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SUBSURFACE INVESTIGATION
AMERICAN NATIONAL CAN COMPANY
Oakland, California, Facility

VOLUME I OF II
(Text and Appendices A and B)

Prepared for:

AMERICAN NATIONAL CAN COMPANY
Chicago, Illinois

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August, 1991

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August 6, 1991

FEDERAL EXPRESS

Ms. Cynthia Chapman
Hazardous Materials Specialist
Department of Environmental Health
Alameda County Health Agency
80 Swan Way, Rm. 200
Oakland, California 94621

Dear Ms. Chapman:

Subject: ANCC Oakland Facility Report

Enclosed are two copies of the final report of the initial subsurface investigation that DUNN has conducted at the American National Can Company's Oakland manufacturing plant. Please pass one copy to Lester Feldman, San Francisco Regional Water Quality Control Board.

If you have any questions, please call me.

Very truly yours,

DUNN GEOSCIENCE CORPORATION

Edward W. Alusow
Senior Environmental Scientist
Project Manager
Calif. Reg. Geologist No. 4282

EWA/me

cc: L. Feldman, RWQCB
J. Peters, ANCC
J. Moran, ANCC

enc.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

LIST OF FIGURES
(Following Text)

Figure

LIST OF TABLES
(Following Text)

LIST OF Plates
(Following Text)

LIST OF APPENDICES

Appendix

EXECUTIVE SUMMARY

INTRODUCTION

The American National Can Company (ANCC) conducted a subsurface investigation of its Oakland, California facility (Site). ANCC initiated this subsurface investigation in response to requests for information made by the Alameda County Department of Health Care Services (Agency).

The subsurface investigation was designed and implemented by Dunn Geoscience Corporation (DUNN) on behalf of ANCC in accordance with a work plan approved by the Agency. Based on the results of previous investigations, and upon Agency requests, the following five areas of concern were evaluated during the subsurface investigation:

Area 1

Area 1 represents the immediate vicinity of a former underground gasoline storage tank that was recently removed. The investigation included the drilling of three test borings and the installation of one groundwater monitoring well around the perimeter of the former tank excavation. The study objectives were to determine if all impacted soil had been remediated at the time the tank was removed and to determine if any previous tank failure had impacted groundwater. The results of the investigation indicate that there is some low level, residual soil impact present near the former tank site. There was no detectable impact to groundwater noted in samples collected from the monitoring well located down gradient from the former tank site. No further investigation in Area 1 is deemed necessary, although quarterly groundwater monitoring will continue pending agency relief.

Area 2

Area 2 represents the immediate vicinity around a former underground heating oil storage tank. A nearby monitoring well has a hydrocarbon product floating on the groundwater surface. Suspected leakage from the former storage tank seems to have caused this impact. The study objectives were to characterize the product present in the monitoring well, identify the source of contamination and determine the extent of soil and groundwater contamination. During the investigation, four soil borings were drilled, of which one was converted into an upgradient monitoring well. A second boring had to be abandoned at a shallow depth. Physical restrictions limited the extent to which the investigation could be carried out. As a result, the extent of soil and groundwater impact in the downgradient direction were not defined closer than within 350 feet. The results indicate that the product detected in the monitoring well is a refined hydrocarbon. It is probable that this product came from leakage of the underground fuel oil tank.

The presence of physical barriers in this area precludes the use of typical investigation techniques to determine the downgradient extent of soil and groundwater impact. Therefore, additional subsurface investigation, to define the extent of contamination, is not recommended at this time. However, it is recommended that a product recovery system be installed to collect and remove the free product. Biweekly product thickness monitoring and quarterly groundwater sampling and analysis should also be continued.

Area 3

Area 3 represents the eastern section of the site between the Lithography Building (No. 12) and the EKOTEK Lube property. The objectives of the investigation were to define the extent of impacted soil and groundwater and to determine the source of the contamination. The investigation included the drilling of eight test borings and the installation of seven monitoring wells. The results of the investigation are that soil and groundwater are severely impacted in this area. The presence of the Lithography building prevented the complete definition of the extent of contamination. The results indicate that the source of the impact is the EKOTEK Lube property and that the downgradient extent of impact is beneath the Lithography building. At this time no further investigation is warranted to identify the source of contamination or to define the limits of soil and/or groundwater contamination. It is recommended that a soil gas survey be conducted to aid in determining if the 8-inch water pipe trench is serving as a preferential pathway for contaminants from the EKOTEK Lube property line towards the Lithography building. Additionally, biweekly product thickness monitoring and quarterly groundwater sampling should be continued.

Area 4

Area 4 encompasses the immediate vicinity of the former underground solvent tanks and the underground solvent pipelines which run from the excavation site of these tanks to the Lithography Building. The study objectives were to further identify the contaminants reported in an earlier investigation and to evaluate the extent of soil and groundwater impact. During the investigation five soil borings were drilled, of which three were converted into groundwater monitoring wells. The results of the investigation indicate that moderate levels of solvent-based contaminants have impacted the shallow soil along the solvent pipeline. It is recommended that a soil gas survey be conducted in this area to define the extent of shallow soil impact around the solvent pipelines. Secondly, the results revealed that groundwater beneath the former UST site is impacted by solvents. Additional soil borings should be drilled around the location of the former solvent tanks to determine if contaminated soil is still present that could be impacting the groundwater quality in this area. A downgradient groundwater monitoring well should be installed to define the extent of contaminant movement. Groundwater sampling should also be continued on a quarterly basis.

Area 5

Area 5 includes the immediate vicinity of the former steam cleaner facility. The study objectives were to validate the earlier findings of shallow soil impact and to determine if groundwater had been impacted. Two soil borings were advanced in this area and one of these, on the downgradient side of the steam cleaner facility, was converted into a groundwater monitoring well. Results of the investigation did not confirm the presence of impacted soil as earlier reported; however, it is recommended that additional shallow soil samples be collected to define soil quality in this area. Other than the quarterly groundwater sampling program, no further groundwater investigation in this area is warranted.

1.0 INTRODUCTION

At the request of American National Can Company (ANCC), Dunn Geoscience Corporation (DUNN) has undertaken a subsurface investigation at the ANCC facility (Site) in Oakland, California. The Site, shown on Figure 1-1, is located at 3801 East 8th Street in Oakland, California 94601.

This subsurface investigation was carried out in response to requests made by the Alameda County Health Care Services Agency (Agency) in letters dated December 5, and December 7, 1990. In responding to these correspondences, DUNN submitted a work plan to the Agency on January 3, 1991 to assess possible impact to soil and/or groundwater at the site. This work plan, which was approved by the Agency, was prepared to investigate the following four areas of concern:

Area 1 — An area on the north side of the Site where an underground storage tank was removed in December 1990;

Area 2 — An area on the northeast perimeter of the Site where petroleum product was observed in GW-6, a previously installed groundwater monitoring well;

Area 3 — The southeastern perimeter of the Site adjacent to the EKOTEK Lube property; and,

Area 4 — An area on the southern portion of the Site where elevated organics were reported in groundwater monitoring well GW-3.

Prior to initiating the subsurface investigation, the Agency further requested that a fifth area (Area 5) be evaluated. Area 5 is located adjacent to the Site steam cleaning area, where petroleum hydrocarbons were detected in the soil during a previous investigation. The five areas of concern, which were evaluated during this investigation, are shown on a site map, Plate 1.

This report presents a detailed description of the subsurface investigation, the methods used, the results of the investigation, and provides a discussion and conclusions drawn from the investigation results.

1.1 Site Description

1.1.1 Physical Setting

The Site is located at 3801 East 8th Street in Oakland, California. The property, shown on Plate 1, is a triangular shaped parcel bordered by East 8th Street to the northeast, 37th Avenue to the west and Alameda Avenue to the south. The Site occupies approximately 16 acres of which 80% is covered by a series of interconnected buildings. Most of the remaining land areas are paved and are principally used for vehicle parking and truck loading/unloading. Unpaved areas exist around two railroad spurs entering the southern perimeter of the Site; on the west side of building number 11; adjacent to the water tank and wash shed; and within the triangular section of land on the north side of the Site between building number 11 and east 8th street (Area 2). The unpaved areas mainly consist of open soil covered with grass and/or crushed stone.

The two railroad spurs were used for the unloading of sheet metal and the loading and distribution of manufactured cans.

The site is located within an industrialized area. Immediately west of the Site and across 37th Avenue is the Owens Glass Company. A Michelin tire warehouse/distributor is located on the south side of Alameda Avenue, southwest of the Site. Immediately south of the Site just across Alameda Avenue is an open grass covered lot. This lot is apparently owned by Uni-Cal and was used as a rail yard for the delivery and shipment of products. The EKOTEK Lube site directly adjoins the southwestern perimeter of the property. The EKOTEK Lube site is a former waste oil recycling operation which is currently under the scrutiny of various public agencies. There is some low income residential housing interspersed through this industrial area. Residential units are present along East 8th Street from 37th Avenue (adjacent to the Site) west for 3/4 of a mile to Fruitvale Avenue.

There are other notable features in the immediate vicinity of the Site. A tidal canal is located one quarter mile south of the Site and empties into the San Leonardo Bay, another mile further to the south. North of the Site, just beyond East 8th Street, is an eight-lane-wide interstate (I-880) also known as the Nimitz Freeway.

1.1.2 Physiographic Setting

The Site is located in a coastal plain lowland region of the Pacific Coastal physiographic province. The lowland area is called the San Francisco Bay depression. The topography of the region varies from gently sloping, along the edge of the bay, to hilly and mountainous, just to the east of the Site. The elevation at the Site varies from 12 to 18 feet above mean sea level.

The climate in the region can best be described as Mediterranean -- the region experiences a rainy season from November through March when precipitation is generated from frontal storms. Average yearly rainfall in the region varies significantly on an east west basis as a result of orographic effects from the uplands to the east. Average yearly rainfall in the immediate vicinity of the site is between 20 and 22 inches (Hickenbottom and Muir, 1988).

1.2 Site History

The subject property has been used exclusively for the manufacturing of steel beverage and food cans since American Can Company began operations in the early 1900s. The merger of National Can Company with American Can Company in 1986 led to the formation of the current site owner, ANCC. In 1988, the manufacturing process was discontinued and now the site is used only for warehousing purposes.

Typical can manufacturing operations would have utilized various solvent and petroleum-based compounds related to either the manufacturing process, the fueling of vehicles, or the heating of the facility. All known underground storage tanks have been closed through either removal or, as in the case of a small gasoline tank located in the parking lot between building number 12 and building number 13, abandonment in place. The most recent vessel to be decommissioned was a 500 gallon tank which was removed in December, 1990, under the supervision of DUNN personnel.

1.3 Prior Subsurface Investigations

In August, 1989, ANCC requested that Dames & Moore conduct a Phase I investigation of the Site. The final report was issued in February, 1990. The study included the installation of five groundwater monitoring wells and at least eleven shallow soil borings. This report is on file at the RWQCB. We have a xerox copy in our files

1.4 Investigation Objectives

Based on the requests of the Agency and a review of Dames and Moore's Phase I study, five areas of concern were identified as requiring further investigation. Specific objectives for investigating each of these areas varied, but generally included assessing any impact to soil and/or groundwater. The following paragraphs provide a brief description of each area of concern and the investigation objectives for each.

Area 1

Area 1 represents the immediate vicinity of the former underground gasoline storage tank that was removed on December 4, 1990. At the time the tank was removed, a series of soil samples

was collected at the base of the excavation. The initial samples were collected at the base of the former tank (at 10 feet below grade) and at a depth of 12 feet. They exhibited concentrations of Total Petroleum Hydrocarbons (TPH) in excess of 100 ppm. A second set of samples was then collected and analyzed from a depth of approximately 14 feet below grade (just above the groundwater table). Sample analyses showed TPH at less than 5 ppm. Based on the above analytical results, the vertical extent of contamination beneath the former tank has been determined. The objectives for the current investigation were to determine the lateral extent of soil contamination, and to determine if any previous failure of the tank has impacted groundwater.

Area 2

Area 2 represents the immediate vicinity surrounding pre-existing monitoring well GW-6. The Phase I study by Dames and Moore reported that this well contained over four feet of a hydrocarbon product floating on the groundwater. The objectives of the current investigation were to identify and characterize the floating product; identify and investigate the source of contamination; investigate the lateral and vertical extent of contamination in the soils around GW-6; and investigate the extent of groundwater contamination beneath the area.

The Agency further requested that an interim remedial measure be conducted in Area 2 congruent with the performance of the investigation outlined above. The interim remedial measure was to consist of the biweekly product thickness monitoring of well GW-6. The biweekly product monitoring included measuring the thickness of the free product layer present in the well, followed by removing as much of the free product as possible with a bailer.

Area 3

Area 3 represents the extreme eastern section of the Site between the Lithography Building (No. 12) and the EKOTEK Lube property. In this area, Phase I groundwater analyses from wells GW-1 and GW-2 revealed elevated concentrations of organic and inorganic contaminants. During DUNN's preliminary site evaluation conducted in December of 1990, a 0.47 foot-thick layer of free product was identified floating on the groundwater in well GW-1.

The investigation objectives of the present evaluation were to identify the contaminants; define the extent of subsurface contamination; and identify the source of contamination. In addition to these objectives, DUNN expanded the biweekly product thickness monitoring described for well GW-6 to include well GW-1. DUNN also chose to characterize the product in well GW-1 through laboratory analysis.

Area 4

Area 4 represents the portion of the Site containing well GW-3. This well was installed during the Dames and Moore Phase I investigation within the excavation area of previously removed underground solvent storage tanks. The Phase I study reported that this well contained elevated concentrations of xylenes and TPH in groundwater. This area encompasses the SP series of borings of the Phase I study where elevated concentrations of xylenes and ethylbenzene were detected in the soil. The SP borings were placed along the solvent pipelines which run below ground between the previous USTs and building 12. This area extends from the west wall of the Lithography Building (No. 12) to just west of the Solvent Storage Building (No. 13).

The objectives of the current investigation were to identify the contaminants of concern; evaluate the extent of soil contamination; determine upgradient and downgradient groundwater quality; and to assess the extent of groundwater contamination.

Area 5

Area 5 represents the part of the Site immediately surrounding and downgradient of the steam cleaner area. The Phase I study reported that a shallow soil sample exhibited a total petroleum hydrocarbon concentration of 3200 ppm.

The investigation objectives in this area were to collect samples to validate the Phase I soil analytical results; and to determine groundwater quality in this area.

2.0 DESCRIPTION OF INVESTIGATION

As described in Section 1.4, there are five areas of concern that were individually evaluated during this investigation. The investigation objectives of each area were specific and therefore, the details of the investigations carried out within each area vary. The general scope of work, however, was consistent from area to area. This section is subdivided into a general description of the overall investigation (Section 2.1) and detailed descriptions of the investigations within the individual areas (Section 2.2). Plate 1 is a site map which depicts the five areas of concern and shows the locations of soil borings and monitoring wells.

2.1 General

Soil borings were drilled in all areas to allow for soil sample collection and the installation of monitoring wells. Soil samples were collected from all borings to evaluate subsurface conditions and to define the nature and extent of any soil contamination. Where possible, all soil samples were screened for volatile organic compounds with a photoionization detector (PID) through headspace analyses. Based on the results of this screening and on visual observations, selected samples were sent to a California-certified laboratory to be analyzed for specific chemical compounds.

In all areas, some of the soil borings were converted into groundwater monitoring wells so that the nature and extent of any groundwater contamination could be defined. Any borings not converted into monitoring wells were properly abandoned.

Groundwater monitoring wells were installed in thirteen of the twenty-two soil borings drilled during this investigation. Although the soil borings were sequentially numbered with the SB designation, monitoring wells installed in the borings were given the MW designation. Because nine borings were not converted to monitoring wells, the monitoring well (MW) numbers are not the same as the corresponding soil boring (SB) numbers. Table 3-1 provides a cross-reference of soil boring (SB) and monitoring well (MW) numbers.

All wells were developed following their installation. All of the wells installed during this investigation, and five of the six previously installed wells, were purged and sampled in one single sampling round.

Three complete sets of groundwater level measurements were recorded from all of the monitoring wells on April 16, May 15 and June 17, 1991. These measurements were recorded so that groundwater flow directions and gradients at the site could be characterized. An assessment of the potential effects of marine tidal fluctuations in the adjacent tidal canal on groundwater gradients at the site was conducted. This was accomplished by continuously monitoring

groundwater levels contemporaneously in eight wells with pressure transducers and a data recorder over a 28 hour period.

The methods and procedures followed in performing all activities of this investigation are described in detail in Section 3.0. The results obtained during this investigation are presented in Section 4.0. A discussion of the results takes place in Section 5.0.

2.2 Individual Areas

Individual areas of concern were identified and defined based on knowledge from previous investigations and historical uses of the areas in question. Each area has a unique potential source of contamination, i.e., petroleum underground storage tanks, chemical underground storage tanks, and pipelines; as well as distinguishable contaminants, i.e., waste oils, gasoline, heating oil, volatile (VOC) or semi-volatile (BNA) organic compounds, and/or polychlorinated biphenyls (PCBs). Another distinct feature for the segregation of the areas was whether or not the source of contamination was from off Site.

Area 1

Three soil borings (SB-15, SB-20, SB-21) were drilled in Area 1. The borings were placed around the perimeter of the previously removed underground gasoline tank so that the presence and extent of any soil contamination resulting from this tank's possible failure could be determined. Based on the direction of groundwater flow presumed at the site, as depicted in the Phase I study and as interpreted from measurements collected by DUNN personnel in December 1990, soil boring SB-21 was drilled on the upgradient side of the backfilled tank excavation and the two other borings were placed on the downgradient side. The three borings were located within ten feet of the center of the tank excavation.

Soil boring SB-15 was continuously sampled from 1.5 feet to 17.5 feet below grade. This boring was converted into monitoring well MW-12. Due to drill rig limitations and health and safety concerns, soil borings SB-20 and SB-21 were each sampled at three intervals (3.0-4.5 feet; 6.0-7.5 feet; and 11.0-12.5 feet (10.0-11.5 feet in SB-21). These two borings were drilled to depths just below where water was first encountered in the borehole in order to evaluate subsurface soil contamination. These borings were backfilled and properly sealed and abandoned following their completion.

Selected soil samples collected from the three borings were analyzed for benzene, toluene, ethyl benzene, and xylenes (BTEX) (EPA Method 8020) and for total petroleum hydrocarbons (TPH) as gasoline (California Department of Health Services (DHS) Leaking Underground Fuel Tank

(LUFT) Method). The groundwater sampled from well MW-12 was analyzed for BTEX, TPH as gasoline and total organic lead.

Area 2

Four soil boring locations were originally proposed for Area 2 to determine the extent of soil and groundwater impacts. Access to this area proved to be limited by a chain link fence with a 3-foot-wide gate; a network of underground utilities including several 8- and 10-inch water pipes, and natural gas lines; an abandoned 12,000 gallon underground fuel oil tank, and an 8-foot diameter by 100-foot high smoke stack which stands on a large concrete slab base and plant buildings.

The first soil boring attempted in Area 2 was SB-17. To gain access to this location, a small drill rig was skidded into a 150-foot-long by 5.5-foot-wide alley between the north side of building No. 11 and the perimeter (property) fence which parallels East 8th Street. A 10-inch water main lies at a depth of 3.5 feet below grade (located by metal detector and hand excavation) and runs 1 foot inside the fence along the entire length of the alley. Boring SB-17 was drilled as close to the pipe as possible (approximately 3.5 feet from the edge of the building) in order to evaluate the backfilled pipe trench for potentially migrating fuel oil. This location was also designed to serve as a downgradient monitoring well for this area. At a depth of 5.5 feet below grade, a concrete slab (most likely the building footing) was encountered and could not be penetrated. The boring could not be moved farther away from the building because of the water pipe, fence, and sidewalk. Therefore, the downgradient monitoring well was not installed.

A section of fence within the triangular portion of Area 2 was removed, providing access for a drill rig. While the drill rig was in this area, soil borings SB-18, SB-18A and SB-19 were drilled. SB-18A was drilled (to 14 feet) because of auger refusal in SB-18 at a depth of 10 feet. These two borings were drilled approximately 20 feet west of the abandoned fuel oil tank. Boring SB-19 was drilled and sampled and subsequently converted to monitoring well MW-13. This boring was located approximately 15-feet north (upgradient) of the abandoned fuel oil tank.

Selected soil samples from borings SB-18 and SB-19 were analyzed for TPH as diesel (DHS LUFT Method). Samples collected from SB-18A were used for characterizing the subsurface geology, but were not submitted for laboratory analysis. The groundwater sample collected from MW-13 was analyzed for TPH as diesel (DHS LUFT Method). A 0.15 foot-thick layer of floating product was present in well GW-6 at the time the wells were sampled. Since this would have prevented the collection of a representative groundwater sample, well GW-6 was not sampled.

Area 3

Eight soil borings (SB-1 through SB-8) were drilled in Area 3. The soil boring locations were selected to test the extent of soil and groundwater contamination identified in pre-existing monitoring wells GW-1 and GW-2.

The borings were drilled to depths ranging from 18.0 to 28.0 feet. All borings were continuously sampled for their entire depths starting from 1.0 foot below the surface. With the exception of SB-3, all borings were drilled to a depth sufficient to fully penetrate the shallow water bearing unit and to encounter the top of a dense silty clay layer. In three of the borings (SB-1, SB-5, and SB-7), several feet of this silty clay layer were penetrated and undisturbed Shelby tube samples were collected. The Shelby tube samples were analyzed at a geotechnical laboratory for permeability, grain size, and moisture content. At least two soil samples were collected for chemical analysis from each soil boring at various depths above where water was first encountered during drilling. These samples were analyzed for VOC, semi-volatile organic compounds (BNA) (EPA Method 8270), PCBs (EPA Method 8080), and metals (T-22 CAM metals).

With the exception of SB-1, which was abandoned, all borings were converted into groundwater monitoring wells (MW-1 through MW-7). Wells were installed to monitor the presence of both light (floating) and dense (sinking) contaminants potentially present in the shallow water bearing unit. This was accomplished by placing each well screen (except MW-2) so that its bottom was in the silty clay layer (described below) and its top was above the top of the seasonally high water table. MW-2 was screened across the top of the shallow water bearing zone. Groundwater samples were collected from monitoring wells MW-1 through MW-7, and GW-1 and GW-2. Groundwater samples from these wells were analyzed for VOC, BNA, PCBs, TPH (EPA Method 418.1) and CAM metals.

Area 4

Three soil borings (SB-9, SB-10 and SB-11) were drilled in Area 4 to evaluate the extent of soil and groundwater contamination associated with the removed underground solvent storage tanks and the solvent pipelines. These three borings were subsequently converted into monitoring wells MW-8, MW-9 and MW-10, respectively.

Soil boring SB-9 (MW-8) was drilled in a location approximately 20 feet south of the solvent pipelines. It was positioned to be downgradient of the Phase I (SP-series) samples which exhibited the highest concentrations of xylenes and ethylbenzene. Three soil samples from this boring were selected for laboratory analysis. The two shallower samples (S-1 and S-3) were analyzed for VOC, tentatively identified compounds (TICs), and TPH (EPA Method 418.1). In

addition to these analyses, the deeper sample (S-5) was also analyzed for BNAs, PCB, and CAM metals.

Soil boring SB-10 (MW-9) was drilled to test the lateral extent of groundwater contamination reported in well GW-3. Soil samples were collected to evaluate if soil contamination associated with the removed underground solvent storage tanks was present. Two soil samples (S-1 and S-5) were analyzed for VOC and TPH (EPA Method 418.1).

Soil boring SB-11 (MW-10) was drilled in a location upgradient from the solvent pipelines and well GW-3. This location was selected to provide upgradient groundwater quality conditions in this area. Soil samples collected from depths of 4.25 feet (S-2) and 8.75 feet (S-5) were analyzed for VOCs, BNAs and TPH.

In addition to the three borings advanced for monitoring well installations, two soil borings (SB-13 and SB-13A) were also drilled adjacent to a previously closed (abandoned after filling with neat-cement) 500-gallon underground gasoline storage tank. The two borings were drilled on the downgradient side of the tank. SB-13 encountered auger refusal from concrete at a depth of 4.0 feet. SB-13A was drilled adjacent to SB-13 and reached a total depth of 10.0 feet, which is equivalent to the top of the groundwater table. Soil boring SB-12 was attempted on the upgradient side of the tank. This boring, however, encountered a concrete slab under a 2-inch thick veneer of asphalt and therefore was abandoned before being drilled. Soil samples collected from SB-13A from depths of 4.25 feet (S-1) and 9.25 feet (S-4) were analyzed for BTEX and TPH as gasoline. These borings were properly abandoned following their completion.

removed in 1992

Monitoring wells (MW-8 through MW-10) installed in the three soil borings described above were constructed so their screened sections extended from above the top of the groundwater table to the base of the shallow water bearing zone. Groundwater samples were collected from these wells and well GW-3 and analyzed for VOCs, BNAs, PCBs, TPH and CAM metals.

Area 5

Two soil borings (SB-14 and SB-16) were drilled in Area 5 to evaluate the presence of soil and/or groundwater impact associated with the steam cleaning facility. Soil boring SB-14 was drilled on the south (hydraulically downgradient) side of the facility. This boring was located within 2 feet of the Phase I study's soil boring location SB-1, which reported a high TPH concentration. Soil samples collected from depths of 5.25 feet (S-3) and 9.25 feet (S-6) were analyzed for VOCs and TPH. Soil boring SB-16 was drilled on the north side of the steam cleaning facility, adjacent to the Phase I study boring SC-2. Soil samples collected from depths of 5.25 feet (S-4) and 9.75 feet (S-7) in this boring were analyzed for VOCs and TPH also.

Monitoring well MW-11 was installed in soil boring SB-14 to a depth of 19.0 feet below grade. Groundwater samples were collected from MW-11 to test for possible groundwater impact from the steam cleaner facility and from GW-4 to test downgradient groundwater conditions. The samples collected from these two wells were analyzed for VOCs, BNAs, PCBs, TPH, and CAM metals.

3.0 METHODOLOGY

3.1 Drilling Program

The drilling program conducted during this investigation was performed between March 11 and March 27, 1991. During this program, a total of twenty-two soil borings were drilled. Subsurface soil samples were collected from each of the borings. Thirteen of these soil borings were converted into groundwater monitoring wells. The remaining nine soil borings were properly abandoned. All drilling, subsurface soil sampling, monitoring well installation, and soil boring abandonment procedures were performed by Exceltech Drilling, of Fremont, California. A DUNN geologist was on site at all times during the drilling program to inspect all activities performed. The DUNN geologist was responsible for recording all data generated during the program, and for ensuring that details of the Site work plan and the Site Health and Safety Plan were followed. A DUNN technician was also on site at all times. The technician conducted health and safety monitoring during the field activities.

3.1.1 Soil Borings

Fifteen soil borings were drilled with a Mobile B-61 truck-mounted drilling rig. Thirteen of these borings (SB-1 through SB-11, SB-14 and SB-15) were advanced with 6 5/8-inch I.D. hollow-stem augers. Borings SB-13 and SB-13A were advanced with 4 1/4-inch I.D. hollow-stem augers. Seven soil borings were drilled with a Dietrich D-25 trailer-mounted skid rig. Five of these borings (SB-16, SB-18, SB-18A, SB-20 and SB-21) were advanced with solid-stem augers and the remaining two borings (SB-17 and SB-19) were advanced with 4 1/4-inch I.D. hollow-stem augers. The solid-stem augers were used in borings that were being advanced to the top of the groundwater table and were expected not to be converted into monitoring wells. This drilling technique was chosen after evaluation of the soil properties had shown that borehole walls would not collapse. All soil cuttings generated during the drilling program were placed in DOT-approved 55-gallon drums and staged on the site pending disposal.

3.1.2 Subsurface Soil Sampling

Subsurface soil samples were collected from all soil borings drilled. Continuous soil sampling was performed at all but three boring locations (SB-19, SB-20, SB-21) where health and safety concerns and drill rig limitations prevented it. At these three locations, samples were collected from selected intervals.

An auger plug was used with the hollow-stem augers to ensure that accurate depths were obtained for sampling intervals. Where solid-stem augers were used to drill borings, the borehole depth was measured after the auger was removed to ensure accuracy of sample depth.

Soil samples were collected with either a 2.5-inch O.D. California sampler or a 2-inch O.D. split-spoon sampler. When the California sampler was used, it was lined with three, 2 1/4-inch diameter by 6-inch long, brass tubes. The California sampler was used to collect samples that would be analyzed at an off site laboratory. The split-spoon sampler was used within the water bearing zones where lab samples were not collected. After the soil sampler was lowered to the bottom of the borehole, it was driven into the undisturbed soil with a 140-pound hammer dropped from a height of 30 inches, in accordance with ASTM Standard Procedure D-1586. The number of hammer blows required to advance the samples every six inches was recorded.

As the sampler was retrieved from the borehole, it was promptly opened and scanned with an HNU Model PI-101 photoionization detector for the presence of volatile organic compounds. When sampling with the California sampler, one of the two tubes nearest the sampler tip was selected and prepared for potential laboratory analysis. This involved slicing the soil off at each end of the tube with a pre-cleaned spatula and quickly capping the ends of the tube with polyethylene lids. The lids were sealed with duct tape to ensure that any volatile organics present in the samples would not escape. The samples were labeled with the boring and sample numbers, date and times collected, and the analyses to be performed. The samples were placed in an ice-filled cooler.

Any soil present in the remaining two brass tubes was then extracted. A portion of this soil was prepared for a volatile organic headspace screening by putting a portion of each soil sample into a 250-ml glass jar and capping the jar with aluminum foil and a screw-top lid. Although the soil was not weighed, care was taken to prepare visually uniform amounts of each sample. After allowing time for the volatile organic compound concentration to equilibrate in the headspace of the sample jar, the tip of the PID was inserted through the aluminum foil into the sample jar headspace. The maximum PID reading of each sample was then recorded. All PID screening results, including the sampler screening ("spoon") and the headspace screening ("HS"), were recorded in the "remarks" column of the soil boring logs. The results of the headspace screening along with visual observations were used to determine which of the brass tube samples stored on ice in the cooler would be sent for laboratory analysis.

As samples were selected for laboratory analysis, they were logged onto a chain-of-custody form. Sample coolers were shipped via courier to the analytical laboratory. All coolers containing samples to be analyzed for VOCs were accompanied by a 40-ml trip blank. Prior to being shipped off site, each cooler lid was sealed closed with a chain-of-custody tape, which was signed by the sampler. All soil samples were analyzed by Anametrix, Inc., of San Jose, California.

A descriptive log of all soils encountered was kept by the DUNN geologist. All samples were logged according to a modified version of the Burmister Soil Classification System and the

Unified Soil System. The Burmister System, developed by Donald Burmister in 1949, allows for a rather precise identification of a soil grain size curve within a narrow range. In addition to color and grain size, other sample characteristics such as the potential presence of contaminants, soil structure, and density were recorded. Detailed logs of all soil borings are presented in Appendix A.

In addition to the soil sampling described above, Shelby tube samples were collected at three soil boring locations (SB-1, SB-5 and SB-7). These undisturbed samples were collected by pushing the Shelby tube into the undisturbed soil immediately beneath the base of the hollow-stem augers with the drill rig drive head. The tubes were pushed until an entire 2.5-feet of penetration had been obtained or until the rig feed pressure had reached 900 p.s.i. After reaching total penetration, the tube was left in place 2 to 3 minutes to allow the clay-rich sample to swell into the tube so as to maximize sample recovery. As tubes were extracted from the borehole, they were immediately capped with polyethylene lids and sealed with duct tape in order to preserve the sample's moisture content. Tubes were then tightly packed into wooden boxes and shipped to a geotechnical laboratory for permeability testing. All laboratory geotechnical analyses were performed by DUNN in their Albany, New York, laboratory. All samples were analyzed within 72-hours of collection.

3.1.3 Monitoring Well Installation

Each monitoring well consists of a ten or a fifteen-foot section of schedule-40 PVC screen (0.020-inch slots), bottom capped and attached to the lower end of schedule-40 PVC solid riser pipe. With the exception of a 2-inch well installed at MW-13, all wells consist of 4-inch I.D. PVC. All pipe connections were flush threaded. All wells were installed at depths that should allow the top of groundwater to stay within the screened interval.

After the well assembly was lowered through the augers to the bottom of the borehole, the sand pack was installed. RMS Lonestar grade #2/12 sand was added to the annular space between the PVC and the augers as the augers were removed. Care was taken to maintain the top of the sand at the base of the augers. The sand pack was extended to about 2 feet above the top of the well screen. Bentonite pellets were placed into the annulus to form a seal on top of the sand pack. Enough pellets were added to form an approximate 2-foot-thick seal. Water was then added to hydrate the pellets. The remainder of the borehole was sealed with a thick, neat-cement grout to a depth of approximately 2 feet below grade. As the cement grout began to set up, a flush mount, water tight, lockable, protective casing was sealed in place over the well with concrete.

Detailed well construction logs are presented in Appendix A. A summary of well construction details is shown on Table 3-1.

3.1.4 Monitoring Well Development

All monitoring wells installed during the drilling program were developed by either the DUNN geologist or the DUNN technician between the dates of March 23 and March 27, 1991.

During well development, groundwater was removed from the well so as to reasonably restore the natural hydrogeologic conditions in the immediate vicinity of the well screen. As groundwater was removed from the well, fine sediments entering the well through the sand pack were removed. As development progressed, some fine sediments were trapped in the sand pack making it a more efficient filter and eventually enabling representative groundwater to be removed from the well.

Well development during this investigation was accomplished with 1 1/2-inch, disposable plastic bailers with bottom valves. Groundwater was removed as rapidly as possible to lower the groundwater levels in the wells. The bailer, filled with well water, was used as a surge device to agitate the groundwater column in the well and adjacent formation, thus freeing some of the fine sediments for removal by the bailer. Development continued until a minimum of 5-well casing volumes of groundwater were removed. All groundwater generated during well development activities was stored in DOT-approved 55-gallon drums pending disposal off site. Table 3-2 provides a summary of well development results.

3.1.5 Soil Boring Abandonment

Nine soil borings were not converted to groundwater monitoring wells and instead were abandoned. The bottoms of all borings which penetrated the groundwater table were sealed with bentonite chips to thicknesses ranging from 1 foot to 5 feet. The remainder of each borehole was filled with a thick neat-cement or cement-bentonite grout. The near-surface of SB-21 was backfilled with cuttings and compacted.

Boring SB-1 was grouted with a tremie pipe through the hollow-stem augers. The augers were kept full of cement as they were removed from the borehole. The other soil borings, most of which did not penetrate the groundwater table, had very competent walls. These borings were grouted after the augers had been removed from the boring. The depth of all borings was measured during abandonment activities to assure that borehole walls had not collapsed. Table 3-3 presents a summary of all well abandonment details.

3.1.6 Decontamination Procedures

A decontamination pad was constructed on Site where all drilling and soil sampling equipment was steam cleaned. The design of this decon pad enabled all soil and decon water to be collected

in DOT-approved 55-gallon drums. The pad consisted of a 15-foot square, wood frame which was triple lined with polyethylene plastic. The pad was stationed on gently sloping asphalt pavement so that water generated during steam cleaning drained to one corner. The waste decon water was pumped to 55-gallon drums.

Both drill rigs and all drilling and sampling tools and equipment were steam cleaned prior to beginning the drilling program. As the program proceeded, all the drilling and sampling tools and equipment were again steam cleaned at the completion of each soil boring, to prevent cross contamination between boring locations. All rigs, tools and equipment were again steam cleaned at the end of the drilling program prior to the equipment leaving the site.

All California samplers, used for the collection of laboratory samples, their accompanying brass liners, and spatulas used for slicing samples were decontaminated between soil samples. The soil sampler decontamination procedures were as follows:

- Prewash with tri-sodium phosphate wash water to remove excess particulates;
- Second wash with clean tri-sodium phosphate solution;
- Tap water rinse;
- Methanol spray;
- Distilled water rinse; and,
- Paper towel or air dry.

All soil sampler decon equipment (brushes, buckets, etc.) were steam cleaned at the decon pad between borings.

3.2 Groundwater Sampling

Each of the newly installed monitoring wells (MW-1 through MW-13) and five of the six pre-existing monitoring wells (GW-1 through GW-5) were sampled during this investigation. The wells were sampled by two DUNN project geologists between the dates of April 16 and April 19, 1991.

Prior to groundwater sampling, groundwater level measurements of all nineteen wells at the Site were taken and recorded. The water volume in the casing of each well was calculated. Immediately prior to being sampled, each well was purged of a minimum of three well water

volumes. Wells were purged with either a centrifugal pump equipped with 1/2-inch polyethylene tubing dedicated to each well; or with 1 1/2-inch disposal plastic bailers. All groundwater generated during well purging was placed in DOT-approved 55-gallon drums, pending disposal. At the completion of purging and prior to collecting samples, the groundwater from each well was tested for pH, conductivity and turbidity.

Groundwater samples were collected with 1 1/2-inch disposable plastic bailers. Samples collected for Title 22, CAM metals analysis, were filtered with disposable 45-micron Nalgene filters and a hand pump. A field blank sample was prepared during each sampling day. The field blank samples were prepared by filling two 40-ml vials with laboratory-provided blank water.

All samples were labeled with the project name, sample number, date and time of collection, name of sampler and type and method of analysis requested. This information was also recorded on a chain-of-custody sheet which accompanied each shipment of samples to the analytical laboratory. After being labeled, samples were immediately placed in an ice-filled cooler to provide sample preservation. Each cooler containing samples to be analyzed for VOCs was accompanied by a 40-ml trip blank. Samples were shipped to the analytical laboratory each sampling day via courier. Prior to being shipped off site, each cooler lid was sealed with chain-of-custody tape, which was signed by the sampler. All groundwater samples were analyzed by Anametrix, Inc., of San Jose, California. Anametrix is a California state-certified lab.

4.0 RESULTS

4.1 Geology and Hydrogeology

4.1.1 Geology

Regional Geology

The region surrounding the Site is comprised of consolidated bedrock units and younger unconsolidated sediments. The top of the bedrock lies at a maximum depth of approximately 1,100 feet within the region, and it slopes up to the east where it outcrops at or near the surface trace of the Hayward Fault Zone.

The unconsolidated units that overlie the bedrock in the region consist of sand, gravel and clay deposited by alluvial processes; and sand, silt, clay and organic sediments deposited on the margins or within bays or lakes (Hickenbottom and Muir, 1988; Radbruch, 1957). The coarse grained alluvial deposit formed from alluvial fans and streams emanating primarily from the bedrock hills to the east of the Hayward Fault Zone. The alluvial deposits are interlayered with, and grade laterally into, the finer grained sediments that were formed within and along the margins of interfluvial basins and marine bays.

Site Geology

The geology at the Site consists of approximately 800 feet of unconsolidated sediments over undifferentiated bedrock (Hickenbottom and Muir 1988). The surficial deposits in the vicinity of the Site are mapped as the Merritt sand by Hickenbottom and Muir (1988). The Merritt sand is a Pleistocene beach deposit consisting of loose, well-sorted, fine to medium grained, silty, clayey sand with lenses of sandy clay and clay. The unit is known to have a maximum thickness of 65 feet.

Three other unconsolidated surficial deposits are mapped within 0.5 miles of the Site. These consist of fluvial deposits; interfluvial basin deposits; and bay mud (Hickenbottom and Muir, 1988). The fluvial deposits are generally less than 15 feet thick and they consist of well bedded, moderately sorted fine sand, silt and clayey silt with occasional thin beds of coarse sand. The interfluvial basin deposits are comprised of silt and clay that are plastic and rich in organics. The bay mud is a dark plastic clay and silty clay rich in organic material that contains some lenses of silt and clay. This unit is typically from 1 foot to about 120 feet thick.

Soil samples were collected from each of the twenty soil borings drilled during the investigation. These samples provided a significant amount of information concerning the unconsolidated

surficial stratigraphy which is present at the Site. The analysis of these samples indicates that the Merritt Sand is not present at the Site. The samples indicate the fluvial deposit described by Hickenbottom and Muir, 1988, is present at the Site. Based on the visual description of the samples, the stratigraphy present at the site may be grouped into three units: fill, tidal marsh, and fluvial deposits, in order of increasing depth.

The fill material is present in fifteen of the twenty-two borings. Its composition varies from reworked natural silty clay surficial deposits to mixtures of sand and gravel. Where observed, this deposit contained very little foreign matter or unnatural debris.

The tidal marsh unit exists immediately below the fill unit or at the surface in areas where the fill was not present. This unit is primarily composed of very dense, stiff silt and clay that is highly plastic when remolded. The unit is rich in organic matter, although it is essentially devoid of any shell fragments.

The fluvial deposit lies immediately beneath the tidal marsh unit. This unit consists of numerous individual fining-upwards sequences which grade vertically upwards in grain size from sandy gravels to clayey silts. Some sequences appear to have been truncated and replaced by subsequently deposited channel sediments.

Where repeated channel sequences were encountered at individual locations, the deeper sequences were generally coarser textured than the shallower sequences.

A distinct contact, characterized by textural, density and in some areas color changes was encountered at the base of the fluvial deposit. This contact was recorded at depths ranging from 15.5 feet in boring SB-15 to 22.5 feet in boring SB-10. In most of the borings, this contact was noted at a depth of 16.5-19.0 feet. This contact was not identified in borings SB-3, 13, 13A or borings SB-16 through SB-21 because these borings were not targeted to be drilled deep enough.

The stratigraphic unit which is present beneath the contact described above generally consists of dense clay and silt with minor amounts of sand and gravel. This unit is interpreted to be the "younger alluvium" of Hickenbottom and Muir (1988), which they found to underlie the surficial deposits of the East Bay Plain. This relatively dense unit exhibited low permeability everywhere that it was observed. Two borings (SB-5 and SB-7) were drilled more than 2.5 feet into the unit to evaluate the vertical extent of the deposit and to collect Shelby tube samples for hydraulic conductivity measurements. A third Shelby tube sample was collected from the top of this unit in boring SB-1.

The results of the Shelby tube sample analyses indicate that the younger alluvium that lies below the contact has a very low hydraulic conductivity which averaged $1.1x10^{-7}$ cm/sec in the three samples tested. Detailed laboratory reporting sheets are presented in Appendix B.

Detailed sample descriptions and further description of the individual deposits discussed above are provided on the boring logs (Appendix A).

4.1.2 Hydrogeology

Regional Hydrogeology

The unconsolidated sediments in the region collectively make up the groundwater reservoir of the East Bay Plain (Hickenbottom and Muir, 1988). This groundwater reservoir is bounded on the east side by the Hayward fault. The northern and southern boundaries of the defined East Bay Plain reservoir are political, not physiographic, in nature; the groundwater resource extends to unknown limits.

The primary source of water supply in the East Bay Plain groundwater reservoir comes from the older alluvium deposits at depths greater than 50 feet. Groundwater is also present in the younger near surface deposits in the region. However, due to the limited quantities of groundwater available, the near surface units are not extensively used.

The East Bay Plain groundwater reservoir receives recharge directly from precipitation. Groundwater in the reservoir generally moves in a west and southwesterly direction from the Hayward Fault to the San Francisco Bay. Under natural conditions, upward movement of groundwater occurs due to differential pressures between confining layers. It is expected that upward flow gradients become more pronounced toward the San Francisco Bay which acts as the primary discharge area for this groundwater reservoir. At this time, vertical flow patterns are most likely differential through the region in response to effects of variable recharge and discharge conditions across the reservoir system.

Bedrock aquifer characteristics are not discussed since those units have no relationship to the site.

Site Hydrogeology

During this investigation, groundwater was found to be present in the fluvial deposit described in Section 4.1.1. Following the installation of thirteen monitoring wells during this investigation, there are now a total of nineteen wells within the surficial water bearing unit at the Site. Groundwater level measurements were collected from all 19 wells on three dates (April 16, May

15 and June 17, 1991) to characterize groundwater flow patterns present at the site. The groundwater level data and the subsurface stratigraphic information gathered during the investigation indicate that the groundwater bearing unit being monitored at the Site exhibits unconfined groundwater aquifer characteristics. It is therefore free to rise and fall with changes in recharge and discharge.

Table 4-1 presents the results of the groundwater level measurements collected over the three dates. Plates 2, 3, and 4 are contour maps of the groundwater surface on the three dates when measurements were recorded.

The groundwater level measurements recorded in April, 1991 were taken a short time after a series of storms passed over the region. The National Weather Service recorded 7.04 inches of precipitation for the month of March 1991 at the Oakland climatological station located at Lake Merritt, 2.5 miles from the site. This recharge, along with the fact that the end of March represents the end of the region's wet season, indicates that the April measurements likely represent the seasonal high groundwater table. Groundwater elevations on April 16 varied from a high of 10.19 feet (AMSL) to a low of 1.77 feet (AMSL). The groundwater contour map for this date shows that groundwater flows generally in a southwesterly direction across the Site. This local flow pattern is part of the regional groundwater flow pattern as supported by the proximity of the Site to the regional discharge zones within the San Francisco Bay and the nearby tidal canal. However, a local reversal in the local flow gradient is present in Area 3. The April measurements show the groundwater table elevation in well MW-3 to be 3.11 feet higher than that of well MW-5, located 60 feet to the north. Considering that all of the wells are screened in the same water bearing unit, the high groundwater levels in MW-3, MW-2, and GW-1 indicate that a significant groundwater mound exists in this area of the Site. As a result of this mound, groundwater in this area of the Site flows in a radial pattern from the ANCC/EKOTEK Lube Property line toward the northwest. The axis of the reversal in the local flow gradient as discussed above is apparently located beneath building No. 12. Due to the absence of data, however, its specific location has been inferred.

A second mounding of the groundwater table is indicated in Area 2. April groundwater level measurements for well MW-13 were 2.72 feet higher than that of GW-6.

The existence of the two groundwater mounds discussed above may be explained by their proximity to potential recharge areas. The surficial water-bearing unit receives its recharge predominantly from direct precipitation, which percolates downward from the surface. The amount of recharge available from precipitation in any one area is related to surface physical conditions. An area with natural soil and grass-covered ground will allow much more precipitation to percolate to the groundwater table than will an area covered with asphalt.

Over a majority of the site, asphalt-covered ground and a stormwater drainage piping network prevents most of the precipitation from recharging the groundwater. The two apparent mounds are, however, located at the perimeter of the Site. The EKOTEK Lube property is located immediately off-site from the mound in Area 3. Although the EKOTEK property also has much of the ground surface covered with concrete, there are features present which could provide the pathways for the percolation of precipitation to the groundwater. There appears to be several sump areas around the base of tanks which are partially or totally open. Grass-covered spill containment structures are present at several locations around the EKOTEK Lube property, several of which are located immediately adjacent to the ANCC/EKOTEK property line. All of these features would be capable of collecting and concentrating precipitation thereby increasing groundwater recharge.

Likewise, the mound which is present in Area 2 is located at the perimeter of the property. Much of the triangular section of Area 2 is not paved or concreted. This could account for the mound in this area. Also the foundation footing is right there would would seem to provide a sort of "dam"

The groundwater level measurement data from May and June, 1991, shows that as the summer dry season progresses, the amplitude of the mound in Area 3 decreases. A full year of monitoring groundwater levels will be necessary to determine if the mound totally disappears at some point in the dry season.

In Area 2, groundwater levels in both MW-13 and GW-2 have continued to decline since the April measurements. However, because groundwater levels in GW-6 have decreased by 0.89 feet from April to June while those in MW-13 have dropped by only 0.57 feet, the amplitude of the mound in this area has become greater. The data presently available is not adequate to explain this phenomenon.

As discussed in Section 2.0, a continuous groundwater monitoring study was performed in May, 1991. This study was performed in order to determine if marine tidal fluctuations in the San Francisco Bay and the nearby tidal canal impact groundwater levels, gradients and flow directions at the Site. This study was carried out by monitoring the water levels in eight wells (GW-1, MW-1, 3, 4, 6, 7, 9 and 10) simultaneously for a period of 28 hours. Only well GW-1 showed any fluctuations over the 28-hour period and that fluctuation was limited to a maximum of 0.20 feet. Fluctuations were not detected in the other seven wells evaluated during the study. The results of this study indicate that, at the time the study was conducted, the water table at the site was not being impacted by marine tidal fluctuations. At the time this study was conducted, water levels at the Site appear to have been at a seasonal high. Increased hydrostatic head present in the surficial water bearing unit may have prevented tidal fluctuations from impacting water table conditions at the Site. Furthermore, it is expected that tidal impacts to the site groundwater would not be significant even when seasonal low groundwater conditions exist.

4.2 Analytical Results

Chemical analyses were performed on both soil and groundwater samples by Anametrix, Inc.

Summary tables of analytical results are located at the end of Section 4.0. Table 4-2 provides a summary of the soil sampling and analysis program. Tables 4-3 through 4-7 summarize the soil analytical results for each of the five individual areas. Tables 4-8 through 4-10 summarize the groundwater analytical results.

Area 1

Soil

Two soil samples, collected from each of the three borings (SB-15, SB-20 and SB-21) drilled around the perimeter of the former underground gasoline storage tank, were analyzed for BTEX and TPH as gasoline. Table 4-3 summarizes Area 1 soil sample analytical results. These compounds were not detected in the shallow samples ((SB-15 (S-3), SB-20 (S-2) and SB-21 (S-2)) which were collected at depths of 5.25, 6.75 and 6.75 feet below grade, respectively. Sample SB-15 (S-6) collected at a depth of 9.25 feet revealed an ethylbenzene concentration of 0.007 mg/kg (ppm) and a total xylene concentration of 0.009 ppm. Sample SB-20 (S-3), collected at a depth of 11.75 feet, contained reported concentrations of toluene, ethylbenzene and total xylenes of 0.17. 0.29 and 0.94 ppm, respectively. This sample also contained reported concentrations of TPH as gasoline at 59 ppm. Sample SB-21 (S-3), also collected at a depth of 11.75 feet, contained reported concentrations of total xylenes and TPH as gasoline at 0.016 and 1.0 ppm, respectively.

Groundwater

Soil boring SB-15 was converted into monitoring well MW-12. The groundwater from wells MW-12 and GW-5 were sampled and analyzed for BTEX, TPH as gasoline and organic lead. Table 4-10 summarizes Area 1 groundwater sample analytical results. With a reporting limit of 0.5 ug/l (ppb), BTEX were not detected in either of the samples analyzed. TPH as gasoline and organic lead, with reporting limits of 50 ppb and 40 ppb, respectively, were also not detected in these two samples. Figure 4-1 is a site map of Area 1. This map also provides a summary of groundwater analytical results.

Area 2

Soil

Two soil samples collected from each of the two borings in Area 2 (SB-18 and SB-19) were analyzed for TPH as diesel. Table 4-4 summarizes Area 2 soil sample analytical results. Sample SB-18 (S-4) collected at a depth of 5.25 feet below grade contained a reported concentration of 130 ppm. Sample SB-18 (S-6) collected at a depth of 8.75 feet contained a reported concentration of 91 ppm. With a reporting limit of 10 ppm, TPH as diesel was not detected in either of the two samples from SB-19.

Groundwater

Soil boring SB-19 was converted into monitoring well MW-13. The groundwater in this well was sampled and analyzed for VOCs, BNAs, TPH as diesel, PCBs and CAM metals. Table 4-8, 4-9, and 4-10 summarize the groundwater sample analytical results from Area 2. VOC, BNA or PCB parameters analyzed for were not detected in the groundwater sample from MW-13. This sample was reported to contain 430 ppb of TPH as diesel. Total matrix chromium, nickel and lead within this sample were reported at concentrations of 13.4, 90.3 and 18.0 ppb, respectively. The sample was also reported to have contained 9,940 ppb of zinc. Figure 4-2 is a site map of Area 2. This map also presents the groundwater analytical results obtained from sample MW-13. As discussed in Section 2.2, a 0.15 foot thick layer of product was present on well GW-6 at the time groundwater samples were collected and therefore a sample was not collected from this well.

Area 3

Soil

Two soil samples collected from each of the eight soil borings in Area 3 (SB-1 through SB-8) were analyzed for VOCs, BNAs, PCBs and CAM metals. A third soil sample from boring SB-5 was analyzed for these parameters, also. Due to matrix interferences of three of the samples analyzed for VOCs and BNAs, the samples were diluted prior to being analyzed. At the reported dilution factors, these samples did not reveal contaminants. However, sample dilution results in higher detection limits which could mask the presence of contaminants at lower concentrations. The diluted samples with no detected VOC concentrations include:

Boring	Sample No.	Depth of Sample	Dilution Factor
SB-3	S-2	3.25 feet	500.00
SB-5	S-5	7.75 feet	50.00
SB-5	S-9	13.75 feet	500.00

Two of the seventeen samples analyzed for BNAs were also diluted and subsequently did not contain detected concentrations of any parameters. These two samples are SB-3 (S-2) and SB-4 (S-4). Both samples had a dilution factor of ten. Table 4-5 summarizes the soil sample analytical results from Area 3..

Sample SB-1 (S-3) collected from a depth of 4.75 feet was reported to contain 200 ppb of acetone. No other VOC or BNA analytes were detected in this sample. The deeper sample SB-1 (S-9) collected from a depth of 13.75 feet contained reported VOC concentrations of chlorobenzene at 67 ppb, ethylbenzene at 1,100 ppb and total xylenes at 1,300 ppb. Three dichlorobenzene isomers were also detected in this sample with a total concentration of 1,330 ppb. The VOC analysis of this sample included a library search of unidentified compounds (TIC analysis) which reported five unknown hydrocarbons which totaled 13,000 ppb. Sample SB-1 (S-9) was also reported to contain several BNA analytes which included 1,4-dichlorobenzene at 450 ppb, naphthalene at 2,500 ppb and 2-methylnapthalene at 3,800 ppb. This sample was also reported to have estimated concentrations of 1,3-dichlorobenzene and 1,2-dichlorobenzene at 69 "J" ppb and 320 "J" ppb. The BNA TIC analysis of this sample identified ten compounds which totalled an estimated concentration of 36,000 ppb.

Sample SB-2 (S-8), collected from a depth of 12.75 feet revealed no detectable VOCs or BNAs. Sample SB-2 (S-9) collected at 13.75 feet was diluted by only a factor of 2.00 and no VOCs were detected. This sample also did not contain any detected concentrations of BNAs.

The two samples collected from SB-3 (S-2 and S-8) were diluted prior to being analyzed for VOCs. Although these compounds subsequently were not detected in the analysis of sample S-2, sample S-8 revealed a total xylene concentration of 1,600 ppb. Sample SB-3 (S-2) was diluted also prior to being analyzed for BNAs; however, the sample was diluted by a factor of only ten. Data indicate that BNA compounds are not a significant concern with respect to sample SB-3 (S-2). Sample SB-3 (S-8) which was not diluted for its BNA analysis, contained six compounds (four of which were estimated concentrations) totalling 6,530 ppb.

VOCs were not detected in sample SB-4 (S-4) which was collected from a depth of 6.25 feet. This sample was diluted ten times for its BNA analysis and was reported to contain no detectable concentrations of analytes. Data indicate that BNA parameters are not a significant concern in this sample. Sample SB-4 (S-7) collected at a depth of 10.75 feet was reported to contain none

of the VOC analytes. The library search performed with this sample analysis revealed five unknown hydrocarbon compounds with a total estimated concentration of 260 ppb. The BNA analysis of sample SB-4 (S-7) reported fluorene at 69 ppb and ten TICs at a total estimated concentration of 18,000 ppb.

One of the three samples collected from boring SB-5 (S-7) was not diluted. This sample did not contain detectable concentrations of the VOC analytes. The laboratory internal standards, however, were outside established method limits for this sample. The other two samples from this boring (S-5 and S-9) were diluted, and the VOC analytes were not detected. BNA compounds were not detected in the three samples from boring SB-5.

Two samples from soil boring SB-6 were analyzed. Sample S-3 was collected from a depth of 4.75 feet and S-6 was collected from a depth of 9.25 feet. Cis-1,2-dichloroethene was the only VOC analyte which was detected in sample S-3 and was reported at a concentration of 31 ppb. BNA compounds were not detected in this sample. Sample S-6 was diluted by a factor of ten due to the presence of high concentrations of hydrocarbons in the sample. This sample was reported to have 110 ppb of methylene chloride, 270 ppb of 1,3-dichlorobenzene and 370 ppb of 1,4-dichlorobenzene. The BNA analysis of this sample revealed no detected compounds.

The two samples analyzed from soil boring SB-7 (S-3) and SB-7 (S-6) were collected from depths of 4.75 feet and 9.25 feet, respectively. Acetone was detected in sample SB-7 (S-3) and reported at a concentration of 320 ppb. No other VOC or BNA compounds were detected in either of the two samples.

Samples SB-8 (S-3) and SB-8 (S-7) were collected from depths of 4.75 feet and 10.75 feet, respectively. No VOC or BNA compounds were detected in these samples.

All of the seventeen soil samples collected in Area 3 were analyzed for PCBs. With the exception of samples SB-1 (S-9), SB-2 (S-9) and SB-5 (S-9), PCBs were not detected in any of the samples. PCBs were detected in these three samples at concentrations of 2,800 ppb, 200 ppb and 370 ppb, respectively.

With the exception of the two samples from soil boring SB-7 (S-3 and S-6), all of the soil samples collected from Area 3 were analyzed for California Title-22 (CAM) metals. Cadmium, molybdenum, selenium, antimony and thallium were not detected in any of the samples analyzed. Due to matrix effects, the matrix spike, matrix spike duplicate and post digestion spike recoveries for both cadmium and antimony were zero. Cadmium and antinomy analytical results for these samples are therefore unreliable. However since the groundwater monitoring well analytical results for these parameters were acceptable and considering that these metals

were not detected at or above the laboratory reporting limit, cadmium and antimony do not appear to be a concern at the site.

With the exception of a concentration of 0.80 ppm reported for sample SB-8 (S-3) silver was not detected in any of the samples analyzed. Arsenic was detected in all samples analyzed in concentrations ranging from 1.4 ppm to 8.4 ppm. The highest concentration was found in sample SB-2 (S-9). Barium was detected in all samples in concentrations ranging from 54.7 ppm to 267 ppm. The highest barium concentration was reported for sample SB-8 (S-3). Beryllium was not detected in six of the seventeen samples analyzed. The detected concentrations ranged from 0.25 ppm to 0.71 ppm with the highest concentration found in SB-1 (S-3). Cobalt was detected in all samples analyzed in concentrations ranging from 11.9 ppm to 37.5 ppm. Sample SB-8 (S-3) exhibited the highest concentration. Total chromium was detected in all samples analyzed at concentrations ranging from 41.8 ppm to 205 ppm, with the highest concentration found in SB-2 (S-8). Copper was reported in all samples in concentrations ranging between 12.7 ppm and 30.8 ppm. Sample SB-2 (S-8) also contained the highest concentration of copper. With the exception of sample SB-5 (S-7), mercury was detected in all samples analyzed. Mercury was detected at concentrations ranging from 0.072 ppm to 0.240 ppm which was reported in sample SB-8 (S-3). Nickel was detected in all samples ranging in concentrations from 71.3 ppm to a high of 236 ppm reported in sample SB-2 (S-8). Lead was detected in all samples in concentrations ranging from 3.5 ppm to 32.1 ppm which was reported in sample SB-3 (S-2). Vanadium was detected in all samples in concentrations ranging from 19.8 ppm to 65.2 ppm which was reported for sample SB-2 (S-8). Zinc was detected in all samples at concentrations ranging from 26.0 ppm to 47.4 ppm which was reported for sample SB-3 (S-2).

Groundwater

Soil borings SB-2 through SB-8 were converted into monitoring wells MW-1 through MW-7, respectively. Groundwater samples collected from these seven monitoring wells and also from wells GW-1 and GW-2 were analyzed for VOCs, BNAs, PCBs, TPH and CAM metals. All analyses were performed following SW-846 methodology. Tables 4-8, 4-9, and 4-10 summarize the groundwater sample analytical results from Area 3.

VOC analysis of the groundwater from well MW-1 revealed detectable concentrations of methylene chloride, benzene, chlorobenzene, ethylbenzene, total xylenes, 1,4-dichlorobenzene and 1,2-dichlorobenzene. The total volatile organic concentration was 609 ppb with the majority concentration belonging to methylene chloride at 390 ppb. BNA analysis of sample MW-1 revealed detected concentrations of phenol, 1,4-dichlorobenzene, 1,2-dichlorobenzene, naphthalene and 2-methylnaphthalene. The total of the detected concentrations for these five compounds equalled 143 ppb. Sample MW-1 was reported to contain 8.5 ppm of TPH and 7.9

ppb of PCBs. Arsenic (13.4 ppb), barium (180 ppb), lead (4.0 ppb) and zinc (26.2 ppb) were reported in the metals analysis of sample MW-1.

Groundwater sample MW-2 was reported to contain detectable concentrations of seven VOC analytes. These included benzene, toluene, ethylbenzene, xylenes, chlorobenzene, 1,2-dichlorobenzene and 1,1-dichloroethane. The total quantity of the concentrations reported for these compounds was 2,522 ppb of which xylene accounted for 1,300 ppb. Sample MW-2 also contained four BNA compounds including 1,2-dichlorobenzene, 2-methylphenol, 2,4-dimethylphenol, and naphthalene. The total concentration of these compounds was reported at 1,703 ppb, of which 1,300 ppb was 2,4-dimethylphenol. Sample MW-2 was reported to contain 48.0 ppm of TPH and 6.0 ppb of PCBs. Arsenic (41.2 ppb), barium (317 ppb), nickel (98.9 ppb), lead (33.3 ppb) and zinc (77.1 ppb) were reported in the metals analysis of sample MW-2.

The sample of groundwater from well MW-3 contained detectable concentrations of the same seven VOC parameters as those found in MW-2. In addition, MW-3 contained detectable concentrations of chloroethane and acetone. The sum of all VOC concentrations reported totalled 601 ppb, which was much lower than that for MW-2. Sample MW-3 was reported to contain two BNA compounds, naphthalene and 1,2-dichlorobenzene, at concentrations of 27 ppb and 9 ppb, respectively. Sample MW-3 was reported to contain 29.0 ppm of TPH. PCBs were not detected. Barium, lead and zinc were reported in sample MW-3 at concentrations of 163 ppb, 3.2 ppb, and 79.7 ppb, respectively.

Groundwater sample MW-4 contained eight (8) VOC analytes. Benzene was most prevalent at a reported 230 ppb. Also detected were toluene, ethylbenzene, total xylenes, chloroethane, chlorobenzene, 1,4-dichlorobenzene, and 1,2-dichlorobenzene. The total quantity of VOCs equalled 337 ppb. The total BNA compound concentrations as reported equalled 182 ppb. This sample was reported to contain 120 ppb of 4-chloro-3-methylphenol which was not detected in any other samples analyzed. TPH was detected in sample MW-4 at a reported concentration of 4.5 ppm. PCBs were not detected. Arsenic, barium, lead and zinc were detected in this sample, also. The barium concentration was reported as being 549 ppb.

The sample of groundwater collected from well MW-5 contained benzene (230 ppb), total xylenes (260 ppb), ethylbenzene (56 ppb) and chlorobenzene (48 "J" ppb). This sample was also reported to contain detected concentrations of eight BNA compounds which totalled in concentration to 355 ppb. Naphthalene was the highest reported BNA compound detected with a concentration of 140 ppb. TPH was detected in sample MW-5 at a reported concentration of 650 ppm and PCBs were detected at a concentration of 10.0 ppb. Arsenic (20.9 ppb), barium (668 ppb), nickel (73.7 ppb), lead (33.5 ppb) and zinc (61.6 ppb) were also detected in sample MW-5.

Groundwater sample MW-6 was reported to contain 32 ppb of 1,1-dichloroethane and an estimated concentration of 1,1-dichloroethene of 2 ppb. 1,1,1-trichloroethane was also detected and reported at an estimated concentration of 2 ppb. This was the only well sampled at the site where these latter two compounds were detected. BNA, PCB, and TPH compounds were not detected in sample MW-6. Barium and zinc were detected in this sample at reported concentrations of 129 ppb and 50.8 ppb, respectively.

Only one VOC was detected in the groundwater sample MW-7; 1,4-dichlorobenzene was reported at an estimated concentration of 2 ppb. The BNA and PCB compounds were not detected in sample MW-7. This sample was reported to contain 1.5 ppm of TPH. Arsenic, barium, nickel, lead and zinc were also detected. The lead concentration of 50.4 ppb was the highest of any groundwater samples collected at the site.

A groundwater sample collected from well GW-1 revealed elevated concentrations of seven VOC parameters. The sum of the reported quantities of the VOCs detected was 3,502 ppb. This was the highest total found in any Area 3 wells. Of this total the concentrations of benzene (540 ppb), toluene (950 ppb), and total xylenes (1,500 ppb) were the highest reported for any well in Area 3. Likewise, sample GW-1 was also reported to have the highest total BNA concentration of any well with a concentration of 10,430 ppb. The predominant BNA compound detected was 2,4-dimethylphenol reported at a concentration of 8,900 ppb. This sample was reported to contain 43.0 ppm of TPH and 33 ppb of PCBs (Aroclor 1260). This PCB concentration was estimated because it exceeded the linear range of the laboratory instrument calibration.

The VOC analysis of the groundwater sample from well GW-2 revealed that ten compounds were detected. The sum of these concentrations equalled 140 ppb. All but two of the compounds reported (vinyl chloride and cis-1,2-dichloroethene) were detected in one or more of the other wells in Area 3. Vinyl chloride was detected at a concentration of 28 ppb while cis-1,2-dichloroethene was reported at a concentration of 8 ppb. Two BNA compounds were detected in sample GW-2 at low estimated concentrations. These included bis(2-chloroethyl) ether at 4 "J" ppb and 1,2-dichlorobenzene at 7 "J" ppb. TPH was detected and reported at a concentration of 2.5 ppm, while PCBs were not detected in this sample. Two metals were detected in sample GW-2, barium (579 ppb) and lead (10.9 ppb).

Figures 4-3a through 4-3d are site maps of Area 3. These four maps present groundwater analytical results for the analyses of Total VOCs, Total BNAs, PCBs, and TPH, respectively.

Area 4

Soil

A total of five soil borings were drilled in Area 4. Two soil samples from each boring were analyzed for various compounds. A third sample was analyzed from boring SB-9. The analysis of individual samples varied based on the objectives of the investigation in this area as outlined in Section 1.4 and as described in Section 2.0. Table 4-6 summarizes the soil sample analytical results from Area 4.

The shallow soil sample from boring SB-9 (S-1) was collected from a depth of 1.75 feet. This sample was analyzed for VOCs and TPH. The sample was diluted by a factor of 5,000 and the VOC analysis detected a concentration of total xylenes which was reported at 490,000 ppb. Due to the high dilution level, other VOC parameters may have gone undetected. The reported TPH concentration in this same sample was 27,000 ppm. Sample SB-9 (S-3) was collected from a depth of 4.75 feet. This sample was analyzed undiluted for VOCs and TPH. VOCs were not detected in this sample; however, TPH was reported as being present at a concentration of 126 ppm. Sample SB-9 (S-5) was collected at a depth of 8.0 feet. This sample was analyzed undiluted for VOCs, BNAs, PCBs and CAM metals. Acetone was detected in this sample at a concentration of 110 ppb. BNA and PCB compounds were not detected in this sample. Arsenic, barium, cobalt, total chromium, copper, mercury, nickel, lead, vanadium and zinc were detected in the metals analysis of sample SB-9 (S-5). All concentrations of metals in this sample were within the ranges of concentrations of metals found in Area 3, discussed in the previous section.

Two soil samples from soil boring SB-10 were analyzed for VOCs and TPH. Sample SB-10 (S-1), collected at a depth of 1.75 feet, did not exhibit any detectable concentrations of VOCs. This sample was reported to contain 3.7 ppm of TPH. Sample SB-10 (S-5) was collected from a depth of 7.75 feet. The VOC analysis of this sample detected total xylenes at an estimated concentration of 350 ppb. The TIC analysis for this sample revealed 5 compounds at a total estimated concentration of 410 ppb. This sample was also reported to contain 5.0 ppm of TPH.

Two soil samples from soil boring SB-11 were analyzed for VOCs, BNAs, and TPH. Sample SB-11 (S-2) and SB-11 (S-5) were collected at depths of 4.25 feet and 8.75 feet, respectively. The VOC and BNA compounds were not detected in these two samples. TPH was detected in samples S-2 and S-5 at reported concentrations of 21.0 ppm and 4.2 ppm, respectively.

Two soil samples collected from soil boring SB-13A (S-1 and S-4) were analyzed for TPH as gasoline and BTEX. The samples, collected at depths of 4.25 feet and 9.25 feet, respectively, revealed no detectable quantities of these compounds.

Groundwater

Soil borings SB-9, SB-10 and SB-11 were converted into monitoring wells MW-8, MW-9 and MW-10, respectively. Groundwater samples collected from these three wells and also from well GW-3 were analyzed for VOCs, BNAs, PCBs, TPH, and CAM metals. Tables 4-8, 4-9, and 4-10 summarize the groundwater sample analytical results from Area 4.

The sample analyzed from well GW-3 was the only one of the four analyzed to contain detectable concentrations of VOCs and BNAs. This sample was reported to have a total xylene concentration of 20,000 ppb and an ethylbenzene concentration of 4,600 ppb. The BNA compounds detected in sample GW-3 were 2-methylphenol, 4-methylphenol, 2,4-dimethylphenol, naphthalene and phenanthrene at various low concentrations which totalled 84 ppb. TPH concentrations were detected only in the samples from wells MW-10 and GW-3 at concentrations of 1.1 ppm and 6.7 ppm, respectively. PCBs were not detected in the groundwater samples from any of the four wells in Area 4. The CAM metals analysis of the groundwater samples from Area 4 revealed that only zinc was detected in all four samples. Nickel was detected in samples MW-9 and MW-10, while barium was detected in samples MW-9, MW-10, and GW-3. Silver was found to be present only in sample MW-9, arsenic only in GW-3 and total chromium only in sample MW-10. All were reported at low concentrations. Figure 4-4 is a site map of Area 4. This map also presents a summary of groundwater analytical results from this area.

Area 5

Soil

Two soil borings (SB-14 and SB-16) were drilled in Area 5. Two samples were collected from each of the two borings and analyzed for VOCs and TPH. Samples S-3 and S-6 were collected from boring SB-14 at depths of 5.25 feet and 9.75 feet, respectively. Samples S-4 and S-7 were collected from boring SB-16, also at depths of 5.25 and 9.75 feet, respectively. Table 4-7 summarizes the soil sample analytical results Area 5.

There were no VOC parameters detected in any of the four samples analyzed. Samples SB-14 (S-3) and SB-14 (S-6) were reported to contain TPH concentrations of 3.3 ppm and 2.7 ppm, respectively. The TPH analysis of samples SB-16 (S-4) and SB-16 (S-7) revealed concentrations of 6.7 ppm and 3.3 ppm, respectively.

Groundwater

Soil boring SB-14 was converted into groundwater monitoring well MW-11. The groundwater samples collected from wells MW-11 and GW-4 were analyzed for VOCs, BNAs, PCBs, TPH, and CAM metals. Tables 4-8, 4-9 and 4-10 summarize the groundwater sample analytical results from Area 5.

The VOC analyses of these samples revealed an estimated quantity (3 "J" ppb) of tetrachloroethene present in sample MW-11. No other VOCs or BNAs were detected in either of the two well samples. TPH was reported as being detected in both samples MW-11 and GW-4 at concentrations of 6.8 ppm and 3.0 ppm, respectively. PCBs were not detected in either sample MW-11 or GW-4. The CAM metals analyses revealed that none of the seventeen metals were detected in sample GW-4. Lead (15.8 ppb) and zinc (48.7 ppb) were the only two metals detected in sample MW-11. Figure 4-5 is a site map for Area 5. This map also presents a summary of groundwater analytical results from this area.

4.3 Product Monitoring

4.3.1 Product Analytical Results

Samples of free product were collected from wells GW-1 (Area 3) and GW-6 (Area 2) on December 19, 1990. These two samples were analyzed for VOCs, BNAs, PCBs, TPH as diesel, TPH as gasoline and CAM metals. Samples were collected by DUNN personnel and analyzed by Precision Analytical Laboratories, Inc. of Richmond, California. Precision subcontracted the BNA analysis to Med-Tox Associates, Inc. of Pleasant Hill, California. Both labs are California State-certified labs.

The VOC analysis of the product sample from GW-1 revealed the detection of toluene (1,200 ppm), ethylbenzene (450 ppm), and total xylenes (3,300 ppm). Both product samples had to be diluted by several factors prior to being analyzed. The sample from GW-6 was diluted to the point where none of the VOCs analyzed for were detected. The product sample from GW-1 was reported to contain 1,100 ppm of 2-methylnapthalene, 880 ppm of naphthalene, 100 ppm of phenanthrene and 830 ppm of 1,2,4-trichlorobenzene. The BNA analysis of sample GW-6 was performed at the same dilution factor as that for GW-1. The GW-6 sample was reported to contain only 2-methylnapthalene at 750 ppm.

The product sample from GW-1 was reported to contain 4,160 ppm of PCBs while PCB compounds were not detected in the sample from GW-6. Sample GW-1 was reported to contain 62,000 ppm of TPH as diesel and 264,000 ppm of TPH in the kerosene range. The TPH analysis of GW-6 revealed 150,000 ppm of diesel while 400,500 ppm was reported within the kerosene

range. The product sample from GW-1 was reported to contain arsenic (12.0 ppm), lead (2.0 ppm) and chromium (3 ppm). Additionally, the metals analysis for this sample also was reported to contain low concentrations of zinc, cadmium, cobalt, nickel, vanadium copper, silver and barium. The metals analysis of product sample GW-6 revealed copper (2 ppm) and low concentrations of zinc, lead, nickel, chromium, vanadium, silver and barium.

Analytical data reveal that the major compounds which differentiate GW-1 product from GW-6 are the detection of PCB, trichlorobenzene and arsenic in the GW-1 product analysis. These compounds are indicative of waste oil rather than being associated with a refined petroleum product. 1,2,4-trichlorobenzene is used as a lubricant and heat transfer medium, in synthetic transformer oils and in dielectric fluids. PCBs have been used as insulator fluids in electric transformers and condensers and as an additive in high pressure lubricants. Neither of these compounds are expected to be present in a heating oil petroleum product.

The analytical laboratory initially reported the product results for samples GW-1 and GW-6 in reversed order. Upon questioning the laboratory as to the validity of the reported results, the laboratory reviewed their log books and confirmed that they had inadvertently switched their internal laboratory identification numbers. The laboratory subcontracted to do the BNA analysis (Med-Tox) reported that their reported results were accurate throughout the analysis. As a result, Precision Analytical issued a revised analytical report with the correct results for the VOC, BNA, PCB and CAM Metals analysis. Appendix E provides the final analytical reports for the product analysis.

4.3.2 Product Thickness Monitoring

Product thickness monitoring is being conducted at the Site as an interim remedial measure.

The product thickness monitoring, initiated in response to requests from the Agency, originally was developed for wells GW-6 and GW-1. DUNN proposed to expand the scope of the monitoring program as was necessary to include additional wells which contained product or which have the potential of developing product.

This product thickness monitoring program was designed by DUNN and is being performed on a biweekly basis. The program includes measuring the thickness of the free product layer in the well and removing the product with a bailer until the product layer is less than 0.01 feet thick.

Product monitoring and removal from well GW-6 began on December 19, 1990, at which time there was 2.77 feet of product present in the well. After one month of product monitoring and removal, the product thickness in GW-6 was 0.13 feet thick. In the five months of monitoring

since that January 21, 1991, measurement, product thickness has varied between 0.01 and 0.21 feet thick.

Product monitoring and removal from well GW-1 also began on December 19, 1990, at which time there was 0.47 feet of product present in the well. The product thickness in well GW-1 quickly diminished over the first month of monitoring, and was maintained over the last 5-months at a thickness between 0.00 and 0.18 feet thick. However, well construction details of well GW-1 indicate that the top of this well's screen should be at an approximate depth of 13.6 feet. All product thickness measurements recorded after December, 1990, may be misleading because at this time groundwater levels rose above the top of the well screen which would have prevented much of the product from entering the well casing. The groundwater in well GW-1 was sampled on April 17, 1991. While purging this well, product thicknesses became thicker in the well as the fluid level was lowered below the top of the well screen. Later in this purging event, all of the product was removed from the well prior to a groundwater sample being collected. Based on the recharge conditions identified on this sampling date, subsequent product removal techniques were modified to remove enough well water to lower water levels below the top of the well screen.

Product monitoring and removal from well MW-5 began on April 29, 1991, after product was identified in the well during sampling (April 16, 1991). Product thicknesses in this well have ranged from 0.03 to 0.24 feet since the well was included in the product monitoring program. A summary of the product thickness monitoring results for wells GW-1, GW-6 and MW-5 are presented on Table 4-11.

5.0 DISCUSSION

Analytical data reveal that the contaminants identified at elevated levels in Site media include volatile organics, semi-volatile organics and PCBs. Soil metals data from Areas 3 and 4 and groundwater metals results from monitoring wells in Areas 2, 3, 4 and 5 indicate that metal concentrations are not a significant concern at the Site.

Metal concentrations detected in soil samples from Areas 3 and 4 are within typical ranges for uncontaminated soils as published in applicable literature (Appendix F presents a summary of typical concentrations of metals in uncontaminated soils).

The elevated lead values detected in MW-7 and the reported arsenic and barium concentrations in GW-1 are potentially related to each sample's sediment load. Suspended matter occurring in total matrix samples (usually introduced as an unavoidable artifact in sampling) is likely to have metal ions adsorbed on its surface and as an integral component of the material itself. When samples are preserved with acid prior to analysis per standard protocol, and especially when samples are prepared in the laboratory under hot acid digestion, also per standard protocol, metals will be desorbed from any solids which are present resulting in metals concentrations higher than actually present.

During the sampling event conducted in July 1991, groundwater samples from Areas 2 through 5 will be analyzed for both total matrix and field-filtered metals. This will allow the sample sediment load impact on groundwater metal results to be evaluated.

The following sections discuss the impacts to soil and groundwater that are present within each of the five areas of investigation. The discussions review the nature and source of impact and describe the defined or interpreted extent of the impact.

Area 1

The results of soil samples analyzed from the three borings advanced around the former underground gasoline storage tank indicate that there may be some soil still present at depth which exhibits low levels of impact. The analytical results of the shallower samples collected from these three borings indicate that the impacted soil within the area immediately around the sides of the tank was removed during the excavation of the tank.

The impacted soil noted in the deeper samples likely has resulted from either the lateral migration of contaminants along bedding features in the sediments or along the surface of the groundwater. Based on the analytical results of the groundwater sample collected from MW-12, it appears that groundwater in the area downgradient of the former storage tank has not been

impacted. Although the concentrations reported in the soil sample from boring SB-15 were slightly lower than those reported for the deeper soil sample from SB-20, the two borings were located at a distance of only six feet from one another. This suggests that the groundwater quality reported in well MW-12 is representative of this downgradient side of the former tank location.

Area 2

As discussed in Section 2.0, the physical obstacles in Area 2 limited the extent to which the Area's investigation could be fulfilled. The soil samples analyzed from boring SB-18 indicate that the soil in this vicinity of the area is impacted. The contamination identified in this boring is apparently the result of previous leakage from the nearby 15,000 gallon underground heating oil tank, which was emptied of product and filled with a cement bentonite grout several years ago. The soil samples analyzed from soil boring SB-19 (MW-13) indicate that soil quality on this upgradient side of the tank has not been impacted; however, some contamination was noted in a groundwater sample retrieved from MW-13.

As discussed in Section 4.3, interim remedial measures are being undertaken in Area 2. These measures include the biweekly monitoring of well GW-6 for the presence of any free product. Product has been removed from well GW-6 on a biweekly basis since December of 1990. Product thicknesses in this well quickly decreased from the 2.77 feet that was present on December 19, 1990. During the groundwater sampling event conducted in April of 1991, only 0.15 feet of product remained in this well. It is anticipated that the thick section of free product noted in well GW-6 during the previous investigation, and that which was identified in December of 1990, is not representative of the actual product thickness present in the area. More likely, this thickness was the result of product being trapped in the well casing over the extended period of time that the well was not monitored. The small amount of product removed to date and the lack of significant recharge indicates that the 0.15-foot-thick layer observed most recently is more representative of product thickness in this area. To date free product has not been observed in monitoring well MW-13.

The original source of the contaminant plume, i.e., the underground tank, is no longer active. The thickness and concentration of the product and impacted groundwater are likely decreasing with distance from the historical source through dispersion. The extent of impact from this source of contamination is not known at this time.

Area 3

Based on data generated from the eight soil borings that were advanced in Area 3, the soils of this Area are impacted by volatile organic, semi-volatile organic, PCB, petroleum hydrocarbon,

and metal contamination. The contaminants are present in varying levels of concentration throughout the vertical extent of the borings, although levels of concentration tend to be highest just above the groundwater table and, locally, in shallow soils.

The thickness of the impacted soils above the water table decreases as the distance from the EKOTEK Lube property increases. This may be a function of the more severely impacted groundwater closer to the source, indicating that the soil impacted may be emanating from contaminated groundwater, which is discussed later. Seasonal rises in the groundwater table probably have carried contaminants up into the soils, to be left behind when the water table drops again. Additional contribution to the impact may occur from the volatilization of contaminants moving upwards from the water table into the unsaturated zone.

Another preferred pathway for contaminant movement in both liquid and vapor phases may exist in the shallower, permeable soils and utility trenches of the Area.

The analytical results reported from wells MW-1 through MW-7 and GW-1 and GW-2 indicate that groundwater in Area 3 has been significantly impacted. Wells GW-1 and MW-2 exhibit the highest concentrations of contamination. The various groundwater chemistry maps indicate that these two wells are closest to the source of contamination and that, generally, groundwater chemistry concentrations decrease radially away from these wells. Chemical analytical results for VOC and BNA analyses strongly follow this pattern. With the exception of high concentrations of TPH and PCBs reported in well MW-5, the analytical results for these two compounds also follow this radial pattern. The high TPH and PCB analytical results from well MW-5 correlate with the presence of free product in well MW-5 (MW-2 and MW-3 show no free product). The product was removed from well MW-5 with a bailer before the groundwater sample was collected. However, the mere existence of this product may have precluded the collection of a truly representative groundwater sample.

Based on the results of the groundwater analyses and the pattern of contaminant gradients (Figures 4-3a through 4-3d) present in Area 3, it appears most probable that the source of groundwater contamination identified in this area is the EKOTEK Lube site. Because of the presence of ANCC's Lithography Building, the western (downgradient) extent of groundwater impact has, at this time, not been defined. Based on gradients of both groundwater chemistry values and groundwater flow itself, the edge of the plume of impacted groundwater is expected to run in a north-south line between wells MW-6 and MW-7.

Area 4

The analytical results of soil sample SB-10 (S-5) and of groundwater sample GW-3 indicate that soil and groundwater has been impacted in this vicinity of Area 4. Several underground solvent

storage tanks had been removed and the excavation backfilled in the area where GW-3 was later installed. The analytical results indicate, however, that all contaminated soil may not have been removed during the excavation of these tanks. The analytical results from monitoring well MW-9 indicate that the impact to groundwater noted in monitoring well GW-3 does not extend to this location.

The analytical results of soil sample SB-9 (S-1) collected near the solvent pipelines indicate that the soil in this part of Area 4 has been impacted. Although boring SB-9 was located approximately 20 feet from the solvent pipelines, the stratigraphy in this area may have permitted the lateral migration of contaminants through the soil. Samples collected from this boring showed the existence of a very permeable sandy fill from the surface to a depth of 3.0 feet where the top of the dense tidal marsh clay sediments were encountered. A leak in one or more of the solvent pipelines could have allowed both liquid and vapor phases of contaminants to migrate through this fill layer while staying "perched" on the dense tidal marsh deposits. The analytical results of soil sample SB-9 (S-5), collected below the base of the tidal marsh deposit indicates that the deposit is precluding the downward migration of volatile organics from the fill above. Additionally, volatile organics were not detected in the groundwater sample from MW-8 (from boring SB-9) which suggests that the impact in this area has not reached the groundwater.

At this time, the extent of impacted soil within this surficial sandy bedding material around the solvent pipeline has not been determined. It is anticipated that it may follow the fill zone and the bedding of the pipelines and the concentrations are expected to be highest close to the pipelines wherever leaks may have occurred.

The analytical results of groundwater from well MW-10 indicate that, except for the presence of very low levels of TPH (1.1 ppm), the groundwater has not been impacted. The groundwater in this well represents upgradient groundwater quality for Area 4.

Area 5

Analytical results from an earlier investigation at the Site indicated the presence of soil which was significantly impacted with petroleum hydrocarbons and which exhibited very low concentrations of toluene and xylene. The soil analytical results for borings SB-14 and SB-16 did confirm the presence of TPH but at three orders of magnitude less than the originally reported results. The presence of volatile organic compounds were not confirmed by the analytical results of soil samples from borings SB-14 and SB-16.

The groundwater analytical results from wells MW-11 and GW-4 indicate that petroleum hydrocarbons may be slightly impacting groundwater in this area of the Site. However, the groundwater samples from MW-11 and GW-4 were analyzed by EPA Method 418.1 (Methods

for Chemical Analysis of Waters and Wastes, EPA-60014-79-020, March 1983). The 418.1 method utilizes silica gel to remove naturally occurring polar organic compounds that would result in false positive results. However, the silica gel is ineffective in removing naturally occurring non-polar organic compounds which will result in false positive values. Additionally, fine particulate matter extracted and incorporated into the Freon extract may reflect I.R. radiation, producing a false absorbance and a false positive test result. The 418.1 samples were collected near the end of each sampling round and as a result, turbidity and sediment were probably elevated in the samples. It is quite possible that these particulates in samples MW-11 and GW-4 have produced TPH results that are falsely positive. The analytical results of MW-11 also indicate that very low levels of tetrachloroethene may be present in the groundwater in this area of the site.

6.0 CONCLUSIONS

The conclusions for each of the five areas are presented in the following sections. The conclusions specifically address whether or not the investigation objectives of each area were met. If the investigation objectives were met the conclusions address the significance of the soil and/or groundwater impact present in the area. Where investigation objectives were not met, the conclusions summarize the scope of additional work that would need to be performed to fulfill the objectives.

Area 1

The investigation in Area 1 defined the lateral extent of soil contamination immediately around the perimeter of the former tank. The investigation results indicate that a thin layer of impacted soil is still present near the groundwater table. The analytical results indicate, however, that the level of soil impact is minimal. Furthermore, the investigation results indicate that groundwater quality on the downgradient side of the former tank is not being adversely impacted.

Based on the evidence that the remaining soil impact is minimal and groundwater quality in the area has not been impacted, no further investigation in Area 1 is deemed necessary. Quarterly groundwater sampling and analysis will be continued.

Area 2

The investigation into Area 2 revealed that the source of free product noted in well GW-6 appears to be residual heating oil from a closed 15,000 gallon underground tank. Two soil borings drilled in Area 2 revealed that soil is impacted between the west side of the tank and the plant building. A third boring drilled for the placement of an upgradient monitoring well revealed that soil on the north side of the tank, adjacent to East 8th Street is not impacted. Analytical results indicate that upgradient groundwater quality has been slightly impacted by petroleum hydrocarbons; however, free product is not present on the upgradient side of the tank.

Due to physical obstructions present in Area 2, equipment access was, and is, severely limited. As a result, downgradient soil borings and monitoring wells could not be drilled during the investigation. A product recovery system should be installed to collect and remove the free product. Additionally, biweekly product monitoring and quarterly groundwater sampling and analysis will be continued.

Area 3

The investigation of Area 3 provided much information regarding the nature and extent of soil and groundwater impact. The investigation appears to have adequately defined the extent of soil impact in Area 3.

From the results of the investigation, it can be concluded that soil is most impacted along the EKOTEK Lube property line. As distance from this part of Area 3 increases, the extent of soil impact decreases. Based on the spatial relationship between impacted soil and contaminated groundwater, it is concluded that the source of soil contamination stems from direct contact with and volatilization from impacted groundwater, as well as surficial deposition or leakage of contaminants from above ground tanks located on the EKOTEK Lube property.

The results of the investigation show that groundwater in Area 3 has been impacted. All of the data gathered during the investigation of Area 3 strongly support the conclusion that the source of soil and groundwater impact in Area 3 is the EKOTEK Lube property.

At this time, no further investigation is necessary to identify the source of contamination or to define the limits of soil and/or groundwater contamination in Area 3. A soil gas survey could be conducted along the 8-inch water line leading towards MW-5 in order to determine if the pipe trench is a preferential pathway for contaminants from the EKOTEK Lube property, Additionally, biweekly product thickness monitoring, and quarterly groundwater sampling will be continued.

Area 4

The investigation into Area 4 provided information regarding the presence of contaminated soil around the solvent pipelines, the presence of groundwater contamination in the vicinity of well GW-3, and the condition of soil near a closed and abandoned gasoline storage tank.

The results of soil boring SB-9 (MW-8) indicate that the near surface soil around the solvent pipelines has been impacted by volatile organic compounds. The lateral extent of impact is not known, although the impact at depth is considered to be limited. The extent of soil and groundwater impact in the vicinity of GW-3 is not completely defined. Soil adjacent to the closed underground gasoline storage tank has not been impacted.

Further investigative work in Area 4 should include a soil gas survey along the solvent pipelines and additional soil borings in the vicinity of well GW-3. Groundwater sampling will also be continued on a quarterly basis.

Area 5

The investigation of Area 5 provided additional information regarding the alleged presence of impacted soil previously reported. Additionally, the investigation provided results for determining downgradient groundwater quality conditions adjacent to the former steam cleaner facility.

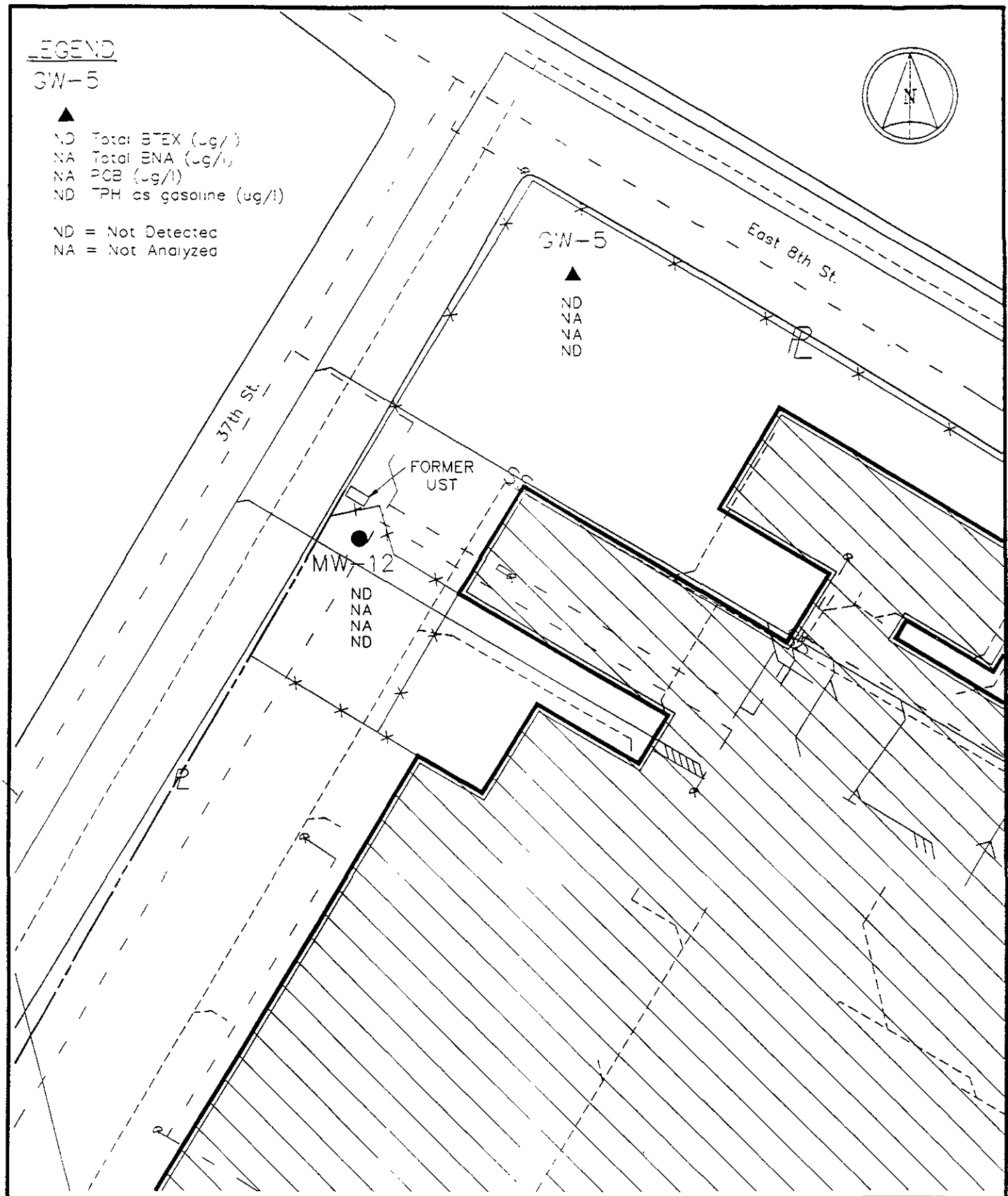
The soil analytical results of the investigation in this area did not support the conclusions reported from a previous investigation. To determine whether or not impacted soil is present in this area, additional soil samples are required.

The groundwater quality results indicate there may have been a slight impact by activities in this area. However, the level of groundwater impact is very low, and thus, further investigation of groundwater quality in this area is not warranted. Quarterly groundwater samples will be collected.

REFERENCES

Hickenbottom, Kelvon, and Muir, 1988, Geohydrology and Groundwater Quality Overview of the East Bay Plain Area, Alameda County, California; Alameda County Flood Control and Water Conservation District, 205 (J) Report.

FIGURES



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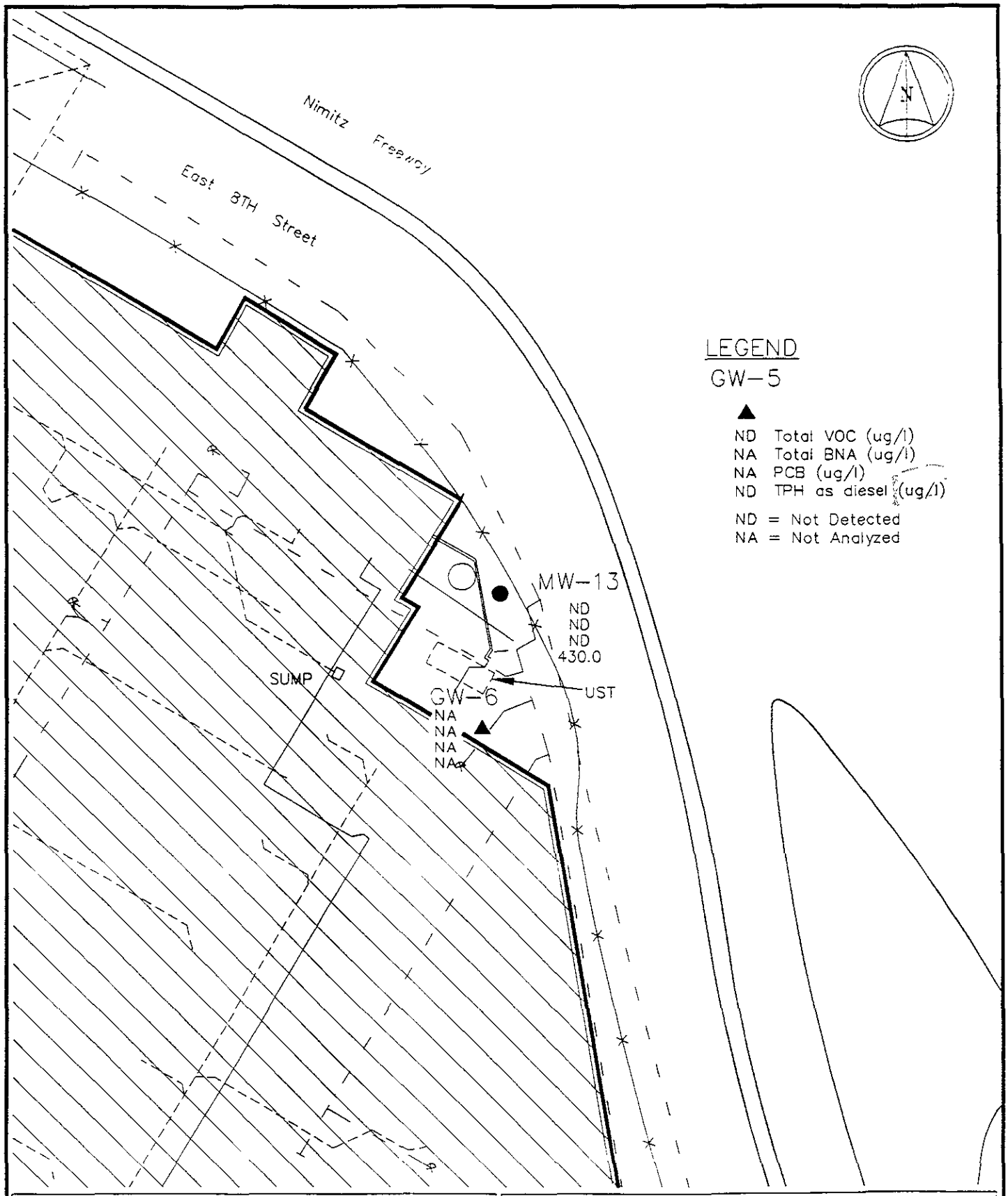
GROUNDWATER ANALYTICAL RESULTS
AREA 1
April 1991

ANC – OAKLAND

PROJECT NO. 02345-01983	DATE June 1991	SCALE IN FEET 0 5 25 50	FIGURE NO. 4-1

A8985A1



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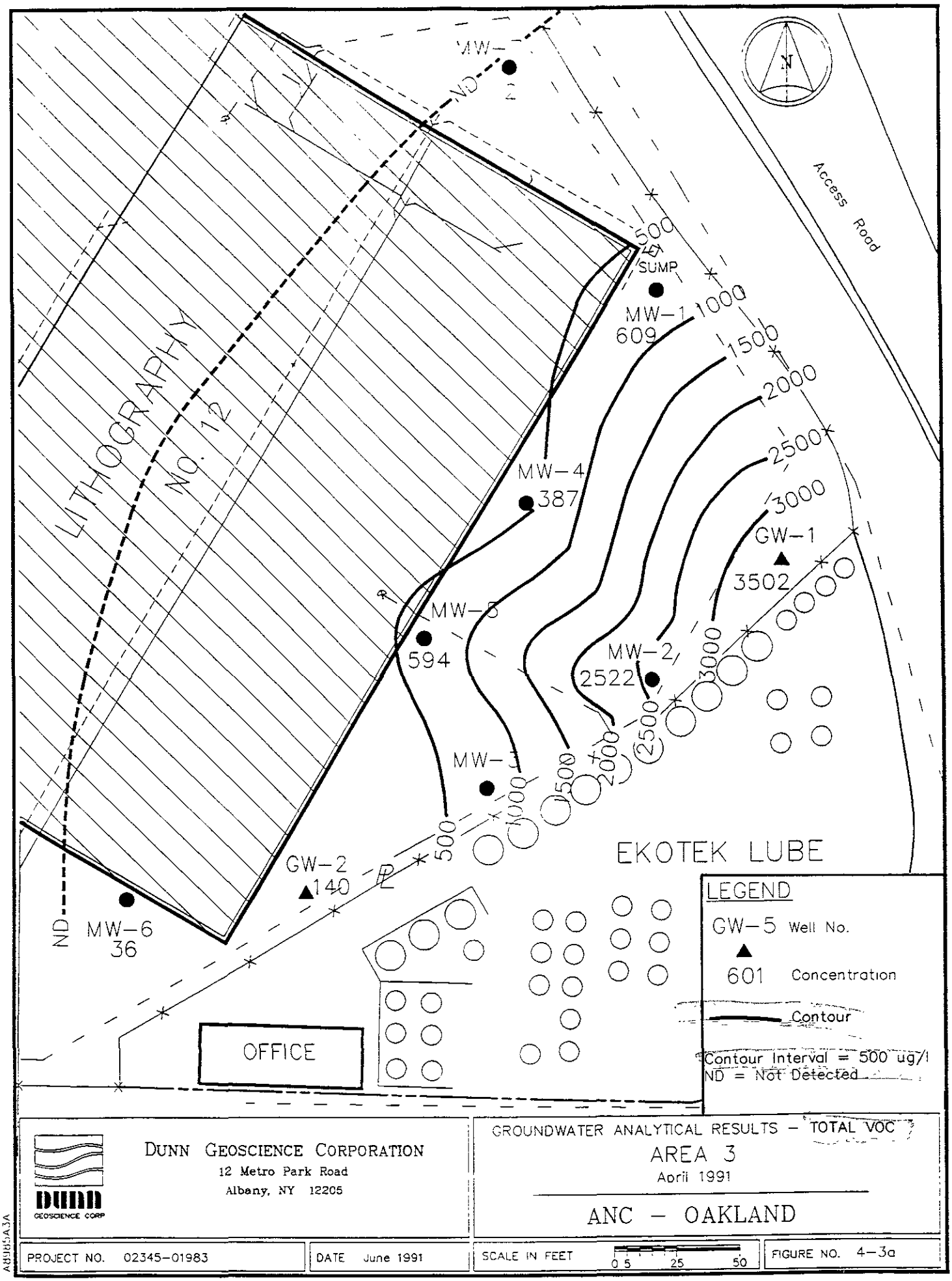
GROUNDWATER ANALYTICAL RESULTS
AREA 2
April 1991

ANC – OAKLAND

PROJECT NO. 02345-01983	DATE June 1991	SCALE IN FEET 0 5 25 50	FIGURE NO. 4-2

AB985A2



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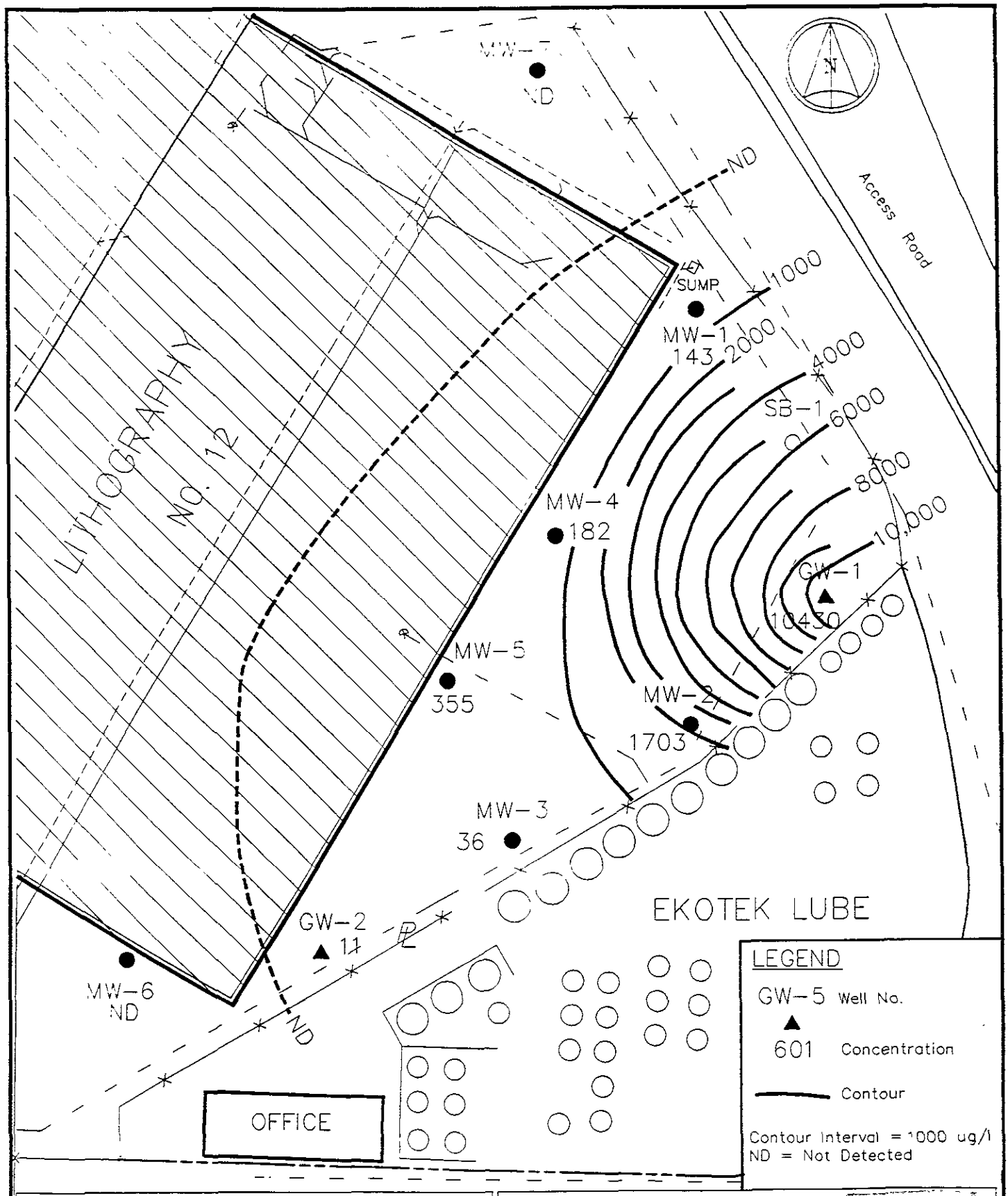
GROUNDWATER ANALYTICAL RESULTS – TOTAL VOC
AREA 3
April 1991

ANC – OAKLAND

PROJECT NO. 02345-01983	DATE June 1991	SCALE IN FEET 0 5 25 50	FIGURE NO. 4-3a

A89085A3A



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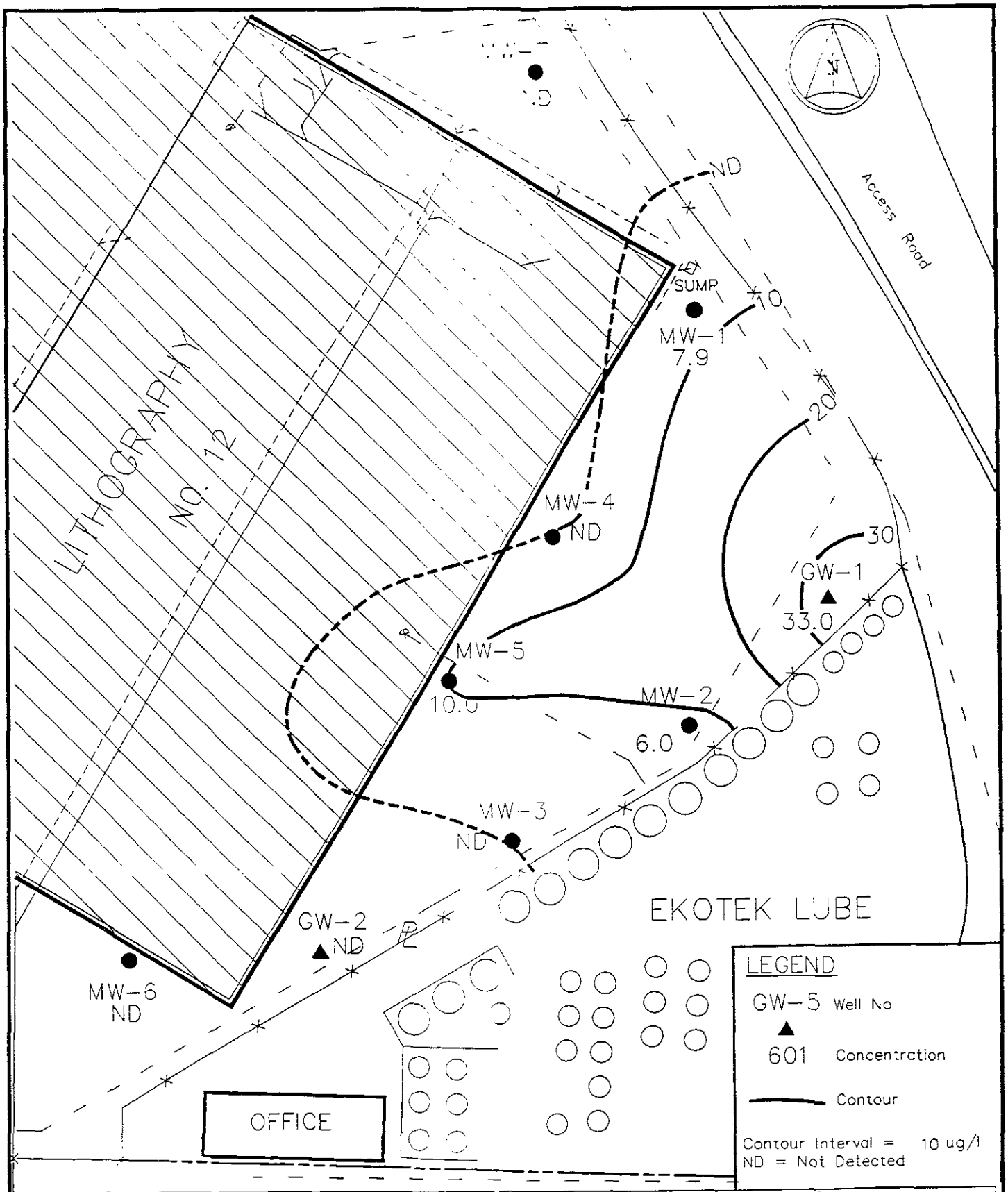
GROUNDWATER ANALYTICAL RESULTS – TOTAL BNA
AREA 3
April 1991

ANC – OAKLAND

PROJECT NO. 02345-01983	DATE June 1991	SCALE N FEET 0 5 25 50	FIGURE NO. 4-3b

ABV05A.SU



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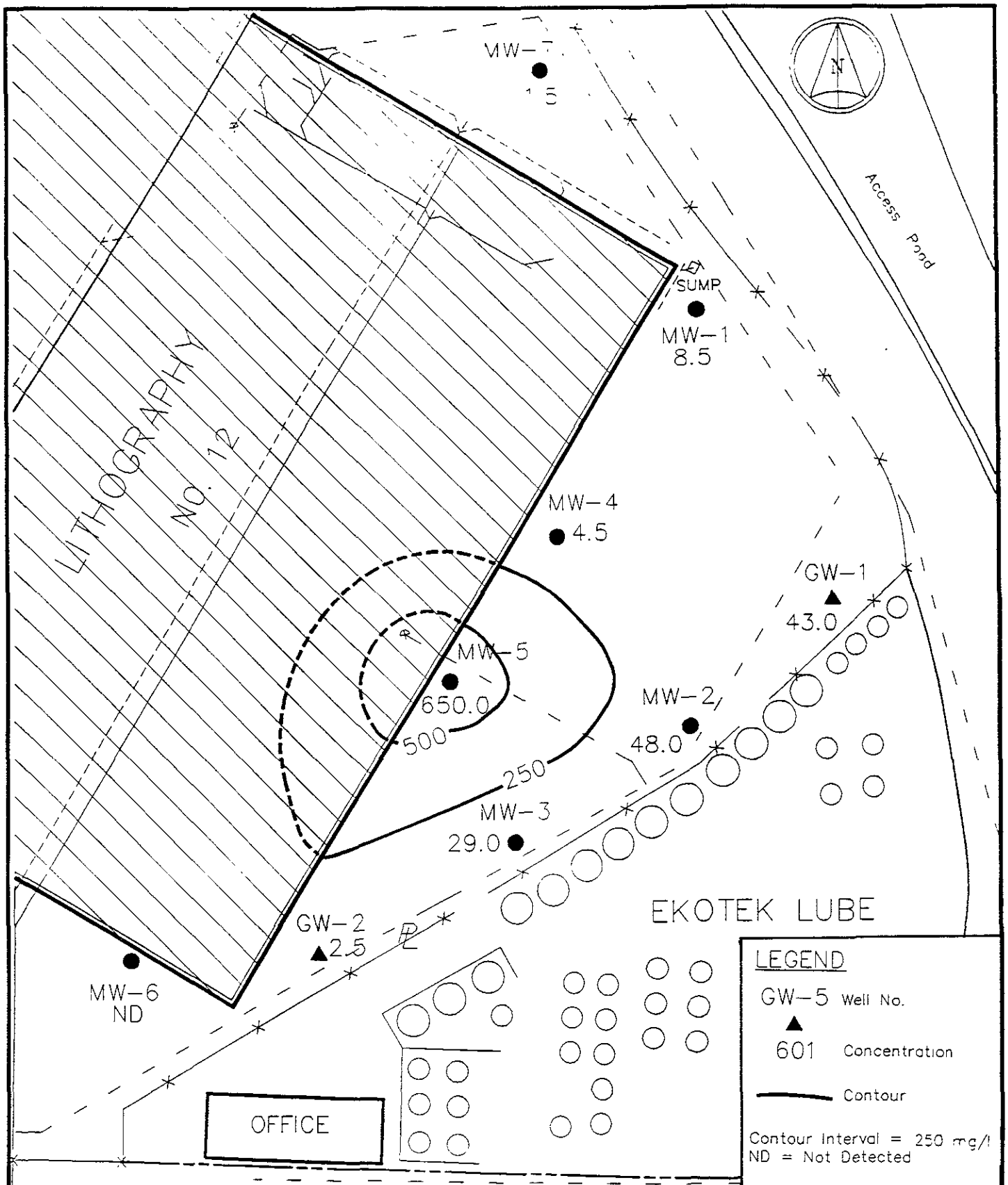
GROUNDWATER ANALYTICAL RESULTS - PCB
AREA 3
April 1991

ANC - OAKLAND

PROJECT NO	DATE	SCALE IN FEET	FIGURE NO
02345-01983	June 1991	0 5 25 50	4-3c

AB985A3C



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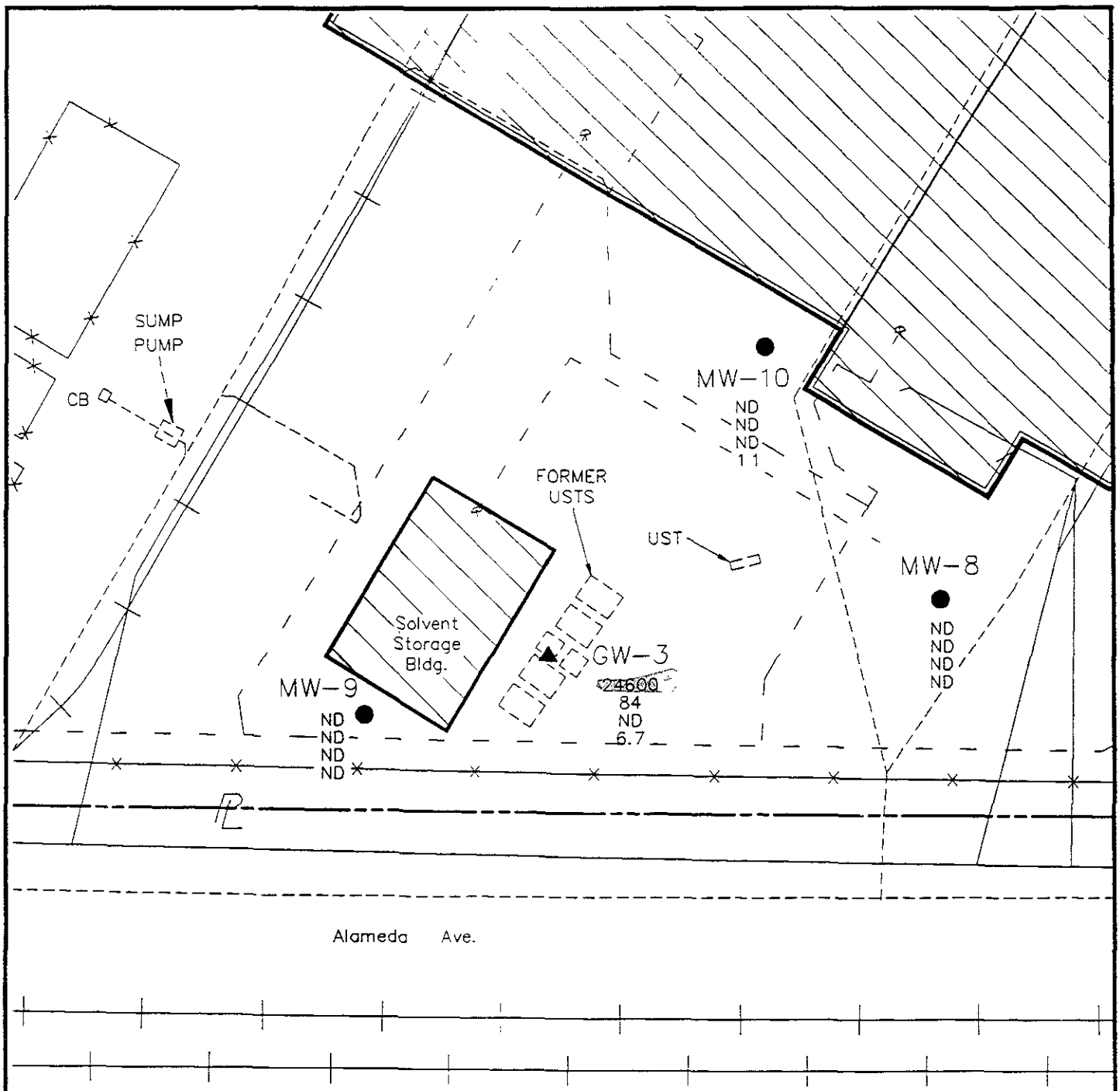
GROUNDWATER ANALYTICAL RESULTS - TPH
AREA 3
April 1991

ANC - OAKLAND

PROJECT NO. 02345-01983	DATE June 1991	SCALE IN FEET 0 5 25 50	FIGURE NO. 4-3d

A89H5A3D



LEGEND

GW-5

▲

ND Total VOC (ug/l)
ND Total BNA (ug/l) ND = Not Detected
ND PCB (ug/l) NA = Not Analyzed
ND TPH (418.1)(mg/l)

N

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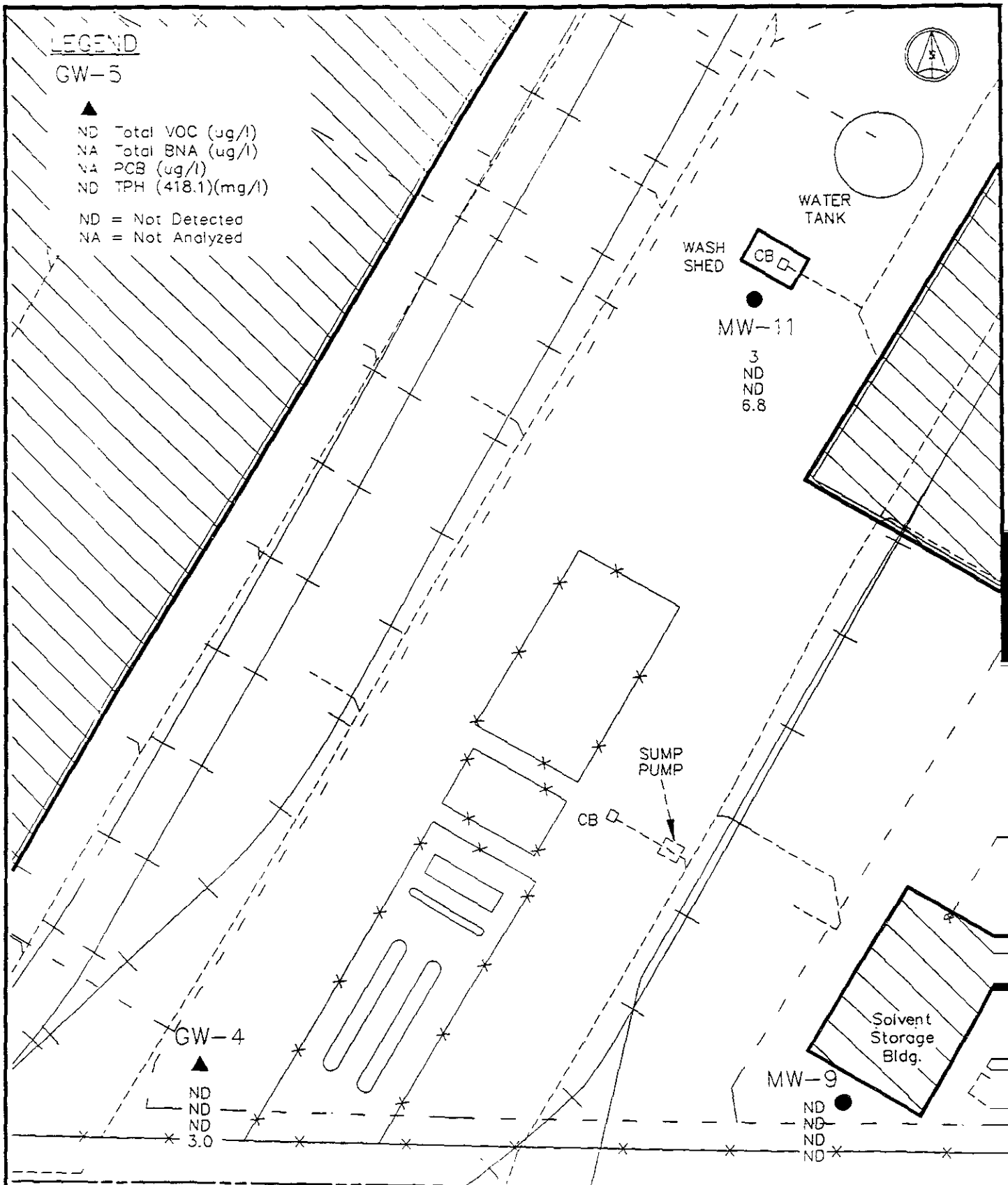
GROUNDWATER ANALYTICAL RESULTS
AREA 4
April 1991

ANC – OAKLAND

PROJECT NO. 02345-01983	DATE June 1991	SCALE IN FEET 0 5 25 50	FIGURE NO. 4-4

A89115A4



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GROUNDWATER ANALYTICAL RESULTS
AREA 5
April 1991

ANC - OAKLAND

PROJECT NO 02345-01983	DATE June 1991	SCALE IN FEET 0 5 25 50	FIGURE NO. 4-5

A8985A5

TABLES

TABLE 3-2
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY
Well Development Results

Well Number	Date	Well Diameter	Well Depth	Water Depth	5 Well Volumes (gallons)	Volume Removed (gallons)
MW-1	3/23/91	4"	18.75'	11.93'	22.5	30
MW-2	3/27/91	4"	18.10'	8.22'	32.5	32.5
MW-3	3/23/91	4"	18.75'	8.65'	33	38
MW-4	3/23/91	4"	18.50'	12.12'	21	35
MW-5	3/23/91	4"	18.50'	11.67'	22.5	33
MW-6	3/24/91	4"	21.60'	10.33'	36.8	40
MW-7	3/28/91	4"	17.30'	12.95'	14.2	25
MW-8	3/24/91	4"	17.60'	10.05'	24.6	30
MW-9	3/24/91	4"	22.60'	9.12'	44	45
MW-10	3/24/91	4"	17.80'	10.04'	25.3	35
MW-11	3/25/91	4"	18.40'	10.85'	24.7	30
MW-12	3/26/91	4"	17.60'	6.65'	35.8	35
MW-13	3/27/91	2"	18.70'	8.66'	8.2	10

All depths are expressed in feet below the top of PVC well.

Volumes based on 0.653 gal/ft for four inch wells and
0.163 gal/ft for two inch wells.

TABLE 3-3
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA,FACILITY
Soil Boring Abandonment Details

Soil Boring Number	Boring Depth	Boring Diameter	Type Seal	Interval	Ground Elevation
SB-1	21.0'	12.25"	Bentonite Chips	19.8' - 21.0'	15.91'
			Cement/Bentonite Grout	0.0' - 19.8'	
SB-12	Location abandoned due to concrete slab at depth of 2" below asphalt, no seal.				
SB-13	4.0'	10.25"	Bentonite Chips	3.0' - 4.0'	12.68'
			Cement Grout	0.0' - 3.0'	
SB-13A	10.0'	10.25"	Bentonite Chips	9.0' - 10.0'	12.85'
			Cement Grout	0.0' - 9.0'	
SB-16	10.5'	6"	Bentonite Chips	8.2' - 10.5'	15.18'
			Cement Grout	0.0' - 8.2'	
SB-17	5.5'	10.25"	Cement Grout	0.0' - 5.5'	17.65'
SB-18	10.0'	6"	Cement Grout	0.0' - 10.0'	17.77'
SB-18A	14.0'	6"	Bentonite Chips	11.5' - 14.0'	18.16'
			Cement Grout	0.0' - 11.5'	
SB-20	12.5'	6"	Bentonite Chips	8.9' - 12.5'	16.83'
			Cement Grout	0.0' - 8.9'	
SB-21	11.5'	6"	Bentonite Chips	6.2' - 11.5'	17.14'
			Compacted Cuttings	0.0' - 6.2'	

All depths and intervals are expressed in feet below grade,
diameter expressed in inches.
Ground elevation expressed in feet above mean sea level.

TABLE 4-1

AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY

Summary of Water Level Measurements

WELL NO.	M.P. EL.	4/16/91 DEPTH TO PRODUCT	4/16/91 DEPTH TO WATER	4/16/91 W.T. EL.	5/15/91 DEPTH TO PRODUCT	5/15/91 DEPTH TO WATER	5/15/91 W.T. EL.	6/17/91 DEPTH TO PRODUCT	6/17/91 DEPTH TO WATER	6/17/91 W.T. EL.
MW-1	15.47	11.76	11.77	3.71		11.93	3.54		12.43	3.04
MW-2	14.86		8.95	5.91		10.05	4.81		10.50	4.36
MW-3	14.56		8.27	6.29		8.74	5.82		9.29	5.27
MW-4	15.27	12.00	12.01	3.27		12.36	2.91		12.58	2.69
MW-5	14.73	11.50	11.79	3.18	11.80	12.14	2.87	12.20	12.28	2.52
MW-6	13.24		10.36	2.88		10.76	2.48		10.96	2.28
MW-7	16.20		13.04	3.16		13.34	2.86		13.53	2.67
MW-8	12.90		10.07	2.83		10.44	2.46		10.66	2.24
MW-9	11.69		9.45	2.24		9.79	1.90		9.98	1.71
MW-10	13.03		10.00	3.03		10.36	2.67		10.58	2.45
MW-11	14.49		10.87	3.62		11.25	3.24		11.51	2.98
MW-12	16.81		6.93	9.88		7.10	9.71		7.34	9.47
MW-13	18.31		9.16	9.15		9.47	8.84		9.73	8.58
GW-1	15.35		10.96	4.39	10.98	11.36	4.05		12.27	3.08
GW-2	13.10		10.45	2.65		10.75	2.35		10.98	2.12
GW-3	11.55		8.89	2.66		9.28	2.27		9.47	2.08
GW-4	11.70		9.93	1.77		9.80	1.90		9.97	1.73
GW-5	17.72		7.53	10.19		7.75	9.97		7.98	9.74
GW-6	19.78	13.33	13.35	6.43	13.90	14.04	5.86		14.24	5.54

All elevations (EL.) are expressed in feet above mean sea level.
Depths are measured in feet below the well measuring point (M.P.).
Estimated product specific gravity of 0.83 was used to calculate an adjusted depth to water in wells containing product.

TABLE 4-2

AMERICAN NATIONAL CAN COMPANY

OAKLAND, CALIFORNIA, FACILITY

Summary of Soil Sampling and Analysis

AREA	Soil Boring	Sample No.	Depth	Analysis
AREA 1	SB-15	S-3	5.25'	BTEX, TPH as Gas
	SB-15	S-6	9.25'	BTEX, TPH as Gas
	SB-20	S-2	6.75'	BTEX, TPH as Gas
	SB-20	S-3	11.75'	BTEX, TPH as Gas
	SB-21	S-2	6.75'	BTEX, TPH as Gas
	SB-21	S-3	10.75'	BTEX, TPH as Gas
AREA 2	SB-18	S-4	5.25'	TPH as Diesel
	SB-18	S-6	8.75'	TPH as Diesel
	SB-19	S-3	7.25'	TPH as Diesel
	SB-19	S-4	10.25'	TPH as Diesel
AREA 3	SB-1	S-3	4.75'	VOC,BNA, PCB, CAM Metals
	SB-1	S-9	13.75'	VOC,BNA, PCB, CAM Metals, TIC
	SB-2	S-8	12.75'	VOC,BNA, PCB, CAM Metals
	SB-2	S-9	13.75'	VOC,BNA, PCB, CAM Metals
	SB-3	S-2	3.25'	VOC,BNA, PCB, CAM Metals
	SB-3	S-8	12.75'	VOC,BNA, PCB, CAM Metals
	SB-4	S-4	6.25'	VOC,BNA, PCB, CAM Metals
	SB-4	S-7	10.75'	VOC,BNA, PCB, CAM Metals, TIC
	SB-5	S-5	7.75'	VOC,BNA, PCB, CAM Metals
	SB-5	S-7	10.75'	VOC,BNA, PCB, CAM Metals
	SB-5	S-9	13.75'	VOC,BNA, PCB, CAM Metals
	SB-6	S-3	4.75'	VOC,BNA, PCB, CAM Metals
	SB-6	S-6	9.25'	VOC,BNA, PCB, CAM Metals
	SB-7	S-3	4.75'	VOC,BNA, PCB, CAM Metals
	SB-7	S-6	9.25'	VOC,BNA, PCB, CAM Metals
	SB-8	S-3	4.75'	VOC,BNA, PCB, CAM Metals, TIC
	SB-8	S-7	10.75'	VOC,BNA, PCB, CAM Metals, TIC
AREA 4	SB-9	S-1	1.75'	VOC, TIC, TPH
	SB-9	S-3	4.75'	VOC, TIC, TPH
	SB-9	S-5	8.00'	VOC, BNA, TIC, TPH, PCB, CAM Metals
	SB-10	S-1	1.75'	VOC, TIC, TPH
	SB-10	S-5	7.75'	VOC, TIC, TPH
	SB-11	S-2	4.25'	VOC, BNA,TIC, TPH
	SB-11	S-5	8.75'	VOC, BNA,TIC, TPH
	SB-13A	S-1	4.25'	BTEX, TPH as Gas
	SB-13A	S-4	9.25'	BTEX, TPH as Gas
AREA 5	SB-14	S-3	5.25'	VOC, TPH, TIC
	SB-14	S-6	9.75'	VOC, TPH, TIC
	SB-16	S-4	5.25'	VOC, TPH
	SB-16	S-7	9.75'	VOC, TPH

TABLE 4-3
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY

Summary of Soil Anlaytical Results - Area 1

Analysis/Compound	Boring No./Sample No./Depth					
	SB-15 S-3 5.25'	SB-15 S-6 9.25'	SB-20 S-2 6.75'	SB-20 S-3 11.75'	SB-21 S-2 6.75'	SB-21 S-3 10.75'
TPH as Gasoline (DHS method) (mg/kg)	nd	nd	nd	**59**	nd	**1.0**
BTEX (DHS Method) (mg/kg)						
Benzene	nd	nd	nd	nd	nd	nd
Toluene	nd	nd	nd	**0.17**	nd	nd
Ethylbenzene	nd	**0.007**	nd	**0.29**	nd	nd
Total Xylenes	nd	**0.009**	nd	**0.94**	nd	**0.016**
PID Headspace (ppm)	11.4	38.0	16.4	440	12.5	350.0

nd indicates compound was not detected.
Sample depth represents midpoint of 6-inch long sample tube in feet below grade.

TABLE 4-4
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY

Summary of Soil Anlaytical Results - Area 2

Analysis/Compound	Boring No./Sample No./Depth			
	SB-18 S-4 5.25'	SB-18 S-6 8.75'	SB-19 SB-3 7.25'	SB-19 S-4 10.25'
TPH as diesel (DHS method) (mg/kg)	**130**	**91**	nd	nd
PID Headspace (ppm)	**12.5**	**84.0**	**14.9**	**13.4**

nd indicates compound was not detected.
Sample depth represents the midpoint of 6-inch long sample tube in feet below grade.

TABLE 4-5
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY

Summary of Soil Anlaytical Results - Area 3

Analysis/Compound	Boring No./Sample No./Depth																
	SB-1 S-3 4.75'	SB-1 S-9 13.75'	SB-2 S-8 12.75'	SB-2 S-9 13.75'	SB-3 S-2 3.25'	SB-3 S-8 12.75'	SB-4 S-4 6.25'	SB-4 S-7 10.75'	SB-5 S-5 7.75'	SB-5 S-7 10.75'	SB-5 S-9 13.75'	SB-6 S-3 4.75'	SB-6 S-6 9.25'	SB-7 S-3 4.75'	SB-7 S-6 9.25'	SB-8 S-3 4.75'	SB-8 S-7 10.75'
VOC (8240) (ug/Kg)																	
Dilution Factor	1.00	10.00	1.00	2.00	500.00	50.00	1.00	1.00	50.00	1.00	500.00	1.00	10.00	1.00	1.00	1.00	1.00
Acetone	200	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	320 E	nd	nd	nd
Methylene Chloride	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	110	nd	nd	nd	nd
cis-1,2-Dichloroethene	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	31	nd	nd	nd	nd	nd
Chlorobenzene	nd	67	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	nd	1,100	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Xylene (total)	nd	1,300	nd	nd	nd	1,600	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	nd	110	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	270	nd	nd	nd	nd
1,4-Dichlorobenzene	nd	600	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	320	nd	nd	nd	nd
1,2-Dichlorobenzene	nd	520	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TIC (total)	--	13000J	--	--	--	--	--	260J	--	--	--	--	--	--	--	nd	nd
PID Headspace (ppm)	48	220	6.7	190	--	270	6.8	118	200	15.5	260	28	225	4.2	3.0	7.0	4.5
BNA (8270) (ug/kg)																	
Dilution Factor	1.00	1.00	1.00	1.00	10.00	1.00	10.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1,3Dichlorobenzene	nd	69 J	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	nd	450	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	nd	320 J	nd	nd	nd	190 J	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	nd	nd	nd	nd	nd	230 J	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Napthalene	nd	2,500	nd	nd	nd	2,200	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Methylnapthalene	nd	3,800	nd	nd	nd	3,500	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Fluorene	nd	nd	nd	nd	nd	130 J	nd	69 J	nd	nd	nd	nd	nd	nd	nd	nd	nd
Phenanthrene	nd	nd	nd	nd	nd	280 J	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TIC (Total)	--	36000J	--	--	--	--	--	18000J	--	--	--	--	--	--	--	--	--
PCB (EPA 8080) (ug/Kg)																	
Aroclor -1260	nd	2,800	nd	200	nd	nd	nd	nd	nd	nd	370	nd	nd	nd	nd	nd	nd
Metals (Title 22) (mg/Kg)																	
Silver	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--	--	0.80	nd
Arsenic	2.9	5.3	5.6	8.4	5.7	1.6	1.4	5.0	2.8	2.3	3.2	2.0	2.5	--	--	2.0	1.4
Barium	254	143	117	91.7	197	54.7	202	84.4	97.0	92.5	127	117	72.1	--	--	267	116
Beryllium	0.71	nd	nd	nd	0.48	0.28	0.51	nd	0.30	0.25	nd	0.35	nd	--	--	0.46	0.27
Cadmium	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--	--	nd	nd
Cobalt	22.7	20.2	19.8	16.3	18.9	11.9	15.4	17.9	29.7	16.3	13.4	13.8	16.1	--	--	37.5	22.8
Total Chromium	92.6	107	205	90.3	71.2	53.5	73.1	58.2	81.0	53.6	41.8	60.6	59.4	--	--	58.3	59.4
Copper	24.8	25.6	30.8	18.3	26.6	24.6	20.1	23.4	26.6	17.4	12.7	18.5	20.0	--	--	17.3	19.0
Mercury	0.097	0.072	0.18	0.18	0.21	0.17	0.15	0.20	0.19	nd	0.12	0.164	0.222	--	--	0.240	0.079
Molybdenum	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--	--	nd	nd
Nickel	166	215	236	131	115	71.3	110	96.2	204	114	79.1	102	133	--	--	174	131
Lead	6.9	8.0	4.3	5.6	32.1	8.4	18.4	3.5	7.6	6.8	6.2	6.8	7.2	--	--	3.8	7.3
Antimony	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--	--	nd	nd
Selenium	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--	--	nd	nd
Thallium	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	--	--	nd	nd
Vanadium	42.2	44.3	65.2	37.1	38.8	40.2	35.9	41.3	47.0	39.0	29.3	32.6	38.6	--	--	47.1	19.8
Zinc	32.1	45.2	43.1	30.6	47.4	26.7	31.1	32.3	37.0	26.7	31.8	26.1	27.1	--	--	26.0	34.0

nd indicates compound was not detected.
-- indicates compound was not analyzed for.
TIC = Tentatively Identified Compounds
J indicates compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value.
E indicates the amount reported exceeded the linear range of the instrument calibration.
Sample depth represents the midpoint of 6-inch long sample tube in feet below grade.

TABLE 4-6
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY

Summary of Soil Analytical Results - Area 4

Analysis/Compound	Boring No./Sample No./Depth								
	SB-9 S-1 1.75'	SB-9 S-3 4.75'	SB-9 S-5 8.00'	SB-10 S-1 1.75'	SB-10 S-5 7.75'	SB-11 S-2 4.25'	SB-11 S-5 8.75'	SB-13A S-1 4.25'	SB-13A S-4 9.25'
VOC (8240) (ug/kg)									
Dilution Factor	5,000	1.00	1.00	1.00	1.00	1.00	1.00	--	--
Acetone	nd	nd	110	nd	nd	nd	nd	--	--
Xylene (total)	490,000	nd	nd	nd	350 E	nd	nd	--	--
TIC (Total)	750,000 J	nd	nd	nd	410 J	nd	nd	--	--
PID Headspace (ppm)	>200	2.8	3.5	3.0	1.8	11.0	11.4	9.4	9.8
BNA (8270) (ug/kg)									
Dilution Factor	--	--	1.00	--	--	1.00	1.00	--	--
Results (Total)	--	--	nd	--	--	nd	nd	--	--
TIC (Total)	--	--	nd	--	--	nd	nd	--	--
TPH (418.1) (mg/Kg)	27,000	126	--	3.7	5.0	21.0	4.2	--	--
TPH as Gasoline (DHS method) (mg/Kg)	--	--	--	--	--	--	--	nd	nd
BTEX (DHS Method)(mg/kg)									
Benzene	--	--	--	--	--	--	--	nd	nd
Tolume	--	--	--	--	--	--	--	nd	nd
Ethylbenzene	--	--	--	--	--	--	--	nd	nd
Total Xylenes	--	--	--	--	--	--	--	nd	nd
PCB (EPA 8080) (ug/kg)									
Aroclor-1260	--	--	nd	--	--	--	--	--	--
Metals (Title 22) (mg/kg)									
Silver	--	--	nd	--	--	--	--	--	--
Arsenic	--	--	1.6	--	--	--	--	--	--
Barium	--	--	111	--	--	--	--	--	--
Beryllium	--	--	nd	--	--	--	--	--	--
Cadmium	--	--	nd	--	--	--	--	--	--
Cobalt	--	--	20.5	--	--	--	--	--	--
Total Chromium	--	--	86.6	--	--	--	--	--	--
Copper	--	--	21.2	--	--	--	--	--	--
Mercury	--	--	0.217	--	--	--	--	--	--
Molybdenum	--	--	nd	--	--	--	--	--	--
Nickel	--	--	193	--	--	--	--	--	--
Lead	--	--	7.6	--	--	--	--	--	--
Antimony	--	--	nd	--	--	--	--	--	--
Selenium	--	--	nd	--	--	--	--	--	--
Thallium	--	--	nd	--	--	--	--	--	--
Vanadium	--	--	37.4	--	--	--	--	--	--
Zinc	--	--	29.2	--	--	--	--	--	--

nd indicates compound was not detected.
- - indicates compound was not analyzed for.
TIC = Tentatively Identified Compounds
J indicates compound was detected below the specified reporting limit. Consequently, the amount is considered approximate.
E indicates the amount reported exceeded the linear range of the instrument calibration.
Sample depth represents the midpoint of 6-inch long sample tube in feet below grade.

TABLE 4-7
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY

Summary of Soil Analytical Results - Area 5

Analysis/Compound	Boring No./Sample No./Depth			
	SB-14 S-3 5.25'	SB-14 S-6 9.75'	SB-16 S-4 5.25'	SB-16 S-7 9.75'
VOC (8240) (ug/kg)				
Dilution Factor	1.00	1.00	1.00	1.00
Result (Total)	nd	nd	nd	nd
TIC (Total)	nd	nd	- -	- -
PID Headspace (ppm)	8.8	8.8	14.5	na
TPH (418.1) (mg/Kg)	3.3	2.7	6.7	3.3

nd indicates compound was not detected.
- - indicates compound was not analyzed for.
TIC = Tentatively Identified Compounds
sample depth represents the midpoint of a 6-inch long sample tube in feet below grade

TABLE 4-8
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA PLANT

Summary of Detected Volatile Organic Compounds in Groundwater (EPA Method 8240)

	AREA 2	AREA 3									AREA 4				AREA 5	
Soil Boring No.	SB-19	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8			SB-9	SB-10	SB-11		SB-14	
Monitoring Well No.	MW-13	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	GW-1	GW-2	MW-8	MW-9	MW-10	GW-3	MW-11	GW-4
Dilution Factor	**1.00**	**5.00**	**10.00**	**2.00**	**1.00**	**10.00**	**1.00**	**1.00**	**10.00**	**1.00**	**1.00**	**1.00**	**1.00**	**100.00**	**1.00**	**1.00**
Vinyl Chloride	nd	nd	nd	nd	nd	nd	nd	nd	nd	**28**	nd	nd	nd	nd	nd	nd
Chloroethane	nd	nd	nd	**35**	**8 J**	nd	nd	nd	nd	**5 J**	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	nd	nd	nd	nd	nd	nd	**2 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd
Acetone	nd	nd	nd	**12 J**	nd	nd	nd	nd	**200**	nd	nd	nd	nd	nd	nd	nd
Methylene Chloride	nd	**390**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	nd	nd	**110**	**66**	nd	nd	**32**	nd	nd	**11**	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	nd	nd	nd	nd	nd	nd	nd	nd	nd	**8**	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane	nd	nd	nd	nd	nd	nd	**2 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd
Benzene	nd	**16 J**	**410**	**220**	**230 E**	**230**	nd	nd	**540**	**45**	nd	nd	nd	nd	nd	nd
Toluene	nd	nd	**450**	**26**	**6**	nd	nd	nd	**950**	**14**	nd	nd	nd	nd	nd	nd
Tetrachloroethene	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**3 J**	nd
Chlorobenzene	nd	**21 J**	**53**	**5 J**	**19**	**48 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Ethylbenzene	nd	**39**	**170**	**36**	**8**	**56**	nd	nd	**150**	nd	nd	nd	nd	**4,600**	nd	nd
Xylene (total)	nd	**53**	**1,300**	**190**	**36**	**260**	nd	nd	**1,500**	nd	nd	nd	nd	**20,000**	nd	nd
1,4-Dichlorobenzene	nd	**47**	nd	nd	**8**	nd	nd	**2 J**	**130**	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	nd	**43**	**29 J**	**11**	**22**	nd	nd	nd	**32 J**	**9**	nd	nd	nd	nd	nd	nd
Total	nd	**609**	**2,522**	**601**	**337**	**594**	**36**	**2**	**3,502**	**120**	nd	nd	nd	**nd**	**3**	nd

nd indicates compound was not detected.
J indicates compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value.
E indicates the amount reported exceeded the linear range of the instrument calibration.
All concentrations expressed in ug/l (ppb).

TABLE 4-9
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY
Summary of Detected Semi-Volatile Organic Compounds
in Groundwater (EPA Method 8270)

	AREA 2	AREA 3									AREA 4				AREA 5	
Soil Boring Number	SB-19	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8			SB-9	SB-10	SB-11		SB-14	
Monitoring Well Number	MW-13	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	GW-1	GW-2	MW-8	MW-9	MW-10	GW-3	MW-11	GW-4
Dilution Factor	**1.00**	**1.00**	**10.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**100.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Phenol	nd	**5 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
bis (2-Chloroethyl) ether	nd	nd	nd	nd	**27**	nd	nd	nd	nd	**4 J**	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	nd	nd	nd	nd	**6 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	nd	**26**	nd	nd	nd	**23**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	nd	**21**	**23 J**	**9 J**	**15**	**40**	nd	nd	nd	**7 J**	nd	nd	nd	nd	nd	nd
2-Methylphenol	nd	nd	**120**	nd	nd	nd	nd	nd	**530 J**	nd	nd	nd	nd	**3 J**	nd	nd
4-Methylphenol	nd	nd	nd	nd	nd	nd	nd	nd	**730 J**	nd	nd	nd	nd	**13**	nd	nd
2,4-Dimethylphenol	nd	nd	**1,300**	nd	nd	nd	nd	nd	**8,900**	nd	nd	nd	nd	**40**	nd	nd
1,2,4-Trichlorobenzene	nd	nd	nd	nd	nd	2 J	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Napthalene	nd	**61**	**260**	**27**	**14**	**140**	nd	nd	**270 J**	nd	nd	nd	nd	**24**	nd	nd
4-Chloro-3-Methylphenol	nd	nd	nd	nd	**120**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
2-Methylnapthalene	nd	**30**	nd	nd	nd	**130**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Fluorene	nd	nd	nd	nd	nd	**6 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Phenanthrene	nd	nd	nd	nd	nd	**11 J**	nd	nd	nd	nd	nd	nd	nd	**4 J**	nd	nd
Pyrene	nd	nd	nd	nd	nd	**3 J**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Total	nd	**143**	**1,703**	**36**	**182**	**355**	nd	nd	**10,430**	**11**	nd	nd	nd	**84**	nd	nd

nd indicates compound was not detected.
J indicates compound was detected at an amount below the specified reporting limit. Consequently, the amount should be considered an approximate value.
All concentrations expressed in ug/l (ppb).

TABLE 4-10
AMERICAN NATIONAL CAN COMPANY
OAKLAND, CALIFORNIA, FACILITY
Summary of Detected Total Petroleum Hydrocarbons, PCBs, and Metals in Groundwater

	AREA 1		AREA 2	AREA 3									AREA 4				AREA 5	
Soil Boring Number	SB-15		SB-19	SB-2	SB-3	SB-4	SB-5	SB-6	SB-7	SB-8			SB-9	SB-10	SB-11		SB-14	
Monitoring Well Number	MW-12	GW-5	MW-13	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	GW-1	GW-2	MW-8	MW-9	MW-10	GW-3	MW-11	GW-4
TPH (418.1) (mg/l)	--	--	--	8.5	48.0	29.0	4.5	650	nd	1.5	43.0	2.5	nd	nd	1.1	6.7	6.8	3.0
TPH as gasoline (DHS method) (ug/l)	nd	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
BTEX																		
Benzene	nd	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	nd	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	nd	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Xylenes	nd	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TPH as diesel (DHS method) (ug/l)	--	--	430	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
PCB (EPA 8080) (ug/l)																		
Aroclor-1260	--	--	nd	7.9	6.0	nd	nd	10.0	nd	nd	33 E	nd	nd	nd	nd	nd	nd	nd
Metals (Title 22) (ug/l)																		
Silver	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**10.0**	nd	nd	nd	nd
Aresnic	--	--	nd	**13.4**	**41.2**	nd	**24.6**	**20.9**	nd	**12.0**	**92.9**	nd	nd	nd	nd	13.0	nd	nd
Barium	--	--	nd	**180**	**317**	**163**	**549**	**668**	**129**	**127**	**1,030**	**579**	nd	**201**	**101**	220	nd	nd
Beryllium	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Cadmium	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Cobalt	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Total Chromium	--	--	**13.4**	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	**14.8**	nd	nd	nd
Copper	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Mercury	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Molybdenum	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Nickel	--	--	**90.3**	nd	**98.9**	nd	nd	**73.7**	nd	**44.5**	**113**	nd	nd	**48.6**	**40.0**	nd	nd	nd
Lead	--	--	**18.0**	**4.0**	**33.3**	**3.2**	**30.3**	**33.5**	nd	**50.4**	**25.7**	**10.9**	nd	nd	nd	nd	**15.8**	nd
Antimony	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Selenium	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Thallium	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Vanadium	--	--	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
Zinc	--	--	**9,940**	**26.2**	**77.1**	**79.7**	**45.6**	**61.6**	**50.8**	**54.1**	**79.5**	nd	**23.4**	**29.0**	**37.6**	34.0	**48.7**	nd
Organic Lead (DHS Method) (ug/l)	nd	nd	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

-- indicates compound was not analyzed.
nd indicates compound was not detected.

Table 4-11
American National Can Company
Oakland, California, Facility

Product Monitoring Results

WELL NO. GW-6 | SP. GRAVITY OF PRODUCT: 0.83
MP ELEV: 19.82

DATE	DEVICE	PRODUCT DEPTH	WATER DEPTH	PRODUCT THICKNESS	ADJ. WATER DEPTH	WATER ELEV.	WATER REMOVED (approx. gallons)	PRODUCT REMOVED (approx. gallons)
12/19/90	IP	15.40	18.17	2.77	15.87	3.95	0.50	0.20
12/19/90	IP	15.64	18.13	2.49	16.06	3.76	3.00	2.50
12/20/90	IP	15.68	16.33	0.65	15.79	4.03	1.00	0.20
12/20/90	IP	15.79	15.94	0.15	15.82	4.00	1.00	0.10
1/3/91	IP	15.83	16.25	0.42	15.90	3.92	0.25	0.03
1/21/91	B	14.88	15.01	0.13	14.90	4.92	0.10	0.01
2/13/91	IP	15.42	15.55	0.13	15.44	4.38	0.26	0.01
2/27/91	IP	15.92	16.13	0.21	15.96	3.86	0.11	0.03
3/18/91	IP	13.85	13.86	0.01	13.85	5.97	0.08	0.00
3/27/91	IP	12.36	12.43	0.07	12.37	7.45	0.09	0.01
4/10/91	IP	13.35	13.44	0.09	13.37	6.45	0.01	0.11
4/29/91	IP	13.48	13.64	0.16	13.51	6.31	2.50	0.07
5/29/91	IP	14.11	14.22	0.11	14.13	5.69	2.50	0.09
6/12/91	IP	14.10	14.21	0.11	14.12	5.70	2.00	0.08
6/27/91	IP	14.21	14.31	0.10	14.23	5.59	1.40	0.05

1. MP Elev = measuring point elevation.
2. All elevations are expressed in feet above mean sea level, depths are measured in feet below the measuring point, product thickness is expressed in feet.
3. Device used to measure product thicknesses: IP = interface probe
   B = clear bailer & tape measure
4. ADJ. (Adjusted) Water Depth = product thickness times the product specific gravity yields water thickness which is subtracted from measured water depth.

Table 4-11 (continued)
American National Can Company
Oakland, California, Facility

Product Monitoring Results

WELL NO. GW-1
MP ELEV: 15.39

SP. GRAVITY OF PRODUCT: 0.83

DATE	DEVICE	MEASURED PRODUCT DEPTH	MEASURED WATER DEPTH	PRODUCT THICKNESS	ADJ. WATER DEPTH	WATER ELEV.	WATER REMOVED (approx. gallons)	PRODUCT REMOVED (approx. gallons)
12/19/90	IP	13.43	13.90	0.47	13.51	1.88	0.10	0.10
12/20/90	IP	13.39	13.83	0.44	13.46	1.93	0.50	1.00
12/20/90	IP	14.17	14.50	0.33	14.23	1.16	0.25	0.50
1/3/91	IP	13.42	13.58	0.16	13.45	1.94	0.10	0.01
1/21/91	B	12.58	12.59	0.01	12.58	2.81	0.10	<0.01
2/13/91	B	13.33	13.42	0.09	13.35	2.04	0.08	0.01
2/27/91	IP	13.10	13.22	0.12	13.12	2.27	0.06	0.02
3/18/91	IP	12.29	12.32	0.03	12.30	3.09	0.00	0.11
3/27/91	IP	11.71	11.73	0.02	11.71	3.68	0.00	0.05
4/10/91	IP	11.35	11.37	0.02	11.35	4.04	0.01	0.11
4/29/91	IP	12.61	12.63	0.02	12.61	2.78	7.50	0.70
5/29/91	IP	11.69	11.87	0.18	11.72	3.67	2.50	0.17
6/12/91	IP	13.18	13.18	0.00	13.18	2.21	2.50	<0.01
6/27/91	IP	11.84	11.84	0.00	11.84	3.55	1.40	<0.01

1. MP Elev = measuring point elevation.
2. All elevations are expressed in feet above mean sea level, depths are measured in feet below the measuring point, product thickness is expressed in feet.
3. Device used to measure product thicknesses: IP = interface probe
   B = clear bailer & tape measure
4. ADJ. (Adjusted) Water Depth = product thickness times the product specific gravity yields water thickness which is subtracted from measured water depth.

Table 4-11 (continued)
American National Can Company
Oakland, California, Facility

Product Monitoring Results

WELL NO. MW-5
MP ELEV: 14.73

SP. GRAVITY OF PRODUCT: 0.83

DATE	DEVICE	MEASURED PRODUCT DEPTH	MEASURED WATER DEPTH	PRODUCT THICKNESS	ADJ. WATER DEPTH	WATER ELEV.	WATER REMOVED (approx. gallons)	PRODUCT REMOVED (approx. gallons)
4/29/91	IP	11.73	11.83	0.10	11.75	2.98	3.50	0.07
5/29/91	IP	12.07	12.31	0.24	12.11	2.62	3.50	0.30
6/12/91	IP	12.18	12.21	0.03	12.19	2.54	4.80	0.13
6/27/91	IP	12.22	12.35	0.13	12.24	2.49	3.50	0.15

NOTES:

1. MP Elev = measuring point elevation.
2. All elevations are expressed in feet above mean sea level, depths are measured in feet below the measuring point, product thickness is expressed in feet.
3. Device used to measure product thicknesses: IP = interface probe
   B = clear bailer & tape measure
4. ADJ. (Adjusted) Water Depth = product thickness times the product specific gravity yields water thickness which is subtracted from measured water depth.

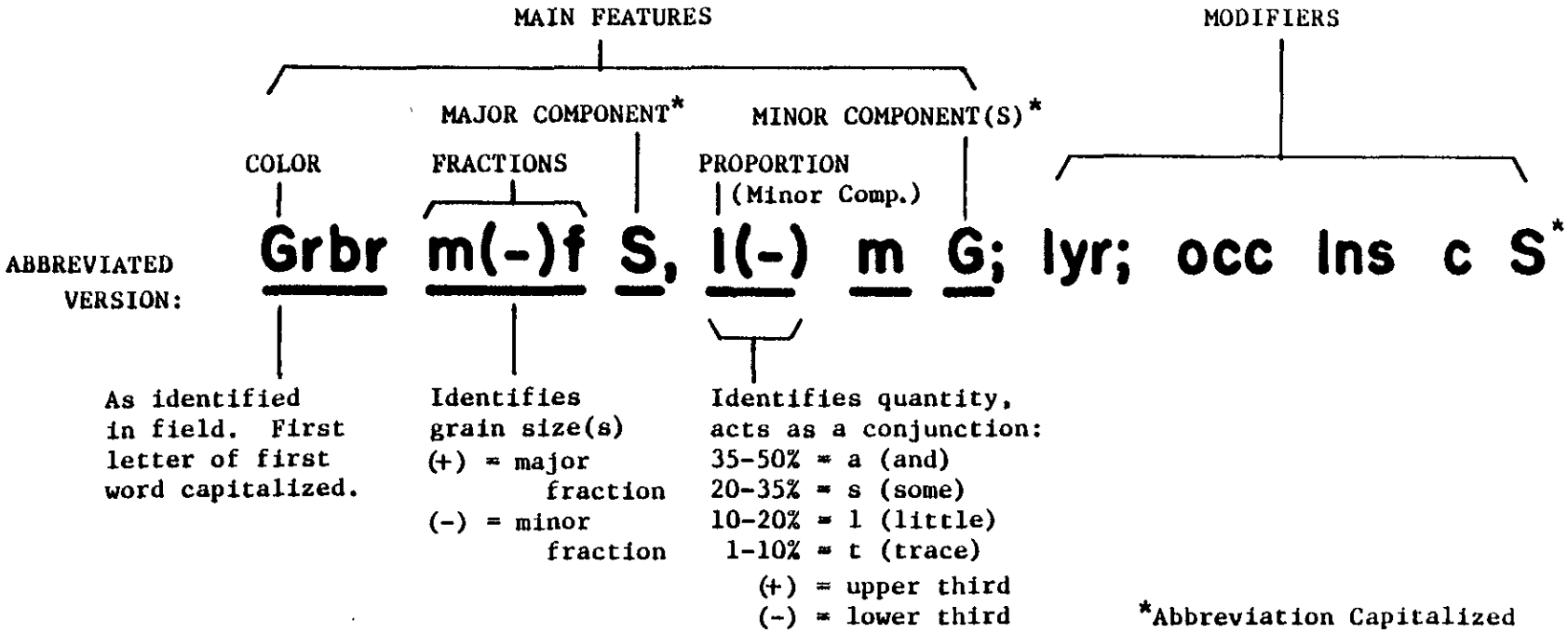
APPENDIX A

SOIL BORING LOGS AND MONITORING WELL COMPLETION LOGS

KEY TO BORING LOG SYMBOLS

Symbol	Meaning
 CS	California Sampler
 SS	Standard Split Spoon
 ST	Shelby Tube Sampler
	Water Table Elevation on Date of Measurement
PID	Photoionization Detector Readings
Spoon = 0.4	PID Result of Opened Soil Sampler
HS = 78	PID Result of Headspace Screening

MODIFIED BURMISTER SYSTEM



UNABBREVIATED VERSION: **Gray brown medium (-) to fine SAND, little (-) medium Gravel; layered; occasional lens coarse Sand (SP).**

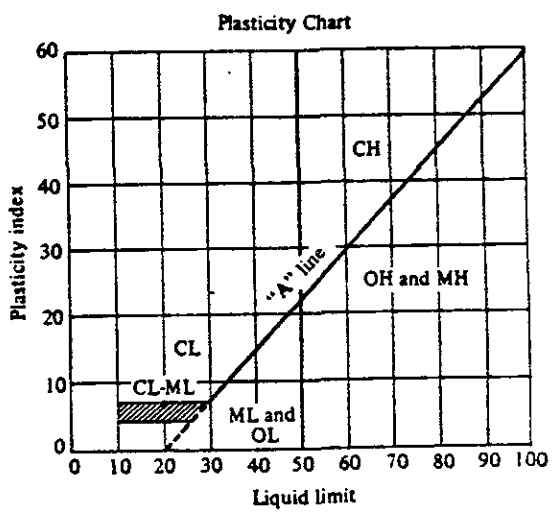
UNIFIED SOIL CLASSIFICATION:** Adequate for a generalized stratum description.

Dunn Geoscience Corporation uses a modified BURMISTER SYSTEM for detailed identification of soil components, fractions, and proportions. The UNIFIED SOIL CLASSIFICATION,** based upon field data, is also presented.

UNIFIED SOIL CLASSIFICATION SYSTEM. (ASTM D-2487)

Major Divisions			Group Symbols	Typical Names	Laboratory Classification Criteria	
Coarse-grained soils (More than half of material is larger than No. 200 sieve size)	Gravels (More than half of coarse fraction is larger than No. 4 sieve size)	Clean gravels (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4, $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines	Not meeting all gradation requirements for GW	
		Gravels with fines (Appreciable amount of fines)	GM[a] d / u	Silty gravels, gravel-sand-silt mixtures	Atterberg limits below "A" line or P.I. less than 4	Above "A" line with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			GC	Clayey gravels, gravel-sand-clay mixtures	Atterberg limits below "A" line with P.I. greater than 7	
	Sands (More than half of coarse fraction is smaller than No. 4 sieve size)	Clean sands (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ between 1 and 3	
			SP	Poorly graded sands, gravelly sands, little or no fines	Not meeting all gradation requirements for SW	
		Sands with fines (Appreciable amount of fines)	SM[a] d / u	Silty sands, sand-silt mixtures	Atterberg limits above "A" line or P.I. less than 4	Limits plotting in hatched zone with P.I. between 4 and 7 are *borderline* cases requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures	Atterberg limits above "A" line with P.I. greater than 7	
Fine-grained soils (More than half material is smaller than No. 200 sieve)	Silts and clays (Liquid limit less than 50)		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity		
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			OL	Organic silts and organic silty clays of low plasticity		
	Silts and clays (Liquid limit greater than 50)		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			CH	Inorganic clays of high plasticity, fat clays		
			OH	Organic clays of medium to high plasticity, organic silts		
	Highly organic soils		Pt	Peat and other highly organic soils		

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:
Less than 5 per cent — GW, GP, SW, SP
More than 12 per cent — GM, GC, SM, SC
5 to 12 per cent — *Borderline* cases requiring dual symbols[b]



[a] Division of GM and SM groups into subdivisions of d and u are for roads and airfields only. Subdivision is based on Atterberg limits; suffix d used when L.L. is 28 or less and the P.I. is 6 or less, the suffix u used when L.L. is greater than 28.

[b] Borderline classifications, used for soils possessing characteristics of two groups, are designated by combinations of group symbols. For example: GW-GC, well-graded gravel-sand mixture with clay binder.

VISUAL IDENTIFICATION OF SAMPLES

The samples were identified in accordance with the American Society for Engineering Education System of Definition.

I. Definition of Soil Components and Fractions

Material	Symbol	Fraction	Sieve Size	Definition
Boulders	Bldr	—	9" +	Material retained on 9" sieve.
Cobbles	Cbl	—	3" to 9"	Material passing the 9" sieve and retained on the 3" sieve.
Gravel	G	coarse (c) medium (m) fine (f)	1" to 3" ⅜" to 1" No. 10 to ⅜"	Material passing the 3" sieve and retained on the No. 10 sieve.
Sand	S	coarse (c) medium (m) fine (f)	No. 30 to No. 10 No. 60 to No. 30 No. 200 to No. 60	Material passing the No. 10 sieve and retained on the No. 200 sieve.
Silt	$	—	Passing No. 200 (0.074 mm)	Material passing the No. 200 sieve that is non-plastic in character and exhibits little or no strength when air dried.

Organic Silt (O$)
Material passing the No. 200 sieve which exhibits plastic properties within a certain range of moisture content, and exhibits fine granular and organic characteristics.

		Plasticity	Plasticity Index
Clayey SILT	Cy$	Slight (Sl)	1 to 5
SILT & CLAY	$&C	Low (L)	5 to 10
CLAY & SILT	C&$	Medium (M)	10 to 20
Silty CLAY	$yC	High (H)	20 to 40
CLAY	C	Very High (VH)	40 plus

Clay-Soil
Material passing the No. 200 sieve which can be made to exhibit plasticity and clay qualities within a certain range of moisture content, and which exhibits considerable strength when air-dried.

II. Definition of Component Proportions

Component	Written	Proportions	Symbol	Percentage Range by Weight *
Principal	CAPITALS	—		50 or more
Minor	Lower Case	and	a.	35 to 50
		some	s.	20 to 35
		little	l.	10 to 20
		trace	t.	1 to 10

* Minus sign (—) lower limit, plus sign (+) upper limit, no sign middle range.

III. Glossary of Modifying Abbreviations

Category	Symbol	Term	Symbol	Term	Symbol	Term
A. Borings	U/D	Undisturbed	B	Exploratory	A	Auger
B. Samples	C	Casing	L	Lost	U	Undisturbed
	D	Denison	S	Spoon	W	Wash
	O.E.	Open End				
C. Colors	bk	black	gn	green	wh	white
	bl	blue	or	orange	yw	yellow
	br	brown	rd	red	dk	dark
	gr	gray	tn	tan	lt	light
D. Organic Soils	dec	decayed	o	organic	veg	vegetation
	dec'g	decaying	rts	roots	pt	peat
	lig	lignite	ts	topsoil		
E. Rocks	LS	Limestone	rk	rock	Shst	Schist
	Gns	Gneiss	SS	Sandstone	Sh	Shale
F. Fill and Miscellaneous Materials	bldr (s)	boulder (s)	cbl (s)	cobble(s)	gls	glass
	brk (s)	brick (s)	wd	wood	misc	miscellaneous
	cndr (s)	cinder (s)	dbr	debris	rbl	rubble
G. Miscellaneous Terms	do	ditto	pp	pocket penetrometer	ref	refusal
	el, El	elevation			sm	small
	fgmt (s)	fragment(s)	P. I.	Plasticity Index	W. L.	water level
	frqt	frequent			W. H.	weight of hammer
	lrg	large	P	pushed pressed	W. R.	weight of rods
	mtld	mottled				
	no rec	no recovery	pc (s)	piece (s)		
	pen	penetration	rec or R	recovered		
H. Stratified Soils	alt	alternating				
	thk	thick				
	thn	thin				
	w	with				
	prt	parting	— 0 to 1/16" thickness			
	seam	seam	— 1/16 to ½" thickness			
	lyr	layer	— ½ to 12" thickness			
	stra	stratum	— greater than 12" thickness			
	vvd c	varved Clay	— alternating seams or layers of sand, silt and clay			
	pkt	pocket	— small, erratic deposit, usually less than 1 foot			
	lns	lens	— lenticular deposit			
	occ	occasional	— one or less per foot of thickness			
	freq	frequent	— more than one per foot of thickness			

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-01

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling					GROUND ELEV.	15.9
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS		HSA	DATE STARTED	03/11/91
GROUNDWATER ELEV.		DIA.	2.5" OD		6 5/8" ID	DATE FINISHED	03/13/91
MEASURING POINT		WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT		FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through asphalt		PID Bkgd = 0.3 All readings ppm
2	S-1	8 10 10	CH		Bk Dk gr $&C l, fs; org; rts		Rec = 1.0' Damp PID Spoon = 1.0 HS = 70
	S-2	4 9 13			Same <u>Black dark gray SILT & CLAY little, fine Sand; organic roots.</u>		Rec = 0.6' Dry PID Spoon = 0.5 HS = 23
4	S-3	6 8 10			Same; <u>Lab analyzed 4.5'-5.0'.</u> (TIDAL MARSH)	10.4	Rec = 1.0' Dry PID Spoon = 1.5 HS = 48
6	S-4	8 19 19	SM		Dk Gr br c(-)mf S, s $; mttld; sm bk sm lt gr; occ rts	5.5	Rec = 1.5' Dry PID Spoon = 1.5 HS = 85
8	S-5	7 9 10			Same <u>Gray brown green coarse (-) to fine SAND, little Silt; gradual coarsening downward.</u>		Rec = 2.0' Dry PID Spoon = Bkgd HS = 80
	S-6	10 14 19			Same 9.0'; Lt gr mf(+) S, t $; strong odor (FLUVIAL)		Rec = 1.4' Moist PID Spoon = 10 HS = 12.0

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-01
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSIFICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	8 12 22	SP		Lt Gr gn mf S, t$; very strong odor Gray brown green coarse (-) to fine SAND, little Silt.		Rec = 1.5' Moist PID Spoon = 20.0 HS = 280
					Same		
12	S-8	5 10 25	SW		12.0': Gr br c(+)mf S, t $, l(-) f G; very strong odor		Rec = 1.0' Moist PID Spoon = 20.0 HS = NA
	S-9	20 10 10	SM		Gr br cmf S, l$, s mf G; 0.4' lyr of Cy$ s, mf S, t mf G @ 13.5' **Lab analyzed 13.5'-14.0'**		Rec = 1.5' Moist/Wet @ Tip PID Spoon = 60 HS = 220
14	S-10	16 23 26	SW		Gr br c(+)mf(-) S, t $, s mf G; very strong odor, some hydrocarbon sheen, possibly product laden.		Rec = 1.1' Wet PID Spoon = 50 HS = 200
	S-11	15 33 22	SW		Gr c(+) mf S, l(-)$, s mf(+) G; slight odor Gray coarse to fine SAND, little (-) silt, some medium to fine (+) Gravel. Same		3/13/91 Rec = 1.1' Wet PID Spoon = 2.0 HS = 90
18	S-12	22 12 16	SW SC		(FLUVIAL)	-2.8	Rec = 0.7' Moist PID Spoon N/A HS = 42
	ST-1				Br Cy$ t, mf S; very stiff, slight odor SHELBY TUBE SAMPLE # ST-1 Br cmf S, a(-) $yC, l(-) f G Brown coarse to fine Sand, and(-) Silty Clay, little (-) fine Gravel. (FLUVIAL)	18.7 -4.9	PEN = 2.0' Rec = 2.0' Feed Press. = 900 psi Bottom 1" of ST-1 sample PID HS = 16
20					Bottom of Boring Augered to 19.0'	20.8	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-02

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	15.47
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	16.2
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/11/91
GROUNDWATER ELEV.	3.71'	DIA.	2.5"/2" OD		6 5/8	DATE FINISHED	03/12/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Aspalt and to 1.0'		PID Bkgd 0.3 all readings in ppm
2	S-1	3 6 11	CH		Bk $&C s, mf(+) S; org, rts; very dense; stiff		Rec = 1.0' Dry PID spoon = 0.5 HS = 14.5
	S-2	4 7 12			Same; very dense, hard Black Silt & Clay some, medium to fine (+) sand; organic; roots; dense; stiff.		Rec = 1.0' Dry PID spoon = Bkgd HS = 14.8
4					(TIDAL MARSH)	12.2	
	S-3	5 12 19	CL/ ML		Br Cy$ l, mf S; some rts, hard, dense	4.0	Rec = 1.0' Dry PID spoon = Bkgd HS = 8.0
6	S-4	3 7 18	SM		Br tn gr C(+) mf S, s$, tf G; dense hard; no odor		HNU Bkgd = 1.0 Rec = 1.2' Dry PID spoon = 1.5 HS = 6.0
	S-5	7 7 10	ML		Br Cy$ t, fs; tight dense; no odor Brown CLAYEY SILT some, medium to fine Sand; dense; stiff.		Rec = 1.2' Dry PID spoon = 4.0 HS = 6.5
8	S-6	6 8 17	ML		Gr br Cy$ l, mf(+) S; occ c S and f G; very dense; no odor (FLUVIAL)		Rec = 1.4' Dry PID spoon = 3.0 HS = 7.2

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-02
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	7 15 18	CL/ ML		Same 10.7': Lt br $a, cmf S 11.3': Br rd C(+) mfS, l$, l f G; mttld; no odor		Rec = 1.4' Dry PID spoon = NA HS = 6.8
12	S-8	12 15 23	SW		Br gr C(+) mfS, l-$, t mf(+) G; mttld; slight odor at spoon tip Lab Analyzed 12.5'-13.0'. Dk Gr br c(+)mf S, l $, s mf(+) G; mttld, some hydrocarbon sheen on sample and on spoon tip; Lab analyzed 13.5'-14.0'.		Rec = 1.4' Damp PID spoon = 5.0 HS = 6.7
14	S-9	11 18 21	SW		Gray brown coarse to fine SAND, little Silt, some medium to fine Gravel; becoming more gravelly toward base. Same; Wet; hydrocarbon sheen; loose		Rec = 1.5' Moist PID spoon = 20 HS = 190
	S-10	11 15 23	SW		15.3': Br C(-)mfS, l(-)$, lf G; moist; tight; slight odor		Rec = 1.5' Wet/Moist PID spoon = 18 HS = 160
16	S-11	3 23 24	GP		Br gr mf(+) G a, cmf S,t$; very loose; slight odor; cbbl fgmt @ tip (FLUVIAL)	-1.3	Rec = 1.3' Wet PID spoon = 5.0 HS = 152
18	S-12	6 8 10	SM		Br rd cmf S, s $, l mf G; very dense Brown CLAYEY SILT little, coarse to fine (+) sand, trace fine Gravel; very stiff, dense.	17.5	Rec = 1.3' Moist PID spoon = NA HS = 22
20	S-13	5 7 11	ML		Br Cy$ l, c(-)mf(+) S; very hard; dense; no odor (FLUVIAL)	-4.3	Rec = 1.7' Moist PID = NA
					End of Boring Augered to 20.0' Installed Monitoring Well MW-1	20.5	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-03

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	0Exceltech Drilling					MEAS. PT. ELEV.	14.86
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	15.2
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/13/91
GROUNDWATER ELEV.	5.91'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/14/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSIFICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Aspalt and to 1.0'		PID Background (Bkgd) = 0.3; all readings in ppm
2	S-1	9 10 23	SW		Bk Dk gr cmf S, l $, t fG; odor Black dark gray coarse to fine SAND, little Silt, trace fine Gravel.		Rec = 0.8' Dry PID spoon = 40 HS = NA
	S-2	6 9 11	CH		(FILL) Bk Dk gr cmf S, l$, tf G; Bk $&C, org; rts; sm odor **Lab analyzed 3.0'- 3.5'.**	12.2 3.0	Rec = 0.8' Dry PID spoon = NA HS = NA
4	S-3	5 8 10			Same Black dark gray SILT & CLAY little, medium to fine (+) Sand; roots, organics.		Rec = 1.1' Dry PID spoon = 30 HS = 104
6	S-4	9 20 27			Bk Dk Gr $&C l, mf+ S; rts, org, poss. oil stained, very stiff (TIDAL MARSH)	8.2	Rec = 0.7' Dry PID spoon = 30 HS = 280
8	S-5	10 17 19	ML/ SM		Gn gr $ s, mf(+) S; very strong odor; mod stiff Gray green brown SILT some, medium to fine (+) sand; moderately stiff. Same	7.0	Rec = 1.5' Dry PID spoon = 46 HS = 230
	S-6	6 10 14			(FLUVIAL)		Rec = 1.3' Dry PID spoon = 30 HS = 230

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-03
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	5 10 14	ML/ SM		Gr gn mf(+) S, a Cy$ <u>Gray green brown SILT some, medium to fine (+) Sand; moderately stiff.</u>		Rec = 1.5' Damp PID spoon = 50 HS = 260
12	S-8	6 8 12			Gr br $s, fS; mttld, horiz. bedding, some vertical stained seams which are brown <u>**Lab Analyzed 12.5'-13.0'.**</u>		Rec = 1.3' PID spoon = 30 HS = 270
14	S-9	11 28 35			Same; Moist Gr cmf S, t f G; wet; sm c G fgmts		Rec = 1.6' Wet @ PID spoon = 5.0 HS = 330
	S-10	4 8 19	SW		Sample not logged <u>Gray brown coarse to fine SAND, little Silt, little medium to fine (+) Gravel; some seams of higher silt content</u>		Rec = 0.6' Moist PID spoon = 10 HS = NA
16	S-11	5 11 13	SW		Dk Gr br c (+) mfs, l $, s(-)mf(+)G; wet seam at 16.8'		Rec = 1.2' Moist PID spoon = 1.0 HS = 130
18					(FLUVIAL)	-3.3	
					Bottom of Boring Augered to 18.5' Installed Monitoring Well MW-2	18.5	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-04

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	14.56
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	14.8
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/14/91
GROUNDWATER ELEV.	6.29'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/14/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through asphalt		PID Bkgd = 0.3; all readings in ppm
					Bk Dk gr Cy$ l, mf S; org; rts; brks, some odor		
	S-1	9 13 17	CL/SM		Black Dark gray CLAYEY SILT little, medium to fine SAND; Bricks		Rec = 0.6' Dry PID spoon = 3.0 HS = 19.0
2							
	S-2	4 8 8			Same		Rec = 0.7' Dry PID spoon = NA HS = 22.0
					(FILL)	10.8	
4	S-3	4 6 10	CH		Gn Dk Gr Bk Cy$ l, c(-) mf S; sm horiz layering Black Dark gray CLAYEY SILT little, coarse to fine Sand.	4.0	Rec = 1.4' Dry PID spoon = NA HS = 7.5
	S-4	4 7 12			Bk Dk gr Cy$ **Lab Analyzed 6.0'-6.5'.**		Rec = 1.4' Dry PID spoon = 0.4' HS = 6.8
6					(TIDAL MARSH)	8.3	
					Gr gn C(-)mf(+) S, a Cy$	6.5	
	S-5	4 12 14	SM		Same 7.8; lyr cmf S, l(-)$, lf G 8.0'; Gr gn C(-)mf(+) S, s$; strong odor		Rec = 1.3' Moist PID spoon = 3.0 HS = 52.0
8							
	S-6	5 8 15			Br gr gn mf S, l $; much bk staining, very distorted appearance Gray green coarse to fine SAND, some (+)silt; occasional fine Gravel.		Rec = 1.2' Dry PID spoon = 5.0 HS = 96.0

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-04
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	6 7 11	SM		Same Lab Analyzed 10.5'-11.0'. 11.0' Bk Dk gr mf(+) G a, cmf S, s(-) $; mttld, very stained		Rec = 1.3' Dry Wet @ tip PID spoon = 20.0 HS = 118.0
12	S-8	13 21 21	SW		Dk gr bk cmf S, t $, s mf(+) G; very stained; sm small red fgmts, sm poss cndrs		Rec = 1.5' Wet PID spoon = 30.0 HS = 94.0
	S-9	6 6 6			Same 13.3' Gr c(-)mf(+) S, l(+) $, t f G Dark Gray coarse to fine SAND, little (-) Silt, some (-) medium to fine (+) Gravel.		Rec = 0.9' PID spoon = NA HS = 130.0
14	S-10	6 8 12			Br Dk gr cmf S, l(-)$, s mf G; very stained w/strong hydrocarbon sheen; poss free product		Rec = 1.2' Wet PID spoon = 20.0 HS = 128
16	S-11	8 9 16			Same; much hydrocarbon sheen (FLUVIAL)		Rec = 1.0' Wet Wet PID spoon = NA HS = 122
18	S-12	7 5 3	CL		Same	-3.2	
					Br Cy$ l, m(-)f S; no odor; moderately soft Brown CLAYEY SILT little, medium to fine SAND. (FLUVIAL)	18.0 -4.2	Rec = 1.1' Wet PID HNU HS = 16.0
					Bottom of Boring Augered to 19.0' Installed Monitoring Well MW-3	19.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-05

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 3	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	15.27
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	15.7
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/15/91
GROUNDWATER ELEV.	3.27'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/15/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt		PID Background = 0.2, all readings in ppm
2	S-1	4 5 7	CH		Dk Gr bk Cy$ l, f S; org, rts, no odor		Rec = 0.9' Dry PID spoon = 0.2 HS = 8.0
	S-2	6 8 14			Bk Cy$ l (+), mf(+) S; very org; rts; very stiff		Rec = 1.3' Dry PID spoon = 3.8 HS = 5.6
4	S-3	3 5 10			Same Black dark gray CLAYEY SILT little, medium to fine Sand. (TIDAL MARSH)	10.7	Rec = 1.3' PID spoon = 32 HS = 146
					Dk Gr bk Cy$ s, c(-) mf S; org, rts	5.0	
6	S-4	6 11 16					Rec = 1.5' Dry PID spoon = 4.8 HS = 162
8	S-5	8 16 21			Same; steadily grading downward to: Gr cmf S, l$, l f G @ tip; very stiff Lab analyzed 7.5-8.0'		Rec = 1.5' Dry PID spoon = 42 HS = 200
	S-6	10 14 14	ML		Gr br cmf S, l$,lf G; very stiff Gray brown SILT little, medium to fine (+) Sand; stiff. 9.6': Gr br $l, f S; mod stiff; no odor (FLUVIAL)		Rec = 1.5' PID spoon = NA HS = 105

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-05
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 3
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	4 6 8	ML		Same; mod stiff Lab analyzed 10.5'-11.0'		Rec = 1.4' Damp PID spoon = 4.2 HS = 15.5
12	S-8	5 7 12			Gr Cy$, mf (+) S; sm br staining; becoming more silty towards tip; stronger odor at tip. Gray brown SILT little, medium to fine (+) Sand; stiff.		Rec = 1.5' PID spoon = NA HS = 120
14	S-9	4 5 7			Gr $ l fS;sm br (Fe?) stain at 14.0'; bottom tube wet Lab analyzed 13.5'-14.0'. W.T. @ 14.0'		Rec = 1.5' Moist/Wet PID spoon = 200+ HS = 260
	S-10	5 17 10 20			Br $ l, f S; sm dk br stain, dry; stiff 15.0': Gr f S s$; moist 15.2': Gr br c(+) mf S, l$, l fG; wet; odor Gray brown coarse to fine SAND, little (-) silt, some medium to fine Gravel.		Rec = 2.0' PID spoon = 25 HS = 250
16	S-11	10 14 17 16	SW/ GW		Gr mf(+) G s (+), c(+) mf S, t$: slight product sheen on outside of spoon (FLUVIAL) Same	-2.9	Rec = 1.2' Wet PID spoon = 50 HS = 100 Rec = 1.3' Wet PID
18	S-12	5 7 7	CL		Br Cy$ l, c(-) mf S; very stiff, slight odor	18.6	spoon = 2.0 HS = 16
20	ST-1				Shelby Tube #1: 20.0'-22.5' Brown Clay & Silt and (+), medium to fine (+) Sand.		Rec = 1.7' Max Rig Feed Press = 400 psi
22					(FLUVIAL)		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-05
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 3 OF 3
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Shelby Tube #2: STIFF Brown $yC s, mf(+) S at top and bottom of TUBE.		Rec = 2.5' Max Rig Feed Pressure = 600 psi
	ST-2		CH		Br C a(+), mf(+)S; Lab grain size		
24					Brown CLAY & SILT and (+), medium to fine (+) Sand.		
					Br gr Cy$ l(+), fS; very stiff; dense; no odor; massive		Rec = 1.5' Moist HNU spoon = Bkgd HS = 11.0
	S-13	6					
26		10					
		10			(FLUVIAL)	-10.8	
					Bottom of Boring	26.5	
					Auger to 22.5', shelby tube to 25.0', put 2" split spoon in Shelby tube hole and drove from 25.0'-26.5'. Installed Monitoring Well MW-4		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-06

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	14.73
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	15.2
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/15/91
GROUNDWATER ELEV.	3.23'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/16/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through asphalt		PID Background = 0.2, all readings in ppm
					Rd br cmf G a, cmf S; Fill		
2	S-1	3 5 7	CH		Dk Gr Bk $&C; org rts; sm odor @ 2.0' Dark Gray black SILT & CLAY.		Rec = 1.5' Dry PID spoon = 0.3 HS = 20.0
	S-2	4 7 13			Same; very stiff (TIDAL MARSH)		Rec = 0.8' Dry PID spoon = NA HS = 12.0
4	S-3	6 11 19			Same Lab analyzed 4.5'-5.0'.	10.4	Rec = 1.2' Dry PID spoon = 3.0 HS = 28.0
					Br gr Cy$ a, c(-)mf S; stiff	4.8	
6	S-4	5 10 12	ML		Same; very hard, stiff; same very light gray to white colored silt material @ 6.5'.		Rec = 1.0' Dry PID spoon = 6.0 HS = 11.0
8	S-5	4 7 12			Br gn $ a, fS; mod stiff; no odor Gray green brown SILT some (+), medium (-) to fine Sand; fining upwards.		Rec = 1.0' Moist PID spoon = 6.5 HS = 70
	S-6	5 6 11			Gr $ S, fS; mod stiff Lab analyzed 9.0'-9.5'. (FLUVIAL)		Rec = 1.2' PID spoon = 4.5 HS = 225

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-06
PROJECT OAKLAND SUBSURFACE INVEST.		SHEET 2 OF 2
CLIENT AMERICAN NATIONAL CAN COMPANY		JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	4 4 6	ML		Gr br $ s, mf(+) S; mod soft; strong odor Gray green brown SILT some (+), medium (-) to fine Sand.		Rec = 1.5' Moist PID spoon = 180 HS = 250
12	S-8	4 7 7			Same: Grading downward to Gr cm(+) f S, l(-)$ at tip (Fining upwards) strong odor at top		Rec = 1.4' Moist/Wet PID spoon = 25 HS = 290
14	S-9	8 10 14	SW/ GW		Gr c(+) mf S, l(-)fG 13.4': Gr cm(+)fS, t fG 13.8': Gr mf(+) G a, cmf S; fining upwards layer, coarsest point approximately 0.15' from spoon tip.		Rec = 1.3' Wet PID spoon = 200 HS = 280
16	S-10	16 11 11 11			Gr cmf S, s(+) mf(+) G; strong odor Gray coarse to fine SAND, some medium to fine (+) Gravel.		Rec = 1.9' Wet PID spoon = 165 HS = 320
18	S-11	6 9 10 8	SM/ ML		Gr c(+) mf S, t$, lfG; coarsening downward to Gr mf(+) G s, cmf S at 17.8' (FLUVIAL) Br cmf S a, Cy$, t f G Brown coarse to fine Sand and, Clayey Silt, trace fine Gravel. (FLUVIAL) Bottom of Boring Auger to 19.0' Installed Monitoring Well MW-5	-2.6 17.8 -3.7 18.9	Rec = 1.9' Wet PID spoon = 90 HS = 290 Bottom 0.6' of Sample: HS = 61

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-07

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 3	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT ELEV.	13.24
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	13.7
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/16/91
GROUNDWATER ELEV.	2.88'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/18/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					0-1'; Auger through asphalt and Red Gravel & Sand fill		PID Background = 0.3 all readings in ppm
2	S-1	5 7 8	CL		Dk Br Bk $&C l, fS; org, rts, distorted Dark Gray black SILT & CLAY little, fine Sand.		Rec = 1.1' Dry PID spoon = 2.5 HS = 13.8
	S-2	4 7 7			Same; sm tar like substance (FILL)	9.7	Rec = 0.6' Moist PID spoon = 1.0 HS = NA
4	S-3	4 7 14	CH		Blk C&$ l, mf(+)S; org, rts; very stiff Lab Analyzed 4.5'-5.0'.	4.0	Rec = 1.0' Dry PID spoon = 1.0 HS = 4.2
6	S-4	3 7 16			Black CLAY & SILT little, medium to fine (+) Sand. Same (TIDAL MARSH)	7.4	Rec 1.0' Dry PID spoon = 0.4 HS = 4.7
	S-5	10 12 23	CL/ ML		Gr $&C l, f S; rts, becoming Siltier towards tip Gr gn Cy$ lt, mf(+) S; mod stiff Gray brown green CLAYEY SILT little, medium to fine Sand; some layers becoming sandier.	6.3	Rec = 1.2' Dry PID spoon 4.5 HS = 3.7
8	S-6	4 5 10	SM		Gr br mf(+)S, s$; moist, mod loose Lab analyzed 9.0'-9.5' 9.5': Gr br Cy$ l, f S; stiff, dry (FLUVIAL)		Rec = 1.4' Dry/Moist PID spoon = 3.5 HS = 3.0

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-07
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 3
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	3 5 10	ML		Gr br $ a, mf(+) S 10.75': Gr br Cy$ l,mf(+) S, t f G; mod stiff Gray brown CLAYEY SILT little, medium to fine Sand, trace fine Gravel.		Rec = 1.4' PID spoon = 3.5 HS = 3.4
12	S-8	12 7 10	ML/ GM		Same 12.2': Gr br mf(+) G a, cmf S, l $; loose 12.75': Gr br Cy$ a, cmf S; mod stiff		Rec = 1.4' Moist/Wet PID spoon = 4.0 HS = 4.7
14	S-9	4 6 10 13	ML/ SM		Gr br $ a, c(-) mf(+) S, l(-) fG; alt lyrs at $ and gravel, all with sand Gray brown CLAYEY SILT and, coarse to fine Sand, little fine Gravel.		Rec = 1.7' Wet PID spoon = 2.0 HS = 3.4
16	S-10	5 6 5 6	ML/ SW ML		Gr br Cy$ s, fS; mod stiff 15.3': Br gr cmf(-)S, l $, lfG, loose wet; seam of Cy$ in middle 16.3': Br Gr Cy$ l, mf(+) S; stiff		Rec = 1.7' Wet PID spoon = 0.2 HS = 3.3
18	S-11	9 17 19	CL/ SC GW		Gr br $&C a, cmf (+) S, t f G; very stiff 17.6': Dk gr br mf(+) G s, cmf S; G ang-sbrdd; wet; loose; no odor		Rec = 1.2' Moist/Wet PID spoon = Bkgd HS = 3.8
20	S-12	4 4 6 7	ML SP/ SM		Gr br Cy$ s, fS; mod stiff; grading to Gr br mf(+) S,s $ @ tip (fining upward) Gray brown CLAYEY SILT some, fine Sand. Br mfS, l(+) $; mod stiff; no odor.		Rec = 1.5' PID spoon = 5.0 HS = 3.6
22	S-13	6 8 14 7	SP GW		Gray brown medium to fine GRAVEL and, coarse to fine Sand, trace Silt. Gr mf(+) G a, cmf S, t $; loose, not wash (FLUVIAL)	-8.5 22.2	Rec = 1.3' Wet PID spoon = 5.0 HS = NA Rec = 1.6' Wet PID

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-07
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 3 OF 3
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-14	7 7 7	GM		Gr br mf(+) G a, cmf (+) S, s Cy$; mod stiff Gray brown medium to fine GRAVEL and, coarse to fine (+) Sand, some (+) Clayey Silt.		spoon = 5.0 HS = 3.9
24	S-15	8 19 37	CL GM		Gr br Cy$ a, c(-)mf S, t f G; very stiff, dense 25.3': Gr br mf G a, cmf S, s Cy$; very stiff		Rec = 1.5' Moist PID spoon = 6.5 HS = 8.2
26	ST-1		CL		Shelby Tube #ST-1: 25.5'-28.0' Gr br $yC a, c(-) m f(+) s, t f G; lab grain size Gray Brown SILTY CLAY and, coarse (-) to fine (+) Sand, trace fine Gravel.		Rec = 2.5' Max. Rig feed pressure = 600 psi
28					(FLUVIAL)	-14.3	
					Bottom of Boring Auger to 25.5' Installed Monitoring Well MW-6	28.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-08

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	16.20
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	16.7
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/18/91
GROUNDWATER ELEV.	3.16'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/18/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt		PID Background = 0.4, all readings in ppm
2	S-1	8 10 12	CH		Bk dk gr Cy$ l, mf+ S; org, rts Black dark gray CLAYEY SILT little medium to fine (+) Sand.		Rec = 1.0 Dry PID spoon = 6.0 HS = 7.5
	S-2	6 16 20			Same		Rec = 0.6' Dry PID spoon = 4.5 HS = NA
4					(TIDAL MARSH)	12.7	
	S-3	8 18 36	SM/ SW		Br cmf S, s Cy$, t f G; v stiff, dense **Lab analyzed 4.5'-5.0'.**	4.0	Rec = 1.0' Dry PID spoon = 6.0 HS = 7.0
6	S-4	4 9 30			Br c(-)mf S, l(+)$, t f G; very dense stiff; sm blk inclusions Brown coarse to fine SAND, some clayey Silt, trace fine Gravel.		Rec = 1.0' Dry PID spoon = 8.8 HS = 6.2
8	S-5	13 15 22	CL		Same; becoming more gravelly @ 7.8'	8.7	Rec = 1.3' Dry PID spoon = 6.2 HS = 5.4
	S-6	11 21 38	ML		Br Cy$ l, mf(+) S; stiff Gr $ a, mf(+) S; mod stiff Brown Gray SILT and, medium to fine (+) Sand. (FLUVIAL)	8.0	Rec = 1.3' Damp PID spoon = 6.8 HS = 5.1

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-08
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	7 11 20	SP/ GP		Gr br $ l, f S, t f G; very stiff; coarsening downward to Gr br mf(+)S, l$ a mf(+) G @ tip Lab analyzed 10.5'-11.0'. Rd br cmf S, l $, a mf(+) G; mod loose		Rec = 1.2' Damp PID spoon = 8.6 HS = 4.5
12	S-8	10 20 24	SW		Red brown coarse to fine Sand, little Silt, and medium to fine (+) Gravel. Br gr C(+)mf S, t $, l mf(+) G; loose		Rec = 1.2' Moist PID spoon = 6.2 HS = 4.1
	S-9	10 20 28	SW/ GP		14.0': Br gr C(-) mf(+) G s, c(+) mf S; loose Gr br c(+) mf S, s(+) mf G; 0.10' thick lyr of Gr c(-) mf(+) S @ 15.3'		Rec = 1.4' Wet PID spoon = 8.0' HS = 3.5'
14	S-10	5 9 21 22			Dark Gray fine GRAVEL and, coarse to fine SAND. (FLUVIAL) Dk Gr f G a, cmf S; loose	-0.0	Rec = 1.3' Wet PID spoon = NA HS = 4.2
16	S-11	7 5 13 13	SM/ ML/ CL		Br mf(+) S, a $, t f G; mod stiff, becoming Cy @ tip Brown medium to fine (+) SAND, and Silt, trace fine Gravel. (FLUVIAL)	16.7 -1.8	Rec = 1.9' Wet PID spoon = 2.5' HS = 3.6
18					Bottom of Boring Auger to 18.5' Installed Monitoring Well MW-7	18.5	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-09

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS PT. ELEV.	12.90
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	13.3
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/19/91
GROUNDWATER ELEV.	2.83'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/19/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt		PID Background = 0.4, all readings in ppm
2	S-1	12 12 9	SP		Dk gr br m S, l $; Strong solvent odor Dark gray black medium SAND, little Silt. **Lab analyzed 1.5'-2.0'** Same		Rec = 1.0' Dry PID spoon = 150 HS = 200+
	S-2	3 5 10	CH		(FILL)	10.3	Rec = 1.0' Dry PID spoon = 100 HS = 140
4	S-3	5 9 18	CL		Bk Cy$ l, f S; org; rts Black CLAYEY SILT little, fine Sand. Same **Lab Analyzed 4.5'-5.0'**	3.0	Rec = 1.3' Dry PID spoon = 5.0 HS = 2.8
					(TIDAL MARSH)	8.5	
6	S-4	4 8 15	ML		Lt Gr Cy$ l(-), f S; rts; v stiff; sm G @ tip Gr $s, mf (+) S; occ c S and fG; very stiff Light Gray CLAYEY SILT little (-), fine sand; coarsening downward to 8.0'. Same	4.8	Rec = 1.0' Damp PID spoon = 5.2 HS = 5.2
8	S-5	6 19 11	ML GM GP		**Lab analyzed 7.7'-8.2'.** 7.8': Gr c(-)mf G a (+), f S, s(+) Cy$ 8.0': Br gr mf(+) G a, cmf S, l Cy$		Rec = 1.2' Damp PID spoon = 6.4 HS = 3.5
	S-6	6 20 12	SM		Gr gn mf(+)S, a $; grading downward to Gr cmf S, l$, smf(+) G (FLUVIAL)		Rec = 0.8' Moist/Wet PID spoon = 4.3 HS = 35.0

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-09
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	4 5 7	CL		Gr Cy$ l, fS; mod soft; sm brown Fe stain Gray CLAYEY SILT little, fine Sand; coarsening downward to 13.4'.		Rec = 1.4' Wet ▼PID spoon = 5.4 HS = 3.2
12	S-8	4 7 12	CL SW		Same; Moist 12.3': Gr cmf S, l(-)$, s mf(+) G; wet; G sbrdd-sbang, no odor		Rec = 1.3' Wet PID spoon = 4.0 HS = 3.0
14	S-9	8 6 10	ML GP		Same 13.4'; Gr $ a, cmf(+) S, lf G; loose wet 14.0': Gr mf(+) G s, cmf S, l$; mod stiff; G Sbang; rd Stained inclusions (Fe?) becoming more clayey at tip		Rec = 1.5' Wet PID spoon = NA HS = 2.5
16	S-10	10 4 14 8 6	CL		Same (FLUVIAL) Gr br Cy$ l, fS; very stiff; occ f G	-3.0 16.3	Rec = 1.4' Wet PID spoon = NA HS = 3.0
18	S-11	4 6 7 12			Gr br $&C l, mf(+) S; occ f G; very stiff; dense Gray brown SILT & CLAY little, medium to fine (+) Sand. (FLUVIAL)	-5.7	Rec 1.8' Wet PID spoon = NA HS = 3.0
					Bottom of Boring Augered to 18.0' Sampled to 19.0' Installed Monitoring Well MW-8	19.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-10

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 3	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	11.69
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	12.1
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/19/91
GROUNDWATER ELEV.	2.24'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/20/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt and to 1.0'		PID Background = 0.4, all readings in ppm
					Lab analyzed 1.5'-2.0'.		
					Bk br c(-)mf(+) S, a Cy$; mttld		
		3					Rec = 1.0' Dry
	S-1	5	SM		Black brown coarse (-) to fine (+) SAND		PID
2					Clayey Silt.		spoon = Bkgd
		7			(FILL)	9.6	HS = 3.0
		4			Blk Cy$;	2.5	Rec = 1.2' Moist
	S-2	5	CL				PID
					Black Clayey Silt.		spoon = 5.0
		7			(TIDAL MARSH)	8.1	HS = 2.1
4		5			Dk Gr br cmf(+) S, a Cy$; stiff	4.0	Rec 1.0' Dry
	S-3	8	SM				PID
							spoon = 4.5
		13					HS = 2.4
		6			Gr dk Gr Cy$ l, mf(+) S; stiff		Rec = 1.0' Dry
6	S-4	18	CL		Dark gray CLAYEY SILT little, medium to fine (+) Sand.		PID
							spoon = 3.4
		23					HS = 4.0
		8			Same; Moist @ 8.0'		Rec = 1.0' Dry/Moist
	S-5	8	CL		Lab analyzed 7.5'-8.0'.		PID
8							spoon = 6.5
		8					HS = 1.8
		4					Rec = 1.2' Moist
	S-6	5	ML		Br $ a, mf(+) S; mod stiff		PID
					(FLUVIAL)		spoon = 7.0
		8					HS = 3.4

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-10
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 3
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-7	4 4 9	ML		Same; sm br (Fe?) stained in places Brown SILT and, medium to fine (+) Sand.		Rec = 1.3' Moist PID spoon = 6.4 HS = 3.4
12	S-8	4 6 9 17	ML/CL SW		Br gr Cy$ s(+), c(-)mf S, l(-) f G; mod stiff; mttld w/Fe stain 12.4': Br gr c(-) mfS,s$, l(-)mf(+)G; coarsening downward to Br mf(+)G s, cmf(+) S, l $ at tip Br c(-)mf(+) G s, cmf S, t $; very loose, wet		Rec = 1.9' Wet PID spoon = 6.4 HS = 4.8
14	S-9	5 10 10	GW SW		13.9': Br gr cm(+) f S; 0.10' thick lyr of coarse Sand at 14.3' Brown Gray medium to fine GRAVEL little (+), coarse to fine Sand, trace Silt.		Rec = 1.4' Wet PID spoon = NA/rain HS = 4.4
16	S-10	5 7 20 24	GP ML SW		Br gr mf G l, cmf S, t $ 15.5' Br $ a, f S; loose; wet 15.8': Br cmf S, t$, smf(+) G; dense mod stiff Poor recovery; c G fgmt in tip		Rec = 1.6' Wet PID spoon = NA/rain HS = 3.8
18	S-11	30 30 25 36					Rec = 0.3' Wet PID spoon = NA HS = NA
20	S-12	18 20 22	SW		Gr br cmf S, l(+) mf(+) G; G sbang-sbrdd Gray brown coarse to fine SAND, little (+) medium to fine (+) Gravel.		Rec = 0.9' Wet PID spoon = NA HS = 4.2
22	S-13	12 15 20 15	SW		Same; Coarsening downward to Br mf(+) G a, cmf S @ tip (FLUVIAL)	-10.4	Rec = 1.3' Wet PID spoon = NA HS = 3.2

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-10
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 3 OF 3
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-14	4 6 9	ML		22.5 Br $&C l, mf(+) S; very stiff no odor Brown SILT and CLAY little, medium to fine (+) Sand. (FLUVIAL) -11.8 23.9 Bottom of Boring Augered to 23.0' Sampled to 24.0'. Installed Monitoring Well MW-9		Rec = 1.4' Wet PID spoon = NA HS = NA

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-11

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	13.03
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	13.2
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobile B-61	TYPE	CS/SS		HSA	DATE STARTED	03/20/91
GROUNDWATER ELEV.	3.03'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/20/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Core through concrete 0-8"		Auger to 2.0' to reach bottom at base fill prior to beginning sampling
					Br rd c(+) mf G; same 3-4" cobbles; Base Fill		
2	S-1	4 10 16	CH		Bk Cy$ t, fS; org; very stiff; sample wet from concrete coring Black CLAYEY SILT trace, fine Sand.		Rec = 1.0' Wet PID spoon = Bkgd HS = 0.6
4	S-2	7 14 22	ML/ CL		Same **Lab analyzed 4.0'-4.5'.** (TIDAL MARSH) Br $&C t, fS; very stiff Br Cy$ l, fS; stiff; occ bk stain	8.9 4.3	Rec = 0.8' Dry PID spoon = 7.4 HS = 11.0
6	S-3	7 14 11			Brown CLAYEY SILT little, fine Sand. Br $ l(+), f S; mod stiff; occ f G		Rec = 1.0' Dry PID spoon = 7.4 HS = 11.2
	S-4	5 7 16	ML		7.8': Br gr cm(+) f S, t$, lf G: loose; dry Same		Rec = 1.4' Dry PID spoon = 5.0 HS = 11.2
8	S-5	14 24 27	SW		Brown gray coarse to fine SAND, trace Silt, little fine Gravel. **Lab analyzed 8.5'-9.0'.** Same (FLUVIAL)		Rec = 1.2' Dry PID spoon = 4.8 HS = 11.4
		10					Rec = 1.1' Damp PID

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-11
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-6	7	SW			2.8 ▼	spoon = NA HS = 11.5
		5	CL/ ML		Gr Cy$ l, fS; top 0.05' br; moist; Fe stain throughout; W.T. @ 10.5' Same	10.4	
		6			Gray CLAYEY SILT little, fine Sand.		Rec 1.4' Moist PID spoon = NA HS = 11.3
12	S-7	11	SW		12.0': Gr br cmf S, t$, a mf(+) G; loose		
		33			Gr br mfG a, cmf S, t $		
		11	GP		Gray brown medium to fine GRAVEL and, coarse to fine Sand, trace Silt.		Rec = 1.7' Wet PID spoon = NA HS = 11.5
		5				-0.1	
	S-8	5	CL/ ML		Gr br Cy$ t, fS; occ f G; sm Fe stain; stiff; more gravel toward tip	13.3	
14		5			Gray brown CLAYEY SILT trace, fine Sand.		
		6			Gr $ s(+), c-mf(+) S, l(+) mf G		
		6	ML		15.0': Br gr cmf(+) S, t$, s(-) mf G; coarser at tip; dk br Fe stain		Rec = 1.5' Wet PID spoon = 4.2 HS = 9.5
	S-9	24			Brown gray coarse to fine (+) SAND, trace silt, some (-) medium to fine Gravel.		
		28	SW		Same		
16					(FLUVIAL)		
		8					Rec = 1.2'Wet PID spoon = NA HS = 9.0
		17				-3.5	
	S-10				Br gr $&C l, f S; very stiff	16.7	
		5	CH/ MH		Brown gray SILT & CLAY little, fine Sand.		
		5			(FLUVIAL)	-4.8	
18					Bottom of Boring Auger to 18.0' Installed Monitoring Well MW-10	18.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-12

PROJECT	OAKLAND SUBSURFACE INVEST.				SHEET 1 OF 1	
CLIENT	AMERICAN NATIONAL CAN COMPANY				JOB No.	02345-01983
DRILLING CONTRACTOR					MEAS. PT. ELEV.	
PURPOSE					GROUND ELEV.	
DRILLING METHOD		SAMPLE	CORE	CASING	DATUM	
DRILL RIG TYPE	Mobile B-61	TYPE			DATE STARTED	03/20/91
GROUNDWATER ELEV.		DIA.			DATE FINISHED	03/20/91
MEASURING POINT		WEIGHT			DRILLER	Don Jenkins
DATE OF MEASUREMENT		FALL			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Drilled through 2 inches of Asphalt and had auger refusal on concrete sub-base; abandoned location.		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-13

PROJECT	OAKLAND SUBSURFACE INVEST.				SHEET 1 OF 1	
CLIENT	AMERICAN NATIONAL CAN COMPANY				JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling				MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.				GROUND ELEV.	12.7
DRILLING METHOD	Hollow Stem Auger	SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobil B-61	TYPE	CS	HSA	DATE STARTED	03/20/91
GROUNDWATER ELEV.		DIA.	2.5" OD	4 1/4" ID	DATE FINISHED	03/20/91
MEASURING POINT		WEIGHT	140 #		DRILLER	Don Jenkins
DATE OF MEASUREMENT		FALL	30"		INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt and to 1.0'		PID Background = 0.4, all readings in ppm
2	S-1	2 2 3			All recovery in brass tube; no odor		Rec = 0.5' Dry PID spoon = NA HS = NA
	S-2	3 4 4	SM		Dk gr cmf S, s$, l mf G; soft; wet; no odor Dark Gray coarse to fine SAND, some silt, little medium to fine Gravel. (FILL)	8.7	Rec = 1.0' Wet PID spoon = 4.0 HS = 10.0
4					Bottom of Boring Auger to 4.0' Had spoon refusal on metal and concrete at 4.0'; move rig 3.0' east and set up on SB-13A; Backfill SB-13 with 2.0' of hole plug and cap up with cement grout.	4.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-13A

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 1	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	12.9
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobil B-61	TYPE	CS		HSA	DATE STARTED	03/20/91
GROUNDWATER ELEV.		DIA.	2.5" OD		4 1/4" ID	DATE FINISHED	03/20/91
MEASURING POINT		WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT		FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					After reaching spoon refusal at 4.0' in SB-13, move rig 3.0' east to location SB-13A; Auger down to 4.0' prior to beginning sampling.		PID Background = 0.4, all readings in ppm
2							
4	S-1	7 17 20			Dk gr br bk Cy$ s, cmf S, tf G; mttld; disturbed; stiff **Lab analyzed 4.0'-4.5'.** (FILL)	7.5	Rec = 1.0' Dry PID spoon = 7.8 HS = 9.4
	S-2	8 11 17	SW/ SM		Br gr cmf(+) S, s$, lf G; very hard, stiff, no odor	5.4	Rec = 0.8' Dry PID spoon = NA HS = 9.8
	S-3	11 13 16	SW		Dk gr cmf (+) S, l$,l f G Gray brown coarse to fine (+) Sand, little Silt, little fine Gravel. Gr cm (+) f S, t $, l m f(+) G; loose		Rec = 1.0' Moist PID spoon = NA HS = 10.6
	S-4	8 11 12	SW		**Lab analyzed 9.0'-9.5'** (FLUVIAL) Bottom of Boring = 10.0'		Rec = 1.0' Moist PID spoon = NA HS = 9.8

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-14

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	14.49
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	15.1
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobil B-61	TYPE	CS/SS		HSA	DATE STARTED	03/21/91
GROUNDWATER ELEV.	3.62'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/21/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt		HNU Background = 0.4, all readings in ppm.
2	S-1	5 7 11	CH		DK GR bk $&C l, mf (+) S; stiff; no odor Dark gray black SILT & CLAY little, medium to fine (+) Sand.		Rec = 1.2' Dry PID Spoon = 1.2 HS = 9.2
4	S-2	4 9 13			Same		Rec = 0.5' Dry PID Spoon = NA HS = NA
					(TIDAL MARSH)	10.6	
	S-3	10 18 17	CL		Br gr Cy$ a , mf (+) S; very stiff; fines are siltier towards tip. **Lab Analyzed 5.0'-5.5'**	4.5	Rec = 1.0' Dry PID Spoon = 10.0 HS = 8.8
6	S-4	10 15 21	SW		Same 6.5'; LT gr br cmf S, l $, t mf (+) G; very stiff		Rec = 1.2' Damp PID Spoon = 7.6 HS = 8.0
8	S-5	6 7 13	SM		Br cmf (+) S, a$, t f G; mod loose Brown coarse to fine (+) SAND, and Silt, trace fine Gravel.		Rec = 1.3' Moist PID Spoon = NA HS = 9.2
	S-6	5 7			Same **Lab Analyzed 9.5'-10.0'** (FLUVIAL)		Rec 1.3' Moist PID Spoon = 11.6 HS = 8.8

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-14
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
		11			Brown coarse to fine Sand, trace Silt, little fine Gravel.		
		11	SW		Br cm (+) f S, t $, l f G; loose		Rec 1.4' Moist PID Spoon = 10.8
	S-7					3.9	
		8	CL		Br gr Cy$ l, mf (+) S, t f G; stiff; dense; same blk inclusions	11.2	HS = 9.4
		11					
12					Br gr Cy$ a, mf (+) S; stiff; dense		Rec = 1.7' Moist PID Spoon = NA HS = 11.0
		4					
	S-8	4			Brown Gray CLAYEY SILT and, medium to fine (+) Sand.		
		6					
		10					
14					Br $ a (-), c(-) mf (+) S, t f G; mod stiff, sm blk inclusions		Rec = 1.5' Moist PID Spoon = NA HS = 10.6
		3					
	S-9	7	ML				
		10					
		8	ML		Gr br $ a, cmf (+) S; mod stiff 15.7' Gr br cmf S, l (-) $, l mf(+) G		Rec = 1.5' Moist PID Spoon = NA HS = 7.9
16	S-10	10				-1.2 16.3	
		13	SP/ SM		Gr br mf S, l (+) $; seams of Cy$		
		9			Gr rd br cm (+) f S, l (-) $, t f G; loose		Rec = 1.8' Wet PID Spoon = NA HS = 9.8
18	S-11	5			Gray red brown coarse to fine SAND, little Silt, trace fine Gravel.		
		5				-3.5	
		7	CL		Gr Cy$ a (+), mf (+) S, s (-) mf G; stiff (FLUVIAL)	18.6 -3.9	
					Bottom of Boring Auger to 19.0' Installed Monitoring Well MW-11	19.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-15

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	16.81
PURPOSE	Subsurface Soil Sampling					GROUND ELEV.	17.2
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Mobil B-61	TYPE	CS/SS		HSA	DATE STARTED	03/21/91
GROUNDWATER ELEV.	9.88'	DIA.	2.5"/2" OD		6 5/8" ID	DATE FINISHED	03/21/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Don Jenkins
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Concrete Cutting Co. cores through 10" of concrete; Auger to 1.5' through subgrade.		PID Background = 0.2, all readings in ppm.
2	S-1	5 7 8			Dk Gr bk $&C l, f S; org; mttld; disturbed; no odor; mod stiff Dark Gray black SILT & CLAY little, fine Sand.		Rec = 1.5' Damp PID Spoon = 0.8 HS = 9.4
4	S-2	3 6 11			Same 4.0':Br gr Cy$ S, mf + S; stiff; mttld; no odor		Rec = 0.9' Damp PID Spoon = 3.5 HS = NA
6	S-3	8 30 30			Same; G fgmts @ 5.0' Lab Analyzed 5.0 - 5.5.		Rec = 1.0' Dry PID Spoon = 4.0 HS = 11.4
	S-4	10 10 12			Gr br mf(+) G s, cmf S, t Cy$; loose; G sbrdd (-) sbang; no odor Gray brown medium to fine (+) GRAVEL some, medium to fine (+) Sand.		Rec = 1.0' Moist PID Spoon = 4.8 HS = 11.2
8	S-5	5 10 11			Gr br Cy$ a (+), cmf S, l (+) mf (+) G; very stiff; s blk inclusions; no odor; disturbed		Rec = 1.3' Damp PID Spoon = 3.8 HS = 11.4
	S-6	4 7			Lab Analyzed 9.0'-9.5' Dk Gn br cmf (+) S, l (+) $, l mf (+) G; mttld, poss disturbed; sm hydrocarbon odor (FILL)		Rec = 1.1' Moist PID Spoon = 4.8' HS = 38.0

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-15
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
		9	CL/ ML		Brown gray CLAYEY SILT and, coarse to fine Sand, little coarse to fine (+) Gravel.		Rec = 1.2' Moist/Wet PID Spoon = 5.8 HS = 10.2
	S-7	7					
		10			Br gr Cy$ a, cmf S, l cmf (+) G; sandier towards tip; mttld; no odor; Wet @ 11.25'		
		7					
12			SW		Gr br cmf S, l $, l mf (+) G		Rec = 1.2'Wet PID Spoon = 4.4 HS = 12.0
		6				4.7	
	S-8	6	CL/ ML		Gr br Cy$ a, mf (+) S; brown Fe stain at 12.8'	12.5	
		10					
		5					Rec = 1.5' Wet PID Spoon = NA HS = 12.2
14							
	S-9	5			Br cmf (+) S, s (-) $, s (+) mf (+) G; mod loose; no odor		
		5	SW/ SW				
		10			Brown coarse to fine Sand, some (-) silt, some (+) medium to fine (+) Gravel.	1.7	
		1	CH/ MH		Br gr $&C t, f S; very stiff; hard; sm bk inclusions	15.5	Rec = 1.7' Moist PID Spoon = 1.5 HS = 11.6
16							
	S-10	3			Brown gray SILT & CLAY trace, fine Sand.		
		5					
		6					
18					(FLUVIAL)	-0.8	
					Bottom of Boring Auger to 18.0' Installed Monitoring Well MW-12	18.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-16

PROJECT	OAKLAND SUBSURFACE INVEST.				SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY				JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling				MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.				GROUND ELEV.	15.2
DRILLING METHOD	Hollow Stem Auger	SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CA/SS		DATE STARTED	03/22/91
GROUNDWATER ELEV.		DIA.	2.5"/2" OD		DATE FINISHED	03/22/91
MEASURING POINT		WEIGHT	140 #		DRILLER	Don Jenkins
DATE OF MEASUREMENT		FALL	30"		INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-1	3 5			Gr gn mf + S, a Cy$, t mf G; stiff (FILL)	14.2	Rec = 1.2' Dry PID Spoon = 5.0 HS = 14.5
		5	CH/ MH		Bk $&C; org; rts; stiff	1.0	Rec = 1.0' Moist PID
2	S-2	3 5 7			Same Black Silt & Clay.		Spoon = 9.0 HS = 14.9
	S-3	7 8 12	CL		Bk Cy$; org; very stiff (TIDAL MARSH)	10.7	Rec = 1.2' Dry PID Spoon = 9.5 HS = 14.4
4	S-4	7 15 20	SM		Gr br mf (+) S, a $; stiff Lab Analyzed 5.0'-5.5'	4.5	Rec = 1.0' Dry PID Spoon = 10.2 HS = 14.5
6	S-5	8 10 11	SM		Br $ s (-), mf (+) S; stiff Brown medium to fine (+) SAND, and Silt. Br mf (+) S, s(-) $; mod stiff, sm bk inclusions		Rec = 1.2' Dry PID Spoon = 10.2 HS =
8	S-6	5 8 8	SM				Rec = 1.2' Moist PID Spoon = 9.8 HS = NA
	S-7	7 10			Lab Analyzed 9.5'-10.0' (FLUVIAL)		Rec = 1.2' very Moist PID Spoon = 9.5 HS = NA

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-16
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
		14				4.7	
					Bottom of Boring Auger to 9.0'	10.5	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-17

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 1	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	17.7
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CA		HSA	DATE STARTED	03/25/91
GROUNDWATER ELEV.		DIA.	2.5" OD		4 1/4" ID	DATE FINISHED	03/25/91
MEASURING POINT		WEIGHT	140 #			DRILLER	Rich Crews
DATE OF MEASUREMENT		FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger through Asphalt		PID Background = 0.4 all readings in ppm.
	S-1	3 5 5	CL/ ML		Dk gr Cy$ I (+), mf S; org, fill		Rec = 0.9' Moist PID Spoon = NA HS = 9.2
2							
	S-2	3 4 4			Same; many G fgmts Dark gr CLAYEY SILT little (+), medium to fine Sand.		Rec = 0.8' Dry PID Spoon = 5.4 HS = 10.0
4							
	S-3	2 5 9			Same		Rec = 0.9' PID Spoon = 7.7 HS = 10.0
					(BUILDING FILL)	12.2	
					Bottom of Boring	5.5	
					Auger and sampler refusal at 5.5' on probable building footing. Could not relocate boring due to proximity of building and property fence. Boring sealed with cement grout to surface.		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-18

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 1	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	17.8
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CS			DATE STARTED	03/25/91
GROUNDWATER ELEV.		DIA.	2.5" OD			DATE FINISHED	03/25/91
MEASURING POINT		WEIGHT	140 #			DRILLER	Rich Crews
DATE OF MEASUREMENT		FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-1	6 6 7	CL/ML		Br Bk Cy$ a, mf S, s mf G; mixture of fill material		Rec = 1.0' Dry PID Spoon = NA HS = 10.5
2	S-2	3 4 7			Lost rec; G fgmt in tip <u>Brown black CLAYEY SILT and, medium to fine Sand, some medium to fine Gravel.</u>		Rec = 0.1 PID Spoon = NA HS = NA
4	S-3	3 3 5	GM		Br Bk mf G a, cmf (+) S, s Cy$		Rec = 1.0' Moist PID Spoon = 3.2 HS = 10.6
	S-4	2 2 3	GM		Dk br mf (+) G a, cmf S, s (+) Cy$; mixed, disturbed fill material <u>**Lab Analyzed 5.0'-5.5'**</u>		Rec = 1.0 Moist PID Spoon = 3.0 HS = 12.5
6	S-5	2 3 3			Same; Faint heavy grease like odor <u>Dark Brown medium to fine (+) GRAVEL and coarse to fine Sand, some (+) Clayey Silt.</u>		Rec = 1.5' Moist PID Spoon = 4.5 HS = 22.0
8	S-6	1 2 2	CL/ML		Same 8.5'; Gn br Cy$ s, cmf S, t f G; sm kerosene type odor <u>**Lab Analyzed 8.5'-9.0'**</u>		Rec = 1.3' Moist PID Spoon = 2.5 HS = 84.0
	S-7	1 5			(FILL) Bottom of Boring = 10.0'; Auger refusal		Rec = 0.9' Wet PID Spoon = 26.0 HS = 85.0

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-18A

PROJECT	OAKLAND SUBSURFACE INVEST.				SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY				JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling				MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.				GROUND ELEV.	18.2
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CS			DATE STARTED	03/25/91
GROUNDWATER ELEV.		DIA.	2.5" OD			DATE FINISHED	03/25/91
MEASURING POINT		WEIGHT	140 #			DRILLER	Rich Crews
DATE OF MEASUREMENT		FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Moved rig approximately 7' ENE from SB-18. Auger down to 10.0' before collecting sample.		
2							Pid Background = 0.4, all readings in ppm.
4							
6							
8							

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-18A
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-1	2 2 3			Gn gr br mf (+) S, a$, t f G; soft, slight kerosene like odor		Rec = 1.0 Moist PID Spoon = 54 HS = 100
12	S-2	1 1 4			Same; some product layden water in top of spoon.		Rec = 0.9' Wet PID Spoon = 38 HS = 122
					Reached spoon-refusal at 13.0', put auger down, augered through to 14.0' in water table.	4.2	
14					Bottom of Boring Sealed boring with cement grout.	14.0	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-19

PROJECT	OAKLAND SUBSURFACE INVEST.					SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY					JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling					MEAS. PT. ELEV.	18.31
PURPOSE	Subsurface Soil Sampling-Monitoring Well Install.					GROUND ELEV.	18.7
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CS		HSA	DATE STARTED	03/26/91
GROUNDWATER ELEV.	9.15'	DIA.	2.5" OD		4 1/4" ID	DATE FINISHED	03/26/91
MEASURING POINT	Top of PVC	WEIGHT	140 #			DRILLER	Rich Crews
DATE OF MEASUREMENT	4/16/91	FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Had to move rig after first attempt encountered a concrete slab @ 1.0'; have drillers go to 3.0' to be sure we are not going to have refusal again.		
2							
	S-1	7 7 8	CH		Bk $&C l, mf s; very stiff; org (TIDAL MARSH)	14.9	Rec = 1.2' Dry PID Spoon = 7.6 HS = 14.5
4			ML		Br $ a, mf S; very stiff	3.8	
	S-2	7 13 20	ML/ SM		Br $ a, C (-) mf S; occ f G; very stiff Brown SILT and, coarse (-) to fine Sand.		Rec = 1.4' Dry PID Spoon = 6.5 HS = 12.5 Heavy Rain Starts
6					Same; coarsening downward to Br cmf (+) S, l $ at tip		
	S-3	5 10 17	SW		**Lab Analyzed 7.0'-7.5'**		Rec = 1.4' Dry PID Spoon = NA HS = 14.9
8					Due to health and safety concerns of operating cat head sampler in rain, number of samples collected from this boring were reduced (FLUVIAL)		
		3					

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-19
PROJECT OAKLAND SUBSURFACE INVEST.		SHEET 2 OF 2
CLIENT AMERICAN NATIONAL CAN COMPANY		JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-4	4 7	CH		Gr br S&C l (-) f S; very stiff; W.T. @ 10.5' Lab Analyzed 10.0-10.5' Gray brown SILT & CLAY little (-), fine Sand.		Rec = 1.5' Moist PID Spoon = NA HS = 13.4
12							
14							
16							
18							
					(FLUVIAL)	-0.1	
					Bottom of Boring	18.8	
					When extracted from the boring, the bottom 5-foot auger had a sheen of hydrocarbon like product over it. Installed Monitoring Well MW-13		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-20

PROJECT	OAKLAND SUBSURFACE INVEST.				SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY				JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling				MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling				GROUND ELEV.	16.8
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CS			DATE STARTED 03/26/91
GROUNDWATER ELEV.		DIA.	2.5" OD			DATE FINISHED 03/26/91
MEASURING POINT		WEIGHT	140 #			DRILLER Rich Crews
DATE OF MEASUREMENT		FALL	30"			INSPECTOR Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Concrete Cutting Co. cores through approximately 8" of concrete. Auger to 3.0' to be sure we are out of any footings.		PID Background = 0.4, all *readings in ppm*
2							
	S-1	6 12 13	ML/ SM		Br $ a, c (-) mf S; stiff; sm small blk inclusions <u>Brown SILT and. coarse (-) to fine Sand.</u>		Rec = 1.4' Dry PID Spoon = 5.5 HS = 16.5
4							
6					(FILL) Br cmf (+) S, l $, t f G; loose;	10.3	
	S-2	10 7 5			Gn gr cmf (+) S, s $; sm hydrocarbon like odor; mod stiff **<u>Lab Analyzed 6.5'-7.0'</u>**	6.5	Rec = 1.1' Dry PID Spoon = 10.0 HS = 16.4 (6.0'-6.5')
8			SW/ SM		<u>Green gray coarse to fine (+) SAND, some Silt.</u> (FLUVIAL)		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-20
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
12	S-3	6 12 17	SW/ SM		Lab Analyzed 11.5'-12.0' Rd br cmf S, s $; t f G; mod stiff, odor Red brown coarse to fine SAND, some Silt, trace fine Gravel. (FLUVIAL)	4.3	Rec = 1.4' Wet PID Spoon = 10.0 HS = 440.0
					Bottom of Boring Auger to 11.0' Backfill boring to 9.0 with bentonite chips and then grout to surface.	12.5	

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-21

PROJECT	OAKLAND SUBSURFACE INVEST.				SHEET 1 OF 2	
CLIENT	AMERICAN NATIONAL CAN COMPANY				JOB No.	02345-01983
DRILLING CONTRACTOR	Exceltech Drilling				MEAS. PT. ELEV.	
PURPOSE	Subsurface Soil Sampling				GROUND ELEV.	17.1
DRILLING METHOD	Hollow Stem Auger		SAMPLE	CORE	CASING	DATUM	Grade
DRILL RIG TYPE	Dietrich D-25	TYPE	CS			DATE STARTED	03/26/91
GROUNDWATER ELEV.		DIA.	2.5" OD			DATE FINISHED	03/26/91
MEASURING POINT		WEIGHT	140 #			DRILLER	Rich Crews
DATE OF MEASUREMENT		FALL	30"			INSPECTOR	Walter Howard

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
					Auger to 3.0' before collecting first sample.		PID Background = 0.4, all readings in ppm
2							
	S-1	4 5 5	SM		Br cmf S, a Cy$, t f G; sm blk inclusions, mod stiff		Rec = 1.0' Dry PID Spoon = 6.5 HS = 10.0
4							
6	S-2	7 8 9	SM		Br cmf (+) S, a $, t f G; mod stiff, no odor **<u>Lab Analyzed 6.5'-7.0'</u>**		Rec = 1.5' Moist PID Spoon = 6.0 HS = 12.5
8					(FILL)	8.6	
						8.5	
					(FLUVIAL)		

Dunn Geoscience Corporation Albany, NY 12205 (518)458-1313	TEST BORING LOG	BORING No. SB-21
PROJECT	OAKLAND SUBSURFACE INVEST.	SHEET 2 OF 2
CLIENT	AMERICAN NATIONAL CAN COMPANY	JOB No. 02345-01983

DEPTH FT.	INTERVAL, RECOVERY, SAMPLE NUMBER	BLOWS ON SAMPLE SPOON PER 6"	UNIFIED CLASSI-FICATION	GRAPHIC LOG	GEOLOGIC DESCRIPTION	ELEV. / DEPTH	REMARKS
	S-3	10 18 24	SM/ SW		Br cmf S, l + $, tf G; sm odor		Rec = PID Spoon = 8.6 HS = 350.0
					(FLUVIAL)	5.6	
					Bottom of Boring Auger to 10.0' Backfill boring 5.0' with bentonite chips and then to the surface with cement grout.	11.5	

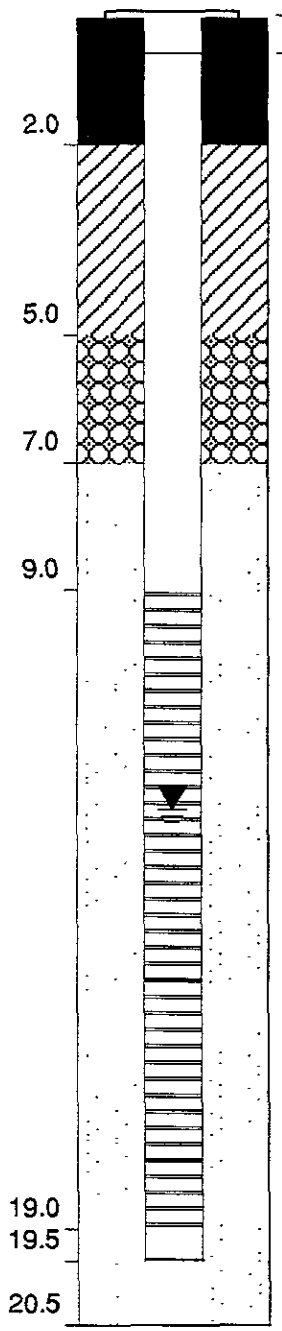
MONITORING WELL LOG

WELL NO. MW-1

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/11/91 to 03/12/91
Date Developed 3/23/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 3.71' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 19.5'
Total Depth of Boring 20.5'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 0.0'-20.5' Continuous

Riser Pipe Left in Place
Material Sch. 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 9.0'

Screen
Material Sch. 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 7 Bags Interval 7.0'-20.0'

Seal(s)
Type Bentonite Pellets Interval 5.0'-7.0'
Type Cement Grout Interval 2.0'-5.0'
Type Interval

Locking Casing YES

Notes: Augered to 20.0', sampled to 20.0'. Used 1.5 pails of pellets, 3 bags of concrete and 2 bags of cement.

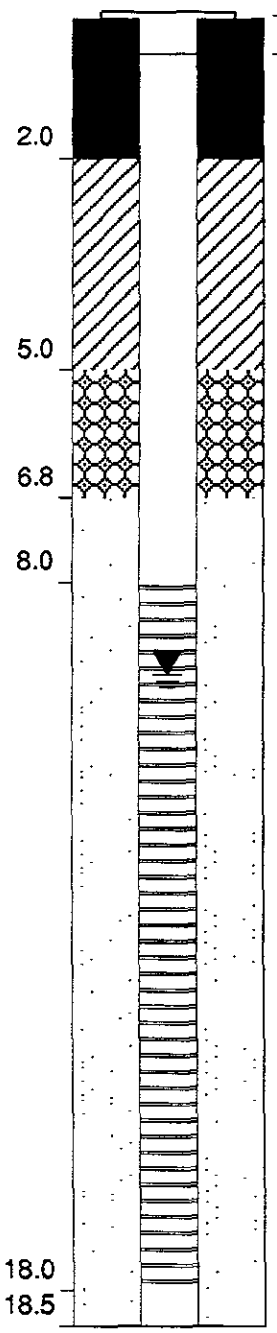
MONITORING WELL LOG

WELL NO. MW-2

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/13/91 to 03/14/91
Date Developed 3/27/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor 0Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 5.91' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 18.5'
Total Depth of Boring 18.5'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-17.5'(continuous)

Riser Pipe Left in Place
Material Sch. 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 8.0'

Screen
Material Sch. 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6 Bags Interval 6.8'-18.5'

Seal(s)
Type Bentonite Pellets Interval 5.0'-6.8'
Type Cement Grout Interval 2.0'-5.0'
Type Interval

Locking Casing YES

Notes: Augered to 18.5', sampled to 17.5'. Used 1.5 pails of pellets, 2 bags of cement and 2.5 bags of concrete.

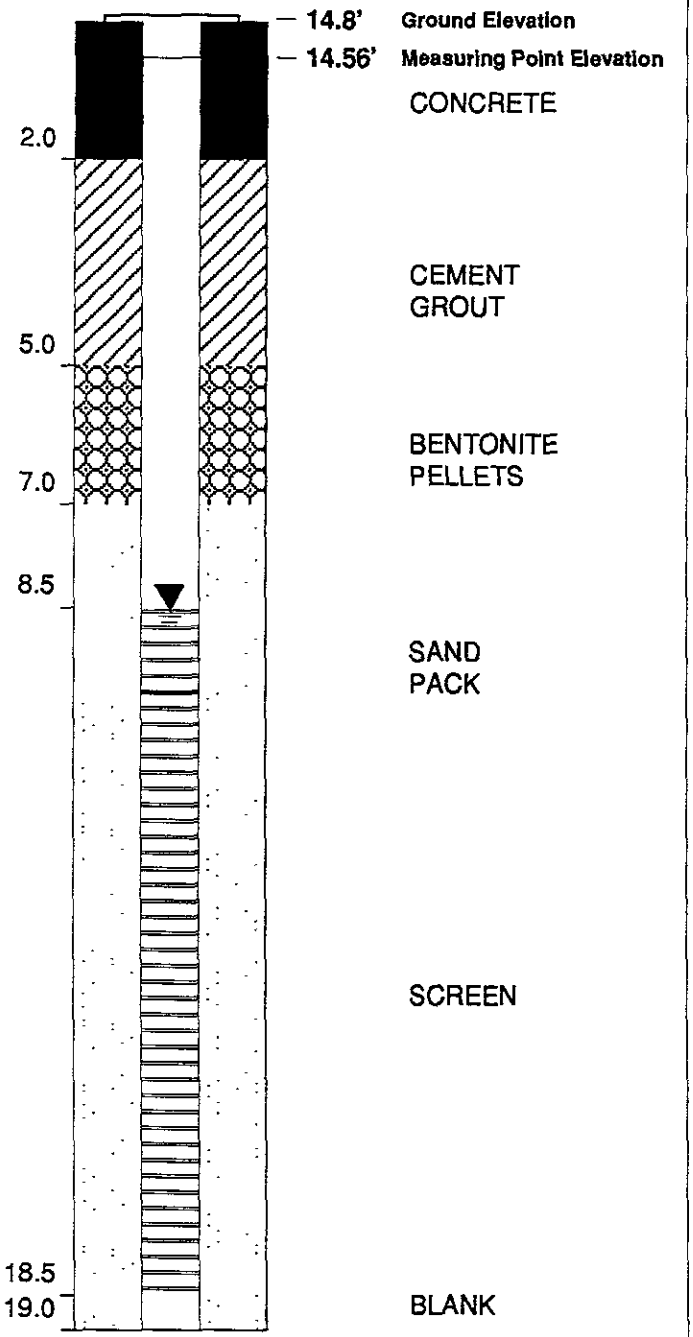
MONITORING WELL LOG

WELL NO. MW-3

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/14/91 to 03/14/91
Date Developed 3/27/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 6.29' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 19.0'
Total Depth of Boring 19.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-19.0' (continuous)

Riser Pipe Left in Place
Material Sch. 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 8.5'

Screen
Material Sch. 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6 Bags Interval 7.0'-19.0'

Seal(s)
Type Bentonite Pellets Interval 5.0'-7.0'
Type Cement Grout Interval 2.0'-5.0'
Type Interval

Locking Casing YES

Notes: Augered to 19.0'. Used 1.5 pails of pellets, 2 bags of cement, and 2.5 bags of concrete.

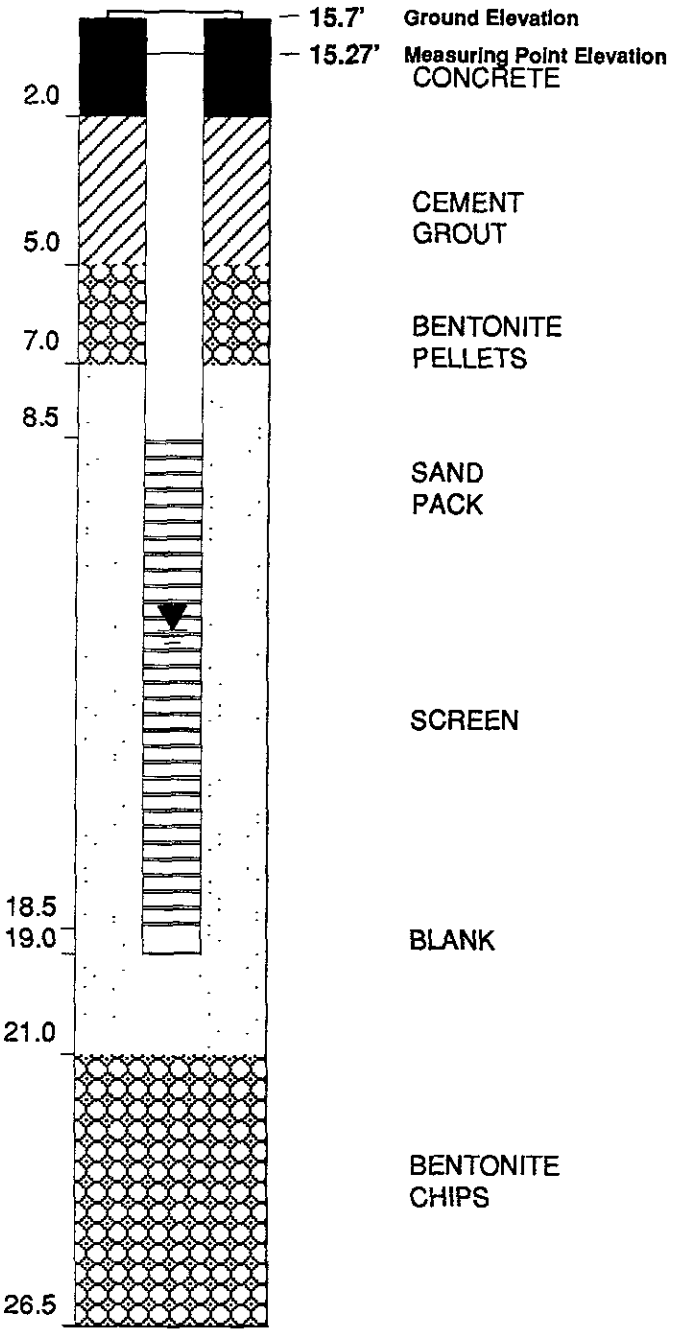
MONITORING WELL LOG

WELL NO. MW-4

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/15/91 to 03/15/91
Date Developed 3/23/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 3.27' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 19.0"
Total Depth of Boring 26.5'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-20.0', 25.0'-26.5'

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 8.5"

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0"
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 7 Bags Interval 7.0'-21.0'

Seal(s)
Type Bentonite Chips Interval 21.0'-26.5'
Type Bentonite Pellets Interval 5.0'-7.0'
Type Cement Grout Interval 2.0'-5.0'
Locking Casing YES

Notes: Augered to 22.5', sampled to 26.5'. Used 1.5 pails of bentonite pellets, 2.5 bags bentonite chips, 2 bags of cement and 2.5 bags of concrete. 2 Shelby Tubes: 20.0'-25.0'.

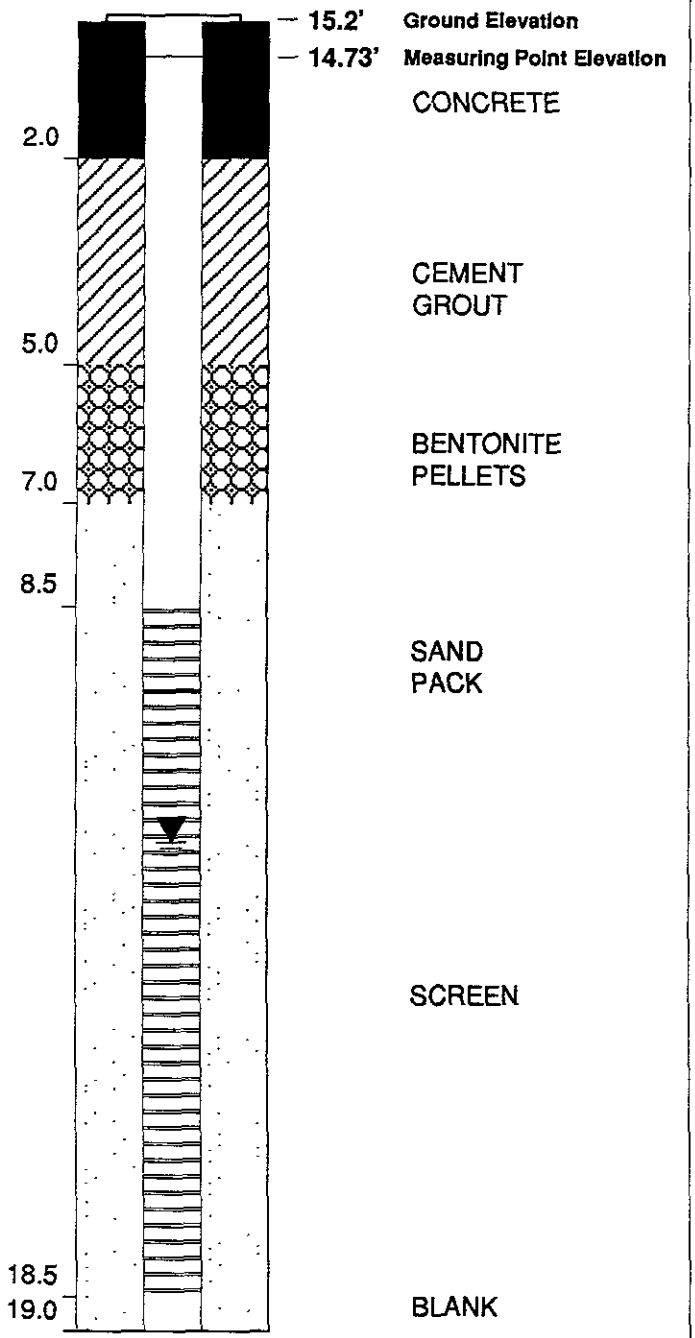
MONITORING WELL LOG

WELL NO. MW-5

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/15/91 to 03/16/91
Date Developed 3/23/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 3.23' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 19.0'
Total Depth of Boring 19.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-18.5' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 8.5"

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0"
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6 Bags Interval 7.0'-19.0'

Seal(s)
Type Bentonite Pellets Interval 5.0'-7.0'
Type Cement Grout Interval 2.0'-5.0"
Type Interval

Locking Casing YES

Notes: Augered to 19.0'. Used 1.5 pails of bentonite pellets, 2 bags of cement, and 2.5 bags of concrete. Water level elevation denotes top of product. Actual data level elevation is 2.94'.

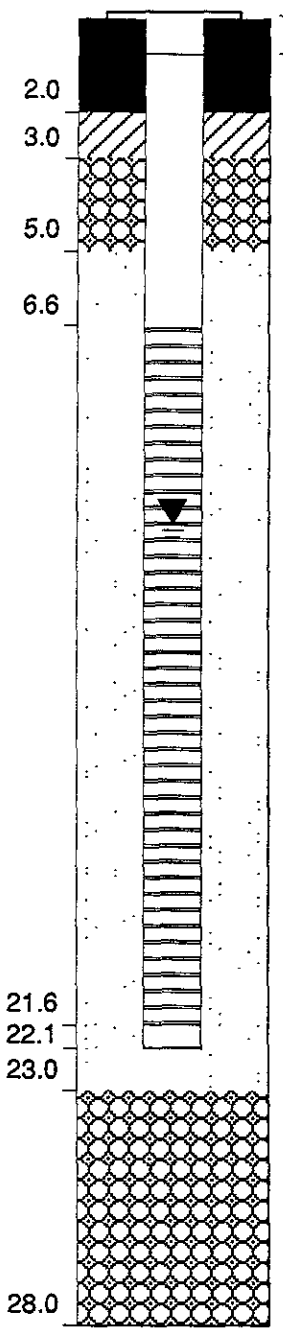
MONITORING WELL LOG

WELL NO. MW-6

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/16/91 to 03/18/91
Date Developed 3/24/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 2.88' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 22.1'
Total Depth of Boring 28.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-25.5' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 6.6'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 15.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 10 Bags Interval 5.0'-23.0'

Seal(s)
Type Bentonite Pellets Interval 23.0'-25.5'
Type Bentonite Pellets Interval 3.0'-5.0'
Type Cement Grout Interval 2.0'-3.0'
Locking Casing YES

Notes: Augered to 25.5'. Used 1.75 pails of bentonite pellets, 1 bag of cement, and 2 bags of concrete. Shelby Tube: 25.5'-28.0'.

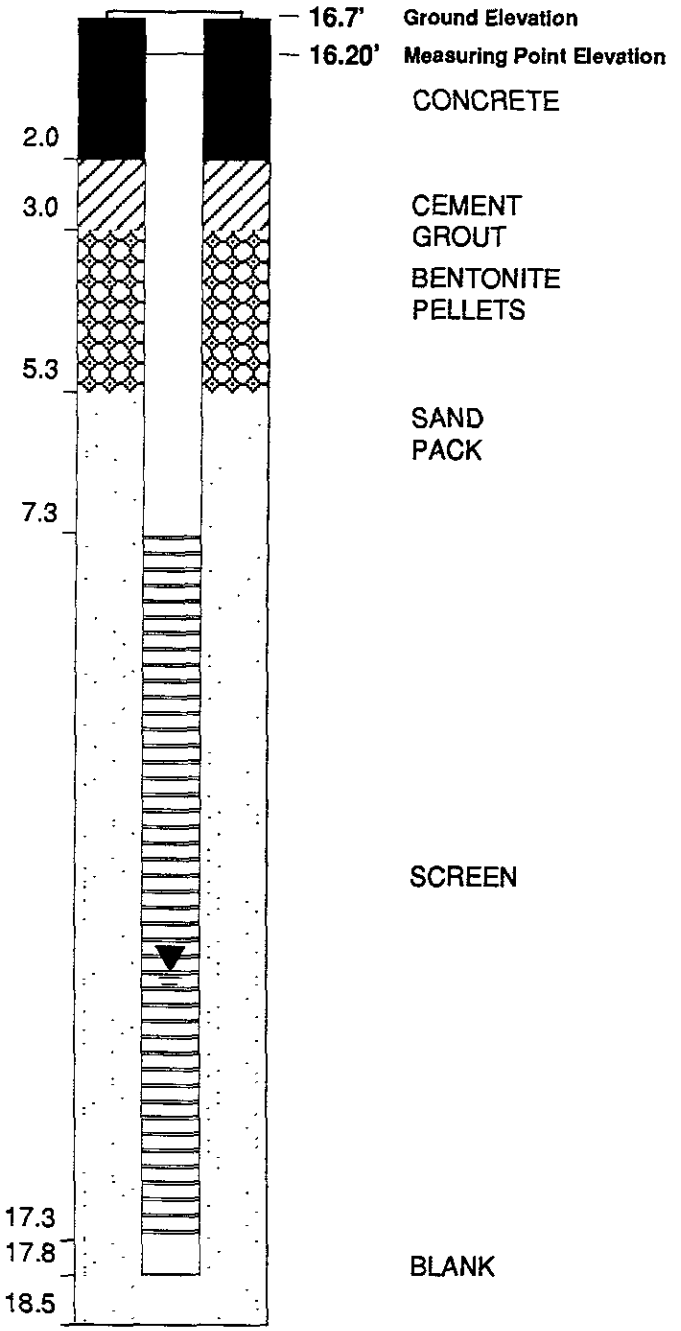
MONITORING WELL LOG

WELL NO. MW-7

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/18/91 to 03/18/91
Date Developed 3/25/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 3.16' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 17.8'
Total Depth of Boring 18.5'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-18.5' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 7.3'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 7 Bags Interval 5.3'-18.5'

Seal(s)
Type Bentonite Pellets Interval 3.0'-5.3'
Type Cement Grout Interval 2.0'-3.0'
Type Interval

Locking Casing YES

Notes: Used 1.5 pails of bentonite pellets, 1 bag of cement, and 2 bags of concrete.

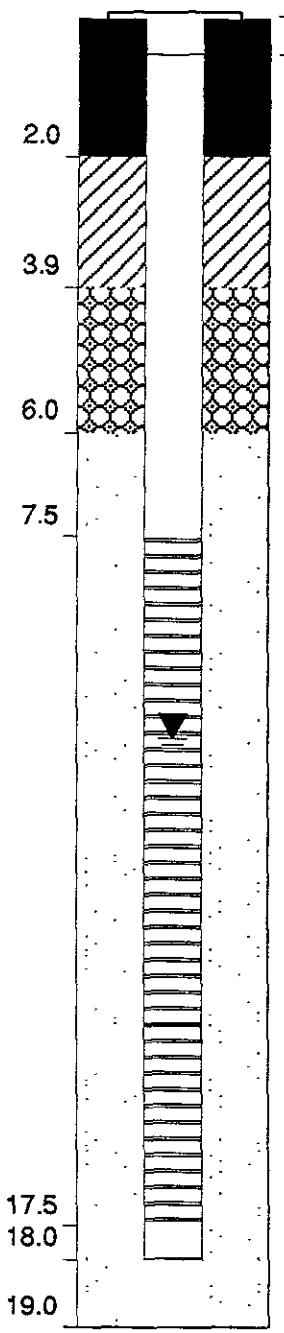
MONITORING WELL LOG

WELL NO. MW-8

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/19/91 to 03/19/91
Date Developed 3/24/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 2.83' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 18.0'
Total Depth of Boring 19.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-19.0' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 7.5'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6.5 Bags Interval 6.0'-19.0'

Seal(s)
Type Bentonite Pellets Interval 3.9'-6.0'
Type Cement Grout Interval 2.0'-3.9'
Type Interval

Locking Casing YES

Notes: Augered to 18.0'. Used 1.5 pails of bentonite pellets, 1.5 bags of cement, and 1.5 bags of concrete.

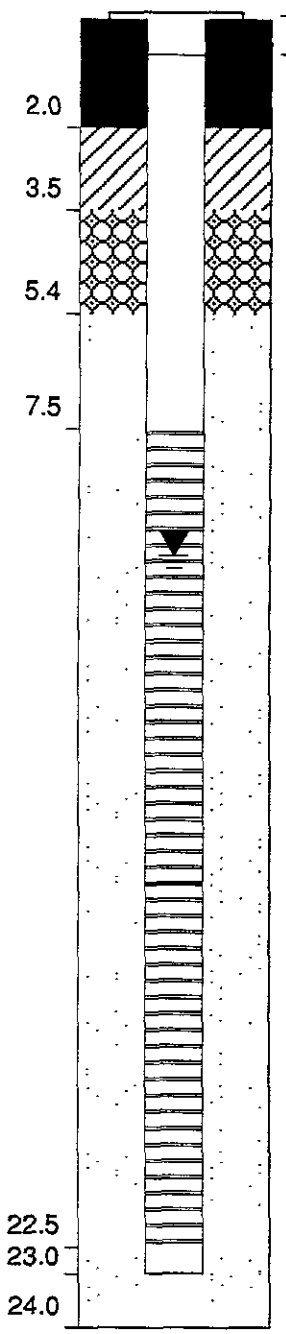
MONITORING WELL LOG

WELL NO. MW-9

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/19/91 to 03/20/91
Date Developed 3/24/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 2.24' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 23.0'
Total Depth of Boring 24.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.0'-24.0' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 7.0'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 15.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 9 Bags Interval 5.4'-24.0'

Seal(s)
Type Bentonite Pellets Interval 3.5'-5.4'
Type Cement Grout Interval 2.0'-3.5'
Type Interval

Locking Casing YES

Notes: Augered to 23.0'. Used 1.5 pails of bentonite pellets, 2 bags of cement, and 2 bags of cement.

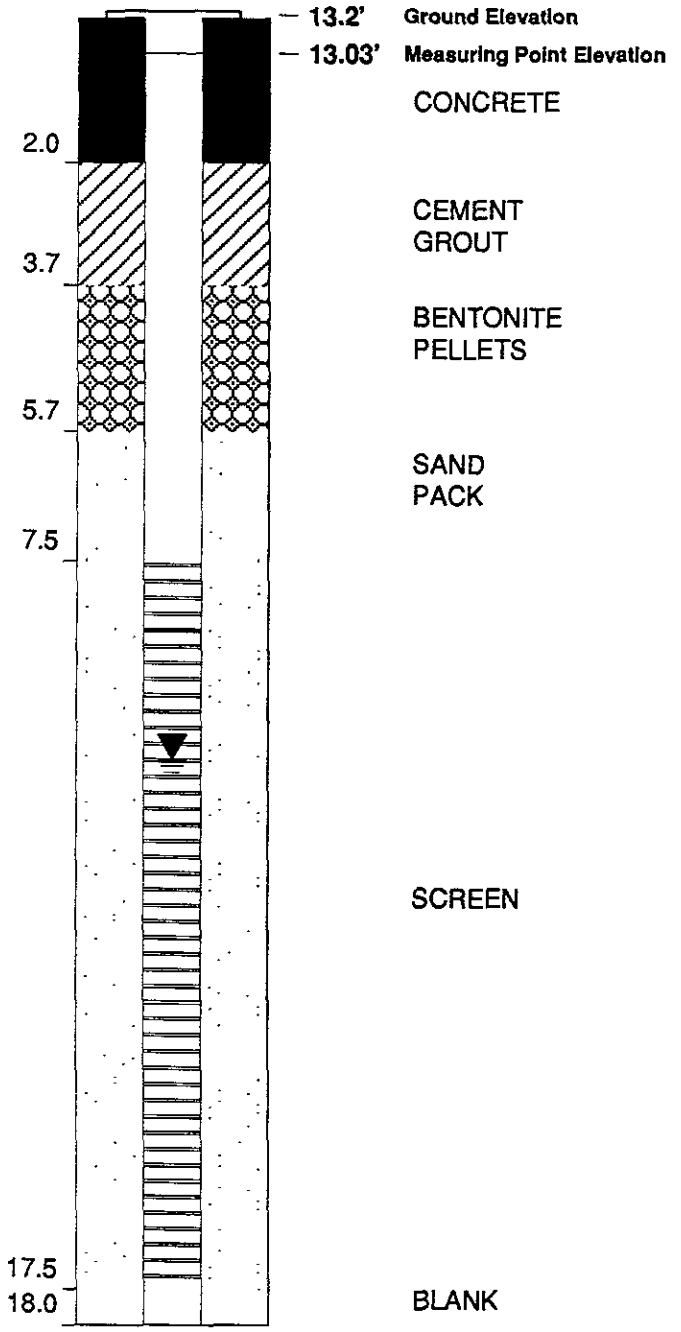
MONITORING WELL LOG

WELL NO. MW-10

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/20/91 to 03/20/91
Date Developed 3/24/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 3.03' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 18.0'
Total Depth of Boring 18.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 2.0'-18.0' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 7.0'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6.5 Bags Interval 5.7'-18.0'

Seal(s)
Type Bentonite Pellets Interval 3.7'-5.7'
Type Cement Grout Interval 2.0'-3.7'
Type Interval

Locking Casing YES

Notes: Augered to 18.0'. Used 1.5 pails of bentonite pellets, 1.5 bags of cement, and 2 bags of concrete.

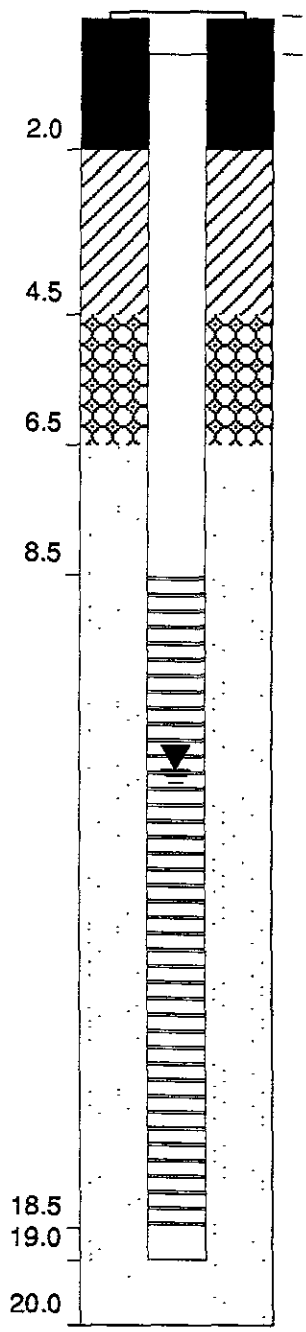
MONITORING WELL LOG

WELL NO. MW-11

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/21/91 to 03/21/91
Date Developed 3/25/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 3.62' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 19.0'
Total Depth of Boring 20.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.5'-20.0' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 8.5'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6.5 Bags Interval 6.5'-20.0'

Seal(s)
Type Bentonite Pellets Interval 4.5'-6.5'
Type Cement Grout Interval 2.0'-4.5'
Type Interval

Locking Casing YES

Notes: Auger to 19.0'. Used 1.5 pails of bentonite pellets, 2 bags of cement, and 1.5 bags of concrete.

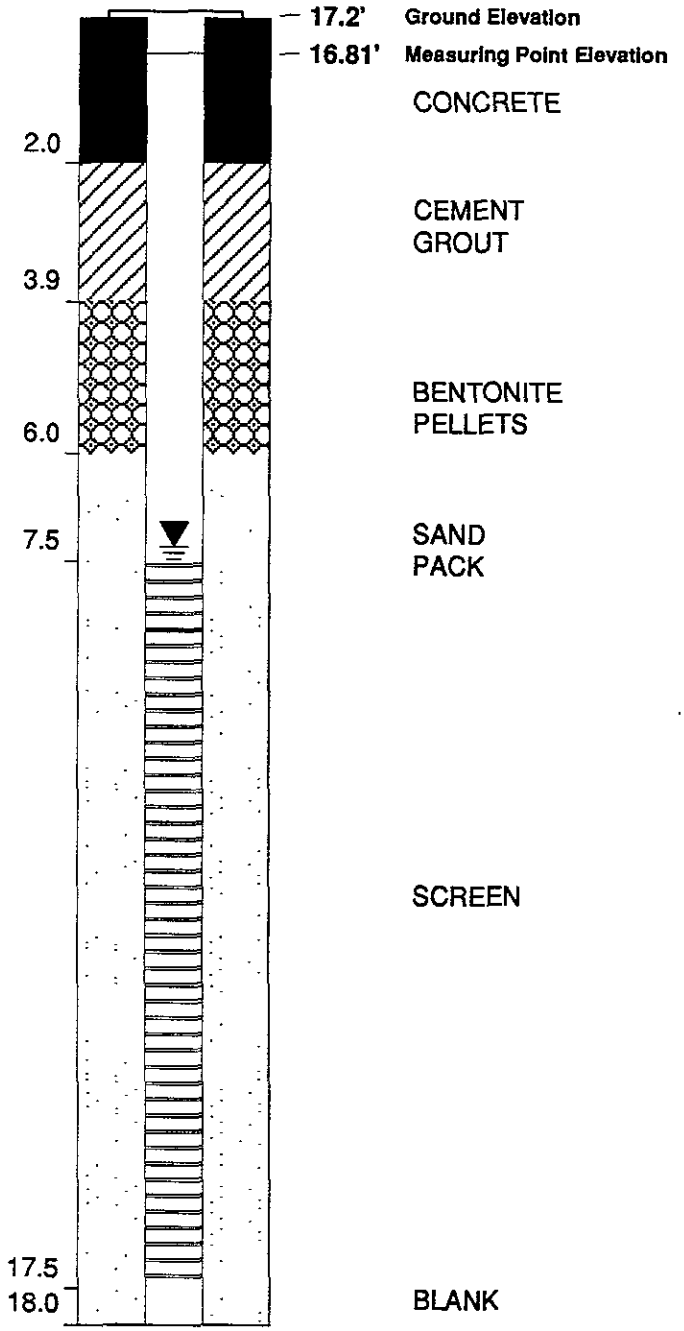
MONITORING WELL LOG

WELL NO. MW-12

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/21/91 to 03/21/91
Date Developed 3/26/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 9.88' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 18.'
Total Depth of Boring 18.0'

Drilling Method
Type Hollow Stem Auger Diameter 6 5/8" ID
Casing HSA

Sampling Method
Type CS/SS Diameter 2.5"/2" OD
Weight 140 # Fall 30"
Interval 1.5'-17.5' (continuous)

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 4" ID
Joint Type Flush Threaded Length 7.5'

Screen
Material Sch 40 PVC Diameter 4" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 6.5 Bags Interval 6.0'-18.0'

Seal(s)
Type Bentonite Pellets Interval 3.9'-6.0'
Type Cement Grout Interval 2.0'-3.9'
Type Interval

Locking Casing YES

Notes: Augered to 18.0'. Used 1.5 pails of bentonite pellets, 1.5 bags of cement, and 1.5 bags of concrete.

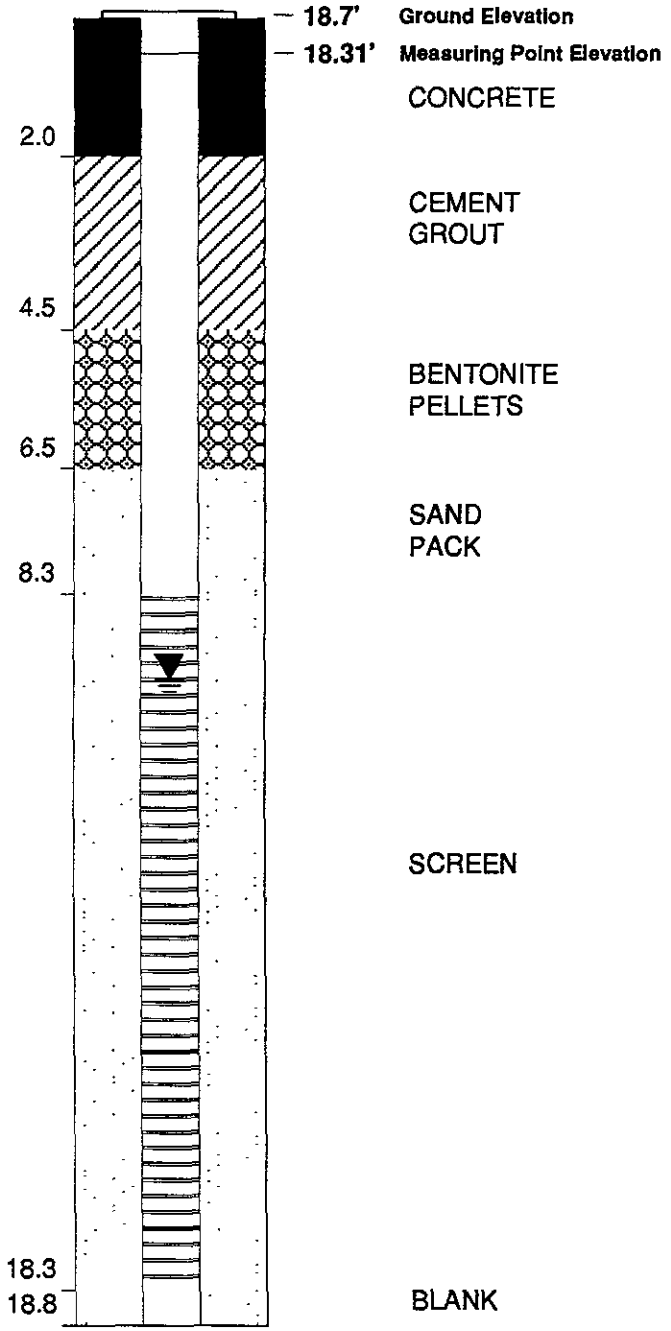
MONITORING WELL LOG

WELL NO. MW-13

DUNN GEOSCIENCE CORPORATION
ALBANY, NY 12205
(518) 458-1313

Project OAKLAND SUBSURFACE INVEST.
Client AMERICAN NATIONAL CAN COMPANY
Location OAKLAND, CA PLANT
Project No. 02345-01983
Date Drilled 03/26/91 to 03/26/91
Date Developed 3/27/91

WELL CONSTRUCTION DETAIL



INSPECTION NOTES

Inspector Walter Howard
Drilling Contractor Exceltech Drilling

Type of Well Groundwater Monitoring
Static Water Level Elev. 9.15' Date 4/16/91
Measuring Point (M.P.) Top of PVC
Total Depth of Well 18.8'
Total Depth of Boring 18.8'

Drilling Method
Type Hollow Stem Auger Diameter 4 1/4" ID
Casing HSA

Sampling Method
Type CS Diameter 2.5" OD
Weight 140 # Fall 30"
Interval 3.0'-7.5', 9.5'-11.0'

Riser Pipe Left in Place
Material Sch 40 PVC Diameter 2" ID
Joint Type Flush Threaded Length 8.3'

Screen
Material Sch 40 PVC Diameter 2" ID
Slot Size 0.020" Length 10.0'
Strat. Unit Screened

Filter Pack
Sand X Gravel Natural
Grade LONESTAR #2/12
Amount 4 Bags Interval 6.5'-18.8'

Seal(s)
Type Bentonite Pellets Interval 4.5'-6.5'
Type Cement Grout Interval 2.0'-4.5'
Type Interval

Locking Casing YES

Notes: Flush mount protective casing. Used 1.5 pails of bentonite pellets, 1 bag of cement, and 1.5 bags concrete.

APPENDIX B

LABORATORY GEOTECHNICAL RESULTS

Summary of Laboratory Testing

	SB-1 (S-1) 19-21 Feet	SB-5 (S-2) 22.5-25 Feet	SB-7 (ST-1) 25.5-28 Feet
Natural moisture content, %	16.9 - 18.0 ave. 17.5	25.0 - 30.1 ave. 27.1	19.7 - 22.0 ave. 21.2
Specific gravity	2.65	2.64	2.63
Atterberg limits			
Plastic limit, %	13.7	15.2	15
Liquid limit, %	42	59	38
Plasticity index, %	28.3	43.8	23
Passing #200 sieve, %	37.1	50.1	55.6
Unified classification	SC	CH	CL
Permeability			
k, cm/sec	4×10^{-8}	2.7×10^{-7}	2×10^{-8}
e_L, psi	8.0	8.5	9.0
Initial conditions			
moisture content, %	18.0	25.1	20.9
dry unit weight, pcf	108.7	96.3	106.4
saturation, %	92	93	100

Dunn Geoscience Laboratory

12 Metro Park Road • Albany, NY 12205 518-458-1313

PERMEABILITY TEST DATA

Lab Number/Project Number:	3-91-9/2345-01983
Client:	American National Can Corporation
Sample ID/Location:	SB-1, S-1, 19.0 - 21.0 ft. Oakland Site Evaluation
Sample Description:	Brown coarse to fine SAND, some (+) Silty CLAY, little fine Gravel.
Sample Type:	Shelby tube.
Test By:	REF
Date Received:	03/15/91
Date Tested:	03/19/91
Date Reported:	04/01/91
Reviewed By:	
Test Description:	Constant Head Flexible Membrane (Triaxial) Permeability
Test Specification:	US Army Corps of Engineers, EM 1110-2-1906 Appendix VII

Results:

Initial Specimen Properties		Specimen Dimensions		Test Conditions	
Water Content =	18.0%	Height =	8.0 cm	Back Pressure =	45.0 psi
Wet Unit Weight =	128.3 lb/ft^3	Weight =	684.19 gm	Ave. Confining Pressure =	8.0 psi
Dry Unit Weight =	108.7 lb/ft^3	Diameter =	7.28 cm	Pressure Gradient =	2.0 psi

Permeability = 4×10^{-8} cm/sec.

Note: Test Samples are retained for 30 days after submission and then discarded, unless other arrangements are made.

Dunn Geoscience Laboratory

12 Metro Park Road Albany NY 12205 518.458-1313

PERMEABILITY TEST DATA

Lab Number/Project Number:	3-91-10/2345-01983
Client:	American National Can Corporation
Sample ID/Location:	SB-5, S-2, 22.5 - 25.0 Ft. Oakland Site Evaluation
Sample Description:	Gray Brown CLAY and (+), coarse (-) to fine (+) Sand.
Sample Type:	Shelby tube.
Test By:	REF
Date Received:	03/18/91
Date Tested:	03/19/91
Date Reported:	04/01/91
Reviewed By:	
Test Description:	Constant Head Flexible Membrane (Triaxial) Permeability
Test Specification:	US Army Corps of Engineers, EM 1110-2-1906 Appendix VII

Results:

Initial Specimen Properties	Specimen Dimensions	Test Conditions
Water Content = 25.1%	Height = 7.8 cm	Back Pressure = 45.0 psi
Wet Unit Weight= 120.5 lb/ft^3	Weight = 630.18 gm	Ave. Confining Pressure = 8.5 psi
Dry Unit Weight = 96.3 lb/ft^3	Diameter = 7.3 cm	Pressure Gradient = 2.0 psi

Permeability = 2.7×10^{-7} cm/sec.

Note: Test Samples are retained for 30 days after submission and then discarded, unless other arrangements are made.

Dunn Geoscience Laboratory

12 Metro Park Road Albany NY 12205 518/458-1313

PERMEABILITY TEST DATA

Lab Number/ Project Number:	3-91-11/2345-01983
Client:	American National Can Corporation
Sample ID/Location:	SB-7, St-1, 25.5 - 28.0 Ft. Oakland Site Evaluation
Sample Description:	Gray Brown Silty CLAY and, coarse (-) to fine (+) Sand, trace fine Gravel.
Sample Type:	Shelby tube.
Test By:	REF
Date Received:	03/19/91
Date Tested:	03/19/91
Date Reported:	04/01/91
Reviewed By:	
Test Description:	Constant Head Flexible Membrane (Triaxial) Permeability
Test Specification:	US Army Corps of Engineers, EM 1110-2-1906 Appendix VII

Results:

Initial Specimen Properties	Specimen Dimensions	Test Conditions
Water Content = 20.9%	Height = 10.2 cm	Back Pressure = 45.0 psi
Wet Unit Weight= 128.7 lb/ft^3	Weight = 884.99 gm	Ave. Confining Pressure= 9.0 psi
Dry Unit Weight = 106.4 lb/ft^3	Diameter = 7.32 cm	Pressure Gradient = 2.0 psi

Permeability = 2×10^{-8} cm/sec.

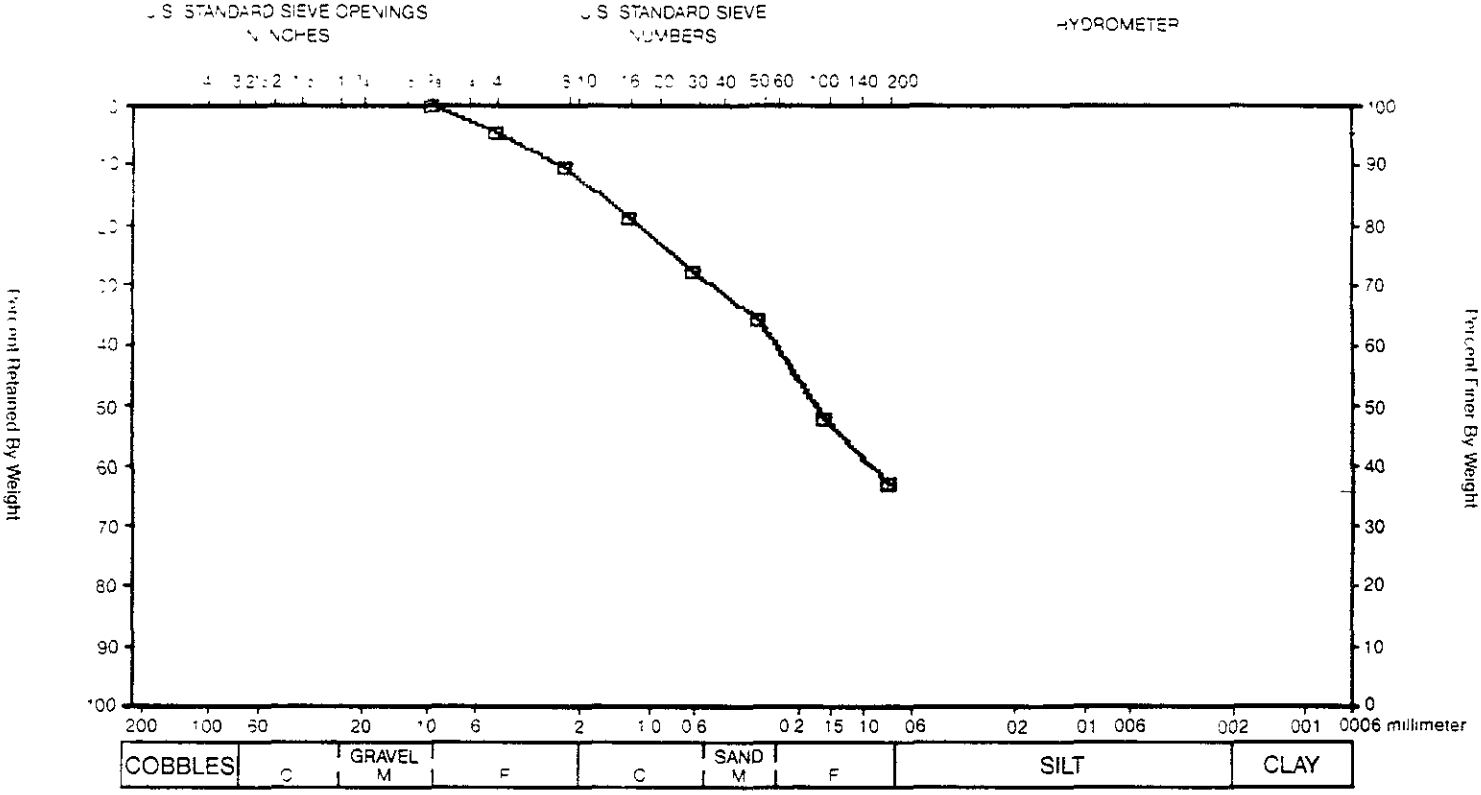
Note: Test Samples are retained for 30 days after submission and then discarded, unless other arrangements are made.

Dunn Geoscience Laboratory

12 Metro Park Road Albany NY 12205 518 458-1313

CLIENT: AMERICAN NATIONAL CAN CORPORATION
LAB NUMBER: 3-91-9/2345-01983 DATE RECEIVED: 03/15/91
TEST BY: REF DATE TESTED: 03/22/91
REVIEWED BY: DATE REPORTED: 03/22/91
SAMPLE DESCR: OAKLAND SITE EVALUATION SB-1, S-1G, 19-21 FT.

GRAIN SIZE DISTRIBUTION



COARSE

SIZE (inches)	PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECS
3/8	0.00	100.00	

FINE

SIEVE	PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECS.
4	4.24	95.76	
8	5.87	89.89	
16	8.56	81.33	
30	8.76	72.57	
50	8.35	64.23	
100	16.39	47.84	
200	10.70	37.14	

HYDROMETER

PARTICLE DIAMETER (mm)	PERCENT PASSING	SPECS

Pan = 37.14%
Wash Loss = 34.86%

SPECIFICATION: ASTM C 136/ASTM C 117
TEST STANDARD:
NOTES:

M% = 17.3, LL = 42.0, PL = 13.7, PI = 28.3
SPECIFIC GRAVITY AS TESTED = 2.65

Test Samples are retained for 30 days after submission and then discarded, unless other arrangements are made.

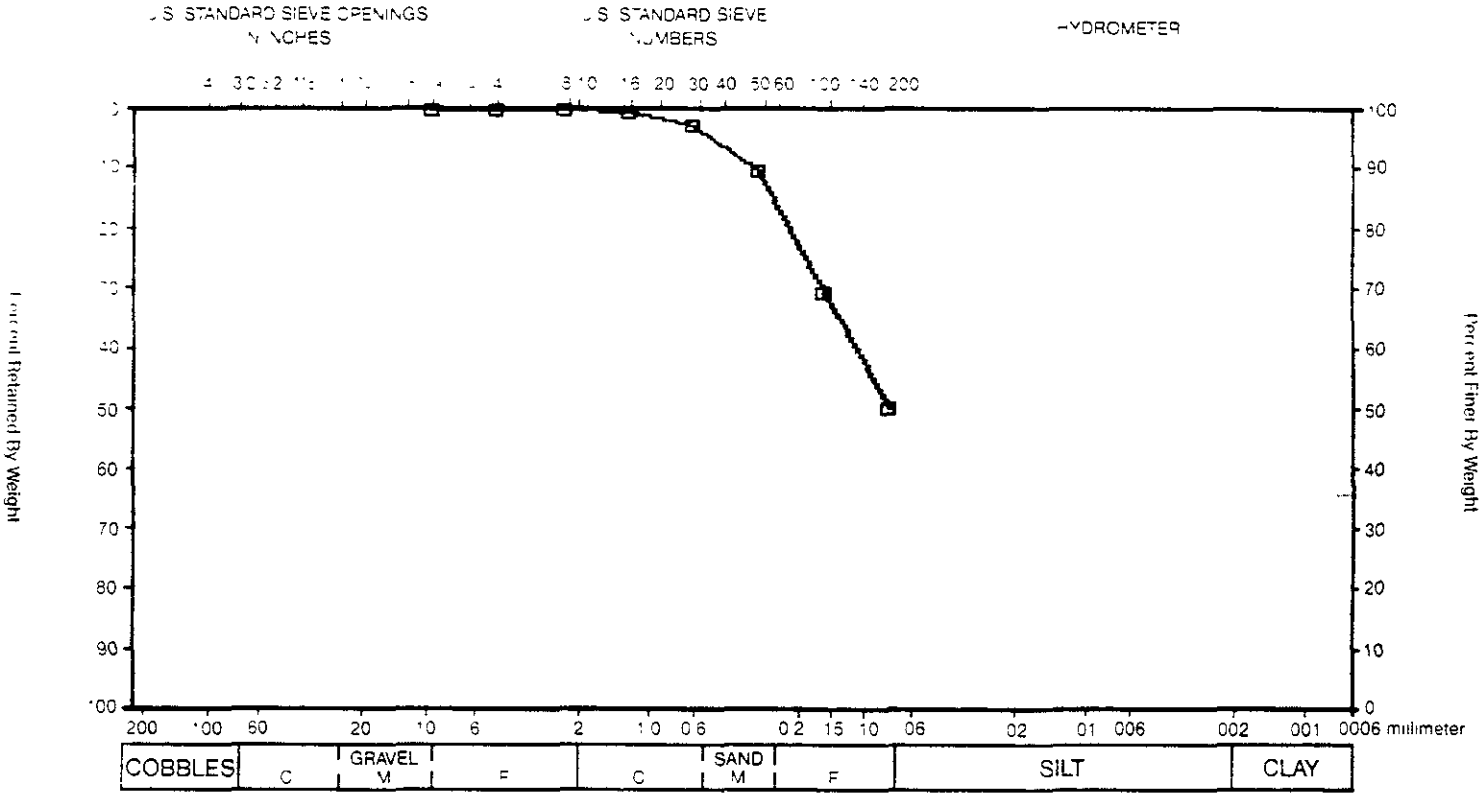
WH

Dunn Geoscience Laboratory

12 Metro Park Road, Albany, NY 12205 (518) 458-1313

CLIENT: AMERICAN NATIONAL CAN CORPORATION
LAB NUMBER: 3-91-10/2345-01983 DATE RECEIVED: 03/18/91
TEST BY: REF DATE TESTED: 03/22/91
REVIEWED BY: DATE REPORTED: 03/22/91
SAMPLE DESCR: OAKLAND SITE EVALUATION SB-5, S-2F, 22.5-25.0 FT.

GRAIN SIZE DISTRIBUTION



COARSE

SIZE (inches)	PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECS
3/8	0.00	100.00	

FINE

SIEVE	PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECS
4	0.00	100.00	
8	0.14	99.86	
16	0.37	99.49	
30	2.05	97.45	
50	7.63	89.82	
100	20.39	69.42	
200	19.29	50.14	

HYDROMETER

PARTICLE DIAMETER (mm)	PERCENT PASSING	SPECS

Pan = 50.14%
Wash Loss = 44.91%

SPECIFICATION: ASTM C 136/ASTM C 117
TEST STANDARD:
NOTES:

M% = 26.9, LL = 59.0, PL = 15.2, PI = 43.8
SPECIFIC GRAVITY AS TESTED = 2.64

Test Samples are retained for 30 days after submission and then discarded, unless other arrangements are made.

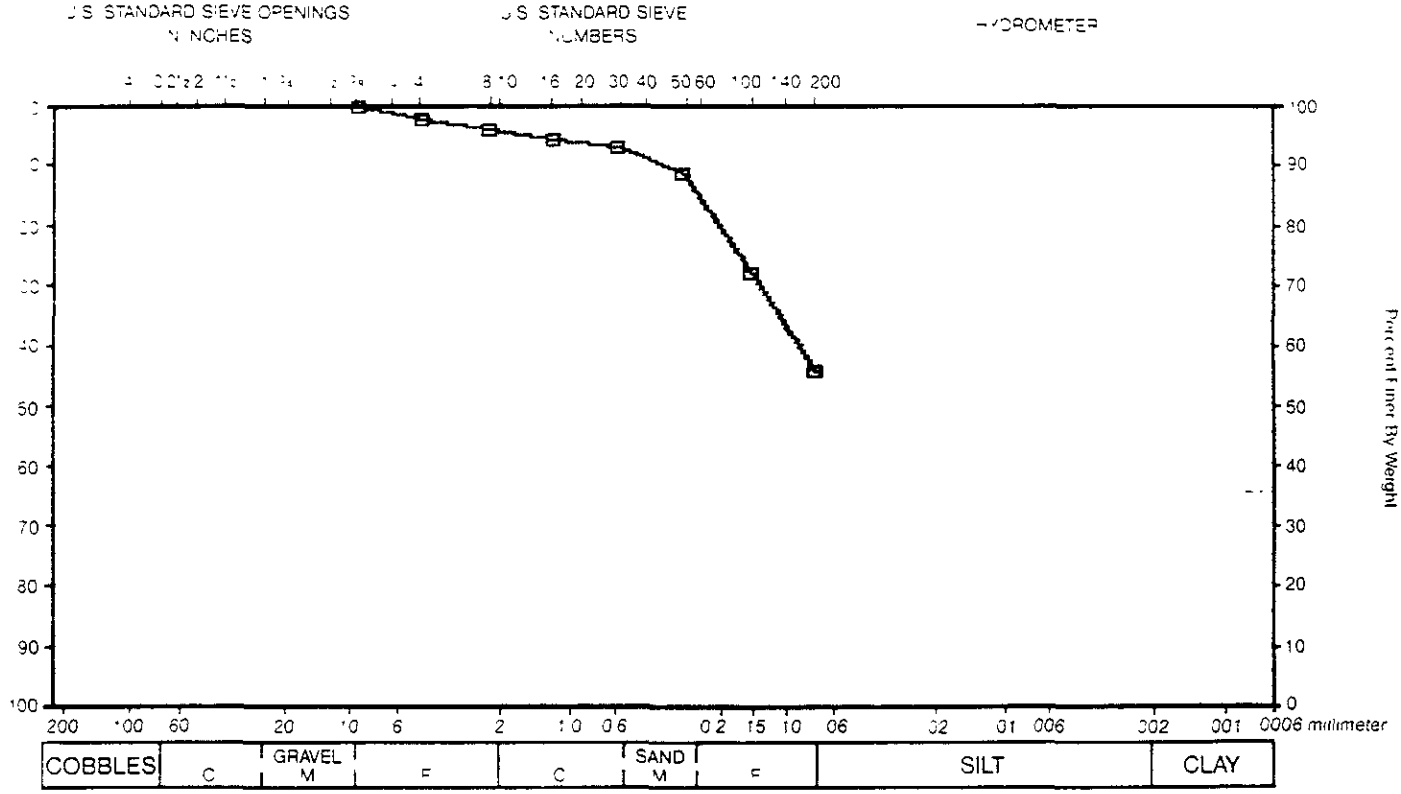
WH

Dunn Geoscience Laboratory

12 Metro Park Road Albany NY 12205 518 458-1313

CLIENT: AMERICAN NATIONAL CAN CORPORATION
LAB NUMBER: 3-91-11/2345-01983 DATE RECEIVED: 03/19/91
TEST BY: REF DATE TESTED: 03/22/91
REVIEWED BY: DATE REPORTED: 03/22/91
SAMPLE DESCR: OAKLAND SITE EVALUATION SB-7, ST-1B, 25.5-28.0 FT.

GRAIN SIZE DISTRIBUTION



COARSE

SIZE (inches)	PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECS
3/8	0.00	100.00	

FINE

SIEVE	PERCENT RETAINED	CUMULATIVE PERCENT PASSING	SPECS
4	2.44	97.56	
8	1.70	95.87	
16	1.44	94.43	
30	1.76	92.67	
50	4.24	88.43	
100	16.41	72.03	
200	16.45	55.57	

HYDROMETER

PARTICLE DIAMETER (mm)	PERCENT PASSING	SPECS

Pan = 55.57%
Wash Loss = 52.68%

SPECIFICATION: ASTM C 136/AST, C 117
TEST STANDARD:
NOTES:

M% = 21.5, LL = 38.0, PL = 15.0, PI = 23.0
SPECIFIC GRAVITY AS TESTED = 2.63

Test Samples are retained for 30 days after submission and then discarded, unless other arrangements are made.

WH