REPORT ON FURTHER GROUNDWATER DELINEATION 1944 MARINA BOULEVARD SAN LEANDRO, CALIFORNIA

IT Project No. 198155.04

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REPORT ON FURTHER GROUNDWATER DELINEATION 1944 MARINA BOULEVARD SAN LEANDRO, CALIFORNIA

IT Project No. 198155.04

Approved: William Schaaf **Date:** 7 August 1992

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1.0 Introduction

IT Corporation (IT) was retained by Ingersoll-Rand Corporation (IR) to further delineate the lateral extent of dissolved hydrocarbons in groundwater resulting from an underground storage tank (UST) release. Additionally, IT has provided a conceptual approach for the recovery and treatment of contaminated groundwater.

The subject site is an IR maintenance facility located at 1944 Marina Boulevard, San Leandro, California (Figure 1). IR reported an unauthorized UST release to the San Leandro Fire Department in May 1989. Subsequently, IT removed all three USTs from the facility, conducted subsurface investigations to assess the impact the release may have had on soils and groundwater, and installed an in-situ soil vapor extraction (SVE) and treatment system.

To further delineate the lateral extent of dissolved hydrocarbons in groundwater, IT installed eight temporary wells. Four of the wells were placed on the adjacent down gradient property and four were on subject site property. Prior to the installation of each well, cone penetrometer testing (CPT) was conducted to profile soil lithologies and to identify appropriate well screen placement.

The analysis of soil vapor, soil, and groundwater collected from the temporary well locations was used to delineate the plume of gasoline dissolved in groundwater. The lenticular shape of the plume (Figure 2) is thought to result from site geology which is characteristic of stream channel deposition (Figures 3, 4, and 5).

2.0 Project Approach

The scope of work undertaken for this remedial investigation was:

- Gain encroachment and regulatory permission required to conduct the extended groundwater quality assessment;
- Survey proposed temporary well locations for the presence of underground utilities;
- Perform cone penetrometer testing (CPT) at each temporary well location to define the geology for proper well screen placement;

- Submit soil vapor samples collected from four of the temporary well locations (TW-1, TW-3, TW-6, TW-8) to California certified contract laboratory for analysis by Environmental protection Agency (EPA) Method TO-14 (volatile organics);

- Submit groundwater samples collected from eight temporary wells to California certified contract laboratory for analysis by EPA Method 8260 (fuel fingerprint and selected volatile organics);

- Submit an equipment rinsate sample to a California state certified laboratory for analysis by EPA Method 8260 (fuel fingerprint and selected volatile organics) to aid in the determination of rinsate disposal options; and

- Generate a remedial investigation report for IR and an abbreviated data summary report to fulfill encroachment agreements with the adjacent lessee.

Because a groundwater sample could not be recovered from temporary well TW-8, a soil sample from the saturated zone was collected. The soil sample was submitted to a California certified contract laboratory for analysis by modified EPA Method 8260 (fuel fingerprint and selected volatile organics).

3.0 Field Activities

This section describes the field activities associated with the remedial investigation undertaken to further delineate the plume of dissolved gasoline in groundwater.

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3.1 Placement and Clearance of Test Probes and Temporary Well Locations

Test probes included CPT and soil vapor collection probes. The CPT probe is a two-inch diameter stainless steel pipe string fitted with strain gauges that is hydraulically pushed into the subsurface. The soil vapor probe is a two-inch diameter stainless steel pipe which has a six-inch length of 200 mesh protected by a retractable sleeve that is withdrawn when collecting a sample. The temporary wells consisted of two-inch diameter galvanized or stainless steel pipe with a five-foot screened interval. Temporary wells were to be installed at each location that CPT was performed. Soil vapor probes were to be installed at four of the eight CPT/temporary well locations.

The four-fold strategy in the placement of the test probes and temporary wells was:

1. to better determine the lateral extent of the previously identified dissolved-phase gasoline plume;

2. to verify that contaminants are identified that may have possible impact to the operating SVE and future groundwater treatment systems;

3. to further develop a geologic model of the subject site as it pertains to groundwater remedial efforts; and

4. to accomplish elements 1, 2, and 3 with a minimum number of wells and samples.

Test probe/temporary well locations TW-1 and TW-2 were placed side-gradient to the defined adsorbed-phase plume which resulted from the 1989 gasoline spill (Figure 2). Test probe/temporary well locations TW-3, TW-4, TW-5, TW-6, TW-7, and TW-8, were placed down-gradient to the adsorbed-phase plume (Figure 2). Down-gradient placement of test probes/temporary wells TW-5, TW-6, TW-7, and TW-8 located them on the adjacent property southwest of the subject site.

Test probes/temporary wells were located where equipment access was feasible and are as close as possible to the locations proposed in the Remedial Approaches document previously submitted to IR by IT. The desire to collect soil vapor samples from the unsaturated zone at radially greater distances from the contaminant source also influenced the placement of test probes/temporary wells TW-1, TW-3, TW-6, and TW-8.

All temporary well locations were cleared for underground utilities prior to breaking ground at any of the test probe/temporary well locations. Underground line clearance was conducted by a certified contractor using an RD 400 line tracer.

3.2 Installation of Test Probes and Temporary Wells

Preceding the installation of soil vapor sample probes and/or temporary wells, the four existing permanent wells (Figure 2) were gauged and CPT was conducted. The gauging of the permanent wells provided depth to water (DTW) measurements (Table 1) useful for estimating the surface of the water table across the study area. CPT data was used to profile soil lithologies and to refine well screen intervals for the collection of soil vapor and groundwater samples. The logs generated during CPT are included in Appendix A. Table 2 summarizes sample collection intervals.

3.3 Sample Collection Procedures

In general, soil vapor samples were grabbed from between 12.5 and 15.5 feet below grade. Location TW-3 was also sampled for soil vapor at a depth of 6.5 feet below grade to provide analytical information about perched water associated with an adjacent backfilled UST pit. In general, groundwater samples were grabbed from between 14.5 and 21.5 feet below grade. The soil sample recovered from location TW-8 was grabbed from within the saturated zone at a depth between 22 and 27 feet below grade.

Soil vapors were recovered from sample probes using a peristaltic pump. Soil vapor samples were collected in Tedlar™ bags. Prior to the collection of soil vapor in a sample bag, the sample string was purged to insure sample integrity. Tedlar™ bags bearing samples were stored at ambient temperature in a shaded insulated cooler prior to delivery to a California certified contract laboratory for testing.

not acceptable

Formation water samples were recovered from the temporary wells using a sample bailer or peristaltic pump. Sample collection time was shorter when using a pre-cleaned sample bailer, but use of the peristaltic pump was required when only a minimum volume of water accumulated within a temporary well. Recovered water samples were collected in volatile organic analyzer (VOC) bottles. Water samples were preserved with dilute hydrochloric acid (HCl) and stored on ice in an insulated cooler prior to delivery to a California certified laboratory for testing.

The soil sample was recovered as a composite grab sample from material that had accumulated within the temporary well screen used at location TW-8. The soil sample was stored in VOC bottles stored on ice in an insulated cooler prior to delivery to a California certified laboratory for testing.

Sample manifests for chain of custody and analytical requests were prepared for and provided with all samples sent to the laboratory (Appendix B).

4.0 Analytical Procedures

Soil vapor samples were subjected to testing by EPA Method TO-14. This procedure tests for about 40 volatile hydrocarbon compounds. A listing of the compounds addressed by Method TO-14 is provided in Table 3.

Groundwater samples were subjected to testing by modified EPA Method 8260. This gas chromatography/mass spectrometry (GC/MS) procedure was used to test for the halogenated hydrocarbon compounds: 1,2-dichlorethane (DCA), ethylene dibromide (EDB), 1,1-dichloroethene (DCE), 1,1,1-trichloroethane (TCA), and trichloroethene (TCE); the fuel constituents: benzene, toluene, ethyl benzene, and xylenes (BTEX); and total petroleum hydrocarbons (TPH) as gasoline and diesel.

The soil sample was subjected to the same testing protocol as the groundwater samples.

5.0 Data Interpretations

This section presents the findings and interpretations made from field observations and data review.

5.1 Site Stratigraphy And Geology

Site geology presents a mixture of soil textures ranging from fine (clay) to coarse (gravel). The distribution of these textures and the spatial relationships between them is characteristic of stream channel deposition (Figures 3, 4, and 5). The stream channel has a northeast-southwest orientation. Because the coarse textures (gravel) are observed at the eastern end of the channel and the finer textures (sand and clay) are observed at the western end of the channel, fluvial processes at the time of deposition flowed west.

A previous investigative effort included an extensive coring program from which initial geological cross sections were generated. The locations of continuous cores are shown in Figure 2. Data from the recent CPT exercise serves to strengthen the stream channel deposition model. Figures 3, 4, and 5 are cross sections generated with data from the recent CPT data and the previous coring effort. The cross-section traverses are shown in Figure 2.

5.2 Soil Vapor Analysis

The four locations that soil vapor samples were collected from, TW-1, TW-3, TW-6, and TW-8, are shown in Figure 2. Analytes found in the soil vapor samples recovered from all four sample collection locations are commonly associated with gasoline. These analytes included benzene, toluene, ethyl benzene, xylenes (BTEX), and total fuel. The concentrations of BTEX and total fuel in soil vapor were greatest from collection points central to the study area. Table 4 provides a summary of soil vapor analyses and Appendix C contains the laboratory reports.

In addition to BTEX and total fuel, the analysis of soil vapor samples from locations TW-3, TW-6, and TW-8 yielded a variety of non-fuel volatile hydrocarbons, including acetone, lab? carbon disulfide, styrene, tetrachloroethene (PCE), 1,1,1 trichloroethane (TCA), trichloroethene (TCE), and trichlorofluoromethane (F-11). Table 4 summarizes the soil vapor analyses and Appendix C provides the laboratory reports.

The presence of the non-fuel volatile hydrocarbons in the soil vapor reinforce the earlier decision to operate the soil vapor treatment system with activated carbon abatement.

5.3 Soil Analysis

Analytes present in measurable concentrations in the soil sample recovered from within the saturated zone at location TW-8 included BTEX and total petroleum fuel hydrocarbons (TPH) as gasoline. The complete list of analytes selected for the soil analysis are listed in Table 5. The concentrations, in milligrams per kilograms (mg/kg), for each detected analyte are as follows: 0.03 benzene, 0.15 toluene, 0.14 ethyl benzene, 0.66 xylenes, and 5.0 TPH. The laboratory report for this sample is included in Appendix C.

The relatively low concentrations of BTEX and TPH reported for the soil sample recovered from location TW-8 suggests that this may be the downgradient extent of the gasoline contamination in groundwater.

The previously conducted coring program, in August 1991, established the distribution of BTEX and TPH in the unsaturated (vadose) zone (Figure 2). This, in conjunction with the initial geologic cross sections generated at that time, served as the basis for the design of the operational SVE system.

5.4 Groundwater Characteristics and Contamination

Water elevations determined for the four permanent wells at the subject site range from close to 12.7 feet above mean sea level (MSL) at the east end of the study area, to slightly less than 11.4 feet above MSL at the west end of the study area. As determined by triangulation, groundwater gradient direction is south. Comparatively, the previously reported groundwater gradient (December 1990) was to the southwest. Measurements for all permanent wells at the site are presented in Table 1.

No free-phase product was detected in the permanent or temporary wells.

The distribution of the dissolved phase gasoline hydrocarbon appears to be influenced by the site geology. The orientation of the lenticular dissolved-phase gasoline plume shown in Figure 2 roughly conforms to the stream-channel dimensions and orientation.

The cross sections presented in Figures 3, 4, and 5 show that the upper one to four feet of the water table aquifer is within sands and gravels that laterally fine to clay. The geologic materials 10 to 12 feet beneath this that have been investigated, are silts and clays. Groundwater transmissivity (T) and hydraulic conductivity (K) within the finer soil textures provided by the silts and clays are relatively low. This was substantiated through a step draw-down test conducted in August 1991, in which the resultant transmissivity and hydraulic conductivity were 6.6 square meters per day and 3 meters per day, respectively.

Due to the coarser soil textures provided by the sands and gravels in the upper one to four feet of the aquifer, groundwater may flow at a greater rate near the surface of the water table than within the deeper silts and clays. However, the finer soil textures that comprise the major portion of the aquifer are likely to be responsible for limiting the migration of the dissolved-phase plume of gasoline in the groundwater.

Laboratory reports indicate that the dissolved hydrocarbon compounds in groundwater at the subject site are commonly associated with gasoline. These compounds include BTEX and TPH. Reported benzene concentrations range from below detection to 4,600 micrograms per liter (ug/L). Reported TPH concentrations range from below detection to 67,000 ug/L. Various combinations of petroleum fuel hydrocarbons were reported for water samples collected from each temporary well location except TW-3. The water sample from location TW-3 was not reported to have concentrations of any test parameter above the detection

limits. Laboratory reports and a summary of groundwater analysis are provide in Appendix C and Table 6, respectively.

The non-fuel volatile hydrocarbons present in the tested soil vapor samples were not found in any of the groundwater samples or the soil sample (TW-8) from the saturated zone. This indicates that the non-fuel hydrocarbons are not present in measurable quantities within the groundwater, will not influence the approach to groundwater treatment, and that the non-fuel hydrocarbons are not related to the UST leak that is the focus of this report.

6.0 Conceptual Approach to Groundwater Treatment

Groundwater at the subject site will most effectively be treated by removal of water from the aquifer for treatment at the surface. Dissolved-phase hydrocarbon fuel constituents are present in concentrations that would allow alternative treatment such as in-situ bioremediation, but geologic parameters preclude this consideration. Soil textures within the saturated zone will not readily allow for proper dispersion of nutrients and oxygen necessary for enhancing the population of hydrocarbon-consuming microbes.

Hydrologic and geologic characteristics of the subject site influence water extraction strategies. With aquifers consisting of homogeneous materials that provide high transmissivity and hydraulic conductivity values, one pumping well may be sufficient. The subject site aquifer is not homogeneous and provided relatively low transmissivity and hydraulic conductivity values when tested. Therefore, an effective groundwater extraction system will employ two or more pumping wells from which recovered water will be treated by a common system (Figure 6). The number of pumping wells to be employed is directly related to the radius of influence for each well. The siting of pumping well locations would be addressed in the design stage. Treated water would be discharged to the City of San Leandro storm water system.

It may not be necessary to operate the most downgradient extraction well for a duration as long as the upgradient extraction well(s). This scenario could occur if the recovery of contaminants exhausted the leading edge of the plume.

Treatment of the recovered water may be accomplished through a number of means. These include activated carbon, air stripping with an activated carbon polish on the stripper vapor

effluent, air stripping with a thermal oxidation system on the stripper vapor effluent, ultra-violet (UV) degradation, or spray aeration with an internal combustion engine on the aerator vapor effluent. With several of these options it is sometimes necessary to provide activated carbon polish on the system water effluent.

The effectiveness of any of these pump-and-treat systems can be enhanced by simultaneously operating an SVE system. Operation of an SVE system for the in-situ treatment of contaminants adsorbed onto soil in the vadose zone has already begun and will continue to be operated in tandem with the groundwater treatment system.

The use of activated carbon as the primary treatment for water may be justifiable when contaminants are present that preclude other alternatives. The use of activated carbon as the primary treatment for water tends to drive remediation costs upward and presents greater disposal risks for the generator. Although air strippers are fairly effective at removing hydrocarbons from water, it is no longer possible to obtain a permit to operate one without additional emission controls within areas regulated by the Bay Area Air Quality Management Board (BAAQMD). Thermal oxidation units have historically been difficult to permit, and are sometimes difficult to operate within permit emissions guidelines. Disadvantages to utilization of UV degradation include possible multi-stage pre-treatment of groundwater to lower turbidity, the need for an auxiliary supply of hydrogen peroxide or ozone to enhance UV destruction of hydrocarbons, and lack of economy in small-scale applications. Spray aeration, combined with an internal combustion engine outfitted with catalytic converters, is a very effective method for hydrocarbon separation and destruction. The costs associated with spray aeration combined with internal combustion engines are competitive with most applicable technologies. Additionally, this technology is favored by the Regional Water Quality Control Board (RWQCB) and BAAQMD.

7.0 Conclusions

The geology at the subject site is characteristic of stream channel deposition. The orientation of the lenticular dissolved-phase gasoline plume roughly conforms to the stream channel dimensions and orientation. Groundwater flow direction is south.

The non-fuel volatile hydrocarbons present in the tested soil vapor samples were not found in any of the groundwater samples or the soil sample from the saturated zone. This indicates that the non-fuel hydrocarbons are not present in measurable quantities within the groundwater, will not influence the approach to groundwater treatment, and are not related to the UST leak that is the focus of this report. The presence of the non-fuel volatile hydrocarbons in the soil vapor reinforces the earlier decision to operate the soil vapor treatment system with activated carbon abatement.

Because aquifer transmissivity and hydraulic conductivity are relatively low, groundwater remediation should be approached with two or more extraction wells to create overlapping cones of depression to recover contaminated groundwater. An attractive water treatment alternative from the viewpoint of cost, performance, and ease of regulatory permitting involves spray aeration combined with an internal combustion engine with catalytic converters.

Tables

TABLE 1
WATER LEVEL DATA

INGERSOLL - RAND
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

? quaternary term, measurement Date — better

Well Number	Guaging Date	Top of Casing (ft)	Depth to Water (ft)	Elevation (MSL, ft.)
MW-1	4/3/92	24.97	12.1	12.68
MW-2	4/3/92	24.64	13.6	11.1
MW-3	4/3/92	27.57	15.9	11.43
MW-4	4/3/92	28.92	18.25	11.36

Notes:

ft = feet
MSL, ft = feet above mean sea level

TABLE 2
SAMPLE COLLECTION DEPTH INTERVALS

INGERSOLL - RAND
MAINTENANCE FACILITY
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

Location	Matrix	Screen (BGS, ft)
TW-1	Vapor	12.5 - 13.0
TW-1	Water	18.5 - 21.5
TW-2	Water	16.0 - 21.0
TW-3	Vapor	6.0 - 6.5
TW-3	Vapor	12.0 - 12.5
TW-3	Water	16.0 - 21.0
TW-4	Water	16.0 - 21.0
TW-5	Water	16.5 - 19.5
TW-6	Vapor	15.0 - 15.5
TW-6	Water	16.5 - 21.5
TW-7	Water	14.7 - 19.7
TW-8	Vapor	13.0 - 13.5
TW-8	Soil	22.0 - 27.0

Note:
BGS, ft = below ground surface in feet

TABLE 3
EPA METHOD TO-14 ANALYTES

INGERSOLL - RAND
MAINTENANCE FACILITY
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

Acetone
Benzene
Bromodichloromethane
Bromomethane (Methyl Bromide)
Bromoform
1,3-Butadiene
2-Butanone (MEK)
Carbon Disulfide
Carbon Tetrachloride
Chlorobenzene
Chloroethane (Ethyl Chloride)
2-Chloroethyl Vinyl Ether
Chloroform
Chloromethane (Methyl Chloride)
Dibromochloromethane
1,2-Dibromoethane
1,2-Dichlorobenzene
1,3-Dichlorobenzene
1,4-Dichlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane (EDC)
1-1-Dichloroethene
cis-1-2-Dichloroethene
trans-1-2-Dichloroethene
Dichloromethane
1,2-Dichloropropane
cis-1,3-Dichloropropane
trans-1,3-Dichloropropane
Ethylbenzene
2-Hexanone
4-Methyl-2-Pentanone (MIBK)
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethene (PCE)
Toluene
1,1,1-Trichloroethane (TCA)
1,1,2-Trichloroethane
Trichloroethene (TCE)
Trichlorofluoromethane (F-11)
Trichlorotrifluoromethane (F-113)
Vinyl Acetate
Vinyl Chloride
Xylenes, Total

TABLE 4
SUMMARY OF SOIL VAPOR ANALYSIS

INGERSOLL - RAND
MAINTENANCE FACILITY
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

SAMPLE IDENTITY	ANALYTE	CONCENTRATION ppmv
TW - A (TW-1)	Benzene	1.2
	Toluene	0.3
	Xylenes, Total	0.3
	Total Fuel (non-methane hydrocarbons)	1900
		ppbv
TW - 3A	Acetone	70
	Benzene	8.6
	2-Butanone (MEK)	4.7
	Carbon Disulfide	28
	Chlorobenzene	0.3
	Dichloromethane	3
	Ethylbenzene	6.3
	4-Methyl-2-Pentanone (MIBK)	0.9
	Styrene	0.9
	Tetrachloroethene (PCE)	0.5
	Toluene	41
	1,1,1-Trichloroethane (TCA)	4.2
	Trichloroethene (TCE)	0.7
	Trichlorofluoromethane (F-11)	15
	Trichlorotrifluoroethane (F-113)	0.7
	Xylenes, Total	34
	Total Fuel (non-methane hydrocarbons)	500
TW - 3B	Acetone	39
	Benzene	5.4
	Carbon Disulfide	9
	Carbon Tetrachloride	0.3
	Chlorobenzene	0.3
	1,3-Dichlorobenzene	0.5
	Ethylbenzene	5.7
	Styrene	0.9
	Tetrachloroethene (PCE)	0.5
	Toluene	32
	1,1,1-Trichloroethane (TCA)	3.5
	Trichloroethene (TCE)	0.6
	Trichlorofluoromethane (F-11)	1.4
	Trichlorotrifluoroethane (F113)	1.1
	Xylenes, Total	34
	Total Fuel (non-methane hydrocarbons)	300

TABLE 4
SUMMARY OF SOIL VAPOR ANALYSIS

INGERSOLL - RAND
MAINTENANCE FACILITY
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

SAMPLE IDENTITY	ANALYTE	CONCENTRATION ppmv
TW - 6	Acetone	50
	Benzene	9.5
	Carbon Disulfide	8
	Chlorobenzene	0.2
	Dichloromethane	5
	Ethylbenzene	8
	Styrene	1.2
	Tetrachloroethene (PCE)	0.6
	Toluene	18
	1,1,1-Trichloroethane (TCA)	2.7
	Trichloroethene (TCE)	1.2
	Trichlorofluoromethane (F-11)	0.8
	Xylenes, Total	30
	Total Fuel (non-methane hydrocarbons)	12000
TW - 8	Acetone	37
	Benzene	6.6
	1,3-Butadiene	0.7
	Carbon Disulfide	2
	Chloroethane (Ethyl Chloride)	0.4
	Chloroform	56
	Chloromethane (Methyl Chloride)	0.8
	Dichloromethane	12
	Ethylbenzene	5.3
	Styrene	1.1
	Tetrachloroethene (PCE)	0.5
	Toluene	34
	1,1,1-Trichloroethane (TCA)	2.7
	Trichloroethene (TCE)	0.22
	Trichlorofluoromethane (F-11)	0.8
	Trichlorotrifluoroethane (F-113)	0.3
	Vinyl Acetate	5
	Xylenes, Total	27
	Total Fuel (non-methane hydrocarbons)	730

TABLE 5
MODIFIED EPA METHOD 8260 ANALYTES

INGERSOLL - RAND
MAINTENANCE FACILITY
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

Benzene
Toluene
Ethylbenzene
Xylenes
1,2-Dichloroethane (EDC)
Ethylene Dibromide (EDB)
Total Petroleum Hydrocarbons (Gasoline)
Total Petroleum Hydrocarbons (Diesel 2)
1,1-Dichloroethene
1,1,1-Trichloroethane (TCA)
Trichloroethene (TCE)

TABLE 6
SUMMARY OF GROUNDWATER ANALYSIS

INGERSOLL - RAND
MAINTENANCE FACILITY
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

SAMPLE IDENTITY	ANALYTE	CONCENTRATION ug/L	
TW - 1	Benzene	1700	*
	Toluene	29000	
	Ethyl benzene	5400	
	Xylenes	30000	*
	Total Petroleum Hydrocarbons (Gasoline)	67000	
TW - 2	Toluene	2	
	Xylenes	1	
TW - 3	No test parameters detected		
TW - 4	Benzene	3.5	
	Toluene	8	
	Xylenes	9.5	
	Total Petroleum Hydrocarbons (Gasoline)	280	
TW - 5	Benzene	70	
	Toluene	180	
	Ethyl benzene	45	
	Xylenes	140	
	Total Petroleum Hydrocarbons (Gasoline)	680	
TW - 6	Benzene	4600	*
	Toluene	23000	
	Ethylbenzene	2800	
	Xylenes	19000	*
	Total Petroleum Hydrocarbons (Gasoline)	53000	
TW - 7	Benzene	1300	
	Toluene	330	
	Ethylbenzene	220	
	Xylenes	370	
	Total Petroleum Hydrocarbons (Gasoline)	2400	
TW - 7 (LAB QC Duplicate)	Benzene	1200	
	Toluene	310	
	Ethyl benzene	220	
	Xylenes	380	
	Total Petroleum Hydrocarbons (Gasoline)	2500	

TW-8 ?

* highest concentrations

Figures

DRAWN BY | T.R.S. 11-13-91 | CHECKED BY | APPROVED BY | DRAWING NUMBER 198154-A5

looks like sw to w
levee for storm
@ 20' contour

FIGURE 1

SITE LOCATION MAP

PREPARED FOR

INGERSOLL-RAND CORPORATION
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

REFERENCE:
U.S.G.S 7.5' TOPOGRAPHIC MAP OF SAN LEANDRO, CA.
DATED 1959 PHOTOREVISED 1980; SCALE 1:24000

INTERNATIONAL TECHNOLOGY CORPORATION

11b494

...ize This Drawing

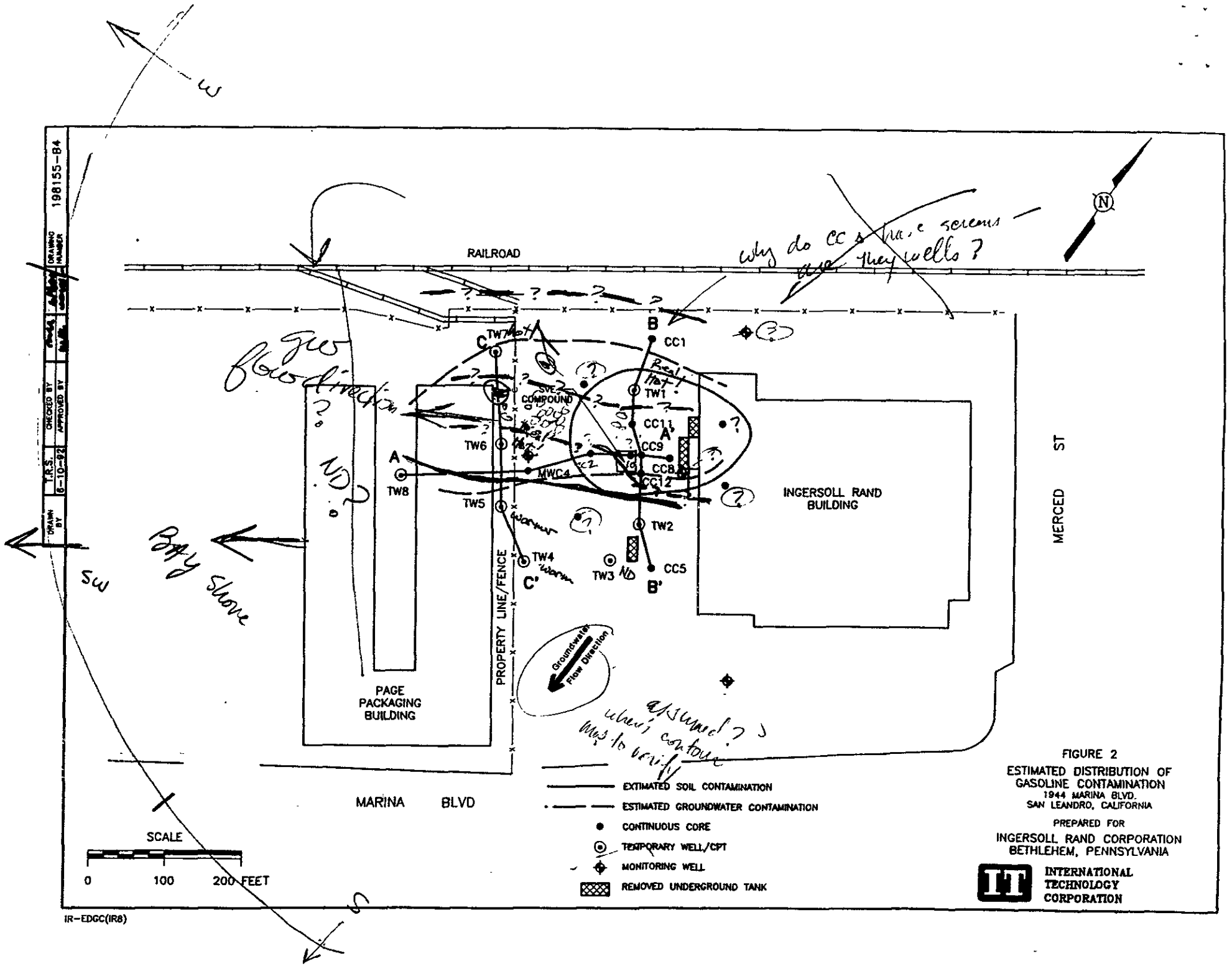

FIGURE 2
ESTIMATED DISTRIBUTION OF GASOLINE CONTAMINATION
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

PREPARED FOR
INGERSOLL RAND CORPORATION
BETHLEHEM, PENNSYLVANIA

INTERNATIONAL TECHNOLOGY CORPORATION

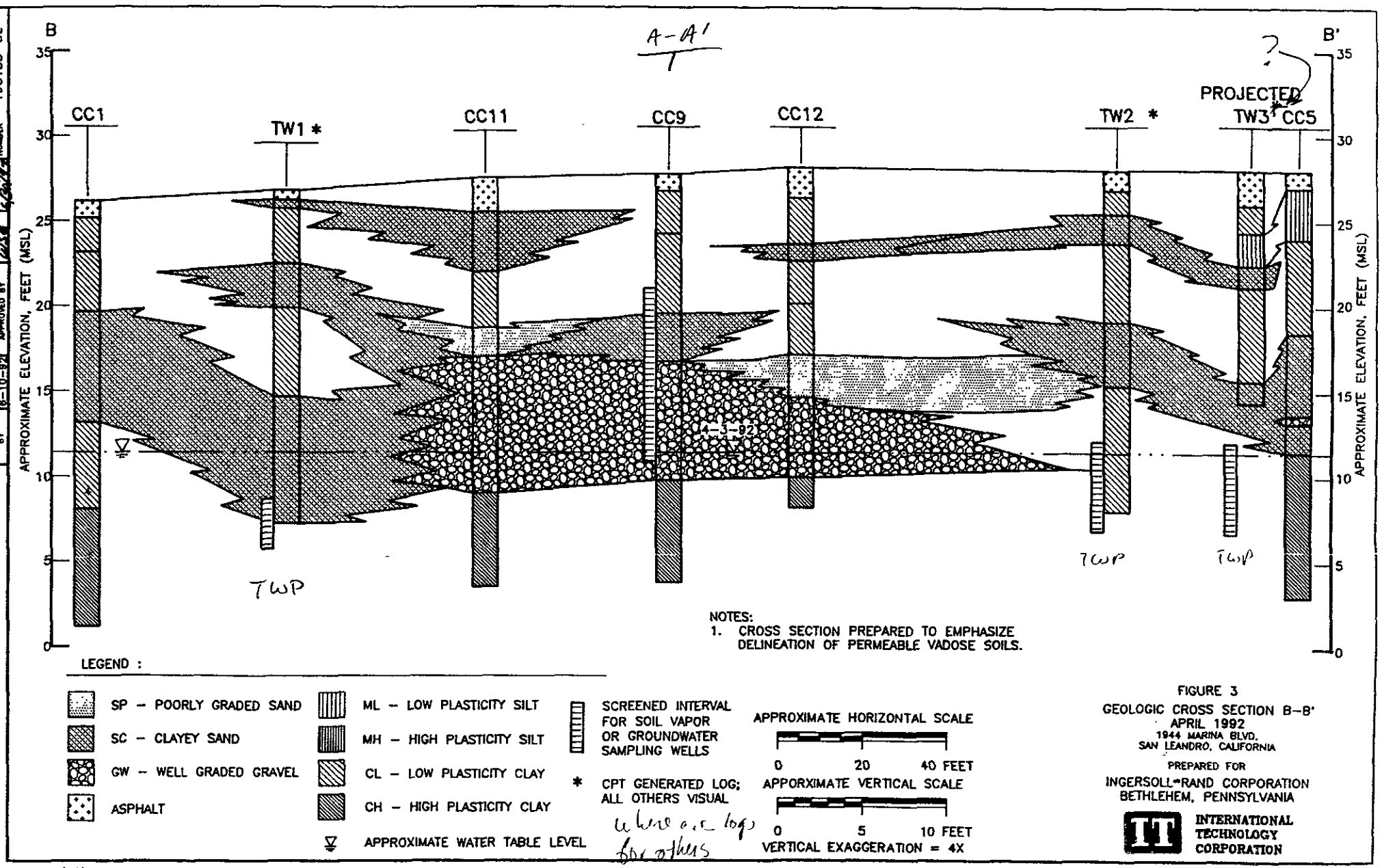

FIGURE 3
GEOLOGIC CROSS SECTION B–B'
APRIL 1992
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA
PREPARED FOR
INGERSOLL-RAND CORPORATION
BETHLEHEM, PENNSYLVANIA

INTERNATIONAL TECHNOLOGY CORPORATION

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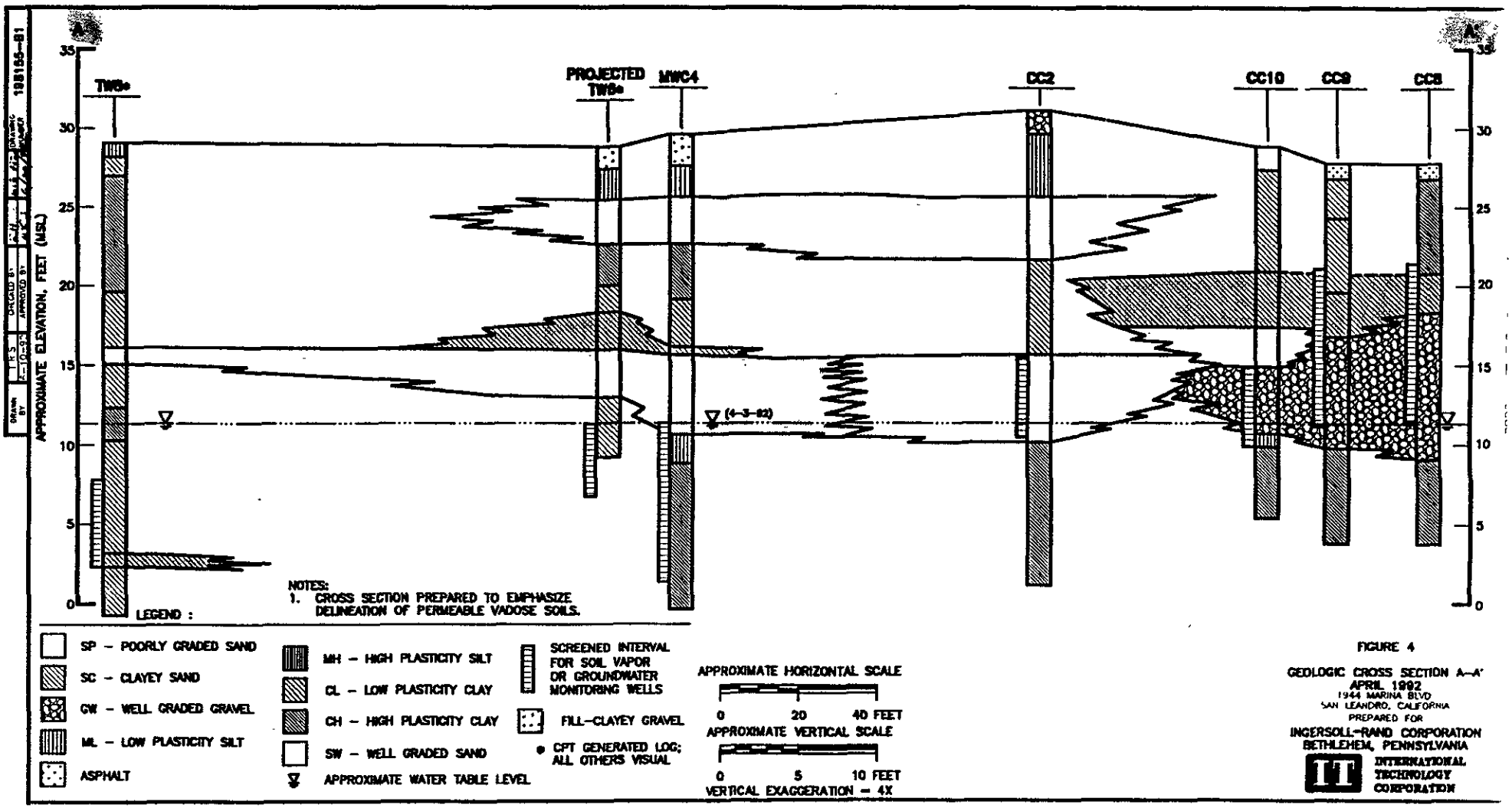


FIGURE 4

GEOLOGIC CROSS SECTION A–A'
APRIL 1992
1944 MARINA BLVD
SAN LEANDRO, CALIFORNIA
PREPARED FOR
INGERSOLL-RAND CORPORATION
BETHLEHEM, PENNSYLVANIA

INTERNATIONAL TECHNOLOGY CORPORATION

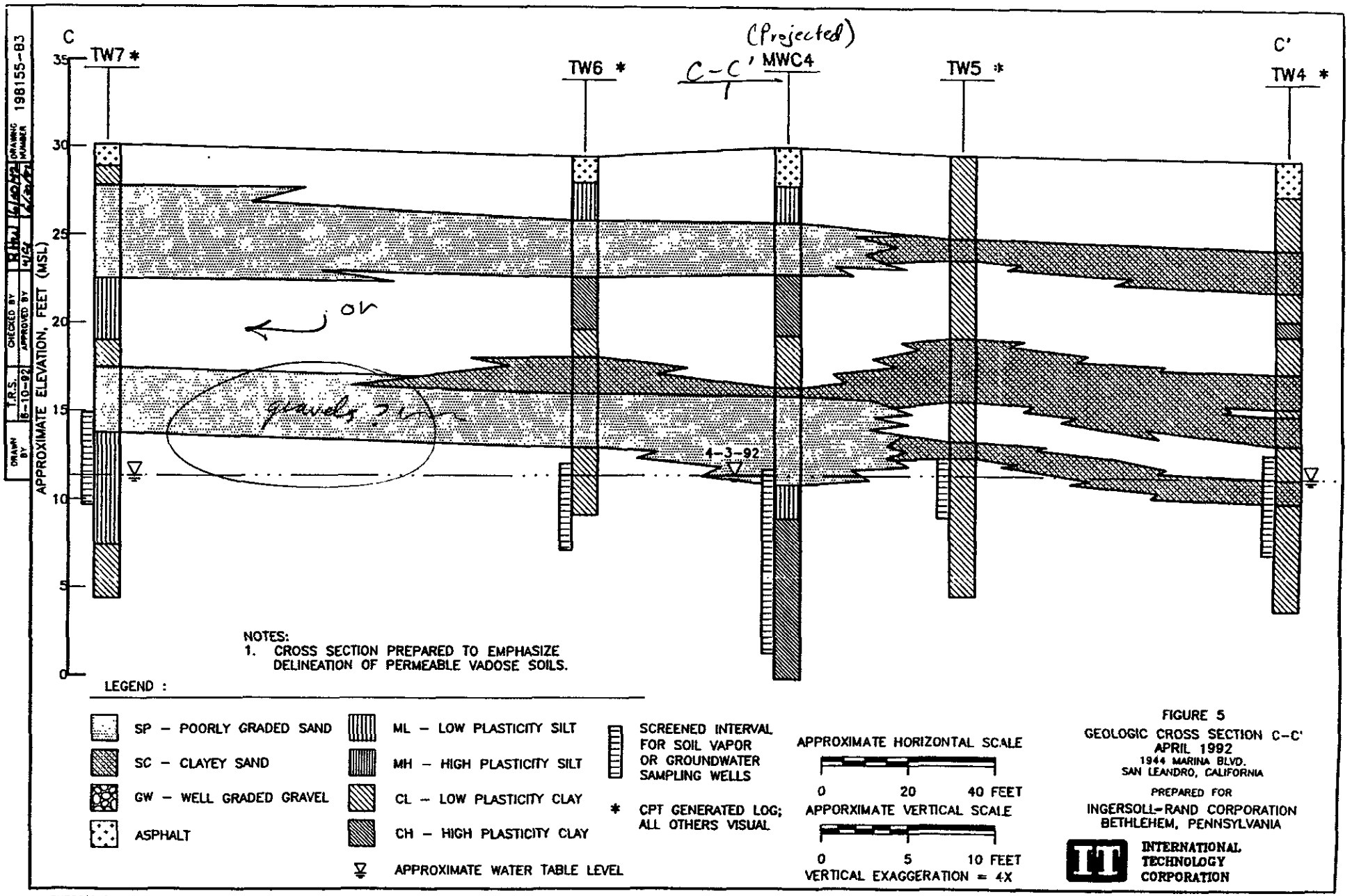


FIGURE 5
GEOLOGIC CROSS SECTION C-C'
APRIL 1992
1944 MARINA BLVD.
SAN LEANDRO, CALIFORNIA

PREPARED FOR
INGERSOLL-RAND CORPORATION
BETHLEHEM, PENNSYLVANIA

INTERNATIONAL TECHNOLOGY CORPORATION

IR-GXSCC(IR8)

DRAWN BY	B.J 6-30-92	CHECKED BY / APPROVED BY	RJW 6/30/92 WJC 6/30/92	DRAWING NUMBER	198154-A8

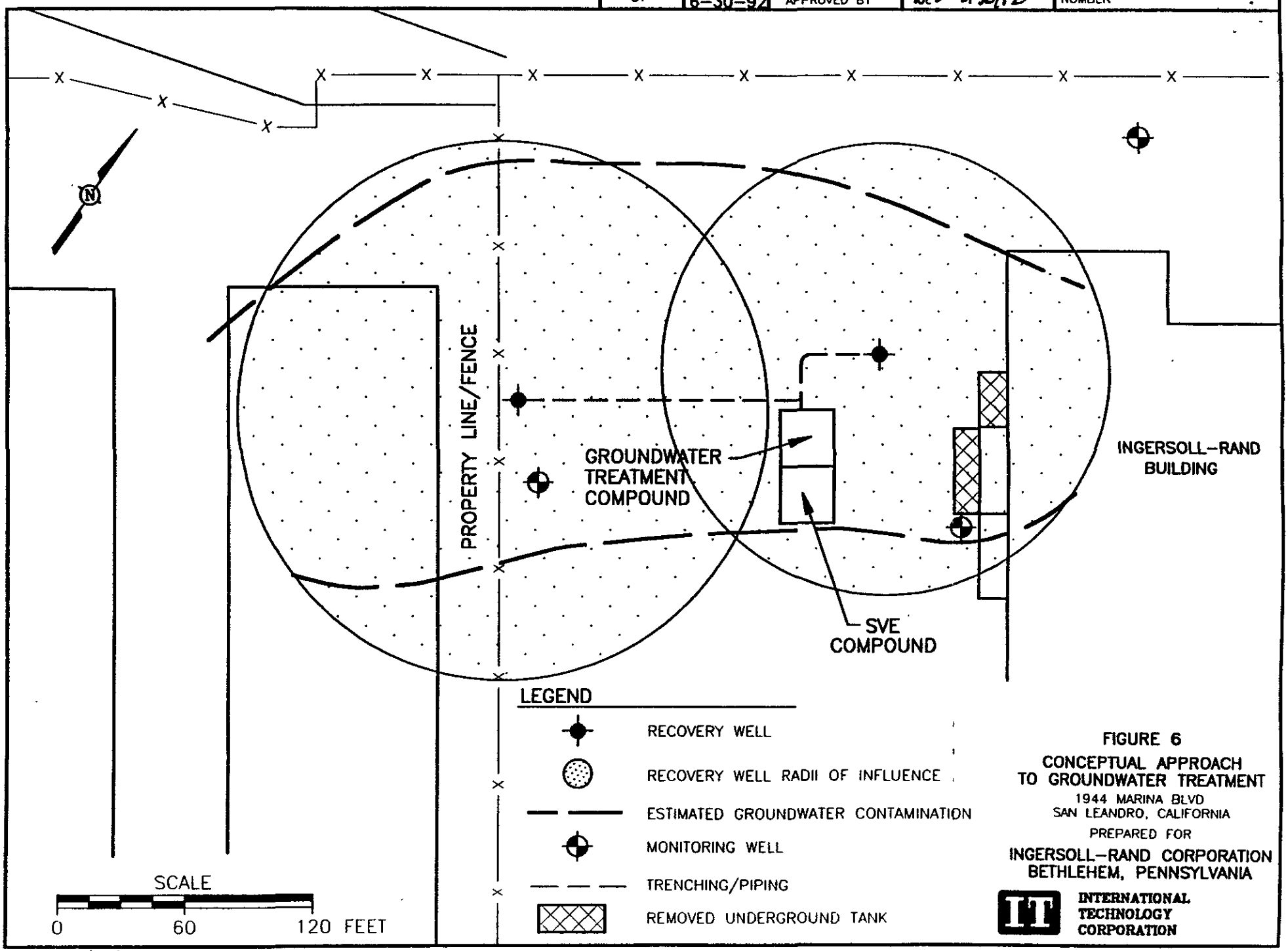


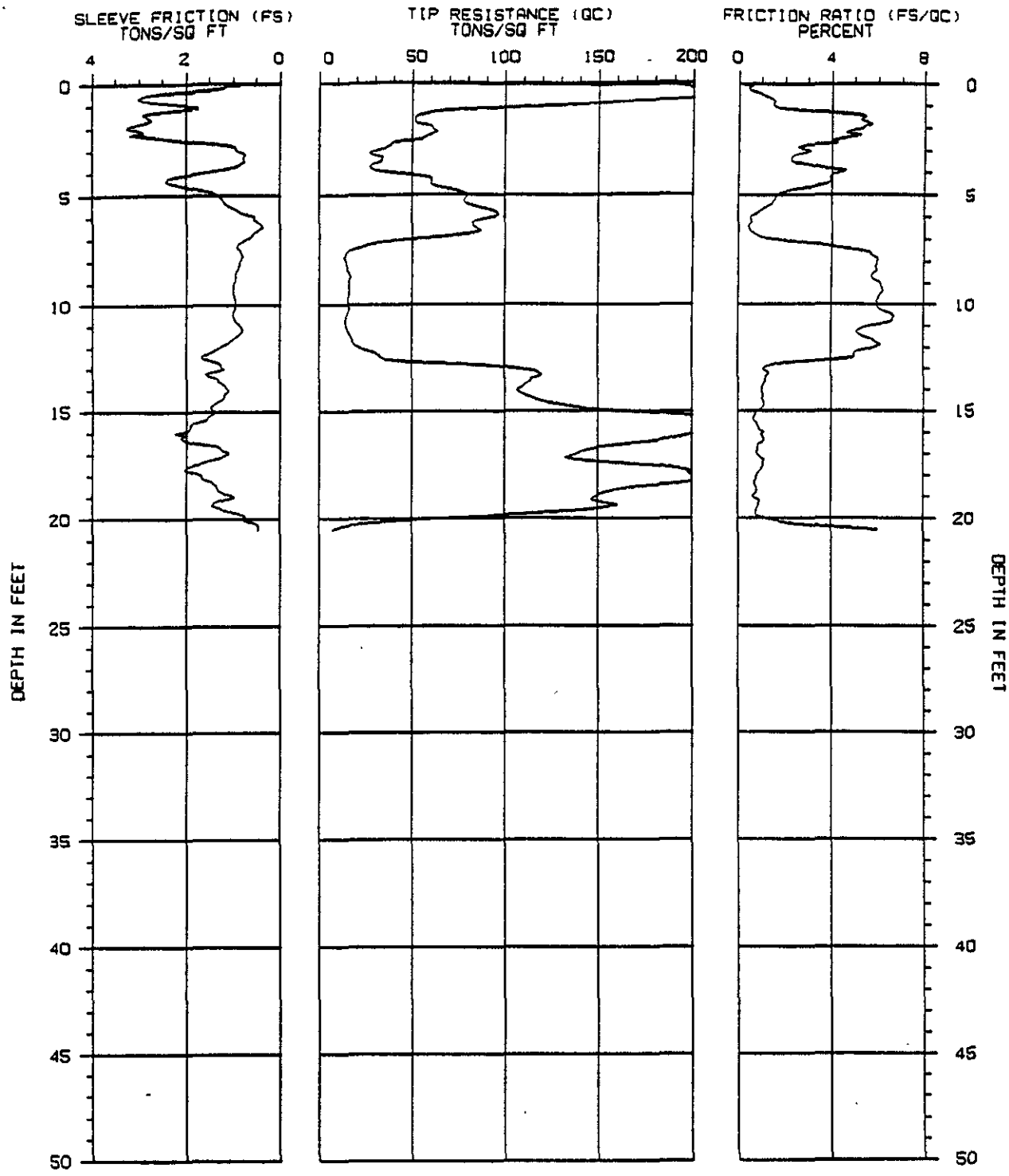
FIGURE 6
CONCEPTUAL APPROACH TO GROUNDWATER TREATMENT
1944 MARINA BLVD
SAN LEANDRO, CALIFORNIA
PREPARED FOR
INGERSOLL-RAND CORPORATION
BETHLEHEM, PENNSYLVANIA

INTERNATIONAL TECHNOLOGY CORPORATION

IR-EDGC1(IR8)

Appendix A

Cone Penetrometer Test Logs



CONE PENETRATION TEST

SOUNDING NUMBER: TW-1

PROJECT NAME : IT/INGERSOLL RAND

PROJECT NUMBER : 92-381-01501

LOCATION : SAN LEANDRO CA

DATE : 04-06-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-1
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-06-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

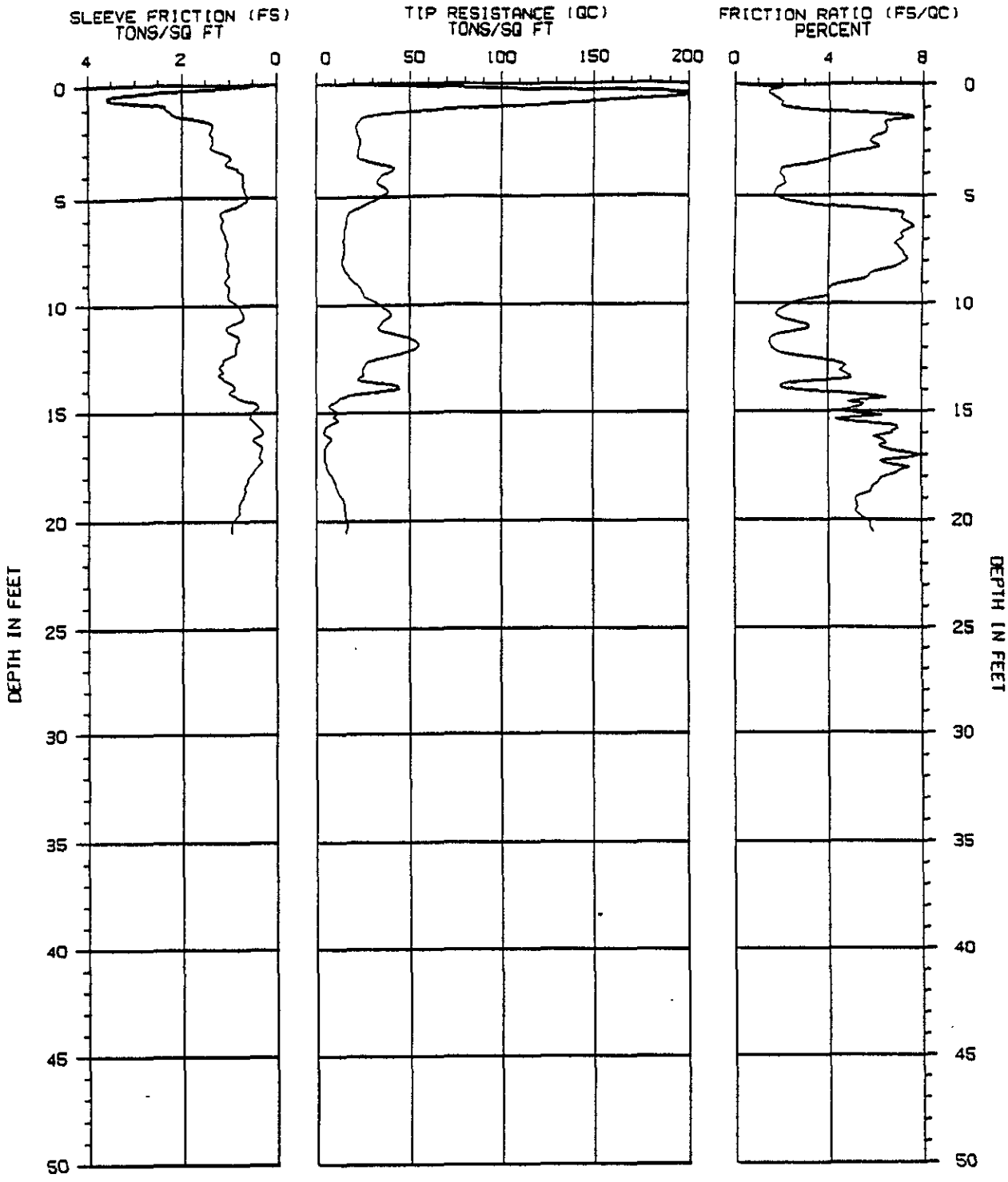
DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	263.2	2.84	1.08	NA
1.0	126.5	1.95	1.54	NA
1.5	52.2	2.83	5.41	NA
2.0	60.9	3.26	5.35	NA
2.5	55.3	2.22	4.02	NA
3.0	29.5	.91	3.10	NA
3.5	33.2	.75	2.27	NA
4.0	38.9	1.68	4.32	NA
4.5	60.1	2.26	3.76	NA
5.0	79.2	1.33	1.68	NA
5.5	83.8	1.07	1.27	NA
6.0	93.7	.52	.56	NA
6.5	85.1	.44	.52	NA
7.0	49.2	.75	1.52	NA
7.5	15.9	.85	5.36	NA
8.0	14.4	.85	5.95	NA
8.5	16.2	.94	5.81	NA
9.0	16.3	1.00	6.13	NA
9.5	16.0	.98	6.09	NA
10.0	15.8	.96	6.07	NA
10.5	14.9	1.00	6.71	NA
11.0	14.9	.83	5.59	NA
11.5	17.4	.95	5.44	NA
12.0	22.2	1.30	5.85	NA
12.5	33.5	1.65	4.94	NA
13.0	108.5	1.20	1.11	NA
13.5	114.0	1.33	1.17	NA
14.0	106.9	1.10	1.03	NA
14.5	117.5	1.26	1.07	NA
15.0	161.8	1.38	.85	NA
15.5	235.8	1.75	.74	NA
16.0	202.2	2.23	1.10	NA
16.5	170.1	1.78	1.05	NA
17.0	138.6	1.14	.82	NA
17.5	167.4	1.78	1.07	NA
18.0	200.8	1.67	.83	NA
18.5	179.0	1.36	.76	NA
19.0	148.7	.98	.66	NA
19.5	154.8	1.33	.86	NA
20.0	64.8	.77	1.19	NA

NA = NOT APPLICABLE

SOUNDING : TW-1

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	7.6	.46	6.02	NA

NA = NOT APPLICABLE



CONE PENETRATION TEST

SOUNDING NUMBER: TW-2

PROJECT NAME : IT/INGERSOLL RAND

LOCATION : SAN LEANDRO CA

PROJECT NUMBER : 92-381-01501

DATE : 04-06-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-2
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-06-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

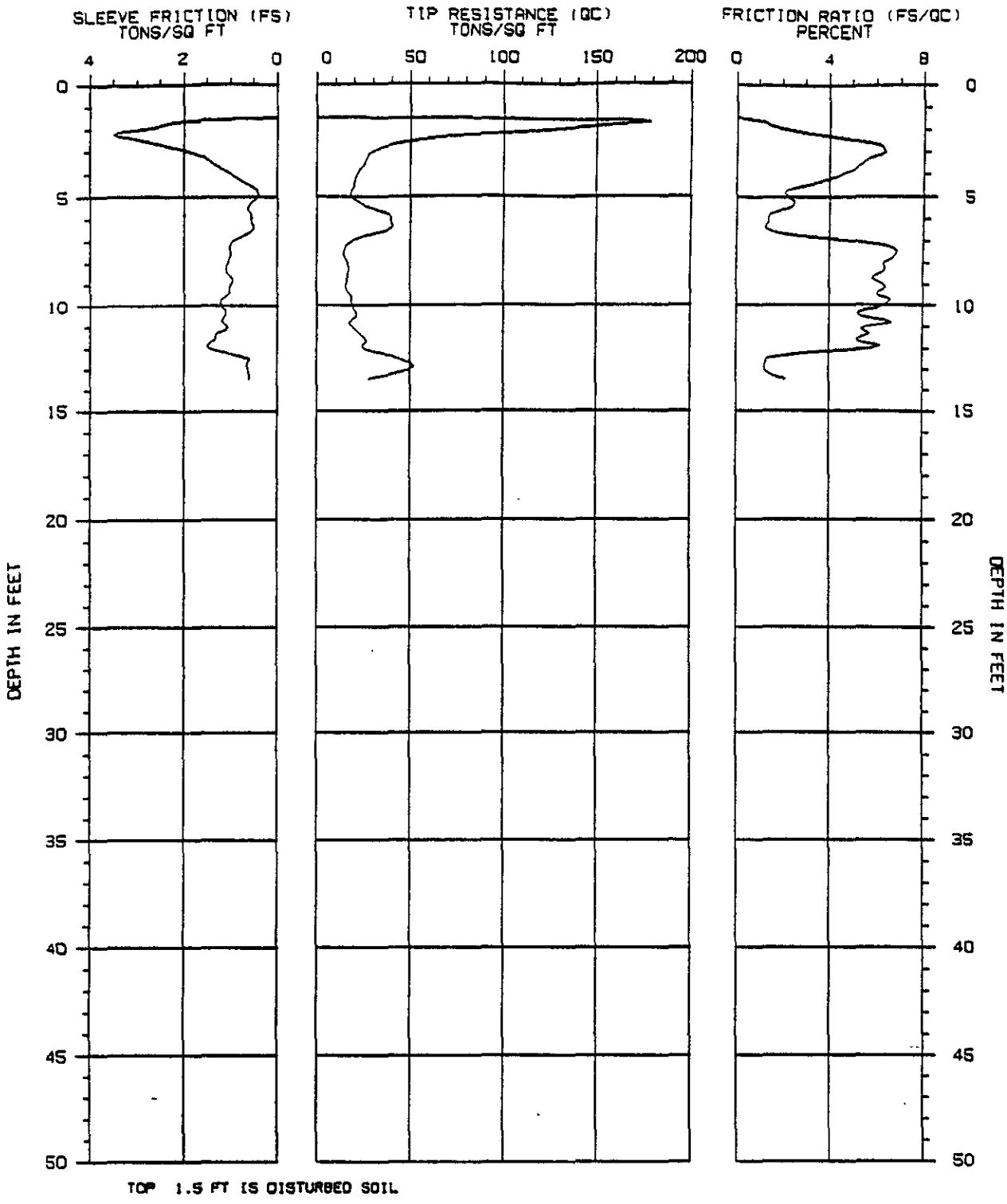
DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	208.9	3.58	1.71	NA
1.0	92.8	2.36	2.54	NA
1.5	23.8	1.80	7.55	NA
2.0	21.6	1.39	6.41	NA
2.5	23.6	1.34	5.69	NA
3.0	22.6	1.18	5.20	NA
3.5	32.8	1.08	3.30	NA
4.0	35.9	.69	1.92	NA
4.5	35.2	.71	2.02	NA
5.0	34.8	.61	1.76	NA
5.5	21.6	.99	4.60	NA
6.0	16.1	1.14	7.07	NA
6.5	15.2	1.13	7.41	NA
7.0	14.9	1.05	7.06	NA
7.5	15.1	1.08	7.14	NA
8.0	14.0	1.02	7.30	NA
8.5	17.2	1.01	5.87	NA
9.0	22.4	1.05	4.68	NA
9.5	25.5	1.03	4.02	NA
10.0	33.9	.82	2.42	NA
10.5	39.4	.70	1.78	NA
11.0	33.3	1.06	3.17	NA
11.5	49.5	.79	1.60	NA
12.0	53.3	.86	1.61	NA
12.5	32.9	1.12	3.41	NA
13.0	25.1	1.16	4.61	NA
13.5	22.3	1.11	4.96	NA
14.0	36.2	.98	2.70	NA
14.5	11.1	.61	5.48	NA
15.0	11.7	.53	4.51	NA
15.5	9.7	.47	4.80	NA
16.0	4.6	.31	6.76	NA
16.5	5.7	.37	6.48	NA
17.0	4.6	.36	7.91	NA
17.5	5.8	.40	6.89	NA
18.0	9.2	.59	6.44	NA
18.5	11.3	.67	5.89	NA
19.0	14.5	.75	5.18	NA
19.5	15.4	.80	5.20	NA
20.0	16.6	.94	5.63	NA

NA = NOT APPLICABLE

SOUNDING : TW-2

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	16.3	.96	5.90	NA

NA = NOT APPLICABLE



CONE PENETRATION TEST

SOUNDING NUMBER: TW-3

PROJECT NAME : IT/INGERSOLL RAND

PROJECT NUMBER : 92-381-01501

LOCATION : SAN LEANDRO CA

DATE : 04-06-1992

THE EARTH TECHNOLOGY CORPORATION

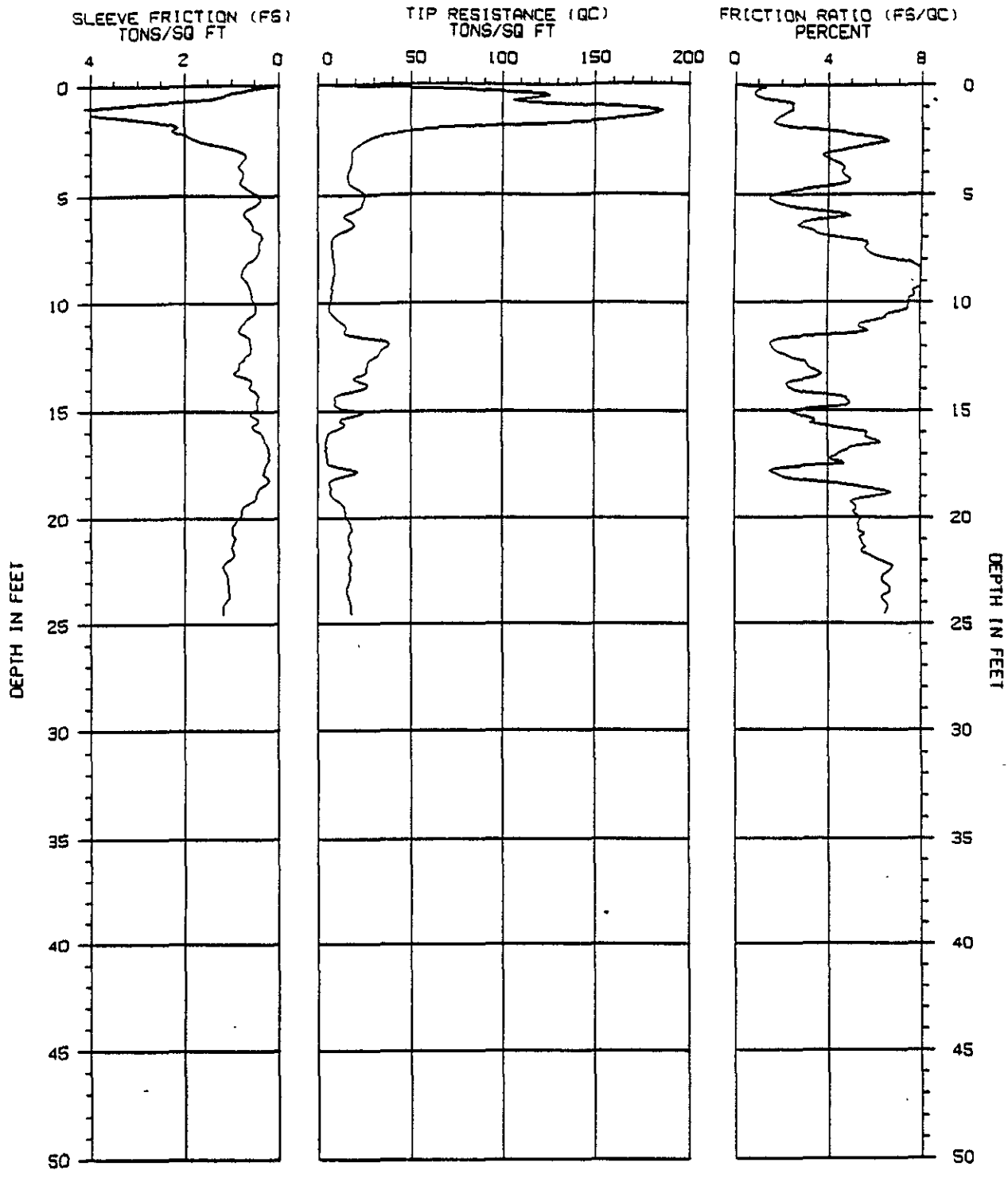
CONE PENETRATION TEST

SOUNDING : TW-3
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-06-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	.0	.00	.00	NA
1.0	.0	.00	.00	NA
1.5	.0	.00	.00	NA
2.0	129.3	3.05	2.36	NA
2.5	52.5	2.80	5.33	NA
3.0	29.6	1.88	6.34	NA
3.5	25.6	1.38	5.38	NA
4.0	21.7	.99	4.54	NA
4.5	20.1	.58	2.86	NA
5.0	18.8	.43	2.26	NA
5.5	28.8	.63	2.20	NA
6.0	39.7	.55	1.38	NA
6.5	37.1	.55	1.48	NA
7.0	19.2	.95	4.97	NA
7.5	14.6	1.00	6.85	NA
8.0	16.7	1.05	6.31	NA
8.5	17.0	1.03	6.09	NA
9.0	15.9	1.01	6.32	NA
9.5	18.3	1.12	6.09	NA
10.0	19.1	1.20	6.30	NA
10.5	21.1	1.15	5.43	NA
11.0	19.1	1.07	5.60	NA
11.5	25.1	1.33	5.29	NA
12.0	25.1	1.45	5.78	NA
12.5	43.7	.60	1.36	NA
13.0	50.1	.63	1.25	NA
13.5	28.1	.60	2.13	NA

NA = NOT APPLICABLE
TOP 1.5 FT IS DISTURBED SOIL



CONE PENETRATION TEST

SOUNDING NUMBER: TW-4

PROJECT NAME : IT/INGERSOLL RAND

PROJECT NUMBER : 92-381-01501

LOCATION : SAN LEANDRO CA

DATE : 04-06-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-4
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-06-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

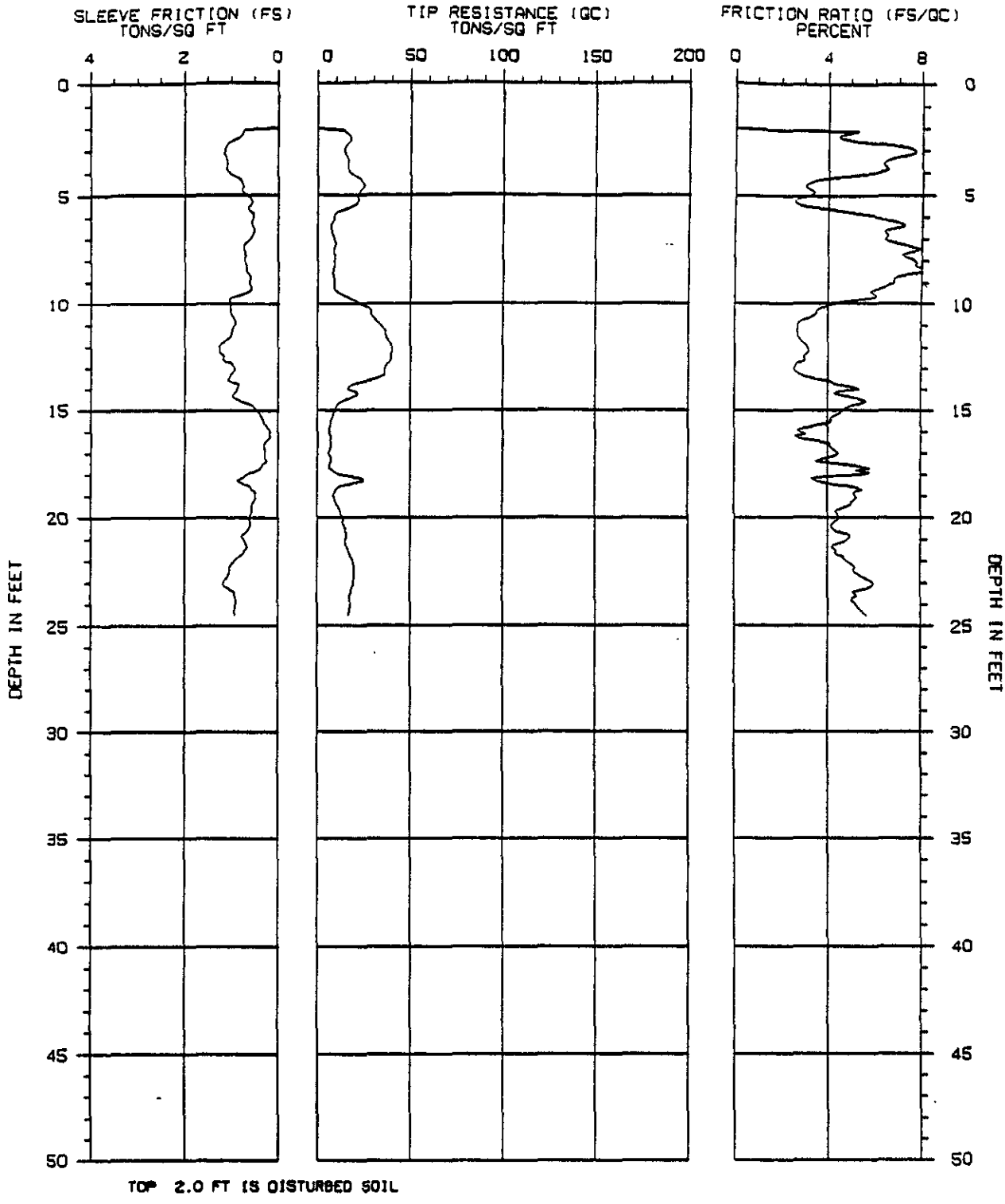
DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	125.4	1.14	.91	NA
1.0	159.6	3.98	2.49	NA
1.5	169.1	3.10	1.84	NA
2.0	60.2	2.29	3.81	NA
2.5	25.4	1.66	6.54	NA
3.0	18.3	.77	4.24	NA
3.5	18.3	.81	4.40	NA
4.0	16.3	.75	4.61	NA
4.5	17.5	.78	4.47	NA
5.0	25.1	.43	1.71	NA
5.5	23.9	.53	2.21	NA
6.0	14.1	.70	4.94	NA
6.5	18.6	.54	2.91	NA
7.0	8.1	.36	4.47	NA
7.5	7.7	.43	5.61	NA
8.0	8.4	.57	6.74	NA
8.5	9.1	.76	8.39	NA
9.0	8.1	.67	8.27	NA
9.5	7.5	.58	7.71	NA
10.0	6.8	.51	7.56	NA
10.5	7.9	.53	6.66	NA
11.0	14.6	.79	5.37	NA
11.5	18.1	.69	3.79	NA
12.0	37.3	.60	1.61	NA
12.5	31.0	.72	2.32	NA
13.0	26.5	.84	3.18	NA
13.5	19.1	.64	3.34	NA
14.0	23.3	.57	2.46	NA
14.5	9.4	.45	4.80	NA
15.0	21.2	.50	2.36	NA
15.5	12.0	.42	3.48	NA
16.0	6.8	.39	5.67	NA
16.5	4.3	.27	6.23	NA
17.0	4.7	.21	4.44	NA
17.5	5.9	.28	4.67	NA
18.0	15.4	.29	1.86	NA
18.5	6.7	.34	4.99	NA
19.0	7.8	.46	5.95	NA
19.5	14.5	.75	5.20	NA
20.0	15.8	.85	5.38	NA

NA = NOT APPLICABLE

SOUNDING : TW-4

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	18.4	.98	5.35	NA
21.0	17.1	.93	5.43	NA
21.5	18.0	.98	5.43	NA
22.0	17.5	1.09	6.21	NA
22.5	17.2	1.14	6.62	NA
23.0	17.1	1.09	6.37	NA
23.5	15.7	1.04	6.64	NA
24.0	17.5	1.14	6.51	NA
24.5	18.3	1.18	6.44	NA

NA = NOT APPLICABLE



CONE PENETRATION TEST

SOUNDING NUMBER: TW-5

PROJECT NAME : IT/INGERSOLL RAND

PROJECT NUMBER : 92-381-01501

LOCATION : SAN LEANDRO CA

DATE : 04-07-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-5
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-07-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

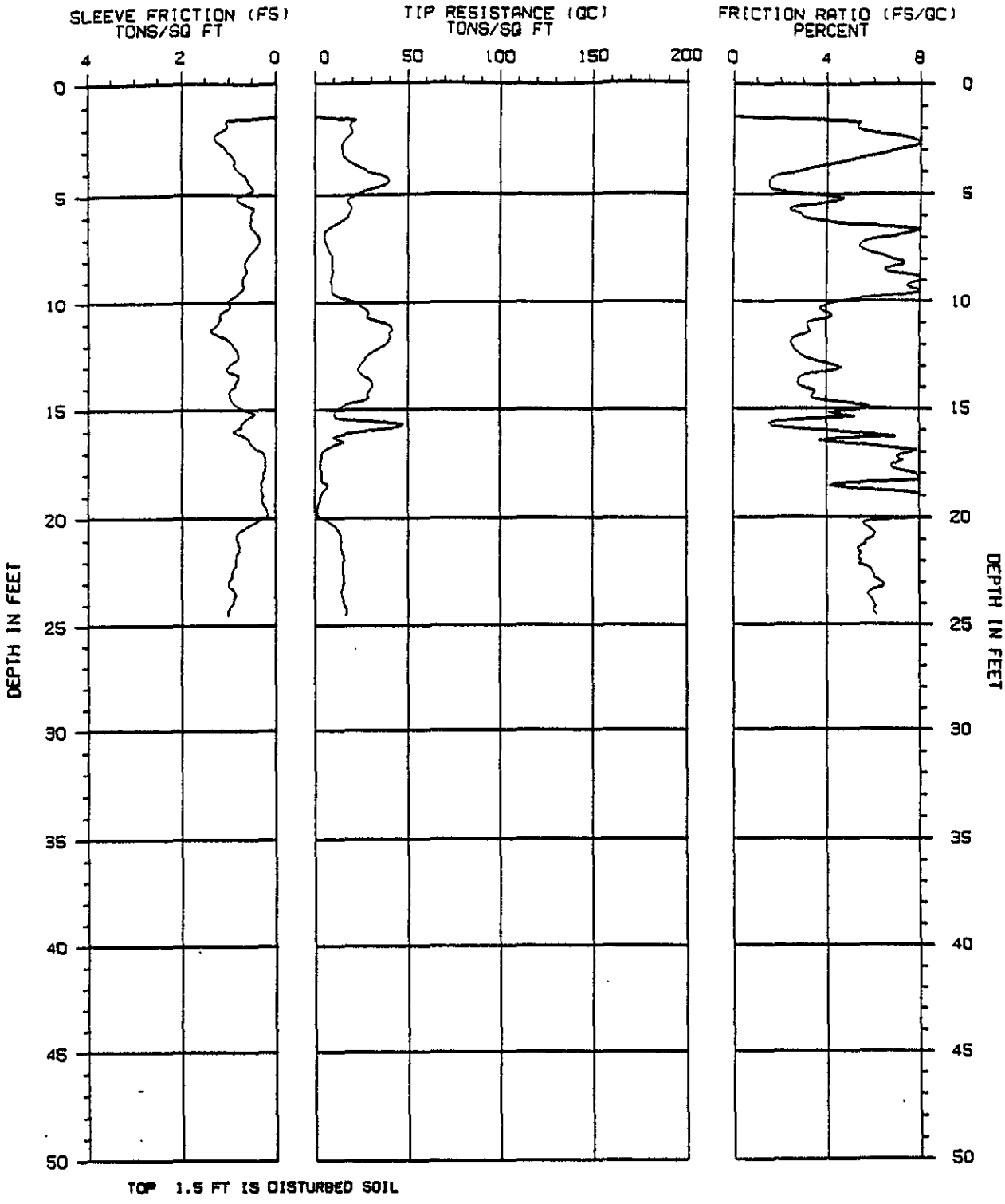
DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	.0	.00	.00	NA
1.0	.0	.00	.00	NA
1.5	.0	.00	.00	NA
2.0	.0	.00	.00	NA
2.5	18.0	.90	4.99	NA
3.0	14.9	1.14	7.67	NA
3.5	17.1	1.09	6.34	NA
4.0	18.1	1.05	5.80	NA
4.5	25.0	.75	3.01	NA
5.0	22.0	.68	3.09	NA
5.5	18.4	.63	3.44	NA
6.0	8.9	.54	6.05	NA
6.5	7.7	.52	6.74	NA
7.0	9.4	.60	6.41	NA
7.5	9.2	.72	7.83	NA
8.0	9.3	.72	7.70	NA
8.5	8.3	.67	8.06	NA
9.0	9.2	.63	6.82	NA
9.5	13.1	.78	5.96	NA
10.0	23.6	1.02	4.34	NA
10.5	29.0	1.00	3.45	NA
11.0	34.6	.94	2.71	NA
11.5	37.2	1.02	2.74	NA
12.0	40.2	1.26	3.12	NA
12.5	39.3	1.17	2.98	NA
13.0	36.1	.92	2.55	NA
13.5	31.9	1.06	3.34	NA
14.0	16.6	.89	5.35	NA
14.5	16.6	.89	5.40	NA
15.0	9.7	.45	4.63	NA
15.5	7.6	.32	4.16	NA
16.0	6.5	.18	2.82	NA
16.5	7.3	.28	3.78	NA
17.0	6.4	.29	4.46	NA
17.5	7.1	.30	4.29	NA
18.0	12.7	.69	5.43	NA
18.5	16.2	.69	4.27	NA
19.0	9.3	.48	5.22	NA
19.5	11.4	.56	4.89	NA
20.0	13.8	.62	4.51	NA

NA = NOT APPLICABLE
TOP 2.0 FT IS DISTURBED SOIL

SOUNDING : TW-5

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	15.0	.63	4.23	NA
21.0	15.3	.74	4.85	NA
21.5	16.6	.72	4.34	NA
22.0	19.4	.93	4.81	NA
22.5	20.2	1.04	5.16	NA
23.0	19.7	1.18	5.96	NA
23.5	17.8	.93	5.19	NA
24.0	18.0	.94	5.21	NA
24.5	16.7	.94	5.65	NA

NA = NOT APPLICABLE



CONE PENETRATION TEST

SOUNDING NUMBER: TW-6

PROJECT NAME : IT/INGERSOLL RAND

LOCATION : SAN LEANDRO CA

PROJECT NUMBER : 92-381-01501

DATE : 04-07-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-6
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-07-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

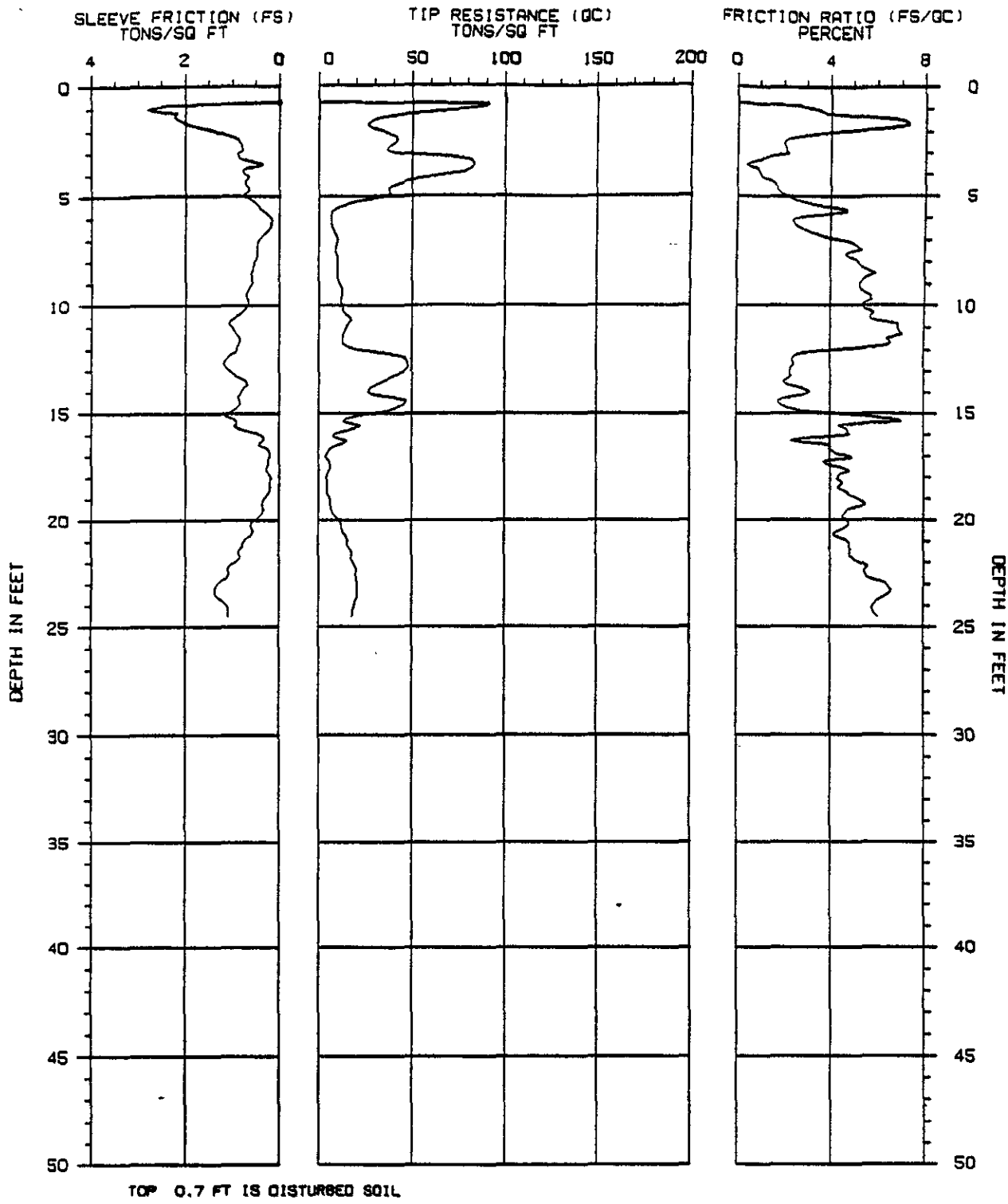
DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	.0	.00	.00	NA
1.0	.0	.00	.00	NA
1.5	.0	.00	.00	NA
2.0	19.7	1.05	5.35	NA
2.5	16.6	1.29	7.78	NA
3.0	15.0	1.03	6.90	NA
3.5	18.3	.87	4.76	NA
4.0	28.6	.77	2.71	NA
4.5	38.5	.58	1.52	NA
5.0	21.9	.69	3.16	NA
5.5	19.4	.57	2.93	NA
6.0	17.8	.52	2.93	NA
6.5	7.2	.52	7.24	NA
7.0	5.4	.34	6.25	NA
7.5	8.2	.46	5.57	NA
8.0	9.3	.64	6.91	NA
8.5	9.6	.62	6.48	NA
9.0	8.8	.71	8.15	NA
9.5	9.7	.79	8.17	NA
10.0	22.4	1.03	4.63	NA
10.5	28.8	1.17	4.06	NA
11.0	39.0	1.25	3.19	NA
11.5	40.1	1.27	3.17	NA
12.0	36.9	.92	2.49	NA
12.5	27.7	.80	2.90	NA
13.0	23.3	1.03	4.41	NA
13.5	27.1	.80	2.94	NA
14.0	30.2	.92	3.05	NA
14.5	28.7	.95	3.32	NA
15.0	11.2	.66	5.90	NA
15.5	18.5	.65	3.51	NA
16.0	25.3	.93	3.67	NA
16.5	15.0	.55	3.64	NA
17.0	3.6	.27	7.64	NA
17.5	3.1	.22	7.09	NA
18.0	3.5	.27	7.86	NA
18.5	6.9	.30	4.37	NA
19.0	3.0	.27	8.90	NA
19.5	1.7	.21	12.11	NA
20.0	3.1	.25	8.21	NA

NA = NOT APPLICABLE
TOP 1.5 FT IS DISTURBED SOIL

SOUNDING : TW-6

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	11.7	.69	5.88	NA
21.0	14.1	.82	5.83	NA
21.5	14.5	.78	5.39	NA
22.0	15.4	.85	5.52	NA
22.5	15.4	.92	6.00	NA
23.0	15.7	1.00	6.39	NA
23.5	14.8	.85	5.76	NA
24.0	15.6	.93	6.00	NA
24.5	16.5	1.01	6.14	NA

NA = NOT APPLICABLE



CONE PENETRATION TEST

SOUNDING NUMBER: TW-7

PROJECT NAME : IT/INGERSOLL RAND

PROJECT NUMBER : 92-381-01501

LOCATION : SAN LEANORO CA

DATE : 04-07-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-7
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-07-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

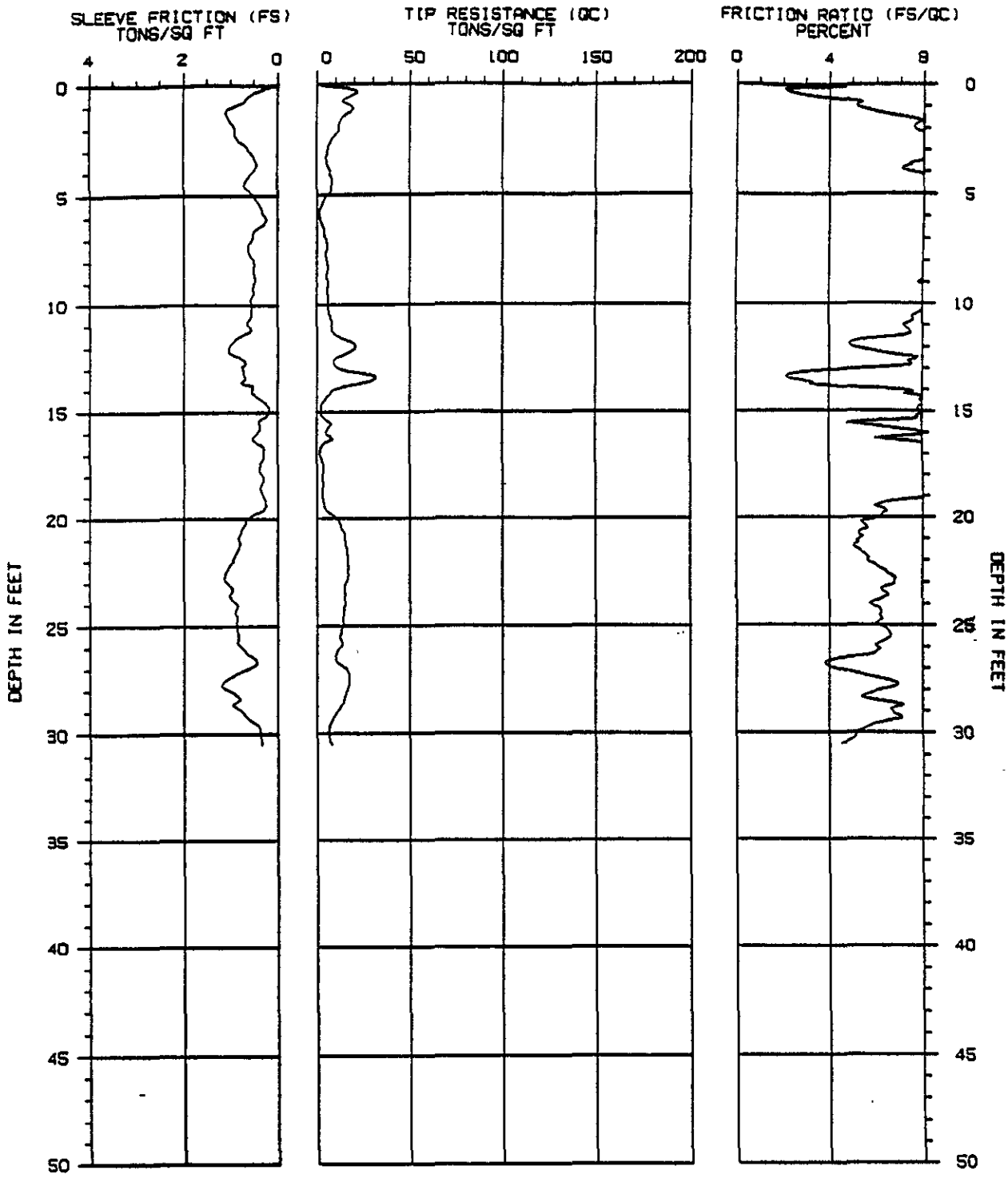
DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	.0	.00	.00	NA
1.0	83.5	2.81	3.37	NA
1.5	31.2	2.16	6.91	NA
2.0	33.8	1.37	4.05	NA
2.5	41.5	.84	2.02	NA
3.0	40.6	.89	2.19	NA
3.5	83.6	.36	.43	NA
4.0	69.6	.71	1.02	NA
4.5	40.5	.69	1.69	NA
5.0	35.7	.76	2.13	NA
5.5	10.3	.43	4.17	NA
6.0	7.0	.18	2.51	NA
6.5	7.9	.23	2.88	NA
7.0	10.0	.45	4.47	NA
7.5	9.3	.46	4.96	NA
8.0	10.1	.52	5.19	NA
8.5	10.0	.59	5.90	NA
9.0	11.2	.59	5.23	NA
9.5	12.3	.71	5.72	NA
10.0	12.9	.70	5.40	NA
10.5	16.3	.93	5.69	NA
11.0	14.7	1.01	6.86	NA
11.5	13.2	.84	6.38	NA
12.0	20.8	.90	4.31	NA
12.5	47.5	1.14	2.40	NA
13.0	46.3	1.05	2.27	NA
13.5	34.9	.71	2.03	NA
14.0	26.3	.82	3.13	NA
14.5	46.9	.83	1.78	NA
15.0	29.3	1.16	3.95	NA
15.5	17.6	.92	5.23	NA
16.0	8.1	.39	4.84	NA
16.5	11.0	.43	3.94	NA
17.0	4.3	.21	4.87	NA
17.5	6.5	.27	4.19	NA
18.0	4.3	.19	4.34	NA
18.5	4.5	.19	4.30	NA
19.0	6.4	.33	5.18	NA
19.5	7.1	.34	4.82	NA
20.0	11.3	.54	4.76	NA

NA = NOT APPLICABLE
TOP .7 FT IS DISTURBED SOIL

SOUNDING : TW-7

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	12.7	.56	4.39	NA
21.0	15.9	.75	4.74	NA
21.5	17.7	.86	4.86	NA
22.0	18.4	.95	5.18	NA
22.5	19.9	1.09	5.50	NA
23.0	20.8	1.33	6.42	NA
23.5	21.0	1.34	6.39	NA
24.0	19.0	1.10	5.81	NA
24.5	18.1	1.09	6.06	NA

NA = NOT APPLICABLE



CONE PENETRATION TEST

SOUNDING NUMBER: TW-8

PROJECT NAME : IT/INGERSOLL RAND

PROJECT NUMBER : 92-381-01501

LOCATION : SAN LEANDRO CA

DATE : 04-07-1992

THE EARTH TECHNOLOGY CORPORATION

CONE PENETRATION TEST

SOUNDING : TW-8
PROJECT : IT/INGERSOLL RAND
LOCATION : SAN LEANDRO CA
DATE : 04-07-1992

PROJECT NO : 92-381-01501
INSTRUMENT : F15CKE093
SYSTEM : T-1
OPERATOR : MR/DH

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
.0	.0	.00	.00	NA
.5	19.7	.62	3.12	NA
1.0	18.7	.96	5.16	NA
1.5	14.3	1.04	7.24	NA
2.0	12.1	.92	7.58	NA
2.5	8.2	.81	9.87	NA
3.0	6.0	.59	9.74	NA
3.5	5.7	.45	7.90	NA
4.0	7.3	.55	7.45	NA
4.5	8.4	.71	8.48	NA
5.0	5.5	.52	9.53	NA
5.5	2.5	.36	14.22	NA
6.0	1.9	.25	13.45	NA
6.5	4.0	.46	11.40	NA
7.0	5.0	.56	11.21	NA
7.5	5.2	.62	11.91	NA
8.0	5.7	.50	8.84	NA
8.5	5.5	.51	9.36	NA
9.0	6.4	.50	7.78	NA
9.5	6.1	.54	8.85	NA
10.0	6.2	.54	8.75	NA
10.5	7.2	.55	7.72	NA
11.0	8.2	.59	7.14	NA
11.5	11.9	.85	7.12	NA
12.0	20.8	1.04	4.98	NA
12.5	10.1	.79	7.79	NA
13.0	12.7	.74	5.79	NA
13.5	30.9	.71	2.29	NA
14.0	8.0	.56	7.05	NA
14.5	3.8	.30	7.84	NA
15.0	2.4	.19	8.01	NA
15.5	7.1	.39	5.57	NA
16.0	5.4	.45	8.33	NA
16.5	4.1	.41	10.15	NA
17.0	2.0	.29	14.41	NA
17.5	3.8	.38	10.03	NA
18.0	3.0	.32	10.52	NA
18.5	3.4	.38	11.37	NA
19.0	3.1	.29	9.27	NA
19.5	4.3	.26	5.93	NA
20.0	10.9	.67	6.13	NA

NA = NOT APPLICABLE

SOUNDING : TW-8

DEPTH (ft)	TIP RESISTANCE (tsf)	SLEEVE FRICTION (tsf)	FRICTION RATIO (%)	CONE PORE PRESSURE (tsf)
20.5	13.6	.77	5.66	NA
21.0	15.4	.82	5.30	NA
21.5	16.4	.87	5.32	NA
22.0	16.8	.94	5.60	NA
22.5	17.0	1.10	6.46	NA
23.0	15.7	1.07	6.80	NA
23.5	15.5	1.01	6.51	NA
24.0	15.3	.87	5.67	NA
24.5	14.2	.87	6.13	NA
25.0	14.2	.87	6.10	NA
25.5	12.6	.84	6.63	NA
26.0	12.3	.75	6.06	NA
26.5	10.2	.46	4.50	NA
27.0	16.1	.68	4.22	NA
27.5	17.4	1.13	6.47	NA
28.0	16.5	1.01	6.12	NA
28.5	14.3	.89	6.22	NA
29.0	11.0	.74	6.71	NA
29.5	7.4	.46	6.22	NA
30.0	6.6	.34	5.17	NA
30.5	7.7	.35	4.51	NA

NA = NOT APPLICABLE

Appendix B

Sample Manifests

IT INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 33799
Page 1 of 1

Project Name/No. 1 INGERSOLL - RAND 198155.02
Sample Team Members 2 J. STRACK
Profit Center No. 3 3541
Project Manager 4 WILLIAM SCHAAL
Purchase Order No. 6
Required Report Date 11 4-22-92

Samples Shipment Date 7 4-8-92
Lab Destination 8 COAST TO COAST
Lab Contact 9 TODD
Project Contact/Phone 12 BILL SCHAAL (510) 372-9100
Carrier/Waybill No. 13 HAND DELIVERED

Bill to: 5 BILL SCHAAL
IT CORPORATION
4585 PACHECO BLVD
MARTINEZ, CA 94553

Report to: 10 BILL SCHAAL

BD0184

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
✓ IRGW-TW-1	GROUNDWATER	4-6-92 1530	3×40ml VIALS	120ml	ICE HCl	MOD. 8260 (BTEX TPH GASOLINE TCA TCE PCE)		-1
✓ IRGW-TW-2	GRD. WATER	4-7-92 1530	1×40ml VIAL	40ml	ICE HCl	MOD. 8260	FOR LAB USE ONLY	-2
✓ IRGW-TW-3	GRND. WATER	4-6-92 1500	3×40ml VIALS	120ml	ICE HCl	MOD. 8260		-3
✓ IRGW-TW-4	GRND. WATER	4-7-92 0900	2×40ml VIALS	80ml	ICE HCl	MOD. 8260		-4
✓ IRGW-TW-5	GRND. WATER	4-8-92 0900	3×40ml VIALS	120ml	ICE HCl	MOD. 8260	FOR LAB	-5
✓ IRGW-TW-6	GRND. WATER	4-8-92 0830	3×40ml VIALS	120ml	ICE HCl	MOD. 8260	USE ONLY	-6
IRGW-TW-7	GRND WATER	4-8-92 0815	3×40ml VIALS	120ml	ICE HCl	MOD. 8260		-7
✓ IRGW-TW-8	SOIL ~~GRND WATER~~	4-8-92 0730	3×40ml VIALS	~100ml	ICE ~~NONE~~	MOD. 8260		-9

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal: 25
Return to Client ☐ Disposal by Lab ☐ Archive ____ (mos.)

Turnaround Time Required: 26
Normal ☒ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): ____

1. Relinquished by 28 (Signature/Affiliation) [signature]	Date: 4-8-92 Time: 1350	1. Received by 28 (Signature/Affiliation) [signature]	Date: 4/8/92 Time: 1350
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

MCA 9/159

04/23/92 11:41 CCHS-BENICIA 7077472765 055

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 33798
Page 1 of ____

Project Name/No.[1] INGERSOLL-RAND 198155.02
Sample Team Members[2] J. STRACK
Profit Center No.[3] 3541
Project Manager[4] WILLIAM SCHAAL
Purchase Order No.[6]
Required Report Date[11] 4-22-92

Samples Shipment Date[7] 4-8-92
Lab Destination[8] COAST TO COAST
Lab Contact[9] TODD
Project Contact/Phone[12] BILL SCHAAL (510)372-9100
Carrier/Waybill No.[13] HAND DELIVERED

Bill to:[5] BILL SCHAAL
IT CORPORATION
4585 PACHECO BLVD
MARTINEZ, CA 94553

Report to:[10] BILL SCHAAL

ONE CONTAINER PER LINE

Sample Number[14]	Sample Description/Type[15]	Date/Time Collected[16]	Container Type[17]	Sample Volume[18]	Preservative[19]	Requested Testing Program[20]	Condition on Receipt[21]	Disposal Record No.[22]
IRSG-TW-3B	SOIL VAPOR	4-6-92/1155	1×½ℓ TEDLAR BAG	~½ℓ	ICE ~~NONE~~	TO-14 VOLATILE ORGANICS		-12
IRSG-TW-3A	SOIL VAPOR	4-6-92/1120	2×½ℓ	~1ℓ	ICE ~~NONE~~	TO-14		-11
IRSG-TW-1	SOIL VAPOR	4-6-92/1400	2×½ℓ	~1ℓ	ICE ~~NONE~~	TO-14		-13
IRSG-TW-C	SOIL VAPOR	4-7-92/1452	1×½ℓ	~½ℓ	ICE ~~NONE~~	TO-14		-13
IRSG-TW-8	SOIL VAPOR	4-7-92/1620	2×½ℓ	~1ℓ	ICE ~~NONE~~	TO-14		-14
IRER-1	EQUIPMENT RINSATE	4-8-92/1200	3×40ml VIALS	120ml	ICE HCl	MODIFIED 8260 BTEX, TPHGas; TETRADE		-8

Special Instructions:[23]

Possible Hazard Identification:[24]
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal:[25]
Return to Client ☐ Disposal by Lab ☐ Archive ____ (mos.)

Turnaround Time Required:[26]
Normal ☐ Rush ☐

QC Level:[27]
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by[28] (Signature/Affiliation) Joe Strack	Date: 4-8-92 Time: 1350	1. Received by[28] (Signature/Affiliation)	Date: 4/8/92 Time: 1350
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments:[29]

MCA 3/15/9

Appendix C

Laboratory Reports

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Goleta, CA • Benicia, CA • Camarillo, CA
Newport Beach, CA • Valparaiso, IN • Westbrook, ME

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-12
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-A	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppmv	RESULT ppmv	RESULT mg/cu M	NOTE
VOLATILE ORGANICS BY EPA TO-14				
Acetone	1.	ND	ND	
Benzene	0.1	1.2	4.2	
Bromodichloromethane	0.1	ND	ND	
Bromomethane (Methyl Bromide)	0.2	ND	ND	
Bromoform	0.1	ND	ND	
1,3-Butadiene	0.5	ND	ND	
2-Butanone (MEK)	0.2	ND	ND	
Carbon Disulfide	1.	ND	ND	
Carbon Tetrachloride	0.1	ND	ND	
Chlorobenzene	0.1	ND	ND	
Chloroethane (Ethyl Chloride)	0.2	ND	ND	
2-Chloroethyl Vinyl Ether	1.	ND	ND	
Chloroform	0.5	ND	ND	
Chloromethane (Methyl Chloride)	0.2	ND	ND	
Dibromochloromethane	0.1	ND	ND	
1,2-Dibromoethane (EDB)	0.2	ND	ND	
1,2-Dichlorobenzene	0.2	ND	ND	
1,3-Dichlorobenzene	0.2	ND	ND	
1,4-Dichlorobenzene	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L50E
LRH/ge/yl
ID09M1

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Goleta, CA • Benicia, CA • Camarillo, CA
Newport Beach, CA • Valparaiso, IN • Westbrook, ME

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

Lab Number : BD-0184-12
Project : 198155.02 Ingersoll-Rand

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
IRSG-TW-A	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppmv	RESULT ppmv	RESULT mg/cu M	NOTE
1,1-Dichloroethane	0.1	ND	ND	
1,2-Dichloroethane (EDC)	0.1	ND	ND	
1,1-Dichloroethene	0.1	ND	ND	
cis-1,2-Dichloroethene	0.1	ND	ND	
trans-1,2-Dichloroethene	0.1	ND	ND	
Dichloromethane	1.	ND	ND	
1,2-Dichloropropane	0.1	ND	ND	
cis-1,3-Dichloropropene	0.1	ND	ND	
trans-1,3-Dichloropropene	0.1	ND	ND	
Ethylbenzene	0.2	ND	ND	
2-Hexanone	0.1	ND	ND	
4-Methyl-2-Pentanone (MIBK)	0.1	ND	ND	
Styrene	0.2	ND	ND	
1,1,2,2-Tetrachloroethane	0.1	ND	ND	
Tetrachloroethene (PCE)	0.1	ND	ND	
Toluene	0.2	0.3	1.1	
1,1,1-Trichloroethane (TCA)	0.2	ND	ND	
1,1,2-Trichloroethane	0.2	ND	ND	
Trichloroethene (TCE)	0.1	ND	ND	
Trichlorofluoromethane (F-11)	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L50E
LRH/ge/yl
ID09M1

COAST - TO - COAST ANALYTICAL SERVICES

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Lab Number : BD-0184-12
Project : 198155.02 Ingersoll-Rand

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-IW-A	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppmv	RESULT ppmv	RESULT mg/cu M	NOTE
Trichlorotrifluoroethane (F-113)	0.2	ND	ND	
Vinyl Acetate	1.	ND	ND	
Vinyl Chloride	0.2	ND	ND	
Xylenes, Total	0.2	0.3	1.3	
Total Fuel (non-methane hydrocarbons)	50.	1900.	7300.	
Percent Surrogate Recovery			100.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L50E
LRH/ge/yl
ID09M1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.
Vice President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

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Newport Beach, CA • Valparaiso, IN • Westbrook, ME

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-11
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-3A	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
VOLATILE ORGANICS BY EPA TO-14				
Acetone	2.	70.	180.	
Benzene	0.2	8.6	30.	
Bromodichloromethane	0.2	ND	ND	
Bromomethane (Methyl Bromide)	0.5	ND	ND	
Bromoform	0.2	ND	ND	
1,3-Butadiene	1.	ND	ND	
2-Butanone (MEK)	0.2	4.7	15.	
Carbon Disulfide	2.	28.	96.	
Carbon Tetrachloride	0.2	ND	ND	
Chlorobenzene	0.2	0.3	1.7	
Chloroethane (Ethyl Chloride)	0.2	ND	ND	
2-Chloroethyl Vinyl Ether	2.	ND	ND	
Chloroform	1.	ND	ND	
Chloromethane (Methyl Chloride)	0.5	ND	ND	
Dibromochloromethane	0.2	ND	ND	
1,2-Dibromoethane (EDB)	0.5	ND	ND	
1,2-Dichlorobenzene	0.2	ND	ND	
1,3-Dichlorobenzene	0.2	ND	ND	
1,4-Dichlorobenzene	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1LA7E
LRH/ge/yl
ID09M1

COAST · TO · COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Goleta, CA • Benicia, CA • Camarillo, CA
Newport Beach, CA • Valparaiso, IN • Westbrook, ME

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-11
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-3A	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
1,1-Dichloroethane	0.2	ND	ND	
1,2-Dichloroethane (EDC)	0.2	ND	ND	
1,1-Dichloroethene	0.2	ND	ND	
cis-1,2-Dichloroethene	0.2	ND	ND	
trans-1,2-Dichloroethene	0.2	ND	ND	
Dichloromethane	2.	3.	12.	
1,2-Dichloropropane	0.2	ND	ND	
cis-1,3-Dichloropropene	0.2	ND	ND	
trans-1,3-Dichloropropene	0.2	ND	ND	
Ethylbenzene	0.5	6.3	30.	
2-Hexanone	0.2	ND	ND	
4-Methyl-2-Pentanone (MIBK)	0.2	0.9	4.0	
Styrene	0.5	0.9	4.1	
1,1,2,2-Tetrachloroethane	0.2	ND	ND	
Tetrachloroethene (PCE)	0.2	0.5	3.5	
Toluene	0.5	41.	170.	
1,1,1-Trichloroethane (TCA)	0.2	4.2	25.	
1,1,2-Trichloroethane	0.2	ND	ND	
Trichloroethene (TCE)	0.2	0.7	4.0	
Trichlorofluoromethane (F-11)	0.2	15.	92.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L47E
LRH/ga/yl
ID09M1

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Goleta, CA • Benicia, CA • Camarillo, CA
Newport Beach, CA • Valparaiso, IN • Westbrook, ME

San Luis Obispo Division (805) 543-2553
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CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-11
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-3A	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
Trichlorotrifluoroethane (F-113)	0.5	0.7	6.0	
Vinyl Acetate	2.	ND	ND	
Vinyl Chloride	0.5	ND	ND	
Xylenes, Total	0.5	34.	160.	
Total Fuel (non-methane hydrocarbons)	100.	500.	1800.	
Percent Surrogate Recovery			86.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L47E
LRH/ge/yl
ID09M1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.
Vice President

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Air, Water & Hazardous Waste Sampling, Analysis & Consultation
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CLIENT: William Schaal
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Martinez, CA 94553

Lab Number : BD-0184-10
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
IRSG-TW-3B	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
VOLATILE ORGANICS BY EPA TO-14				
Acetone	2.	39.	100.	
Benzene	0.2	5.4	19.	
Bromodichloromethane	0.2	ND	ND	
Bromomethane (Methyl Bromide)	0.5	ND	ND	
Bromoform	0.2	ND	ND	
1,3-Butadiene	1.	ND	ND	
2-Butanone (MEK)	0.2	ND	ND	
Carbon Disulfide	2.	9.	29.	
Carbon Tetrachloride	0.2	0.3	2.2	
Chlorobenzene	0.2	0.3	1.5	
Chloroethane (Ethyl Chloride)	0.2	ND	ND	
2-Chloroethyl Vinyl Ether	2.	ND	ND	
Chloroform	1.	ND	ND	
Chloromethane (Methyl Chloride)	0.5	ND	ND	
Dibromochloromethane	0.2	ND	ND	
1,2-Dibromoethane (EDB)	0.5	ND	ND	
1,2-Dichlorobenzene	0.2	ND	ND	
1,3-Dichlorobenzene	0.2	0.5	3.3	
1,4-Dichlorobenzene	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L46E
LRH/ge/yl
ID09M1

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Lab Number : BD-0184-10
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-3B	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
1,1-Dichloroethane	0.2	ND	ND	
1,2-Dichloroethane (EDC)	0.2	ND	ND	
1,1-Dichloroethene	0.2	ND	ND	
cis-1,2-Dichloroethene	0.2	ND	ND	
trans-1,2-Dichloroethene	0.2	ND	ND	
Dichloromethane	2.	ND	ND	
1,2-Dichloropropane	0.2	ND	ND	
cis-1,3-Dichloropropene	0.2	ND	ND	
trans-1,3-Dichloropropene	0.2	ND	ND	
Ethylbenzene	0.5	5.7	27.	
2-Hexanone	0.2	ND	ND	
4-Methyl-2-Pentanone (MIBK)	0.2	ND	ND	
Styrene	0.5	0.9	4.2	
1,1,2,2-Tetrachloroethane	0.2	ND	ND	
Tetrachloroethene (PCE)	0.2	0.5	3.9	
Toluene	0.5	32.	130.	
1,1,1-Trichloroethane (TCA)	0.2	3.5	21.	
1,1,2-Trichloroethane	0.2	ND	ND	
Trichloroethene (TCE)	0.2	0.6	3.7	
Trichlorofluoromethane (F-11)	0.2	1.4	8.4	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

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Lab Number : BD-0184-10
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
IRSG-TW-3B	Air	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
Trichlorotrifluoroethane (F-113)	0.5	1.1	9.4	
Vinyl Acetate	2.	ND	ND	
Vinyl Chloride	0.5	ND	ND	
Xylenes, Total	0.5	34.	160.	
Total Fuel (non-methane hydrocarbons)	100.	300.	1200.	
Percent Surrogate Recovery			86.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L46E
LRH/ge/yl
ID09M1

Respectfully submitted,
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Gesheng Dai

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CLIENT: William Schaal
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4585 Pacheco Blvd.
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Lab Number : BD-0184-1
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-1	Aqueous	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	(CAS #N)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2,3
Benzene	(71432)	50.	1700.	
Toluene	(108883)	50.	29000.	
Ethylbenzene	(100411)	50.	5400.	
Xylenes		50.	30000.	
1,2-Dichloroethane (EDC)	(107062)	50.	ND	
Ethylene Dibromide (EDB)	(106934)	50.	ND	
Total Petroleum Hydrocarbons (Gasoline)		5000.	67000.	
BTX as a percent of fuel			91.	
1,2-Dichloroethane-d4 (Surrogate)			111.	
Toluene-d8 (Surrogate)			92.	
p-Bromofluorobenzene (Surrogate)			104.	
1,1-Dichloroethene	(75354)	50.	ND	
1,1,1-Trichloroethane (TCA)	(71556)	50.	ND	
Trichloroethene (TCE)	(79016)	50.	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)
(3) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits for analytes. Refer to instrument blank for undiluted Practical Quantitation Limits.

04/15/92
INCOS 50-387
MH/trk/ahz/htc
HDD09I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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CLIENT: William Schaal
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Lab Number : BD-0184-2
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-2	Aqueous	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	(CAS #N)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	ND	
Toluene	(108883)	0.5	2.0	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	1.0	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	ND	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			Not Appl.	
1,2-Dichloroethane-d4 (Surrogate)			99.	
Toluene-d8 (Surrogate)			88.	
p-Bromofluorobenzene (Surrogate)			96.	
1,1-Dichloroethane	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/15/92
INCOS 50-387
MH/trk/htc
HDD09I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

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CLIENT: William Schaal
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4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-3
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-3	Aqueous	Bill Schaal	04/06/92	04/08/92

CONSTITUENT	(CAS #N)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	ND	
Toluene	(108883)	0.5	ND	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	ND	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	ND	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			Not Appl.	
1,2-Dichloroethane-d4 (Surrogate)			88.	
Toluene-d8 (Surrogate)			92.	
p-Bromofluorobenzene (Surrogate)			97.	
1,1-Dichloroethene	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/15/92
INCOG 50-387
MH/trk/ahz/htc
BDD10I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

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President

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Lab Number : BD-0184-4
Project : 198155.02 Ingersoll-Rand

CLIENT: William Schaal
IT Corporation
4585 Pachaco Blvd.
Martinez, CA 94553

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-4	Aqueous	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	(CAS #N)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	3.5	
Toluene	(108883)	0.5	8.0	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	9.5	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	280.	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			7.5	
1,2-Dichloroethane-d4 (Surrogate)			119.	
Toluene-d8 (Surrogate)			91.	
p-Bromofluorobenzene (Surrogate)			108.	
1,1-Dichloroethene	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/15/92
INCOS 50-387
MH/trk/htc
BD009I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicak

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COAST - TO - COAST ANALYTICAL SERVICES

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Lab Number : BD-0184-13
Project : 198155.02 Ingersoll-Rand

CLIENT: William Schaal
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4585 Pacheco Blvd.
Martinez, CA 94553

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
IRSG-TW-6	Air	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
VOLATILE ORGANICS BY EPA TO-14				
Acetone	2.	50.	130.	
Benzene	0.2	9.5	33.	
Bromodichloromethane	0.2	ND	ND	
Bromomethane (Methyl Bromide)	0.5	ND	ND	
Bromoform	0.2	ND	ND	
1,3-Butadiene	1.	ND	ND	
2-Butanone (MEK)	0.2	ND	ND	
Carbon Disulfide	2.	8.	28.	
Carbon Tetrachloride	0.2	ND	ND	
Chlorobenzene	0.2	0.2	1.1	
Chloroethane (Ethyl Chloride)	0.2	ND	ND	
2-Chloroethyl Vinyl Ether	2.	ND	ND	
Chloroform	1.	ND	ND	
Chloromethane (Methyl Chloride)	0.5	ND	ND	
Dibromochloromethane	0.2	ND	ND	
1,2-Dibromoethane (EDB)	0.5	ND	ND	
1,2-Dichlorobenzene	0.2	ND	ND	
1,3-Dichlorobenzene	0.2	ND	ND	
1,4-Dichlorobenzene	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L48E
LRH/ge/yl
ID09M1

COAST - TO - COAST ANALYTICAL SERVICES

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Lab Number : BD-0184-13
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
IRSG-TW-6	Air	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
1,1-Dichloroethane	0.2	ND	ND	
1,2-Dichloroethane (EDC)	0.2	ND	ND	
1,1-Dichloroethene	0.2	ND	ND	
cis-1,2-Dichloroethene	0.2	ND	ND	
trans-1,2-Dichloroethene	0.2	ND	ND	
Dichloromethane	2.	5.	19.	
1,2-Dichloropropane	0.2	ND	ND	
cis-1,3-Dichloropropene	0.2	ND	ND	
trans-1,3-Dichloropropene	0.2	ND	ND	
Ethylbenzene	0.5	8.	38.	
2-Hexanone	0.2	ND	ND	
4-Methyl-2-Pentanone (MIBK)	0.2	ND	ND	
Styrene	0.5	1.2	5.7	
1,1,2,2-Tetrachloroethane	0.2	ND	ND	
Tetrachloroethene (PCE)	0.2	0.6	4.1	
Toluene	0.5	18.	72.	
1,1,1-Trichloroethane (TCA)	0.2	2.7	16.	
1,1,2-Trichloroethane	0.2	ND	ND	
Trichloroethene (TCE)	0.2	1.2	7.1	
Trichlorofluoromethane (F-11)	0.2	0.8	4.8	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

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MSD1/1L48E
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Lab Number : BD-0184-13
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-6	Air	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
Trichlorotrifluoroethane (F-113)	0.5	ND	ND	
Vinyl Acetate	2.	ND	ND	
Vinyl Chloride	0.5	ND	ND	
Xylenes, Total	0.5	30.	140.	
Total Fuel (non-methane hydrocarbons)	100.	12000.	45000.	
Percent Surrogate Recovery			92.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L48E
LRH/ge/yl
ID09M1

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Gesheng Dai

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Vice President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
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San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-14
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
IRSG-TW-8	Air	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
VOLATILE ORGANICS BY EPA TO-14				
Acetone	1.	37.	97.	
Benzene	0.1	6.6	23.	
Bromodichloromethane	0.1	ND	ND	
Bromomethane (Methyl Bromide)	0.2	ND	ND	
Bromoform	0.1	ND	ND	
1,3-Butadiene	0.5	0.7	1.8	
2-Butanone (MEK)	0.2	ND	ND	
Carbon Disulfide	1.	2.	8.2	
Carbon Tetrachloride	0.1	ND	ND	
Chlorobenzene	0.1	ND	ND	
Chloroethane (Ethyl Chloride)	0.2	0.4	1.1	
2-Chloroethyl Vinyl Ether	1.	ND	ND	
Chloroform	0.5	56.	300.	
Chloromethane (Methyl Chloride)	0.2	0.8	1.8	
Dibromochloromethane	0.1	ND	ND	
1,2-Dibromoethane (EDB)	0.2	ND	ND	
1,2-Dichlorobenzene	0.2	ND	ND	
1,3-Dichlorobenzene	0.2	ND	ND	
1,4-Dichlorobenzene	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L51E
LRH/ge/yl
ID09M1

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Martinez, CA 94553

Lab Number : BD-0184-14
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-8	Air	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
1,1-Dichloroethane	0.1	ND	ND	
1,2-Dichloroethane (EDC)	0.1	ND	ND	
1,1-Dichloroethene	0.1	ND	ND	
cis-1,2-Dichloroethene	0.1	ND	ND	
trans-1,2-Dichloroethene	0.1	ND	ND	
Dichloromethane	1.	12.	44.	
1,2-Dichloropropane	0.1	ND	ND	
cis-1,3-Dichloropropene	0.1	ND	ND	
trans-1,3-Dichloropropene	0.1	ND	ND	
Ethylbenzene	0.2	5.3	25.	
2-Hexanone	0.1	ND	ND	
4-Methyl-2-Pentanone (MIBK)	0.1	ND	ND	
Styrene	0.2	1.1	4.9	
1,1,2,2-Tetrachloroethane	0.1	ND	ND	
Tetrachloroethene (PCE)	0.1	0.5	3.6	
Toluene	0.2	34.	140.	
1,1,1-Trichloroethane (TCA)	0.2	2.7	16.	
1,1,2-Trichloroethane	0.2	ND	ND	
Trichloroethene (TCE)	0.1	0.22	1.3	
Trichlorofluoromethane (F-11)	0.2	0.8	4.9	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1LS1E
LRH/ge/yl
ID09M1

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CLIENT: William Schaal
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Lab Number : BD-0184-14
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: CR
Method : EPA TO-14

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRSG-TW-8	Air	Bill Schaal	04/07/92	04/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
Trichlorotrifluoroethane (F-113)	0.2	0.3	2.2	
Vinyl Acetate	1.	5.	18.	
Vinyl Chloride	0.2	ND	ND	
Xylenes, Total	0.2	27.	130.	
Total Fuel (non-methane hydrocarbons)	50.	730.	2800.	
Percent Surrogate Recovery			92.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L51E
LRH/ge/yl
ID09M1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.
Vice President

COAST - TO - COAST ANALYTICAL SERVICES

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6006 Egret Court, Benicia, California 94510 FAX (707)747-2765

Lab Number : BD-0184-5
Project : 198155.02 Ingersoll-Rand

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-5	Aqueous	Bill Schaal	04/08/92	04/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	70.	
Toluene	(108883)	0.5	180.	
Ethylbenzene	(100411)	0.5	45.	
Xylenes		0.5	140.	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	680.	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			57.	
1,2-Dichloroethane-d4 (Surrogate)			121.	
Toluene-d8 (Surrogate)			95.	
p-Bromofluorobenzene (Surrogate)			106.	
1,1-Dichloroethene	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/15/92
INCOS 50-387
MH/trk/htc
BDD09I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
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CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-6
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-6	Aqueous	Bill Schaal	04/08/92	04/08/92

CONSTITUENT	(CAS #)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2,3
Benzene	(71432)	5.	4600.	
Toluene	(108883)	5.	23000.	
Ethylbenzene	(100411)	5.	2800.	
Xylenes		5.	19000.	
1,2-Dichloroethane (EDC)	(107062)	5.	ND	
Ethylene Dibromide (EDB)	(106934)	5.	ND	
Total Petroleum Hydrocarbons (Gasoline)		500.	53000.	
BTX as a percent of fuel			88.	
1,2-Dichloroethane-d4 (Surrogate)			94.	
Toluene-d8 (Surrogate)			89.	
p-Bromofluorobenzene (Surrogate)			115.	
1,1-Dichloroethene	(75354)	5.	ND	
1,1,1-Trichloroethane (TCA)	(71556)	5.	ND	
Trichloroethene (TCE)	(79016)	5.	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)
(3) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits for analytes. Refer to instrument blank for undiluted Practical Quantitation Limits.

04/15/92
INCOS 50-387
MH/trk/htc
BDD091I

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
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Lab Number : BD-0184-7
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-7	Aqueous	Bill Schaal	04/08/92	04/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2,3
Benzene	(71432)	2.	1300.	
Toluene	(108883)	2.	330.	
Ethylbenzene	(100411)	2.	220.	
Xylenes		2.	370.	
1,2-Dichloroethane (EDC)	(107062)	2.	ND	
Ethylene Dibromide (EDB)	(106934)	2.	ND	
Total Petroleum Hydrocarbons (Gasoline)		200.	2400.	
Total Petroleum Hydrocarbons (Diesel 2)		200.	ND	
BTX as a percent of fuel			83.	
1,2-Dichloroethane-d4 (Surrogate)			126.	
Toluene-d8 (Surrogate)			95.	
p-Bromofluorobenzene (Surrogate)			110.	
1,1-Dichloroethene	(75354)	2.	ND	
1,1,1-Trichloroethane (TCA)	(71556)	2.	ND	
Trichloroethene (TCE)	(79016)	2.	ND	

Benicia Division Lab Certifications: CARLAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)
(3) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits for analytes. Refer to instrument blank for undiluted Practical Quantitation Limits.

04/16/92
INCOS 50-387
MH/trk/ahz/htc
EDD10I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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CLIENT: William Schaal
IT Corporation
4585 Pachaco Blvd.
Martinez, CA 94553

QC Batch ID: BDD10I1 BD-0184-7
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

QC DUPLICATE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-7	Aqueous	Bill Schaal	04/08/92	04/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	%DIFF	NOTE
FUEL FINGERPRINT ANALYSIS					1,2,3
Benzene	(71432)	2.	1200.	8.	
Toluene	(108883)	2.	310.	6.3	
Ethylbenzene	(100411)	2.	220.	0.	
Xylenes		2.	380.	2.7	
1,2-Dichloroethane (EDC)	(107062)	2.	ND		
Ethylene Dibromide (EDB)	(106934)	2.	ND		
Total Petroleum Hydrocarbons (Gasoline)		200.	2500.	4.1	
Total Petroleum Hydrocarbons (Diesel 2)		200.	ND		
BTX as a percent of fuel			76.		
1,2-Dichloroethane-d4 (Surrogate)			124.	1.6	
Toluene-d8 (Surrogate)			92.	3.2	
p-Bromofluorobenzene (Surrogate)			109.	0.91	
1,1-Dichloroethene	(75354)	2.	ND		
1,1,1-Trichloroethane (TCA)	(71556)	2.	ND		
Trichloroethene (TCE)	(79016)	2.	ND		

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)
(3) High concentration of some analytes caused the sample to be run diluted resulting in raised Practical Quantitation Limits for analytes. Refer to instrument blank for undiluted Practical Quantitation Limits.

04/16/92
INCOS 50-387
MH/trk/ahz/htc
BD0184-7

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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CLIENT: William Schaal
IT Corporation
4585 Pachsco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-9
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRGW-TW-8	Soil	Bill Schaal	04/08/92	04/08/92

CONSTITUENT	(CAS #N)	*PQL mg/Kg	RESULT mg/Kg	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.005	0.03	
Toluene	(108883)	0.005	0.15	
Ethylbenzene	(100411)	0.005	0.14	
Xylenes		0.005	0.66	
1,2-Dichloroethane (EDC)	(107062)	0.005	ND	
Ethylene Dibromide (EDB)	(106934)	0.005	ND	
Total Petroleum Hydrocarbons (Gasoline)		0.5	5.0	
Total Petroleum Hydrocarbons (Diesel 2)		0.5	ND	
BTX as a percent of fuel			17.	
1,2-Dichloroethane-d4 (Surrogate)			120.	
Toluene-d8 (Surrogate)			88.	
p-Bromofluorobenzene (Surrogate)			113.	
1,1-Dichloroethene	(75354)	0.005	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.005	ND	
Trichloroethene (TCE)	(79016)	0.005	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/15/92
INCOS 50-387
MH/trk/htc
BDD09I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
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QC Batch ID: BDD09I1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
QC SPIKE DUPLICATE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
FUEL FINGERPRINT ANALYSIS						1,2
Benzene	0.5	160.	180.	113.	12.	
Toluene	0.5	700.	640.	91.	3.1	
Ethylbenzene	0.5	190.	170.	89.	11.	
Xylenes	0.5	930.	940.	101.	6.6	
1,2-Dichloroethane (EDC)	0.5		NS			
Ethylene Dibromide (EDB)	0.5		NS			
Total Petroleum Hydrocarbons (Gasoline)	50.	7100.	5600.	79.	1.8	
Total Petroleum Hydrocarbons (Diesel 2)	50.		NS			
BTX as a percent of fuel		25.	31.			
Percent Surrogate Recovery		100.	99.			
1,2-Dichloroethane-d4 (Surrogate)		100.	97.	97.	6.	
Toluene-d8 (Surrogate)		100.	96.	96.	3.2	
p-Bromofluorobenzene (Surrogate)		100.	105.	105.	0.96	
1,1-Dichloroethene	0.5		NS			
1,1,1-Trichloroethane (TCA)	0.5		NS			
Trichloroethene (TCE)	0.5		NS			

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/21/92
INCOS 50-387
MH/trk/htc
BD0184-2

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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QC Batch ID: BDD10I1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
QC SPIKE DUPLICATE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
FUEL FINGERPRINT ANALYSIS						1,2
Benzene	0.5	160.	160.	100.	6.5	
Toluene	0.5	710.	650.	92.	4.7	
Ethylbenzene	0.5	190.	190.	100.	17.	
Xylenes	0.5	870.	920.	106.	9.1	
1,2-Dichloroethane (EDC)	0.5		NS			
Ethylene Dibromide (EDB)	0.5		NS			
Total Petroleum Hydrocarbons (Gasoline)	50.	7100.	6500.	92.	15.	
Total Petroleum Hydrocarbons (Diesel 2)	50.		NS			
BTX as a percent of fuel		25.	27.			
Percent Surrogate Recovery		100.	109.			
1,2-Dichloroethane-d4 (Surrogate)		100.	127.	127.	1.6	
Toluene-d8 (Surrogate)		100.	96.	96.	4.3	
p-Bromofluorobenzene (Surrogate)		100.	104.	104.	1.9	
1,1-Dichloroethene	0.5		NS			
1,1,1-Trichloroethane (TCA)	0.5		NS			
Trichloroethene (TCE)	0.5		NS			

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/21/92
INCOS 50-387
MH/trk/ahz/htc
BD0184-3

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

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Benicia Division
6006 Egret Court, Benicia, California 94510

(707) 747-2757
FAX (707)747-2765

QC Batch ID: EDD10I1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE
FUEL FINGERPRINT ANALYSIS					1,2
Benzene	0.5	160.	150.	94.	
Toluene	0.5	710.	620.	87.	
Ethylbenzene	0.5	190.	160.	84.	
Xylenes	0.5	870.	840.	97.	
1,2-Dichloroethane (EDC)	0.5		NS		
Ethylene Dibromide (EDB)	0.5		NS		
Total Petroleum Hydrocarbons (Gasoline)	50.	7100.	5600.	79.	
Total Petroleum Hydrocarbons (Diesel 2)	50.		NS		
BTX as a percent of fuel		25.	29.		
Percent Surrogate Recovery		100.	108.		
1,2-Dichloroethane-d4 (Surrogate)		100.	129.	129.	
Toluene-d8 (Surrogate)		100.	92.	92.	
p-Bromofluorobenzene (Surrogate)		100.	102.	102.	
1,1-Dichloroethene	0.5		NS		
1,1,1-Trichloroethane (TCA)	0.5		NS		
Trichloroethene (TCE)	0.5		NS		

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/21/92
INCOS 50-387
MH/trk/ahz/htc
ED0184-3

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

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Benicia Division
6006 Egret Court, Benicia, California 94510

(707) 747-2757
FAX (707)747-2765

QC Batch ID: BDD10I1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE RECEIVED
METHOD BLANK	Aqueous		

CONSTITUENT	(CAS NN)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	ND	
Toluene	(108883)	0.5	ND	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	ND	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	ND	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			Not Appl.	
Percent Surrogate Recovery			109.	
1,2-Dichloroethane-d4 (Surrogate)			123.	
Toluene-d8 (Surrogate)			92.	
p-Bromofluorobenzene (Surrogate)			112.	
1,1-Dichloroethene	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/21/92
INCOS 50-387
MH/trk/ahz/htc
BD0184-3

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

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FAX (707)747-2765

QC Batch ID: BDD09I1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE
FUEL FINGERPRINT ANALYSIS					1,2
Benzene	0.5	160.	160.	100.	
Toluene	0.5	700.	660.	94.	
Ethylbenzene	0.5	190.	190.	100.	
Xylenes	0.5	930.	880.	95.	
1,2-Dichloroethane (EDC)	0.5		NS		
Ethylene Dibromide (EDB)	0.5		NS		
Total Petroleum Hydrocarbons (Gasoline)	50.	7100.	5500.	77.	
Total Petroleum Hydrocarbons (Diesel 2)	50.		NS		
BTX as a percent of fuel		25.	31.		
Percent Surrogate Recovery		100.	100.		
1,2-Dichloroethane-d4 (Surrogate)		100.	103.	103.	
Toluene-d8 (Surrogate)		100.	93.	93.	
p-Bromofluorobenzene (Surrogate)		100.	104.	104.	
1,1-Dichloroethene	0.5		NS		
1,1,1-Trichloroethane (TCA)	0.5		NS		
Trichloroethene (TCE)	0.5		NS		

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/21/92
INCOS 50-387
MH/trk/htc
BD0184-2

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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6006 Egret Court, Benicia, California 94510 FAX (707)747-2765

QC Batch ID: EDD09I1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: AZ
Method : As Listed

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
METHOD BLANK	Aqueous			

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	ND	
Toluene	(108883)	0.5	ND	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	ND	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	ND	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			Not Appl.	
Percent Surrogate Recovery			96.	
1,2-Dichloroethane-d4 (Surrogate)			92.	
Toluene-d8 (Surrogate)			96.	
p-Bromofluorobenzene (Surrogate)			99.	
1,1-Dichloroethene	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/21/92
INCOS 50-387
MH/trk/htc
HD0184-2

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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Benicia Division
6006 Egret Court, Benicia, California 94510

(707) 747-2757
FAX (707)747-2765

CLIENT: William Schaal
IT Corporation
4585 Pacheco Blvd.
Martinez, CA 94553

Lab Number : BD-0184-8
Project : 198155.02 Ingersoll-Rand

Analyzed : 04/10/92
Analyzed by: AZ
Method : As Listed

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
IRER-1	Aqueous	Bill Schaal	04/08/92	04/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
FUEL FINGERPRINT ANALYSIS				1,2
Benzene	(71432)	0.5	ND	
Toluene	(108883)	0.5	2.5	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	6.5	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
Ethylene Dibromide (EDB)	(106934)	0.5	ND	
Total Petroleum Hydrocarbons (Gasoline)		50.	60.	
Total Petroleum Hydrocarbons (Diesel 2)		50.	ND	
BTX as a percent of fuel			15.	
1,2-Dichloroethane-d4 (Surrogate)			114.	
Toluene-d8 (Surrogate)			91.	
p-Bromofluorobenzene (Surrogate)			106.	
1,1-Dichloroethene	(75354)	0.5	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.5	ND	
Trichloroethene		0.5	ND	

Benicia Division Lab Certifications: CAELAP #1719; L.A.Co.CSD#10185
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) ANALYZED by CAL DHS DRAFT TPH (modified) and EPA 8260 (GC/MS)
(2) EXTRACTED by EPA 5030 (purge-and-trap)

04/15/92
INCOS 50-387
MH/trk/ahz/htc
HDD10I1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
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San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

QC Batch ID: ID09M1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: YL
Method : EPA TO-14

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
INSTRUMENT BLANK	Air			

CONSTITUENT	(CAS RN)	*PQL µg/cu M	RESULT µg/cu M	NOTE
VOLATILE ORGANICS BY EPA TO-14				
Acetone	(67641)	3.	ND	
Benzene	(71432)	0.5	ND	
Bromodichloromethane	(75274)	1.	ND	
Bromomethane (Methyl Bromide)	(74839)	1.	ND	
Bromoform	(75252)	1.	ND	
1,3-Butadiene	(106990)	1.	ND	
2-Butanone (MEK)	(78933)	0.5	ND	
Carbon Disulfide	(75150)	5.	ND	
Carbon Tetrachloride	(56235)	1.	ND	
Chlorobenzene	(108907)	0.5	ND	
Chloroethane (Ethyl Chloride)	(75003)	0.5	ND	
2-Chloroethyl Vinyl Ether	(110758)	5.	ND	
Chloroform	(67663)	3.	ND	
Chloromethane (Methyl Chloride)	(74873)	.5	ND	
Dibromochloromethane	(124381)	1.	ND	
1,2-Dibromoethane (EDB)	(106934)	2.	ND	
1,2-Dichlorobenzene	(95501)	1.	ND	
1,3-Dichlorobenzene	(541731)	1.	ND	
1,4-Dichlorobenzene	(106467)	1.	ND	
1,1-Dichloroethane	(75343)	0.5	ND	
1,2-Dichloroethane (EDC)	(107062)	0.5	ND	
1,1-Dichloroethene	(75354)	0.5	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L45E
LRH/ge/yl
ED0184-10

COAST - TO - COAST ANALYTICAL SERVICES

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San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

QC Batch ID: ID09M1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: YL
Method : EPA TO-14

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
INSTRUMENT BLANK	Air			

CONSTITUENT	(CAS RN)	*PQL µg/cu M	RESULT µg/cu M	NOTE
cis-1,2-Dichloroethene	(156694)	0.5	ND	
trans-1,2-Dichloroethene	(156605)	0.5	ND	
Dichloromethane	(75092)	5.	ND	
1,2-Dichloropropane	(78875)	0.5	ND	
cis-1,3-Dichloropropene	(10061015)	0.5	ND	
trans-1,3-Dichloropropene	(10061026)	0.5	ND	
Ethylbenzene	(100411)	1.	ND	
2-Hexanone	(591786)	0.5	ND	
4-Methyl-2-Pentanone (MIBK)	(108101)	0.5	ND	
Styrene	(100425)	1.	ND	
1,1,2,2-Tetrachloroethane	(79345)	1.	ND	
Tetrachloroethene (PCE)	(127184)	1.	ND	
Toluene	(108883)	1.	ND	
1,1,1-Trichloroethane (TCA)	(71556)	1.	ND	
1,1,2-Trichloroethane	(79005)	1.	ND	
Trichloroethene (TCE)	(79016)	0.5	ND	
Trichlorofluoromethane (F-11)	(75694)	1.	ND	
Trichlorotrifluoroethane (F-113)	(76131)	2.	ND	
Vinyl Acetate	(108054)	5.	ND	
Vinyl Chloride	(75014)	0.5	ND	
Xylenes, Total		1.	ND	
Total Fuel (non-methane hydrocarbons)		200.	ND	
Percent Surrogate Recovery			94.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

04/24/92
MSD1/1L45E
LRH/ge/yl
ED0184-10

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.
Vice President

COAST - TO - COAST ANALYTICAL SERVICES

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San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

QC Batch ID: ID09M1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: EA
Method : EPA TO-14

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
QC SPIKE	Air			

CONSTITUENT	*PQL µg/cu M	SPIKE AMOUNT	RESULT µg/cu M	%REC	NOTE
VOLATILE ORGANICS BY EPA TO-14					1
Acetone	3.		NS		
Benzene	0.5	17.	16.	94.	
Bromodichloromethane	1.		NS		
Bromomethane (Methyl Bromide)	1.	23.	22.	96.	
Bromoform	1.		NS		
1,3-Butadiene	1.	11.	10.	91.	
2-Butanone (MEK)	0.5		NS		
Carbon Disulfide	5.		NS		
Carbon Tetrachloride	1.	34.	25.	74.	
Chlorobenzene	0.5	25.	19.	76.	
Chloroethane (Ethyl Chloride)	0.5		NS		
2-Chloroethyl Vinyl Ether	5.		NS		
Chloroform	3.	27.	23.	85.	
Chloromethane (Methyl Chloride)	.5		NS		
Dibromochloromethane	1.		NS		
1,2-Dibromoethane (EDB)	2.	40.	38.	95.	
1,2-Dichlorobenzene	1.		NS		
1,3-Dichlorobenzene	1.		NS		
1,4-Dichlorobenzene	1.		NS		
1,1-Dichloroethane	0.5		NS		
1,2-Dichloroethane (EDC)	0.5	22.	21.	95.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) Zero Air spiked with NIST SRM 1804, Cylinder # ALM-000881.

04/24/92
MSD1/1L53E
LRH/ge/yl
ED0184-10

COAST · TO · COAST ANALYTICAL SERVICES

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QC Batch ID: ID09M1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 04/09/92
Analyzed by: EA
Method : EPA TO-14

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE	Air			

CONSTITUENT	*PQL µg/cu M	SPIKE AMOUNT	RESULT µg/cu M	%REC	NOTE
1,1-Dichloroethene	0.5		NS		
cis-1,2-Dichloroethene	0.5		NS		
trans-1,2-Dichloroethene	0.5		NS		
Dichloromethane	5.	19.	17.	89.	
1,2-Dichloropropane	0.5	25.	23.	92.	
cis-1,3-Dichloropropene	0.5		NS		
trans-1,3-Dichloropropene	0.5		NS		
Ethylbenzene	1.	22.	18.	82.	
2-Hexanone	0.5		NS		
4-Methyl-2-Pentanone (MIBK)	0.5		NS		
Styrene	1.		NS		
1,1,2,2-Tetrachloroethane	1.		NS		
Tetrachloroethene (PCE)	1.	37.	32.	86.	
Toluene	1.	20.	17.	85.	
1,1,1-Trichloroethane (TCA)	1.	30.	29.	97.	
1,1,2-Trichloroethane	1.		NS		
Trichloroethene (TCE)	0.5	29.	24.	83.	
Trichlorofluoromethane (F-11)	1.	31.	29.	94.	
Trichlorotrifluoroethane (F-113)	2.		NS		
Vinyl Acetate	5.		NS		
Vinyl Chloride	0.5	15.	15.	100.	
Xylenes, Total	1.	24.	18.	75.	
Total Fuel (non-methane hydrocarbons)	200.		NS		
Percent Surrogate Recovery		100.	93.		

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit

04/24/92
MSD1/1L53E
LRH/ge/yl
ED0184-10

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.