

**Report**

# **Environmental Assessment**

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ENVIRONMENTAL ASSESSMENT  
TORRINGTON COMPANY  
BANTAM BEARING DIVISION  
SOUTH BEND, INDIANA

1.0 INTRODUCTION

Canonie Engineers, Inc. (Canonie) was retained by Barnes and Thornburg, legal counsel for Torrington Company (Torrington), to assess the soil, surface water, and ground water quality at Torrington's Bantam Bearing Division plant in South Bend, Indiana. This report summarizes Canonie's findings based on field and laboratory investigations performed in July and August, 1984.

1.1 Background

The Torrington Company began the manufacture of metal bearings at the Sample Street facility in South Bend in 1928. The facility has been expanded numerous times, reaching its final size in 1967. In September, 1983, Torrington decided to close the South Bend plant because of the weak market for bearing products. As part of a responsible plant closure action, this assessment of the South Bend plant property was undertaken to determine if any environmental hazards remain at the site.

The site (Figure 2) consists of the West Building; Sheds A, B, and C; the foundry; and five ponds ranging in plan dimension from 1,000 to 15,000 square feet. The East Building, which was never used for manufacturing operations, was transferred to new ownership prior to this assessment and is not part of the site or this study.

An initial environmental assessment took place in early 1984. Environmental Instrument Systems, Inc. (EIS) of South Bend collected and tested water and sediment samples from the ponds and from the two production wells at the site. The samples were analyzed for polychlorinated biphenyls (PCB), volatile organics, phenols, and EP toxic metals. The results of this analysis indicated no leachable metals and no phenol concentrations in the pond sediments, but the presence of the volatile organic compound 1,1,1-trichloroethane (TCA) was detected at a significant level in one sediment sample. The test results for PCBs were inconclusive, however, they did indicate that PCBs might be present. The water samples from the Torrington production wells showed no significant concentration of volatiles or PCBs in this initial analysis.

### 1.2 Purpose and Scope

Based on the results of the initial analysis and an assessment of the degreasing, coating, and metal cleaning products used in the plant, it was decided to commission a complete assessment of the soil, surface water, and ground water conditions at the site. This assessment incorporates a basic review of the hydrogeology in the site area and its relationship to potential PCB and volatile organic materials at the following locations:

1. Above ground waste oil tank;
2. Underground fuel oil and cutting oil tanks;
3. Underground Mobilmet Omicron and Stoddard solvent tanks;
4. Five surface water and cooling water blowdown ponds.

The plan for the environmental assessment (Appendix A) was submitted to the Indiana State Board of Health and was found to be adequate on August 21, 1984.

## 2.0 FIELD INVESTIGATION

The field investigation at the Torrington plant occurred between July 25 and August 15, 1984. The investigation was composed of three principal parts: monitoring well installation and sampling, soil sampling from selected locations, and sediment and water sampling from the ponds.

### 2.1 Monitoring Wells

Six monitoring wells were installed at the site. The wells are numbered W-1 through W-5, and S-3. The boreholes were started with a hand auger from the ground surface to the ground water table. Soil samples were recovered at each well borehole during the hand augering using a one-inch-diameter hand sampler tube with an acetate liner. Deeper samples below the ground water level were recovered using a standard split-spoon sampler with brass liners inside of the spoon. The choice of soil samples for analysis was based on two criteria which are:

1. Visible presence of oil;
2. High readings from the on-site organic vapor analyzer;

The soil details for each monitoring well borehole are shown on the boring logs in Appendix B. At least one soil sample from each well boring was sent to the laboratory for analysis of PCBs and volatiles.

All six monitoring wells were installed by the cable tool method using an eight-inch-diameter casing. Wells W-1 and W-3 extend down to the clay layer (65 feet and 61 feet, respectively). Three of the wells, W-2, W-4, and W-5, extend to a depth of approximately 35 feet. The sixth well, S-3, extends to a depth of 24 feet. Wells W-1 through W-5 are constructed of five-inch Schedule 40 PVC with threaded joints. Well S-3 is constructed of four-inch Schedule 40 PVC with threaded joints. The screens are five-foot sections of Number 10 machine-slotted PVC.

The wells are sealed with a mixture of Type I Portland cement and bentonite. Wells W-1 and W-3 are sealed to a depth of 45 feet and 39 feet, respectively. Wells W-2, W-4, W-5, and S-3 are sealed to approximately the water table. A protective steel casing with locking cap is cemented into place around each well casing with a bentonite and concrete surface seal at the well. Manhole covers are installed over the protective casing for Wells W-1 and W-3 to allow for flush installation with the pavement surface in the shipping and receiving area. The monitoring well details are shown in Appendix C.

Water samples were obtained from all six monitoring wells and the two on-site production wells (Torrington Wells No. 3 and No. 4). A volume of water in excess of 300 gallons was purged from each well before sampling. A 40 ml bottle and a one-liter bottle of water was obtained from each well. The samples were tested for volatile organics and polychlorinated biphenyls (PCB), respectively. These results are discussed in Section 4.

All drilling and sampling equipment was steam cleaned after the completion of each well. The hand-sampler was rinsed with reagent-grade hexane, then with distilled water after each sample.

The locations of Wells W-1 and W-3 were changed during the field program to avoid conflict with overhead power lines and the separation of the property between the east and west buildings. One additional well, S-3, was added during the program to expand the assessment of the waste oil tank area to include a ground water assessment. Locations and details for the remaining four wells are as presented in the work plan, Appendix A.

## 2.2 Soil Borings

Seven locations were selected by the field engineer for exploration and sampling. The borings are numbered A-1 through A-7. The basis for selection



was primarily the physical appearance of the ground surface in relation to the location of tanks, ponds, or buildings.

The borings were advanced by hand auger with samples being taken at regular intervals. At least one sample from each boring was sent to the laboratory for chemical analysis. As with the monitoring well installations, a flame ionization organic vapor analyzer was used to monitor vapors emanating from the borings and individual samples. The previous criteria were used for selection of samples for testing. The boring logs for the hand augered borings are presented in Appendix B.

The drilling equipment was steam cleaned after each borehole. The sampler was rinsed with reagent-grade hexane, and distilled water after each sample. All holes were backfilled with the soil cuttings from the boring.

### 2.3 Pond Samples

Water samples and sediment samples were obtained from the five ponds behind the Torrington plant. A water sample was not recovered from Pond No. 3 because the pond was dry at the time of sampling. Water samples were obtained in both 40 ml and one-liter bottles, while sediment samples were taken in both brass tubes and mason jars. The sediment samples in the brass tubes were recovered at the inlet to each pond and were submitted for volatile organics analysis. The sediment samples in the mason jars were composite samples which were submitted for PCB analysis.

### 2.4 Torrington Water Supply Wells

There are two existing water supply wells in the Torrington plant. These wells are designated as Torrington Well No. 3 and Torrington Well No. 4.

The locations of these wells on the plant interior are shown on Figure 2. Torrington Well No. 3 was installed to a depth of 100 feet using the cable tool method. The cable tool method involves the driving and cleaning of a steel casing to the selected screen interval. The screen is then placed inside the steel casing and the casing is pulled back to expose the screen to the aquifer. The steel casing provides a seal at the clay aquitard which prevents water above the clay from entering the well screen.

Torrington Well No. 4 was installed to a depth of 112 feet using the reverse circulation method. The reverse circulation method involves the rotary drilling of a large diameter borehole. When the desired screen interval is reached, a steel casing is placed in the borehole. The annular space between the well casing and borehole is filled with gravel. This creates a permeable gap through the clay aquitard. For Torrington Well No. 4, the borehole is 30 inches in diameter and the steel casing is 16 inches in diameter. Therefore, long pumping intervals at Well No. 4 will result in production from both the upper and lower aquifer.

## 3.0 HYDROGEOLOGIC ASSESSMENT

### 3.1 Regional Geology

The regional hydrogeology for the South Bend, Indiana area is discussed in two bulletins prepared by the State of Indiana, Indiana Department of Conservation.<sup>(1,2)</sup> In general, the ground water system consists of an unconfined aquifer which flows toward the St. Joseph River. Soils in the St. Joseph County, Indiana region are Pleistocene age glacial drift, primarily composed of glaciofluvial sands and gravels and some glacio-lacustrine clays and silts. The glacial drift is underlain by an impermeable, blue-black shale formed during the Devonian or Mississippian age. Soil conditions in the area are represented by several maps from the 1948 ground water resources study. These maps were compiled based on numerous well logs from the South Bend vicinity, and are presented in Appendix F. The subsurface profile typical of this region shows a permeable stratum of sands and gravels, 80 to 200 feet in depth, overlying a bedrock of blue shale. Interbedded with the sands and gravels are lenses of clays and sandy clays which vary in areal extent and thickness, and which may hydraulically divide the aquifer in various areas into an upper and a lower aquifer.

### 3.2 Local Geology

The soils in the southwest quarter of South Bend, Indiana reflect quite accurately the general description of the regional subsurface profile. The area soils are primarily sands and gravels which overlay a blue shale bedrock found approximately 180 feet below the ground surface. The sand and gravel stratum is divided by a gravelly to sandy clay layer approximately 20 to 30 feet in thickness, thereby creating an upper aquifer approximately 60 feet in thickness and a lower aquifer approximately 90 feet in thickness.

The clay layer is sufficiently impermeable and continuous to act as a confining layer for the water in the lower aquifer throughout a large part of the city. The extensive continuity of the clay layer is evidenced by the presence of flowing wells in the northern part of the city. However, the clay layer is missing in some localities, either because it was cut out by stream erosion during the recent geologic age or because it grades laterally into fine sand.

Figure 3 illustrates the subsurface profile in the southwest quadrant of South Bend, near the Torrington plant. The profile is based on information obtained from well logs in the area (see Appendix D). As is typical of the regional geology, the clay layer underlying the Roach-Appleton Company and the Torrington sites pinches out to the east, providing a hydraulic connection between the upper and lower aquifers. The well logs from the shallow wells installed during the field investigation confirm the presence of the clay layer beneath the site (see Appendix B).

### 3.3 Regional Ground Water Hydrology

The regional ground water hydrology is influenced by the glacial action that occurred during the Wisconsin stage. The large quantities of water from the melting ice fronts, flowing in the old St. Joseph-Kankakee River, carved out a large valley in the rocks underlying the region. When the flow of the river decreased by the withdrawal of the glacial ice and by changes in drainage, large quantities of sand and gravel were deposited in the valley, forming extensive underground reservoirs of ground water. The present day St. Joseph River follows, approximately, the course of the older St. Joseph-Kankakee River. Thus, regionally the ground water flows toward the St. Joseph River. This pattern has been altered somewhat by the construction of the South Bend Dam. The 1948 ground water resources study reports that upstream of the dam, the aquifer is apparently recharged by the stream flow, while below the dam, ground water discharges to the river.

The hydraulic characteristics of the aquifer were determined through a series of pumping tests in conjunction with other field work for the 1948 study. The results of pumping tests on municipal and industrial wells in the South Bend area showed transmissibilities ranging from about 100,000 to 500,000 gallons a day per foot, with an average of about 250,000 gallons a day per foot. Studies of the regional piezometric surface confirms that the ground water flows generally toward the river and to areas of heavy ground water pumping. Hydraulic gradients ranged from 16 to 55 feet per mile (0.003 - 0.010 feet/foot), according to the 1948 study. The variation in values of these hydraulic characteristics is typical of glaciofluvial deposits, due to the stratification of materials during deposition as well as the slight influence of interbedded clay layers.

#### 3.4 Local Ground Water Hydrology

The ground water hydrology of the southwestern quadrant of South Bend, and the Torrington site in particular, is influenced primarily by the St. Joseph River. The site is located in an area which used to be the very bottom of the old St. Joseph-Kankakee River, the present day elevation places the site on a broad, flat plain which slopes very gradually to the northeast and the St. Joseph River. Thus, surface runoff in the area of the site is directed toward the river. Also, as indicated above and as noted on the map in Appendix G, the ground water moves northeast toward the river.

The Oliver Park well field is located approximately 4,000 feet due east of the site. This well field has been inactive for several years because a chemical spill from a nearby industry affected the quality of the ground water in the area. However, when pumping resumes from the approximately 30 wells in the park, the ground water flow near the Torrington site will

remain the same, since the transmissibility of the local Oliver Street well field area is high. Testing during the 1948 study indicated that the transmissibility of the soils at the Oliver Park well field is approximately 500,000 gallons per day per foot. The 1948 study (see Appendix G,) indicates that the hydraulic gradient in the local area of the Torrington site is approximately 0.003 feet per foot. Using a thickness of saturated aquifer of 180 feet, the ground water flow rate would be approximately one foot per day.

Water levels recorded in each of the wells on the site indicate that piezometric elevations range from 703.9 feet to 704.2 feet and average 704.0 feet. These elevations do not vary significantly from those found during the 1948 study but are higher than those recorded during the latter 1962 study. These differences are likely due to yearly variations, seasonal variations, and the influence of industrial and economic activity in the South Bend area.

### 3.5 Surface Water Hydrology

As noted above, the site is located on a broad, flat plain which slopes gradually to the northeast and the St. Joseph River. No streams or creeks are present to facilitate drainage. Soil samples taken on the site, and a review of local boring and well logs, indicate that the upper surface soils are generally medium to coarse sands. These factors suggest that precipitation normally percolates through the soil where it falls and that runoff is not significant except in areas where development has displaced the relatively pervious surface soils with impervious surfaces such as asphalt and building materials. At the site in particular, surface waters on the north and east sides (where a major thoroughfare and an access drive are the prominent physical features) are directed to the city

are directed to the city storm sewer system, while on the south and west of the grounds, the surface water is sumped and drained into the pond system. Surface water in the ponds percolates into the soil and may be synonymous with the water table at some times of the year. Sediments found in these ponds probably slow, but do not prevent, the recharge of the water into the upper aquifer.

## 4.0 ENVIRONMENTAL ASSESSMENT

### 4.1 Introduction

In the course of gathering data for the environmental assessment of the site, water samples were obtained from four principal sources:

1. Surface water samples were obtained from Pond Nos. 1, 2, 4, and 5.
2. Ground water samples from the upper aquifer were obtained from Well Nos. W-1 through W-5, and S-3.
3. Ground water samples from the lower aquifer were obtained from Torrington Well Nos. 3 and 4.
4. Samples of municipal water available at the site and used in drilling were taken from the drinking water fountain in the guardhouse.

Two samples were (generally) obtained at each sampling location and identified for separate PCB and volatile organic analysis.

There were two principal sources for soil samples obtained during the gathering of data for the environmental assessment of the site:

1. Soil sediment samples were obtained from Pond Nos. 1 through 5.
2. Primarily, granular soil samples were obtained from the unsaturated soils above the upper aquifer at Well Nos. W-1 through W-5 and S-3, and from Boring Nos. A-1 through A-7.

At least one soil sample was selected from each sampling location according to the guidelines discussed in Section 2.0 of this report. Each soil sample was analyzed for both PCBs and volatile organics.



All water and soil samples obtained in the field were forwarded to Gulf Coast Laboratories, Inc. of Park Forest, Illinois. Gulf Coast Laboratories, Inc. has recently been serving Region V of the U. S. EPA as its primary subcontractor for PCB analysis.

PCB analyses were performed using hexane methylene chloride extraction for the water samples and hexane-acetone extraction for the soil samples. The PCB analyses were performed using a gas chromatograph with electron capture detection, and the detection limits under this procedure for water and soil samples were, respectively, 0.0001 ppm and 5 ppm.

Water and soil samples were analyzed for volatile organics using Method 624 as recommended by the U.S. EPA, and the detection limit under this method was 0.01 ppm for water samples. Due to interference from non-volatile hydrocarbons, a detection limit of .1 ppm was used for all soil samples. A list of the volatile organic compounds analyzed for under Method 624 is presented in Table 1.

The results of all laboratory tests performed on water and soil samples retrieved from the site are presented in Appendix E and these results are summarized on Figure 2. The laboratory results on the soil samples are reported on a wet weight basis.

#### 4.2 Surface Water Assessment

The laboratory test results for surface water samples retrieved from Pond Nos. 1, 2, 4, and 5 reveal that PCBs and volatile organics were not detected. Except for the surface water sample from Pond No. 4, all PCB test results were below the general method detection limit of .0001 ppm. An unidentified compound present in the Pond No. 4 water sample produced interference which resulted in a unique PCB detection limit for this test of about 0.003 ppm. All laboratory tests on surface water samples indicate volatile organic compound concentrations which were below the general method detection limit of 0.01 ppm.

Since the laboratory test results indicate no PCBs or volatile organics in the surface water, remedial actions will not be required with respect to the surface water at the site.

#### 4.3 Upper Aquifer Ground Water Assessment

Laboratory PCB analyses of ground water samples retrieved from wells installed in the upper aquifer at the site indicate that PCB concentrations were below the general method detection limit of .0001 ppm in every instance.

Volatile organics were not detected in the ground water samples from Well Nos. W-1 and W-3 on the east side of the site. However, several halogenated volatile organic\* species were detected in the ground water of the upper aquifer at Well Nos. W-2, W-4, W-5, and S-3. The volatile organic compounds encountered and their respective concentrations are shown on the following table.

<u>Well No.</u>	<u>Volatile Organic Compound</u>	<u>Concentration, ppm</u>
W-2	1,1-dichloroethane (DCA)	0.030
	1,1,1-trichloroethane (TCA)	0.030
W-4 ✓	1,1-dichloroethane	0.065
	1,1-dichloroethylene (DCE)	0.020
	1,1,1-trichloroethane	0.285
W-5	1,1-dichloroethane	0.014
	1,1,1-trichloroethane	0.055
S-3 ✓	1,1-dichloroethane	3.23
	1,1-dichloroethylene	0.15
	1,1,1-trichloroethane	4.90

\*A halogenated volatile organic is an organic compound with either fluorine, chlorine, bromine, or iodine replacing at least one of the hydrogen atoms. In the above compounds, chlorine replaces the hydrogen.

In addition, mineral spirits at 0.175 ppm were detected in the ground water sample from S-3. This indicates a series of peaks on the gas chromatograph which are not specifically identifiable as one of the compounds from Table E-2. The laboratory has identified this chromatograph pattern as water solubilized mineral spirits, or the volatile fraction of a light hydrocarbon.

Regulations governing the acceptable level of halogenated organics in ground water have not been promulgated to date by either the U.S. EPA or the state of Indiana. The U.S. EPA has recently proposed "Recommended Maximum Contaminant Levels" (RMCLs) for some of the halogenated organics<sup>(3)</sup>. Although these are not regulatory levels, it appears that the level for TCA may be set at 0.1 to 0.3 ppm, and DCE at 1 to 5 ppb. The state of New Mexico has set a limit for DCE in potable ground water of 0.005 ppm. Limits for TCA have not been proposed by regulatory agencies to date.

The apparent range of proposed federal rulemaking, other state regulations, and precedence at other Indiana locations indicate that some form of remedial action will be required to improve the water quality in the vicinity of W-4 and S-3.

#### 4.4 Lower Aquifer Ground Water Assessment

The laboratory test results for samples of ground water from the lower aquifer retrieved from these deep wells indicate that neither PCBs or volatile organic compounds were present at concentrations above the respective detection limits.

The absence of detectable PCB or volatile organic compound concentrations in ground water samples from the lower aquifer is significant. This indicates that the halogenated volatiles have solubilized in the upper

aquifer and that the clay aquitard has been effective in confining the volatile organic compounds to the upper aquifer. It also indicates no degradation of water quality in the lower aquifer, the primary production zone for this region.

#### 4.5 Pond Soil Sediment Assessment

Laboratory test results for samples of soil sediments retrieved from Pond Nos. 1 through 5 provide no evidence of the presence of PCBs. All PCB analysis results were below the general method detection limit of 5 ppm.

Soil sediment samples taken from Pond Nos. 1 through 4 displayed volatile organic compound concentrations which were below the general method detection limit of 0.1 ppm. Mineral spirits was, however, encountered in the soil sediment sample from Pond No. 5 at a concentration of 0.360 ppm.

Visual inspection of the soil sediments from the ponds indicates that they contained oil. However, there is no evidence that the oil is affecting the quality of pond water or ground water in the upper aquifer. Since mineral spirits were not detected in the ground water samples from the downstream Wells W-1 through W-5, the pond sediments are not affecting the ground water quality and no remedial action will be required for the ponds.

#### 4.6 Site Subsoil Assessment

The laboratory analyses for all soil samples retrieved from wells and borings indicate that PCB concentrations were below the detection limit of 5 ppm. These test results are consistent with all other data gathered at the site, and they indicate again that PCBs are not present at the site.

Halogenated volatile organic compounds were encountered at several well and boring locations on the west side of the site. Locally, concentrations of some compounds were high. The soil samples at the well and boring locations were retrieved primarily above the ground water level and represent an assessment of the source zone affecting surface water and ground water quality at the site.

Mineral spirits were encountered in the upper 10 feet at all well and boring locations. Laboratory test results indicate that the concentrations of mineral spirits in these soil samples varied from 230 ppm (Well No. W-1, 10-foot depth) to 32,000 ppm (Well No. S-3, 5-foot depth). Of approximately 20 test results concerning concentrations of mineral spirits in soil samples, about half were below and half were above the 2,500 ppm concentration level.

At four of the thirteen well and boring locations, significant concentrations of 1,1,1-trichloroethane (1,1,1-TCA) were encountered. TCA concentrations in the soil samples varied from 440 ppm (Well No. S-3, 5-foot depth) to 100,000 ppm (Boring No. A-1, 5-foot depth). TCA concentrations in the soil samples were above the detection limit at Well No. S-3 and at Boring Nos. A-1, A-4, and A-5.

Toluene was encountered at four of the thirteen well and boring locations. Those locations were Well No. S-3 and Boring Nos. A-1, A-3, and A-4. Toluene concentrations in the soil samples varied from 24 ppm (Well No. S-3, 0.5-foot depth) to 1,300 ppm (Boring A-3, 1-foot depth).

In addition, benzene was detected at a concentration of 0.170 ppm in the soil sample retrieved from near the ground surface at Well No. W-4. One soil sample taken from the six-foot depth at Boring No. A-4 displayed 1,1-dichloroethane at a concentration of 1,270 ppm.

After hand augering had been completed to the approximate elevation of the water table at Boring No. S-3, a grab sample of the water which had seeped into the hole was obtained. A water sample obtained in this manner is not a valid representation of the ground water at Boring No. S-3, but the laboratory test results on such a sample do represent compounds that are present in the immediate vicinity of the boring. This grab sample displayed mineral spirits (7.3 ppm), 1,1-dichloroethylene (0.290 ppm), 1,1-dichloroethane (9.8 ppm), 1,2-dichloroethane (0.585 ppm), and toluene (0.140 ppm).

The high concentrations of volatile organic compounds encountered in the soils above the water table will provide a primary source for increased degradation of ground water quality if left in place. These materials are rapidly transported by ground water generally spreading in an elliptical pattern in the downgradient direction. The soils above the water table in the area south of the existing loading dock should be removed as promptly as is feasible.

#### 4.7 Municipal Water Sample

Municipal water available at the site was used during drilling operations. In order to certify the suitability of this water for use in the environmental assessment, and in order to provide a background or control water sample for comparison with the surface and ground water samples from the site, one municipal water sample was obtained. The sample was taken from the drinking fountain in the guardhouse. The sample was found to contain no detectable concentrations of volatile organic compounds or PCBs.

## 5.0 SUMMARY AND CONCLUSIONS

Canonie Engineers' environmental assessment of July and August, 1984, examined the soil, ground water, pond sediment, and surface water quality at the Torrington site. The important findings of the investigation are:

1. PCBs were not detected in the soil, pond sediment, surface water, or ground water.
2. The volatile fraction of mineral spirits (light hydrocarbons) were detected in most soil samples. 1,1,1-Trichloroethane (TCA) and 1,1-dichloroethane (DCA) were detected in high concentrations in four of the five borings between the waste oil tank and the two 20,000-gallon fuel oil tanks.
3. Volatile organic compounds were not detected in the ground water at Wells W-1 and W-3. Trichloroethane was detected in Wells W-2, W-4, W-5, and S-3 at levels ranging from 4.9 ppm to 0.030 ppm. The volatile compounds DCE and DCA were also detected in the ground water at W-2, W-4, W-5, and S-3.
4. Volatile organic compounds were not detected in the pond sediments, except in Pond No. 5 where mineral spirits were found at a concentration of .360 ppm. Visual inspection indicates that oil is present in the pond sediments.
5. Volatile organic compounds were not found in the surface water of the ponds.

6. The volatile fraction of mineral spirits were not detected in the ground water samples from Wells W-1 through W-5 which are down-gradient from the ponds.

The environmental assessment has shown that oils in the pond sediments and soils at the site are not degrading the surface water and ground water at the site. These oils and their associated volatile fractions are biodegraded by normal soil bacteria and will not persist in the environment. Therefore, no remedial site actions are required to address the pond sediments or oily soils.

The environmental assessment has shown that halogenated volatile organics are present in the ground water near the west side of the site at levels above generally acceptable limits for potable water. These halogenated volatile organics are also present in the overlying soils at concentrations several orders of magnitude higher than in the ground water. This source of halogenated volatile organics will continue to migrate into the ground water beneath the site and may be degrading off-site ground water quality.



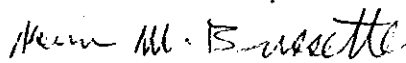
## 6.0 RECOMMENDATIONS

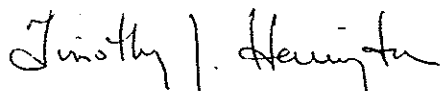
Canonie recommends that a remedial action to control the halogenated volatile organics at the site be pursued by the implementation of the following two initial efforts:

1. Install two ground water monitoring wells downgradient of S-3. The wells will be located by the old boiler area (see Figure 2). The wells will be screened at the bottom of the upper aquifer, approximately 50 to 60 feet, and the top of the upper aquifer, approximately 20 to 30 feet. The volatile organic water quality in these wells will be a critical factor in assessing the extent of ground water degradation and remedial action requirements.
2. Install shallow soil borings on the west side of the plant to define the vertical and horizontal extent of the halogenated volatile organics in the soil. Borings will be taken on a 25-foot by 25-foot pattern. The borings will cover a rectangular area from the fence on the west property line to the building and from the waste oil tank to the two fuel oil tanks. All borings will be drilled to the water table with at least three samples recovered and analyzed from each borehole.

These tasks will provide the information for defining the extent of required remedial action for the soil in the waste oil tank area and for defining the extent of ground water degradation downgradient of the waste oil tank area.

Respectfully submitted,

  
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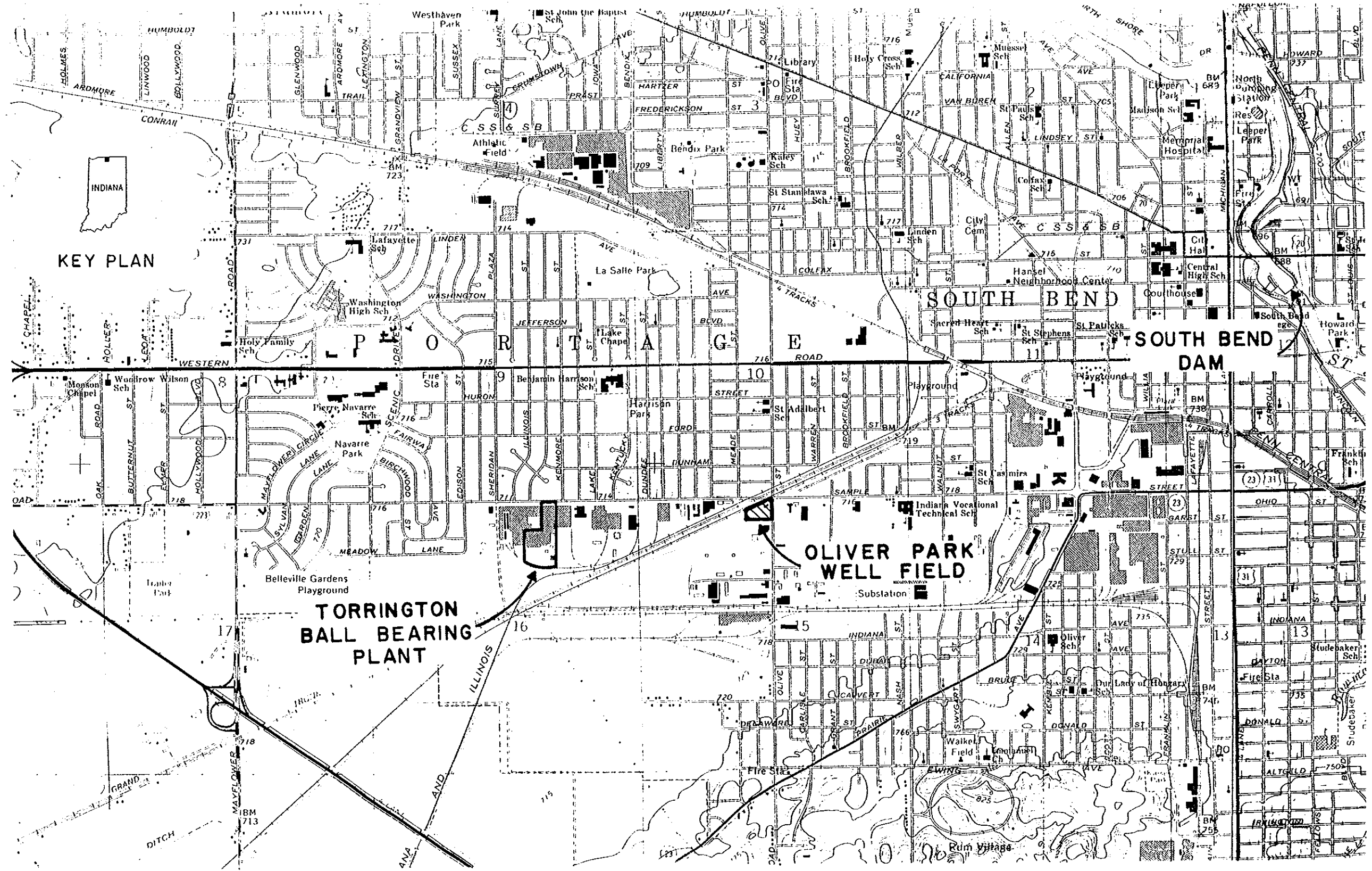


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2. Rosenshein, J. S., and Hunn, J. D., "Ground-Water Resources of Northwestern Indiana", Geological Survey, United States Department of the Interior, Bulletin No. 15, 1962.
3. Environmental Protection Agency, "National Primary Drinking Water Regulations; Volatile Synthetic Organic Chemicals", EPA 40 CFR Part 141, Federal Register, Vol. 49, No. 114, June 12, 1984.



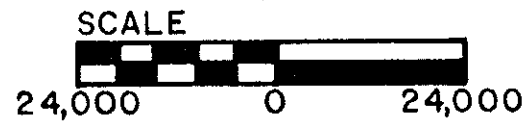
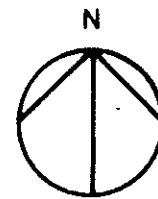
DRAWING 83-182-B5  
 NUMBER 7758  
 CHECKED BY KAC 1-25-84  
 APPROVED BY FJH 7-25-84  
 DRAWN BY AP 9-14-84



**REFERENCES:**

Mapped, edited, and published by the Geological Survey  
 Revised in cooperation with Indiana Department of Natural Resources  
 Control by USGS, NOS/NOAA, and Indiana Flood Control  
 and Water Resources Commission  
 Planimetry by photogrammetric methods from aerial photographs  
 taken 1952. Topography by planetable surveys 1957-1958  
 Revised from aerial photographs taken 1967. Field checked 1969  
 Depth curves and soundings compiled from USGS-Indiana  
 Department of Natural Resources lake charts

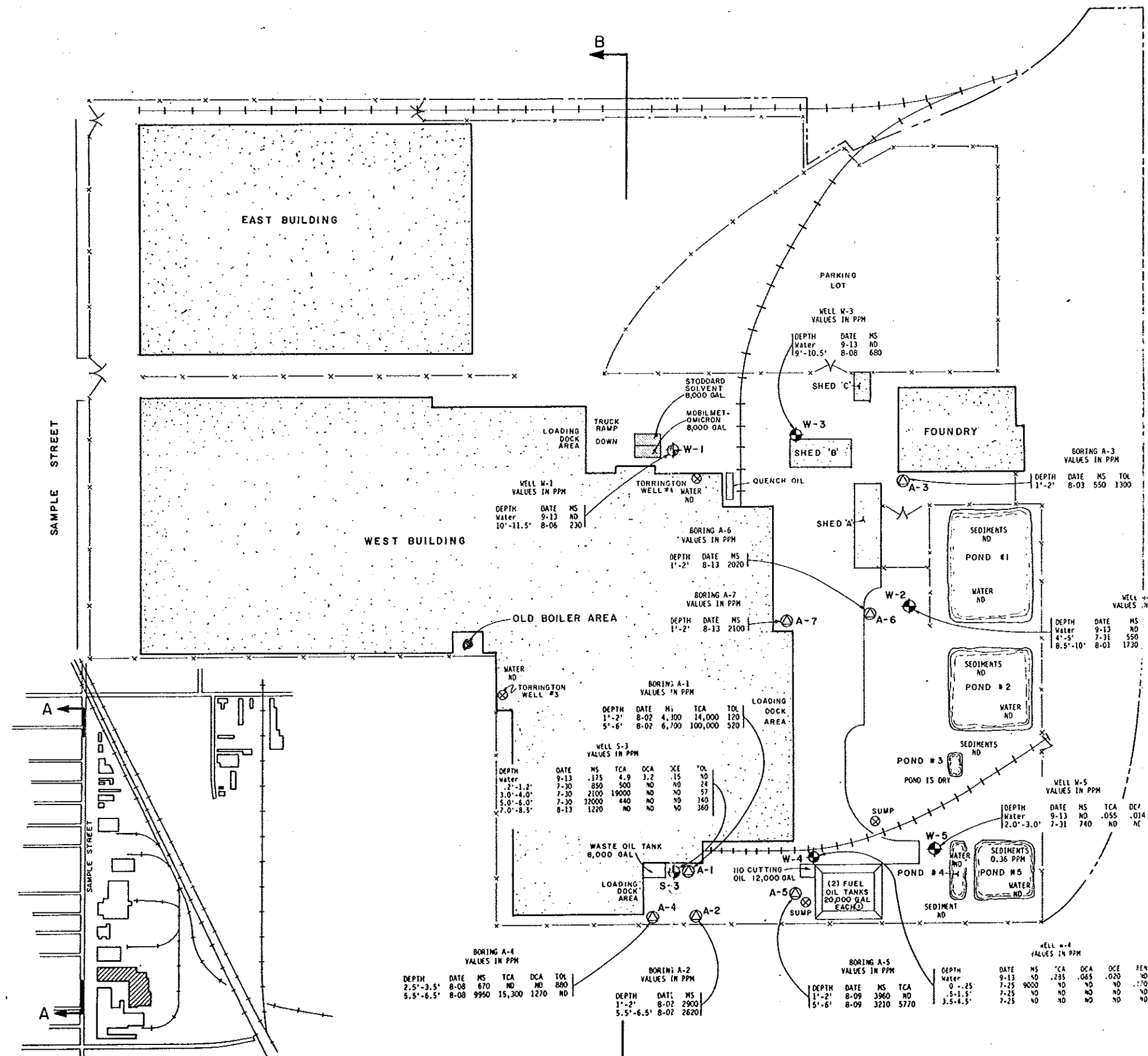
SOUTH BEND EAST, IND.  
 N4137.5—W8607.5/7.5  
 SOUTH BEND WEST, IND.  
 N4137.5—W8615/7.5



SITE LOCATION  
 TORRINGTON COMPANY  
 BANTAM BEARING DIVISION  
 SOUTH BEND, INDIANA  
**BARNES AND THORNBURG**  
 FIGURE 1

**Canonic**Engineers

REVISIONS NO. DATE  
 DRAWN BY RS 9-14-84 CHECKED BY K.M.B. 9-25-84 APPROVED BY T.P.H. 9-25-84  
 DRAWING NUMBER 83-182-E4



**LEGEND**

- UNDERGROUND TANKS
- ABOVEGROUND TANKS
- RAILROAD
- PROPERTY LINE
- FENCE LINE
- SOIL BORING LOCATION
- MONITORING WELL

**CONTAMINANT ABBREVIATIONS**

MS = MINERAL SPIRITS  
 TCA = 1,1,1 TRICHLOROETHANE  
 DCA = 1,1,1 DICHLOROETHANE  
 OCE = 1,1,1 DICHLOROETHYLENE  
 TOL = TOLUENE  
 BEN = BENZENE  
 ND = NOT DETECTED

**BORING GROUND SURFACE ELEVATION**

BORING	GROUND SURFACE ELEVATION
W-1	713.46
W-2	712.42
W-3	712.90
S-3	710.38
W-4	710.31
W-5	712.33
A-1	710.10
A-2	710.40
A-3	712.47
A-4	710.41
A-5	710.05
A-6	710.55
A-7	713.27

**NOTES**

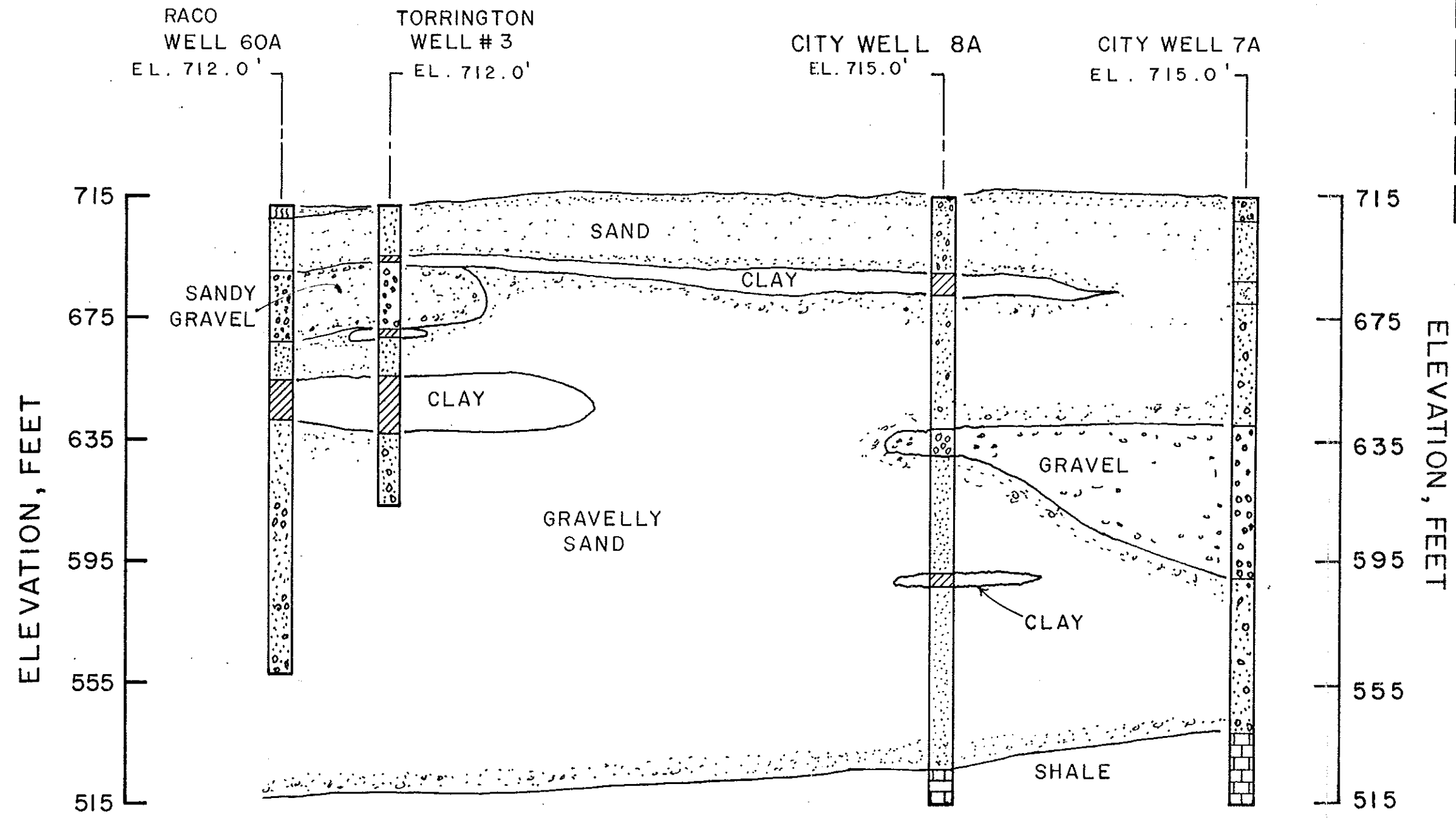
- 110 CUTTING OIL TANK AND FUEL OIL TANKS COVERED BY SOIL MOUND.
- TABLES LIST VOLATILE COMPOUNDS DETECTED AT EACH WELL. PCB WAS NOT DETECTED ANYWHERE ON THE TORRINGTON SITE.
- ALL SAMPLES WERE TAKEN IN 1984.

SITE PLAN AND TEST RESULTS  
 TORRINGTON COMPANY  
 BANTAM BEARING DIVISION  
 SOUTH BEND, INDIANA  
 PREPARED FOR  
**BARNES AND THORNBURG**






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**GENERAL SITE PLAN**  
N.D.T.S.

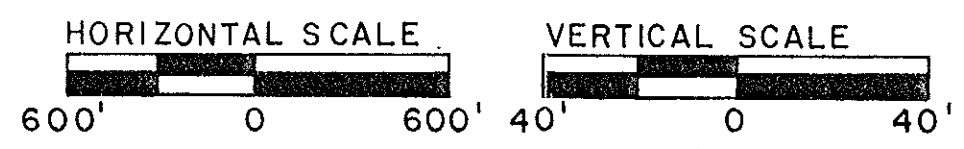
DRAWING NUMBER 83-182-B2  
 CHECKED BY V.P.M.  
 APPROVED BY T.P.M.  
 RS 9-12-84  
 DRAWN BY



**LEGEND**

-  SAND
-  GRAVEL
-  CLAY
-  SILT
-  SHALE

ELEVATION, FEET  
 715  
 675  
 635  
 595  
 555  
 515



SOIL PROFILE A-A  
 TORRINGTON COMPANY  
 BANTAM BEARING DIVISION  
 SOUTH BEND, INDIANA  
 BARNES AND THORNBURG  
 FIGURE 3

DRAWING NUMBER 83-182-E3

9-26-84  
9-26-84

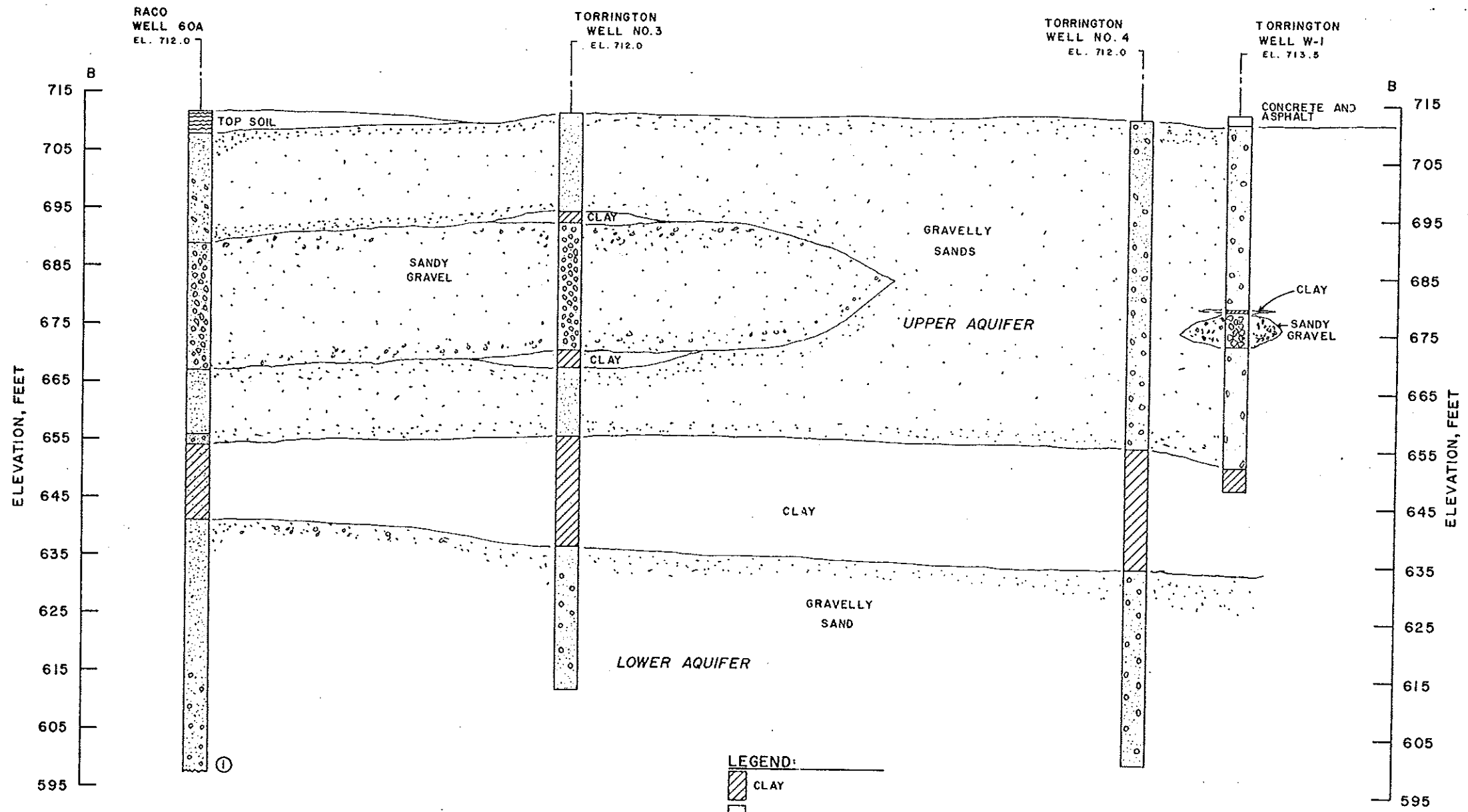
LMR  
TJH

CHECKED BY  
AP 9-13-84 APPROVED BY

DRAWN BY

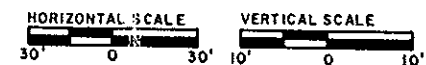
NO. DATE

REVISIONS



**NOTES**  
 1. BORING CONTINUES AS GRAVELLY SAND TO ELEVATION OF 658'.

- LEGEND:**
- CLAY
  - SAND
  - GRAVEL
  - SANDY GRAVEL
  - GRAVELLY SAND



SOIL PROFILE B-B  
 TORRINGTON COMPANY  
 BANTAM BEARING DIVISION  
 SOUTH BEND, INDIANA  
 PREPARED FOR  
**BARNES AND THORNBURG**

**CanonieEngineers**

DATE: 9-13-84  
 SCALE: AS SHOWN  
 FIGURE 4  
 DRAWING NUMBER 83-182-E3



WORK PLAN  
ENVIRONMENTAL ASSESSMENT  
TORRINGTON COMPANY  
BANTAM BEARING DIVISION  
SOUTH BEND, INDIANA

## 1.0 INTRODUCTION

The Environmental Assessment for Torrington's Bantam Bearing Division in South Bend, Indiana, is proposed to detect the ground water, surface water, and soil conditions at the facility in summer, 1984. The detection activities are centered around the two underground raw product storage areas and the storm water and cooling water ponds on the south end of the plant, Figure A-1. The goal of the environmental assessment is to determine the environmental conditions at the time of the shutdown of the plant and to thereby ensure that no unsafe environmental conditions have resulted due to Torrington's operation.

### 1.1 Background

In January, 1984, a preliminary analysis was performed on the sediments from the ponds, the pond waters, and ground water from the two production wells at the facility. The results of this program were reported by EIS Environmental Engineers, Inc., of South Bend, Indiana. The sediments from the ponds were analyzed for EP toxicity using method 1310, SW-846 "Test Methods for Evaluating Solid Waste/Physical Chemical Methods". No EP toxic metals were leached from the pond sediments. The sediments from the ponds were also analyzed for volatile organics. Trichloroethane was found in the bottom sediments of pond No. 4 at a concentration of 70 parts per million (ppm). Methylene chloride and dichloroethane were also detected at levels from 0.56 to 2.8 ppm. The water samples from the ponds indicated that methylene chloride, dichloroethane, trichloroethane, and tetrachloroethylene

were present in concentrations of less than 30 parts per billion (ppb). The water samples collected from the two production wells at the facility indicated levels of tetrachloroethylene of 2.6 and 3.1 ppb. Both of these reported detection levels are below the normal 10 ppb detection limits for tetrachloroethylene in a standard gas chromatograph scan. There is no indication that the low levels reported for some of the volatile organics were actually confirmed by mass spectography. The pond sediments were also analyzed for PCBs using a 2 ppm detection limit. The sediment from pond No. 4 had a reported concentration of 5 ppm PCB.

## 2.0 FIELD PROGRAM

The Environmental Assessment includes an investigation and assessment of soil, surface water, and ground water at the facility. The assessment includes a planned program for sampling the soil, surface water and ground water using a sampling and analytical protocol that controls the quality of the samples obtained for analysis. The protocol for the soil and ground water sampling, respectively, are presented in Attachments A and B.

The proposed soil sampling program includes the following three areas.

1. Soil samples from boreholes near the underground storage tanks. The proposed boring locations are shown on Figure A-1 by S-1, S-2, S-3, and S-4. Soil samples will be recovered from near the top elevation of the underground tank or the ground surface, whichever is lowest, and from other depths down to the ground water table. A minimum of three soil samples will be recovered from each of the proposed borings. Soil samples from the boreholes will be selected for PCB analysis based on their physical appearance and for volatile organics analysis based on organic vapor analysis using a Century Portable Organic Vapor Analyzer. A minimum of two samples from each boring will be submitted for both PCB and priority pollutant volatile organics analysis.
2. Sediments from each of the five ponds will be taken and analyzed for PCBs and volatile organics. The samples will be taken using 1-1/2 inch diameter brass tubes for volatile organics analysis and

bulk sampling and compositing for the PCB analysis. The brass tube for the volatile organics analysis will be recovered at the inlet to the pond.

3. Four or five locations will be selected for near surface soil sampling from approximately the ground surface to a depth of three or four feet. The locations of these samples will be chosen in the field to correspond to those areas where apparent oil staining of the surface soils is noted. A minimum of six samples is expected for this activity.

The soil samples from the borings will be recovered using a standard 1.5-inch diameter split-spoon with brass liner tubes. The tubes and split-spoon sampler will be cleaned prior to each individual sampling event using the procedure set forth in Attachment A. The brass tubes will be removed from the sampling spoon immediately upon removal from the borehole and will be capped and sealed to prevent the loss of volatile compounds. A Century Organic Vapor Analyzer will be utilized at each borehole location to determine the presence of volatile organics. The composite samples of pond sediments will be recovered from six locations around each pond and mixed in a disposable tin pan to create a uniform sample. The brass tubed samples from the ponds will be treated the same as the boring samples. The near surface soils will be sampled by using either a hand operated sampling tube device with Teflon liners or by a hand excavation and soil compositing.

Surface water samples will be recovered from each of the five ponds. Two samples will be taken from each pond, one for volatile organics analysis, the other for PCB analysis. Samples will not be taken during or immediately after heavy rainfall. The procedures for collecting the water samples are described in Attachment B.

The aquifer beneath the facility is subdivided into an upper and lower zone by a clay layer at approximately 60 feet. Ground water samples will be taken from the five proposed detection wells in the upper zone (see Figure A-1 for proposed depths) and from the two production wells at the facility. Presently, it is anticipated that a single monitoring zone will be established at each proposed well location. If a light hydrocarbon phase is present in the soil above the water table, temporary access will be provided to obtain a sample for analysis.

Wells W-1 and W-3 will extend down to the dividing clay layer. These wells will be depth integrating wells screened at the bottom of the boring with a gravel pack extending up to the ground water surface. Wells at locations W-2, W-4, and W-5 will be shallower wells extending to a maximum depth of 35 feet. These wells will monitor and detect in the upper zone of the aquifer, and will be able to detect the presence of any substance entering directly from the ponds into the ground water system. These wells will be gravel packed from the ground water surface to the bottom of the borehole.

All five wells will be installed by the cable tool method using an eight-inch diameter casing. The wells will be constructed of 5-inch diameter PVC Johnson monitoring pipe and with threaded joints. The screen will be a five-foot section of machine slotted PVC. The monitoring zone will be gravel packed to match the screen and formation characteristics. The eight-inch casing will then be withdrawn and a cement bentonite grout will be placed from the water table to the ground surface with a protective steel locking cap installed over the well casing.

The five new detection wells and the two production wells at the facility will be sampled and analyzed for PCBs and volatile organics. The sampling protocol is presented in Attachment B. If the upgradient ground water

quality is essential to the assessment of conditions at the facility, samples will be recovered from an upgradient production well located on the adjoining property.

The analysis of the water and soil samples will be performed by Gulf Coast Laboratories of Park Forest South, Illinois, U.S. EPA Region 5's primary subcontractor for PCB analysis. The volatile organics will be analyzed using method 624 with a detection limit of approximately 10 ppb for the listed materials. The PCB analysis will be performed using a hexane-acetone extraction on the soil samples with a detection limit of 5 ppm. The PCB analysis for water will be by methylene chloride extraction with a detection limit of 0.1 ppb. The analysis will be run on a gas chromatograph with electron capture detection.

### 3.0 ASSESSMENT REPORT

An Environmental Assessment report will be prepared using both the data collected during the field program and data available from the regional literature. The report will include the following information.

1. A discussion of the regional hydrogeology at the facility.
2. A compilation of the site data collected during the field program, including soil cross sections and plans.
3. A discussion of the chemical analysis results.
4. An assessment of the raw data, including conclusions and recommendations to ensure that no unsafe environmental condition exists at the facility.

ATTACHMENT A  
SOIL SAMPLING PROTOCOL

Introduction

This protocol provides guidance and procedures for the collection, preparation, and control of soil samples collected at the Torrington Plant. The procedures outlined herein are intended as a guide for the field sampling team; however, the site conditions may necessitate modifying the protocol in order to expedite the field sampling operations. All deviations from the procedures outlined herein will be noted on the field logs and included in accompanying reports.

The purpose of this sampling protocol is to outline the methodology for recovering a representative soil sample for chemical analysis. The protocol includes a listing of the equipment to be used in the program, the cleaning procedures for the equipment, the soil sampling procedures, and the sample control procedures.

Equipment

1. Cable-tool well rig;
2. Standard 1-1/2 inch diameter split-spoon sampler;
3. Precleaned, brass sample tubes with caps;
4. Reagent grade hexane;
5. Scrub brushes;
6. Spatulas;
7. Squeeze bottles;
8. Distilled water;
9. Surgical gloves;
10. Precleaned standard glass sampling bottles.



### Equipment Cleaning

Prior to sampling at a location, all tools and equipment surfaces which will be placed in contact with the sampled soil or water will be cleaned to remove soil from the previous operation. Cleaning will be conducted in the following manner:

- A. All interior and exterior sampling equipment surfaces will be cleaned with water to remove any soil from the previous sampling.
- B. The sampling equipment that will come in direct contact with the soil sample will be flushed, washed, or wiped with reagent grade hexane. Care will be taken to recover all excess solvent used in the cleaning phase in a drip pan at each test location. Health and safety requirements appropriate for the use of solvents will be practiced. This cleaning procedure will apply to both sampling equipment that is reused and sampling equipment or devices that are used only one time.
- C. All surfaces that are hexane rinsed will be final rinsed with distilled water.

### Soil Sampling

At each sampling location, a clean, decontaminated, 1-1/2 inch brass sampler tube will be pushed either manually or as a liner inside the split-spoon sampler. The sampler will then be quickly extracted and capped and sealed, followed by a thorough rinse of the outside of the sampling tube using fresh water. The sample will then be logged, noting sample location and depth, labeled, and finally packed in ice. Any odors, sheen,

oily appearance, or other unusual appearance will also be noted on the test pit or boring log. The amount of sampled material obtained and the depth of the sampling will be left to the discretion of the engineer, geologist, or technician controlling the sampling.

A Century Flame Ionization Organic Vapor Analyzer will also be used at each sampling location to monitor organic vapors. The results will be used to select sample locations and will be recorded on the test pit log.

To prevent migration of fluids from one level to another, borings will be backfilled with grout following completion of sampling activities.

#### Sample Control

The sample bottles or tubes containing the soils will be labeled with the date, laboratory ID, sampler's initials, and sample location and depth. The chain-of-custody form indicating the requested analysis will be completed by the sampler and, if PCB or volatile organics analysis is required, the sample packed in ice. At the end of the day the collected samples will be placed in a shuttle for delivery to the laboratory.

ATTACHMENT B  
GROUND WATER SAMPLING PROTOCOL

Protocol Intent

This Ground Water Sampling Protocol provides a uniform procedure for obtaining samples of water from ground water detection wells at the Torrington Plant. The protocol also provides a mechanism for obtaining field replicate, and trip blank samples to be used in evaluating field and laboratory techniques. Sections of this protocol may be modified to accommodate existing field conditions at the discretion of the field sampling team.

This protocol does not provide for replicate or fortified samples required for in-house validation of accuracy or precision by the testing laboratory. Standard quality assurance practices should be followed by the laboratory and calculated values of accuracy and precision reported with the ground water analytical results.

Equipment Cleaning

Sample bottles, bottle caps, and septums will be thoroughly washed with detergent, rinsed extensively with tap water, and then rinsed again with high purity deionized water. After washing and rinsing, sample bottles and components will be dried at a temperature of 105°C for a period of one hour. Sample bottles, bottle caps, and septums will be protected from all forms of solvent contact between the time of drying and actual usage at the sample site.

Prior to purging or sampling each well, all equipment surfaces which will be placed in the well or may come in contact with the ground water will be

cleaned to prevent the introduction of spurious materials. Cleaning will be accomplished either by flushing, washing, or wiping equipment components with reagent grade Hexane and then thoroughly rinsing with fresh deionized water, or alternatively steam cleaning all components that come in contact with the ground water. Care will be exercised to assure that normally wetted interior surfaces of pumps, bailers, hoses, tubes, or other components are properly cleaned. Health and safety requirements appropriate for the use of Hexane will be enforced.

Stainless steel wire, or cable, which can be properly cleaned after repeated usage, will be used for lowering and raising equipment in the wells. In the event that absorbent materials (i.e. rope or cord) are placed in the wells, they will be stored in dust tight containers until usage and the used portion will be discarded after completion of sampling at each well. Similarly, disposable surgical-type gloves will be worn while sampling and discarded after each well sample is completed.

All equipment components and critical openings (i.e. bailer slots, pump valves, etc.) will be visually inspected to assure they are free of soil particles or other solid material which may become dislodged during purging or sampling operations.

All equipment utilized in the actual augering or coring of a new well, as well as all casings which are withdrawn and reutilized, will be steam or pressurized hot water cleaned and flushed prior to commencement of work on a new well.

#### Well Purging and Sampling

Immediately prior to purging each well, the depth from top of well casing to top of water surface will be determined to the nearest 0.1 foot and

recorded as a portion of the well sample data. The top of well casing elevation will be determined to the nearest 0.1 foot by conventional survey methods.

Jetting methods will not be used for purging the monitor wells. The preferred method for purging and sampling of the monitoring wells is with a submersible type pump providing a uniform rate of discharge. Pumps causing aeration or agitation of the water are not to be used for sampling purposes. Teflon tubing will be used for intake/discharge lines as required for pump operation. The pump intake or suction end will be lowered to the well bottom and then raised one foot before starting the pump. In small diameter, low purging volume monitor wells, purging and sampling can be effected with a bailer constructed of stainless steel, glass, or Teflon-coated materials.

Initially, monitoring wells will be purged by removing a quantity of ground water equal to 3-4 times the volume of the well casing. If a well is evacuated during the purging operation, the well will be allowed to recharge for a period not exceeding 24 hours before sampling. An evacuated well which has not recovered sufficiently after 24 hours of recharge time to allow sampling to proceed will be deleted from the sampling sequence.

Purging methods, volumes, times, and any other pertinent information will be recorded and reported by the sampling team. Purged water will be disposed of at the site.

The ground water samples for volatile organics analysis will be placed in glass bottles fitted with caps having Teflon-faced silicon seals. The sample bottles will be 40 ml or larger in size. The ground water samples for PCBs will be one-liter samples with tin foil seals on the caps. Information to be shown on the bottle label will include:

1. Name of sampling group;
2. General site name, identification, or location;
3. Sampling date;
4. Sample identification.

Immediately prior to obtaining each ground water sample, the sample bottles and caps will be thoroughly rinsed two or more times with the final well purge water. Water samples for volatile organics analysis will totally fill the sample bottle in such a manner as to prevent air bubbles from passing through the sample and eliminating the entrapment of any air in the bottle. The sample bottles will be capped immediately after filling, inverted, and tapped to test for air bubbles. If any bubbles are observed, the sample will be discarded and a fresh sample obtained from the monitor well. Samples will be placed in an ice chest or similar container capable of maintaining a temperature between 5°C to 15°C (40°F to 60°F) for transporting to the laboratory. Unavoidable vacuum bubbles, which may form during storage as a result of sample contraction from cooling, shall not disqualify the analysis of a sample from inclusion in the final report. Air bubbles in the one-liter PCB water samples are not considered critical to the sample integrity.

In addition to the ground water sample set, a minimum of five percent (5%) of the sample bottles will contain city water as trip blanks.

DRAWING NUMBER 83-182-E1

6-17-84

T.H.

CHECKED BY

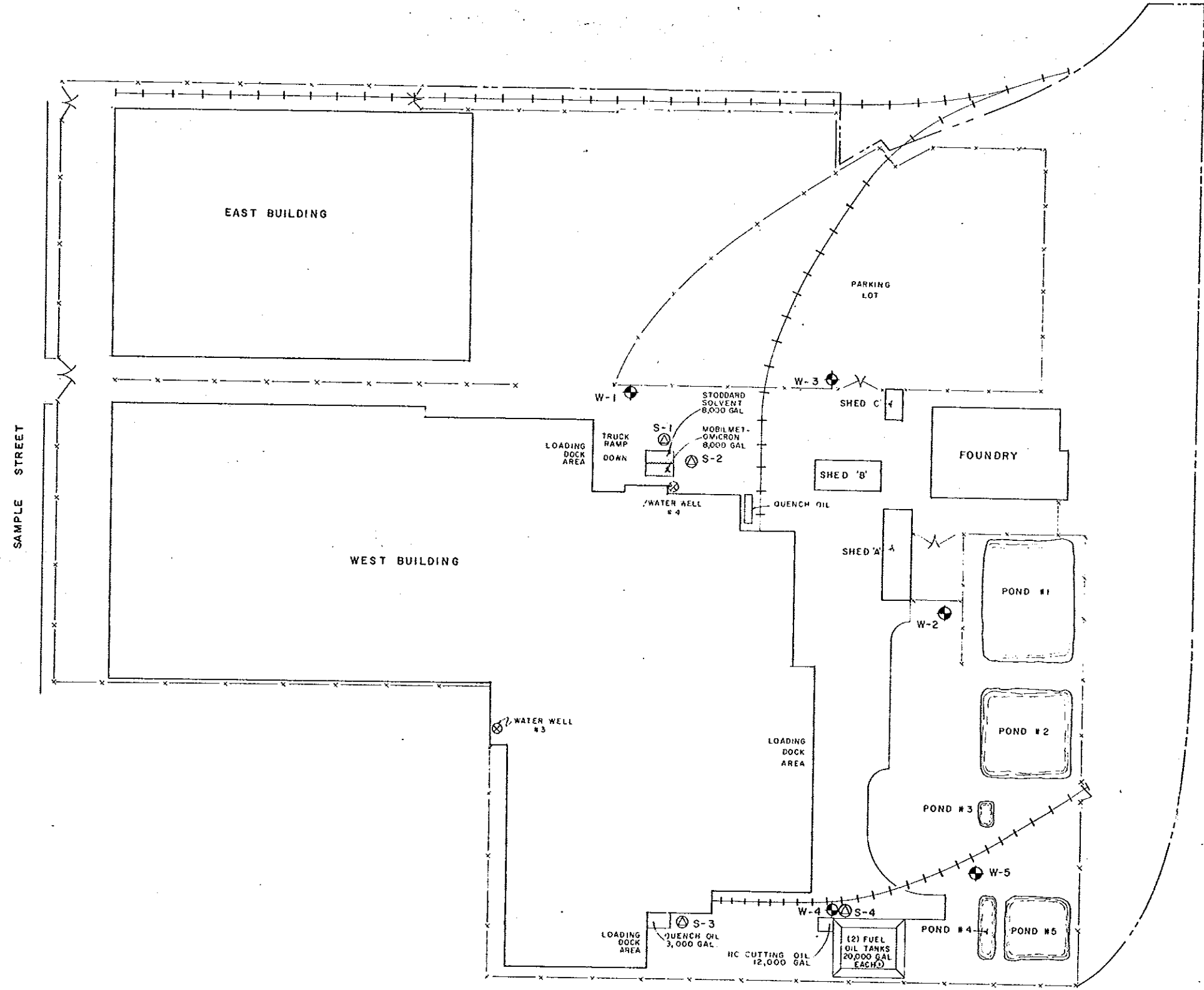
APPROVED BY

SP 5-8-84

DRAWN BY

NO. DATE

REVISIONS



LEGEND

- UNDERGROUND TANKS
- ABOVEGROUND TANKS
- RAILROAD
- PROPERTY LINE
- FENCE LINE
- S-4 PROPOSED SOIL SAMPLE LOCATION
- W-5 PROPOSED DETECTION WELL

PROPOSED DETECTION WELL MAXIMUM DEPTH

W-1	60'
W-2	35'
W-3	60'
W-4	35'
W-5	35'

NOTES

- ① NO CUTTING OIL TANK AND FUEL OIL TANKS COVERED BY SOIL MOUND.
- ② SOIL SAMPLING PROGRAM WILL ALSO INCLUDE SPOT SURFACE SOIL SAMPLES AND SEDIMENT SAMPLES FROM PONDS.
- ③ WATER SAMPLING PROGRAM WILL ALSO INCLUDE SURFACE WATER AND GROUND WATER FROM PLANT WATER WELLS.
- ④ DETECTION WELL DEPTHS AND SOIL SAMPLE LOCATION MAY BE VARIED IN THE FIELD TO ACCOMMODATE UTILITIES OR TO PROVIDE THE REQUIRED DATA.



SITE PLAN  
 TORRINGTON COMPANY  
 BANTAM BEARING DIVISION  
 SOUTH BEND, INDIANA  
 PREPARED FOR  
 BARNES AND THORNBURG

CanonicEngineers





## Boring Log Legend

### SAMPLE

No: (Number) Soil samples are numbered consecutively from the ground surface. Core samples are numbered consecutively from the first core run.

Type: SS= Split-Spoon (2" O.D.)  
PT= Piston Tube

ST= Shelby Tube  
CR= Core Run

A= Auger Cuttings

Interval: The depth of sampling interval in feet below ground surface.

### BLOW COUNT

The number of blows required to drive a 2-inch O.D. split-spoon sampler with a 140 pound hammer falling 30-inches. When appropriate, the sampler is driven 18 inches and blow counts are reported for each 6-inch interval. The sum of blow counts for the last two 6-inch intervals is designated as the standard penetration resistance (N) expressed as blows per foot.

### RECOVERY IN INCHES

The length of sample recovered by the sampling device.

### U.S.C.S SOIL TYPE

The Unified Soil Classification System symbol for recovered soil samples determined by visual examination or laboratory tests. Refer to ASTM D2487-69 for a detailed description of procedure and symbols. Underlined symbols denote classifications based on laboratory tests (ie: ML), all others are based on visual classification only.

### PERCENT MOISTURE

Natural moisture content of sample expressed as percent of dry weight.

### qu,TSF

Unconfined compressive strength in tons per square foot obtained by Hand Penetrometer. Laboratory compression test values are indicated by underlining.

### CONTACT DEPTH

The contact depth between soil layers is interpreted from significant changes in recovered samples and observations during drilling. Actual changes between soil layers often occur gradationally and the contact depths shown on the boring logs should be considered as approximate.

### SOIL DESCRIPTION AND REMARKS

Soil descriptions include consistency or density, color, predominant soil types, and modifying constituents.

COHESIVE SOILS			GRANULAR SOILS	
Consistency	qu (TSF)	Blows/Ft.	Density	Blows Per Foot
Very Soft	less than 0.25	0-1	Very Loose	4 or less
Soft	0.25 to 0.50	2-4	Loose	5 to 10
Medium Stiff	0.50 to 1.00	5-8	Medium Dense	11 to 30
Stiff	1.00 to 2.00	9-15	Dense	31 to 50
Very Stiff	2.00 to 4.00	15-30	Very Dense	over 50
Hard	more than 4.00	Over 30		

### PARTICLE SIZE DESCRIPTION

Boulder= Larger than 12 inches.  
Cobble= 3 to 12 inches.  
Gravel= 0.187 to 3 inches.  
Sand= 0.074 mm to 4.76 mm.  
Silt and Clay= Smaller than 0.074 mm

### DEFINITION OF TERMS

Trace= 5 to 12 percent by weight.  
Some= 12 to 30 percent by weight.  
And= Approximately equal fractions.  
( )= Drillers observation.

### PIEZO.

(Piezometer) Screened interval of the piezometer installation is denoted by cross-hatching.

### GENERAL NOTE

The boring logs and related information depict subsurface conditions only at the specific locations and dates indicated. Soil conditions and water levels at other locations may differ from conditions occurring at these boring locations. Also the passage of time may result in a change in the conditions at these boring locations.

### SOIL TEST BORING REFUSAL

Defined as any material causing a blow count greater than 100 blows/6 inches. Such material may include bedrock, "floating" rock slabs, boulders, dense gravel seams, or cemented soils. Refusal is usually indicated in fractional notation showing number of blows as the numerator and inches of penetration as the denominator.

# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. W-1

PAGE 1 OF 2

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4299.03, E 6082.64 \* SURFACE ELEV. 713.46

DRILLER J. BLATZ, PEERLESS-MIDWEST DATE: START 8/3/84 FINISH 8/8/84

DEPTH	SAMPLE				BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	No.	TYPE	INTERVAL		0	6	12							
			FROM	TO	6	12	18							
5	1	HS	2.0					3	SP			.4	REINFORCED CONCRETE,	
													.8	BLACKTOP PAVEMENT.
5	2	HS	5.0	6.0				12					DARK BROWN MEDIUM TO COARSE SAND, TRACE OF GRAVEL. OVA = 0.0 PPM.	
10	1	SS	10.0	11.5	10	12	14	14					LIGHT BROWN MEDIUM TO COARSE SAND, TRACE OF GRAVEL. OVA = 0.0 PPM.	
15													WATER ENCOUNTERED AT APPROXIMATELY 8.5 FT.	
20													LIGHT BROWN MEDIUM TO COARSE SAND, SOME GRAVEL.	
25														
30													LIGHT GRAY MEDIUM TO COARSE SAND, TRACE OF GRAVEL.	
35												34.0	VERY STIFF GRAY SANDY GRAVELLY	
									CL			34.5	CLAY,	
									GP				GRAVEL, SOME MEDIUM SAND.	
40												40.0		

\*PLANT COORDINATES

# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. W-1

PAGE 2 OF 2

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4299.03, E 6082.64 \* SURFACE ELEV. 713.46

DRILLER J. BLATZ, PFERLESS-MIDWEST DATE: START 8/3/84 FINISH 8/8/84

DEPTH	SAMPLE			BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	No.	TYPE	INTERVAL	0	6	12							
			FROM TO	6	12	18							
45								SP				BROWNISH-GRAY COARSE TO MEDIUM SAND, SOME GRAVEL.	
50												TRACE OF CLAY.	
55													
60											61.0		
65								CL				VERY STIFF GRAY SANDY GRAVELLY CLAY.	
											65.0		
												BORING TERMINATED AT 65.0 FT.	
												NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.	



# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. W-3

PAGE 1 OF 2

PROJECT NAME TORRINGTON BEARING BANTAM DIVISION

BORING LOCATION N 4173.35, E 6103.37 \* SURFACE ELEV. 712.90

DRILLER J. BLATZ, PEERLESS-MIDWEST DATE: START 8/8/84 FINISH 8/10/84

DEPTH	SAMPLE				BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
	No.	TYPE	INTERVAL		0	6	12							
			FROM	TO	6	12	18							
	1	HS	2.0	2.0				3				.4	REINFORCED CONCRETE.	
									SP			.8	BLACKTOP PAVEMENT.	
5	2	HS	5.0	6.0				12	SM-SP				BROWN GRAVELLY SAND FILL. OVA = 0 PPM. DARK BROWN MEDIUM SAND, TRACE OF GRAVEL, SILT, AND CLAY.	
10	1	SS	9.0	10.5	15	22	26	16	SP				LIGHT BROWN MEDIUM TO COARSE SAND, TRACE OF GRAVEL.  WATER ENCOUNTERED AT APPROXIMATELY 8.5 FT.	
15														
20														
25													LIGHT GRAY MEDIUM TO COARSE SAND, SOME GRAVEL.	
30													TRACE OF CLAY.	
35														
40														
													NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.	

\*PLANT COORDINATES



# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. W-4

PAGE 1 OF 1

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4112.18, E 5579.40 \* SURFACE ELEV. 710.31

DRILLER J. BLATZ, PEERLESS-MIDWEST DATE: START 7/27/84 FINISH 7/30/84

DEPTH	SAMPLE		BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
	No.	TYPE	INTERVAL FROM	TO	0							
5	3	HS	0	.25							OILY BLACK SAND WITH GRAVEL. OVA = 80 PPM. BROWN MEDIUM TO COARSE SAND, TRACE OF GRAVEL. GRAY MEDIUM TO COARSE SAND, TRACE OF GRAVEL. OVA = 0.0 PPM.	
	4	HS	.5	1.5								
	1	HS	3.5	4.5								
	2	HS	4.5	5.5								
10	1	SS	10.0	11.5							BROWNISH-GRAY GRAVEL AND MEDIUM TO COARSE SAND.	
	2	SS	11.5	13.0	4	4	5					
25									24.0			
35										34.0		
											BORING TERMINATED AT 34.0 FT.	
											NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.	

\*PLANT COORDINATES

# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. W-5

PAGE 1 OF 1

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 3994.81, E 5613.03 \* SURFACE ELEV. 712.33

DRILLER J. BLATZ, PEERLESS-MIDWEST DATE: START 7/30/84 FINISH 7/31/84

DEPTH	SAMPLE				BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
	No.	TYPE	INTERVAL		0	6	12							
			FROM	TO	6	12	18							
	2	HS	.5	.5				3	SP				BLACK MEDIUM TO COARSE SAND, TRACE OF CLAY AND SOME GRAVEL. OVA = 0.0 PPM.	
	1	HS	2.0	3.0				12						
5	3	HS	5.0	6.0				12					BROWN MEDIUM TO COARSE SAND, SOME GRAVEL.	
10	1	SS	8.5	10.0				9					ENCOUNTERED WATER AT 8.5 FT. CASING WENT DOWN 1 FT. WHILE BAILING 3 IN.	
15														
20														
25														
30											29.0		BROWN SANDY GRAVEL.	
35											35.0		TERMINATED BORING AT 35.0 FT.	
													NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.	

\*PLANT COORDINATES



# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. S-3

PAGE 1 OF 1

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4307.30, E 5552.18 \* SURFACE ELEV. 710.38

DRILLER J. BLATZ, PEERLESS-MIDWEST DATE: START 8/13/84 FINISH 8/13/84

DEPTH	SAMPLE			BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
	No.	TYPE	INTERVAL FROM TO	0 6 12	6 12 18								
5	1	HS	.2 1.2				12	SP			.2	BLACK SANDY GRAVEL, FILL (OIL STAINED). BROWN MEDIUM SAND, SOME GRAVEL. SEWAGE ODOR. BLACK MEDIUM SAND, SOME GRAVEL. OVA = 200 PPM. OVA = 500 PPM. OVA = 700 PPM. DARK BROWN MEDIUM SAND. STRONG ODOR. OVA > 1,000 PPM.  GRAY MEDIUM TO COARSE SAND, SOME GRAVEL. OVA = 200 PPM.  BROWN MEDIUM TO COARSE SAND, SOME GRAVEL. OVA = 100 PPM.	
	2	HS	1.4 2.4				12						
	3	HS	1.5 1.5				3						
	4	HS	3.0 4.0				12						
	5	HS	4.0 5.0				12						
	6	HS	5.0 6.0				12						
10	1	SS	7.0 8.5				14						
15													
20													
25											24.0		
												BORING TERMINATED AT 24.0 FT. WATER ENCOUNTERED AT APPROXIMATELY 6.5 FT.  NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.	

\*PLANT COORDINATES



# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. A-2

PAGE 1 OF 1

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4262.42, E 5524.42 \* SURFACE ELEV. 710.40

DRILLER K. BRISSETTE DATE: START 8/2/84 FINISH 8/2/84

DEPTH	SAMPLE				BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO
	No.	TYPE	INTERVAL		0	6	12							
			FROM	TO	6	12	18							
5	1	HS	.7					3	SM-SP				BLACK MEDIUM SAND, TRACE OF GRAVEL AND CLAY. OVA = 0 PPM. ORANGISH-RED SOFT CLAY, SOME SAND, BROWN MEDIUM TO COARSE SAND. OVA = 80 PPM. LIGHT BROWN MEDIUM TO COARSE SAND, OVA = 100 PPM. GRAY MEDIUM TO COARSE SAND OVA = 100 PPM.	
	2	HS	1.0	2.0				12	CL			1.2		
	3	HS	2.0	3.0				12	SP			1.7		
	4	HS	3.0	4.0				12						
	5	HS	5.5	6.5				12				6.5		
10													BORING TERMINATED AT 6.5 FT.	
													WATER ENCOUNTERED AT APPROXIMATELY 6.5 FT.	

NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.

\*PLANT COORDINATES



# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. A-4

PAGE 1 OF 1

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4315.37, E5526.21 \* SURFACE ELEV. 710.41

DRILLER K. BRISSETTE DATE: START 8/8/84 FINISH 8/8/84

DEPTH	SAMPLE		BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.	
	No.	TYPE	INTERVAL FROM	TO	0								6
5	1	HS	1.5	2.5							BROWN MEDIUM SAND, SOME BLACK OIL-STAINED AREAS, TRACE OF GRAVEL. OVA = 0 PPM. LIGHT BROWN MEDIUM TO COARSE SAND. STRONG OILY ODOR. OVA = 30 PPM. OILY ODOR STRONGER AT APPROXIMATELY 5.0 FT. OVA = 150 PPM. WET BLACK MEDIUM SAND.		
	2	HS	2.5	3.5									
	3	HS	3.5	4.5									
	4	HS	4.5	5.5									
	5	HS	5.5	6.5									
10										7.0	BORING TERMINATED AT 7.0 FT.  WATER ENCOUNTERED AT APPROXIMATELY 7.0 FT.  NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.		

\*PIANT COORDINATES



# Canonie

# Boring Log

PROJECT No. CE 83-182

BORING No. A-6

PAGE 1 OF 1

PROJECT NAME TORRINGTON BANTAM BEARING DIVISION

BORING LOCATION N 4053.50, E 5858.03 \* SURFACE ELEV. 710.55

DRILLER K. BRISSETTE DATE: START 8/13/84 FINISH 8/13/84

DEPTH	SAMPLE				BLOW COUNT			RECOVERY IN INCHES	U.S.C.S. SOIL TYPE	PERCENT MOISTURE	qu TSF	CONTACT DEPTH	SOIL DESCRIPTION AND REMARKS	PIEZO.
	No.	TYPE	INTERVAL		0	6	12							
			FROM	TO	6	12	18							
5	1	HS	1.0	2.0				12	SP			.5	BLACK SANDY GRAVEL, FILL. OVA = 5 PPM. BROWN MEDIUM TO COARSE SAND. OVA = 5 PPM.	
	2	HS	2.0	3.0				12						
10												5.0	OVA = 0 PPM. BORING TERMINATED AT 5.0 FT.	

NOTE: OVA VALUE IS ORGANIC VAPOR LEVEL FROM BOREHOLE MONITORED WITH A CENTURY FLAME IONIZING OVA METER.

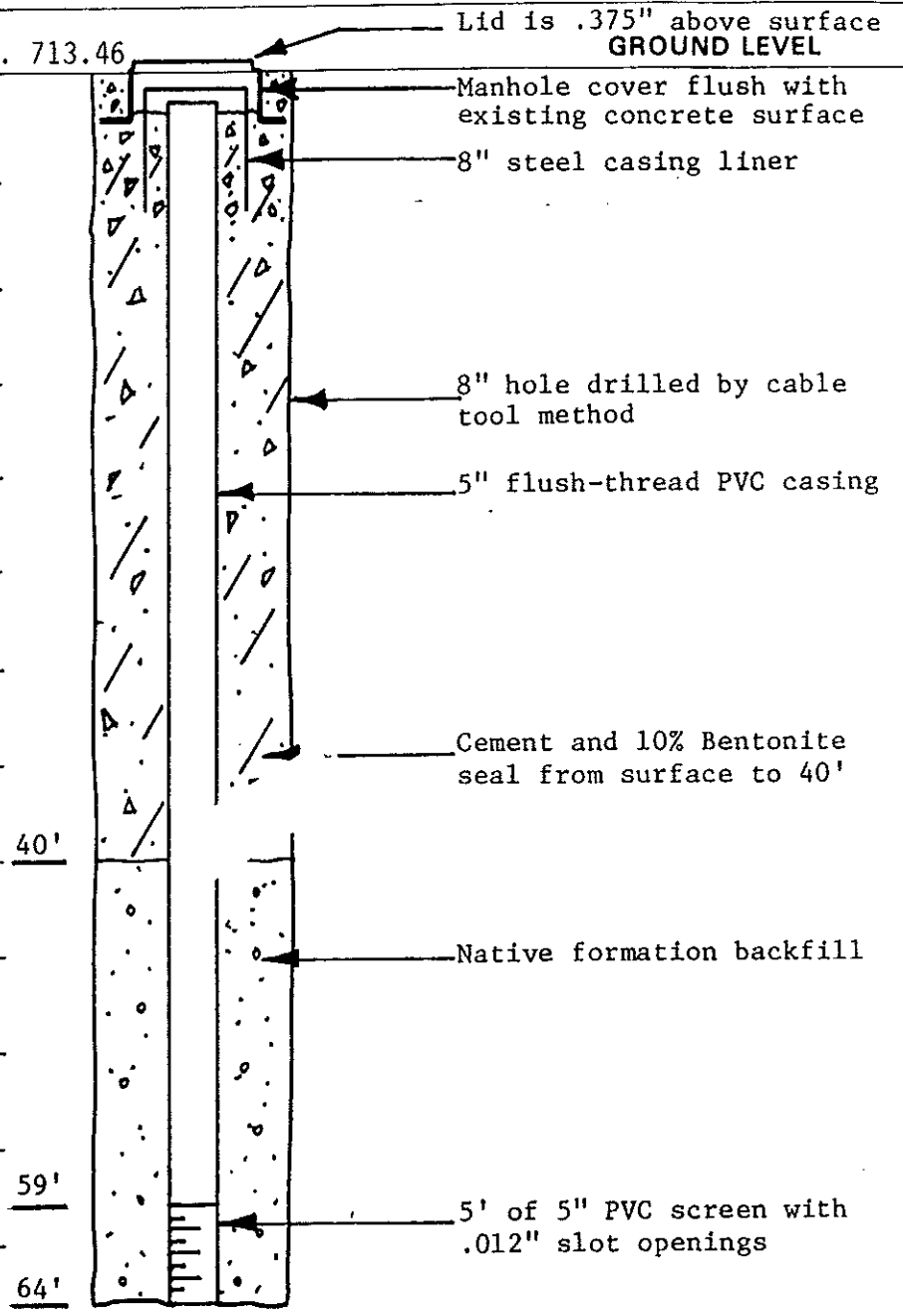
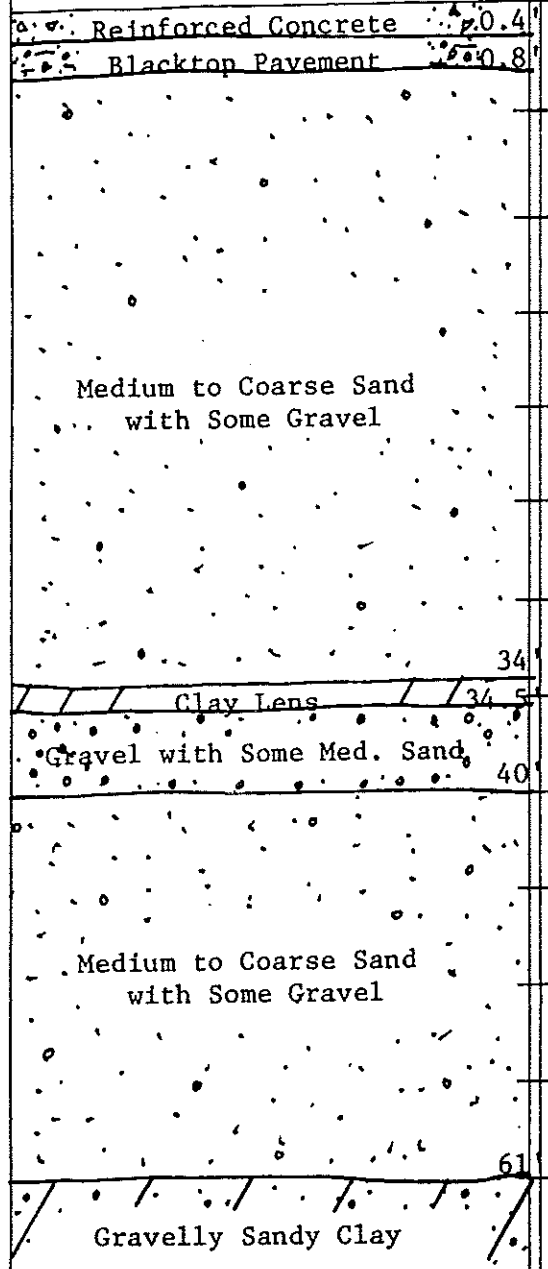
\*PI ANT COORDINATES







**WELL LOG** Surface Elev. 713.46



ENGINEERS: CANONIE ENGINEERS  
CHESTERTON, INDIANA

City South Bend State Indiana

Location Approximately 50' East of Water Supply Well #4

County St. Joseph Twp. Portage Section SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  of 16

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.

Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.

Date Drilled August 7, 1984

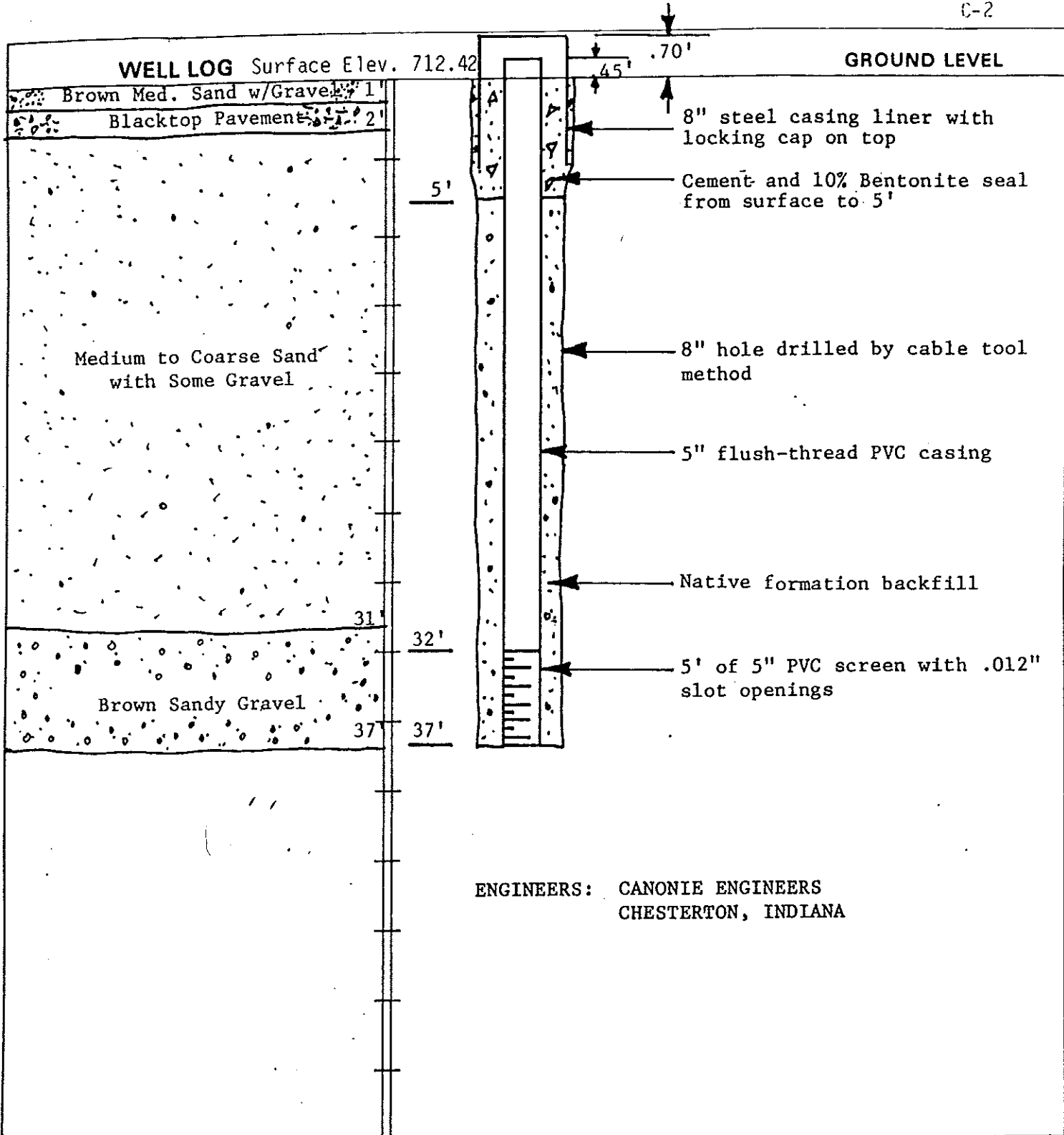
Driller John Blatz

Job No. 4704

Well No. W-1

TORRINGTON COMPANY  
SOUTH BEND, INDIANA

**PEERLESS-MIDWEST, INC.**  
Granger, Indiana



City South Bend State Indiana

Location Off NW Corner of Pond #1

County St. Joseph Twp. Portage Section SE 1/4 NW 1/4 of 16

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.

Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.

Date Drilled August 1, 1984

Driller John Blatz

Job No. 4704

Well No. W-2

TORRINGTON COMPANY  
SOUTH BEND, INDIANA

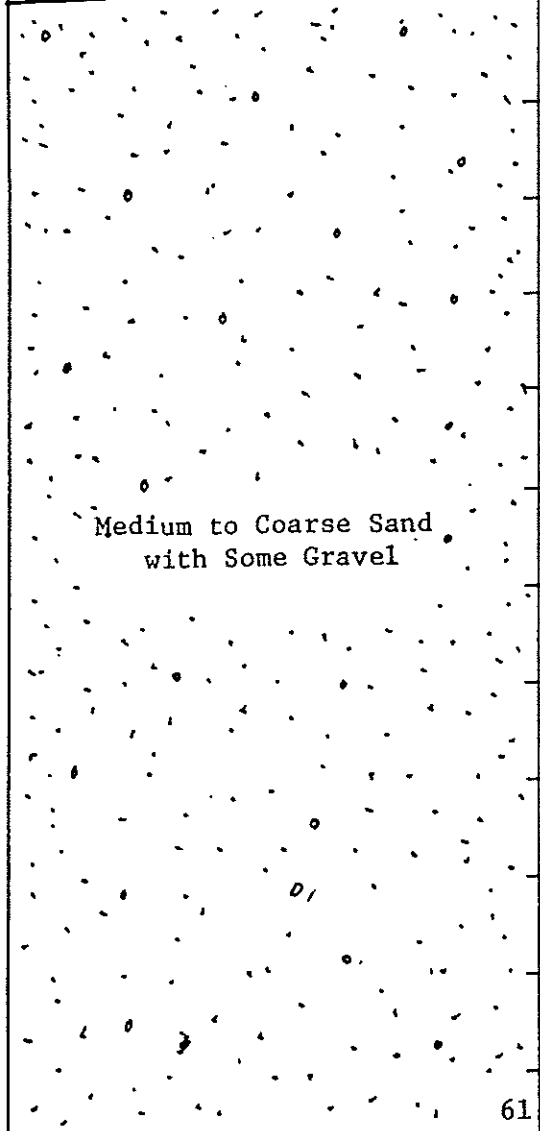
**PEERLESS-MIDWEST, INC.**  
Granger, Indiana

**WELL LOG** Surface Elev. 712.90

Lid is .375" above surface  
**GROUND LEVEL**

- Reinforced Concrete 0.4
- Blacktop Pavement 0.8
- Brown Gravelly Sand Fill 1.8

- Manhole cover flush with existing concrete surface
- 8" steel casing liner



8" hole drilled by cable tool method

5" flush-thread PVC casing

Cement and 10% Bentonite seal from surface to 40'

Native formation backfill

5' of 5" PVC screen with .012" slot openings

ENGINEERS: CANONIE ENGINEERS  
CHESTERTON, INDIANA

City South Bend State Indiana

Location Approximately 15' East of NE Corner of Maintenance Shed "B"

County St. Joseph Twp. Portage Section SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  of 16

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.

Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.

Date Drilled August 10, 1984

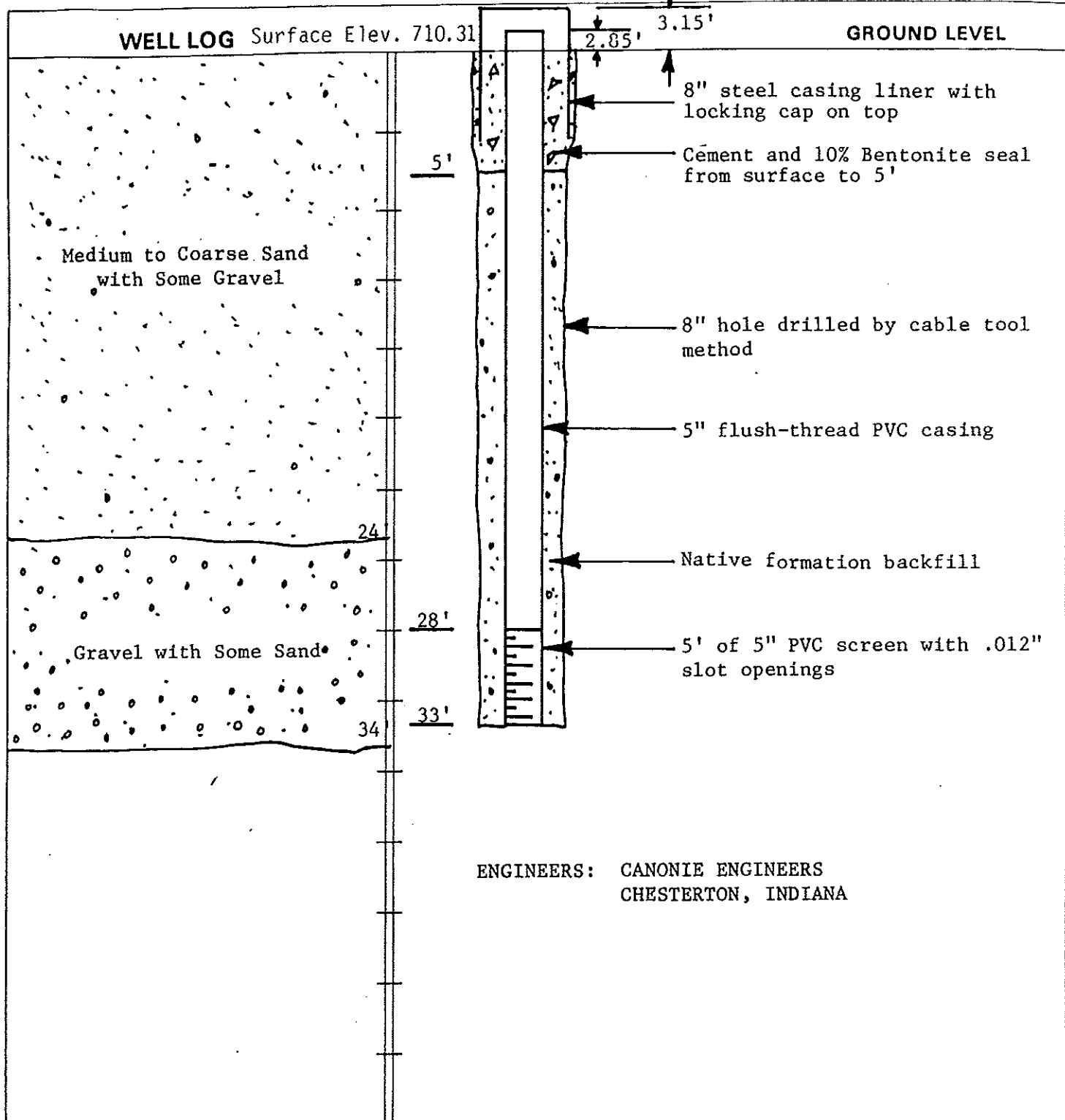
Driller John Blatz

Job No. 4704

Well No. W-3

TORRINGTON COMPANY  
SOUTH BEND, INDIANA

**PEERLESS-MIDWEST, INC.**  
Granger, Indiana



City South Bend State Indiana

Location Along East Edge of Mound Containing Buried Oil Tanks Just North of Pond #4

County St. Joseph Twp. Portage Section SE 1/4 NW 1/4 of 16

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.

Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.

Date Drilled July 30, 1984

Driller John Blatz

Job No. 4704

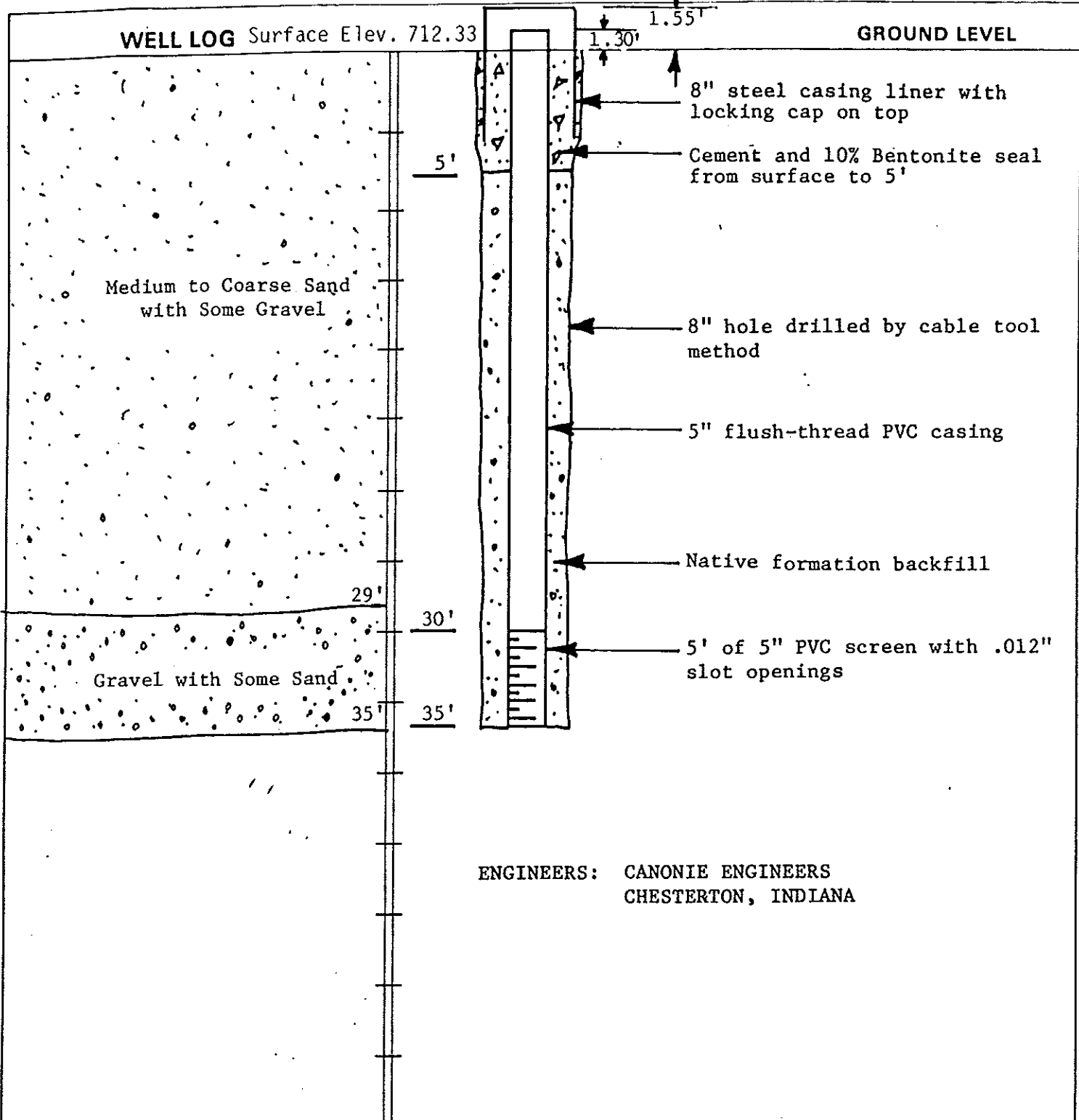
Well No. W-4

TORRINGTON COMPANY  
SOUTH BEND, INDIANA

**PEERLESS-MIDWEST, INC.**  
Granger, Indiana

WELL LOG Surface Elev. 712.33

GROUND LEVEL



ENGINEERS: CANONIE ENGINEERS  
CHESTERTON, INDIANA

City South Bend State Indiana

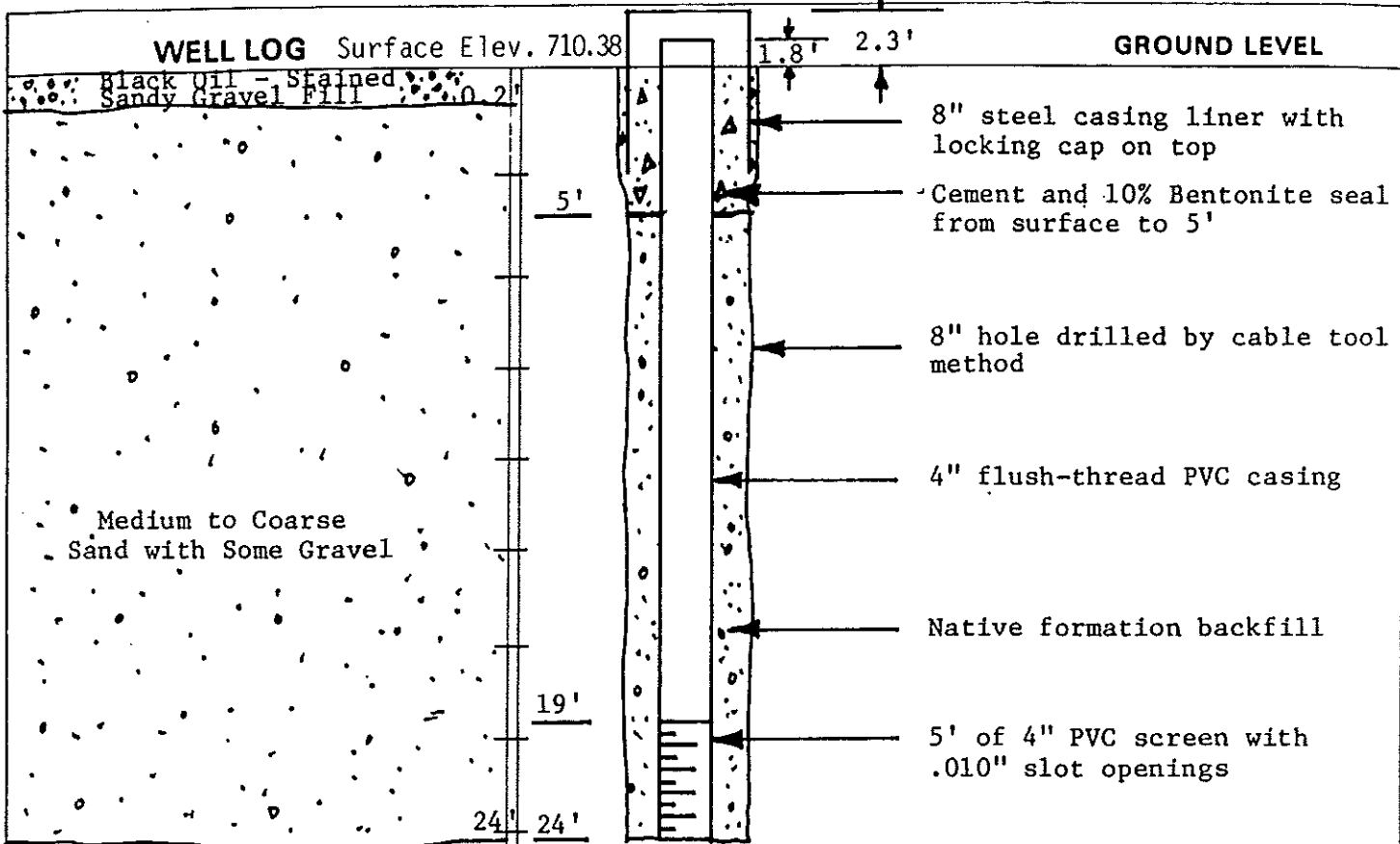
Location On North Side of Line Between Pond #4 and Pond #3

County St. Joseph Twp. Portage Section SE 1/4 NW 1/4 of 16

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.  
 Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.  
 Date Drilled July 31, 1984  
 Driller John Blatz  
 Job No. 4704

Well No. W-5  
 TORRINGTON COMPANY  
 SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.  
 Granger, Indiana



ENGINEERS: CANONIE ENGINEERS  
CHESTERTON, INDIANA

City South Bend State Indiana

Location Next to above ground quench oil tanks on west side of plant

County St. Joseph Twp. Portage Section SE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$  of 16

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.

Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.

Date Drilled August 13, 1984

Driller John Blatz

Job No. 4704

Well No. S-3

TORRINGTON COMPANY  
SOUTH BEND, INDIANA

**PEERLESS-MIDWEST, INC.**  
Granger, Indiana





INDIANA-MICHIGAN WATER DEVELOPMENT CO.

1912 So. Main St.  
SOUTH BEND 23, INDIANA  
Phone 3-8231

Log. 943

Well log for: Torrington Company, South Bend, Indiana  
*Sold thru Sollitt Constr. Co.*

Location of well North East Corner of New Building

Date completed 4-17-51 *2w. " " Old " "*

*Well #3*

Size or diameter 12"

Finished depth. Surface to bottom of screen 100'

SCREEN

Diameter 12

Length (Exclusive of fittings) 18'

Make and type Johnson Everdur

Opening or slot size 30 Slot

Fittings Stanaard

Formations encountered

0-17 Dry Sand	<u>80%</u> Analytic
17-19 Hard Pan	80/97
19-33 Coarse gravel	70/65
33-37 Coarse gravel	66/46
37-41 Gravel with Clay balls	64/39
41-44 Clay	60/33
44-56 Fine Sand	58/28
56-75 Clay & Hard Pan	50/23
75-80 Sand & Gravel- Some Clay balls	36/40
80-97 Sand & Gravel	24/16
97-100 Fine Sand (Still in it)	12/14

75'-80' Same as 80'-97' but very dirty.

Total depth penetrated

Static or normal water level ~~from base of machine~~ 139

*15'*

PUMPING TEST No test made

Drawdown *(35 ft. at 325 GPM.*

*Tested 8/30 by Roy with Permanent Pump - W.O. 329*

Permanent well information, as installed







# LAYNE-NORTHERN COMPANY

Incorporated

## MISHAWAKA, INDIANA

TEST

PERMANENT

Job No. \_\_\_\_\_

WELL LOG No. 8A CITY South Bend County St. Joseph

Owner \_\_\_\_\_ Township Portage

Section \_\_\_\_\_

Location Sample St. and Camden State Indiana

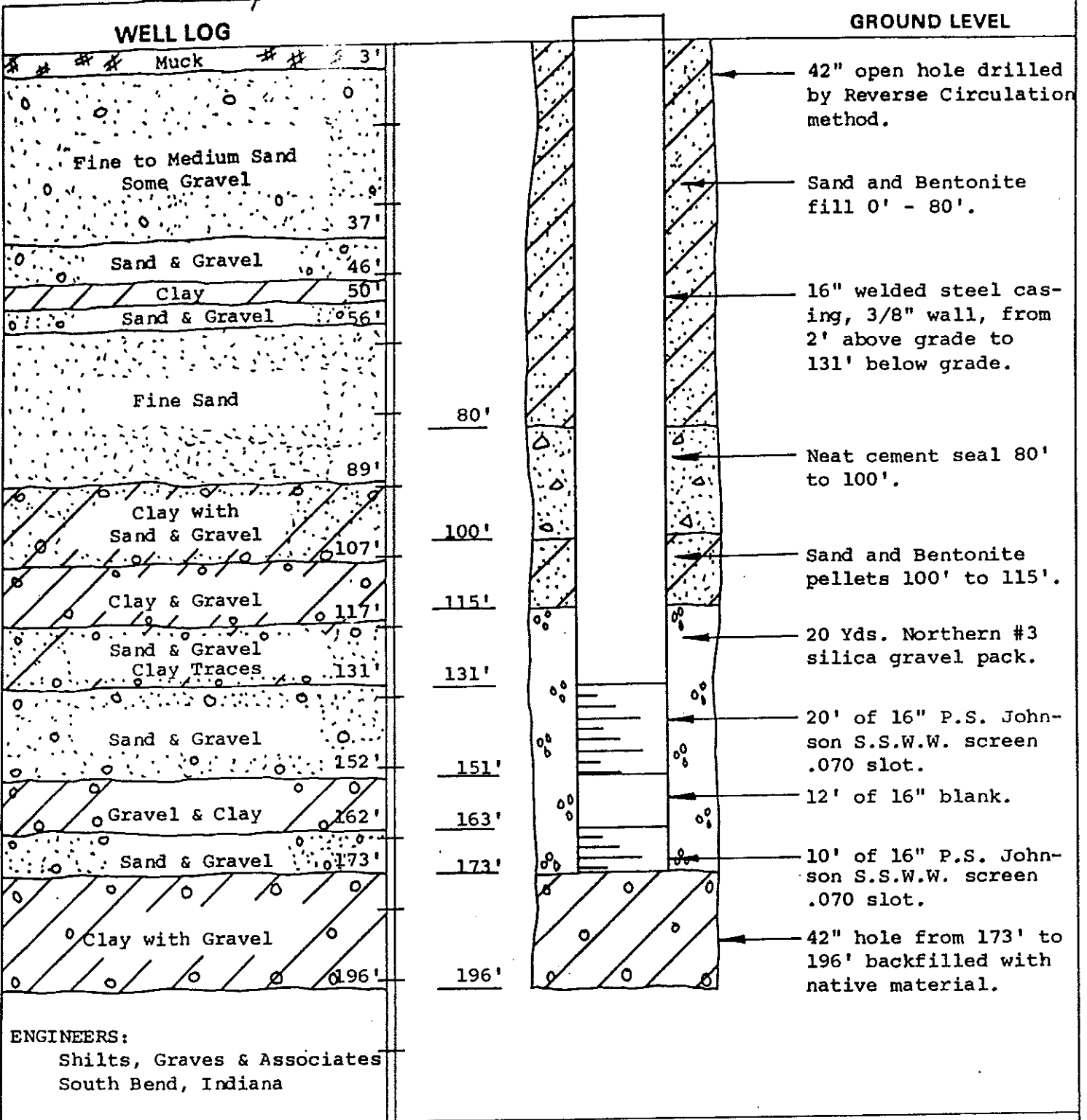
From Land Description \_\_\_\_\_ ft. East and \_\_\_\_\_ ft. North of SW Corner of Section.

From Street or Road \_\_\_\_\_

FORMATION FOUND -- DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Top Soil	0	8		5.94
Sand and Gravel	8-	25		
Hard Pan	25	32		
Sand and Gravel	32	44		
Sand and Gravel and Boulders	44	66		
Sand and Gravel small boulders	66	77		
Gravel	77	85		
Fine Sand with some gravel	85	105		
Fine Sand	105	115		
Fine Sand	115	124		
Hard Pan	124	127		
Coarse Sand	127	141		
Coarse Water Sand	141	155		
Fine reducing to sand	155	165		
Fine Sand	165	170		
Finer Sand	170	180		
Fine Sand with some Clay	180	188		
Shale	188	194		

\_\_\_\_\_ inch diameter hole drilled by  Cable Tool  Rotary  Jetting  
Pipes left in hole \_\_\_\_\_

Date Started \_\_\_\_\_ Finished 1921

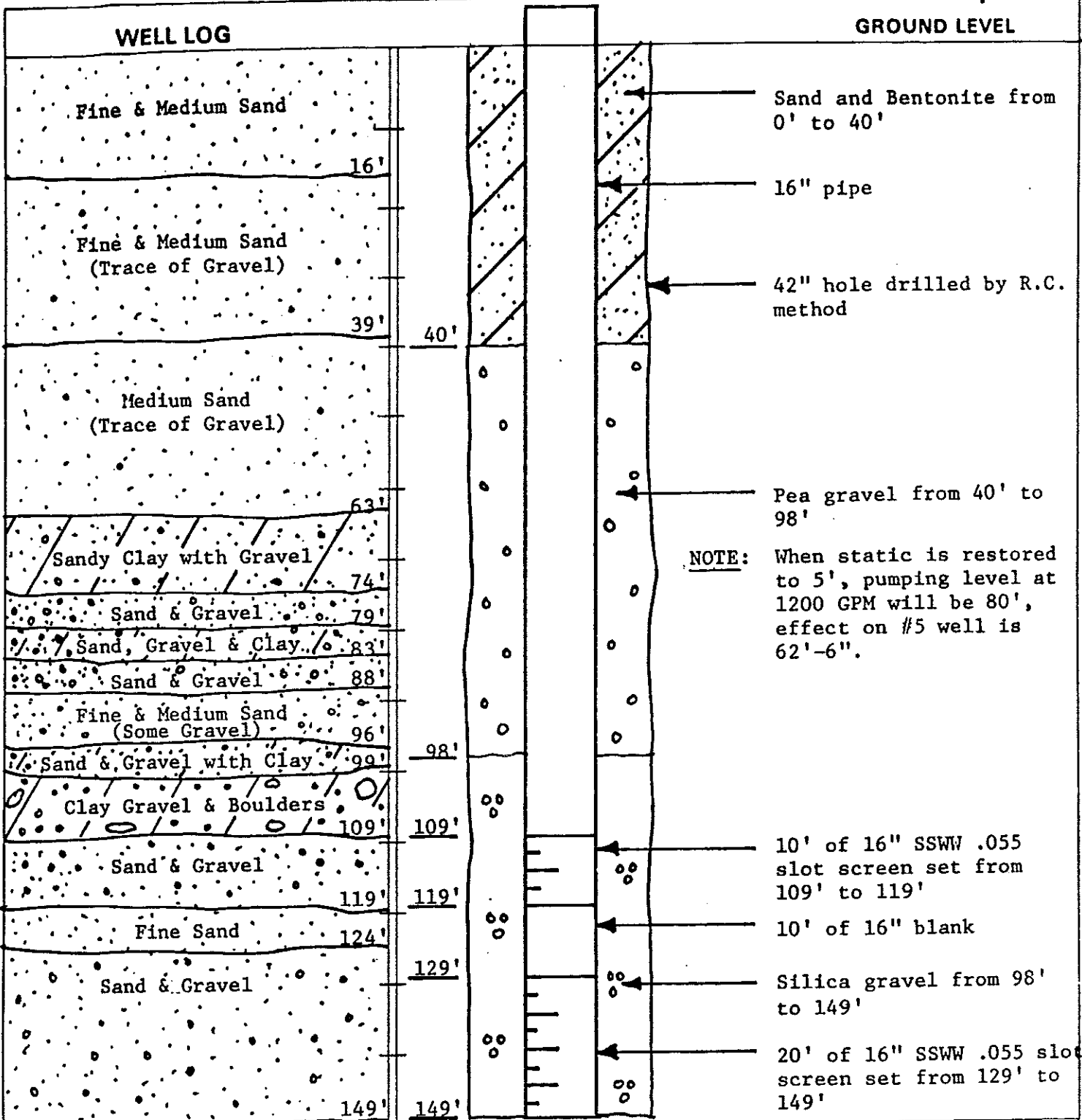


City South Bend State Indiana  
 Location Davy-McKee Corp. Co-ordinates N785, E3860  
785' N. of Calvert St. (extended) & 1130' W. of E. Line Section 16  
 County St. Joseph Twp. Portage Section N $\frac{1}{2}$  of SW $\frac{1}{4}$  of 16

Test Capacity 2000 GPM. Static Water Level 5 ft. Pumping Level 114 ft.  
 Specific Capacity 18.35 GPM/Ft. D.D.  
 Date Drilled 2-18-81  
 Driller Mike Garrage  
 Job No. 2961

Well No. 1  
 New Energy Company of Indiana  
 South Bend, Indiana

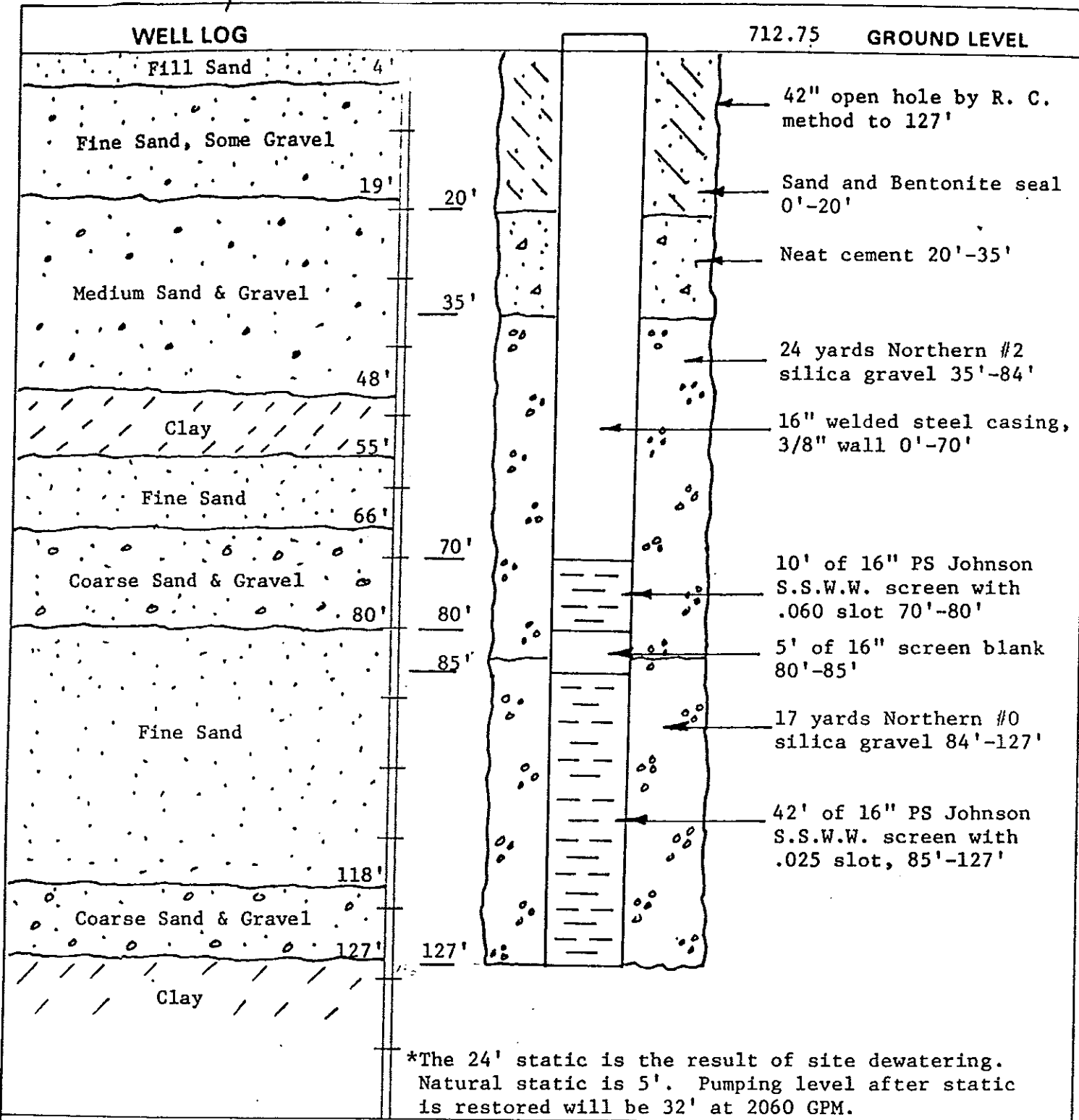
**PEERLESS-MIDWEST, INC.**  
 Granger, Indiana



City South Bend State Indiana  
 Location N360 E3885  
 County St. Joseph Twp. Portage Section NW $\frac{1}{4}$  of SW $\frac{1}{4}$  of 16

Test Capacity 1200 GPM. Static Water Level 24' ft. Pumping Level 99 ft.  
 Specific Capacity 16.0 GPM/Ft. D.D.  
 Date Drilled 6-16-83  
 Driller Mike Garrage  
 Job No. 4027

Well No. 2  
 NEW ENERGY COMPANY OF INDIANA  
 SOUTH BEND, INDIANA



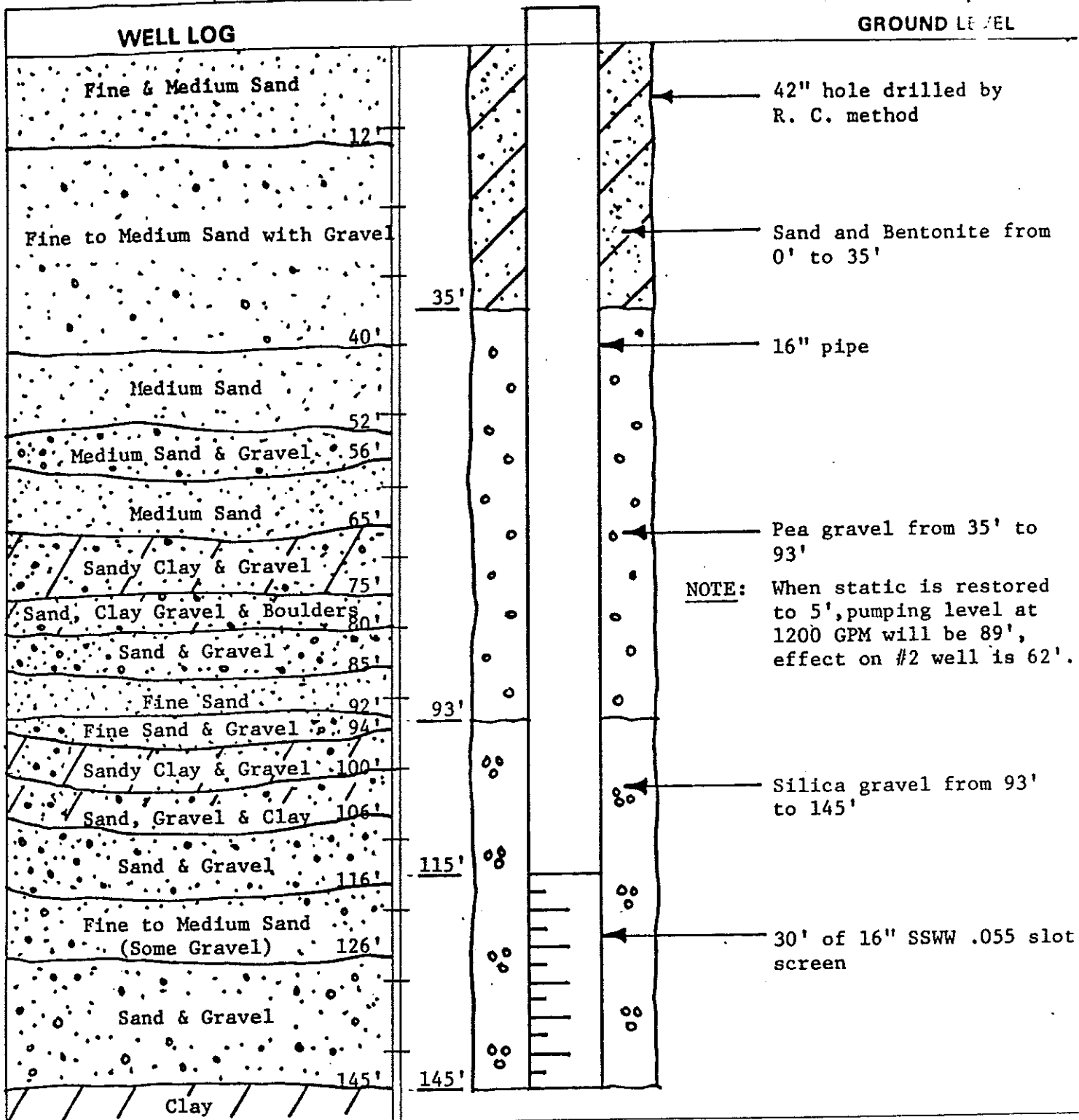
\*The 24' static is the result of site dewatering. Natural static is 5'. Pumping level after static is restored will be 32' at 2060 GPM.

City South Bend State Indiana  
 Location N520 - E4260, 520' North of Calvert Street  
 County St. Joseph Twp. Portage Section NW $\frac{1}{4}$  of SW $\frac{1}{4}$  of 16

Test Capacity 2210 GPM. Static Water Level \* 24 ft. Pumping Level \* 53 ft.  
 Specific Capacity 76.2 GPM/Ft. D.D.  
 Date Drilled 5-13-83  
 Driller Mike Garrage  
 Job No. 4027

Well No. 4  
 NEW ENERGY COMPANY OF INDIANA  
 SOUTH BEND, INDIANA

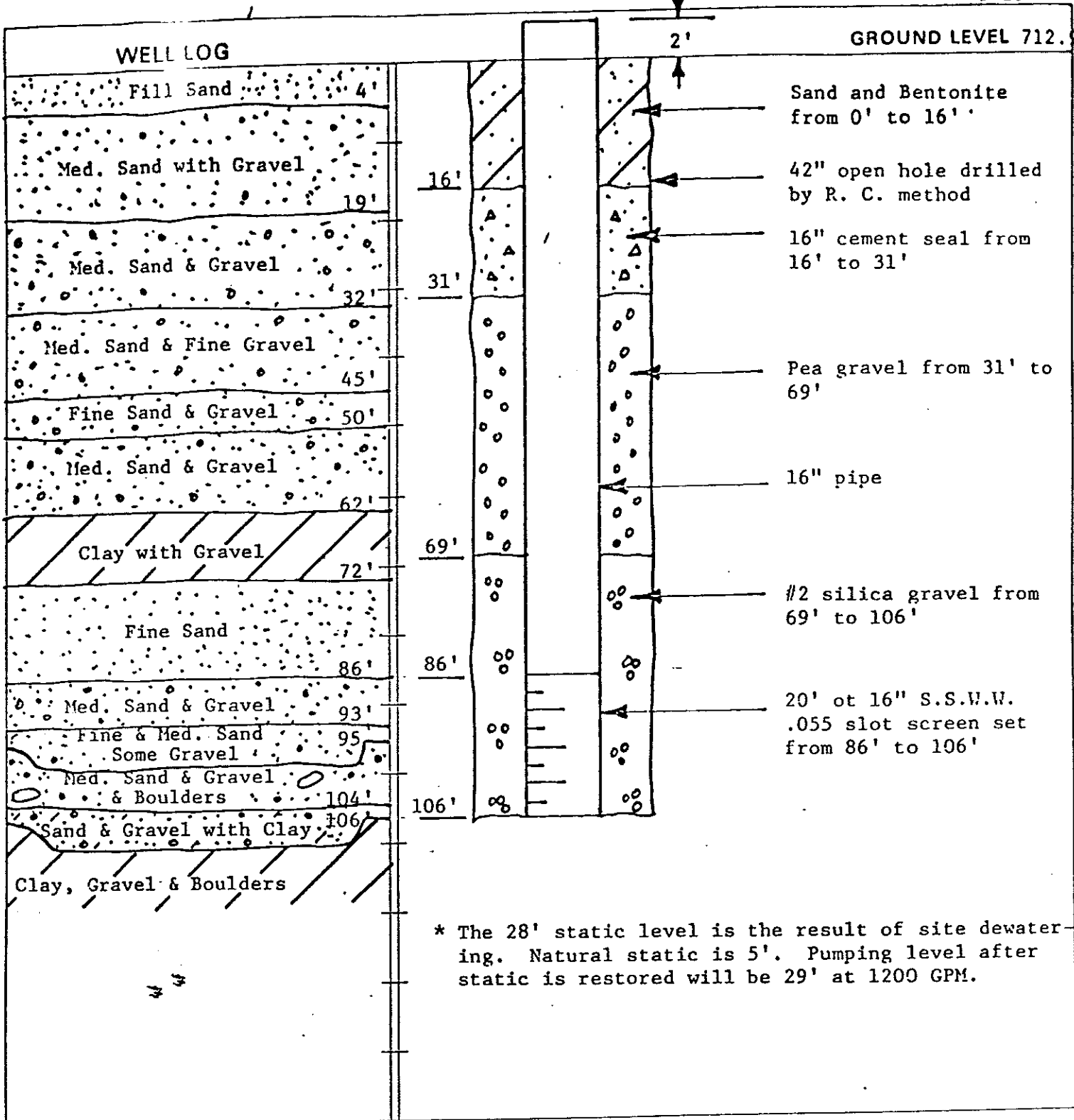




City South Bend State Indiana  
 Location N345 E3885  
 County St. Joseph Twp. Portage Section NW¼ of SW¼ of 16

Test Capacity 1200 GPM. Static Water Level 24 ft. Pumping Level 108 ft.  
 Specific Capacity 14.3 GPM/Ft. D.D.  
 Date Drilled 6-9-83  
 Driller Mike Garrage  
 Job No. 4027

Well No. 5  
 NEW ENERGY COMPANY OF INDIANA  
 SOUTH BEND, INDIANA



\* The 28' static level is the result of site dewatering. Natural static is 5'. Pumping level after static is restored will be 29' at 1200 GPM.

City South Bend State Indiana

Location N 376.5 - E 4160, 376.5' North of Calvert Street

County St. Joseph Twp. Portage Section NW $\frac{1}{4}$  of SW $\frac{1}{4}$  of 16

Test Capacity 1200 GPM. Static Water Level \* 28 ft. Pumping Level \* 52 ft.

Specific Capacity 50.75 GPM/Ft. D.D.

Date Drilled 9-1-83

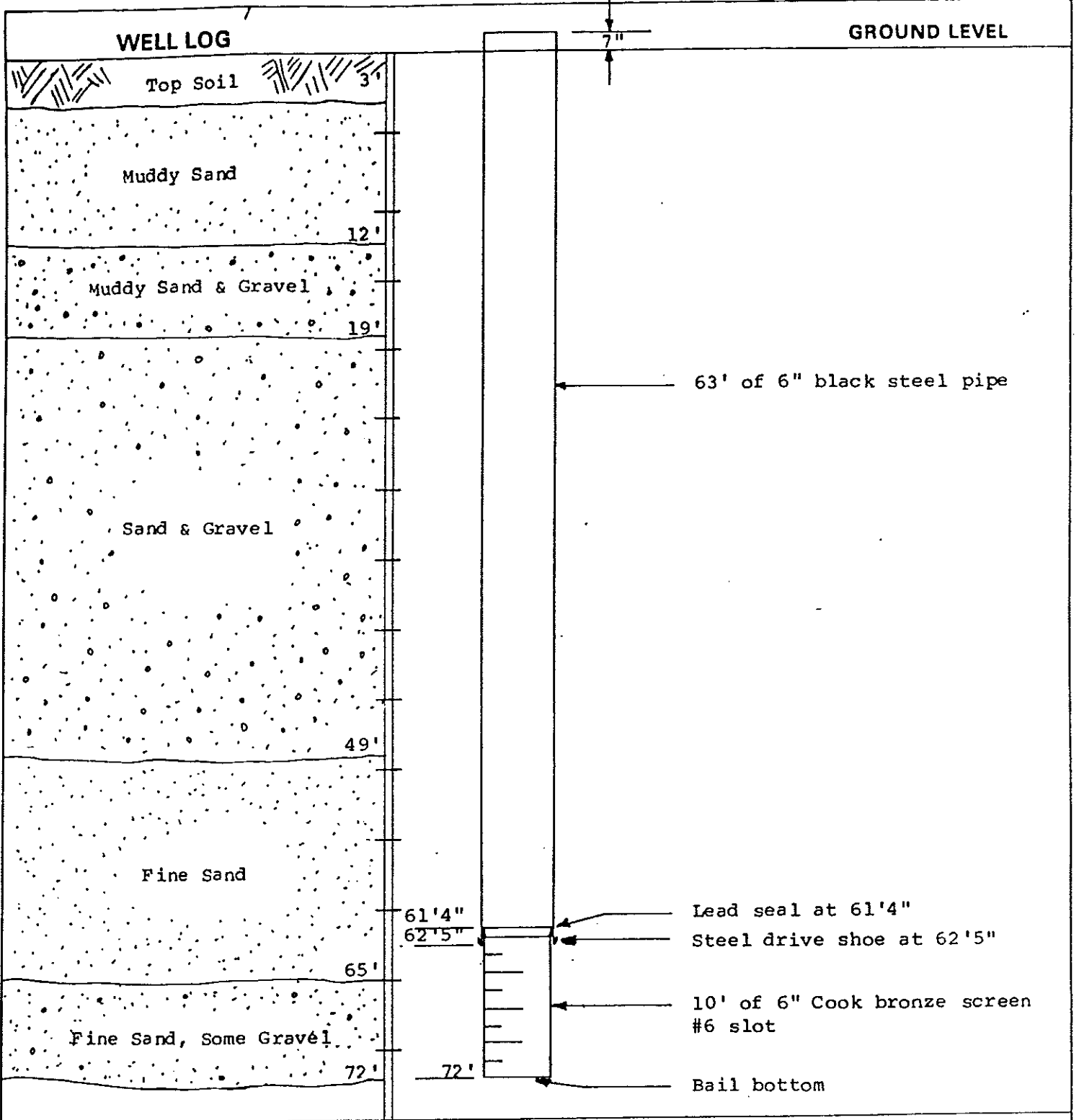
Driller Mike Garrage

Job No. 4027

Well No. 6

NEW ENERGY COMPANY OF INDIANA  
SOUTH BEND, INDIANA

PEERLESS-MIDWEST INC.



City South Bend State Indiana

Location 50' South of South Wall of Shop & 45' East of East Wall of Main Building

County St. Joseph Twp. Portage Section 8

Test Capacity 160 GPM. Static Water Level 16 ft. Pumping Level 34 ft.

Specific Capacity 8.8 GPM/Ft. D.D.

Date Drilled 1-14-60

Driller Others

Job No. \_\_\_\_\_

Well No. 1

WASHINGTON HIGH SCHOOL  
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, I.C.  
Granger, Indiana

# Layne-Northern Company

D-12

Division of Layne-Western Company, Inc.

INDIANAPOLIS • MISHAWAKA • LANSING

TEST

PERMANENT

Job No. MS1033

WELL LOG No. 79A CITY South Bend

County St. Joseph

Owner Martin Blad

Township Portage

Section 21

Location

State Indiana

From Land Description SE $\frac{1}{4}$ , SE $\frac{1}{4}$ , NW $\frac{1}{4}$

From Street or Road 5000' E. of Mayflower Rd. 2000' N. of U.S. 20 Bypass

FORMATION FOUND - DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Stratum
Black muck	0	4	4	
Brown medium sand to med. gravel	4	113	109	4'
Grey clay	113	115	2	
Brown medium sand to medium gravel	115	130	15	
Grey clay	130	134	4	
Brown medium sand to medium gravel	134	140	6	
Brown medium to coarse sand	140	145	5	
Brown coarse sand, gravel and rocks	145	187	42	
Blue clay	187	192	5	
Blue shale	192	200		

Hole 6 $\frac{1}{2}$  "Dia Drilled by: { Cable Tool \_\_\_\_\_ Rotary X Jetting \_\_\_\_\_  
Reverse Circ. \_\_\_\_\_ Bucket \_\_\_\_\_ Auger \_\_\_\_\_

Rotary Hole Grouted: Neat Cement \_\_\_\_\_ Drilling Mud X Other \_\_\_\_\_

Casing 4 "OD From 24 "above ground to 165 feet below ground. Weight \_\_\_\_\_ Pounds per foot

Screen 4 "Set from 165 to 170 feet Make Layne Type Plastic Slot .025

Pumping test 80 plus or minus GPM drawdown to \_\_\_\_\_ feet after 1 hours pumping

Date Completed 9/25/79 Driller Don Snyder



# LAYNE-NORTHERN COMPANY

Incorporated

MISHAWAKA, INDIANA

- TEST  
 PERMANENT

Job No. E10389

WELL LOG No. 1 CITY So. Bend

County St. Joseph

Owner Martin Blad Farms

Township Portage

Section 19

Location

State Indiana

From Land Description \_\_\_\_\_ ft. East and \_\_\_\_\_ ft. North of SW Corner of Section.

From Street or Road 300' West of Mayflower Road-50' East of large drainage ditch

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Good Sand and gravel	49	70	21	6'
Light brown fine sand	70	75	5	
Light brown sand and gravel (muddy)	75	78	3	
Sandy Clay	78	90	12	
Sandy Clay some gravel	90	102	12	
Sand Gravel, soft sand (clay)	102	105	3	
Brown Sand, some gravel	105	115	10	
Brown Sand and gravel	115	135	20	
Clayey Concrete grey sand and gravel	135	160	25	
Old screen pulled and well drilled to 160 ft.				

\_\_\_\_\_ 12 inch diameter hole drilled by  Cable Tool  Rotary  Jetting  
 Pipe left in hole

Date Started 3-7-51 Finished 3-27-51 A. Folger  
 DRILLER









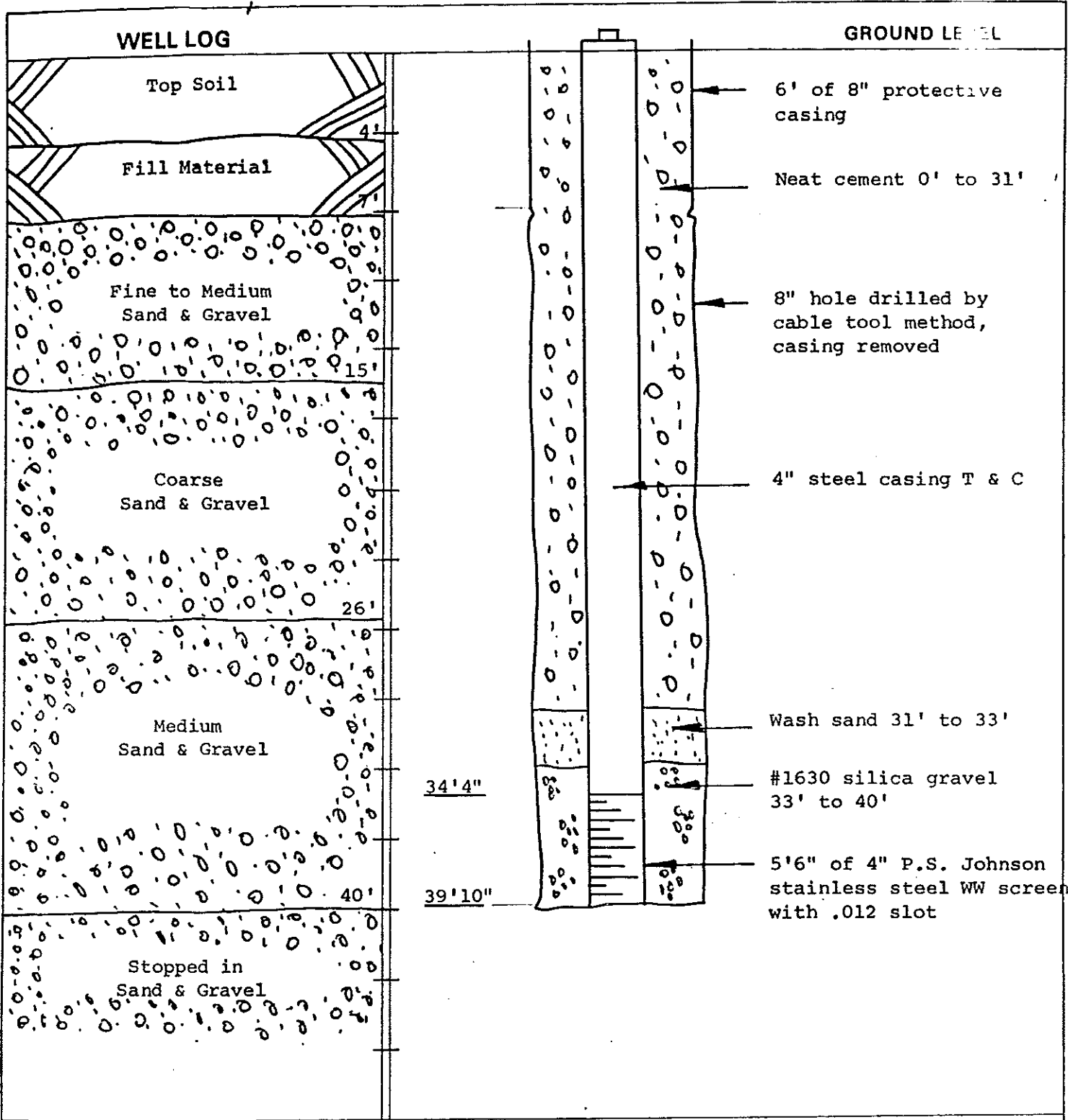












City South Bend State Indiana

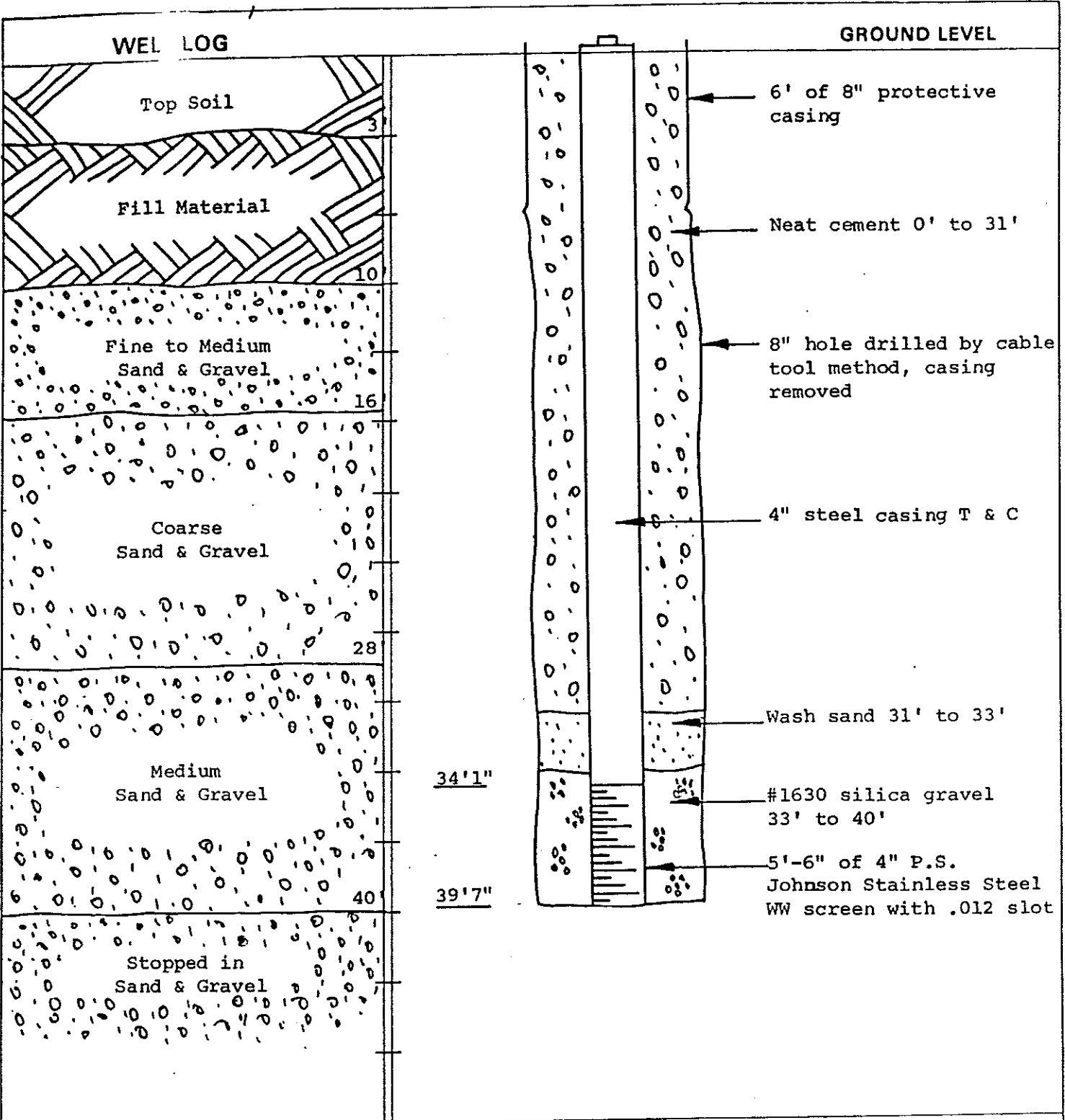
Location 20' N of Well #4, approximately 200' W of Olive Street

County St. Joseph Twp. Portage Section 15

Test Capacity \_\_\_\_\_ GPM. Static Water Level \_\_\_\_\_ ft. Pumping Level \_\_\_\_\_ ft.  
 Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.  
 Date Drilled 8-5-80  
 Driller John Blatz  
 Job No. 2701

Well No. MW 1 (Shallow)  
Olive-Sample Well Field  
City of South Bend, Indiana

PEERLESS-MIDWEST, INC.

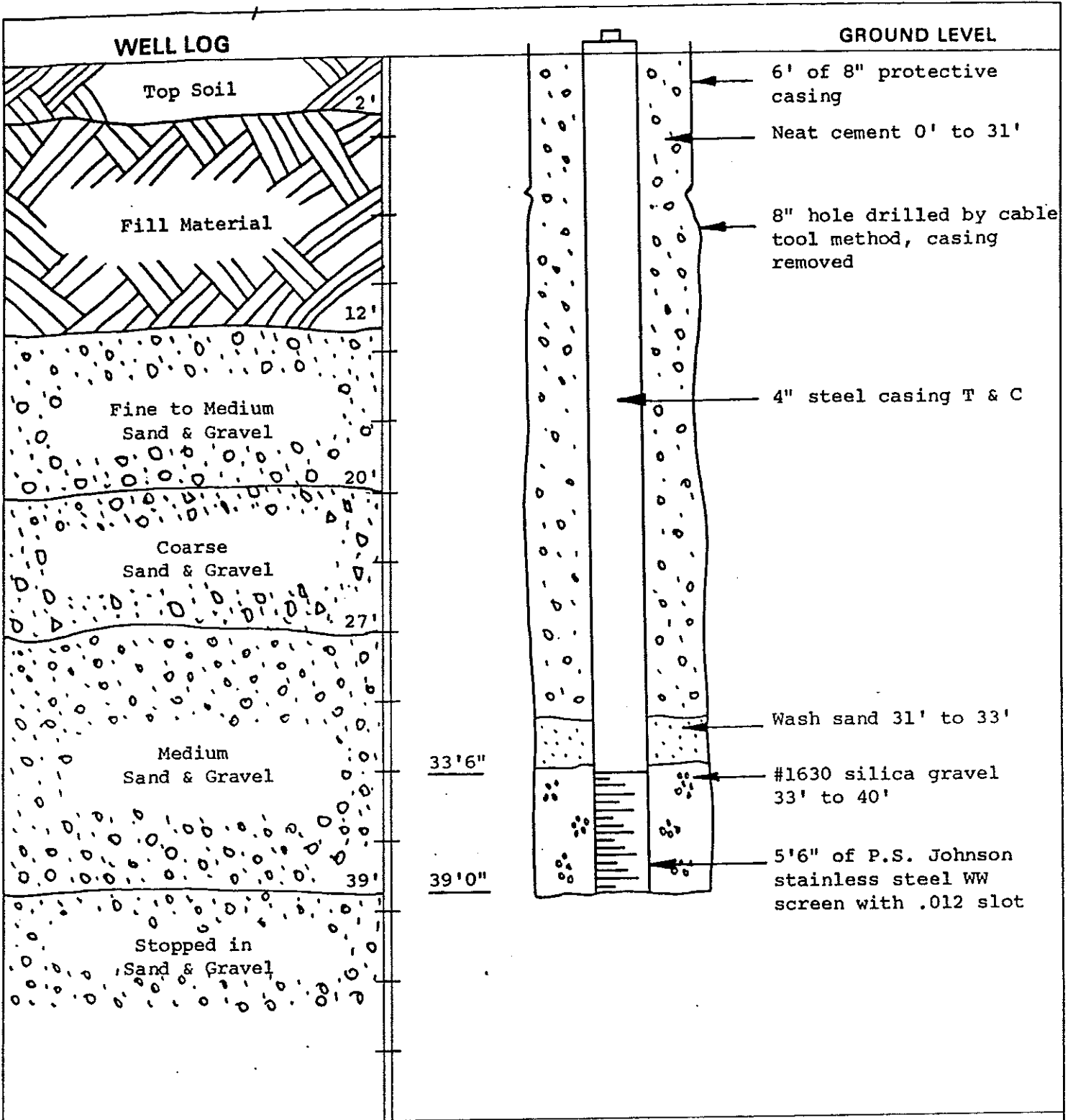


City South Bend State Indiana  
 Location Approx. 150' NE of Well #4, outside fence, approx. 140' W of Olive Street  
 County St. Joseph Twp. Portage Section 15

Test Capacity \_\_\_\_\_ GPM. Static Water Level 14 ft. Pumping Level \_\_\_\_\_ ft.  
 Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.  
 Date Drilled 8-8-80  
 Driller John Blatz  
 Job No. 2701

Well No. MW 2  
 Olive-Sample Well Field  
 City of South Bend, Indiana  
 PEERLESS-MIDWEST, INC.  
 Granger, Indiana





City South Bend State Indiana

Location In front of Main Bldg, approximately 30' W of Olive St., approx. 220' SE of Well #4.

County St. Joseph Twp. Portage Section 15

Test Capacity \_\_\_\_\_ GPM. Static Water Level 14 ft. Pumping Level \_\_\_\_\_ ft.

Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.

Date Drilled 8-12-80

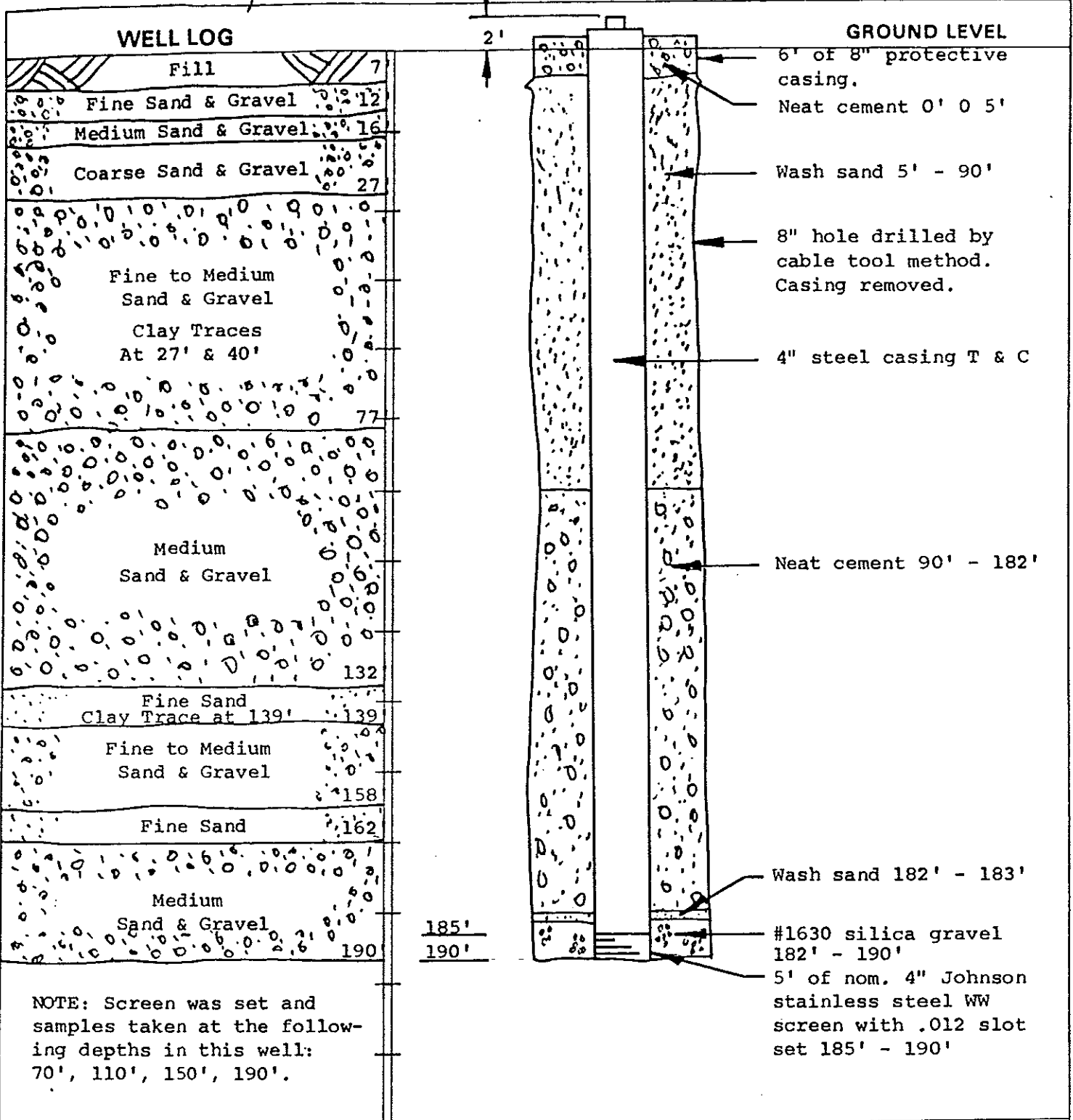
Driller John Blatz

Job No. 2701

Well No. MW 3

Olive-Sample Well Field  
City of South Bend, Indiana

PEERLESS-MIDWEST, INC.



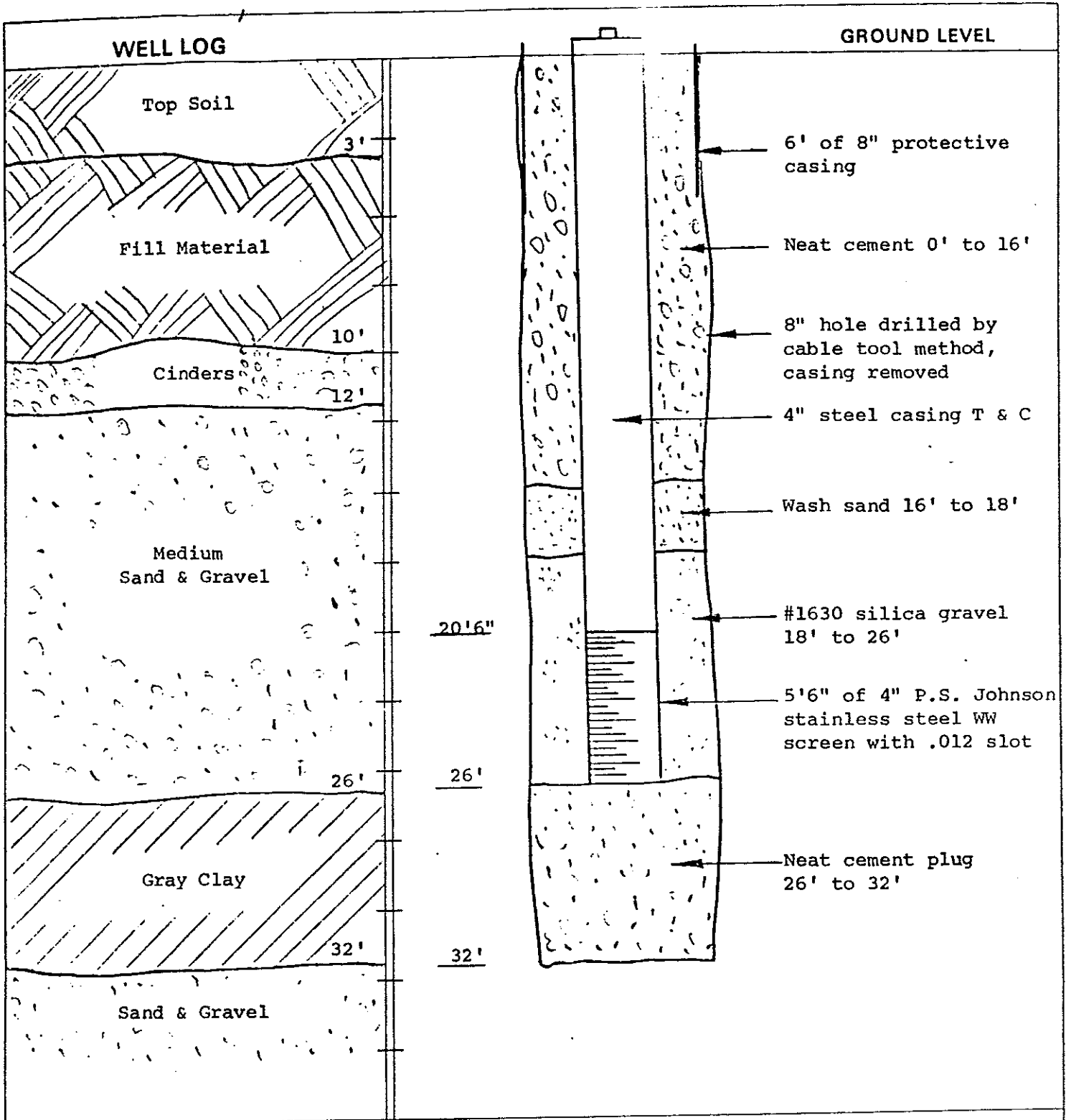
NOTE: Screen was set and samples taken at the following depths in this well:  
70', 110', 150', 190'.

City South Bend State Indiana

Location 12' N of Well #4, approx. 200' W of Olive Street

County St. Joseph Twp. Portage Section 15

Test Capacity _____ GPM. Static Water Level <u>13</u> ft. Pumping Level _____ ft. Specific Capacity _____ GPM/Ft. D.D. Date Drilled <u>8-20-80</u> Driller <u>Mike Garrage</u> Job No. <u>2701</u>	Well No. <u>MW 1 (Deep)</u> Olive-Sample Well Field City of South Bend, Indiana
<b>PEERLESS-MIDWEST, INC.</b> Greener, Indiana	



City South Bend State Indiana

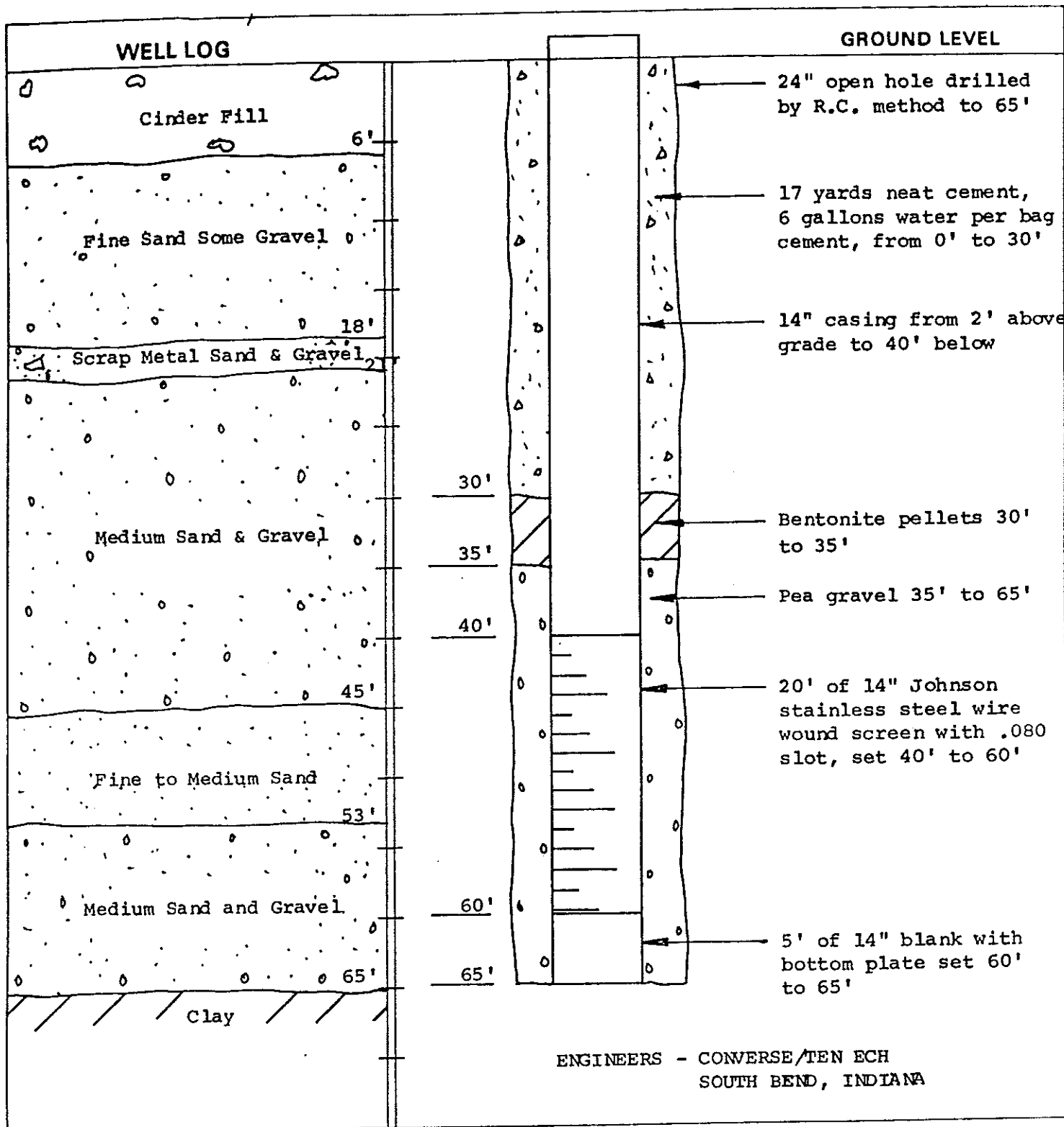
Location 40' N of Sample St. and 385' W of Olive St.

County St. Joseph Twp. Portage Section 15

Test Capacity \_\_\_\_\_ GPM. Static Water Level 13 1/2 ft. Pumping Level \_\_\_\_\_ ft.  
 Specific Capacity \_\_\_\_\_ GPM/Ft. D.D.  
 Date Drilled 8-15-80  
 Driller John Blatz  
 Job No. 2701

Well No. MW 4  
 Olive-Sample Well Field  
 City of South Bend, Indiana

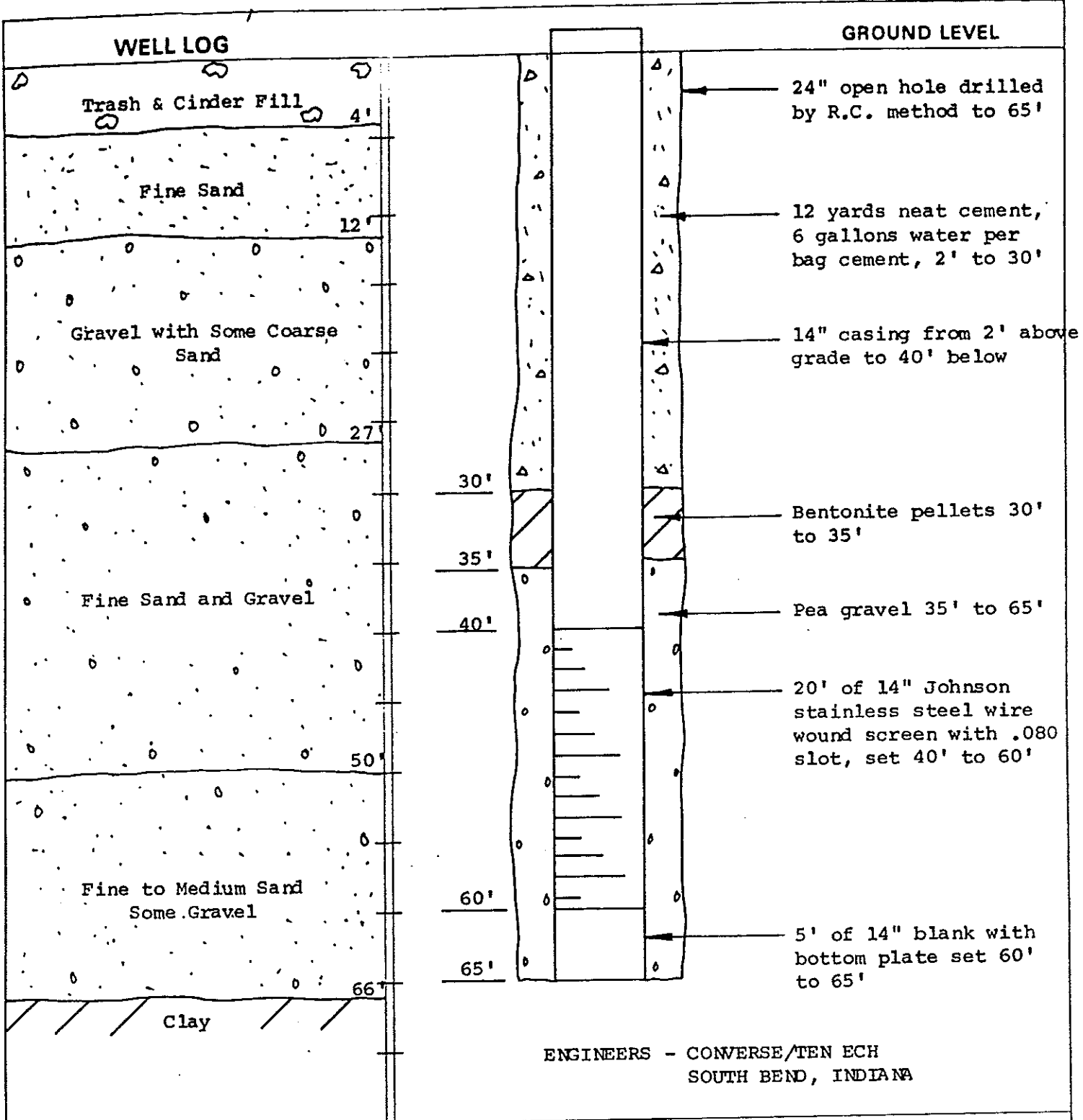
**PEERLESS-MIDWEST, INC.**  
 Granger, Indiana



ENGINEERS - CONVERSE/TEN ECH  
SOUTH BEND, INDIANA

City South Bend State Indiana  
 Location S.E. Corner of Grant & Davis - Olive/Sample Well Field  
 County St. Joseph Twp. Portage Section 15

Test Capacity <u>1200</u> GPM. Static Water Level <u>10</u> ft. Pumping Level <u>23</u> ft. Specific Capacity <u>92.3</u> GPM/Ft. D.D. Date Drilled <u>6-26-81</u> Driller <u>Mike Garrage</u> Job No. <u>3132</u>	Well No. <u>3 - Interceptor</u>  City of South Bend South Bend, Indiana  <b>PEERLESS-MIDWEST, INC.</b> Ellettsville, Indiana
--	--



City South Bend State Indiana  
 Location 320' E. of Olive St. & 700' N. of Davis Rd. - Olive/Sample Well Field  
 County St. Joseph Twp. Portage Section 15

Test Capacity 800 GPM. Static Water Level 10 ft. Pumping Level 36 ft.  
 Specific Capacity 30.8 GPM/Ft. D.D.  
 Date Drilled 7-2-81  
 Driller Mike Garrage  
 Job No. 3132

Well No. 4 Interceptor  
 City of South Bend  
 South Bend, Indiana

PEERLESS-MIDWEST, INC.  
 Granger, Indiana













# LAYNE-NORTHERN COMPANY

INCORPORATED  
MISHAWAKE, INDIANA

TEST WELL LOG No. 1 City SOUTH BEND County ST. JOSEPH

Township PORTAGE

Owner CITY OF SOUTH BEND Section 15

State INDIANA

Location—From Land Description 200' SOUTH OF 1ST RAIL NE. YORK CENTRAL RAILROAD, 110' SOUTH C

Location—From Street or Road 1250' WEST OF OLIVE STREET PROPERTY LINE.

FORMATION FOUND	THICKNESS OF STRATUM	DEPTH TO BOTTOM OF STRATUM	STATIC WATER LEVEL	TEMP.	REMARKS
Soil	1 1/2'	1 1/2'			
Sandy Clay	1 1/2'	3'			
Sand	12'	15'			
Coarse Sand	7'	22'			
Sand	3'	25'			
Gravel Sand	20'	45'			
Gravel Sand	41'	86'			Coarse
Gravelly Clay	5'	91'			
Gravelly Clay	27'	118'			
Sand & Gravel	47'	165'	20' 6"		
Shale	6'	171'			
Set 6' screen at 151' 6" with 10' 6" of 1 1/2" Pipe. 5' of 2" pipe. 38' of 3" Pipe.					

Date Started 10-13-14 Finished 10-13-14 CALVIN REYNOLDS  
DRILLER

(SKETCH OF LOCATION ON BACK OF THIS LOG SHEET)







TABLE E-1  
SOURCE OF WATER SAMPLES

<u>SAMPLE</u>	<u>SOURCE</u>
TB-1	Not Used
TB-2	Torrington Well No. 4, Volatiles
TB-3	Torrington Well No. 3, Volatiles
TB-4	Pond No. 4, Volatiles
TB-5	Pond No. 5, Volatiles
TB-6	Pond No. 2, Volatiles
TB-7	Pond No. 1, Volatiles
TB-8	Not Used
TB-9	Not Used
TB-10	Torrington Well No. 3, PCB
TB-11	Torrington Well No. 4, PCB
TB-12	Grab Sample From S-3
TB-13	Pond No. 4, PCB
TB-14	Pond No. 5, PCB
TB-15	Pond No. 2, PCB
TB-16	Pond No. 1, PCB

TABLE E-2  
VOLATILE ORGANIC COMPOUNDS  
INCLUDED IN METHOD 624

Acrolein	1,2-Dichloropropane
Acrylonitrile	1,3-Dichloropropylene
Benzene	Ethylbenzene
Bis (Chloromethyl) Ether	Methyl Bromide
Bromoform	Methyl Chloride
Carbon Tetrachloride	Methylene Chloride
Chlorobenzene	1,1,2,2-Tetrachloroethane
Chlorodibromomethane	Tetrachloroethylene
Chloroethane	Toluene
2-Chloroethylvinyl Ether	1,2-Trans-Dichloroethylene
Chloroform	1,1,1-Trichloroethane
Dichlorobromomethane	1,1,2-Trichloroethane
Dichlorodiflouromethane	Trichloroethylene
1,1-Dichloroethane	Trichloroflouromethane
1,2-Dichloroethane	Vinyl Chloride
1,1-Dichloroethylene	





GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canone Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

ATTN: Mr. Tim Harrington

RE: PW-1  
Sample Date: 08/15/84  
GCL# 52368

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald Lipple

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., University Park, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canone Engineering  
1408 North Tremont  
Chesterton, In 46304  
  
ATTN: Mr. Tim Harrington

DATE: Sept. 28, 1984  
  
RE: Torrington W #1  
Sample Date: 09/13/84  
GCL# 53207

PARAMETERS

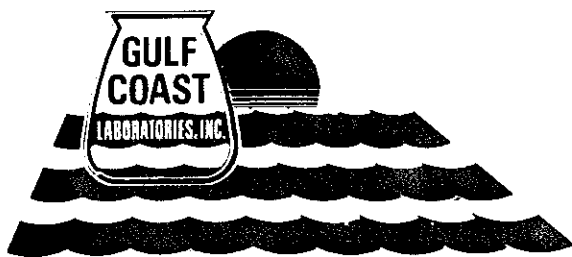
RESULTS

Mineral Spirits

< 0.100 mg/l

Approved: Donald Supple

Analyst \_\_\_\_\_ Date 9/28/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: W-1 SS-1 Tube 1  
Sample Date: 08/06/84  
GCL# 52382

ATTN: Mr. Tim Harrington

PARAMETERS

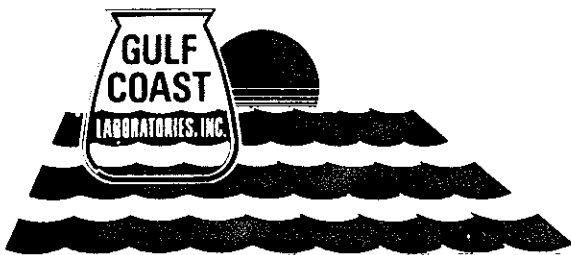
RESULTS

Total PCB's < 5 mg/kg

Mineral Spirits 230 mg/l

Approved: Donald J. Apple

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.  
 2417 Bond St., Park Forest South, Illinois 60466  
 Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
 1408 North Tremont  
 Chesterton, In 46304

DATE: Sept. 4, 1984

ATTN: Mr. Tim Harrington

RE: PW-2  
 Sample Date: 08/15/84  
 GCL# 52369

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

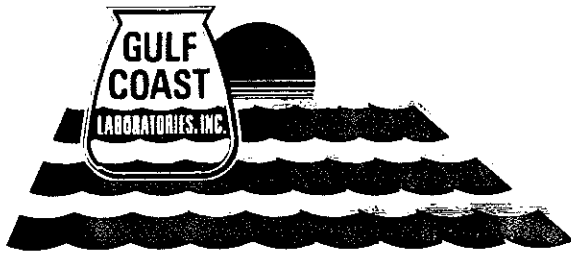
proved:

*Donald Apple*

Analyst

Date

9/4/84



GULF COAST LABORATORIES, INC.

2417 Bond St., University Park, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

## ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 28, 1984

RE: Torrington W #2  
Sample Date: 09/13/84  
GCL# 53208

ATTN: Mr. Tim Harrington

## PARAMETERS

## RESULTS

Mineral Spirits

&lt; 0.100 mg/l

1,1,1 Trichloroethane

0.030 mg/l

1,1 Dichloroethane

0.030 mg/l

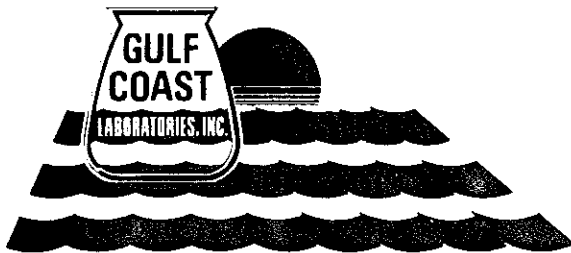
proved:

*Donald Rippe*

Analyst

Date

*9/28/84*



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Sludge W-2 HS-2  
Sample Date: 07/31/84  
GCL# 51760

PARAMETERS

RESULTS

Total PCB's

< 5 mg/kg

Mineral Spirits

550 mg/l

proved:

*Donald J. Lippert*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.  
 2417 Bond St., Park Forest South, Illinois 60466  
 Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
 1408 North Tremont  
 Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: W-2 SS-1 Tube 1  
 Sample Date: 08/01/84  
 GCL# 51938

PARAMETERS

RESULTS

Mineral Spirits

1730 mg/l

Total PCB's

< 5 mg/kg

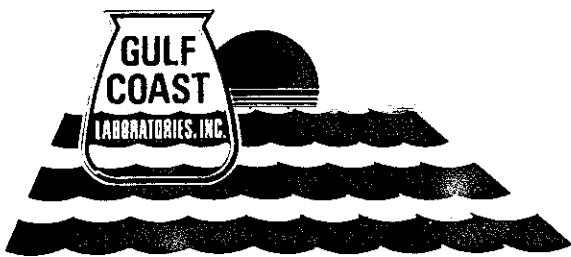
Approved:

*Donald Depple*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

PO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: PW-3  
Sample Date: 08/15/84  
GCL# 52370

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald Lipple

Analyst \_\_\_\_\_ Date 9/4/84





GULF COAST LABORATORIES, INC.  
2417 Bond St., University Park, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304  
  
ATTN: Mr. Tim Harrington

DATE: Sept. 28, 1984  
  
RE: Torrington W #3  
Sample Date: 09/13/84  
GCL# 53209

PARAMETERS

RESULTS

Mineral Spirits

< 0.100 mg/l

Approved: Donald Sipple

Analyst \_\_\_\_\_ Date 9/28/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: W-3 SS-1 Tube 1  
Sample Date: 08/08/84  
GCL# 52383

ATTN: Mr. Tim Harrington

PARAMETERS

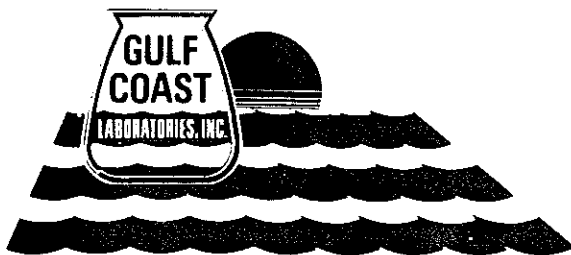
RESULTS

Total PCB's < 5 mg/kg

Mineral Spirits 680 mg/l

Approved: Donald Apple

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: PW-4  
Sample Date: 08/15/84  
GCL# 52371

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

proved:

*Donald J. Apple*

Analyst

Date

9/4/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

## ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 28, 1984

RE: Torrington W-4 Pump  
Sample Date: 09/13/84  
GCL# 53212

ATTN: Mr. Tim Harrington

## PARAMETERS

## RESULTS

Mineral Spirits

&lt; 0.100 mg/l

1,1 Dichloroethylene

0.020 mg/l

1,1 Dichloroethane

0.065 mg/l

1,1,1 Trichloroethane

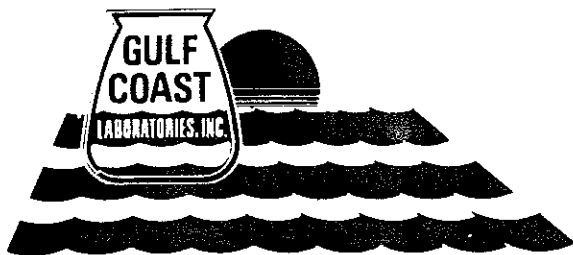
0.285 mg/l

Approved: \_\_\_\_\_

Analyst \_\_\_\_\_

Date

9/28/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: HS-1  
Sample Date: 07/25/84  
GCL# 51639

ATTN: Mr. Tim Harrington

PARAMETERS

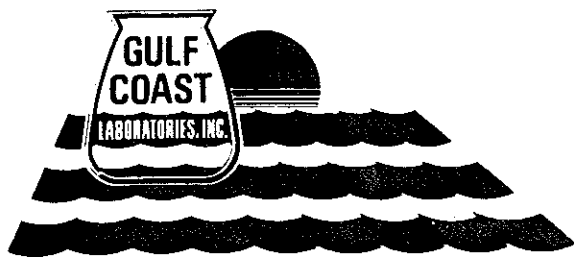
RESULTS

Volatile Organic Acid

< 0.10 mg/l

proved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304  
  
ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984  
  
RE: HS-3  
Sample Date: 07/25/84  
GCL# 51640

PARAMETERS

RESULTS

Volatile Organic Acid

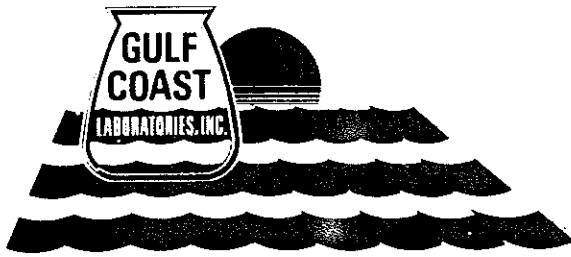
9000 mg/l

Benzene

0.170 mg/l

Approved: Donald J. [Signature]

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: HS-3  
Sample Date: 07/25/84  
GCL# 51640

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Mineral Spirits

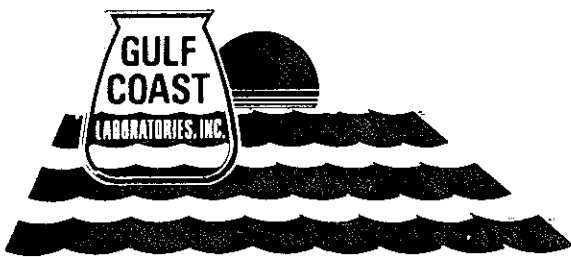
9000 mg/l

Benzene

0.170 mg/l

Approved: Donald D. Apple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Fremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: HS-4  
Sample Date: 07/25/84  
GCL# 51641

PARAMETERS

RESULTS

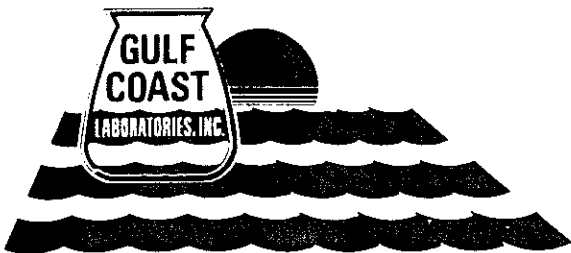
Volatile Organic Acid

< 0.10 mg/l

Approved: Donald J. Supple

Analyst \_\_\_\_\_ Date 8/29/84





GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1403 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

ATTN: Mr. Tim Harrington

RE: PW-5  
Sample Date: 08/15/84  
GCL# 52372

PARAMETERS

RESULTS

Total PCB's

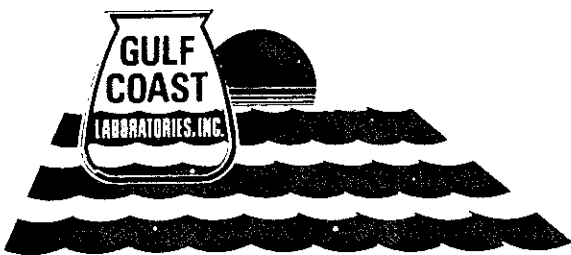
< 0.1 ug/l

Approved: Donald Lippie

Analyst \_\_\_\_\_

Date

9/4/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 28, 1984

RE: Torrington W-5  
Sample Date: 09/13/84  
GCL# 53213

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Mineral Spirits

< 0.100 mg/l

1,1 Dichloroethane

0.014 mg/l

1,1,1 Trichloroethane

0.055 mg/l

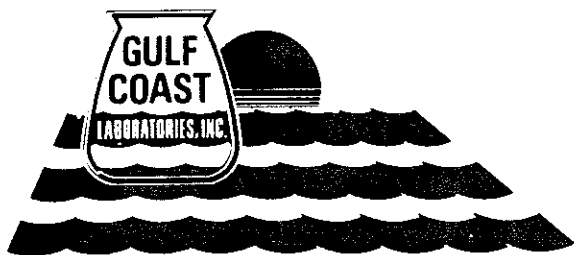
Approved: \_\_\_\_\_

*Donald Juppie*

Analyst \_\_\_\_\_

Date \_\_\_\_\_

9/28/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: Sludge W-5 HS-1  
Sample Date: 07/31/84  
GCL# 51761

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 5 mg/kg

Mineral Spirits

740 mg/l

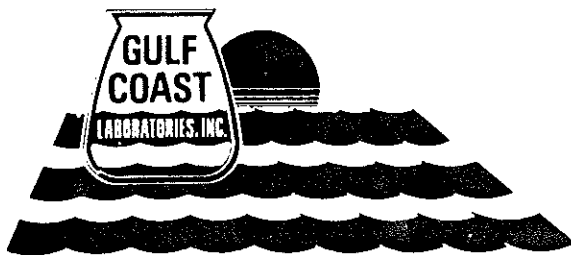
proved:

*Donald J. Apple*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Fremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: PS-3  
Sample Date: 08/15/84  
GCL# 52373

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald Lippie

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

## ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Sept. 28, 1984

RE: Torrington S-3 Pump  
Sample Date: 09/13/84  
GCL# 53214

## PARAMETERS

## RESULTS

Mineral Spirits

0.175 mg/l

1,1 Dichloroethylene

0.150 mg/l

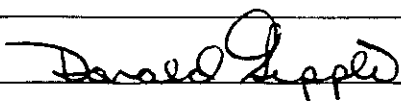
1,1 Dichloroethane

3.230 mg/l

1,1,1 Trichloroethane

4.900 mg/l

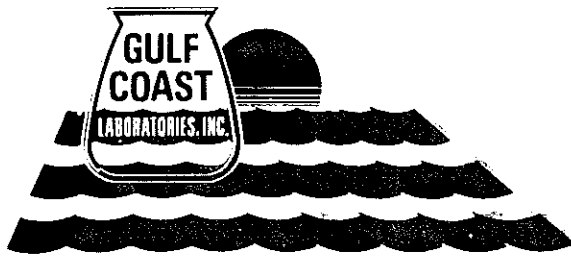
Approved: \_\_\_\_\_



Analyst \_\_\_\_\_

Date

9/28/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

## ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: Sludge S-3 HS-1  
Sample Date: 07/30/84  
GCL# 51757

## PARAMETERS

## RESULTS

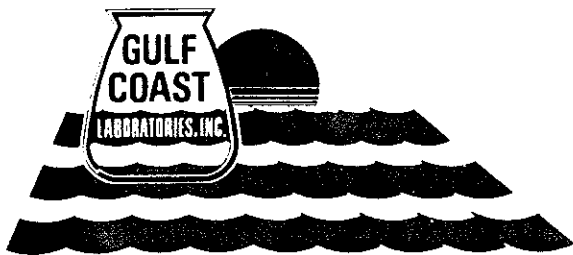
PARAMETERS	RESULTS
Total PCB's	< 5 mg/kg
Mineral Spirits	850 mg/l
1,1,1 Trichlorethane	500 mg/l
Toluene	24 mg/l

proved: Donald Lippel

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Sludge S-3 HS-4  
Sample Date: 07/30/84  
GCL# 51758

PARAMETERS

RESULTS

Total PCB's	< 5 mg/kg
Mineral Spirits	2100 mg/l
1,1,1 Trichlorethane	19000 mg/l
Toluene	57 mg/l

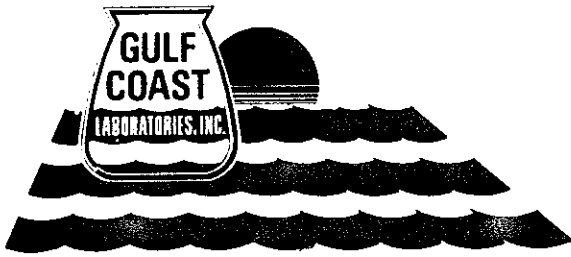
Approved:

*Donald J. Papp*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Fremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: Sludge S-3 HS-6  
Sample Date: 07/30/84  
GCL# 51759

ATTN: Mr. Tim Harrington

PARAMETERS

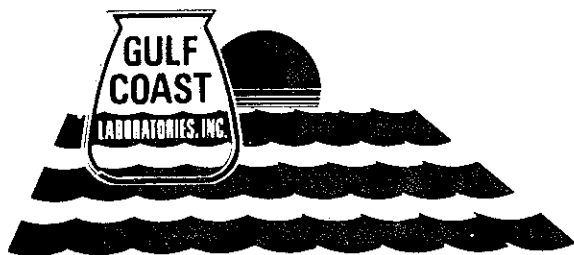
RESULTS

Total PCB's	< 5 mg/kg
Mineral Spirits	32000 mg/l
1,1,1 Trichlorethane	440 mg/l
Toluene	340 mg/l

proved: Donald Lippe

Analyst \_\_\_\_\_ Date 8/29/84





GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Fremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: S-3 SS-1 Tube 2  
Sample Date: 08/13/84  
GCL# 52381

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Mineral Spirits

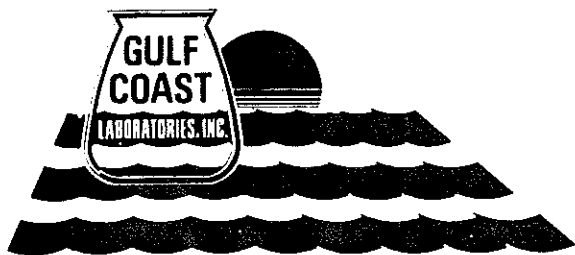
1220 mg/l

Toluene

360 mg/l

Approved: Donald Juppel

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: A-1 HS-1  
Sample Date: 08/02/84  
GCL# 51934

PARAMETERS	RESULTS	
Mineral Spirits	4300	mg/l
1,1,1 Trichloroethane	14000	mg/l
Toluene	120	mg/l
Total PCB's	< 5	mg/kg

proved: Donald Depper

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: A-1 HS-5  
Sample Date: 08/02/84  
GCL# 51935

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

PARAMETERS	RESULTS
Total PCB's	< 5 mg/kg
Mineral Spirits	6700 mg/l
1,1,1 Trichloroethane	100000 mg/l
Toluene	520 mg/l

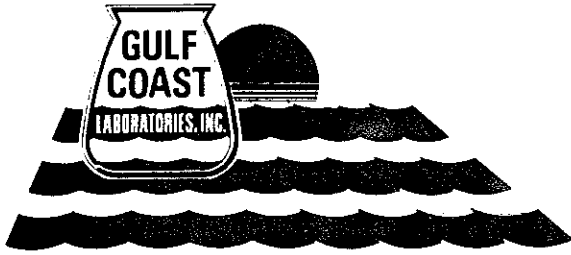
Approved:

*Donald Juppel*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: Sample A-1  
Sample Date: 08/02/84  
GCL# 51930

ATTN: Mr. Tim Harrington

PARAMETERS

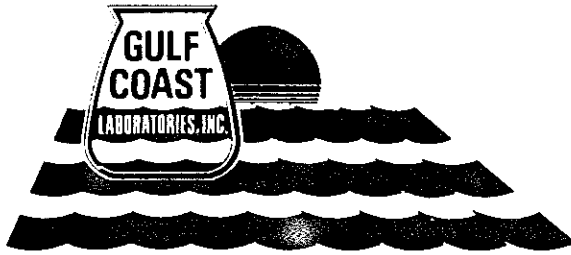
RESULTS

Volatile Organic Acid

0.020 mg/l

Approved: Donald J. Apple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Sample A-1  
Sample Date: 08/02/84  
GCL# 51930

PARAMETERS

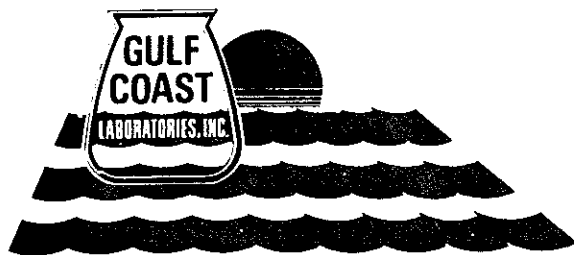
RESULTS

Mineral Spirits

0.020 mg/l

Approved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: A-2 HS-2  
Sample Date: 08/02/84  
GCL# 51936

PARAMETERS

RESULTS

Total PCB's

< 5 mg/kg

Mineral Spirits

2900 mg/l

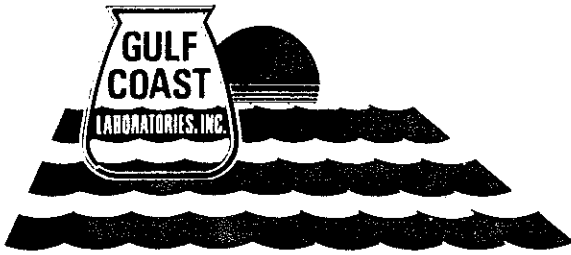
Approved:

*Donald Supple*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: A-2 HS-5  
Sample Date: 08/02/84  
GCL# 51937

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

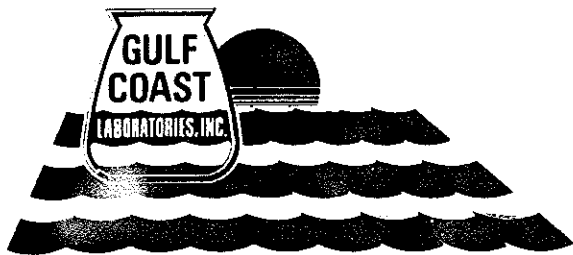
< 5 mg/kg

Mineral Spirits

2620 mg/l

Approved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: A-2 HS-5  
Sample Date: 08/02/84  
GCL# 51933  
DUPLICATE

PARAMETERS

RESULTS

SPIKED RECOVERY

Total PCB's

< 5 mg/kg

98%

Approved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84





GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Fremont  
Chesterton, In 46304  
  
ATTN: Mr. Tim Harrington

DATE: Sept. 4, 1984  
  
RE: A-3 HS-1  
Sample Date: 08/03/84  
GCL# 52384

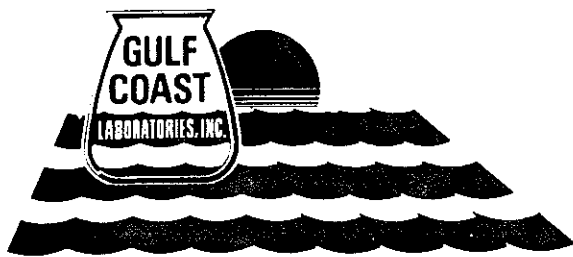
PARAMETERS

RESULTS

PARAMETERS	RESULTS
Total PCB's	< 5 mg/kg
Mineral Spirits	550 mg/l
Toluene	1300 mg/l

proved: Donald Lepple

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canone Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

ATTN: Mr. Tim Harrington

RE: A-4 HS-2  
Sample Date: 08/08/84  
GCL# 52385

PARAMETERS

RESULTS

PARAMETERS	RESULTS
Total PCB's	< 5 mg/kg
Mineral Spirits	670 mg/l
Toluene	880 mg/l

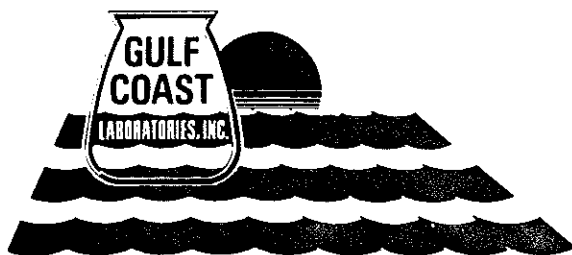
proved:

*Donald Seppel*

Analyst

Date

9/4/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

## ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Sept. 4, 1984

RE: A-4 HS-5  
Sample Date: 08/08/84  
GCL# 52386

## PARAMETERS

## RESULTS

PARAMETERS	RESULTS
Total PCB's	< 5 mg/kg
Mineral Spirits	9950 mg/l
1,1,1 Trichlorethane	15300 mg/l
1,1 Dichlorethane	1270 mg/l

Approved: \_\_\_\_\_

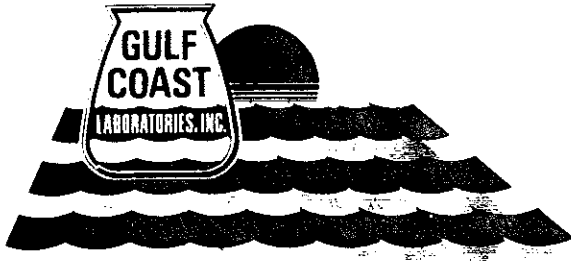
*Donald J. Papp*

Analyst \_\_\_\_\_

Date

9/4/84





GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

ATTN: Mr. Tim Harrington

RE: A-5 HS-5  
Sample Date: 08/09/84  
GCL# 52388

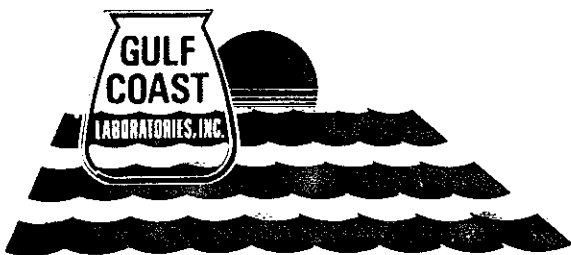
PARAMETERS

RESULTS

PARAMETERS	RESULTS
Total PCB's	< 5 mg/kg
Mineral Spirits	3210 mg/l
1,1,1 Trichloroethane	5770 mg/l

proved: *Daniel J. [Signature]*

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tramont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: A-6 HS-1  
Sample Date: 08/13/84  
GCL# 52389

ATTN: Mr. Tim Harrington

PARAMETERS

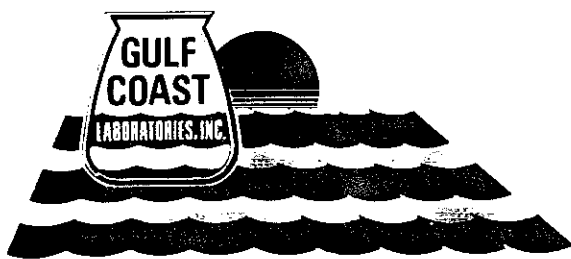
RESULTS

Total PCB's < 5 mg/kg

Mineral Spirits 2020 mg/l

proved: Donald Shipped

Analyst \_\_\_\_\_ Date 9/4/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canone Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 4, 1984

RE: A-7 HS-1  
Sample Date: 08/13/84  
GCL# 52390

ATTN: Mr. Pim Harrington

PARAMETERS

RESULTS

Total PCB's < 5 mg/kg

Mineral Spirits 2100 mg/l

proved: Donald Lippert

Analyst \_\_\_\_\_ Date 9/4/84







GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-16 Water Sample  
Sample Date: 08/02/84  
GCL# 51927

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

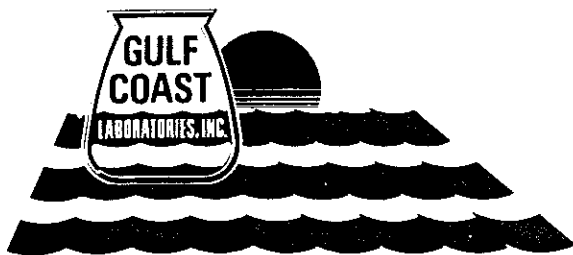
Approved:

*Donald J. Papp*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: TB-7  
Sample Date: 07/26/84  
GCL# 51628

PARAMETERS

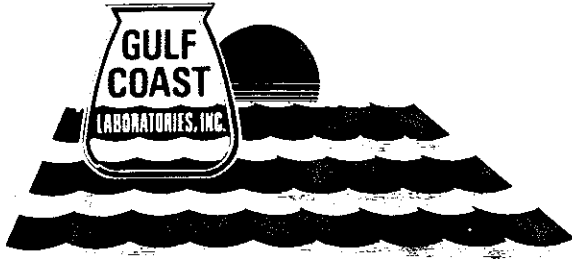
RESULTS

Volatile Organic Acid

< 0.010 mg/l

Approved: Donald J. Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Pond 1  
Sample Date: 07/25/84  
GCL# 51634

PARAMETERS

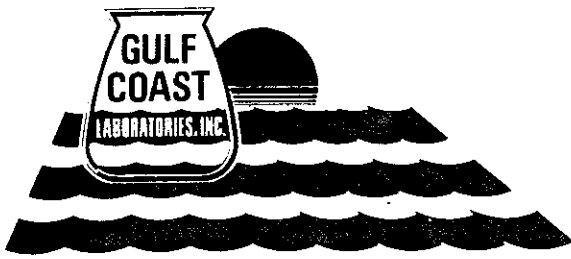
RESULTS

Total PCB's

< 5 mg/kg

proved: Donald Lippert

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

PO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: Pond 1  
Sample Date: 07/25/84  
GCL# 51634  
DUPLICATE

PARAMETERS

RESULTS

SPIKED RECOVERY

Total PCB's

< 5 mg/kg

117%

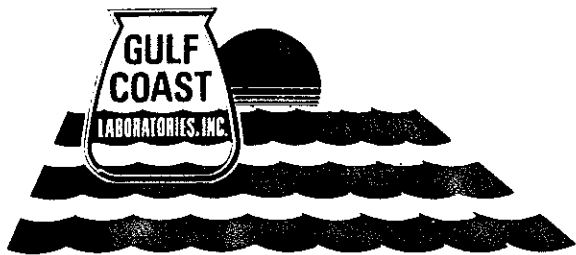
proved:

*Donald J. Apple*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Pond 1  
Sample Date: 07/25/84  
GCL# 51629

PARAMETERS

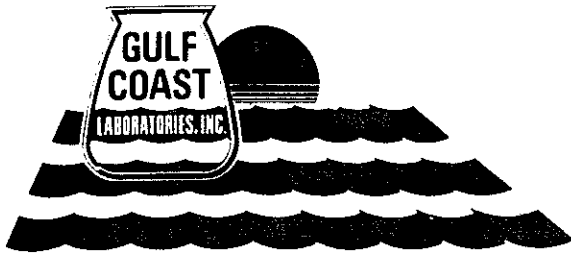
RESULTS

Volatile Organic Acid

< 0.10 mg/l

proved: Donald Shupp

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304  
  
ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984  
  
RE: TB-15 Water Sample  
Sample Date: 08/02/84  
GCL# 51929

PARAMETERS

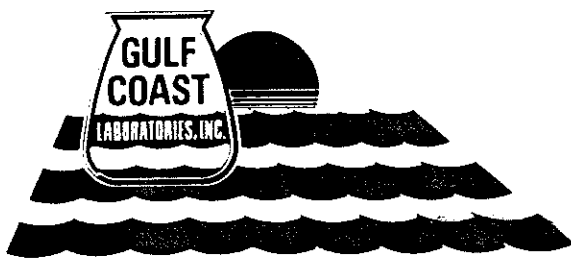
RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald J. [Signature]

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-6  
Sample Date: 07/26/84  
GCL# 51627

ATTN: Mr. Tim Harrington

PARAMETERS

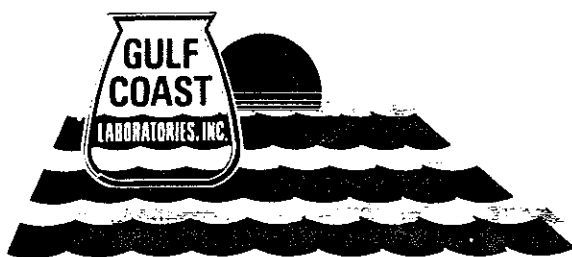
RESULTS

Volatile Organic Acid

< 0.010 mg/l

Approved: Donald Apple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: Pond 2  
Sample Date: 07/25/84  
GCL# 51635

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 5 mg/kg

Approved:

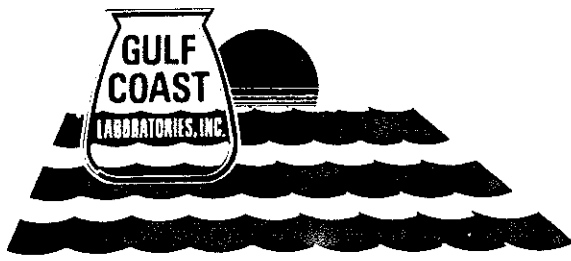
*Donald Lippe*

Analyst

Date

8/29/84





GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: Pond 2  
Sample Date: 07/25/84  
GCL# 51630

PARAMETERS

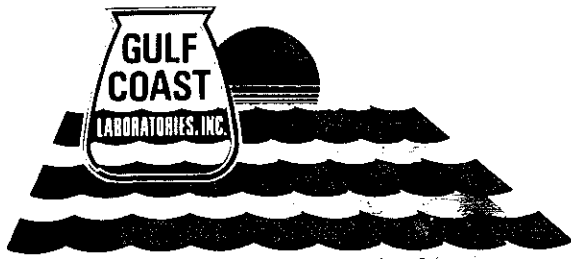
RESULTS

Volatile Organic Acid

< 0.10 mg/l

Approved: Donald J. Apple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Pond 3  
Sample Date: 07/25/84  
GCL# 51636

PARAMETERS

RESULTS

Total PCB's

< 5 mg/kg

Approved: Donald J. Papp

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: Pond 3  
Sample Date: 07/25/84  
GCL# 51631

PARAMETERS

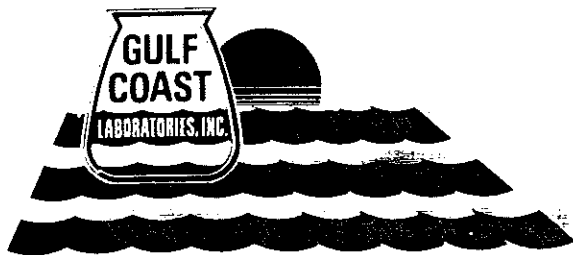
RESULTS

Volatile Organic Acid

< 0.10 mg/l

proved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-13 Water Sample  
Sample Date: 08/02/84  
GCL# 51928

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's \*

< 3 ug/l

\* THERE ARE PEAKS PRESENT, BUT THEY DO NOT APPEAR TO BE PCB'S.

Approved:

*Donald Seppel*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-4  
Sample Date: 07/26/84  
GCL# 51625

ATTN: Mr. Tim Harrington

PARAMETERS

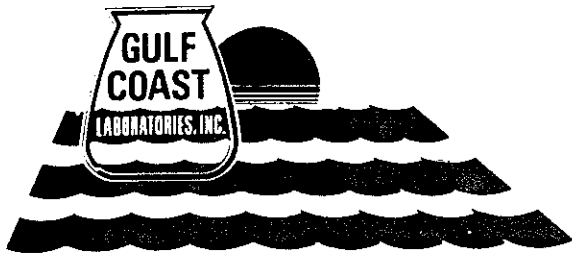
RESULTS

Volatile Organic Acid

< 0.010 mg/l

Approved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

PO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: Pond 4  
Sample Date: 07/25/84  
GCL# 51637

PARAMETERS

RESULTS

Total PCB's

< 5 mg/kg

Approved: Donald J. Papp

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., University Park, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304  
  
ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984  
  
RE: Pond 4  
Sample Date: 07/25/84  
GCL# 51632

PARAMETERS

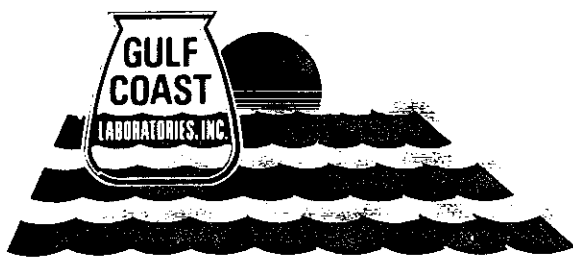
RESULTS

Mineral Spirits

< 0.100 mg/l

Approved: Donald Supple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-14 Water Sample  
Sample Date: 08/02/84  
GCL# 51926

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald Lippel

Analyst \_\_\_\_\_ Date 8/29/84





GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: TB-5

Sample Date: 07/27/84

GCL# 51626

PARAMETERS

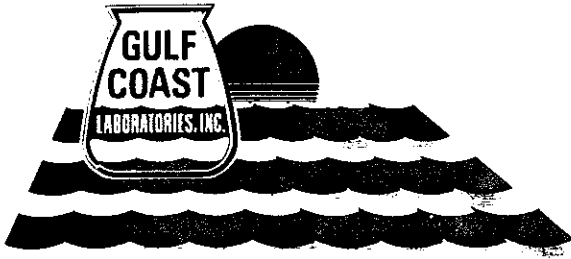
RESULTS

Volatile Organic Acid

< 0.010 mg/l

Approved: Donald J. Apple

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Cnesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Pond 5  
Sample Date: 07/25/84  
GCL# 51638

PARAMETERS

RESULTS

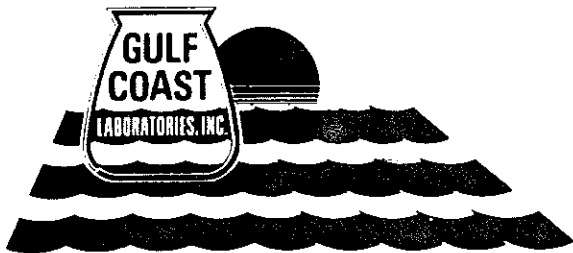
Total PCB's

< 5 mg/kg

Approved: Donald Hipple

Analyst \_\_\_\_\_

Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

ATTN: Mr. Tim Harrington

RE: Pond 5  
Sample Date: 07/25/84  
GCL# 51633

PARAMETERS

RESULTS

Mineral Spirits

0.36 mg/l

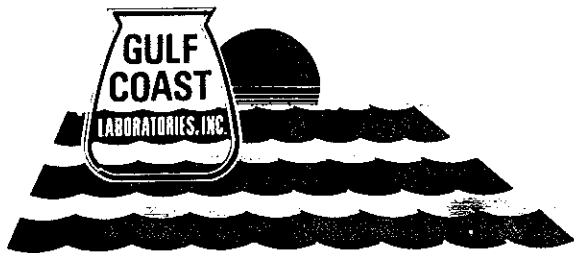
Approved:

*Donald J. Papp*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonic Engineering  
1408 North Tremont  
Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: TB-2

Sample Date: 07/26/84

GCL# 51624

PARAMETERS

RESULTS

Volatile Organic Acid

< 0.010 mg/l

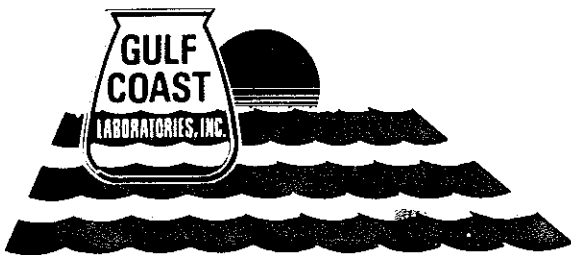
Approved:

*Donald Lippel*

Analyst

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-10 Water Sample  
Sample Date: 08/02/84  
GCL# 51924

ATTN: Mr. Tim Harrington

PARAMETERS

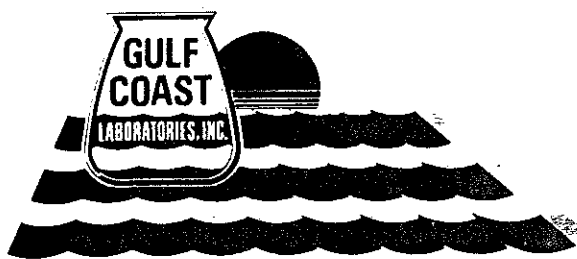
RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald Lippel

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.  
2417 Bond St., Park Forest South, Illinois 60466  
Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Aug. 29, 1984

RE: TB-11 Water Sample  
Sample Date: 08/02/84  
GCL# 51925

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Total PCB's

< 0.1 ug/l

Approved: Donald Juppel

Analyst \_\_\_\_\_ Date 8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

## ANALYTICAL REPORT

TO: Canonic Engineering  
 1408 North Tremont  
 Chesterton, In 46304

ATTN: Mr. Tim Harrington

DATE: Aug. 29, 1984

RE: TB-12

Sample Date: 08/02/84

GCL# 51932

PARAMETERS	RESULTS
Mineral Spirits	7.3 mg/l
1,1 Dichloroethylene	0.290 mg/l
1,1 Dichloroethane	9.8 mg/l
1,2 Dichloroethane	0.585 mg/l
Toluene	0.140 mg/l

Approved: \_\_\_\_\_

*Donald J. Papp*

Analyst \_\_\_\_\_

Date

8/29/84



GULF COAST LABORATORIES, INC.

2417 Bond St., Park Forest South, Illinois 60466

Phones (312) 534-5200 (219) 885-7077 (815) 723-7533

ANALYTICAL REPORT

TO: Canonie Engineering  
1408 North Tremont  
Chesterton, In 46304

DATE: Sept. 28, 1984

RE: VOA Water Foundation  
Sample Date: 09/13/84  
GCL# 53217

ATTN: Mr. Tim Harrington

PARAMETERS

RESULTS

Mineral Spirits

< 0.100 mg/l

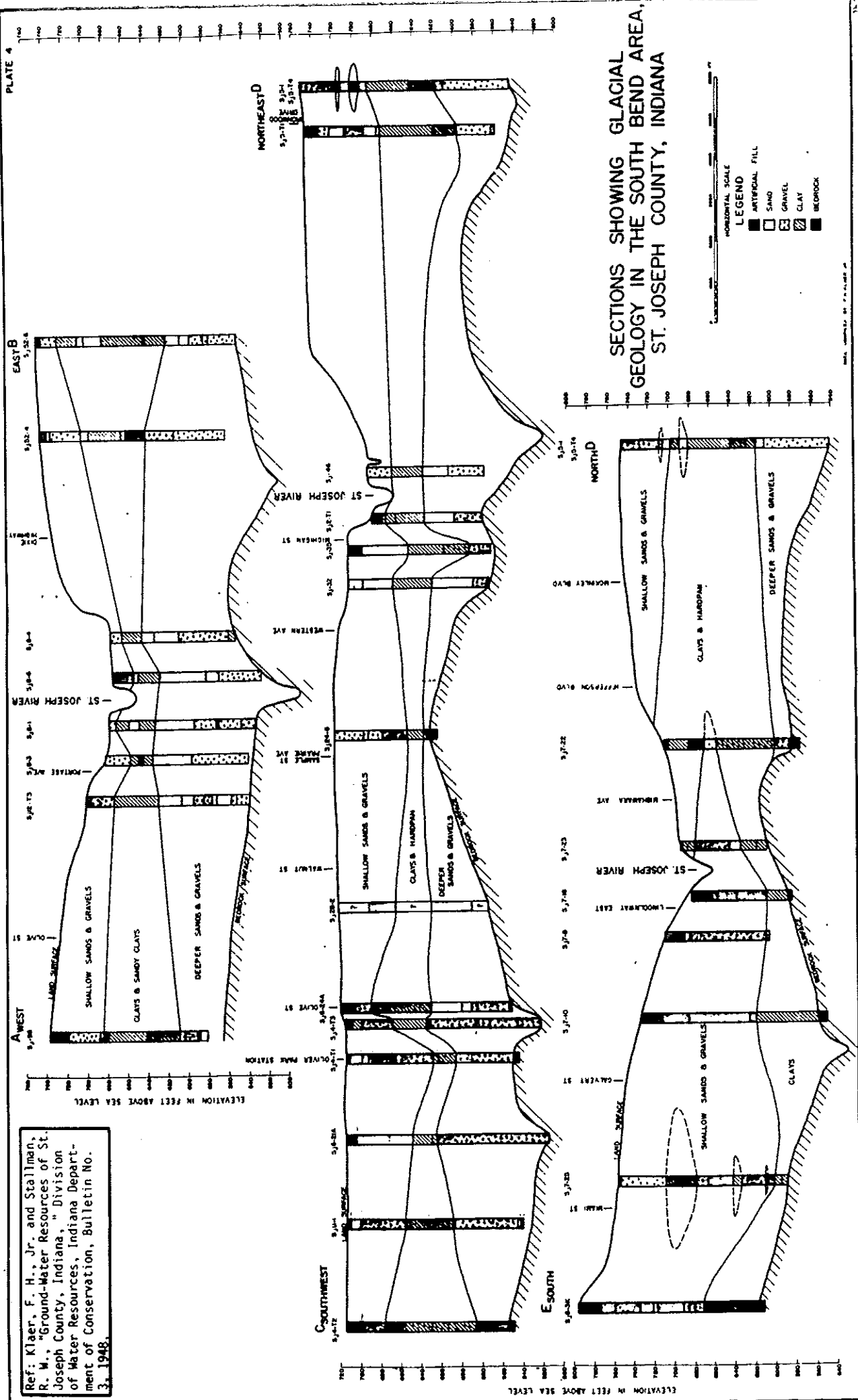
Approved: Donald Gipple

Analyst \_\_\_\_\_ Date 9/28/84





PLATE 4

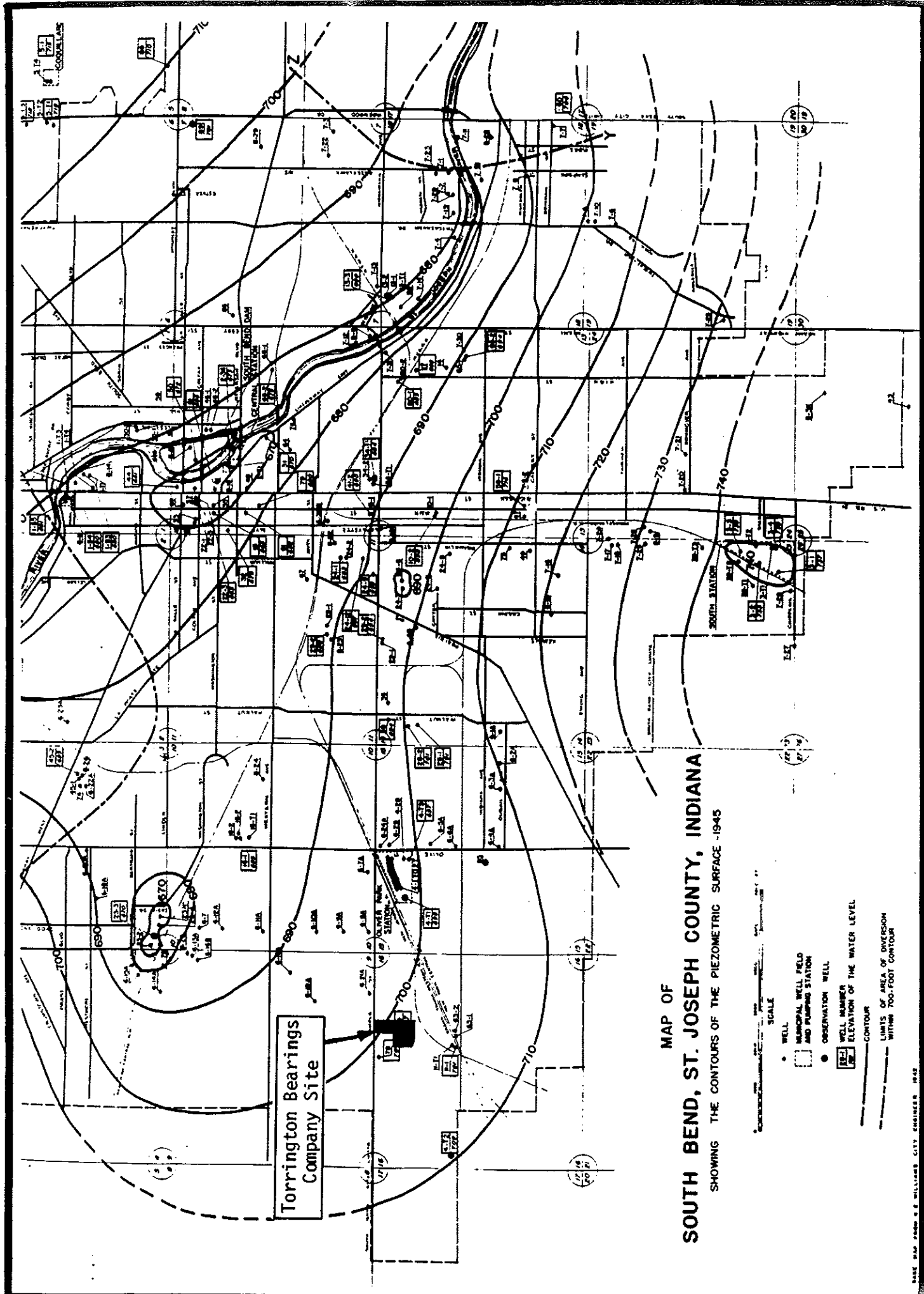


SECTIONS SHOWING GLACIAL  
 GEOLOGY IN THE SOUTH BEND AREA,  
 ST. JOSEPH COUNTY, INDIANA

Ref: Klaer, F. H., Jr. and Stallman, R. W., "Ground-Water Resources of St. Joseph County, Indiana," Division of Water Resources, Indiana Department of Conservation, Bulletin No. 3, 1948.

DATE: 10/15/50 BY: F. H. KLAER, JR.





Torrington Bearings  
Company Site

MAP OF  
SOUTH BEND, ST. JOSEPH COUNTY, INDIANA  
SHOWING THE CONTOURS OF THE PIEZOMETRIC SURFACE - 1945

- WELL
- MUNICIPAL WELL FIELD AND PUMPING STATION
- OBSERVATION WELL
- WELL NUMBER ELEVATION OF THE WATER LEVEL
- - - CONTOUR
- LIMITS OF AREA OF DIVERSION WITHIN 700-FOOT CONTOUR