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GeoEngineers

REPORT OF PHASE 2
ENVIRONMENTAL SITE ASSESSMENT
NORTHWEST PLATING COMPANY
SEATTLE, WASHINGTON
FOR
WASHINGTON INDUSTRIES, INC.

NWP 0049

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GeoEngineers

June 20, 1990

Consulting Geotechnical
Engineers and Geologists

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1500 Washington Building
P.O. Box 21846
Seattle, Washington 98111

Attention: Mr. Dan Henke

This transmits 12 copies of our Phase 2 Environmental Site Assessment Report of the Northwest Plating Company property in Seattle, Washington. The scope of services is described in our proposal of May 30, 1989. Our services were authorized on August 21, 1989 by Mr. Dan Henke.

We appreciate the opportunity to assist you on this project. Should you have any questions or need additional information, please call.

Yours very truly,

GeoEngineers, Inc.

Stephen C. Perrigo
Associate

SCP:cs

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INTRODUCTION

The results of our Phase 2 Environmental Site Assessment (ESA) of the Northwest Plating Company site are presented in this report. The Northwest Plating Company property, referred to herein as "the site", is located at 825 South Dakota Street in Seattle, Washington.

The location of the site relative to its physical surroundings is shown in Figure 1. The location of the site relative to surrounding businesses is shown in Figure 2. The site is presently occupied by an 18,000-square-foot brick and masonry building with concrete slab floors (Figure 3). The exterior portion of the property is limited to driveways and border planter areas.

The site is located along the eastern edge of the lower Duwamish River industrial area at an elevation of about 20 feet above sea level. This area is typically underlain by dredge fill and other imported fill placed during the early development of Seattle. Prior to filling and development, this area consisted of a river estuary under the influence of tidal changes. Around the turn of the century, the general site area was occupied by a large brick manufacturing plant which obtained clay from a hillside quarry to the northeast.

Our Phase 1 ESA (dated May 5, 1989) identified the presence of significant concentrations of chromium, cyanide, and chlorinated solvents in ground water from monitor wells installed outside the building. Based upon the type and distribution of contamination, we concluded that it was likely attributed to releases from the Northwest Plating Company's operations. Analytical data collected as part of the Phase 1 study are also included in this report.

SCOPE OF SERVICES

The purposes of the Phase 2 services described herein are to assist Northwest Plating Company in their evaluation of the distribution and concentration of subsurface contaminants on and off their facility property.

Our Phase 2 services included further evaluation of existing information about the site and surrounding area as well as the generation of new information regarding fill, soil, and ground water conditions beneath the site. Specifically, our Phase 2 scope of services included:

1. **Underground Tank Reporting Assistance:** Assisting Northwest Plating Company with formal reporting requirements for their underground storage tank.
2. **Research Subsurface Conditions:** Researching subsurface conditions in the vicinity of the facility as they relate to native soil, fill history, ground water conditions, and potential contaminant migration pathways. We researched the location and depth of buried utilities in the area and obtained available soil boring logs from the City of Seattle.
3. **Sampling Beneath Building:** Exploring subsurface soil and ground water conditions beneath the building including: (1) beneath the soil-bottomed sump at the eastern end of the building, (2) beneath the large degreaser tank, and (3) at six additional locations beneath the concrete slab in the building.
4. **On-site Ground Water Investigations:** Installing two additional ground water monitor wells on the Northwest Plating Company property (and outside the limits of the building).
5. **Off-site Ground Water Investigations:** Installing five off-site ground water monitor wells in the area of projected ground water movement from the facility.
6. **Off-site Soil Vapor Investigations:** Sampling shallow soil vapors in the vicinity of the site for detection of possible chlorinated solvent vapors.

OVERVIEW OF THE FACILITY AND PHASE 1 STUDY

FACILITY PROFILE

Northwest Plating Company began operations on the northeastern part of the site in 1957. The firm grew to its present size over several years and has occupied the entire site since about 1962. Metal plating operations have generally remained the same since that time.

Services provided by Northwest Plating Company include (1) cadmium, chrome, copper, nickel, and zinc plating; (2) anodizing; (3) application

of special metal coatings; (4) metal inspection services; (5) metal polishing and finishing; and (6) spray painting.

Most of the plating, anodizing and coating application processes are performed in open-top tanks. According to a 1989 tank inventory, 40 different process tanks at the facility have a total storage capacity of 16,900 gallons. This inventory does not include rinse tanks or degreasing tanks. Most of the liquids contained in the tanks are classified as hazardous according to state and/or federal regulations. Most of the tanks are of metal, box-type construction. At least one tank is constructed of wood with a metal liner. Many of the liquids used in the plating process are highly alkaline (high pH) or very acidic (low pH) and contain very high concentrations of metals and/or cyanide in solution. According to routine testing information, the pH in the tanks ranges from 0.10 to 12.29 pH units. Acids routinely used at the facility include boric, chromic, hydrochloric, hydrofluoric, nitric, phosphoric and sulfuric acid.

Degreasing of metal parts is also routinely done as part of the plating process. Degreasing is accomplished using a chlorinated solvent that consists primarily of trichloroethene (also known as TCE or trichloroethylene).

The facility has a waste water treatment system that accepts acid waste and caustic/cyanide waste. The waste water is treated through a multi-stage process and then discharged to the METRO sanitary sewer. At the time of our Phase 1 study, Northwest Plating Company was discharging about 12,000 to 13,000 gallons of waste water per day, as allowed by their METRO discharge permit.

PHASE 1 STUDY

We explored subsurface conditions by advancing four shallow exploratory borings at the locations shown on Figures 2 and 3 (MW-1, MW-2, MW-3, and MW-4). A ground water monitor well was constructed in each boring. The water table at the site was present at a depth of about 6½ to 8½ feet below the ground surface with a gradient (and ground water flow direction) toward the northwest.

We obtained ground water samples for chemical analysis from each of the ground water monitor wells and analyzed the samples for pH, electrical

conductivity, cyanide, halogenated volatile organic compounds, and selected metals (arsenic, cadmium, total chromium, hexavalent chromium, copper, lead, nickel, and zinc).

The results of the ground water analyses are included on Table 1a of this report. Ground water from all of the Phase 1 wells showed evidence of significant contamination by hazardous materials routinely used at the site. The most significant contamination included chlorinated solvent contamination in Wells MW-1 and MW-3, chromium contamination in Wells MW-2 and MW-3, and cyanide contamination in Wells MW-1, MW-2 and MW-3.

PHASE 2 STUDY - SITE CONDITIONS

GROUND WATER

We explored ground water conditions beneath the site and in the surrounding area by advancing exploratory borings and installing ground water monitor wells in each boring. Eight additional monitor wells were installed outside of the limits of the building on and off the property using truck-mounted power auger drilling equipment. One well, MW-6, was grouted and abandoned shortly after installation due to the potential it created for contamination of deeper zones. Seven monitor wells were installed inside the building using hand-operated augering equipment. A 2-inch slotted well casing was installed in each of the hand borings. Soil exploration and well construction logs are included in Appendix A along with a more detailed account of our field exploration techniques.

Three distinct zones of ground water occurrence are present beneath this site: (1) a shallow water table aquifer, (2) a moderate depth semi-confined aquifer, and (3) a deeper semi-confined aquifer.

All of the monitor wells inside the building were constructed to monitor the shallow aquifer. The monitor wells outside the building are constructed to monitor the shallow aquifer and deeper water bearing zones. Of the seven new wells completed outside of the building, three monitor the shallow aquifer (less than 15 feet deep), three monitor the moderate depth aquifer (20 to 25 feet deep), and one well monitors a deep aquifer (34 to 39 feet deep). The well locations are shown on Figures 2 and 3.

The shallow aquifer extends to a maximum depth of about 14 feet below ground surface. It is comprised of sand and silty sand. Generally, ground

water in this shallow aquifer is encountered at a depth of about 6 to 12 feet. The gradient observed in ground water wells in the shallow aquifer indicates a ground water flow direction toward the northwest, as shown in Figure 4. Although the soil and fill types present in the shallow aquifer vary somewhat, the aquifer is relatively permeable with a an estimated horizontal ground water flow velocity of about 10 to 100 feet per year.

The upper aquifer zone is underlain by soils with a lower permeability, referred to as the medium depth aquifer zone. Soils in this zone generally consist of silty sand or silt with an observed thickness of about 14 to 17 feet. Beneath the building, the top of this zone is comprised of silt. Immediately north of the building the silt is absent, but soils with a lower permeability than those seen in the shallow aquifer zone are present. The ground water gradient in the medium depth aquifer zone is similar to that observed in the shallow aquifer; however, the average ground water levels in this zone are about 4 feet higher than those observed in the shallow aquifer. Ground water flow direction, interpreted from ground water levels in the medium depth aquifer indicate a flow direction toward the northwest as shown in Figure 5. This is very similar to that seen in the shallow aquifer. Ground water flow in the medium depth aquifer has both a horizontal and vertical component because it acts as a confining layer for a deeper aquifer. We estimate that average ground water flow velocities through this zone are about 0.1 to 10 feet per year horizontally and about 1 to 10 feet per year vertically upward.

The deep aquifer was penetrated by two wells, one of which was abandoned to prevent potential cross-contamination from shallower zones. The deep aquifer was observed at a depth of 26 feet below the ground surface in wells MW-6 and MW-7. It consists of permeable sand and gravel. Ground water levels measured in well MW-7 are about 6 feet higher than those seen in the shallow aquifer in the same area. An estimated horizontal ground water flow velocity for the deep aquifer (assuming a gradient similar to those seen in the middle and shallow aquifer) would be on the order of 100 to 2000 feet per year.

We sampled ground water from the wells outside the building on September 21 and 22, 1989, and from the wells completed within the building on October 11, 1989. Ground water samples were collected for analysis of selected metals, cyanide, and halogenated volatiles (chlorinated solvents). The results of the chemical analyses are summarized on Tables 1a, 1b, and 1c. The analytical results of ground water samples collected for the Phase 1 ESA report are also presented in Table 1a. The analytical laboratory reports for this Phase 2 study are included in Appendix B. The ground water contamination detected in the wells is limited, for the most part, to the shallow aquifer.

The most significant contamination detected in the shallow aquifer is attributed to chromium, cadmium, cyanide, and degreasing solvents. Chromium contamination is prevalent in the wells in the northern part of the site. Cyanide is present in ground water from wells throughout the site. Chlorinated solvents, particularly trichloroethene and one of its breakdown products (cis-1,2-dichloroethene), are present in ground water at significant concentrations on and off the property.

OFF-SITE EXPLORATIONS BY OTHERS AND UTILITIES

We examined records of the City of Seattle Engineering Department to locate prior subsurface explorations in the vicinity of the site. We located records of three private studies which are referenced in Figure 6. The locations and depths of soil borings identified from each of those studies are shown on Figure 6. A copy of each of the off-site boring logs collected is included in Appendix C.

The explorations referenced as study "A" in Figure 6 encountered 5 or less feet of fill overlying fine to medium sand to the full depth of the explorations (20 feet). The explorations referenced as study "B" in Figure 6 encountered the top of the middle aquifer zone at a depth similar to that seen at the Northwest Plating Company site. Those explorations encountered a soil unit described as "blue clay" at a depth of about 10 to 17 feet. All of the study "B" borings terminated in the "clay" at their full depth of 20 feet. The exploration referenced as study "C" in Figure 6 encountered silty sand fill to a depth of about 7 feet overlying about 2 feet of silty sand and peat. Fine to coarse sand was encountered from 9 feet to the total depth of the boring at 24½ feet.

We researched the presence of deep subsurface utilities in the vicinity of the site to evaluate the potential effect they might have in the movement of ground water and the transport of contaminants. During the installation of buried utilities, it is common practice to place very porous backfill such as sand and/or gravel in the trench. This can result in the creation of "conduits" beneath the ground through which ground water and/or soil vapors can move more readily than through the native soil or fill. If the utility trench backfill is much more permeable than the surrounding soil, the movements of contaminants in ground water or soil vapor within the backfill can be many times faster than through the native soil or natural ground water aquifer.

Of the many utilities buried in the public rights-of-way in this area, three of them potentially intersect the water table zone. These are the storm sewer, the sanitary sewer, and a pressurized fuel pipe line operated by Olympic Pipe Line Company. We obtained utility maps from the City of Seattle Engineering Department and from Olympic Pipe Line Company which show the locations of these utilities in the vicinity of the site. Figure 7 summarizes the routes of these buried lines and presents generalized cross-sections showing the relative depths of the utility lines and the approximate shallow ground water level as measured on September 21, 1989.

The sewer utility lines in the area are installed to allow for gravity flow to the west, along South Dakota Street, at a gradient of about 1 to 2 percent. Sanitary and storm sewer lines on Airport Way flow to South Dakota Street from the north and south. The most significant conduit along South Dakota Street is a large storm sewer line which is 48 inches in diameter east of Airport Way and 60 inches in diameter west of Airport Way. At the time of our water level measurements, part or all of this storm sewer line would have been below the shallow water table. The backfill surrounding this storm drain could act as a preferred conduit for the movement of ground water contaminants and vapors to the west along South Dakota Street.

SUBSURFACE VAPORS

We collected subsurface vapor samples at four locations as shown in Figure 8. All samples were collected at depths of about 2 feet below the ground surface. The vapor samples were collected in tedlar bags and were

transported to the analytical laboratory for analysis of halogenated volatile organic compounds. The results of these chemical analyses are summarized on Table 2. High concentrations of trichloroethene vapors were found in all of the samples. Vapor concentrations ranged from 3,200 ppb (vol/vol) to 44,000 ppb. A graph on Table 2 demonstrates the relationship between TCE vapor concentration in soil vapors and the distance from the site.

Subsurface vapors of toxic compounds may present an exposure risk to humans through breathing air in basements or below grade structures where such vapors might accumulate. With the possible exception of utility vaults, we did not identify the presence of basements or subsurface vaults in the area that could be subject to the accumulation of subsurface vapors. Because of the shallow ground water conditions, we would not expect to find basements in the vicinity of the site.

SOIL ANALYTICAL RESULTS

We obtained soil samples from soil borings on the property and from test pits excavated in the base of soil lined sumps within the building. Selected soil samples were analyzed for halogenated volatile organic compounds, metals, and cyanide. Several soil samples were also tested for characteristics of EP Toxicity, a designation test used to determine if a material is a Dangerous Waste (also known as Hazardous Waste) according to Washington State's Dangerous Waste Regulations (173-303 WAC). The results of chemical analysis of soil samples from one power soil boring (MW-7) and five hand explorations (MW-15 through MW-19) are summarized on Table 3. The results of chemical analysis of samples from beneath the sumps are summarized on Tables 4 and 5. The analytical laboratory reports are included in Appendix B.

Ten soil samples from soil borings in the central and northwestern part of the site were tested for the presence of chemical contamination. These samples represented soil conditions above and below the water table. Chlorinated solvents, metals, and cyanide were identified in these soil samples (Table 3). The most significant contamination detected is attributed to trichloroethene, cadmium, chromium, zinc, and cyanide.

We identified three soil-based sumps within the facility. Two of these sumps are located in the southeastern part of the building and the other is located beneath the large degreaser tank in the central part of the building (Figure 3).

The southeastern sumps are constructed with concrete walls. The floor of each sump is unlined. At the time of our explorations, ground water was encountered at a depth of about 2 feet below the base of one of these sumps in Well MW-13. We understand that during the wetter times of the year, standing ground water may be present within these sumps. Each of the southeastern sumps is about 22 feet long, 8 feet wide, and 4 feet deep. We understand that they were constructed about 30 years ago to accommodate two deep tanks which were never installed. Currently there are a number of tanks installed over or adjacent to these sumps (chrome seal, chrome anodizing, sulfuric anodizing, oakite, aladine 1200, and rinse tanks).

We explored conditions beneath the southeastern sumps by advancing one hand boring for installation of a monitor well (MW-13) on September 22, 1989 and by advancing three shallow test pits (TP-1, TP-2, and TP-3) on October 12, 1989 (Figure 3). The hand boring exploration (MW-13) encountered an accumulation of about 1 foot of red and white sludge in the base of the sump. The sludge has the consistency of soft clay. Beneath this sludge we encountered dark sandy soil. The three test pits encountered one-half to one foot of similar red to yellow sludge overlying black to brown sandy soil. It appears that the sludge is the result of many years of accumulation of very fine particulate material and metal flocculent from the site.

We obtained samples of the sludge and underlying soils for chemical analysis. The results of those analyses are summarized on Table 4. Very high concentrations of metals (cadmium, chromium, nickel, and zinc) were found in all of the sludge samples. Concentrations of metals were lower in the underlying soils, but were still present at significantly elevated concentrations. Three sludge samples and one soil sample were tested for characteristics of EP Toxicity.

On December 27, 1989, the large degreasing tank was briefly removed from its concrete walled, soil based sump so that a tank liner could be placed beneath the tank. We obtained four soil samples from the base of the

sump when the tank was removed. Brown sand was observed at the base of this sump. Each of the soil samples was analyzed for the presence of halogenated volatile organic compounds. The results of chemical testing are summarized in Table 5. The analytical laboratory reports are included in Appendix B. Relatively low concentrations of trichloroethene were present in the soils beneath the degreasing tank.

UNDERGROUND STORAGE TANKS

During a briefing of the Northwest Regional office of the Washington State Department of Ecology (Ecology) about the site on May 5, 1989, attention was drawn to two of the tanks at the facility regarding their possible regulation under the underground storage tank regulations. Those regulations apply to tanks for which 10 percent or more of their contents are below grade. Two tanks at the facility were identified as being potentially covered under these regulations. Those tanks are the large degreasing tank discussed in the prior section and the sulfuric anodizing tank.

Northwest Plating Company had plans for the installation of a metal tank liner (a containment sump) beneath the large degreasing tank at the onset of this study. This liner was installed on December 27, 1989.

We investigated the applicability of the Leaking Underground Storage Tank (LUST) regulations to the two tanks at this site. According to Mr. John Aspach of the Environmental Protection Agency and Mr. Joe Hickey of Ecology, the sulfuric anodizing tank is not an underground storage tank (UST), but the large degreasing tank would be considered a UST. We inquired about reporting requirements, and Ecology recommended that we report the large degreasing tank to them after installation of the new tank liner.

We were present at the time the large degreasing tank was removed from its soil based sump. The results of testing beneath the tanks are described in the previous section of this report. We observed minor evidence of tank corrosion on the existing tank. There was evidence of significant corrosion of the concrete walls of the sump. We observed no evidence of significant leakage of degreasing solvents into underlying soils. The new tank liner provides containment for a volume in excess of the typical operating capacity of the degreasing tank.

Reporting of the UST to Ecology was completed on March 12, 1990 by Mr. Gerald Heider, the Facility Manager. A copy of the reporting documentation is included in Appendix D.

DISCUSSION AND CONCLUSIONS

REGULATORY ISSUES

Regulatory jurisdiction for the monitoring and cleanup of the Northwest Plating Company site will be by the Washington State Department of Ecology. It is unlikely that the U.S. Environmental Protection Agency would become involved with the site. Based on our May 5, 1989, meeting with Ecology, they expect that Northwest Plating Company will proceed with a voluntary investigation and cleanup of the site. Under current regulatory terminology, this is referred to as an Independent Action.

The environmental regulations that apply to the contamination and its cleanup at this site include: (1) the Model Toxics Control Act (MTCA) (WAC 173-340), (2) the Dangerous Waste Regulations (WAC 173-303), and (3) Water Pollution Control laws (RCW 90.48). The MTCA will be the regulatory mechanism through which Ecology will require and monitor the mitigation of contamination at the site. The MTCA regulation became effective in May 1990. The Cleanup Standards Section of the MTCA regulation is presently in final development. This section of the regulation will include the soil and ground water cleanup levels appropriate for use at the site.

Ecology released DRAFT MTCA Compliance Cleanup Levels (March 8-9, 1990) for some of the contaminants known to be present at this site. For the purpose of the evaluation of this site, we believe that the DRAFT Compliance Cleanup Levels provide a sufficient basis for evaluation of existing contamination, even though the final levels could change somewhat. In the ensuing sections, references to cleanup goals should be interpreted to refer to the appropriate DRAFT MTCA Compliance Cleanup Level.

GROUND WATER CONTAMINANT DISTRIBUTION AND BEHAVIOR

General: Based on our explorations and testing, ground water contamination is limited, for the most part, to the upper aquifer zone. Geology and ground water conditions in the immediate vicinity of the site help prevent the downward migration of contaminants. Two properties of the

local geology and aquifers produce this result. They are: (1) the presence of a zone of soils with a much lower permeability beneath the upper sandy soil zone which comprises the shallow aquifer, and (2) the strong vertical upward ground water gradient observed between the deep confined aquifer and the shallow aquifer. The vertical ground water flow gradient minimizes (and may prevent) the downward migration of contaminants from the shallow aquifer to the deep aquifer.

Three general types of ground water contamination were identified beneath the site: metals, cyanide, and chlorinated solvents. Table 6 summarizes the highest concentrations of each analyte detected in the three aquifer zones. As shown on the table, the most significant contamination is found in the shallow aquifer.

Based on the degree of contamination seen in the shallow aquifer, it is possible that the contamination observed in the middle and deep aquifers may be attributed to cross-contamination caused by localized down-drag of contaminants during the drilling process. This hypothesis could be checked by future sampling and analysis of ground water from these wells. Further discussions of contamination and remedial alternatives will be limited to the contamination identified in the shallow aquifer.

Table 7 presents the DRAFT MTCA Compliance Cleanup Levels for those contaminants detected in the shallow ground water. Table 7 also presents information about the highest concentrations of each contaminant observed in the shallow aquifer beneath the building, outside the building on the property, and off the property. The most significant contamination of ground water appears to be directly beneath the building. However, a more diverse group of chlorinated solvents was detected in ground water outside the building at the northwest corner of the property.

The contaminants of greatest concern at the site are chromium, cyanide, and trichloroethene (TCE). In addition, cadmium and zinc were detected at concentrations exceeding regulatory cleanup levels in addition to chromium. It is our opinion that the remediation of the chromium contamination will likely result in mitigation of the other metal contaminants in ground water. For this reason, further discussion of metal contamination in ground water will focus on chromium.

Chromium: Chromium and other dissolved metals occur in ground water as positive ions (cations) and as components of negative ions (anions) such as metal oxides. Their ability to remain in solution (solubility) depends upon a number of factors including the pH and the availability of binding sites in the soil.

Many metallic cations precipitate from solution as the pH approaches the neutral range (6-8 pH units). Plating solutions at the site are maintained at either very high or very low pH levels in order to optimize the plating process. When these fluids are spilled or leaked into the subsurface environment, they immediately mix and react with the underlying ground water. The pH becomes more neutral by dilution and by natural buffering. When the pH of the contaminated ground water approaches neutral, metals such as trivalent chromium (Cr^{+3}) precipitate out of solution.

Hexavalent chromium (Cr^{+6}) occurs in ground water as chromium oxides, predominantly as chromate anions (CrO_4^{-2}) and to a lesser degree dichromate anions ($Cr_2O_7^{-2}$). In a neutral range pH as was observed beneath the site, the chromate anion will predominate. Both of these hexavalent chromium oxide anions are very soluble, will tend to be relatively non-reactive in solution, and will be transported with the movement of ground water.

Soils containing clay minerals also provide binding sites for ions which can halt or retard their movement in ground water. The soils in the shallow aquifer where most of the ground water contamination is present consist largely of sand or silty sand. We expect, however, that within the soil matrix at this site there are fine-grained particles which have binding sites for these metal ions.

Ground water at the site was analyzed for total chromium (the sum of Cr^{+3} and Cr^{+6}) and for hexavalent chromium. Hexavalent chromium contamination was present in ground water from shallow wells at concentrations exceeding Ecology's DRAFT MTCA Compliance Cleanup Level (0.05 ppm) in the north-central part of the facility, and near the southeastern sumps. Figure 9 shows the distribution of chromium contamination in shallow ground water in the building area and the location of process tanks holding chromium solutions within the facility. Three specific sources of chromium likely contribute to subsurface chromium contamination at the facility. These are: (1) spillage and/or leakage from the chrome seal and chrome anodizing tanks

adjacent to and over the soil based sumps, (2) spillage and/or leakage from the chromium process tanks at the north-central part of the building, and (3) condensate from a demister/vapor collector situated on the roof above the previously mentioned chromium process tanks. Source number three was identified by Mr. Greg Allan of Advanced Chemical Technologies, Inc., an independent consultant to Northwest Plating Company. We understand that vapor condensate collected from above the chromium process tanks leaked from the demister enclosure and onto the roof where it drained directly to the ground in the north-central part of the property. This information correlates well with the ground water quality data, which shows very high chromium concentrations in wells MW-2, MW-17, and MW-18 (all of which are close to and downgradient of the condensate discharge point). We understand that shortly after the condensate discharge was brought to the attention of Northwest Plating Company, this situation was corrected to prevent further releases of condensate.

The downgradient distribution of chromium within the shallow aquifer will be affected by: (1) pH neutralization resulting in precipitation, (2) dispersion into ground water, and (3) the presence of fine-grained clay minerals in the soil to which chromium cations and chromium oxides can bind. The concentration of chromium at the downgradient edge of the property (wells MW-1 and MW-3) is significantly lower than that seen beneath the facility and does not exceed DRAFT MTCA Compliance Cleanup Levels. Relatively high concentrations of chromium (both hexavalent and total) were detected in ground water from well MW-11, which is located on South Dakota Street about 350 feet west of the site. This suggests that some of the shallow ground water may have migrated west within the backfill of the large sewer line along South Dakota Street.

Cyanide: At this site, cyanide likely occurs in ground water as a nickel or zinc metallocyanide complex and to a much lesser degree as free cyanide. Complexed metallocyanides tend to be relatively stable in ground water and will not disassociate except in the presence of strongly acidic conditions. The complexed metallocyanides also tend to be less toxic than hydrogen cyanide. The mobility of cyanide in ground water is lower in environments with low pH, high concentrations of dissolved iron, organic soils, or clayey soils.

The most toxic form of cyanide is free cyanide (HCN or CN^-). Aquatic organisms are very sensitive to the presence of free cyanide. Free cyanide is naturally removed from the aquatic environment through volatilization, adsorption, and biodegradation.

The EPA's document Quality Criteria for Water 1986 (EPA 440/5-86-001) states that the federal drinking water standard for cyanide is 0.2 ppm. No Washington State drinking water standard exists for cyanide. Total cyanide concentrations in the shallow ground water exceed this standard in the central and western part of the site, with concentrations of up to 13 ppm in well MW-19. Figure 10 shows the cyanide concentrations in shallow ground water wells in the building area and those locations within the site where cyanide is used.

Tables 6 and 7 summarize the highest concentration occurrences of cyanide detected in ground water within each aquifer zone and relative to the building structure and the site property. Cyanide was not present in ground water at concentrations exceeding the drinking water standard in off-site wells or in wells completed in the medium depth or deep aquifers.

Chlorinated Solvents: Chlorinated solvents in ground water are difficult to remediate due to their physical behavior in the subsurface environment and the low concentration cleanup goals that are often mandated for these contaminants. Even though most chlorinated solvents are referred to as being only slightly soluble in water, their maximum solubilities can result in concentrations that are very high relative to cleanup goals.

Most chlorinated solvents are significantly more dense than water. This property can affect their distribution in ground water aquifers making them prone to sink within the ground water column. Chlorinated solvents tend to adsorb onto organic carbon in the soil. However, the adsorbed solvent can later desorb and act as a continued source of dissolved solvent contamination in ground water.

If chlorinated solvents are released into the subsurface environment they may infiltrate as a "pure-phase" product where they can move downward through the soil and water column until they meet a physical barrier to continued downward migration, such as a relatively impermeable soil unit. Pure liquid phase solvents in the subsurface environment are referred to as DNAPLs (dense non-aqueous phase liquids). They may exist as a "pool" of

solvent at the base of an aquifer or as residual DNAPL trapped in pore spaces of the soil above and below the water table. The presence of chlorinated solvent DNAPLs at a site can present significant problems for site remediation because they are very difficult to remove from the ground and they can act as long-term sources for solution of chlorinated solvents into ground water and volatilization as soil vapors.

Trichloroethene (TCE), the predominant chlorinated solvent found in the ground water at the site, is slightly soluble in water (maximum solubility about 1,100,000 parts per billion), is about 1.45 times as dense as water, and tends to partition readily into the vapor phase. TCE is relatively persistent in the subsurface environment and does not degrade readily. Releases of TCE at the site would likely be in the form of leaks or spills of pure solvent (DNAPL) as opposed to releases of contaminated water containing dissolved phase TCE.

A number of other chlorinated solvents were also detected in ground water at this site. Most of them can be attributed to the solvent degreasing process. Table 8 lists possible derivations for most of the solvents detected at this site. Degradation and production contamination of TCE likely accounts for most of the chlorinated solvents found at moderate to low concentrations (relative to TCE) in ground water. Tetrachloroethene (PERC) was found at concentrations of up to 130 ppb in the shallow aquifer. The source of the PERC is likely its past use as a metal degreasing solvent at the site. Methylene chloride was also found at the site in one well at a very low concentration. Its presence may be attributed to minor releases from the paint shop area.

Tables 6 and 7 summarize the highest concentration occurrences of chlorinated solvents detected in ground water within each aquifer zone and relative to the building structure and the site property. Very high concentrations of TCE were found in ground water beneath the building (up to 56,000 ppb). Figure 11 shows the TCE concentrations in shallow ground water wells in the building area and the main locations within the building where degreasing solvents have been used. The highest concentration was noted in well MW-15, which is located downgradient of the main solvent storage tank (above grade) and a former degreasing sump. The TCE concentration noted in well MW-19 (350 ppb), which is located adjacent to the main

degreasing tank, suggests that this tank is not the major source of solvent contamination. The most significant source of TCE contamination in ground water appears to be in the vicinity of the former degreasing sump.

Although no DNAPL pool was observed visually in any of the monitor wells, we believe that it is likely that such a condition may be present near the base of the upper aquifer zone beneath the building. This opinion is based upon the magnitude of TCE concentrations observed in ground water.

The DRAFT MTCA Compliance Cleanup Level for TCE in ground water is 5.0 ppb. This cleanup standard is consistent with federal drinking water maximum contaminant limits that have been established for a number of years. TCE concentrations in ground water from all shallow wells on the property significantly exceed this level.

TCE was also detected in shallow wells off the property. Figure 12 shows the TCE concentrations in shallow wells on and off of the property. The most significant detection of TCE off-site is in well MW-11, about 350 feet to the west, where TCE was detected at a concentration of 4,300 ppb. As discussed with the chromium contamination in that well, it is likely that contaminants are migrating west along the backfill surrounding the large buried storm sewer line in South Dakota Street.

Summary - Ground Water Contamination: On-site ground water contamination by chromium, cadmium, zinc, cyanide, and TCE is present at concentrations that warrant ground water cleanup activities. Off-site ground water contamination by chromium and chlorinated solvents also has been documented at concentrations that could warrant cleanup activities. Ground water with chromium, cyanide and TCE has been documented at a distance of 350 feet from the site. The full lateral extent of ground water contamination is unknown. The existing off-site data suggest that contaminant migration in ground water may be controlled largely by preferential movement through utility backfill. Additional off-site exploration would be required to substantiate this hypothesis.

The natural hydrogeologic conditions at the site and surrounding area appear to provide some protection against contamination of deeper ground water zones. A significant vertical upward gradient is present between a deeper, partially confined ground water zone and the shallow ground water zone where significant contamination has been identified. Additional ground

water sampling would be required to substantiate the isolation of the deeper ground water zone from the effects of shallow ground water contamination.

SUBSURFACE VAPORS

The TCE vapors we detected in near-surface soils a significant distance from the site can be an indicator of either of two processes. The subsurface vapor plume could result from volatilization of TCE in the soil above the water table (the unsaturated zone) beneath the building with lateral migration of the vapors through the unsaturated zone. The TCE vapors in the soil also could be a result of volatilization of TCE from contaminated ground water. In this latter scenario, TCE vapors could be generated at significant distances away from the site, where shallow ground water contamination is present. We believe that the former process is dominant based on the magnitude of the concentrations of TCE in subsurface vapors.

Air fully saturated with TCE vapors is heavy when compared to normal atmospheric air (about 1.3 times as dense as dry air at 20°C). Very high concentrations of TCE vapors were measured in shallow soil zones that are about six to 10 feet above the static water table. This suggests that even higher vapor concentrations may be present at greater depths near the base of the unsaturated zone. The strong correlation of vapor concentration as a function of distance from the facility suggests that significant TCE vapor concentrations may be present in near-surface soils at considerably greater distances from the site than were tested.

Ecology does not have specific soil vapor quality standards under the MTCA regulation. However, Ecology has released DRAFT guidance for reporting under the MTCA. The guidance calls for reporting of soil vapors that exceed 20 percent of the Lower Explosive Limit (LEL) of the compound detected. The soil vapors concentrations measured off site did not exceed this reporting criteria. This DRAFT reporting requirement is meant to address risk for combustible vapors and does not address the issue of chemical toxicity.

The allowable industrial exposure limit for TCE (Permissible Exposure Limit) is 100 parts per million. The TCE concentrations noted in shallow soils ranged from 3.2 to 44 parts per million (vol/vol). The highest concentration noted (44 ppm) is roughly 1/1000th of the maximum saturated vapor concentration possible in air (46,000 ppm at 10°C).

The presence of subsurface TCE vapors in shallow soils off of the property presents a potential environmental liability to Northwest Plating Company. The extent of the TCE vapor contamination is poorly understood because only four vapor samples were obtained along the suspected alignment of the plume of ground water contamination. The subsurface vapor sampling and analysis completed to date is not sufficient to evaluate the limits of the area impacted by subsurface TCE vapors. Additional subsurface vapor sampling and analysis would be necessary to evaluate the limits of TCE vapor contamination.

The distribution of TCE soil vapors may correlate with the distribution of ground water contaminated with TCE. Testing soil vapors is relatively quick and inexpensive when compared to installing and sampling ground water monitor wells. We recommend that any further work to define the TCE plume in ground water employ the testing of shallow soil vapors as a potential method to delineate the limits of the plume.

SOIL CONTAMINATION

General: Soil contaminants of concern at the site are very similar to ground water contaminants. The predominant contaminants found in soil were cadmium, chromium, zinc, cyanide, and trichloroethene (TCE). The DRAFT MTCA Compliance Cleanup Levels for those soil contaminants observed at this site are shown in Table 9. Table 9 also shows the highest concentrations of each contaminant found in the sump areas, under other parts of the building, and in soil samples collected outside of the building from MW-7.

The source of metals contamination in soil beneath the building is likely the result of precipitation of metals from solution in ground water that has become contaminated by infiltrating fluids. The fluids with dissolved metals likely entered the ground as a result of leakage or spillage from process tanks or as floor washdown water.

The source of metal contamination in sludges from the base of sumps is likely from fluids leaking or draining from nearby process tanks as well as from contaminated wash and rinse waters that spill, leak or drain into these sumps.

Soil Contamination Outside of and Beneath the Building: Soil samples were collected from one of the borings installed outside of the building and

from most of the borings installed within the building. Selected samples were analyzed for metals, cyanide, and chlorinated solvents. The results of the individual analyses are summarized in Table 3.

Cadmium contamination in soil exceeded the DRAFT MTCA Compliance Cleanup Level of 8.0 ppm in soils from MW-15, MW-16, and MW-18. In those borings where more than one sample was analyzed, the deeper samples had higher concentrations of cadmium. Cadmium concentrations of up to 130 ppm were found in soils beneath the building. Soils from MW-7, outside of the building, had cadmium concentrations less than the DRAFT Compliance Cleanup Level.

Chromium concentrations in soil exceed the typical Puget Sound area soil background concentration of 80 ppm in soils from MW-16, MW-18, and MW-19. The highest concentration found was from well MW-18, where a concentration of 2,700 ppm was detected in a soil sample from a depth of 8.0 feet. MW-18 is also the location of the highest chromium concentration observed in ground water. Hexavalent chromium was not encountered in soil samples from borings at concentrations exceeding the DRAFT MTCA Compliance Cleanup Level of 80 ppm.

Zinc contamination in soil exceeded the DRAFT MTCA Compliance Cleanup Level of 500 ppm in soils from MW-15, MW-16, and MW-18. The highest concentration found was from well MW-15, where a concentration of 1,600 ppm was detected in a soil sample from a depth of 8.5 feet.

The distribution of cyanide contamination in soil correlates with the occurrence of zinc contaminated soils that are near or below the ground water level. This could be due to spillage and/or leakage from one of the tanks containing zinc and cyanide, or it may be attributable to detection of complexed zinc metallocyanide compounds that have formed in the soil environment.

Chlorinated solvents were detected in soil samples from outside and beneath the building. The presence of chlorinated solvents in the soil samples is an indication of residual liquid phase solvent trapped within the soil structure. TCE is the solvent found at the greatest concentration. TCE was detected at concentrations exceeding the DRAFT MTCA Compliance Cleanup Level in soils (0.5 ppm) from MW-7, MW-15, MW-16, MW-17, and MW-18,

with a maximum concentration of 47 ppm in MW-16. We found no clear correlation relating TCE concentration to the depth of the soil sample or its relation to ground water levels.

Soil Contamination Beneath Sumps: The accumulated sludge and the underlying soils in the southeastern sumps were tested for metals, cyanide, and chlorinated solvents. Some of these samples were also tested for characteristics of EP toxicity. The results of these tests are summarized on Table 4.

The sludge typically has very high concentrations of cadmium, chromium, nickel, and zinc. The three sludge samples from TP-1, TP-2 and TP-3 contain 7.5, 8.2 and 1.4 percent chromium by weight, respectively. Underlying soils contain lower but still significantly elevated concentrations of these metals. Two of the samples tested for characteristics of EP toxicity (TP-1-1 and TP-1-2) exceeded Dangerous Waste designation thresholds for chromium. This means that if the sludge and underlying soil from the southern end of the eastern sump were to be excavated for disposal, the excavated materials would be designated as Dangerous Waste and would require compliance with special handling and disposal requirements. EP Toxicity testing was not completed on all of the soil samples. Using comparative methods to relate total metals concentrations to EP toxicity testing results, we believe that it is likely that all of the sludge from the easternmost sump and the underlying soil to a depth of 2 to 3 feet would be designated as a Dangerous Waste.

The sludges and underlying soils also contain high concentrations of cyanide and moderate concentrations of TCE.

Soil from beneath the large degreaser tank was tested for the presence of chlorinated solvents. The results of those tests are summarized on Table 5. TCE was detected in all of the soil samples at concentrations that exceed the DRAFT MTCA Compliance Cleanup Level. However, these concentrations are relatively low compared to other occurrences of TCE in soil at the site.

Summary - Soil Contamination: Our studies indicate that there is a significant volume of contaminated soil beneath the property. Only a small portion of the soil appears to be contaminated to a degree such that it could be designated as a Dangerous Waste. Furthermore, soil can only become

a Dangerous Waste if it is first excavated and requires disposal. This means that the sludges and soil beneath the site in their present state are not designated as a Dangerous Waste.

Soils beneath the site exceed DRAFT MTCA Compliance Cleanup Levels for cadmium, hexavalent chromium, zinc, and chlorinated solvents. Cleanup of the site under the MTCA will necessitate that action be taken to remove, isolate or immobilize the contamination present in the soil.

LIMITATIONS

We have prepared this Phase 2 report for use by Washington Industries, Inc. This report is not intended for use by others and the information contained herein may not be applicable to other sites.

This report is not intended to be a final report of site conditions. Additional investigation and cleanup activities are warranted at this site.

Environmental regulations are presently in a state of significant modification. Conclusions made herein are made with respect to current environmental regulation in Washington State unless stated otherwise.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in this area at the time this report was prepared. No other conditions, express or implied, should be understood.

- o O o -

We appreciate the opportunity to assist you with this project. Please call if you have any questions.

Yours very truly,

GeoEngineers, Inc.

Stephen C. Perrigo
Associate

James A. Miller, P.E.
Principal

SCP:JAM:cs

TABLE 1a
GROUND WATER ANALYSIS (Monitor Wells MW-1 through MW-4)

Well:	MW-1		MW-2		MW-3		MW-4	
Aquifer Monitored:	Shallow		Shallow		Shallow		Shallow	
Sample Date:	03/23/89	09/21/89	03/23/89	09/21/89	03/23/89	09/22/89	03/23/89	09/21/89
Parameter / **Units**								
Field Parameters								
pH (pH units)	6.8	NT	6.6	NT	6.4	NT	6.6	NT
electrical conductance (umhos)	700	NT	2300	NT	1100	NT	700	NT
Dissolved Metals								
arsenic (ppm)	< 0.005	NT	< 0.005	NT	< 0.005	NT	< 0.005	NT
cadmium (ppm)	0.17	0.5	0.16	0.7	0.07	0.008	0.005	< 0.005
chromium (total) (ppm)	0.03	0.02	180	280	30	0.05	0.43	< 0.01
chromium (hexavalent) (ppm)	< 0.025	< 0.01	110	280	25	0.02	0.30	< 0.01
copper (ppm)	0.10	NT	0.06	NT	0.02	NT	< 0.02	NT
lead (ppm)	< 0.005	NT	< 0.005	NT	< 0.005	NT	< 0.005	NT
nickel (ppm)	0.09	0.08	0.09	0.2	2.4	0.06	< 0.03	< 0.01
zinc (ppm)	0.13	0.70	0.06	0.40	0.08	< 0.01	< 0.01	< 0.01
Cyanide (ppm)	2.7	1.4	0.52	0.03	0.11	0.15	0.03	0.01
Halogenated Volatiles *								
chloroform (ppb)	3.5	< 100	0.4	3.4	2.0	< 100	< 0.2	< 0.2
1,1-dichloroethene (ppb)	< 2.0	< 100	< 0.2	< 0.2	3.0	< 100	< 0.2	< 0.2
cis-1,2-dichloroethene (ppb)	390	210	7.6	6.4	2700	1600	< 0.2	< 0.2
trans-1,2-dichloroethene (ppb)	4.1	< 100	0.5	< 0.2	11	< 100	< 0.2	< 0.2
methylene chloride (ppb)	< 10	<1000	1.9	< 2.0	<1.0	<1000	< 1.0	< 2.0
tetrachloroethene (PERC) (ppb)	86	< 100	0.5	< 0.2	130	< 100	0.3	< 0.2
1,1,1-trichloroethane (ppb)	12	< 100	0.5	< 0.2	8.2	< 100	1.0	1.1
1,1,2-trichloroethane (ppb)	< 2.0	< 100	< 0.2	< 0.2	2.8	< 100	< 0.2	< 0.2
trichloroethene (TCE) (ppb)	9500	6900	170	50	8300	5400	94	72
vinyl chloride (ppb)	< 5.0	< 250	< 0.5	< 0.5	7.5	< 250	< 0.5	< 0.5

Notes:
"ppm" signifies "parts per million" "ppb" signifies "parts per billion" "<" signifies "less than" "NT" signifies "Not Tested"
* only halogenated volatile compounds detected are listed. See Appendix B for a complete list of analytes
Halogenated volatile compounds analyzed by EPA Method 8010
Samples collected on 03/23/89 were also analyzed for aromatic volatile compounds (EPA Method 8020) and none were detected.

TABLE 1b
GROUND WATER ANALYSIS (Monitor Wells MW-5 through MW-12)

Well:	MW-5	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
Aquifer Monitored:	Medium	Deep	Medium	Shallow	Medium	Shallow	Shallow
Sample Date:	09/21/89	09/21/89	09/21/89	09/21/89	09/21/89	09/21/89	09/21/89

Parameter	Units						
Dissolved Metals							
cadmium	ppm	< 0.005	< 0.005	< 0.005	0.010	< 0.005	< 0.005	< 0.005
chromium (total)	ppm	< 0.01	< 0.01	0.02	< 0.01	< 0.01	2.6	< 0.01
chromium (hexavalent)	ppm	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	2.5	< 0.01
nickel	ppm	< 0.01	< 0.01	0.03	0.01	< 0.01	0.09	< 0.01
zinc	ppm	< 0.01	< 0.01	0.05	0.03	< 0.01	< 0.01	< 0.01
Cyanide	ppm	< 0.01	< 0.01	0.03	< 0.01	< 0.01	0.08	< 0.01
Halogenated Volatiles *							
cis-1,2-dichloroethene	ppb	< 0.2	< 0.2	3.7	< 0.2	45	670	< 0.2
tetrachloroethene (PERC)	ppb	< 0.2	< 0.2	< 0.2	< 0.2	< 1.0	< 100	0.2
trichloroethene (TCE)	ppb	< 0.2	6.6	13	< 0.2	< 1.0	4300	0.5

Notes:
"ppm" signifies "parts per million" (mg/l)
"ppb" signifies "parts per billion" (ug/l)
"<" signifies "less than"
* only halogenated volatile compounds detected are listed. See Appendix B for a complete list of analytes
Halogenated volatile compounds analyzed by EPA Method 8010

TABLE 1c
GROUND WATER ANALYSIS (Monitor Wells MW-13 through MW-19)

Well:	MW-13	MW-14	MW-15	MW-16	MW-17	MW-18	MW-19
Aquifer Monitored:	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow	Shallow
Sample Date:	10/11/89	10/11/89	10/11/89	10/11/89	10/11/89	10/11/89	10/11/89

Parameter	Units							
Dissolved Metals								
cadmium	ppm	0.02	0.0012	0.05	0.034	0.27	11	0.02
chromium (total)	ppm	17	0.24	0.02	< 0.02	200	440	0.49
chromium (hexavalent)	ppm	17	0.23	0.02	< 0.01	200	430	0.15
nickel	ppm	0.05	< 0.03	0.35	0.10	0.41	7.4	0.05
zinc	ppm	0.20	0.03	0.21	0.05	0.16	9.2	0.04
Cyanide	ppm	2.1	0.04	4.3	10	0.2	< 0.1	13
Halogenated Volatiles *								
1,1,1-trichloroethane	ppb	< 8	< 8	< 150	20	< 8	< 8	< 8
trichloroethene (TCE)	ppb	130	580	56,000	9,600	1,850	260	350

Notes:
"ppm" signifies "parts per million"
"ppb" signifies "parts per billion"
"<" signifies "less than"
* only halogenated volatile compounds detected are listed. See Appendix B for a complete list of analytes
Halogenated volatile compounds analyzed by EPA Method 8010

TABLE 2
SOIL VAPOR ANALYSIS

Sample Location:	VS-1	VS-2	VS-3	VS-4
Sample Date:	10/05/89	10/05/89	10/05/89	10/05/89
Sample Depth:	2.0 feet	2.0 feet	2.0 feet	1.8 feet
Distance *:	20 feet	160 feet	270 feet	370 feet

Parameter	Units				
Halogenated Volatiles *					
chloroform	ppb (v/v)	8.7	< 4.1	< 102	< 20
1,1-dichloroethene	ppb (v/v)	80	< 5.0	< 125	< 25
cis-1,2-dichloroethene	ppb (v/v)	< 5.0	140	< 125	< 25
trans-1,2-dichloroethene	ppb (v/v)	160	< 5.0	< 125	< 25
1,1,1-trichloroethane	ppb (v/v)	160	< 3.6	< 90	< 18
trichloroethene	ppb (v/v)	44,000	9,000	5,700	3,200

Notes:
"ppb (v/v)" signifies "parts per billion, volume/volume basis"
* Distance refers to the linear distance from the edge of the facility property to the sample location.
Soil vapors analyzed for halogenated volatile compounds using EPA Method 8010 (modified).
Only those analytes detected are shown, refer to the appendix for a complete list of analytes.

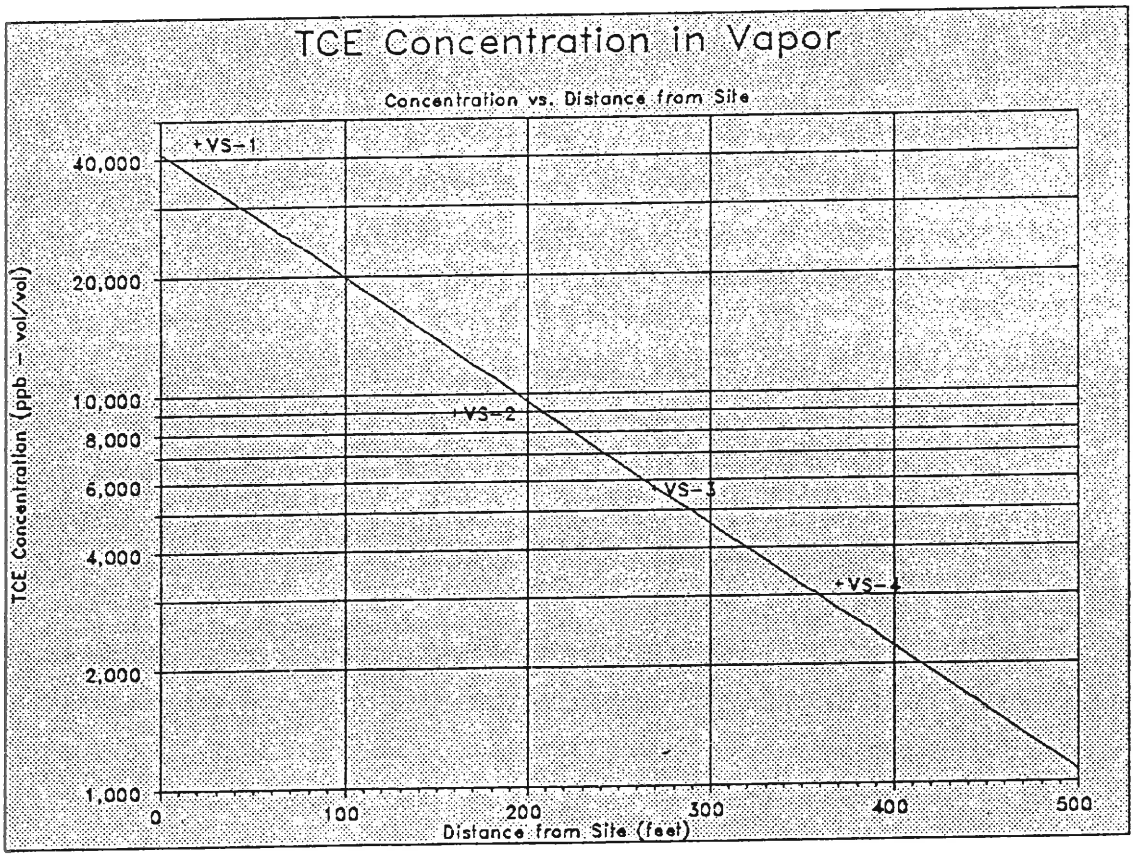

TABLE 3
CHEMICAL ANALYSIS OF SOIL FROM SOIL BORINGS

		Outside of Building		Beneath Building							
Sample Designation:		7–2	7–3	15–4	16–1	16–3	17–2	17–3	18–1	18–2	19–1
Sample Location:		MW-7	MW-7	MW-15	MW-16	MW-16	MW-17	MW-17	MW-18	MW-18	MW-19
Sample Depth:		8.0 feet	13.0 feet	8.5 feet	2.5 feet	12.5 feet	4.3 feet	9.0 feet	2.0 feet	8.0 feet	2.0 feet
Sample Date:		09/06/89	09/06/89	10/09/89	10/09/89	10/09/89	10/10/89	10/10/89	10/10/89	10/10/89	10/10/89
Parameter	**Units**										
Halogenated Volatiles *											
1,1–dichloroethene	ppm	< 0.010	< 0.010	< 1.0	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	0.011
cis–1,2–dichloroethene	ppm	0.23	< 0.010	< 1.0	0.40	0.088	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
methylene chloride	ppm	< 0.10	< 0.10	< 10	< 0.10	< 0.10	< 0.10	0.15	< 0.10	< 0.10	< 0.10
tetrachloroethene	ppm	0.077	< 0.010	< 1.0	0.56	0.055	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
trichloroethene	ppm	1.7	< 0.010	4.2	47	3.9	0.44	1.05	1.6	0.40	0.042
Total Metals											
cadmium	ppm	< 1	< 1	100	13	25	< 1	1.7	23	130	6.5
chromium	ppm	25	45	67	87	56	22	51	85	2,700	230
hexavalent chromium	ppm	0.51	< 1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	4.9
nickel	ppm	6.6	21	53	57	42	8.6	27	110	300	92
zinc	ppm	17	30	1,600	720	410	35	52	630	420	43
Cyanide	ppm	0.9	< 0.1	32	1.0	3.8	< 0.2	< 0.2	0.4	2.4	< 0.2

Notes:
"ppm" signifies "parts per million" "<" signifies "less than"
* only halogenated volatile compounds detected are listed. See Appendix B for a complete list of analytes.
Halogenated volatile compounds analyzed by EPA Method 8010.

TABLE 4
CHEMICAL ANALYSIS OF SOIL FROM BENEATH EASTERN SUMPS

Sample Designation:	13–1	13–5	TP–1–1	TP–1–2	TP–2–1	TP–2–2	TP–3–1
Sample Matrix:	Sludge	Soil	Sludge	Soil	Sludge	Soil	Sludge
Sample Location:	MW–13	MW–13	TP–1	TP–1	TP–2	TP–2	TP–3
Sample Depth:	surface	3.9 feet	0.5 foot	1.2 feet	0.4 foot	1.0 foot	0.2 foot
Sample Date:	09/22/89	09/22/89	10/12/89	10/12/89	10/12/89	10/12/89	10/12/89

Parameter	Units							
Halogenated Volatiles *								
1,1–dichloroethene	ppm	< 0.010	< 0.010	< 0.063	< 0.012	< 0.042	< 0.010	< 0.11
methylene chloride	ppm	< 0.10	< 0.10	< 0.62	0.16	< 0.42	< 0.10	< 1.1
trichloroethene	ppm	0.17	0.074	0.1	0.15	0.10	0.034	0.25
trichlorofluoromethane	ppm	< 0.10	< 0.10	< 0.16	0.29	< 0.10	< 0.025	< 0.28
Total Metals								
cadmium	ppm	253	4.8	190	27	130	2.4	220
chromium	ppm	9,150	220	75,000	2,200	82,000	1,500	14,000
hexavalent chromium	ppm	394	31	13,100	380	2,700	200	2,400
nickel	ppm	1,090	13.5	540	58	510	26	1,500
zinc	ppm	948	65.2	760	170	1,000	36	1,600
Cyanide	ppm	2.5	0.3	36	8.2	8.3	1.0	131
EP Toxicity Test (DW)								
arsenic (5 ppm)	ppm	< 0.03	NT	< 0.005	< 0.005	NT	NT	< 0.005
barium (100 ppm)	ppm	0.04	NT	0.13	0.15	NT	NT	< 0.06
cadmium (1 ppm)	ppm	0.46	NT	0.33	0.40	NT	NT	0.05
chromium (5 ppm)	ppm	1.4	NT	40	8.2	NT	NT	1.1
lead (5 ppm)	ppm	< 0.03	NT	< 0.1	< 0.1	NT	NT	0.1
mercury (0.2 ppm)	ppm	< 0.005	NT	< 0.0005	< 0.0005	NT	NT	< 0.0005
selenium (1 ppm)	ppm	< 0.03	NT	< 0.005	< 0.005	NT	NT	< 0.005
silver (5 ppm)	ppm	< 0.01	NT	0.04	< 0.02	NT	NT	< 0.02

Notes:
"ppm" signifies "parts per million" "NT" signifies "Not Tested"
* only halogenated volatile compounds detected are listed. See Appendix B for a complete list of analytes.
Halogenated volatile compounds analyzed by EPA Method 8010.
Dangerous Waste (DW) designation threshhold concentrations are shown in parenthesis.

TABLE 5
CHEMICAL ANALYSIS OF SOIL FROM BENEATH LARGE DEGREASER

Sample Designation:	N–1	N–2	S–1	S–2
Sample Location:	N	N	S	S
Sample Depth:	1.0 feet	2.3 feet	1.0 feet	2.3 feet
Sample Date:	12/27/89	12/27/89	12/27/89	12/27/89

Parameter	Units				
Halogenated Volatiles *					
trichloroethene	ppm	0.7	0.2	0.7	0.4

Notes:
"ppm" signifies "parts per million"
* only halogenated volatile compounds detected are listed. See Appendix B for a complete list of analytes. Halogenated volatile compounds analyzed by EPA Method 8010.

TABLE 6
GROUND WATER CONTAMINATION DISTRIBUTION BETWEEN AQUIFER ZONES

Parameter	Units	Highest Concentration in Each Aquifer Zone		
		Shallow	Medium	Deep
Dissolved Metals				
arsenic	ppm	ND	NT	NT
cadmium	ppm	11	ND	ND
chromium (total)	ppm	440	0.02	ND
chromium (hexavalent)	ppm	430	ND	ND
copper	ppm	0.10	NT	NT
lead	ppm	ND	NT	NT
nickel	ppm	7.4	0.03	ND
zinc	ppm	9.2	0.05	ND
Cyanide	ppm	13	0.03	ND
Halogenated Volatiles *				
chloroform	ppb	3.5	ND	ND
1,1-dichloroethene	ppb	3.0	ND	ND
cis-1,2-dichloroethene	ppb	2700	45	ND
trans-1,2-dichloroethene	ppb	11	ND	ND
tetrachloroethene (PERC)	ppb	130	ND	ND
methylene chloride	ppb	1.9	ND	ND
1,1,1-trichloroethane	ppb	20	ND	ND
1,1,2-trichloroethane	ppb	2.8	ND	ND
trichloroethene (TCE)	ppb	56,000	13	6.6
vinyl chloride	ppb	7.5	ND	ND

Notes:

"ppm" signifies "parts per million" "ppb" signifies "parts per billion"
"NT" signifies "Not Tested" "ND" signifies "Not Detected"
* only halogenated volatile compounds detected are listed. See Table 1 for a summary of ground water testing data.
Refer to the text for a description of the different aquifer zones.
Shallow aquifer zone wells include: MW-1 through MW-4, MW-9, and MW-11 through MW-19.
Medium depth aquifer zone wells include: MW-5, MW-8, and MW-10.
Deep aquifer zone well includes: MW-7.

TABLE 7
GROUND WATER CONTAMINANTS EXCEEDING REGULATORY STANDARDS

Parameter	Units	DRAFT MTCA Levels	Highest Concentration Observed		
			In On-site Wells		In Offsite Wells
			Under Building	Outside Building	
Dissolved Metals					
arsenic	ppm	0.002	NT	< 0.005	NT
cadmium	ppm	0.002	11	0.7	0.010
chromium (total)	ppm	---	440	280	2.6
chromium (hexavalent)	ppm	0.050	430	280	2.5
copper	ppm	1.0	NT	0.10	NT
lead	ppm	0.005	NT	< 0.005	NT
nickel	ppm	---	7.4	2.4	0.09
zinc	ppm	5.0	9.2	0.70	0.05
Cyanide	ppm	---	13	2.7	0.08
Halogenated Volatiles *					
chloroform	ppb	---	ND	3.5	ND
1,1-dichloroethene	ppb	---	ND	3.0	ND
cis-1,2-dichloroethene	ppb	---	ND	2,700	670
trans-1,2-dichloroethene	ppb	---	ND	11	ND
tetrachloroethene (PERC)	ppb	1.0	ND	130	0.2
methylene chloride	ppb	5.0	ND	1.9	ND
1,1,1-trichloroethane	ppb	200	20	12	ND
1,1,2-trichloroethane	ppb	---	ND	2.8	ND
trichloroethene (TCE)	ppb	5.0	56,000	9,500	4,300
vinyl chloride	ppb	0.4	ND	7.5	ND

Notes:
"ppm" signifies "parts per million" "ppb" signifies " "<" signifies "less than"
"NT" signifies "Not Tested" "ND" signifies " "---" signifies "no standard found"
* only halogenated volatile compounds detected are listed. See Table 1 for a summary of ground water testing data.
"MTCA DRAFT Levels" signifies "DRAFT MTCA Compliance Cleanup Levels (March 8-9, 1990)"
Shaded values indicate those concentrations exceeding DRAFT MTCA Compliance Cleanup Levels.
On-site wells under building include: MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, and MW-19.
On-site wells outside building include: MW-1, MW-2, MW-3, MW-4, MW-5, and MW-7.
Offsite wells include: MW-8, MW-9, MW-10, MW-11, MW-12.

TABLE 8
POSSIBLE DERIVATION OF SOLVENTS DETECTED IN GROUND WATER

1. trichloroethene (trichloroethylene or TCE)

Metal Degreasing Solvent — 56,000 ppb

Contaminants of Technical Grade TCE		
chloroform	(@ 0.01%)	3.5 ppb
1,1,1–trichloroethane	(@0.035%)	20 ppb
Daughter Product		
1,1–dichloroethene		3.0 ppb
Daughter Products		
cis–1,2–dichloroethene		2,700 ppb
trans–1,2–dichloroethene		11 ppb
vinyl chloride		7.5 ppb

2. tetrachloroethene (perchloroethylene or PERC)

Metal Degreasing Solvent — 130 ppb

Daughter Products (more likely attributable to trichloroethene)	
trichloroethene (TCE)	56,000 ppb
cis–1,2–dichloroethene	2,700 ppb
trans–1,2–dichloroethene	11 ppb
vinyl chloride	7.5 ppb
1,1,2–trichloroethane	2.8 ppb

3. methylene chloride

Paint Solvent — 1.9 ppb

Notes:

Concentrations noted indicate the greatest concentration detected in ground water.

TABLE 9
SOIL CONTAMINANTS EXCEEDING REGULATORY STANDARDS

Parameter	Units	DRAFT MTCA Levels	Average Soil	Highest Concentration Observed On-site		
				Under Building	Under Sump	Outside Building
Total Metals						
cadmium	ppm	8.0	0.06	130	253	<1
chromium (total)	ppm	---	80	2,700	82,000	45
chromium (hexavalent)	ppm	80.0	---	4.9	13,100	0.51
nickel	ppm	---	80	300	1,500	21
zinc	ppm	500.0	80	1,600	1,600	30
Cyanide	ppm	---	ND	32	131	0.9
Halogenated Volatiles *						
1,1-dichloroethene	ppm	---	ND	0.011	ND	ND
cis-1,2-dichloroethene	ppm	---	ND	0.40	ND	0.23
methylene chloride	ppm	0.5	ND	0.15	0.16	ND
tetrachloroethene (PERC)	ppm	0.1	ND	0.56	ND	0.077
trichloroethene (TCE)	ppm	0.5	ND	47	0.7	1.7
trichlorofluoromethane	ppm	---	ND	ND	0.29	ND

Notes:
"ppm" signifies "parts per million" (mg/l) "ND" signifies "Not Detected"
"<" signifies "less than" "---" signifies "no standard found"
* only halogenated volatile compounds detected are listed. See Tables 3 and 4 for a summary of soil testing data.
"DRAFT MTCA Levels" signifies "DRAFT MTCA Compliance Cleanup Levels (March 8-9, 1990)"
Shaded values indicate those concentrations exceeding DRAFT MTCA Compliance Cleanup Levels.
Average soil concentrations for cadmium from EPA document SW-894 (April 1983).
Average Puget Sound Regional soil concentrations for chromium, nickel and zinc from Dexter et. al., 1981, NOAA Technical Memorandum OMPA-13.
On-site borings under building include:
On-site borings under sumps include:
On-site borings outside building include:

REFERENCE: USGS 7.5' TOPOGRAPHIC QUADRANGLE MAP "SEATTLE SOUTH, WASH."

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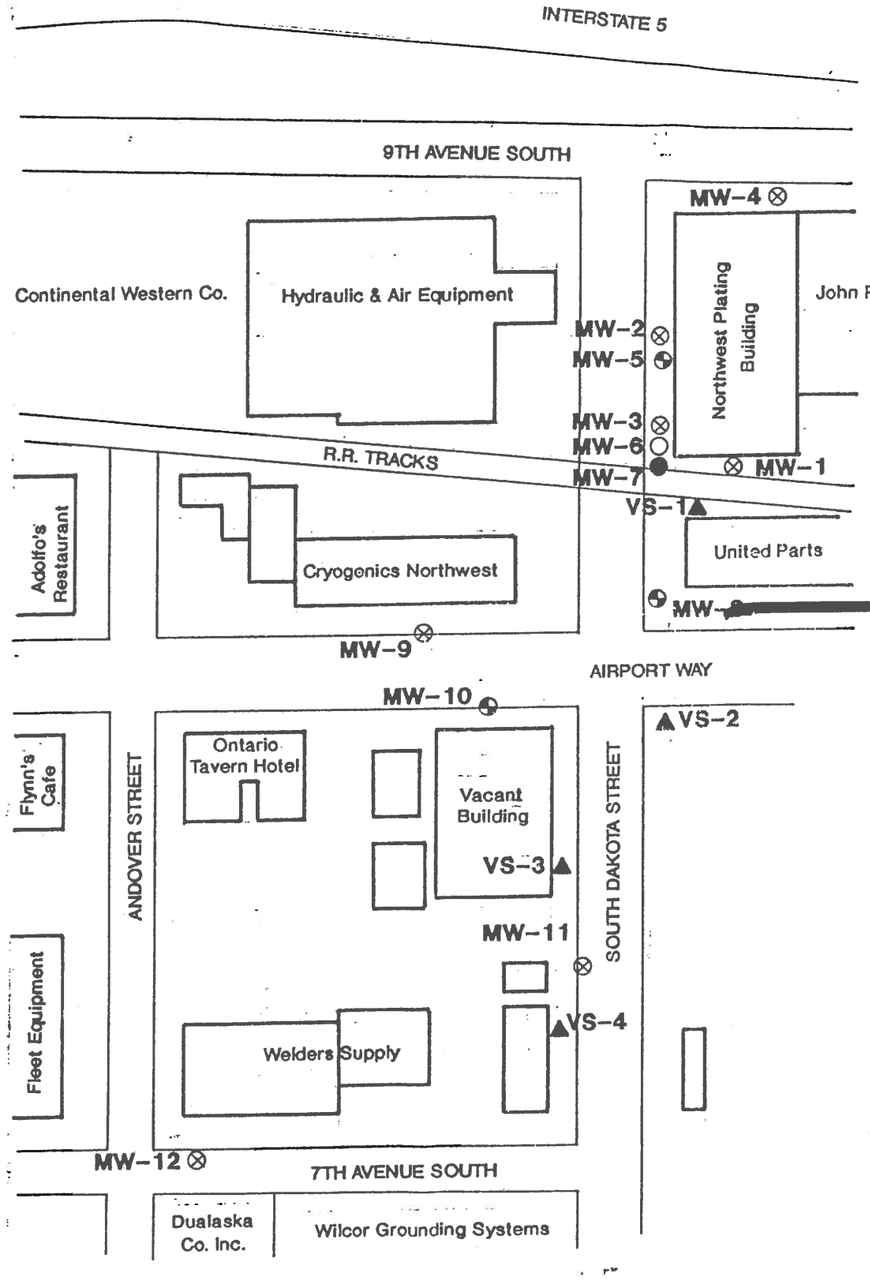
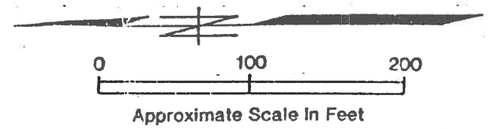
VICINITY MAP

FIGURE 1

NWP 0087

1331-01-4 SCP:KKT 5-4-89





EXPLANATION:

MW-1 ⊗ SHALLOW MONITOR WELL LOCATION & NUMBER (WELL SCREEN INSTALLED NO DEEPER THAN 15 FEET)

MW-5 ⊖ MEDIUM DEPTH MONITOR WELL LOCATION AND NUMBER (WELL SCREEN INSTALLED FROM 20 TO 25 FEET)

MW-7 ● DEEP MONITOR WELL LOCATION AND NUMBER (WELL SCREEN INSTALLED FROM 34 TO 39 FEET)

MW-6 ○ ABANDONED MONITOR WELL LOCATION AND (WELL WAS SEALED WITH CEMENT AND BENTONITE GROUT)

VS-1 ▲ VAPOR SAMPLE LOCATION AND NUMBER

1531-002-804 CSL:KKT 10-30

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GENERAL SITE PLAN AND EXPLORATION LOCATIONS

FIGURE 2

NWP 0088

S. DAKOTA STREET

MW-7 ●
MW-3 ⊗
MW-5 ◒
⊗ MW-2
Planter
Sand Blast Area
Lab
MW-18 ⊗
Chrome Area
Shipping And Receiving and Quality Assurance Areas
Office
Planter
MW-17 ⊗
Polishing Room
MW-19 ⊗
Soil Based Sump
Zinc Line
N
Cadmium Line
S
MW-1 ⊗
MW-15 ⊗
Hand Coat Tank
MW-14 ⊗
TP-3 ■
TP-2 ■
Paint and Solvent Storage
Chemical Storage
TCE
Chromium Tank
Paint Shop
TP-1 ■
MW-13 ⊗
⊗ MW-4
MW-16 ⊗
Barrel Line
Paint Booth
Soil Based Sumps
Chromium Strip Tank
sludge
R.R. Tracks
S. 9TH AVENUE

N

0 20 40
SCALE IN FEET

EXPLANATION:

MW-1 ⊗ SHALLOW MONITOR WELL LOCATION AND NUMBER

MW-5 ◒ MEDIUM DEPTH MONITOR WELL LOCATION AND NUMBER

MW-7 ● DEEP MONITOR WELL LOCATION AND NUMBER

TP-1 ■ SOIL SAMPLING LOCATION AND NUMBER

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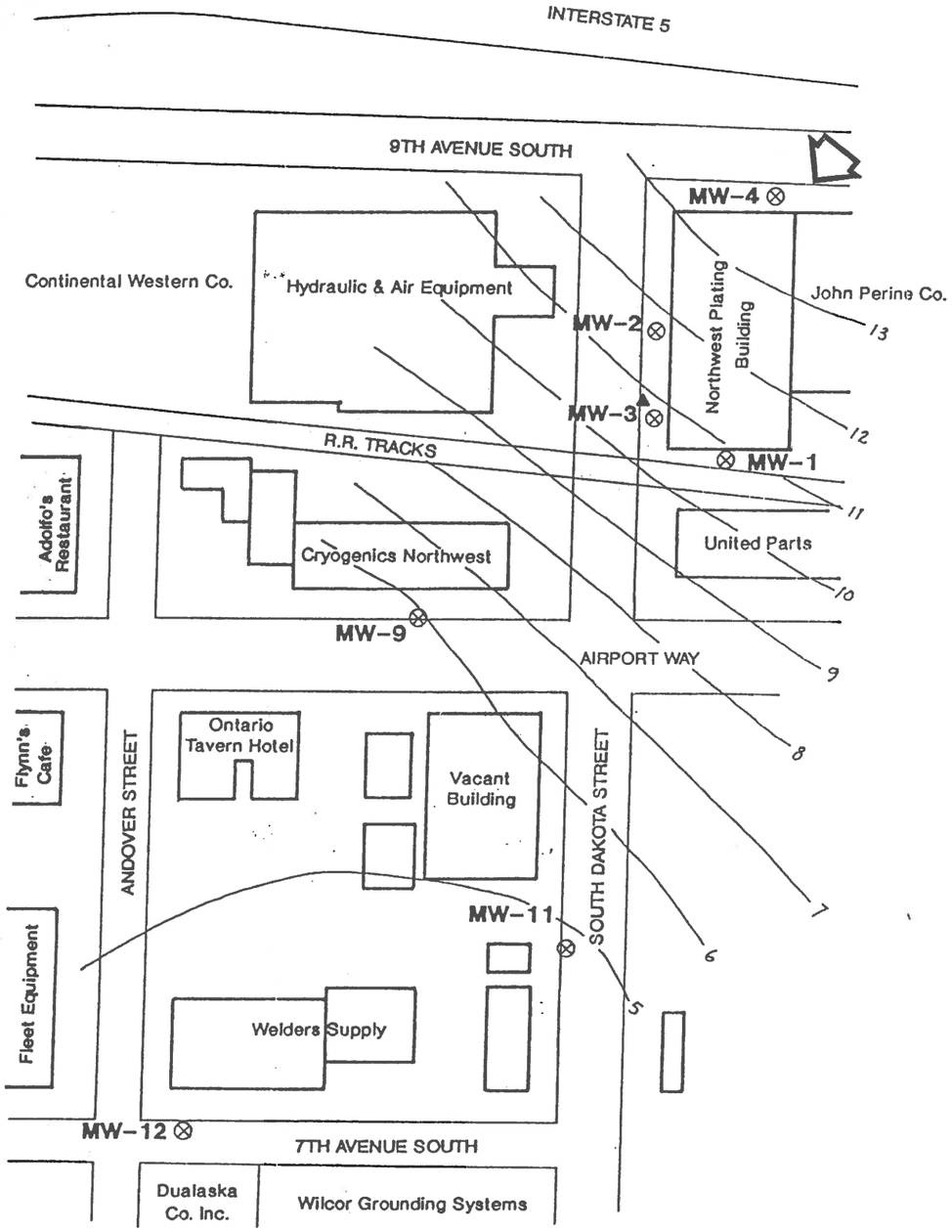
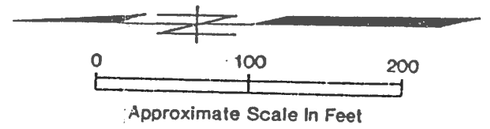
BUILDING SITE PLAN AND EXPLORATION LOCATIONS

FIGURE 3

NWP 0089





EXPLANATION:

MW-1 ⊗ SHALLOW MONITOR WELL LOCATION & NUMBER (WELL SCREEN INSTALLED NO DEEPER THAN 15 FEET)

5 GROUND WATER ELEVATION CONTOUR (FEET)

GENERAL DIRECTION OF GROUND WATER FLOW

▲ BENCHMARK LOCATED AT CENTER OF CATCH BASIN. ELEVATION ASSUMED AT 20.00 FEET.

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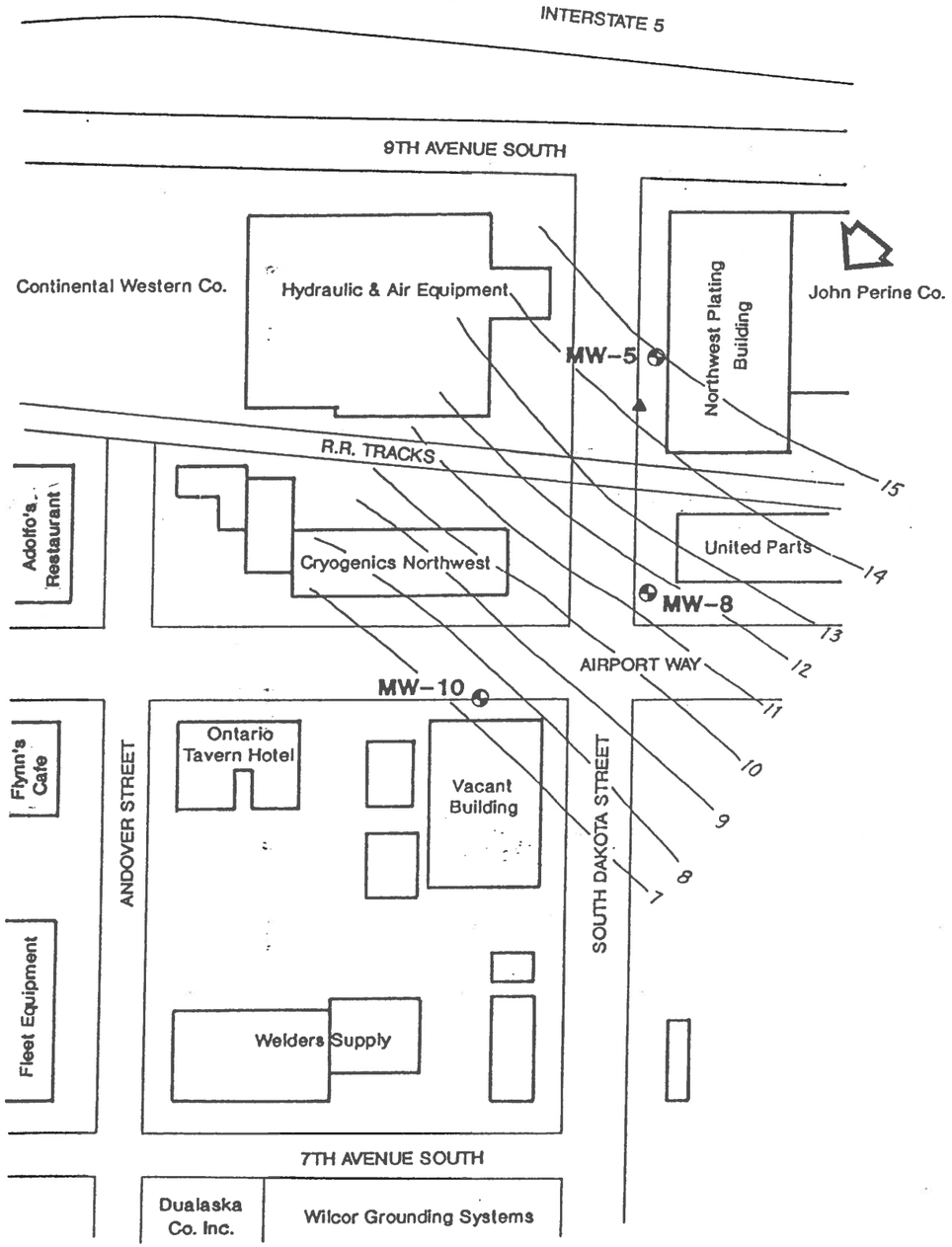
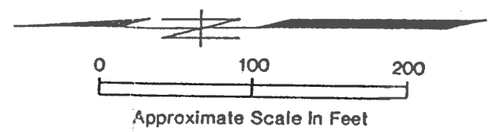
GROUND WATER FLOW DIRECTION – SHALLOW AQUIFER

FIGURE 4

NWP 0090





EXPLANATION:

MW-5 ⊕ MEDIUM DEPTH MONITOR WELL LOCATION AND NUMBER (WELL SCREEN INSTALLED FROM 20 TO 25 FEET)

7 MEDIUM DEPTH AQUIFER ELEVATION CONTOUR (FEET)

GENERAL DIRECTION OF WATER FLOW

▲ BENCHMARK LOCATED AT CENTER OF CATCH BASIN. ELEVATION ASSUMED AT 20.00 FEET.

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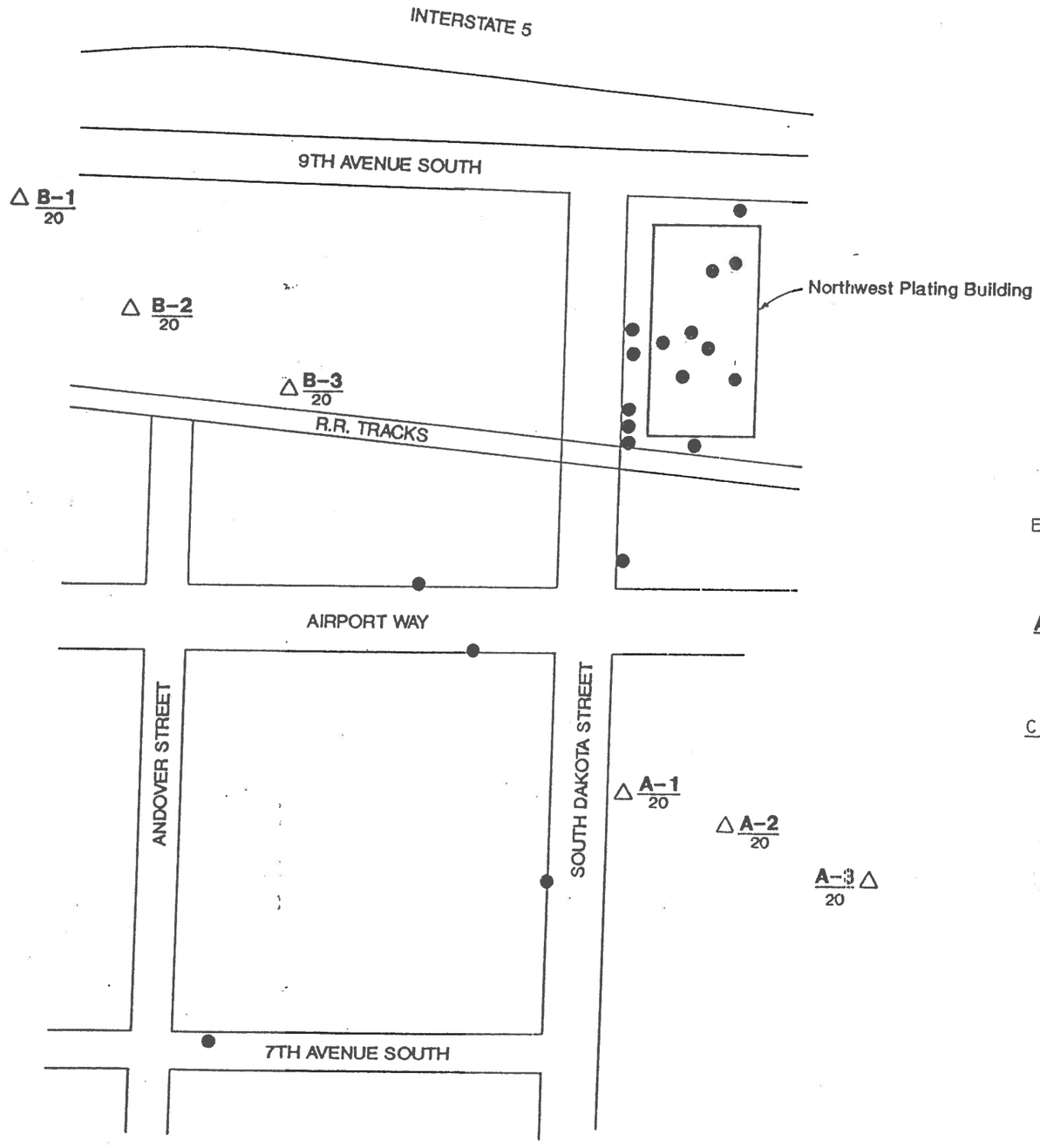
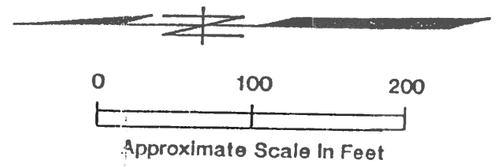
GROUND WATER FLOW DIRECTION – MEDIUM DEPTH AQUIFER

FIGURE 5

NWP 0091

1351-002 SC4 LSL·RKF 10-30 89.





EXPLANATION:

- ● EXPLORATIONS ADVANCED BY GEOENGINEERS (SEE FIGURES 2 AND 3).
- A-1/20 △ EXPLORATIONS ADVANCED BY OTHERS, CITATION, BORING NUMBER AND TOTAL DEPTH IN FEET

CITATIONS

A) SOIL INVESTIGATION FOR DOUGLAS MULVANNY ARCHITECTS BY CARLSON CONSTRUCTION CONSULTANTS, INC. (UNDATED, APPROX. 1972) CITY OF SEATTLE PERMIT NO 547391

B) SOIL INVESTIGATION FOR CHARLES YONSIFRAN BY CARLSON CONSTRUCTION CONSULTANTS, INC. (10/11/72) CITY OF SEATTLE PERMIT 547688

C) SOIL INVESTIGATION FOR SINCLAIR AND VALENTINE BY GEOENGINEERS, INC. (6/6/83) CITY OF SEATTLE ENGINEERING DEPT. ARCHIVE NO. 10452

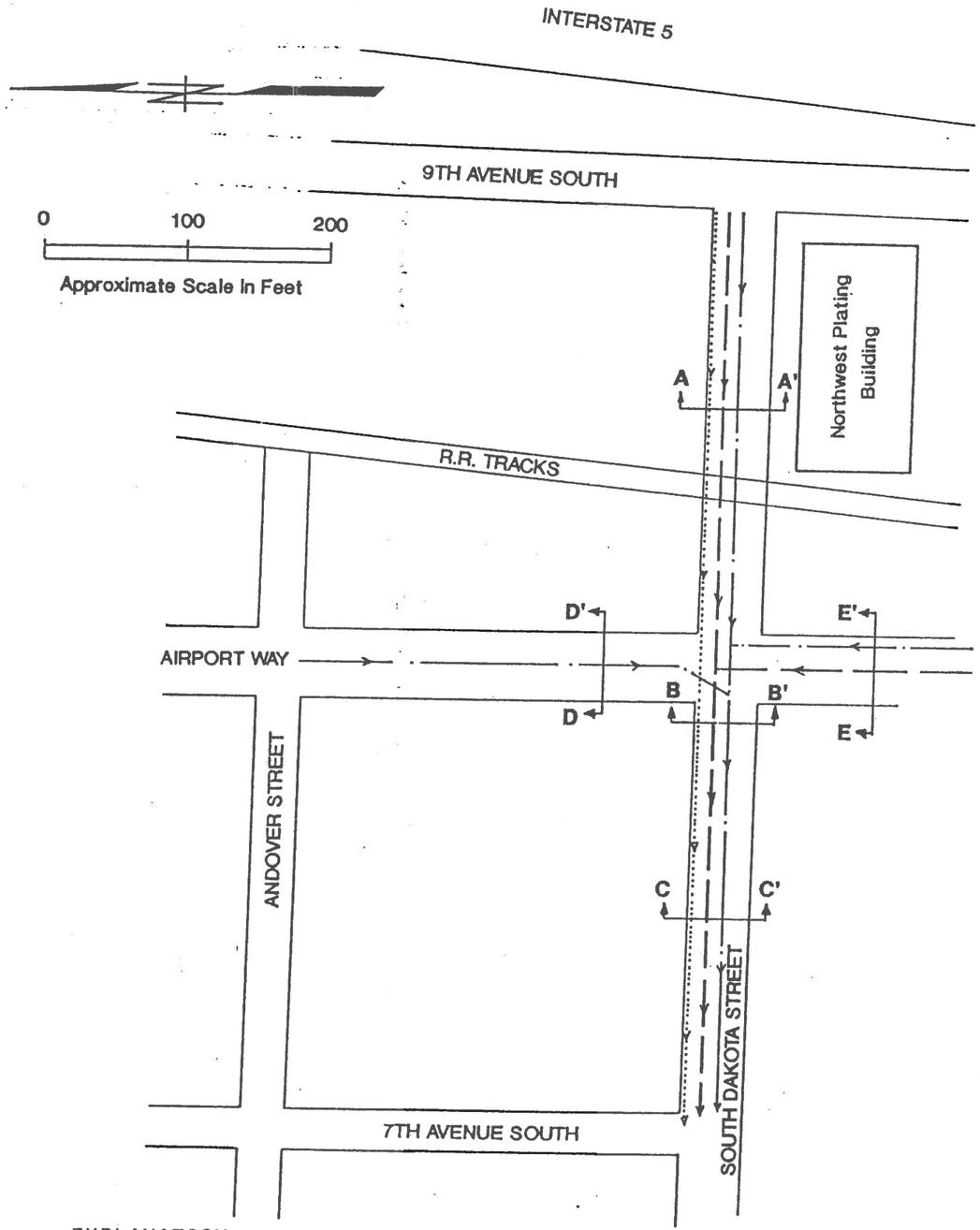
GeoEngineers

SOIL EXPLORATIONS BY OTHERS

FIGURE 6.

NWP 0092

1537.001.004 JOP:KST 4.7.90



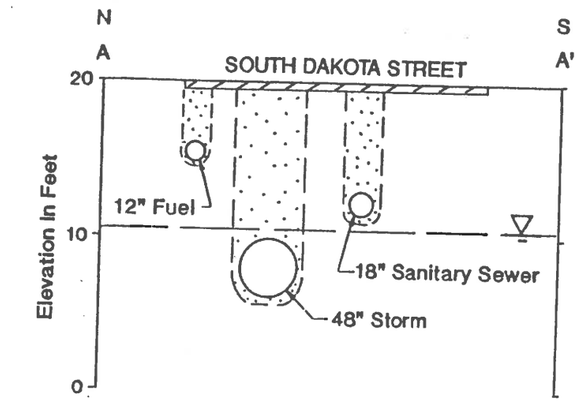
EXPLANATION:

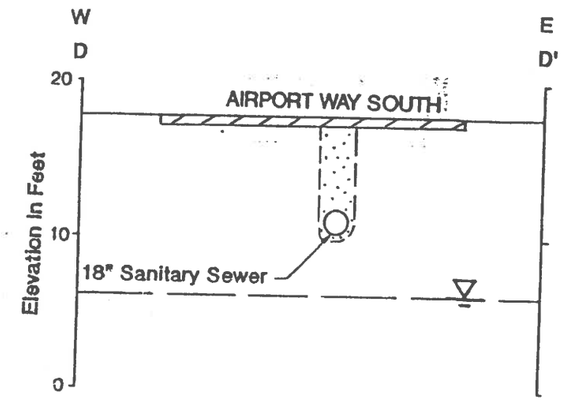
SANITARY SEWER

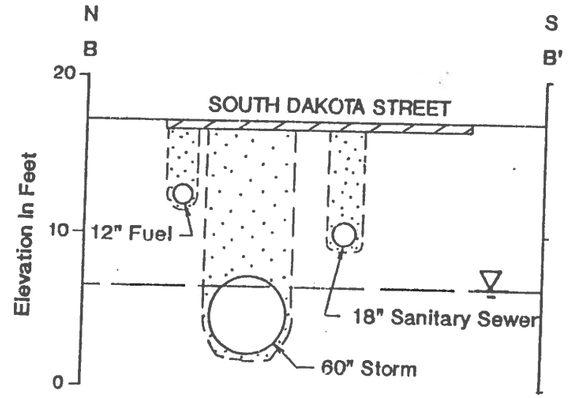
STORM SEWER

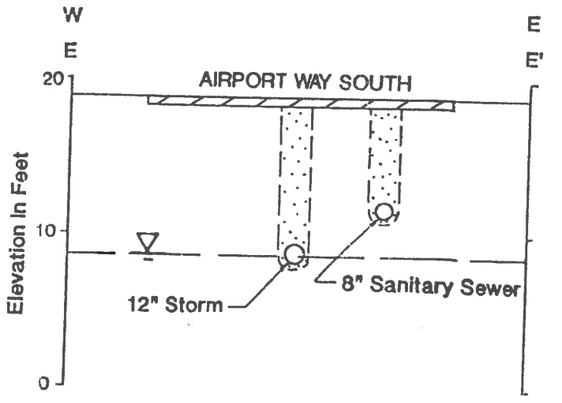
FUEL (OLYMPIC PIPE LINE COMPANY).

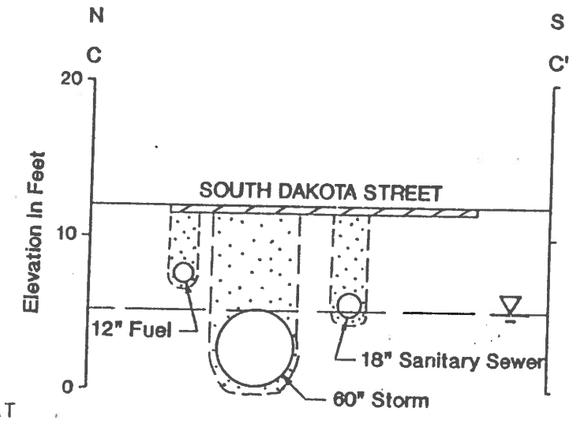
NOTE: ONLY THOSE UTILITIES PRESENT AT DEPTHS OF FIVE FEET OR MORE ARE SHOWN (TELEPHONE, WATER, ELECTRICAL, NATURAL GAS, ETC. ARE NOT SHOWN.











EXPLANATION:

APPROXIMATE GROUND WATER ELEVATION ON 9/21/89

THE SHAPE OF UTILITY TRENCHES IS PRESENTED IN SCHEMATIC FORM AND DOES NOT NECESSARILY REPRESENT ACTUAL CONDITIONS.
PIPE DIAMETERS AND DEPTHS ARE SHOWN TRUE RELATIVE TO THE VERTICAL SCALE.
ELEVATIONS ARE REFERENCED TO GEI DATUM.

SCALE FOR CROSS SECTIONS

HORIZONTAL SCALE: 1" = 25'
VERTICAL SCALE : 1" = 10'

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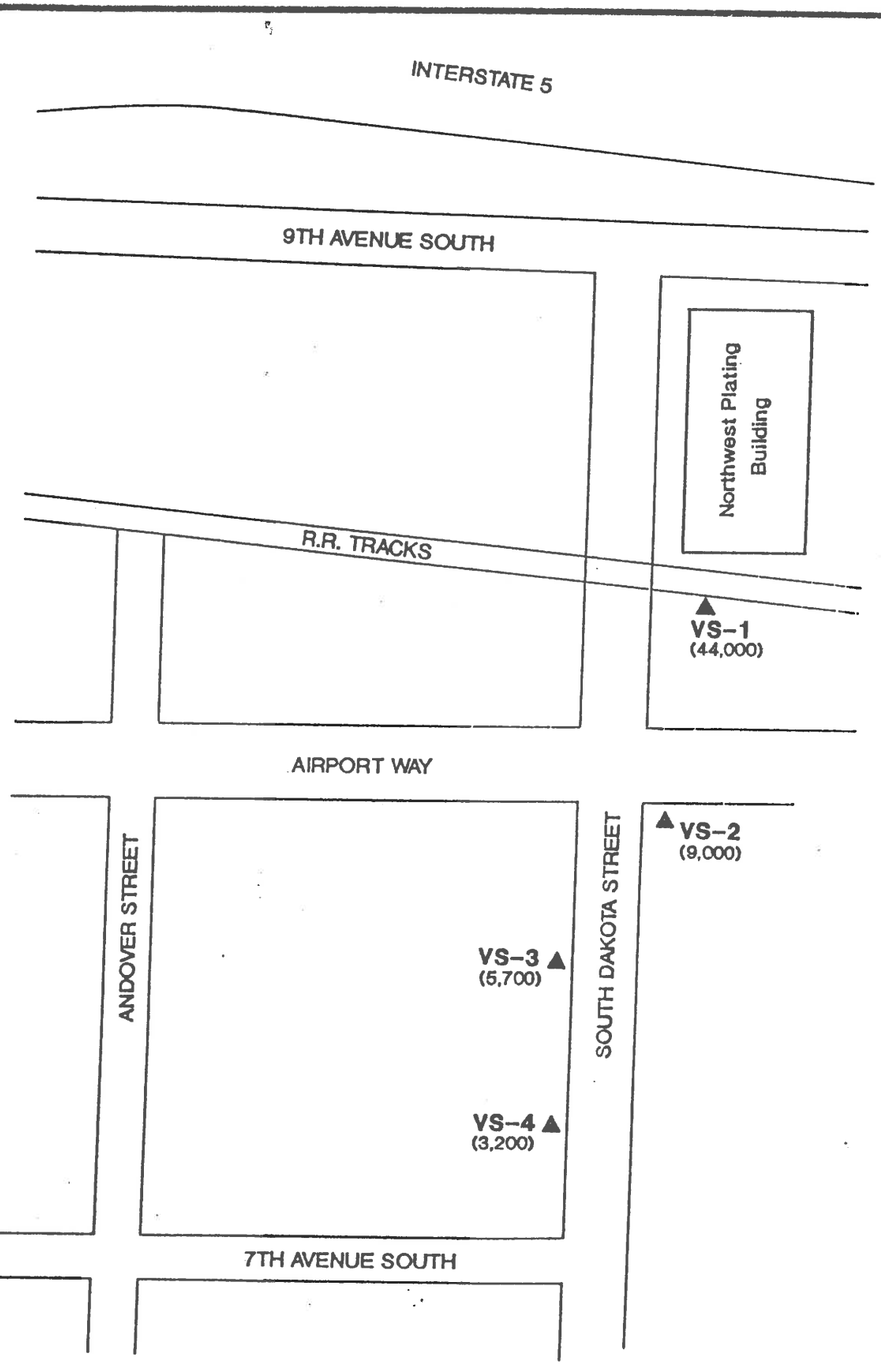
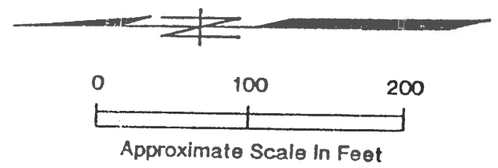
SUBSURFACE UTILITES

FIGURE 7

NWP 0093

1551-002-804 SCP:KT 2.16.90





EXPLANATION:

VS-1 (44,000) ▲ = VAPOR SAMPLE LOCATION AND NUMBER
TRICHLOROETHENE CONCENTRATION (PPB, VOL/VOL)

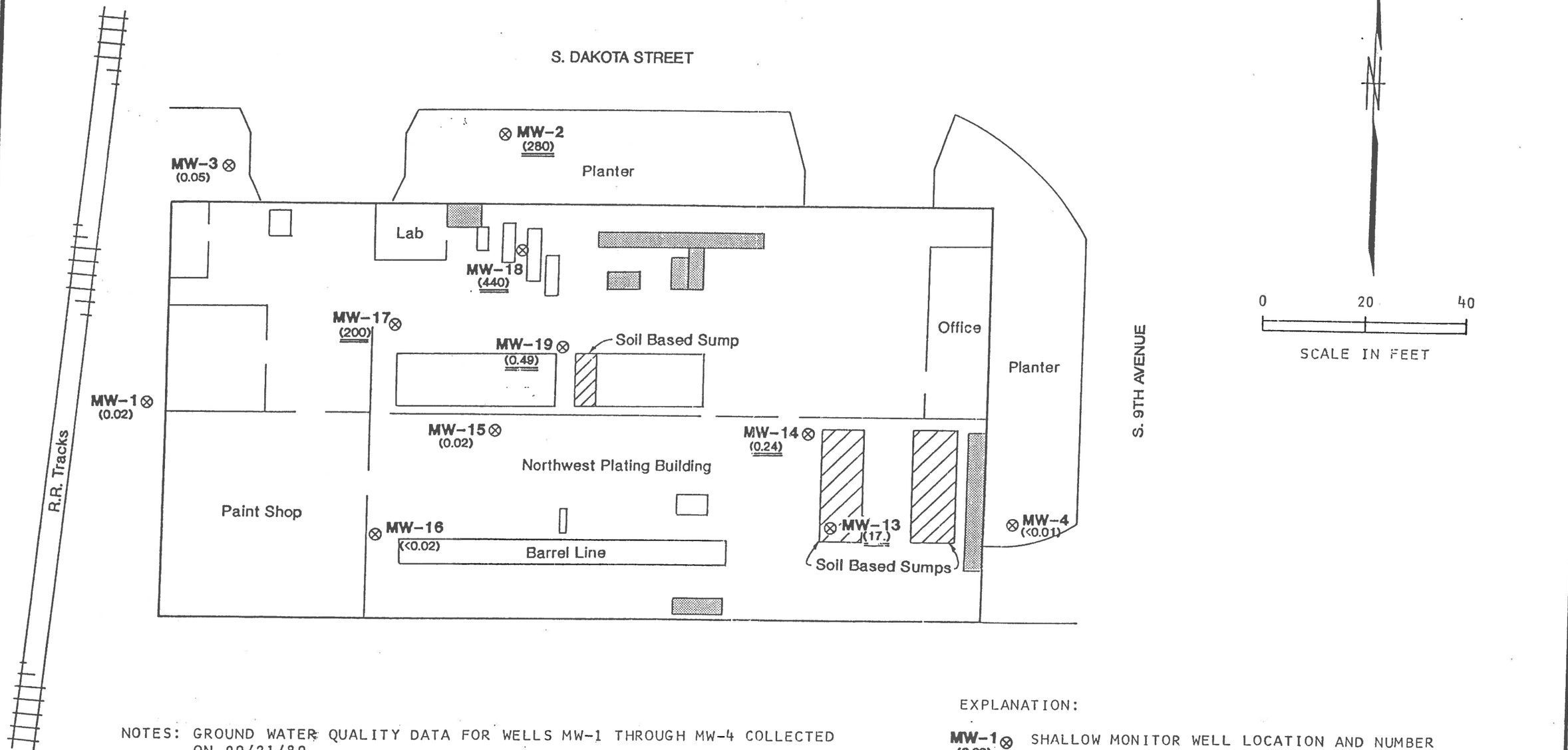
Geo Engineers

SOIL VAPOR CONCENTRATIONS – TRICHLOROETHENE

FIGURE 8

NWP 0094

1531-002-804 SCP: KKT 2-7-90



NOTES: GROUND WATER QUALITY DATA FOR WELLS MW-1 THROUGH MW-4 COLLECTED ON 09/21/89.

GROUND WATER QUALITY DATA FOR WELLS MW-13 THROUGH MW-19 COLLECTED ON 10/11/89.

ALL VALUES REPORTED AS PPM.

UNDERLINED CONCENTRATIONS, IE. (280), EXCEED CURRENT REGULATORY ACTION CONCENTRATIONS.

EXPLANATION:

MW-1 (0.02) ⊗ SHALLOW MONITOR WELL LOCATION AND NUMBER TOTAL CHROMIUM CONCENTRATION (PPM)

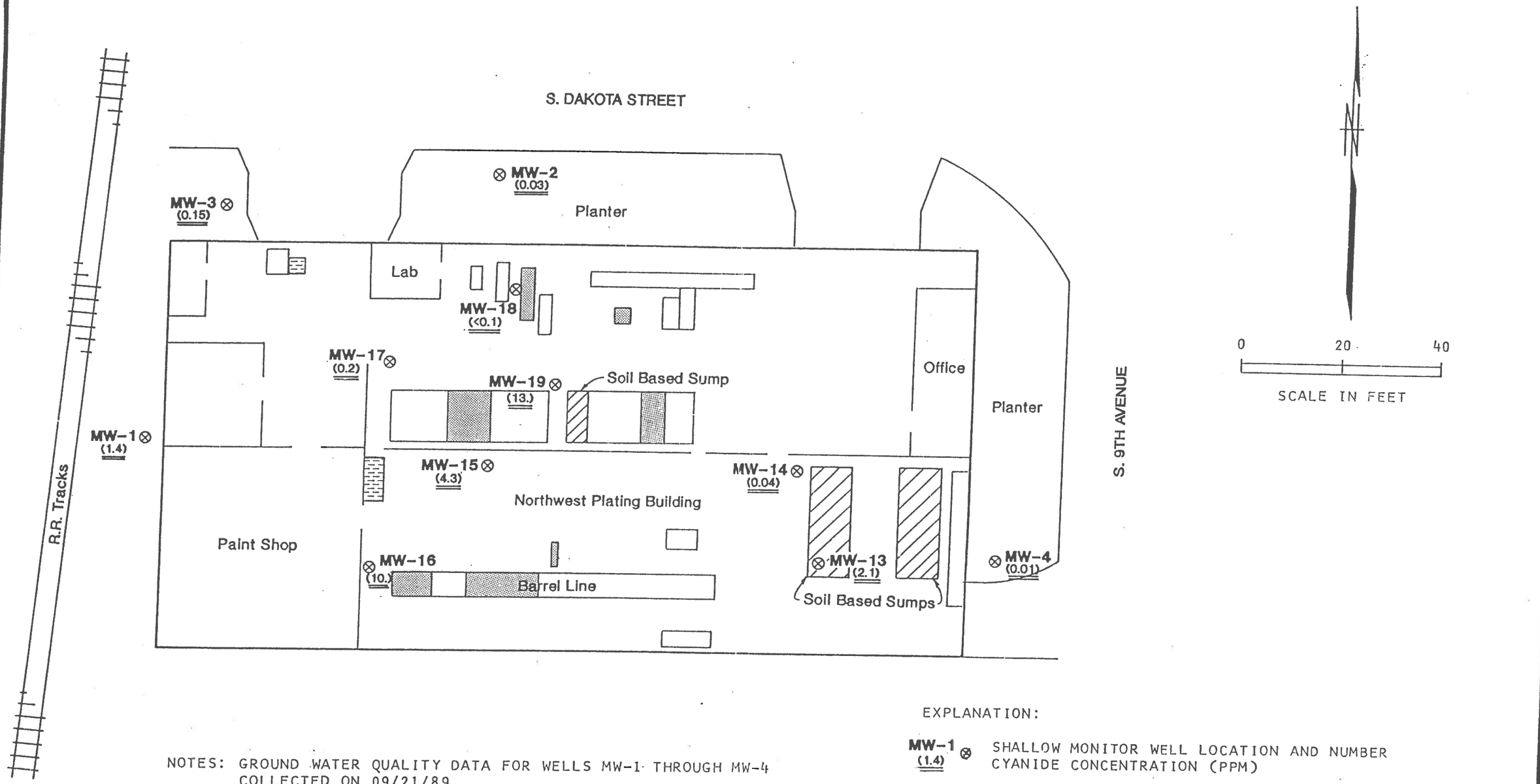
▨ POTENTIAL SOURCE OF CHROMIUM CONTAMINATION

Geo Engineers

DISTRIBUTION OF CHROMIUM IN GROUND WATER – BUILDING AREA

FIGURE 9

NWP 0095



NOTES: GROUND WATER QUALITY DATA FOR WELLS MW-1 THROUGH MW-4 COLLECTED ON 09/21/89.

GROUND WATER QUALITY DATA FOR WELLS MW-13 THROUGH MW-19 COLLECTED ON 10/11/89.

ALL VALUES REPORTED AS PPM.

UNDERLINED CONCENTRATIONS, IE. (10.), EXCEED CURRENT REGULATORY ACTION CONCENTRATIONS.

EXPLANATION:

MW-1 (1.4) ⊗ SHALLOW MONITOR WELL LOCATION AND NUMBER CYANIDE CONCENTRATION (PPM)

POTENTIAL SOURCE OF AQUEOUS CYANIDE CONTAMINATION

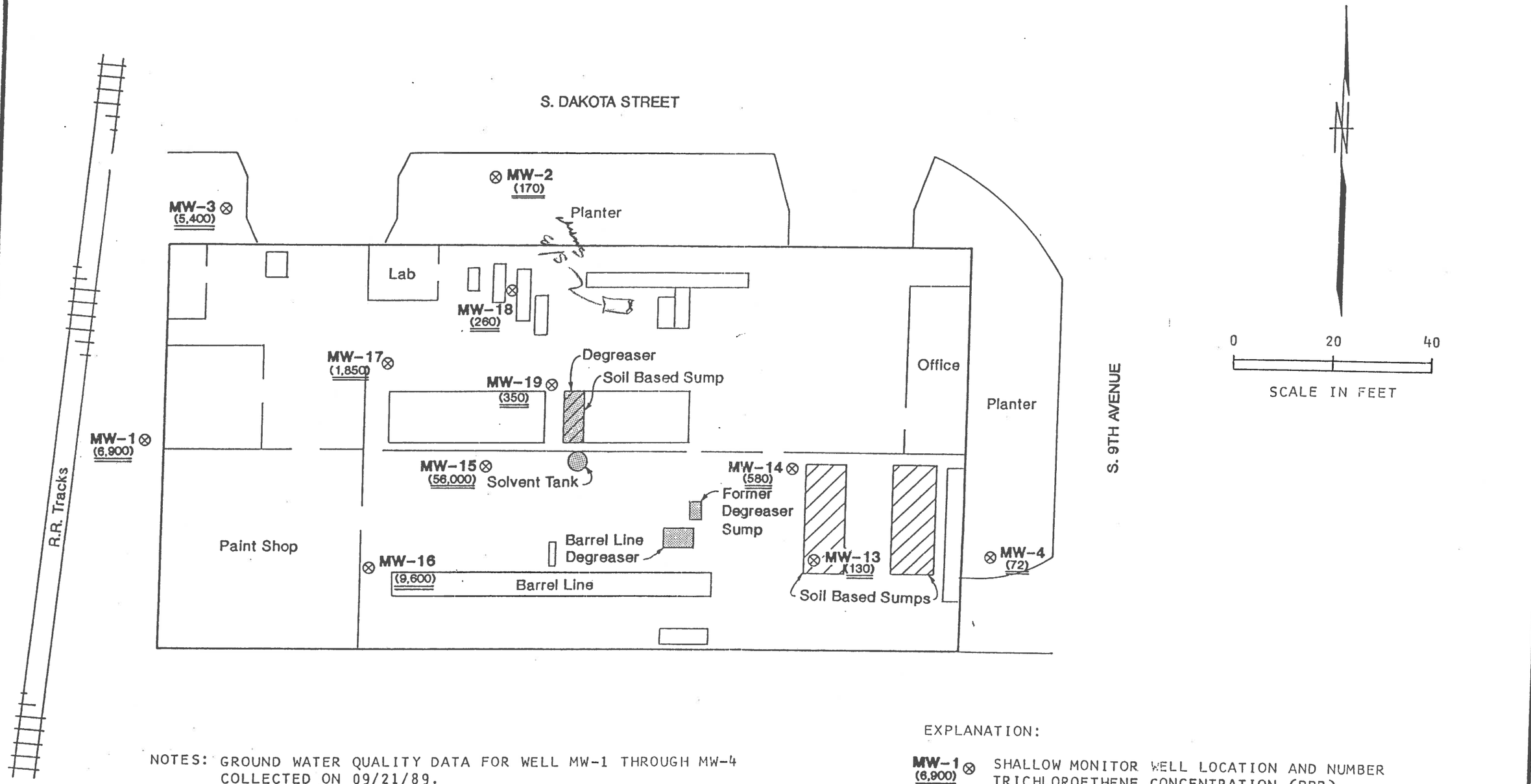
STORAGE AREAS FOR NON-AQUEOUS CYANIDE

Geo Engineers

DISTRIBUTION OF CYANIDE IN GROUND WATER – BUILDING AREA

FIGURE 10

NWP 0096



NOTES: GROUND WATER QUALITY DATA FOR WELL MW-1 THROUGH MW-4 COLLECTED ON 09/21/89.

GROUND WATER QUALITY DATA FOR WELLS MW-13 THROUGH MW-19 COLLECTED ON 10/11/89.

ALL VALUE REPORTED IN PPB.

UNDERLINED CONCENTRATIONS, IE. (72), EXCEED CURRENT REGULATORY ACTION CONCENTRATIONS.

EXPLANATION:

MW-1 (6,900) ⊗ SHALLOW MONITOR WELL LOCATION AND NUMBER TRICHLOROETHENE CONCENTRATION (PPB)

▨ POTENTIAL SOURCE OF TCE CONTAMINATION

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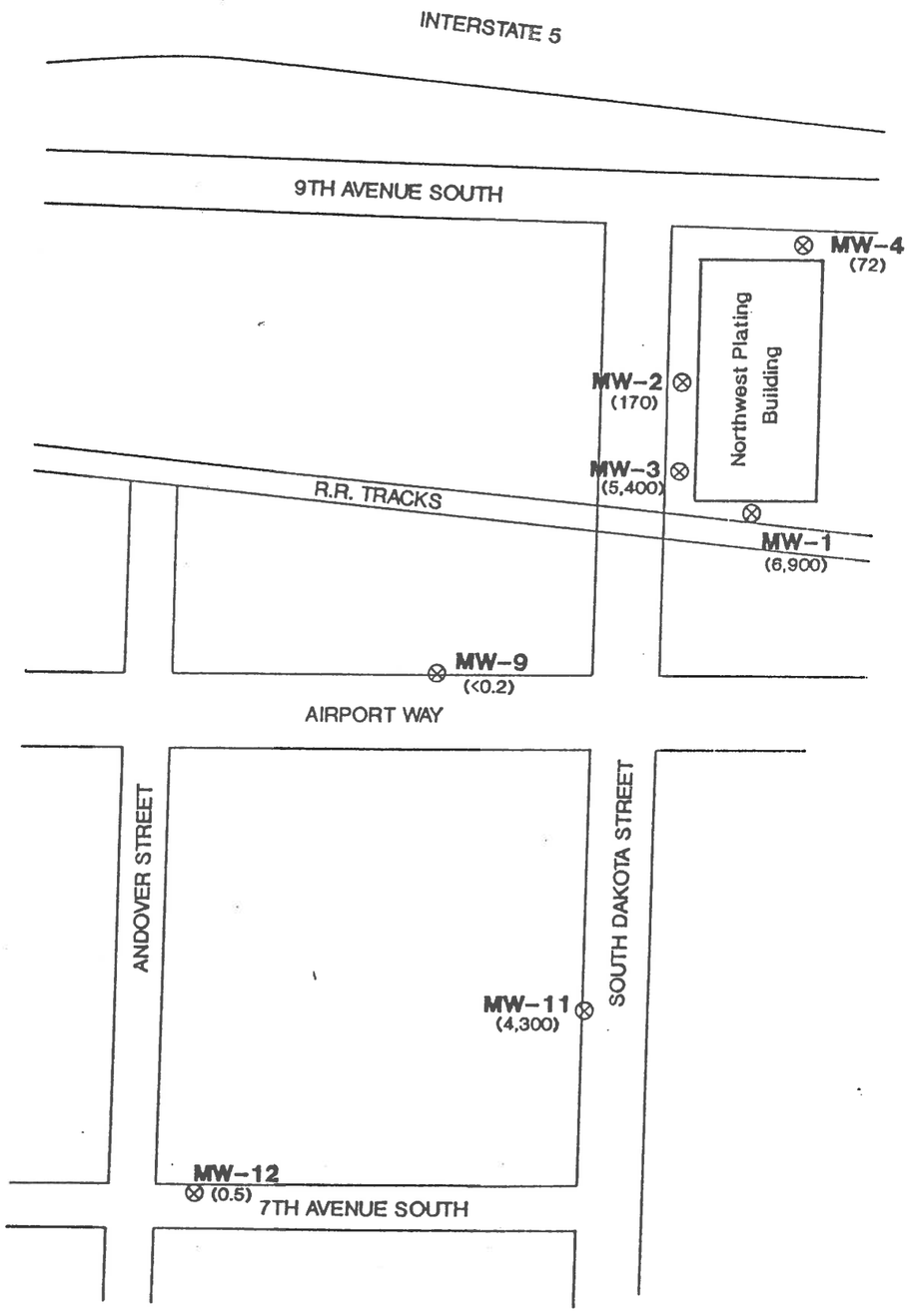
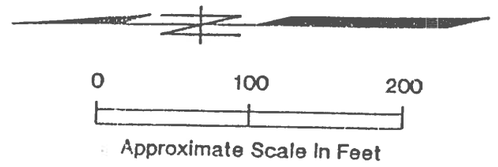
DISTRIBUTION OF TCE IN GROUND WATER – BUILDING AREA

FIGURE 11

NWP 0097





EXPLANATION:

MW-1 (6,900) ⊗ SHALLOW MONITOR WELL LOCATION AND NUMBER (WELL SCREEN INSTALLED NO DEEPER THAN 15 FEET)

Geo Engineers

DISTRIBUTION OF TCE IN GROUND WATER – SHALLOW AQUIFER

FIGURE 12

NWP 0098

1531-001-804 SCP:KKT 2-7-90

APPENDIX A

FIELD EXPLORATIONS AND CHEMICAL ANALYTICAL PROGRAM

A P P E N D I X A

FIELD EXPLORATIONS

DRILLING AND SOIL SAMPLING PROGRAM

Subsurface conditions both on and off site were explored during our phase one and phase two studies by (1) drilling 11 power borings using hollow-stem auger methods, (2) drilling seven hand-auger borings, (3) collecting four soil vapor samples and (4) collecting soil samples from the base of sumps. Three on-site hollow-stem auger boring were drilled on March 18, 1989 using drilling equipment owned and operated by R&R Drilling, Inc. Three on-site and eight off-site hollow-stem auger borings were drilled between September 6 and September 12, 1989 using drilling equipment owned and operated by GeoBoring and Development, Inc. The drilling and soil sampling equipment was cleaned with a hot-water pressure washer between each boring.

A hydrogeologist from our staff determined the power and hand boring locations, examined and classified the soils encountered, and prepared a detailed log of each boring. Soils encountered were classified visually in general accordance with ASTM D-2488-83, which is described in Figure A-1. An explanation of the boring log symbols is presented in Figure A-2. Power boring logs are given in Figures A-3 through A-14. Hand-auger boring logs are given in Figures A-15 through A-21.

Relatively undisturbed soil samples were obtained from each power boring using a Dames & Moore split-barrel sampler (2.4-inch-ID). The sampler was driven 18 inches by a 300-pound weight falling a vertical distance of approximately 30 inches. The number of blows needed to advance the sampler the final 12 inches is indicated to the left of the corresponding sample notations on the boring logs.

Selected soil samples from the power and hand-auger borings were submitted to Analytical Technologies Inc. for analysis of metals (Cd, Cr, Cr^{+6}, Ni and Zn), halogenated volatile compounds (EPA Method 8010), cyanide, and EP Toxicity Test (metals only). The soil samples tested are denoted in our boring logs with a "CA." Chain-of-custody procedures were followed in transporting the soil samples to the laboratory.

MONITOR WELL CONSTRUCTION

Two-inch-diameter, Schedule 40 PVC pipe was installed in each boring at the completion of drilling. The lower portion of the PVC pipe is machine slotted (0.020-inch slot width) to allow entry of ground water into the well casings. Fine gravel or a coarse to medium sand was placed in the borehole annulus surrounding the slotted portion of the wells. The well casings are protected with flush-grade surface monuments. Monitor well construction is indicated in Figure A-3 through A-21.

The monitor well screens were developed by removing water from the wells with a stainless steel bailer. We determined the elevations of the well casings to the nearest 0.01 foot with an engineer's level on March 23, September 11 and October 11, 1989. An elevation datum of 20.00 feet was assumed at the center of a catch basin located near the northwest corner of the building. Elevations referenced to this datum are included on the monitor well logs.

GROUND WATER ELEVATIONS

The depth to ground water relative to the monitor well casing rims was measured on March 23, September 21 and October 11, 1989. The site measurements were made using a weighted fiberglass tape and water-finding paste. The tape was cleaned prior to use at each well with a trisodium phosphate wash and a distilled water rinse. Ground water elevations were calculated by subtracting the water table depth from the casing rim elevations.

GROUND WATER SAMPLING PROGRAM

Ground water samples were collected from the monitor wells by GeoEngineers on March 23, September 21 and October 11, 1989. The water samples were collected with a teflon bailer after at least three well volumes of water were removed from each well casing. The bailer was cleaned prior to each sampling attempt with a fresh water rinse, trisodium phosphate wash, and a distilled water rinse.

The ground water samples obtained for analysis of dissolved metals on March 23, 1989 were filtered through a membrane filter with a pore size of 45 microns and preserved with nitric acid in the field by GeoEngineers. The remaining water samples were filtered by ATI. Ground water samples were

transferred to appropriate containers provided by the analytical laboratory. Samples were kept cool during transport to the testing laboratory. Standard chain-of-custody methods were used in labeling and transporting the water samples to the laboratory.

CHEMICAL ANALYTICAL PROGRAM

Nineteen water samples, 17 soil samples, and four vapor samples were submitted to Analytical Technologies, Inc. for analysis. Soil and ground water samples were analyzed for halogenated volatile compounds using EPA Method 8010, cyanide using EPA Method 9012, and metals using appropriate standard EPA methods. Vapor samples collected in tedlar bags were analyzed for purgeable halocarbons using EPA Method 8010, modified. Analytical results are presented in Appendix B.

SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE GRAINED SOILS MORE THAN 50% RETAINED ON NO. 200 SIEVE	GRAVEL MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVEL	GW	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	GM	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSES NO. 4 SIEVE	CLEAN SAND	SW	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	SM	SILTY SAND
			SC	CLAYEY SAND
FINE GRAINED SOILS MORE THAN 50% PASSES NO. 200 SIEVE	SILT AND CLAY LIQUID LIMIT LESS THAN 50	INORGANIC	ML	SILT
			CL	CLAY
		ORGANIC	OL	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY LIQUID LIMIT 50 OR MORE	INORGANIC	MH	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	OH	ORGANIC CLAY, ORGANIC SILT
HIGHLY ORGANIC SOILS			PT	PEAT

NOTES:

1. Field classification is based on visual examination of soil in general accordance with ASTM D2488-83.
2. Soil classification using laboratory tests is based on ASTM D2487-83.
3. Descriptions of soil density or consistency are based on interpretation of blowcount data, visual appearance of soils, and/or test data.

SOIL MOISTURE MODIFIERS:

Dry – Absence of moisture, dusty, dry to the touch

Moist – Damp, but no visible water

Wet – Visible free water or saturated, usually soil is obtained from below water table

Geo Engineers

SOIL CLASSIFICATION SYSTEM

FIGURE A-1

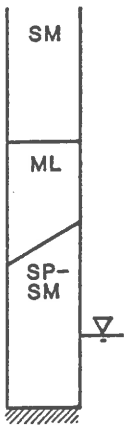
GEI 85-88

NWP 0103

LABORATORY TESTS:

AL	Atterberg limits
CP	Compaction
CS	Consolidation
DS	Direct shear
GS	Grain-size analysis
HA	Hydrometer analysis
K	Permeability
M	Moisture content
MD	Moisture and density
SP	Swelling pressure
TX	Triaxial compression
UC	Unconfined compression
CA	Chemical Analysis

SOIL GRAPH:



Soil Group Symbol (See Note 1)

Distinct contact between Soil Strata

Gradual Change between Soil Strata

Water Level

Bottom of Boring

BLOW-COUNT/SAMPLE DATA:

Blows required to drive Dames & Moore sampler 12 inches or other indicated distances using 300 pound hammer falling 30 inches.

"P" indicates sampler pushed with weight of hammer or hydraulics of drill rig.

22 ■ Location of relatively undisturbed sample

12 ⊠ Location of disturbed sample

P □ Location of sampling attempt with no recovery

10 ◪ Location of sample attempt using Standard Penetration Test procedures

NOTES:

1. Soil classification system is summarized in Figure A-1.
2. The reader must refer to the discussion in the report text as well as the exploration logs for a proper understanding of subsurface conditions.

GEI 86-88 Rev. 1/90

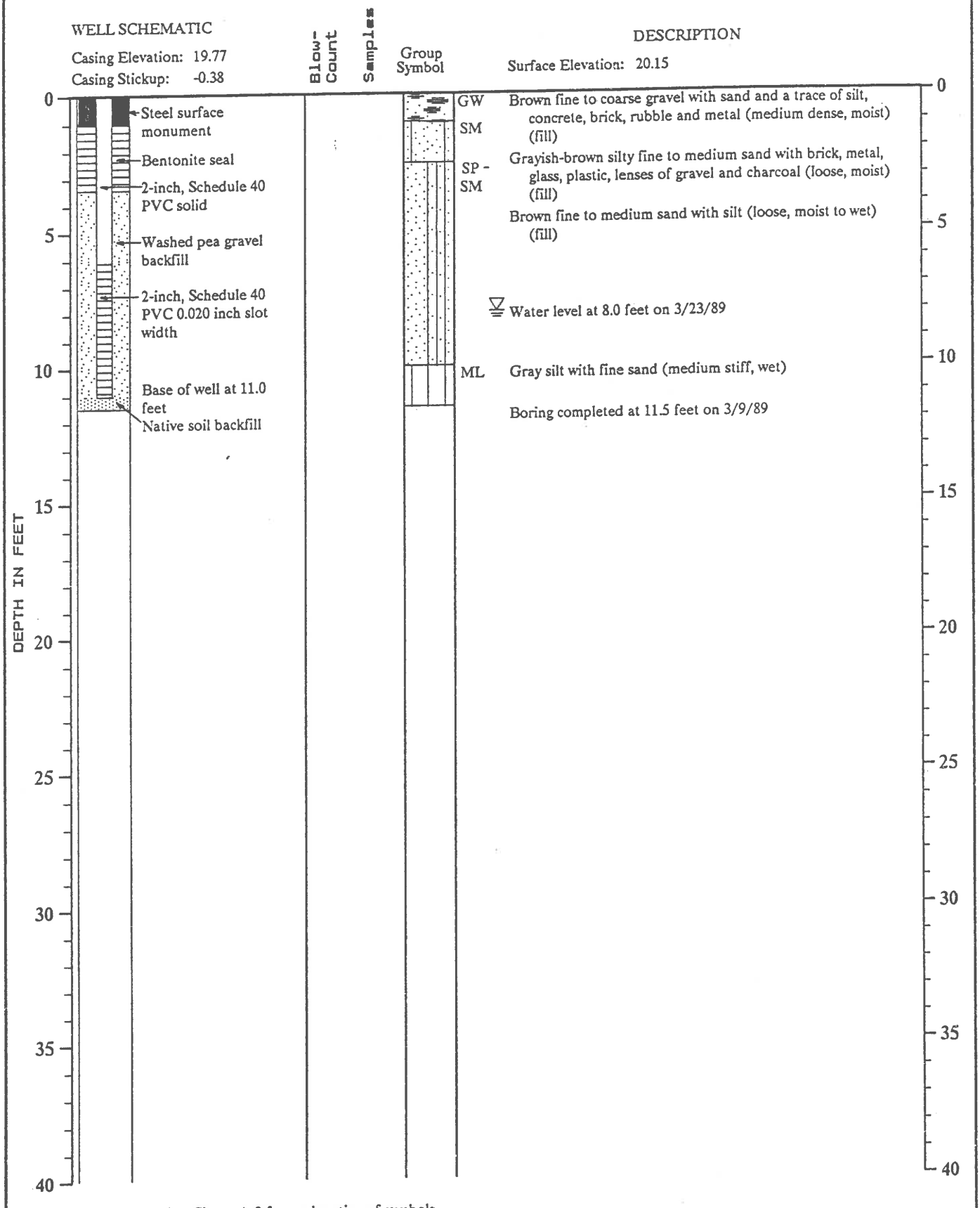
Geo Engineers

KEY TO BORING LOG SYMBOLS

FIGURE A-2

NWP 0104

MONITOR WELL NO. MW-1



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

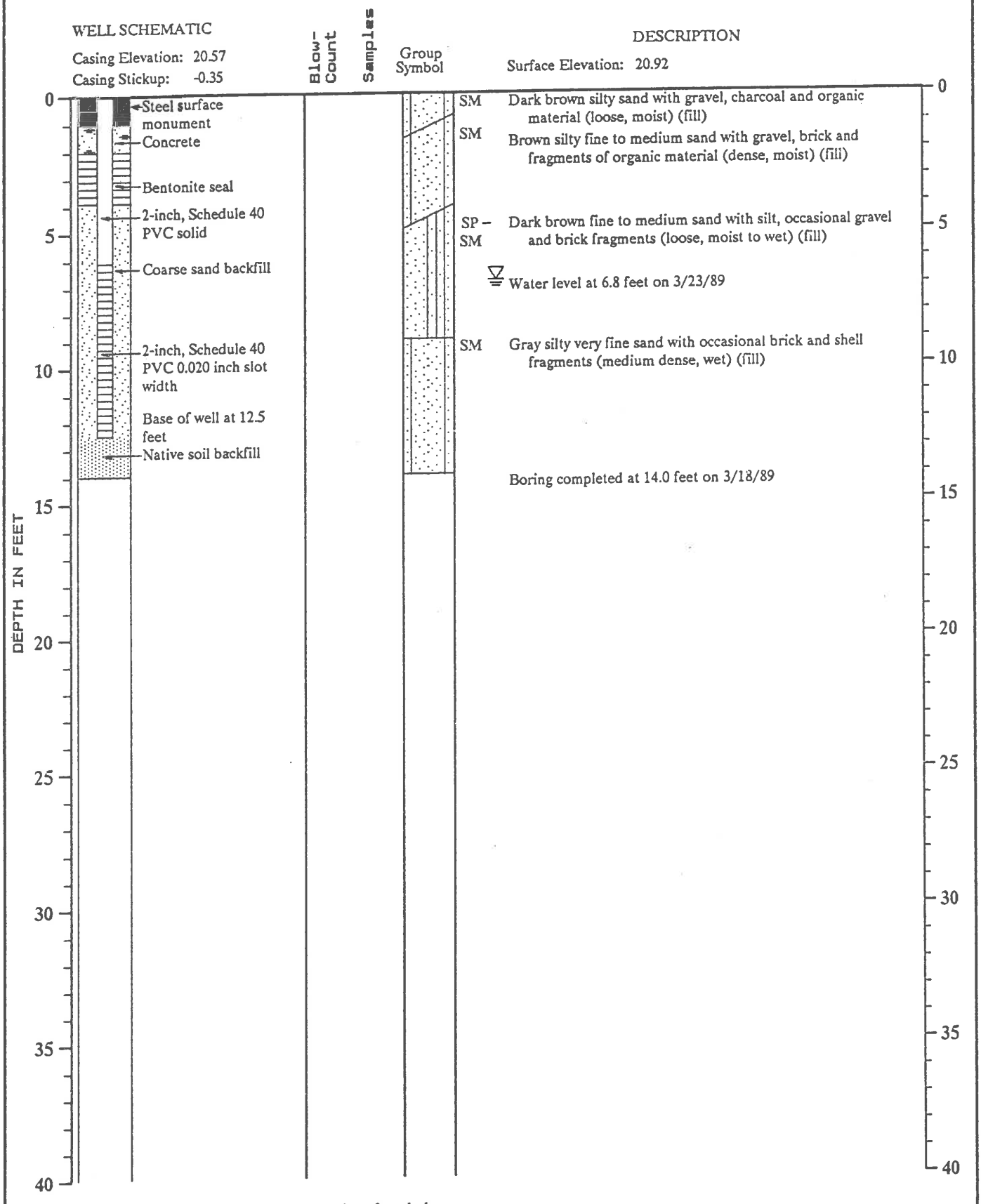
Figure A-3

NWP 0105

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-2



Note: See Figure A-2 for explanation of symbols

Geo Engineers

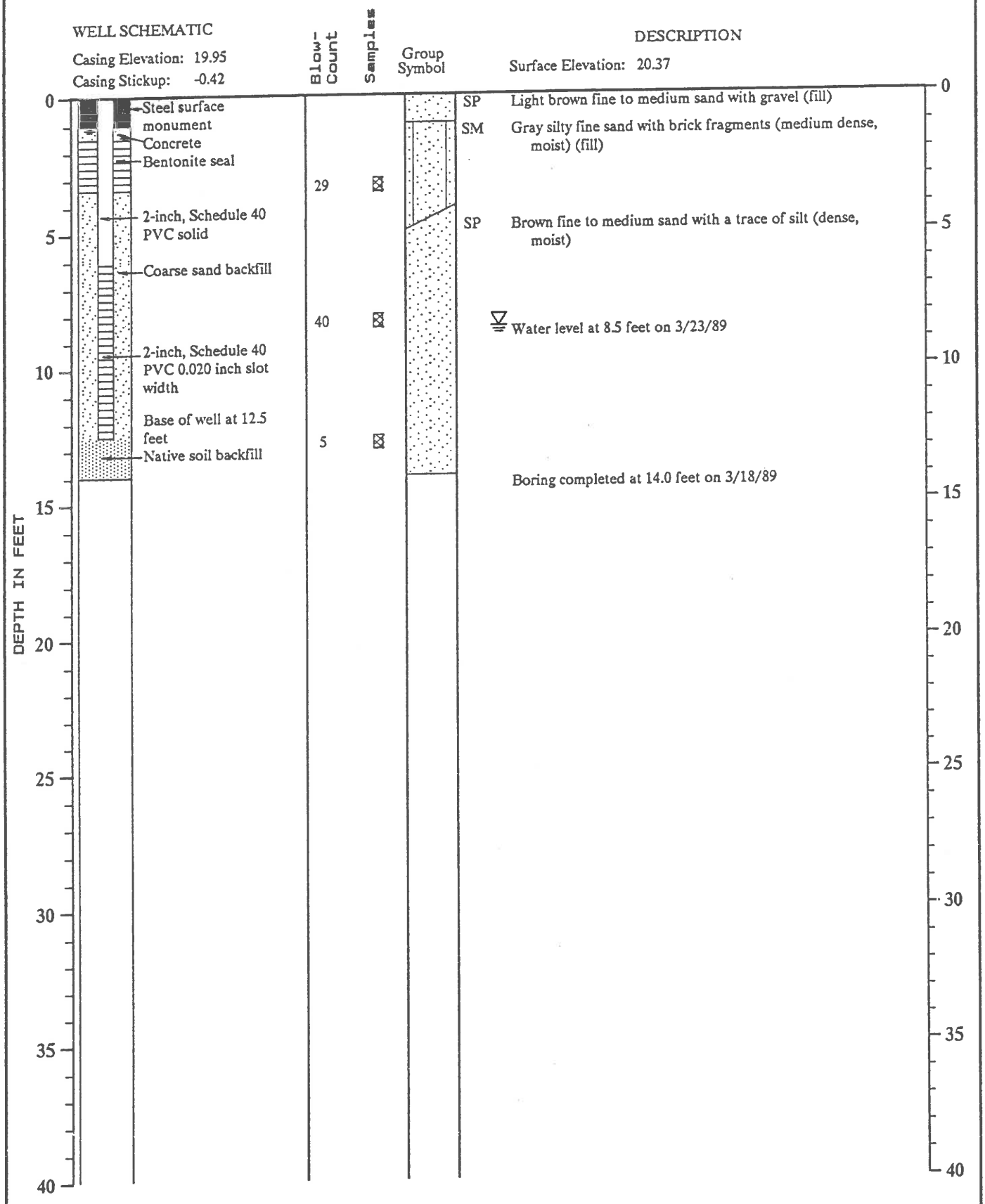
Log of Monitor Well

Figure A-4

NWP 0106

1531-002-B04 :CSL:CDO 2/22/90

MONITOR WELL NO. MW-3



Note: See Figure A-2 for explanation of symbols

Geo Engineers

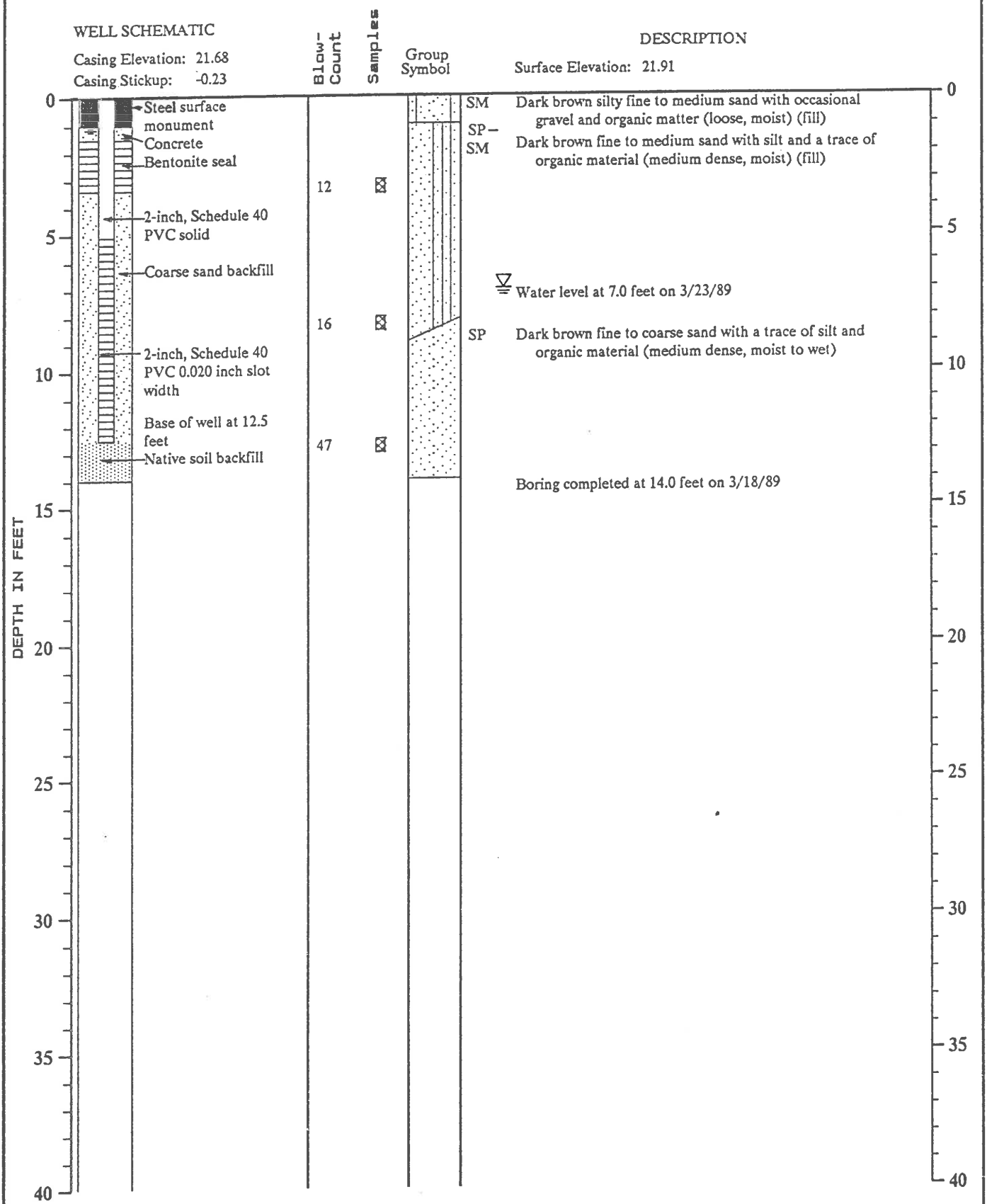
Log of Monitor Well

Figure A-5

NWP 0107

1531-002-B04 :CSL:CDO 2/22/90

MONITOR WELL NO. MW-4



Note: See Figure A-2 for expianation of symbols

Geo Engineers

Log of Monitor Well

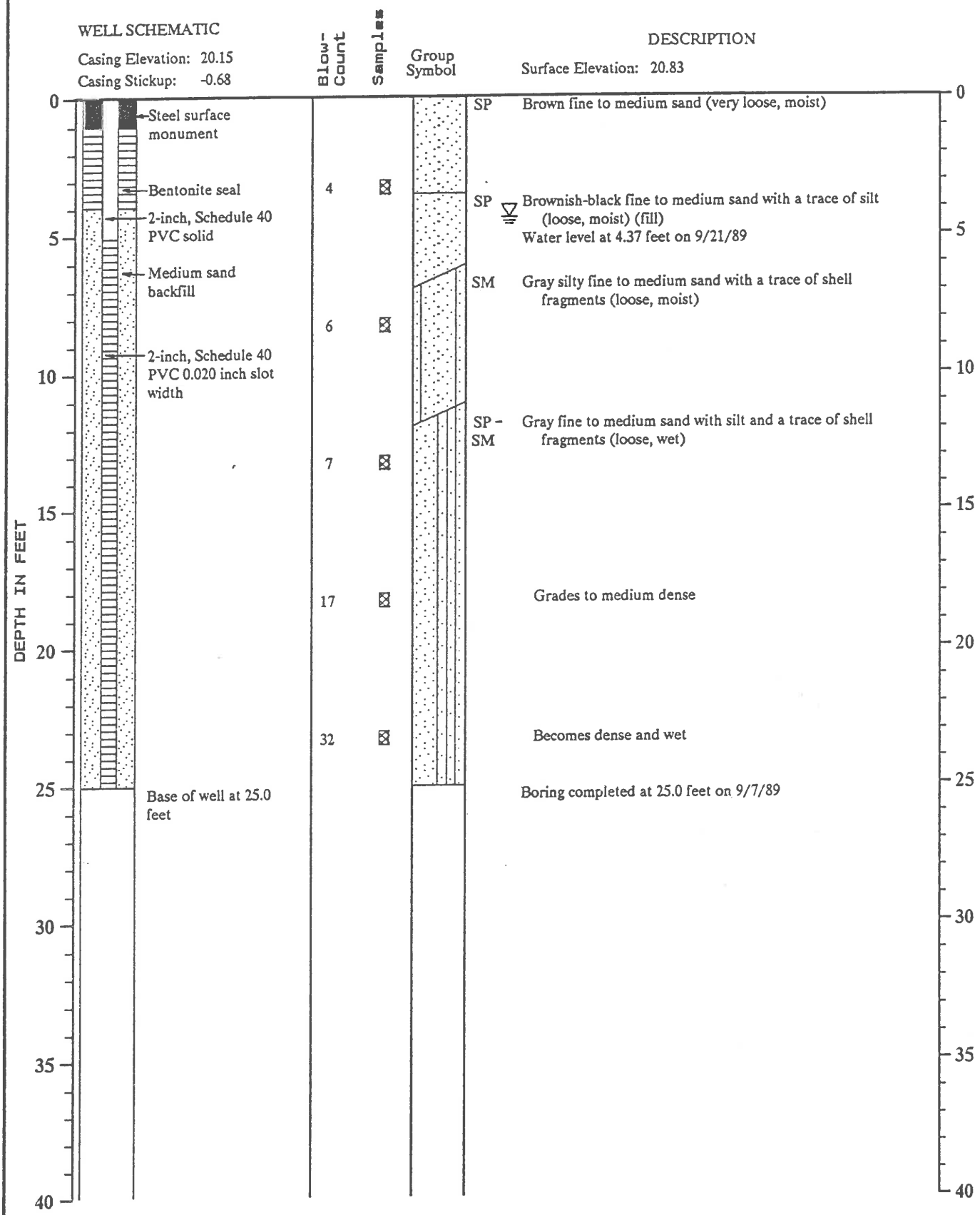
Figure A-6

NWP 0108

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-5



Note: See Figure A-2 for explanation of symbols

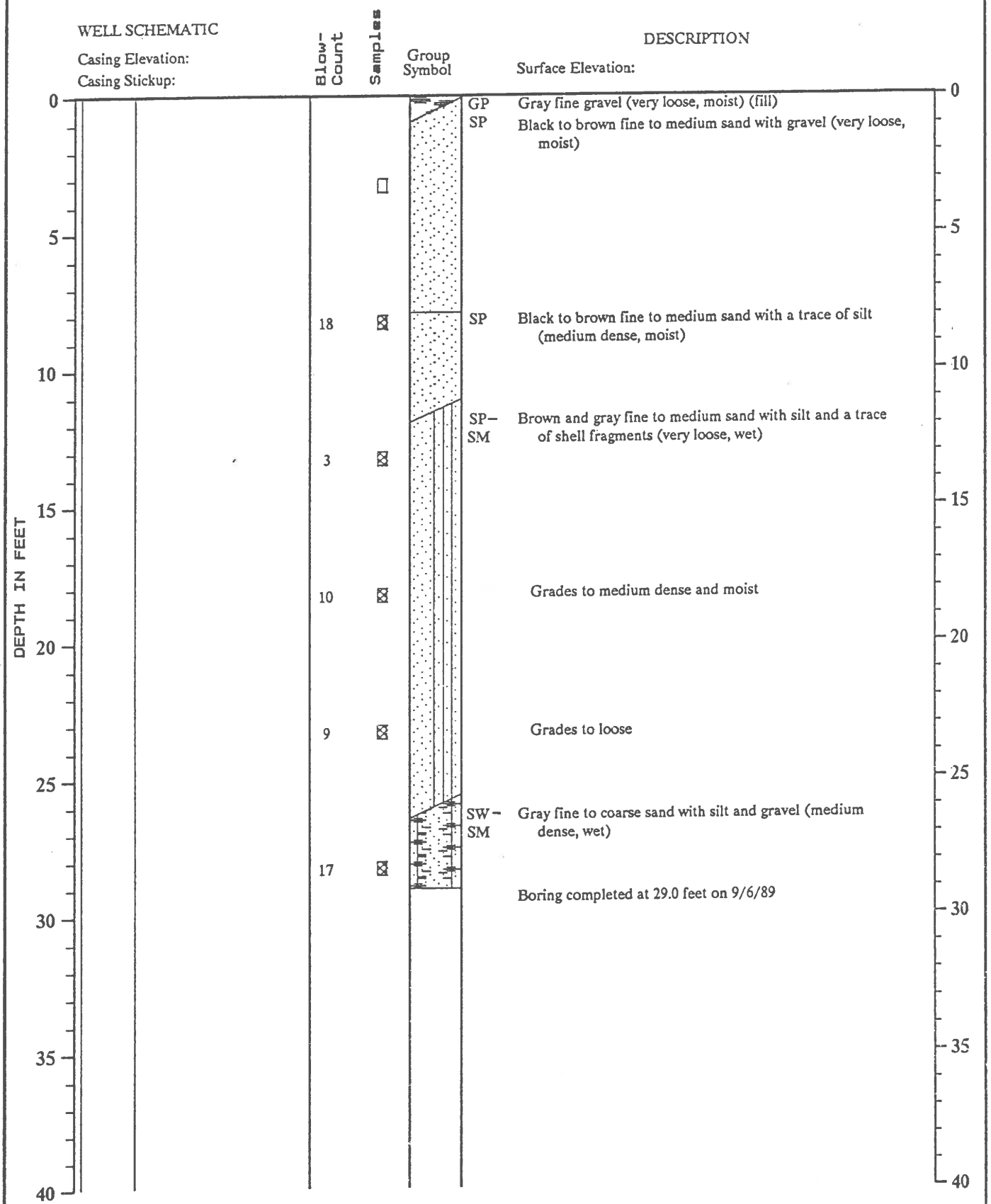
Geo Engineers

Log of Monitor Well

Figure A-7

NWP 0109

MONITOR WELL NO. MW-6



Note: See Figure A-2 for explanation of symbols

1531-002-B04 :CSL:CDO 2/22/90

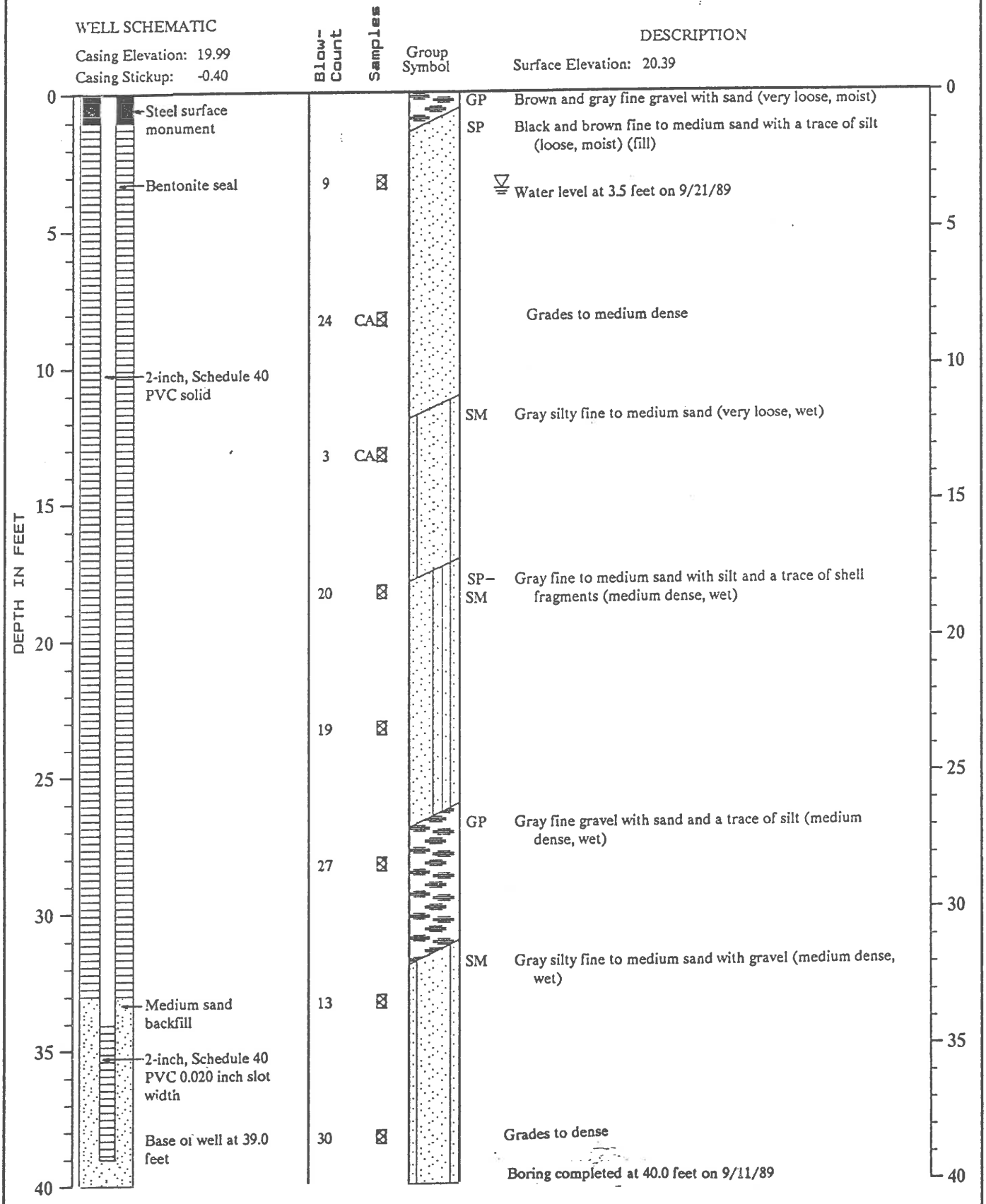
Geo Engineers

Log of Monitor Well

Figure A-8

NWP 0110

MONITOR WELL NO. MW-7



Note: See Figure A-2 for explanation of symbols

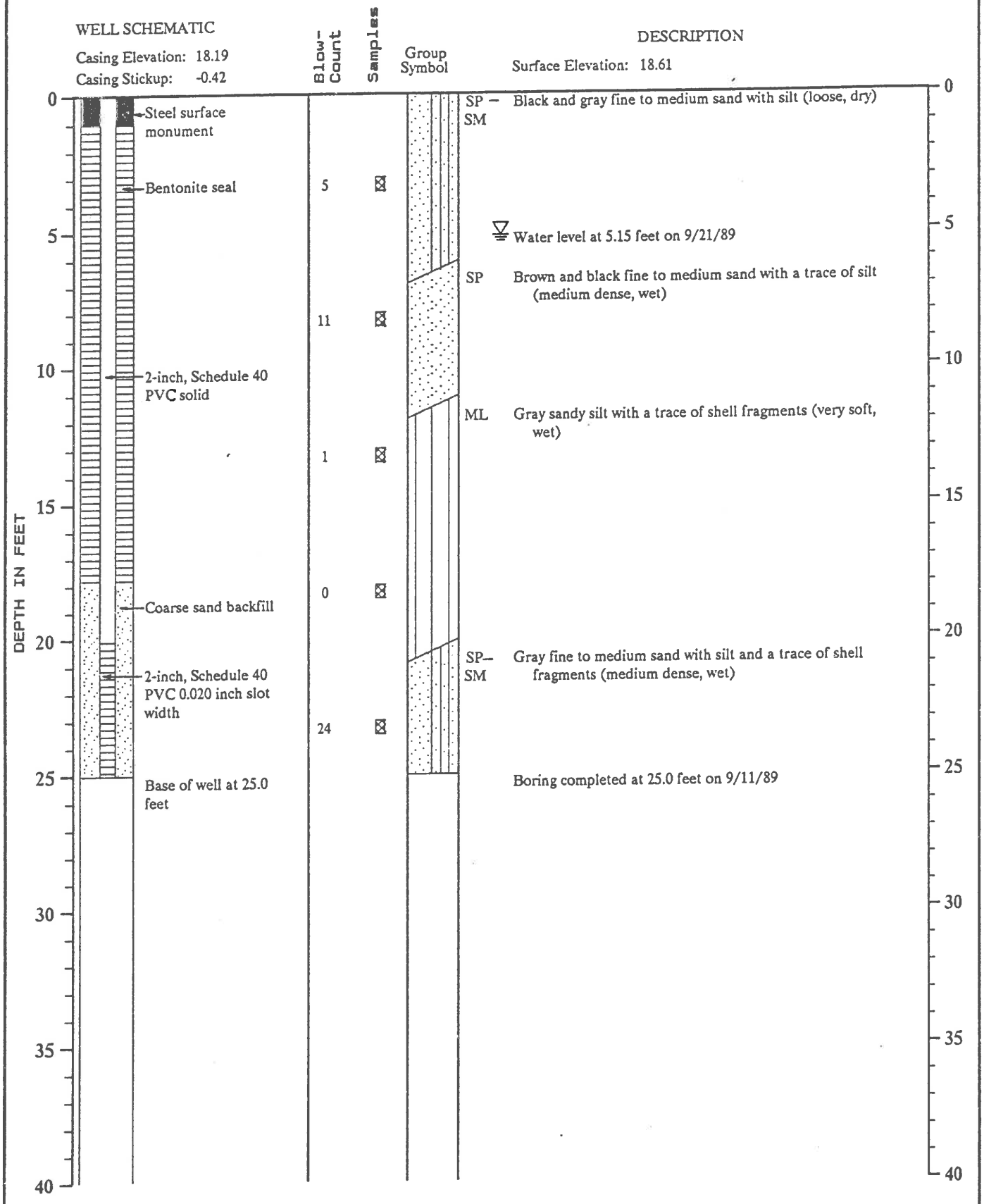
Geo Engineers

Log of Monitor Well

Figure A-9

NWP 0111

MONITOR WELL NO. MW-8



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

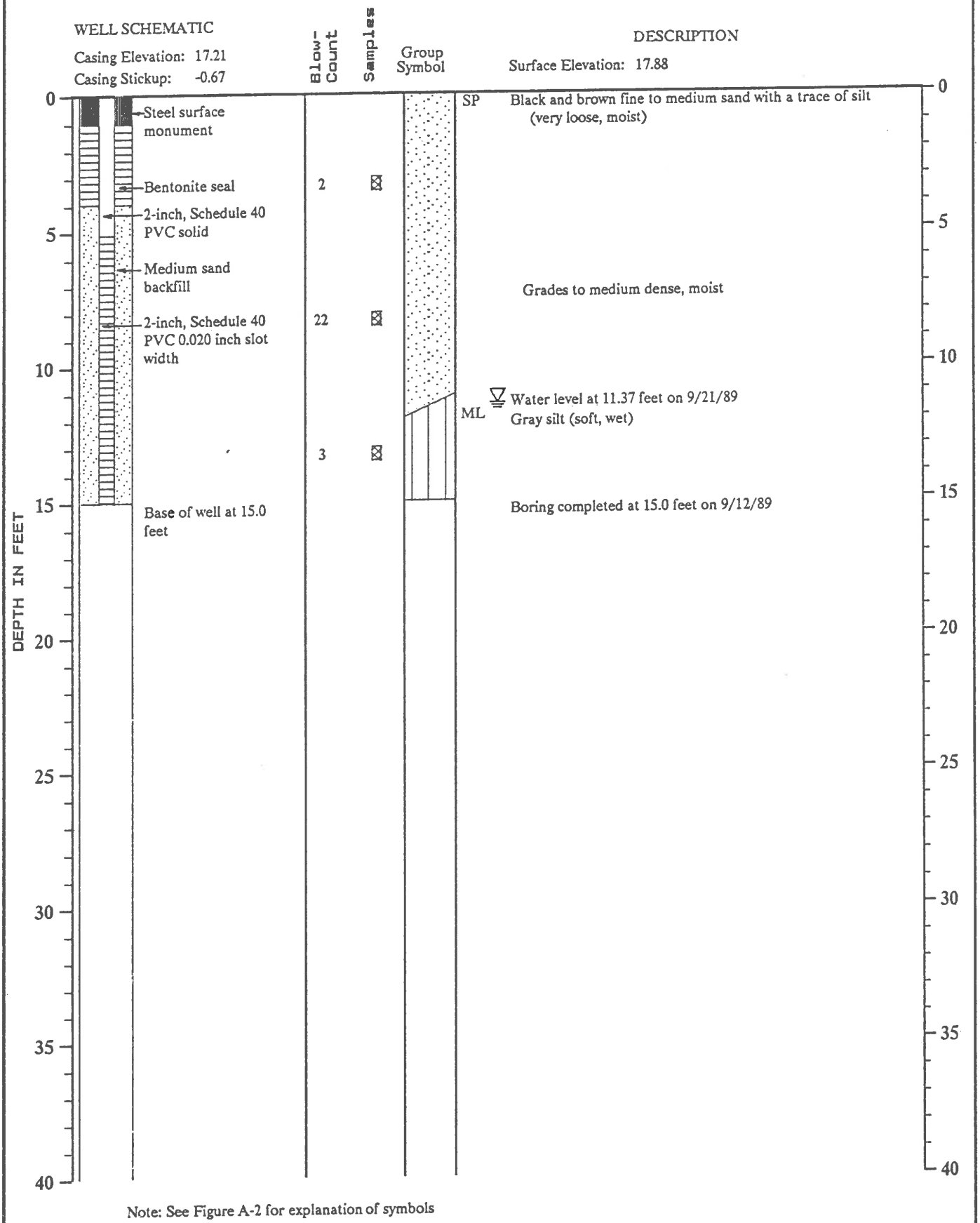
Figure A-10

NWP 0112

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-9



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

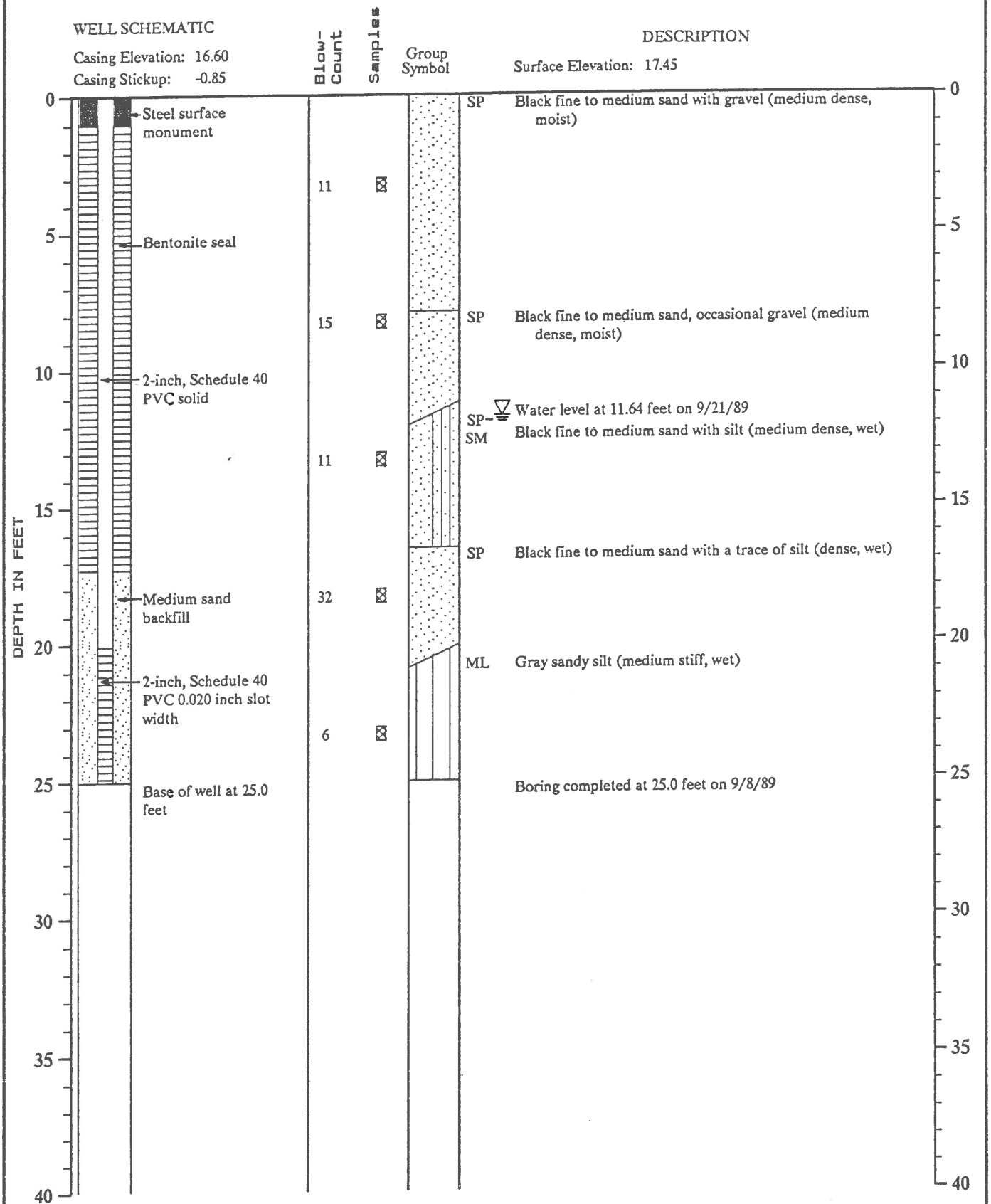
Figure A-11

NWP 0113

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-10



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

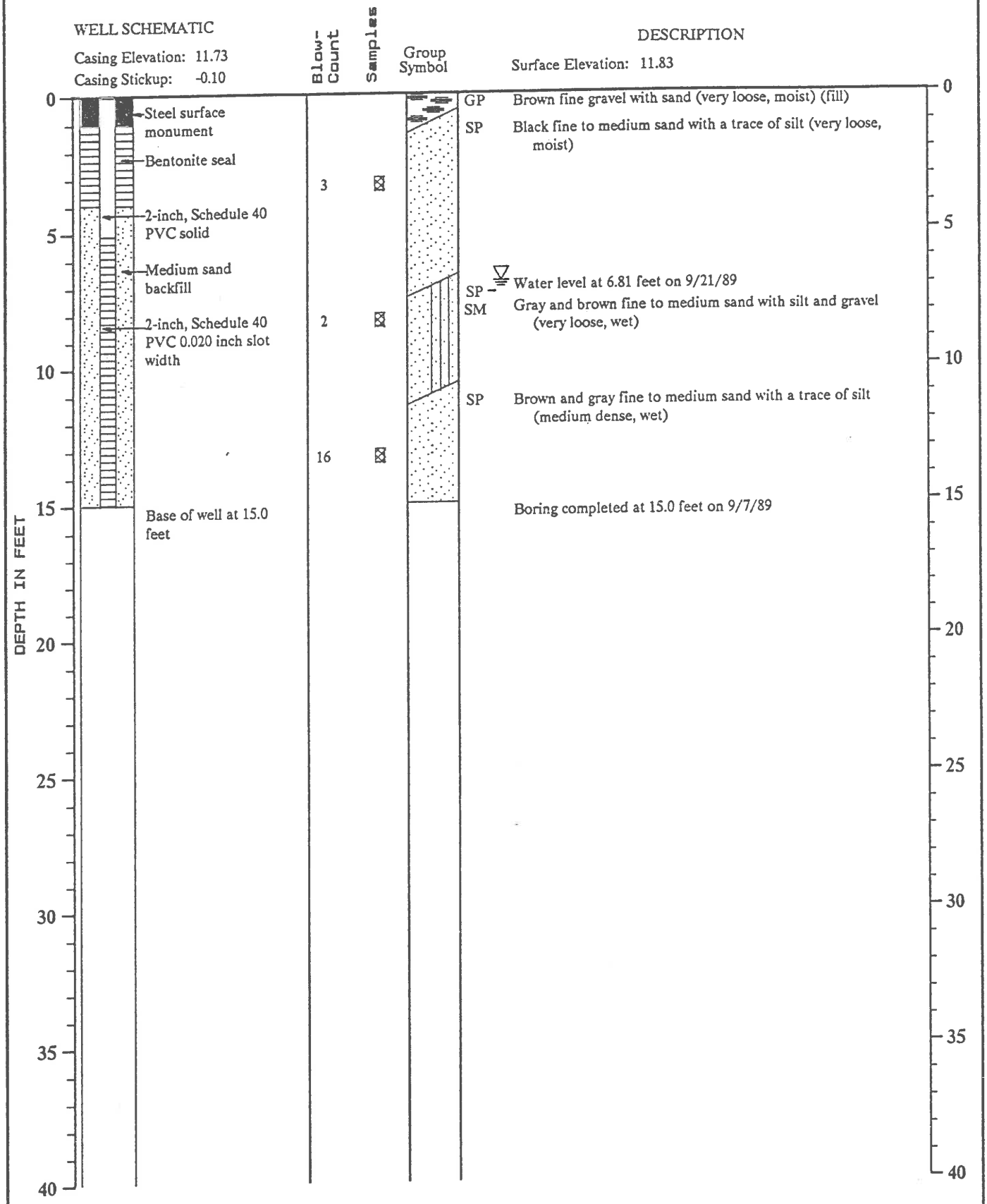
Figure A-12

NWP 0114

:CSL:CDO 2/23/90

1531-002-B04

MONITOR WELL NO. MW-11



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

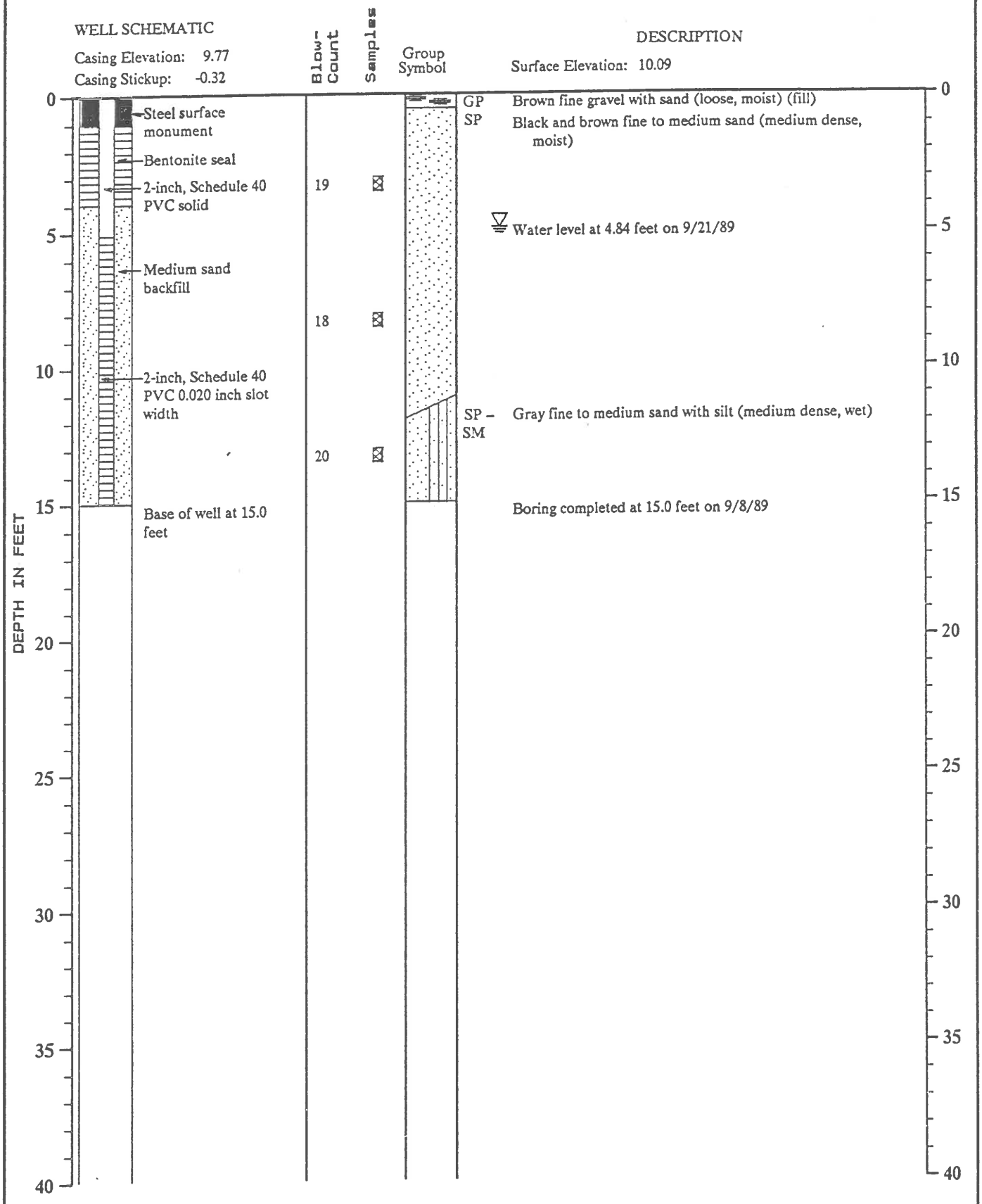
Figure A-13

NWP 0115

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-12



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

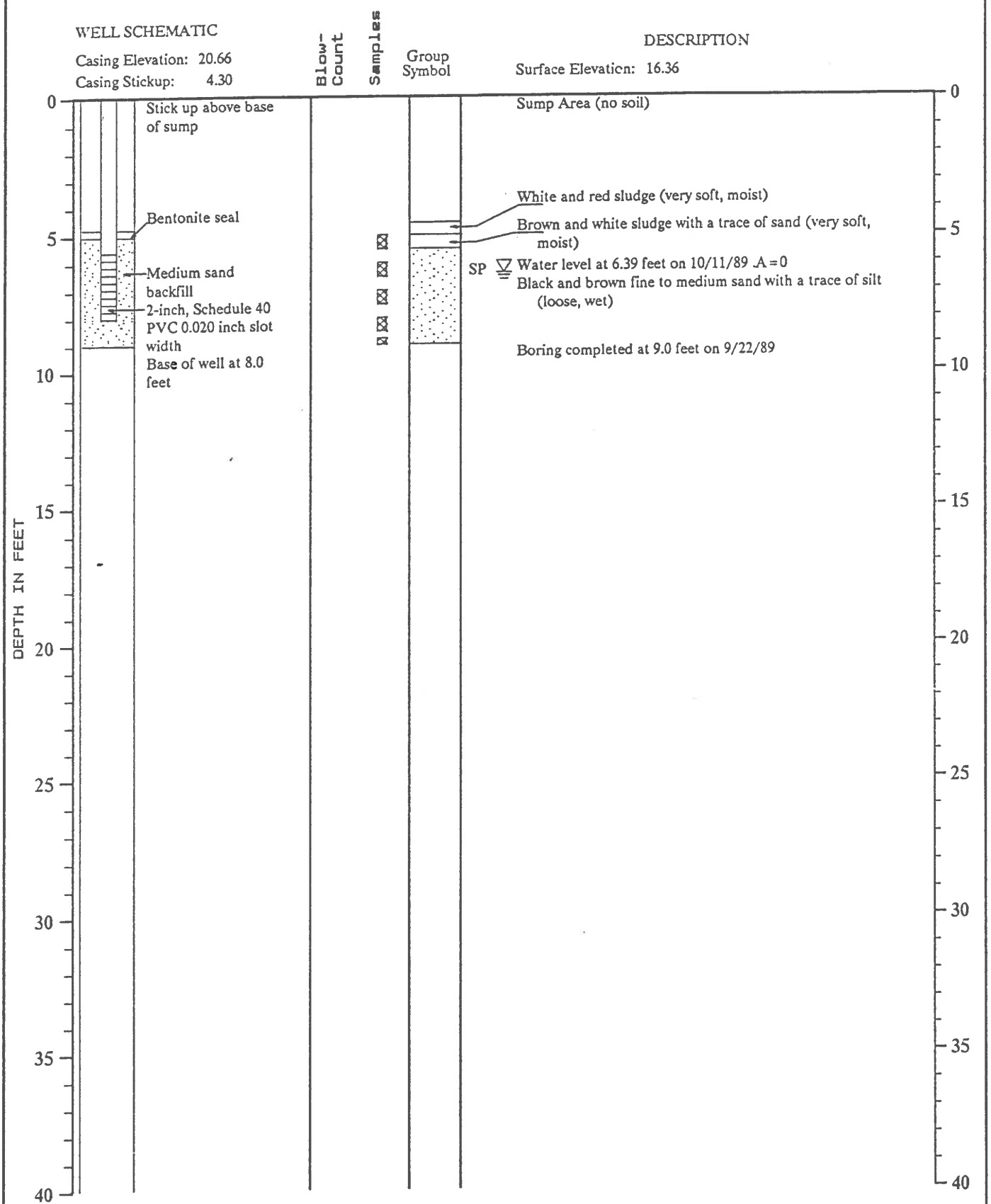
Figure A-14

NWP 0116

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-13



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

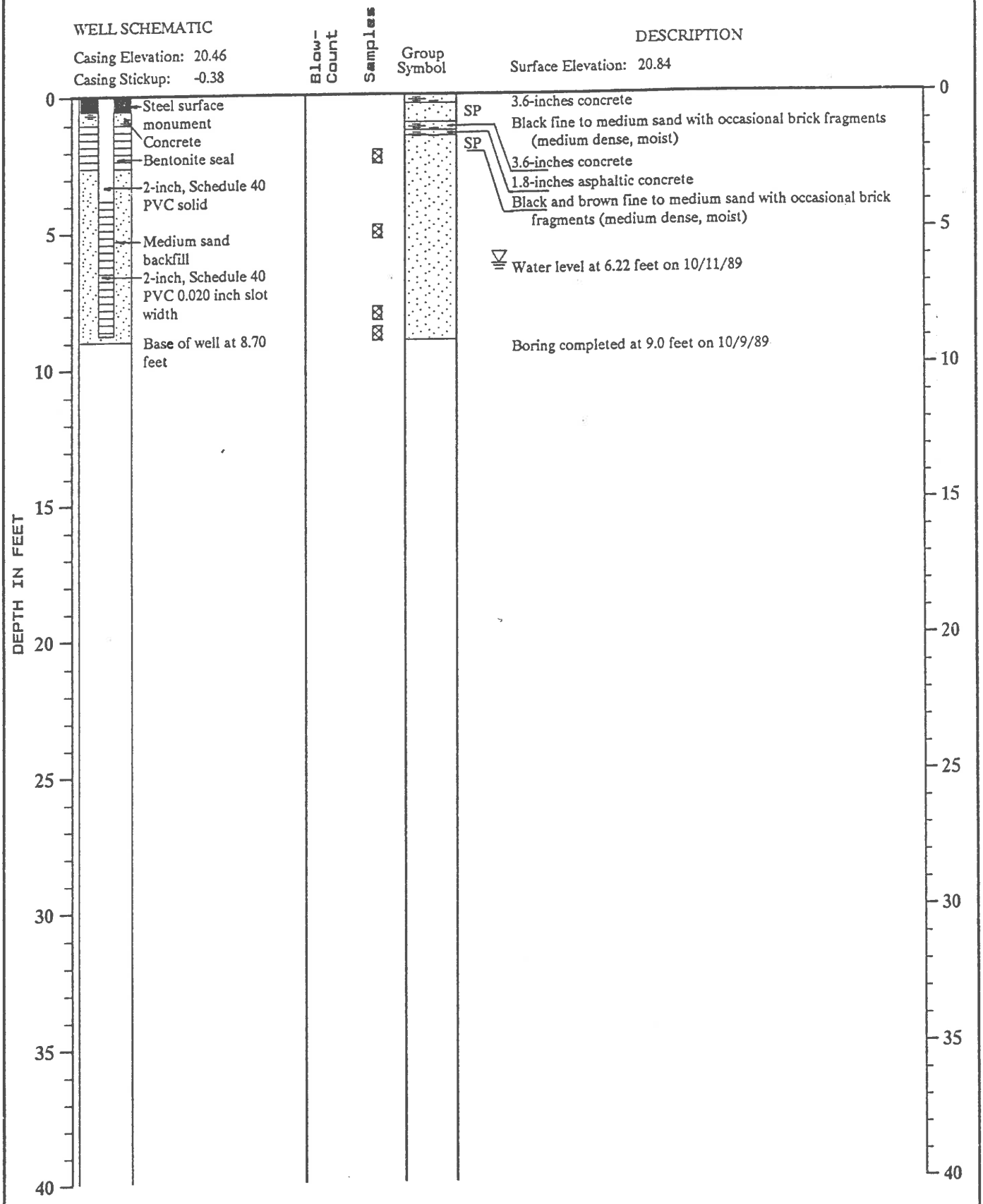
Figure A-15

NWP 0117

:CSL:CDO 2/27/90

1531-002-B04

MONITOR WELL NO. MW-14



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

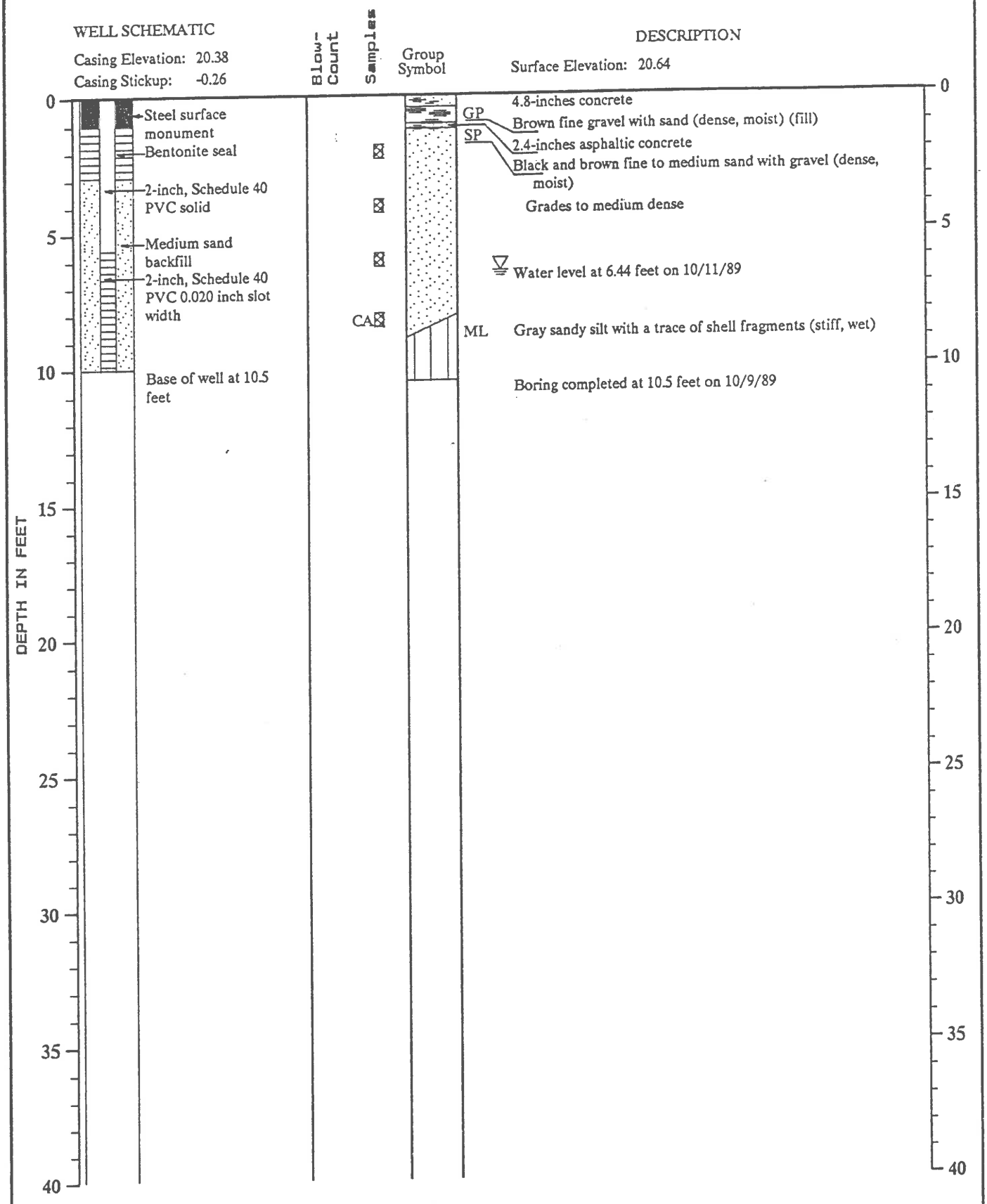
Figure A-16

NWP 0118

:CSL:CDO 2/22/90

1631-002-B04

MONITOR WELL NO. MW-15



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

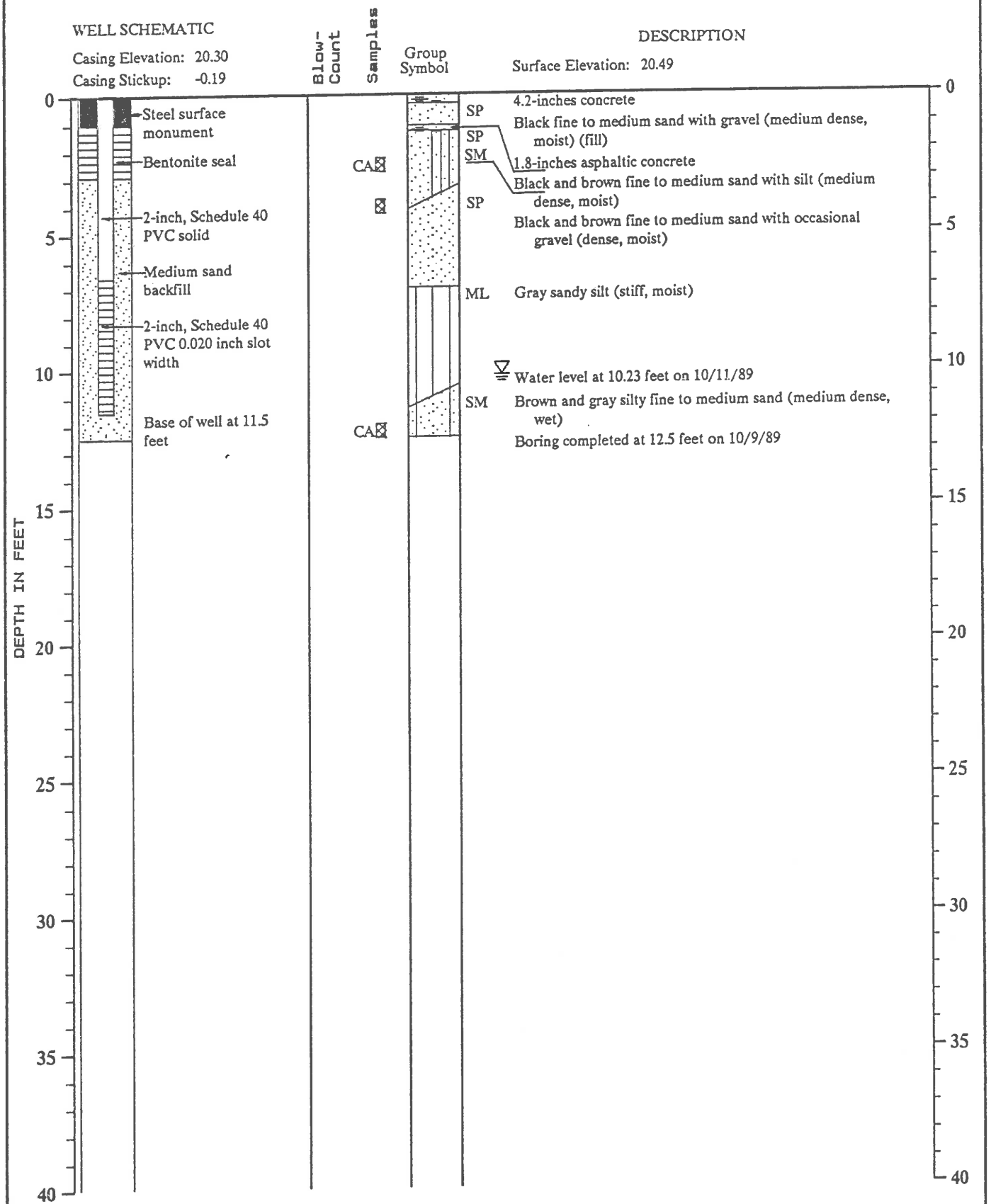
Figure A-17

NWP 0119

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-16



Note: See Figure A-2 for explanation of symbols

GeoEngineers

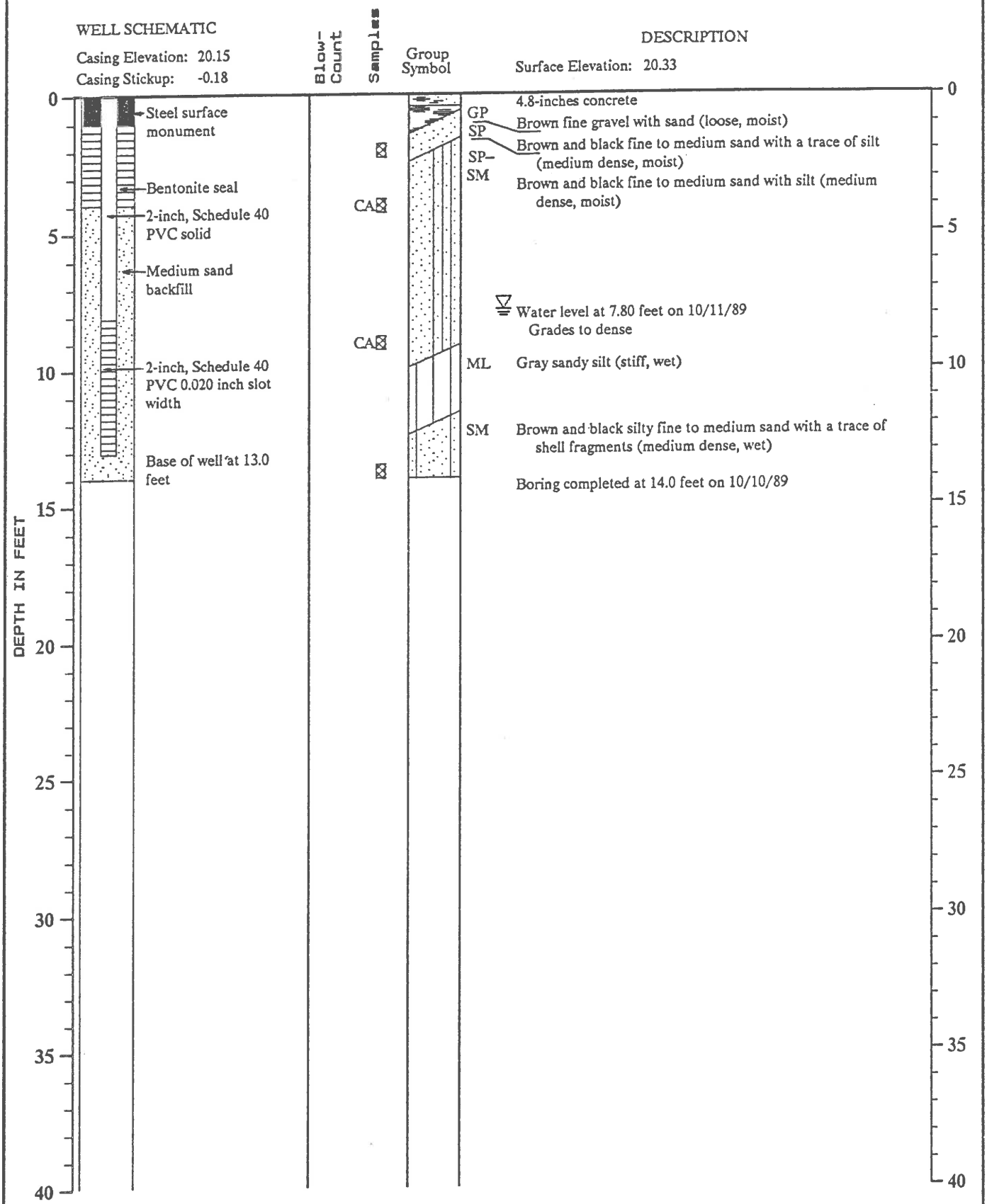
Log of Monitor Well

Figure A-18

NWP 0120

1631-002-B04 :CSL:CDO 2/22/90

MONITOR WELL NO. MW-17



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

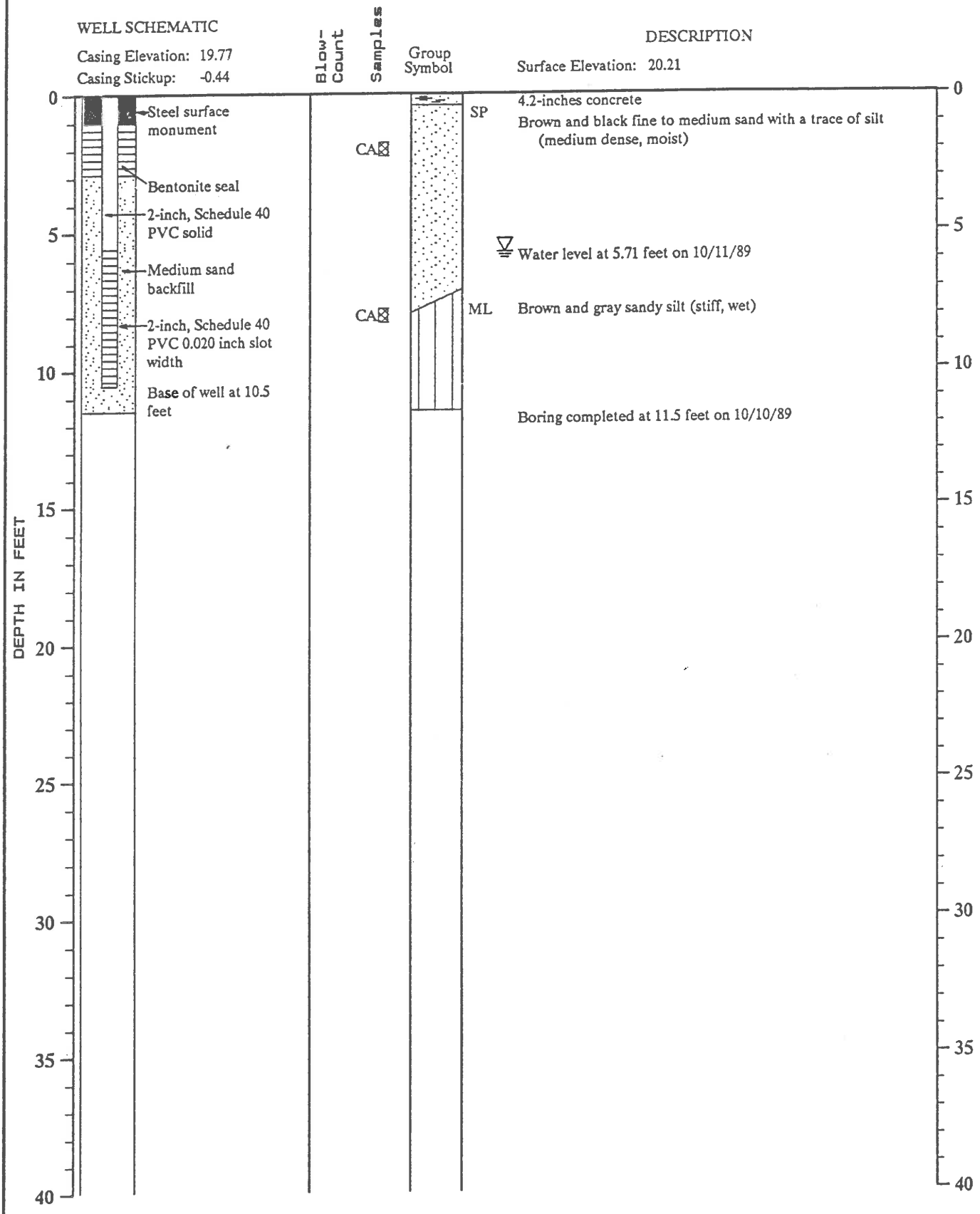
Figure A-19

NWP 0121

:CSL:CDO 2/22/90

1531-002-B04

MONITOR WELL NO. MW-18



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

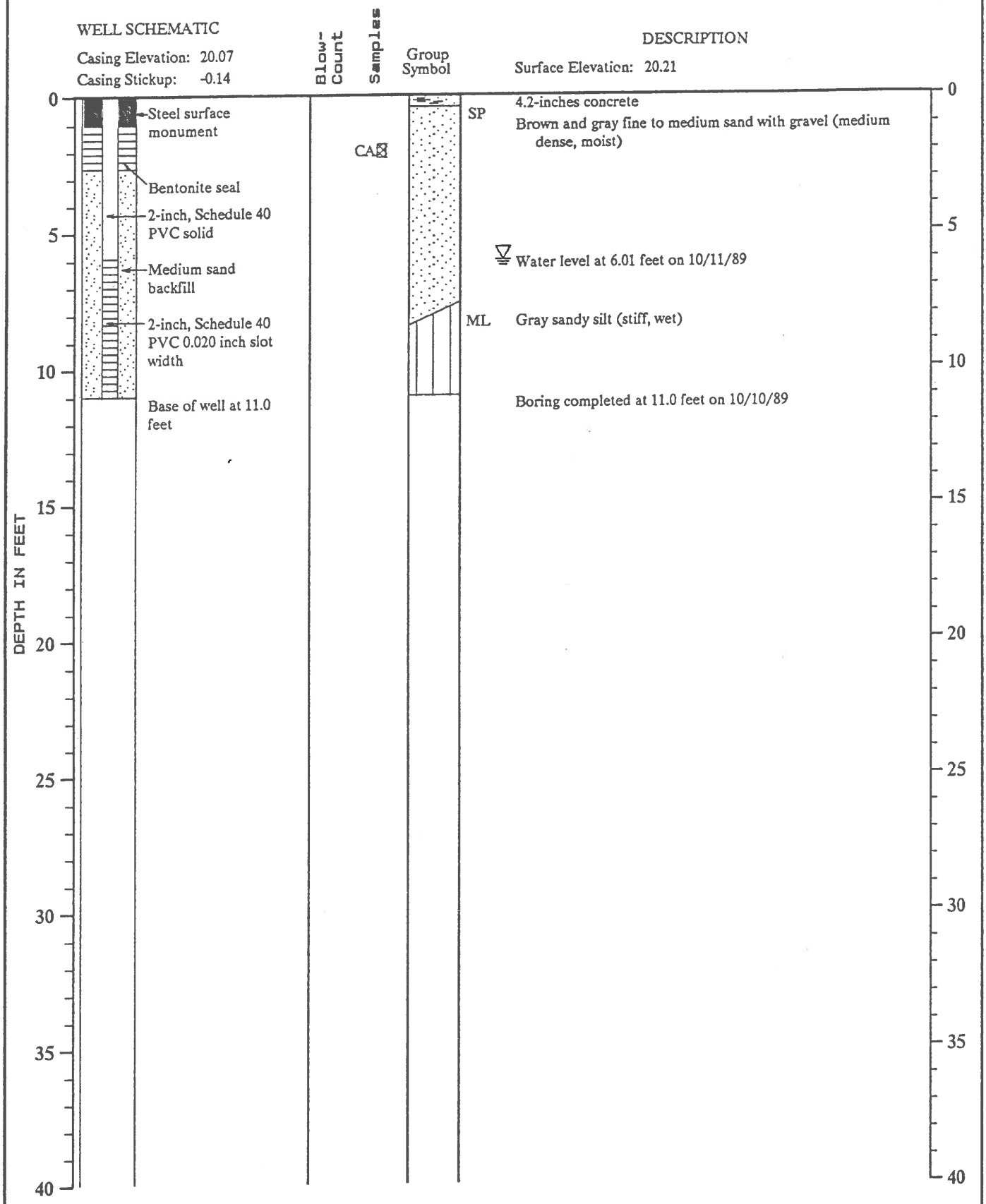
Figure A-20

NWP 0122

:CSL:CDO 2/22/90

1631-002-B04

MONITOR WELL NO. MW-19



Note: See Figure A-2 for explanation of symbols

Geo Engineers

Log of Monitor Well

Figure A-21

NWP 0123

:CSL:CDO 2/22/90

1531-002-B04

APPENDIX B

CHEMICAL ANALYTICAL DATA

TABLE B–1
LABORATORY REPORT SUMMARY AND KEY TO APPENDIX B

Appendix	Laboratory Report		Sample			Summarized
Page No.	Date	ID Number	Media	Source	Analyses	on Tables
	09/20/89	ATI 8909-026	Soil	MW-7	8010, Metals, Cyanide	3, 9
	10/20/89	ATI 8909-102	Ground Water	10 wells	8010, Metals, Cyanide	1, 6, 7
	10/20/89	ATI 8909-104	Ground Water	MW-3	8010, Metals, Cyanide	1, 6, 7
	10/27/89	ATI 8910-032	Vapor	4 probes	8010 (modified)	2
	11/01/89	ATI 909447	Soil, Sludge	Eastern Sumps	8010, Metals, Cyanide, EP Tox Metals	4, 9
	11/13/89	ATI 8910-069	Soil	Beneath Building	8010, Metals, Cyanide	3, 9
	11/13/89	ATI 8910-078	Ground Water	Beneath Building	8010, Metals, Cyanide	1, 6, 7
	11/13/89	ATI 8910-087	Ground Water	Beneath Building	8010, Metals, Cyanide	1, 6, 7
	"	"	Soil	Eastern Sumps	8010, Metals, Cyanide, EP Tox Metals	4, 9
	01/22/90	ATI 8912-079	Soil	Beneath Degreaser	8010	5, 9

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8909-026

GeoEngineers

SEP 22 1989

Routing CSL

File

September 20, 1989

GeoEngineers, Inc.
2405 140th Ave. N.E.
Suite 105
Bellevue, WA 98005

Attention : Charles S. Lindsay

Project Number : 1531-02-B04

Project Name : Northwest Plating

On September 6, 1989 Analytical Technologies, Inc. received two soil samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/hbb

Analytical Technologies, Inc.

ATI I.D. # 8909-026

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8909-026-1	MW-7-2	SOIL	09/06/89
8909-026-2	MW-7-3	SOIL	09/06/89

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	2

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

NWP 0127

ATI I.D. # 8909-026

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
CADMIUM	AA/F	EPA 7130
CHROMIUM	AA/F	EPA 7190
NICKEL	AA/F	EPA 7520
ZINC	AA/F	EPA 7950
CYANIDE, TOTAL	COLORIMETRIC	EPA 9012
HEXAVALENT CHROMIUM	COLORIMETRIC	EPA 7196
MOISTURE	GRAVIMETRIC	METHOD 7-2.2

Analytical Technologies, Inc.

ATI I.D. # 8909-026

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-02-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 09/07/89
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/07/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	109

ATI I.D. # 8909-026-1

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/06/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/06/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 09/07/89
CLIENT I.D.	: MW-7-2	DATE ANALYZED	: 09/07/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	0.23
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.077
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	1.7
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	100

Analytical Technologies, Inc.

ATI I.D. # 8909-026-2

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/06/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/06/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 09/07/89
CLIENT I.D.	: MW-7-3	DATE ANALYZED	: 09/07/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	99

NWP 0131

ATI I.D. # 8909-026

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: 8909-005-1
PROJECT #	: 1531-02-B04	DATE ANALYZED	: 09/07/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8010	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	<0.025	0.600	0.538	90	0.525	88	2
CHLOROBENZENE	<0.025	0.600	0.534	89	0.523	87	2
1,1-DICHLOROETHENE	<0.010	0.200	0.201	101	0.201	101	0
TETRACHLOROETHENE	0.042	0.200	0.393	176*	0.425	192*	8
TOLUENE	<0.025	0.600	0.554	92	0.530	87	6
TRICHLOROETHENE	<0.010	0.200	0.216	108	0.216	108	0
META & PARA XYLENE	<0.025	1.10	0.950	87	0.914	83	4

* Out of limits due to matrix interference.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

ATI I.D.# 8909-026

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL
UNITS : mg/Kg

PARAMETER	-1	-2
CADMIUM	<1	<1
CHROMIUM	25	45
NICKEL	6.6	21
ZINC	17	30
HEXAVALENT CHROMIUM	0.51	<1.0*

* Sample diluted due to matrix interference.

NWP 0133

Analytical Technologies, Inc.

ATI I.D. # 8909-026

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL
UNITS : mg/Kg

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8908-154-3	<1	<1	0	15	16	94
CHROMIUM	8908-154-3	26	25	4	83	64	89
NICKEL	8908-154-3	6.8	6.1	11	151	159	91
ZINC	8908-154-3	18	18	0	32	16	88
HEXAVALENT CHROMIUM	8909-026-2	<1.0	<1.0	0	1.83	3.60	53

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

ATI I.D. # 8909-026

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL

PARAMETER	UNITS	-1	-2
CYANIDE, TOTAL	mg/Kg	0.9	<0.1
MOISTURE	%	12	24

ATI I.D. # 8909-026

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
CYANIDE, TOTAL	mg/Kg	8909-026-2	<0.1	0.3	0	4.5	5.3	85
MOISTURE	%	8909-019-1	7.2	7.6	5	N/A	N/A	N/A
MOISTURE	%	8908-022-2	6.5	6.3	3	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

NWP 0136

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{} \times 100$$

Analytical Technologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody

DATE 9/6/87 PAGE 1 OF 1

PROJECT MANAGER: Charles S. Lindsay
COMPANY: Geo Engineers
ADDRESS: 2405 140th Ave N.E. Suite 105
Bellevue, WA 98005
PHONE: 746-5200 SAMPLED BY: CSL

LABORATORY NUMBER: 8709-026

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	NUMBER OF CONTAINERS
MW-7-2	9/6/87	0945	Soil	-1	X																					1
MW-7-3	9/6/87	0950	Soil	-2	X																					1
					X																					
					X																					

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NUMBER: 1531-02-804	TOTAL NUMBER OF CONTAINERS	2
PROJECT NAME: Northwest Plating	CHAIN OF CUSTODY SEALS Y/N/NA	N
PURCHASE ORDER NUMBER:	INTACT? Y/N/NA	Y
VIA:	RECEIVED GOOD COND./COLD	Y

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:
Cd, Cr, Cr^{+6}, Ni, Zn
8010
Cyanide

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Charles S. Lindsay Time: 1740	Signature: Time:	Signature: Time:
Printed Name: Charles S. Lindsay Date: 9/6	Printed Name: Date:	Printed Name: Date:
Company: Geo Engineers	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Dayna L. Barkley Time: 5:3
Printed Name: Date:	Printed Name: Date:	Printed Name: DAYNA L. BARKLEY Date: 9/6
Company:	Company:	Analytical Technologies, Inc.

ATI La... San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola ...474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • P... ORIGINATOR

B - 13

NWP 0137

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8909-102

October 20, 1989

GeoEngineers, Inc.
2405 140th N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-02-B04

Project Name : Northwest Plating

On September 21, 1989 Analytical Technologies, Inc. received 10 water samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/hbb

ATI I.D. # 8909-102

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8909-102-1	MW-1	WATER	09/21/89
8909-102-2	MW-2	WATER	09/21/89
8909-102-3	MW-4	WATER	09/21/89
8909-102-4	MW-5	WATER	09/21/89
8909-102-5	MW-7	WATER	09/21/89
8909-102-6	MW-8	WATER	09/21/89
8909-102-7	MW-9	WATER	09/21/89
8909-102-8	MW-10	WATER	09/21/89
8909-102-9	MW-11	WATER	09/21/89
8909-102-10	MW-12	WATER	09/21/89

----- TOTALS -----

MATRIX	# SAMPLES
WATER	10

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 8909-102

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
CADMIUM	ICAP	EPA 6010
CHROMIUM	ICAP	EPA 6010
HEXAVALENT CHROMIUM	COLORIMETRIC	EPA 7196
NICKEL	NICKEL	EPA 6010
ZINC	ICAP	EPA 6010
CYANIDE	COLORIMETRIC	EPA 9012

ATI I.D. # 8909-102

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-02-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/22/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	94

ATI I.D. # 8909-102

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-02-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	73

ATI I.D. # 8909-102

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-02-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/28/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	90

ATI I.D. # 8909-102-1

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-1	DATE ANALYZED	: 09/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 500

COMPOUND	RESULT
BROMODICHLOROMETHANE	<100
BROMOFORM	<100
BROMOMETHANE	<250
CARBON TETRACHLORIDE	<100
CHLOROBENZENE	<250
CHLOROETHANE	<250
CHLOROFORM	<100
CHLOROMETHANE	<1000
DIBROMOCHLOROMETHANE	<100
1,1-DICHLOROETHANE	<100
1,2-DICHLOROETHANE	<100
1,1-DICHLOROETHENE	<100
CIS-1,2-DICHLOROETHENE	210
TRANS-1,2-DICHLOROETHENE	<100
1,2-DICHLOROPROPANE	<100
CIS-1,3-DICHLOROPROPENE	<100
TRANS-1,3-DICHLOROPROPENE	<100
METHYLENE CHLORIDE	<1000
1,1,2,2-TETRACHLOROETHANE	<100
TETRACHLOROETHENE	<100
1,1,1-TRICHLOROETHANE	<100
1,1,2-TRICHLOROETHANE	<100
TRICHLOROETHENE (TCE)	6,900
TRICHLOROFLUOROMETHANE	<250
VINYL CHLORIDE	<250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	75

ATI I.D. # 8909-102-2

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-2	DATE ANALYZED	: 09/22/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1 & 5

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	3.4
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	6.4
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	50 *
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	101

* Dilution factor = 5.

ATI I.D. # 8909-102-3

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-4	DATE ANALYZED	: 09/22/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1 & 10

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	1.1
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	72 *
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	86

* Dilution factor = 10.

ATI I.D. # 8909-102-4

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-5	DATE ANALYZED	: 09/22/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	77

ATI I.D. # 8909-102-5

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-7	DATE ANALYZED	: 09/28/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	6.6
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	105

ATI I.D. # 8909-102-6

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-8	DATE ANALYZED	: 09/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	3.7
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	13
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	87

ATI I.D. # 8909-102-7

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-9	DATE ANALYZED	: 09/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	78

ATI I.D. # 8909-102-8

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-10	DATE ANALYZED	: 09/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 5

COMPOUND	RESULT
BROMODICHLOROMETHANE	<1.0
BROMOFORM	<1.0
BROMOMETHANE	<2.5
CARBON TETRACHLORIDE	<1.0
CHLOROBENZENE	<2.5
CHLOROETHANE	<2.5
CHLOROFORM	<1.0
CHLOROMETHANE	<10
DIBROMOCHLOROMETHANE	<1.0
1,1-DICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROETHENE	<1.0
CIS-1,2-DICHLOROETHENE	45
TRANS-1,2-DICHLOROETHENE	<1.0
1,2-DICHLOROPROPANE	<1.0
CIS-1,3-DICHLOROPROPENE	<1.0
TRANS-1,3-DICHLOROPROPENE	<1.0
METHYLENE CHLORIDE	<10
1,1,2,2-TETRACHLOROETHANE	<1.0
TETRACHLOROETHENE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,1,2-TRICHLOROETHANE	<1.0
TRICHLOROETHENE (TCE)	<1.0
TRICHLOROFLUOROMETHANE	<2.5
VINYL CHLORIDE	<2.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	86

ATI I.D. # 8909-102-9

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-11	DATE ANALYZED	: 09/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 500

COMPOUND	RESULT
BROMODICHLOROMETHANE	<100
BROMOFORM	<100
BROMOMETHANE	<250
CARBON TETRACHLORIDE	<100
CHLOROBENZENE	<250
CHLOROETHANE	<250
CHLOROFORM	<100
CHLOROMETHANE	<1000
DIBROMOCHLOROMETHANE	<100
1,1-DICHLOROETHANE	<100
1,2-DICHLOROETHANE	<100
1,1-DICHLOROETHENE	<100
CIS-1,2-DICHLOROETHENE	670
TRANS-1,2-DICHLOROETHENE	<100
1,2-DICHLOROPROPANE	<100
CIS-1,3-DICHLOROPROPENE	<100
TRANS-1,3-DICHLOROPROPENE	<100
METHYLENE CHLORIDE	<1000
1,1,2,2-TETRACHLOROETHANE	<100
TETRACHLOROETHENE	<100
1,1,1-TRICHLOROETHANE	<100
1,1,2-TRICHLOROETHANE	<100
TRICHLOROETHENE (TCE)	4,300
TRICHLOROFLUOROMETHANE	<250
VINYL CHLORIDE	<250

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE	77

ATI I.D. # 8909-102-10

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/21/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/21/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-12	DATE ANALYZED	: 09/22/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	0.5
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	88

ATI I.D. # 8909-102

VOLATILE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: 8909-102-10
PROJECT #	: 1531-02-B04	DATE ANALYZED	: 09/22/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: WATER
EPA METHOD	: 8010	UNITS	: ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	<0.5	12.0	11.6	97	11.8	98	2
CHLOROBENZENE	<0.5	12.0	11.7	98	11.9	99	2
1,1-DICHLOROETHENE	<0.2	4.00	3.63	91	3.96	99	9
TETRACHLOROETHENE	0.3	4.00	4.91	115	5.12	120	4
TOLUENE	2.5	12.0	13.9	95	14.0	96	1
TRICHLOROETHENE	<0.2	4.00	4.98	112	5.27	119	6
META & PARA XYLENE	<0.5	21.9	21.8	100	22.1	101	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D.# 8909-102

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	-1	-2	-3	-4	-5
CADMIUM	0.5	0.7	<0.005	<0.005	<0.005
CHROMIUM	0.02	280	<0.01	<0.01	<0.01
HEXAVALENT CHROMIUM	<0.01	280	<0.01	<0.01	<0.01
NICKEL	0.08	0.2	<0.01	<0.01	<0.01
ZINC	0.70	0.40	<0.01	<0.01	<0.01

ATI I.D.# 8909-102

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	-6	-7	-8	-9	-10
CADMIUM	<0.005	0.010	<0.005	<0.005	<0.005
CHROMIUM	0.02	<0.01	<0.01	2.6	<0.01
HEXAVALENT CHROMIUM	<0.01	<0.01	<0.01	2.5	<0.01
NICKEL	0.03	0.01	<0.01	0.09	<0.01
ZINC	0.05	0.03	<0.01	<0.01	<0.01

ATI I.D. # 8909-102

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8909-102-3	<0.005	<0.005	0	0.97	1.0	97
CHROMIUM	8909-102-3	<0.01	<0.01	0	1.0	1.0	100
HEXAVALENT CHROMIUM	8909-102-5	<0.01	<0.01	0	N/A	N/A	N/A
HEXAVALENT CHROMIUM	8909-102-10	<0.01	N/A	N/A	0.152	0.200	76
NICKEL	8909-102-3	<0.01	<0.01	0	1.0	1.0	100
ZINC	8909-102-3	<0.01	<0.01	0	1.0	1.0	100

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8909-102

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER

PARAMETER	UNITS	-1	-2	-3	-4	-5
CYANIDE, TOTAL	mg/L	1.4	0.03	0.01	<0.01	<0.01

ATI I.D. # 8909-102

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : WATER
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

PARAMETER	UNITS	-6	-7	-8	-9	-10
CYANIDE, TOTAL	mg/L	0.03	<0.01	<0.01	0.08	<0.01

ATI I.D. # 8909-102

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
CYANIDE	mg/L	8909-102-9	0.08	0.08	0	0.59	0.50	102

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody

DATE Sept 21 PAGE 1 OF 1

PROJECT MANAGER: Steve Perrigo
COMPANY: GeoEngineers
ADDRESS: 2405 N.E. 140th Ave Suite 105
Bellevue, WA 98005
PHONE: 746-5200 SAMPLED BY: CSL

LABORATORY NUMBER: 8909-102

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	Cyanide	Cd, Cr, Cr+6, Ni, Zn						NUMBER OF CONTAINERS
MW-1	9/21/89		water	-1	X																					X	X						4
MW-2	"		"	-2	X																					X	X						4
					X																					X	X						4
MW-4	"		"	-3	X																					X	X						4
MW-5	"		"	-4	X																					X	X						4
MW-7	"		"	-5	X																					X	X						4
MW-8	"		"	-6	X																					X	X						4
MW-9	"		"	-7	X																					X	X						4
MW-10	"		"	-8	X																					X	X						4
MW-11	"		"	-9	X																					X	X						4
MW-12	"		"	-10	X																					X	X						4

NWP 0161

B - 37

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NUMBER: 1531-02-B04	TOTAL NUMBER OF CONTAINERS	40
PROJECT NAME: Northwest Platting	CHAIN OF CUSTODY SEALS Y/N/NA	
PURCHASE ORDER NUMBER:	INTACT? Y/N/NA	
VIA:	RECEIVED GOOD COND./COLD	

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:
Cyanide
Cd, Cr, Cr^{+6}, Ni, Zn
8010

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Charles D. Lindsay Time:	Signature: Time:	Signature: Time:
Printed Name: Charles D. Lindsay Date: 9/21	Printed Name: Date:	Printed Name: Date:
Company: GeoEngineers	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Dayna L Barkley Time: 3:29
Printed Name: Date:	Printed Name: Date:	Printed Name: DAYNA L. BARKLEY Date: 9/21
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8909-104

GeoEngineers

OCT 23 1989

Routing

File

October 20, 1989

GeoEngineers, Inc.
2405 140th N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-02-B04

Project Name : Northwest Plating

On September 22, 1989 Analytical Technologies, Inc. received one water sample for analyses. The sample was analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Karen L. Mixon
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/hbb

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8909-104-1	MW-3	WATER	09/22/89

----- TOTALS -----

MATRIX	# SAMPLES
WATER	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 8909-104

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
CADMIUM	ICAP	EPA 6010
CHROMIUM	ICAP	EPA 6010
HEXAVALENT CHROMIUM	COLORIMETRIC	EPA 7196
NICKEL	NICKEL	EPA 6010
ZINC	ICAP	EPA 6010
CYANIDE	COLORIMETRIC	EPA 9012

ATI I.D. # 8909-104

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-02-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 09/29/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.2
BROMOFORM	<0.2
BROMOMETHANE	<0.5
CARBON TETRACHLORIDE	<0.2
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	<0.2
CHLOROMETHANE	<2.0
DIBROMOCHLOROMETHANE	<0.2
1,1-DICHLOROETHANE	<0.2
1,2-DICHLOROETHANE	<0.2
1,1-DICHLOROETHENE	<0.2
CIS-1,2-DICHLOROETHENE	<0.2
TRANS-1,2-DICHLOROETHENE	<0.2
1,2-DICHLOROPROPANE	<0.2
CIS-1,3-DICHLOROPROPENE	<0.2
TRANS-1,3-DICHLOROPROPENE	<0.2
METHYLENE CHLORIDE	<2.0
1,1,2,2-TETRACHLOROETHANE	<0.2
TETRACHLOROETHENE	<0.2
1,1,1-TRICHLOROETHANE	<0.2
1,1,2-TRICHLOROETHANE	<0.2
TRICHLOROETHENE (TCE)	<0.2
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	96

ATI I.D. # 8909-104-1

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 09/22/89
PROJECT #	: 1531-02-B04	DATE RECEIVED	: 09/22/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-3	DATE ANALYZED	: 09/29/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 500

COMPOUND	RESULT
BROMODICHLOROMETHANE	<100
BROMOFORM	<100
BROMOMETHANE	<250
CARBON TETRACHLORIDE	<100
CHLOROBENZENE	<250
CHLOROETHANE	<250
CHLOROFORM	<100
CHLOROMETHANE	<1000
DIBROMOCHLOROMETHANE	<100
1,1-DICHLOROETHANE	<100
1,2-DICHLOROETHANE	<100
1,1-DICHLOROETHENE	<100
CIS-1,2-DICHLOROETHENE	1,600
TRANS-1,2-DICHLOROETHENE	<100
1,2-DICHLOROPROPANE	<100
CIS-1,3-DICHLOROPROPENE	<100
TRANS-1,3-DICHLOROPROPENE	<100
METHYLENE CHLORIDE	<1000
1,1,2,2-TETRACHLOROETHANE	<100
TETRACHLOROETHENE	<100
1,1,1-TRICHLOROETHANE	<100
1,1,2-TRICHLOROETHANE	<100
TRICHLOROETHENE (TCE)	5,400
TRICHLOROFLUOROMETHANE	<250
VINYL CHLORIDE	<250
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	91

ATI I.D. # 8909-104

VOLATILE HALOCARBONS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING
EPA METHOD : 8010

SAMPLE I.D. : 8909-063-1
DATE ANALYZED : 09/25/89
SAMPLE MATRIX : WATER
UNITS : ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
BENZENE	<0.5	12.0	11.6	97	11.8	98	2
CHLOROBENZENE	<0.5	12.0	11.8	98	11.8	98	0
1,1-DICHLOROETHENE	<0.2	4.00	3.43	86	3.57	89	4
TETRACHLOROETHENE	<0.2	4.00	3.85	96	3.72	93	3
TOLUENE	<0.5	12.0	11.6	97	11.8	98	2
TRICHLOROETHENE	<0.2	4.00	3.77	94	3.80	95	1
META & PARA XYLENE	<0.5	21.9	21.6	99	21.8	100	1

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D.# 8909-104

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	-1
CADMIUM	0.008
CHROMIUM	0.05
HEXAVALENT CHROMIUM	0.02
NICKEL	0.06
ZINC	<0.01

ATI I.D. # 8909-104

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8909-104-1	0.008	0.007	13	1.0	1.0	99
CHROMIUM	8909-104-1	0.05	0.05	0	1.0	1.0	95
HEXAVALENT CHROMIUM	8909-104-1	0.02	0.02	0	N/A	N/A	N/A
HEXAVALENT CHROMIUM	BLANK SPIKE	N/A	N/A	N/A	0.087	0.100	87
NICKEL	8909-104-1	0.06	0.08	29	1.1	1.0	103
ZINC	8909-104-1	<0.01	<0.01	0	1.1	1.0	110

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8909-104

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : WATER
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

PARAMETER	UNITS	-1
CYANIDE, TOTAL	mg/L	0.15

ATI I.D. # 8909-104

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-02-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
CYANIDE	mg/L	90945402	0.07	0.07	0	1.1	1.0	103

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody

DATE 9/22/97 PAGE 1 OF 1

PROJECT MANAGER: Steve Petrigo
COMPANY: GeoEngineers
ADDRESS: 2405 N E 14th
Bellevue, WA
PHONE: 746-5200 SAMPLED BY: CSC

LABORATORY NUMBER: 8909-104

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	Cd, Cr, Cr+6, Ni, Zn	Cyanide						NUMBER OF CONTAINERS
MW-3	9/22	0700	Water	-1	X																					X	X						4

PROJECT INFORMATION

PROJECT NUMBER: 1531-02-R04
PROJECT NAME: Northwest Pkwy
PURCHASE ORDER NUMBER:
VIA:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS Y/N/NA	N
INTACT? Y/N/NA	Y
RECEIVED GOOD COND./COLD	Y

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:
8010
Cd, Cr, Cr+6, Ni, Zn
Cyanide

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Date: Charles S Lindsay 9/22	Printed Name: Date:	Printed Name: Date:
Company: GET	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: Dayna L. Barkley
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: Dayna L. Barkley
Company:	Company:	Analytical Technologies, Inc.

DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

NWP 0172

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8910-032

GeoEngineers

OCT 27 1989

Routing ☐ ☐
☐ ☐ ☐
File

October 27, 1989

GeoEngineers, Inc.
2405 140th Avenue N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-002-BO4

Project Name : Northwest Plating

On October 5, 1989 Analytical Technologies, Inc. received four vapor samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Karen L. Mixon/DM
Karen L. Mixon
Project Manager

Frederick W. Grothkopp
Frederick W. Grothkopp
Technical Manager

FWG/nah

NWP 0173

ATI I.D. # 8910-032

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8910-032-1	VS-1	VAPOR	10/05/89
8910-032-2	VS-2	VAPOR	10/05/89
8910-032-3	VS-3	VAPOR	10/05/89
8910-032-4	VS-4	VAPOR	10/05/89

----- TOTALS -----

MATRIX	# SAMPLES
VAPOR	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 8910-032

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010 MODIFIED

ATI I.D. # 8910-032

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: VAPOR	UNITS	: ppb (v/v)
EPA METHOD	: 8010 A	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<3.0
BROMOFORM	<1.9
BROMOMETHANE	<13
CARBON TETRACHLORIDE	<3.1
CHLOROBENZENE	<11
CHLOROETHANE	<19
CHLOROFORM	<4.1
CHLOROMETHANE	<96
DIBROMOCHLOROMETHANE	<2.3
1,1-DICHLOROETHANE	<4.9
1,2-DICHLOROETHANE	<4.9
1,1-DICHLOROETHENE	<5.0
CIS-1,2-DICHLOROETHENE	<5.0
TRANS-1,2-DICHLOROETHENE	<5.0
1,2-DICHLOROPROPANE	<4.3
CIS-1,3-DICHLOROPROPENE	<4.4
TRANS-1,3-DICHLOROPROPENE	<4.4
METHYLENE CHLORIDE	<57
1,1,2,2-TETRACHLOROETHANE	<2.9
TETRACHLOROETHENE	<2.9
1,1,1-TRICHLOROETHANE	<3.6
1,1,2-TRICHLOROETHANE	<3.6
TRICHLOROETHENE (TCE)	<3.7
TRICHLOROFLUOROMETHANE	<8.8
VINYL CHLORIDE	<19
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	111

ATI I.D. # 8910-032-1

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/05/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/05/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: VS-1	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: VAPOR	UNITS	: ppb (v/v)
EPA METHOD	: 8010 A	DILUTION FACTOR	: 1 & 100

COMPOUND	RESULT
BROMODICHLOROMETHANE	<3.0
BROMOFORM	<1.9
BROMOMETHANE	<13
CARBON TETRACHLORIDE	<3.1
CHLOROBENZENE	<11
CHLOROETHANE	<19
CHLOROFORM	8.7
CHLOROMETHANE	<96
DIBROMOCHLOROMETHANE	<2.3
1,1-DICHLOROETHANE	<4.9
1,2-DICHLOROETHANE	<4.9
1,1-DICHLOROETHENE	80
CIS-1,2-DICHLOROETHENE	<5.0
TRANS-1,2-DICHLOROETHENE	160
1,2-DICHLOROPROPANE	<4.3
CIS-1,3-DICHLOROPROPENE	<4.4
TRANS-1,3-DICHLOROPROPENE	<4.4
METHYLENE CHLORIDE	<57
1,1,2,2-TETRACHLOROETHANE	<2.9
TETRACHLOROETHENE	<2.9
1,1,1-TRICHLOROETHANE	160
1,1,2-TRICHLOROETHANE	<3.6
TRICHLOROETHENE (TCE)	44,000 *
TRICHLOROFLUOROMETHANE	<8.8
VINYL CHLORIDE	<19
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	84

* Dilution factor = 100.

ATI I.D. # 8910-032-2

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/05/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/05/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: VS-2	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: VAPOR	UNITS	: ppb (v/v)
EPA METHOD	: 8010 A	DILUTION FACTOR	: 1 & 50

COMPOUND	RESULT
BROMODICHLOROMETHANE	<3.0
BROMOFORM	<1.9
BROMOMETHANE	<13
CARBON TETRACHLORIDE	<3.1
CHLOROBENZENE	<11
CHLOROETHANE	<19
CHLOROFORM	<4.1
CHLOROMETHANE	<96
DIBROMOCHLOROMETHANE	<2.3
1,1-DICHLOROETHANE	<4.9
1,2-DICHLOROETHANE	<4.9
1,1-DICHLOROETHENE	<5.0
CIS-1,2-DICHLOROETHENE	140
TRANS-1,2-DICHLOROETHENE	<5.0
1,2-DICHLOROPROPANE	<4.3
CIS-1,3-DICHLOROPROPENE	<4.4
TRANS-1,3-DICHLOROPROPENE	<4.4
METHYLENE CHLORIDE	<57
1,1,2,2-TETRACHLOROETHANE	<2.9
TETRACHLOROETHENE	160
1,1,1-TRICHLOROETHANE	<3.6
1,1,2-TRICHLOROETHANE	<3.6
TRICHLOROETHENE (TCE)	9,000 *
TRICHLOROFLUOROMETHANE	<8.8
VINYL CHLORIDE	<19
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	132

* Dilution factor = 50.

ATI I.D. # 8910-032-3

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/05/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/05/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: VS-3	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: VAPOR	UNITS	: ppb (v/v)
EPA METHOD	: 8010 A	DILUTION FACTOR	: 25

COMPOUND	RESULT
BROMODICHLOROMETHANE	<75
BROMOFORM	<48
BROMOMETHANE	<320
CARBON TETRACHLORIDE	<78
CHLOROBENZENE	<280
CHLOROETHANE	<480
CHLOROFORM	<102
CHLOROMETHANE	<2400
DIBROMOCHLOROMETHANE	<58
1,1-DICHLOROETHANE	<122
1,2-DICHLOROETHANE	<122
1,1-DICHLOROETHENE	<125
CIS-1,2-DICHLOROETHENE	<125
TRANS-1,2-DICHLOROETHENE	<125
1,2-DICHLOROPROPANE	<108
CIS-1,3-DICHLOROPROPENE	<110
TRANS-1,3-DICHLOROPROPENE	<110
METHYLENE CHLORIDE	<1400
1,1,2,2-TETRACHLOROETHANE	<72
TETRACHLOROETHENE	<72
1,1,1-TRICHLOROETHANE	<90
1,1,2-TRICHLOROETHANE	<90
TRICHLOROETHENE (TCE)	5,700
TRICHLOROFLUOROMETHANE	<220
VINYL CHLORIDE	<475
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	93

ATI I.D. # 8910-032-4

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/05/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/05/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: VS-4	DATE ANALYZED	: 10/06/89
SAMPLE MATRIX	: VAPOR	UNITS	: ppb (v/v)
EPA METHOD	: 8010 A	DILUTION FACTOR	: 5

COMPOUND	RESULT
BROMODICHLOROMETHANE	<15
BROMOFORM	<9.5
BROMOMETHANE	<65
CARBON TETRACHLORIDE	<16
CHLOROBENZENE	<55
CHLOROETHANE	<95
CHLOROFORM	<20
CHLOROMETHANE	<480
DIBROMOCHLOROMETHANE	<12
1,1-DICHLOROETHANE	<24
1,2-DICHLOROETHANE	<24
1,1-DICHLOROETHENE	<25
CIS-1,2-DICHLOROETHENE	<25
TRANS-1,2-DICHLOROETHENE	<25
1,2-DICHLOROPROPANE	<22
CIS-1,3-DICHLOROPROPENE	<22
TRANS-1,3-DICHLOROPROPENE	<22
METHYLENE CHLORIDE	<280
1,1,2,2-TETRACHLOROETHANE	<14
TETRACHLOROETHENE	<14
1,1,1-TRICHLOROETHANE	<18
1,1,2-TRICHLOROETHANE	<18
TRICHLOROETHENE (TCE)	3,200
TRICHLOROFLUOROMETHANE	<44
VINYL CHLORIDE	<95
SURROGATE PERCENT RECOVERIES	
BROMOCHLOROMETHANE	110

Analytical Technologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody

DATE Oct. 4 PAGE 1 OF 1

PROJECT MANAGER: Steve Perrigo
COMPANY: Geo Engineers
ADDRESS: 2405 NE 140th Ave Suite 105
Bellevue, WA 98005
PHONE: 746-5700 SAMPLED BY: CSL

LABORATORY NUMBER: 8910.032

SAMPLE DISPOSAL INSTRUCTIONS

☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	NUMBER OF CONTAINERS
VS-1	10/5	0945	Vapor	-1	X																					1
VS-2	"	1020	"	-2	X																					1
VS-3	"	1100	"	-3	X																					1
VS-4	"	1040	"	-4	X																					1

PROJECT INFORMATION

PROJECT NUMBER: 15310.002-804
PROJECT NAME: Northwest Plating
PURCHASE ORDER NUMBER:
VIA:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	4
CHAIN OF CUSTODY SEALS Y/N/NA	N
INTACT? Y/N/NA	Y
RECEIVED GOOD COND./COLD	Y

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA 8910.032

SPECIAL INSTRUCTIONS:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Charles S. Lindsay Time: 1145	Signature: Time:	Signature: Time:
Printed Name: Charles S. Lindsay Date: 10/5	Printed Name: Date:	Printed Name: Date:
Company: GEI	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Dayna L. Barkley Time: 11:
Printed Name: Date:	Printed Name: Date:	Printed Name: Dayna L. Barkley Date: 10/
Company:	Company:	Analytical Technologies, Inc.

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B - 57

NWP 0181

AnalyticalTechnologies, Inc. Corporate Offices: 5550 Morehouse Drive San Diego, CA 92121 (619) 458-9141

ATI I.D. 909447

November 1, 1989

Geo Engineers, Inc.
2405 140th Avenue, NE, Suite 105
Bellevue, Washington 98005

Project Name: Northwest Plating

Project No.: 1531-002-B04

Attention: Steve Perrigo

On September 29, 1989, Analytical Technologies, Inc. received one soil and one sludge sample for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The symbol for "less than" indicates a value below the reportable detection limit. Please see the attached sheet for the sample cross reference.

The results of these analyses and the quality control data are enclosed.

Marcilen Lindsey
Senior Project Manager

ML:bc

Richard M. Amano
Laboratory Manager

ANALYTICAL SCHEDULE

CLIENT: GEO ENGINEERS
PROJECT NAME: NORTHWEST PLATING

PROJECT NO.:1531-002-B04

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
CYANIDE, TOTAL	COLORIMETRIC	EPA 9012
CHROMIUM HEXAVALENT	COLORIMETRIC	EPA 7196
PERCENT MOISTURE	GRAVIMETRIC	METHOD 7-2 Methods of Soil Analysis, American Society of Agronomy
ARSENIC	ICAP	EPA 6010
BARIUM	ICAP	EPA 6010
CADMIUM	ICAP	EPA 6010
CHROMIUM	ICAP	EPA 6010
LEAD	ICAP	EPA 6010
MERCURY	AA/COLD VAPOR	EPA 7471
NICKEL	ICAP	EPA 6010
SELENIUM	ICAP	EPA 6010
SILVER	ICAP	EPA 6010
ZINC	ICAP	EPA 6010
EXTRACTION PROCEDURE TOXICITY (EP TOXICITY)	-	EPA 1310
HALOGENATED VOLATILE ORGANICS	GC/HALL	EPA 8010

Analytical Technologies, Inc.

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING
ATI I.D. : 909447

DATE RECEIVED : 09/28/89
REPORT DATE : 11/01/89

ATI #	CLIENT DESCRIPTION	MATRIX	DATE COLLECTED
01	MW-13-1	SLUDGE	09/22/89
02	MW-13-5	SOIL	09/22/89
03	MW-13-1 (EP)	EP EXTRACT	09/22/89

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	1
SLUDGE	1
EP EXTRACT	1

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc.

GENERAL CHEMISTRY RESULTS

ATI I.D. : 909447

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

DATE RECEIVED : 09/28/
REPORT DATE : 11/01/89

PARAMETER	UNITS	01	02
CYANIDE, TOTAL	MG/KG	2.5	0.3
CHROMIUM HEXAVALENT	MG/KG	394	31
% MOISTURE	%	79.9	26.1

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING ATI I.D. : 909447

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CYANIDE, TOTAL	MG/KG	90946103	<0.4	<0.4	0	2.5	4.0	62
CHROMIUM HEXAVALENT	MG/KG	90944702	31	35	12	126	127	73
MOISTURE (%)		90944702	26.1	25.7	2	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 909447

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

DATE RECEIVED : 09/28/
REPORT DATE : 11/01/89

PARAMETER	UNITS	01	02
CADMIUM	MG/KG	253	4.8
CHROMIUM	MG/KG	9150	220
NICKEL	MG/KG	1090	13.5
ZINC	MG/KG	948	65.2

Analytical Technologies, Inc.

METALS RESULTS

ATI I.D. : 909447

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

DATE RECEIVED : 09/28/89
REPORT DATE : 11/01/89

PARAMETER	UNITS	03
SILVER	MG/L	<0.01
ARSENIC	MG/L	<0.03
BARIUM	MG/L	0.04
CADMIUM	MG/L	0.46
CHROMIUM	MG/L	1.4
MERCURY	MG/L	<0.005
LEAD	MG/L	<0.03
SELENIUM	MG/L	<0.03

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING ATI I.D. : 909447

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP. RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
SILVER	MG/L	90944703	<0.01	<0.01	0	1.2	1.0	120
ARSENIC	MG/L	90944703	<0.03	<0.03	0	1.1	1.0	110
BARIUM	MG/L	90944703	0.04	0.04	0	1.2	1.0	116
CADMIUM	MG/L	90944703	0.46	0.46	0	1.6	1.0	114
CADMIUM	MG/KG	91004302	3.6	4.3	18	46.9	49.8	86
CHROMIUM	MG/L	90944703	1.4	1.5	7	2.5	1.0	105
CHROMIUM	MG/KG	91004302	16.6	19.0	13	59.3	49.8	83
MERCURY	MG/L	90944703	<0.005	<0.005	0	0.059	0.050	118
NICKEL	MG/KG	91004302	19.9	25.6	25	64.0	49.8	83
LEAD	MG/L	90944703	<0.03	<0.03	0	1.2	1.0	120
SELENIUM	MG/L	90944703	<0.03	<0.03	0	1.2	1.0	120
ZINC	MG/KG	90946114	784	690	13	**	**	**

$$\%\ \text{Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative Percent Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

** Due to the necessary dilution of the sample, result was not attainable

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 90944701

TEST : EPA 8010 (HALOGENATED VOLATILE ORGANICS)

CLIENT	: GEO ENGINEERS	DATE SAMPLED	: 09/22/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 09/28/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 09/29/89
CLIENT I.D.	: MW-13-1	DATE ANALYZED	: 10/12/89
SAMPLE MATRIX	: SLUDGE	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,3-DICHLOROBENZENE	<0.025
1,2- & 1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE (TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.17
TRICHLOROFLUOROMETHANE	<0.10
VINYL CHLORIDE	<0.010

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	97
TRIFLUOROTOLUENE (%)	89

Analytical Technologies, Inc.

GAS CHROMATOGRAPHY - RESULTS

ATI I.D. : 90944702

TEST : EPA 8010 (HALOGENATED VOLATILE ORGANICS)

CLIENT	: GEO ENGINEERS	DATE SAMPLED	: 09/22/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 09/29/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 09/29/89
CLIENT I.D.	: MW-13-5	DATE ANALYZED	: 10/12/89
SAMPLE MATRIX	: SOIL	UNITS	: MG/KG
		DILUTION FACTOR	: 1

COMPOUNDS	RESULTS
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,3-DICHLOROBENZENE	<0.025
1,2- & 1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE (TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.074
TRICHLOROFLUOROMETHANE	<0.10
VINYL CHLORIDE	<0.010

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	117
TRIFLUOROTOLUENE (%)	96

NWP 0191

AnalyticalTechnologies, Inc. GAS CHROMATOGRAPHY - RESULTS

REAGENT BLANK

TEST : EPA 8010 (HALOGENATED VOLATILE ORGANICS)

CLIENT	: GEO ENGINEERS	ATI I.D.	: 909447
PROJECT #	: 1531-002-B04	DATE EXTRACTED	: 09/29/89
PROJECT NAME	: NORTHWEST PLATING	DATE ANALYZED	: 10/03/89
CLIENT I.D.	: REAGENT BLANK	UNITS	: MG/KG
		DILUTION FACTOR	: N/A

COMPOUNDS	RESULTS
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.010
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.010
CHLOROFORM	<0.010
CHLOROMETHANE	<0.010
DIBROMOCHLOROMETHANE	<0.010
1,3-DICHLOROBENZENE	<0.025
1,2- & 1,4-DICHLOROBENZENE	<0.025
DICHLORODIFLUOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
1,2-DICHLOROETHENE (TOTAL)	<0.010
1,2-DICHLOROPROPANE	<0.010
[illegible]-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.10
VINYL CHLORIDE	<0.010

SURROGATE PERCENT RECOVERIES

BROMOCHLOROMETHANE (%)	99
TRIFLUOROTOLUENE (%)	134

Analytical Technologies, Inc.

QUALITY CONTROL DATA

ATI I.D. : 909447

TEST : EPA 8010 (HALOGENATED VOLATILE ORGANICS)

CLIENT : GEO ENGINEERS
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING
REF I.D. : 90933701

DATE EXTRACTED : 09/27/89
DATE ANALYZED : 09/29/89
SAMPLE MATRIX : SOIL
UNITS : MG/KG

COMPOUNDS	SAMPLE RESULT	CONC. SPIKED	SPIKED SAMPLE	% REC.	DUP. SPIKED SAMPLE	DUP. % REC.	RPD
CHLOROFORM	<0.010	0.20	0.18	90	0.17	85	6
CHLOROBENZENE	<0.025	0.60	0.55	92	0.50	83	10
1,1-DICHLOROETHENE	<0.010	0.20	0.17	85	0.15	75	12
TRICHLOROETHENE	<0.010	0.20	0.18	90	0.16	80	12
TETRACHLOROETHENE	<0.010	0.20	0.17	85	0.15	75	12

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Spiked Sample Result} - \text{Duplicate Spike Sample Result})}{\text{Average of Spiked Sample}} \times 100$$

AnalyticalTechnologies,Inc.
560 Naches Avenue SW, Suite 101 Renton,WA 98055

Chain of Custody

DATE Sept 28 PAGE 1 OF 1

PROJECT MANAGER: Steve Perrigo
COMPANY: GEI
ADDRESS: 2405 140th Ave N.E. Suite 105
Bellevue, WA
PHONE: 746-5200 SAMPLED BY: CSL

LABORATORY NUMBER: 409447

SAMPLE DISPOSAL INSTRUCTIONS

☐ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	Cyanide	Cd, Cr, Cr^{+6}, Ni, Zn						NUMBER OF CONTAINERS
MW-13-1	9/22	—	Sludge	01	X																				X	X	X						1
MW-13-5	9/22	—	Soil	02	X																					X	X						1

PROJECT INFORMATION

PROJECT NUMBER: 1531-002-B04
PROJECT NAME: Northwest Plating
PURCHASE ORDER NUMBER:
VIA:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	2
CHAIN OF CUSTODY SEALS Y/N/NA	
INTACT? Y/N/NA	
RECEIVED GOOD COND./COLD	

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS: FAX ... DATA DUE 10/13 FAX RESULTS TO Geoengineers ... 5068

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Charles S. Lindsey Time:	Signature: C.J. Alston Time:	Signature: Time:
Printed Name: Charles S. Lindsey Date: 9/28	Printed Name: C.J. Alston Date: 092889	Printed Name: Date:
Company: GEI	Company: Analytical Technol.	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: C.J. Alston Time: 1530	Signature: Time:	Signature: Kaufe Time:
Printed Name: C.J. Alston Date: 092889	Printed Name: Date:	Printed Name: Kaufe Date:
Company: Analytical Technol.	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC • Pink - ORIGINATOR

NWP 0194

B - 70

AnalyticalTechnologies,Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8910-069

November 13, 1989

GeoEngineers, Inc.
2405 140th Avenue N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-002-BO4

Project Name : Northwest Plating

On October 11, 1989 Analytical Technologies, Inc. received eight soil samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/nah

ATI I.D. # 8910-069

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8910-069-1	MW-15-4	SOIL	10/09/89
8910-069-2	MW-16-1	SOIL	10/09/89
8910-069-3	MW-16-3	SOIL	10/09/89
8910-069-4	MW-17-2	SOIL	10/10/89
8910-069-5	MW-17-3	SOIL	10/10/89
8910-069-6	MW-18-1	SOIL	10/10/89
8910-069-7	MW-18-2	SOIL	10/10/89
8910-069-8	MW-19-1	SOIL	10/10/89

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	8

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

ATI I.D. # 8910-069

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
CADMIUM	AA/GF	EPA 7131
CHROMIUM	AA/F	EPA 7190
HEXAVALENT CHROMIUM	COLORIMETRIC	EPA 7196
NICKEL	AA/F	EPA 7520
ZINC	AA/F	EPA 7950
CYANIDE	COLORIMETRIC	EPA 9012
MOISTURE	GRAVIMETRIC	METHOD 7-2.2

ATI I.D. # 8910-069

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-002-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 11/08/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	72

ATI I.D. # 8910-069-1

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/09/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-15-4	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 100

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<1.0
BROMOFORM	<1.0
BROMOMETHANE	<2.5
CARBON TETRACHLORIDE	<1.0
CHLOROBENZENE	<2.5
CHLOROETHANE	<2.5
CHLOROFORM	<1.0
CHLOROMETHANE	<10
DIBROMOCHLOROMETHANE	<1.0
1,1-DICHLOROETHANE	<1.0
1,2-DICHLOROETHANE	<1.0
1,1-DICHLOROETHENE	<1.0
CIS-1,2-DICHLOROETHENE	<1.0
TRANS-1,2-DICHLOROETHENE	<1.0
1,2-DICHLOROPROPANE	<1.0
CIS-1,3-DICHLOROPROPENE	<1.0
TRANS-1,3-DICHLOROPROPENE	<1.0
METHYLENE CHLORIDE	<10
1,1,2,2-TETRACHLOROETHANE	<1.0
TETRACHLOROETHENE	<1.0
1,1,1-TRICHLOROETHANE	<1.0
1,1,2-TRICHLOROETHANE	<1.0
TRICHLOROETHENE	4.2
TRICHLOROFLUOROMETHANE	<2.5
VINYL CHLORIDE	<2.5

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	**

** Due to the necessary dilution of the sample, result was not attainable.

ATI I.D. # 8910-069-2

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/09/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-16-1	DATE ANALYZED	: 10/21/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1 & 100

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	0.40
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.56
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	47 *
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	95

* Dilution factor = 100.

ATI I.D. # 8910-069-3

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/09/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-16-3	DATE ANALYZED	: 10/21/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1 & 5

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	0.088
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	0.055
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	3.9 *
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	97

* Dilution factor = 5.

ATI I.D. # 8910-069-4

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/10/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-17-2	DATE ANALYZED	: 10/21/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.44
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	101

Analytical Technologies, Inc.

ATI I.D. # 8910-069-5

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/10/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-17-3	DATE ANALYZED	: 10/21/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	0.15
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	1.05
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	82

ATI I.D. # 8910-069-6

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/10/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-18-1	DATE ANALYZED	: 10/21/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	1.6
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	103

ATI I.D. # 8910-069-7

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/10/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-18-2	DATE ANALYZED	: 10/21/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.40
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	97

ATI I.D. # 8910-069-8

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/10/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: MW-19-1	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	0.011
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.042
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	71

ATI I.D. # 8910-069

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: BLANK 10/16
PROJECT #	: 1531-002-BO4	DATE ANALYZED	: 11/08/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8010	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CHLOROBENZENE	<0.025	0.600	0.481	80	N/A	N/A	N/A
1,1-DICHLOROETHENE	<0.010	0.200	0.114	*	N/A	N/A	N/A
TETRACHLOROETHENE	<0.010	0.200	0.162	81	N/A	N/A	N/A
TRICHLOROETHENE	<0.010	0.200	0.148	74	N/A	N/A	N/A

* Out of limits. It is believed that the low 1,1-Dichloroethene recovery is due to the aging of the spike solution. It is generally the first compound to dissipate, indicating problems with the spike solution.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8910-069

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: 8910-069-8
PROJECT #	: 1531-002-BO4	DATE ANALYZED	: 10/21/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8010	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CHLOROBENZENE	<0.025	0.600	0.638	106	0.610	102	4
1,1-DICHLOROETHENE	0.011	0.200	0.103	*	0.080	*	*
TETRACHLOROETHENE	<0.010	0.200	0.196	98	0.198	99	1
TRICHLOROETHENE	0.040	0.200	0.226	93	0.689	**	**

* Out of limits. It is believed that the low 1,1-Dichloroethene recovery is due to the aging of the spike solution. It is generally the first compound to dissipate, indicating problems with the spike solution.

** Out of limits due to matrix interference.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D.# 8910-069

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL
UNITS : mg/Kg

PARAMETER	-1	-2	-3	-4	-5	-6	-7	-8
CADMIUM	100	13	25	<1	1.7	23	130	6.5
CHROMIUM	67	87	56	22	51	85	2,700	230
HEXAVALENT CHROMIUM	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	4.9
NICKEL	53	57	42	8.6	27	110	300	92
ZINC	1,600	720	410	35	52	630	420	43

ATI I.D. # 8910-069

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL
UNITS : mg/Kg

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8910-069-8	6.9	6.1	12	19.3	14.1	91
CHROMIUM	8910-069-8	225	226	0	306	57	70
HEXAVALENT CHROMIUM	8910-069-8	4.7	4.9	4	**	**	**
NICKEL	8910-069-8	92.4	97.8	6	234	141	100
ZINC	8910-069-8	42	44	5	58	14.1	106

** Due to the necessary dilution of the sample, result was not attainable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

ATI I.D. # 8910-069

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL

PARAMETER	UNITS	-1	-2	-3	-4
CYANIDE	mg/Kg	32	1.0	3.8	<0.2
MOISTURE	%	25	23	19	7.4

ATI I.D. # 8910-069

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL

PARAMETER	UNITS	-5	-6	-7	-8
CYANIDE	mg/Kg	<0.2	0.4	2.4	<0.2
MOISTURE	%	26	23	26	6.3

ATI I.D. # 8910-069

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
CYANIDE	mg/Kg	91032512	<0.2	<0.2	0	3.4	4.0	85
MOISTURE	%	8910-069-6	23	20	14	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8910-087

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: 8910-069-8
PROJECT #	: 1531-002-B04	DATE ANALYZED	: 10/21/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8010	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CHLOROBENZENE	<0.025	0.600	0.638	106	0.610	102	4
1,1-DICHLOROETHENE	0.011	0.200	0.103	*	0.080	*	25
TETRACHLOROETHENE	<0.010	0.200	0.196	98	0.198	99	1
TRICHLOROETHENE	0.040	0.200	0.226	93	0.689	**	**

* Out of limits. It is believed that the low 1,1-Dichloroethene recovery is due to the aging of the spike solution. It is generally the first compound to dissipate, indicating problems with the spike solution.

** Out of limits possibly due to inhomogeneous sample.

$$\% \text{ Rcovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8910-087

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: BLANK 10/16
PROJECT #	: 1531-002-B04	DATE ANALYZED	: 11/08/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8010	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CHLOROBENZENE	<0.025	0.600	0.481	80	N/A	N/A	N/A
1,1-DICHLOROETHENE	<0.010	0.200	0.114	**	N/A	N/A	N/A
TETRACHLOROETHENE	<0.010	0.200	0.162	81	N/A	N/A	N/A
TRICHLOROETHENE	<0.010	0.200	0.148	74	N/A	N/A	N/A

** Out of limits. It is believed that the low 1,1-Dichloroethene recovery is due to the aging of the spike solution. It is generally the first compound to dissipate, indicating problems with the spike solution.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

Analytical Technologies, Inc.

ATI I.D. # 8910-087-6

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/12/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/12/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: TP-3-1	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.11
BROMOFORM	<0.11
BROMOMETHANE	<0.28
CARBON TETRACHLORIDE	<0.11
CHLOROBENZENE	<0.28
CHLOROETHANE	<0.28
CHLOROFORM	<0.11
CHLOROMETHANE	<1.1
DIBROMOCHLOROMETHANE	<0.11
1,1-DICHLOROETHANE	<0.11
1,2-DICHLOROETHANE	<0.11
1,1-DICHLOROETHENE	<0.11
CIS-1,2-DICHLOROETHENE	<0.11
TRANS-1,2-DICHLOROETHENE	<0.11
1,2-DICHLOROPROPANE	<0.11
CIS-1,3-DICHLOROPROPENE	<0.11
TRANS-1,3-DICHLOROPROPENE	<0.11
METHYLENE CHLORIDE	<1.1
1,1,2,2-TETRACHLOROETHANE	<0.11
TETRACHLOROETHENE	<0.11
1,1,1-TRICHLOROETHANE	<0.11
1,1,2-TRICHLOROETHANE	<0.11
TRICHLOROETHENE	0.25
TRICHLOROFLUOROMETHANE	<0.28
VINYL CHLORIDE	<0.28

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	**

** Results not attainable due to matrix interference.

NWP 0241

ATI I.D. # 8910-087-5

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/12/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/12/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: TP-2-2	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.034
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	69

Analytical Technologies, Inc.

ATI I.D. # 8910-087-4

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/12/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/12/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: TP-2-1	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.042
BROMOFORM	<0.042
BROMOMETHANE	<0.10
CARBON TETRACHLORIDE	<0.042
CHLOROBENZENE	<0.10
CHLOROETHANE	<0.10
CHLOROFORM	<0.042
CHLOROMETHANE	<0.42
DIBROMOCHLOROMETHANE	<0.042
1,1-DICHLOROETHANE	<0.042
1,2-DICHLOROETHANE	<0.042
1,1-DICHLOROETHENE	<0.042
CIS-1,2-DICHLOROETHENE	<0.042
TRANS-1,2-DICHLOROETHENE	<0.042
1,2-DICHLOROPROPANE	<0.042
CIS-1,3-DICHLOROPROPENE	<0.042
TRANS-1,3-DICHLOROPROPENE	<0.042
METHYLENE CHLORIDE	<0.42
1,1,2,2-TETRACHLOROETHANE	<0.042
TETRACHLOROETHENE	<0.042
1,1,1-TRICHLOROETHANE	<0.042
1,1,2-TRICHLOROETHANE	<0.042
TRICHLOROETHENE	0.10
TRICHLOROFLUOROMETHANE	<0.10
VINYL CHLORIDE	<0.10

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	**

** Results not attainable due to matrix interference.

ATI I.D. # 8910-087-3

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/12/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 10/12/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: TP-1-2	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	0.012
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	0.16
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.15
TRICHLOROFLUOROMETHANE	0.29
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	**

** Results not attainable due to matrix interference.

NWP 0238

Analytical Technologies, Inc.

ATI I.D. # 8910-087-2

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/12/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/12/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: TP-1-1	DATE ANALYZED	: 11/01/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.063
BROMOFORM	<0.063
BROMOMETHANE	<0.16
CARBON TETRACHLORIDE	<0.063
CHLOROBENZENE	<0.16
CHLOROETHANE	<0.16
CHLOROFORM	<0.063
CHLOROMETHANE	<0.62
DIBROMOCHLOROMETHANE	<0.063
1,1-DICHLOROETHANE	<0.063
1,2-DICHLOROETHANE	<0.063
1,1-DICHLOROETHENE	<0.063
CIS-1,2-DICHLOROETHENE	<0.063
TRANS-1,2-DICHLOROETHENE	<0.063
1,2-DICHLOROPROPANE	<0.063
CIS-1,3-DICHLOROPROPENE	<0.063
TRANS-1,3-DICHLOROPROPENE	<0.063
METHYLENE CHLORIDE	<0.62
1,1,2,2-TETRACHLOROETHANE	<0.063
TETRACHLOROETHENE	<0.063
1,1,1-TRICHLOROETHANE	<0.063
1,1,2-TRICHLOROETHANE	<0.063
TRICHLOROETHENE	0.1
TRICHLOROFLUOROMETHANE	<0.16
VINYL CHLORIDE	<0.16

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	**

** Results not attainable due to matrix interference.

ATI I.D. # 8910-087

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: 10/16/89
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 11/08/89
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	72

ATI I.D. # 8910-087

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
ARSENIC	AA/GF	EPA 7060
BARIUM	AA/F	EPA 7080
CADMIUM	AA/F	EPA 7130
CHROMIUM	AA/F	EPA 7190
HEXAVALENT CHROMIUM	COLORIMETRIC	EPA 7196
LEAD	AA/F	EPA 7420
MERCURY	AA/COLD VAPOR	EPA 7471
NICKEL	AA/F	EPA 7520
SELENIUM	AA/GF	EPA 7740
SILVER	AA/F	EPA 7760
ZINC	AA/F	EPA 7950
CYANIDE	COLORIMETRIC	EPA 9012
MOISTURE	GRAVIMETRIC	METHOD 7-2.2

ATI I.D. # 8910-087

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8910-087-1	MW-16	WATER	10/12/89
8910-087-2	TP-1-1	SOIL	10/12/89
8910-087-3	TP-1-2	SOIL	10/12/89
8910-087-4	TP-2-1	SOIL	10/12/89
8910-087-5	TP-2-2	SOIL	10/12/89
8910-087-6	TP-3-1	SOIL	10/12/89

----- TOTALS -----

MATRIX	# SAMPLES
WATER	1
SOIL	5

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

AnalyticalTechnologies,Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8910-087

November 13, 1989

GeoEngineers, Inc.
2405 140th Avenue N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-002-BO4

Project Name : Northwest Plating

On October 12, 1989 Analytical Technologies, Inc. received one water sample and five soil samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/nah

Analytical Technologies, Inc.
5550 Morehouse Drive • San Diego, CA 92121-1709

8910078

Chain of Custody

DATE 10/11 PAGE 1 OF 1

PROJECT MANAGER: Steve Perrigo
COMPANY: GeoEngineers
ADDRESS: 2405 140th Ave N.E. Suite 105
Bellevue, WA

BILL TO: Same
COMPANY:
ADDRESS:

Charles Linder
SAMPLERS: (Signature)

(206) 746-5200
PHONE NUMBER

Recommended Quantity and Preservative (Provide triple volume on QC Samples)

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	Petroleum Hydrocarbons 418.1	Oil and Grease 413.2	Gasoline (MOD 8015/DOHS)	Diesel (MOD 8015/DOHS)	Gasoline/BTXE (MOD 8015/8020)	Petroleum Distillates (C6-C25)	BTXE (8020)	Chlorinated Hydrocarbons (8010)	Aromatic Hydrocarbons (8020)	Chlorinated/Aromatic Hydrocarbons (8010/8020)	Organic Pb		Pesticides/PCB (8080)	Base/NEU/Acid Cmpds GC/MS (8270)	Volatile Cmpds GC/MS (8240)	Polynuclear Aromatic (8310)	CCR Metals	Priority Pollutant Metals	Cyanide	Cd, Cr, Cr+6, Ni, Zn								Number of Containers
					1L (H_2SO_4)/100g	1L (H_2SO_4)/100g	4 oz (HCl)/50g	4 oz (HCl)/50g	4 oz (HCl)/50g	4 oz (HCl)/50g	2X40ml (HCl)/50g	2X40ml (HCl)/50g	2X40ml (HCl)/50g	2X40ml (HCl)/50g	500ml/50g		1L/50g	1L/100g	2X40ml (HCl)/100g	1L/100g	500ml/100g	500ml/100g										
MW-13	10/11		Water	1								X											X	X							4
MW-14	"		"	2								X											X	X							4
MW-15	"		"	3								X											X	X							4
MW-16	"		"	4								X											X								3
MW-17	"		"	5								X											X	X							4
MW-18	"		"	6								X											X	X							4
MW-19	"		"	7								X											X	X							4

B-108

NWP 0232

PROJECT INFORMATION	SAMPLE RECEIPT	
PROJECT NUMBER: 1531-002-B04	TOTAL NUMBER OF CONTAINERS	27
PROJECT NAME: Northwest Plating	CHAIN OF CUSTODY SEALS Y/N/NA	NA
PURCHASE ORDER NUMBER:	INTACT? Y/N/NA	Y
VIA:	RECEIVED GOOD COND./COLD	Y
TAT: ☐ 24HR ☐ 48 HRS ☐ 1 WK ☒ 2 WKS	LAB NUMBER 8910-078 CDA	

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Charles Linder Time: 1640	Signature: Time:	Signature: Time:
Printed Name: Charles S. Linder Date: 10/11	Printed Name: Date:	Printed Name: Date:
Company: GEI	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 1645
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 10/11
Company:	Company:	Analytical Technologies, Inc.

ATI LABORATORIES: San Diego (619) 458-9141 • Phoenix (602) 438-1530 • Seattle (206) 228-8335 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. • Pink - ORIGINATOR

Analytical Technologies, Inc.

ATI I.D. # 8910-078

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
CYANIDE	mg/L	91025703	<0.01	<0.01	0	0.49	0.50	98

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8910-078

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	-1	-2	-3	-4	-5	-6	-7
CYANIDE	2.1	0.04	4.3	10	0.2	<0.1	13

ATI I.D. # 8910-078

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8910-078-5	0.272	0.274	1	**	**	**
CADMIUM	8910-073-5	0.0021	0.0020	5	0.0046	0.0020	125
CHROMIUM	8910-078-5	190	190	0	**	**	**
HEXAVALENT CHROMIUM	8910-078-3	0.03	0.02	40	N/A	N/A	N/A
HEXAVALENT CHROMIUM	8910-078-7	0.15	N/A	N/A	**	**	**
NICKEL	8910-078-5	0.411	0.407	0	2.83	2.50	97
ZINC	8910-078-5	0.174	0.148	10	0.368	0.250	83

** Due to the necessary dilution of the sample, result was not attainable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D.# 8910-078

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	-1	-2	-3	-5	-6	-7
CADMIUM	0.02	0.0012	0.05	0.27	11	0.02
CHROMIUM	17	0.24	0.02	200	440	0.49
HEXAVALENT CHROMIUM	17	0.23	0.02	200	430	0.15
NICKEL	0.05	<0.03	0.35	0.41	7.4	0.05
ZINC	0.20	0.03	0.21	0.16	9.2	0.04

Analytical Technologies, Inc.

ATI I.D. # 8910-078

VOLATILE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: 8910-078-1
PROJECT #	: 1531-002-BO4	DATE ANALYZED	: 10/25/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: WATER
EPA METHOD	: 8010	UNITS	: ug/L

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CARBONTETRACHLORIDE	<0.3	20	21.4	107	20.8	104	3
BROMODICHLOROMETHANE	<0.3	20	19.2	96	19.4	97	2
TETRACHLOROETHENE	<0.3	20	20.0	100	21.8	109	8

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

NWP 00227

ATI I.D. # 8910-078-7

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-19	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 25

COMPOUND	RESULT
BROMODICHLOROMETHANE	<8
BROMOFORM	<12
BROMOMETHANE	<25
CARBON TETRACHLORIDE	<8
CHLOROBENZENE	<12
CHLOROETHANE	<12
CHLOROFORM	24 B
CHLOROMETHANE	<25
DIBROMOCHLOROMETHANE	<8
1,1-DICHLOROETHANE	<8
1,2-DICHLOROETHANE	<8
1,1-DICHLOROETHENE	<12
CIS-1,2-DICHLOROETHENE	<12
TRANS-1,2-DICHLOROETHENE	<12
1,2-DICHLOROPROPANE	<8
CIS-1,3-DICHLOROPROPENE	<8
TRANS-1,3-DICHLOROPROPENE	<8
METHYLENE CHLORIDE	730 B
1,1,2,2-TETRACHLOROETHANE	<8
TETRACHLOROETHENE	<8
1,1,1-TRICHLOROETHANE	<8
1,1,2-TRICHLOROETHANE	<8
TRICHLOROETHENE (TCE)	350
TRICHLOROFLUOROMETHANE	<12
VINYL CHLORIDE	<12

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE	71

B = Found in Blank.

Injected solution concentration for Chloroform and Methylene Chloride is 1.0 and 29 ug/L respectively. High result is probably due to dilution factor multiplication.

ATI I.D. # 8910-078-6

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-18	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 25

COMPOUND	RESULT
BROMODICHLOROMETHANE	<8
BROMOFORM	<12
BROMOMETHANE	<25
CARBON TETRACHLORIDE	<8
CHLOROBENZENE	<12
CHLOROETHANE	<12
CHLOROFORM	23 B
CHLOROMETHANE	<25
DIBROMOCHLOROMETHANE	<8
1,1-DICHLOROETHANE	<8
1,2-DICHLOROETHANE	<8
1,1-DICHLOROETHENE	<12
CIS-1,2-DICHLOROETHENE	<12
TRANS-1,2-DICHLOROETHENE	<12
1,2-DICHLOROPROPANE	<8
CIS-1,3-DICHLOROPROPENE	<8
TRANS-1,3-DICHLOROPROPENE	<8
METHYLENE CHLORIDE	760 B
1,1,2,2-TETRACHLOROETHANE	<8
TETRACHLOROETHENE	<8
1,1,1-TRICHLOROETHANE	<8
1,1,2-TRICHLOROETHANE	<8
TRICHLOROETHENE (TCE)	260
TRICHLOROFLUOROMETHANE	<12
VINYL CHLORIDE	<12
SURROGATE PERCENT RECOVERIES	
BROMOFLUOROBENZENE	72

B = Found in Blank.

Injected solution concentration for Chloroform and Methylene Chloride is 0.9 and 30 ug/L respectively. High result is probably due to dilution factor multiplication.

NWP 00225

ATI I.D. # 8910-078-5

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-17	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 25

COMPOUND	RESULT
BROMODICHLOROMETHANE	<8
BROMOFORM	<12
BROMOMETHANE	<25
CARBON TETRACHLORIDE	<8
CHLOROBENZENE	<12
CHLOROETHANE	<12
CHLOROFORM	21 B
CHLOROMETHANE	<25
DIBROMOCHLOROMETHANE	<8
1,1-DICHLOROETHANE	<8
1,2-DICHLOROETHANE	<8
1,1-DICHLOROETHENE	<12
CIS-1,2-DICHLOROETHENE	<12
TRANS-1,2-DICHLOROETHENE	<12
1,2-DICHLOROPROPANE	<8
CIS-1,3-DICHLOROPROPENE	<8
TRANS-1,3-DICHLOROPROPENE	<8
METHYLENE CHLORIDE	760 B
1,1,2,2-TETRACHLOROETHANE	<8
TETRACHLOROETHENE	<8
1,1,1-TRICHLOROETHANE	<8
1,1,2-TRICHLOROETHANE	<8
TRICHLOROETHENE (TCE)	1,850
TRICHLOROFLUOROMETHANE	<12
VINYL CHLORIDE	<12
SURROGATE PERCENT RECOVERIES	
BROMOFLUOROBENZENE	75

B = Found in Blank.

Injected solution concentration for Chloroform and Methylene Chloride is 0.8 and 30 ug/L respectively. High result is probably due to dilution factor multiplication.

NWP 0224

Analytical Technologies, Inc.

ATI I.D. # 8910-078-4

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-16	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 50

COMPOUND	RESULT
BROMODICHLOROMETHANE	<15
BROMOFORM	<25
BROMOMETHANE	<50
CARBON TETRACHLORIDE	<15
CHLOROBENZENE	<25
CHLOROETHANE	<25
CHLOROFORM	30 B
CHLOROMETHANE	<50
DIBROMOCHLOROMETHANE	<15
1,1-DICHLOROETHANE	<15
1,2-DICHLOROETHANE	<15
1,1-DICHLOROETHENE	<25
CIS-1,2-DICHLOROETHENE	<25
TRANS-1,2-DICHLOROETHENE	<25
1,2-DICHLOROPROPANE	<15
CIS-1,3-DICHLOROPROPENE	<15
TRANS-1,3-DICHLOROPROPENE	<15
METHYLENE CHLORIDE	7,000 B
1,1,2,2-TETRACHLOROETHANE	<15
TETRACHLOROETHENE	<15
1,1,1-TRICHLOROETHANE	20
1,1,2-TRICHLOROETHANE	<15
TRICHLOROETHENE (TCE)	9,600
TRICHLOROFLUOROMETHANE	<25
VINYL CHLORIDE	<25
SURROGATE PERCENT RECOVERIES	
BROMOFLUOROBENZENE	87

B = Found in Blank

Injected solution concentration for Chloroform and Methylene Chloride is 0.6 and 140 ug/L respectively. High result is probably due to dilution factor multiplication.

NWP 0223

ATI I.D. # 8910-078-3

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-15	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 500

COMPOUND	RESULT
BROMODICHLOROMETHANE	<150
BROMOFORM	<250
BROMOMETHANE	<500
CARBON TETRACHLORIDE	<150
CHLOROBENZENE	<250
CHLOROETHANE	<250
CHLOROFORM	250 B
CHLOROMETHANE	<500
DIBROMOCHLOROMETHANE	<150
1,1-DICHLOROETHANE	<150
1,2-DICHLOROETHANE	<150
1,1-DICHLOROETHENE	<250
CIS-1,2-DICHLOROETHENE	<250
TRANS-1,2-DICHLOROETHENE	<250
1,2-DICHLOROPROPANE	<150
CIS-1,3-DICHLOROPROPENE	<150
TRANS-1,3-DICHLOROPROPENE	<150
METHYLENE CHLORIDE	63,900 B
1,1,2,2-TETRACHLOROETHANE	<150
TETRACHLOROETHENE	<150
1,1,1-TRICHLOROETHANE	<150
1,1,2-TRICHLOROETHANE	<150
TRICHLOROETHENE (TCE)	56,000
TRICHLOROFLUOROMETHANE	<250
VINYL CHLORIDE	<250

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE	86

B = Found in Blank.

Injected solution concentration for Chloroform and Methylene Chloride is 0.5 and 130 ug/L respectively. High result is probably due to dilution factor multiplication.

ATI I.D. # 8910-078-2

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-14	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 25

COMPOUND	RESULT
BROMODICHLOROMETHANE	<8
BROMOFORM	<12
BROMOMETHANE	<25
CARBON TETRACHLORIDE	<8
CHLOROBENZENE	<12
CHLOROETHANE	<12
CHLOROFORM	28 B
CHLOROMETHANE	<25
DIBROMOCHLOROMETHANE	<8
1,1-DICHLOROETHANE	<8
1,2-DICHLOROETHANE	<8
1,1-DICHLOROETHENE	<12
CIS-1,2-DICHLOROETHENE	<12
TRANS-1,2-DICHLOROETHENE	<12
1,2-DICHLOROPROPANE	<8
CIS-1,3-DICHLOROPROPENE	<8
TRANS-1,3-DICHLOROPROPENE	<8
METHYLENE CHLORIDE	800 B
1,1,2,2-TETRACHLOROETHANE	<8
TETRACHLOROETHENE	<8
1,1,1-TRICHLOROETHANE	<8
1,1,2-TRICHLOROETHANE	<8
TRICHLOROETHENE (TCE)	580
TRICHLOROFLUOROMETHANE	<12
VINYL CHLORIDE	<12

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE	84

B = Found in Blank.

Injected solution concentration for Chloroform and Methylene Chloride is 1.1 and 32 ug/L respectively. High result is probably due to dilution factor multiplication.

NWP 0221

ATI I.D. # 8910-078-1

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 10/11/89
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: 10/11/89
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: MW-13	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 25

COMPOUND	RESULT
BROMODICHLOROMETHANE	<8
BROMOFORM	<12
BROMOMETHANE	<25
CARBON TETRACHLORIDE	<8
CHLOROBENZENE	<12
CHLOROETHANE	<12
CHLOROFORM	27 B
CHLOROMETHANE	<25
DIBROMOCHLOROMETHANE	<8
1,1-DICHLOROETHANE	<8
1,2-DICHLOROETHANE	<8
1,1-DICHLOROETHENE	<12
CIS-1,2-DICHLOROETHENE	<12
TRANS-1,2-DICHLOROETHENE	<12
1,2-DICHLOROPROPANE	<8
CIS-1,3-DICHLOROPROPENE	<8
TRANS-1,3-DICHLOROPROPENE	<8
METHYLENE CHLORIDE	770 B
1,1,2,2-TETRACHLOROETHANE	<8
TETRACHLOROETHENE	<8
1,1,1-TRICHLOROETHANE	<8
1,1,2-TRICHLOROETHANE	<8
TRICHLOROETHENE (TCE)	130
TRICHLOROFLUOROMETHANE	<12
VINYL CHLORIDE	<12
SURROGATE PERCENT RECOVERIES	
BROMOFLUOROBENZENE	85

B = Found in Blank.

Injected solution concentration for Chloroform and Methylene Chloride is 1.1 and 31 ug/L respectively. High result is probably due to dilution factor multiplication.

Analytical Technologies, Inc.

ATI I.D. # 8910-078

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK 2	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.3
BROMOFORM	<0.5
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.3
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	1.0
CHLOROMETHANE	<1.0
DIBROMOCHLOROMETHANE	<0.3
1,1-DICHLOROETHANE	<0.3
1,2-DICHLOROETHANE	<0.3
1,1-DICHLOROETHENE	<0.5
CIS-1,2-DICHLOROETHENE	<0.5
TRANS-1,2-DICHLOROETHENE	<0.5
1,2-DICHLOROPROPANE	<0.3
CIS-1,3-DICHLOROPROPENE	<0.3
TRANS-1,3-DICHLOROPROPENE	<0.3
METHYLENE CHLORIDE	130
1,1,2,2-TETRACHLOROETHANE	<0.3
TETRACHLOROETHENE	<0.3
1,1,1-TRICHLOROETHANE	<0.3
1,1,2-TRICHLOROETHANE	<0.3
TRICHLOROETHENE (TCE)	<0.3
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5
SURROGATE PERCENT RECOVERIES	
BROMOFLUOROBENZENE	92

NWP 0219

ATI I.D. # 8910-078

VOLATILE HALOCARBONS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-002-BO4	DATE RECEIVED	: N/A
PROJECT NAME	: NORTHWEST PLATING	DATE EXTRACTED	: N/A
CLIENT I.D.	: REAGENT BLANK 1	DATE ANALYZED	: 10/25/89
SAMPLE MATRIX	: WATER	UNITS	: ug/L
EPA METHOD	: 8010	DILUTION FACTOR	: 1

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.3
BROMOFORM	<0.5
BROMOMETHANE	<1.0
CARBON TETRACHLORIDE	<0.3
CHLOROBENZENE	<0.5
CHLOROETHANE	<0.5
CHLOROFORM	1.2
CHLOROMETHANE	<1.0
DIBROMOCHLOROMETHANE	<0.3
1,1-DICHLOROETHANE	<0.3
1,2-DICHLOROETHANE	<0.3
1,1-DICHLOROETHENE	<0.5
CIS-1,2-DICHLOROETHENE	<0.5
TRANS-1,2-DICHLOROETHENE	<0.5
1,2-DICHLOROPROPANE	<0.3
CIS-1,3-DICHLOROPROPENE	<0.3
TRANS-1,3-DICHLOROPROPENE	<0.3
METHYLENE CHLORIDE	40
1,1,2,2-TETRACHLOROETHANE	<0.3
TETRACHLOROETHENE	<0.3
1,1,1-TRICHLOROETHANE	<0.3
1,1,2-TRICHLOROETHANE	<0.3
TRICHLOROETHENE (TCE)	<0.3
TRICHLOROFLUOROMETHANE	<0.5
VINYL CHLORIDE	<0.5

SURROGATE PERCENT RECOVERIES

BROMOFLUOROBENZENE	93

ATI I.D. # 8910-078

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
CADMIUM	AA/GF	EPA 7131
CADMIUM	AA/F	EPA 7130
CHROMIUM	AA/F	EPA 7190
HEXAVALENT CHROMIUM	COLORIMETRIC	EPA 7196
NICKEL	AA/F	EPA 7520
ZINC	AA/F	EPA 7950
CYANIDE	COLORIMETRIC	EPA 9012

ATI I.D. # 8910-078

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

ATI #	CLIENT DESCRIPTION	MATRIX	DATE SAMPLED
8910-078-1	MW-13	WATER	10/11/89
8910-078-2	MW-14	WATER	10/11/89
8910-078-3	MW-15	WATER	10/11/89
8910-078-4	MW-16	WATER	10/11/89
8910-078-5	MW-17	WATER	10/11/89
8910-078-6	MW-18	WATER	10/11/89
8910-078-7	MW-19	WATER	10/11/89

----- TOTALS -----

MATRIX	# SAMPLES
WATER	7

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

Analytical Technologies, Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8910-078

November 13, 1989

GeoEngineers, Inc.
2405 140th Avenue N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-002-B04

Project Name : Northwest Plating

On October 11, 1989 Analytical Technologies, Inc. received seven water samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Donna M. McKinney
Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/nah

Analytical Technologies, Inc.
5550 Morehouse Drive • San Diego, CA 92121-1709

Chain of Custody

8910069

DATE 10/11 PAGE 1 OF

NWP 0214

B - 90

PROJECT MANAGER: Steve Perrigo
COMPANY: GeoEngineers
ADDRESS: 2405 140th Ave N.E. Suite 105
Bellevue, WA 98005 746-5200

BILL TO: Same
COMPANY:
ADDRESS:

Chad S. Hinkley
SAMPLERS: (Signature)

(206) 746-5200
PHONE NUMBER

SAMPLE ID	DATE	TIME	MATRIX	LAB ID
MW-15-4	10/9	—	Soil	1
MW-16-1	10/9	—	Soil	2
MW-16-3	10/9	—	Soil	3
MW-17-2	10/10	—	Soil	4
MW-17-3	10/10	—	Soil	5
MW-18-1	10/10	—	Soil	6
MW-18-2	10/10	—	Soil	7
MW-19-1	10/10	—	Soil	8

Recommended Quantity and Preservative (Provide triple volume on QC Samples)

Petroleum Hydrocarbons 418.1	Oil and Grease 413.2	Gasoline (MOD 8015/DOHS)	Diesel (MOD 8015/DOHS)	Gasoline/BTXE (MOD 8015/8020)	Petroleum Distillates (C6-C25)	BTXE (8020)	Chlorinated Hydrocarbons (8010)	Aromatic Hydrocarbons (8020)	Chlorinated/Aromatic Hydrocarbons (8010/8020)	Organic Pb	Pesticides/PCB (8080)	Base/NEU/Acid Cmpds GC/MS (8270)	Volatile Cmpds GC/MS (8240)	Polynuclear Aromatic (8310)	CCR Metals	Priority Pollutant Metals	Cd, Cr, Cr+6, Ni, Zn	Cyanide	Number of Containers
1L (H_2SO_4)/100g	1L (H_2SO_4)/100g	4 oz (HCl)/50g	4 oz (HCl)/50g	4 oz (HCl)/50g	4 oz (HCl)/50g	2X40ml (HCl)/50g	2X40ml (HCl)/50g	2X40ml (HCl)/50g	2X40ml (HCl)/50g	500ml/50g	1L/50g	1L/100g	2X40ml (HCl)/100g	1L/100g	500ml/100g	500ml/100g			
							X										X	X	1
							X										X	X	1
							X										X	X	1
							X										X	X	1
							X										X	X	1
							X										X	X	1
							X										X	X	1
							X										X	X	1

PROJECT INFORMATION	
PROJECT NUMBER:	1531-002-804
PROJECT NAME:	Northwest Plating
PURCHASE ORDER NUMBER:	
VIA:	
TAT:	☐ 24HR ☐ 48 HRS ☐ 1 WK ☑ 2 WKS

SAMPLE RECEIPT	
TOTAL NUMBER OF CONTAINERS	8
CHAIN OF CUSTODY SEALS Y/N/NA	NA
INTACT? Y/N/NA	Y
RECEIVED GOOD COND./COLD	Y
LAB NUMBER	8910-069

SAMPLE DISPOSAL INSTRUCTIONS
☒ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

Comments: Repack in jars.

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Chad S. Hinkley Time: 1015	Signature: Time:	Signature: Time:
Printed Name: Charles S. Lindsey Date: 10/11	Printed Name: Date:	Printed Name: Date:
Company: GEL	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Time:	Signature: Time:	Signature: Time: 1015
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: 10/11/89
Company:	Company:	Analytical Technologies, Inc.

ATI I.D. # 8910-087

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT	: GEOENGINEERS, INC.	SAMPLE I.D.	: 8910-087-3
PROJECT #	: 1531-002-B04	DATE ANALYZED	: 11/01/89
PROJECT NAME	: NORTHWEST PLATING	SAMPLE MATRIX	: SOIL
EPA METHOD	: 8010	UNITS	: mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CHLOROBENZENE	<0.025	0.600	0.584	97	0.564	94	3
1,1-DICHLOROETHENE	0.011	0.200	0.090	40	0.078	34	14
TETRACHLOROETHENE	<0.010	0.200	0.165	82	0.149	74	10
TRICHLOROETHENE	0.134	0.200	0.335	101	0.262	64	*

* Results out of limits due to matrix effect.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8910-087

EP TOX
METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : EP EXTRACT
UNITS : mg/L

PARAMETER	-2	-3	-6
ARSENIC	<0.005	<0.005	<0.005
BARIUM	0.13	0.15	<0.06
CADMIUM	0.33	0.40	0.05
CHROMIUM	40	8.2	1.1
LEAD	<0.1	<0.1	0.1
MERCURY	<0.0005	<0.0005	<0.0005
SELENIUM	<0.005	<0.005	<0.005
SILVER	0.04	<0.02	<0.02

ATI I.D. # 8910-087

EP TOX
METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : EP EXTRACT
UNITS : mg/L

COMPOUND	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
ARSENIC	8910-099-9	<0.005	<0.005	0	0.047	0.050	94
BARIUM	8910-087-3	0.15	0.09	50	19.9	20.0	99
CADMIUM	8910-087-3	0.40	0.39	3	0.91	0.50	103
CHROMIUM	8910-099-4	<0.02	<0.02	0	2.08	2.00	104
LEAD	8910-087-3	<0.1	<0.1	0	9.86	10.0	99
MERCURY	8910-087-3	<0.0005	<0.0005	0	0.0023	0.0020	115
SELENIUM	8910-099-9	<0.005	<0.005	0	0.046	0.050	92
SILVER	8910-087-3	<0.02	<0.02	0	1.04	1.00	104

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D.# 8910-087

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	-1
CADMIUM	0.034
CHROMIUM	<0.02
HEXAVALENT CHROMIUM	<0.01
NICKEL	0.10
ZINC	0.05

ATI I.D. # 8910-087

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : WATER
UNITS : mg/L

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8910-078-5	0.272	0.274	1	**	**	**
CHROMIUM	8910-073-5	<0.02	<0.02	0	1.01	1.00	102
HEXAVALENT CHROMIUM	8910-078-3	0.03	0.02	40	N/A	N/A	N/A
HEXAVALENT CHROMIUM	8910-078-7	0.15	N/A	N/A	**	**	**
NICKEL	8910-078-5	0.411	0.407	1	2.83	2.50	97
ZINC	8910-073-5	0.03	0.03	0	0.28	0.25	100

** Due to the necessary dilution of the sample, result was not attainable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D.# 8910-087

METALS RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL
UNITS : mg/Kg

PARAMETER	-2	-3	-4	-5	-6
CADMIUM	190	27	130	2.4	220
CHROMIUM	75,000	2,200	82,000	1,500	14,000
HEXAVALENT CHROMIUM	13,100	380	2,700	200	2,400
NICKEL	540	58	510	26	1,500
ZINC	760	170	1,000	36	1,600

ATI I.D. # 8910-087

METALS QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL
UNITS : mg/Kg

PARAMETER	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED SAMPLE	SPIKE CONC	% REC
CADMIUM	8910-069-8	6.9	6.1	12	19.3	14.1	91
CHROMIUM	8910-069-8	225	226	0	306	57	70
HEXAVALENT CHROMIUM	8910-087-3	375	374	0	**	**	**
HEXAVALENT CHROMIUM	8910-087-4	2,680	3,310	17	**	**	**
NICKEL	8910-087-6	1,540	1,390	10	2,830	1,640	78
ZINC	8910-069-8	42	44	5	58	14	106

** Due to the necessary dilution of the sample, result was not attainable.

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8910-087

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-BO4
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL

PARAMETER	UNITS	-2	-3	-4	-5	-6
CYANIDE	mg/Kg	36	8.2	8.3	1.0	131
MOISTURE	%	84	13	76	14	91

ATI I.D. # 8910-087

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NORTHWEST PLATING

SAMPLE MATRIX : SOIL

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
CYANIDE	mg/Kg	8910-087-3	8.2	9.5	15	11.6	4.6	60
MOISTURE	%	8910-087-5	14	13	7	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

AnalyticalTechnologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

Chain of Custody

DATE 10/12 PAGE 1 OF 1

PROJECT MANAGER: Steve Perrigo
COMPANY: Geo Engineers
ADDRESS: 2405 140th Ave NE Suite 105 Bellevue, WA
PHONE: 746-5200 SAMPLED BY: CSL

LABORATORY NUMBER: 8910.087 DLB 10/12/89

SAMPLE DISPOSAL INSTRUCTIONS

☑ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

ANALYSIS REQUEST

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT	Cd, Cr, Cr+6, Pb, Zn	Cyanide						NUMBER OF CONTAINERS
MW-16	10/12		Water	-1																				—		X	X					1
TP-1-1	"	1215	Soil	-2	X																			X	X	X	X					2
TP-1-2'	"	1335	"	-3	X																			X	X	X	X					2
TP-2-1	"	1330	"	-4	X																			X	X	X	X					2
TP-2-2	"	1230	"	-5	X																			X	X	X	X					2
TP-3-1	"	1345	"	-6	X																			X	X	X	X					2
																								X	X	X	X					2
																									10/12 DLB							

PROJECT INFORMATION

PROJECT NUMBER: 1531-002-R04
PROJECT NAME: #6-Northwest Plating
PURCHASE ORDER NUMBER:
VIA:

SAMPLE RECEIPT

TOTAL NUMBER OF CONTAINERS	11
CHAIN OF CUSTODY SEALS Y/N/NA	N
INTACT? Y/N/NA	Y
RECEIVED GOOD COND./COLD	Y

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time: 1500	Signature: Time:	Signature: Time:
Printed Name: Charles S. Lindsey Date: 10/12	Printed Name: Date:	Printed Name: Date:
Company: PCT	Company:	Company:

RECEIVED BY: 1.	RECEIVED BY: 2.	RECEIVED BY: (LAB) 3.
Signature: Time:	Signature: Time:	Signature: Time: Jayne L. Barkley 1500
Printed Name: Date:	Printed Name: Date:	Printed Name: Date: DAYNA L. BARKLEY 10/12/89
Company:	Company:	Analytical Technologies, Inc.

ATI Labs: San Diego (619)458-9141 • Phoenix (602)438-1530 • Seattle (206)228-8335 • Pensacola (904)474-1001 DISTRIBUTION: White, Canary - ANALYTICAL TECHNOLOGIES, INC. Pink - ORIGINATOR

NWP 0253

B - 129

AnalyticalTechnologies,Inc. 560 Naches Avenue, S.W., Suite 101, Renton, WA 98055, (206) 228-8335

ATI I.D. # 8912-079

GeoEngineers

JAN 23 1990

Routing KSK SCP SCP

File 1531-002-B04

January 22, 1990

GeoEngineers, Inc.
2405 140th Avenue N.E.
Suite 105
Bellevue, WA 98005

Attention : Steve Perrigo

Project Number : 1531-002-B04

Project Name : NW Plating

On December 27, 1989 Analytical Technologies, Inc. received four soil samples for analyses. The samples were analyzed with EPA methodology or equivalent methods as specified in the attached analytical schedule. The results, sample cross reference, and the quality control data are enclosed.

Mary C. Silva
Senior Project Manager

Frederick W. Grothkopp
Technical Manager

FWG/pes

SAMPLE CROSS REFERENCE SHEET

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NW PLATING

ATI #	CLIENT DESCRIPTION	DATE SAMPLED	MATRIX
8912-079-1	N-1	12/27/89	SOIL
8912-079-2	N-2	12/27/89	SOIL
8912-079-3	S-1	12/27/89	SOIL
8912-079-4	S-2	12/27/89	SOIL

----- TOTALS -----

MATRIX	# SAMPLES
SOIL	4

ATI STANDARD DISPOSAL PRACTICE

The samples from this project will be disposed of in thirty (30) days from the date of this report. If an extended storage period is required, please contact our sample control department before the scheduled disposal date.

NWP 0255

ANALYTICAL SCHEDULE

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NW PLATING

ANALYSIS	TECHNIQUE	REFERENCE/METHOD
PURGEABLE HALOCARBONS	GC/HALL	EPA 8010
MOISTURE	GRAVIMETRIC	METHOD 7-2.2

ATI I.D. # 8912-079

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: N/A
PROJECT #	: 1531-002-B04	DATE RECEIVED	: N/A
PROJECT NAME	: NW PLATING	DATE EXTRACTED	: 12/28/89
CLIENT I.D.	: REAGENT BLANK	DATE ANALYZED	: 01/02/90
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	0.4
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	<0.010
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	112

NWP 0257

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 12/27/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 12/27/89
PROJECT NAME	: NW PLATING	DATE EXTRACTED	: 12/28/89
CLIENT I.D.	: N-1	DATE ANALYZED	: 01/02/90
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.7
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	101

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 12/27/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 12/27/89
PROJECT NAME	: NW PLATING	DATE EXTRACTED	: 12/28/89
CLIENT I.D.	: N-2	DATE ANALYZED	: 01/02/90
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.2
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	100

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 12/27/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 12/27/89
PROJECT NAME	: NW PLATING	DATE EXTRACTED	: 12/28/89
CLIENT I.D.	: S-1	DATE ANALYZED	: 01/02/90
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.7
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY

BROMOCHLOROMETHANE	101

PURGEABLE HALOCARBONS ANALYSIS
DATA SUMMARY

CLIENT	: GEOENGINEERS, INC.	DATE SAMPLED	: 12/27/89
PROJECT #	: 1531-002-B04	DATE RECEIVED	: 12/27/89
PROJECT NAME	: NW PLATING	DATE EXTRACTED	: 12/28/89
CLIENT I.D.	: S-2	DATE ANALYZED	: 01/02/90
SAMPLE MATRIX	: SOIL	UNITS	: mg/Kg
EPA METHOD	: 8010	DILUTION FACTOR	: 1

RESULTS BASED ON DRY WEIGHT

COMPOUND	RESULT
BROMODICHLOROMETHANE	<0.010
BROMOFORM	<0.010
BROMOMETHANE	<0.025
CARBON TETRACHLORIDE	<0.010
CHLOROBENZENE	<0.025
CHLOROETHANE	<0.025
CHLOROFORM	<0.010
CHLOROMETHANE	<0.10
DIBROMOCHLOROMETHANE	<0.010
1,1-DICHLOROETHANE	<0.010
1,2-DICHLOROETHANE	<0.010
1,1-DICHLOROETHENE	<0.010
CIS-1,2-DICHLOROETHENE	<0.010
TRANS-1,2-DICHLOROETHENE	<0.010
1,2-DICHLOROPROPANE	<0.010
CIS-1,3-DICHLOROPROPENE	<0.010
TRANS-1,3-DICHLOROPROPENE	<0.010
METHYLENE CHLORIDE	<0.10
1,1,2,2-TETRACHLOROETHANE	<0.010
TETRACHLOROETHENE	<0.010
1,1,1-TRICHLOROETHANE	<0.010
1,1,2-TRICHLOROETHANE	<0.010
TRICHLOROETHENE	0.4
TRICHLOROFLUOROMETHANE	<0.025
VINYL CHLORIDE	<0.025

SURROGATE PERCENT RECOVERY	
BROMOCHLOROMETHANE	96

PURGEABLE HALOCARBONS
QUALITY CONTROL DATA

CLIENT : GEOENGINEERS, INC.
PROJECT # : 1531-002-B04
PROJECT NAME : NW PLATING
EPA METHOD : 8010

SAMPLE I.D. : 00199906
DATE EXTRACTED : N/A
DATE ANALYZED : 01/02/90
MATRIX : SOIL
UNITS : mg/Kg

COMPOUND	SAMPLE RESULT	SPIKE ADDED	SPIKED SAMPLE	% REC	DUP SPIKED SAMPLE	DUP % REC	RPD
CHLOROBENZENE	<0.025	1.0	0.98	98	1.00	100	2
1,1-DICHLOROETHENE	<0.010	1.0	0.85	85	0.85	85	0
TETRACHLOROETHENE	<0.010	1.0	0.93	93	0.98	98	5
TRICHLOROETHENE	<0.010	1.0	1.12	112	1.07	107	5

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

ATI I.D. # 8912-079

GENERAL CHEMISTRY RESULTS

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 1531-002-B04
PROJECT NAME : NW PLATING UNITS : %

ATI I.D. #	CLIENT I.D.	MOISTURE
8912-079-1	N-1	5.7
8912-079-2	N-2	13
8912-079-3	S-1	14
8912-079-4	S-2	9.8

GENERAL CHEMISTRY QUALITY CONTROL

CLIENT : GEOENGINEERS, INC. SAMPLE MATRIX : SOIL
PROJECT # : 1531-002-B04
PROJECT NAME : NW PLATING

PARAMETER	UNITS	ATI I.D.	SAMPLE RESULT	DUP RESULT	RPD	SPIKED CONC	SPIKE ADDED	% REC
MOISTURE	%	8912-079-4	9.8	9.6	2	N/A	N/A	N/A

$$\% \text{ Recovery} = \frac{(\text{Spike Sample Result} - \text{Sample Result})}{\text{Spike Concentration}} \times 100$$

$$\text{RPD (Relative \% Difference)} = \frac{(\text{Sample Result} - \text{Duplicate Result})}{\text{Average Result}} \times 100$$

8912-079

Chain of Custody

Analytical Technologies, Inc.
560 Naches Avenue SW, Suite 101 Renton, WA 98055

DATE 12/27/89 PAGE 1 OF 1

PROJECT MANAGER: Steve Perrigo
COMPANY: GeoEngineers
ADDRESS: 2405 - 140th Ave. NE #105
Bellevue, WA. 98005
PHONE: 206 746-5200 SAMPLED BY: SCP

LABORATORY NUMBER: 8912-079

SAMPLE DISPOSAL INSTRUCTIONS

☒ ATI Disposal @ $5.00 each ☐ Return ☐ Pickup (will call)

SAMPLE ID	DATE	TIME	MATRIX	LAB ID	8010 Halogenated Volatiles	8020 Aromatic Volatiles	BETX ONLY	8240 GCMS Volatiles	8270 GCMS BNA	8310 HPLC PNA	8080 Pesticides & PCB's	PCB's ONLY	8140 Phosphate Pesticides	8150 Herbicides	WDOE PAH/HH (WAC 173)	418.1 (TPH)	413.2 Grease & Oil	8015 (Modified)	TOC 9060	TOX 9020	% Moisture	TCLP	Priority Pollutant Metals (13)	EPTOX Metals (8) Total	EP TOX Metals (8) EP EXT							NUMBER OF CONTAINERS
N-1	12/27/89		Soil	-1	X																										1
N-2	"		Soil	-2	X																										1
S-1	"		Soil	-3	X																										1
S-2	"		Soil	-4	X																										1

PROJECT INFORMATION		SAMPLE RECEIPT	
PROJECT NUMBER:	1531-002-BC4	TOTAL NUMBER OF CONTAINERS	4
PROJECT NAME:	NW Plating	CHAIN OF CUSTODY SEALS Y/N/NA	NA
PURCHASE ORDER NUMBER:		INTACT? Y/N/NA	Y
VIA:		RECEIVED GOOD COND./COLD	Y

TAT: ☐ 24HR ☐ 48 HRS ☐ 72 HRS ☐ 1 WK ☒ 2 WKS (Normal)

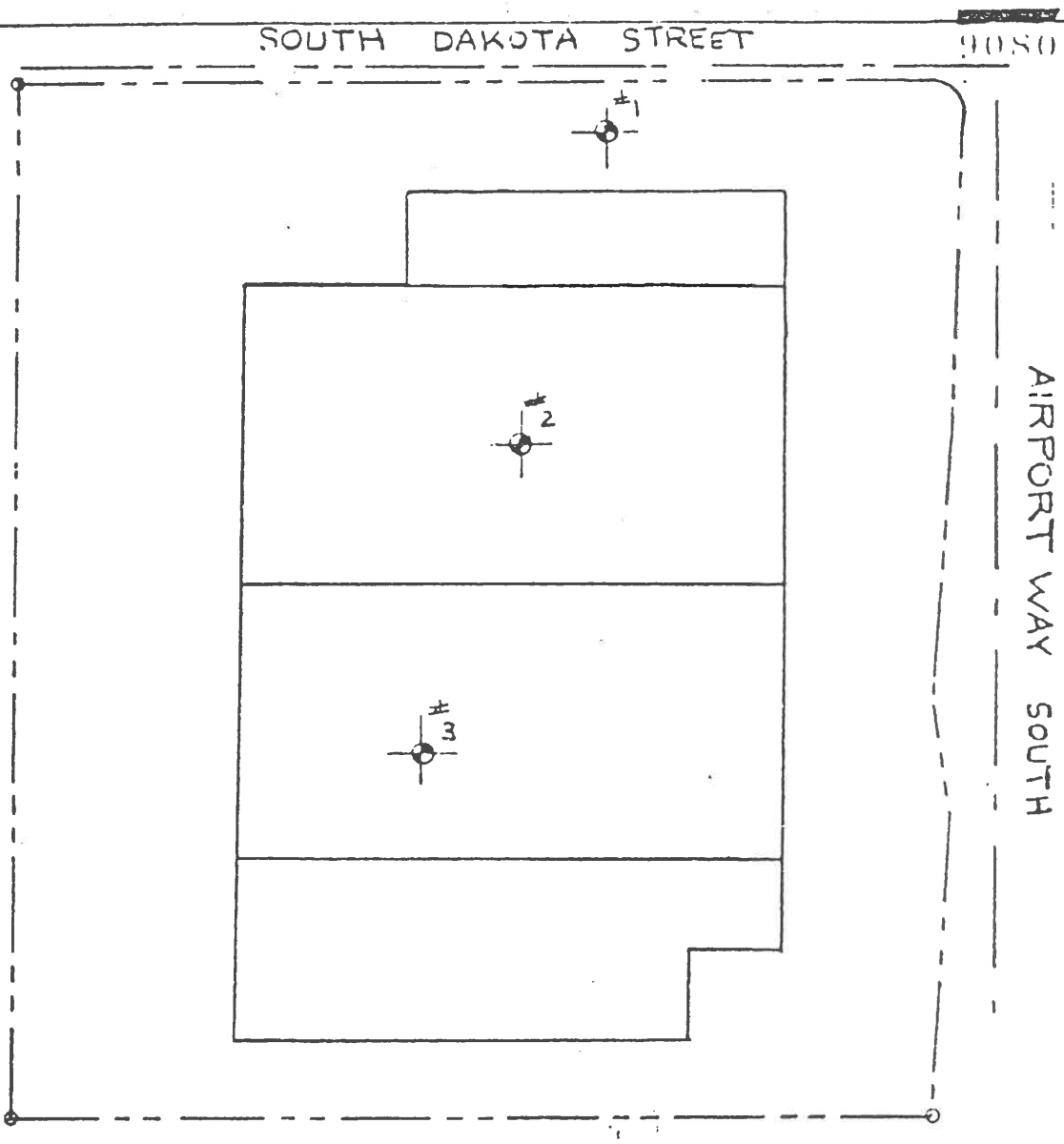
PRIOR AUTHORIZATION IS REQUIRED FOR RUSH DATA

SPECIAL INSTRUCTIONS:
1.) Sub-Sample from Center of Tube
2.) Transfer remainder to Jars and retain.
3.) Return end-caps to GEI

RELINQUISHED BY: 1.	RELINQUISHED BY: 2.	RELINQUISHED BY: 3.
Signature: Time:	Signature: Time:	Signature: Time:
Printed Name: Steve Perrigo Date: 12/27	Printed Name: Date:	Printed Name: Date:
Company: GEI	Company:	Company:
RECEIVED BY: 1.	**RECEIVED BY: 2.**	**RECEIVED BY: (LAB) 3.**
Signature: Frederick W Grothkopp Time:	Signature: Time:	Signature: Time:
Printed Name: FREDERICK W GROTHKOPP Date:	Printed Name: Date:	Printed Name: Date:
Company: 12/27/89 11:20AM	Company:	Analytical Technologies, Inc.

APPENDIX C

OFF-SITE BORING LOGS COMPLETED BY OTHERS



SCALE: 1" = 50'

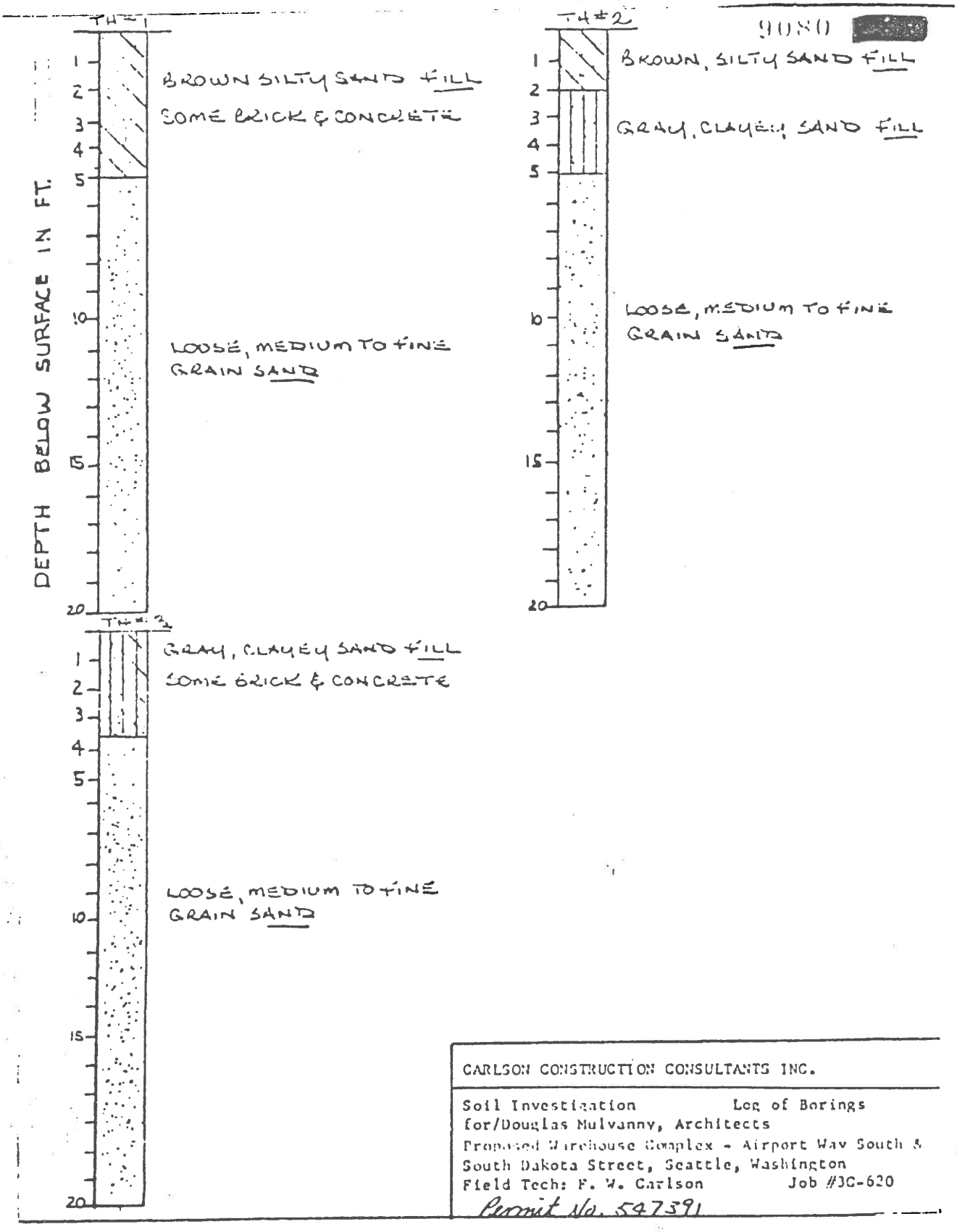
APPROX. TEST HOLE LOCATION

CARLSON CONSTRUCTION CONSULTANTS INC.

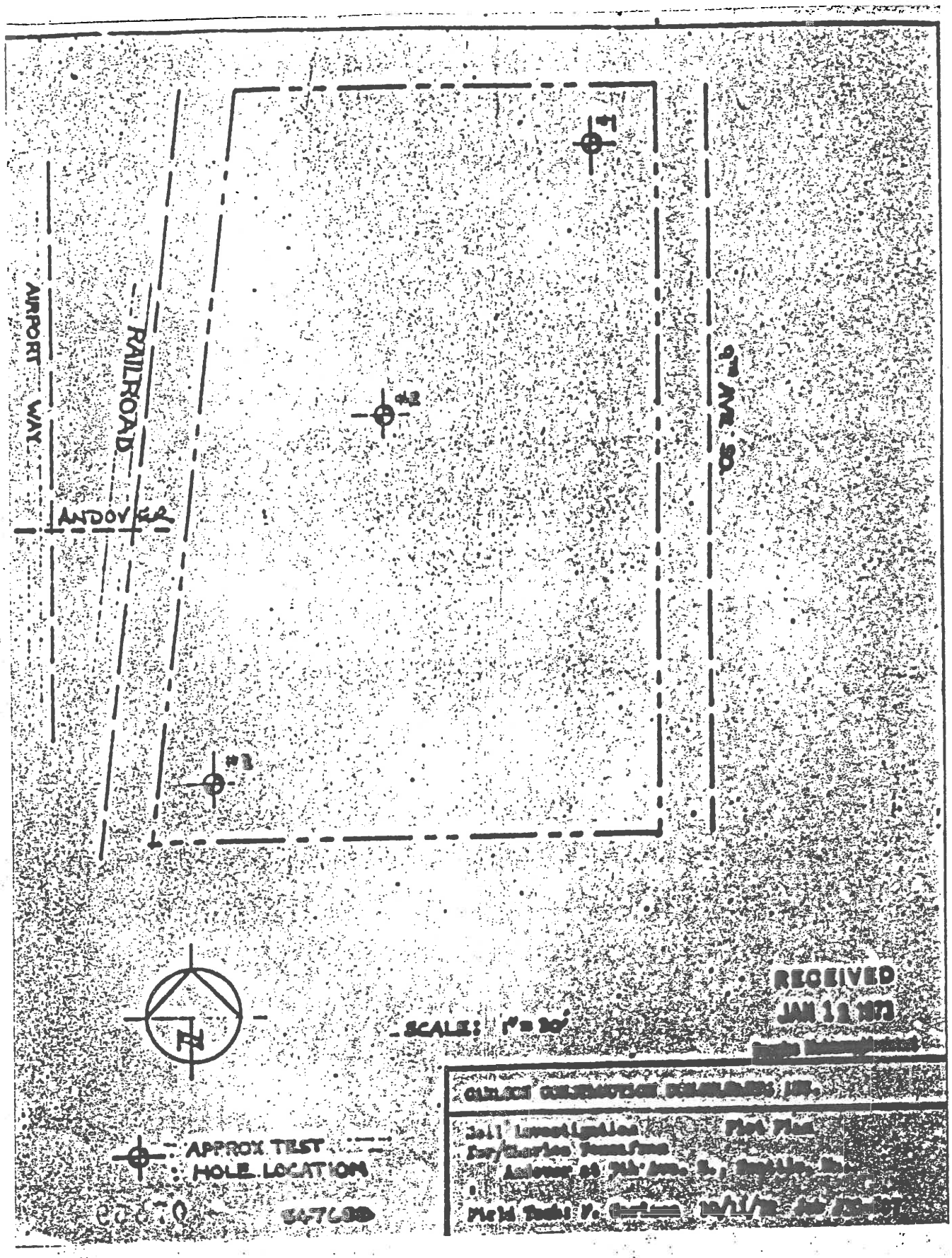
Soil Investigation Plot Plan
for/Douglas Mulvanny, Architects
Proposed Warehouse Complex - Airport Way South &
South Dakota Street, Seattle, Washington
Field Tech: F. W. Carlson Job #JC-620
Permit No. 597391

Referenced as "Study A" on Figure 6

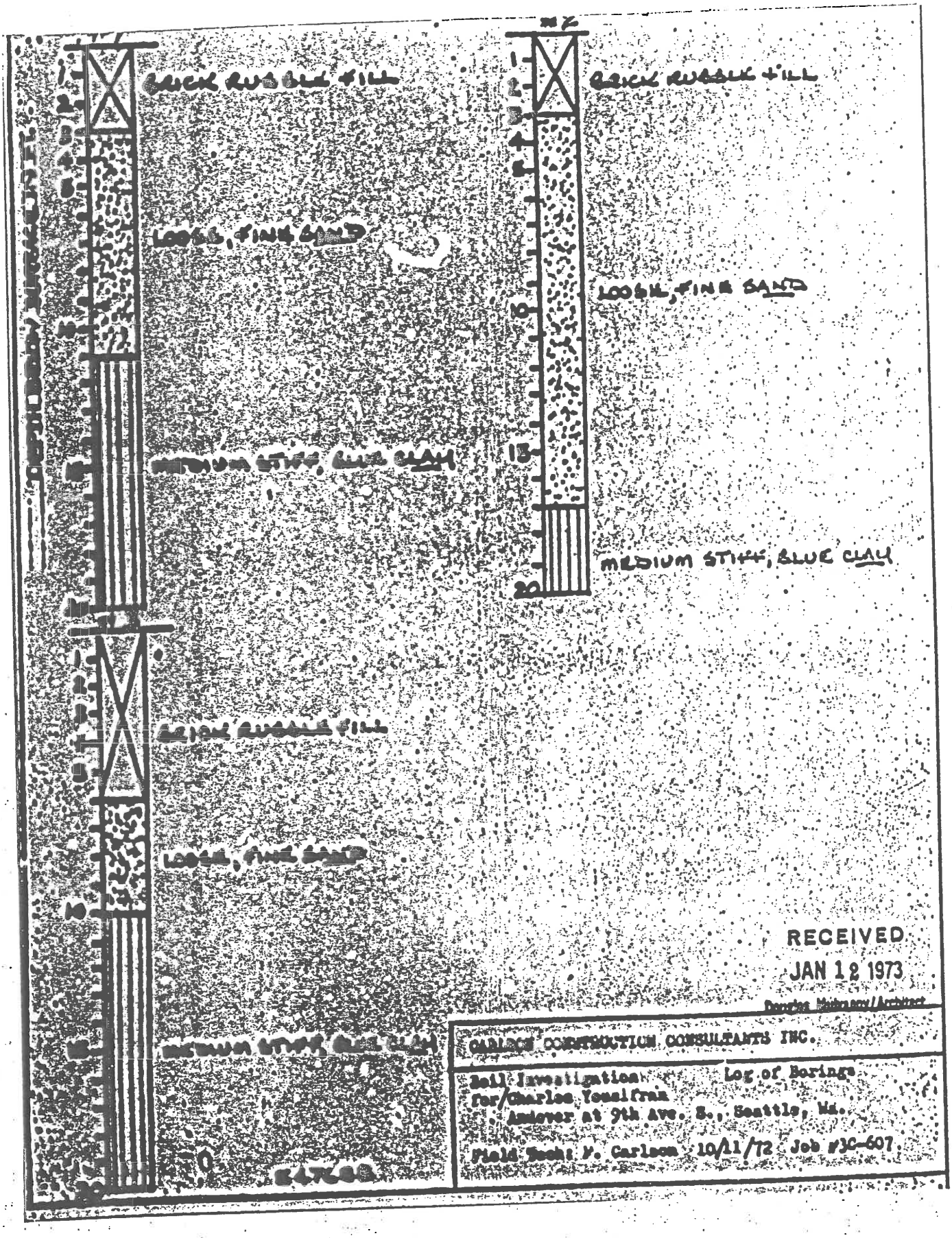
NWP 0267



Referenced as "Study A" on Figure 6

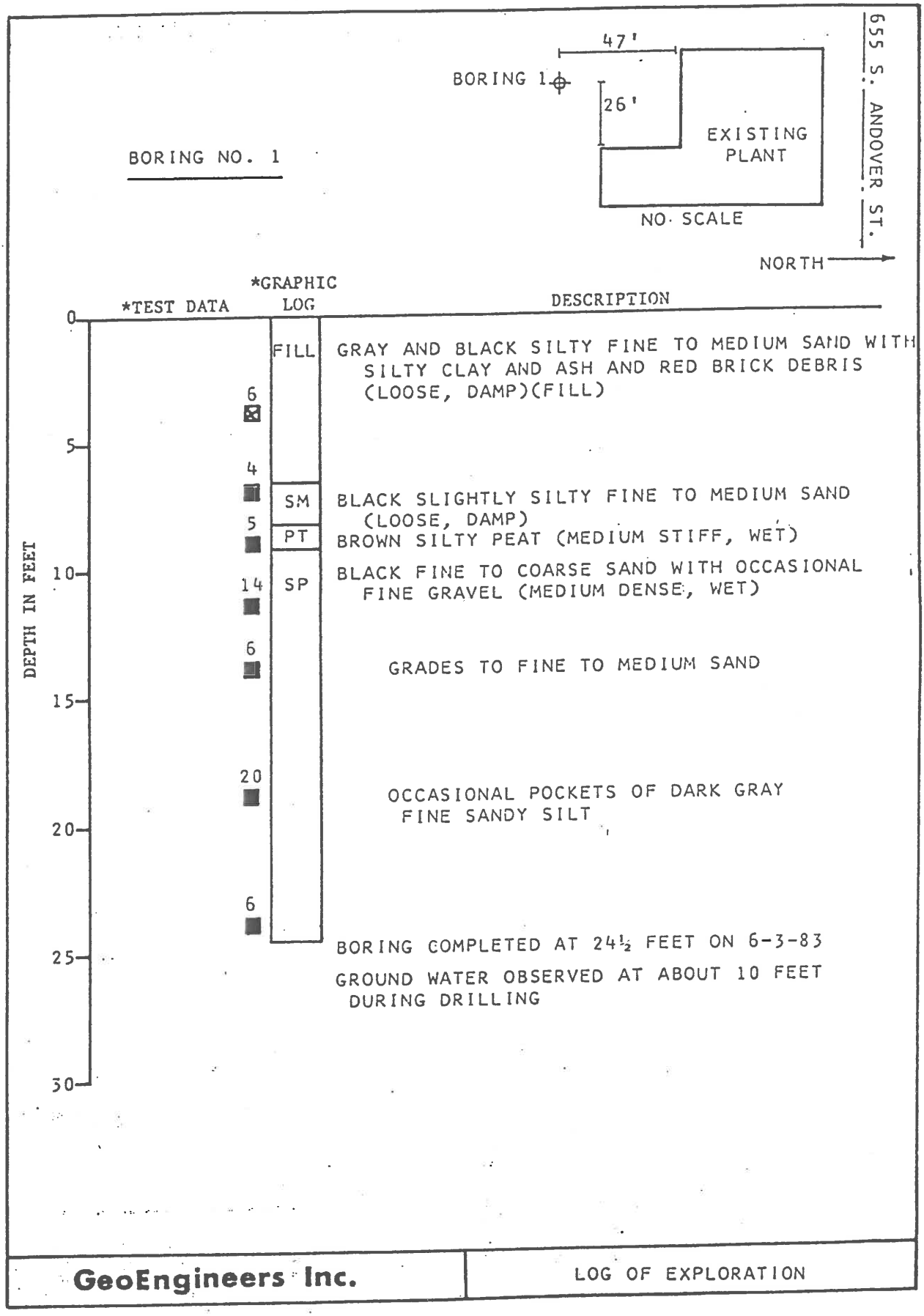


Referenced as "Study B" on Figure 6



Referenced as "Study B" on Figure 6

FIGURE 1



GeoEngineers Inc.	LOG OF EXPLORATION

Referenced as "Study C" on Figure 6

NWP 0271

APPENDIX D

UNDERGROUND STORAGE TANK REPORTING DOCUMENTATION

WASHINGTON STATE UNDERGROUND STORAGE TANK NOTIFICATION FORM

IMPORTANT: PLEASE READ ALL INSTRUCTIONS ON PAGES I-1 AND I-2 BEFORE ENTERING INFORMATION.

- ABOVEGROUND TANKS MUST BE REPORTED IF THE CONNECTED UNDERGROUND PIPING COMPRISES AT LEAST 10% OF THE OVERALL STORAGE SYSTEM (TANK AND PIPING).
- A SEPARATE FORM MUST BE USED FOR EACH SITE, EXCEPT FOR SITES WITH ONLY ONE TANK EACH. SEE THE GENERAL INSTRUCTIONS (PAGE I-2) FOR THE DEFINITION OF A SITE AND DETAILS ON REPORTING SITES WITH ONE TANK EACH.
- THERE IS ROOM IN SECTION VI FOR INFORMATION CONCERNING 15 TANKS. IF YOU HAVE MORE THAN 15 TANKS, PHOTOCOPY BOTH PAGES OF SECTION VI BEFORE ENTERING ANY INFORMATION. (IF YOU HAVE MORE THAN ONE SITE, EITHER OBTAIN MORE FORMS FROM THE DEPARTMENT OF ECOLOGY OR BE SURE TO ALSO PHOTOCOPY THIS PAGE.)
- PLEASE TYPE, OR PRINT IN INK; THE SIGNATURE UNDER "CERTIFICATION" (SECTION V) MUST BE SIGNED IN INK.

STATE USE ONLY

I. OWNERSHIP OF THE TANK(S)

Please enter information regarding the owner of the tank(s). If the ownership of the tank(s) is uncertain, enter information regarding the owner of the property where the tanks are located, or information regarding the former owner of the tanks. Please circle the correct letter, indicating who the information given below refers to:

A. OWNERSHIP UNCERTAIN (B.) CURRENT OWNER OF TANK(S) C. FORMER OWNER OF TANK(S) D. PROPERTY OWNER

E. OTHER (PLEASE SPECIFY): _____

Northwest Pipeting Company
Owner Name (Corporation, Individual, Public Agency, or Other Entity)

825 South Dakota Street
Street Address

Seattle | WA | 98108-
City | State | ZIP Code

King | 206-682-6442
County | Area Code | Phone Number

Type of Owner or Facility: CIRCLE CORRECT CODE(s)

CODE	TYPE	CODE	TYPE	CODE	TYPE	CODE	TYPE
A.	Service Station	(G.)	Industrial/Manufacturing	M.	City/Town	S.	Port District
B.	Bulk Plant	H.	Private Institution	N.	County	T.	Utility District
C.	Petroleum Distributor	I.	Residence (Non-Farm)	O.	State	U.	Fire Dept./District
D.	Convenience Store	J.	Farm	P.	Federal (Military)*	V.	Other Special Service District (e.g., sewer, water)
E.	Auto Dealer	K.	Airport	Q.	Federal (Non-Military)*	W.	Other
F.	Other Commercial/Retail	L.	Marina	R.	School District		

*FEDERAL FACILITIES ONLY: Please give your GSA Facility ID Number (Building Number). _____

II. CONTACT PERSON AT THE TANK LOCATION

The contact person should be the individual responsible for regularly monitoring the operation of the tank(s).

Gerald A Heider
Name (If same as Section I, mark box here ☐)

Facility Manager | 206-682-6442
Job Title | Area Code | Phone Number

III. SITE OF THE TANK(s)

(If the same as Section I, mark box here ☒) See the General Instructions (Page I-2, 2.a.) for the definition of a site.

Facility Name or Company Site Identifier, as applicable. (IF THE FACILITY IS OPERATED BY A LESSEE OR RENTER, THE NAME OF THE CORPORATION, INDIVIDUAL, PUBLIC AGENCY, OR OTHER ENTITY WHICH OPERATES THE FACILITY SHOULD BE ENTERED HERE.)

Street Address or State Road where the tanks are located. (IF NO STREET ADDRESS OR STATE ROAD, PLEASE ENTER THE LONGITUDE AND LATITUDE OR TOWNSHIP, RANGE, AND QUARTER SECTION WHERE THE TANKS ARE LOCATED.)

City | State | ZIP Code

County | Area Code | Phone Number

IV. THE TOTAL NUMBER OF TANKS AT THIS SITE

1.	Number of tanks containing petroleum, which are now in use:	0
2.	Number of tanks which have stored petroleum, but are not now in use:	0
3.	Number of tanks containing regulated chemicals, which are now in use:	1
4.	Number of tanks which have stored regulated chemicals, but are not now in use:	0
	TOTAL NUMBER OF TANKS	1

Please mark this box if the site is located on land within an Indian reservation or on other Indian trust lands ☐

V. CERTIFICATION (Please read and sign after completing Section VI.)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this and all attached documents. To the best of my knowledge and belief, the submitted information is true, accurate, and complete.

Gerald A Heider
Manager
Name and official title of owner or owner's authorized representative or, in cases where the ownership is unknown, the name and title of the person signing the form. (PLEASE TYPE OR PRINT IN INK.)

3-9-90 | Gerald A Heider
Date Signed | Signature (PLEASE SIGN IN INK)

VI. INFORMATION REGARDING INDIVIDUAL TANKS (See instructions regarding individual tanks, Page I-2)

a. Tank Identification Please list your tanks numerically (1, 2, 3, etc.) or use an established tank identification number or code. The information in the following columns should apply to the tank identified in the corresponding row of this column.	b. Tank Status Please put the correct letter for each tank in the appropriate row of the column below. A. Currently in use. B. Temporarily out of use. C. Permanently out of use. D. Brought into use after 5/8/86.	c. Age of the Tank If the year of installation of the tank is known, please enter the last 2 digits of that year in the appropriate row. If the exact year of installation is not known, please estimate as closely as possible, using the groupings shown below (choose a letter and put it in the appropriate row.) A. Less than 1 year B. 1-2 years C. 3-5 years D. 6-10 years E. 11-15 years F. 16-20 years G. 21-30 years H. More than 30 years	d. Capacity of the Tank Please put the correct letter for each tank in the appropriate row of the column below. If the exact capacity isn't known, please choose an estimate. A. Under 500 gallons B. 500-999 gallons C. 1,000-4,999 gallons D. 5,000-9,999 gallons E. 10,000-19,999 gallons F. Over 20,000 gallons	e. Tank Construction Please put all the letters which apply to each tank in the appropriate row of the column below. (If "Other" (H) please enter type of material.) A. Carbon Steel B. Stainless Steel C. Steel, type unknown D. Fiberglass Reinforced Plastic E. Plastic F. Concrete G. Aluminum H. Other Material (please specify) I. Unknown Material J. Single Walled K. Double Walled L. Has secondary containment M. Has overfill protection	f. Leak Detection Please put all the letters which apply to each tank in the appropriate row of the column below. (If "Other" (N) please also enter type of detection.) A. Daily inventory B. Tightness/Leak test within past year C. In-tank system D. In-piping system E. Product gauge F. Electronic sensor G. Manually sampled well(s) H. Automatically sampled well(s) I. Well or detector in secondary containment J. In-ground detector K. Between walls of double-walled tank L. Groundwater monitoring plan M. Spill Prevention Control and Countermeasure Plan N. Other (please specify) O. None	g. Cathodic Protection Please put the correct letter for each tank in the appropriate row of the column below. (If "Other" (C) please also enter the type of protection.) A. Sacrificial Anode/Galvanic Type B. Impressed Current Type C. Other Type (please specify) D. Cathodically Protected, Type Unknown E. None F. Unknown	h. Internal Protection Please put the correct letter for each tank in the appropriate row of the column below. (If "Other" (F or I) please also enter the type of protection.) A. Rubber Lining B. Alkyd Lining C. Epoxy Lining D. Phenolic Lining E. Glass Lining F. Other Lining (please specify) G. Lined, type unknown H. Unlined I. Other internal protection (please specify) J. Unknown
1.	A	G (1966)	Full Capacity=C A maximum of 350 gallons of the tanks capacity is actually used	A, J, L	O	E	H

D - 2

NWP 0274

Tank Identification Please enter the same identification used in column a.	i. External Protection of the Tank Please put the correct letter for each tank in the appropriate row of the column below. (If "Other" (D or G) please also enter the type of coating and/or wrapping.) A. Asphalt Coated B. Fiberglass Reinforced Plastic Coated C. Epoxy Coated D. Other Coating (please specify) E. Vinyl Wrapped F. Polyethylene Wrapped G. Other Wrapping (please specify) H. None I. Unknown	j. Piping Please enter all the letters which apply to the portion of the piping which is underground. (If "Other" (D) please also enter the type of material.) A. Bare Steel B. Galvanized Steel C. Fiberglass Reinforced Plastic D. Other Material (please specify) E. Coated with non-corrosive materials F. Cathodically Protected G. Double-walled H. Within a secondary containment I. Protected with interior lining J. In native soil rather than backfill K. In backfill rather than native soil L. Not certain regarding backfill/native soil M. Details of piping are unknown N. None of the piping is underground	k. Type of Substance Currently or Last Stored in the Tank Please put the correct letter for each tank in the appropriate row of the column below. 1. If the substance is a hazardous substance (J) rather than a petroleum product, please also enter the name of the substance or its Chemical Abstract Service (CAS) number. (See "What Substances Are Covered"? on page I-1 of the instructions for information regarding hazardous substances.) 2. If different substances are stored in the tank at different times, or if a mixture of substances is stored, please enter all letters which apply. A. Leaded gasoline B. Unleaded gasoline C. Alcohol enriched gasoline D. Diesel fuel E. Aviation fuel F. Kerosene G. Nos. 1, 2, or 4 fuel oil H. Nos. 5 or 6 fuel oil I. Used oil/Waste oil J. Hazardous substance K. Other (Please specify) L. Unknown M. Empty	THESE ITEMS REFER ONLY TO TANKS PERMANENTLY OUT OF SERVICE. PLEASE LEAVE THE ROWS FOR THE TANKS STILL IN SERVICE BLANK.		
				l. Date of Last Use If the exact month and year of last use isn't known, please enter an estimate. (Use two digits for the month and two for the year; e.g., 06-84.)	m. Quantity Left in the Tank If the exact amount left in the tank isn't known, please enter an estimate, in gallons.	n. Was the Tank Filled? Was the tank filled with an inert material, such as sand or concrete? Was it filled with water? Please put the correct letter in the appropriate row of the column below. A. The tank was filled with an inert material. B. The tank was filled with water. C. The tank was not filled. D. Unknown
1	A	N	J trichloroethene			

D - 3

NWP 0275

INSTRUCTIONS FOR MAILING THE FORM

When the notification form is fully completed and signed, staple any photocopies of Section VI to page one of the form (not the instructions), with page one in the front. (Please staple once in the upper right corner.) The forms may then be folded and placed in an envelope for mailing or may be folded as described below for mailing without an envelope. FOR MAILING WITHOUT AN ENVELOPE: Fold the form(s) in half along the line in the center of the page, so that these instructions are on the outside, at the top. Then fold in half again, so that these instructions are still on the outside. When you turn the folded form(s) over, Ecology's address should be in the center, with blank lines for the return address in the upper left corner. Please enter your return address, staple once where shown, place the correct postage in the upper right corner, and mail.

PLEASE INDICATE THE NUMBER OF PHOTOCOPIED SHEETS ATTACHED (IF ANY) _____

Underground Storage Tank Notification
Solid and Hazardous Waste Program
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504-8711

PLEASE PLACE CORRECT POSTAGE HERE

STAPLE HERE WHEN FOLDED

IMPORTANT
THIS IS AN UNDERGROUND STORAGE TANK NOTIFICATION FORM. A RECENT FEDERAL LAW REQUIRES UNDERGROUND TANK OWNERS TO NOTIFY THE DEPARTMENT OF ECOLOGY OF THEIR TANKS BY MAY 8, 1986.
(CERTAIN ABOVEGROUND TANKS ARE ALSO INCLUDED.)
PLEASE OPEN FOR FURTHER INFORMATION.

BULK RATE
U.S. POSTAGE PAID
Olympia, Washington
Permit No. 24

Underground Storage Tank Notification
Solid and Hazardous Waste Program
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504-8711

IMPORTANT
THIS IS AN UNDERGROUND STORAGE TANK NOTIFICATION FORM. A RECENT FEDERAL LAW REQUIRES UNDERGROUND TANK OWNERS TO NOTIFY THE DEPARTMENT OF ECOLOGY OF THEIR TANKS BY MAY 8, 1986.
(CERTAIN ABOVEGROUND TANKS ARE ALSO INCLUDED.)
PLEASE OPEN FOR FURTHER INFORMATION.

NWP 0276