATE	TIME	BORING STARTED	9-18-8		STS OFFI	CE				
									BORING COMPLETED	9-18-8	39	DRAWN E	TLL YE	SHEET	1	OF 2	
	$\dashv$										{	APP'D. B	y vw	OL STS	B NO.	17200	
BL: 5-983						L	L	L	FOREMAN PD				VW	1		17289XI	

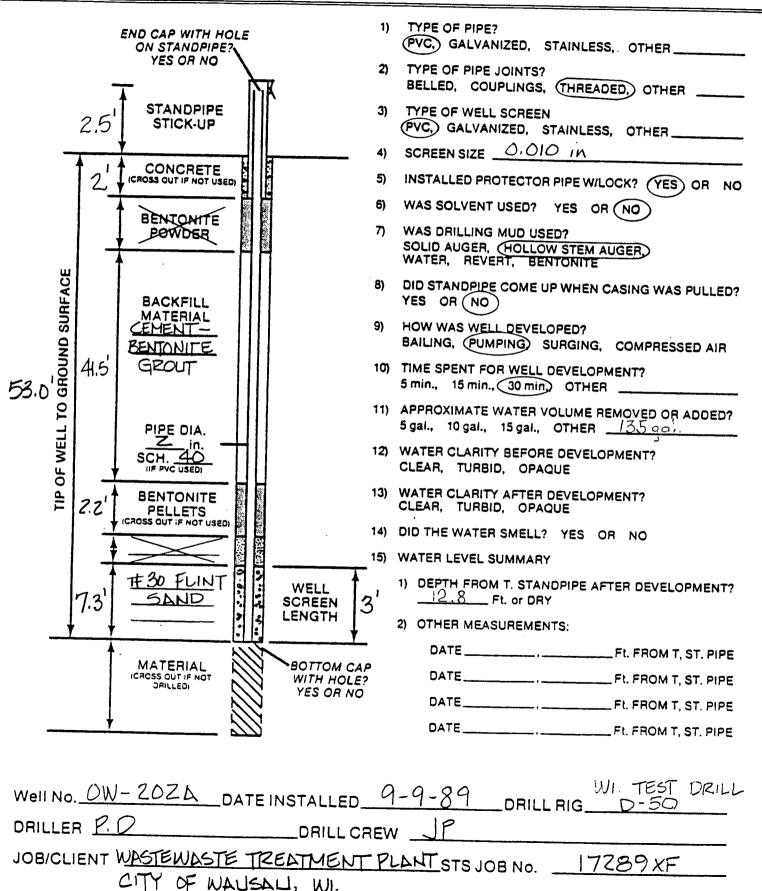
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				┝		Wausau			=.·		202						
	<u> </u>			1	PROJEC					1	INEER						
STSC		_			Well in	stallation				Бе		oppe, 1	T.	r	<u> </u>		<del>.</del>
SITE	LOC		ON			Wastewate: Wisconsi:		ent Plant			N	Tr)					
								WELL INS	TALLATION		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT*)	41. %	IGHT	LIQUID/PLASTIC LIMIT	SING	×
			SAMPLE DISTANCE							1	PENE N (B/	COM T	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	VPL /PL	PERCENT PASSING #200 SIEVE	PERMEABILITY,
DEPTH ELEVATION	NO.	SAMPLE TYPE	DIST	≿		DESC	RIPTION OF	MATERIAL			ARD EST.	TH. (	ER CO	T DR		CENT #200	MEA
DEPTH	SAMPLE NO.	IPLE	1PLE	несолену							TEND	SONF	WATI	INN	Ing	PER	PER
	SAN	SAN	SAN	射	SURFACE E	LEVATION				]	S	STE	-			[	
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					No samp descrip	ling - see	e Boring	DW-202 1c	og for soil								
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25																	
	2	ss	IJР	Ч				•	-		28						
			Щ	-								1					1
					Dark br	own (1079	4/4-3/31	fine to	medium sand								
-30					(SP) -	a little 🤉	gravel -	decreasir	ng grain size								
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	3	ss									21						
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45-		• • •		+			·			┢ -	<u> </u>			<u> </u>			
							Contin		· · ·								
			es rep	eser	t the approxin	nate boundary be	ween soil type	as. In situ, the tra	ansition may be gradual. W			sured at the					asona
VL 10			TE	1	TIME	WLTDDE	DATE	TIME	BORING STARTED	9-7-8	9	STS OFFI	UE .	540 Laπ Green E		Street 54303	3
				+	11/11/2	WL-T. PIPE	UATE	TIME	BORING COMPLETED	9-7-8	9	DRAWN B		SHEET		OF 2	
	-			+				<u> </u>	RIG WTD D-50	-		DOWN B		JANEEL	±		5
				- 1				L				APP'D. BY		1		7289XF	

C					OWNER						GOF	BOF	RING	NUMB	ER			
						f Wausau					-202	_	inued	1				
		,			PROJEC	TNAME				EN	GINEE	R					_	_
STSC	_				Well I	nstallatio	ns			B	echer	Hop	ppe, 1	nc.				
SITE	LOC	CAT	101	1	Wausau	Wastewate	er Treatm	ent Plant				T						Γ
		r	ı			, Wisconsi					NO		SIVE FT <sup>2</sup> )			-		
								WELL INS	TALLATION		STANDARD PENETRATION	<u></u>	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>2</sup> )	IT. %	GHT	LIQUID/PLASTIC LIMIT	UNG.	×
			SAMPLE DISTANCE								NET		OMF (TO	WATER CONTENT,	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIC	PERCENT PASSING #200 SIEVE	PERMEABILITY.
NO		Ы	STA			DES	CRIPTION OF	MATERIAL				2	000	CON	BS/I	LAS		ABI
TAT Y	ENC	1	ē	≩							DAR	3	GTH	EB			#20	BMB
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	٨P	RECOVERY							TAN		REN	MA	S	IOU	E E	뮡
ਕ ਕ	SAI	SAM	SAI	Ĩ	SURFACE	ELEVATION					o		STI	1		-		
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	ь	55									25							
															1			
50		ŀ	m	$\vdash$														
	7	ss		*							35							
			μι		Dark he		4/4-3/3	) fina ±-	medium sand		33	'						
					(SP) -	a little	gravel -	decreasi	ng grain size									
55					with de	epth - med	ium dens	e to dense	2									
	8	SS		끠											1			
			Ш	$\square$												ŀ		
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-60										1								
60			hτ	щ						1								
	.9	ss									15							
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70																		
	,,		$\prod$	$\Pi$	Verv da	irk gray (	5¥ (1) א		t (MT.) -	1		$\neg$						
	11	SS	Щ		a littl	.e sand - 1	medium de	ense to de	ense		. 30							
			TT	; [		• ·				<u> </u>								
75	12	ss		Щ	Dark gr dense	ay (5Y 4/	l) silty	clayey fi	ne sand (SM-SC)-	1	34							
			╨	-+		······	·	- <u></u>				_						
					End of				<i>.</i>									
					Boring roller	advanced : bit	rom U.O	το /3.0 f	eet with									
					Used 73	.0 feet o	f HW casi	ing										
						borehole bentonite		ace with										
							31011Y				1							
				ľ	* Wash	Sampie												
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			es re	prese	ent the approxim	nate boundary be	tween soil type	es. In situ, the tra	insition may be gradual. V			asure	d at the					isonal
VL 10.			TE		TIME	WL-T, PIPE	DATE	TIME	BORING STARTED	9-7-8	39	ST	S OFFIC		40 Lam reen B		treet 54303	
	<u> </u>			-+		TULL FIFE	UATE	TIME	BORING COMPLETED	9-7-8	39		RAWN BY		SHEET		DF 2	
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-	-+		- · · ·	-+				<u> </u>	RIG WTD D-50									





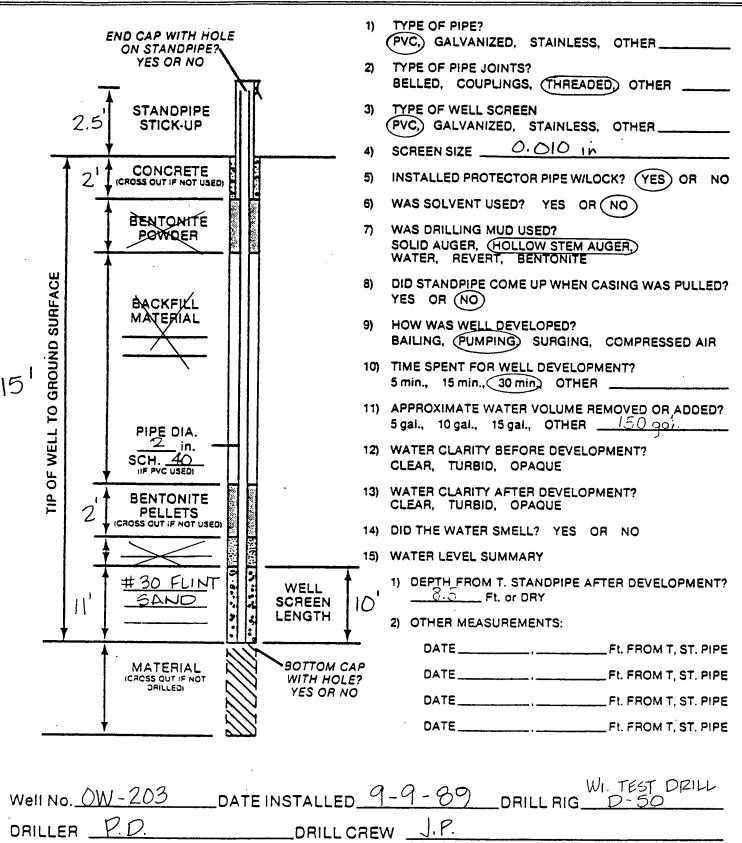




					OWNER					LOG	OF B	ORING	NUMB	ER			
					City of	Wausau				OW-	203						
					PROJEC	T NAME				ENG	INEEF	1					
STSC	onsu	Itan	ts Li	d.	Well In	stallation	ns			Bec	her-Ho	ppe, I	nc.				
SITE	LOC	CAT	101	1		Wastewate Wisconsin		nt Plant			z	IVE [12]					
DEPTH Elevation	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	ECOVERY			SCRIPTION OF		STALLATION NDPIPE EL. + <u>1168.3</u>	33	STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>3</sup> )	WATER CONTENT, %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY, K (CM/SEC)
$\boxtimes$	ŝ	Ś	Š	R	SURFACE	ELEVATION	1166.0					E.S.					
	1	SS			Strong dense	brown (7.5	5YR 5/6) :	fine sand	(SP) - medium		22						
	2	ss		11 	Reddish with tra dense	brown (5) ce of silt	(R 4/3) fi and fine	ne to coa e to mediu	arse sand (SP) - ım gravel -		35						
10	3	SS			Reddish (SP) - v dense	brown (5) with some	(R 4/3) me fine to r	edium to c nedium gra	coarse sand avel - very		55						
13	4	SS	- TT	=	Possible	e bedrock	- driller	's observ	vation	<u> </u>	100/5"						
					hollow s	advanced f stem auger	•		et with 4.25" ed at 15.0 feet								
						·											
	licati	an line	85 100		Int the approvi	Table boundary b	stween soil ture	5 <b>[0 6</b> ](1) 18.4 17.5	insition may be gradual. Wa				line				
WL 5.5								, the tre					54	Cated. Wate			sonaliy.
WL-T. PIP			TE		TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED	9-7-89 9-7-89		STS OFFIC	Gr Gr	een Bay	/, WI 9	54303	
<u> </u>	-+-			-+					RIG WTD D-50		{	DRAWN B	Y JJT	SHEET	1 0	DF 1	
81 - 5-083							· · · · · · · · · · · · · · · · · · ·		FOREMAN JP			APP'D. BY	VW	STS JOB	NO. 17	7289XF	

C					OWNER						OF BO	DRING	NUMB	ER			
					City of				· ·· ·· ·· · · · · · · · · · · · · · ·	B-2							
					PROJEC						INEER						
STS Co	onsu	tant	s Lte	1.	Well Ins	stallation	s			Bec	her-Ho	ope, Ir	nc.				
SITE	LOC	ATI	ON			Vastewater Wisconsin		nt Plant			N	IVE T <sup>2</sup> )					
								WELL INS TOP STAN	TALLATION DPIPE EL. +	 	L STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT*)	NT. %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	X.
-			ANC								PENE N (B	D COV	INTE	, WE	PL PL	PAS	PERMEABILITY,
4 TION	NO.	ΤYΡ	DIST	≥		DESC	CRIPTION OF	MATERIAL			ARD ST.	LH.	E CC	LBS (LBS	LL.	200	MEA
DEPTH ELEVATION	SAMPLE NO	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY							AND	ONF	WATER CONTENT.	INN	aino	PER(	PER
	SAN	SAN	SAN	꾍	SURFACE E	ELEVATION				ן ר	SI	STR	-		5		
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5																	
						ing - see	Boring (	0W-203 log	for soil								
				-	descript	ion											
10-											:						
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15-																	
										1							
				_			· · · · · ·			ļ							
					Weathere	d bedrock	changes	to compet	ent bedrock								
20		ŀ			with dep	th - dril	ler's obs	servation									
			$\frac{1}{11}$	╓┼													
		_			hornblen	en mafic : de bearin	g pyroxe	nite - phan	eritic								
	tun #1	DB NX							ering of rock faces - trace								
-25		·		Щ		c plagioc			Fracture								
26	-		4	$\neg$	Run No.	<u>Depth</u> 21.0-26.0			Frequency 0.8/ft.		1			· · ·			
					<u> </u>	21.0-20.0	J 65,		0.8/10.								
					End of B	-											
						dvanced fi tem auger	rom 0.0 1	to 21.0 fe	et with 4.25"								
					Bornig a	dvanced fi			et with NX								
						bit core l g driven f			ter							· .	
					Boring g	routed wit	th cement	-bentonit	e grout		ł						
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The start	illect				of the on	ngto house	tuoor " ·				<u> </u>						
VL	incati	un liñe	91.6	1836	m me approxin	Date Doundary De	ween soll typ	as. In situ, the tra	nsition may be gradual. W BORING STARTED	ater levels			54	icated. Wat 10 Lamb			asonal
WL T. PIP	E	DA	TE	T	TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED			STS OFFI	CE	een Ba			
										-11-		DRAWN B	TLL Y	SHEET	1	OF 1	
	_			+		+			RIG WTD D-50					1			





JOB/CLIENT WASTE WATER TREATMENT PLANTSTS JOB NO. \_ 17 289 XF CITY OF WAUSAU, WI.

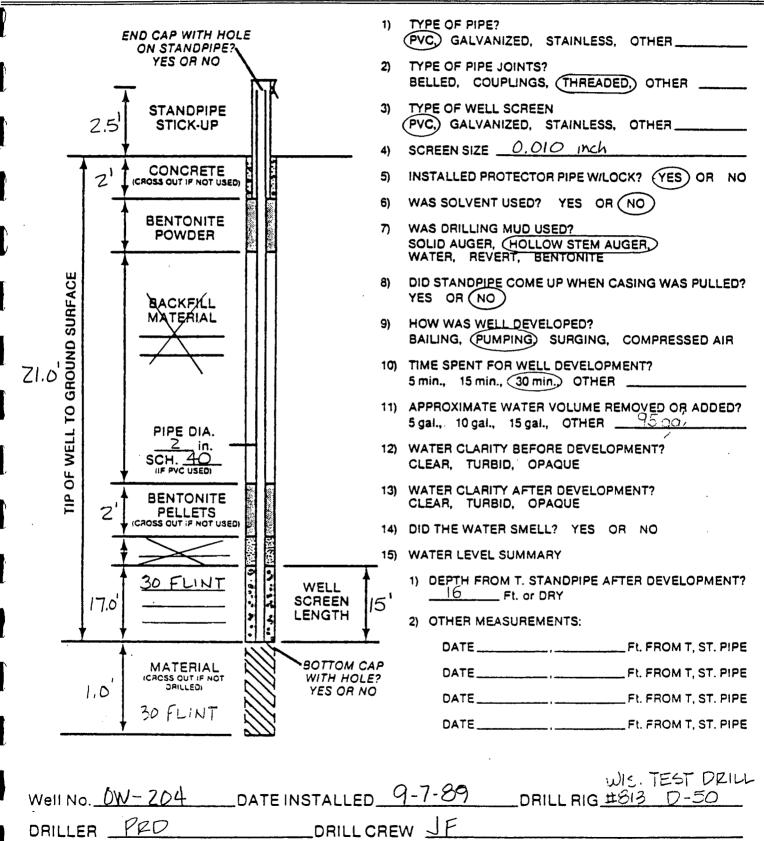
C				OWNER			·204	RING					
			L	City of Wausau			NEER			•		<u></u>	
				PROJECT NAME				oppe, I	nc.				
STS Consul				Well Installations			1	1		[			[
SITE LOC	ATI	ON		Wausau Wastewater Treatment Plant Wausau, Wisconsin			N	13 13 13					
			1	WELL INSTALLATION TOP STANDPIPE EL. +_	1171 24		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT <sup>1</sup> )	۲, %	SHT	LIQUID/PLASTIC LIMIT	UNG	×
		щ		TOP STANDPIPE EL. +_		<u>-</u>	B/F	OMP.	WATER CONTENT.	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	STIC PL	PERCENT PASSING #200 SIEVE	PERMEABILITY, K
z	SAMPLE TYPE	TAN		DESCRIPTION OF MATERIAL			1. N B	0 0	CO	DRV LBS/	LL/	ENT	AEAB CM/:
DEPTH Elevation Mple No.	TYF	DIS	Ϋ́				TES	NFIN	ATEF	TINE	nın (	ERC #	PERV
DEPTH ELEVATIO SAMPLE NO	MPLE	MPL	SOV				STA	STRE	Š		9	<b>—</b>	
X N	SAI	SAI	Ē	SURFACE ELEVATION 1168.9						<u> </u>	ļ		
				Fill: Light gray (10YR 7/2) to brownish ye	llow	2	15						
1	SS		Ш	(10YR 6/6) fine to medium sand (SP) - mediu dense	111								
5				uense		*							
2	ss	$\prod$	凹				10			1			
								+			+	+	
10		$\frac{1}{1}$	$\mathbf{H}$	Fill: Very dark gray (10YR 3/1) silt (ML)	-		5						
3	ss	Ш		trace of sand - loose - peat layer observer from 15.8 to 16.0 feet	d	I I							
				ILOW 72.8 CO 10.0 LEEC									
15											1		
4	ss		Ш	(10) 2/2)	51	<u> </u>	1	2	+		+	+	
	$\uparrow$	┲		Fill: Very dark grayish brown (10YR 3/2) coarse gravelly sand (SW) - medium dense	rine to		1						
	+-	+	┢	Fill: Dark brown (10YR 3/3) medium sand (	(SP) -				T				
-20			<b> </b>	some gravel - trace of silt - some blue sa grains - very dense to extremely dense	ina						1		
5	ss	;	Ш			#	77	_			_		
22	+	╞				ł							
				End of Boring Boring advanced from 0.0 to 22.0 feet with	n 4.25"	}							
				ID hollow stem auger Installed 2 inch PVC monitoring well at 2:									
				feet with protector pipe									
				· · · · · · · · · · · · · · · · · · ·									
										1			
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						<u> </u>							
			is rep	esent the approximate boundary between soil types. In situ, the transition may		Water le	evels were			indicated. 540	Lambea	u Stre	et
WL 11.0			TE	BORING : TIME WL-T. PIPE DATE TIME BOBING			5-89	STS O	FFICE	Gree	n Bay,	WI 54	303
WL-T. PIPE	+	UA	· C	BORING			/-89	DRAW	N BY J	JT SH	EET 1	OF	1
					TD D - 50			APP'	). BY M	DS ST	S JOB NO.	1728	9XF
t -				FOREMA	N PC	, 				<u> </u>			

C					OWNER							ORING	NUMB	ER						
						f Wausau	<u> </u>		<u> </u>		B-204 NGINEER									
						CT NAME Installatio	206					l loppe, 1	Inc							
STS C	_		_										1	<u> </u>	·	<u> </u>	<b></b> -			
SILE			. <u></u>	4		Wastewate		ment Plant			_ ×	IZE (13)								
			Γ					WELL IN TOP STA	STALLATION NDPIPE EL. +		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>2</sup> )	T. %	GHT	LIQUID/PLASTIC LIMIT LL/PL	ING	×			
			NCE								ENET (B/F	OMP (TO	WATER CONTENT.	WEI(	LIC	ASS	2			
NO	0	۲. ۳	SAMPLE DISTANCE			DES	SCRIPTION O	F MATERIAL			N N	- op	CON	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	PLAS	PERCENT PASSING #200 SIEVE	PERMEABILITY, I (CM/SEC)			
DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	Ū U	RECOVERY							TES	4FIN 1GTH	TER		NOI					
EL	AMPI	MPI	AMPI	S.							STAN	VCON LREN	MA N	5		H H	ā			
$\boxtimes$	S	Š	ŝ	æ	SURFACE	ELEVATION						Ξ'n								
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5																				
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					No sam đescri		ee Boring	1 OW-204 1	og for soil		1									
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	1	SS		Ш							6									
			T								1									
	2	ss		Щ							24									
				-																
					Dark b	rown (10YF	R 3/4-4/3	) fine to	medium sand											
35						trace of y dense	gravel -	trace of	silt - loose					ľ						
	3	ss	$\Pi$	Ш							38									
	-	-																		
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40										1	1									
	4	SS	$\Pi^{+}$	Щ																
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						<u> </u>	Continu		<u></u>											
			es re	orese	nt the approxi	mate boundary b	etween soil typ	es. In situ, the t	ansition may be gradual. V	Vater levels	were mea	sured at the					isona			
WL-T. PIP		AB	TE	T	TIME	WL-T. PIPE	DATE	TIME	BORING STARTED	9-6-8	9	STS OFFIC		40 Lam reen B			3			
				+					BORING COMPLETED	9-6-8	9	DRAWN B		SHEET		DF 2				
· · · · · · · · · · · · · · · · · · ·						†		1	RIG WTD D-50			B			- (					
				-+-			t					APP'D. BY		i						

Ĉ					OWNER						LOG	OF BC	DRING	NUMB	ER			
	I N					Wausau							Continued					
<u> </u>		,				T NAME					1	INEER				_		
STS C			_		Well In	stallatio	ns				Bec	cher-Ho	ppe, I	nc.				
SITE	LOO		ON	1		Wastewate: Wisconsi		ent Plant				NO	11) (17					
			μ					WELL INS	TALLATION		ı	STANDARD PENETRATION TEST. N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Qp (TONS/FT*)	WATER CONTENT. %	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	PERMEABILITY, K
7	1		ŚAMPLE DISTANCE									N (B	00 g	ONTE	, Fi	/PL	PAS	BILL
UEPTH ELEVATION	ġ	SAMPLE TYPE	DIST	≻		DES	CRIPTION OF	MATERIAL				ST.	UN H	R C(	LBS	1.2	ENT 200	MEA
UEPTH ELEVA]	SAMPLE NO.	ш	ш	RECOVERY								ND I	NGI	ATE		) din	ERC #	ERI
5 ਛ	AMF	AMP	AMP	S S	0105405						,	STA	NCO	3		E	<u>م</u>	1
$\triangleleft$	s	s	ŝ	~	SURFACE	ELEVATION			<u></u>				20					
	5	ss		Ш								50						
					Dark br	cown (10YR	3/4-4/3)	fine to	medium sand									
	]						gravel -	trace of	silt - loose	3								
	}				to very	y dense												
50				Π														
51.5	6	ss	Ш						·····			48						
	1				End of	Boring								1				
	1						from 0.0	to 50.0 f	eet with 3.2	25"								
					ID holl	low stem a	uger			-								
				·		l borehole		ice with										
					cement-	-bentonite	slurry											
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The stra	tificati	on line	IS rep	orese	nt the approxir	mate boundary be	tween soil type	s. In situ, the tra	nsition may be gradu	al. W	ater levels	were meas	ured at the	times indi	cated. Wat	ar levels m	ay vary sea	isonal
/L 13	.5'								BORING STARTED		9-6-89		STS OFFIC	5	40 Lam	beau S	treet	<u> </u>
VL·T. PIP	PE	ĎA	ΤE	_	TIME	WL-T. PIPE	DATE	TIME	BORING COMPLET	TED	9-6-90			- G	reen B	ay, WI	54303	
	_							ļ			2-0-05		DRAWN B	Y JJT	SHEET	2	OF 2	
				- I		1		1	RIG WTD D-	- 10					+			
		······		+		<u> </u>		<u> </u>	FOREMAN	PD			APP'D. BY	MDS	STS JOE	NC	17289x	

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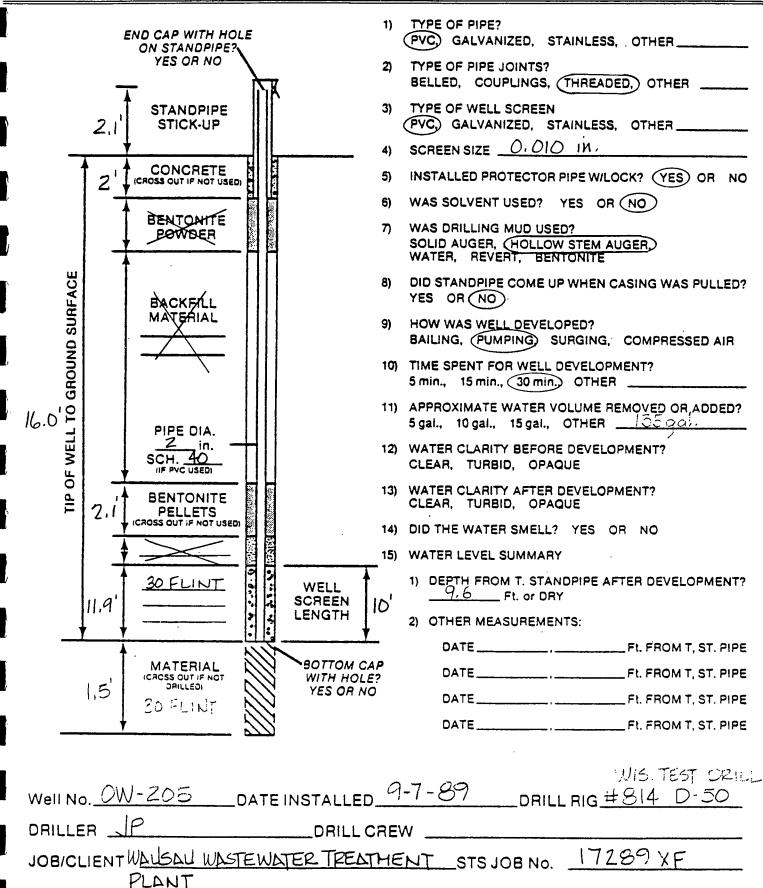
JOBICLIENT WAUSAU WASTEWATER TREATMENT STSJOBNO. 17289XF PLANT

C					OWNER									OG OF BORING NUMBER									
						Wausau					-	205											
					PROJEC	I NAME stallatio	ne					NEER her-Ho	ppe, I	nc.									
STS Co	_			_		Wastewate:		ont Plant									Γ	<u> </u>					
		F	r			Wisconsi						TION	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>3</sup> )	%		AIT							
			س					TOP STA	STALLATION IDPIPE EL. + <u>1168</u>	.18_,		STANDARD PENETRATION TEST, N (B/FT)	MPRE: TONS,	WATER CONTENT, 9	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	TY. K					
z		<u>س</u>	SAMPLE DISTANCE			-						PEN N (B	op CO	ONTE	V MI	ASTI /PL	r PAS	BILI'					
DEPTH Elevation	NO.	SAMPLE TYPE	DIS	ž		DESU	SRIPTION OF	MATERIAL		1		DARD EST,	STH,	ERC			CEN.	PERMEABILITY, I					
DEPTH ELEVAI	SAMPLE NO.	MPLE	MPLE	RECOVERY								TAN	CONF	WAT	N.	IOUI	PER	E					
X	SAI	SAI	SAI	Ë	SURFACE I	ELEVATION 1	166.5					S	UN ST			ſ							
					Fill.	Light vel	lowish h	(10V)	R 6/4) medium														
						P) - trac					5					•							
	1	ss		Ш								22											
5			Π	$\left  \right $		•					$\left  \right $												
	2	SS	Ш.		Fill: loose ,		red fine	e to mediu	ım sand (SP) -			4											
						r .																	
-10					• •	· ·																	
	3	ss	$\prod$	Ш					um sand (SP)			12											
				-1		.rk gray ( .um dense	ox 4/1) s	siit (ML)	seams - loose														
15																							
	4	SS		Ш						I		16											
17.5																							
					End of	Boring																	
					Boring	advanced		to 17.5 i	eet with 4.25	'													
					Install		PVC mon:	itoring we	ell at 16.0														
					feet wi	th protec	tor pipe																
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The strat	ificar	on lin	AS 74	01894	ant the approvis	nate boundary by	tween soil twe	as in eiter the t-	ansition may be gradual.	Water			ured at the	times inc	cated Mich	at lovels -	21 102						
WL 10								ss. in situ, the fr	BORING STARTED	9-7-				5	40 Lam	beau S	treet						
WL-T. PIP			ATE		TIME	WL-T. PIPE	DATE	TIME	BORING COMPLETED				STS OFFIC				54303	3					
				_				<b> </b>	RIG WTD D-50	· · · · ·			DRAWN B	Y JJT	SHEET	1	OF 1						
	1			- 1					1 WID D-30														

		_			7	OWNER					LOG	OF BO	DRING	NUMB	ER						
						City of	Wausau				B-205										
<b>.</b>		<b>N</b>	) 1		ľ	PROJEC				······································	ENG	INEER									
	STSC	onsu	Itant	sLte	d.	Well In	nstallatio	ns			Be	cher-H	oppe, 3	Inc.							
ļ	SITE				_		Wastewate Wisconsi		ent Plant	· · · · · · · · · · · · · · · · · · ·	<u> </u>										
							<u></u>		WELL INS	STALLATION		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH, Op (TONS/FT <sup>2</sup> )	L. %	H	LIQUID/PLASTIC LIMIT	ING	×			
ł				SAMPLE DISTANCE			-		TUP STAI			ENET (B/F	COMP (TO	WATER CONTENT,	UNIT DRY WEIGHT (LBS/FT <sup>3</sup> )	STIC	PERCENT PASSING #200 SIEVE	PERMEABILITY, K (CM/SEC)			
<b>.</b>	DEPTH ELEVATION	0	SAMPLE TYPE	ISTA			DES	CRIPTION OF	MATERIAL			A D P		CO	DRY BS/	LL/I	OO S	M/S			
	DEPTH ELEVAI	SAMPLE NO.	ЕТ	9	RECOVERY							TES	VEIN VGTU	VTER	UIT I	) dir	ERCE #2	ERM (C			
		WP	MPI	MP	SI.						,	STAI	TREI	Ň	2	L IOI	PI	۹.			
	$\boxtimes$	ŝ	ŝ	ŝ	æ	SURFACE E	LEVATION						50								
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,		3	SS	1		trace o	own (10YR f gravel - loose to	- decreas	e to medi sing grain	um sand (SP) - a size with		3									
	35	4	SS									45									
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	WL									BORING STARTED	9-7-8			5	40 Lam	beau S	treet				
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l						BORING COMPLETED 9-7-89 DRAWN BY JJT SHEET 1				1	OF 2										
	<b> </b>			-					ļ	RIG WTD D-50		ł	APP'D. BY		STE IO						
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STS						JECT NA		3				E	NGI	GINEER Becher-Hoppe, Inc.					·	
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			15	3				<u> </u>	WE	LL INSTALLATION STANDPIPE EL. +_				TRATION FT)	PRESSIV DNS/FT	1. %	GHT	LIMIT	ING	3
C DEPTH ELEVATION	SAMPLE NO.	SAMPLE TYPE	SAMPLE DISTANCE	RECOVERY	SURF	ACE ELEVAT			N OF MATE	NAL		-,		STANDARD PENETRATION TEST, N (B/FT)	UNCONFINED COMPRESSIVE STRENGTH. Qp (TONS/FT*)	WATER CONTENT, %	UNIT DRY WEIGHT (LBS/FT3)	LIQUID/PLASTIC LIMIT	PERCENT PASSING #200 SIEVE	DEDATEADILITY V
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he stratific	ation li	nes re	epre:	sent t	he approx	imate boundar	y between so	oil type	s. In situ, the	transition may be gradue	Wate									_
						<u> </u>				BORING STARTED	. water	7. 00	were r			s indica	ted. Water le	vels may v	ary season	ally
L-T. PIPE		ATE			TIME	WL-T. PIPE	DAT	TE	TIME	BORING COMPLET	_	-7-89		STS	OFFICE	Gre	0 Lambea een Bay	WI 54	et 1303	
						<u> </u>				RIG WTD D-50					WN BY J	JJT   1	SHEET 2	2 OF	2	
							1			FOREMAN JP				APP	D. BY		STS JOB NO			





#### STS CONSULTANTS, LTD.

### DRILLING & SAMPLING SYMBOLS:

SS : Split Spoon-1 3/8" I.D., 2" O.D.

STS General Notes

- Unless otherwise noted
- ST : Shelby Tube-2'' O.D., Unless otherwise noted
- PA : Power Auger
- DB : Diamond Bit-NX, BX, AX
- AS : Auger Sample
- JS : Jar Sample
- VS : Vane Shear

GS : Giddings Sampler

PM : Pressuremeter Test, In-Situ

HS : Hollow Stem Auger

WS : Wash Sample

BS : Bulk Sample

FT : Fish Tail

**RB** : Rock Bit

OS : Osterberg Sampler-3" Shelby Tube

Standard "N" Penetration:

Blows per foot of a 140 pound hammer falling 30 inches on a 2 inch 0.D. split spoon sampler, except where otherwise noted.

### WATER LEVEL MEASUREMENT SYMBOLS:

- WL : Water Level
- WS : While Sampling
- WD : While Drilling
- AB : After Boring

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations may not be possible, even after several days of observations; additional evidence of groundwater elevations must be sought.

### **GRADATION DESCRIPTION & TERMINOLOGY:**

Coarse Grained or Granular Soils have more than 50% of their dry weight retained on a #200 sieve; they are described as: boulders, cobbles, gravel or sand. Fine Grained soils have less than 50% of their dry weight retained on a #200 sieve; they are described as: clays or clayey silts if they are cohesive and silts if they are non-cohesive. In addition to gradation, granular soils are defined on the basis of their relative in-place density and fine grained soils on the basis of their strength or consistency and their plasticity.

Major Component Of Sample	Size Range	Description Of Components Also Present in Sample	Percent Of Dry Weight
Boulders	• Over 8 in. (200 mm)	Trace	1-9
Cobbles	8 inches to 3 inches (200 mm to 75 mm)	Little	10-19
Gravel	3 inches to #4 sieve (75 mm to 4.76 mm)	Some	20-34
Sand	#4 to #200 sieve (4.76 mm to 0.074 mm)	And	35-50
Silt	Passing #200 sieve (0.074 mm to 0.005 mm)		
Clay	Smaller than 0.005 mm		

#### **CONSISTENCY OF COHESIVE SOILS:**

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Inconfined Compressive			
Strength, Qu, tsf	Consistency	N-Blows per ft.	<b>Relative Density</b>
0.25	Very Soft	0-3	Very Loose
0.25-0.49	Soft	4-9	Loose
0.50-0.99	Medium (Firm)	10-29	Medium Dense
1.00-1.99	Stiff	30-49	Dense
2.00-3.99	Very Stiff	50-80	Very Dense
4.00-8.00	Hard	>80	Extremely Dense
>8.00	Very Hard		

- WCI : Wet Cave In DCI : Dry Cave In
  - BCR : Before Casing Removal
  - ACR : After Casing Removal

**RELATIVE DENSITY OF GRANULAR SOILS:**