Formerly Utilized Sites Remedial Action Program (FUSRAP)

Maywood Chemical Company Superfund Site

ADMINISTRATIVE RECORD

Document Number

MISS-006.



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U.S. Department of Energy Oak Ridge Operations Post Office Box 2001 Oak Ridge, Tennessee 37831-8723

Attention: Robert G. Atkin

Technical Services Division

Subject:

Bechtel Job No. 14501, FUSRAP Project DOE Contract No. DE-AC05-810R20722

Publication of Radiological Characterization Report for seventeen residential properties, four municipations

properties, and seven commercial properties in

Lodi and Maywood, New Jersey

Code: 7315/WBS: 138

Dear Mr. Atkin:

Enclosed is one copy each of the 28 subject published reports for the properties listed in Attachment 1. These reports incorporate all comments received in this review cycle (CCNs 063165, 063327, 062285, and 061568) and are being published with approval of Steve Oldham, as reported in CCN 063868.

Also enclosed (as Attachment 2) is a proposed distribution list for these reports. Please send us any changes to the proposed distribution list at your earliest convenience so we may distribute the reports.

BNI would like to express our thanks to Mr. Oldham for his cooperation and efforts to review these drafts in an accelerated manner. His efforts have allowed us to publish these reports or schedule. If you have any questions about these documents, please call me at 576-4718.

Very truly yours,

R. C. Robertson

Project Manager - FUSRAP

RCR:wfs:1756x Enclosure: As stated

cc: J. D. Berger, ORAU (w/e)
N. J. Beskid, ANL (w/e)

CONCURRENCE

RADIOLOGICAL CHARACTERIZATION REPORT

FOR THE COMMERCIAL PROPERTY AT

80 INDUSTRIAL ROAD (FLINT INK CORPORATION)

LODI, NEW JERSEY

SEPTEMBER 1989

Prepared for

UNITED STATES DEPARTMENT OF ENERGY

OAK RIDGE OPERATIONS OFFICE

Under Contract No. DE-AC05-810R20722

Ву

N. C. Ring, D. J. Whiting, and W. F. Stanley

Bechtel National, Inc.

Oak Ridge, Tennessee

Bechtel Job No. 14501

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ABBREVIATIONS

cm centimeter

cm² square centimeter cpm counts per minute

dpm disintegrations per minute

ft foot h hour in. inch

km² square kilometer

L liter

L/min liters per minute

m meter

m² square meter

MeV million electron volts μ R/h microroentgens per hour

mi mile

mi² square mile

min minute

mrad/h millirad per hour

mrem millirem

mrem/yr millirem per year
pCi/g picocuries per gram
pCi/L picocuries per liter

WL working level

yd yard

yd³ cubic yard

1.0 INTRODUCTION AND SUMMARY

This section provides a brief description of the history and background of the Maywood site and its vicinity properties. Data obtained from the radiological characterization of this vicinity property are also presented.

1.1 INTRODUCTION

The 1984 Energy and Water Appropriations Act authorized the U.S. Department of Energy (DOE) to conduct a decontamination research and development project at four sites, including the site of the former Maywood Chemical Works (now owned by the Stepan Company) and its vicinity properties. The work is being administered under the Formerly Utilized Sites Remedial Action Program (FUSRAP) under the direction of the DOE Division of Facility and Site Decommissioning Projects. Several residential, commercial, and municipal properties in Lodi, New Jersey, are included in FUSRAP as vicinity properties. Figure 1-1 shows the location of the Lodi vicinity properties in relation to the former Maywood Chemical Works.

The U.S. Government initiated FUSRAP in 1974 to identify, clean up, or otherwise control sites where low-activity radioactive contamination (exceeding current guidelines) remains from the early years of the nation's atomic energy program or from commercial operations that resulted in conditions Congress has mandated that DOE remedy (Ref. 1).

FUSRAP is currently being managed by DOE Oak Ridge Operations. As the Project Management Contractor for FUSRAP, Bechtel National, Inc. (BNI) is responsible to DOE for planning, managing, and implementing FUSRAP.

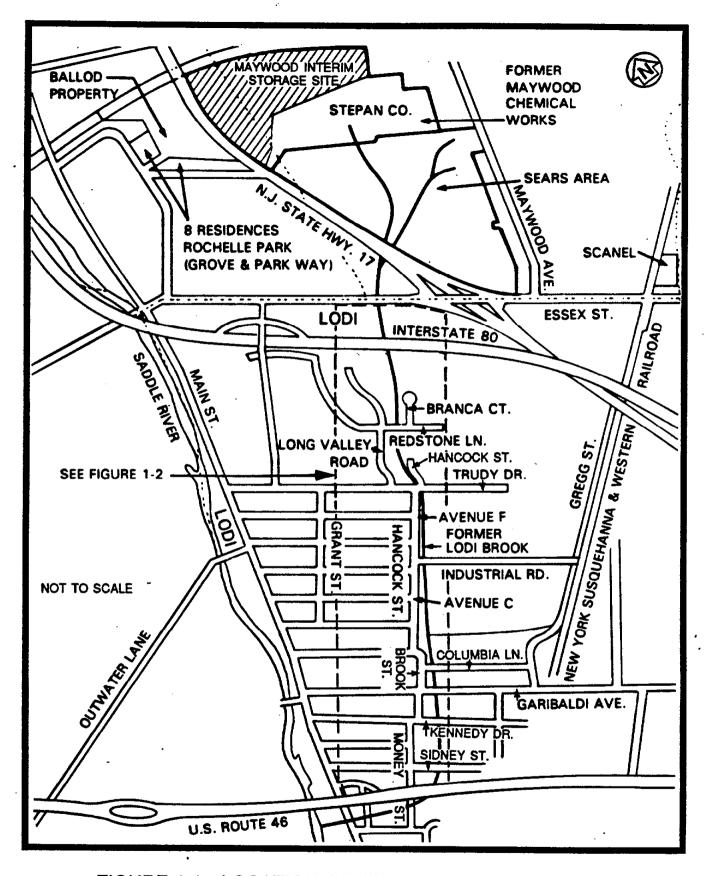


FIGURE 1-1 LOCATION OF LODI VICINITY PROPERTIES

1.2 PURPOSE

The purpose of the 1987 survey performed by BNI was to locate the horizontal and vertical boundaries of radionuclide concentrations exceeding remedial action guidelines.

1.3 SUMMARY

This report details the procedures and results of the radiological characterization of the property at 80 Industrial Road (Figure 1-2) in Lodi, New Jersey, which was conducted in November and December 1987. Additional data were obtained in November 1988.

Ultimately, the data generated during the radiological characterization will be used to define the complete scope of remedial action necessary to release the site.

The property located at 80 Industrial Road is a commercial property that consists of a concrete block building with a grassy area and an asphalt-paved parking lot along the western side and an asphalt-paved parking/loading area along the eastern side. The entrance or north side of the building is bordered by a grassy area, and the rear or south side of the building is bordered by a grassy area that adjoins a state-operated property. The property at 80 Industrial Road is occupied by the Flint Ink Company, which manufactures and distributes ink used in printing operations. The property is situated in a densely populated residential neighborhood; however, other commercial properties are located in close proximity or adjacent to this property.

This characterization confirmed that thorium-232 is the primary radioactive contaminant at this property. Results of

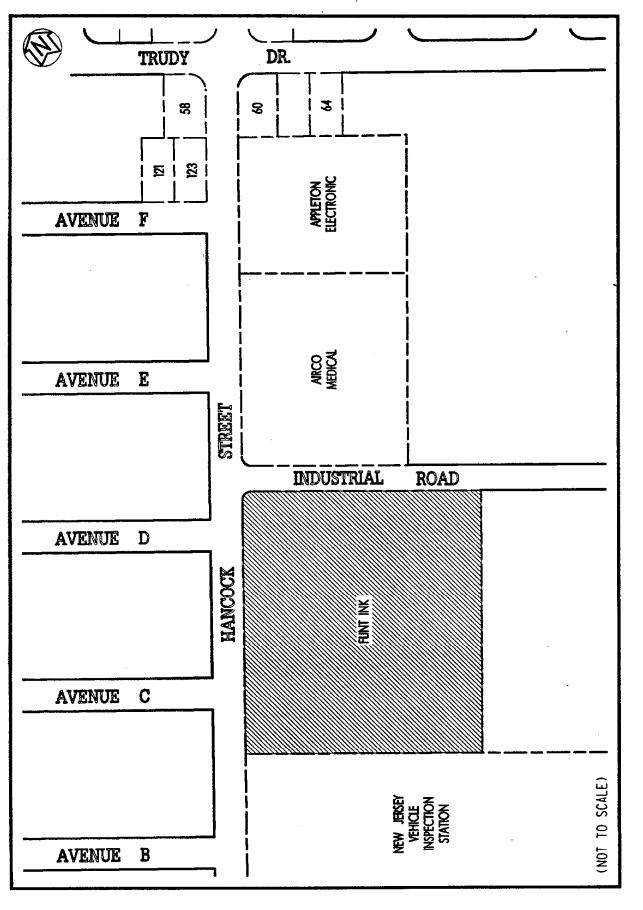


FIGURE 1-2 LOCATION OF 80 INDUSTRIAL ROAD

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surface soil samples for 80 Industrial Road showed maximum concentrations of thorium-232 and radium-226 to be 15.0 and less than 1.7 pCi/g, respectively. The maximum concentration of uranium-238 in surface soil samples was less than 11.6 pCi/g.

Subsurface soil sample concentrations ranged from less than 0.5 to 28.8 pCi/g for thorium-232 and from 0.3 to 13.3 pCi/q for radium-226. The average background level in this area for both radium-226 and thorium-232 is 1.0 pCi/q. concentrations of uranium-238 in subsurface soil samples ranged from less than 1.0 to 42.7 pCi/g. Because the major contaminants at the vicinity properties are thorium and radium, the decontamination guidelines provide the appropriate guidance for the cleanup activities. DOE believes that these guidelines are conservative for considering potential adverse health effects that might occur in the future from any residual contamination. dose contributions from uranium and any other radionuclides not numerically specified in these guidelines are not expected to be significant following decontamination. addition, the vicinity properties will be decontaminated in a manner so as to reduce future doses to levels that are as low as reasonably achievable (ALARA) (Ref. 2).

Soil analysis data for this property indicated surface contamination. Subsurface investigation by gamma logging indicated contamination to a depth of 1.83 m (6.0 ft).

Measurements for radon and its progeny (radon and thoron daughters) were not obtained for this property.

All data tables for this property appear at the end of this report.

1.4 CONCLUSIONS

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Evaluation of data collected, analyses performed, and historical documentation reviewed indicates the presence of radiological contamination on the property located at 80 Industrial Road. This contamination is both surface and subsurface contamination. The surface contamination is located along the rear (south side) of the building. subsurface contamination ranges from a depth of 15.2 cm (6.0 in.) to 1.83 m (6.0 ft). In addition, the contamination appears to extend beneath the building, and there is a high probability that the contamination extends beneath the street (Industrial Road) in front of the building. The total affected area is estimated to be approximately 35 percent of the property. These conclusions are supported by documentation that establishes the presence of the former channel of Lodi Brook in this area. channel is the suspected transport mechanism for the radiological contamination.

It has been determined, from review of aerial photographs of the area, that the former channel of Lodi Brook was realigned and buried in concrete conduit parallel to Hancock Street on this property. Prior to this realignment it is suspected that the former channel flowed across the property in a southwesterly direction in the area where the building now stands. Confirmation of this suspicion was obtained by drilling boreholes inside the building during characterization activities.

2.0 SITE HISTORY

The Maywood Chemical Works was founded in 1895. The company began processing thorium from monazite sand in 1916 (during World War I) for use in manufacturing gas mantles for various lighting devices. Process wastes from manufacturing operations were pumped to two areas surrounded by earthen dikes on property west of the plant. Subsequently, some of the contaminated wastes migrated onto adjacent and vicinity properties.

In 1928 and again between 1944 and 1946, some of the residues from the processing operations were moved from the company's property and used as mulch and fill in nearby low-lying areas. The fill material consisted of tea and coca leaves mixed with other material resulting from operations at the plant. Some fill material apparently contained thorium process wastes (Ref. 3).

Uncertainty exists as to how the properties in Lodi were contaminated. According to an area resident, fill from an unknown source was brought to Lodi and spread over large portions of the previously low-lying and swampy area. several reasons, however, a more plausible explanation is that the contamination migrated along a drainage ditch originating on the Maywood Chemical Works property. First, it can be seen from photographs and tax maps of the area that the course of a previously existing stream known as Lodi Brook, which originated at the former Maywood Chemical Works, generally coincides with the path of contamination in Lodi. The brook was subsequently replaced by a storm drain system as the area was developed. Second, samples taken from Lodi properties indicate elevated concentrations of a series of elements known as rare earths. Rare earth elements are typically found in monazite sands, which also contain

thorium. This type of sand was feedstock at the Maywood Chemical Works, and elevated levels are known to exist in the by-product of the extraction process. Third, the ratio of thorium to other radionuclides found on these Lodi properties is comparable to the ratio found in contaminated material on other properties in Lodi (Ref. 4). And finally, long-time residents of Lodi recalled chemical odors in and around the brook in Lodi and steam rising off the water. These observations suggest that discharges of contaminants occurred upstream.

The Stepan Chemical Company (now called the Stepan Company) purchased Maywood Chemical Works in 1959. The Stepan Company itself has never been involved in the manufacture or processing of any radioactive materials (Ref. 5).

2.1 PREVIOUS RADIOLOGICAL SURVEYS

Numerous surveys of the Maywood site and its vicinity properties have been conducted. Among the past surveys, three that are pertinent to this vicinity property are detailed in this section.

January 1981—The Nuclear Regulatory Commission directed that a survey be conducted of the Stepan Company property and its vicinity properties in January 1981. Using the Stepan Company plant as the center, a 10.3-km² (4-mi²) aerial survey was conducted by the EG&G Energy Measurements Group, which identified anomalous concentrations of thorium-232 to the north and south of the Stepan Company property. The Lodi vicinity properties were included in this survey (Ref. 6).

June 1984 -- In June 1984, Oak Ridge National Laboratory (ORNL) conducted a "drive-by" survey of Lodi using its

"scanning van." Although not comprehensive, the survey indicated areas requiring further investigation (Ref. 7).

<u>September 1986</u>—At the request of DOE, ORNL conducted radiological surveys of the vicinity properties in Lodi in September 1986 to determine which properties contained radioactive contamination in excess of DOE guidelines and would, therefore, require remedial action (Ref. 8).

2.2 REMEDIAL ACTION GUIDELINES

Table 2-1 summarizes the DOE guidelines for residual contamination. The thorium-232 and radium-226 limits listed in Table 2-1 will be used to determine the extent of remedial action required at the vicinity properties. DOE developed these guidelines to be consistent with the guidelines established by the U.S. Environmental Protection Agency (EPA) for the Uranium Mill Tailings Remedial Action Program.

TABLE 2-1 SUMMARY OF RESIDUAL CONTAMINATION GUIDELINES

BASIC DOSE LIMITS

The basic limit for the annual radiation dose received by an individual member of the general public is 100 mrem/yr.

SOIL GUIDELINES

Radionuclide	Soil Concentration (pCl/g) Above Background ^{a,b,c}			
Radium-226	5 pCi/g when averaged over the first 15 cm of soil below			
Radium-228	the surface; 15 pCi/g when averaged over any 15-cm-thick			
Thorium-230	soil layer below the surface layer.			
Thorium-232	·			
Other Radionuclides	Soil guidelines will be calculated on a site-specific basis using the DOE manual developed for this use.			

STRUCTURE GUIDELINES

Airborne Radon Decay Products

Generic guidelines for concentrations of airborne radon decay products shall apply to existing occupied or habitable structures on private property that has no radiological restrictions on its use; structures that will be demolished or buried are excluded. The applicable generic guideline (40 CFR 192) is: In any occupied or habitable building, the objective of remedial action shall be, and reasonable effort shall be made to achieve, an annual average (or equivalent) radon decay product concentration (including background) not to exceed 0.02 WL^d. In any case, the radon decay product concentration (including background) shall not exceed 0.03 WL. Remedial actions are not required in order to comply with this guideline when there is reasonable assurance that residual radioactive materials are not the cause.

External Gamma Radiation

The average level of gamma radiation inside a building or habitable structure on a site that has no radiological restrictions on its use shall not exceed the background level by more than 20 µR/h.

Indoor/Outdoor Structure Surface Contamination_

Allowable Surface Residual Contamination® (dpm/100 cm²)

Radionuclide ^f	Average ^{g,h}	Maximum ^{h,l}	Removable ^{h,j}
Transuranics, Ra-226, Ra-228, Th-230, Th-228 Pa-231, Ac-227, I-125, I-129	100	300	20
Th-Natural, Th-232, Sr-90, Ra-223, Ra-224 U-232, I-126, I-131, I-133	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay products	5,000 α	15,000 α	1,000 α
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above	5,000 8 - γ	15,000 8 - γ	1,000 β - γ

TABLE 2-1 (CONTINUED)

- ^aThese guidelines take into account ingrowth of radium-226 from thorium-230 and of radium-228 from thorium-232, and assume secular equilibrium. If either thorium-230 and radium-226 or thorium-232 and radium-228 are both present, not in secular equilibrium, the guidelines apply to the higher concentration. If other mixtures of radionuclides occur, the concentrations of individual radionuclides shall be reduced so that 1) the dose for the mixtures will not exceed the basic dose limit, or 2) the sum of ratios of the soil concentration of each radionuclide to the allowable limit for that radionuclide will not exceed 1 ("unity").
- ^bThese guidelines represent allowable residual concentrations above background averaged across any 15-cm-thick layer to any depth and over any contiguous 100-m² surface area.
- CLocalized concentrations in excess of these limits are allowable, provided that the average concentration over a 100-m² area does not exceed these limits. In addition, every reasonable effort shall be made to remove any source of radionuclide that exceeds 30 times the appropriate soil limit, regardless of the average concentration in the soil.
- ^dA working level (WL) is any combination of short-lived radon decay products in 1 liter of air that will result in the ultimate emission of 1.3 x 105 MeV of potential alpha energy.
- ^eAs used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.
- Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.
- ^gMeasurements of average contamination should not be averaged over more than 1 m². For objects of less surface area, the average shall be derived for each such object.
- ^hThe average and maximum radiation levels associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.
- ⁱThe maximum contamination level applies to an area of not more than 100 cm².
- ³The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm² is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. The numbers in this column are maximum amounts.

3.0 HEALTH AND SAFETY PLAN

BNI is responsible for protecting the health of personnel assigned to work at the site. As such, all subcontractors and their personnel were required to comply with the provisions of BNI health and safety requirements and as directed by the on-site BNI Health and Safety Officer.

3.1 SUBCONTRACTOR TRAINING

Before the start of work, all subcontractor personnel attended an orientation session presented by the BNI Health and Safety Officer to explain the nature of the material to be encountered in the work and the personnel monitoring and safety measures that are required.

3.2 SAFETY REQUIREMENTS

Subcontractor personnel complied with the following BNI requirements:

- o Bioassay--Subcontractor personnel submitted bioassay samples before or at the beginning of on-site activity, upon completion of the activity, and periodically during site activities as requested by BNI.
- o Protective Clothing/Equipment--Subcontractor personnel were required to wear the protective clothing/equipment specified in the subcontract or as directed by the BNI Health and Safety Officer.
- o Dosimetry--Subcontractor personnel were required to wear and return daily the dosimeters and monitors issued by BNI.
- o Controlled Area Access/Egress--Subcontractor personnel and equipment entering areas where access and egress were controlled for radiation and/or chemical safety purposes were surveyed by the BNI Health and Safety Officer (or personnel representing BNI) for contamination before leaving those areas.

o Medical Surveillance--Upon written direction from BNI, subcontractor personnel who work in areas where hazardous chemicals might exist were given a baseline and periodic health assessment defined in BNI's Medical Surveillance Program.

Radiation and/or chemical safety surveillance of all activities related to the scope of work was under the direct supervision of personnel representing BNI.

Health and safety-related requirements for all activities involving exposure to radiation, radioactive material, chemicals, and/or chemically contaminated materials and other associated industrial safety hazards are generated in compliance with applicable regulatory requirements and industry-wide standards. Copies of these requirements are located at the BNI project office for use by project personnel.

4.0 CHARACTERIZATION PROCEDURES

A master grid was established by the surveyor. BNI's radiological support subcontractor, Thermo Analytical/Eberline (TMA/E), established a grid on individual properties. The size of the grid blocks was adjusted to characterize each property adequately. The grid origin allows the grid to be reestablished during remedial action and is correlated with the New Jersey state grid system. All data correspond to coordinates on the characterization grid. The grid with the east and north coordinates is shown on all figures included in Sections 4.0 and 5.0 of this report.

4.1 FIELD RADIOLOGICAL CHARACTERIZATION

This section provides a description of the instrumentation and methodologies used to obtain exterior surface and subsurface measurements during radiological characterization of this property.

4.1.1 Measurements Taken and Methods Used

An initial walkover survey was performed using an unshielded gamma scintillation detector [5.0- by 5.0-cm (2- by 2-in.) thallium-activated sodium iodide probe] to identify areas of elevated radionuclide activity. Near-surface gamma measurements taken using a cone-shielded gamma scintillation detector were also used to determine areas of surface contamination. The shielded detector ensured that the majority of the radiation detected by the instrument originated from the ground directly beneath the unit. Shielding against lateral gamma flux, or shine, from nearby areas of contamination minimized potential sources of error in the measurements. The measurements were taken 30.4 cm (12 in.) above the ground at the intersections of

3.0-m (10-ft) grid lines. The shielded detector was calibrated at the Technical Measurements Center (TMC) in Grand Junction, Colorado, to provide a correlation of counts per minute (cpm) to picocuries per gram (pCi/g). This calibration demonstrated that approximately 11,000 cpm corresponds to the DOE guideline of 5 pCi/g plus local average background of 1 pCi/g for thorium-232 in surface soils (Ref. 9).

A subsurface investigation was conducted to determine the depth to which the previously identified surface contamination extended and to locate subsurface contamination where there was no surface manifestation. The subsurface characterization consisted of drilling 42 boreholes (Figure 4-1), using either a 7.6-cm- (3-in.-) or 15.2-cm- (6-in.-) diameter auger bit, and gamma logging them. The boreholes were drilled to depths determined in the field by the radiological and geological support representatives.

The downhole gamma logging technique was used because the procedure can be accomplished in less time than collecting soil samples, and the need for analyzing these samples in a laboratory is eliminated. A 5.0- by 5.0-cm (2- by 2-in.) sodium iodide gamma scintillation detector was used to perform the downhole logging. The instrument was calibrated at TMC where it was determined that a count rate of approximately 40,000 cpm corresponds to the 15-pCi/g subsurface contamination guideline for thorium-232. This relationship has also been corroborated by results from previous characterizations where thorium-232 was found (Ref. 9).

Gamma radiation measurements were taken at 15.2-cm (6-in.) vertical intervals to determine the depth and concentration



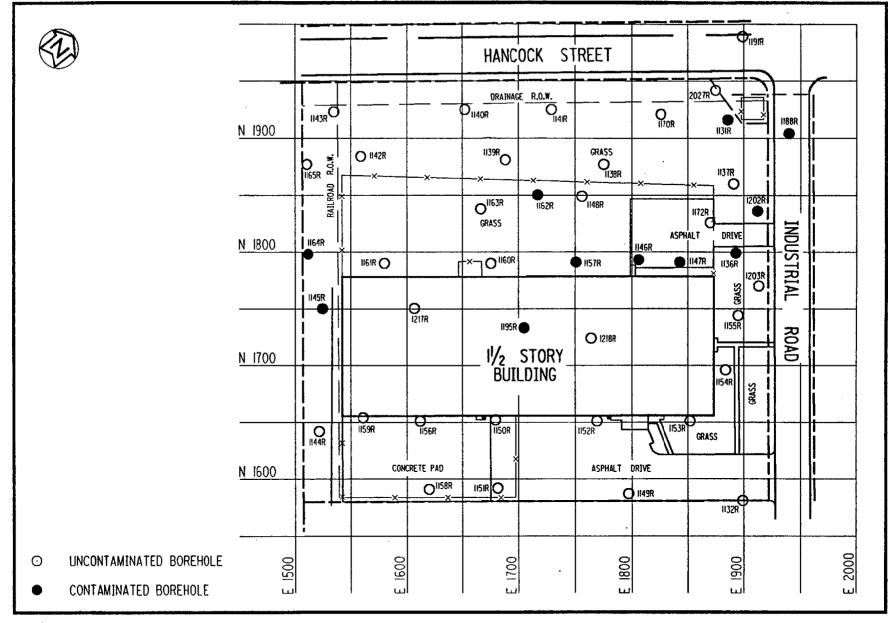


FIGURE 4-1 BOREHOLE LOCATIONS AT 80 INDUSTRIAL ROAD

of the contamination. The gamma-logging data were reviewed to identify trends, whether or not concentrations exceeded the guidelines.

4.1.2 <u>Sample Collection and Analysis</u>

To identify surface areas where the level of contamination exceeded the DOE guideline of 5 pCi/g for thorium-232, areas with measurements of more than 11,000 cpm were plotted. Using these data as well as data from previous surveys (Refs. 5, 6, 7, and 8), the locations of biased surface soil samples were selected to better define the limits of contamination. Surface soil samples were taken at 36 locations (Figure 4-2) and analyzed for thorium-232, uranium-238, and radium-226. Each sample was dried, pulverized, and counted for 10 min using an intrinsic germanium detector housed in a lead counting cave lined with cadmium and copper. The pulse height distribution was sorted using a computer-based, multichannel analyzer. concentrations were determined by comparing the gamma spectrum of each sample with the spectrum of a certified counting standard for the radionuclide of interest.

Subsurface soil samples were collected from 42 locations (Figure 4-2) using a 7.6-cm (3.0-in.) outside diameter (0.D.) split-spoon sampler mounted to a tripod or attached to a truck-mounted auger stem. The subsurface soil samples were analyzed for radium-226, uranium-238, and thorium-232 in the same manner as the surface soil samples.

FIGURE 4-2 SURFACE AND SUBSURFACE SOIL SAMPLING LOCATIONS AT 80 INDUSTRIAL ROAD

4.2 <u>BUILDING RADIOLOGICAL CHARACTERIZATION</u>

After evaluating previous radiological survey data as well as data from this characterization, it was suspected that contamination might be present under the foundation of the building. Three boreholes were drilled inside the building to confirm the presence of contamination beneath the building. These boreholes were drilled, using either a 7.6-cm- (3-in.-) or 15.2-cm- (6-in.-) diameter auger bit, and gamma logged. The boreholes were drilled to depths determined in the field by the radiological and geological support representatives. In addition, soil samples were collected from each location.

Indoor measurements for radon and radon progeny were not obtained due to scheduling conflicts.

Exterior gamma exposure rate measurements were made at eight locations throughout the property grid system. these measurements, either a 5.0- by 5.0-cm (2- by 2-in.) thallium-activated sodium iodide gamma scintillation detector designed to detect gamma radiation only or a pressurized ionization chamber (PIC) was used. Measurement locations are shown in Figure 4-3. The PIC instrument has a response to gamma radiation that is proportional to exposure in roentgens. A conversion factor for gamma scintillation to the PIC was established through a correlation of these two measurements at four locations in the vicinity of the property. The unshielded gamma scintillation detector readings were then used to estimate gamma exposure rates for each location. These measurements were taken 1 m (3 ft) above the ground. The locations were determined to be representative of the entire property.

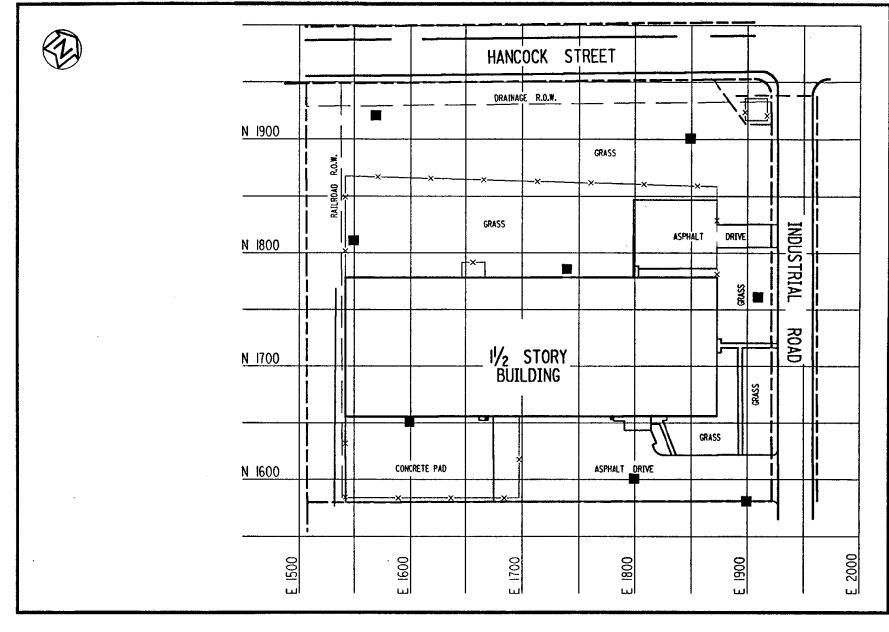


FIGURE 4-3 GAMMA EXPOSURE RATE MEASUREMENT LOCATIONS AT 80 INDUSTRIAL ROAD

5.0 CHARACTERIZATION RESULTS

Radiological characterization results are presented in this section. The data included represent exterior surface and subsurface radiation measurements and interior radiation measurements.

5.1 FIELD RADIOLOGICAL CHARACTERIZATION

Near-surface gamma radiation measurements on the property ranged from 6,000 cpm to approximately 22,000 cpm. The average background level for this area is 5,000 cpm. A measurement of 11,000 cpm is approximately equal to the DOE guideline for thorium-232 of 5 pCi/g above background for surface soil contamination. Using this correlation, the near-surface gamma measurements were used to determine the extent of surface contamination and the basis for selecting the locations of soil samples. Areas of surface contamination are shown in Figure 5-1.

Surface soil samples [depths from 0.0 to 15.2 cm (6.0 in.)] were taken at 36 locations on the property (Figure 4-2).

These samples were analyzed for thorium-232, uranium-238, and radium-226. The concentrations in these samples ranged from less than 2.6 to less than 11.6 pCi/g for uranium-238, from less than 0.6 to 15.0 pCi/g for thorium-232, and from less than 0.4 to less than 1.7 pCi/g for radium-226. Analytical results for surface soils are provided in Table 5-1; these data showed that concentrations of thorium-232 exceeded DOE guidelines (5 pCi/g plus background of 1 pCi/g for surface soils) with a maximum concentration of 15.0 pCi/g. Use of the "less than" (<) notation in reporting results indicates that the radionuclide was not present in concentrations that are quantitative with the instruments and techniques used. The "less than" value represents the lower bound of the

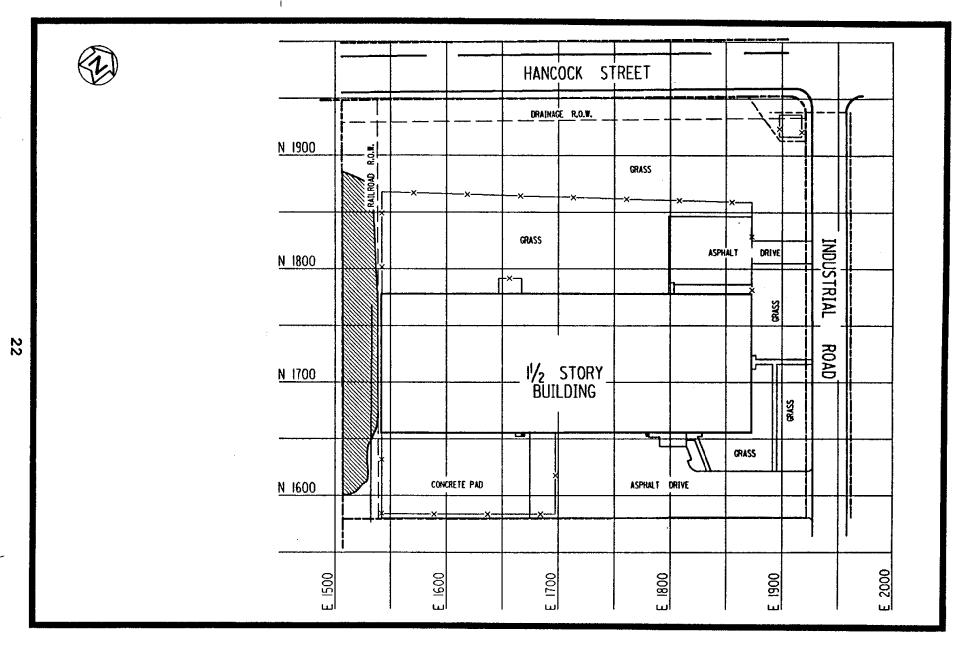


FIGURE 5-1 AREAS OF SURFACE CONTAMINATION AT 80 INDUSTRIAL ROAD

quantitative capacity of the instrument and technique used. The "less than" value is based on various factors, including the volume, size, and weight of the sample; the type of detector used; the counting time; and the background count rate. The actual concentration of the radionuclide is less than the value indicated. In addition, since radioactive decay is a random process, a correlation between the rate of disintegration and a given radionuclide concentration cannot be precisely established. For this reason, the exact concentration of the radionuclide cannot be determined. As such, each value that can be quantitatively determined has an associated uncertainty term (±), which represents the amount by which the actual concentration can be expected to differ from the value given in the table. The uncertainty term has an associated confidence level of 95 percent.

Thorium-232, the primary contaminant at the site, is the radionuclide most likely to exceed a specific DOE guideline in soil. Parameters for soil sample analysis were selected to ensure that the thorium-232 would be detected and measured at concentrations well below the lower guideline value of 5 pCi/g in excess of background level. Radionuclides of the uranium series, specifically uranium-238 and radium-226, are also potential contaminants but at lower concentrations than thorium-232. Therefore, these radionuclides (considered secondary contaminants) would not be present in concentrations in excess of guidelines unless thorium-232 was also present in concentrations in excess of its guideline Parameters selected for the thorium-232 analyses also provide detection sensitivities for uranium-238 and radium-226 that demonstrate that concentrations of these radionuclides are below guidelines. However, because of the relatively low gamma photon abundance of uranium-238, many of the uranium-238 concentrations were below the detection sensitivity of the analytical procedure; these concentrations

are reported in the data tables as "less than" values. To obtain more sensitive readings for the uranium-238 radionuclide with these analytical methods, much longer instrument counting times would be required than were necessary for analysis of thorium-232, the primary contaminant.

Analytical results for subsurface soil samples are given in Table 5-1, and gamma logging data are given in Table 5-2. The results in Table 5-2 showed a range from 7,000 cpm to 114,000 cpm. A measurement of 40,000 cpm is approximately equal to the DOE guideline for subsurface contamination of 15 pCi/g. Analyses of subsurface soil samples indicated uranium-238 concentrations ranging from less than 1.0 to 42.7 pCi/g, thorium-232 concentrations ranging from less than 0.5 to 28.8 pCi/g, and radium-226 concentrations ranging from 0.3 to 13.3 pCi/g.

On the basis of near-surface gamma radiation measurements, surface and subsurface soil sample analyses, and downhole gamma logging, contamination on this property is believed to consist primarily of subsurface contamination at depths ranging from 15.2 cm (6.0 in.) to 1.83 m (6.0 ft). The areas of subsurface contamination are shown in Figure 5-2. The subsurface contamination appears to extend beneath the building as well as into the street (Industrial Road) in front of the property.

It is apparent from review of historical documentation (e.g., aerial photographs of the area, interviews with local residents, and previous radiological surveys) that the subsurface contamination on this property lies along the former channel of Lodi Brook and its associated floodplain.

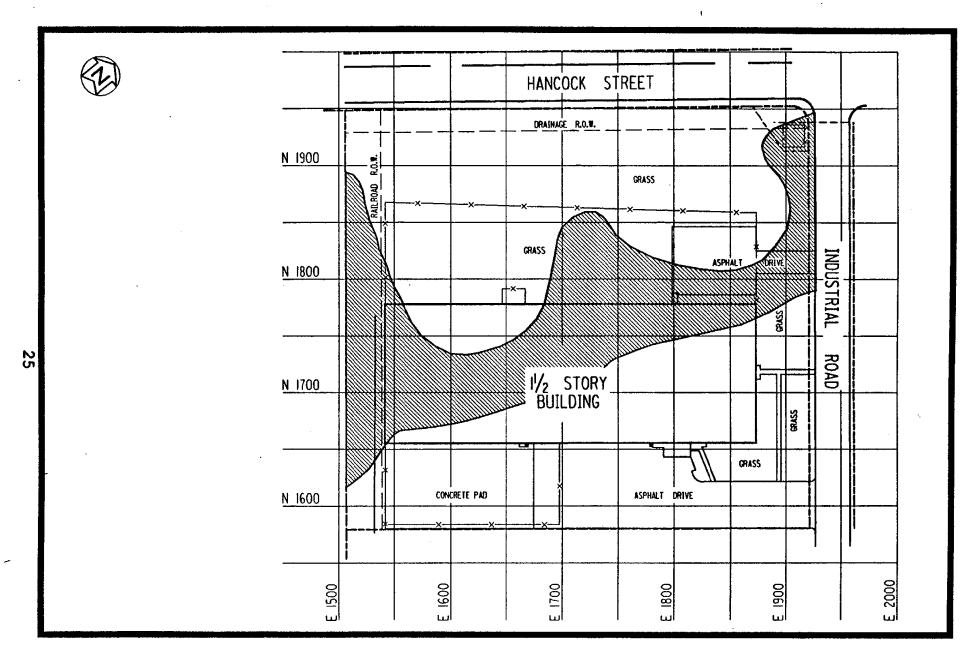


FIGURE 5-2 AREAS OF SUBSURFACE CONTAMINATION AT 80 INDUSTRIAL ROAD

The contamination on this property is similar to contamination found on commercial and municipal properties in close proximity to this property. It has been established that the Lodi Brook channel through these neighboring properties once occupied locations connecting to those where stream sediments were found at 80 Industrial Road. Thus, the elevated gamma readings shown on gamma logs from boreholes drilled on this property serve as further indication of the suspected mechanism of transport for radiological contamination (i.e., stream deposition from Lodi Brook).

The vertical and horizontal limits of contamination as determined by this characterization effort are being evaluated to determine the volume of contaminated material that will require remedial action. To develop this estimate, BNI will consider the location of the contamination, construction techniques, and safety procedures.

5.2 BUILDING RADIOLOGICAL CHARACTERIZATION

Boreholes were drilled inside the building to better define the boundaries of subsurface contamination. Data from these boreholes confirmed the presence of contamination beneath the building.

Exterior gamma radiation exposure rate measurements ranged from 7 to 20 μ R/h, including background. These results can be found in Table 5-3. The average exterior rate for the property is 11 μ R/h. Assuming the indoor exposure rate is the same as the average exterior exposure rate, and that employees are present for 45 hours per week for 50 weeks per year (2,250 hours or 9 hours per day for 5 days per week), a yearly dose of 5 mrem above background (after subtracting average background of 9 μ R/h; Ref. 12) could be expected.

The DOE guideline is 100 mrem/yr above background. Based on the above information, the exposure rates and doses at this property are within DOE guidelines. Further, it should be emphasized that natural background exposure rates vary widely across the United States and are often significantly higher than average background for this area.

TABLE 5-1
SURFACE AND SUBSURFACE RADIONUCLIDE CONCENTRATIONS IN SOIL

FOR 80 INDUSTRIAL ROAD

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	<u>inates^a </u>	Depth	*	Concer	<u>itration</u>	$(pCi/q \pm 2)$	sigma)		
East 	North	(ft)	Uranium-238		Radium-226			Thorium-232	
1501	1877	0.0 - 0.5	<	3.4	<	0.6	<	0.9	
1501	1877	0.0 - 1.0	<	14.5	<	2.0	15.2	± 1.3	
1501	1877	3.0 - 4.0	<	6.0	<	1.1	<	1.5	
1501	1877	7.0 - 8.0	<	5.3	<	1.0	<	1.2	
1512	1798	0.0 - 0.5	<	6.1	<	0.8	6.5	± 0.4	
1512	1798	0.0 - 2.0	<	3.4	<	0.6	<	1.1	
1512	1798	4.0 - 5.0	<	3.4	<	0.6	<	1.1	
1512	1798	8.0 - 9.0	<	4.4	<	0.7	<	1.2	
L512	1798	9.0 - 10.0	<	4.4	· <	0.8	<	1.0	
L522	1642	0.0 - 0.5	<	11.6	<	1.7	9.6	± 0.6	
L522	1642	0.0 - 2.0	<	5.7	<	0.7	7.8	± 0.1	
L522	1642	7.0 - 8.0	<	6.8	<	1.2	<	1.7	
L522	1642	8.0 - 9.0	<	3.8	<	0.7	<	1.2	
L522	1642	9.0 - 10.0	<	5.9	<	1.0	<	1.5	
L522	1642	10.0 - 12.0	<	3.7	<	0.6	<	0.9	
1522	1642	12.0 - 14.0	<	4.7	<	0.8	<	0.9	
L522	1642	14.0 - 16.0	<	4.3	<	0.7	<	1.1	
1525	1750	0.0 - 0.5	<	8.0	<	1.1	15.0	± 0.7	
L525	1750	0.0 - 2.0	<	8.2	<	0.9	<	2.5	
L525	1750	4.0 - 6.0	<	2.7	<	0.4	<	0.6	
L525	1750	6.0 - 7.0	<	3.0	<	0.6	<	0.7	
L 525	1750	7.0 - 8.0	<	5.3	<	0.9	<	1.1	
L525	1750	8.0 - 9.0	<	3.6	<	0.7	<	1.2	
L525	1750	9.0 - 10.0	<	5.2	<	0.9	<	1.4	
L525	1750	10.0 - 11.0	<	1.6	<	0.4	<	0.6	
L 52 5	1750	11.0 - 12.0	<	1.8	<	0.5	<	0.6	

TABLE 5-1 (continued)

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Coordinatesa Depth		Concentration (pCi/g ± 2 sigma)						
East North		(ft)	Uran	ium-238		ium-226		um-232
1535	1923	0.0 - 0.5	<	4.5	<	0.9	<	1.3
1535	1923	0.0 - 2.0	<	2.8	<	0.4	<	1.0
1535	1923	6.0 - 7.0	<	1.9	<	0.5	<	0.6
1535	1923	9.0 - 10.0	<	3.4	<	0.9	<	1.3
1535	1923	10.0 - 12.0	<	3.0	<	0.6	<	0.9
1535	1923	12.0 - 13.0	<	3.8	<	1.0	<	1.5
1535	1923	13.0 - 14.0	<	3.4	<	0.7	<	0.9
1559	1923	0.0 - 0.5	<	3.4	<	0.9	<	1.1
1559	1923	0.0 - 2.0	<	4.0	<	1.1	<	1.9
1559	1923	5.0 - 6.0	<	4.3	<	1.0	<	1.6
1559	1923	8.0 - 9.0	<	5.1	<	1.3	<	6.9
1559	1923	9.0 - 10.0	<	5.3	<	1.1	<	1.7
1561	1654	0.0 - 0.5	< ,	5.1	<	0.8	<	1.3
1561	1654	0.0 - 2.0	<	5.0	<	0.6	5.5	± 0.
1561	1654	2.0 - 3.0	<	7.5	<	1.3	<	2.0
1561	1654	4.0 - 5.0	<	4.1	<	0.8	<	1.3
1561	1654	8.0 - 9.0	<	7.3	<	1.1	<	1.8
1561	1654	9.0 - 10.0	<	3.5	<	0.7	<	1.2
1580	1790	0.0 - 0.5	<	4.1	<	0.7	<	1.1
1580	1790	0.0 - 2.0	<	3.3	<	0.6	<	1.1
1580	1790	4.0 - 6.0	<	2.8	<	0.5	<	0.8
1580	1790	8.0 - 10.0	<	3.0	<	0.6	<	0.8
1607	1750	0.5 - 1.5	<	4.4	<	1.0	<	1.4
1607	1750	2.5 - 4.5	<	4.6	<	0.8	<	1.7
1607	1750	6.5 - 8.5	<	4.8	<	1.0	<	1.4

TABLE 5-1 (continued)

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<u>Coordinates</u>		Depth	Concentration (pCi/g ± 2						
East ————	North	(ft)	Uranium-238		Radium-226		Thor	Thorium-232	
1612	1651	0.0 - 0.5	<	3.4	<	0.6	<	1.1	
1612	1651	0.0 - 2.0	<	3.3	<	0.5	~	0.9	
1612	1651	3.0 - 4.0	<	3.6	<	0.6	<	1.0	
1612	1651	6.0 - 7.0	<	3.4	<	0.6	~	1.0	
1612	1651	7.0 - 8.0	<	3.0	<	0.7	<	1.1	
1620	1591	0.0 - 0.5	<	3.6	<	0.6	<	1.1	
1620	1591	0.0 - 1.0	<	5.5	<	1.1	<	1.6	
1620	1591	3.4 - 4.0	<	6.3	<	0.9	<	1.9	
1620	1591	7.0 - 8.0	<	3.4	<	0.6	<	1.2	
1652	1925	0.0 - 0.5	<	3.6	<	0.9	< '	1.3	
1652	1925	0.0 - 2.0	<	3.4	<	0.7	<u> </u>	1.0	
1652	1925	5.0 - 6.0	<	4.3	<	1.4	<	1.7	
1652	1925	8.0 - 9.0	<	1.8	1.3	± 0.2	<	0.6	
1652	1925	9.0 - 10.0	<	5.0	<	1.3	<	1.9	
1666	1838	0.0 - 0.5	<	3.5	<	0.6	. <	0.9	
1666	1838	0.0 - 2.0	<	3.7	<	0.8	<	1.3	
1666	1838	4.0 - 6.0	<	3.0	<	0.6	<	0.8	
1666	1838	6.0 - 8.0	<	3.2	<	0.6	<	1.0	
1666	1838	8.0 - 9.0	<	1.6	<	0.5	<	0.6	
1666	1838	9.0 - 10.0	<	3.3	<	0.6	<	0.9	
1675	1790	0.0 - 0.5	<	5.0	<	0.9	<	1.6	
1675	1790	0.0 - 2.0	<	7.1	<	1.0	<	2.1	
1675	1790	4.0 - 6.0	<	6.5	<	0.7	<	1.7	
1675	1790	8.0 - 10.0	<	3.5	<	0.6	<	0.9	
1675	1790	10.0 - 12.0	<	2.7	<	0.5	<	0.6	

TABLE 5-1 (continued)

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	inatesa	Depth	Concer	sigma)			
East	North	(ft)	Uranium-238	Rad	ium-226	Thor	ium-232
1679	1652	0.0 - 0.5	< 5.8	<	0.7	<	1.4
1679	1652	0.0 - 2.0	< 3.8	<	0.6		
1679	1652	4.0 - 5.0	< 6.4	<	1.0	<	0.8
1679	1652	7.0 - 8.0	< 6.9	<	0.8	< <	1.7 1.7
1681	1952	0.0 - 0.5	< 8.3	<	1.5	<	2.5
1681	1952	0.0 - 1.0	< 6.6	<	1.0		1.4
1681	1952	4.0 - 6.0	< 4.8	<	0.8	~	1.0
1681	1952	7.0 - 8.0	< 5.7	<	0.9	<	1.3
1688	1881	0.0 - 0.5	< 3.7	<	0.8	<	1.4
1688	1881	0.0 - 2.0	< 3.1	<	0.6	~	0.9
1688	1881	6.0 - 7.0	< 4.6	<	0.9	~	1.3
1688	1881	8.0 - 9.0	< 4.3	<	1.2	<	1.6
1688	1881	9.0 - 10.0	< 3.3	<	0.7	<	1.0
1705	1733	0.5 - 2.0	< 4.3	<	0.9	<	1.5
1705	1733	6.0 - 8.0	< 11.5	5.0	± 0.3	17.1	± 0.0
1705	1733	8.0 - 9.0	< 5.6	<	1.1	<	1.7
1705	1733	9.0 - 10.0	< 6.9	<	1.8	<	2.3
1705	1733	10.0 - 12.0	< 2.6	<	0.4	<	0.9
1717	1850	0.0 - 0.5	< 4.7	<	0.8	4.9	± 0.0
1717	1850	0.0 - 2.0	< 5.1	<	1.1	<	1.6
1717	1850	3.0 - 4.0	< 3.5	<	0.8	<	1.1
1717	1850	4.0 - 6.0	< 4.0	<	0.8	<	
1717	1850	6.0 - 8.0	< 4.3	<	0.6	4.3	1.2
1717	1850	8.0 - 9.0	< 10.2	<	1.2		± 0.4
1717	1850	9.0 - 10.0	< 4.1	~	0.7	23.6	± 0.7
1717	1850	10.0 - 12.0	< 3.5	<	0.7	<	1.3
			` 3.3		V.8	<	1.2

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	inates ^a	Depth	77			(pCi/g ± 2		
East ————	North	(ft)	Uranı	.um-238	кас	ium-226	Thori	.um-232
1729	1925	0.0 - 0.5	<	4.4	<	1.2	<	1.6
1729	1925	0.0 - 2.0	<	5.6	<	1.0	<	1.7
1729	1925	4.0 - 5.0	<	4.2	<	1.0	<	1.6
1729	1925	8.0 - 10.0	<	3.1	<	0.9	<	1.3
1751	1791	0.0 - 0.5	<	4.8	<	0.8	<	1.4
1751	1791	0.0 - 2.0	<	2.6	<	0.7	3.7	± 0.
1751	1791	4.0 - 5.0	<	4.2	<	1.0	<	1.4
1751	1791	5.0 - 6.0	<	5.8	<	0.8	<	1.5
1751	1791	6.0 - 7.0	42.7	± 6.4	<	1.6	28.8	± 2.
1751	1791	9.0 - 10.0	<	3.7	<	0.7	<	1.2
1756	1849	0.0 - 0.5	<	7.0	<	1.2	<	2.0
1756	1849	0.0 - 2.0	<	3.0	<	0.5	<	0.9
1756	1849	4.0 - 6.0	<	5.9	<	0.9	<	1.7
1756	1849	6.0 - 7.0	<	3.4	<	0.6	<	0.9
1756	1849	7.0 - 8.0	<	5.7	<	1.1	<	1.6
1764	1724	0.5 - 2.5	<	4.5	<	1.0	<	1.4
1764	1724	4.5 - 5.5	<	3.8	<	0.9	<	1.1
1764	1724	9.5 - 10.5	<	4.0	<	0.9	<	1.4
1769	1651	0.0 - 0.5	<	1.6	<	0.5	<	0.6
1769	1651	0.0 - 2.0	<	7.8	<	1.2	<	1.9
1769	1651	3.0 - 4.0	<	3.4	<	0.7	<	1.3
1769	1651	7.0 - 8.0	<	6.1	<	1.1	<	1.5

TABLE 5-1 (continued)

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	<u>Coordinates</u> Depth		Concentration (pCi/g ± 2 sigma)					
East	North	(ft)	Uran.	ium-238	Rad:	ium-226	Thori	um-232
1775	1877	0.0 - 0.5	<	3.6	<	0.7	<	1.1
1775	1877	0.0 - 2.0	<	3.5	<	0.7	<	1.1
1775	1877	4.0 - 6.0	<	3.1	<	0.7	<	1.1
1775	1877	9.0 - 10.0	<	3.9	< .	0.7	<	1.1
1797	1587	0.0 - 0.5	<	6.1	<	0.7	<	1.3
1797	1587	0.0 - 2.0	<	5.6	<	1.0	<	1.6
1797	1587	4.0 - 6.0	<	5.5	<	0.9	<	1.3
1797	1587	6.0 - 8.0	<	4.8	<	0.7	<	1.2
1797	1587	8.0 - 9.0	<	6.0	<	1.1	. <	1.5
1797	1587	9.0 - 10.0	<	6.6	<	0.9	<	1.4
1806	1793	0.0 - 0.5	<	2.6	<	0.4	<	0.7
1806	1793	0.0 - 2.0	<	1.7	<	0.5	<	0.7
1806	1793	4.0 - 6.0	<	5.6	<	0.7	<	1.2
1806	1793	6.0 - 8.0	<	3.9	<	0.7	<	1.1
1806	1793	8.0 - 10.0	<	2.8	<	0.4	<	0.7
1806	1793	10.0 - 12.0	<	4.8	<	8.0	<	1.3
1826	1921	0.0 - 0.5	<	6.1	<	0.8	4.1	± 0.
1826	1921	0.0 - 1.0	<	4.4	<	1.0	<	1.7
1826	1921	4.0 - 5.0	<	9.7	<	1.5	<	2.3
1826	1921	8.0 - 9.0	<	5.3	<	1.0	<	1.7
1826	1921	9.0 - 10.0	<	4.9	<	0.8	<	1.3

TABLE 5-1 (continued)

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	inates ^a	Depth				pCi/g ± 2		
East ————	North	(ft)	Urani	ium-238	Radi	um-226	Thori	um-232
1843	1791	0.0 - 0.5	<	5.0	<	0.6	<	1.5
1843	1791	0.0 - 2.0	<	9.4	<	1.5	<	2.6
1843	1791	4.0 - 6.0	<	3.7	<	0.7	<	1.1
1843	1791	6.0 - 8.0	<	8.4	<	1.2	5.1	± 0.3
1843	1791	8.0 - 9.0	<	3.2	<	0.8	<	1.0
1843	1791	9.0 - 10.0	<	4.2	<	0.7	<	1.3
1852	1651	0.0 - 0.5	<	4.2	<	0.8	<	1.2
1852	1651	0.0 - 2.0	<	5.2	<	0.9	<	1.5
1852	1651	3.0 - 4.0	<	3.8	. <	0.7	<	1.2
1852	1651	7.0 - 8.0	<	4.9	<	0.7	<	1.5
1870	1826	0.0 - 0.5	<	7.7	<	1.2	<	2.1
1870	1826	0.0 - 2.0	<	6.0	<	1.0	<	1.5
1870	1826	6.0 - 8.0	<	4.5	<	0.6	<	1.0
1870	1826	8.0 - 9.0	<	6.3	<	0.8	<	1.5
1870	1826	9.0 - 10.0	<	5.1	<	0.7	<	1.3
1875	1942	0.5 - 1.0	1.9	± 1.0	0.6		0.8	± 0.3
1875	1942	1.0 - 1.5	<	2.0	0.6		1.1	± 0.5
1875	1942	2.0 - 2.5	<	2.0			<	1.0
1875	1942	2.5 - 3.0	<	2.0	0.6		0.9	± 0.1
1875	1942	3.0 - 3.5	2.2	± 1.3	0.7	± 0.1	1.4	± 0.1
1875	1942	3.5 - 4.0	<	1.0	0.5		0.5	± 0.2
1875	1942	4.0 - 4.5	1.3	± 1.0	0.6	± 0.1	0.9	
1875	1942	4.5 - 5.0	<	2.0	0.8	± 0.5	1.4	

TABLE 5-1 (continued)

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Coord	inates ^a	Depth	<u>Concentration (pCi/g ± 2 sigma)</u>					
East	North	(ft)	Urani	um-238		ium-226		um-232
1875	1942	5.0 - 5.5	<	2.0	0.6	± 0.4	1.1	± 0.
1875	1942	5.5 - 6.0	<	2.0	<	1.0	<	1.0
1875	1942	6.0 - 6.5	<	1.0	0.5		0.9	
1875	1942	6.5 - 7.0	<	2.0	0.3		0.7	
1875	1942	7.0 - 7.5	<	2.0	0.8		<	1.0
1875	1942	7.5 - 8.0	<	2.0	0.7		1.1	
1875	1942	8.0 - 8.5	<	2.0	0.6		1.1	
1875	1942	8.5 - 9.0	<	3.0	<	1.0	<	1.0
1875	1942	9.0 - 9.5	<	2.0	0.5	± 0.2	0.9	
1875	1942	9.5 - 10.0	<	2.0	0.4		<	1.0
1884	1696	0.0 - 0.5	<	3.8	<	0.7	<	1.0
1884	1696	0.0 - 2.0	<	3.4	<	0.6	<	1.1
1884	1696	4.0 - 5.0	<	3.7	<	0.8	<	1.1
1884	1696	6.0 - 8.0	<	3.4	<	0.7	<	1.1
1886	1916	0.0 - 0.5	<	3.5	<	0.7	<	1.0
1886	1916	0.0 - 1.0	<	5.4	<	1.1	6.6	± 1.3
1886	1916	2.0 - 3.0	<	9.0	<	1.7	23.6	± 2.
1886	1916	6.0 - 7.0	<	1.4	<	0.4	<	0.5
1886	1916	7.0 - 8.0	<	8.8	<	1.3	16.9	
1886	1916	8.0 - 9.0	<	4.9	<	0.9	<	1.9
1886	1916	9.0 - 10.0	<	3.9	<	1.0	<	1.6
1886	1916	10.0 - 12.0	<	3.6	<	0.8	<	1.1
1886	1916	12.0 - 14.0	<	3.1	<	0.8	<	1.0
1886	1916	14.0 - 16.0	<	2.8	<	0.5	<	0.8
1886	1916	15.0 - 16.0	<	3.1	<	0.7	<u> </u>	0.9

TABLE 5-1 (continued)

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East	inates ^a North	Depth	TT	- Concer	ICT GCTOIL	(pCi/g ± 2		
- NOI CII	(ft)	uran	ium-238	Rad	ium-226	Thor	ium-232	
1891	1860	0.0 - 0.5	<	3.8	<	0.9	<	1.5
1891	1860	0.0 - 2.0	<	5.1	<	0.9	<u> </u>	1.4
1891	1860	6.0 - 8.0	<	3.8	<	1.0	~	1.3
1891	1860	8.0 - 9.0	<	4.4	<	0.8	~	1.2
1891	1860	9.0 - 10.0	<	3.9	<	1.1	<	1.6
1893	1799	0.0 - 0.5	<	3.3	<	0.9	<	1.8
1893	1799	0.0 - 1.0	<	4.6	<	0.8	<	1.3
1893	1799	5.0 - 6.0	<	2.9	<	0.8	<	1.3
1893	1799	9.0 - 10.0	<	3.9	<	0.9	<	1.3
1895	1744	0.0 - 0.5	<	3.6	<	0.8	<	1.3
1895	1744	0.0 - 2.0	<	5.8	<	1.0	<	1.5
1895	1744	4.0 - 6.0	<	3.7	<	0.6	<	1.0
1895	1744	9.0 - 10.0	<	5.1	<	0.9	<	1.1
1899	1581	0.0 - 0.5	<	3.4	<	0.7	<	1.0
1899	1581	0.0 - 2.0	<	3.3	<	0.6	<	0.8
1899	1581	5.0 - 6.0	<	3.5	<	0.6	<	1.0
1899	1581	8.0 - 10.0	<	4.5	<	0.8	<	1.4
1899	1581	10.0 - 11.0	<	2.4	<	0.5	<	0.7
1899	1581	11.0 - 12.0	<	4.5	<	0.6	<	0.9
1899	1581	12.0 - 14.0	<	2.5	<	0.6	<	0.7
1899	1989	0.0 - 0.5	<	3.5	<	0.7	<	1.0
1899	1989	0.5 - 2.0	<	3.1	<	0.7	<	1.0
1899	1989	3.0 - 4.0	<	3.9	<	0.8	<	1.1
1899	1989	8.0 - 10.0	<	1.4	<	0.3	<u> </u>	0.5

TABLE 5-1 (continued)

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Coord	inates ^a _	Depth	Conce	ntration (pCi/q ± 2 g	sicma)
East	North	(Ît)	Uranium-238	Radium-226	Thorium-232
1912	1836	0.0 - 0.5	< 4.1	< 0.7	< 1.4
1912	1836	0.0 - 1.0	< 2.9	< 0.7	< 1.0
1912	1836	3.0 - 4.0	< 5.3	< 1.1	< 1.8
1912	1836	4.0 - 5.0	< 3.6	< 0.9	< 1.2
1912	1836	5.0 - 6.0	41.9 ± 6.9	13.3 ± 1.7	28.3 ± 1.5
1912	1836	6.0 - 7.0	< 3.1	< 0.7	< 1.1
1912	1836	7.0 - 8.5	< 3.6	< 0.8	< 1.1
1913	1770	0.0 - 1.0	< 3.1	< 0.7	< 1.1
1913	1770	1.0 - 2.0	< 4.8	< 1.1	< 1.6
1913	1770	6.0 - 7.0	< 4.3	< 0.9	< 1.2
1913	1770	8.0 - 9.0	< 3.6	< 0.9	< 1.2
1913	1770	9.0 - 10.0	< 2.3	< 0.4	< 0.7
1913	1770	10.0 - 11.0	< 3.6	< 0.8	< 1.1
1940	1904	0.0 - 0.5	< 4.1	< 1.0	< 1.9
1940	1904	0.5 - 2.0	< 3.8	< 0.7	< 1.6
1940	1904	2.0 - 4.0	< 3.8	< 0.8	< 1.4
1940	1904	4.0 - 6.0	< 4.4	< 0.9	
1940	1904	8.0 - 10.0	< 2.8		< 1.6
T)40	1904	0.0 - 10.0	~ 2.6	< 0.6	< 1.0

^aSampling locations are shown in Figure 4-2.

TABLE 5-2

DOWNHOLE GAMMA LOGGING RESULTS

FOR 80 INDUSTRIAL ROAD

Dann	4	-a€	20
Page		ΟÍ	20

Page 1 c	of 20		
<u>Coord</u>	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
Borehole	<u> 1165R</u> d		
1501	1877	0.5	8000
1501	1877	1.0	9000
1501	1877	1.5	9000
1501	1877	2.0	9000
1501	1877	2.5	10000
1501	1877	3.0	9000
1501	1877	3.5	8000
1501	1877	4.0	7000
1501	1877	4.5	6000
1501	1877	5.0	6000
1501	1877	5.5	6000
1501	1877	6.0	6000
Borehole	2 1164R ^d	•	
1512	1798	0.5	38000
1512	1798	1.0	51000
1512	1798	1.5	47000
1512	1798	2.0	14000
1512	1798	2.5	10000
1512	1798	3.0	10000
1512	1798	3.5	8000
1512	1798	4.0	8000
1512	1798	4.5	8000
1512	1798	5.0	7000
1512	1798	5.5	7000
1512	1798	6.0	8000
1512	1798	6.5	7000
1512	1798	7.0	8000
1512	1798	7.5	8000
1512	1798 .	8.0	8000
1512	1798	8.5	8000
Borehole	: 1144R ^đ		
1522	1642	0.5	19000
1522	1642	1.0	13000
1522	1642	1.5	12000
1522	1642	2.0	11000
1522	1642	2.5	10000

TABLE 5-2 (continued)

Page	2	of	20
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0	:	h	
East	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
Borehole	e 1144R (con	tinued)d	
1522	1642	3.0	10000
1522	1642	3.5	11000
1522	1642	4.0	13000
1522	1642	4.5	10000
1522	1642	5.0	8000
1522	1642	5.5	8000
1522	1642	6.0	9000
1522	1642	6.5	8000
1522	1642	7.0	9000
1522	1642	7.5	10000
1522	1642	8.0	11000
Borehole	<u> 1145R</u> d		
1525	1750	0.5	26000
1525	1750	1.0	51000
1525	1750	1.5	34000
1525	1750	2.0	16000
1525	1750	2.5	10000
1525	1750	3.0	8000
1525	1750	3.5	7000
1525	1750	4.0	8000
1525	1750	4.5	8000
1525	1750	5.0	8000
Borehole	= 1143R ^d		
1535	1923	0.5	9000
1535	1923	1.0	8000
1535	1923	1.5	8000
1535	1923	2.0	10000
1535	1923	2.5	9000
1535	1923	3.0	8000
1535	1923	3.5	8000
1535	1923	4.0	9000
1535	1923	4.5	10000
1535	1923	5.0	10000
1535	1923	5.5	9000
1535	1923	6.0	9000
1535	1923	6.5	9000

TABLE 5-2 (continued)

		(concinued)	
Page 3 (of 20		
	inates <mark>a</mark>	Depth ^b	Count Rate ^C
East	North	(ft)	(cpm)
Borehol/	e 1143R (cont	-inual d	
DOTEIOTE	S II43K (COM	<u> Linuea)</u>	
1535	1923	7.0	9000
1535	1923	7.5	10000
1535	1923	8.0	10000
1535	1923	8.5	9000
Borehole	<u> 1142R</u> d		
1559	1884	0.5	9000
1559	1884	1.0	9000
1559	1884	1.5	9000
1559	1884	2.0	9000
1559	1884	2.5	9000
1559	1884	3.0	9000
1559	1884	3.5	7000
1559	1884	4.0	7000
1559	1884	4.5	8000
1559	1884	5.0	7000
1559	1884	5.5	8000
155 9	1884	6.0	9000
1559	1884	6.5	9000
1559	1884	7.0	10000
1559	1884	7.5	10000
1559	1884	8.0	10000
Borehole	2 1159R ^d		
1561	1654	0.5	12000
1561	1654	1.0	18000
1561	1654	1.5	19000
1561	1654	2.0	26000
1561	1654	2.5	23000
1561	1654	3.0	11000
1561	1654	3.5	10000
1561	1654	4.0	9000
1561	1654	4.5	9000
1561	1654	5.0	9000
1561	1654	5.5	8000

TABLE 5-2 (continued)

Page 4 c	of 20		
Coordi East	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
Borehole	1159R (con	tinued)d	
1561	1654	6.0	12000
1561	1654	6.5	6000
1561	1654	7.0	6000
1561	1654	7.5	6000
1561	1654	8.0	5000
Borehole	1161R ^d		
1580	1790	0.5	12000
1580	1790	1.0	13000
1580	1790	1.5	12000
1580	1790	2.0	12000
1580	1790	2.5	12000
1580	1790	3.0	12000
1580	1790	3.5	12000
1580	1790	4.0	8000
1580	1790	4.5	8000
1580	1790	5.0	7000
1580	1790	5.5	7000
1580	1790	6.0	8000
1580	1790	6.5	8000
1580	1790	7.0	8000
1580	1790	7.5	8000
1580	1790	8.0	8000
1580	1790	8.5	8000
Borehole	: 1217R ^đ		
1607	1750	0.5	12000
1607	1750	1.0	12000
1607	1750	1.5	14000
1607	1750	2.0	16000
1607	1750	2.5	12000
1607	1750	3.0	12000
1607	1750	3.5	12000
1607	1750	4.0	12000
1607	1750	4.5	12000

TABLE 5-2 (continued)

Page	5	of	20
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	1 20		
<u>Coordi</u> East	nates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
	1102 011	(10)	(Opm)
Borehole	1217R (con	tinued) d	
1607	1750	5.0	12000
1607	1750	5.5	13000
1607	1750	6.0	13000
1607	1750	6.5	13000
1607	1750	7.0	13000
1607	1750	7.5	10000
1607	1750	8.0	9000
Borehole	1156R ^d		
1612	1651	0.5	10000
1612	1651	1.0	11000
1612	1651	1.5	11000
1612	1651	2.0	12000
1612	1651	2.5	12000
1612	1651	3.0	13000
1612	1651	3.5	13000
1612	1651	4.0	13000
1612	1651	4.5	13000
1612	1651	5.0	14000
1612	1651	5.5	13000
1612	1651	6.0	13000
1612	1651	6.5	13000
Borehole	1158Rd		
1620	1501	0.5	10000
1620	1591	0.5	10000
1620	1591	1.0	10000
1620	1591	1.5	10000
1620	1591	2.0	9000
1620	1591	2.5	9000
1620	1591	3.0	8000
1620	1591	3.5	8000
1620	1591	4.0	9000
1620	1591	4.5	9000
1620	1591	5.0	9000
1620	1591	5.5	9000
1620	1591	6.0	9000
1620	1591	6.5	10000
1620	1591	7.0	10000
1620	1591	7.5	10000

TABLE 5-2 (continued)

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Page	o	OI	20

Page 6 of 20					
<u>Coordi</u> East	nates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)		
Borehole	1140pd				
por chore	- 1140K				
1652	1925	0.5	14000		
1652	1925	1.0	12000		
1652	1925	1.5	11000		
1652	1925	2.0	10000		
1652	1925	2.5	10000		
1652	1925	3.0	9000		
1652	1925	3.5	9000		
1652	1925	4.0	9000		
1652	1925	4.5	9000		
1652	1925	5.0	8000		
1652	1925	5.5	8000		
1652	1925	6.0	8000		
1652 1652	1925	6.5	8000		
1652	1925 1925	7.0 7.5	9000		
1652	1925	7.5	10000		
Borehole	: 1163R ^d				
1666	1838	0.5	10000		
1666	1838	1.0	10000		
1666	1838	1.5	10000		
1666	1838	2.0	10000		
1666	1838	2.5	10000		
1666	1838	3.0	10000		
1666	1838	3.5	10000		
1666 1666	1838 1838	4.0	11000		
1666	1838	4.5 5.0	10000 9000		
1666	1838	5.5	8000		
1666	1838	6.0	8000		
1666	1838	6.5	8000		
1666	1838	7.0	8000		
1666	1838	7.5	8000		
1666	1838	8.0	8000		
1666	1838	8.5	9000		
1666	1838	9.0	9000		

TABLE 5-2 (continued)

Page	7 ()f	20	

rage / OI ZU				
<u>Coordi</u> East	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)	
Borehole	1160R ^đ			
1675	1790	0.5	13000	
1675	1790	1.0	15000	
1675	1790	1.5	19000	
1675	1790	2.0	15000	
1675	1790	2.5	12000	
1675	1790	3.0	12000	
1675	1790	3.5	11000	
1675	1790	4.0	12000	
1675	1790	4.5	11000	
1675	1790	5.0	9000	
1675	1790	5.5	9000	
1675	1790	6.0	9000	
1675	1790	6.5	9000	
1675	1790	7.0	8000	
1675	1790	7.5	8000	
1675	1790	8.0	8000	
1675	1790	8.5	7000	
Borehole	1150Rd			
1679	1652	0.5	7000	
1679	1652	1.0	9000	
1679	1652	1.5	10000	
1679	1652	2.0	12000	
1679	1652	2.5	12000	
1679	1652	3.0	12000	
1679	1652	3.5	13000	
1679	1652	4.0	13000	
1679	1652	4.5	13000	
1679	1652	5.0	13000	
1679	1652	5.5	13000	
1679	1652	6.0	13000	
1679	1652	6.5	13000	
1679	1652	7.0	12000	

TABLE 5-2 (continued)

		(continuea)	
Page 8 c	of 20		
<u>Coordi</u> East	nates ^a North	Depthb	Count Rate ^C
£ast	NOLUL	(ft)	(cpm)
Borehole	1151R ^d		
1681	1952	0.5	9000
1681	1952	1.0	11000
1681	1952	1.5	12000
1681	1952	2.0	12000
1681	1952	2.5	12000
1681	1952	3.0	13000
1681	1952	3.5	12000
1681	1952	4.0	13000
1681	1952	4.5	13000
1681	1952	5.0	13000
1681	1952	5.5	13000
1681	1952	6.0	13000
1681	1952	6.5	13000
1681	1952	7.0	12000
Borehole	1139R ^d		
1688	1881	0.5	12000
1688	1881	1.0	12000
1688	1881	1.5	13000
1688	1881	2.0	13000
1688	1881	2.5	11000
1688	1881	3.0	10000
1688	1881	3.5	9000
1688	1881	4.0	9000
1688	1881	4.5	9000
1688	1881	5.0	9000
1688	1881	5.5	9000
1688	1881	6.0	9000
1688	1881	6.5	10000
1688	1881	7.0	10000
1688	1881	7.5	10000
1688	1881	8.0	10000
Borehole	1195R ^đ		
1705	1733	0.5	9000
1705	1733	1.0	13000
1705	1733	1.5	17000
	#	# • •	27000

TABLE 5-2 (continued)

Coord	inates ^a	Depth ^b	Count Rate ^C
East	North	(Ēt)	(cpm)
Borehole	e 1195R (con	tinued) ^d	
1705	1733	2.0	13000
1705	1733	2.5	12000
1705	1733	3.0	13000
1705	1733	3.5	12000
1705	1733	4.0	12000
1705	1733	4.5	12000
1705	1733	5.0	11000
1705	1733	5.5	12000
1705	1733	6.0	18000
1705	1733	6.5	46000
1705	1733	7.0	101000
1705	1733	7.5	114000
1705	1733	8.0	38000
Borehole	<u> 1162R</u> d		
1717	1850	0.5	11000
1717	1850	1.0	12000
1717	1850	1.5	12000
1717	1850	2.0	12000
1717	1850	2.5	13000
1717	1850	3.0	13000
1717	1850	3.5	15000
1717	1850	4.0	23000
1717	1850	4.5	30000
1717	1850	5.0	27000
1717	1850	5.5	32000
1717	1850	6.0	35000
1717	1850	6.5	43000

1717	1850	6.5	43000
1717	1850	7.0	50000
1717	1850	7.5	65000
1717	1850	8.0	41000
Borehole	: 1141R ^d		
1729	1925	0.5	14000
1729	1925	1.0	12000
1729	1925	1.5	14000
1729	1925	2.0	17000
1729	1925	2.5	13000
1729	1925	3.0	11000

TABLE 5-2 (continued)

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<u>Coordinates</u>		Depth ^b	Count Rate ^C
East	North	(ft)	(cpm)
Borehole	e 1141R (con	tinued)d	
1729	1925	3.5	9000
1729	1925	4.0	7000
1729	1925	4.5	8000
1729	1925	5.0	9000
1729	1925	5.5	9000
1729	1925	6.0	9000
1729	1925	6.5	9000
1729	1925	7.0	10000
1729	1925	7.5	10000
1729	1925	8.0	11000
Borehole	1157R ^d		
1751	1791	0.5	10000
1751	1791	1.0	15000
1751	1791	1.5	13000
1751	1791	2.0	12000
1751	1791	2.5	11000
1751	1791	3.0	12000
1751	1791	3.5	13000
1751	1791	4.0	14000
1751	1791	4.5	15000
1751	1791	5.0	25000
1751	1791	5.5	64000
1751	1791	6.0	85000
1751	1791	6.5	34000
1751	1791	7.0	12000
1751	1791	7.5	12000
1751	1791	8.0	11000
1751	1791	8.5	11000
1751	1791	9.0	10000
1751	1791	9.5	9000
Borehole	_		
1756	1849	0.5	9000
1756	1849	1.0	12000
1756	1849	1.5	14000
1756	1849	2.0	15000
1756	1849	2.5	16000
1756	1849	3.0	16000

TABLE 5-2 (continued)

Page 11 of 20					
<u>Coord</u>	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)		
Borehole	= 1148R (conf	inued)d			
1756	1849	3.5	15000		
1756	1849	4.0	13000		
1756	1849	4.5	12000		
1756	1849	5.0	11000		
1756	1849	5.5	11000		
1756	1849	6.0	11000		
Borehole	≥ 1218R ^đ				
1764	1724	0.5	13000		
1764	1724	1.0	13000		
1764	1724	1.5	12000		
1764	1724	2.0	12000		
1764	1724	2.5	11000		
1764	1724	3.0	11000		
1764	1724	3.5	12000		
1764	1724	4.0	11000		
1764	1724	4.5	11000		
1764	1724	5.0	9000		
1764	1724	5.5	9000		
1764	1724	6.0	9000		
1764	1724	6.5	9000		
1764	1724	7.0	9000		
1764	1724	7.5	9000		
Borehole	1152R ^d				
1769	1651	0.5	8000		
1769	1651	1.0	8000		
1769	1651	1.5	11000		
1769	1651	2.0	10000		
1769	1651	2.5	9000		
1769	1651	3.0	9000		
1769	1651	3.5	10000		
1769	1651	4.0	11000		
1769	1651	4.5	11000		
1769	1651	5.0	12000		
1769	1651	5.5	13000		
1769	1651	6.0	13000		
	— - - -				

TABLE 5-2 (continued)

Page	12	of	20
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rage ra	<u> </u>		
<u>Coord</u> :	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
Borehole	1130pd		.,
POTEHOTE	= 1120V		
1775	1877	0.5	12000
1775	1877	1.0	13000
1775	1877	1.5	19000
1775	1877	2.0	19000
1775	1877	2.5	12000
1775	1877	3.0	10000
1775	1877	3.5	10000
1775	1877	4.0	10000
1775	1877	4.5	9000
1775	1877	5.0	9000
1775	1877	5.5	9000
1775	1877	6.0	9000
1775	1877	6.5	9000
1775	1877	7.0	9000
1775	1877	7.5	10000
1775	1877	8.0	10000
Borehole	: 1149R ^d		
1797	1587	0.5	8000
1797	1587	1.0	10000
1797	1587	1.5	12000
1797	1587	2.0	12000
1797	1587	2.5	13000
1797	1587	3.0	13000
1797	1587	3.5	13000
1797	1587	4.0	13000
1797	1587	4.5	13000
1797	1587	5.0	19000
Borehole	: 1146R ^d		
1806	1793	0.5	13000
1806	1793	1.0	14000
1806	1793	1.5	14000
1806	1793	2.0	14000
1806	1793	2.5	15000
1806	1793	3.0	15000
1806	1793	3.5	15000

TABLE 5-2 (continued)

Page	13	of	20
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Coord	inates ^a	Depth ^b	Count Rate ^C
East	North	(Ît)	(cpm)
Borehole	e 1146R (cont	tinued)d	
1806	1793	4.0 .	15000
1806	1793	4.5	20000
1806	1793	5.0	43000
1806	1793	5.5	92000
1806	1793	6.0	49000
1806	1793	6.5	29000
1806	1793	7.0	18000
1806	1793	7.5	14000
1806	1793	8.0	12000
Borehole	≥ 1170R ^d		
1826	1921	0.5	10000
1826	1921	1.0	11000
1826	1921	1.5	11000
1826	1921	2.0	12000
1826	1921	2.5	14000
1826	1921	3.0	14000
1826	1921	3.5	17000
1826	1921	4.0	20000
1826	1921	4.5	20000
1826	1921	5.0	18000
1826	1921	5.5	15000
1826	1921	6.0	14000
1826	1921	6.5	11000
1826	1921	7.0	10000
1826	1921	7.5	9000
1826	1921	8.0	9000
Borehole	= 1147R ^d		
1843	1791	0.5	9000
1843	1791	1.0	11000
1843	1791	1.5	15000
1843	1791	2.0	17000

TABLE 5-2 (continued)

		(continued)	
Page 14	of 20		
<u>Coordi</u> East	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
Borehole	= 1147R (cont	tinued)d	
1843	1791	2.5	16000
1843	1791	3.0	16000
1843	1791	3.5	15000
1843	1791	4.0	14000
1843	1791	4.5	15000
1843	1791	5.0	18000
1843	1791	5.5	26000
1843	1791	6.0	40000
1843	1791	6.5	51000
1843	1791	7.0	27000
1843	1791	7.5	16000
1843	1791	8.0	14000
Borehole	<u> 1153R</u> d		
1852	1651	0.5	9000
1852	1651	1.0	12000
1852	1651	1.5	14000
1852	1651	2.0	15000
1852	1651	2.5	13000
1852	1651	3.0	11000
1852	1651	3.5	12000
1852	1651	4.0	13000
1852	1651	4.5	13000
1852	1651	5.0	13000
1852	1651	5.5	14000
1852	1651	6.0	14000
1852	1651	6.5	13000
Borehole	2 1172R ^d		
1870	1826	0.5	11000
1870	1826	1.0	12000
1870	1826	1.5	12000
1870	1826	2.0	12000
1870	1826	2.5	11000
1870	1826	3.0	12000
		5.0	22000

TABLE 5-2 (continued)

	Pac	1e	15	of	20
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Page 15	OI 20		
<u>Coord:</u> East	inates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
Borehole	≥ 1172R (con	tinued)d	
1870	1826	3.5	11000
1870	1826	4.0	10000
1870	1826	4.5	9000
1870	1826	5.0	9000
1870	1826	5.5	9000
1870	1826	6.0	9000
1870	1826	6.5	9000
1870	1826	7.0	9000
1870	1826	7.5	10000
1870	1826	8.0	10000
1870	1826	8.5	10000
Borehole	2027R ^d		
1875	1942	0.5	6000
1875	1942	1.0	6000
1875	1942	1.5	7000
1875	1942	2.0	9000
1875	1942	2.5	7000
1875	1942	3.0	5000
1875	1942	3.5	5000
1875	1942	4.0	5000
1875	1942	4.5	5000
1875	1942	5.0	6000
1875	1942	5.5	6000
1875	1942	6.0	6000
1875	1942	6.5	6000
1875	1942	7.0	5000
Borehole	1154R ^d		
1884	1696	0.5	11000
1884	1696	1.0	14000
1884	1696	1.5	15000
1884	1696	2.0	14000
	-		

TABLE 5-2 (continued)

Page	16	of	20

Coord	inates ^a	Depthb	Count Rate ^C
East	North	(ft)	(cpm)
			(~
Borehol	e 1154R (cont	tinued) a	
1004	1.50.5		
1884	1696	2.5	12000
1884 1884	1696	3.0 3.5	12000
1884	1696 1696	3.5 4.0	12000
1884	1696	4.5	13000
1884	1696	5.0	13000
1004	1090	5.0	12000
Borehol	e 1131R ^d		
1886	1916	0.5	15000
1886	1916	1.0	21000
1886	1916	1.5	38000
1886	1916	2.0	35000
1886	1916	2.5	17000
1886	1916	3.0	12000
1886	1916	3.5	11000
1886	1916	4.0	12000
1886	1916	4.5	12000
1886	1916	5.0	11000
1886	1916	5.5	13000
1886	1916	6.0	18000
1886	1916	6.5	28000
1886	1916	7.0	51000
1886	1916	7.5	43000
1886	1916	8.0	18000
1886	1916	8.5	12000
1886	1916	9.0	10000
Borehole	<u> 1137R</u> đ		
1891	1860	0.5	11000
1891	1860	1.0	13000
1891	1860	1.5	13000
1891	1860	2.0	13000
1891	1860	2.5	12000
1891	1860	3.0	12000
1891	1860	3.5	12000
1891	1860	4.0	11000
1891	1860	4.5	10000
1891	1860	5.0	10000
1891	1860	5.5	9000
	2000	J.J	2000

TABLE 5-2 (continued)

		(continued)			
Page 17 of 20					
	<u>inates^a</u>	Depth ^b	Count Rate ^C		
East	North	(ft)	(cpm)		
Borehol	e 1137R ^d				
1891	1860	6.0	9000		
1891	1860	6.5	9000		
1891	1860	7.0	9000		
Borehol	e 1136R ^d				
1893	1799	0.5	11000		
1893	1799	1.0	12000		
1893	1799	1.5	13000		
1893	1799	2.0	12000		
1893	1799	2.5	12000		
1893	1799	3.0	12000		
1893	1799	3.5	12000		
1893	1799	4.0	12000		
1893	1799	4.5	12000		
1893	1799	5.0	18000		
1893	1799	5.5	51000		
1893	1799	6.0	36000		
1893	1799	6.5	17000		
1893	1799	7.0	12000		
1893	1799	7.5	11000		
1893	1799	8.0	10000		
1893	1799	8.5	10000		
Borehole	<u> 1155R</u> d				
1895	1744	0.5	10000		
1895	1744	1.0	12000		
1895	1744	1.5	14000		
1895	1744	2.0	14000		
1895	1744	2.5	14000		
1895	1744	.3.0	14000		
1895	1744	3.5	14000		
1005	2744	4 ^			

4.0

4.5

5.0

5.5

TABLE 5-2 (continued)

Pag	9	18	of	20

Page 18	of 20		
<u>Coordi</u>	nates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
		(10)	(Cpm)
Borehole	1155R (con	tinued)d	
1895	1744	6.0	10000
1895	1744	6.5	11000
1895	1744	7.0	11000
1895	1744	7.5	10000
1895	1744	8.0	9000
Borehole	1132R ^d		
1899	1581	0.5	10000
1899	1581	0.5 1.0	10000
1899	1581	1.5	10000 10000
1899	1581	2.0	
1899	1581	2.5	10000
1899	1581	3.0	10000 10000
1899	1581	3.5	9000
1899	1581	4.0	8000
1899	1581	4.5	9000
1899	1581	5.0	10000
1899	1581	5.5	9000
1899	1581	6.0	9000
1899	1581	6.5	9000
1899	1581	7.0	9000
1899	1581	7.5	9000
1899	1581	8.0	9000
1899	1581	8.5	9000
<u>Borehole</u>	1191R ^d		
1899	1989	0.5	7000
1899	1989	1.0	9000
1899	1989	1.5	9000
1899	1989	2.0	10000
1899	1989	2.5	9000
1899	1989	3.0	8000
1899	1989	3.5	6000
1899	1989	4.0	5000
1899	1989	4.5	5000
1899	1989	5.0	5000
1899	1989	5.5	6000
		- • •	3000

TABLE 5-2 (continued)

Page	19	of	20
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Coordi	a	Donah b	Court DateC
East	nates ^a North	Depth ^b (ft)	Count Rate ^C (cpm)
		(20)	(Opm)
Borehole	1191R (con	tinued) a	
1899	1989	6.0	5000
1899	1989	6.5	5000
1899	1989	7.0	5000
1899	1989	7.5	5000
1899	1989	8.0	5000
Borehole	1202R ^d		
1912	1836	0.5	13000
1912	1836	1.0	17000
1912	1836	1.5	16000
1912	1836	2.0	15000
1912	1836	2.5	15000
1912	1836	3.0	17000
1912	1836	3.5	31000
1912	1836	4.0	62000
1912	1836	4.5	97000
1912	1836	5.0	51000
1912	1836	5.5	18000
1912	1836	6.0	15000
1912	1836	6.5	13000
1912	1836	7.0	12000
Borehole	1203R ^đ		
1913	1770	0.5	10000
1913	1770	1.0	12000
1913	1770	1.5	12000
1913	1770	2.0	12000
1913	1770	2.5	12000
1913	1770	3.0	12000
1913	1770	3.5	13000
1913	1770	4.0	13000
1913	1770	4.5	12000
1913	1770	5.0	13000
1913	1770	5.5	13000
1913	1770	6.0	13000
1913	1770	6.5	12000
1913	1770	7.0	10000
1913	1770	7.5	8000
1913	1770	8.0	9000
	,,		5000

TABLE 5-2 (continued)

Page 20 of 20

Coord	inates ^a	Depthb	Count Rate ^C
East	North	(ft)	(cpm)
Borehole	≥ 1188R ^d		
1940	1904	0.5	16000
1940	1904	1.0	26000
1940	1904	1.5	34000
1940	1904	2.0	37000
1940	1904	2.5	35000
1940	1904	3.0	35000
1940	1904	3.5	36000
1940	1904	4.0	29000
1940	1904	4.5	19000
1940	1904	5.0	18000
1940	1904	5.5	19000
1940	1904	6.0	20000
1940	1904	6.5	20000
1940	1904	7.0	20000
1940	1904	7.5	19000
1940	1904	8.0	20000
1940	1904	8.5	21000

aBorehole locations are shown in Figure 4-1.

bThe variations in depths of boreholes and corresponding results given in this table are based on the boreholes penetrating the contamination or the drill reaching refusal.

CInstrument used was 5.0- by 5.0-cm (2- by 2-in.) thallium-activated sodium iodide gamma scintillation detector.

dBottom of borehole collapsed.

TABLE 5-3

GAMMA RADIATION EXPOSURE RATES

FOR 80 INDUSTRIAL ROAD

Coord	<u>inates^a</u>	Rateb
East	North	(μR/h)
1550	1810	20
1570	1920	14
1600	1650	8
1900	1580	9
1740	1785	12
1800	1600	7
1850	1900	7
1910	1760	10

^aMeasurement locations are shown in Figure 4-3.

b_{Measurements} include background.

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APPENDIX A
GEOLOGIC DRILL LOGS FOR 80 INDUSTRIAL ROAD

	G	iΕC	LOG	IC D	RIL	L LO	G	PROJE	CT		FUEDAD	J08 NO.	1 -	ET NO.	HOLE NO.
ITE							COORD I NA	ITES			FUSRAP	14501-		OF 1	1165R
	80		ustrial			[)				N	1,877 E 1,511	ſ	Veri	1	
EĞÜ	-		MPLETED		LER ·		_			L	AKE AND MODEL SIZE	OVERBURDEN		(FT.)	TOTAL DEP
			1-23-8		BOYE	E.D.	<u>I.</u> Esel. to	D CAS	TNC		obile B-57 6.5				8.0
-		1.5/			- 6076	4		r was	ING	N.	OUND EL. DEPTH/EL. G	ROUND WATER	DEPTH	/EL. TOP /	OF ROCK
AMP			R WEIGHT	/FALL	CAS	ING LE	FT IN HO	LE: DI	A./L	EN	GTH LOGGED BY:		٠	~~!	
-	14	0 lb	s./ 30	in.			NO	NE				D. Harn	ish	402	
ايا	SAMP. ADV. LEN CORE	9	BLOWS "N" X CORE	PF	WATER	₹ RE			8	П					
AND DIAM.	쥑	E E	7. 65	<u> </u>	TESTS	3	ELEV.	Ŧ	GRAPHICS	SAMPLE	DESCRIPTION AND	C ASSTETCA	TTON	NOTES	ON: LEVELS,
	₫ Z		E300	ÖΖ.	I MH	TIME AIN.		DEPTH	<u>ā</u>					WATER	RETURN,
Ž		E C	20 E	LOSS IN P. M	PRES.	HH			6	7					CTER OF ING, ETC
S	2.0	1.3	2-2-3-6								0.0 - 3.8 Ft. Silty SANI	D (FILL?) (SM).		Borehol	e advanced
								•			0.0-0.7 Ft. Dark bro	wn (10YR3/3) to	psoil.	o.d. holl	using 6.5 in low-stem
S	2.0	1.7	4-8-10 11	1		·	^	•			0.7-3.8 Ft. Brown (1	loYR3/3) with		auger. Radiolo	gically
			**	1				•			iron-oxide mottling w downward to a perva			sampled gamma-	l and -logged by Sberline, Inc
S	2.0	1.5	5-10-9 12	1			-		11 2 1		fine-grained.	D (PITTS) (2) ()		TMA-E	perune, inc
ļ		1	1.4					5_			3.8 - 4.4 Ft. Silty SANI Black, thin beds with	<u>v (FLDb?)</u> (SM). i black silt, rewor	ked 🕺		
SS	2.0		7-16 19-25	1			-		$\ \cdot\ $	ŀ	fill?	5 (6) 5	<i> </i>	4	
			19-43						<u> </u>		(10YR4/3), fine-grain	u (SM). Brown ned, subangular (rains, ∫		
				1			-	,		M	saturated.	CIT M (CD) (T)			ved in to 6.
										$\ $	6.3 - 8.0 Ft. SAND and Dark reddish brown (weak red (2.5YR4/2)	(2.5YR3/4) become	ning	Ft.	
										Ш	Ine-grained sand, so	me clay toward to	op,		
				1						Ш	beds 2-10 mm. thick.	•			
										$\ $	Bottom of borehole at 8.			1	
										$\ $	Borehole backfilled with	spoils, 11/23/87.	•		
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			<u> </u>				<u> </u>	<u> </u>		Ц					
			POON; S1			,	ITE		חם	I	duction DJ (1	ODI)		HOLE NO	165R
=	NENN	1 20H	; P = PI	ICHER;	U * C	HER			UU	Ш	dustrial Rd. (L	וטטו		1 1	TOOK

	PROJECT	JOB NO. SHEET NO. HOLE NO.
GEOLOGIC DRILL LOG	G FUSRAP	14501-138 1 of 1 1164R
1	COORDINATES	ANGLE FROM HORIZBEARING
80 Industrial Rd. (LODI)	N 1,798 E 1,512	Vertical
BEGUN COMPLETED DRILLER 11-23-8711-23-87 E.D.I.	DRILL MAKE AND MODEL SIZE	OVERBURDEN ROCK (FT.) TOTAL DEPTH
CORE RECOVERY (FT./%) CORE BOXES SAMPLES		
5.7/57 5	¥ //	Jerniyee. Tor or Rock
SAMPLE HAMMER WEIGHT/FALL CASING LEFT	T IN HOLE: DIA./LENGTH LOGGED BY:	m!
140 lbs./ 30 in.	NONE	D. Harnish
SAMPLE CORE SAMPLE CORE LEN 1 SAMPLE CORE LIN	ELEV. DESCRIPTION AND DESCRIPTION AND	WATER RETURN, CHARACTER OF DRILLING, ETC.
35 2.0 1.9 4-4-0-0	0.0 - 4.0 Ft. SILT FILL brown mixed with oth 0.0-0.9 Ft. Mixed wi	er silts. 0-10 Ft. using 6.5 in. o.d. hollow-stem auger.
SS 2.0 0.7 5-5-5-5	(10YR6/2) silt. 1.6-2.0 Ft. Mixed wi	Radiologically sampled and gamma-logged by TMA-Eberline, Inc.
SS 2.0 1.5 2-2-7-6	5 Sand (PII) 5 (10YR4/3), silty, wet	1.7) (SM). Brown 4-6 Ft. Sample is saturated.
SS 2.0 1.6 4-6-8 12	4.3 - 4.7 Ft. SILT (FILL dark brown to black,	
SS 2.0 9-14	4.7 - 8.0 Ft. Silty SANI fine-grained, massive	Ч
15-13	6.8-7.5 Ft. Faint bed variations in silt fract	ion.
	7.9-8.0 Ft. Silt, brow laminated.	
	8.0 - 10.0 Ft. <u>SAND</u> (SI (7.5YR4/2), very fine	-grained, wet. Hole caved in to 9.0
	Bottom of borehole at 10 Borehole backfilled with	0.0 Ft. spoils, 11/23/87.
		,
	.	
		Description and classification of soils by visual examination.
SS = SPLIT SPOON; ST = SHELBY TUBE; SIT D = DENNISON; P = PITCHER; O = OTHER	80 Industrial Rd. (L	ODI) HOLE NO. 1164R

	G	E(OLC	G	IC D	RIL	L LC	G	PROJE	CT	FUSRAP 145	NO. SHE	ET NO.	HOLE NO.
SITE								COORDIN	ATES		100KAI 143	ANGLE FR		1144R BEARING
BEGL					Rd. ([)	<u> </u>			N 1,642 E 1,522	Vert		
	•••		1-1			LEK	E.D.	т			MAKE AND MODEL SIZE OVERBUR		K (FT.)	TOTAL DEPT
						BOXE	SSAMPL	ESEL. TO	P CAS	ING	OBILE B-57 6.5" 18 ROUND EL. DEPTH/EL. GROUND WATER		1.5 /EL. TOP	20.0
	1	1.4	/71		<u> </u>		8	ŀ		- 1	₹ /	DEFIN	18.	
Samp					/FALL	CAS	ING LE			A./LI	NGTH LOGGED BY:		74-1	/
LLI	14	1.3	os./	30	In.	VATER	· · · · · · · · · · · · · · · · · · ·	NO	NE		D. H	arnish	770	
SAMP. TYPE	SAMP. ADV	BAMPLE REC	BLOWS "N"	% CORE	LOSS IN G.P.M	ESSU TESTS	RE	ELEV.	ОЕРТН	GRAPHICS			WATER	ON: LEVELS, RETURN, CTER OF ING, ETC.
SS	2.0	1.4	1-1	-9-9							0.0 - 5.0 Ft. Gravelly SILT, GRAVE SILT (ML-GM,GP, OL).	CL, and	Borehol	e advanced . using 6.5 in
SS	2.0	1.7		8-8 4						0.00	0.0-1.0 Ft. Silt, dark brown (10Y humus topsoil. 1.0-2.7 Ft. Gravelly silt, dark red	R3/3),	o.d. holl auger. Radiolog	ow-stem gically
SS	2.0	0.2	11-	10-3 2				_	5_	•	brown (2.5YR2.5/4), pieces of woo Brunswick sandstone. 2.7-3.9 Ft. Silt, black, damp,	od, T	4-6 Ft.	mpled from
SS	2.0	1.7	2-4	-1-1					-		homogeneous, organic. 3.9-4.1 Ft. Gray, fine-grained loc	ose sand.	-aker m	.8114.
ss	2.0	1.8		12 -27				-	-		4.1-5.0 Ft. Gravel, broken pieces Brunswick sandstone.]	
ss	2.0	1.7		24 -42					10_		5.0 - 7.8 Ft. Silty SAND (SM). Blac dark gray and gray, fine-grained, saturated.	ek to		
SS	2.0	1.5		21 -18			·		-		6.7-7.8 Ft. Finely interbedded. 7.8 - 8.9 Ft. SAND. Greenish gray (5Y5/1), fine-grained, saturated.			
SS	2.0	1.4		12				_	-		8.9 - 14.5 Ft. SILT and CLAY (ML- Weak red (2.5YR4/2), laminated	·CL). with 3-5		
			13-	.12		ļ	ļ		15_		mm layers. 14.5 - 18.0 Ft. SAND and SILT (SP Dark yellowish brown (10YR4/4), medium-grained, some coarse-grathin interbeds of sand of silt.	, ML). fine- to ined sand,		
								_	20 _		18.0 - 20.0 Ft. WEATHERED BEDROCK.		18.0 Ft. weather	Top of ed bedrock.
									20 _		Bottom of borehole at 20.0 ft. Borehole backfilled with spoils, 11/17	7/87.	rotary b stuck. V out of he	d sands caus it to get Water comin ole. Pulled and augered Ft.
													Descript classifica soils by examina	tion of visual
					= SHEI		-,	ITE	8	1 08	ndustrial Rd. (LODI)		HOLE NO.	!44R

								PROJE	ГĪ			100 115	I		luca e
		GE(DLOG	IC D	RIL	L LC)G	1005	. .	FUSRAP		JOB NO. 14501-1:			HOLE NO.
SIT							COORDIN	ATES		LUDIAL				M HORIZE	
			ustrial			I)				1,750 E 1,520	0		Verti		
BEG			OMPLETED		LER	T 10	-					BURDEN	ROCK	(FT.)	TOTAL DEPT
			1-17-8		BOXE	E.D.	.1. .ESEL. TO	D CAS		OBILE B-57 ROUND EL. DEPTH/	6.5"	12.0			12.0
		9.8/				6		ir und	1	ROUND EL. DEPIN	EL. GROUND WA	RIEK	DEPTH/	EL. TOP	OF ROCK
SAM			R WEIGHT		CAS	ING LE	FT IN HO	LE: DI	A./LE	NGTH LOGGED BY:					
<u></u>			s./ 30				NO:	NE			D	. Harnis	h		
SAMP. TYPE			BLOWS "N" X CORE RECOVERY	PR	WATE	RE		İ	g l						
1-5	₫ 5	# B	7. RP	<u> </u>	TEST		ELEU.	Ŧ	GRAPHICS	DESCRIPTION	AND CLASS	STETCAT		NOTES	
90	<u>L</u> Z	길뿐	E3 .0	LOSS IN G.P.M		ANN T		ОЕРТН	Q K					WATER	LEVELS, RETURN,
₽₹	S -	[종]	, ^E	2.9	PRES.	E Z		_	8						TER OF NG, ETC.
SS	2.0	1.3	1-1-4-8							0.0 - 2.4 Ft. Grav	elly SILT FILI	<u> </u>		Borehole	advanced
								-		(ML-GM). Dar black, organic w	ith plant fragi	R3/3) to - ments,		0-12 Ft. o.d. holld	using 6.5 in.
SS	2.0	1.8	8-7-15 20							Brunswick sand	<u>~</u>			auger. Radiolog	ically
			""					-		2.4 - 4.0 Ft. SANI (10YR4/3), fine	<u>) (FILL?)</u> (SP) -grained, suba). Brown ingular gra	- 1	sampled	and logged by perline, Inc.
SS	2.0	1.4	10-11 12-8				-	-	1:1	damp. 4.0 - 9.0 Ft. SANI brown (10YR4/			\dashv	TMA-Eb	erline, Inc.
			12-0					5_		brown (10YR4/	2), silty.				
SS	2.0	2.0	9-12 10-15					-							
			10-13					-					ľ		
SS	2.0	2.0	4-7-15 18					•						Hole cave	ed in to 3.0
			•				_	-		9.0 - 12.0 Ft. SAN	D and SILT (S	SP, ML).		Ft. deep. twice to (Cleaned ou 8.0 Ft. but
SS	2.0	1.3	3-6-7 12					10		Brown (10YR4/ interbedded with	3), very fine-g h 5-10 mm lay	rained, ers, satura	ted.	hole wou! open.	ld not remain
			12			1		-						•	
						ļ	4	-	3.1						
										Bottom of borehole Borehole backfilled	at 12.0 ft. with spoils, 11	l/17/87.			
						İ							Ì		
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													c	Description lassificat	ion of
						- 1								oils by vi xaminati	
							İ								
	<u> </u>		2011				TE								
			OON; ST P = PIT				It	Ω	<u> </u>	dustrial Rd.	(I ODI)		H	OLE NO.	45R
			+41	J. 1000	- 01				A-4	uustiiai Nu.	(LODI)	· · · · · ·		11,	710+

		EC	LOG	ilC	DR	ILI	L LO		PROJEC	СТ		FUSRAP		J08 N	1-138	SHEET N	1	HOLE NO. 1143R
ITE		Ind	ustrial	Rđ.	a.	ומס	n	COORDIN	ATES		NIC	23 E 1,53	_		1		- 1	BEARING
EGL			MPLETE				.,	<u> </u>				· · · · · · · · · · · · · · · · · · ·	SIZE	OVERBURDE		Pertica		TOTAL DEP
			1-17-				E.D.			N	1OBI	LE B-57	6.5"	12.		1.8		14.0
ORE		OVER 1.0		X) C	ORE E	BOXES	SAMPL 7	ESEL. TO	P CAS	NG	GROUNI	EL. DEPTH/	EL. GROU	ND WATER	DE	PTH/EL.		OF ROCK
AMP			R WEIGH	T/FAL	L	CAS		FT IN HO	LE: DI	A./L	ENGTH	LOGGED BY:			l_	· · · · · · · · · · · · · · · · · · ·	12.	2/
			s./ 30					NO		,		500000 511		D. Ha	rnish		1	
r.	-1 III	oj :	Ξ,)		WA PRE	TER				m						- 	<u> </u>	
SAMP DIAM.	SAMP. AD	SAMPLE RECORE REC	BLOWS "N"	LOSS	TE	STS		ELEV.	DEPTH	GRAPHICS	a laws	ESCRIPTION	AND C	LASSIFI	CATIO	00 11 0 110 110 110 110	TER ARAC	ON: LEVELS, RETURN, CTER OF ING, ETC
SS	2.0	1.3	1-4-4-	4							0.0	- 4.8 Ft. SAN ML).	D and SI	LT FILL (S	P,			advanced using 6.5 i
SS	2.0	2.0	2-2-4-1	3								0.0-0.7 Ft. Silt red Brunswick (0.7-4.8 Ft. Sar (10YR5/6) with	gravel. id, yellow	ish brown	·	o.d au Ra sar	l. holl ger. diolo; npled	ow-stem gically
SS	2.0	1.5	6-15 10-13				i	-	5_		4 0	stain, fine-grain - 9.7 Ft. SAN	ned, loose	•			<i></i>	
SS	2.0	1.5	7-20-2 20	ō					-	$\ \ $.	Finely interbed clay toward top	ded with	1-3 cm lay	ers, so	me		
SS	2.0	1.9	12-13	4] -		ľ	4.8-6.7 Ft. Str. 6.7-8.0 Ft. Silt	_	` '	•			
			17-20					_	-			8.0-9.7 Ft. Bro	wn (10Y			,		
SS	2.0	1.2	2-2-7-	9				_	10_		9.7	weak red (7.5R) - 12.2 Ft. SAP	ND (SM).	Brown		_/		
SS	2.0	1.6	10-31 24-34					-		Ш	h	(10YR4/3), son 9.7-10.6 Ft. M	edium- te	COATSe-gr	ained.	4		
			24-34									round grains, so 10.6-12.2 Ft. V		•	vel.	13.	0 Ft.	Top of ed bedrock.
											12.	2 - 14.0 Ft. W BEDROCK. D Brunswick form downward.	RATHER	ED	al,			
						1						ttom of borehole rehole backfilled			87.			
													-					•
																يسبب و و و و و و و و و و و و و و و و و و		
																cla soi	ssifica	ion and stion of visual tion.
			POON; S; P = P				,	ITE	8		Indu	strial Rd.	. (LOI))		HOL	E NO.	i43R

	G	EO	LOG	וכ ח	RII	10	G ·	PROJEC	T				JOB NO.	1	ET NO.	HOLE NO.
SITE					- 1 - April		COORDINA	ATES			FUSRAP		14501-1:		OF 1	1142R
L			ustrial			[)				N	1,884 E 1,559	9	The state of the s	Vert		
BEGL	N	CC	MPLETED	DRILL			_	F		L	MAKE AND MODEL	SIZE	OVERBURDEN			TOTAL DEPTH
			1-17-8		POYE	E.D.	I. Esel. To	2 242			OBILE B-57	6.5"	10.0		181 555	10.0
1	7	.9/	79			5					\\	EL. GROU	ND WATER	DEPTH,	/EL. TOP	OF ROCK
SAMP			R WEIGHT		CAS	ING LE	FT IN HO		A./I	LEN	GTH LOGGED BY:		D. Harnis	$\overline{\mathbb{Q}}$	XOJ	· <u> </u>
Ш	14	0 10	s./ 30		JATE	₹	NO	NE	Ī	П		··	D. Harni	n /	100	
SAMP. TYPE	SAMP. ADV LEN CORE	CORE REC	BLOWS "N" X CORE RECOVERY	LOSS IN G.P.M	ESSU	RE	ELEV.	рертн	GRAPHICS	SAMPLE	DESCRIPTION	AND C	LASSIFICAT	ION	WATER CHARAC	ON: LEVELS, RETURN, CTER OF ING, ETC.
SS	2.0	0.9	1-3-3-4								0.0 - 5.0 Ft. <u>SILT</u> SP).	and SAI	VD FILL (ML,	•	Borehol	e advanced using 6.5 in.
SS	2.0	1.9	3-2-3-1:								0.0-3.3 Ft. Silt dark grayish br some charcoal ; 3.3-3.5 Ft. Silt	own and pieces.	yellowish brown	1,	o.d. holl auger. Radiolo sampled	ow-stem
SS	2.0	1.8	15-10 14-16				-	5_			3.5-5.0 Ft. Sar fine-grained, lo	nd, strong	brown (7.5YR	1/6), r		
ss	2.0	2.0	14-14 24-24								base. 5.0 - 5.7 Ft. SAN (10YR5/2) with					
SS	2.0	1.3	12-21 20-20								fine-grained, fil	nely bedd	ed.	-	8.0 Ft.	Sample is
_			20-20				_	10			5.7 - 7.0 Ft. SAN (7.5YR4/2), fin silt, subangular features, satura	grains, n	dium-grained, s to bedding	ome	- saturate	
											7.0 - 10.0 Ft. SIL Brown (7.5 YR5 interbedded with		ND (ML, SP). fine-grained,			
											8.0-10.0 Ft. Si					
											Bottom of borehol Borehole backfilled	e at 10.0 d with spe	Ft. oils, 11/17/87.			
							- -									
															Descrip classific soils by examina	
			POON; S'; P = P			, ,	SITE		B0	lr	ndustrial Rd	. (LO	DI)		HOLE NO	142R

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		ΕO	LOG	IC D	RILI	L LO	G	PROJE	СТ	FUSRAP 14501-138 1	
SITE		Ind	ustrial	Rd. ()	LODI	n	COORDINA	NTES	1	ANGLE FRO ANGLE FRO Verti	M HORIZBEARING
BEGU			MPLETED			<u>- / </u>	<u> </u>				(FT.) TOTAL DEPTI
			1-20-8		. 2045	E.D.				OBILE B-57 6.5" 12.0	12.0
COKE		.6/) CUKE	BUXE	S SAMPL	ESEL. TO	P CAS	ING	ROUND EL. DEPTH/EL. GROUND WATER DEPTH/	EL. TOP OF ROCK
SAMP			WEIGHT	/FALL	CAS		FT IN HO	LE: DI	A./L	NGTH LOGGED BY:	NOP -
			s./ 30				NO	NE	·	D. Harnish	210
SAMP. TYPE AND DIAM.	SAMP. ADV.	AMPLE REC.	BLOWS "N" X CORE RECOVERY	LOSS IN G.P.M.	PATER ESST: N.S. T.	RE	ELEV.	DEPTH	GRAPHICS	l l	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
SS	2.0	1.7	3-6-6-4		<u> </u>		-	 		0.0 - 1.3 Ft. Sandy SH.T (FH.L?) (SM-ML). Dark grayish brown on top to	Borehole advanced 0-12 Ft. using 6.5 in
SS SS	2.0	1.8	3-6-6-7 3-4-5 12 17-15 24-24				-	5.		1.3 - 2.4 Ft. SILT (FILL?) (OL). Black. 2.4 - 4.3 Ft. SILT (ML). Grayish green, minor iron-oxide mottling. 4.3 - 12.0 Ft. SAND and SILT (SP, ML). Gray and grayish brown, fine- to very fine-grained, interbedded. 4.3-4.7 Ft. Sand, very dark gray, some	o.d. hollow-stem auger. Radiologically sampled and gamma-logged by TMA-Eberline, Inc. 1.3-2.4 Ft. Strong diesel odor to silt. ENMET reads 300+ppm.
00	2.0	10	6 6 7 9						4111	silt, wet.	
22	2.0	1.8	6-6-7-8	1					4111	4.7-6.2 Ft. Sand and silt, gray. 6.2-6.7 Ft. Sand, grayish brown (2.5Y5/2),	
SS	2.0	0.2	11-16 23-28					10.		subangular grains. 6.7-8.0 Ft. Silty sand, dark grayish brown (2.5Y4/2), saturated.	
										8.0-8.7 Ft. Silt, light grayish green. 8.7-12.0 Ft. Sand, dark brown (10YR4/3), some silt, saturated, liquefied. Bottom of borehole at 12.0 Ft. Borehole backfilled with spoils, 11/20/87.	Description and classification of soils by visual examination.
			POON; S'; P = P:			,	SITE		80	Industrial Rd. (LODI)	HOLE NO. 1159R

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	G	ΕO	LOG	IC D	RIL	L LO	G	PROJEC	CT			71 1CT 4 1	D		JOB N		1		HOLE NO.
SITE							COORDINA	ATES				USRAI			1450			OF 1	1161R BEARING
			ustrial			[)						90 E 1				1	Vert	- 1	
BEG			MPLETED		.ER	E ~			DRI			AND MODE		SIZE	OVERBURDE		ROCK	(FT.)	TOTAL DEPTH
			(FT./2		BOXE	E.D.	I. ESEL. TO	P CASI	ING			E B-57		6.5"	10.0		EDTU	EI TOP	OF ROCK
		1.5/4			, Jone	5		, 500		٦	NOO ND	3	//	EL. GROU	NO MAIER		Eriny	/EL. 10P	UP ROCK
SAME			WEIGHT	•	CAS	ING LE	FT IN HO		A.,	/LEI	NGTH	LOGGED B	Y:		-			Oe	<u> </u>
			s./ 30				NO	NE		7				···	D. Ha	rnis	h	710	
DIAM.	김분	E C	BLOWS "N" * CORE RECOUERY	PR	JATE! ESSU	RE		_	8	3									0114
H	€ 0	RE	400 200 300 300 300 300 300 300 300 300 3	ω Σ	TESTS	1	ELEV.	DEPTH	[IPI	DI	ESCRIPT	'ION	AND C	LASSIFI	CATI	ON		LEVELS,
Seg	T I	APL SRE	SA OU FC	LOSS IN G.P.	PRESS. P.S.I.	HAN.		8	POPHICS	SAMPLE									RETURN, TER OF
₽₹	S L	800	<u> </u>	_ e	5.	FE			L _G	<u>' </u>								<u> </u>	NG, ETC.
SS	2.0	1.4	1-3-9-9	1							0.0	- 4.2 Ft. FILL (GM	Grav I-MI	velly SILT ., OL).	and SILT			0-10 Ft.	e advanced using 6.5 in.
			40.40]				١.).0-3.5 Ft	. Gr	avelly silt	, dark brow	'n,		o.d. holl auger. Radiolog	ow-stem
55	2.0	0.6	10-18 14-7				-	١.			1	pieces of c	emer	light gray it, Brunsw	rish brown, rick sandst	prok	en	l sampled	and
20	2.0	-7.6	1-3-6	-		•] .				harcoal.	er	7 T 1 L L - L - L	ansit .			TMA-E	logged by berline, Inc.
33	2.0	1.2	111				•	5_	Π		1			LT, black,			Γ		Grab sample ger flight.
-	2.0	1.3	4-8-13	-					$\ \ $		\ \			LT, grayis		214		1	
33	2.0	1.5	13] 1/2	ML). Dar downward	k gra , fine	yish brow	nd SILT () in becoming fine-graine	broved.	vn		
SS	2.0		6-12 12-16									1.2-7.3 Ft inconsolic		ty sand, n	nassive,			8-10 Ft. little wa	. Sample had iter.
-				1			-	10 .	Ш		h i	7.3-7.5 Ft (2.5Y4/2)	. S il	t, dark gr	ayish brow	n	Г	10.0 Ft.	ENMET
											$ \setminus $	7.5-10.0 F 5-10 mm	t. S	and, brow nterbeds.	n (7.5YR4,	/2), fe	w	LEL 6" hole.) ppm, 70% into open
											Bot	tom of bo	reho	le at 10.0	Ft.				
										-	Bor	ehole bac	kfille	d with spe	oils, 11/23/	87.			
								-		1	ļ								
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				'															
																		classific	tion and ation of
																		soils by	
		1				İ													
ss	= SPL	IT S	POON; S	T = SHE	LBY T	UBE; S	SITE	<u> </u>	<u></u>		1							HOLE NO	
			; P = P					1	8() [ndu	strial	Rd	I. (LO	(וט			1	161R

	G	EC	LOG	IC D	RIL	L LO	G	PROJEC	CT		erica (.	JOB NO	- 1	HEET NO.	HOLE NO.
SIT							COORDIN	ATES			FUSR/	AP		14501		I OF 1 FROM HORIZ	1217R
			ustrial			I)					50 E		7			ertical	
BEG			MPLETED 2-11-8		ER.	77 Th	_	ř			AND HOD		L	OVERBURDEN	R	OCK (FT.)	TOTAL DEPTH
					BOXE	E.D.	ESEL. TO	P CASI	ING K	I,T I	BEAVE		6.5"	10.6	DED	TH/EL. TOP	10.6
L	4	1.8/	48	<u> </u>		4	-		l			₹ /	EL. GROOM	WAIER	DEP	/ IN/EL. 10P	OF RUCK
SAH			R WEIGHT		CAS	SING LE	FT IN HO		A./LE	NGTH	LOGGED	BY:				sal	
Ш	14	0 10	s./ 30	10.	JATE	.	NO:	NE	T T	_	<u></u>			D. Har	nish (100	
SAMP. TYPE	SAMP. ADV	BAMPLE REC	SAMPLE BLOWS "N" % CORE RECOVERY	LOSS IN A.P.M	ESSU EST:	RE	ELEV.	DEPTH	GRAPHICS		,			_ASSIFIC	ATION	WATER CHARAC DRILLI	LEVELS, RETURN, CTER OF ING, ETC.
	2.0		6-6-16 20				- }	-		0.6	- 9.0 Ft	. Gran	ENT. Cor lint Ink. relly SILT rk grayish	PILL brown with		0-10.6 F o.d. spli	e advanced It. using 3 in. t-spoons and .d.
	2.0	1.2	11-21 23-22 9-13					5_		:	reddish i	prown	and grayu unawick sa	h green silt indstone, so nd metamor p 0.4 ft. is d gravel.	muxed me	depths f	em augers. hrough 6 in. e floor. All rom top of
			10-6						ŧ	ĺ						Radiolog sampled	and
SS	2.0	1.1	5-7-14 16													A	logged by berline, Inc.
SS	2.0		ND				-	10_		9.0			t is approx			ft.	logged to 8.0
							-			_				SM). Gray imp. Ft. ils, 12/10/8	7.	10.6 Ft. reads >: >20% L of open	ENMET 300 ppm, EL, at mouth hole.
ss:	= SPL	IT SI	POON; ST	= SHE	BY TL	BE: S	ITE									Descript classifics soils by examina	ation of visual tion.
			P = PI			, ,	- · -	8	30 I	ndu	strial	Rd	. (LOI) 1)			217R

	G	EC	LOG	IC D	RIL	L LO	G	PROJE	СТ	FUSRAP	JOB NO. SHE 14501-138 1	et No. HOLE NO. OF 1 1156R
ITE	80	Ind	ustrial	D 4 (I OD	۲۱	COORDIN	ATES		N 1 651 TO 1 610		OM HORIZBEARING
EGUN			MPLETED			<u>., </u>	<u> </u>		DRIL	N 1,651 E 1,612 MAKE AND MODEL SIZE	Vert	ical
			1-20-8			E.D.			N	OBILE B-57 6.5"	8.0	8.0
ORE				CORE	BOXE		ESEL. TO	P CAS	ING	ROUND EL. DEPTH/EL. GROU	ND WATER DEPTH	/EL. TOP OF ROCK
AMPI		.2/	B/ R WEIGHT	/FALL	CAS	3	FT IN HO	LF: D	A . /1	NGTH LOGGED BY:		/
			s./ 30				NO		, .	NOTIL COURTS ST.	D. Harnish 9	PL .
<u>"-</u>	ĵш	ပ္ပါ ႏ	حر ہے	٥٥	ATER ESSU				m			
AND DIAM.	LEN COR	BAMPLE REC	SAMPLE BLOWS "N" % CORE RECOVERY	LOSS IN G.P.M	PRESS. I.S. I		ELEV.	DEPTH	GRAPHICS	DESCRIPTION AND C		NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC
SS :			4-12-15				· -			0.0 - 2.2 Ft. Silty SAND (F Olive gray (5Y4/2) with mushy, wet.	some black silt,	Borehole advanced 0-8 Ft. using 6.5 in o.d. hollow-stem auger. Radiologically
SS 2	2.0	1.6		:					-	2.2 - 8.0 Ft. SILT and SAN Fine- to very fine-graine interlayered.	ID (ML, SP). d, 3-5 mm beds	sampled and gamma-logged by TMA-Eberline, Inc
			14-15					5.	4111	2.2-2.9 Ft. Olive (5Y5/4	•	0-2 Ft. Grab samp
SS 2	2.0	1.8	10-15 12-20						-	2.9-4.0 ft. Brown (7.5YI olive layers.	R4/2) with some	from auger flights. 0-0.5 Ft. is loading
_		İ	14-20	:				•		4.0-6.0 Ft. Silt, brown.		dock cement slab.
							-	·		6.008 Ft. Silt, dark red (5YR4/2), faintly lamina	ddish gray sted.	Olive color at 2.2-2 Ft. may be petroleum-related.
										Bottom of borehole at 8.0 F Borehole backfilled with spo		
												Description and classification of soils by visual examination.
			POON; ST			, ;	ITE		BO 1	ndustrial Rd. (LOI))	HOLE NO. 1156R

	G	EC	LOG	IC D	RIL	L LO	G	PROJE	CT		FUSRAP	JOB NO.	SHEE	T NO.	HOLE NO.
SITE		T		D. 4	. ^-	T\	COORDINA	ATES		_				M HORIZ	1158R BEARING
BEGL			ustrial MPLETED			1)	1		DRII		1,591 E 1,620 AKE AND MODEL SIZE FOR	***************************************	Vert		
			l-20-8	7		E.D.			1		BILE B-57 6.5"	WERBURDEN 8.0	ROCK	(FT.)	TOTAL DEP
CORE				CORE	BOXE	1	ESEL. TO	P CAS	ING		OUND EL. DEPTH/EL. GROUND		DEPTH/	EL. TOP	OF ROCK
SAME		3.0/3 AMME	38 R WEIGHT	/FALL	CAS	ING LE	FT IN HO	E. D1	A (1	EN	TH I ocern av	· · · · · · · · · · · · · · · · · · ·		/	
			s./ 30		ļ~.	,,,,d CC	NO		M./L	.EM	TH LOGGED BY:	D. Harn	ich C	201	
Ψ.					JATE					П		D. Hain	1911		
SAMP. TYPE	SAMP, ADU.	SAMPLE REC	SAMPLE BLOWS "N" % CORE RECOUERY	LOSS IN G.P.M	ESTS FSTS T.S.T.		ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLA	ASSIFICA		WATER CHARAC	ON: LEVELS, RETURN, CTER OF ING, ETC
SS	2.0	1.5	2-5-8 12								0.0 - 2.6 Ft. SILT and Sandy (GM-ML, SM-ML).	SILT PILL		Borehol 0-8 Ft.	e advanced using 6.5 in
SS	2.0	1.5	5-13 17-14			i.	,	-			0.0-0.2 Ft. Silt, yellowish (10YR4/6), dusky red grav	brown velly silt on	top.	auger. Radiolo	ow-stem gically
SS	2.0		10-15 21-20								0.2-2.6 Ft. Sandy silt, red (5YR5/3) mixed with yello light greenish gray silt, abu	wish brown	sand, ∫	sampled gamma- TMA-E	and logged by berline, Inc.
SS	2.0		19-16					5_			iron-oxide mottling. 2.6 - 8.0 Ft. SAND and SILT ML). Interbedded, sand is	(SM, SP,	eilt.		
			19-18					•			is reddish brown to reddish 2.6-3.1 Ft. Silt, reddish br	n gray.			
											3.1-4.2 Ft. Sand, dark bro fine-grained.	•	11		
											4.2-6.0 Ft. Silt, reddish gr beds 3-10 mm thick.	ray (5YR5/2	2),		
											6.0-7.4 Ft. Sand, dark bro some silt, subangular, dam	wn (10YR4	/3),		
					:						7.4-8.0 Ft. Silt.	•			
											Bottom of borehole at 8.0 Ft. Borehole backfilled with spoils	s, 11/20/87.			
															•
-															
.															
, , [•												
														Descript classifics soils by examina	stion of visual
			OON; ST			,	ITE	8	30	In	dustrial Rd. (LODI	i)		HOLE NO	

	G	ΕO	LOG	IC D	RIL	L LO	G	PROJEC	T		ELICD AD	, , , · · · · · · · · · · · · ·	JOB NO.		ET NO.	HOLE NO.
SITE							COORDINA	ATES			FUSRAP		14501-1		OF 1	1140R BEARING
			ustrial			I)			N	1 1,9	25 E 1,6	552		Vert	ì	
BEGL		1	MPLETED		ER.	E 10	-	•			AND MODEL	SIZE	OVERBURDEN	ROCK	(FT.)	TOTAL DEPTH
			-17-8		ROYE	E.D.	I. Esel. To	D CAS	M NG G	OBI	LE B-57	6.5"	10.0	DEDTU	/EL. TOP	10.0
		.8/5				5				NOOND	₹	/ /	DAD MAIEK	DEPIN	/EL. 10P /	UP RUCK
SAMF			WEIGHT		CAS	ING LE			A./LEI	NGTH	LOGGED BY:				^ 	
	14	0 lb	s./ 30	in.			NO	NE	·				D. Harn	ish '	76 8	-
	걸	C.	BLOWS "N" X CORE	PR	IATEI ESSU	RE		l	9	ļ						
FIG	COA	RE		ωΣ	EST		ELEV.	DEPTH	BRAPHICS SAMPLE	D	ESCRIPTI	DN AND C	LASSIFICA	TION	NOTES	ON: LEVELS,
90	ďΖ	모	F 30 20 20 20 20 20 20 20 20 20 20 20 20 20	LOSS IN G.P.M	3. I	TIME MIN.		DE	A 5							RETURN, CTER OF
84 Ex	SA	38.00	`` ਜ਼ ```````	7.9	PRE98. P. S. I.	Ε.Ε			9							ING, ETC.
SS	2.0	0.3	2-4-4-3							0.0	- 2.0 Ft. G	Park brown	r FILL (7.5YR4/4),			e advanced . using 6.5 in.
							_			1 :	organic. Gr	raei 12 plok	en Brunswick		o.d. holl	ow-stem
SS	2.0	1.4	1-1-2-5			٠,١				2.0	- 5.0 ft. Silt (SM, ML). L	y SAND an	d SILT (FILL) sh gray (10YR) de mottling	() (6/2)	Radiolo sampled	gically and
											with increasi downward.	ng iron-oxi	de mottling	, -,	gamma- TMA-E	logged by berline, Inc.
SS	2.0	1.4	5-19 19-19				_	5_				-		_		•
]		ł 1	4.7-5.0 Ft.	-				
SS	2.0	1.4	25-20 20-23					١.		5.0	- 10.0 Ft. § Dark brown	(10YR4/3)	ILT (SM, ML) sand is fine- interbedded.). and		
	0.0	1.0											interbedded.			
33	2.0	1.3	7-10 12-8								5.0-6.0 Ft.		1	'a\		
<u> </u>							-	10 .		L			h gray (5YR4/	2). r	1	
]						\	6.7-10.0 Ft.	Dark plow	n (10YR4/3).			
											tom of bore		ft. oils, 11/17/87.			,
										50	tettore pacett	ned with st	QIIS, 11/11/01.	•		
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																tion and
															classific soils by	visual
			-		ŀ										examina	ation.
								1								
SS	= SPL	IT S	POON; ST	= SHE	LBY T	UBE; S	ITE	1	1l					· · · · · · · · · · · · · · · · · · ·	HOLE NO	
			, P = P					į	80 I	ndu	strial R	d. (LO	DI)		1	140R

		EC	LOG	IC D	RIL	L LO		PROJE	<u> </u>		FUSRAP	JOB NO. 14501-	1	OF 1	HOLE NO. 1163R
ITE		Ind	ustrial	Rd. (LOD	r)	COORDIN	ATES		N	1,838 E 1,666	Al	NGLE FR	ON HORIZ	BEARING
GU	N	CC	MPLETED	DRILL		-/	.1					VERBURDEN		(FT.)	TOTAL DEP
			1-23-8		BOVE	E.D.	I. ESEL. TO			M	obile B-57 6.5"	10.0			10.0
UKE		5.9/:		LUKE	BUXE	5 SAMPL	ESEL. IC	P CAS.	ING	GRU	UND EL. DEPTH/EL. GROUND	WATER	DEPTH	/EL. TOP	OF ROCK
AMP			R WEIGHT	/FALL	CAS		FT IN HO	LE: DI	A./L	ENG	TH LOGGED BY:	 	<u> </u>	~	D
. 1	14	0 lb	s./ 30	in.			NO	NE	7			D. Harn	ish	- 40	<u>} </u>
AND DIAM.	SAMP. ADV. LEN CORE	CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	LOSS IN G.P.M.d	PRESS. 1.8.9	RE	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLA	ASSIFICA	TION	WATER	ON: LEVELS, RETURN, CTER OF ING, ETC
	2.0	1.3	1-3-7		<u> </u>			1			0.0 - 4.7 Ft. Gravelly SILT a	nd SAND		Borehol	advanced
	2.0		5-9-3-2								FILL (GM-ML, SP). 0.0-4.0 Ft. Gravelly silt, reproved and yellowish brown and, gravel is cement and sandstone.	n. some gray	silty	o.d. holl auger. Radiolog	using 6.5 i ow-stem gically and logged by berline, Inc
	2.0	1.1	10				-	5_			4.0-4.7 Ft. Sand, dark yel fine-grained, some medium uniformly graded.	llowish brow n-grained,	n, /	-	·
S	2.0	1.2	3-8-14				-]			4.7 - 6.4 Ft. SILT (FILL?) (N Reddish gray (5YR5/2) wi iron-oxide stain; disturbed	ML). ith some		1	
S	2.0	1.7	11-14 16-19	†							6.4 - 10.0 Ft. <u>SAND</u> (SP). B (10YR4/3), very fine-grain	Brown	., wet.		
							-	10 .	†		8.1 Ft. Thin silt bed.		- 1	1	
		ŀ									9.6 Ft. Thin silt bed.				
											Bottom of borehole at 10.0 Ft Borehole backfilled with spoils		,		
				1										I	
	;							'							
														Descript classific soils by examina	visual
			POON; ST ; P = PI			, ,	1TE	1	 80	In	dustrial Rd. (LOD)!)		HOLE NO	i63R

	~	EΛ	LOGI	ר ח	DII I	IΛ	G	PROJEC	T				JOB NO		ET NO.	HOLE NO.
			LUGI	CD	/IL	- LU		TEC			FUSRAP			-138 1	OF 1	1160R
SITE		Ind.	ıstrial	P4 /1	. .	rs -	COORDIN	A) ES		N ·	.,790 E 1,67	5		veri Veri	- 1	DEAR180
BEGU			MPLETED			.,	L	- 6			KE AND MODEL	SIZE	OVERBURDEN			TOTAL DEPTH
11-	23-8	3711	-23-8	7		E.D.		1	N	10	BILE B-57	6.5"	12.0	1		12.0
CORE	REC	OVERY	(FT./%	CORE	BOXE	SSAMPL	ESEL. TO	P CASI	NG	GRO	JND EL. DEPTH	EL. GROU	ND WATER	DEPTH	/EL. TOP	OF ROCK
		.2/6		L_		6					¥ /				/	<u> </u>
SAMP			WEIGHT		CAS	ING LE			A./L	ENG	H LOGGED BY:		D. Har	nich	OP-1	
			s./ 30		ATE		NO	NE		Т			D. nai	пізп		
2	징		BLOWS "N" X CORE	PR	ESSU ESTS	RE		\	CS	Ш					NOTES	on:
F	₹ O		T. 83	ω Σ			ELEV.	ОЕРТН	H		DESCRIPTION	N AND C	LASSIFIC	MOITA	WATER	LEVELS,
1	PZ	급뿐	E	LOSS IN G.P.M				1 2	BRAPHICS	SAMPLE						RETURN, CTER OF
gg	SAP	준임	2H, E	7.9	<u> </u>	TIME MIN.		1	≅	Ш					DRILL	ING, ETC.
SS	2.0	1.5	2-2-6 14								0.0 - 6.4 Ft. Gra FILL (GM-M	velly SIL7	and SILT		0-12 Ft	e advanced using 6.5 in.
1			7.5	1			•	1.			0.0-6.0 Ft. G			lish	o.d. hol	low-stem
SS	2.0	1.7]	_				brown, dark b	rown, ligh	t gray; piece	s of	Radiolo sample	gically
			11-8								wood, hard gr Brunswick san	dstone gr	vel.		gamma	-logged by Sperline, Inc.
SS	2.0	0.4	5-4-2-6					.			•				1	
			•					5_								
SS	2.0	1.7	3-12	1] .								ط	
			14-22	1				.	$\{ \ \cdot \ \}$		6.0-6.4 Ft. Si semi-liquid.	it, black, '	very soft,		[]	
SS	2.0	1.1	4-15	}				. }	╂┼┼		6.4 - 8.0 Ft. SIL becoming dar	T (ML).	Grayish gree	:n	Ч	
			20-24	\	}	}	1	١ .	-{{}}}		becoming dark toward base, i	grayish t ome iron-	orown (10YF oxide mottli	14/2) ng,	}	
00	2.0	1.8	8-7-14	-				10_	-{		interbedded.				[[
33	2.0	1.0	15			1	1		4111		6.4-6.8 Ft. L					
	<u> </u>	<u> </u>	<u> </u>	4			} .	۰ ا	Ш		6.8-8.0 Ft. Se sand.	ome interb	eds of fine-	grained	Н	
Ì		}			•						8.0 - 12.0 Ft. S	NT and 6	TTT (SM N	,,, _,	}[
											Grayish brow 2-30 mm in t	(10YR\	1/2), 30% sil	t beds	[]	
	Ì	1		Ì							1]]	
	l	1	į	ĺ	[11	10.0-12.0 Ft. mm silt interl	eds, satur	.s : n.a/2), so ated.	ome 2-1		
		1			1	1		-								
					ļ						Bottom of boreh Borehole backfill	ole at 12.0 ed with sp	rt. poils, 11/23/	87.		
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	1		\perp	<u> </u>			<u></u>			\prod						
			SPOON; S			.002,	SITE		00		J A . ! . I . D	. () (וחו		HOLE	NO. 1160R
			N; P = F						δÚ	11	dustrial R	a. (LL	ווטו			TIOOK

	C	ΕΛ	LOG	ר ח	RII I	10	G	PROJEC	T				JOB NO.	•		HOLE NO.
SITE		EU	LUGI		VIL.	LLO	COORDINA	TEC			FUSRAP			138 1	OF 1 OM HORIZ	1150R
3115		Indi	ustrial	Rd. O	[OD]	n	COOKDINA	VIE2	1	N 1.6	52 E 1,67	0	ľ	Veri	1	DEAKING
BEGL			MPLETED			·/	<u>.l</u>	þ			AND MODEL	SIZE	OVERBURDEN			TOTAL DEPTH
11-	18-8	3711	-18-8	7		E.D.	I.		N	10BI	LE B-57	6.5"	8.0			8.0
CORE				CORE	BOXE	SSAMPL	ESEL. TO	P CASI	NG	GROUNE	EL. DEPTH	/EL. GROU	IND WATER	DEPTH	/EL. TOP	OF ROCK
<u></u>		3/5			1	4	1				1 1	 			-	
SAME			WEIGHT		CAS	ING LE			A./LI	ENGTH	LOGGED BY:		D II	_!_L	CN	
	14	UID	s./ 30	ın.	JATE	-	NO	NE -		Υ			D. Har	nisn	A C	
DIAM.	2 2	CEC.	BLOWS "N" % CORE	PR	ESSU	RE		_	_က					•	NOTES	ON.
댿	EÖ	HH	7,182		EST		ELEV.	DEPTH	GRAPHICS		ESCRIPTION	N AND C	LASSIFIC	HOITA		LEVELS,
	ůΖ	김씨	E 300	S Z	SS:	HENE ENTE			₹ .	E						RETURN,
SAND	준의	£ 0	의원생품	LOSS IN G.P.M	PRESS.	본부분		-	8	7						CTER OF ING, ETC.
SS	2.0	0.3	11-5-4	-	<u> 88</u>					0.0	- 1.8 Ft. Gra	velly SIL	CFILL		Borehol	e advanced
			11			}		-			(ML-GM). BI	ack silt, d	ark gray san	dy silt.	o.d. hol	using 6.5 in. low-stem
SS	2.0	1.0	2-8-13				-	-		1.8	- 2.8 Ft. SIL	r (FILL?)	(ML).		auger. Radiolo	gically
			12				-	-	HHH	\neg	Reddish gray iron-oxide sta	5YR5/2)	mottled with	and.	- sampled	and
66	2.0	1.8	12-12					-		_			_	,	TMA-E	logged by berline, Inc.
33	2.0	1.0	14-11					5_		•	3 - 8.0 Ft. SIL (7.5YR5/2) wi	th some i	ron-oxide sta	in,		
]] .			uniform.					
SS	2.0	1.2	7-13 12-14					١.								
ļ		ļ		1		ļ									Borehol	e caved in to
				1			-]		Bo	ttom of boreho	le at 8.0 l	Ft.			
										Bo	ttom of borehorehole backfille	d with sp	oils, 11/18/8	7.		
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			}	1	1			'	}						soils by	y visual
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_	<u> </u>	<u></u>		<u> </u>	<u> </u>	<u> </u>	SITE			<u> </u>					HOLE N	0.
			POON; S			JJL,		•	80	Ind	ustrial Re	d. (LC	DI)			150R

SITE		EC	LOG	IC D	RIL	L LC	G	PROJE	CT		FUSRAP	14501-138 1	
2115		Ind	ustrial	Rd. ()	LOD	I)	COORDIN	ATES		N	1,952 E 1,681	ANGLE FR	ON HORIZBEARING
BEGU	N	œ	MPLETED	DRILL					DRIL		WAKE AND MODEL SIZE		(FT.) TOTAL DEPT
			-19-8			E.D.					lobile B-57 6.5"	8.0	8.0
LUKE		5.5/C		COXE	BUXE	S SAMPL	ESEL. TO	P CAS	ING	GR	OUND EL. DEPTH/EL. GROU	IND WATER DEPTH	/EL. TOP OF ROCK
SAMP			WEIGHT	/FALL	CAS		FT IN HO	LE: DI	A./L	.EN	GTH LOGGED BY:		<u>, </u>
			s./ 30				NO	NE				D. Harnish	10-
焸	SAMP. ADV. LEN CORE	000	SAMPLE BLOWS "N" % CORE RECOVERY	PR	JATEF ESSU	RE			δ.	[]			
댽		RE	<u> </u>		FESTS		ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND C	LASSIFICATION	NOTES ON: WATER LEVELS,
و		밀	PAN SP	LOSS IN G. P. M	3. I	HAY HAY HAY H			8				WATER RETURN,
कुर सुर	정기	8A7	בון בור שר	9,7	PRES P. S.	F~£			9	N			CHARACTER OF DRILLING, ETC
SS	2.0	1.4	14-8 10-14								0.0 - 4.3 Ft. SILT and SAN SP).	VD FILL (ML,	Borehole advanced 0-8 Ft. using 6.5 in.
											•	av (2.5Y7/2)	o.d. hollow-stem
SS	2.0	1.5	6-7-21 21				-				0.0-0.8 Ft. Silt, light gramottled with yellowish b	•	Radiologically sampled and
								ļ			0.8-2.4 Ft. Sand, yellow (10YR5/6), fine-grained	vish brown with minor gravel	gamma-logged by TMA-Eberline, Inc.
SS	2.0	1.3	11-13 12-14	ļ			-	5		ı	of dusky red Brunswick silt at base (0.1 Ft.)	sandstone. Gray	
][]]		2.4-4.3 Pt. Sand (FILL?	?), brown (10YR5/3)	Borehole caved in to 5.0 Ft.
SS	2.0	1.3	13-14 19-17								fine- and very fine-grain graded.	ied, uniformly	
_							_	ļ	Ш		4.3 - 8.0 Ft. SILT (ML). R (5YR4/3), finely bedded	Reddish brown ,	
										П	(5YR4/3), finely bedded beds.	with 1-5 mm thin	8.0 Ft. ENMET res
										П			hole.
-											Bottom of borehole at 8.0 F Borehole backfilled with spo		
										$\ $			
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l													
													Description and
								}					classification of soils by visual
													examination.
-													
 :s =	SPL	IT SF	POON; ST	= SHF	BY TI	BE. S	ITE	l	<u>.</u>	Ц			HOLE NO.
			P = PI			,		1	30	ln	dustrial Rd. (LOI	DI)	1151R

ITE		ΕO	LOG	C D	RILI	L LO	G	PROJEC	CT)	FUSRAP					138	EET NO.	HOLE NO. 1139R
1115		Ind	ustrial	Rd. (1	[[[n	COORDINA	ATES	1	N 1,8	81 E 1.	400			^		ROM HORIZ	BEARING
EGU			MPLETED				1	1			AND MODEL		1ZE	OVERB	URDEN		tical K (FT.)	TOTAL DEP
			-16-8		2014	E.D.			M	OBI	LE B-57		6.5"		10.0	_		10.0
OKE		0VERT		CORE	BOXE	SISAMPL 5	ESEL. TO	P CASI	ING	iround	EL. DEF	PTH/EI	L. GROU	ND WAT	ER	DEPT	H/EL. TOP	OF ROCK
AMP			WEIGHT,	/FALL	CAS		FT IN HO	LE: DI	A./LE	NGTH	LOGGED BY	<u>/</u>						,
			s./ 30				NO	NE						D.	Наго	ish	001	
SAMP. TYPE AND DIAM.	SAMP. ADV. LEN CORE	SAMPLE REC. CORE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	LOSS IN G.P.M	PRESS. ESST. P. S. I.	RE	ELEV.	DEPTH	GRAPHICS	Ö	ESCRIPTI	EON (and C	LASS:	IFICA	HOIT	WATER CHARA	ON: LEVELS, RETURN, CTER OF ING, ETC
SS	2.0	1.8	3-3-2-3				,	•	e secon	· · · · · · · · · · · · · · · · · · ·	- 3.8 Ft. G FILL (ML- 0.0-2.7 Ft. (7.5R2.5/2) Brunswick s 2.7-3.4 Ft.	Grav , coar sands Silt,	elly silt se-grain tone, soi mixed g	, very oned graft, dam	dusky i wel of ip. brown		Boreho 0-10 Ft o.d. hol auger. Radiolo sample	le advanced . using 6.5 i low-stem
SS	2.0	1.1	3-9-17 20				-	5_		Ηl	(10YR5/2) 3.4-3.8 Ft.			•	-	ļ		·
SS	2.0	1.4	11-18 21-20							3.8	- 4.7 Ft. S (10YR5/1) greenish gra	mottl my, fin	AND (S ed with se-grain	M). G grayis ed.	ray h brow	n and		
SS	2.0	1.7	9-12 10-13				<u>-</u>	10 .		8.0	- 8.0 Ft. S (10YR5/3), interbeds of base. - 10.0 Ft. Reddish grs (7.5YR 5/4	SILT	and CL	AY (M	IL-CL	·		
										Bot Bor	ttom of bore rehole backf	ehole filled	at 10.0 i	ft. ils, 11	/16/87			
																-		٠
																		tion and
																	classific soils by examin	
			POON; ST			,	ITE		30 I	ndu	strial F	₹d.	(LOI	OI)		,	HOLE NO	139R

	G	EC	LOG	IC D	RIL	L LC)G	PROJE	CT		Erica in	JOB NO.		ET NO.	HOLE NO.
SIT							COORDIN	ATES			FUSRAP	14501-1		OF 1	1195R
	80	Ind	ustrial	Rd. (LOD	I)				N	1,733 E 1,705	· ["		tical	DEAKING
BEG			OMPLETED						DRI		MAKE AND MODEL SIZE	OVERBURDEN			TOTAL DEPTH
			2-4-8			E.D.	.I			M	INUTEMAN 6.5"	12.0			12.0
COR				() CORI	BOXE		ESEL. TO	P CAS	ING	GF	OUND EL. DEPTH/EL. GRO	UND WATER	DEPTH	/EL. TOP	
CAM		2.9/	25 R WEIGHT	7/50/1	ica	3					¥ /		<u> </u>	/	
SAT:			s./ 30		LA	SING LE			iA./	LEN	GTH LOGGED BY:		_		
111		1.	13./ 30	111.	JATE	<u> </u>	NO	NE	т —	Ti		D. Harni	sh		
Ĕ	김씨		SAMPLE BLOWS "N" % CORE RECOUERY	PF	ESSU	RE		l _	ရွ	Ш					
냼	₽ B		耳。 第2		TESTS		ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND (LASSIFICAT	ION	NOTES	ON: LEVELS,
茚	투고	김분	E 3 .0	SZ.	SS	Ezz	İ		PP	H				WATER	RETURN,
g₹	[N	질망		LOSS IN G.P.M	E.	HINI HINI HINI HINI HINI HINI HINI HINI		-	6	n				1	TER OF NG, ETC.
				3		 -		-		H	0.0 - 0.5 Ft. CONCRETE			1	advanced
33	1.5	1.1	8-13-26	1							FOUNDATION.		/	0-12 Ft.	using 3 inspoons and
SS	2.0	1.8		1							0.5 - 4.0 Ft. Gravelly SIL' FILL (GM-ML, ML, OI	C and SILT		6.5 in. o.	d. m augers.
			18-19		·						0.5-1.3 Ft. Gravelly sil	•		Cored th	rough 6 in. floor. All
SS	2.0	0.0	15-14	{			_				brown (5YR3/2), round	cobbles.	r	depths fi	rom top of
			9-9	ļ				5_			1.3-2.0 Ft. Silt, gray m	ixed with very	1	floor.	
-	2.0		ND				_		1		dark gray (7.5YR3/0) a brown.	nd dark reddish	Ĺ	_	
	1.5		, AD								2.0-4.0 Ft. Gravelly sil	, dusky red	- 1		
66	20		16 ND						Ш		(2.5YR3/2), gravel is Brand shale, silt is soft.	unswick sandst	one		
33	2.0		16-ND						Ш		2.5-2.7 Ft. Minor black			Radiolog sampled	rically and
								10			(7.5YR3/0) silt mixed in	١.	- 1	gamma-	logged by perline, Inc.
SS	2.0		7-15 15-7								3.1-3.3 Ft. Light olive mixed in.	ray silt (5Y6/2) #		,
								_			¥	FILL?) (SM)	∦		
							1	•		П	4.0 - 6.0 Ft. Silty SAND (Brown, some round grav	el.	N/		
										Ш	6.0 - 8.1 Ft. SILT (FILL?) dark gray (7.5YR3/0), c	(OL). Very			
										П	of wood, soft.	rgame with piet	es]	
							ļ			П	8.1 - 8.9 Ft. SILT and Silt	y SAND (ML,			
										$\ \cdot\ $	SM). Grayish green bed downward, sand is fine-	oming brown grained, sand ar	ıd		
											silt are interbedded.]	
										П	8.9 - 12.0 Ft. Silty SAND red (5YR5/3) with yello	(SM). Weak wish brown	1	}	
										П	iron-oxide stain near ba	se, fine-grained	. 1		
					·						11.1-12.0 Ft. Brown (10	YR4/3)			•
						j				П	medium-grained with so	me gravel,			
										Ш				1	
	ſ									Ш	Bottom of borehole at 12.0	Ft.			
						}			Ī		Borehole backfilled with sp	ms, 12/4/87.]	
		.													
		İ									•				
									İ		`				
				1	- 1	ł		-							
							1							Descripti	
														classificat	isual
			ای	j	.		į							examinat	ion.
	1		ığ.	ŀ	- 1							•			
				.]	l										
SS =	SPLI	T SP	DON; ST	= SHFI	BY TIS	BF SI	TE			Ц.				HOLE NO.	
D = 1	DENNI	SON;	P = PI1	CHER;	0 = 0	THER		8	0	ln	dustrial Rd. (LOI	JI) (IC			95R

	G	EC	LOG	C D	RIL	L LO	G	PROJE	CT		FUSRAP	ЈОВ NO. SH 14501-138	EET NO. HOLE NO. 1 OF 1 1162R
SITE	00	T J		70.1 (.	COORDINA	TES				ANGLE F	ROM HORIZBEARING
BEGUN	_		ustrial MPLETED			<u>U</u>	<u> </u>				1,850 E 1,717 AKE AND MODEL SIZE ON		tical
		371	1-23-8	7		E.D.		1		M	obile B-57 6.5"	12.0	CK (FT.) TOTAL DEPT
CORE				CORE	BOXE	1	ESEL. TO	P CAS	NG	GRO	WIND EL. DEPTH/EL. GROUND		H/EL. TOP OF ROCK
SAMPL		.5/G	3 R WEIGHT	/FALL	CAS	6	FT IN HO	F. DI	A /I	ENG	TH LOGGED BY:		/
			s./ 30	-			NO		n./ L	E-M-C	in Irodgen Bt:	D. Harnish	BT.
٠: :	i u	Ċ.	투. >	.	JATER		· · · · · · · · · · · · · · · · · · ·						
SAMP. TYPE AND DIAM.	LEN COR	SAMPLE REC	BLOWS "N" X CORE	Loss IN G.P.M	ESTS		ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLA	ASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC
SS 2	.0	0.8	1-2-26 26								0.0 - 8.0 Ft. Gravelly SILT a FILL (GM-ML, ML).	nd SILT	Borehole advanced 0-12 Ft. using 6.5 in
SS 2		1.8	13-15 8-13								0.0-6.2 Ft. Gravelly silt, d (5R3/2), gravel is broken E sandstone, granite. Silt is c Brunswick formation.	Brunswick	o.d. hollow-stem auger. Radiologically sampled and gamma-logged by TMA-Eberline, Inc.
SS 2	.0	0.9	7-12-8 3					5_			4.0-6.2 Ft. Brown silt mix	ed in.	
SS 2		, ,	1-2-3-4								5.0-6.0 Ft. Gravel.		
								•			6.2-8.0 Ft. Silt, mixed greedark gray, and brown with bottom.		
SS 2	.0	1.7	3-8-14 14				-				8.0 - 9.8 Ft. SILT (OL). Gra (10YR5/2), organic, faint li medium stiff.	yish brown aminations,	6-8 Ft. Sample saturated near 8.0 l
SS 2	.0	0.9	4-12 19-20				_	10_			8.0-8.3 Ft. Wet and soft.	Dark	Hole caved in to 10.
							=	•			9.8 - 12.0 Ft. SH.T (ML-OL) brown (10YR4/2), vague is mm thick defined by reddis Bottom of borehole at 12.0 Ft. Borehole backfilled with spoils		12.0 Ft. ENMET reads 100 ppm, 50% LEL 6" into open hole.
			² ООН; ST Р = PI				ITE.	8	30	In	dustrial Rd. (LODI	I)	Description and classification of soils by visual examination. HOLE NO. 1162R

		EC	LOG	IC D	RIL	L LO	G	PROJE(CT	JOB NO. SHEE 14501-138 1	of 1 1141R
ITE		Ind	ustrial	D 4 (1	I OD	r۱	COORDINA	ATES		• 1	M HORIZBEARING
EGU			MPLETED			.)	1	1		N 1,925 E 1,729 Verti	(FT.) TOTAL DEP
			-17-8			E.D.			N	OBILE B-57 6.5" 10.0	10.0
ORE	_		_) CORE	BOXE		ESEL. TO	PCAS	ING	ROUND EL. DEPTH/EL. GROUND WATER DEPTH	EL. TOP OF ROCK
AMP		1.4/ AMMEI	VEIGHT	/FALL	CAS	ING LE	FT IN HO	LE: DI	A./L	NGTH LOGGED BY:	7
			s./ 30				NO			D. Harnish	9/12
7.	기밀	<u> </u>		PR	JATER ESSU	, RE			87		
and orahi	SAMP. AC	MPLE RESONE	BLOWS "N" X CORE RECOVERY	LOSS IN G.P.M	PRESS. P.S.I.	TIME IN MIN.	ELEV.	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF
SS.	2.0	1.0	1-15-2	- 6	ĒΩ					0.0 - 3.3 Ft. Gravelly SILT and SILT	DRILLING, ETC Borehole advanced
	2.0		6 4-2-4-5							7111 (GM-ML, ML). 0.0-2.0 Ft. Gravelly silt, dark brown (10YR3/3) topsoil mixed with yellowish brown silty sand, gravel is dusky red	0-10 Ft. using 6.5 o.d. hollow-stem auger. Radiologically sampled and
SS	2.0	1.9	3-15 30-25				-	5_		Brunswick shale. 2.0-2.4 Ft. Gravelly silt, very dusky red (7.5R2.5/2) decomposed Brunswick shale	gamma-logged by TMA-Eberline, Inc
SS	2.0	1.3	13-24 25-24				_		-	and sandstone with angular sandstone and shale gravel. 2.4-2.6 Ft. Silt, yellowish brown silt with 0.1 Ft. thick layer of yellowish white	
SS	2.0	1.4	11-10 11-16						-	silt. 2.6-3.3 Ft. Silt, mixed very dark brown and grayish brown, root cast, iron-oxide	
							-	10		stained, disturbed material. 3.3 - 4.9 Ft. SILT (ML). Light gray (10YR7/2), abundant small root holes and	10.0 Ft. ENMET reads 100 ppm, 2 t LEL, 6" down oper
										finely disséminated iron-oxide stain. 4.0-4.9 Ft. Light brownish gray (10YR6/2), some thin beds of gray clay.	hole.
										4.9 - 6.9 Ft. SAND (SP). Yellowish brown (10YR5/4) becoming brown (7.5YR5/4) downward, fine- to very fine-grained.	
										6.9 - 10.0 Ft. SAND and SILT (SP, ML). Fine-grained, finely interbedded, wet.	
										6.9-8.0 Ft. Brown (7.5YR5/4). 8.0-10.0 Ft. Dark reddish gray (5YR4/2).	
										Bottom of borehole at 10.0 Ft. Borehole backfilled with spoils, 11/17/87.	,
		•									Description and classification of soils by visual examination.
-S -	SPL	IT S	POON; ST	* SHF	LBY 71	IBE: IS	ITE				HOLE NO.
			P = P					- 1	80	ndustrial Rd. (LODI)	1141R

	G	EC	LOG	IC D	RIL	LLO)G	PROJE	CT				JOB NO	1	ET NO.	HOLE NO.
SIT							COORDIN	ATES		_	FUSRAP			-138 1	OF 1	1157R
	80	Ind	ustrial	Rd. (LOD	I)				N	1,791 E 1,75	51			tical	DEAKING
BEG		1 -	MPLETED		.ER					L	MAKE AND MODEL	SIZE	OVERBURDEN		K (FT.)	TOTAL DEPTH
			1-20-8		ROYE	E.D.		D CAS	INC	M(OBILE B-57 ROUND EL. DEPTH	6.5*	12.0	D		12.0
		1.4/(., Conc	, DUAL	6	ESEL. IL	F LAS	ING	۳	COND EL. DEPTR	/EL. GKOU	IND WATER	DEPTH	I/EL. TOP	OF ROCK
SAM	PLE H	AMME	WEIGHT	•	CAS	SING LE			A. /	LEN	GTH LOGGED BY:				${}$	****
			s./ 30				NO	NE	-	+ +			D. Har	nish '	982	
뿣	吕胐	S C	BLOWS "N" % CORE RECOVERY	PR	JATE! ESSU	IRE		_	9						1	
or April	₹ 8	m &	1 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	₍₀ Σ	TESTS	1	ELEV.	DEPTH	BRAPHICS	SAMPLE	DESCRIPTION	N AND C	LASSIFIC	ATION	NOTES	ON: LEVELS,
SAMP	문교	횩뚦	SO SU	LOSS IN B.P.A	S. 1	TINE NIN			1	Ġ						RETURN,
	SIL	g ö	≅, ∝	_ 0	20	FΣ			0							ING, ETC.
SS	2.0	0.7	3-6-6-8								0.0 - 7.5 Ft. Silt SILT FILL (G	GRAVE M. ML. M	L. SILT. Gra L-GM).	velly		e advanced using 6.5 in.
				}				[·		o.d. holl auger.	ow-stem
SS	2.0	1.1	4-5-20 16			•	-				0.0-2.8 Ft. Si brown, minor				Radiolog	and
						. '	•				2.8-4.0 Ft. Si Brunswick san	ity gravel, dstone, bl	cement, ack rock.		gamma- TMA-E	logged by berline, Inc.
55	2.0	1.5	8-9-7-8			}		5_			3.0 Ft. Some	white pow	der.			
				1	1			١.			4.0-6.3 Ft. G	ravelly silt	, mixed very		0-2 Ft. from au	Grab sample ger flights.
33	2.0	1.6	4-3-5 11								dusky red (5R Brunswick san	2.5/2), gra dstone, gr	ly, black; gra anite, schist.	vel is		D. 17D 840
50	2.0	1.2	11-14				-	1.	41		6.3-7.3 Ft. Bi	ack silt, w	ith gray sand	i j		Ft. HP-260 evated reading ple.
	2.0	1.2	14-12						$\ \ $		6.4-6.5 Ft. 7.3-7.5 Ft. Sa	المحاد المسا		- 1	ior sam;	oie.
SS	2.0	1.3	9-14					10_	411		fine-grained.	ma, asrx (reemish gray	•	5 O F+	Groundwater
	•		15-22						$\ \ $		7.5 - 12.0 Ft. SI SM). Weak re	LT and Sil	ty SAND (M	L,	observed	
-	-						-	┨ .	Ш		top, some browning interbedded w	VD silt bed	s, thinly		_	
										$\ $	Ft. thick beds	· · · · · · · · · · · · · · · · · · ·	resent as U.I	-0.2		
											Bottom of boreho	le at 12 O	r t		ĺ	
										$\ \ $	Borehole backfille	ed with spe	oils, 11/20/8	7.	}	
1						1									ĺ	
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						1	İ			Ш						
									1							
						'			1	\parallel						
					1											
							1	<u> </u>							Descript	tion and
															classific	ation of visual
}															examina	tion.
ss	= SPL	IT S	POON; ST	= SHE	LBY TL	JBE: S	ITE	I	!	ТТ		<u>-</u>		•	HOLE NO	
			P = PI						80	Ir	ndustrial Ro	I. (LO	DI)		1 1:	157R

							·									
	(GE(DLOG	IC D	RIL	LLC)G	PROJE	CT					1	SHEET NO.	HOLE NO.
SIT							COORDIN	ATEC			FUSRAP		145		1 OF 1	1148R
	80	Ind	lustrial	Rd. (LOD	1)	COOKDIN	AILS		N 1	,849 E 1,	756		- 1	FROM HORIZ	BEARING
BEG	UN	C	OMPLETED	DRIL							E AND MODEL	SIZE	OVERBUR		ertical	TOTAL DEPT
11.	-18-	871	1-18-8	7		E.D	.I.	- 1		AO F	II F R-57	6.5"	8.	11		8.0
COR				() COR	E BOXE		ESEL. TO	P CAS	ING	GROU		TH/EL. GRO	UND WATER	DEI	PTH/EL. TOP	
SAM		2.4/	R WEIGH	/EALL	Icas	<u>4</u>	ET 111 115				₹	<u>′</u>			/	
			s./ 30		LA.	SING FE	NO.		A./L	ENGT	LOGGED BY:		.			
ш.					WATE	₹		I E					D. F.	<u>Iarnish</u>		
SAMP. TYPE	SAMP. ADV	SAMPLE REC	SAMPLE BLOWS "N" % CORE RECOVERY	LOSS IN G.P.M	PRESS. P.S.I.S.		ELEV.	ОЕРТН	GRAPHICS	Seg	DESCRIPTI				WATER CHARAC	ON: LEVELS, RETURN, CTER OF ING, ETC.
33	2.0	0.2	1-3-8 24							0	0 - 5.8 Ft. G FILL (GW,	ravelly SIL'	r and SIL	T		e advanced using 6.5 in.
SS	2.0	1.1	8-10 15-10					-	THE STATE		0.0-4.0 Ft. (2.5YR3/2), Brunswick st	Gravelly sil	t, dusky re broken gr	ed avel of	o.d. holi auger. Radiolog	ow-stem gically
	2.0	0.0	5-3-2-4 9-28				_	5_	Para applica		4.0-5.8 Ft. disturbed.				0-2 Ft.	mpled from
	2.0	0.0	30-27				_	- -		, s	8 - 8.0 Ft. Si gray and dar fine-grained. 7.1-8.0 Ft.	•				
										B	ottom of borel	nole at 8.0 f	vn downw:	ard.]	
						ļ				В	orehole backfi	lled with sp	oils, 11/18	3/87.		
				ļ												•
													•			
		.														
													•			
															Descripti	on and
			S.												classificate soils by version at	ion of isual
			DON; ST P = PIT				TE	8	0 lı	ıdı	strial Re	d. (LOI))		HOLE NO.	48R

		EC	LOG	C D	RIL	L LO	G	PROJE	СТ		FUSRAP 14501-		ET NO. OF 1	HOLE NO. 1218R
SITE		T_ J.		י גם	ימט ו	r\	COORDINA	ATES			A	NGLE FR	OM HORIZ	
BEGL			ustrial MPLETED			<u>.) </u>	!		DPTI		1,724 E 1,764 AKE AND MODEL SIZE OVERBURDEN	Ver		
	••	1.	2-10-8			E.D.	I.	[L BEAVER 6.5" 10.6	KULI	K (FT.)	TOTAL DEP
					BOXE		ESEL. TO	P CAS	ING	GR	UND EL. DEPTH/EL. GROUND WATER	DEPTH	/EL. TOP	OF ROCK
		7.5/				5							/	<u> </u>
	14	0 lb	R WEIGHT	in.			FT IN HO		A./I	.EN	TH LOGGED BY: D. Harr	ish (785	
SAND DIAM.	MP. ADV.	MPLE REC.	SAMPLE BLOWS "N" % CORE RECOVERY	Loss IN G.P.M Jac	PRESS. SOUTH	RE	ELEV.	ОЕРТН	BRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICA	NOIT	WATER	ON: LEVELS, RETURN, CTER OF
Se	S	ğl Ö	<u> </u>	7 9	g q	Ε			-	Ц				ING, ETC
SS		1.3	11-29 24-21				-				0.0 - 0.6 Ft. CEMENT. Concrete foundation of Flint Ink. 0.6 - 5.3 Ft. Silty GRAVEL and SILT FILL (GM, ML).	/	0-10.6 l o.d. spli 6.5 in. c	le advanced Ft. using 3 is it-spoons an o.d. em augers.
SS	20	1.5	15-6 5-5-3					5			0.6-2.4 Ft. Silty gravel, dusky red on and dark reddish brown below, broker Brunswick sandstone gravel, some silt sand, bits of glass at 1.8 Ft.	top	Cored t	hrough 6 in e floor. All from top of
			13						F		2.4-3.2 Ft. Silt, brownish gray, dry.	- 1	Radiolo sampled	land -logged by
SS	2.0	1.4	13-25 23-19				!				3.2-5.3 Ft. Gravel, dusky red, broker Brunswick sandstone. 5.3 - 5.8 Ft. SILT (OL). Very dark gray	, 	4-6 Ft.	berline, Inc OVA reads om toxics at of open hole
SS	2.0	1.8	8-14 11-11				-	10_			to black becoming dark gray downwar organic, abundant plant material. 5.8 - 9.4 Ft. Silty SAND (SM). Dark gr	rd,	Augered	i and -logged to 8
							-		نـــــــــــــــــــــــــــــــــــــ		(5Y4/1), fine-grained, some sandy sile gradational contact with unit above.			
											9.4 - 10.6 Ft. <u>Silty SAND</u> (SM). Brown (10YR4/3), fine-grained. 10.2-10.3 Ft. Silt, reddish brown			
							į				(5YR5/3). Bottom of borehole at 10.0 Ft.			
											Borehole backfilled with spoils, 12/10/87	•		
		!												
				!										
					:	:						-		
													Descrip	tion and
													classific soils by examina	ation of visual
			POON; ST ; P = PI			,,,	ITE		B0	In	dustrial Rd. (LODI)		HOLE NO	218R

	G	EC	LOG	IC D	RIL	L LC	G	PROJE	CT		FIICDAD		JOB NO.		T NO.	HOLE NO.
SIT							COORDINA	ATES		_	FUSRAP	 <u>, _</u>	14501-1:		OF 1 M HORIZ	1152R
			ustrial			I)					1,651 E 1,76	9	٦٠٠٠	Verti	ı	DEAKING
BEG		- 1	MPLETED		ER .		_		DRIL		MAKE AND MODEL	SIZE	OVERBURDEN		(FT.)	TOTAL DEPTH
			1-19-8		POVE	E.D.	I. ESEL. TO			N	Iobile B-57	6.5"	8.0	<u> </u>		8.0
		4.4/		., COK	BUXE	4	ESEL. IU	P CAS	Į NG		COUND EL. DEPTH	EL. GROU	ND WATER	DEPTH/	EL. TOP	OF ROCK
SAH			R WEIGHT	/FALL	CAS		FT IN HOL	.E: DI	A./I	LEN	GTH LOGGED BY:				/	
			s./ 30			· · · · · · · · · · · · · · · · · · ·	NO	NE					D. Harnis	h		
SAMP. TYPE	Σ'n	<u> </u>	SAMPLE BLOWS "N" % CORE RECOVERY	PR	JATEF ESSU	RE			97	[]						
F	본	2 2	7-85		FESTS	3	ELEV.	Ŧ	GRAPHICS	SAMPLE	DESCRIPTION		ARRIETAAT	701	NOTES	ON:
	οz	김분	E300	SZ.	SH.	E SE		DEPTH	E	閪	5500KZP 120K				WATER	LEVELS, RETURN,
g Z	(S)	필앙	n, ₽, y ₽	LOSS IN G.P.M	PRESS. P.S.I.	보니다		_	8	n						TER OF NG, ETC.
	2.0	0.2	27-11 7-4								0.0 - 4.0 Ft. Silty	GRAVEI	and Silty SAN	D D	Borehole	advanced
			,					-			FILL (GM, SM	•			o.d. holl	using 6.5 in. ow-stem
SS	2.0	1.2	2-1-1 11				,	-			0.9-0.5 Ft. Sile red silt, broken	y gravel, basalt gr	black and dusk; svel.	⁷	auger. Radiolog	rically
							·	-		:	0.5-2.3 Ft. Sile weathered and	y gravel,	very dusky red,	.	sampled gamma-	and logged by berline, Inc.
SS	2.0	1.3	8-11 10-9				1	-	11	1	formation	proken be	ces of Brunswi	* /	2" of asp	perline, Inc. halt at
							•				2.3-4.0 Ft. Sile with iron-oxide	y sand, b	rown (10YR5/3) []	surface.	
SS	2.0	1.7	5-11 18-19					-			clean sand at b	ase.				
\vdash							4		Ш		4.0 - 8.0 Ft. SAN ML). Yellowish brown on top, o	D and SII brown (1	T (SM, SP, 0YR5/6) and			
											interbedded.	ark brow	n Delow 3.1 Pt.,	[]		
											4.0-5.1 Ft. Sar interbedded wit	nd and silt ih 3-10 m	, fine-grained, m layers.			
			-							$\ $	5.1-6.7 Ft. Sar medium-graine	d, very fir d. subang	ne- to ular grains.			
					,						6.0-7.2 Ft. Silt fine-grained.	•	-			
											7.2-8.0 Ft. San	id, fine-gr	ained.			
											Bottom of borehole	e at 8.0 Ft				
											Borehole backfilled	with spo	ils, 11/19/87.			
												1				
														l		
														ŀ		
				-						$\ $						
						İ										
										Ш						
										Ш				- 1		
														- 1		
				.			j									
					l											
					j										Descripti classifica	tion of
															soils by v examinat	isual ion.
					l			l						-		
ss =	SPL1	T SP	OON; ST	= SHF1	BY TIT	RE. SI	TE			Ц.					HOLE NO.	
			P = PI					8	0	ln	dustrial Rd.	(LOE)1)	[52R

	G	EC	LOG	IC D	RII	LIO	G	PROJE	CT			T NO. HOLE NO.
SITE			-				COORDIN	ATES			FUSRAP 14501-138 1	
		Ind	ustrial	Rd. (LOD	I)		1123		N	1,770 E 1,913 Vert	M HORIZBEARING
BEGL	IN	CC	MPLETED	DRILL			.J					(FT.) TOTAL DEPTH
			2-2-87		G.	Engel	BNI.		M	in	uteman Auger 4" 11.0	11.0
CORE		over' 1.5/		() CORE	BOXE	SSAMPL 11	ESEL. TO	P CAS	ING	GR	OUND EL. DEPTH/EL. GROUND WATER DEPTH,	'EL. TOP OF ROCK
SAMI			R WEIGHT	/FALL	CAS		FT IN HO	LE: DI	A./L	EN	GTH LOGGED BY:	/
			s./ 18				NO	NE			R. Migues	7_
DIAM.	Ç U		SAMPLE BLOWS "N" X CORE RECOVERY	PR	JATE! ESSU				90	П		
떕	된 당		<u> </u>	1	EST		ELEV.	Ŧ	BRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS,
	₽ Z	빏	EB 00	SZ.	SH.	Yzz:		DEPTH	E	Ē		WATER RETURN,
SAND	장의	E S	"됩ッR	LOSS IN G.P.M	F	TIME MIN.		_	6	n		CHARACTER OF DRILLING, ETC.
SS	1.0	0.7									0.0 - 1.4 Ft. Silty sandy CLAY (CL-ML). Dusky yellowish brown (10YR2/2). Fine-	Borehole advanced 0-11 Ft. using 6.5 in.
SS	1.0	0.6					-			ł	to medium-grained.	o.d. hollow-stem
SS	1.0	0.9					-	•			1.4 - 5.0 Ft. Clayey silty SAND (SC-SM). Moderate reddish brown (10R4/6). Fine- to	Radiologically sampled and
SS	2.0	0.4						•	1 8		very coarse-grained with angularfragments of brunswick and carbonaceous material, or	gamma-logged by TMA-Eberline, Inc.
L								5			paint or ink residues.	
L_	1.0	1.0] "		ŀ	5.0 - 5.4 Ft. SAND (SW). Pale yellowish brown (10YR6/2). Fine- to	
SS		1.0				İ	_				medium-grained.	
	1.0	1.0					_			I	5.4 - 5.9 Ft. Sandy CLAY (CL-SC). Light brown (5YR5/6) mottled with pale	
SS		0.9					_]			Light brown (5YR5/6) mothed with pale brown (5YR5/2) and moderate reddish brown (10R4/6).	Augered to 8.5 Ft. Gamma-logged to 8.0 Ft.
SS		1.0					-	10_		ł	5.9 - 6.4 Ft. CLAY (CL). Dusky yellowish brown (10YR2/2) mottled with	Ft.
SS	1.0	1.0					-				yellowish brown (10YR2/2) mottled with dark reddish brown (10R3/4).	
										П	6.4 - 7.0 Ft. Silty SAND (SM). Brownish	
											6.4 - 7.0 Ft. Silty SAND (SM). Brownish gray (5YR4/1) mottled with moderate reddish brown (10R4/6). Fine- to medium-grained.	
				<u> </u>							7.0 - 7.7 Ft. SAND (SP). Medium light gray (N6). Fine- to coarse-grained.	
				!							7.7 - 8.1 Ft. <u>CLAY</u> (CL). Medium gray (N5).	
						!				$\ $	8.1 - 9.5 Ft. SAND (SW). Light brownish	
									İ	$\ $	gray (5YR6/1). Fine- to medium-grained layered with grayish orange (10YR7/4) and light brown (5YR5/6).	
										$\ $	9.0-9.5 Ft. Light olive gray (5Y6/1), and increasingly coarse-grained.	
				1						$\ $		
											9.5 - 10.9 Ft. CLAY (CL). Light olive gray (5Y6/1) layered with moderate reddish brown (10R4/6) and dark yellowish orange	-
									1	Ш	(10R6/8).	
											10.9 - 11.0 Ft. SAND (SP). Pale reddish brown (10R5/4). Fine- to coarse-grained.	
1.										$\ \ $	Bottom of borehole at 11.0 Ft.	
										$\ \ $	Borehole backfilled with spoils, 12/2/87.	1
										$\ \ $		
										$\ \ $		- 100 A
		1			1					$\ \ $		Description and
		1								$\ $		classification of
										$\ \ $		examination.
										Ш		
				1]	1					
66	E 891	 T	 POON; S1	= ene	BY 7	IRE. IS	ITE	<u> </u>	1	Ц		HOLE NO.
			; P = P			JUL,		}	80	lı	ndustrial Rd. (LODI)	1203R

	G	FC	LOG	וכ D	RII	110	G	PROJE	Ţ			T NO. HOLE NO.
SIT							COORDINA	TES			FUSRAP 14501-138 1	
		Ind	ustrial	Rd. (LOD	I)				N	1,877 E 1,775 Vert	OM HORIZBEARING
BEG	UN	CC	MPLETED	DRILL		· · · · · · · · · · · · · · · · · · ·	··!	1	ORIL	L)		(FT.) TOTAL DEPTH
			1-16-8			E.D.	I.			M	DBILE B-57 6.5" 10.0	10.0
COR				CORE	BOXE		ESEL. TO	P CASI	NG	GR	OUND EL. DEPTH/EL. GROUND WATER DEPTH	EL. TOP OF ROCK
SAM		1.8/G	OO R WEIGHT	/FALL	CAS	5	FT IN HO	F+ DI	Ā /I	EN	GTH LOGGED BY:	/
1	14	O Ib	s./ 30	in.			NO		~.,,	. L R	D. Harnish) P L
ш.	٠,,	<u>.</u>		,	JATE				Π	П	D. Hainish	
126			백국 발문	PR	ESSU EST:			I	GRAPHICS	Щ		NOTES ON:
[,5	Ö	w."	문학교	ω_Σ.	s. I.	ш.	ELEV.	рертн	E	SAMPLE	DESCRIPTION AND CLASSIFICATION	WATER LEVELS,
器		T O	R S × F	LOSS IN G.P.R	PRESS. P. S. I.	HAY!		ä	E	8	•	WATER RETURN, CHARACTER OF
Q.C	2.0	80	BLOWS "N" 2-1 BLOWS "N" 11- X CORE RECOUERY	- 6	āa				Ľ	Ш	OO AS EL Consilie OH Consilie	DRILLING, ETC.
33	2.0	1.5	20	ļ				_			0.0 - 3.5 Ft. Gravelly SILT and SILT FILL (ML-GM, OL).	Borehole advanced 0-10 Ft. using 6.5 in.
ਰਨ			6-6-6-3								0.0 - 2.8 Ft. Gravelly silt, dusky red	o.d. hollow-stem
33	2.0	1.0	0-0-0-3								0.0 - 2.8 Ft. Gravelly silt, dusky red (5R3/3), minor fine-grained sand and black silt interbeds; gravel is Brunswick	Radiologically sampled and
L.	0.0						-				andstone.	gamma-logged by TMA-Eberline, Inc.
33	2.0	1.3	1-3-11 13				_	5	Ш		2.8-3.3 Ft. Silt matrix is brown (10YR4/3).	
	·										3.3-3.5 Ft. Silt, black, soft.	
SS	2.0	0.8	13-12 10-9			İ			ļ., .,		15 21	
								_			3.5 - 5.0 Ft. SILT (ML). Olive gray (5Y5/2) to gray (5Y5/1), black plant fragments and minor iron-oxide mottling.	
SS	2.0	1.4	5-6-10 12	<u>.</u>							5.0 - 8.0 Ft. SAND (SP). Dark gravish	
							_	10.			brown (2.5Y4/2), very fine-grained, saturated.	
						}				П	7)	
										Ш	8.0 - 10.0 Ft. CLAY and SILT (CL-ML). Weak red (5R5/3), and reddish gray (10R5/1), interbedded as 1 cm layers.	
										П	(4000)	
							1			П	Bottom of borehole at 10.0 Ft. Borehole backfilled with spoils, 11/16/87.	
										$\ $	201 miles 200 miles 2010, 22, 20, 01.	
										П		
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		.							ŀ	$\ \ $		
							1			$\ $		Description and
												classification of soils by visual
			1									examination.
]		$\ $		
_	<u></u>		<u> </u>		<u>'</u>	<u></u>		L	_			
			POON; ST ; P = P1				ITE	{	80	Ir	idustrial Rd. (LODI)	1138R

		ΕO	LOG	C D	RIL	L LO	G	PROJEC	ī		FUSRAP	JOB NO. 14501-1	138 1	
SITE		Ind.	ustrial	D4 (ומט.ז	n	COORDINA	TES	1	N 1,	87 E 1,797	JAN	igle fro Verti	M HORIZBEARING
BEGU			MPLETED	DRILL		·	<u>.i</u>	þ				OVERBURDEN		(FT.) TOTAL DEPTH
			-18-8			E.D.					LE B-57 6.5"	10.0		10.0
CORE			/ (FT./% E4) CORE	BOXE	SSAMPL 5	ESEL. TO	P CASI	NG	SROUN	EL. DEPTH/EL. GROUP	ND WATER	DEPTH/	EL. TOP OF ROCK
SAMP		.6/5 AMMEI	NEIGHT	/FALL	CAS		FT IN HOL	E: DI	A./LI	NGTH	LOGGED BY:		I AV	12
			s./ 30				NOI	NE				D. Harn	ish 🎢	7
:	تالد	<u>ن</u> ان	خ اخ	PF	WATER	RE			ě.					
SAMP DIAM.	SAMP. ADU.	MPLE RI	BLOWS "N" X CORE	LOSS IN G.P.M	TESTS	TIME IIN MIN.	ELEV.	DEPTH	GRAPHICS		ESCRIPTION AND C	Lassifica'	TION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF
S S	7 2.0	W O	29-19	<u> </u>	<u>ā</u> a	Ε Σ			0		- 4.0 Ft. SAND and SII	T FILL (SP.		DRILLING, ETC. Borehole advanced
	2.0	1.3	23-17					- -	:	0.	ML). 0.0-2.8 Ft. Sand, grayisl and yellowish brown (10)	h brown (2.5)		0-10 Ft. using 6.5 in. o.d. hollow-stem auger. Radiologically
	2.0		12-8 7-9-9-8					-		\ \	fine-grained. 2.8-4.0 Ft. Silt, mixed g yellowish brown, disturb	rayish brown	and r	sampled and gamma-logged by TMA-Eberline, Inc.
	2.0		7-10-10					5_		4.	- 8.2 Ft. SAND and SU Grayish brown (10YR5)/ fine-grained, some is fine iron-oxide stained; all be	T (SP, ML).		
			9		1	1		-			iron-oxide stained; all be thick.	eds are 5-10 m	ım	
SS	2.0	-	5-12 13-13	i			-	-	HH	\neg	7.8-8.2 Ft. Strong brown	n (7.5YR5/6).	. [
		İ	13-13				}	10		8.	2 - 10.0 Ft. SILT (ML). brown (10YR4/2), wet.	Dark grayish		
						-	-	10.		B	ottom of borehole at 10.0 sprehole backfilled with spo	ft. pils, 11/18/87.		10 Ft. ENMET read 150 ppm 6" into oper hole.
														,
						-								
			1											
														Description and classification of soils by visual examination.
			SPOON; S			,	SITE		80	 Ind	ustrial Rd. (LO	DI)		HOLE NO. 1149R

		EC	LOG	IC D	RIL	L LO	G	PROJE		FUSRAP 14501-138 1	T NO. HOLE NO. OF 1 1146R
ITE		Tod	ustrial	D4 ((\D.)	r\	COORDINA	TES		ANGLE FRO	M HORIZBEARING
EGU			MPLETED			<u>') </u>	<u> </u>			N 1,793 E 1,806 Vert	
1-	18-	871	1-18-8	7		E.D.	I.		ì	OBILE B-57 6.5" 12.0	(FT.) TOTAL DEP
ORE) CORE	BOXE		ESEL. TO	P CAS	ING		EL. TOP OF ROCK
AMD		1.8/	40 R WEIGHT	/EALL	icas	6	FT IN HO	F- 0		NOTE HORSE BY	/
ייייאני			s./ 30			ING LE	NO!		IA./LI	NGTH LOGGED BY: D. Harnish	M2
W .					JATER			\ <u>\</u>	ΪT	D. Harnish	
SAMP DIAM.	SAMP, ADV.	SAMPLE REC	SAMPLE BLOWS "N" % CORE RECOVERY	Loss IN G.P.M	ESSTS OF THE STATE	TIME SE	ELEV.	DEPTH	GRAPHICS	DESCRIPTION AND CLASSIFICATION	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC
	2.0	0.3	3-13 13-13							0.0 - 7.5 Ft. <u>Silty GRAVEL</u> (GW).	Borehole advanced 0-12 Ft. using 6.5 i
SS	2.0	0.6	3-13 13-10							0.0-2.0 Ft. Very dusky red Brunswick sandstone gravel with some black coal ash (?). 2.0-6.0 Ft. Brunswick sandstone gravel	o.d. hollow-stem auger. Radiologically sampled and gamma-logged by
SS	2.0	1.3	7-6-10 12					5.		with mixed silts: very dusky red, dark gray, dusky red.	TMA-Eberline, Inc 0-2 Ft. Grab samp from auger flights.
SS	2.0	0.1	4-4-4 11						1-1	6.0-7.5 Ft. Basalt gravel.	
SS	2.0	1.2	13-14-3		ı		_			7.5 - 10.0 Ft. <u>SAND</u> (SP). Greenish gray, very fine- and medium-grained interbedded.	6-8 Ft. Grab samp from auger flights.
								10.		•	8-10 Ft. Sample h
SS	2.0	1.3	5-2-3 14				•	10.	-	10.0 - 12.0 Ft. SILT and SAND (ML, SP). Silt is gray and dark olive gray (5Y3/2); sand is light greenish gray, fine- and medium-grained. Bottom is silt, brown.	tint.
										Bottom of borehole at 12.0 Ft. Borehole backfilled with spoils, 11/18/87.	12.0 Ft. ENMET reads 200 ppm at 6 in open hole. 10-12 Ft. Sample saturated.
						:				-	·
					;						
											Description and classification of soils by visual examination.
			POON; ST; P = PI			,,,	ITE		DO I	ndustrial Rd. (LODI)	HOLE NO. 1146R

	G	EO	LOG	IC D	RILI	LLO	G	PROJEC	:T		Erico		JOB NO			HOLE NO.
SIT							COORDINA	TEC			FUSRAP	 		-138 1		1170R
ļ		Ind	ustrial	Rd. C	מס.ז	n	COOKDINA	1163		N 1	921 E 1,82	6		ANGLE PRI Vert	OM HORIZ	BEARING
BEG			MPLETED			-/		k			E AND MODEL	SIZE	OVERBURDEN		(FT.)	TOTAL DEPTH
11-	24-1	8711	l-24-8	7		E.D.	I.	- 1			ile B-57	6.5"	10.0			10.0
CORI				CORE	BOXE		ESEL. TO	P CASI	NG	GROU	ID EL. DEPTH	/EL. GROL	ND WATER	DEPTH,	/EL. TOP	
		.4/		4541	lose	5					1 /		<u>.</u> .			
SAM			WEIGHT		LA:	SING LE	FT IN HO		A./L	.ENGT	LOGGED BY:		D II.	., \subset	Jel	
111			s./ 30		JATER		NO	NE	_	77	<u> </u>		D. Har	nisn	1	
毙	김씨	E C	m z m ç	PR	ESSU	RE		_	8	Ш					NOTES	Chi.
TIO	48	□ □	투 의 없고	E		T	ELEV.	DEPTH	붗	SAMPLE	DESCRIPTION	N AND C	LASSIFIC	ATION	WATER	LEVELS,
SAMP DIAM.	원교	퇵뽒	Solvin S	LOSS IN G.P.M	5.3	ELL			GRAPHICS	5						RETURN, CTER OF
	3A L	E S	BLOWS "N" X CORE	9 1	g c	HIN HIN HIN HIN HIN HIN HIN HIN HIN HIN			0		•					NG, ETC.
SS	2.0	1.5	1-1-2-1							0	.0 - 6.7 Ft. Gra SILT FILL (G	velly SILT	Silty SAN) and		e advanced . using 6.5 in.
											0.0-1.4 Ft. G			ıh	o.d. holl auger.	ow-stem
SS	2.0	1.8	15-14 15-10			[-	•			brown (2.5YR sandstone grav	3/4), some	Brunswick		Radiolo	
								•			abundant grav				gamma-	logged by berline, Inc.
SS	2.0	1.3	10-6-4	1				_'			1.4-3.0 Ft. Si becoming light	ity sand, y	rellowish bro	WR (6/4) -+		
	1						ļ	5_			base, very fine	grained,	slightly stiff.	(O/E) 25		
SS	2.0	1.4	4-4-11 15	1	}	1	_] .			3.0-4.0 Ft. Si black, yellowis	lt, mixed i	eddish brow	n,		
			13					Ι.			horisontally in	terlayered	l.	- 1		
SS	2.0	1.4	7-14	1		l		•	 		4.0-6.7 Ft. Si	lt, mixed	lark gray, gr	ay,		
		1	14-17				1	٠. ا	111		with pieces of silt, minor yell	grayian gr lowish bro	een and blac wn sand, and	wood.		
				1		1	-	10 .	1		6.0 Ft. Wood	with tarry	black coati	ng.	1	
										$\ \cdot\ $	6.3-6.7 Ft. W	ood in bla	ck silt.			
											.7 - 10.0 Ft. SI becoming mor	LT (ML).	Laminated,		ĺ	
										111						
		}								$ \cdot $	6.7-8.4 Ft. W	eak red (R5/3) and g	Tay.		
	1									$\ \cdot\ $	8.4-10.0 Ft. I yellowish brow yellowish brow	Reddish br vn (5YR5/	own (5YR5/ '3) interlayer	3) and ed, less	}	
			ļ								yellowish brow	vn downw	ard.			
			İ							11	ottom of boreho	le at 10.0	Ft.			
					1						orehole backfill	ed with sp	oils, 11/24/8	7.	1	
	1.									11						
	1														İ	
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	1				1											
				1			ŀ									
				1											1	
								1							Descrip	tion and ation of
					1										soils by	visual
															-vennu	
					1										}	
						1										
22	<u> </u> = CD1	IT 9	POON; S'	T = CUE	I RY T	URE. IS	I SITE	ــــــــــــــــــــــــــــــــــــــ	1	ш_	· · · · · · · · · · · · · · · · · · ·				HOLE NO	
			; P = P			~~.		į	80	Ind	ustrial Ro	i. (LO	DI)		1	170R

		EC	LOG	IC D	RIL	L LO	G	PROJEC	CT		FUSRAP	JOB N 1450	1-138 1		HOLE NO. 1147R
ITE		T-4	ustrial	D4 C	T OD	r\	COORDINA	NTES		18.T	1 701 E 1 0 10		ANGLE FR		BEARING
EGL			MPLETED			.)	J	-			1,791 E 1,843 AKE AND MODEL SIZE	OVERBURDE	Vert	(FT.)	TOTAL DEPI
1-	18-	Ł	1-18-8	1		E.D.	I.				BILE B-57 6.5"	1		(11.)	10.0
ORE				CORE	BOXE		ESEL. TO	P CAS	ING	GR	OUND EL. DEPTH/EL. GR			/EL. TOP	OF ROCK
444		5.4/		75411	1046	5	57 111 1191				¥ /				<u>'</u>
iAM)			R WEIGHT		CAS	ING LE	FT IN HOL		A./L	.EN	TH LOGGED BY:	75. TV-	(AJ	
ш	14	10	s./ 30	1111.	JATER	}	NOI	NE.		П		D. Ha	rnisn		
SAMP DIAM.	SAMP. ADU	SAMPLE REC	SAMPLE RECOVERY	LOSS IN G.P.A	ESSU	RE	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND	CLASSIFI	CATION	WATER	ON: LEVELS, RETURN, CTER OF ING, ETC
SS	2.0	1.8	8-12 8-11								0.0 - 6.0 Ft. Gravelly SII GRAVEL FILL (GW- 0.0-4.0 Ft. Silty grave Brunswick sandstone, some basalt gravel, pie is grayish brown.	el, dusky red broken angul	ar pieces, silt	0-10 Ft o.d. hol auger. Radiolo	
33	2.0	1.0	10		:			δ_			4.0-6.0 Ft. Gravelly s (10YR5/2), pieces of E	ilt, grayish b Brunswick sar	rown idstone.		
SS	2.0	1.1	2-1-1-2						П		6.0 - 6.4 Ft. <u>SAND</u> (SP) (5Y6/2), fine-grained.				
SS	2.0	1.8	10-14 8-5	1			_	.			6.4 - 7.8 Ft. SILT. Black some plant material.	k, organic wi	^{'n} /	1	
							_	10 .			7.8 - 10.0 Ft. Silty SANI greenish gray (5 Y7/2) medium-grained, minc interbedded, wet. Bottom of borehole at 10. Borehole backfilled with a	fine-'and or clay and si	lt	chemics 10.0 Ft reads 2 in open	ENMET 00 ppm at 6 hole.
			•											classific soils by examin	ation.
			POON; S1; P = P1			,,,	ITE	-	80	In	dustrial Rd. (LC	ODI)		HOLE NO	147R

	G	EC	LOG	IC D	RIL	L LC)G	PROJE	CT				JOB NO.		ET NO.	HOLE NO.
SIT							COORDINA	ATES			FUSRAP		14501-1		OF 1	1153R
			ustrial			I)				N	1,651 E 1,85	2		Vert	i	
BEG		- 1	MPLETED 1-19-8		LER	E.D.	T	İ				SIZE	OVERBURDEN	ROCK	(FT.)	TOTAL DEPTH
					BOXE		ESEL. TO	P CAS	ING	IGR	OBILE B-57	6.5"	8.0	NEDTH	/EL. TOP	8.0
L	3	3.2/	40			4				1	至了				/LLGF /	OF ROLK
SAM			R WEIGH		CA:	SING LE			A./L	EN	GTH LOGGED BY:			. 0	<u>~</u>	
ш.					WATE	₹	NO	NE		П			D. Harni	sh 7	P.	
SAMP. TYPE	SAMP. ADV	SAMPLE REC	BLOWS "N" % CORE	LOSS IN G.P.M.	ESSU TEST:	RE	ELEV.	ОЕРТН	GRAPHICS	SAMPLE	DESCRIPTION			ION	WATER CHARAC DRILLI	LEVELS, RETURN, CTER OF ING, ETC.
33	2.0	1.4	1-3-7-	1]					0.0 - 2.7 Ft. Grav FILL (GM, OL)	elly SILT	and SILT		0-8 Ft. 1	e advanced using 6.5 in.
SS	2.0	1.8	4-1-2-4						8.55		0.0-2.5 Ft. Gra (5YR3/2), grav of Brunswick sa	ei is broke ndstone.	en angular piec broken glass: si	es lt [o.d. holl auger. Radiolog	ow-stem gically and
SS	2.0		10-15 14-14	-			_	5_		ŀ	is soft with som	lt, black,	organic.		famma- TMA-E	logged by berline, Inc.
SS	2.0		13-17 16-17				-				2.7 - 4.1 Ft. Sand Dark grayish br fine-grained, da 3.5-4.1 Ft. San	own (2.5) ump.	(4/2), very	,		
-				-			-	•			4.1 - 6.5 Ft. Sand Light gray (2.5)	v CLAY (CL-SC).). 	300 ppm	ENMET read: 1 6" into open
											mottling, sand i 6.5 - 8.0 Ft. SILT Dark yellowish fine-grained, int	and SAN	D (ML SP)		hole.	
											thick beds.		· · · · · · · · · · · · · · · · · · ·			
		:									Bottom of borehole Borehole backfilled	at 8.0 Fe with spo	ils, 11/19/87.			
			,													
				_												•
													•			
															Descript classifica soils by examina	ition of visual
			OON; ST			,	ITE	8	10	⊥ ln	dustrial Rd.	(LOE)I)		HOLE NO. 11	53R

	C	EC	LOG	IC E	ORIL	L LC	G	PROJE	CT		EUCDAD		JOB NO		SHEET NO.	HOLE NO.
ITE							COORDINA	ATES	·		FUSRAP			,	1 OF 1	1172R
			ustrial			I)				N	1,826 E 1,87	0		1	ertical	
EGL		1	MPLETED	F	LER	T			DRIL			SIZE	OVERBURDEN		ROCK (FT.)	TOTAL DEP
			1-25-8		E BOXE	E.D.	ESEL. TO	P CAS	ING	M	lobile B-57	6.5"	10.0 ND WATER			10.0
		5.1/				5		- UNG	1 110	S.	SUAD EL. DEPIN	EL. BKUU	NU WAIEK	PE	PTH/EL. TO	P OF ROCK
AMP			R WEIGHT	-	CA	ING LE	FT IN HOL	E: D1	A./L	EN	GTH LOGGED BY:		·		··	/
		17.7	s./ 30	· · · · · · · · · · · · · · · · · · ·			NO	NE					D. Har	nish		
DIAM.	ADU.	REC.	7. E. Z. E.	Pi	WATEI RESSU TEST:	RE	ELEV.	Ŧ	ICS	37,		A115 - A1			NOTES	
ONG DNG	SAMP.	CORE	BLOWS "N" % CORE	LOSS IN IN	PRESS.	HINI MINI MINI MINI	2224.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION	HND C	rw221L1C	HIIC	WATER	R LEVELS, RETURN, ACTER OF ING. ETC
SS	2.0	1.2	1-4-9 38								0.0 - 6.8 Ft. Grav and SAND FIL			LT	Boreho 0-10 F	ole advanced t. using 6.5 i llow-stem
S	2.0	1.7	10-22 9-9								0.0-2.7 Ft. Grabrown (5YR3.3 Brunswick sand), fine-gra	sined with c	rushed	auger. Radiol sample	ogically d and
S	2.0	0.2	1-5-17 22					5_			2.7-4.2 Ft. San gray silt and Br	dy silt, ye unswick s	ellowish bro andstone gr	wn, avel		i-logged by Eberline, Inc.
S	2.0	1.4	17-20 19-17					•			mixed in. 3.5 Ft. Rock.		, -		from a	Grab samp uger flights.
S	2.0	1.6	9-13 18-20					-			4.2-4.4 Ft. Bla silty sand. 5.0-6.8 Ft. San		•	brown		
$\frac{1}{1}$								10 .		-	(10YR5/4), very	y fine-gra ID (SM-S	ined, clean. P). Brown		No free	water in ho
İ											(7.5YR4/2), ver defined by silty	y fine-gra beds.	ained, thin b	oeddir.	.8	
							İ				Bottom of borehole Borehole backfilled	at 10.0 I with spo	ît. ils, 11/25/8	7.		
		ĺ														
										ĺ						
																•
				,											Descrip	tion and
			أخو												classific soils by examin	ation of visual
			3F													
 = : 1)	SPLI ENNI	T SPI	OON; ST P = PIT	= SHE	BY TU	<i>,</i> , ,	TE	<u></u>	ו מצ	L n	dustrial Rd.	(1 0 -			HOLE NO	172R

	G	EO	LOG	IC D	RIL	L LO)G	PROJE	CT	JOB NO. SHEET	111111111111111111111111111111111111111
SIT							COORDINA	ATES		FUSRAP 14501-138 1 OF	1 2027R HORIZBEARING
	80	Ind	ustrial	Rd. (LOD	I)			1	V 1,942 E 1,875 Vertica	1
BEG			MPLETED							MAKE AND MODEL SIZE OVERBURDEN ROCK (
			-22-8		EM.	PIRE	SOILS			TRIPOD 4" 8.0 ROUND EL. DEPTH/EL. GROUND WATER DEPTH/EL	8.0
		1.6/9		CORE	BUAE	4	ESEL. IU	P CAS	ING R	ROUND EL. DEPTH/EL. GROUND WATER DEPTH/EL	TOP OF ROCK
SAM	PLE H	ANNE	WEIGHT	/FALL	CAS		FT IN HO	LE: DI	A./LE	NGTH LOGGED BY:	
	14	0 lb	. / 12	in.	-		NO			J. Lord	
빞.	31	ប់ .	BLOWS "N" 2 CORE		JATE! ESSU			<u> </u>			
125	58	REC		PK	ESSU FESTS	5		ĮΞ	GRAPHICS	N	OTES ON:
.0	. 7	LE F	출라 입장	ω_E	ñΗ	<u> </u>	ELEV.	DEPTH	RAPHIC	DESCRIPTION AND CLASSIFICATION שני	ATER LEVELS, ATER RETURN.
器		A N	요김~莊	250	Ή̈́ο	AL LE		•	18		HARACTER OF
SS	2.0	2.0	7-15-45		0.0				8888	0.0 - 1.0 Ft. TOPSOIL. Moderate brown	RILLING, ETC.
			40				-		***	L (5YR3/4) silty sand topsoil. Loose, dry, ∃B	orehole advanced -8 ft. using 3 in.
SS	2.0	2.0	23-30							/ ; /	d. split-spoon implers inside 4 in.
			31-37				´ •	┨ .	व न	Dusky brown (5YR2/2) matrix with mixed = 0.	d. steel drive pipe. adiologically
-	2.0	2.0	55-67					Ι.	1	i conesive, dry. Crumbies easily. No [188	impled and
"	2.0	2.0	60-89				,	ξ 5		thread. Some gravel and cobble pieces.	amma-logged by MA-Eberline, Inc.
-	2.0	1.0	70.10								0 Ft. Groundwater beerved.
33	2.0	1.6	12-19 22-19							poorly sorted overall. No thread.	
ļ							_	.		i U.S.D.Ft. Water.	oring originally riven to 6', 10/8/88.
										5.3 - 8.0 Ft. Sandy SILT (ML). Light 11	xtended to 8', 1/22/88.
									1 1	5.3 - 8.0 Ft. Sandy SILT (ML). Light brown (5YR5/6). Moist. Stiff, well sorted, slightly cohesive, but crumbles easily. Dense. Probably undisturbed. 6.0 Ft. Saturated.	
										Dense. Probably undisturbed. 6.0 Ft. Saturated.	
										\	.3 Ft. Top of ndisturbed soil.
										Bottom of borehole at 8.0 Ft. Borehole backfilled with well gravel and	
										spoils, 11/22/88.	
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1										{ cl	escription and assification of
											oils by visual camination.
					ł		[1	
							<u> </u>		ot		
SS	= SPL	IT SI	POON; ST ; P = PI	= SHE	LBY TI		ITE	1	RA I	ndustrial Rd. (LODI)	DLE NO. 2027R

	G	FC	LOG	וכ ח	RII I		nc	PROJE	CT				JOB NO.			HOLE NO.
			<u> </u>		1/16						FUSRAP		‡4501·	-138	1 OF 1	1154R
SIT							COORDINA	TES				•		ANGLE	FROM HORIZE	BEARING
L	80	Ind	ustrial	Rd. (LOD	I)				N	1,696 E 1,884	4	Į	Ve	rtical	
BEG	JN	α	MPLETED	DRILL	.ER	·			DRILI	LK	AKE AND MODEL	SIZE	OVERBURDEN			TOTAL DEPTH
h 1-	19-	871	1-19-8	37		E.D.	I.	ı	N	иO	BILE B-57	6.5"	8.0			8.0
					BOXE		ESEL. TO	P CAS	ING	GRO	TIND EL DEDTHA		ND WATER	DED	TH/EL. TOP	
İ		5.8/				4			•		室 / /	LL. UNGO	MD MAICK	DEF	IN/EL. 10P	UP ROCK
SAM			R WEIGH	T/FALL	icas	1 -	FT IN HO	E. 01	A /1	ENC	TH LOGGED BY:					
				-	-	oing LE			A./L	ENU	TOGGED BT:				OBP	
			s./ 30				NOI	NE.	-				D. Har	nish	78-	
SAMP OIGHE			BLOWS "N" % CORE		JATEF ESSU				6	Ш						
≱₹	운동				EST!			Ţ	GRAPHICS	SAMPLE					NOTES	ON:
5	٦٥	m r	높 교	m E	S. H.		ELEV.	ΡŦ	¥		DESCRIPTION	AND C	Lassific	HOITE	WATER	LEVELS,
100	민지	디	₹3. 5	NZ.	85	Σzz	1	рертн	₫	đ						RETURN,
Iĝ₹	٦	문문	<u>, </u>	LOSS IN G.P.M	PRES P.S.	E ZZ			6	"						TER OF
	2.0	<u>m' -</u>	1-6-6-4	4	תת	 				Ш.	00 468		1 0015 - 0			NG, ETC.
33	2.0	1.3	1-0-0-	1				_			0.0 - 4.6 Ft. Grave FILL (GM-ML,	elly SILT SM)	and Silty S	AND		advanced using 6.5 in.
1							Í				•	•			o.d. holl	ow-stem
SS	2.0	1.2	2-3-2-3	3			,	•			0.0-2.5 Ft. Gra (5R3/3) decomp	oosed Bru	nswick shale	with	auger. Radiolog	rically
					ļ						gravel of broken 0.3 ft of brown i	Brunswi	ck sandston	. Top	sampled	and
				j											gamma-	logged by berline, Inc.
SS	2.0	1.8	1-6-17	1				٠ . '		L	2.5-3.0 Ft. Gradusky red, grave	velly silt,	dark brown	and		beime, mc.
		İ	17					5_	-		dusky red, grave Brunswick sand	el of brick	t, glass and	and	Л	
		<u>.</u>		.			_		Ш		damp, at base.	stone. Di	MCK SIII, SUII	and	Ц	
SS	2.0	1.5	11-13 11-13								SO-ARTH Sile	v sand d	ark vallowish		П	
								•	11:1		3.0-4.6 Ft. Silt- brown (10YR4/	4), fine-g	rained, dam	р.	# 1	
\vdash			l	1 :			-		1		4.6 - 6.0 Ft. SILT	(ML) L	ight gray		4 /₁	
		ŀ										some iro	n-oxide mot	tling,	<i>l</i> l 1	
			l							$\ \cdot \ $	clayey in spots.				(
									1 1		6.0 - 8.0 Ft. SANI	and SII	T (SP, SM)		11	
											Brown (7.5YR5) fine-grained.	/2), very	fine- and		[]	
1											ine granteu.] [
										11	Bottom of borehole	at 8 N ft				
										П	Borehole backfilled	with spo	ils, 11/19/8	7.		
1										Н						
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															Descript	ion and
															classifica	tion of
	İ														soils by v	
										П					evening	TIVII.
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				1												
]												
SS =	SPL	IT SF	POON; ST	= SHE	BY TU	BE · S	ITE								HOLE NO.	
			P = P					8	30	In	dustrial Rd.	(LOI	OI)		11	154R

		EC	LOG	IC I	DF	RILI	L LO	G	PROJEC	T		JOS NO. FUSRAP 14501-		ET NO.	HOLE NO.
SITE		T	* - الساودورو	n.	/=	Δ».	 T\	COORDIN	ATES				WGLE FI	ROM HORIZ	
BEGL			ustrial MPLETEC	_			1)					1,916 E 1,886		tical	
		ı	1-10-8	1 1	LLE	-N	E.D.	T.				KE AND MODEL SIZE OVERBURDEN 6.5" 23.0	ROC	K (FT.)	TOTAL DEPI
					RE	BOXE		ESEL. TO	P CASI			UND EL. DEPTH/EL. GROUND WATER	DEPTI	I/EL. TOP	OF ROCK
		2.4/					8					¥ //	-	/ / / / /	' NOOK
AMP	LE H	AMME	R WEIGH	/FAL		CAS	ING LE	FT IN HO	LE: DI	A./L	EN	TH LOGGED BY:		0.05	
			s./ 30		-	1		NO	NE			D. Har	aish	76	
쁜	2 m		. 		W PRE	ATER ESSU			1	9	П				
SAMP. TYPE AND DIAM.	SAMP. AD	CORE REC	BLOWS "N" ** CORE	Loss	E.P.	ESTS		ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND CLASSIFICA	NOITE	WATER CHARA	ON: LEVELS, RETURN, CTER OF ING, ETC
SS	2.0	1.3	1-20-1	1	7							0.0 - 3.8 Ft. SILT and Gravelly SILT FILL (ML, GM-ML).	·		e advanced
SS	2.0	1.9						•				0.0-0.5 Ft. Topsoil, dark brown (10% organic.		o.d. hollauger. Radiolo	and
	A A		P A A	ļ				-	┨ .	ww		0.5-1.1 Ft. Gravel, dusky red, broker Brunswick sandstone.	1	gamma- TMA-E	logged by berline, Int
SS	2.0	1.2	5-8-8-8	1				-	5_		1	1.1-2.6 Ft. Gravelly silt, dark brown		H	•
SS	2.0	2.0	7-4-4-	1								(10YR4/3), soft reddish brown silt pe dusky red Brunswick sandstone grave toward base.	bbles,		
]				-]]	П	ı	2.6-2.9 Ft. Silt, black.		П	
SS	2.0	1.8	4-12 10-7		1			-	-		l	2.9-3.1 Ft. Silt, black interlayered ward brown silt.	i		Black sludg up outside
ss	2.0	1.0	3-14 11-12					-	10_			3.1-3.8 Ft. Gravelly silt, grayish browith soft yellowish brown, green and reddish brown silt pebbles.	vn		•
SS	2.0	1.2	3-4-7-1	7					-			3.8 - 4.7 Ft. CLAY (CL). Reddish brow (5YR5/3), base has plant fragments a small silt pieces.	n nd		
SS	2.0	2.0	6-7-18 2 0						15_			4.7 - 7.1 Ft. SAND (SP). Dark gray (10YR4/1), fine-grained, minor small gravel.	round	14-16 ft Ground	water
									-			7.1 - 8.4 Ft. ORGANIC SILT (OL). Black, soft, organic.			a. 5 Ft. of arge in auge
												7.5-7.8 Ft. Silty sand, weak red, medium-grained, wet.	Ī	no more Augered describi	samples. l 16-23 ft., ng cuttings
		Ì							-			7.8-8.4 Ft. Sludge, black, organic.		18 Ft.	Some grave
									20_			8.4 - 10.7 Ft. CLAY (CL). Reddish brown (2.5YR4/4) and grayish brown (10YR5/2) finely interbedded; yellow brown clay interbedded toward base.	ish	Sand 18	-23 ft. ,
								-	-			10.7 - 23.0 Ft. SAND (SP). Reddish brown (5YR4/3), fine- to coarse-grai some round gravel, wet.	ned,	 23 ft. A	- Luger refusa
-									1	ł		10.7-12.5 Ft. Fine-grained.			
												12.5-12.8 Ft. Medium-grained.			
İ												12.8-13.0 Ft. Coarse-grained, some r	ound		
												gravel. 13.0-13.2 Ft. Brownish yellow with it density plant material mixed in.]		
l									1			14.0-15.5 Ft. Reddish brown,	1		
												medium-grained. 15.5-16.0 Ft. Coarse-grained, gravell	y,	classific	tion and
												channel sand. 18.0 Ft. Gravelly.		soils by examina	
												Bottom of borehole at 23.0 ft. Borehole backfilled with spoils, 11/10/87	·.		
			POON; S'; P = P:					ITE		30	ln	dustrial Rd. (LODI)		HOLE NO	i31R

	C	FO	LOG	ור ח	RII	110	G	PROJEC	T				JOB NO	1	ET NO.	HOLE NO.
SIT					- \12		COORDIN	ATES			FUSRAP			-138 1		1137R
Γ'''	•	Ind	ustrial	Rd. (1	LOD:	I)	THE REAL PROPERTY.	- I E 3		N	1,860 E 1,89)1		angle fr Veri	OM HORIZ	BEAKING
BEG			MPLETED				J	1	DRIL	_	TAKE AND MODEL	SIZE	OVERBURDEN		(FT.)	TOTAL DEPTH
			l-16-8			E.D.		İ			DBILE B-57	6.5"	10.0			10.0
COR				CORE	BOXE		ESEL. TO	P CAS	ING	GR	OUND EL. DEPTH	/EL. GROU	ND WATER	DEPTH	/EL. TOP	OF ROCK
CAMI		1.8/	S WEIGHT	/FALL	FAS	5 the 15	ET IN HO	IE. DI	A /	LEN	GTH LOGGED BY:		· · · · · · · · · · · · · · · · · · ·		/	
			s./ 30			,,,,,, C.	NO			LEN	din Codden Bi:		D. Har	nish (THE	
ш.					JATER				Ī.,	П			2. 114.			
SAMP, TYPE		E C	SAMPLE BLOWS "N" X CORE RECOVERY	PR	ESSU (ESTS			I	BRAPHICS	Ы					NOTES	ON:
l H	10	W	토리 요일	σ Σ	e.∺	ш•	ELEV.	DEPTH	E	SAMPLE	DESCRIPTION	N AND C	LASSIFIC	ATION		LEVELS, RETURN,
段		哥哥	R R R	LOSS IN G.P.M	, 30 30	H H H		5	E	18					CHARAC	CTER OF
	2.0	MO.	1-5-17-0	- 6	<u>0</u> .			<u> </u>		Ш	00 475 6-	- IL GAN	D CANT			ING, ETC.
55	2.0	1.0	ή-9-11-4					١.			0.0 - 4.7 Ft. Gra FILL (SW-SP).	D and SAMI	2	0-10 Ft	e advanced . using 6.5 in. low-stem
60	2.0	0.0	4-4-7-1:				-				0.0-4.3 Ft. Gr	ravelly san	d, dark redd	ish	auger. Radiolo	
33	2.0	0.2						١.			0.0-4.3 Ft. Gr brown (2.5YR: broken pieces	of hard Br	unswick san	dstone.	11-2	
00	2.0	10	8-2-2-6								•				TMA-E	logged by berline, Inc.
33	2.0	1.0	0-2-2-0				-	5_	-	П	4.3-4.6 Ft. Sa	ınd, yellow	ish brown	1	□ Grab-st	impled from
			-			Ì			J i ll		(10YR5/6), me		-		auger fl	ignt.
33	2.0	1.3	7-18 19-13				- 	1.	╢		4.6-4.7 Ft. Sil				1	
00	20	1							411		4.7 - 6.4 Ft. SIL' (10YR5/2), so	\mathbf{r} (OL). Git, damp, 1	rayısı brow	nts		
33	2.0	1.5	4-15 12-17				İ		411		with iron-oxid					
<u></u>	<u> </u>						<u> </u>	10.	Ш		6.4 - 10.0 Ft. SII gray (5YR4/2) very fine-grain	LT (ML).), some thi	n sand inteb	n eds, ,	<u>.</u>	
										Ш	\			ľ		
							ļ		İ		8.0-10.0 Ft. D)ark brown tint.	1 (7.5YR4/2) with		
		ł								Ш	Bottom of boreho Borehole backfille	ole at 10.0 ed with spo	ft. pils, 11/16/8	7 .		
	1									Ш						
				'					İ	\parallel						
							1		1							
	İ									\parallel					·	
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									ļ	Ш				-	_	
	1														ŀ	
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										$\parallel \parallel$					j	
				1			1									
				,											1	
		1													Descrip	tion and ation of
															soils by	visual
			1												examin	B+1011.
											•					
SS	E SPI	IT S	POON; S'	T = SHF	LBY T	UBE - IS	SITE	1		Щ.	· · · · · · · · · · · · · · · · · · ·				HOLE NO	
			; P = P					;	80	li	ndustrial Ro	i. (LO	DI)		1	137R

	-	EC	LOG	IC D	DIL	1.1.0		PROJE	СТ			JOB NO.	SHE	ET NO.	HOLE NO.
SIT		EC	LUG		KIL	L LC					FUSRAP	14501-1			1136R
3111		Ind	ustrial	Rd (I OD	T١	COORDINA	ATES		N T	1 700 E 1 002	JAN		ON HORIZ	BEARING
BEG			MPLETED				<u></u>		DRIL		1,799 E 1,893 UKE AND MODEL SIZE	OVERBURDEN	Vert		TOTAL DEPTH
			1-16-8			E.D.			3	M	OBILE B-57 6.5"	10.0	, and a	(11.7	10.0
COR				CORE	BOXE		ESEL. TO	P CAS	ING	GR	OUND EL. DEPTH/EL. GRO		DEPTH	/EL. TOP	
244		5.9/	66 R WEIGHT		1000	5				L	<u> </u>		<u> </u>	/	
SAN			s./ 30		CA:	SING LE			A./	LEN	GTH LOGGED BY:			001	
					JATE		NO	NE	T -	П		D. Harn	sh	No	·
SAMP. TYPE	SAMP. ADV	SAMPLE REC	SAMPLE BLOWS "N" % CORE RECOUERY	LOSS IN G.P.M	ESSU EST:	RE S	ELEV.	DEPTH	GRAPHICS	SAMPLE	DESCRIPTION AND (CLASSIFICA	rion	WATER CHARAC	ON: LEVELS, RETURN, TER OF NG, ETC.
SS	2.0	1.8	1-14 17-9								0.0 - 6.8 Ft. Gravelly SIL FILL (GM-ML, OL).	T and SILT			with hollow
	1.0 2.0	0.3						5_			0.0-6.0 Ft. Gravelly sil (2.5YR2.5/2), some ver coarse-grained sand, Br and basalt gravel. 3.0-3.5 Ft. Rock; glacing	unswick sandst	ed one	Analytic	reophysically by Eberline
SS	2.0	1.3	7-11											Water	ose to 6.0
		-/-	17-18				-			1	6.0-6.8 Ft. Silt, black, clay mixed in at base.	soft, bluish gray	, <u> </u>		min. after
SS	2.0	1.5	14-25 25-25								6.8 - 10.0 Ft. Silty CLAY Weak red (2.5YR5/2) v in places, minor finely i	(CL-ML). arying to dusky nterbedded very	red	ENMET	alarm >300 cars LEL, 6 10 ft. hole.
							-	10 .	- FA	П	fine-grained sand, beds		ſ	1	
										$\ $	8.5-8.9 Ft. Sand, dark (5YR4/2), very fine-gradus	ined.	}		
-									-	Ш	8.9-10.0 Ft. Dark redd	ish gray (5YR4)	/2).		
									1		9.5 Ft. Thin bed of me	dium-grained s	ınd.	·	
											Bottom of borehole at 10.0 Borehole backfilled with sp				
					:										
														-	• ·
										$\ $					
													-	1	
										$\ $					
66	. 601	TT 64	DOON - 57	- 605	0V T	pe. le	ITE	<u> </u>		Ш				HOLE NO.	
			POON; ST ; P = PI			,	. 16	8	B 0	In	dustrial Rd. (LO	DI)			36R

GEOLOG	IC DRILL LO	G PROJECT	FUSRAP	JOB NO. SHEET NO. HOLE NO. 14501-138 1 OF 1 1155R
ITE 80 Industrial		COORDINATES	N 1,744 E 1,895	ANGLE FROM HORIZBEARING Vertical
EGUN COMPLETED		DRI	ILL MAKE AND MODEL SIZE OF	ERBURDEN ROCK (FT.) TOTAL DEPT
1-19-8711-19-8	7 E.D.I		MOBILE B-57 6.5"	10.0 10.0
ORE RECOVERY (FT./7	CORE BOXES SAMPLE	ESEL. TOP CASING	G GROUND EL. DEPTH/EL. GROUND	WATER DEPTH/EL. TOP OF ROCK
AMPLE HAMMER WEIGHT			./LENGTH LOGGED BY:	<u> </u>
140 lbs./ 30	in. WATER	NONE		D. Harnish 47
SAMP. ADU. LEN CORE SAMPLE REC. CORE REC. SAMPLE REC. SAMPLE REC. SAMPLE REC. SAMPLE REC. SAMPLE REC. SAMPLE REC.	PRESSURE TESTS TESTS TO STILL THE TESTS TO STILL TH	ETEA.	DESCRIPTION AND CLA	NOTES ON: WATER LEVELS, WATER RETURN, CHARACTER OF DRILLING, ETC.
SS 2.0 1.2 1-4-8-1 SS 2.0 1.3 8-8-7 13 SS 2.0 0.0 5-3-1- SS 2.0 1.2 19-30 33-54 SS 2.0 1.3 10-14 18-21	5	10	0.0 - 4.9 Ft. Silty GRAVEL: (GM, ML). 0.0-1.8 Ft. Silty gravel, ve (5R 2.5/2), broken Brunswich save dusky red and dark brown decomposed Brunswick savesome sand. 1.6 - 4.9 Ft. Silt, mixed degrayish brown and light brownish gray (2.5 Y6/2), damp, thin bed of black silts. 6.0 - 10.0 Ft. SAND and SIL ML). Dark grayish brown fine-grained. 6.0-8.7 Ft. Interbedded wilayers. 8.7-10.0 Ft. Silty sand, firmedium-grained, subround. Bottom of borehole at 10.0 Ft. Borehole backfilled with spoil	Borehole advanced 0-10 Ft. using 6.5 in o.d. hollow-stem auger field and gamma-logged by TMA-Eberline, Inc. usky red, dark ownish gray, from auger flights. (1). Light inne-grained, t at top. Tr (SM, SP, (2.5Y4/2), ith 3-5 mm ne- to di grains, wet.
		SITE		Description and classification of soils by visual examination.

	<u>.</u>	FC	LOG	ור ח	PII	1 10)G	PROJE	CT	_			JOB NO	. SH	EET NO.	HOLE NO.
SIT			LOG	<u> D</u>	IXIL	LLU	COORDIN	TES			FUSRAP			-138		1132R
		Ind	ustrial	Rd. (LOD	I)	COOKUTH	RIES	1	N ·	1,581 E 1,89	0		ł	ROM HORIZ	BEARING
BEG	UN	CC	MPLETED	DRILL				-			KE AND MODEL		OVERBURDEN		tical K (FT.)	TOTAL DEPTH
			1-13-8			E.D.	.I.		N	10	BILE B-57	6.5"	12.9		1.1	14.0
COR		OVER'		() CORE	BOXE	S SAMPL	ESEL. TO	P CASI	ING	GRO	UND EL. DEPTH	/EL. GROU	ND WATER	DEPT	H/EL. TOP	OF ROCK
SAM			R WEIGHT	/FALL	CAS	. 1 °	FT IN HO	LE: DI	A. /! !	FNG	TH LOGGED BY:				12.	9/
	14	0 lb	s./ 30	in.			NO			LNU	in coddeb Bi:		D. Har	nich	9P1	
<u>н</u>	31111	ပ္ပုံ	BLOWS "N" X CORE X RECOUERY	1	JATE! ESSU					Т			D. 1141	111311	 	
DIAM.	88	E S	교육		EST			<u>=</u>	GRAPHICS	4					NOTES	ON:
0.0	a z		톭휪임	g_Σ	ğΗ	¥-÷	ELEV.	DEPTH	Ĭ	SAMPLE	DESCRIPTION	I AND C	LASSIFIC	ATION	1	RETURN,
88 88 88		£ 00	호김~띬	LOSS IN G. P. M	PRESS. P. S. I.	HAY.		0	품	Ä					CHARAC	TER OF
	2.0	1.2	1-11-10		00			 		-	0.0 - 5.8 Ft. SAN	D and SII	T. and San	dv		NG, ETC.
	١.		7								0.0 - 5.8 Ft. SAN GRAVEL FIL	, (SM, SP	ML, GW).	AT.	0-14 Ft.	using 6.5 in.
SS	2.0		7-9				-	-			0.0-0.8 Ft. San Brunswick san	ndy GRAN	EL, dusky	red gular	auger. Radiolog	
			9-13						:		mixed with bro	wnish yel	ow sand,	B ,	sampled	and logged by
SS	2.0	1.4	8-10				•	-				ND light	erov (10VR	6/1) and	ITMA.F	berline, Inc.
			13-13					5_		ŀ	0.8-5.8 Ft. SA yellowish brow fine-grained, u	n (10YR5	6), very	0/1) 8110	'	
SS	2.0	2.0	11-13				-	-		\vdash	4.0-5.8 Ft. Fir				Д	
			13-14					-		'						
SS	2.0	1.3	8-13				}	-			5.8 - 9.1 Ft. SIL7 (10YR4/3), sor fine-grained sa	ne 2-3 cm	interbeds of	f		
			10-8				-	-	Ш	ļ	9.1 - 12.6 Ft. SA		Reddish			
SS	2.0	2.0	3-5					10_		l	brown (5YR4/; gravel.	3), mediur	n-grained, s	ome		-
			7-18					-			graver.					
SS	2.0	0.9	18-22			i .		-		ł	11.5-11.7 Ft.	Sama amau	al mound			
			17-19				=		anna.	h	12.6 - 12.9 Ft. CL brownish gray	AY (CL).	Light		7	
<u> </u>							_	-		$ar{\bot}'$		-	•	<u>. </u>	/	ann com d-
										11	12.9 - 14 Ft. <u>WE</u> Dusky red (7.5	R3/2), Br	inswick san	n. dstone.	300 ppm	ENMET reads 2" into open
											D				hole.	
								,			Bottom of borehol Borehole backfille	le at 14.0 i d with spo	t. ils, 11/13/8	7.		
																•
																_
					:											
										1						
															1	
															Descript	
															classifica	visual
															examina	tion.
															-	
SS =	SPL	IT SP	OON; ST	* SHEL	BY TU	BE: S	ITE	<u>.</u>	LL	Т					HOLE NO.	
			P = PI					8	30 I	nc	lustrial Rd	. (LOI	DI)		11	32R

Hancock St. EGUN COMPLETED 12-3-87 12-3-87	. (LODI)		JOB NO. SHEET NO. HOLE NO. 14501-138 1 OF 1 1191R ANGLE FROM HORIZBEARING Vertical VE OVERBURDEN ROCK (FT.) TOTAL DEPTH 5.5" 10.0 10.0 GROUND WATER DEPTH/EL. TOP OF ROCK
AMPLE HAMMER WEIGHT/	FALL CASING LEFT IN I	HOLE: DIA./LENGTH LOGGED BY:	/
140 lbs./ 30 i	PRESSTS WILL WILL SENT SOUTH AND A SECOND SOUTH AND A SECOND SECO	0.0 - 2.6 Ft. GRAVE (GP, ML). 0.0 - 0.5 Ft. Grave basalt. 0.5 - 0.8 Ft. Silt, bland reddish brown gravel. 0.8 - 2.6 Ft. Silty s gray (2.5 Y6/2), ve 2.6 - 4.0 Ft. Silt an (ML, SP). 2.6 - 3.1 Ft. Silt, ling green mottling, min silt and (2.5 Y4/1), very fin 4.0 - 5.2 Ft. Silty SA (10 YR4/3) with ye stain, fine to med 4.9 Ft. Top of wet 5.2 - 10 Ft. SAND (Sbrown (10 YR4/4), 6.3 Ft. Some grave 6.9 - 7.3 Ft. Some grave	o.d. hollow-stem auger. Radiologically sampled and gamma-logged by TMA-Eberline, Inc. o.0.5 Ft. No sample roadbed. o.0.5 Ft. No sample roadbed. o.0.5 Ft. No sample roadbed. o.0.6 Ft. Rotary bit jams inside augers due to saturated san due to saturated san lowish brown iron-oxide itum-grained. o.0.6 Ft. No sample roadbed. 8-10 Ft. Rotary bit jams inside augers due to saturated san due to saturated san lowish brown iron-oxide itum-grained. o.0.6 Ft. No sample roadbed. 8-10 Ft. Rotary bit jams inside augers due to saturated san due to saturated san lowish brown iron-oxide itum-grained. sand. P). Dark yellowish some silt and gravel. el. o.0.6 Ft. No sample roadbed.
s = split spoon; st = = DENNISON; P = PIT(Hancock St. (LC	DI) 1191R

	GEC	LOG	IC D	RII		G	PROJE(CT			JOB NO.		T NO.	HOLE NO.	
SITE						COORDINA	ATES			FUSRAP	14501-			1202R	
1	Ind	ustrial	Rd. (LOD	I)			,	N 1.	836 E 1,912	ř	ngle fro Verti	OM HORIZ	BEARING	
BEGUN	CC	MPLETED	DRILL			*		DRILL	MAK	AND MODEL SIZE	OVERBURDEN		(FT.)	TOTAL DEPTH	
		2-2-87		<u>G.</u>	Engel	BNI.	N	IINI	JTE	MAN AUGER 4"	8.5			8.5	
	7.5/		CORE	BOXE	SISAMPL 8	ESEL. TO	P CAS	ING	GROUN	DEL. DEPTH/EL. GROU	IND WATER	DEPTH	EL. TOP	OF ROCK	
		R WEIGHT	/FALL	CAS		FT IN HO	LE: DI	A./L	NGTH	LOGGED BY:		.1	/		
1.	40 lb	s./ 18	in.			NO					R. Migu	1es 9	<u>4</u>		
出. 31	ျပ္ပုံ .	SAMPLE BLOUS "N" X CORE RECOVERY	L Co	JATE! ESSU				_							
DIAM.				EST			Į	ű	4				NOTES		
0.00		불의당	<u>ω_</u> Σ	ΩH	<u> </u>	ELEV.	СЕРТН	E	a lawes	DESCRIPTION AND C	LASSIFICA	TION		LEVELS, RETURN,	
\$5 B B		SINE	LOSS IN G.P.M	PRESS. P.S.I.	E SE		<u> </u>	GRAPHICS	Ä				CHARAC	TER OF	
SS 1.0	1.1		- 6	<u> </u>	, –				0	0 - 0 5 Ft Sandy eilty C	TAY (CL-MI)	<u> </u>	<u> </u>	NG, ETC.	
SS 1.0						_] -		Ŋ	0 - 0.5 Ft. Sandy silty C Dusky yellowish brown (to medium-grained.	(10YR2/2). F	ine- /	0-8.5 Ft	. using 6.5 hollow-stem	
SS 1.0		<u> </u>						Wyp.	Ĺ	-	eile SAND		auger. Radiolo		
SS 1.0	1.0	-			٠.					5 - 4.0 Ft. Pebbly clayer (SC-SG). Moderate redd (10R4/6). Fine- to coar	ish brown	th	sampled		
SS 1.0	0.6					-		Mille.	\vdash	subangular pebbles to 1. Fm. and other lithologie	0 in.; Brunswi	ck /	TMA-E	berline, Inc.	
SS 1.0	1.0					_	5_		\dashv			<i>-</i> -/ ₋			
SS 1.0	0.7					-			H	0 - 5.0 Ft. SAND (SW). (10Y6/2) finely layered	with lesser				
SS 1.5	S 1.0 0.7 S 1.5 1.2 Dortions of moderate reddish brown (10R4/6) and brownish gray (5YR4/1) layers. Fine- to medium-grained.														
	SS 1.5 1.2 [10R4/6] and brownish gray (5YR4/1) layers. Fine- to medium-grained. [5.0 - 6.0 Ft. Sandy CLAY (CL-SC).														
	Isyers. Fine- to medium-grained. 5.0 - 6.0 Ft. Sandy CLAY (CL-SC). Brownish gray (5Y4/1).														
1									6.	0 - 7.0 Ft. <u>SAND</u> (SP). gray (5Y6/1) mottled wi	Light olive			•	
										(5GY6/1) and dusky yel (5GY5/2).	lowish green	"			
									7	· ·	Pale red				
										0 - 8.5 Ft. SUT (ML). I (5R6/2) mottled with lig (5YR6/1).	tht brownish g	тау		,	
										(0.100/.2).					
								1 1	B	ottom of borehole at 8.5 Forehole backfilled with spe	t. oils 12/2/87				
									-	orthore backing with spi	J. 12/2/01.				
									Ì						
												i		,	
													-	·	
													Deseries	ion and	
												j	Descript classifics	tion of	
						,	•						examina		
							1								
					لا		<u> </u>								
		POON; ST				ITE	8	30 I	nd	ıstrial Rd. (LOI	DI)		HOLE NO.	202R	

								PROJE	ा				JOB NO).	SHEET NO.	HOLE NO.
SITE		EC	LOG	IL L	KIL	L LO		750			FUSRAP		14501		1 OF 1	1188R
2115		ndus	strial I	Rd. (L	(IQO		COORDINA	HES		N	1,904 E 1,94	n		1	FROM HORIZ	BEARING
BEGL			MPLETE					1			AKE AND MODEL	SIZE	OVERBURDE		ROCK (FT.)	TOTAL DEPTH
			2-2-8			E.D.					BILE B-57	6.5"	10.0			10.0
CORE		5.4/		Z) COR	E BOXE	SSAMPL 5	ESEL. TO	P CAS	NG	GR	DUND EL. DEPTH, 又 人	EL. GROU	IND WATER	DE	PTH/EL. TOP /	OF ROCK
SAME			R WEIGH	T/FALL	CAS		FT IN HO	LE: DI	A./L	ENG	STH LOGGED BY:			1	/	
140 lbs./ 30 in. NONE																
SAMP. TYPE	EN CORE	MPLE REC.	SAMPLE BLOWS "N" % CORE	LOSS LOSS IN B.P. A	WATEF RESSU TESTS OH	RE i	ELEV.	DEPTH	акарніся	SAMPLE	DESCRIPTION	AND C	LASSIFIC	CITA	WATER	LEVELS, RETURN, CTER OF
ૐ⊄	<u></u>	KIO	<u> </u>	- 0	1 10					4	0.0 - 5.5 Ft. Gra	relly SILT	SILT and			ING, ETC.
SS	1.5	1.0	14-15-1	4				-			GRAVEL FIL	, (GM-M	L, ML, GP)	•	0-10 Ft	. using 6.5 in. low-stem
SS	2.0	1.2	7-13 11-22	1	٠.				N(2)N		0.0-0.5 Ft. Gr 0.5-1.0 Ft. Gr	•		wick	auger. Radiolo sampled	gically
								•			sandstone.				gamma- TMA-E	logged by berline, Inc.
SS	0.5	0.5	8	1				5_	1		1.0-4.5 Ft. Sil small pieces of	t, grayish reddish b	brown (10) rown and bl	'R5/2) açk	•	
SS	2.0	1.4	10-19	-							mixed in at top green mixed in	through t	nve green a the rest.	na	4.5-5.5 glacial e	Ft. Possible rratic.
			25-25		1						4.5-5.5 Ft. Ro					
SS	2.0	1.3	9-10 9-10								5.5 - 10.0 Ft. SII (10YR5/2) bed downward with bedding.	T (ML). oming bro minor ire	Grayish broown (7.5YR- on-oxide sta	wn 4/2) un, fair	8.0 Ft. >300 pr open ho	ENMET read om 6" into le.
		_		1			-				6.0-10.0 Ft. V	et.			∬ No free	water in hole
											8.0-10.0 Ft. F	aint lamir	nae.		_]	
		}									Bottom of boreho Borehole backfille	e at 10.0 d with spo	Ft. oils, 12/2/87	7.		
																•
													-		ľ	
	,								•			•				
.																
	•															
											-				Description classification soils by examination	visual
			JŠ.													
			POON; ST ; P = P			,	ITE		ln	<u>d</u>	ustrial Rd.	(LODI)	\	HOLE NO	i88R