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WORK PLAN
FOR
SUBSURFACE ENVIRONMENTAL INVESTIGATION
CHEVRON SERVICE STATION 9-8341
3530 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Prepared for:

Chevron U.S.A. Products Company

Canonie Environmental Services Corp.
7901 Stoneridge Drive, Suite 100
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CanonieEnvironmental

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1.0 INTRODUCTION

Chevron U.S.A. Products Company (Chevron) requested that Canonie Environmental Services Corp. (Canonie), formerly RESNA Industries, Inc. (RESNA) which was purchased by Canonie on January 13, 1995, prepare this work plan to evaluate soil and groundwater conditions beneath the subject site.

2.0 SITE DESCRIPTION

This site is occupied by an active Chevron service station located in a mixed residential and commercial zone on the corner of Magee Avenue and MacArthur Boulevard in Oakland, California (Figure 1). The site is located at an elevation of approximately 210 feet above mean sea level in a gently sloping area of the City of Oakland. Interstate Route 580 is located about 0.2 miles southwest of the site, and the Brooklyn Basin Tidal Canal, which connects with San Francisco Bay, is located approximately 2-1/2 miles southwest of the site.

On May 19, 1994 a 1,000-gallon used oil tank was removed from the site by Touchstone Developments. No holes or leaks were noted in the fiberglass tank and verification soil and groundwater samples from the excavation did not detect the presence of any used-oil related compounds (Touchstone Developments June 28, 1994).

3.0 PROPOSED WORK

This investigation is designed to evaluate soil and groundwater conditions beneath the subject site. The specific tasks are summarized below and discussed in the sections that follow. Consultant will perform the following tasks:

- Prepare a site safety plan and obtain appropriate well permits.
- Engage a utility locator service prior to drilling at the site.
- Drill three soil borings B-1 through B-3, to approximately 16 feet below ground surface. We expect to encounter groundwater at approximately 6 feet below grade. The locations of the proposed soil borings are shown on Figure 2.
- Collect and classify relatively undisturbed soil samples at 5-foot intervals, at obvious changes in soil type, where subjective evidence of petroleum hydrocarbons is observed, and just above first encountered groundwater.
- Construct 2-inch-inner-diameter monitoring wells MW-1 through MW-3 in borings B-1 through B-3, respectively.
- Develop, purge, and sample the newly installed monitoring wells.
- Submit selected soil and water samples to a Chevron approved laboratory certified by the state of California to perform hazardous waste analysis. Samples from B-1/MW-1 through B-3/MW-3 will be submitted for analyses of total petroleum hydrocarbons as gasoline (TPHg) using U.S. Environmental Protection Agency (EPA) Method 8015 mod., and benzene, toluene, ethylbenzene, and total xylene isomers (BTEX) using EPA Method 8020.
- Contract a licensed land surveyor to survey the locations and elevations of the tops-of-casings of the newly installed wells relative to mean sea level.
- Prepare a report summarizing field and laboratory procedures and findings.

3.1 Site Safety Plan and Permits

A Site-Specific Health and Safety Plan will be prepared by the Consultant as required by the Occupational Health and Safety Administration (OSHA) Standard Hazardous Waste Operations and Emergency Response guidelines (29 CFR 1910.120). The Site-Specific Health and Safety Plan will be prepared by Consultant personnel, following a complete review of site conditions and any existing Site-Specific Health and Safety Plans for the site. The document will be reviewed by field personnel and subcontractors performing work at the site. A copy of the Site-Specific Health and Safety Plan will be kept at the work site and will be available for reference by appropriate parties during the work. The Consultant's geologist will act as the Site Safety Officer.

Applicable state and local permits related to work to be performed at the site will be obtained by Consultant.

3.2 Soil Borings and Sampling

The Consultant will contact Underground Service Alert before drilling to help locate public utility lines at the site. The Consultant will hand auger boring locations to a depth of approximately 5 feet before drilling to reduce the risk of damaging underground structures. Locations of the proposed monitoring wells are shown on Figure 2. Monitoring well locations were selected by Chevron to further evaluate if petroleum hydrocarbons are present in soil and whether dissolved hydrocarbons are present in groundwater beneath the site. Based on the site topography, the groundwater gradient is expected to be to the southwest.

Soil borings will be drilled with a Mobile B-53 (or similar) drill rig equipped with 8-inch-diameter, hollow-stem augers. Augers and sampling equipment will be steam cleaned before use and between borings to minimize the possibility of crosshole contamination. The rinseate will be transported to Chevron's Richmond, California refinery for disposal. Drilling will be performed under the observation of a RESNA field geologist, and the earth materials removed from the bore hole will be classified while

drilling using visual methods according to the Unified Soil Classification System. All work will be performed under the supervision of a California Registered Geologist.

The soil borings for the monitoring wells will be drilled to approximately 10 feet below the first-encountered groundwater, or a maximum of 5 feet into any confining layer encountered beneath the uppermost water-bearing zone. We anticipate encountering groundwater at approximately 6 feet below ground surface. If a confining layer is encountered, the boring will be terminated and backfilled with bentonite to the top of the confining layer before installing a groundwater monitoring well. While drilling, soil samples will be collected every 5 feet, at obvious changes in soil type, where subjective evidence of petroleum hydrocarbons is observed, and just above groundwater. Samples will be collected with a California-modified, split-spoon sampler equipped with laboratory-cleaned brass sleeves. Samples will be collected by advancing the auger to a point just above the sampling depth and driving the sampler into the soil. The sampler will be driven 18 inches with a standard 140-pound hammer repeatedly dropped from a height of 30 inches. The number of blows required to drive the sampler each successive 6-inch interval will be counted and recorded to give an indication of soil consistency.

Soil samples will be monitored with a photoionization detector (PID), which measures hydrocarbon concentrations in the ambient air or headspace above the soil sample. Field instruments such as the PID are useful for indicating relative levels of volatile hydrocarbons, but do not detect concentrations of hydrocarbons with the same precision as laboratory analyses. Soil samples selected for possible chemical analysis will be sealed promptly with aluminum foil and plastic caps. The samples will be labeled and placed in iced storage for transport to the laboratory. Chain of Custody Records will be initiated by the geologist in the field, updated throughout handling of the samples, and sent with the samples to the laboratory.

Copies of these records will be included in the final report. Cuttings generated during drilling will be stored on plastic sheeting pending characterization and disposal. The drill cuttings will be removed to an appropriate disposal facility by a contractor selected by Chevron upon receipt of analytical results.

3.3 Well Construction

The monitoring wells will be constructed of thread-jointed, 2-inch-inside-diameter, Schedule 40 polyvinyl chloride (PVC) casing. No chemical cements, glues, or solvents will be used in well construction. The screened portion of each well will consist of factory-perforated casing with 0.020-inch-wide slots. We expect that well screen will be installed from approximately 10 feet below the upper surface of the water table (approximately 16 feet below grade) to approximately 3-1/2 feet above the upper surface of the water table (approximately 2-1/2 feet below grade). Consultant will have to contact Alameda County Zone 7 Water District to discuss the well construction details and placement of the seal. Alameda County Zone 7 Water District can permit non-standard well designs, but they decide it on the case to case basis pending the site specific information included on the well permit application. The screened interval will permit entry of separate-phase hydrocarbons, if present, and to allow for fluctuations in the groundwater elevation. Unperforated casing will be installed from the top of the screen to the ground surface. The annular space in the wells will be packed with #3 sand to approximately 1/2 foot above the slotted interval. A bentonite plug will be constructed above the sand pack to prevent cement from entering the filter pack. The remaining annulus will be backfilled to grade with a slurry of cement and bentonite powder. Due to the shallow groundwater conditions which are expected at the site we anticipate that the Alameda County Zone 7 Water District will not object to the above well design. The monitoring wells will be protected with traffic-rated, cast aluminum utility boxes equipped with PVC skirts. The box will have a seal to minimize surface-water infiltration and must be opened with a wrench. The design of this box reduces the possibility of accidental disturbance of the well.

3.4 Monitoring Well Development and Sampling

The Consultant will wait a minimum of 24 hours after well development prior to sampling each well. The monitoring wells will be allowed to vent to the atmosphere for approximately one-half hour prior to taking initial water level readings, to allow the groundwater level to stabilize in the wells. After the water level has been allowed to stabilize, the wells will be checked for separate-phase hydrocarbons using an interface

probe. The thickness of any product detected in the wells will be recorded. If separate-phase hydrocarbons are encountered in the wells, the wells will not be purged, and the water will not be sampled for chemical analysis. Separate-phase hydrocarbons, if present, will be bailed from the wells and stored in labeled drums onsite. The Consultant will apprise Chevron of appropriate disposal options for any separate-phase hydrocarbons bailed from the wells.

If separate-phase hydrocarbons greater than 0.02-inches thick are not detected after development, the wells will be purged of approximately 4 to 5 casing volumes of water with a bailer, or until pH, conductivity, and temperature of the purged water have stabilized. Water without free-phase product purged from the wells will be placed in a tank trailer and transported to Chevron's Richmond Refinery for disposal. Water with free-phase product will be stored onsite in steel drums, and will be the responsibility of Chevron. The wells will be allowed to recover to at least 80 percent of static conditions, and a sample of the groundwater will be collected with a new Teflon bailer. The water will be transferred slowly from the bailer to laboratory-cleaned containers appropriate for the analysis requested. The Consultant's personnel will check to see if headspace is present. If headspace is present, we will collect more samples until no headspace is present. Chain of Custody Records will be initiated in the field by the technician or geologist, updated throughout handling of the samples, and sent along with the samples to the laboratory. Copies of Chain of Custody Records will be included in final report.

3.5 Evaluation of Potentiometric Surface

The groundwater gradient and direction of groundwater flow at the site will be evaluated. The elevation of the tops of the newly installed well casings will be measured relative to mean sea level by a licensed land surveyor. Water-depth measurements will be made from the top of the casing in the new wells to the nearest 0.01 foot with an electronic water-level indicator. The wells will be vented to the atmosphere for a minimum of one-half hour before obtaining depth-to-water measurements. Venting is conducted to allow the groundwater to equilibrate with barometric pressure. These data will be combined to evaluate the relative elevation

of the groundwater surface in each well and the slope of the groundwater surface across the site.

3.6 Laboratory Analyses

Soil samples selected for laboratory analysis from each boring will generally include the sample with the highest reading on the PID, any sample with visual evidence of hydrocarbons, and the sample collected from just above first encountered water. Soil samples from B-1 through B-3 will be analyzed for TPHg, and BTEX. Detection limits for the tests requested and concentrations present will be stated on the laboratory reports. Analytical methods and detection limits will conform to guidelines specified in the latest edition of the Tri-Regional Recommendations. Laboratory analyses will be performed by a laboratory certified by the State of California and selected by Chevron. Groundwater samples collected from wells MW-1 through MW-3 will be analyzed for TPHg, and BTEX.

3.7 Surveying

A licensed land surveyor will be contracted to survey the locations of the wells and the tops-of-casing elevations relative to mean sea level.

3.8 Report Preparation

A report summarizing field and laboratory procedures and findings will be prepared by the Consultant.

Respectfully submitted,

Zbigniew L. Ignatowicz
Assistant Project Scientist

James A. Lehrman, R.G.
Project Supervisor

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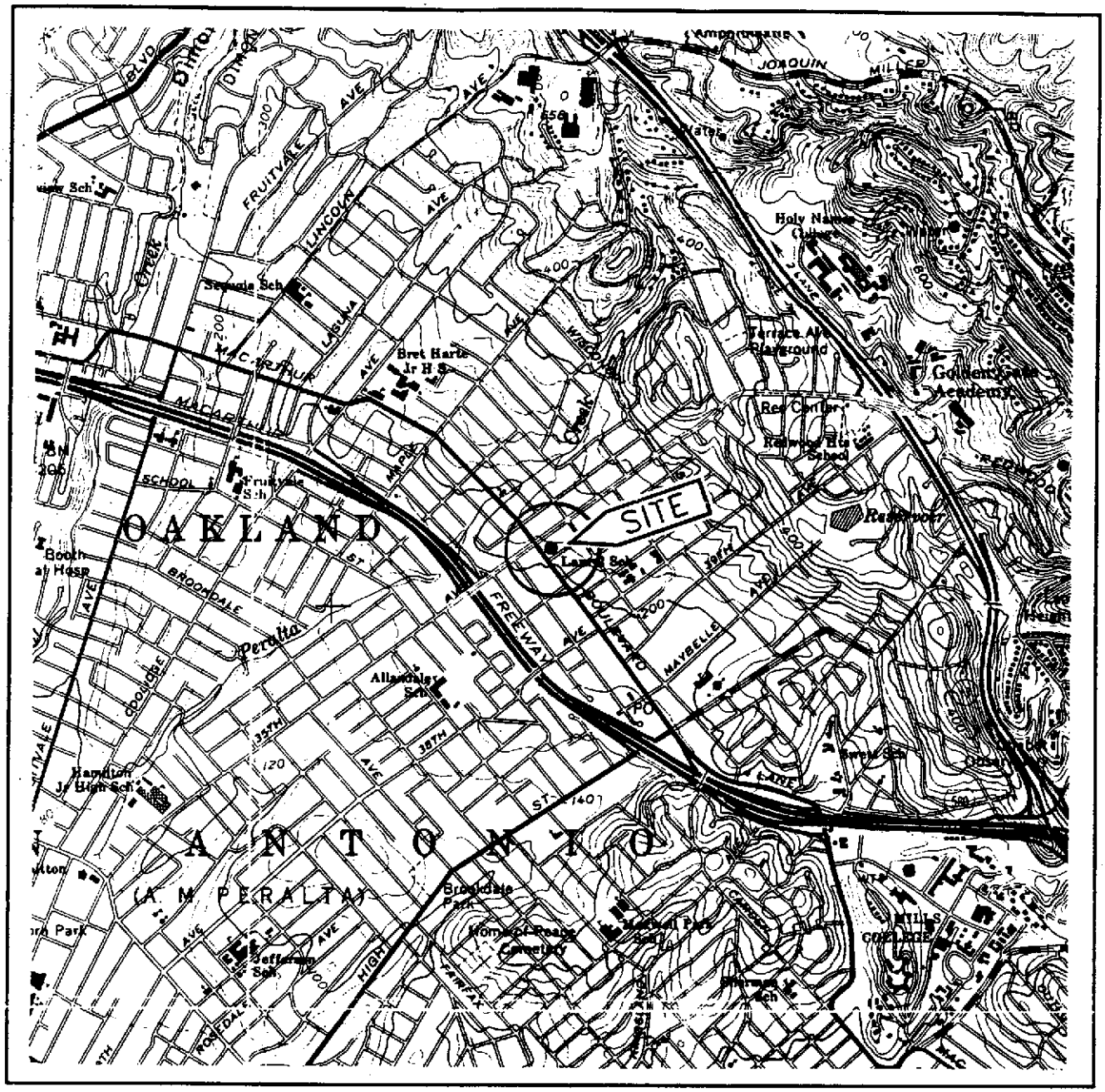
REFERENCE

Touchstone Developments, 1994, Waste Oil Tanks and Product Line Removal and Over Excavation Report for Chevron Station No. 9-8341, 3530 MacArthur Boulevard, Oakland, California: Unpublished report for Chevron U.S.A. Products Company, San Ramon California, June 28.



N

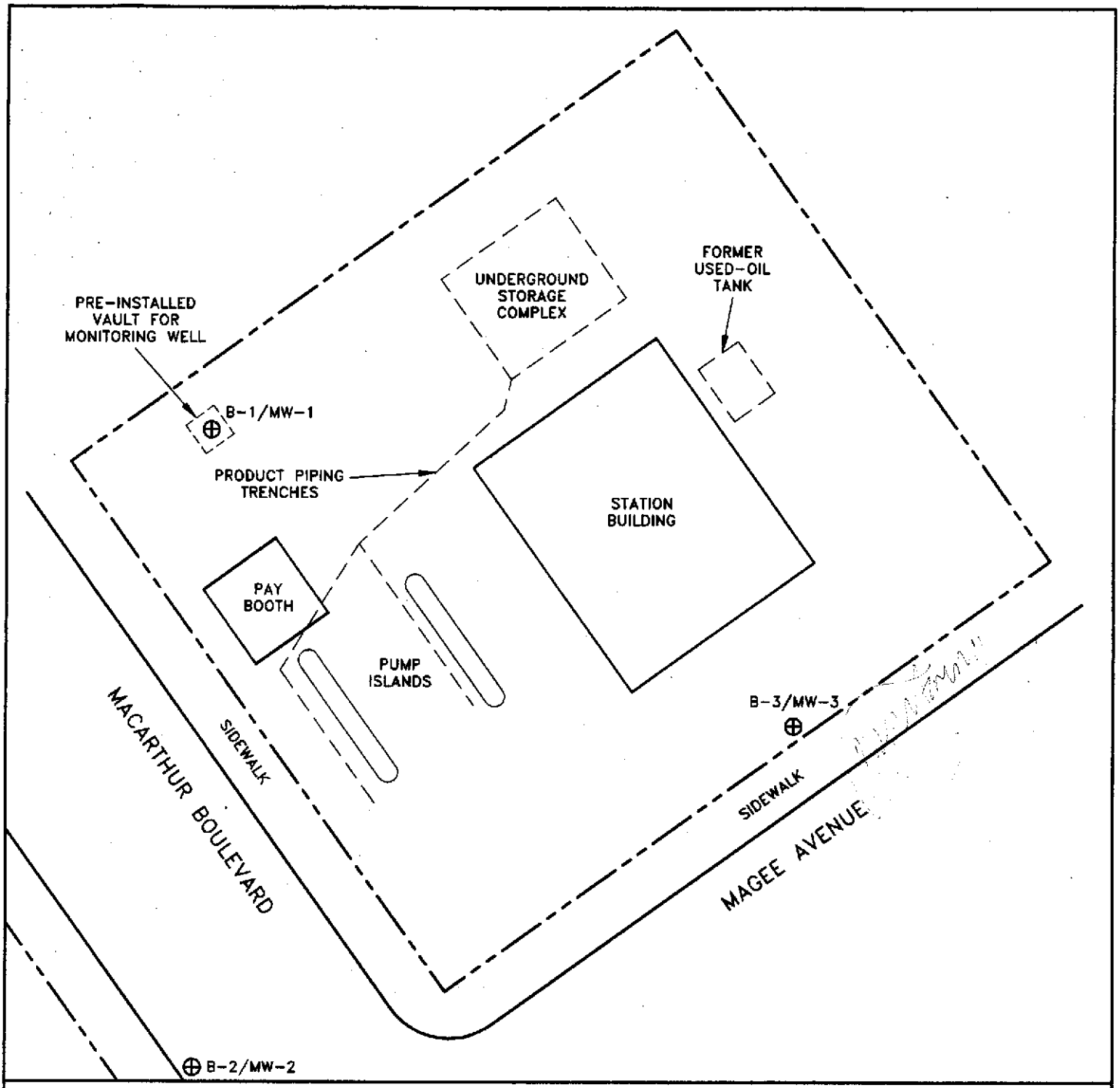
Approximate Scale

2000 1000 0 2000

feet

SOURCE: U.S. GEOLOGICAL SURVEY
7.5-MINUTE QUADRANGLE
OAKLAND EAST, CALIFORNIA
PHOTOREVISED 1980

CanonieEnvironmental	SITE VICINITY MAP CHEVRON SERVICE STATION NO. 9-8341 3530 MACARTHUR BOULEVARD OAKLAND, CALIFORNIA	FIGURE 1
DRAWING NO. 94-221-A1		



LEGEND

B-3/MW-3 ⊕ = PROPOSED GROUNDWATER MONITORING WELL

N

Approximate Scale

30 15 0 30

feet

SOURCE: MODIFIED FROM PLAN SUPPLIED BY TOUCHSTONE DEVELOPMENTS

Canonie Environmental	GENERALIZED SITE PLAN CHEVRON SERVICE STATION 9-8341 3530 MACARTHUR BOULEVARD OAKLAND, CALIFORNIA	FIGURE 2
DRAWING NO. 94-221-A2		