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REMEDIATION PLAN FOR THE DOWCRAFT CORPORATION SITE 65 SOUTH DOW STREET FALCONER, NEW YORK

April 93

Prepared For:

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BTA-92-266
April 1993

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REMEDIATION PLAN FOR THE DOWCRAFT SITE 65 SOUTH DOW STREET, JAMESTOWN, NEW YORK

I. INTRODUCTION

A. General

Empire Soils Investigations, Inc. (ESI) is contracted by Dowcraft Corporation (Dowcraft) to prepare a Remediation Plan to address ground water contamination present at the Dowcraft Corporation property and the Jamestown Container property (collectively referred to as the "site") located at 65 South Dow Street, Falconer, New York. Conestoga-Rovers and Associates (CRA) was also retained by Dowcraft for additional environmental consulting capabilities. The remediation scope of work specifically addresses the cleanup of trichloroethene (TCE) and other volatile organic compounds (VOC's) present in the ground water from a limited area on the Dowcraft and Jamestown Container properties. A Site Location Map is included as Drawing No. 1 in Appendix A.

ESI completed a Phase II Environmental Investigation including a sampling and laboratory testing program (mechanical and analytical testing) on soil and ground water samples collected from the site and has incorporated the results into the Remediation Plan. The details of the Remediation Plan will focus on the nature of contamination, vertical and horizontal extent of contamination, aquifer characteristics, remedial design and the analytical testing program to be completed during remediation.

It should be noted that it is the intent of Dowcraft and their environmental consultants that the site remediation be completed with the approval of the New York State Department of Environmental Conservation (NYSDEC). Ground water sampling and analytical testing procedures are designed to be in accordance with industry wide accepted practices and the NYSDEC and United States Environmental Protection Agency (USEPA) guidelines, protocols and procedures.

Limitations to the Remediation Plan are presented in Appendix B.

B. Background

The Dowcraft site consists of property owned by the Dowcraft Corporation and Jamestown Container Corporation located at 65 South Dow Street and 14 Deming Drive in Falconer, New York, respectively. Refer to the Site Plan presented as Drawing No. 2 in Appendix A for the specific location of the Dowcraft facility, Jamestown Container facility, ground water monitoring wells, the Chadakoin River and other site features.

South Dow Street borders the site to the southwest and Conrail Railroad property lies to the southeast. The frontage along South Dow Street is approximately 400-feet and the railroad property borders the property for approximately 1,800-feet. The Chadakoin River is located directly northwest of the site and Phetteplace Street forms the northeast site border approximately 1,700 feet northeast of South Dow Street. The northeast site border extends approximately 480-feet between the railroad property and the Chadakoin River. Based on these dimensions, the subject property occupies approximately 18-acres. It should be noted that the ground water contamination discussed herein is limited to an area generally between the northeast end of the Dowcraft building and the Chadakoin River.

The topography of the property slopes slightly from south southeast to north northwest. The Chadakoin River is the only surface water body present near the site. ESI examined a United States Geological Survey (USGS) quadrangle of the site and determined the difference in elevation across the western end of the site (area of concern) from south southeast to north northwest is approximately 10-feet. The Chadakoin River is the nearest major natural water body with the southern banks of the river located on the northern edge of the subject site.

The Dowcraft facility has occupied the site since the early 1900's. The building was initially a woolen mill, however, in the late 1930's the woolen mill was reportedly converted to a factory which manufactured steel partitions. Today the Dowcraft facility

continues manufacturing steel partitions for office space and the telecommunications industry.

The Jamestown Container plant was also constructed around the turn of the century. The Jamestown Container Corporation manufactures cardboard boxes and related paper packing products.

II. PREVIOUS STUDIES COMPLETED AT THE SITE

ESI was authorized by Dowcraft to complete a Phase I Environmental Site Assessment of the Dowcraft property on August 30, 1990. The Phase I report entitled "Phase I Environmental Site Assessment, Dowcraft Corporation, Falconer, New York" was issued in October, 1990 (ESI Job Number BTA-90-179). The recommendations of the Phase I report were to complete a Phase II Environmental Site Assessment on the Dowcraft property. Specific Phase I recommendations included installation of ground water monitoring wells as well as sampling and analytical testing of the ground water down gradient of the Dowcraft plant.

On October 30, 1990, Dowcraft retained ESI to complete a Phase II Environmental Site Assessment on the Dowcraft property. The Phase II report entitled "Phase II Environmental Site Assessment, Dowcraft Corporation, 65 South Dow Street, Falconer, New York" was issued in December 1990 (ESI Job Number BTA-90-179A). As part of the Phase II investigations, ESI installed five (5) ground water monitoring wells in the access road between the Dowcraft and Jamestown Container buildings. The significant conclusions contained in the Phase II report indicated VOC's, specifically trichloroethene (TCE) and 1,2-dichloroethene (DCE), were present in the ground water in the vicinity of the northeast end of the Dowcraft plant.

Subsequent to the completion of the Phase II investigations, ESI installed and sampled two (2) additional ground water monitoring wells on the east end of the Dowcraft plant to better understand the nature and extend of ground water contamination. Two (2) drywells historically used for discharge of plant process water were also sampled to determine if the drywells were potential source areas for the VOC contamination. The summary report entitled "Environmental Investigation, Dowcraft Corporation, Falconer, New York" was issued in May, 1991 (ESI Job Number BTA-92-179B). A copy of the environmental summary report was submitted to the NYSDEC for their review and comments.

On December 16, 1991 representatives from Dowcraft, ESI and Whiteman, Osterman and Hanna (Dowcraft's attorney) met with the NYSDEC regarding the ground water contamination identified at the site. The NYSDEC indicated that prior to listing the site on New York State's Registry of Inactive Hazardous Waste Sites, the agency could not formally become involved with the project. However, it was determined that additional subsurface investigations would be required in an effort to better define the vertical and horizontal extent of contamination and acceptable pumping rates for remediation. To achieve this objective, ESI completed the following tasks:

- Installed six (6) shallow ground water monitoring wells across the Dowcraft and Jamestown Container properties;
- Installed one (1) deep ground water monitoring well (screened in the underlying silt-type soils) where previous testing indicated elevated levels of contamination was present in the sand and gravel overburden;
- Collected samples from the thirteen (13) shallow and one (1) deep ground water monitoring wells and analyzed the samples for USEPA Target Compound List (TCL) volatile organics, Target Analyte List (TAL) metals and pH;
- Completed a soil gas survey using a gas chromatograph in the area where ground water contamination was present;
- Analyzed a water sample collected from Dowcraft plant Outfall 002 for TCL volatile organics;
- Installed two (2) pumping wells for aquifer pump testing and ground water remediation;
- Completed grain size analysis on soil samples collected from sand and gravel-type soils present from ground surface to a depth of approximately 25-feet below ground surface and from cohesive soils present below the sand and gravel overburden;

- o Analyzed confirmation samples from monitoring wells ESI-2 (TCL volatile organics), ESI-6 (TCL volatile organics) and ESI-9 (aluminum, iron and manganese) to verify earlier reported levels of contamination;

- o Completed an aquifer pump test to better understand the hydraulic characteristics of the aquifer, and;

- o Analyzed ground water samples collected from the two (2) pumping wells during step draw down testing and a 24-hour pumping test to evaluate the effect of long term pumping on contaminant concentrations.

The significant findings of the above tasks were summarized to develop a technically and economically feasible approach to ground water remediation.

III. SUBSURFACE EXPLORATIONS

A. Test Borings Procedures

ESI advanced sixteen (16) test borings at the site to determine subsurface conditions and to facilitate the installation of ground water monitoring/pump wells. The test boring/monitoring well locations are shown on the Site Plan presented as Drawing No. 2 in Appendix A. The subsurface boring logs associated with each test boring are presented in Appendix C.

Test borings ESI-1 through ESI-13 were advanced using 4.25-inch inside diameter (I.D.) hollow stem augers to allow installation of 2-inch I.D. PVC ground water monitoring wells. Test borings PW-1 and PW-2 were advanced using 8.25-inch I.D. hollow stem augers for installation of 6-inch I.D. predominantly stainless steel pumping wells.

Representative soil samples of the overburden were obtained by driving a standard 2-inch outside diameter (O.D.) split-spoon sampler into the undisturbed material below the auger casing with a 140-pound hammer falling freely a distance of 30-inches (American Society of Testing Materials (ASTM) Method D-1586). The number of blows required to drive the split-spoon each 6-inch interval was recorded. Standard Penetration Tests (SPT) conforming to ASTM D-1586 were completed as noted on the subsurface logs. Soil samples were recovered from each sampling interval. The required depth of each test boring was determined in the field by an ESI geologist based on subsurface conditions and ground water encountered during drilling operations. Soil descriptions are reported on the subsurface logs presented in Appendix C.

B. Ground Water Monitoring Well Installation

Ground water monitoring wells were installed in test borings ESI-1 through ESI-13 to allow collection of representative ground water samples. Ground water pumping wells were installed in test borings PW-1 and PW-2 to facilitate pumping ground water from the aquifer for remediation. Table 1 summarizes the ground water monitoring/pumping

well construction. The ground water monitoring well installation diagrams are presented in Appendix C.

Ground water monitoring wells ESI-1 through ESI-5 (excluding ESI-2D) were located to generalize ground water quality down gradient of the Dowcraft plant and associated drywells. Monitoring wells ESI-8 and ESI-9 were located up-gradient of the potential VOC source areas. The location of monitoring wells ESI-6, ESI-7 and ESI-10 through ESI-13 were selected to better define the lateral extent of VOC contamination.

The location and depth of the screened interval for monitoring well ESI-2D was chosen to evaluate whether ground water contamination had migrated downward to the cohesive soils underlying the upper sand and gravel soil deposits. Pumping wells PW-1 and PW-2 were located within the ground water contamination plume to facilitate an aquifer pump test and to maximize remediation efforts. Both pumping wells PW-1 and PW-2 were screened from the bottom of the well to above the observed static water level. The pumping well installation details are presented in Appendix C.

The ground surface elevation at each of the test boring/ground water monitoring well locations was measured in the field by ESI with a Leitz B2C level (Model 300) using differential leveling techniques. The ground surface elevations were referenced to a benchmark established on the westernmost bonnet nut on the top flange of a fire hydrant located on the east end of the Dowcraft plant adjacent to the loading dock. The elevation at this point was selected to be 100.00 feet. The benchmark location is plotted on Drawing No. 2 in Appendix A.

TABLE 1						
SUMMARY OF MONITORING/PUMPING WELL CONSTRUCTION						
Well Number	**Date Installed**	**Test Boring Depth (Feet Below Ground Surface)**	**Screened Interval (Feet Below Ground Surface)**	**Well Diameter (Inches)**	**Well Riser and Screen Material**	**Ground Surface Elevation (Relative to Established Benchmark)**
ESI-1	11/2/90	16.0	4.7 - 14.7	2.0	PVC	98.44
ESI-2	11/5/90	17.0	4.7 - 14.7	2.0	PVC	98.75
ESI-2D	4/16/92	60.0	35.3 - 45.3	2.0	PVC	98.78
ESI-3	11/5/90	15.9	4.5 - 14.5	2.0	PVC	99.07
ESI-4	11/5/90	16.8	5.0 - 15.0	2.0	PVC	99.32
ESI-5	11/6/90	16.0	5.2 - 15.2	2.0	PVC	99.24
ESI-6	12/26/90	14.0	3.5 - 13.5	2.0	PVC	98.99
ESI-7	12/26/90	15.0	4.5 - 14.5	2.0	PVC	99.13
ESI-8	4/8/92	20.0	8.0 - 18.0	2.0	PVC	102.30
ESI-9	4/8/92	15.0	4.0 - 14.0	2.0	PVC	100.23
ESI-10	4/9/92	17.0	9.8 - 14.8	2.0	PVC	99.39
ESI-11	4/10/92	17.5	10.1 - 15.1	2.0	PVC	99.34
ESI-12	4/10/92	17.8	10.2 - 15.2	2.0	PVC	99.26
ESI-13	4/13/92	18.0	4.95 - 14.95	2.0	PVC	97.83
PW-1	11/12/92	28.0	7.0 - 22.0	6.0	Stainless Steel	98.94
PW-2	11/12/92	28.0	10.0 - 25.0	6.0	Stainless Steel	99.01

well summary

C. Soil Sample Organic Vapor Measurements and Results

Recovered soil samples from the test borings were screened by an ESI geologist or engineer using an Hnu photoionization detector (PID) with a 10.2 electron volt lamp to determine the potential presence of VOC's. The PID measurements (reported in parts per million, ppm) provided ESI an indication of VOC's in the recovered soil samples. Ambient (background) organic vapor concentrations were measured prior to sample screening. Table 2 summarizes the organic vapor measurement results. It should be noted that test borings in which no organic vapor concentrations were detected above background are not included in Table 2.

D. Soil Gas Survey and Results

ESI completed a soil gas survey at the Dowcraft site from April 15 to April 17, 1992. C.T. Male Associates, P.C. of Latham, New York was retained by ESI to complete purging, sampling and analysis of soil gas samples. C.T. Males's procedures for sampling and analysis of the soil gas points are included in their report presented in Appendix D. The analysis of the soil gas was completed with a portable gas chromatograph (GC). The locations of the soil gas measurement points are plotted on Drawing No. 3 in Appendix A. A total of 29 soil gas measurement points were sampled at depths ranging from two (2) feet to six (6) feet below the ground surface.

Soil gas sample points were advanced by driving and retrieving a solid steel rod to the required depths. One-half (0.5) inch PVC soil gas sample pipes were inserted in the hole at each location. The pipes were installed to depths approximately one (1) foot above the bottom of the soil gas probe hole. The soil gas hole was then reamed to the specified sample depth with a ream rod which fits inside the PVC pipe. The annulus around each soil gas pipe at the ground surface was sealed with a bentonite paste mix to reduce possible migration of soil vapors from around the outside of the PVC pipes. Each of the pipes were capped with a PVC cap to avoid venting of the soil prior to sample collection.

TABLE 2						
SUMMARY OF ORGANIC VAPOR MEASUREMENTS COLLECTED DURING TEST BORING EXPLORATIONS						
Depth	Photoionization Detector Measurements Recorded in Parts Per Million (ppm)					
	Monitoring Well Number					
	ESI-6	ESI-7	ESI-10	ESI-2D	PW-1	PW-2
Background	0.3 - 0.5	0.3	0.3 - 0.4	0.2 - 0.6	0.2 - 0.6	0.2 - 0.6
0-2	BG	BG	NM	NM	NM	NM
2-4	0.6	BG	NM	NM	NM	NM
4-6	BG	0.7	NM	NM	1-2	NM
6-8	0.8	BG	NM	NM	BG	NM
8-10	0.8	0.6	NM	NM	BG	NM
10-12	6.6	BG	5.5	NM	BG	BG
12-14	7.1	BG	4.5	NM	BG-2	BG
14-16	NM	BG	1.0	1-4	5-7	2
16-18	NM	NM	NM	5-10	1-2	BG
18-20	NM	NM	NM	5-10	3-5	20-30
20-22	NM	NM	NM	5-10	3-5	8-10
22-24	NM	NM	NM	3-5	BG-1	10-15
24-26	NM	NM	NM	BG	BG-1	50-70
26-28	NM	NM	NM	BG	BG-1	1-2
>28	NM	NM	NM	BG	NM	NM

NOTE: No PID measurements were taken during advancement of test borings ESI-1, ESI-2, ESI-3, ESI-4, ESI-5 and ESI-13. PID measurements collected during advancement of test borings ESI-8, ESI-9, ESI-11 and ESI-12 were all below detection. All soil samples were screened in the field except samples from test boring ESI-7 which were screened in the laboratory. BG and NM represent background concentrations and no measurement was taken, respectively.

The soil gas survey was completed to preliminarily determine if the source of the detected VOC contamination is predominantly in the unsaturated soils. Ground water was measured to be approximately seven (7) feet to ten (10) feet below ground surface. Rational selection of an appropriate remediation alternative can be based on whether the source areas of contamination are present in the saturated soils (ground water) or unsaturated (vadose zone) soils.

Compounds detected during the soil gas survey included trichloroethene (TCE) and toluene. None of the other target compounds for which the GC was calibrated (trans 1,2-dichloroethene, cis 1,2-dichloroethene, benzene and perchloroethene) were detected. Trichloroethene was detected in soil gas points SG-3, SG-4, SG-11, SG-14, SG-17 and SG-18 at concentrations ranging from 3.298 parts per billion (ppb) to 6.904 ppb. Toluene was also present in soil gas sample SG-12 at a concentration of 0.6013 ppb. The presence of TCE and toluene at these concentrations indicates these compounds are not appreciably present in the unsaturated subsurface soils above the ground water. However, it should be noted the soil gas locations which were above the method detection limit were down gradient from the trichloroethene vapor degreaser used within the Dowcraft plant.

Soil gas result

E. Subsurface Conditions

ESI evaluated the subsurface conditions based on the sixteen (16) test borings completed at the Dowcraft site. In general, the soil types and nature of fill materials, were consistent between test boring locations.

Fill materials were observed to be present overlying the native soils at varying depths ranging from two (2) feet to four (4) feet below grade. The consistency of the fill included cinders, sand, silt, gravel, shale fragments, brick, concrete, coal, slag and metal. Asphaltic concrete was present overlying crusher run stone sub-base in the first foot at the locations of test borings ESI-2, ESI-2D, ESI-3, ESI-4, ESI-5 and PW-1. Railroad ties were also encountered below the crusher run stone in test borings ESI-2,

Fill

Soil Gas

ESI-3 and ESI-4 indicating a railroad siding was formerly active in the access road between the Jamestown Container and Dowcraft buildings.

ESI cored through the concrete floor slab (approximately 0.8 feet thick) in the Jamestown Container plant to facilitate drilling test borings ESI-10, ESI-11 and ESI-12. A basement area was present below the ground floor at test boring locations ESI-10 and ESI-11 with the basement floor at a depth of approximately 8-feet below the concrete slab (ground floor). Concrete was also encountered in test borings ESI-7 and ESI-12 at depths of 4.5 - 5.5 and 7.2 - 7.6 feet below grade, respectively.

Underlying the fill materials, the native soils generally consisted of silty sand, fine to coarse sand and fine to coarse gravel to a depth of approximately 21 to 25-feet below grade. In test borings ESI-2D, PW-1 and PW-2 a predominantly gray silt soil unit was encountered at depths of 21.0, 22.0 and 25.0 feet below grade, respectively and deeper. Occasional fine to coarse sand or sandy silt seams were observed within the silt soil strata.

ESI collected four (4) soil samples from test borings PW-1 and PW-2 (two (2) from each boring) for grain size analysis. Samples were retained from the noncohesive and the cohesive native soil units for mechanical testing to estimate permeability characteristics, based on grain size, for each soil type. The results of the grain size analyses will be discussed in Section IV-A.

Ground water levels in the monitoring wells and the elevation of the Chadakoin River were measured on February 9 and 10, 1993. Ground water was encountered between approximately seven (7) and ten (10) feet below the ground surface. The ground water elevations for the above mentioned dates are plotted on Drawing Nos. 4 and 5 in Appendix A. Based on the ground water level measurements obtained on February 9 and 10, 1993, it appears the ground water beneath the site is flowing to the north northeast.

A slightly higher ground water level was recorded for monitoring well ESI-2D which was screened in the underlying silt-type soils. This may indicate a slight upward

vertical hydraulic gradient exists in the underlying silt-type soils. It should be noted that several artesian production wells are present in the general vicinity of the site. A upward vertical hydraulic gradient condition may impede the downward migration of contaminants in the ground water.

IV. SUMMARY OF LABORATORY TESTING AND RESULTS

A. General

Soil and/or ground water samples were collected from the Dowcraft site for laboratory testing to better define the subsurface conditions and level of environmental contamination present. Mechanical testing of samples was completed at ESI's construction testing laboratory in Hamburg, New York. Copies of the mechanical and analytical testing reports are found in Appendices E and F, respectively.

Samples collected for analytical testing were obtained using precleaned specialized environmental sampling equipment. Each sample for analytical testing was placed directly into precleaned environmental sample bottles, preserved (as necessary) and shipped to Huntingdon Analytical Services, Inc. (HAS) in an ice cooler for analytical testing. HAS is a NYSDOH certified laboratory in Middleport, New York. Chain-of-Custody forms were maintained on all samples with the required sample identification and analysis.

B. Mechanical Laboratory Testing

ESI retained soil samples from test borings PW-1 and PW-2 for grain size analysis (ASTM D-422) to estimate the permeability of the cohesive and noncohesive soil units encountered during drilling. The soils classifications for both test borings PW-1 and PW-2 indicated primarily sand and gravel soils were present overlying silt-type soils. Table 3 summarizes the sample identification, composition and percent gravel, sand and fines (silt and clay).

The grain size distribution results indicate that there is a significant difference in the native soil types at approximately 22-feet (test boring PW-1) to 25-feet (test boring PW-2) below ground surface. A predominantly sand and gravel soil unit is overlying cohesive soils (silts and clays) at both test boring locations. The grain size analysis results confirm the soil classifications presented on the subsurface boring logs in Appendix C.

The consistency of the underlying cohesive soil unit is shown by the similar grain size results of samples PW-1L and PW-2L. The overlying sand and gravel soils characteristically are relatively permeable and the underlying cohesive soils a potential confining layer. Based on the opinion of the senior level geologist classifying the subsurface soils, the permeability of the underlying cohesive soils is expected to be several orders of magnitude lower than the sand and gravel-type soils.

TABLE 3

SUMMARY OF GRAIN SIZE ANALYSIS OF SOIL SAMPLES COLLECTED FROM TEST BORINGS PW-1 AND PW-2

Test Boring	Sample Identification	Depth From Which Composite Sample Was Collected	Percent Gravel	Percent Sand	Percent Silt and Clay
PW-1	PW-1U	8 - 22 Feet Below Ground Surface	20.2	62.0	17.8
PW-1	PW-1L	22 - 28 Feet Below Ground Surface	0.0	6.7	93.3
PW-2	PW-2U	10 - 25 Feet Below Ground Surface	18.2	70.6	11.2
PW-2	PW-2L	25 - 28 Feet Below Ground Surface	0.0	6.7	93.3

C. Analytical Laboratory Testing – Outfall 002 and Drywells 004 and 005 Sampling and Results

Soil samples were obtained from Dowcraft Drywells 004 and 005 on February 20, 1991 by ESI assisted by Dowcraft personnel. Refer to Drawing No. 2 presented in Appendix A for Outfall 002 and Drywell 004 and 005 locations. At the time of the sampling Drywell 005 was receiving rinse water from the adjacent phosphatizer unit and non-contact cooling water from the main boiler. A precleaned pipe was used to collect the soil sample from Drywell 005.

Drywell 004 is located on the exterior of the building and was abandoned some time before the sample was collected. There was no free standing water present in Drywell 004 at the time of the sampling. A decontaminated hand auger was used to obtain the sample from Drywell 004. Both soil samples were collected from soils between surface of soils in the drywell and six (6) inches below the surface. The soil samples collected from the drywells were analyzed for Target Compound List (TCL) volatile organics (USEPA Method 8240).

Table 4 summarizes the detectable VOC's found in the soil samples obtained from the drywells. The sample obtained from Drywell 005 was found to contain 440 ug/kg (parts per billion) of 1,2-dichloroethene and 310 ug/kg trichloroethene. The sample collected from Drywell 004 was found to also contain 120 ug/kg trichloroethene.

TABLE 4

ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED FROM DRYWELLS 004 AND 005

Contaminant	Drywell 004	Drywell 005
1,2-Dichloroethene, ug/kg	Not Detected	440
Trichoroethene, ug/kg	120	310

One (1) outfall sample was collected from Dowcraft Outfall 002 discharge on May 5, 1992. Non-contact cooling water from three (3) spot welders and the trichloroethene vapor degreaser is discharged to Outfall 002 as well as storm water runoff from the roof drains. The outfall sample was analyzed for TCL volatile organics (USEPA Method 624) to ensure Outfall 002 was not a potential source of ground water contamination. There were no volatile organic compounds present in the outfall sample above the method detection limit.

The results of the drywell soil sample analyses indicates slight concentrations of VOC's are present in both drywells. The presence of these compounds at the reported concentrations does not provide an indication whether the drywells could be source areas for ground water contamination at the site. The analytical results of the water sample collected from Outfall 002 indicates VOC's are not entering the outfall unexpectantly causing a potential source for ground water contamination.

D. Analytical Laboratory Testing -- Ground Water Sampling and Results

ESI obtained ground water samples from fourteen (14) monitoring wells (ESI-1 through ESI-13 as well as ESI-2D) after development/purging. Well development was accomplished by pumping ground water from the well with either a guzzler pump or a peristaltic pump with dedicated tubing. A minimum of ten (10) water well volumes were evacuated from each well unless the well went dry during development. Monitoring wells ESI-1, ESI-5, ESI-6 and ESI-9 went dry during development. These wells were allowed to recharge and pumped dry a second time to achieve the desired level of development.

Field measurements of pH, temperature and specific conductivity were obtained during well development to determine whether representative ground water had entered the well. Representative ground water is assumed to have been obtained when the field measurements stabilize (variation of less than ten (10) percent over successive well volumes). The well development procedures and data were recorded on well development logs presented in Appendix C.

Ground water samples were also collected from pump wells PW-1 and PW-2 during aquifer pump testing. Pumping wells PW-1 and PW-2 were not developed according to the procedures discussed above, however, a minimum of five (5) water well volumes were pumped from each well as part of the aquifer pump testing prior to collecting ground water samples. The analytical results for ground water samples collected from the pump wells during the aquifer pump testing are discussed in Section V-G.

ESI collected ground water samples from fourteen (14) monitoring wells (ESI-1 through ESI-13 as well as ESI-2D) with precleaned bailers made of either stainless steel or PVC. Samples collected from pump wells PW-1 and PW-2 were obtained from a sample port in the aquifer pump testing apparatus.

A summary of analytical testing completed on samples collected from the ground water monitoring wells is presented in Table 5. It should be noted, ground water samples collected from monitoring wells ESI-1 through ESI-5 on November 13 and 14, 1990 were part of the Phase II Environmental Site Assessment completed at the site. Subsequent sampling was completed to determine the extent of contamination and assess dynamic concentrations of the contaminants of interest during ground water pumping.

TABLE 5						
SUMMARY OF ANALYTICAL TESTING **COMPLETED ON GROUND WATER SAMPLES**						
Well Number	**Date Sampled**	**Target Compound List (TCL) Volatiles**	**pH**	**Priority Pollutant Metals**	**Target Analyte List (TAL) Metals**	**Total Petroleum Hydrocarbons**
ESI-1	11/14/90	X	X	X		
ESI-1	4/16/92	X	X		X	
ESI-2	11/13/90	X	X	X		
ESI-2	3/9/92	X				
ESI-2	4/16/92	X	X		X	
ESI-2D	4/16/92	X	X		X	
ESI-3	11/13/90	X	X	X		
ESI-3	4/16/92	X	X		X	
ESI-4	11/13/90	X	X	X		
ESI-4	4/16/92	X	X		X	
ESI-5	11/13/90	X	X	X		
ESI-5	4/16/92	X	X		X	
ESI-6	1/2/91	X				X
ESI-6	4/16/92	X	X		X	
ESI-6	2/10/93	X				

TABLE 5 (Continued)

SUMMARY OF ANALYTICAL TESTING
COMPLETED ON GROUND WATER SAMPLES

Well Number	Date Sampled	TCL Volatiles	pH	Priority Pollutant Metals	TAL Metals	Total Petroleum Hydrocarbons	Aluminum, Manganese and Iron (Total)	Aluminum, Manganese and Iron (Filtered)
ESI-7	1/2/91	X				X		
ESI-7	4/16/92	X	X		X			
ESI-8	4/16/92	X	X		X			
ESI-9	4/16/92	X	X		X			
ESI-9	2/11/93						X	X
ESI-10	4/16/92	X	X		X			
ESI-11	4/16/92	X	X		X			
ESI-12	4/16/92	X	X		X			
ESI-13	4/16/92	X	X		X			
PW-1	2/9/93	X					X	X
PW-1	2/9/93	X					X	X
PW-2	2/10/93	X					X	X
PW-2	2/11/93	X					X	X
PW-2	2/11/93	X					X	X

NOTE: Samples collected from pump wells PW-1 and PW-2 were during ground water pumping.

INORGANIC AND pH RESULTS

Table 6 presents the inorganic and pH analytical results for samples collected from the ground water monitoring wells at the Dowcraft site. Analytical results for pump well samples collected during aquifer pump testing are discussed in Section V-G. The reported concentrations were compared to ground water quality standards (Class GA ground water) published by the NYSDEC entitled "Water Quality Regulations, Surface Water and Groundwater Classifications and Standards" (September 1, 1992). This publication forms Parts 700-705, Title C, Chapter X of the New York State Codes, Rules and Regulations.

The pH of ground water samples (field analysis) collected from monitoring wells ESI-3 (9.28 standard units, s.u.) and ESI-5 (12.05 s.u.) during the Phase II Environmental Site Assessment were above the NYSDEC Class GA ground water standard for pH (6.5 s.u. - 8.5 s.u.). Follow-up sampling and laboratory analytical testing for pH completed in April 1992 ranged from 7.02 s.u. - 7.93 s.u. Based on the second pH sampling and analytical testing event, the ground water pH at the Dowcraft site is within the limits of the NYSDEC Class GA ground water standards.

Iron, lead, manganese and sodium were reported to be present above the ground water standards in one or more ground water sample. Iron was above the NYSDEC ground water standard of 0.3 mg/l in all samples collected on April 16, 1992 except for monitoring well ESI-4. The elevated iron concentrations ranged from 0.73 mg/l to 18.6 mg/l. Lead was present in samples collected from monitoring wells ESI-3 (2 events, 0.03 mg/l and 0.04 mg/l), ESI-4 (0.038 mg/l), ESI-5 (0.06 mg/l) and ESI-13 (0.03 mg/l) at levels slightly above the 0.025 mg/l NYSDEC ground water standard. Sodium was present in samples analyzed from monitoring wells ESI-1 through ESI-13 (excluding ESI-5) slightly above the state ground water standard of 20 mg/l. Manganese was also present in samples collected from monitoring wells ESI-2D, ESI-6, ESI-7, ESI-8, ESI-10, ESI-11 and ESI-13 above the 0.30 mg/l NYSDEC ground water standard. The other metals constituents analyzed for were below the NYSDEC criteria presented in Table 6.

The metals data in Table 6 corresponds to a total metals analysis which can be erroneously higher than the soluble metals concentration in the ground water due to the presence of turbidity. Even small quantities of turbidity barely detectable to the human eye can cause the concentration of total metals be reported higher than soluble metals. The NYSDEC ground water standards are established for dissolved or soluble metals.

TABLE 6

pH AND INORGANIC ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED FROM MONITORING WELLS

Sample Date and pH and Metal Concentration	Monitoring Well Number							NYSDEC Class GA Ground Water Standard
	ESI-1	ESI-1	ESI-2	ESI-2	ESI-2D	ESI-3	ESI-3	
Sample Date	11/14/90	4/16/92	11/13/90	4/16/92	4/16/92	11/13/90	4/16/92	--
pH, std. units	6.5	7.27	6.82	7.30	7.93	9.28	7.46	6.5 - 8.5
Aluminum, mg/l	NA	1.03	NA	1.71	0.62	NA	7.01	NS
Barium, mg/l	NA	0.08	NA	0.13	0.13	NA	0.17	1.0
Calcium, mg/l	NA	63.8	NA	88.2	60.1	NA	76.1	NS
Chromium, mg/l	0.05	<0.01	<0.01	0.04	<0.01	0.03	0.05	0.05
Copper, mg/l	0.01	<0.01	0.02	<0.01	<0.01	0.04	0.03	0.2
Iron, mg/l	NA	1.57	NA	2.64	0.73	NA	10.2	0.3
Lead, mg/l	0.006	0.006	<0.005	0.01	<0.005	0.03	0.04	0.025
Magnesium, mg/l	NA	6.69	NA	11.7	11.4	NA	11.5	NS
Manganese, mg/l	NA	0.18	NA	0.12	0.52	NA	0.52	0.3
Potassium, mg/l	NA	4.1	NA	5.65	21.6	NA	5.8	NS
Selenium, mg/l	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	0.01
Sodium, mg/l	NA	38.2	NA	45.7	21.5	NA	33.2	20
Zinc, mg/l	0.02	<0.02	<0.02	<0.02	<0.02	0.08	0.09	0.3

NOTE: Total metals analyses were completed (unfiltered). Metals which were below method detection limit for monitoring wells ESI-1 through ESI-3 were not included.

NA - Not Analyzed NS - No Standard

GW-
Inorganics

TABLE 6 (Continued)

pH AND INORGANIC ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED FROM MONITORING WELLS

Sample Date and pH and Metal Concentration	Monitoring Well Number						NYSDEC Class GA Ground Water Standard
	ESI-4	ESI-4	ESI-5	ESI-5	ESI-6	ESI-7	
Sample Date	11/13/90	4/16/92	11/13/90	4/16/92	4/16/92	4/16/92	--
pH, std. units	8.26	7.51	12.05	7.77	7.49	7.48	6.5 - 8.5
Aluminum, mg/l	NA	0.65	NA	1.08	3.35	10.8	NS
Arsenic, mg/l	0.02	<0.01	0.01	<0.01	0.02	<0.01	0.025
Barium, mg/l	NA	0.08	NA	0.10	0.19	0.33	1.0
Cadmium, mg/l	<0.005	<0.005	0.013	<0.005	<0.005	<0.005	0.01
Calcium, mg/l	NA	65.5	NA	53.7	53.3	40.6	NS
Chromium, mg/l	0.05	<0.01	0.03	<0.01	0.01	0.02	0.05
Copper, mg/l	0.06	<0.01	0.05	<0.01	0.02	0.02	0.2
Iron, mg/l	NA	0.25	NA	1.07	6.54	11.3	0.3
Lead, mg/l	0.038	<0.005	0.06	<0.005	0.02	0.018	0.025
Magnesium, mg/l	NA	8.73	NA	7.43	9.66	6.64	NS
Manganese, mg/l	NA	0.01	NA	0.06	4.43	1.05	0.3
Potassium, mg/l	NA	4.3	NA	3.1	4.6	6.7	NS
Sodium, mg/l	NA	36.4	NA	14.7	37.4	33.5	20
Zinc, mg/l	0.13	<0.02	<0.06	<0.02	0.02	0.07	0.3

NOTE: Total metals analyses were completed (unfiltered). Metals which were below method detection limit for monitoring wells ESI-4 through ESI-7 were not included.

NA - Not Analyzed NS - No Standard

TABLE 6 (Continued)

pH AND INORGANIC ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED FROM MONITORING WELLS

Sample Date and pH and Metal Concentration	Monitoring Well Number						NYSDEC Class GA Ground Water Standard
	ESI-8	ESI-9	ESI-10	ESI-11	ESI-12	ESI-13	
Sample Date	4/16/92	4/16/92	4/16/92	4/16/92	4/16/92	4/16/92	--
pH, std. units	7.23	7.56	7.02	7.39	7.34	7.14	6.5 - 8.5
Aluminum, mg/l	7.70	3.33	0.05	3.27	3.29	16.5	NS
Arsenic, mg/l	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.025
Barium, mg/l	0.19	0.10	0.13	0.18	0.11	0.38	1.0
Calcium, mg/l	44.8	71.2	55.1	66.9	48.5	68.2	NS
Chromium, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.05
Copper, mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.2
Iron, mg/l	8.18	3.55	1.07	6.45	4.92	18.6	0.3
Lead, mg/l	0.011	0.008	<0.005	<0.01	0.009	0.03	0.025
Magnesium, mg/l	5.41	11.0	5.82	8.66	8.2	13.8	NS
Manganese, mg/l	0.59	0.17	1.04	1.12	0.08	0.61	0.3
Potassium, mg/l	5.0	4.1	4.27	5.8	3.8	7.3	NS
Sodium, mg/l	26.4	22.5	25.1	27.2	25.5	22.3	20
Zinc, mg/l	0.03	<0.02	<0.02	<0.02	<0.02	0.01	0.3

NOTE: Total metals analyses were completed (unfiltered). Metals which were below method detection limit for monitoring wells ESI-8 through ESI-13 were not included.

NA - Not Analyzed NS - No Standard

On February 11, 1993, ESI collected a ground water sample from monitoring well ESI-9 (the most up-gradient well). The sample was split in the field and part of the sample was filtered to remove turbidity. Both the filtered and unfiltered samples were preserved with nitric acid prior to shipment to Huntingdon Analytical Services for analysis. The analytical results for the filtered (soluble) and unfiltered (total) metals analysis is shown in Table 7. Iron and manganese were both present in the total metals analysis above the ground water standards established by the NYSDEC. However, the filtered sample metals concentrations were significantly lower than the total analysis. The soluble metals concentrations were below the NYSDEC ground water standards for the metals tested.

Based on the results in Table 7, it appears the cause of the elevated total metals concentrations is turbidity in the samples. It is ESI's opinion that the elevated metals concentrations in Table 6 are also caused by turbidity in the samples and would be significantly lower if soluble metals analyses were completed. Additional total and soluble metals analysis comparisons were completed as part of the aquifer pump testing to confirm the effects turbidity has on reported total metals concentrations. The analytical results of samples collected during the aquifer pump test generally support the suspected effects of turbidity and will be discussed in detail in Section V-G.

TABLE 7

COMPARISON BETWEEN TOTAL AND FILTERED INORGANIC ANALYSIS OF GROUND WATER SAMPLE COLLECTED FROM MONITORING WELL ESI-9 2/11/93

Metal of Concern	Concentration (mg/l)		NYSDEC Class GA Ground Water Standards
	Total Analysis	Filtered Analysis	
Aluminum	6.47	< 0.03	No Standard
Iron	5.55	0.043	0.30 mg/l
Manganese	0.326	0.011	0.30 mg/l

VOLATILE ORGANIC RESULTS

Table 8 presents the detectable VOC concentrations in samples collected from the ground water monitoring wells at the Dowcraft site. Each ground water sample was analyzed for TCL volatile organics (USEPA Method 624). VOC's were detected in ground water samples collected from monitoring wells ESI-1, ESI-2, ESI-2D, ESI-3, ESI-6, ESI-7, ESI-10, ESI-11, ESI-12 and ESI-13. Trichloroethene (TCE) was the principal VOC present in the samples analyzed. However, lesser concentrations of various degradation products of TCE such as 1,2-dichloroethene, vinyl chloride, tetrachloroethene, 1,1,1-trichloroethane and 1,1-dichloroethene were also detected in several samples.

Isoconcentration lines corresponding to total VOC's for samples collected on April 16, 1992 were plotted on Drawing No. 6 (Appendix A) to assess the approximate aerial extent of ground water contamination. Sampling data from monitoring well ESI-2 (April 16, 1992) was not included since it did not agree with the results from the surrounding wells and it was significantly lower than the previous sampling events (1,300 ug/l and 3,100 ug/l). In addition, data from monitoring well ESI-2D was not included since it is not screened in the same soil strata.

It appears the western edge of the ground water contamination plume is located between monitoring wells ESI-3 and ESI-4 and extends in a northern direction towards the Chadakoin River. The southern boundary of the plume is located approximately from the 1976 Dowcraft addition (former storage area for trichloroethene) passing just south of monitoring well ESI-7 to just south of well ESI-1. The eastern edge of the VOC contamination appears to be located slightly east of monitoring wells ESI-1, ESI-13 and ESI-10. The contamination plume extends beyond wells ESI-10, ESI-11 and ESI-12 to the north.

The reported VOC concentrations are generally significantly higher than the ground water (Class GA ground water) standards established by the NYSDEC. The VOC ground

water standards incorporate maximum contaminant levels (MCL's) and the New York State Department of Health (NYSDOH) recommendations for contaminants found in ground water. The Class GA ground water standard for trichloroethene, 1,2-dichloroethene, tetrachloroethene, 1,1,1-trichloroethane and 1,1-dichloroethene is 5 ug/l. The Class GA standard for vinyl chloride is 2 ug/l.

ESI collected ground water samples from the pumping wells during the aquifer pump test to assess the dynamic contaminant concentrations during pumping. Although the results of samples collected during the aquifer test were not plotted on Drawing No. 6 (different sampling events), the results do confirm the location of the plotted isoconcentration lines. The results of the pumping well sampling and analytical testing are presented in Section V-G.

TABLE 8					
VOLATILE ORGANIC ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED FROM MONITORING WELLS					
Monitoring Well Number	**Date Sampled**	**Trichloroethene (ug/l)**	**1,2-Dichloroethene (ug/l)**	**Vinyl Chloride (ug/l)**	**Tetrachloroethene (ug/l)**
ESI-1	11/14/90	12	ND	ND	ND
ESI-1	4/16/92	20	ND	ND	ND
ESI-2	11/13/90	1,300	230	ND	ND
ESI-2	3/9/92	3,100	390	ND	ND
ESI-2	4/16/92	340	58	ND	ND
ESI-2D	4/16/92	100	ND	ND	ND
ESI-3	11/13/90	180	ND	ND	ND
ESI-3	4/16/92	2,800	310	ND	ND
ESI-4	11/13/90	ND	ND	ND	ND
ESI-4	4/16/92	ND	ND	ND	ND
ESI-5	11/13/90	ND	ND	ND	ND
ESI-5	4/16/92	ND	ND	ND	ND
NYSDEC Class GA Ground Water Standard	--	5	5	2	5

ND - Not Detected.

GW.
ORGANICS

TABLE 8 (Continued)

VOLATILE ORGANIC ANALYTICAL RESULTS FOR GROUND WATER SAMPLES COLLECTED FROM MONITORING WELLS

Monitoring Well Number	Date Sampled	Trichloro-ethene (ug/l)	1,2-Dichloro-ethene (ug/l)	Vinyl Chloride (ug/l)	Tetrachloro-ethene (ug/l)	1,1,1-Trichloro-ethane (ug/l)	1,1-Dichloro-ethane (ug/l)
ESI-6	1/2/91	57	30	ND	ND	ND	ND
ESI-6	4/16/92	13,000	1,900	100	13	5	8.7
ESI-6	2/10/93	14,000	1,900	36	17	ND	ND
ESI-7	1/2/91	3.9	ND	ND	ND	ND	ND
ESI-7	4/16/92	50	7.1	ND	ND	ND	ND
ESI-8	4/16/92	ND	ND	ND	ND	ND	ND
ESI-9	4/16/92	ND	ND	ND	ND	ND	ND
ESI-10	4/16/92	87	590	160	ND	ND	ND
ESI-11	4/16/92	590	620	87	ND	ND	ND
ESI-12	4/16/92	650	160	ND	ND	ND	ND
ESI-13	4/16/92	21	ND	ND	5	51	12
NYSDEC Class GA Ground Water Standards	--	5	5	2	5	5	5

ND - Not Detected.

V. AQUIFER PUMP TESTING

A. General

ESI completed aquifer pump testing at the Dowcraft Site on February 9, 10 and 11, 1993 to assess the hydraulic characteristics of the overburden soils. The purpose for evaluating the aquifer hydraulic characteristics is to determine the pumping rates for subsequent remediation (ground water pumping and treatment). This section discusses the setup, procedures, results and interpretation of results for the completed aquifer pump testing.

B. Supplemental Subsurface Explorations

ESI installed two (2) pumping wells (PW-1 and PW-2) at the Dowcraft site to facilitate completion of the aquifer pump test and for future ground water remediation. Refer to Section III-A for details on test boring procedures during pump well installation. The pump wells were located within the ground water contamination plume shown on Drawing No. 6 in Appendix A. The location of the pump wells was selected to optimize future remediation efforts based on the location of existing buildings, utilities and the area of the highest concentrations of ground water contamination.

The pump wells were installed to pump ground water from the sand and gravel-type soils overlying the cohesive soils present approximately 25-feet below ground surface. Both wells were screened with stainless steel well screen from the bottom of the sand and gravel soils to above the observed static water level. The pump well installation diagrams are presented in Appendix C.

C. Pumping Test Setup

A downhole pump purchased from General Pump Manufacturing was used for pumping ground water during the aquifer pump test. The pump was capable of pumping 35-gallons per minute (gpm) at 40-feet below ground surface and was powered by a 220-volt power source (supplied by Dowcraft). The ground water was pumped through one (1) inch diameter plastic pipe from the bottom of the well to an activated carbon treatment

system on the ground surface. A six (6) foot section of steel pipe located between the pump and carbon treatment system contained an in-line flow meter, a valve to control the pumping rate and a PVC sample port.

The activated carbon treatment system manufactured by Carbtrol Corporation consisted of three (3) 55-gallon drums of activated carbon, connected in parallel, and the required manifolds and piping for the influent and effluent to the carbon drums. The effluent from the carbon treatment system was discharged through a one (1) inch diameter plastic pipe plumbed into Dowcraft's sanitary sewer. ESI requested and received formal authorization from the City of Jamestown Department of Public Works to discharge the treated ground water generated during the aquifer pump test to the city sanitary sewer system. During the pump test, water was discharged to the sanitary sewer which is ultimately received by the City of Jamestown Publicly Owned Treatment Works (POTW).

ESI collected one (1) effluent sample from the carbon treatment system at the end of the pump test for TCL volatile organic analysis (USEPA Method 624) to determine whether breakthrough of the carbon had occurred during the test. The results of the testing indicated there were no VOC's present above the method detection limit.

D. Pumping Test Procedures

The aquifer pump testing consisted of a step drawdown test in pumping wells PW-1 and PW-2 and a 24-hour long term pump test in pumping well PW-2. The step drawdown tests completed while pumping PW-1 and PW-2 (independently) were completed on February 9 and 10, 1993, respectively. The 24-hour pump test was completed on February 10 and 11, 1993.

A preliminary one (1) hour test was completed on February 9 to check pump operation, flow rates and reaction of the activated carbon treatment system to the influent water pressure. It was determined after the preliminary test, that the pump test apparatus was hydraulically sound and the carbon treatment system responded well to the influent

water pressure. In addition, the valve designed to control the pumping rate was roughly calibrated.

The step drawdown test completed while pumping pumping well PW-1 lasted 98-minutes. The pumping rates were 5 gpm, 8 gpm, 10 gpm, 12 gpm and 14 gpm over the length of the test. Water levels in both pumping wells PW-1 and PW-2 were monitored with electronic water level indicators. Readings were recorded at one-half (0.5) minute intervals during the first five (5) minutes after increasing each pumping rate. After five (5) minutes of pumping at the increased rate, the water level measurements were taken at one (1) to two (2) minute intervals. A two (2) man crew was continuously assigned to measuring ground water levels in the fourteen (14) monitoring wells and the Chadakoin River during the step drawdown tests.

The same procedures were used for the step drawdown test while pumping pumping well PW-2 on February 10. This step drawdown test was longer in duration (148-minutes) due to the well producing larger quantities of ground water than pumping well PW-1. The pumping rates were 5 gpm, 8 gpm, 10 gpm, 12 gpm, 14 gpm, 16 gpm, 18 gpm, 20 gpm, 22 gpm and 24 gpm.

The 24-hour pumping test was completed on February 10 and 11, 1993. Pumping well PW-2 was pumped at a constant rate of 20 gpm over the entire test. Water levels in wells ESI-2, ESI-2D, ESI-3, ESI-6 and PW-1 were measured at two (2) minute intervals for the first 30-minutes of the test, five (5) minute intervals from thirty (30) minutes to one (1) hour, ten (10) minute intervals from one (1) hour to two (2) hours and once an hour thereafter. Water levels were measured in the pumping well (PW-2) at closer intervals during the initial twenty (20) minutes of the test and the same intervals as above after twenty (20) minutes. Water levels in monitoring wells ESI-1, ESI-7, ESI-10, ESI-11, ESI-12 and ESI-13 were read at five (5) minute intervals over the first hour, ten (10) minute intervals over the second hour and once an hour for the remainder of the test. Water levels in well ESI-8 and ESI-9 were monitored beginning at approximately

thirty (30) minutes after pumping had begun at twenty (20) minute intervals for the first ninety (90) minutes and every hour thereafter. Immediately after shutting off the pump, water levels were monitored in approximately the same interval sequence for four (4) hours during recovery portion of the test.

E. Pumping Test Results

Step-Drawdown Tests

The primary purpose for completing the step tests on each of the two pumping wells on the Dowcraft site was to determine the maximum sustainable pumping rates for the 24-hour pumping test, and eventually for ground water remediation. Since data from the 24-hour aquifer test was available for determining hydraulic parameters, the step test data are simply plotted on a linear graph to provide a visual representation of the step test responses.

The step test on PW-1 showed the maximum pump rate obtainable before the water levels were lowered to the pump intake to be 12 gpm (drawdown of 11.82 feet). The maximum drawdown in the observation wells as a result of the PW-1 step test was 0.14 feet in PW-2. (see Table A in Appendix G).

The maximum obtainable pumping rate in PW-2 was 24 gpm. Well PW-2 was pumped for 10 to 20 minutes at pumping rates from 5 to 25 gpm at 2 gpm intervals. The maximum drawdown in the pumping well was 15.15 feet at 24 gpm. The maximum resultant drawdown in the observation wells during the step test on PW-2 was 0.29 feet in PW-1 (refer to Table A in Appendix G). It was decided to complete the 24-hour aquifer test by pumping PW-2 because of the larger drawdown available and higher sustainable pump rates in this well.

24 Hour Pump Test on PW-2

The 24-hour pump test was completed after water levels had recovered to 90% of the pre-step test levels. Table B (Appendix G) summarizes the static water levels before

pump testing began (before the test, BT) and immediately prior to the 24-hour test (initial, INIT).

For 24-hours, PW-2 was pumped at a constant rate of 20 gpm. The pumping well drew down 11-feet during the first 10 minutes of pumping, reaching a final maximum drawdown of 11.62 feet by the end of the 24 hour test (refer to plot X1 in Appendix G). The water level in the pumping well fluctuated significantly for the next 100-minutes, possibly due to turbulent flow within the well. Table C (Appendix G) summarizes the maximum drawdown in each of the 15 observation wells and the water level fluctuations in the nearby Chadakoin River. The wells in Table C (Appendix G) are listed in order of maximum to minimum final drawdown.

The largest drawdown response occurred between the two pumping wells. PW-1 drew down 0.42-feet after 24-hours of pumping PW-2, and 0.29-feet after the 148-minutes step test on PW-2. PW-2 also had the largest response to pumping of PW-1, drawing down 0.14-feet during the 98-minute step test. This is true even though other monitoring wells are closer to the pumping well (i.e. ESI-6 is only 8 feet from PW-2, yet it drew down only 0.28-feet whereas PW-1, 52-feet from PW-2, drew down 0.42-feet). This is partially due to the horizontal stratification of the glacial till soils which make up this aquifer. Both pumping wells are screened across the entire thickness of the aquifer from just above the water table to the top of the gray silt aquitard at approximately 25-feet below grade. Flow occurs laterally more readily than across strata in a vertical direction. All of the other observation wells except ESI-2D, only partially penetrate the aquifer, ending at 15-feet below grade. It should be noted that monitoring well ESI-6 went dry during well development indicating the presence of fill materials or unexpected subsurface conditions may be causing a reduced hydraulic recharge. As a result the observed drawdown appears to be erroneously low.

The step test on PW-1 also indicates the aquifer in the vicinity of PW-1 is tighter than near PW-2. A tighter aquifer will also experience greater drawdown than a more permeable aquifer.

There is some hydraulic connection between the 35 to 45 foot below grade screened zone in the deep well (ESI-2D) and the 6 to 26 foot below grade screened zone in the pumping well. The deep well drewdown 0.13-feet when PW-2 was pumped for 24-hours. This is less drawdown than observed in nearby shallow well ESI-2. (drawdown of 0.21-feet). The gray silt zone at 25-feet appears to be inhibiting flow of contaminants to the 35 to 45 foot zone. There is also a slight upward gradient between ESI-2D and ESI-2 (0.4-feet) which will inhibit downward migration of contaminants into the deep interval.

The effect on the water table elevations and the resultant capture zone from pumping PW-2 alone at 20 gpm for 24-hours can be seen in the Observed Ground Water Capture Zone Map presented as Drawing No. 7 in Appendix A (Data in Table C of Appendix G). Most of the wells were still drawing down slightly after 24 hours of pumping. As will be more extensively discussed in the data analysis section, the effects of delayed gravity drainage are still being observed in many of the wells, and additional drawdown may be expected in the observation wells before they return to a Theissian type response.

F. Methodology

Data from the four wells with the highest drawdowns were analyzed using a variety of techniques to generate estimates of the hydraulic parameters of the aquifer. The drawdown data was used rather than the recovery data because of the longer observation period for the drawdown data. Barometric pressure was measured but no corrections to observed water levels were made because the unconfined nature of the aquifer makes barometric effects negligible. The area of drawdown did not extend to the

Chadakoin River, therefore, no recharge boundaries from this potential lateral source are believed to have influenced the data.

Although the total observed drawdowns in the observation wells were not large, the log-log response curves do have the typical shape of drawdown in unconfined aquifers. Withdrawal of water from an unconfined aquifer occurs in three phases. Initially, water is released from storage due to expansion of the water and compaction of the aquifer just as occurs in a confined aquifer (Theissian type response). Then, as the cone of depression develops, water is supplied through gravity drainage of the aquifer by both vertical and horizontal flow. The curve flattens (drawdown slows down) in this interval because extra water is available through drainage. Finally, when the piezometric head and water table elevations within the drawdown cone coincide, flow is generally horizontal again and the data will again follow a Theis curve response. Neuman has developed a set of type curves for use in determining hydraulic parameters from unconfined aquifers (Neuman, S.P. Water Resources Research, 11 (1975):329-42).

Finally, Neuman type curve matches were made and hydraulic parameters calculated on two of the wells. Both an early elastic response match (ua) and a delayed response curve (ub) match were made. Beta ($b\text{-}r^2/b^2$) was calculated using an aquifer thickness of 20-feet (as in the Jacob calculations) and the observed distance from the pumping well. The hydraulic conductivity from these curve matches were calculated at 0.002 and 0.011 cm/s, somewhat lower than the values calculated by the Jacob technique as would be expected under dewatering conditions. The parameters derived from these type curves should be the most "accurate" since more of the equation assumptions match the true aquifer characteristics.

We know from the PW-1 step test that conductivity is variable across the site since PW-1 could only be pumped at half the pumping rate obtainable in PW-2, even though they are only 52-feet apart. From these combined results we conclude the water table aquifer at the Dowcraft site has a hydraulic conductivity of on the order of 0.001 to 0.01 cm/s. 10^{-3} to 10^{-2} cm/sec

G. Ground Water Quality During Pumping Test

Ground water samples were collected from the pumping wells during the aquifer pumping test for analytical testing. The purpose for evaluating the ground water quality during pumping was to assess the dynamic concentrations of the contaminants of interest. The ground water samples were collected from a PVC sample port located on the influent piping to the activated carbon treatment system. Each sample was analyzed for TCL volatile organics, aluminum (total and soluble), iron (total and soluble) and manganese (total and soluble). The volatile organics and metals were analyzed according to USEPA Methods 624 and 200.7, respectively. Table 9 presents the analytical results for samples collected during the aquifer pump test.

The total metal concentrations for iron and manganese were significantly above the NYSDEC ground water (Class GA) standard of 0.3 mg/l. Total aluminum was also present at concentrations well above typical ground water concentrations. However, the filtered sample concentrations for iron was well below the ground water standard. The filtered aluminum samples were also at or near detection levels. The comparison between total and filtered metals for aluminum and iron further supports the contribution of turbidity on the elevated total metals results. The filtered manganese results were very close to the total manganese concentrations. Soluble (filtered) manganese levels ranged between 0.831 mg/l and 2.240 mg/l.

VOC's present in the samples collected from the pump wells consisted of trichloroethene, 1,2-dichloroethene, tetrachloroethene, 1,1,1-trichloroethane and vinyl chloride. As expected, the concentration of trichloroethene was significantly higher than the other detectable VOC's.

The total VOC concentration in pumping well PW-1 increased approximately 36 percent during the step drawdown test. Total VOC levels increased from 6,080 ug/l to 8,260 ug/l after about two (2) hours of pumping (the pumping rate ranged from 5 gpm to 12 gpm). The increase in VOC concentration may have been due to migration of

contaminated ground water with a higher concentration of VOC's from the vicinity of pumping well PW-2. The total organic compounds present in samples collected from pumping well PW-2 decreased from 22,515 ug/l to 19,259 ug/l over approximately 28-hours of pumping ground water at 20 gpm. The reduction of approximately fifteen (15) percent total VOC's was likely due to the flushing effect induced during long term ground water pumping.

The magnitude of VOC concentrations in the pumping wells was significantly higher than the NYSDEC Class GA ground water standards. It should be noted the levels reported in pumping well PW-2 were the highest VOC concentration detected at the site to date. Remediation efficiency will likely be enhanced due to this situation. Total VOC concentrations are expected to be significantly reduced through long term ground water pumping.

TABLE 9

SUMMARY OF ANALYTICAL TESTING COMPLETED ON GROUND WATER SAMPLES COLLECTED DURING AQUIFER PUMP TESTING

Parameter (ug/L)	Sample Designation and Time Elapsed from Beginning of Pumping				
	PW-1 (5 Minutes)	PW-1 (129 Minutes)	PW-2 (5 Minutes)	PW-2 (1184 Minutes)	PW-2 (1658 Minutes)
Total Aluminum	61,500	10,100	7,520	847	1,170
Filtered Aluminum	35	53	46	33	<30
Total Iron	133,000	22,400	16,100	1,610	2,760
Filtered Iron	67	98	80	47	79
Total Manganese	5,100	1,690	2,850	940	900
Dissolved Manganese	1,480	1,140	2,240	831	893
Trichloroethene	5,900	8,100	22,000	20,000	19,000
1,2-Dichloroethene	180	160	410	190	190
Tetrachloroethene	ND	ND	76	58	54
1,1,1-Trichloroethane	ND	ND	18	16	15
Vinyl Chloride	ND	ND	11	ND	ND
Total VOC's	6,080	8,260	22,515	20,264	19,259

ND - Not Detected.

VI. CONCLUSIONS AND PROPOSED GROUND WATER REMEDIATION

A. General

The initial concerns of elevated pH and various metals present in the ground water at concentrations above NYSDEC Class GA standards were found to be unjustified. However, remediation of the ground water at the Dowcraft site is required due to the presence of trichloroethene and other VOC's above the NYSDEC Class GA ground water standards. The ground water remediation plan incorporates information gathered from the subsurface investigations, laboratory testing and aquifer pump testing completed at the site. The purpose of the remediation is to reduce the VOC concentrations in the ground water to a level acceptable by the NYSDEC and NYSDOH.

B. Recommendations from the Pumping Test Results

The cone of depression in the natural water table created by pumping PW-2 alone for only 24-hours appears to be generating a significant capture radius (refer to Drawing No. 7 in Appendix A) within the area requiring remediation. Most significantly, contamination from ESI-6, the most highly contaminated well on the site, is readily being captured by pumping PW-2.

Based on the field organic measurements during drilling it appears that the highest concentrations of TCE occur just above the gray silt, or in the bottom 10-feet of the sand and gravel aquifer. The results of all three (3) pumping tests (step tests pumping PW-1/PW-2 and the 24-hour test pumping PW-2) that there is a good hydraulic connection between the ~~either~~ pumping well and the bottom 10-feet of the sand and gravel aquifer. This was apparent since the largest response to pumping PW-2 was in PW-1 which is screened deeper within the coarse aquifer relative to the other monitoring wells. Therefore, pumping PW-1 and/or PW-2 will likely capture contamination present at these depths.

The maximum observed drawdowns in observation wells at the end of the 24-hour test are most likely not the maximum equilibrium drawdowns which will result with

Conclusion &
Recommendation

sustained pumping over much longer remediation times. The type curves suggest the nearest wells were just beginning to drawdown again after having dewatered the cone of depression, when most flow again comes from the horizontal direction and data follows a more Theissian type response curve. This suggests that the capture zone from pumping PW-2 at 20 gpm for much longer periods of time may be slightly larger than mapped on Drawing No. 7.

We recommend proceeding with remediation, pumping PW-2 at the maximum sustainable rate. Based on the 24-hour pump test we expect pumping well PW-2 to produce approximately 20 gpm consistently. The actual final long term drawdown and contaminant capture will be monitored during the remediation itself, and modifications to the plan made as necessary.

C. Discharge to the Sanitary Sewer System

Ground water will be pumped from pumping well PW-2 and discharged directly to the sanitary sewer system for off-site treatment. Subsequent remediation will occur at the city of Jamestown Publicly Owned Treatment Works (POTW) through bioremediation. Currently, Dowcraft, ESI and CRA are working together to obtain a discharge permit from the City of Jamestown POTW.

D. Analytical Testing and Reporting

Ground water samples will be collected from the monitoring and pumping wells during remediation to determine the concentration of contaminants in the ground water discharged to the POTW and to evaluate the effectiveness of remediation. After remediation pumping has started, ground water samples will be collected from pumping well PW-2 weekly during the first month. After one (1) month of ground water pumping, monthly ground water samples will be collected from pumping well PW-2 during months two (2) and three (3). During the fourth month of remediation, samples will be collected from pumping wells PW-1 and PW-2 as well as monitoring wells ESI-3, ESI-10, ESI-11 and ESI-12.

1st mo weekly
2-3 mo monthly
4th mo

Each sample will be analyzed for trichloroethene using USEPA Method 601. TCE was selected as the indicator parameter due to the high ratio of TCE to other VOC's reported in the previous analytical testing. It should be noted that specific analytical testing required by the POTW will be coordinated with the schedule outlined above. Table 10 summarizes the proposed sampling schedule during remediation.

A letter report will be prepared and submitted to the NYSDEC summarizing the ground water sampling data and the estimated ground water capture area after four months of remediation. A long term sampling and analytical testing program will also be included with the data report.

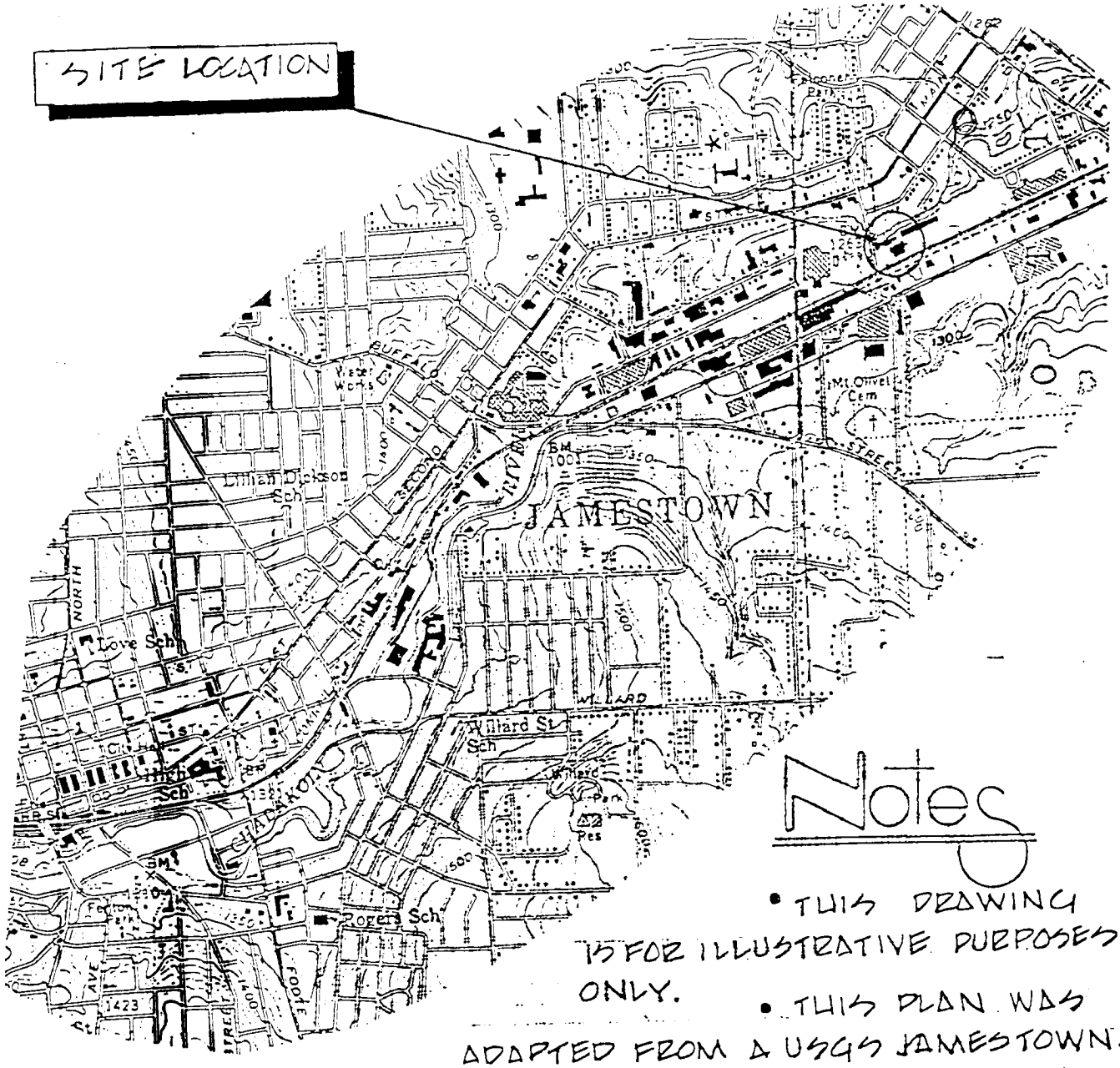
TABLE 10	
GROUND WATER SAMPLING SCHEDULE FOR MONITORING AND PUMPING WELLS DURING REMEDIATION	
Time Elapsed From Beginning Remediation	**Wells to be Sampled**
1 Week	PW-2
2 Weeks	PW-2
3 Weeks	PW-2
4 Weeks	PW-2
2 Months	PW-2
3 Months	PW-2
4 Months	PW-1, PW-2, ESI-3, ESI-6, ESI-10, ESI-11 and ESI-12

NOTE: Each sample will be analyzed for trichloroethene using USEPA Method 601.

Huntingdon

Consulting Engineers

APPENDIX A



EMPIRE SOILS INVESTIGATIONS INC.

SITE LOCATION PLAN

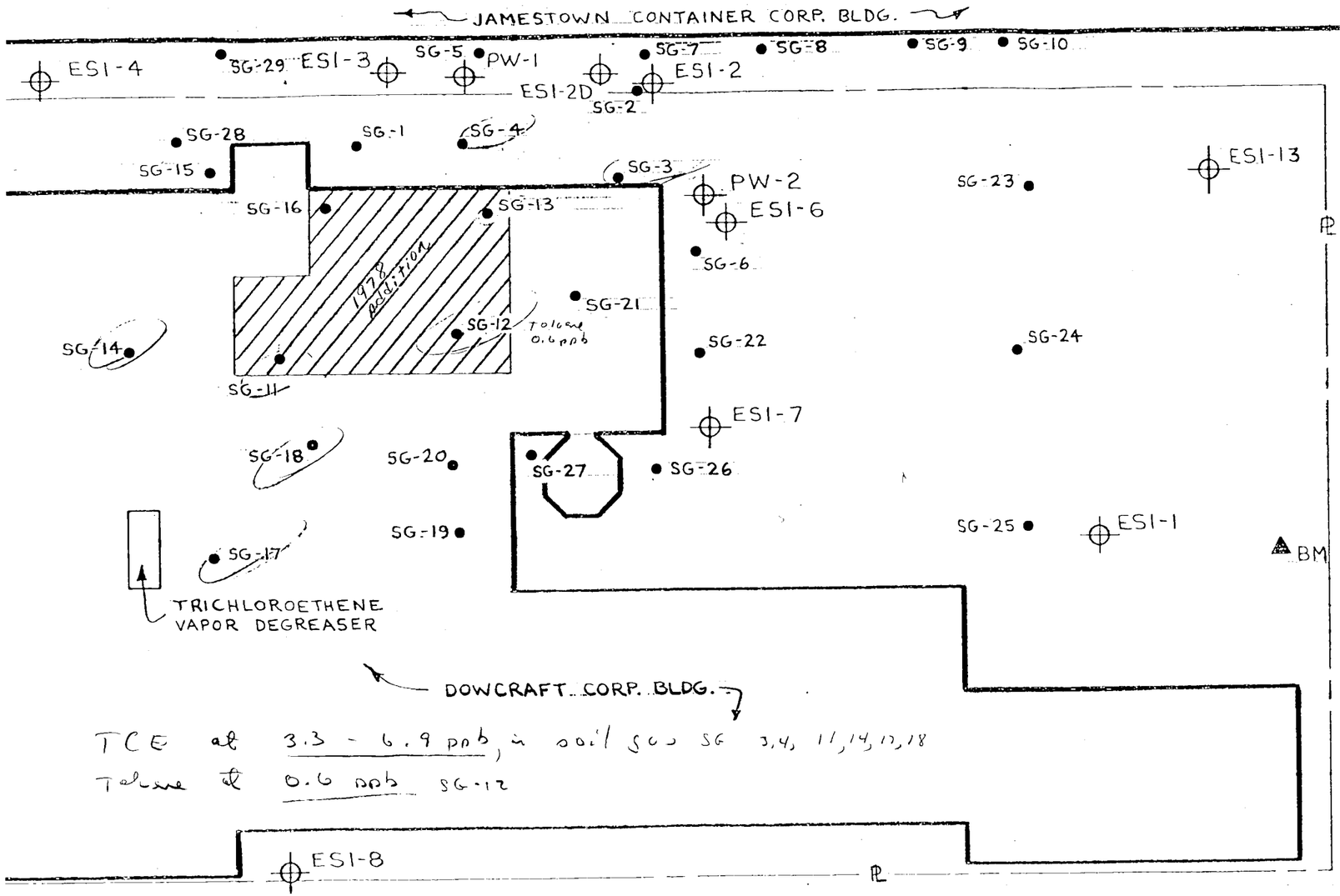
DOWCRAFT CORPORATION
65 SOUTH DOW STREET
FALCONER, NEW YORK

DRAWN BY: DAW	SCALE: 1" = 2000'	PROJECT: BTA-92-266
CHECKED BY: KJS	DATE: APRIL 1993	DRAWING NO. 1

R/T FORM R-1

Site Plan

DW.2



NOTES:

- THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY
- THIS DRAWING WAS ADAPTED FROM A SITE PLAN SUPPLIED BY DOWCRAFT CORP., DATED 3-27-84
- ALL SOIL GAS SAMPLE LOCATIONS ARE APPROXIMATE

EMPIRE SOILS INVESTIGATIONS INC

SOIL GAS SURVEY SAMPLE LOCATION MAP

DOWCRAFT CORPORATION
65 SOUTH DOW ST.
FALCONER, NEW YORK

DR BY: DAW	SCALE: 1" = 25' +/-	PROJ. NO. BTA 92 266
CK'D BY: KJS	DATE: 4-93	DRWG NO. 3

GW. Elev Contour map
2-9-93

DWG. 4

G.W. Contour Elev.

2-10-93

NNE .44%

DW.5

Dw. 6.

VOC Iso. Conc.

DWG 7

GW. capture zone

Huntingdon
Consulting Engineers and Environmental Scientists

APPENDIX B

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division
S-5167 South Park Avenue
Box 0313
Hamburg, New York 14075
(716)649-8110
Fax: (716)649-8051

LIMITATIONS

1. Empire Soils Investigations, Inc. (ESI) work was completed in accordance with generally accepted practices of other consultants undertaking similar studies, and ESI observed that degree of care and skill generally exercised by other consultants under similar circumstances and conditions. ESI's findings and conclusions must be considered not as scientific certainties but as probabilities based on our professional judgement concerning the significance of the limited data gathered during the course of the work.

2. The Environmental Investigation completed has not included comprehensive analytical testing on the site due to cost constraints. Without such testing, ESI can assume no responsibility for the undetected presence of either identified potential conditions or other latent conditions.

3. The observations described in this report were made under conditions stated therein. The conclusions presented in the report were based solely upon the services described therein and not on tasks and procedures beyond the scope of described services or the time and budgetary constraints imposed by the client.

4. In preparing this report, ESI has relied on certain information provided by the State, County and Town Officials and other parties referenced herein and on information contained in the files of the state and local agencies made available to ESI at the time this report was prepared.

5. Observations were made of the subject site and on adjacent sites as indicated within the report. Where access to portions of the site or structures were limited or unavailable, ESI renders no opinion as to the presence of hazardous materials or to the presence of indirect evidence relating to hazardous material in that portion of the site or adjacent structures.

6. Unless otherwise specified in the report, ESI did not perform testing or analyses to determine the presence of concentrations of hazardous chemical compounds, asbestos, polychlorinated biphenyls (PCB's), oil, gasoline, radon and lead paint at the subject property.

Huntingdon
Consulting Engineers Environmental Scientists

Empire Soils Investigations, Inc., Division
5-5187 South Park Avenue
Box 0913
Hamburg, New York 14075
(716)648-8110
Fax (716)648-8051

LIMITATIONS (Continued)

7. The purpose of the Environmental Ivestigation was to assess the physical characteristics of the subject property with respect to the presence in the environment of hazardous materials. No specific attempt was made to check on the compliance of present or past owners or operators of the site with federal, state or local laws and regulations, environmental or otherwise.

8. Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the Environmental Investigation. Where such analyses have been conducted by a laboratory, ESI has relied upon the data provided and has not conducted an independent evaluation of the reliability of these data.

9. Evaluation of the possible impact of activities at neighboring locations on the subject property was beyond the scope of services for this investigation.

11. This report has been prepared for the exclusive use of the Dowcraft Corporation and its designated agents and lending institutions for the specific application to the subject property in accordance with generally accepted engineering practice. No other warrant, expressed or implied, is made. The environmental concerns noted in this report (if any) are applicable to the current identified proposed usage of this property.

12. ESI cannot warranty that the proposed Remediation Plan will successfully remove the levels of contamination identified at both the Dowcraft and Jamestown Container properties.

Huntingdon

Consulting Engineers Environmental Scientists

APPENDIX C

DATE
STARTED 11-2-90
FINISHED 11-2-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. **SUBSURFACE LOG**

HOLE NO. ESI-1
SURF. ELEV. ---
G.W. DEPTH See Notes

PROJECT Dowcraft (BTA-90-179A)
LOCATION S. Dow Street, Falconer, New York

DEPTH FEET	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID Sample	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	11	13		24		Brown-black f-c SAND, some f-m Gravel, little-tr. Silt, tr. brick (moist, FILL)	Note:Concrete obstruction at 2 locations moved twice to final plan location.
			11	11					
		2	11	13		29		Becomes brown-red-gray Contains "and" f-c GRAVEL (concrete and brick)	
			16	16					
5		3	1	3		8		Becomes black Contains tr. coal Contains tr. brick	
			5	3					
		4	3	1		2			
			1	9					
		5	8	10		14		Lt. brown-tan f-m GRAVEL and f-c Sand, little Clayey Silt (wet,firm)	Water at approx. 8.0'.
10			4	5					
		6	5	7		11			Driller notes running sands and gravel at 14.0'.
			4	4					
		7	3	1		2		(loose)	
			1	3					
15		8	1	3		5		Contains occasional broken rock fragments	
			2	4					
								Boring Complete at 16.0'.	Free Standing Water measured at 10.2' inside augers at boring completion.
20								Ground water monitoring well installed tip set at 14.7'. Refer to monitoring well completion report for details.	

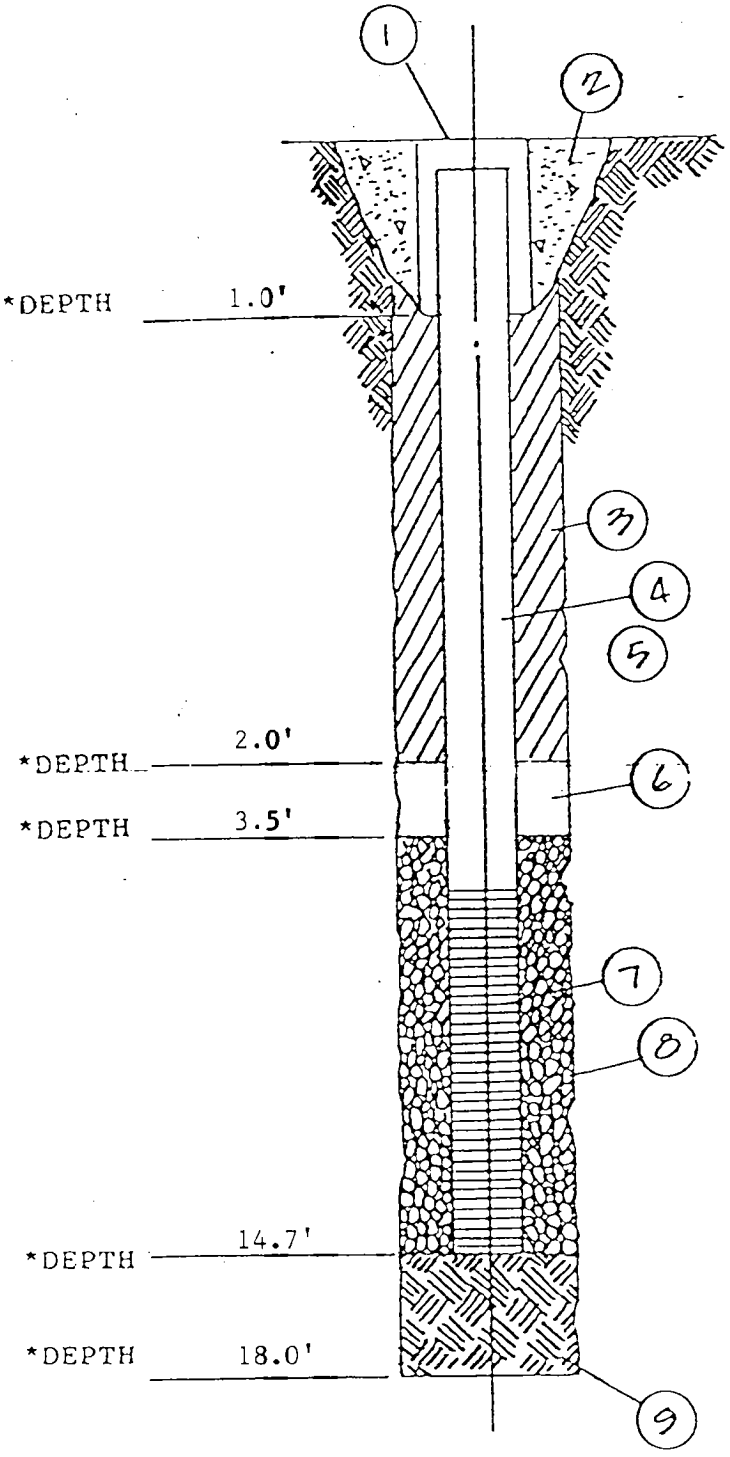
N = No. blows to drive 2" spoon 12" with 140 lb. pin wt. falling 30" per blow
C = No. blows to drive ____" casing ____" with ____ lb. weight falling ____" per blow

CLASSIFICATION Visual by Geologist

METHOD OF INVESTIGATION ASTM D-1586 USING 4-1/4" HOLLOW STEM AUGERS

B/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-1 JOB No. BTA-90-179A

PROJECT: Dowcraft Corporation

Falconer, New York

1. GATE BOX I.D.: 8 INCHES
2. SURFACE SEAL TYPE: Type I Portland Cement
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. LENGTH 4.5 FEET
   d. JOINT TYPE Flush Couple Threaded
5. BACKFILL:
   a. TYPE Type I Portland Cement
   b. INSTALLATION Surface Pour
6. TYPE OF SEAL: Bentonite Pellet
7. SCREEN:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. SLOT SIZE 0.010 In.
   d. LENGTH 10 FT.
8. SCREEN FILTER TYPE: #2 Q Rok Sand
9. BACKFILL TYPE: Natural Sands & Gravel

EMPIRE SOILS INVESTIGATIONS INC.

DATE
STARTED 11-5-90
FINISHED 11-5-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. **SUBSURFACE LOG**

HOLE NO. ESI-2
SURF. ELEV. ---
G. W. DEPTH See Notes

PROJECT Dowcraft Corporation (BTA-90-179A)

LOCATION S. Dow Street, Falconer, New York

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID Sample	SOIL OR ROCK CLASSIFICATION	NOTES
0								0-2' ASPHALTIC CONCRETE 0-8' CRUSHER RUN STONE	
		1	26	23		-		Brown WOOD (RAILROAD TIE), some f-c Sand, tr. gravel (moist, FILL)	
		2	16	13		25		Black f-c SAND, little Clayey Silt, tr. gravel, tr. wood, tr. coal, tr. brick (moist, FILL)	
			12	10					
5		3	8	7		11			
			4	25				Contains "and" f-m GRAVEL, tr. lime	
		4	5	2		5		Gray-brown-tan mottled f-c SILTY SAND, some f-c Gravel (moist, loose)	
			3	7				Becomes brown-gray	
		5	2	5		15		Contains "and" f-c GRAVEL, occasional tan silt partings (wet, firm)	
			10	14					
10		6	8	10		20		Contains tr. silt (loose)	Note: Water at approx. 10.0'.
			10	9					
		7	9	4		9			Driller notes running sands and gravels at approx. 14.0'
			5	5					
15									
								Boring Complete at 17.0'.	Free Standing Water measured at 10.8' inside augers at boring completion.
20								Ground water monitoring well installed tip set at 14.7-feet. Refer to monitoring well completion report for details.	

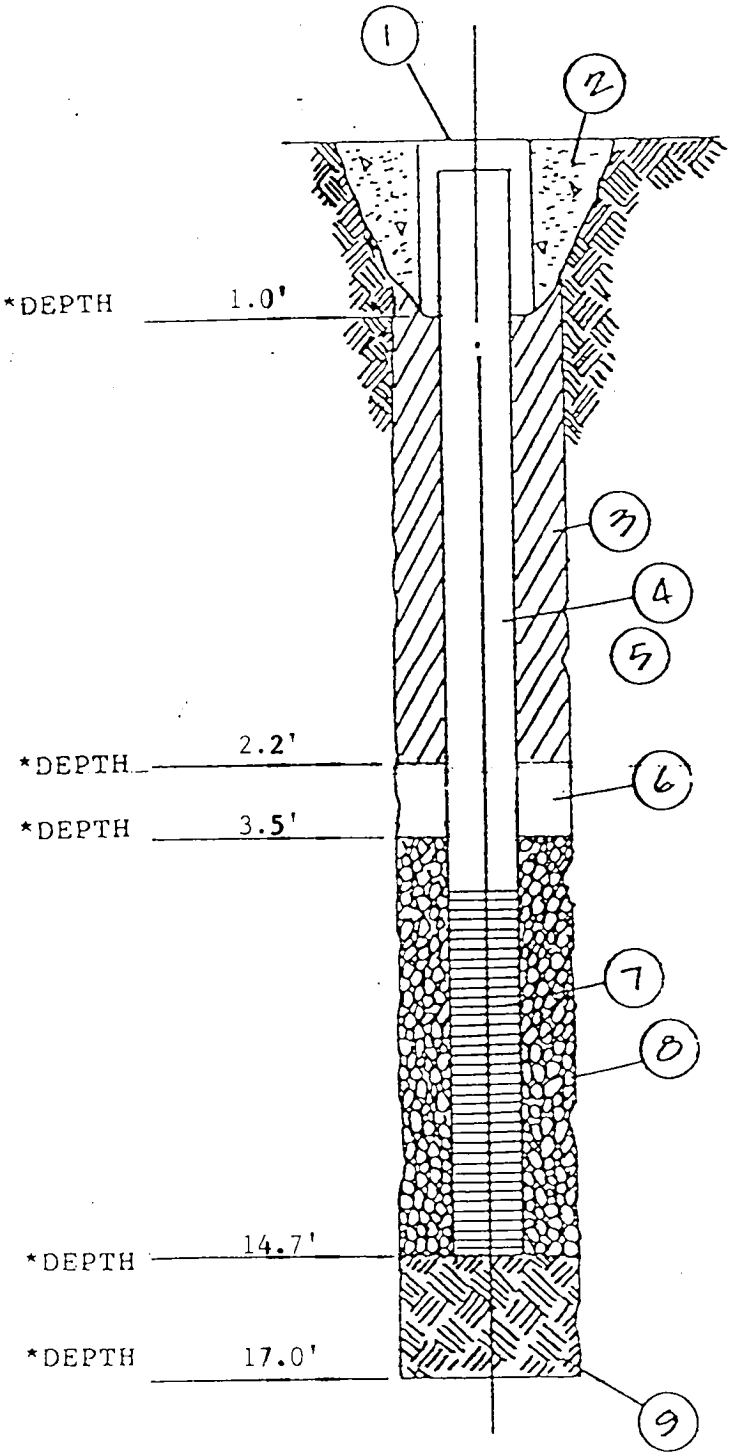
N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow. CLASSIFICATION Visual by Geologist

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

METHOD OF INVESTIGATION: ASTM D-1586 USING 4-1/4" HOLLOW STEM AUGERS

R/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-2 JOB No. BTA-90-179A
PROJECT: Dowcraft Corporation
Falconer, New York

1. GATE BOX I.D.: 8 INCHES
2. SURFACE SEAL TYPE: Type I Portland Cement
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. LENGTH 4.5 FEET
   d. JOINT TYPE Flush Couple Threaded
5. BACKFILL:
   a. TYPE Type I Portland Cement
   b. INSTALLATION Surface Pour
6. TYPE OF SEAL: Bentonite Pellet
7. SCREEN:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   C. SLOT SIZE 0.020 In.
   d. LENGTH 10 FT.
8. SCREEN FILTER TYPE: #4 Q Rok Sand
9. BACKFILL TYPE: Natural Sands & Gravel

EMPIRE SOILS INVESTIGATIONS INC.

DATE
STARTED: 4-3-92
FINISHED: 4-6-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

BTA-92179B

BORING NO.: ESI-2D
SURF. ELEV.: 98.8 ±
SHEET 1 OF 3

PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation

LOCATION: 65 South Dow Street
Falconer, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0										Auger with 8 1/4" I.D. to 15 feet - No samples collected. Refer to Log for ESI-2 for Soil Characteristics	BG PID = 0.2 - 0.6 ppm
5											
10											PID = BG after augering to 10'
15		1	2	3	3	5	6	1-4		Brown f-c SAND, some f-m Gravel, tr. silt (wet, loose, SW)	
		2	4	3	2	2	5	5-10			
		3	3	2	3	4	5	5-10			
20										Gray SILT, tr. sand, tr. clay (wet,loose,ML)	
		4	3	2	2	3	4	5-10			
		5	2	2	3	4	5	3-5			
25											

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly Cloudy, 40-50 F.
CLASSIFIED BY: D. R. Steiner

DATE STARTED: 4-3-92
FINISHED: 4-6-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

BORING NO.: ESI-2D
SURF. ELEV.: 98.8 ±
SHEET 2 OF 3

PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation
LOCATION: 65 South Dow Street, Falconer, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
25		6	5	5	7	19	12	BG		Contains increased clay content Contains Gravel and/or Rock fragments in bottom of spoon (firm)	
		7	3	7	10	13	17	BG		Gray f-c SAND, some f-c Gravel, some Clayey Silt (wet, firm, SM-SW)	
		8	WOR/1'		11	14	11	BG		Gray f-c GRAVEL, some f-c Sand, tr.-little clayey silt (wet, firm, SW)	
30		9	14	26	39	40	65	BG		Contains "and" f-c Sand, some Clayey Silt (moist-wet, very compact, GW-GM)	—
		10	16	17	14	14	31	BG		Contains tr. silt	
35		11	WOR	1	6	7	7	BG		Gray and brown Clayey SILT, little-some f-m Sand, tr. gravel (moist, ML)	Free standing water recorded at 14.8' after augering to 35'
		12	3	6	8	13	14	BG		Gray-brown f-m SAND, tr.-little f-m gravel, tr.-little silt (wet, loose, SP)	
		13	3	10	13	15	23	BG		Becomes gray, contains little Silt, tr. gravel (firm, SP-SM)	
40		14	22	19	21	20	40	BG		Contains sandy silt seam 40.5' - 41.0' (compact)	
		15	8	8	8	12	16	BG		Gray SILT, little f. Sand (wet, firm,ML) (Slight plasticity)	
45		16	3	4	6	6	10	BG		Contains little-some f. Sand, occ. moist seams (loose)	
			AUGER								
		17	2	2	4	7	6	BG			
50											

well screen

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly Cloudy, 40-50 F.
CLASSIFIED BY: D. R. Steiner

DATE
STARTED: 4-3-92
FINISHED: 4-6-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

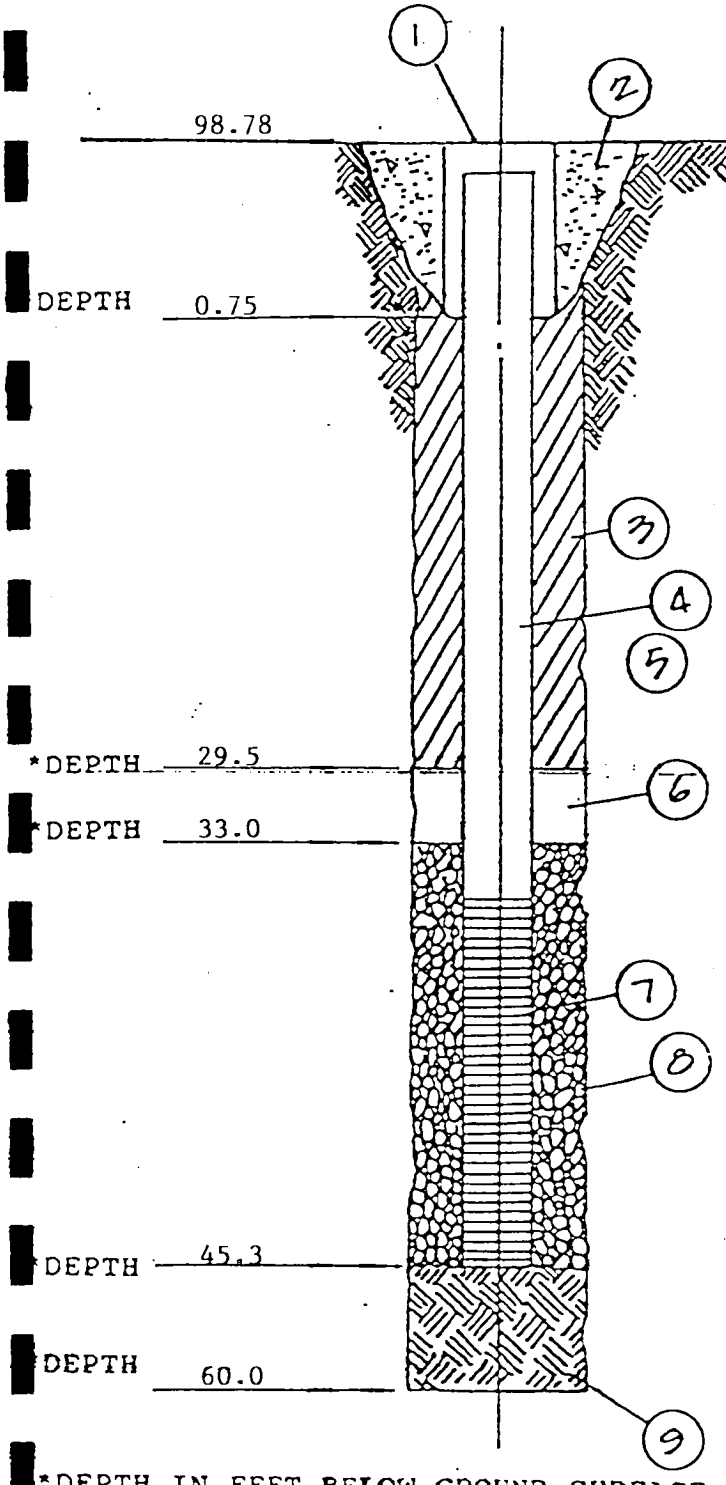
BORING NO.: ESI-2D
SURF. ELEV.: 98.8 ±
SHEET 3 OF 3

PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation
LOCATION: 65 South Dow Street, Falconer, NY

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
50		18	4	5	4	5	9			Gray fine SAND, little Silt (wet, SP-SM)	No recovery for Sample S-18
		19	4	10	21	19	31	BG		Gray Silty CLAY, tr.-little f. sand, tr. gravel (moist, CL)	
		AUGER									
55		20	8	13	12	11	25	BG		Gray SILT, tr. sand (slight plasticity) (wet, firm, ML)	—
		AUGER									
		21	4	14	13	18	27	BG		Contains silty clay seam 59' - 59.5'	
60										Boring complete at 60.0'	
65											
70											
75											

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly Cloudy, 40-50 F.
CLASSIFIED BY: D. R. Steiner

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-2D JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 35.1 FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   C. SLOT SIZE 0.010 In.
   d. LENGTH 10.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED 11-5-90
FINISHED 11-5-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. SUBSURFACE LOG

HOLE NO. ESI-3
SURF. ELEV. ---
G. W. DEPTH See Notes

PROJECT Dowcraft Corporation
BTA-90-179A

LOCATION Dow Street
Falconer, New York

DEPTH	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID Sample	SOIL OR ROCK CLASSIFICATION	NOTES
0								0.2' ASPHALTIC CONCRETE 0.8' CRUSHER RUN STONE 1' Wood Railroad Tie	Driller notes railroad tie at approximately 1.0'.
		1	11	22		49		Brown-gray f-c GRAVEL, some f-c Sand, little-tr. Silt, tr. coal, tr. concrete (moist, FILL)	
			27	9					
5		2	8	5		10		Brown-tan mottled f-c SAND, some Clayey Silt, little f-c Gravel (moist, loose)	Water at approximately 8.5'.
			5	6					
		3	6	7		17			
			10	11					
		4	8	13		25		Brown f-c GRAVEL, some f-c Sand, little Clayey Silt (wet, firm)	
10			12	9					
		5	10	6		13			
			7	6					
		6	9	5		9		Contains occasional brown-gray f-c sand seams (loose)	Driller notes running sands at 13.0'.
15			4	4					
								Boring Complete at 15.9'.	Free Standing Water measured at 12.3' inside augers at boring completion.
20								Ground water monitoring well installed tip set at 14.5-feet. Refer to monitoring well completion report for details.	
25									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

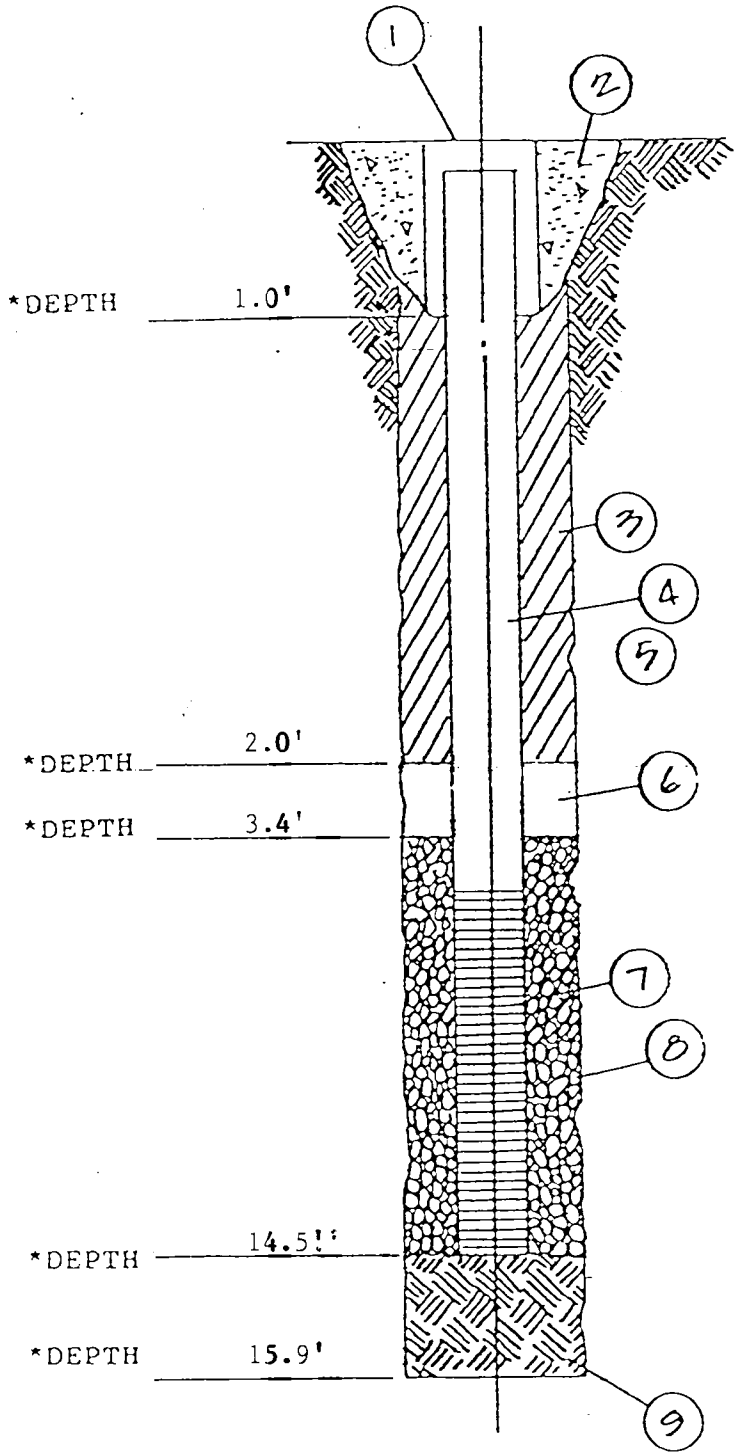
C = No. blows to drive ____ " casing ____ " with ____ lb. weight falling ____ "per blow.

CLASSIFICATION Visual by Onsite Geologist

METHOD OF INVESTIGATION ASTM D-1586 USING 4-1/4" HOLLOW STEM AUGERS

R/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-3 JOB No. BTA-90-179A
PROJECT: Dowcraft Corporation
Falconer, New York

1. GATE BOX I.D.: 8 INCHES
2. SURFACE SEAL TYPE: Type I Portland Cement
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. LENGTH 4.6 FEET
   d. JOINT TYPE Flush Couple Threaded
5. BACKFILL:
   a. TYPE Type I Portland Cement
   b. INSTALLATION Surface Pour
6. TYPE OF SEAL: Bentonite Pellet
7. SCREEN:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. SLOT SIZE 0.020 In.
   d. LENGTH 10 FT.
8. SCREEN FILTER TYPE: #4 Q Rok Sand
9. BACKFILL TYPE: Natural Sands & Gravel

EMPIRE SOILS INVESTIGATIONS INC.

DATE
STARTED 11-5-90
FINISHED 11-5-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC — SUBSURFACE LOG

HOLE NO. ESI-4
SURF. ELEV. ---
G. W. DEPTH See Notes

PROJECT Dowcraft Corporation (BTA-90-179A)

LOCATION Dow Street, Falconer, New York

DEPTH	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0								0.2' ASPHALTIC CONCRETE	
								0.8' CRUSHER RUN STONE FILL	
		1	17	8		-		Black f-c SAND, some f-m Gravel, little-tr. Silt, tr. coal, tr. concrete, tr. metal shavings, tr. brick (moist, FILL)	
		2	10	8		12			
			4	3					
		3	3	5		10			
5			5	5				Becomes brown	
		4	5	6		12		Contains little Clayey Silt	
			6	7				Contains "and" Clayey Silt, little f. Gravel	
		5	7	9		18		Brown-tan f-c GRAVEL, some f-c Sand, little Clayey Silt (moist, firm)	
			9	7					
10		6	8	6		11		Contains "and" f-c SAND (wet)	—
			5	5					Drilling completed to 8.0' on 11-5-90. Water at approximately 10.0'.
		7	5	5		10		(loose)	
			5	4					
15									
								Boring Complete at 16.8'.	Free Standing Water measured at 14.4' inside augers at boring completion.
20								Ground water monitoring well installed tip set at 15.0-feet. Refer to monitoring well completion report for details.	
25									

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

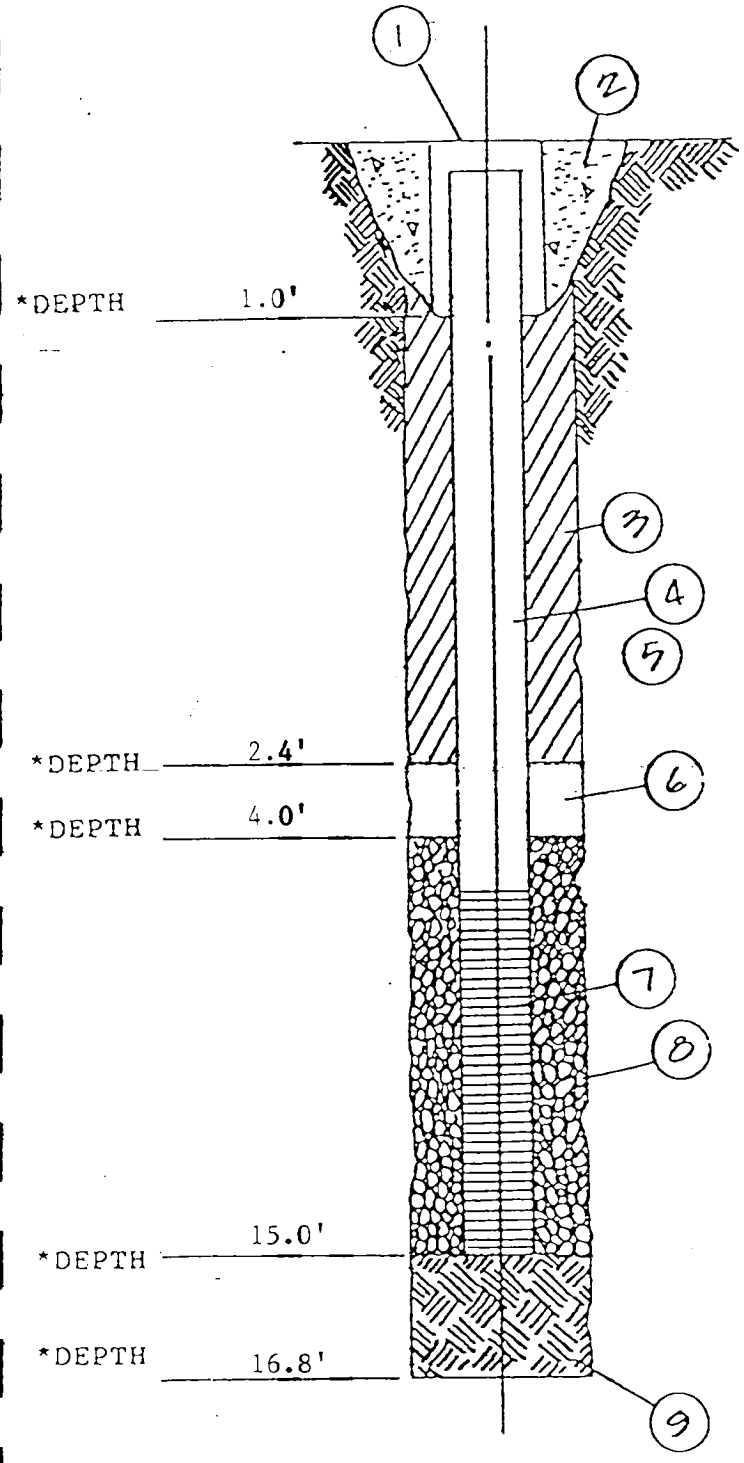
C = No. blows to drive ____ " casing ____ " with ____ lb. weight falling ____ "per blow.

CLASSIFICATION Visual by Geologist

METHOD OF INVESTIGATION: ASTM D-1586 USING 4-1/4" HOLLOW STEM AUGERS

B/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-4 JOB No. BTA-90-179A
PROJECT: Dowcraft Corporation
Falconer, New York

1. GATE BOX I.D.: 8 INCHES
2. SURFACE SEAL TYPE: Type I Portland Cement
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. LENGTH 4.8 FEET
   d. JOINT TYPE Flush Couple Threaded
5. BACKFILL:
   a. TYPE Type I Portland Cement
   b. INSTALLATION Surface Pour
6. TYPE OF SEAL: Bentonite Pellet
7. SCREEN:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. SLOT SIZE 0.020 In.
   d. LENGTH 10 FT.
8. SCREEN FILTER TYPE: #4 Q Rok Sand
9. BACKFILL TYPE: Natural Sands & Gravel

EMPIRE SOILS INVESTIGATIONS INC.

DATE
STARTED 11-6-90
FINISHED 11-6-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC. — **SUBSURFACE LOG**

HOLE NO. ESI-5
SURF. ELEV. ---
G. W. DEPTH See Notes

PROJECT Dowcraft Corporation (BTA-90-179A)

LOCATION Dow Street, Falconer, New York

DEPTH FT	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	N	BLOW ON CASING C	SOIL OR ROCK CLASSIFICATION	NOTES
0								0.4' ASPHALTIC CONCRETE 0.6' CRUSHER RUN STONE FILL Thin Concrete layer Wood Railroad tie	
		2	7	10		-		Brown-tan f-c SAND, some f-c Gravel, little Silt, tr. brick, tr. wood, (moist, FILL)	Railroad tie from approximately 1.5' to 2.7'.
5		3	7	12		26			
			14	19				Contains tr. rusted metal shaving	
		4	19	13		24		Brown-tan f-c GRAVEL, some f-c Sand, little Silt (moist, firm) (wet)	
			11	9					
		5	8	8		14			
10			6	5					Water at approximately 8.0'.
		6	2	4		9		Contains "and" f-c Sand (loose)	
			5	3					
		7	1	1		2			
			1	1					
15									
								Boring Complete at 16.0'.	Free Standing Water measured at 12.1' inside augers at boring completion.
20								Ground water monitoring well installed tip set at 15.2-feet. Refer to monitoring well completion report for details.	

N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow.

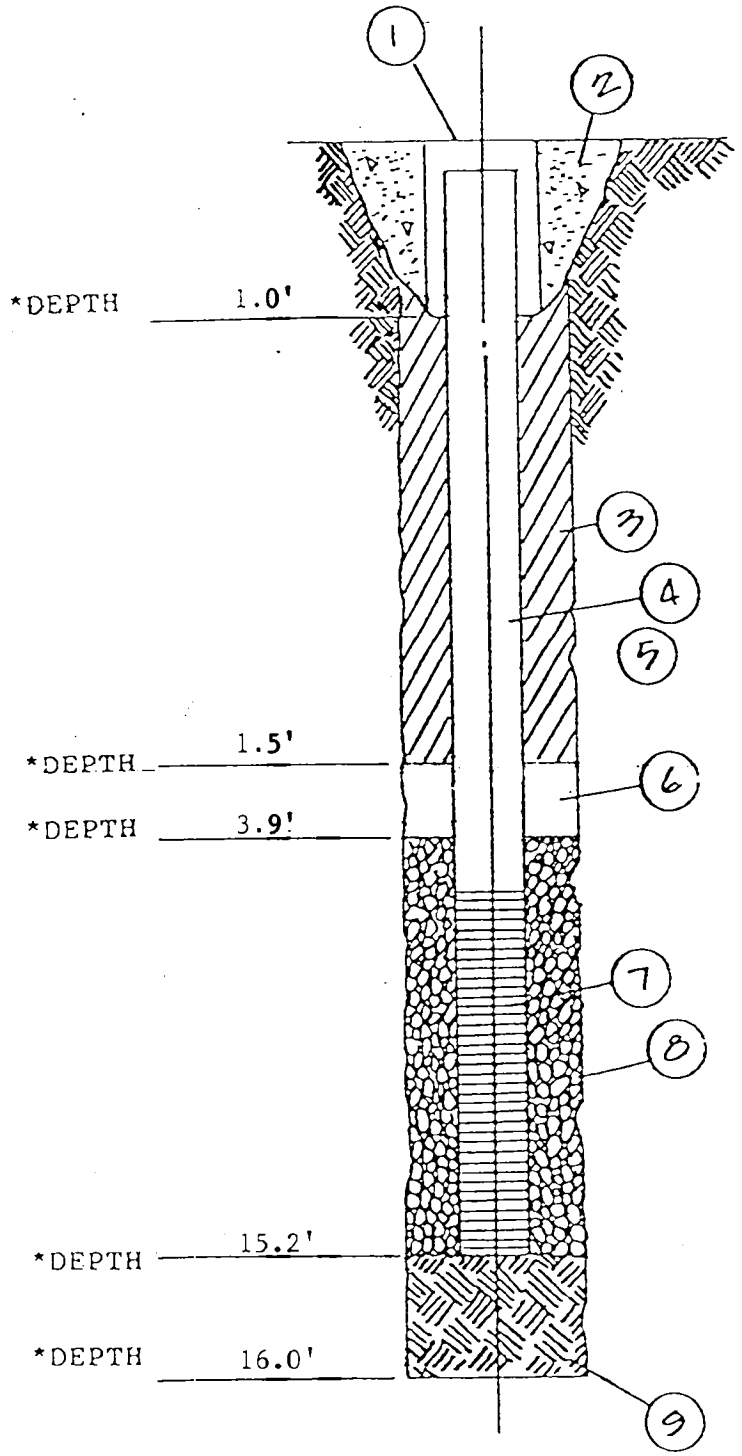
C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow

CLASSIFICATION Visual by Geologist

METHOD OF INVESTIGATION ASTM D-1586 USING 4-1/4" HOLLOW STEM AUGERS

B/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI- 5 JOB No. BTA-90-179A

PROJECT: Dowcraft Corporation

Falconer, New York

1. GATE BOX I.D.: 8 INCHES
2. SURFACE SEAL TYPE: Type I Portland Cement
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   c. LENGTH 5.0 FEET
   d. JOINT TYPE Flush Couple Threaded
5. BACKFILL:
   a. TYPE Type I Portland Cement
   b. INSTALLATION Surface Pour
6. TYPE OF SEAL: Bentonite Pellet
7. SCREEN:
   a. TYPE 40 Schedule PVC
   b. I.D. 2 INCHES
   C. SLOT SIZE 0.010 In.
   d. LENGTH 10 FT.
8. SCREEN FILTER TYPE: #2 Q Rok Sand
9. BACKFILL TYPE: Natural Sands & Gravel

EMPIRE SOILS INVESTIGATIONS INC.

DATE STARTED 12-26-90
FINISHED 12-26-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

(BTA-90-179B)

HOLE NO. ESI-6
SURF. ELEV. ----
G. W. DEPTH **

PROJECT Dowcraft Corporation
Environmental Investigation

LOCATION 65 South Dow Street
Falconer, New York 14733

DEPTH FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID F	PID L	SOIL OR ROCK CLASSIFICATION
0		1	8	7					
			11	21		18	BG	BG	Brown Clayey SILT, and black CINDERS, some crushed red Brick, some f-c Sand, little f.-Gravel (damp, FILL)
		2	10	10					
			7	8		17	BG	0.6	Black crushed CINDERS, some Slag, tr. silt, tr. f-c sand, tr. black-brown sand, (moist, FILL)
5		3	2	3					
			2	1		5	BG	0.4	Some Silt, some f-m Sand, some crushed red Brick
		4	3	2					
			6	4		8	BG	0.8	tr. red brick pieces (wet)
		5	1	2					
			2	6		4	BG	0.8	"And" f-m SAND, little crushed red Brick, tr. crushed cinders
10		6	2	2					
			2	3		4	BG	6.6	
		7	5	6					
			6	7		12	BG	7.1	Gray f-m GRAVEL, some Silt, tr.f.-sand, tr. clay (wet, FILL)
15									Boring Complete at 14.0'. Tip of ground water monitoring well set at 13.5' (See Well Construction Diagram for details).
20									

NOTES

*Organic vapor measurements recorded in-field (F) using a photoionization detector (PID) by an ESI geologist. Measurements collected as split-spoon was opened measurements recorded in parts per million (ppm).

Field Background (BG) =0.3-0.5 ppm.
Laboratory headspace measurements (L) collected as aluminum foil capped jar was opened. BG=0.3 ppm.

S-5,6,7: Water had slight sheen on surface.

**Free standing water measured in well after completion of well construction at depth of 7.21' below grade.

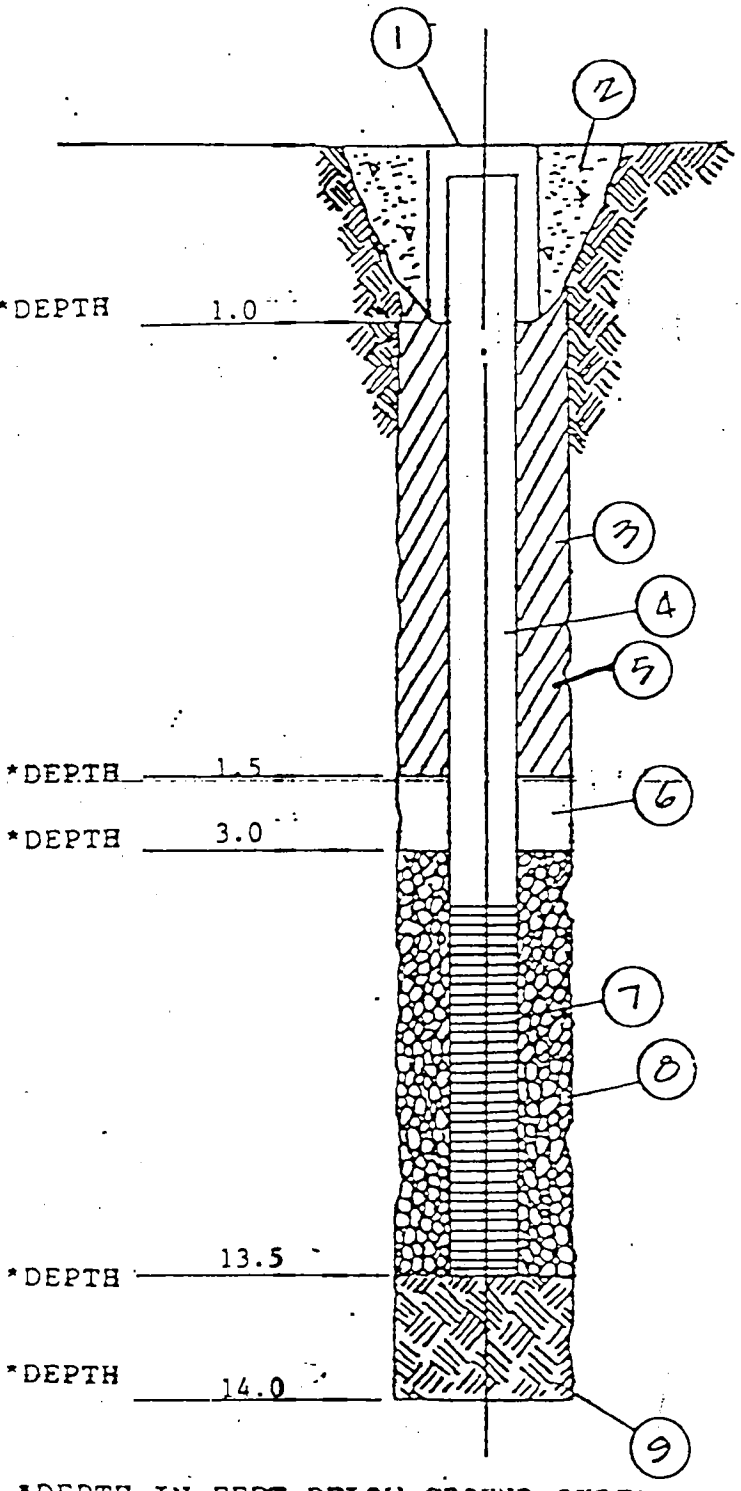
N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow. CLASSIFICATION Visual by Geologist

C = No. blows to drive ____ " casing ____ " with ____ lb. weight falling ____ "per blow.

METHOD OF INVESTIGATION: ASTM D-1586; BORING ADVANCED USING A CME-45B DRILL RIG W/4¼" I.D.H.S.A.

R/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-6 JOB No. BTA-90-179B
PROJECT: Dowcraft Corp. Environmental Invest.
65 South Dow Street

1. GATE BOX I.D.: 8-3/8" INCHES
2. SURFACE SEAL TYPE: Cement Grout
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2 INCHES
   c. LENGTH 3.5 FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Pour From Ground Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2 INCHES
   C. SLOT SIZE 0.020 In.
   d. LENGTH 10 FT.
8. SCREEN FILTER TYPE: 4 QRok Sand
9. BACKFILL TYPE: 4 QRok Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED 12-26-90
FINISHED 12-26-90
SHEET 1 OF 1

EMPIRE SOILS INVESTIGATIONS INC.

SUBSURFACE LOG

(BTA-90-179B)

HOLE NO. ESI-7
SURF. ELEV. -----
G. W. DEPTH * *

PROJECT Dowcraft Corporation
Environmental Investigation

LOCATION 65 South Dow Street
Falconer, New York 14733

DEPTH-FT.	SAMPLES	SAMPLE NO.	BLOWS ON SAMPLER 0/6	6/12	12/18	N	PID F	PID L	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	14	9			BG	0.4	Brown Clayey SILT AND f-c Sand, little f. Gravel, tr. concrete (damp, FILL)	*Organic vapor measurements recorded in-field (F) using photoionization detector (PID) by an ESI Geologist. Measurements collected as split-spoon was opened. Measurements recorded in parts per million (ppm). Field Background (BG) =0.4-0.5 ppm. Laboratory headspace measurements (L) collected as aluminum foil capped jar was opened. BG=0.3 ppm.
			6	6		15				
		2	3	3					Does not contain concrete	
			4	10		7	BG	0.4	little Coal	
5		3	8	100/0.3		100	*	0.8	CONCRETE	
		4	11	6		17	*	0.6		
		5	9	6			*	0.5	Brown Clayey SILT, little Brick, little Coal (moist, FILL)	
			15	11		21			some f.-Gravel (wet)	
		6	6	8			*	0.6		
10			9	7		17			Brown f-c SAND, some Silt, tr. clay, tr. calcareous shells (wet, stiff)	
		7	2	8			*	0.4		
			8	7		16			tr. silt, tr. clay, no calcareous shells	
		8	9	7			*	0.4		
			6	5		13			"And" SILT "And" f.-SAND (medium)	
15		9	4	5		9	*	0.6	"And" f-c SAND, little f.-Gravel, little Silt, tr. clay	
									Boring Complete at 15.0'. Tip of ground water monitoring well set at 14.5' (See Well Construction Diagram for details).	PID not working properly due to temperature. S-8,9: Slight sheen on water surface Note: Auger spoil has slight sheen.
20										**Free standing water measured in well after completion of well construction at depth of 7.11' below grade.

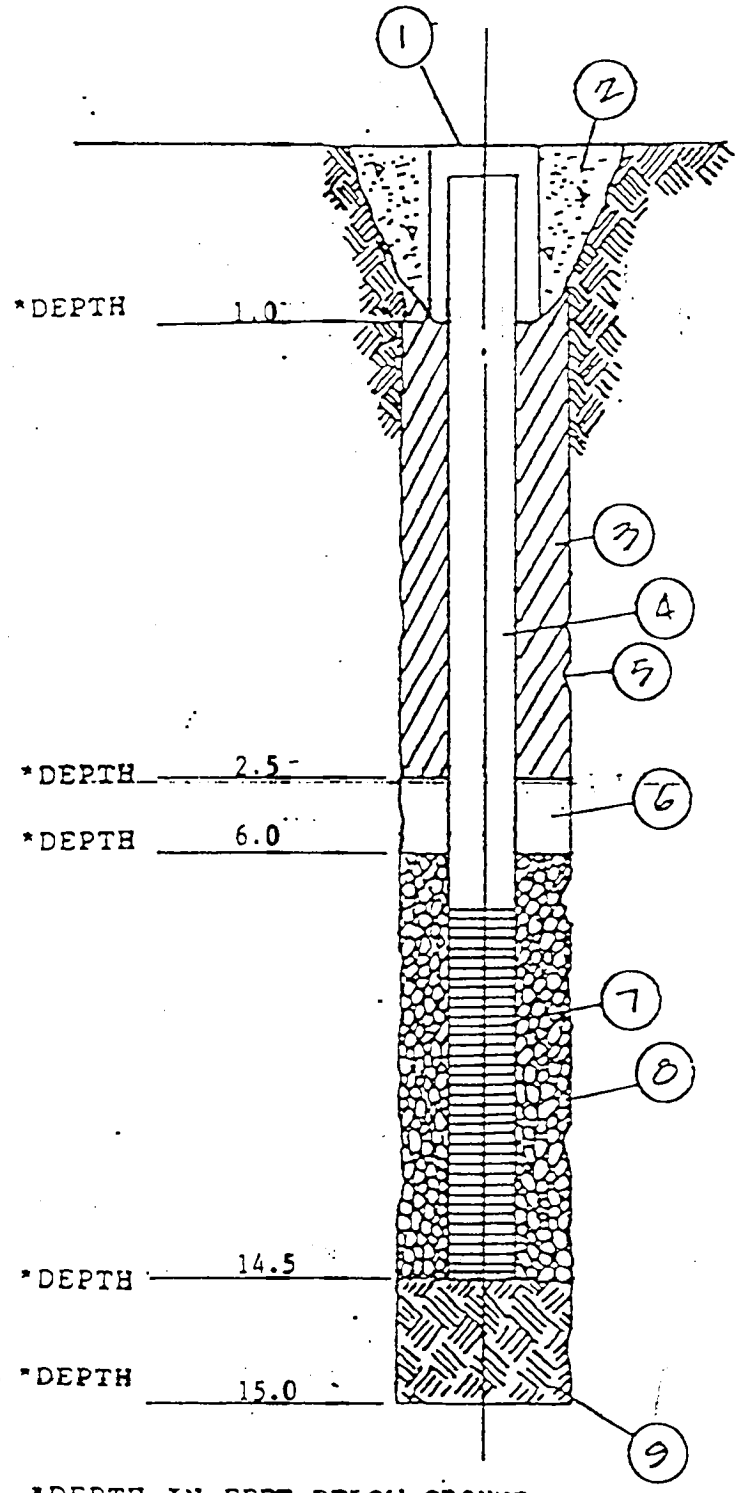
N = No. blows to drive 2 " spoon 12 " with 140 lb. pin wt. falling 30 "per blow. CLASSIFICATION Visual by Geologist

C = No. blows to drive _____ " casing _____ " with _____ lb. weight falling _____ "per blow.

METHOD OF INVESTIGATION: ASTM D-1586; BORING ADVANCED USING A CME-45B DRILL RIG W/4¼" I.D.H.S.A.

R/T Form H

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-7 JOB No. BTA-90-179B

PROJECT: Dowcraft Corp. Environmental Invest.
65 South Dow Street

1. GATE BOX I.D.: 8-3/8" INCHES

2. SURFACE SEAL TYPE: Cement Grout

3. BOREHOLE DIAMETER 8 INCHES

4. RISER PIPE:

   a. TYPE Schedule 40 PVC

   b. I.D. 2.0 INCHES

   c. LENGTH 6.0 FEET

   d. JOINT TYPE Flush Threaded

5. BACKFILL:

   a. TYPE Cement Grout

   b. INSTALLATION Pour From Ground Surface

6. TYPE OF SEAL: Bentonite Pellet

7. SCREEN:

   a. TYPE Schedule 40 PVC

   b. I.D. 2 INCHES

   C. SLOT SIZE 0.020 In.

   d. LENGTH 8 FT.

8. SCREEN FILTER TYPE: 40Rok Sand

9. BACKFILL TYPE: 4QRok Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED: 4-8-92
FINISHED: 4-8-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

BORING NO.: ESI-8
SURF. ELEV.: 102.3 ±
SHEET 1 OF 1

PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation

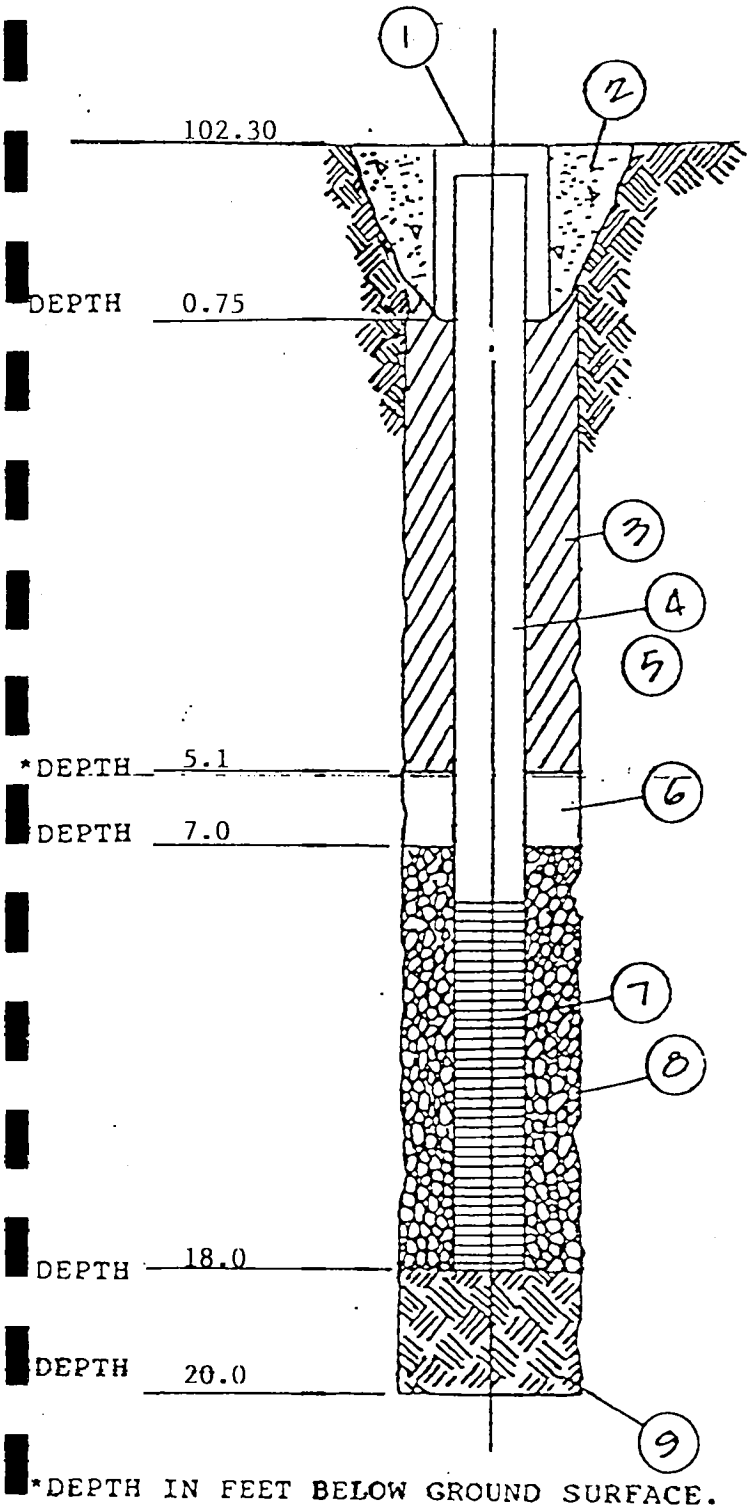
LOCATION: 65 South Dow Street
Falconer, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	3	5	5	7	10	BG		Red BRICK, little gray Shale, little black Sand (moist, FILL)	Organic vapor measurements recorded in the field as the split spoons were opened. Measurements recorded in parts per million (ppm). Background measurement 0.2 ppm.
		2	7	3	4	3	7	BG		Black and gray f-c SAND, little Concrete, little Brick, tr. gravel (moist, FILL)	
		3	4	1	1	1	2	BG		Black m-c SAND, little Coal, little Concrete, tr. organics (moist, FILL)	
5		4	24	12	24	25	36	BG		Mottled Brown and Black f-c SAND and f-c Gravel, tr. silt (moist, compact, SW)	
		5	25	11	12	12	23	BG		Brown m.SAND, little f-Gravel (moist,firm,SW)	
10		6	34	27	23	14	50	BG		f-c GRAVEL, some brown f-c Sand (moist, compact,GW)	
		7	10	9	12	8	21	BG		f-c GRAVEL, some brown f-c Sand, tr. silt (wet, firm,GW)	Apparent water table at 13.5 feet below ground surface.
		8	10	9	11	12	20	BG			
15		9	12	11	6	6	17	BG			
		10	11	11	8	8	19	BG			
20										Boring complete at 20.0'	
25											
30											

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly cloudy 50-60 F.
CLASSIFIED BY: K. Shanahan

MONITOR WELL COMPLETION REPORT:

WELL No. ESI-8 JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation



*DEPTH IN FEET BELOW GROUND SURFACE.

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 7.77 FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   C. SLOT SIZE 0.010 In.
   d. LENGTH 10.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED: 4-8-92
FINISHED: 4-8-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

BORING NO.: ESI-9
SURF. ELEV.: 100.2 ±
SHEET 1 OF 1

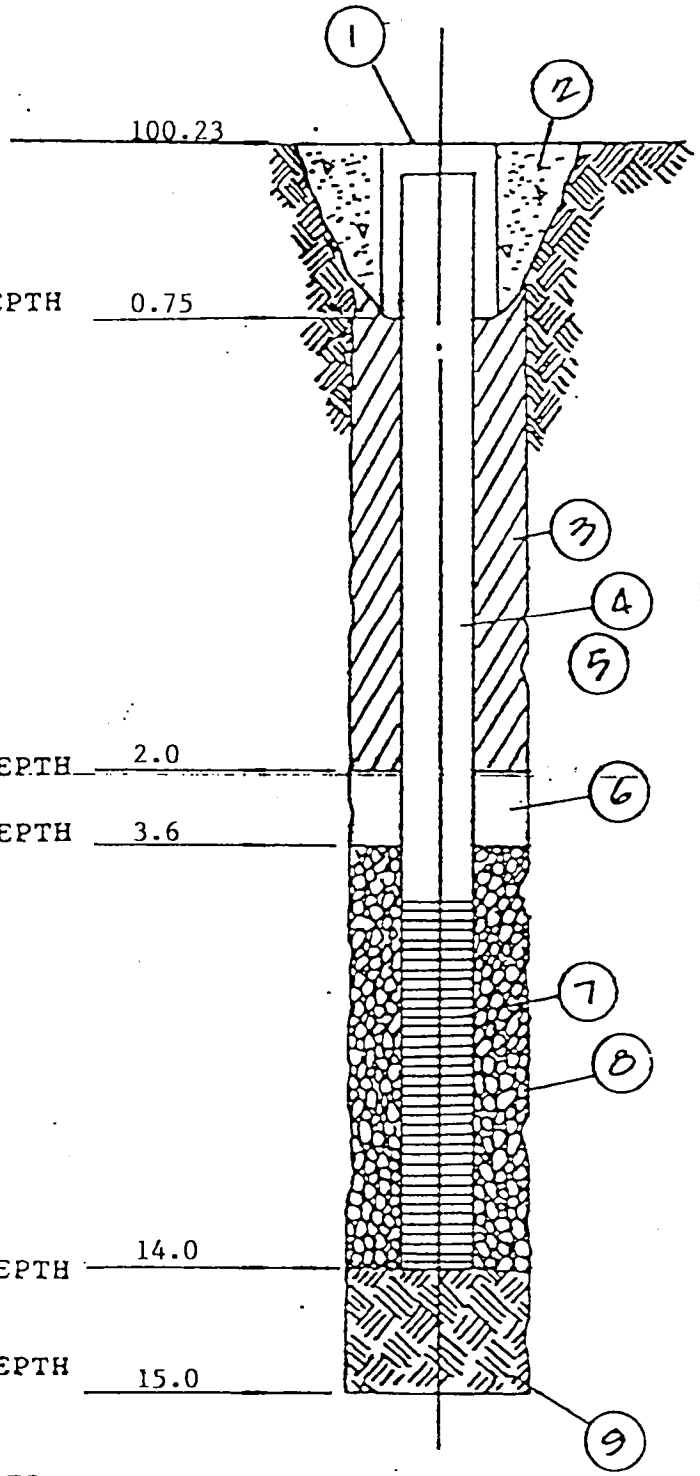
PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation

LOCATION: 65 South Dow Street
Falconer, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1		11	6	2	17	BG		ASPHALT	Organic vapor measurements recorded in the field as the split spoons were opened. Measurements recorded in parts per million (ppm). Background measurement 0.2 ppm. Apparent water at 8.2 feet below ground surface.
										Brown f-c SAND and f-c Gravel, tr. black sand, tr. coal (moist, FILL)	
		2	3	5	6	10	11	BG		Yellow-Brown SILT, tr. Clay (moist, medium,ML)	
5		3	9	9	9	10	18	BG		Brown f-c GRAVEL, some Sand (moist, compact,GW)	
		4	20	13	8	7	21	BG			
		5	8	11	13	12	24	BG		Brown f-c SAND, some f. Gravel, tr. slit (wet, firm,SW)	
10		6	13	10	8	6	18	BG		Gray c. SAND, some f. Gravel, little Silt (wet,firm,SM)	
		7	6	2	1	1	3	BG		Brown f. SAND (wet, loose,SP)	
15										Boring complete at 15.0'	
20											
25											
30											

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly Cloudy 50's
CLASSIFIED BY: K. Shanahan

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-9 JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 3.8 FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   C. SLOT SIZE 0.010 In.
   d. LENGTH 10.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED: 4-9-92
FINISHED: 4-9-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

BORING NO.: ESI-10
SURF. ELEV.: 99.4 ±
SHEET 1 OF 1

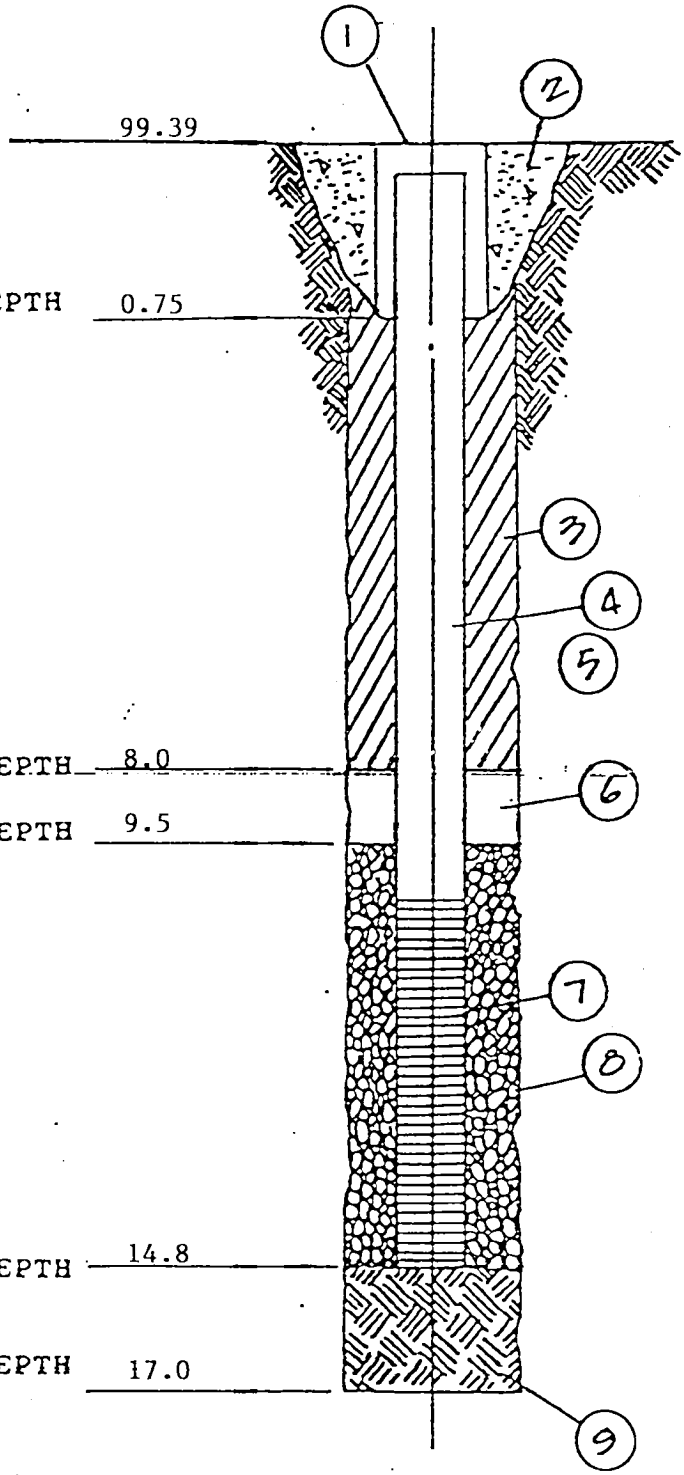
PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation
LOCATION: 65 South Dow Street, Falconer, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6 6/12 12/18 18/24 N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0						CONCRETE FLOOR	
						Basement Area	Organic vapor measurements recorded in the field as the split spoons were opened. Measurements recorded in parts per million (ppm) Background measurement 0.2 ppm Background HNu reading 0.3 - 0.4 ppm Apparent ground water at 10.0 feet below surface concrete slab. Unable to obtain blow counts due to limited space
5							
10		1		5.5		f-c GRAVEL, some f-c Sand, tr. silt (wet,GW)	
		2		4.5		f-c Brown SAND (wet,SP)	
15		3		1.0		Brown f-c SAND and f-c Gravel, tr. silt (wet,SW)	
						Boring complete at 17.0'	
20							
25							
30							

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly cloudy 50-60 F
CLASSIFIED BY: K. Shanahan

MONITOR WELL COMPLETION REPORT:

WELL No. ESI-10 JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation



*DEPTH IN FEET BELOW GROUND SURFACE.

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 9.6 FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. SLOT SIZE 0.010 In.
   d. LENGTH 5.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

A 10-inch diameter protecting casing was installed from approximately 0.4-feet and 8.0-feet below ground surface due to the presence of the basement area

DATE
STARTED: 4-10-92
FINISHED: 4-10-92

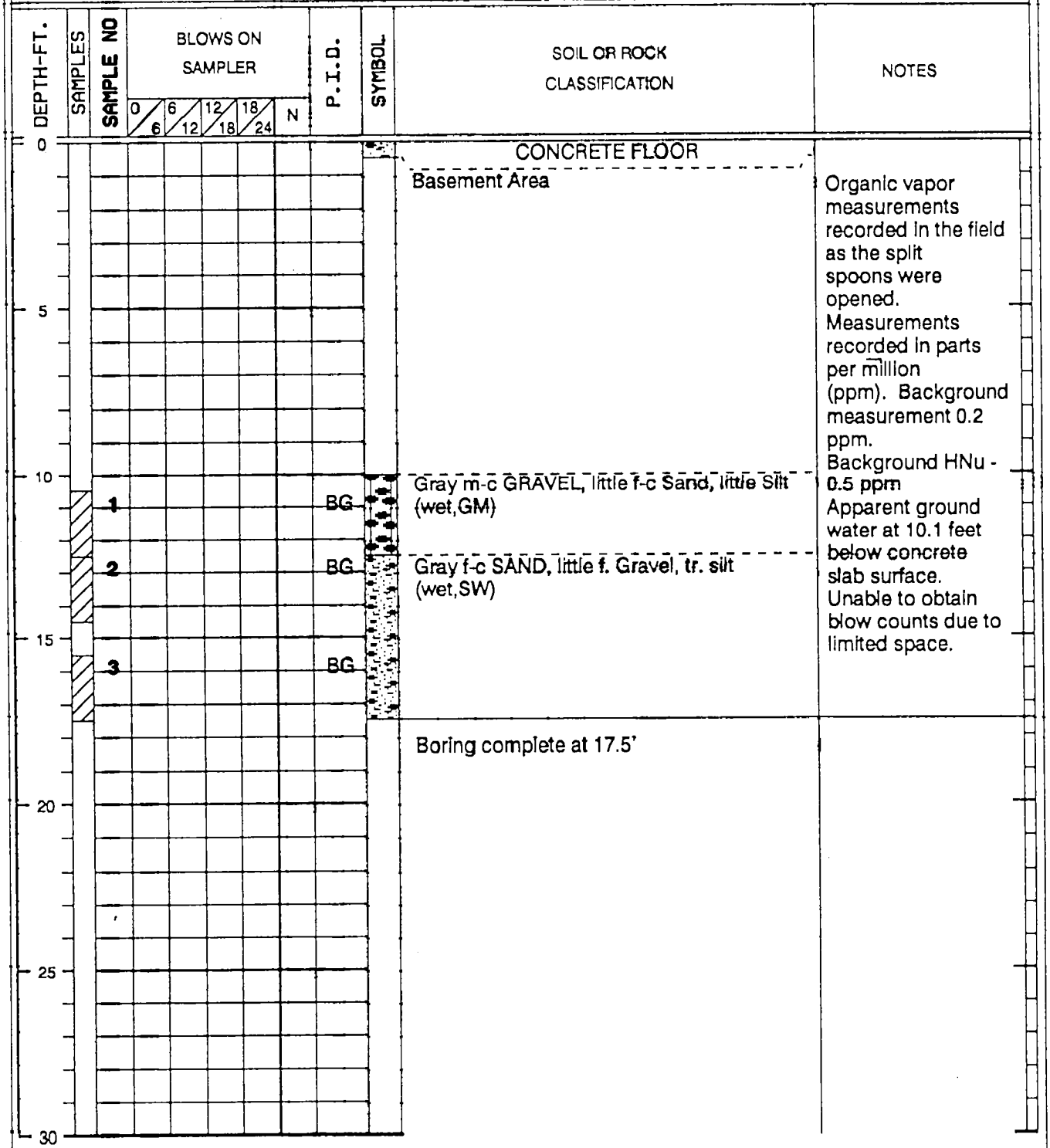
EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

BORING NO.: ESI-11
SURF. ELEV.: 99.3 ±
SHEET 1 OF 1

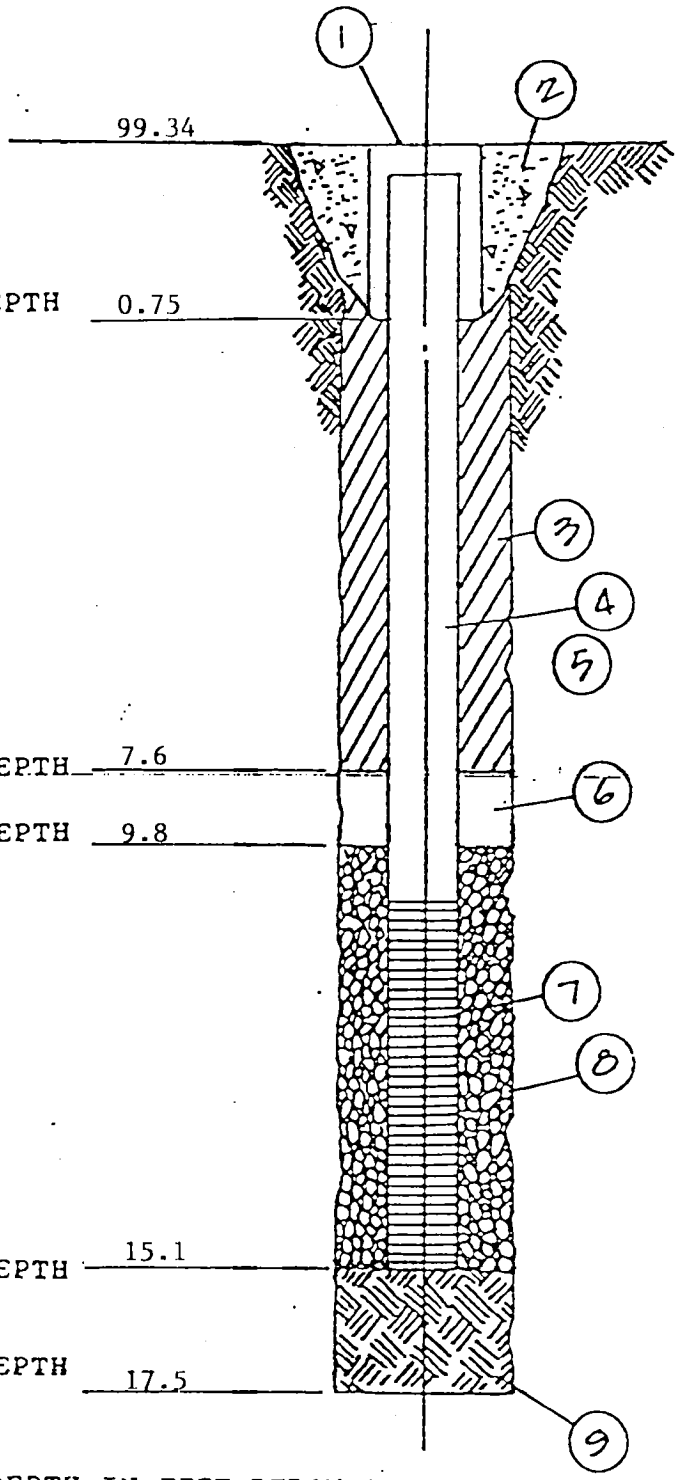
PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation

LOCATION: 65 South Dow Street
Falconer, New York



DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly cloudy 50-60 F.
CLASSIFIED BY: K. Shanahan

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-11 JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 9.9 — FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   C. SLOT SIZE 0.010 In.
   d. LENGTH 5.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

A 10-inch diameter protecting casing was installed from approximately 0.4-feet and 8.0-feet below ground surface due to the presence of the basement area.

DATE
STARTED: 4-10-92
FINISHED: 4-10-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

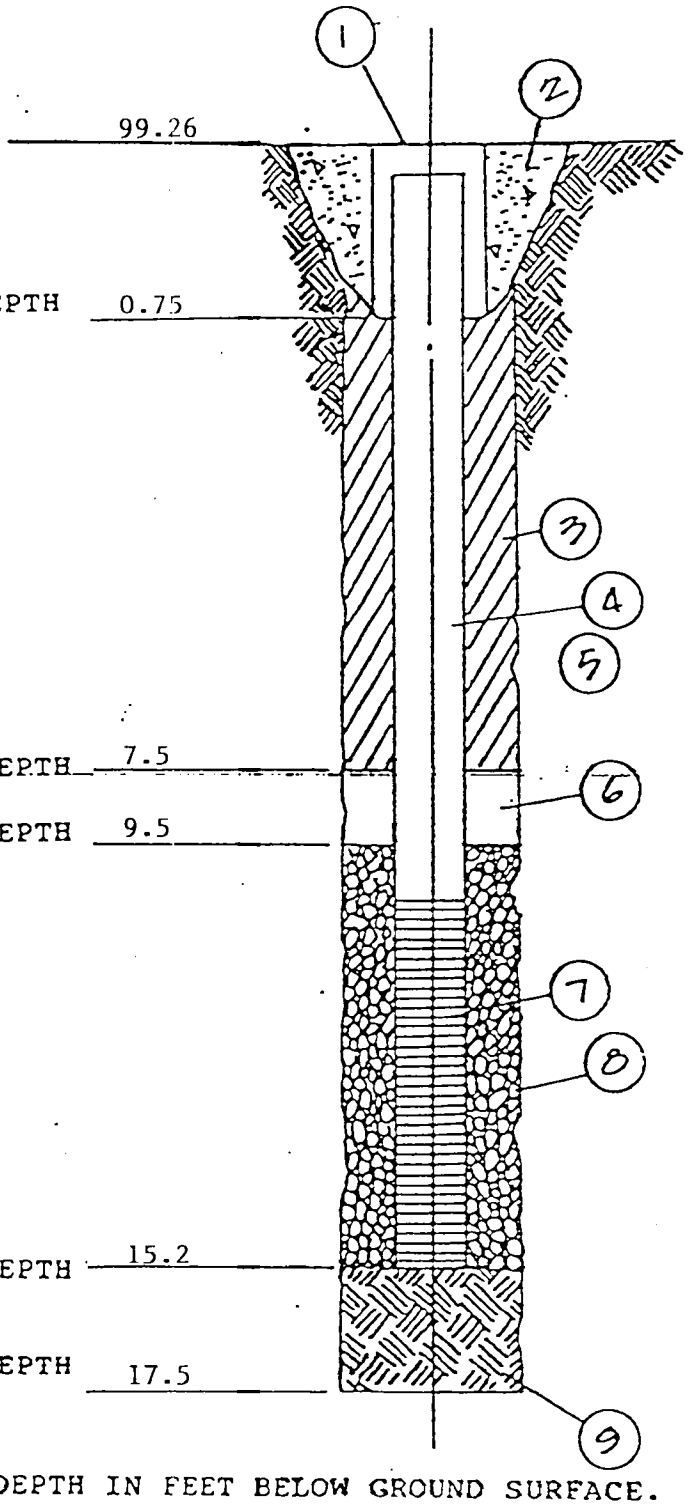
BORING NO.: ESI-12
SURF. ELEV.: 99.3 ±
SHEET 1 OF 1

PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation
LOCATION: 65 South Dow Street, Falconer, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER (0/6, 6/12, 12/18, 18/24, N)	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0						CONCRETE FLOOR	Organic vapor measurements recorded in the field as the split spoons were opened. Measurements recorded in parts per million (ppm). Background measurement 0.2 ppm. Background HNu - 0.6 ppm Apparent ground water at 10.2 feet below concrete slab surface. Unable to obtain blow counts due to limited space.
		1		BG		Brown f. GRAVEL and Silt, little f-c Sand (moist, FILL)	
		2		BG		Brown f-c SAND and Silt, little f. Gravel (moist, FILL)	
5		3		BG			
		4		BG		CONCRETE	
						f-c Brown GRAVEL, some f-c Sand, tr. silt (moist-wet,GW)	
10		5		BG		Gray f-c SAND, tr. silt, tr. gravel (wet,SP)	
		6		BG		Brown f-c SAND, some f. Gravel, tr. silt (wet,SW)	
						Gray f-c SAND, tr. silt (wet,SP)	
15		7		BG			
						Gray f-c SAND and f-c Gravel, tr. silt (wet,SW)	
						Boring complete at 17.8'	
20							
25							
30							

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly cloudy 50-60 F.
CLASSIFIED BY: K. Shanahan

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-12 JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 10.0 — FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. SLOT SIZE 0.010 In.
   d. LENGTH 5.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED: 4-13-92
FINISHED: 4-13-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92179B

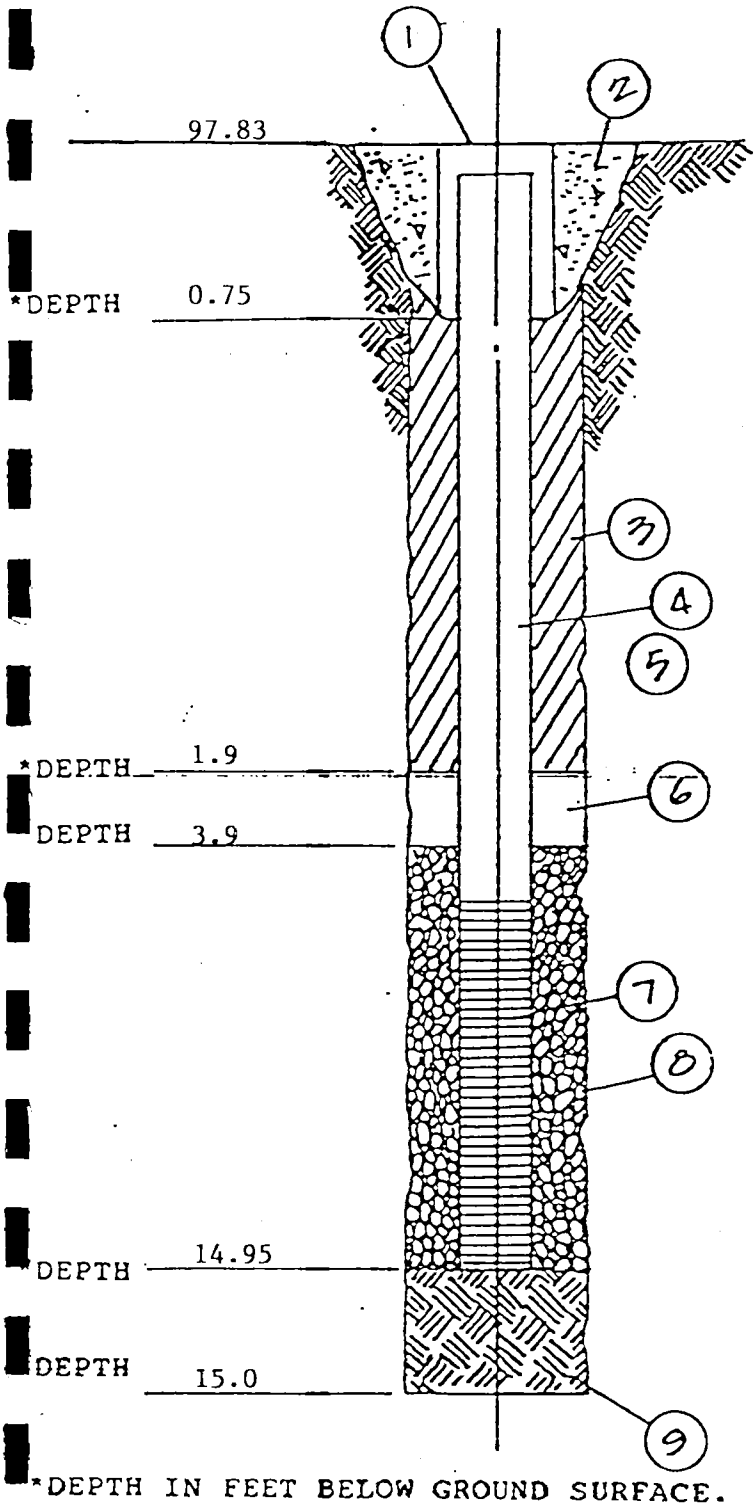
BORING NO.: ESI-13
SURF. ELEV.: 97.8 ±
SHEET 1 OF 1

PROJECT: Dowcraft Environmental Investigation
CLIENT: Dowcraft Corporation
LOCATION: 65 South Dow Street, Falconer, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	P.I.D.	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0		1	17	21	23	18	44	*		Brown-Black f-c SAND, some Gravel, little Cinders, tr. silt (moist, FILL)	Organic vapor measurements recorded in the field as the split spoons were opened. Measurements recorded in parts per million (ppm) Background measurement 0.2 ppm Apparent Ground water at approximately 9.0 feet below ground surface.
		2	10	11	13	6	24			Contains tr. wood	
5		3	6	3	5	6	8				
		4	8	2	2	7	4			Becomes brown-tan mottled, some clayey Silt, contains little f. Gravel, tr. cinders (moist,FILL)	
		5	7	6	7	12	13			Brown f-c GRAVEL and Sand, little-tr. Silt (wet, medium,GW)	
10		6	9	6	3	5	9			(loose)	
		7	3	4	4	4	8			Contains tr. silt	
		8	5	3	3	4	6			Becomes brown gray	*HNu battery low - no field measuremtns taken.
15		9	5	2	3	7	5			Contains occasional f. Sand partings	
										Boring complete at 18.0'	
20											
25											
30											

DRILLER: P. Bence
DRILL RIG: CME-75
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly cloudy 50-60 F.
CLASSIFIED BY: L. Zimmerman

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. ESI-13 JOB No. BTA-92-179B
PROJECT: Dowcraft Environmental Investigation

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 8 INCHES
4. RISER PIPE:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   c. LENGTH 4.7 — FEET
   d. JOINT TYPE Flush Threaded
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE Schedule 40 PVC
   b. I.D. 2.0 INCHES
   C. SLOT SIZE 0.010 In.
   d. LENGTH 10.0 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: No. 1 Morie Silica Sand

EMPIRE SOILS INVESTIGATIONS INC

DATE
STARTED: 11-11-92
FINISHED: 11-12-92

EMPIRE
SOILS INVESTIGATIONS INC.

SUBSURFACE LOG
BTA-92-266

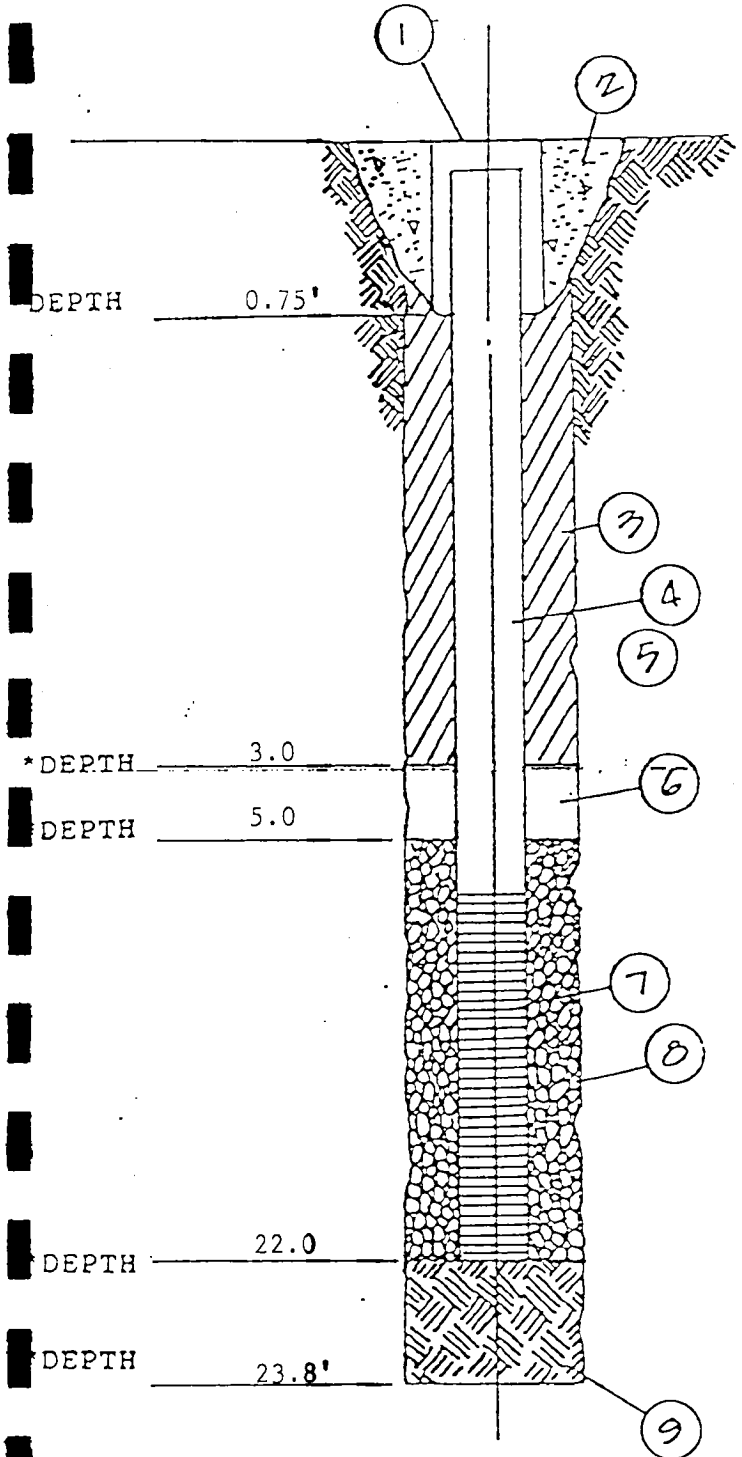
BORING NO.: PW-1
SURF. ELEV.: ±
SHEET 1 OF 1

PROJECT: Dowcraft -Pumping Wells
CLIENT: Dowcraft Corporation
LOCATION: South Dow Street, Falconer, New York

DEPTH-FT.	SAMPLES	SAMPLE NO	BLOWS ON SAMPLER 0/6	6/12	12/18	18/24	N	PID	SYMBOL	SOIL OR ROCK CLASSIFICATION	NOTES
0										Asphaltic Concrete Pavement @ Surface	
		A	U	G	E	R				Auger to 4' before taking S. S. Samples	
5		1	3	5	4	5	9	1-2		Brown f-c SAND, some Clayey Silt, some f-c Gravel (moist, loose, SM)	PID = Photoionization Detector Readings (PPM) Background (BG) PID = 0.2 - 0.6 ppm
		2	3	3	3	7	6	BG		Contains occ. Silty Clay seams	
		3	8	12	27	37	39	BG		Contains little Clayey Silt (wet, compact)	
10		4	2	21	25	21	46	BG			
		5	9	5	4	4	9	BG-2		Contains tr. silt, some f-m Gravel (loose, SW)	
15		6	6	4	3		7	5-7		Contains tr. gravel	
		7	7	10	7	10	17	1-2		Contains occ f-m Sand seams	
		8	4	1	1	2	2	3-5		Contains f. Sand, tr. - little Silt (loose, SP-S)	
20		9	2	3	1	2	4	3-5		Contains occ. seams of f. Sand and Silt	
		10	12	4	5	6	9	BG-1		Gray SILT, tr. - little f. Sand (wet, loose, ML)	
		11	4	3	4	5	7	BG-1			
25		12	5	6	5	5	11	BG-1		(firm)	
										Boring Complete at 28.0'	
30											

DRILLER: P. Bence
DRILL RIG: CME-75 Truck
METHOD OF INVESTIGATION: ASTM D-1586 USING HOLLOW STEM AUGERS
WEATHER: Partly Cloudy 50's
CLASSIFIED BY: D.R. Steiner

MONITOR WELL COMPLETION REPORT:



*DEPTH IN FEET BELOW GROUND SURFACE.

WELL No. PW-1 JOB No. BTA-92-266
PROJECT: Dowcraft Pumping Wells

1. GATE BOX I.D.: 9 INCHES
2. SURFACE SEAL TYPE: Concrete
3. BOREHOLE DIAMETER 12 INCHES
4. RISER PIPE: (PVC 0.5'-2.0' feet)
   a. TYPE Stainless Steel (Type 304)
   b. I.D. 6 INCHES
   c. LENGTH 5 FEET
   d. JOINT TYPE Flush Thread
5. BACKFILL:
   a. TYPE Cement Grout
   b. INSTALLATION Surface
6. TYPE OF SEAL: Bentonite Pellets
7. SCREEN:
   a. TYPE 304 Stainless Steel
   b. I.D. 6 INCHES
   c. SLOT SIZE 0.010 In.
   d. LENGTH 15 FT.
8. SCREEN FILTER TYPE: No. 1 Morie Silica Sand
9. BACKFILL TYPE: Bentonite Pellets 23.2-23.8 feet; No. 1 Morie Silica Sand above 23.2-feet.

EMPIRE SOILS INVESTIGATIONS INC

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Phase II Environmental Site Assessment

PROJECT NUMBER: BTA-90-179A DATE: 11-13-90

LOCATION: Dowcraft Plant, 65 South Dow Street, Falconer, New York

WELL NUMBER: ESI- 1

PERSONNEL: K. Shanahan, D. Lauzon

DEVELOPMENT METHOD: BAILERS - BK PUMP - PERASTALLIC PUMP
DOWN HOLE PUMP - COMPRESSED AIR
OTHER: Guzzler Pump

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY --- NTU
WELL VOLUMES 10
STABLE pH Yes
STABLE CONDUCTIVITY Yes

WATER LEVEL PRIOR TO DEVELOPMENT 7.69' (TOR) (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT 7.72' (TOR) (elevation in feet)
DEVELOPMENT STARTED 11:20 am
DEVELOPMENT COMPLETED 12:00 Noon
TOTAL VOLUME OF WATER REMOVED 16 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES F)	TURBIDITY NTU
1	6.39	56.3	51	Extremely Turbid
5	6.61	36.4	52	345
8	6.58	33.6	52	195
13	6.63	32.2	52	89
16	6.66	31.0	53	98

NOTES: Depth To Water Surface = 7.69' (TOR)

Depth To Bottom of Well= 14.05' (TOR)

1 Well Volume= 1.04 Gallons

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Phase II Environmental Site Assessment

PROJECT NUMBER: BTA-90-179A DATE: 11-12-90

LOCATION: Dowcraft Plant, 65 South Dow Street, Falconer, New York

WELL NUMBER: ESI- 2

PERSONNEL: K. Shanahan

DEVELOPMENT METHOD: BAILERS - BK PUMP - PERASTALLIC PUMP
DOWN HOLE PUMP - COMPRESSED AIR
OTHER: Guzzler Pump

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY --- NTU
WELL VOLUMES 10
STABLE pH Yes
STABLE CONDUCTIVITY Yes

WATER LEVEL PRIOR TO DEVELOPMENT 8.0' (TOR) (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT 8.0' (TOR) (elevation in feet)
DEVELOPMENT STARTED 3:25 pm
DEVELOPMENT COMPLETED 4:20 pm
TOTAL VOLUME OF WATER REMOVED 13 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES F)	TURBIDITY NTU
1	7.57	53.6	57	Extremely Turbid
4	7.42	50.9	57	"
7	7.37	50.0	57	"
10	7.21	48.2	58	"
12	7.17	47.2	61	"

NOTES: Depth To Water Surface = 8.0' (TOR)

Depth To Bottom of Well= 12.92' (TOR)

1 Well Volume= 0.803 Gallons

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Phase II Environmental Site Assessment

PROJECT NUMBER: BTA-90-179A DATE: 11-12-90

LOCATION: Dowcraft Plant, 65 South Dow Street, Falconer, New York

WELL NUMBER: ESI- 3

PERSONNEL: K. Shanahan

DEVELOPMENT METHOD: BAILERS - BK PUMP - PERASTALLIC PUMP
DOWN HOLE PUMP - COMPRESSED AIR
OTHER: Guzzler Pump

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY -- NTU
WELL VOLUMES 10
STABLE pH Yes
STABLE CONDUCTIVITY Yes

WATER LEVEL PRIOR TO DEVELOPMENT 8.08' (TOR) (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT 8.15' (TOR) (elevation in feet)
DEVELOPMENT STARTED 2:30 pm
DEVELOPMENT COMPLETED 3:15 pm
TOTAL VOLUME OF WATER REMOVED 15 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES F)	TURBIDITY NTU
1	10.53	27.7	38	Extremely Turbid
8	9.61	36.4	41	"
12	9.73	35.4	41	"
14	9.56	35.4	41	"
15	10.16	30.3	39	"

NOTES: Depth To Water Surface = 8.08' (TOR)

Depth To Bottom of Well= 13.80' (TOR)

1 Well Volume= 0.933 Gallons

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Phase II Environmental Site Assessment

PROJECT NUMBER: BTA-90-179A DATE: 11-12-90

LOCATION: Dowcraft Plant, 65 South Dow Street, Falconer, New York

WELL NUMBER: ESI-4

PERSONNEL: K. Shanahan

DEVELOPMENT METHOD: BAILERS - BK PUMP - PERASTALLIC PUMP
DOWN HOLE PUMP - COMPRESSED AIR
OTHER: Guzzler Pump

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY	-+-	NTU
WELL VOLUMES	10	
STABLE pH	Yes	
STABLE CONDUCTIVITY	Yes	

WATER LEVEL PRIOR TO DEVELOPMENT	8.23' (TOR)	(elevation in feet)
WATER LEVEL AFTER DEVELOPMENT	8.27' (TOR)	(elevation in feet)
DEVELOPMENT STARTED	1:20 pm	
DEVELOPMENT COMPLETED	2:20 pm	
TOTAL VOLUME OF WATER REMOVED	17	GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES F)	TURBIDITY NTU
1	6.94	63.6	49	Extremely Turbid
10	6.93	57.9	49	"
12	7.24	63.0	52	"
15	7.11	59.0	56	"
17	7.12	59.8	56	"

NOTES: Depth To Water Surface = 8.23 (TOR)

Depth To Bottom of Well= 12.23' (TOR)

1 Well Volume= 0.653 Gallons

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Phase II Environmental Site Assessment

PROJECT NUMBER: BTA-90-179A DATE: 11-12-90

LOCATION: Dowcraft Plant, 65 South Dow Street, Falconer, New York

WELL NUMBER: ESI- 5

PERSONNEL: K. Shanahan

DEVELOPMENT METHOD: BAILERS - BK PUMP - PERASTALLIC PUMP
DOWN HOLE PUMP - COMPRESSED AIR
OTHER: Guzzler Pump

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY	---	NTU
WELL VOLUMES	10	
STABLE pH	Yes	
STABLE CONDUCTIVITY	Yes	

WATER LEVEL PRIOR TO DEVELOPMENT 7.70' (TOR) (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT 7.72' (TOR) (elevation in feet)
DEVELOPMENT STARTED 11:45 pm
DEVELOPMENT COMPLETED 1:00 pm
TOTAL VOLUME OF WATER REMOVED 14 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES F)	TURBIDITY NTU
1	6.10	64.2	51	Extremely Turbid
5	6.56	62.6	52	65
10	6.65	60.0	52	27
11	6.79	62.4	53	> 200
13	7.20	62.7	55	87
14	7.14	63.7	53	64

NOTES: Depth To Water Surface = 7.70' (TOR)

Depth To Bottom of Well= 14.19' (TOR)

1 Well Volume= 1.06 Gallons

WELL DEVELOPMENT PARAMETERS

PROJECT: Dowcraft - Additional Wells - Development

LOCATION: 65 South Dow Street

WELL NO: ESI-6

DATE: 1-2-91

WATER LEVEL PRIOR TO DEVELOPMENT: 6.34' (Top of Well Riser)
(elevation in feet)

WATER LEVEL AFTER DEVELOPMENT: 6.34' (Top of Well Riser)
(elevation in feet)

DEVELOPMENT STARTED: 12:25 pm

DEVELOPMENT COMPLETED: 12:50 pm

TOTAL VOLUME OF WATER PRODUCED: 15 (gallons)

SCREENED INTERVAL: 13.5'-3.5'
(elevation in feet)

DEVELOPMENT METHOD: Stainless Steel Bailer and Guzzler Band w/ garden hose.

Date	pH (Standard Units)	Conductivity (umho/cm)	Temp (°C)	Volume Evacuated (Gallons)	Turbidity (NTU's) & Comments	
1-2-91	7.03	1870	13.2	Initial	<200	Grey Color, No odor
1-2-91	7.35	1230	9.7	2 gal	<200	Grey Color, No odor
1-2-91	7.24	990	13.1	4 gal	<200	Grey-Black
1-2-91	7.36	760	13.7	6 gal	<200	Grey-Black
1-2-91	7.43	740	11.8	8 gal	<200	Light Grey, No odor
1-2-91	7.31	730	11.2	10 gal	<200	Light Grey, No odor
1-2-91	7.17	730	14.1	12 gal	<200	Light Grey, No odor
1-2-91	7.19	700	14.1	15 gal	174	V. Light Grey, No odor

WELL DEVELOPMENT PARAMETERS

PROJECT: Dowcraft - Additional Wells - Development

LOCATION: 65 South Dow Street

WELL NO: ESI-7

DATE: 1-2-91

WATER LEVEL PRIOR TO DEVELOPMENT: 6.34' (Top of Well Riser)
(elevation in feet)

WATER LEVEL AFTER DEVELOPMENT: 6.36' (Top of Well Riser)
(elevation in feet)

DEVELOPMENT STARTED: 12:56 pm

DEVELOPMENT COMPLETED: 1:37 pm

TOTAL VOLUME OF WATER PRODUCED: 20 (gallons)

SCREENED INTERVAL: 14.5'-6.5'
(elevation in feet)

DEVELOPMENT METHOD: Stainless Steel Bailer and Guzzler Band w/ garden hose.

Date	pH (Standard Units)	Conductivity (umho/cm)	Temp (°C)	Volume Evacuated (Gallons)	Turbidity (NTU's) & Comments	
1-2-91	8.88	470	11.1	Initial	<200	Brown-Sandy Order, No odor
1-2-91	9.01	430	10.4	2 gal	<200	Brown-Sandy, No odor
1-2-91	9.33	380	10.1	6 gal	<200	Brown-Sandy, No odor
1-2-91	8.82	350	5.9	8 gal	<200	Light Brown, No odor
1-2-91	8.45	350	8.2	10 gal	<200	Light Brown, No odor
1-2-91	7.99	360	7.6	12 gal	<200	Light Brown, No odor
1-2-91	7.75	360	11.2	14 gal	<200	Light Brown, No odor
1-2-91	7.60	370	11.3	16 gal	<200	Light Brown, No odor
1-2-91	7.74	350	11.0	18 gal	<200	Light Brown, No odor
1-2-91	7.45	350	11.1	20 gal	<200	Light Brown, No odor

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-14-92

LOCATION:

WELL NUMBER: ESI-1

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 20 NTU
WELL VOLUMES 10
STABLE pH X
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 8.74 (elevation in feet) 14.3
WATER LEVEL AFTER DEVELOPMENT 14.3 Bottom of hole (elevation in feet)
DEVELOPMENT STARTED 10.00
DEVELOPMENT COMPLETED 11.25
TOTAL VOLUME OF WATER REMOVED 9 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.8	6.94	0.936	8.5	-------
3.6	7.19	0.702	8.6	----------
5.4	7.07	0.573	8.7	---------
7.2	7.07	0.523	8.5	---------
9.0	7.08	0.502	8.7	20

NOTES: 1 Well volume = .9 gallon 90% REC=9.30

Well dry at 2.5 gallons then recharges & pumps app. 1 gallon at a time. Sample taken at 5.4 water very clear

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI-2

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 9 NTU
WELL VOLUMES 10
STABLE pH X
STABLE CONDUCTIVITY X

WATER LEVEL PRIOR TO DEVELOPMENT 8.90 (elevation in feet) 14
WATER LEVEL AFTER DEVELOPMENT 9.00 (elevation in feet)
DEVELOPMENT STARTED 3:15
DEVELOPMENT COMPLETED 3:30
TOTAL VOLUME OF WATER REMOVED 9.0 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.8	7.18	0.504	14.8	----------
3.6	7.05	0.490	14.6	----------
5.4	7.03	0.486	14.5	----------
7.2	7.02	0.486	14.4	----------
9.0	7.01		14.4	9

NOTES: 1 Well Volume = 0.9 90% REC=9.41

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI- 2D

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 144 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 8.67 (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT 10.10 (elevation in feet)
DEVELOPMENT STARTED 12:30
DEVELOPMENT COMPLETED 3:00
TOTAL VOLUME OF WATER REMOVED 55 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
11	7.85	0.601	16.1	---------
22	7.71	0.590	16.3	----------
33	7.67	0.581	16.2	----------
44	7.72	0.587	16.0	----------
55	7.71	0.593	15.9	----------

NOTES: 1 Well volumne = 5.5 Gallons 90% REC= 11.89

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI-3

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 10 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 9.27 (elevation in feet) 13.95
WATER LEVEL AFTER DEVELOPMENT 9.28 (elevation in feet)
DEVELOPMENT STARTED 3:45
DEVELOPMENT COMPLETED 4:00
TOTAL VOLUME OF WATER REMOVED 8 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.6	7.25	0.627	14.5	------
3.2	7.22	0.628	14.3	-------
4.8	7.15	0.629	14.3	-------
6.4	7.18	0.628	14.3	------
8.0	7.13	0.633	14.3	10

NOTES: 1 Well volumne = 0.8 Gallons 90% REC= 9.74

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI- 4

PERSONNEL: LA Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 40 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 9.33 (elevation in feet) (14.5
WATER LEVEL AFTER DEVELOPMENT 9.35 (elevation in feet)
DEVELOPMENT STARTED 4:10
DEVELOPMENT COMPLETED 4:30
TOTAL VOLUME OF WATER REMOVED 9 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.8	7.35	0.661	10.6	----------
3.6	7.4	0.659	10.2	---------
5.4	7.42	0.658	10.2	---------
7.2	7.39	0.655	10.0	----------
9.0	7.39	0.656	10.0	40

NOTES: 1 Well volumne = 0.9 Gallons 90% REC=9.85

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI- 5

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 8.59 (elevation in feet) 14.4
WATER LEVEL AFTER DEVELOPMENT Bottom of Well (elevation in feet)
DEVELOPMENT STARTED 4:40
DEVELOPMENT COMPLETED 4-16-92
TOTAL VOLUME OF WATER REMOVED 10 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
2	7.91	0.450	11.5	---------
4				----------
6				------
8				-------
10				--------

NOTES: 1 well volume = 1 Gallon 90% REC= 9.17

Well went dry after 1.5 gallons and again at 2 gallons after well set fo 10 minutes

It takes 5 minutes/foot to recharge will repurge on 4-16-92 in A.M. Stopped Development

at 3 gallons. 4-16-92 Purged 1.5 gallon well went dry water well was at 8.61

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-14-92

LOCATION:

WELL NUMBER: ESI- 6

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 140 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 9.22 (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT Botton of Hole (elevation in feet)
DEVELOPMENT STARTED 2:00
DEVELOPMENT COMPLETED 3:00
TOTAL VOLUME OF WATER REMOVED 7 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.4	6.97	0.616	15.6	--
2.8	7.07	0.606	16.0	--
4.2	7.04	0.602	16.1	--
5.6	7.03	0.589	15.7	--
7.0	7.10	0.592	15.5	--

NOTES: 1 Well volumne= 0.7 gallon 90% REC= 9.62

Well dry at 1 gallon and again at 2 gallans

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BIA-90-179D DATE: 4-14-92

LOCATION:

WELL NUMBER: ESI- 7

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 57 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 9.29 (elevation in feet) 13.95
WATER LEVEL AFTER DEVELOPMENT 9.30 (elevation in feet)
DEVELOPMENT STARTED 1:00
DEVELOPMENT COMPLETED 1:30
TOTAL VOLUME OF WATER REMOVED 8 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.6	7.21	0.470	11.5	--
3.2	7.12	0.438	11.5	--
4.8	7.10	0.432	11.3	--
6.4	7.09	0.430	11.2	--
8.0	7.06	0.434	11.1	--

NOTES: 1 Well volumne = .8 gallons 90% REC= 9.76

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-14-92

LOCATION:

WELL NUMBER: ESI- 8

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 200 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 11.90 (elevation in feet) 16.95
WATER LEVEL AFTER DEVELOPMENT 11.92 (elevation in feet)
DEVELOPMENT STARTED 11.35
DEVELOPMENT COMPLETED 12:20
TOTAL VOLUME OF WATER REMOVED 9 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.8	7.23	0.548	11.1	--
3.6	7.05	0.522	11.0	--
5.4	6.95	0.490	10.9	--
7.2	6.94	0.484	10.7	--
9.0	6.98	0.476	10.7	--

NOTES: 1 Well volumne = .9 gallons 90% REC= 12.41

Water very turbid (brown) Pump pulls a lot of sand and silt from the bottom of the well.

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-13-92

LOCATION: Dow Street, Falconer, NY

WELL NUMBER: ESI- 9

PERSONNEL: L.A Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER: _____

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 93 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 7.42 (elevation in feet) Bottom
WATER LEVEL AFTER DEVELOPMENT 14 (elevation in feet) 12.85
DEVELOPMENT STARTED 10:40
DEVELOPMENT COMPLETED 12:00
TOTAL VOLUME OF WATER REMOVED 10 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
2	6.95	0.442	10.3	--
3	7.15	0.365	9.4	--
4	7.36	0.650	10.3	--
5	7.16	0.626	10.5	--
6	7.43	0.630	10.2	--
7	7.25	0.632	10.1	--

NOTES: 1 well volumne = 1 gallon 90% REC= 7.98

Well dry at 2 gallons but recharges quickly. Well dry at 3 gallons Water very turbid (brown) Let well recharge to 10 took from 11:10 to 11:25 well continues to go dry every 1 to 1½ gallons
NOTE: ESI purged as additional 3 gallons to complete 10 well volumne criteria.
~~Well dry at 2 gallons- Let recharge and purged additional 1 gallon~~

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI-10

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 190 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 10.03 (elevation in feet) 14.0
WATER LEVEL AFTER DEVELOPMENT 10.16 (elevation in feet)
DEVELOPMENT STARTED 9:30
DEVELOPMENT COMPLETED 10:00
TOTAL VOLUME OF WATER REMOVED 7 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.4	6.66	0.536	15.4	--
2.8	6.76	0.510	15.5	--
4.2	6.82	0.520	15.5	--
5.6	6.89	0.565	15.4	--
7.0	6.87	0.517	15.5	--

NOTES: 1 well volumne = 0.7 gallon 90% REC= 10.43

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI- 11

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 87 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 10.11 (elevation in feet) 14.55
WATER LEVEL AFTER DEVELOPMENT 10.00 (elevation in feet)
DEVELOPMENT STARTED 10:15
DEVELOPMENT COMPLETED 10:45
TOTAL VOLUME OF WATER REMOVED 7 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.4	7.25	0.627	16.1	--
2.8	7.18	0.605	16.1	--
4.2	7.14	0.641	16.0	--
5.6	7.18	0.589	16.0	--
7.0	7.11	0.575	16.0	--

NOTES: 1 well volumne = 0.7 90% REC= 10.55

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-15-92

LOCATION:

WELL NUMBER: ESI- 12

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 196 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 9.65 (elevation in feet)
WATER LEVEL AFTER DEVELOPMENT 9.75 (elevation in feet)
DEVELOPMENT STARTED 11:00
DEVELOPMENT COMPLETED 11:30
TOTAL VOLUME OF WATER REMOVED 8 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
1.6	7.53	0.515	15.9	--
3.2	7.50	0.506	15.4	--
4.8	7.41	0.505	15.7	--
6.4	7.36	0.497	15.6	--
8.0	7.38		15.6	196

NOTES: 1 Well volume = 0.8 90% REC= 10.14

WELL DEVELOPMENT RECORD

PROJECT: Dowcraft Corporation

PROJECT NUMBER: BTA-90-179D DATE: 4-14-92

LOCATION:

WELL NUMBER: ESI- 13

PERSONNEL: L.A. Zimmerman

DEVELOPMENT METHOD: BAILERS - BK PUMP - (PERASTALLIC PUMP)
DOWN HOLE PUMP - COMPRESSED AIR
OTHER:

REQUIRED DEVELOPMENT CRITERIA:

TURBIDITY 186 NTU
WELL VOLUMES 10
STABLE pH x
STABLE CONDUCTIVITY x

WATER LEVEL PRIOR TO DEVELOPMENT 8.15 (elevation in feet) 14.5
WATER LEVEL AFTER DEVELOPMENT 8.21 (elevation in feet)
DEVELOPMENT STARTED 3:20
DEVELOPMENT COMPLETED 4:00
TOTAL VOLUME OF WATER REMOVED 11 GALLONS

VOLUME EVACUATED (GALLONS)	pH (STANDARD UNITS)	CONDUCTIVITY (umhos cm) x 10	TEMPERATURE (DEGREES	TURBIDITY NTU
2.2	6.85	2.02	10.9	--
4.4	6.75	1.84	11.0	--
6.6	6.73	1.64	10.5	--
8.8	6.72	1.65	10.5	--
11.0	6.73	1.59	10.6	--

NOTES: 1 Well volume = 1.1 gallon 90% REC= 8.79

Huntingdon

Consulting Engineers Environmental Scientists

APPENDIX D

FROM

C.T. MALE ASSOCIATES, P.C.
50 Century Hill Drive
P.O. Box 727
Latham, New York 12110
Tel. (518) 786-7400
Fax. (518) 786-7299

LETTER OF TRANSMITTAL

DATE: Apr 20, 1992 PROJECT NO.: 92.884

RE: Dowcraft Soil Gas Survey 4/15/92 - 4/17/92

TO Empire Soils Investigations, Inc.
5-5167 S. Park Avenue
Hamburg, NY ZIP 14075

ATTENTION: Mr. Kevin Shannahan

WE ARE SENDING YOU

[x] ENCLOSED [ ] UNDER SEPARATE COVER

VIA Mail

THE FOLLOWING ITEMS:

[ ] DRAWINGS
[ ] PROJECT MANUAL
[ ] SPECIFICATIONS
[ ] COPY OF LETTER
[ ] SHOP DRAWING PRINTS
[ ] SHOP DRAWING REPRODUCIBLES
[ ] SAMPLES
[ ] PRODUCT LITERATURE
[ ] MEETING NOTES
[ ] CHANGE ORDER
[ ] REPORT
[ ] COST ESTIMATE
[x] OTHER Soil Gas Survey Chromatograms

NO. OF ORIG.	NO. OF COPIES	IDENT. NO.	DATE.	DESCRIPTION	ACTION CODE
1				Soil Gas Survey Chromatograms for Dowcraft	
				Job	

FOR [ ] APPROVAL [ ] REVIEW [x] YOUR USE [ ] INFORMATION [ ] DISTRIBUTION
[x] OTHER as requested.

ACTION CODE: FS-FURNISH AS SUBMITTED; FC-FURNISH AS CORRECTED; R-REJECTED; RR-REVISE AND RESUBMIT; S-SUBMIT SPECIFIED ITEM

REMARKS

Kevin:

Please note that reported concentrations of 1,2-DCE are solvent peak interference. If this compound had been detected it would show a peak above the nominal baseline. TCE was detected in Points #3, #4, #11, #14, #17, #18 only. Toluene was detected in Point #12 only. All other points were non-detect.

COPIES TO: _____

SIGNED _____

NAME Kim L. Baines

TITLE: Environmental Scientist

4/15/92
DOWCRAFT
EMPIRE
SOIL GAS S
PAGE 1

Method File : DOWCRAFT.MTD
Calibration File : 4-92CAL

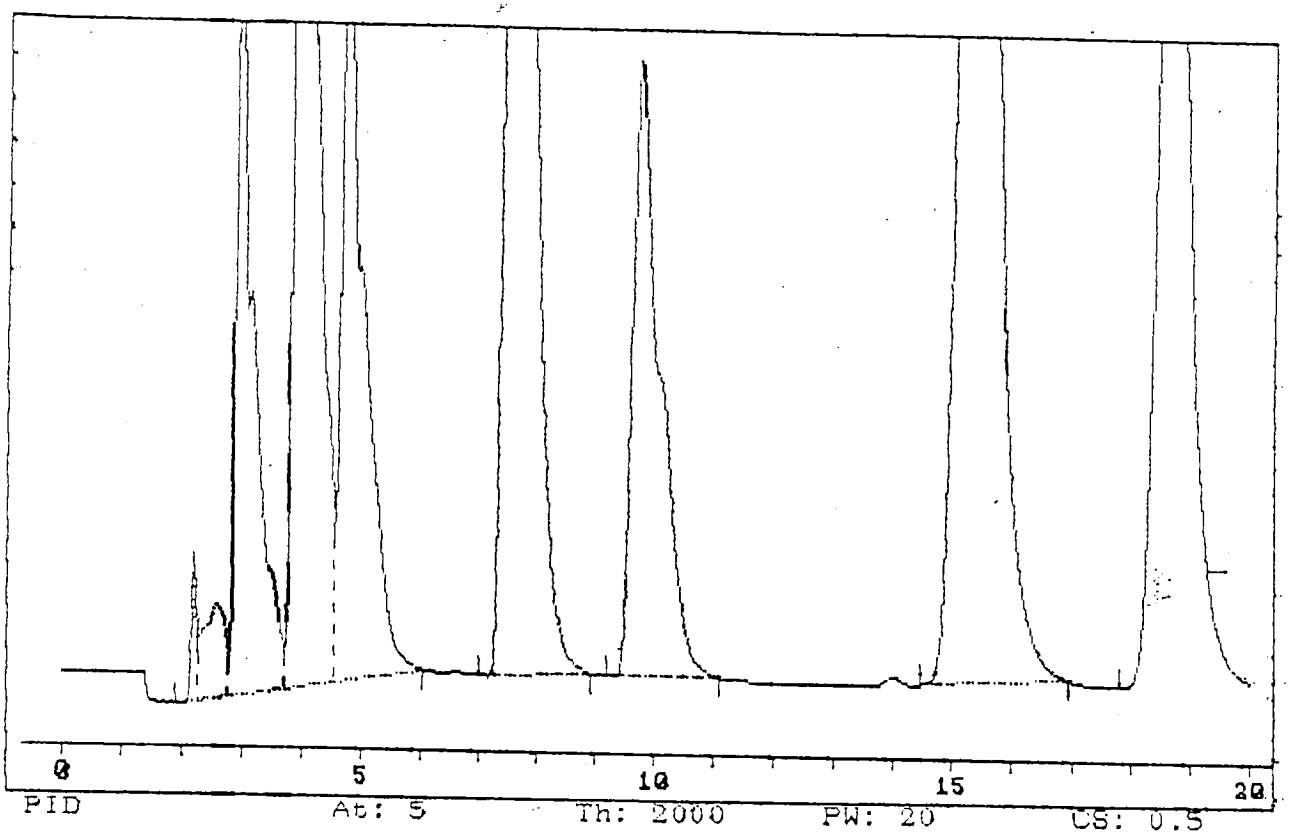
	DATA FILE NAME	DESCRIPTION	REMARKS
4/15/92	DOWCRFT0	RETENTION CHECK STANDARD	GOOD
	DOWCRFT1	SYRINGE #1 BLANK	GOOD
	~~DOWCRFT2~~	~~SAMPLE POINT # SYR #1~~	
	DOWCRFT	SAMPLE POINT #1 SYR#1 1min	ND
	DOWCRFT2	SAMPLE POINT #1 SYR#1 2min	ND
	DOWCRFT3	SAM PT # 2 1 MIN 1000 UL SYR1	
		1000 UL INJ 2 ft deep	ND
	DOWCRFT4	SAM PT # 3 4-5 ft 1000 UL 1min	TCE HIT
	DOWCRFT5	" " " " " " " " 2 min	TCE HIT
	DOWCRFT6	SAM PT # 4 1000 UL INJ 2 MIN SAM	ND
	DOWCRFT7	SAM PT # 5 1000 UL INJ 2 MIN SAM	ND
	DOWCRFT8	SAMPLE PT #6 1000 UL INJ 2MIN SAM	ND
	RETCAL01	RETENTION CHECK #2 WITH STD	OK
	DOWCRFT9	SAMPLE PT #7 @ 4' DEEP 1000 UL >2MIN	
	DOWCFT10	SAMPLE PT #7 @ 6' DEEP 1000 UL	
	DOWCFT11	SAMPLE PT #8 @ 4' DEEP 1000 UL 2MIN	
	DOWCFT12	SAMPLE PT #9 @ 4' DEEP 1000 UL 2 MIN	
	DOWCFT13	SAMPLE PT #10 @ 4' DEEP 1000 UL, 2 MIN	
4/16/92	RETCHK03	RETENTION CHECK WITH STD	GOOD
	DOWSBLK01	SYRINGE #1 BLANK RUN	
	" 02	SYRINGE #2 BLANK RUN	
	SYRNG02	" " " " AFTER WEEK CLEAN	
	SYRNG02A	" " " " " "	
	DOWCF1	SAMPLE POINT # 11 IN PHOS ROOM, 2MIN, SYR#1	
	" 2	SAMPLE PT # 12 IN PHOS ROOM, 2MIN, SYR#2	
	3	SAMPLE PT # 13 " " " , 2MIN, SYR#1	
	DOWCRF1	SAMPLE PT # 14 " " #1	
	2	SAMPLE PT # 15 UNDER STAIRS SYR #2	
	3	RETENTION CHECK W/STANDARD	
	4	SAMPLE PT # 16 IN STORE ROOM SYR#1	
	5	SAMPLE PT # 17 NEAR VAPOR DEGREASER SYR#1	
	DOWCRT1	SAMPLE PT # 18 IN WAREHOUSE ROOM SYR#2	
	2	" " # 19 " " " SYR#1	
	3	" " # 20 " " " SYR#2	

DOWCRAFT
EMPIRE
SGS
4/15-16/92
PAGE 2

DATA FILE	DESCRIPTION	REMARKS
DOWCRT4	SAMPLE PT # 21 IN BOILER ROOM SYR# 1	
5	" " # 22 OUTSIDE BETWEEN RAILWAYS SYR #2	
4/7/92		
DOWCT01	STANDARD AM RETENTION TIMES RUN 1	NG
02	" " " " CHECK RUN 2	
03	SYRINGE # 1 BLANK RUN	
04	SAMPLE POINT # 23 OUTSIDE CIR PKNG LOT	
05	SP # 24 OUTSIDE PKNG LOT CIR PKNG LOT	
06	SP # 25 " " " NEAR TRASH COMPACTOR	
07	SP # 26 " UNDER SHED ROOF NEAR LUMBER	
08	SP # 27 " NEXT TO CHIMNEY BASE	
09	SP # 28 " IN ALLEY DOWCRAFT SIDE	
10	SP # 29 " IN " JT CONTAINER SIDE	
11	STANDARD RET CHECK RUN # 2	

Time : 01:11:50
Data File : DOWCRAFT
Method File : DOWCRAFT
Sample Notes: RETENTION CHECK

Date 4/15/1992



Peak Report

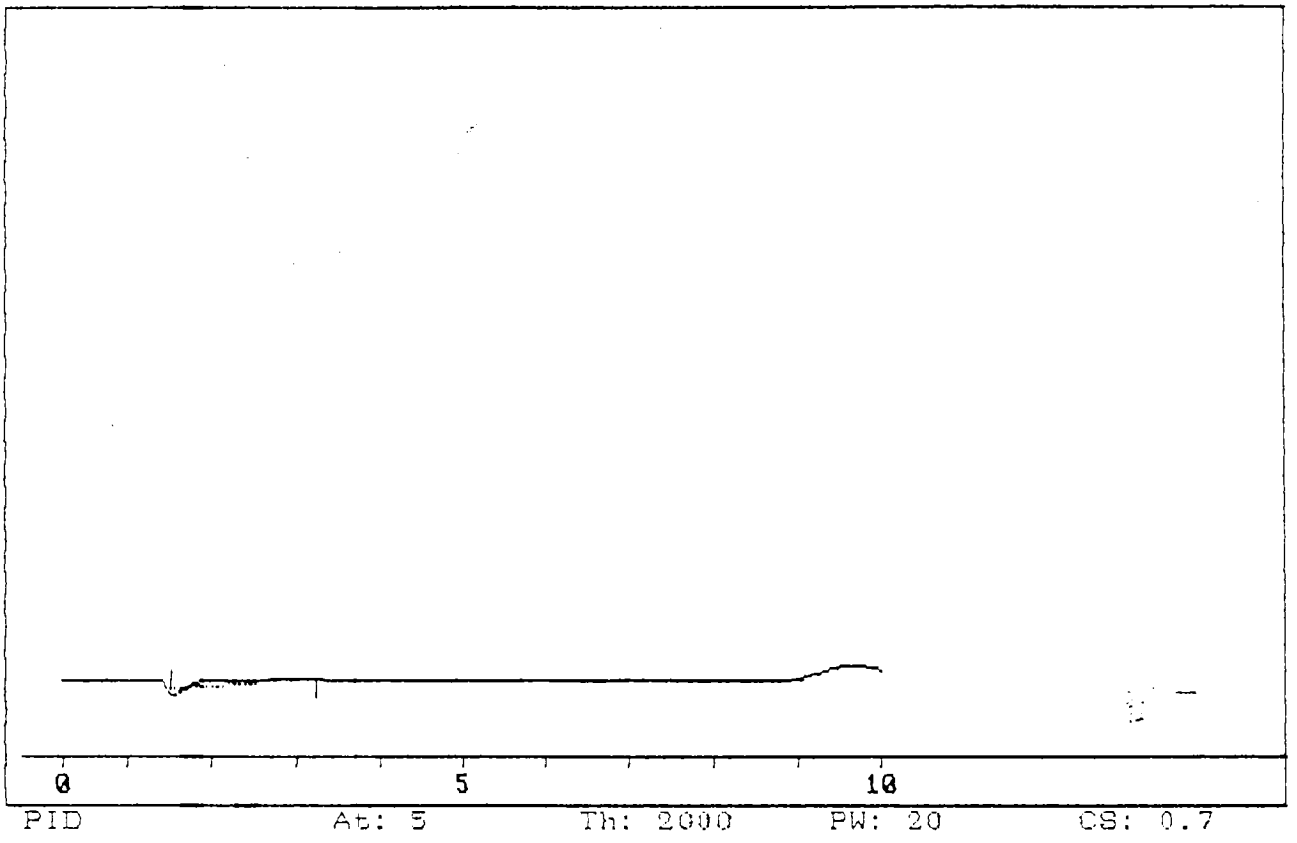
Time 01:11:50
2

Date 4/15/199

Data File: DOWCRAFT
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : RETENTION CHECK

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:08	2.712E+05	4.195E+04	TRA 12-DCE	505.4
2	00:02:32	6.967E+05	2.510E+04		
3	00:02:52	5.571E+06	5.670E+05	CIS 12-DCE	790.8
4	00:03:50	1.221E+07	8.634E+05	BENZENE	737.4
5	00:04:39	6.785E+06	4.805E+05	TCE	697.9
6	00:07:28	1.217E+07	4.365E+05	TOLUENE	655.2
7	00:09:41	5.119E+06	1.661E+05	PCE	609.5
8	00:15:20	2.634E+07	8.595E+05		



Peak Report

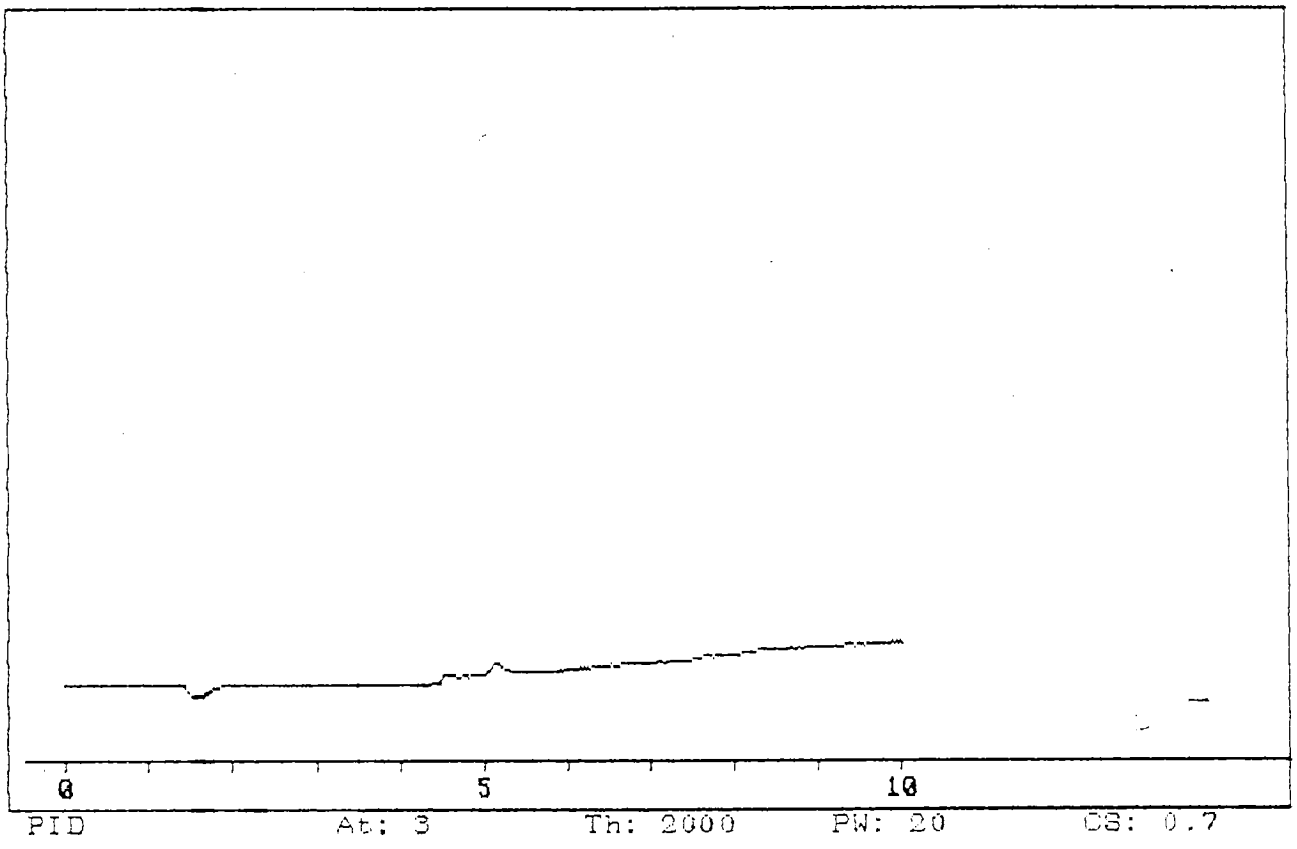
Time 01:48:43 Date 4/15/199
2

Data File: DOWCRFT1
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SYRINGE #1 BLANK RUN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:55	6.836E+04	1.013E+03	CIS 12-DCE	-69.14

↑ NO, IN SOLVENT PEAK



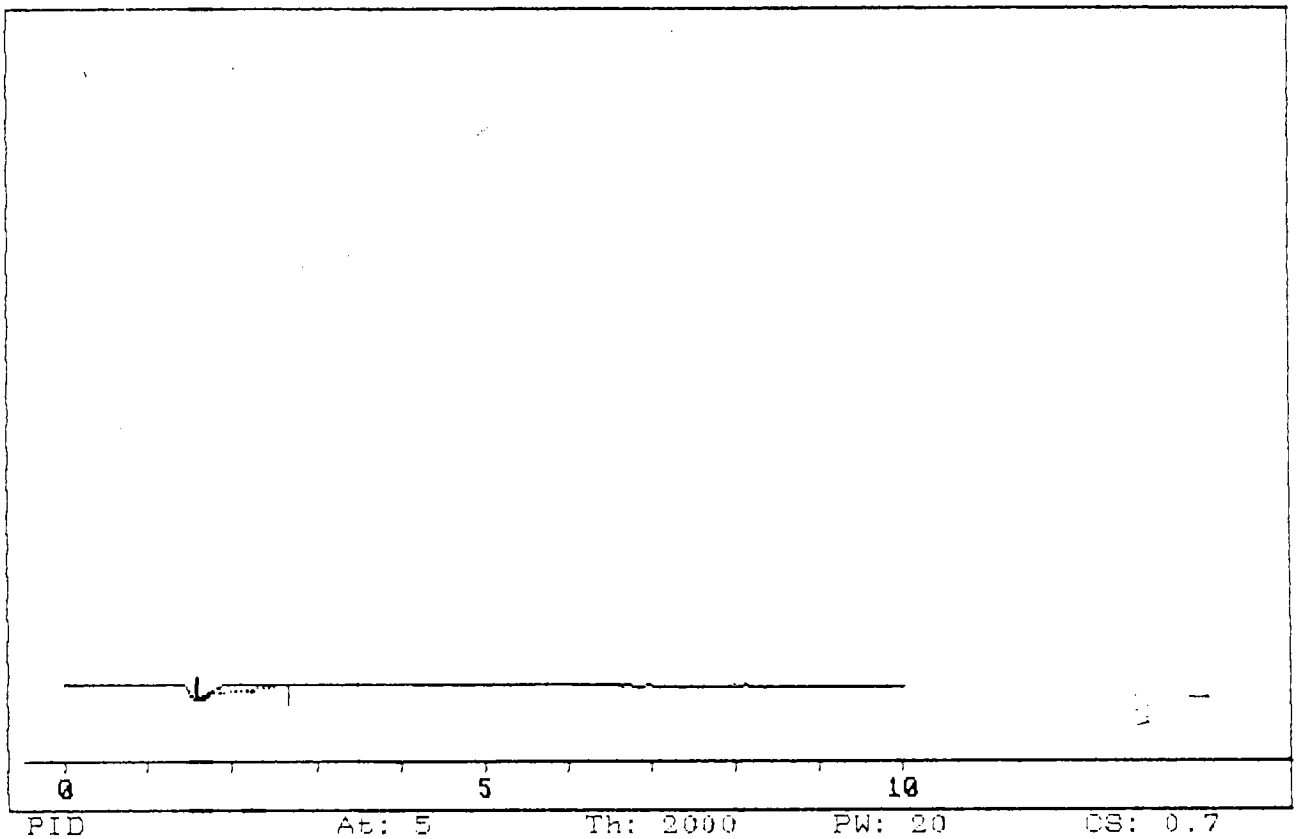
Peak Report

Time 02:12:33 Date 4/15/199
2
Data File: DOWCRFT
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : HOLE NO 1 1000 UL INJ 1 MIN SAMPLE

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



Peak Report

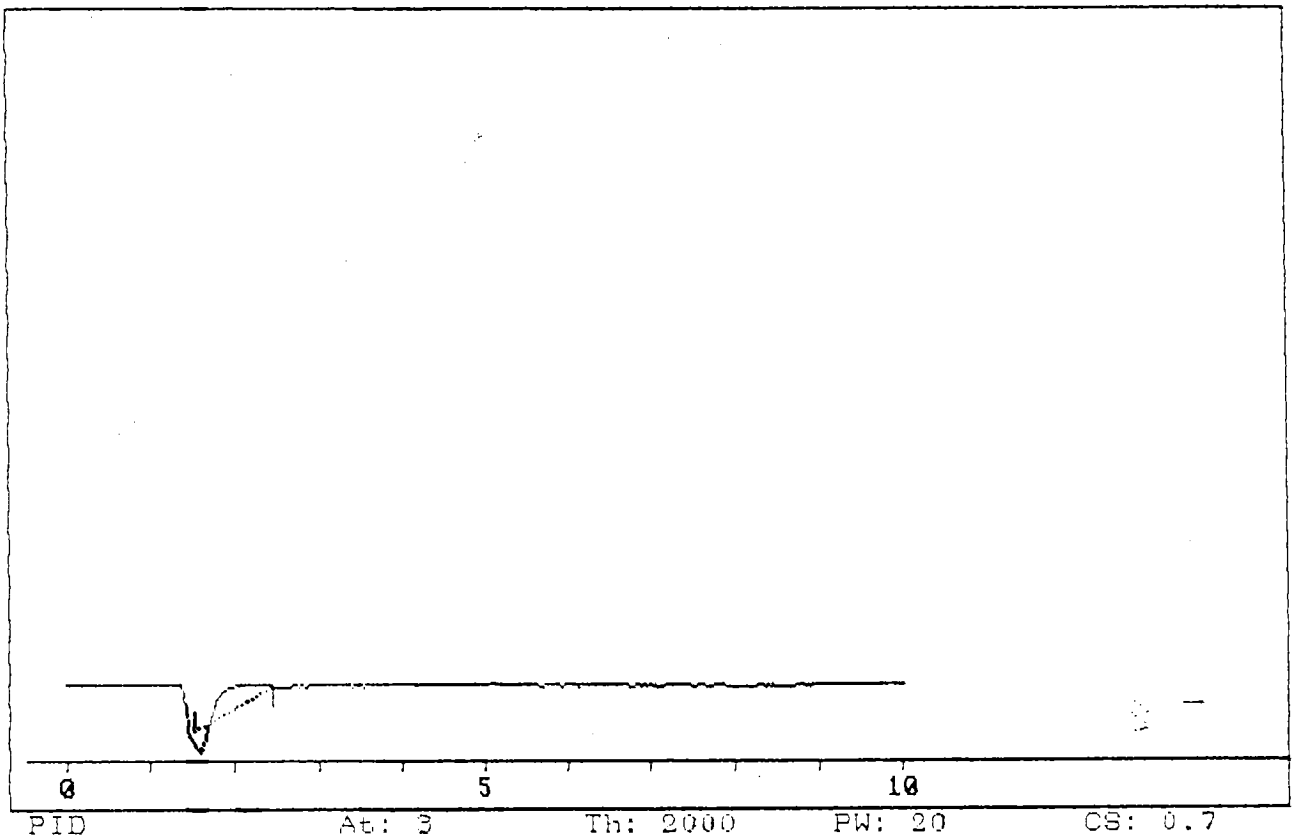
Time 02:26:16 Date 4/15/199
2

Data File: DOWCRFT2
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 1 RUN 2, 2 MIN SAMPLE

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:20	4.063E+04	8.488E+02	TRA 12-DCE	476.4

NO solvent peak
NOT DCE



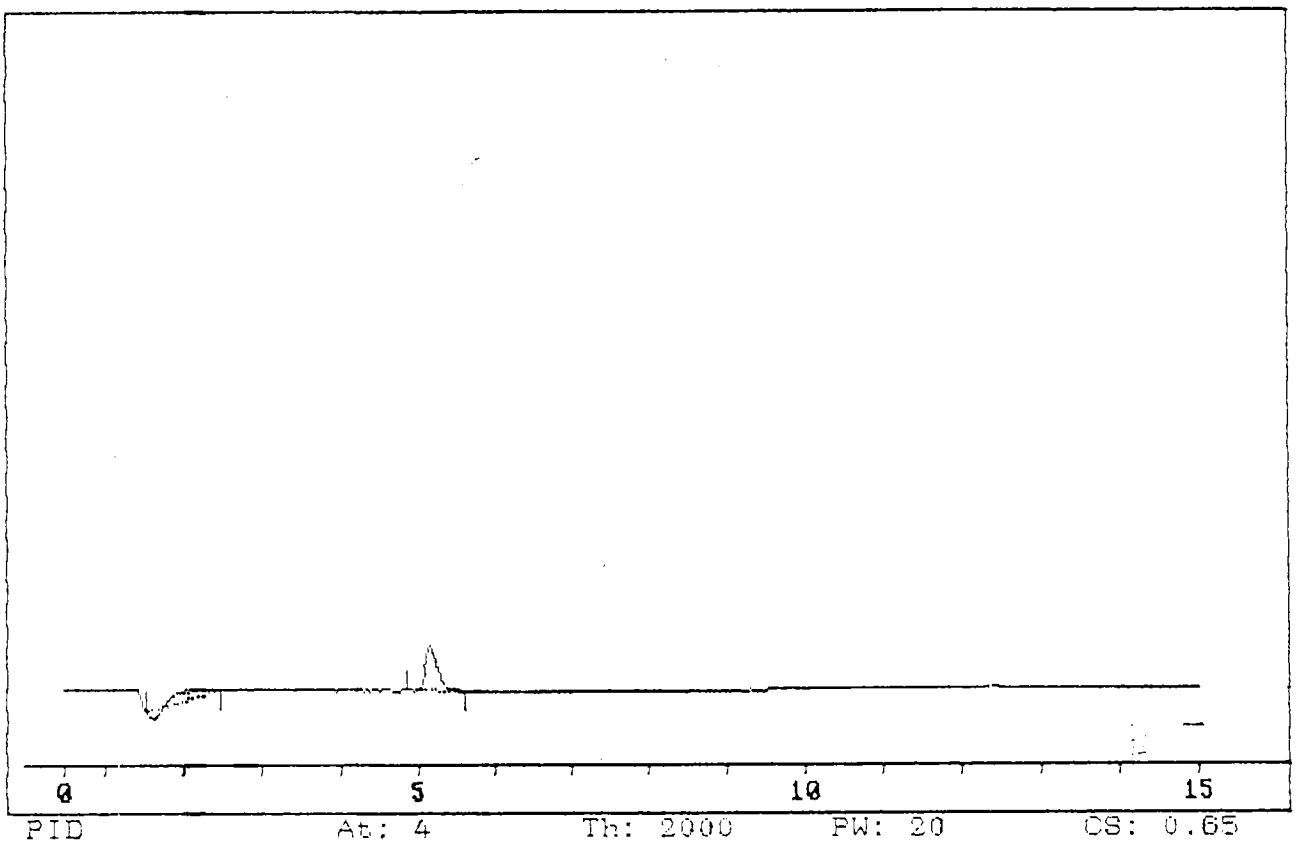
Peak Report

Time 02:59:34 Date 4/15/199
2
Data File: DOWCRFT3
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE POINT 2, 1 MIN @ 2 FEET DP

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:08	3.049E+04	1.141E+03	TRA 12-DCE	475.1

↑
ND, IN SOLVENT PEAK



Peak Report

Time 03:41:29 Date 4/15/199
2
Data File: DOWCRFT5
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAM POINT 3 1000UL INJ 2 MIN SMPL

Ch 1 Detector: PID

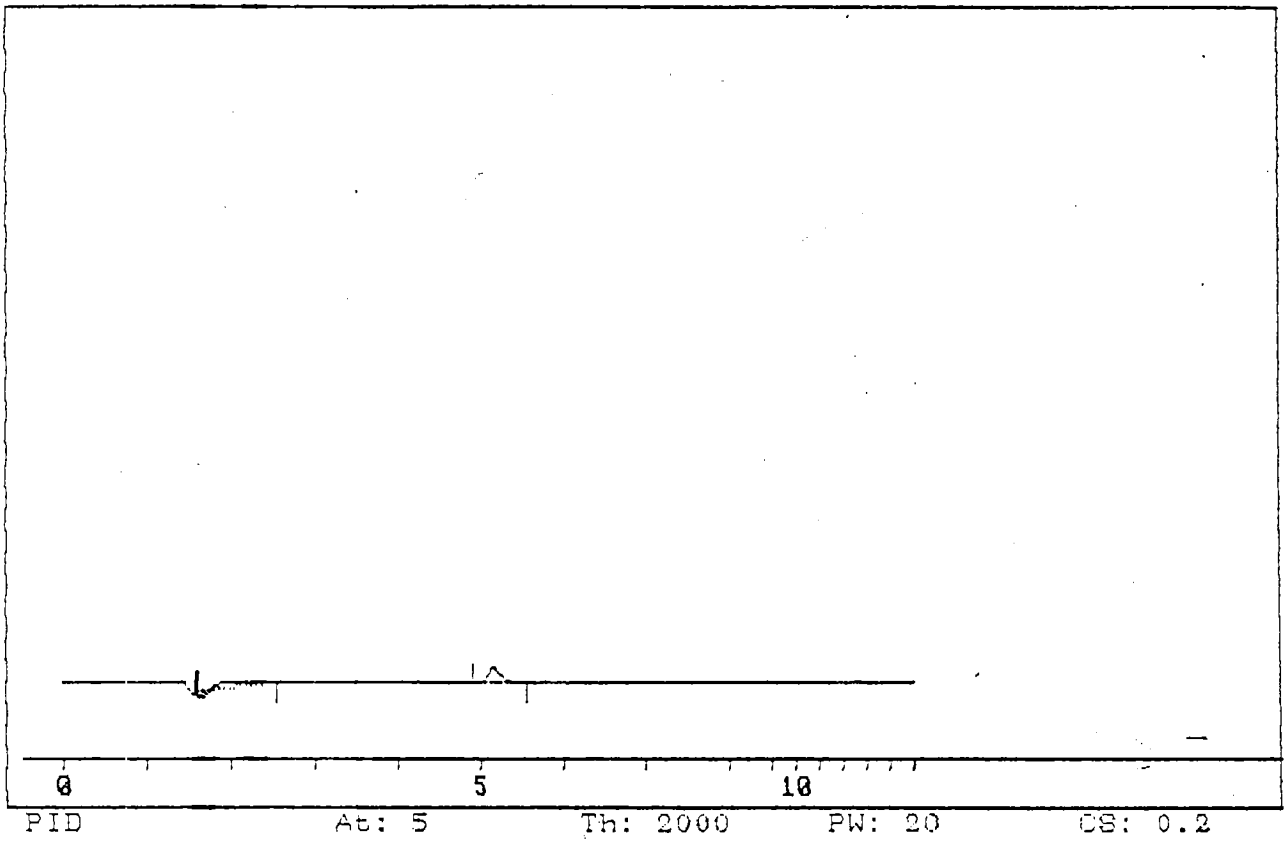
NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:14	2.720E+04	9.417E+02	TRA 12-DCE	474.7
2	00:05:07	7.567E+04	6.343E+03	TCE	6.904

NOTE

TRA 1,2-DCE IS ND IN SOLVENT PEAK

TCE IS VALID CONC.

ALL CONCENTRATION VALUES ARE PPB WEIGHT / VOLUME



Peak Report

Time 03:18:02 Date 4/15/199
2

Data File: DOWCRFT4
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : PT NO 4 1000 UL INJ 1 MIN 4-5 FT

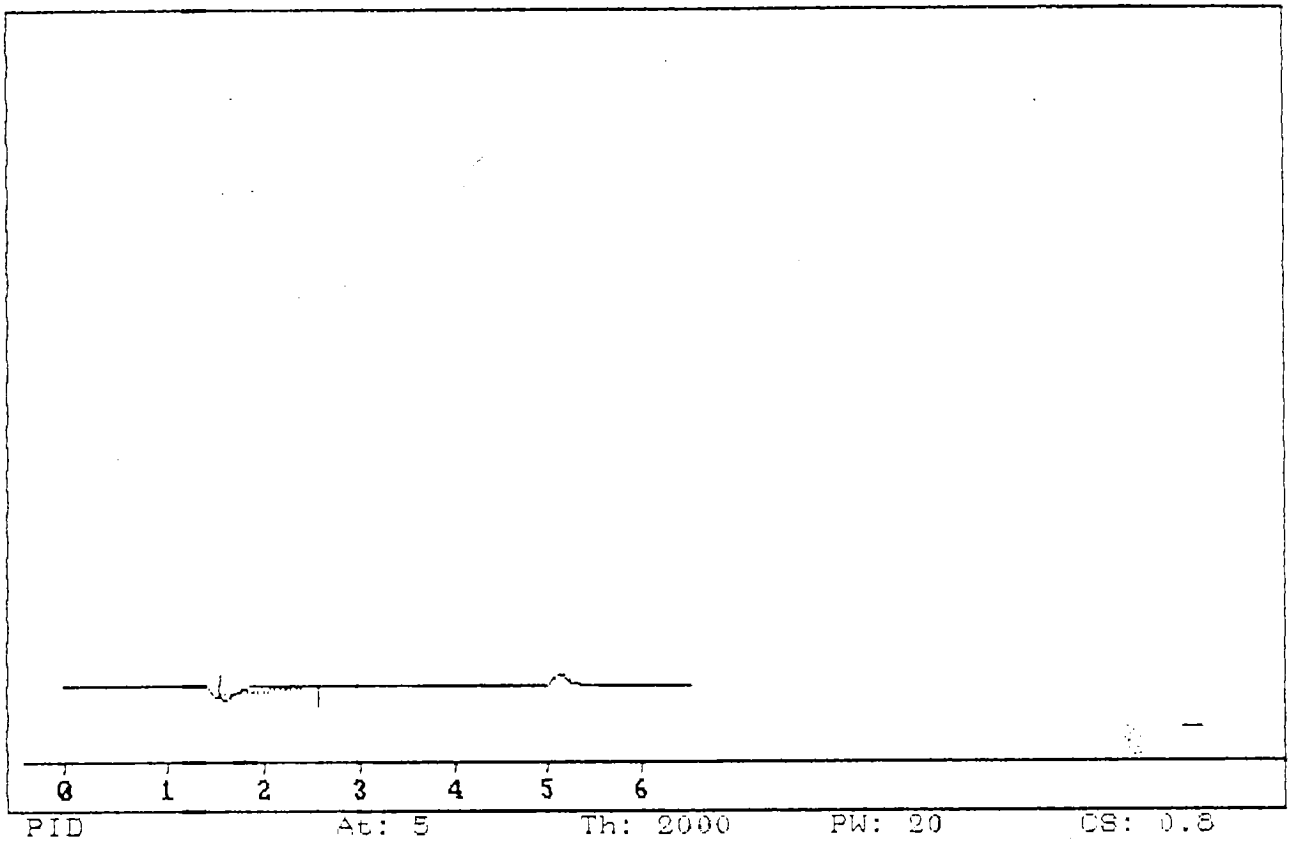
Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:14	3.315E+04	1.016E+03	TRA 12-DCE	475.4
2	00:05:07	4.751E+04	4.292E+03	TCE	4.281

NOTE

TRA 1,2-DCE IS ND IN SOLVENT PEAK

TCE IS VALID CONC. (PPB)



Peak Report

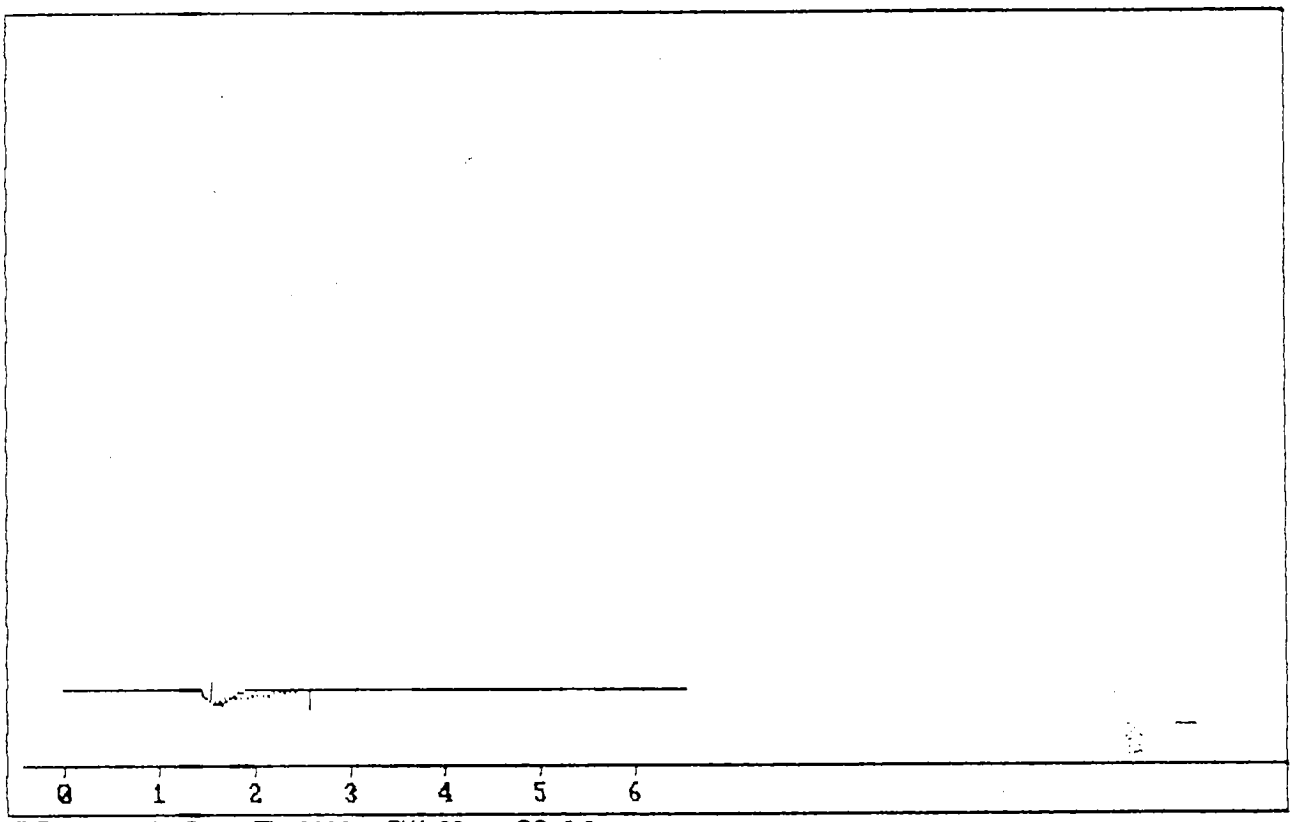
Time 04:03:10 Date 4/15/199
2

Data File: DOWCRFT6
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 4, 2 MIN SAMPLE 1000UL

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:17	3.952E+04	8.826E+02	TRA 12-DCE	476.2

↑
ND, IN SOLVENT PEAK

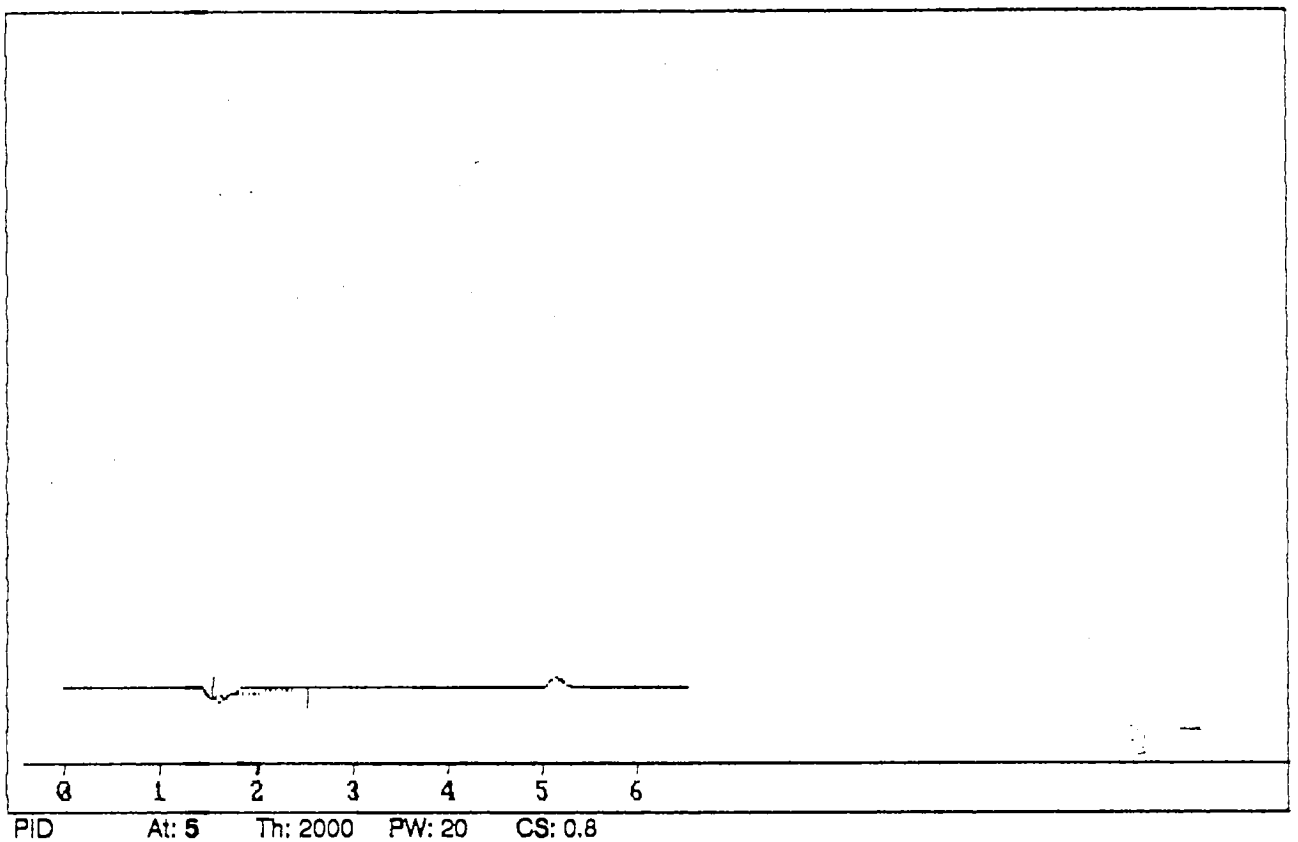


Peak Report

Time 04:14:11 Date 4/15/1992
Data File: DOWCRFT7
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 5 1000UL INJ 2 MIN SAM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION	
1	00:02:14	3.351E+04	9.725E+02	TRA 12-DCE	475.5	← ND, IN SOLVENT PEAK



Peak Report

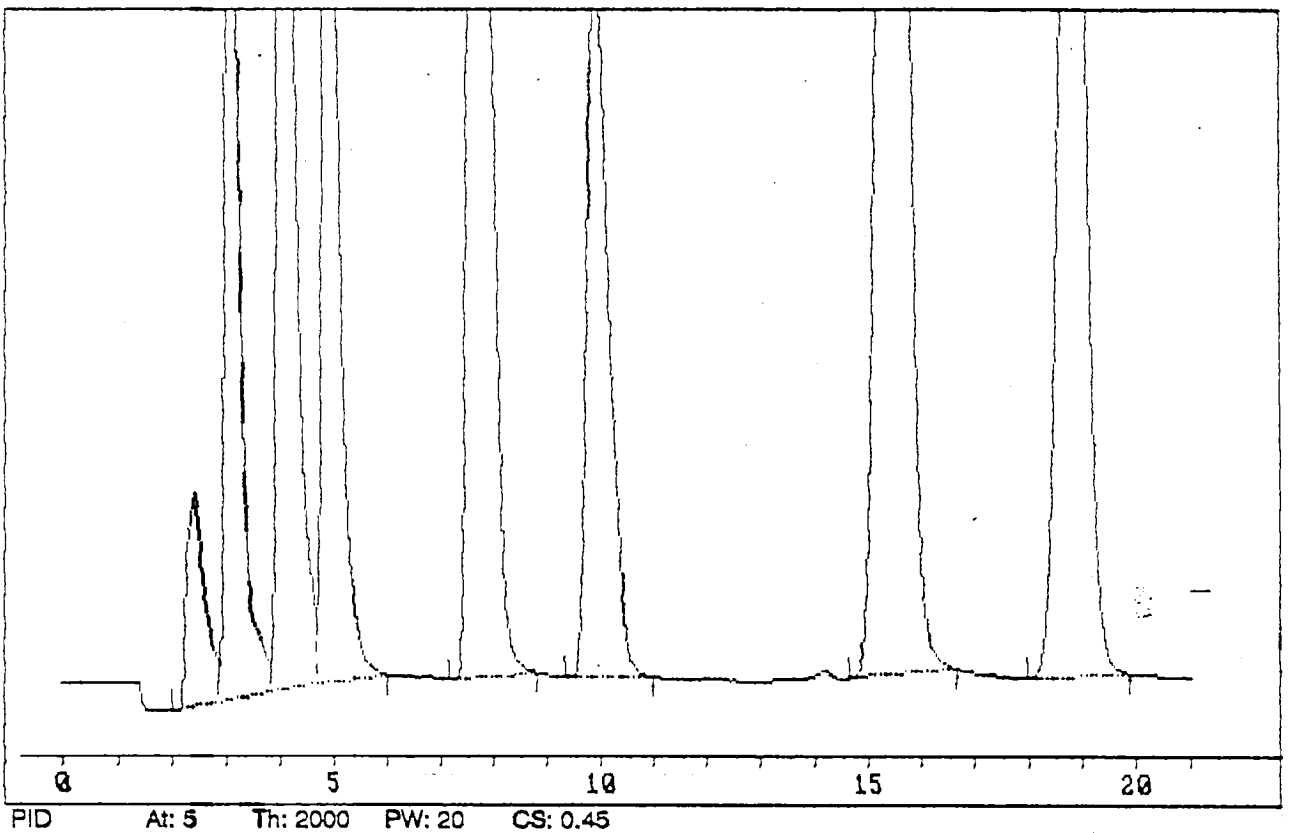
Time 04:28:45 Date 4/15/1992
Data File: DOWCRFT8
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 6 1000UL INJ 2 MIN SAM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:15	3.311E+04	8.249E+02	TRA 12-DCE	475.4

← ND, IN SOLVENT PEAK

Time : 04:48:37 Date 4/15/1992
Data File : RETCAL1
Method File : DOWCRAFT
Sample Notes: RETENTION CHECK WITH STANDARD



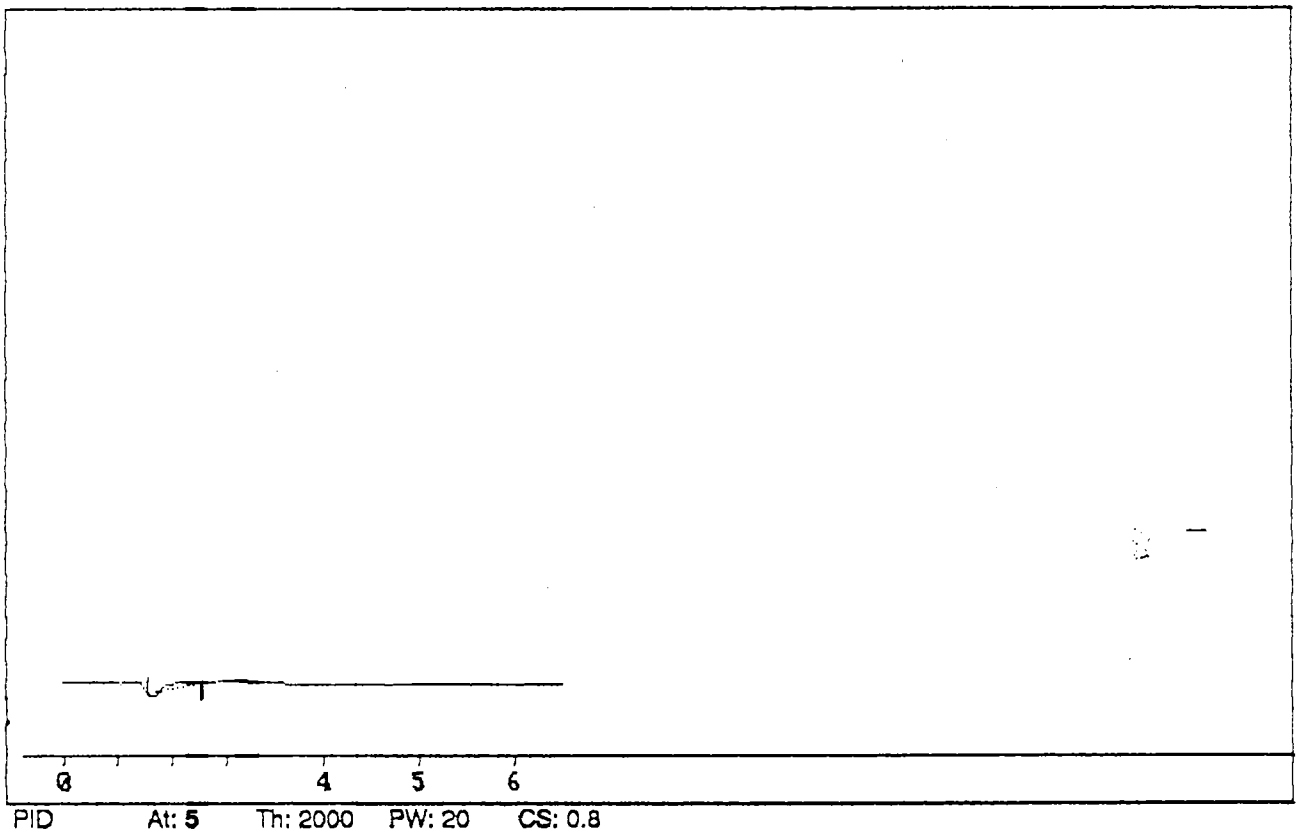
PID At: 5 Th: 2000 PW: 20 CS: 0.45

Peak Report

Time 04:48:37 Date 4/15/1992
Data File: RETCAL1
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : RETENTION CHECK WITH STANDARD

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:23	1.365E+06	5.733E+04	TRA 12-DCE	643.1
2	00:03:00	6.157E+06	4.320E+05	CIS 12-DCE	882.3
3	00:04:00	1.346E+07	8.621E+05	BENZENE	822.5
4	00:04:49	6.940E+06	3.879E+05	TCE	714.2
5	00:07:38	1.259E+07	4.844E+05	TOLUENE	879
6	00:09:53	5.268E+06	1.895E+05		
7	00:15:33	2.685E+07	8.571E+05		
8	00:18:48	1.177E+07	3.918E+05		



Peak Report

Time 05:16:51 Date 4/15/1992

Data File: DOWCRFT9

Method File: DOWCRAFT

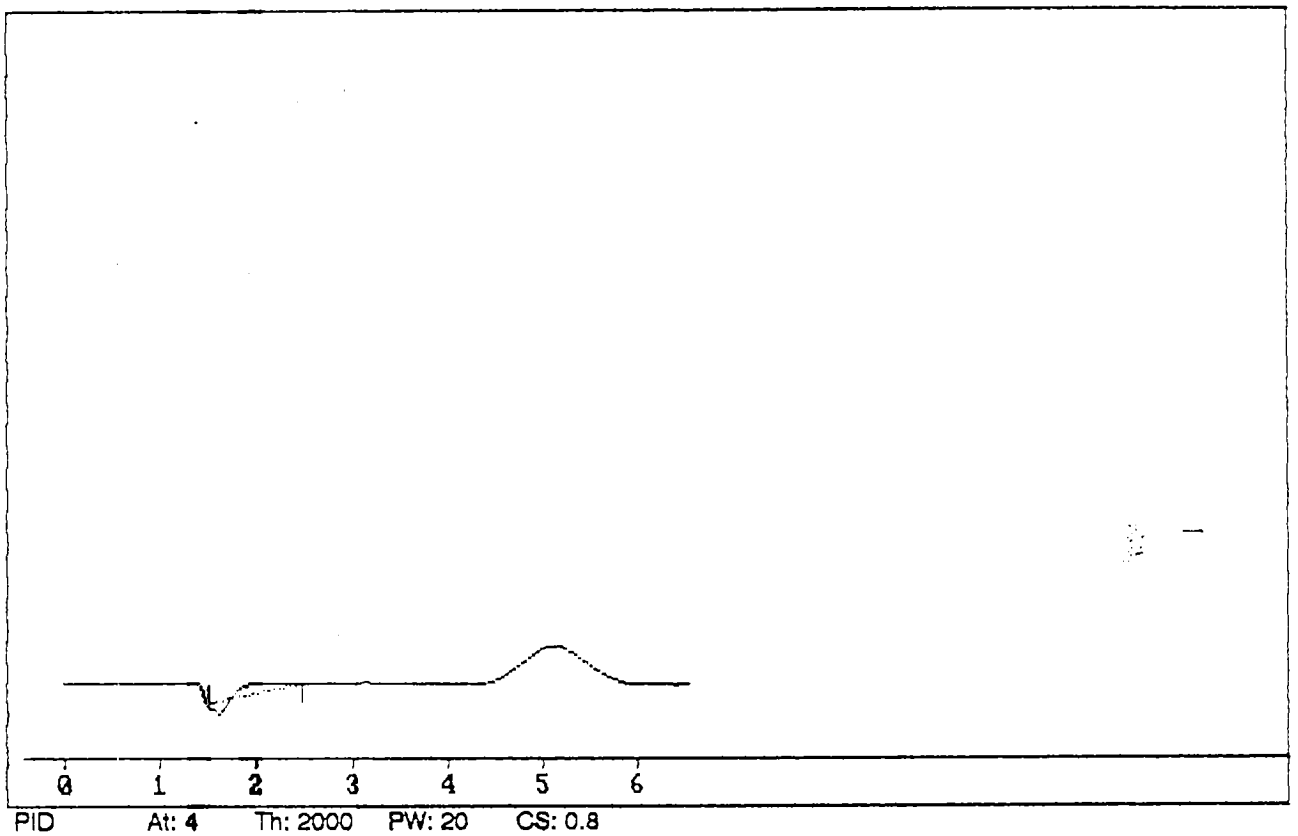
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92

SAMPLE POINT # 7 @ 4' 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:18	2.906E+04	5.524E+02	TRA 12-DCE	474.9

← ND, IN SOLVENT PEAK

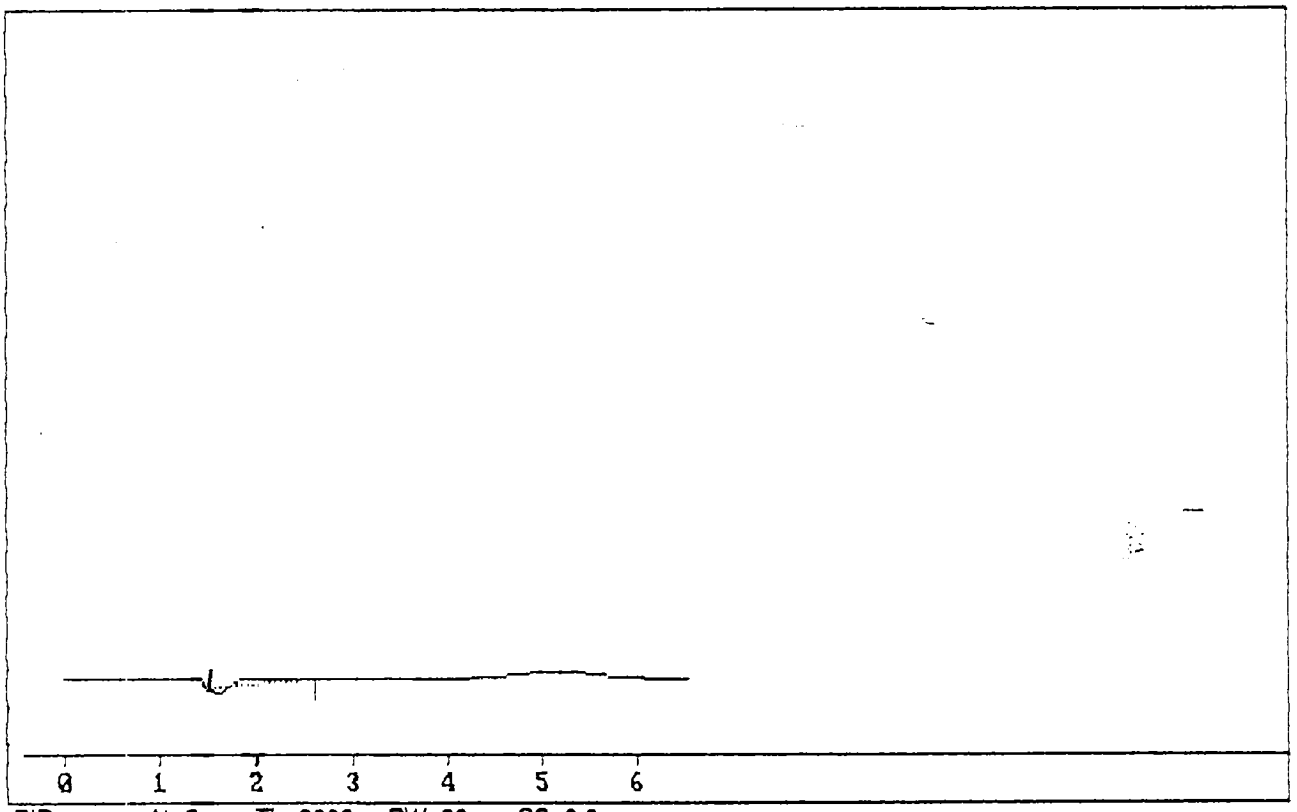


Peak Report

Time 05:28:10 Date 4/15/1992
Data File: DOWCFT10
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 7 @ 6 FT, 1000UL, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:11	2.610E+04	9.679E+02	TRA 12-DCE	474.5 ← ND, Solvent Peak

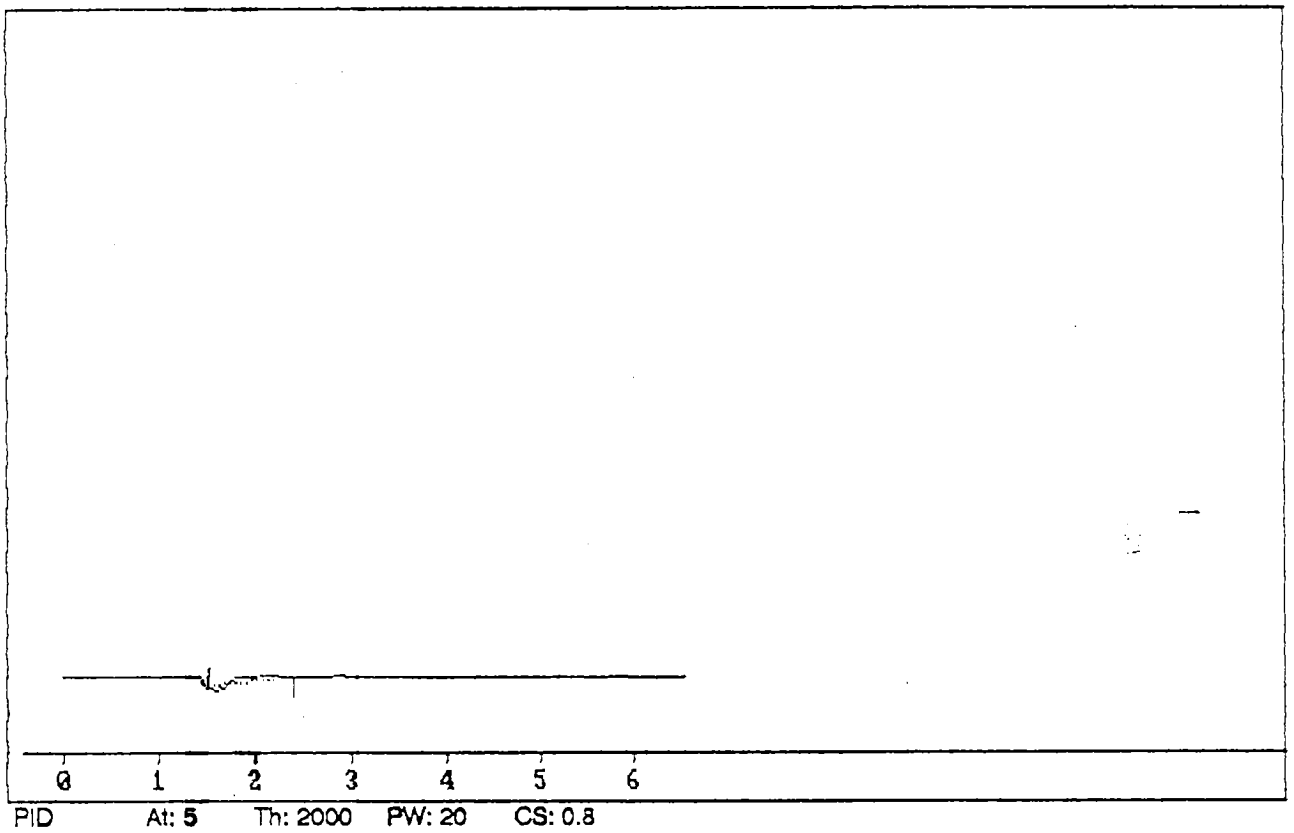


Peak Report

Time 05:40:38 Date 4/15/1992
Data File: DOWCFT11
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 8 @ 4 FT 1000UL, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION	
1	00:02:17	3.629E+04	8.516E+02	TRA 12-DCE	475.8	< ND, SOLVENT PEAK



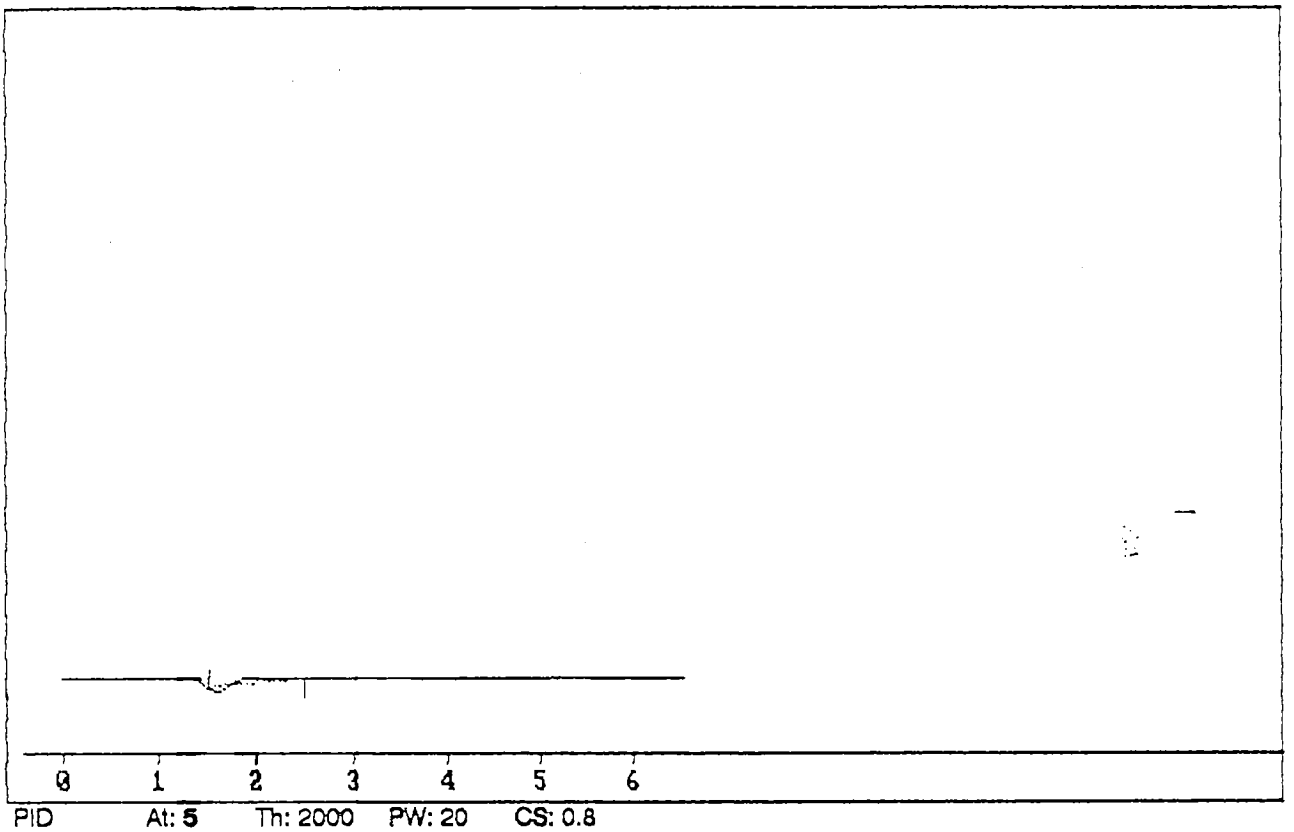
Peak Report

Time 05:53:56 Date 4/15/1992
Data File: DOWCFT12
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 9 @ 8 FT, 1000UL, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:08	3.594E+04	1.801E+03	TRA 12-DCE	475.8

← ND, SOLVENT PEAK



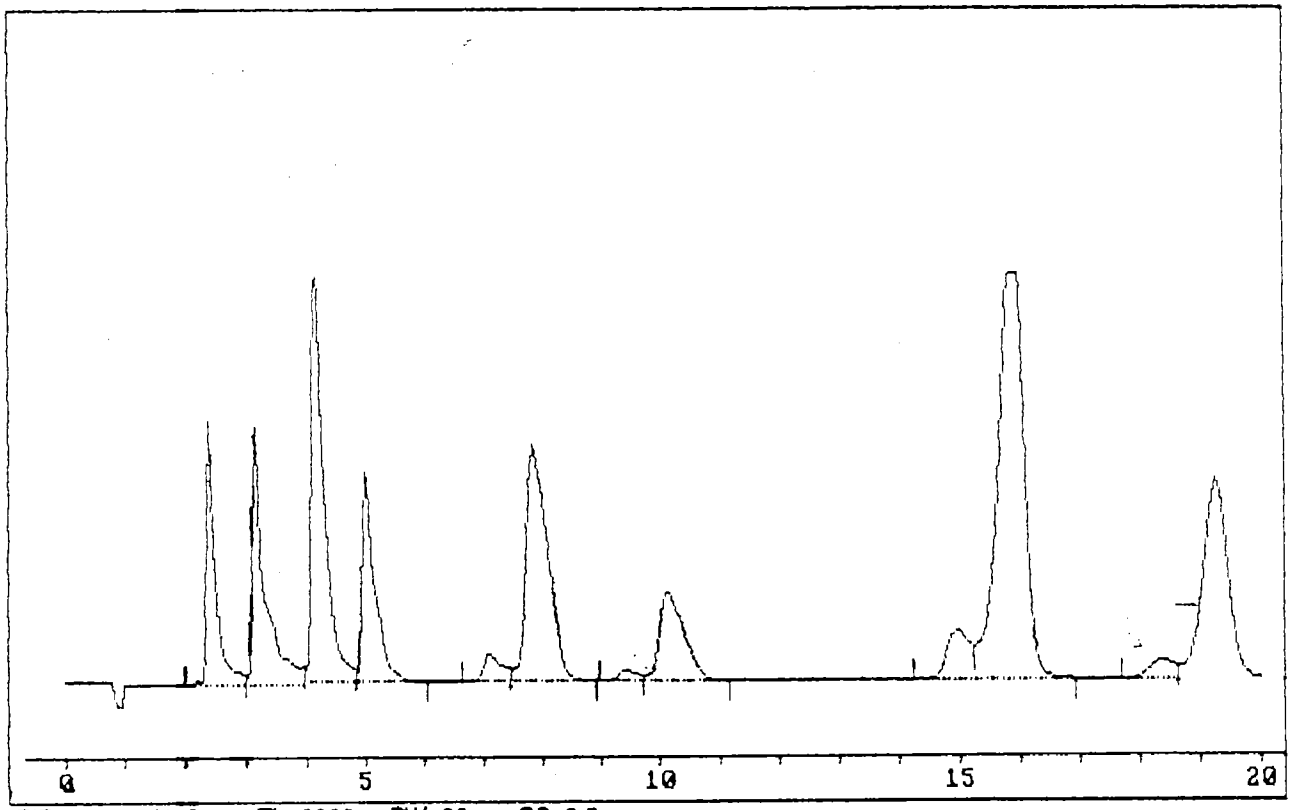
Peak Report

Time 06:06:51 Date 4/15/1992
Data File: DOWCFT13
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : SAMPLE PT 10 @ 4 FT, 1000UL, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:13	2.763E+04	8.581E+02	TRA 12-DCE	474.7

← ND, SOLVENT PEAK



Peak Report

Time 20:20:20 Date 4/15/1992
Data File: RETCHK03
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : 4/16/92 AM STD RETENTION CHECK

Ch 1 Detector: PID

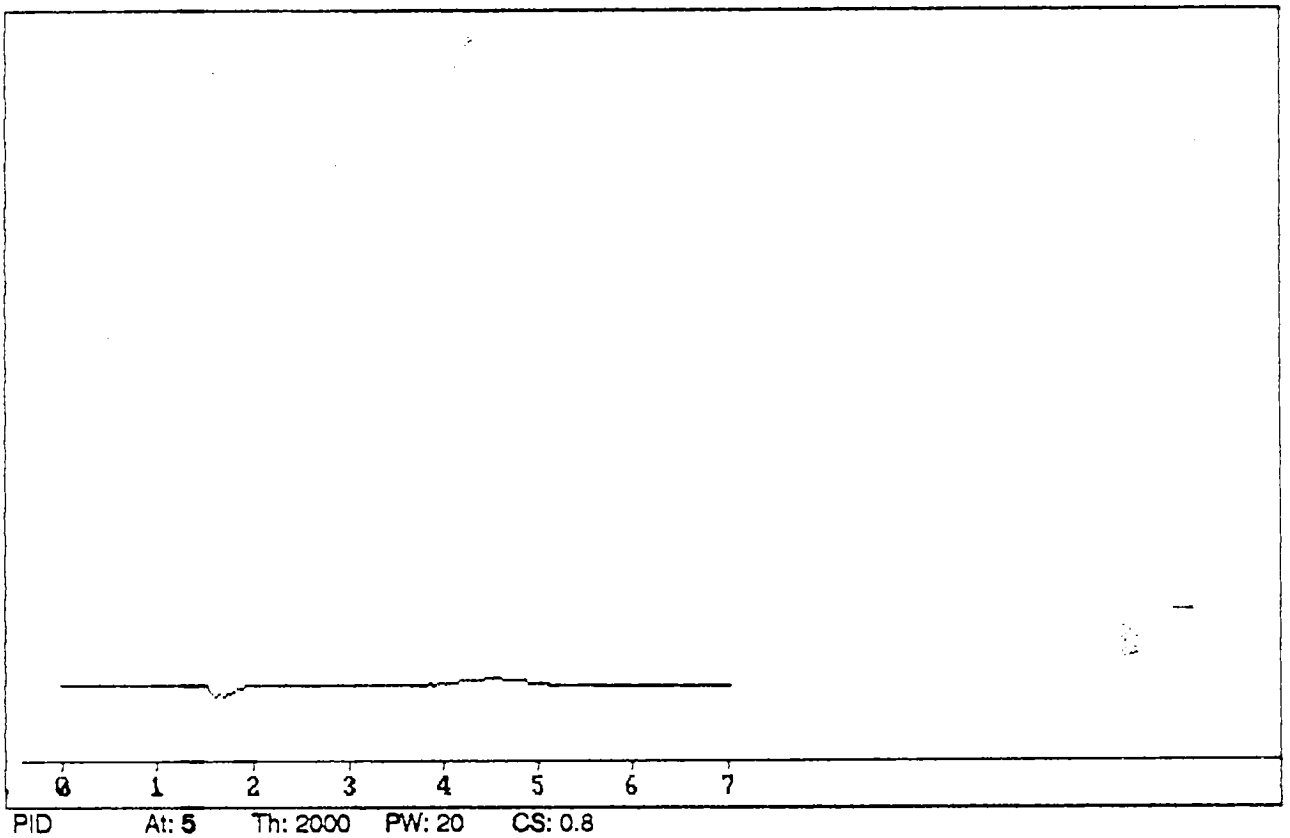
NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:20	5.750E+06	5.630E+05	TRA 12-DCE	1195
2	00:03:08	7.733E+06	5.772E+05	CIS 12-DCE	1129
3	00:04:07	1.308E+07	8.596E+05	BENZENE	796.3
4	00:04:57	8.589E+06	4.566E+05	TCE	677.3
5	00:07:03	1.319E+06	5.964E+04	TOLUENE	39.32
6	00:07:47	1.242E+07	4.970E+05		
7	00:09:22	4.989E+05	2.184E+04	PCE	82.72
8	00:10:05	5.223E+06	1.888E+05		
9	00:14:54	2.803E+06	1.026E+05	M,P-XYLENE	1.412
10	00:15:55	2.621E+07	8.544E+05		
11	00:18:19	1.169E+06	3.979E+04		

Peak Report

Time 20:20:20 Date 4/15/1992
Data File: RETCHK03
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/15/92
Sample remarks : 4/16/92 AM STD RETENTION CHECK

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:20	5.750E+06	5.630E+05	TRA 12-DCE	1195
2	00:03:06	7.733E+06	5.772E+05	CIS 12-DCE	1129
3	00:04:07	1.308E+07	8.596E+05	BENZENE	798.3
4	00:04:57	6.589E+06	4.586E+05	TCE	677.3
5	00:07:03	1.319E+06	5.964E+04		
6	00:07:47	1.242E+07	4.970E+05	TOLUENE	669.3
7	00:09:22	4.989E+05	2.184E+04		
8	00:10:05	5.223E+06	1.888E+05	PCE	621.8
9	00:14:54	2.803E+06	1.026E+05	M,P-XYLENE	1.412
10	00:15:55	2.621E+07	8.544E+05		
11	00:18:19	1.169E+06	3.979E+04		



Peak Report

Time 20:54:49 Date 4/15/1992

Data File: DOWSBLK1

Method File: DOWCRAFT

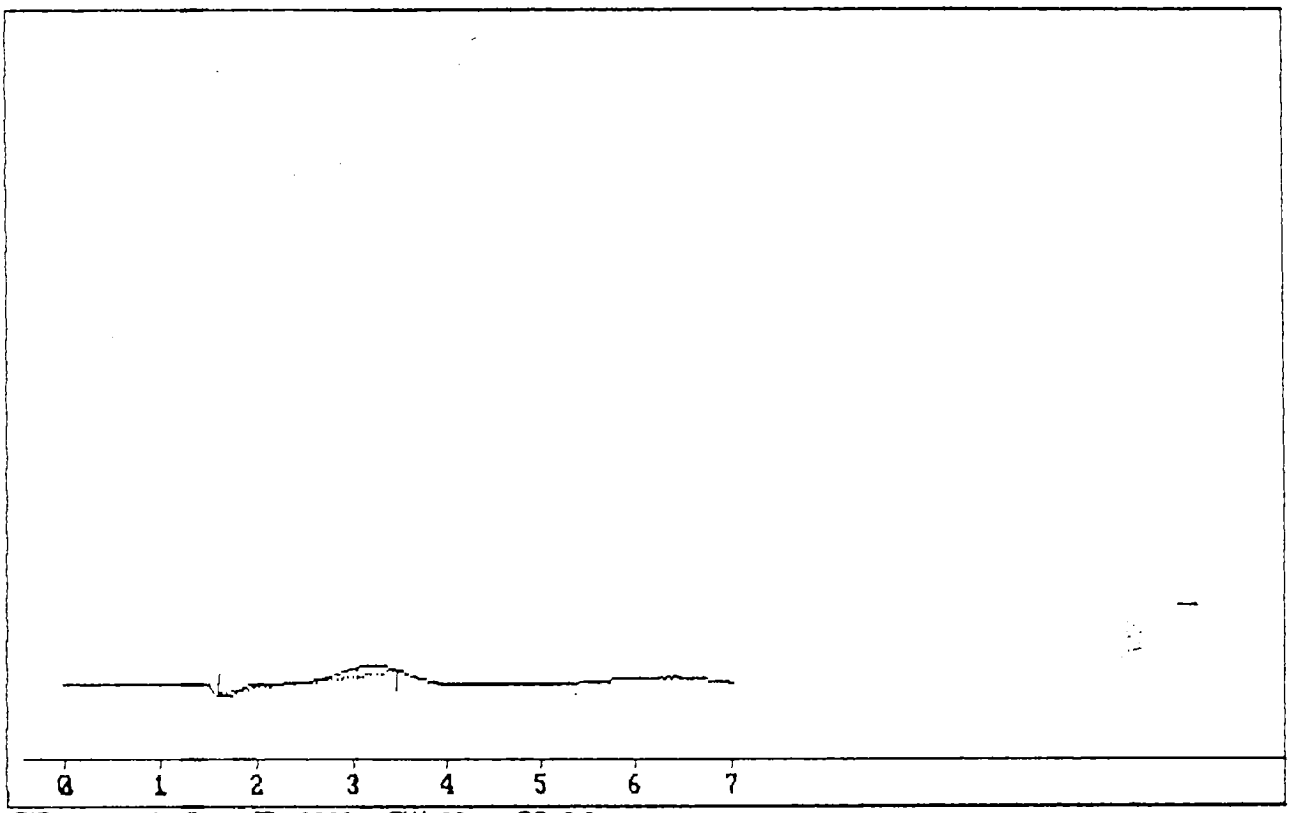
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92

SYRINGE NO. 1 AM BLANK RUN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.

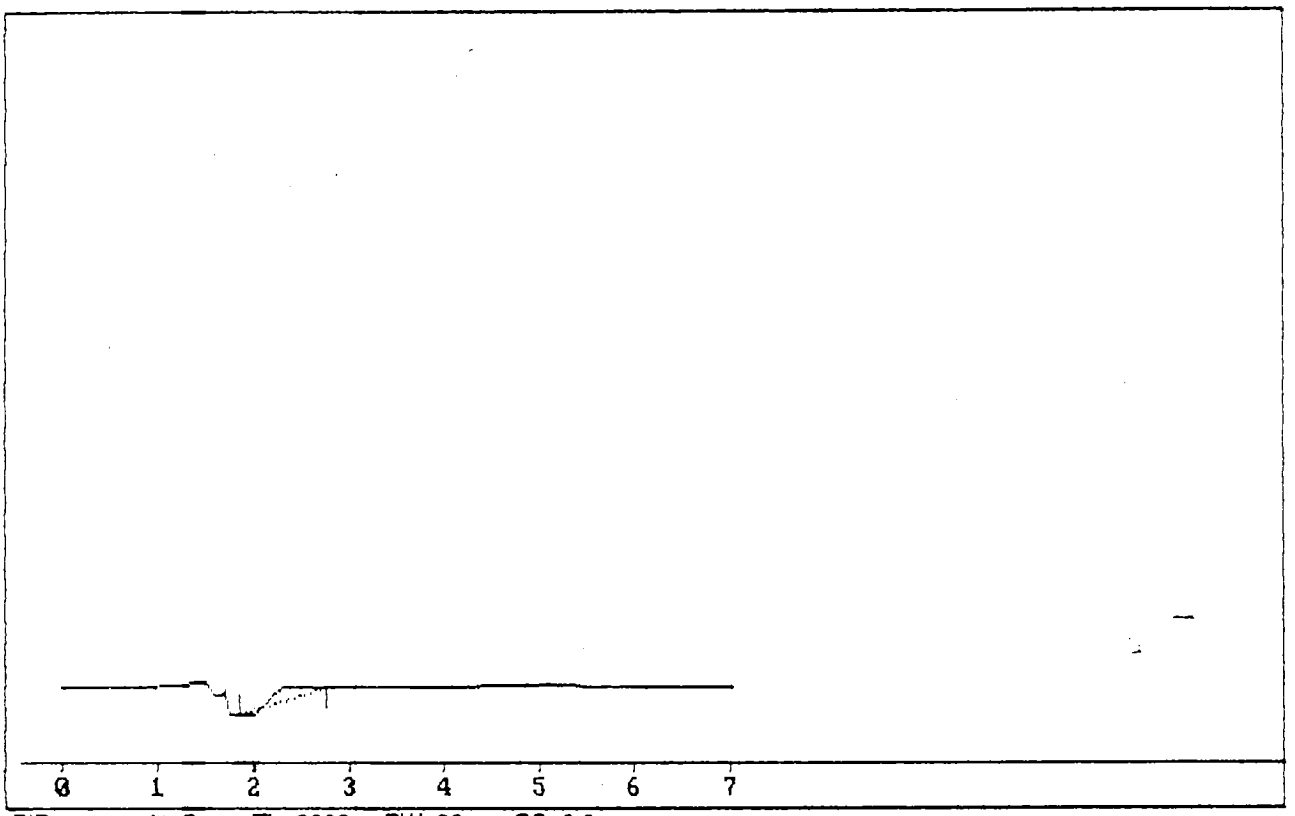


Peak Report

Time 21:02:54 Date 4/15/1992
Data File: DOWS8LK2
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SYRINGE NO. 2 AM BLANK RUN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:03:13	1.202E+05	2.147E+03	CIS 12-DCE	-61.04

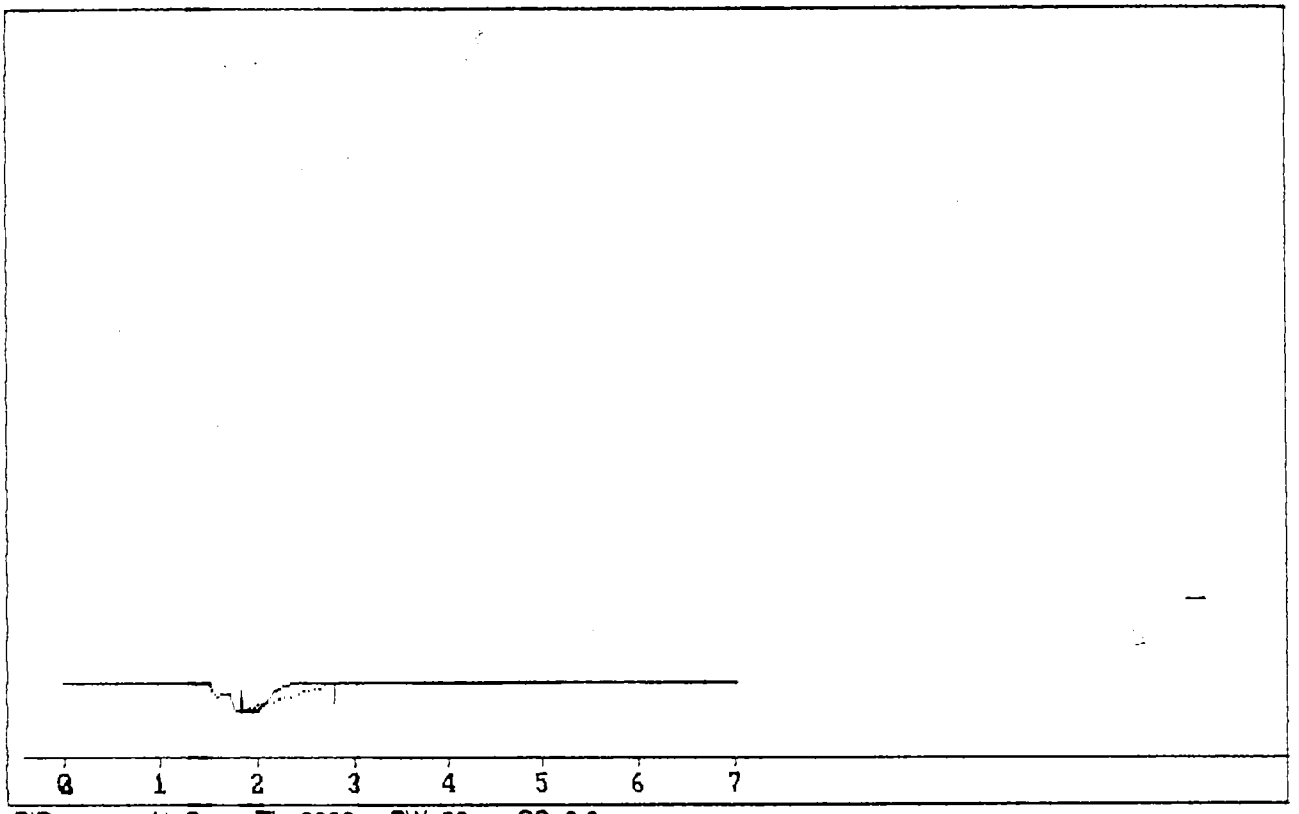


Peak Report

Time 21:17:14 Date 4/15/1992
Data File: SYRING02
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SYRINGE #2 BLANK AFTR MEOH CLEAN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:30	7.418E+04	2.058E+03		

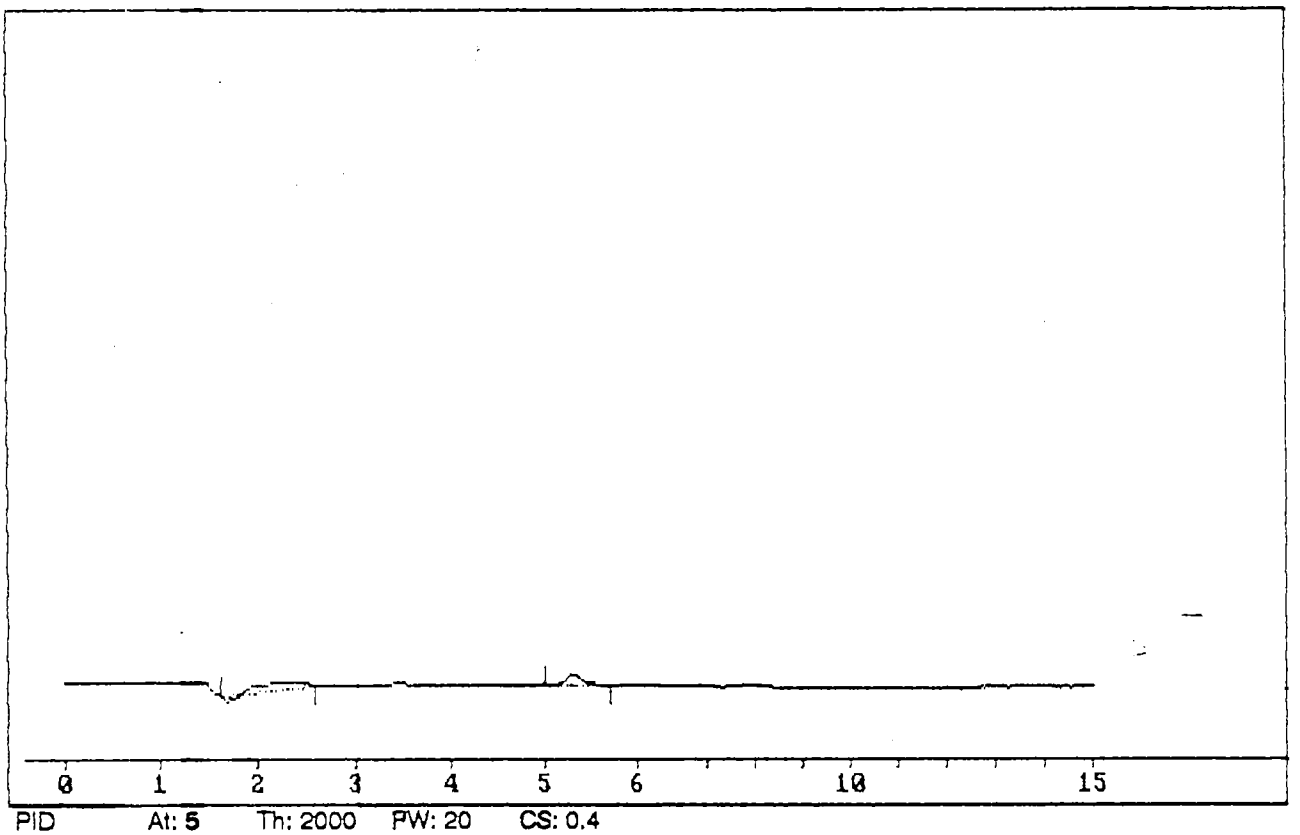


Peak Report

Time 21:28:28 Date 4/15/1992
Data File: SYRNG02A
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:31	8.918E+04	1.779E+03		



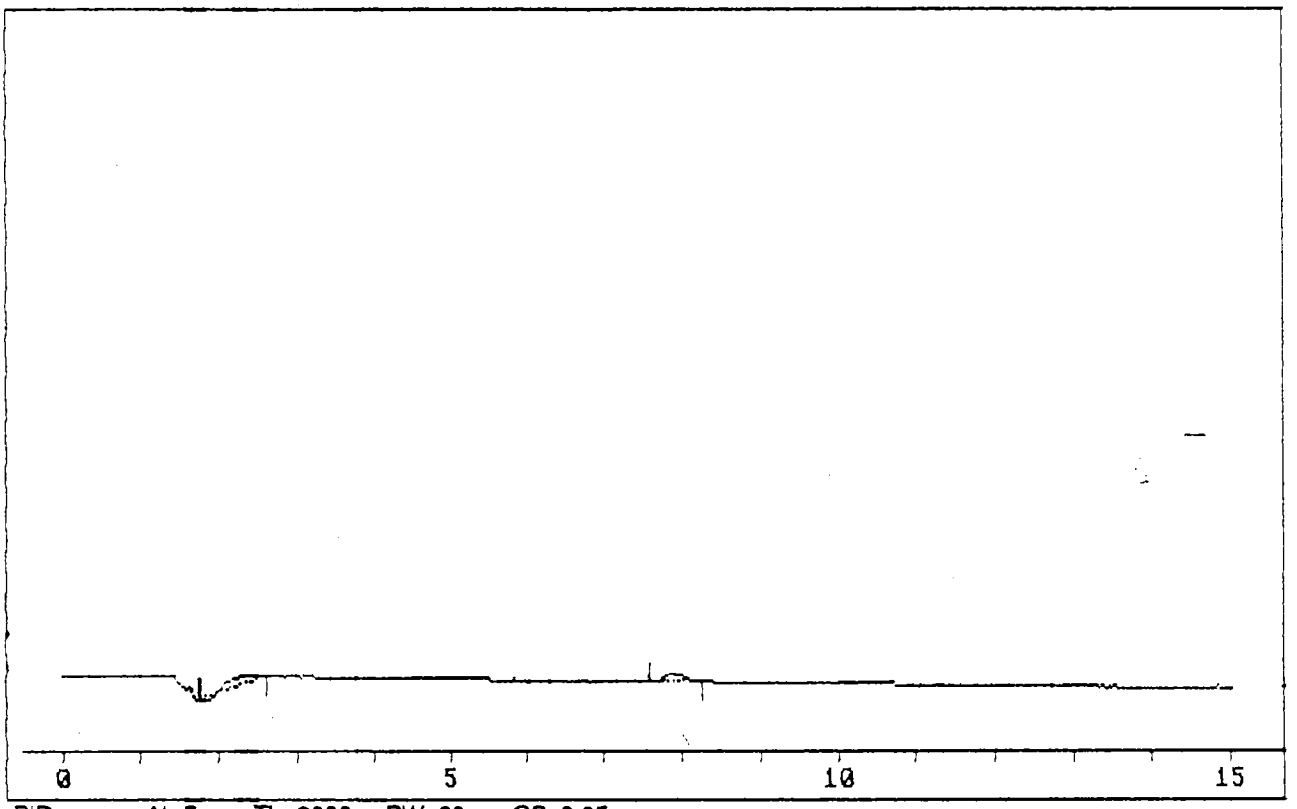
Peak Report

Time 23:09:31 Date 4/15/1992
Data File: DOWCF1
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE POINT #11 INSIDE PHOS ROOM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:20	3.599E+04	9.779E+02	TRA 12-DCE	475.8
2	00:05:15	4.597E+04	3.716E+03	TCE	4.139

Time : 23:39:00 Date 4/15/1992
Data File : DOWCF2
Method File : DOWCRAFT
Sample Notes: SAMPLE PT #12 IN PHOS ROOM 2 MIN



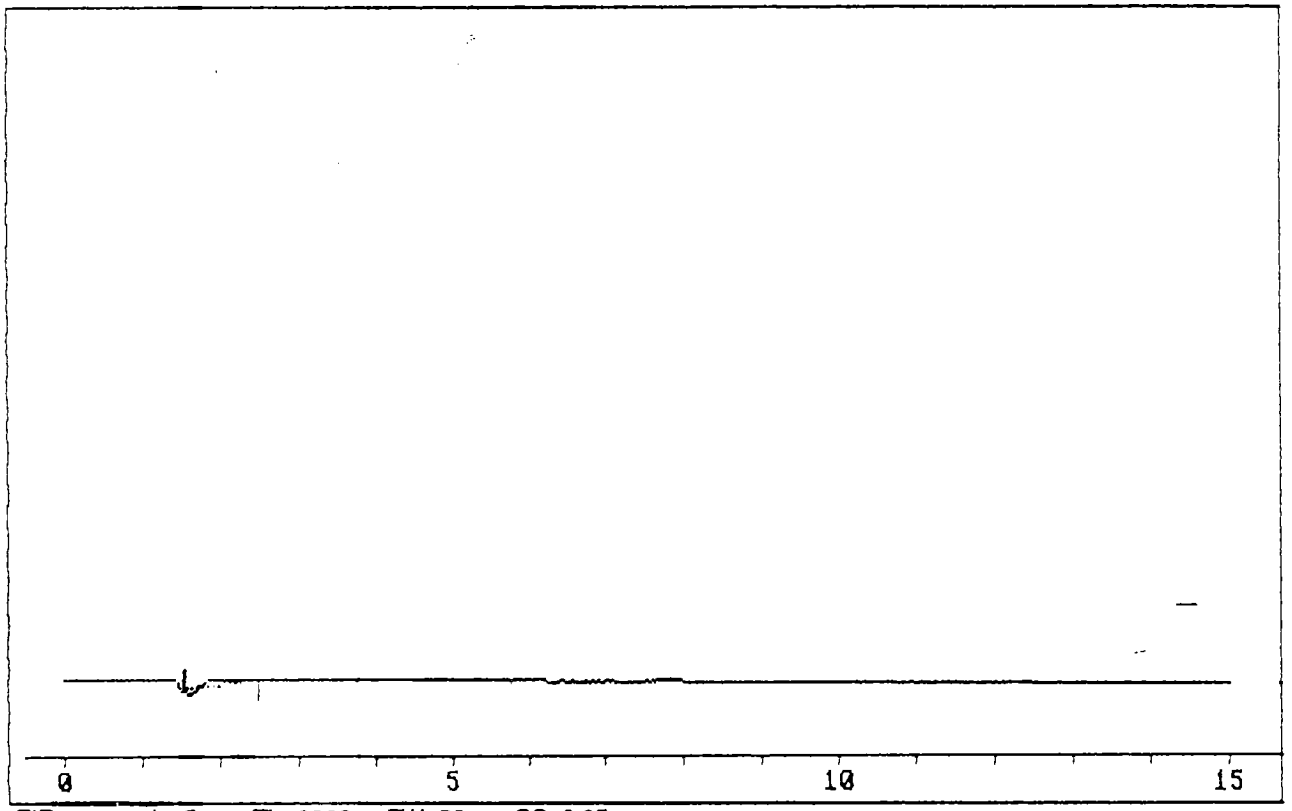
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 23:39:00 Date 4/15/1992
Data File: DOWCF2
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT #12 IN PHOS ROOM 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:18	4.848E+04	2.040E+03	TRA 12-DCE	477.4
2	00:07:51	3.852E+04	2.897E+03	TOLUENE	0.6013

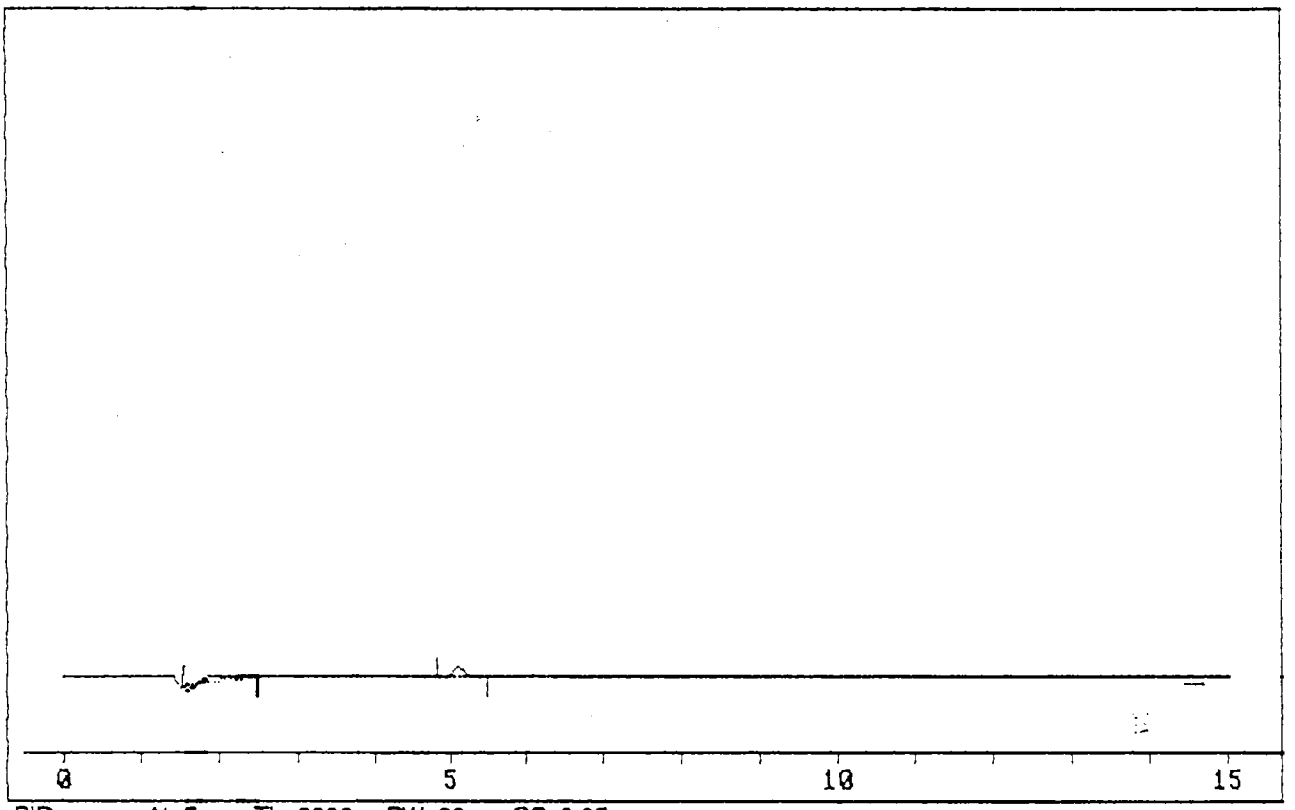


Peak Report

Time 00:01:59 Date 4/16/1992
Data File: DOWCF3
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAM PT 13 IN PHOS ROOM, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:11	3.095E+04	9.668E+02	TRA 12-DCE	475.2



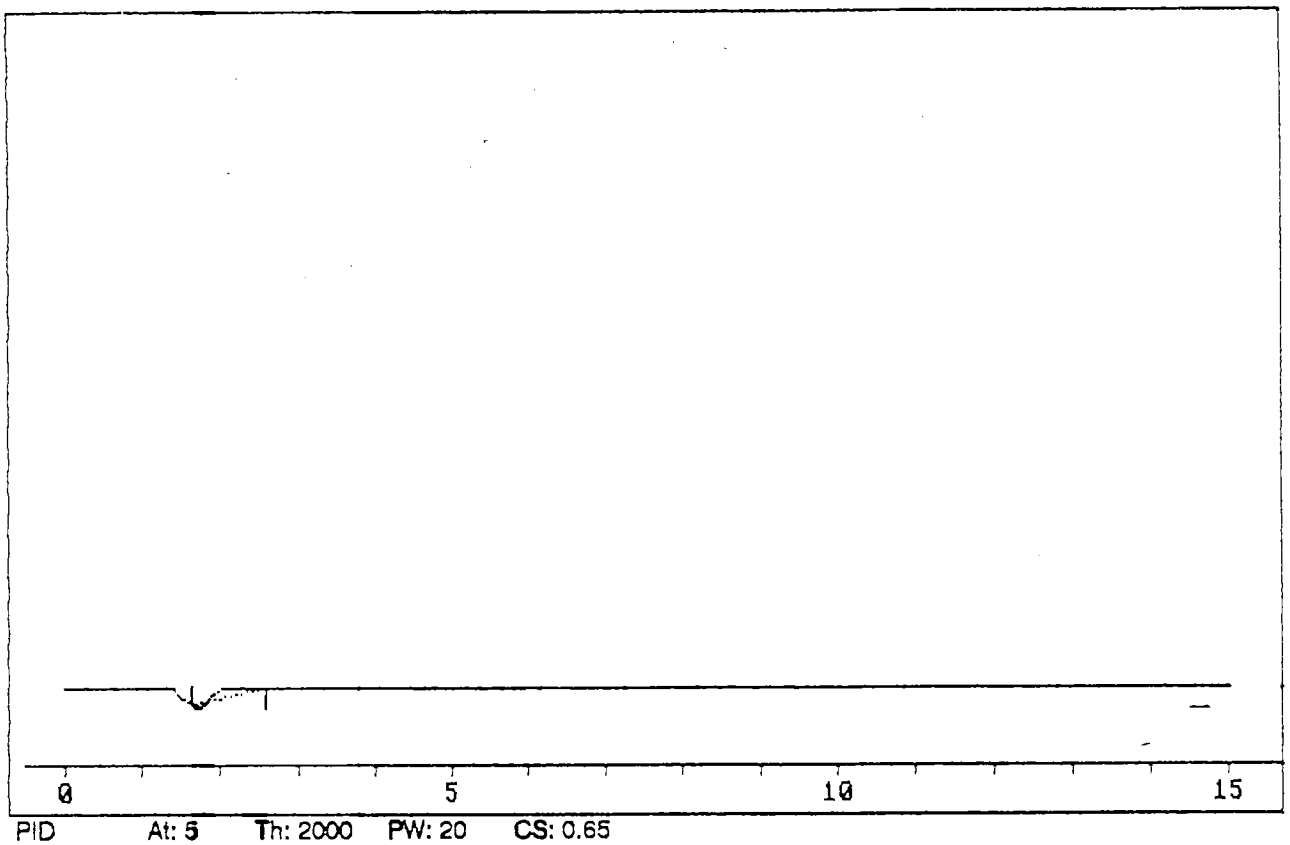
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 00:36:26 Date 4/16/1992
Data File: DOWCRF1
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT 14 IN PROD ROOM, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:12	2.742E+04	8.097E+02	TRA 12-DCE	474.7
2	00:05:03	3.685E+04	3.243E+03	TCE	3.298



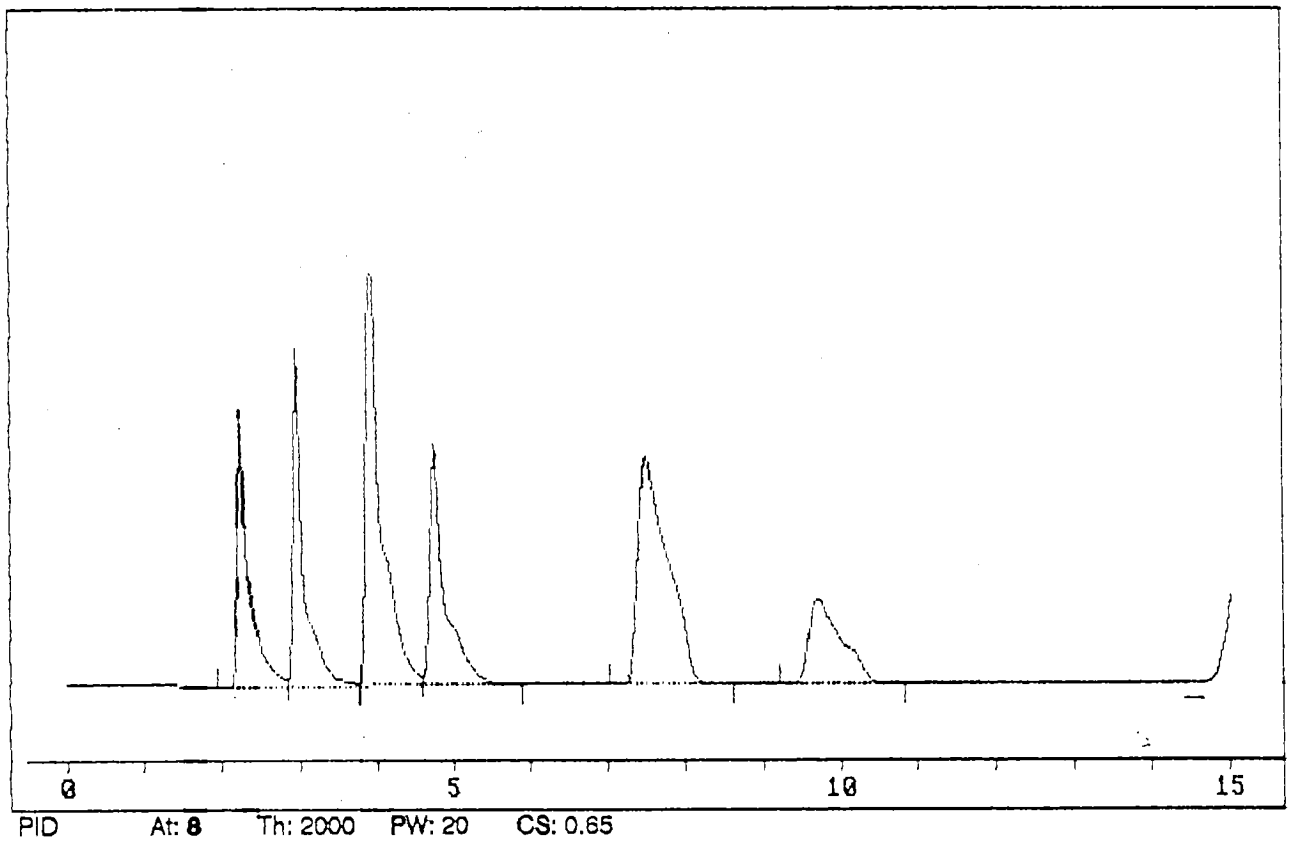
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 00:58:39 Date 4/16/1992
Data File: DOWCRF2
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT #15 UNDER STAIRS, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:16	3.872E+04	1.311E+03	TRA 12-DCE	476.1



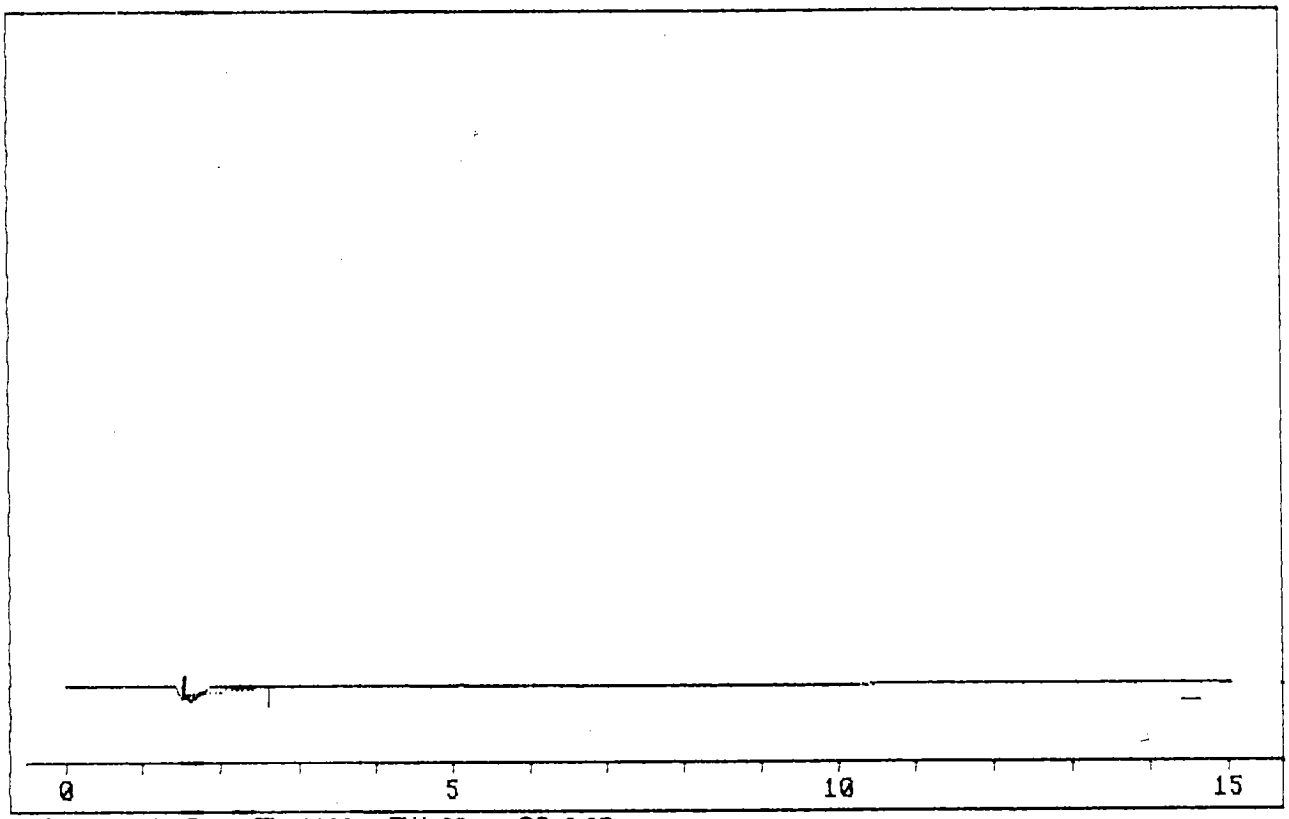
PID At: 8 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 01:14:23 Date 4/16/1992
Data File: DOWCRF3
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : AFTERNOON RETENTION CHECK W/STD

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:11	6.079E+06	5.968E+05	TRA 12-DCE	1237
2	00:02:55	6.550E+06	7.197E+05	CIS 12-DCE	943.8
3	00:03:53	1.244E+07	8.681E+05	BENZENE	753.5
4	00:04:42	6.874E+06	5.167E+05	TCE	707.3
5	00:07:28	1.280E+07	4.833E+05	TOLUENE	640.1
6	00:09:40	5.359E+06	1.821E+05	PCE	638



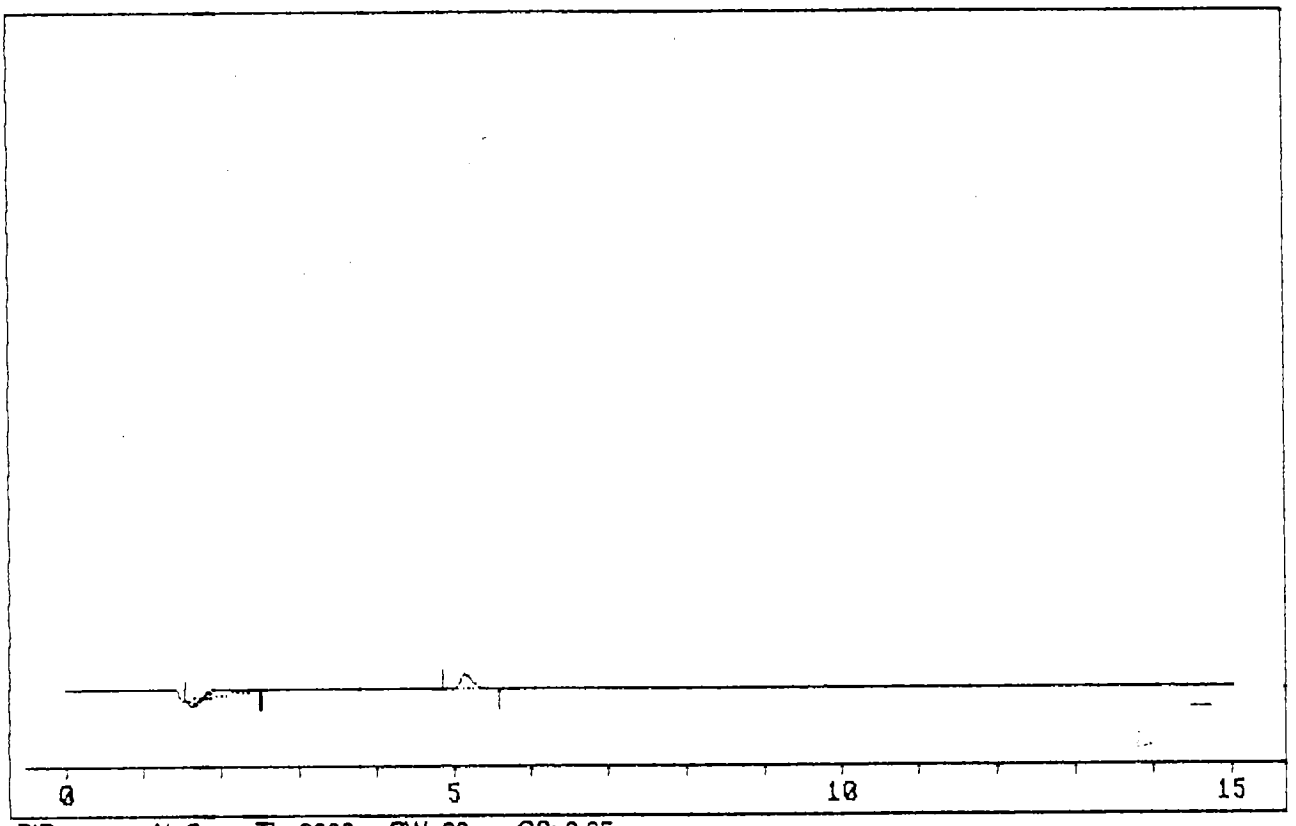
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 02:46:44 Date 4/16/1992
Data File: DOWCRF4
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT #16 IN STOR ROOM, 2 MIN

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:17	3.610E+04	8.283E+02	TRA 12-DCE	475.8



PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 03:22:01 Date 4/16/1992

Data File: DOWCRF5

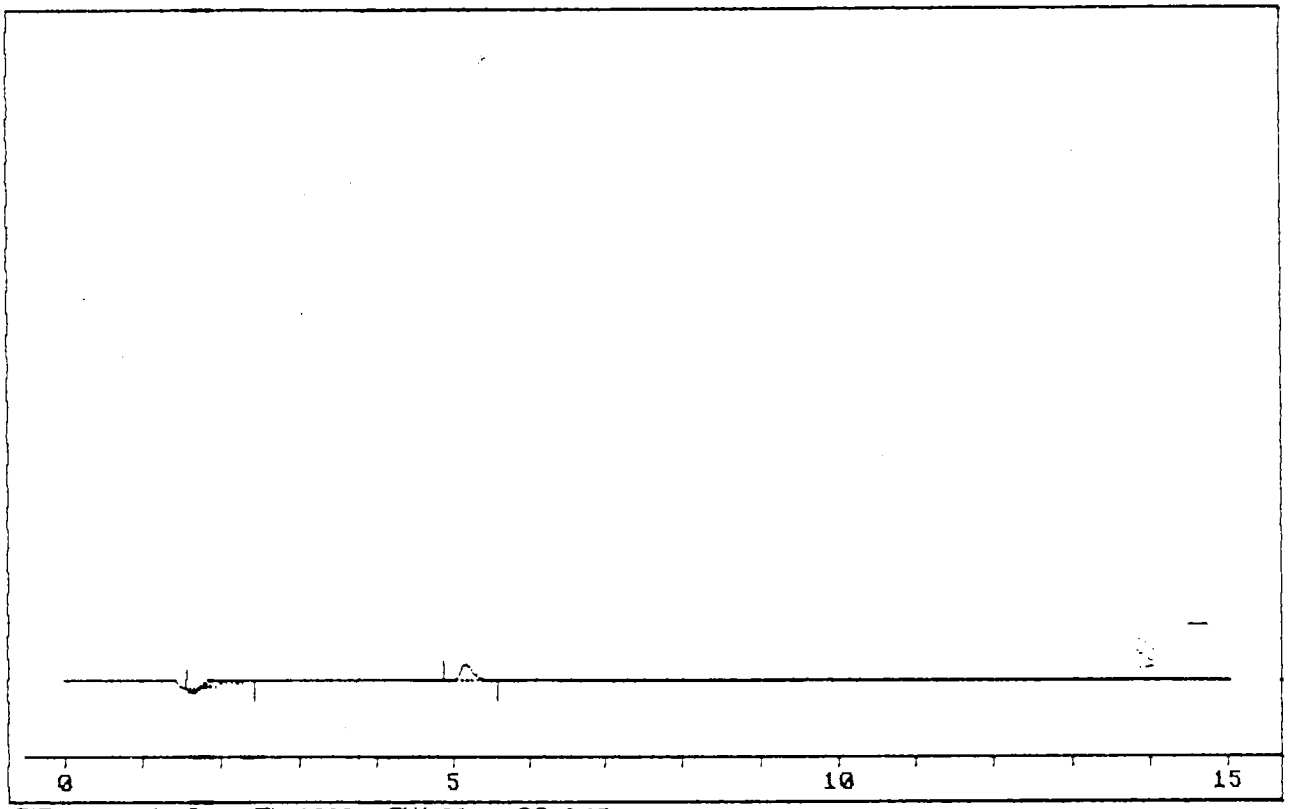
Method File: DOWCRAFT

Method remarks: EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92

SAMPLE POINT # 17 NEAR VAPOR DEGREASER

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:12	2.821E+04	1.064E+03	TRA 12-DCE	474.8
2	00:05:05	4.938E+04	4.275E+03	TCE	4.454



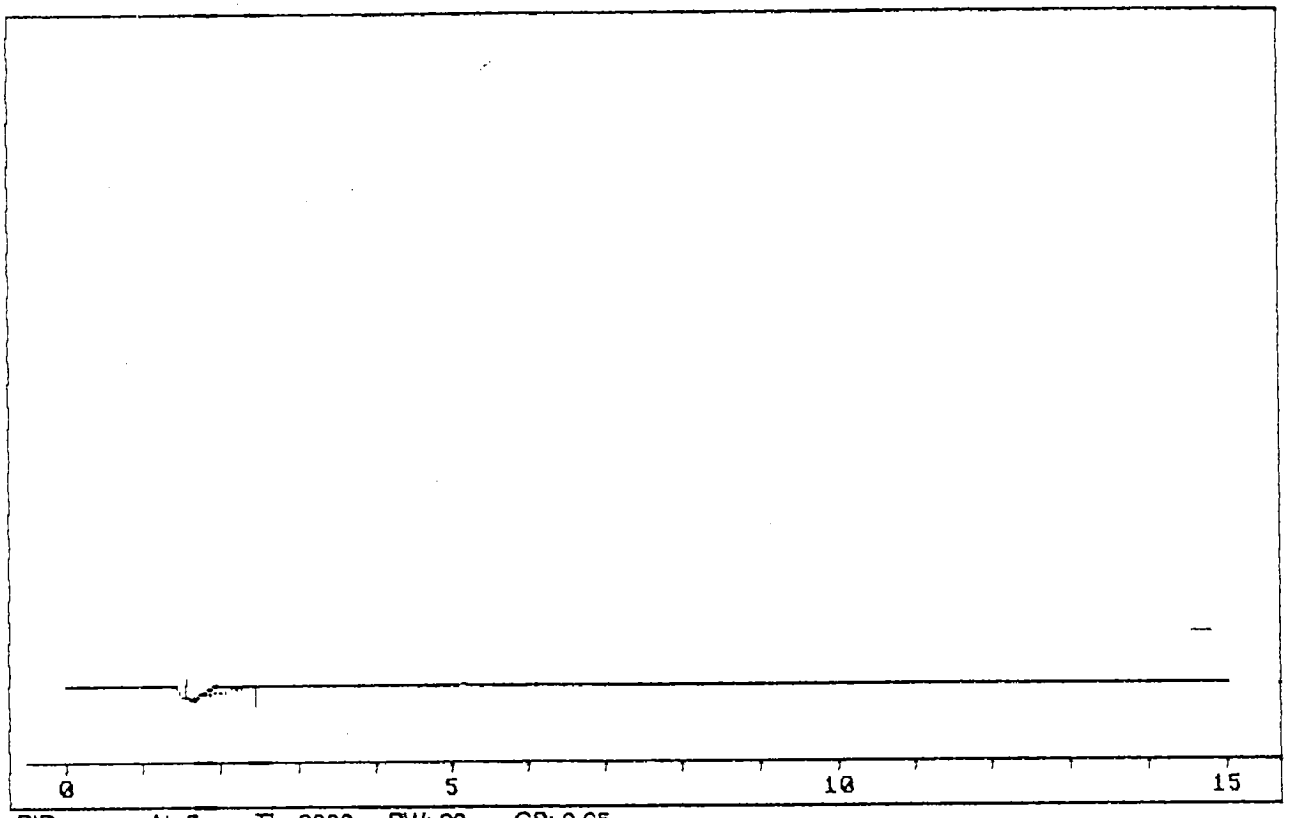
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 04:00:07 Date 4/18/1992
Data File: DOWCRT1
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT #18 IN WAREHOUSE ROOM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:12	2.591E+04	8.625E+02	TRA 12-DCE	474.5
2	00:05:07	5.379E+04	4.548E+03	TCE	4.862



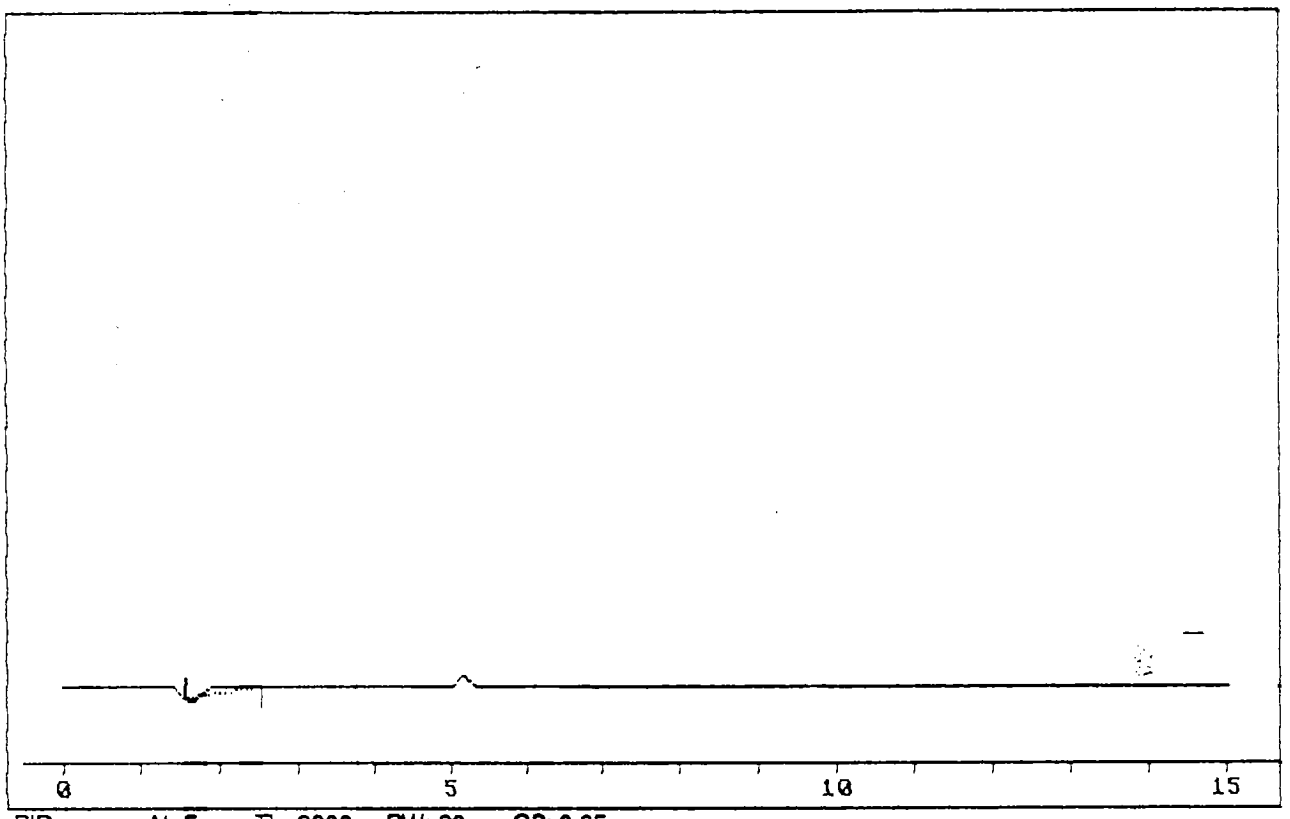
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 04:18:44 Date 4/16/1992
Data File: DOWCRT2
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : POINT #19 IN WAREHOUSE ROOM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:11	2.681E+04	8.867E+02	TRA 12-DCE	474.6



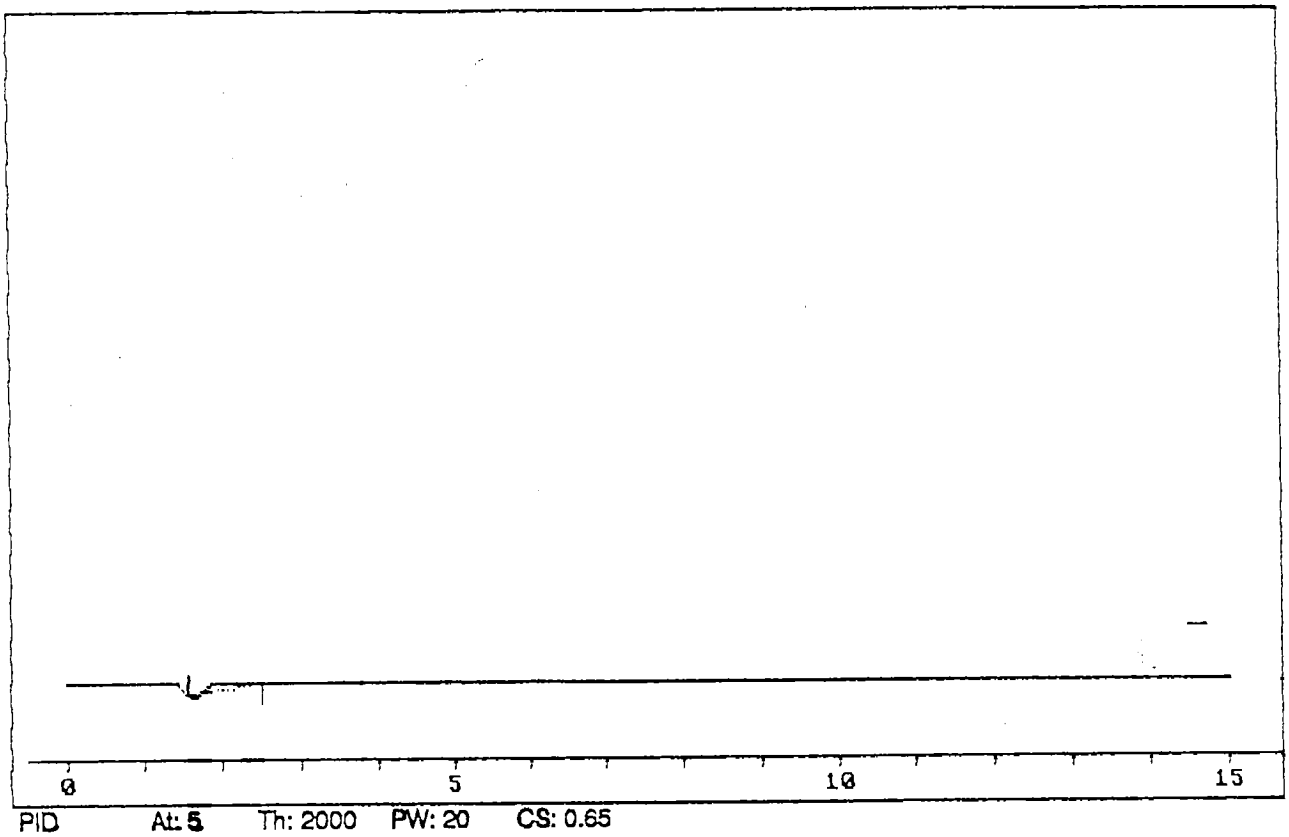
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 04:38:02 Date 4/16/1992
Data File: DOWCRT3
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT 20 IN WAREHOUSE ROOM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:14	3.183E+04	9.065E+02	TRA 12-DCE	475.2

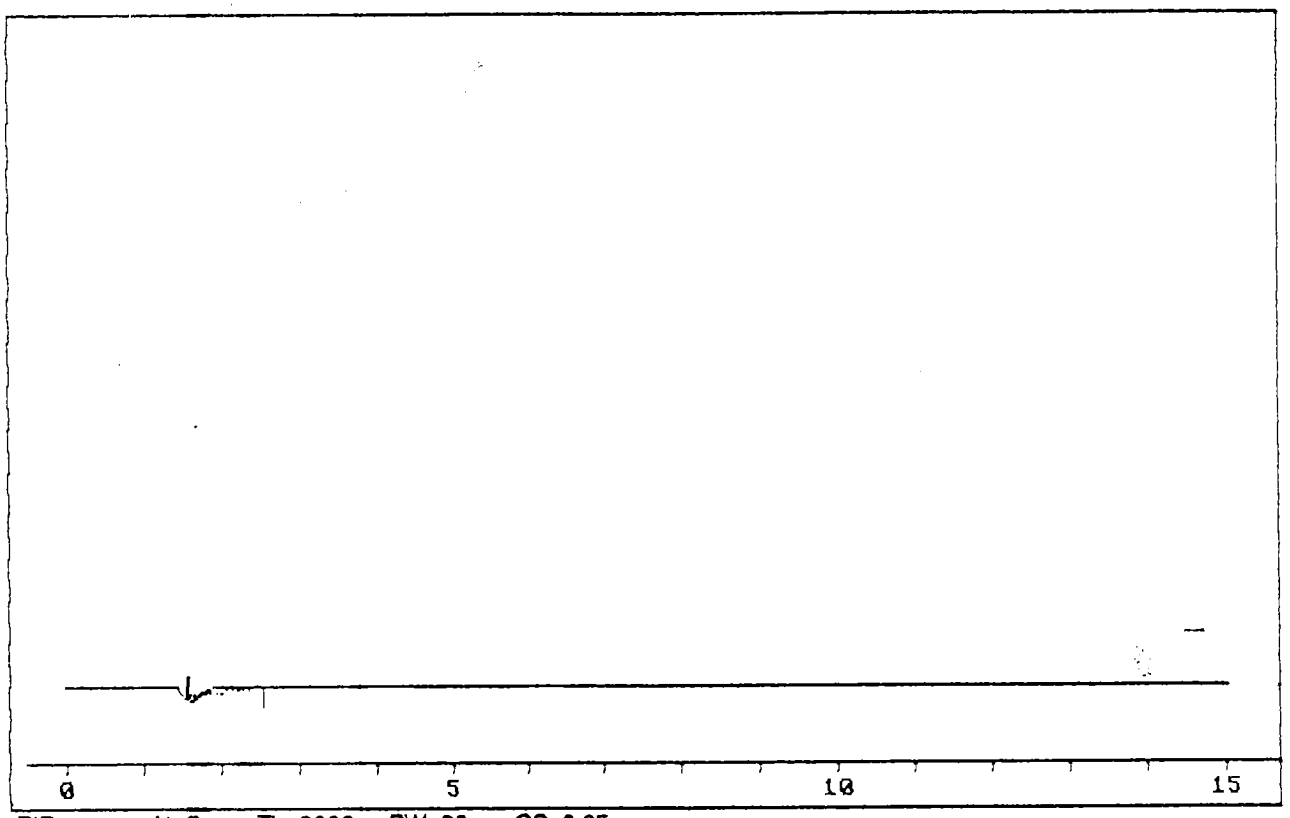


Peak Report

Time 04:59:30 Date 4/16/1992
Data File: DOWCRT4
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT 21 IN BOILER ROOM

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:12	3.116E+04	9.764E+02	TRA 12-DCE	475.2



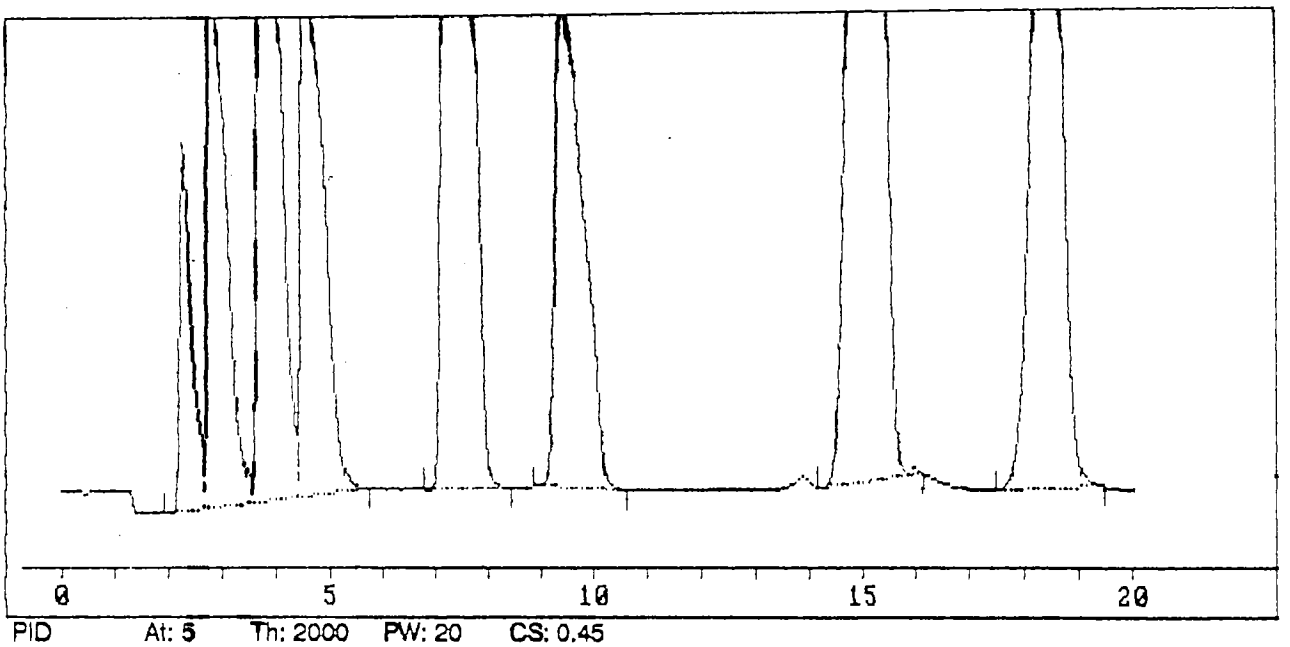
PID At: 5 Th: 2000 PW: 20 CS: 0.65

Peak Report

Time 05:26:07 Date 4/16/1992
Data File: DOWCRT5
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/16/92
Sample remarks : SAMPLE PT 22 OUTSIDE NEAR PALLETTS

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:14	3.141E+04	7.959E+02	TRA 12-DCE	475.2



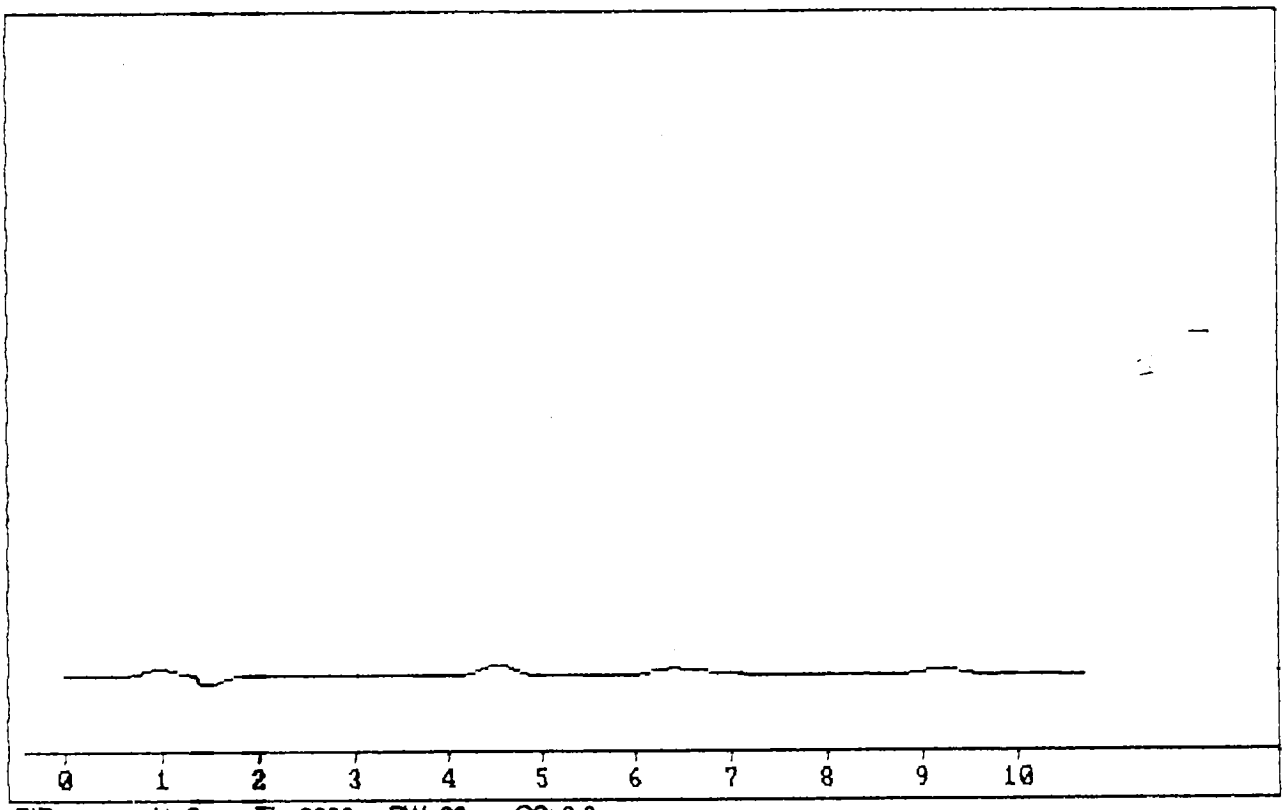
Peak Report

Time 08:01:23 Date 4/17/1992
Data File: DOWCT02
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : AM STANDARD RET CHECK RUN 2

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:12	1.672E+08	1.059E+05	TRA 12-DCE	681.7
2	00:02:44	6.745E+08	8.113E+05	CIS 12-DCE	974.2
3	00:03:41	1.228E+07	8.616E+05	BENZENE	742.3
4	00:04:29	7.131E+08	5.594E+05	TCE	734.5
5	00:07:12	1.317E+07	4.768E+05	TOLUENE	662.7
6	00:09:22	5.629E+08	1.851E+05	PCE	669.9
7	00:15:14	2.715E+07	8.558E+05	M,P-XYLENE	298.2
8	00:18:24	1.274E+07	4.689E+05		

Time : 08:22:57 Date 4/17/1992
Data File : DOWCT03
Method File : DOWCRAFT
Sample Notes: AM SYRINGE BLANK, SYR #1



PID At: 5 Th: 2000 PW: 20 CS: 0.8

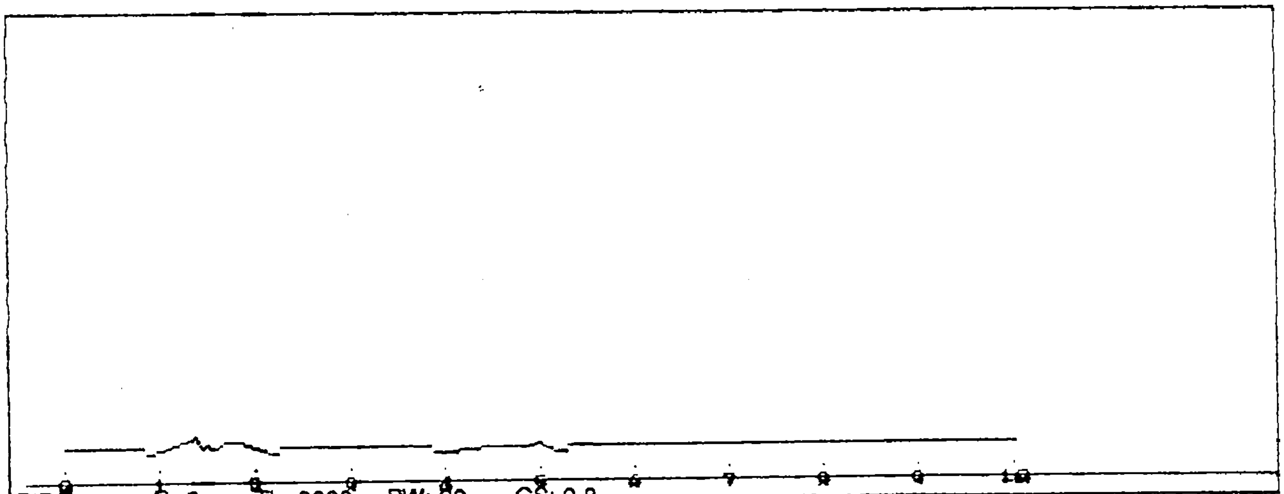
Peak Report

Time 08:22:57 Date 4/17/1992
Data File: DOWCT03
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : AM SYRINGE BLANK, SYR #1

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



Peak Report

Time 08:43:57 Date 4/17/1992

Data File: [illegible]

Method File: DOWCRAFT

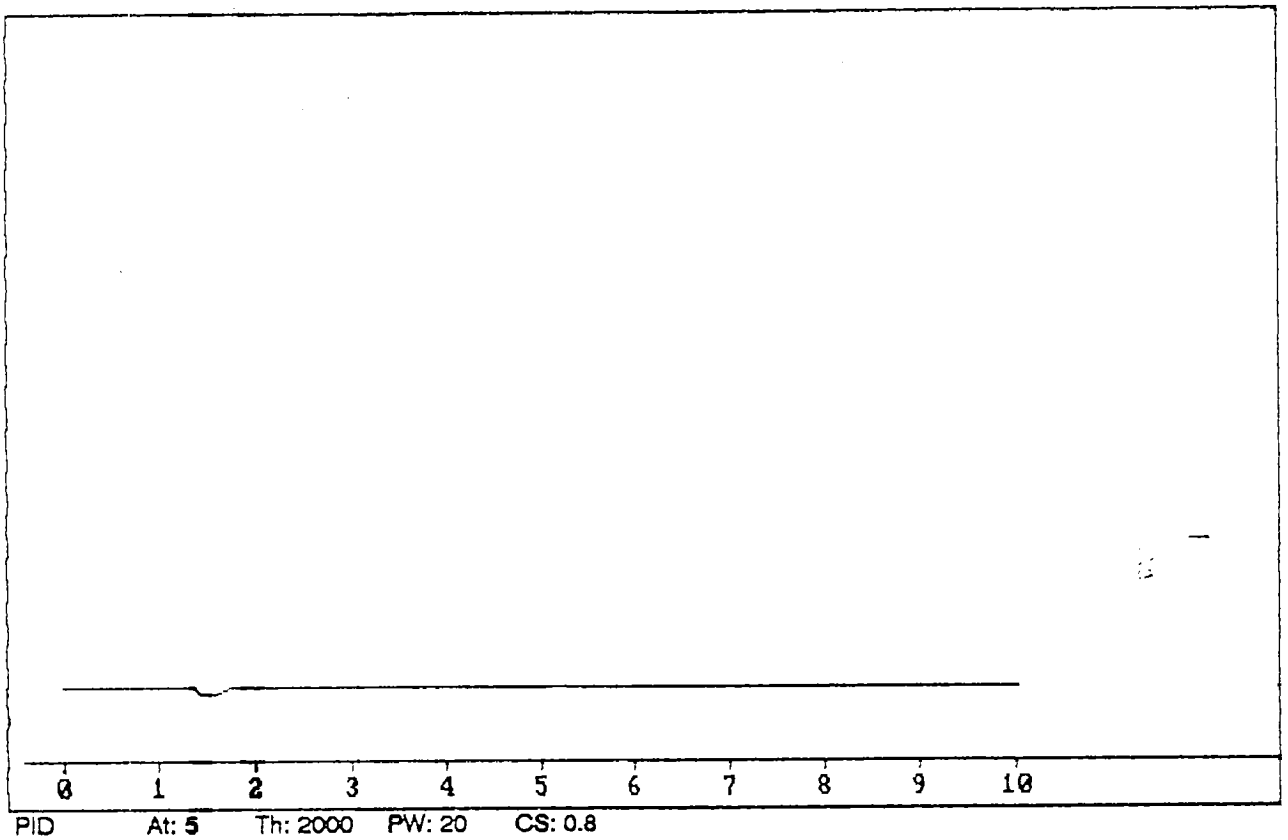
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.

Sample 23. 10'
Pt # 62 @ 4'



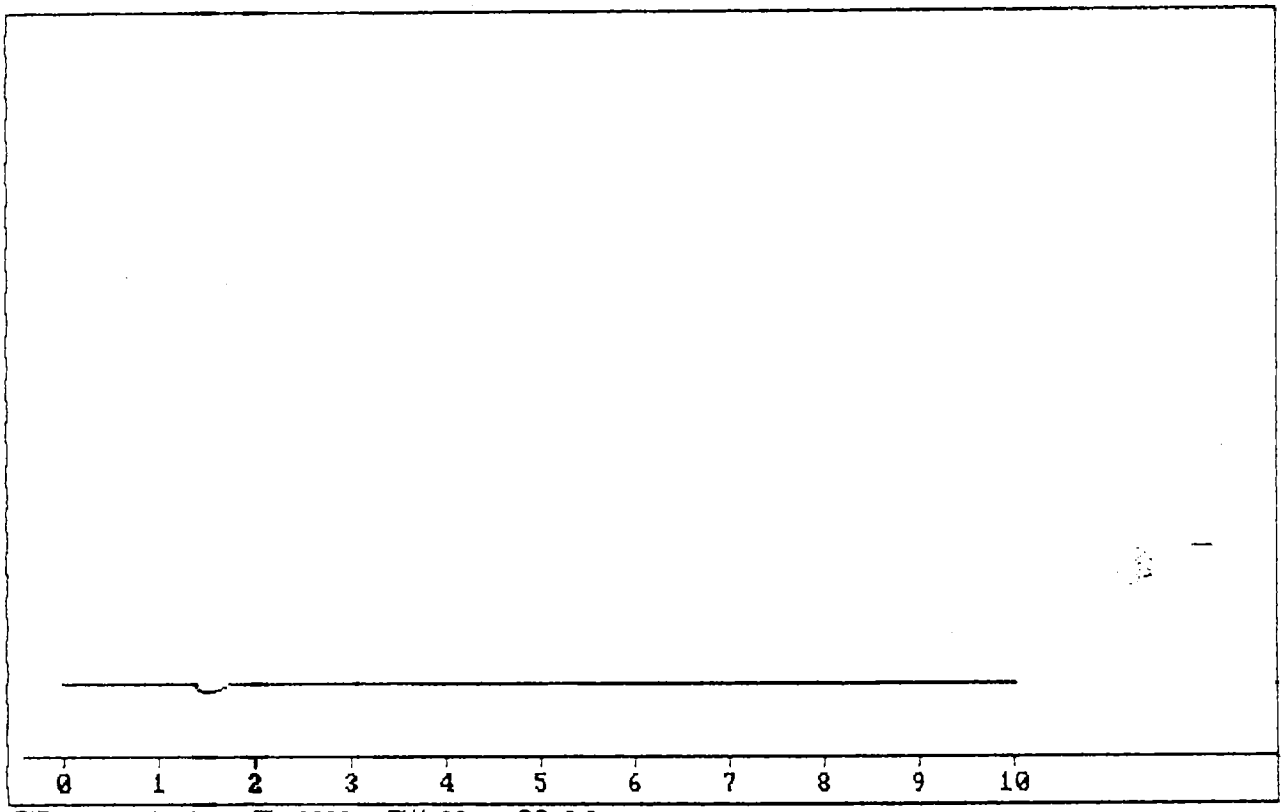
Peak Report

Time 09:19:45 Date 4/17/1992
Data File: DOWCT05
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : SAMPLE PT 23 OUTSIDE IN PRKNG LOT

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



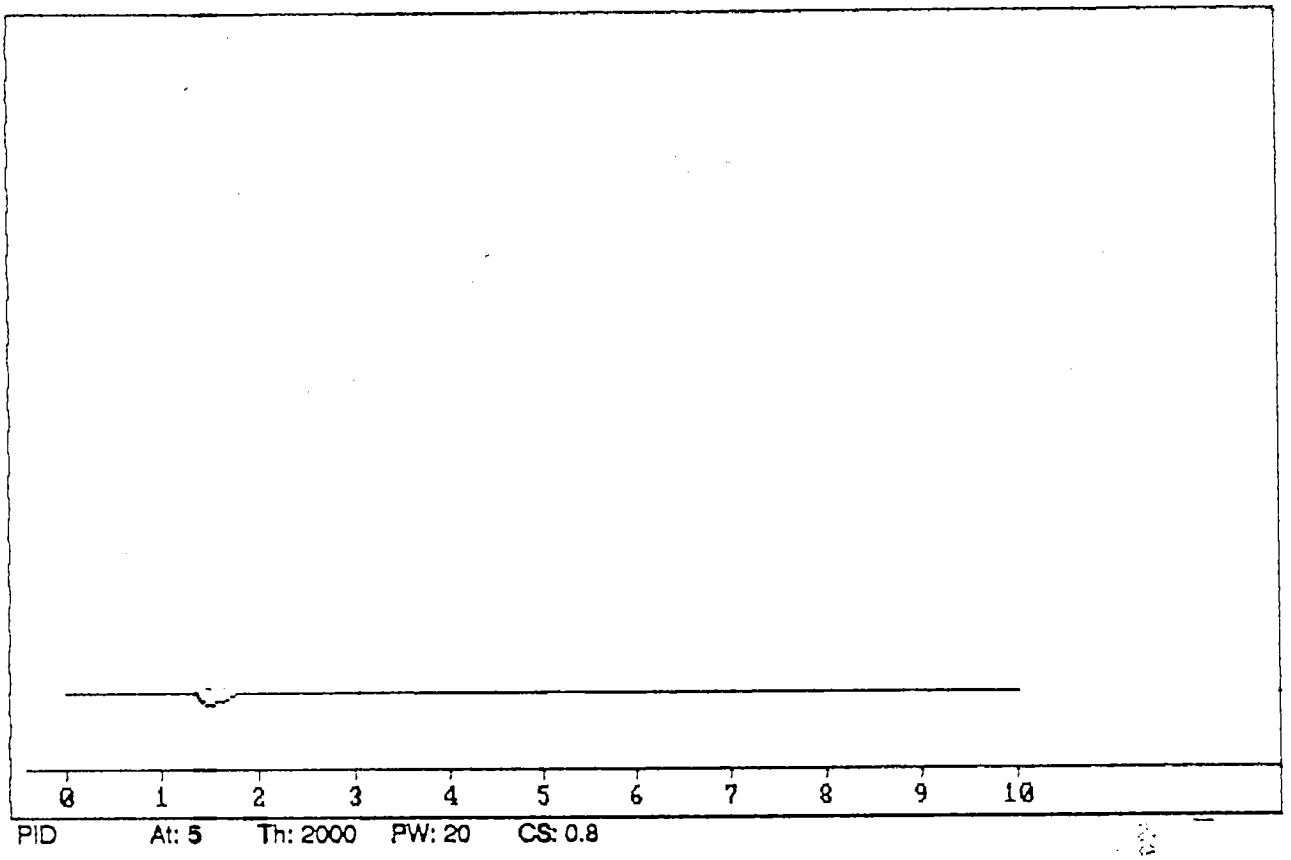
Peak Report

Time 09:37:42 Date 4/17/1992
Data File: DOWCT06
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : SAM PT 25 NEAR TRASH COMPACTOR

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



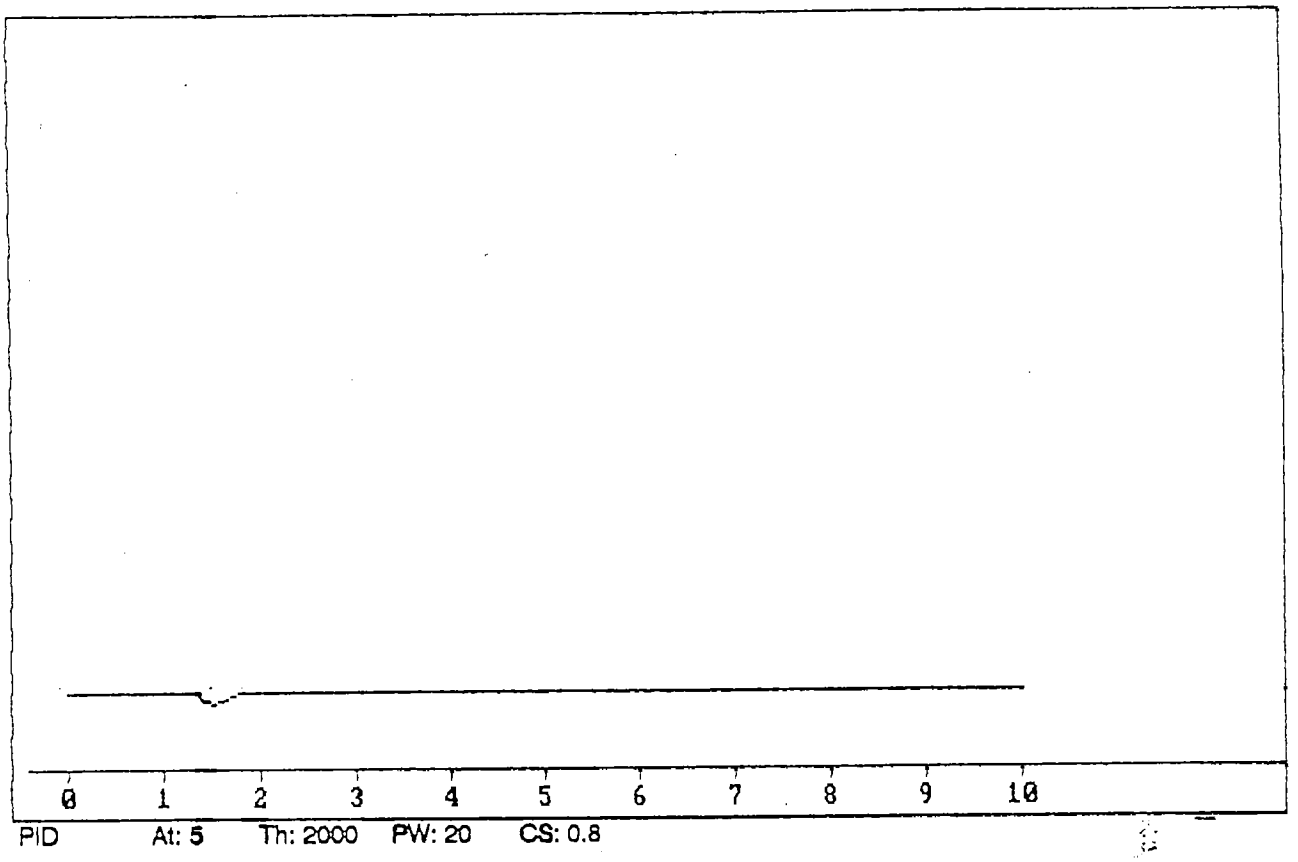
Peak Report

Time 09:52:40 Date 4/17/1992
Data File: DOWCT07
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : SAMPLE PT 26 UNDER SHED NR WOOD

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



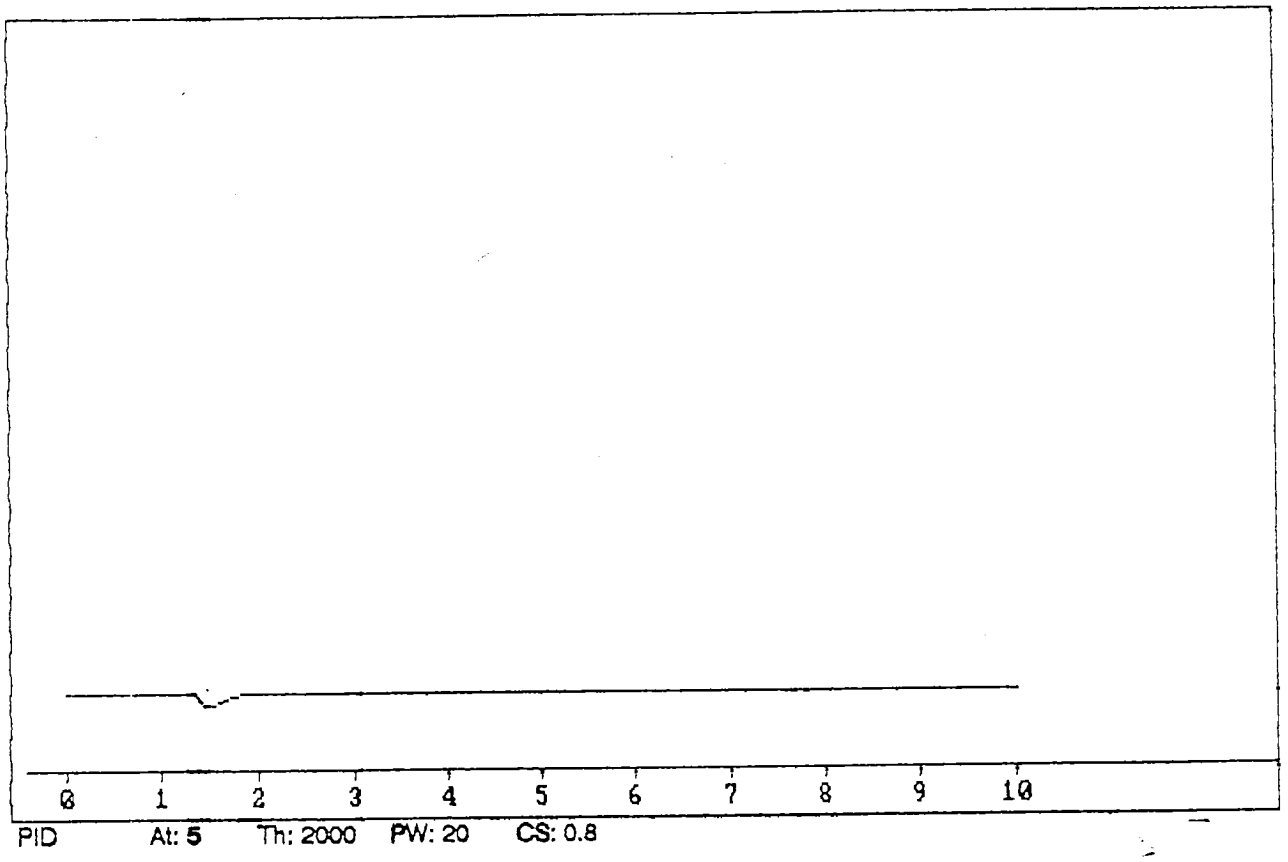
Peak Report

Time 10:05:48 Date 4/17/1992
Data File: DOWCT08
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : SAMPLE PT 27 NEAR CHIMNEY BASE

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



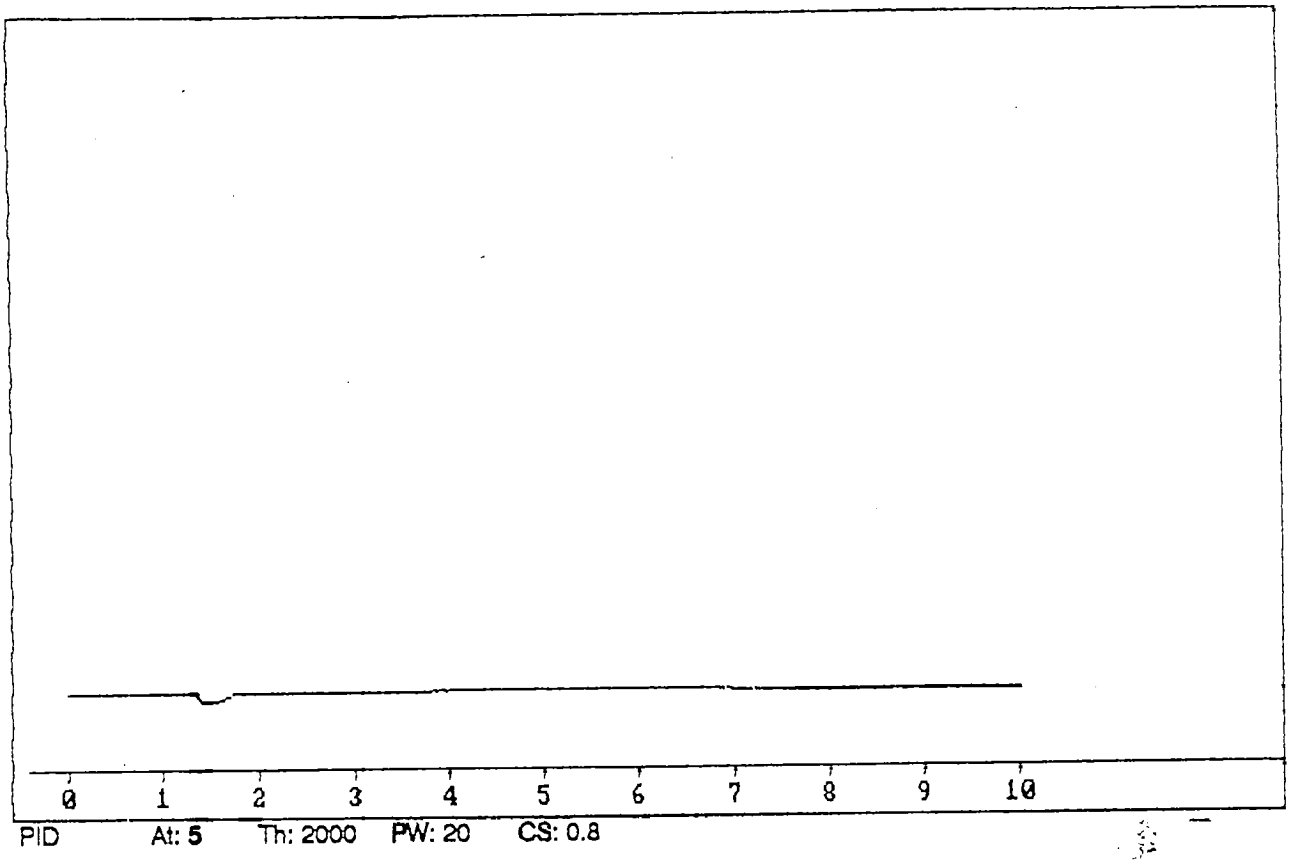
Peak Report

Time 10:25:16 Date 4/17/1992
Data File: DOWCT09
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



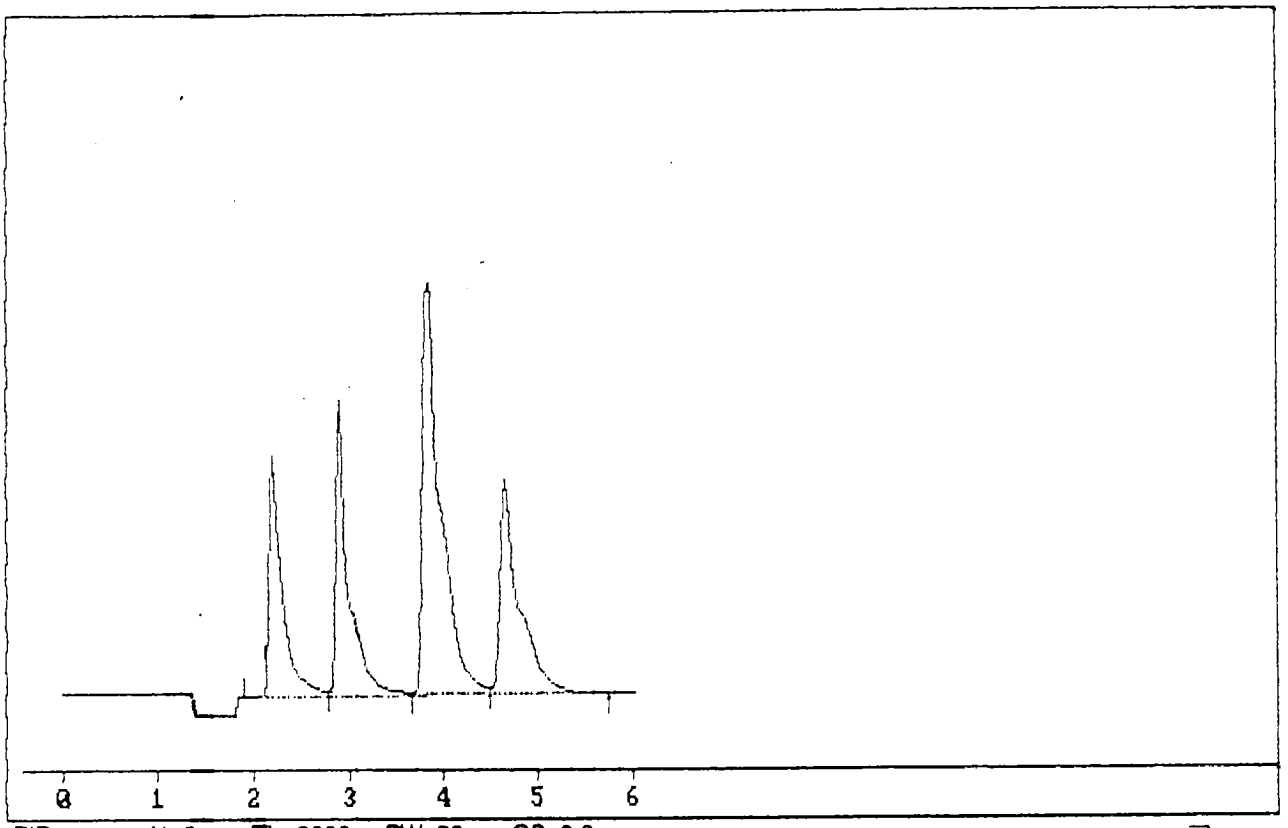
Peak Report

Time 10:37:33 Date 4/17/1992
Data File: DOWCT10
Method File: DOWCRAFT
Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
Sample remarks : SP NO 29 IN ALLEY ON JT CONT SIDE

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION

No peaks detected.



Peak Report

Time 10:49:17 Date 4/17/1992

Data File: DOWCT11

Method File: DOWCRAFT

Method remarks : EMPIRE DOWCRAFT SOIL GAS SURVEY 4/17/92
PM RETENTION CHECK

Ch 1 Detector: PID

NUMBER	RET. TIME	AREA	HEIGHT	IDENTIFIER	CONCENTRATION
1	00:02:09	4.879E+06	5.084E+05	TRA 12-DCE	1086
2	00:02:51	5.895E+06	6.329E+05	CIS 12-DCE	841.3
3	00:03:49	1.177E+07	8.612E+05	BENZENE	708.1
4	00:04:38	6.222E+06	4.460E+05	TCE	638.6

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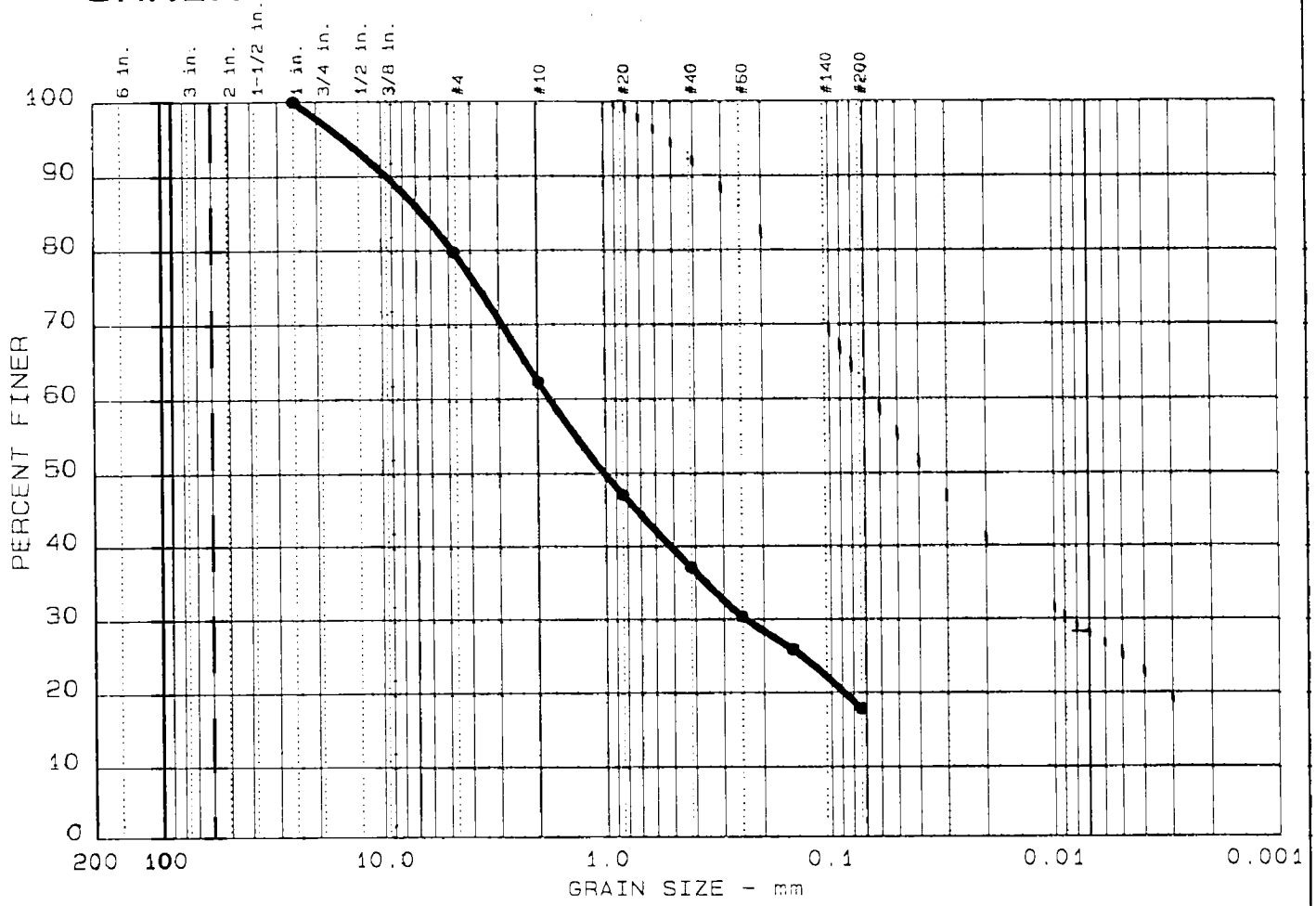
APPENDIX E

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	20.2	62.0	17.8	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			6.53	1.78	1.01	0.240				

MATERIAL DESCRIPTION	USCS	AASHTO
● F-C SAND with Little GRAVEL, Little SILT		

Project No.: BTA-92-266
Project: Dowcraft Pumping Wells
● Location: PW - 1U Composite

Date: 12/16/92

Remarks:
Sample collected by Empire Soils

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Figure No. 1

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 2

Date: 12/16/92
Project No.: BTA-92-266
Project: Dowcraft Pumping Wells

Sample Data

Location of Sample: PW - 1U Composite
Sample Description: F-C SAND with Little GRAVEL, Little SILT
USCS Class: Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Sample collected by Empire Soils

Fig. No.: 1

Mechanical Analysis Data

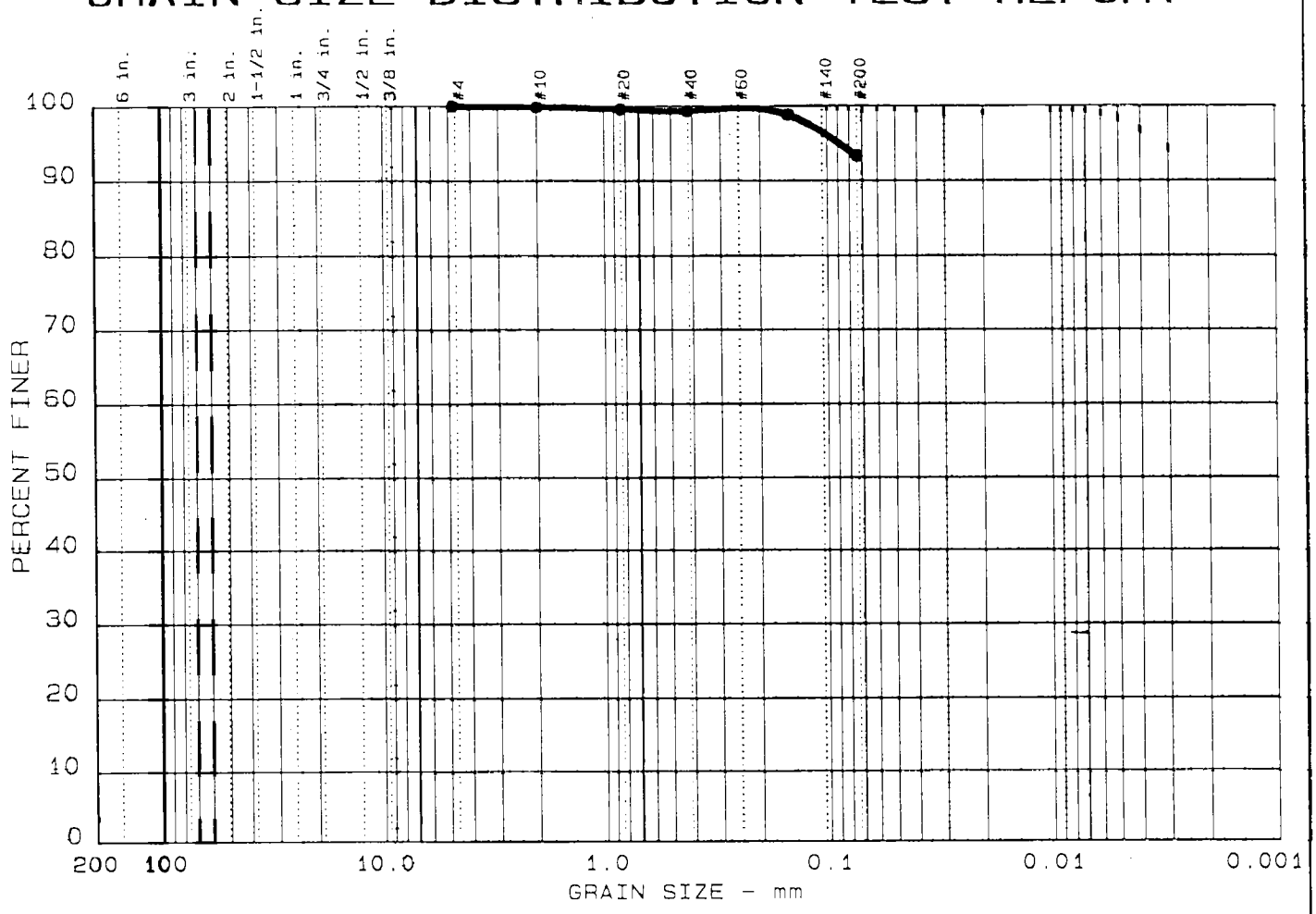
Sieve	Size, mm	Percent finer
1 inches	25.40	100.0
4	4.760	79.8
# 10	2.000	62.3
# 20	0.840	47.0
# 40	0.420	37.1
# 60	0.250	30.4
# 100	0.149	25.9
# 200	0.074	17.8

Fractional Components

% + 3 in. = 0.0 % GRAVEL = 20.2 % SAND = 62.0
% FINES = 17.8

D85= 6.53 D60= 1.778 D50= 1.012
D30= 0.2399

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	6.7	93.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●										

MATERIAL DESCRIPTION	USCS	AASHTO
● SILT or CLAY with Trace SAND		

Project No.: BTA-92-266
Project: Dowcraft Pumping Wells
● Location: PW - 1L Composite

Date: 12/16/92

Remarks:
Sample collected by Empire Soils

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Figure No. 2

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 1

Date: 12/16/92
Project No.: BTA-92-266
Project: Dowcraft Pumping Wells

Sample Data

Location of Sample: PW - 1L Composite
Sample Description: SILT or CLAY with Trace SAND
USCS Class: Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Sample collected by Empire Soils

Fig. No.: 2

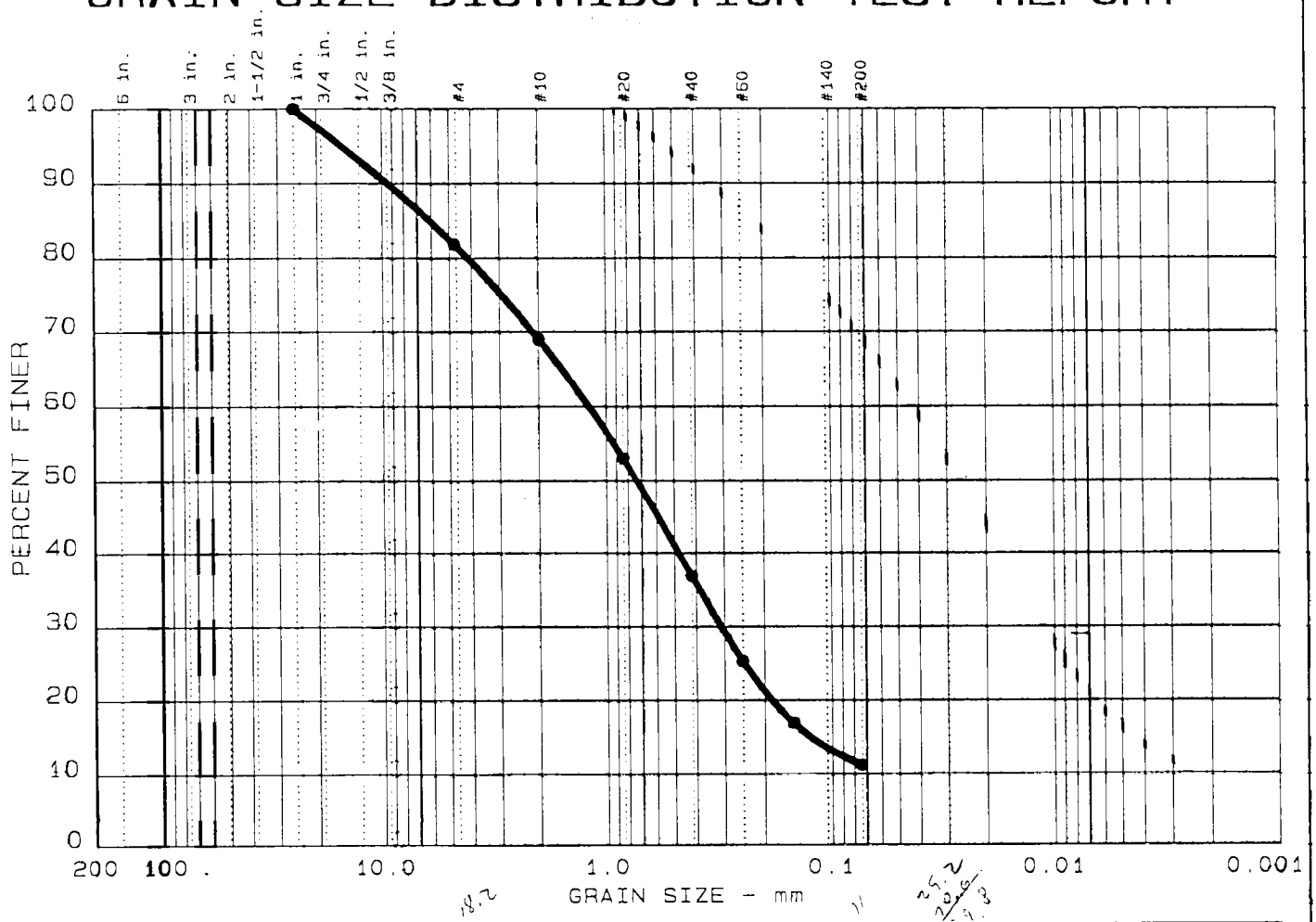
Mechanical Analysis Data

Sieve	Size, mm	Percent finer
# 4	4.760	100.0
# 10	2.000	99.9
# 20	0.840	99.6
# 40	0.420	99.3
# 100	0.149	98.8
# 200	0.074	93.3

Fractional Components

% + 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 6.7
% FINES = 93.3

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	2	0.0	18.2	70.6	11.2	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●			6.10	1.19	0.73	0.312	0.1242			

	MATERIAL DESCRIPTION	USCS	AASHTO
●	F-C SAND with Little GRAVEL, Little SILT		

Project No.: BTA-92-266
Project: Dowcraft Pumping Wells
● Location: PW - 2U Composite

Date: 12/16/92

Remarks:
Sample collected by Empire Soils

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Figure No. 3

GRAIN SIZE DISTRIBUTION TEST DATA — Test No.: 2

Date: 12/16/92
Project No.: BTA-92-266
Project: Dowcraft Pumping Wells

Sample Data

Location of Sample: PW - 2U Composite
Sample Description: F-C SAND with Little GRAVEL, Little SILT
USCS Class: Liquid limit:
AASHTO Class: Plasticity index:

Notes

Remarks: Sample collected by Empire Soils

Fig. No.: 3

Mechanical Analysis Data

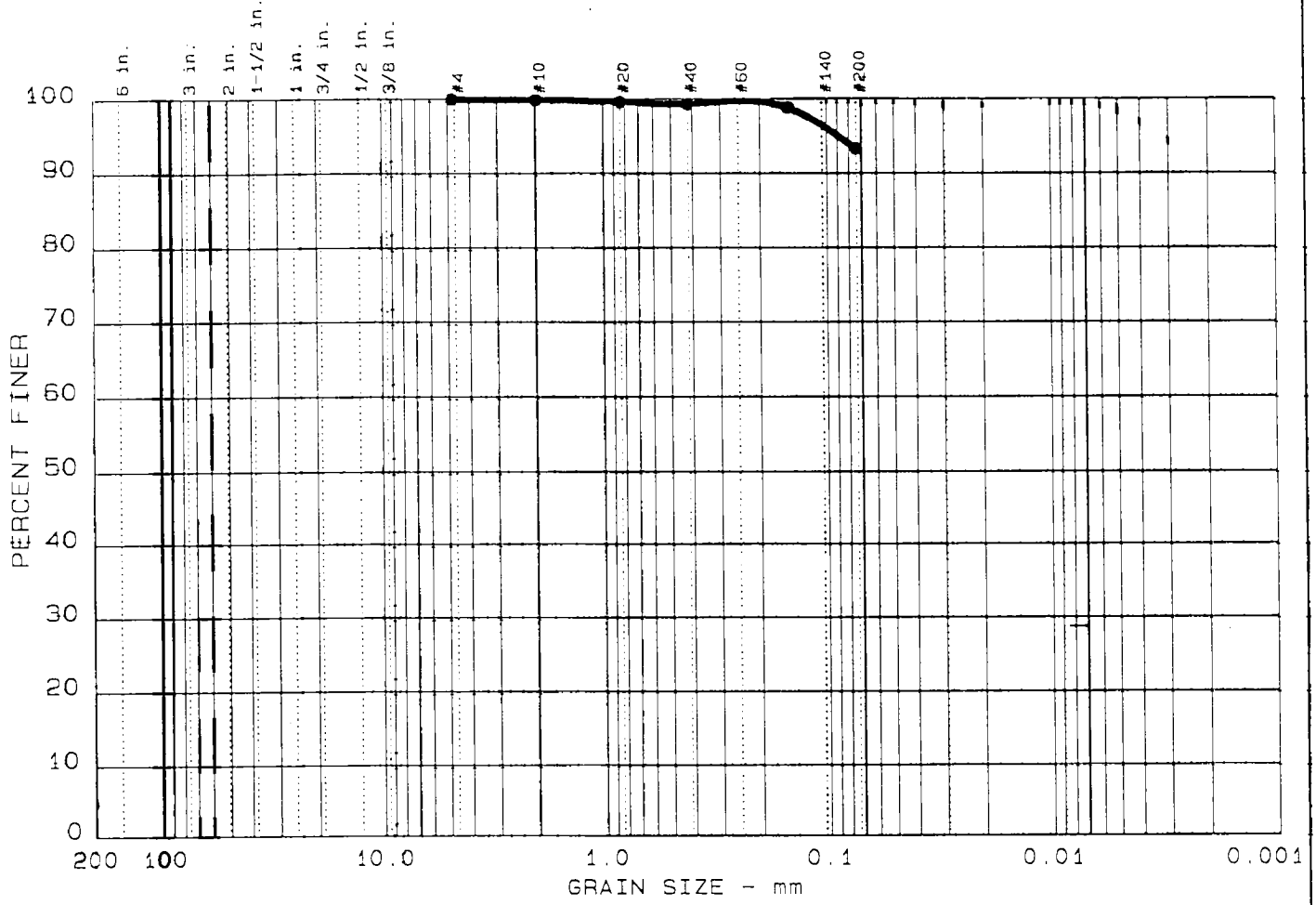
Sieve	Size, mm	Percent finer
1 inches	25.40	100.0
# 4	4.760	81.8
# 10	2.000	69.0
# 20	0.840	53.0
# 40	0.420	36.9
# 60	0.250	25.3
# 100	0.149	16.9
# 200	0.074	11.2

Fractional Components

% + 3 in. = 0.0 % GRAVEL = 18.2 % SAND = 70.6
% FINES = 11.2

D85= 6.10 D60= 1.189 D50= 0.732
D30= 0.3119 D15= 0.12417

GRAIN SIZE DISTRIBUTION TEST REPORT



	Test	%+75mm	% GRAVEL	% SAND	% SILT	% CLAY
●	1	0.0	0.0	6.7	93.3	

	LL	PI	D_{85}	D_{60}	D_{50}	D_{30}	D_{15}	D_{10}	C_c	C_u
●										

MATERIAL DESCRIPTION	USCS	AASHTO
● SILT or CLAY with Trace SAND		

Project No.: BTA-92-266
Project: Dowcraft Pumping Wells
● Location: PW - 2L Composite of S-8, and S-9
24'-26' 26'-28'
S, T-S
Date: -1

Remarks:
Sample collected
by Empire Soils

GRAIN SIZE DISTRIBUTION TEST REPORT

EMPIRE SOILS INVESTIGATIONS, INC.

Figure No. 4

GRAIN SIZE DISTRIBUTION TEST DATA Test No.: 1

ate: -1
roject No.: BTA-92-266
Project: Dowcraft Pumping Wells

Sample Data

Location of Sample: PW - 2L Composite of S-8, and S-9
Sample Description: SILT or CLAY with Trace SAND
SCS Class: Liquid limit:
ASHTO Class: Plasticity index:

Notes

Remarks: Sample collected by Empire Soils

ig. No.: 4

Mechanical Analysis Data

ieve	Size, mm	Percent finer
# 4	4.760	100.0
# 10	2.000	99.9
# 20	0.840	99.6
# 40	0.420	99.3
# 100	0.149	98.8
# 200	0.074	93.3

Fractional Components

+ 3 in. = 0.0 % GRAVEL = 0.0 % SAND = 6.7
% FINES = 93.3

Huntingdon

APPENDIX F

ENVIRONMENTAL ANALYTICAL REPORT

REPORT NUMBER: 93-0225

PREPARED FOR:

EMPIRE SOILS INVESTIGATIONS, INC.
S-5167 S. PARK AVENUE
HAMBURG, NEW YORK 14075

RE: BTA-92-226; DOWCRAFT

PREPARED BY:

HUNTINGDON ANALYTICAL SERVICES
DIVISION OF EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 250
MIDDLEPORT, NEW YORK 14105
TELEPHONE: 716/735-3400; FAX: 716/735-3653

MARCH 2, 1993

Huntingdon
Analytical Laboratory
Analytical Services Division

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

REPORT NUMBER: 93-0225

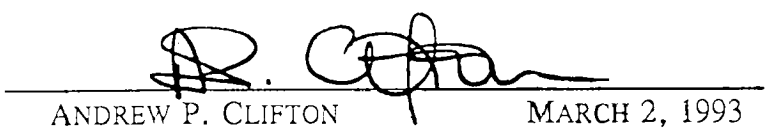
STATEMENT OF WORK PERFORMED

I HEREBY DECLARE THAT THE WORK WAS PERFORMED UNDER MY SUPERVISION ACCORDING TO THE PROCEDURES OUTLINED BY THE FOLLOWING REFERENCES AND THAT THIS REPORT PROVIDES A CORRECT AND FAITHFUL RECORD OF THE RESULTS OBTAINED.

- 40 CFR PART 136, "GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS UNDER THE CLEAN WATER ACT", OCTOBER 26, 1984 (FEDERAL REGISTER) U. S. ENVIRONMENTAL PROTECTION AGENCY.

- U.S. ENVIRONMENTAL PROTECTION AGENCY, "TEST METHODS OF EVALUATING SOLID WASTE - PHYSICAL/CHEMICAL METHODS", OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, SW-846, 2ND EDITION AND 3RD EDITION.

THIS REPORT CONTAINS ANALYTICAL DATA BASED ON OUR EXAMINATION OF THE SAMPLE(S) PRESENTED TO US. THIS REPORT CONTAINS (EXCEPT WHERE EXPLICITLY STATED) A COMPLETE ACCOUNT OF THE ANALYSES REQUESTED TO BE PERFORMED ON THE SAMPLE(S). INFORMATION WHICH WAS NOT REQUESTED TO BE REPORTED IS NOT INCLUDED.



ANDREW P. CLIFTON MARCH 2, 1993
ENVIRONMENTAL LABORATORY DIRECTOR

REPORT CODE LEGEND:

<DL	= LESS THAN DETECTION LIMIT
ND	= NOT DETECTED
NA	= NOT APPLICABLE
INP	= INFORMATION NOT PROVIDED
MB	= METHOD BLANK

Huntingdon
Analytical Laboratory

Analytical Services Division

HUNTINGDON ANALYTICAL SERVICES

Analyte: ALUMINUM (TOTAL)

Date Sampled : 2/11/93
Date Prepared: 2/23/93

SAMPLE ID: HAS #	CLIENT	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/L)	RESULT ug/L	
93-0225-03	ESI-9	6010	2/26/93	30.0	6,470	*95
93-0225-04	PW-2	6010	2/26/93	30.0	7,520	*95
93-0225-05	PW-2	6010	2/26/93	30.0	847	*95
93-0225-06	PW-2	6010	2/26/93	30.0	1,170	*95
93-0225-07	PW-1	6010	2/26/93	150.0	61,500	*95
93-0225-08	PW-1	6010	2/26/93	30.0	10,100	*95

HUNTINGDON ANALYTICAL SERVICES

Analyte: IRON (TOTAL)

Date Sampled : 2/11/93
Date Prepared: 2/23/93

SAMPLE ID: HAS #	CLIENT	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/L)	RESULT ug/L
93-0225-03	ESI-9	6010	2/26/93	20.0	5,550
93-0225-04	PW-2	6010	2/26/93	20.0	16,100
93-0225-05	PW-2	6010	2/26/93	20.0	1,610
93-0225-06	PW-2	6010	2/26/93	20.0	2,760
93-0225-07	PW-1	6010	2/26/93	100.0	133,000
93-0225-08	PW-1	6010	2/26/93	20.0	22,400

HUNTINGDON ANALYTICAL SERVICES

Analyte: MANGANESE (TOTAL)

Date Sampled : 2/11/93
Date Prepared: 2/23/93

SAMPLE ID: HAS #	CLIENT	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/L)	RESULT ug/L
93-0225-03	ESI-9	6010	2/26/93	10.0	326
93-0225-04	PW-2	6010	2/26/93	10.0	2,850
93-0225-05	PW-2	6010	2/26/93	10.0	940
93-0225-06	PW-2	6010	2/26/93	10.0	900
93-0225-07	PW-1	6010	2/26/93	50.0	5,100
93-0225-08	PW-1	6010	2/26/93	10.0	1,690

HUNTINGDON ANALYTICAL SERVICES

Analyte: ALUMINUM (DISSOLVED)

Date Sampled : 2/11/93
Date Prepared: 2/23/93

SAMPLE ID: HAS #	CLIENT	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/L)	RESULT ug/L
93-0225-03	ESI-9	6010	2/26/93	30.0	<30
93-0225-04	PW-2	6010	2/26/93	30.0	46
93-0225-05	PW-2	6010	2/26/93	30.0	33
93-0225-06	PW-2	6010	2/26/93	30.0	<30
93-0225-07	PW-1	6010	2/26/93	30.0	35
93-0225-08	PW-1	6010	2/26/93	30.0	53

HUNTINGDON ANALYTICAL SERVICES

Analyte: IRON (DISSOLVED)

Date Sampled : 2/11/93
Date Prepared: 2/23/93

SAMPLE ID: HAS #	CLIENT	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/L)	RESULT ug/L
93-0225-03	ESI-9	6010	2/26/93	20.0	43
93-0225-04	PW-2	6010	2/26/93	20.0	80
93-0225-05	PW-2	6010	2/26/93	20.0	47
93-0225-06	PW-2	6010	2/26/93	20.0	79
93-0225-07	PW-1	6010	2/26/93	20.0	67
93-0225-08	PW-1	6010	2/26/93	20.0	98

HUNTINGDON ANALYTICAL SERVICES

Analyte: MANGANESE (DISSOLVED)

Date Sampled : 2/11/93
Date Prepared: 2/23/93

SAMPLE ID: HAS #	CLIENT	EPA METHOD	DATE ANALYZED	DET.LIMIT (ug/L)	RESULT ug/L
93-0225-03	ESI-9	6010	2/26/93	10.0	11
93-0225-04	PW-2	6010	2/26/93	10.0	2,240
93-0225-05	PW-2	6010	2/26/93	10.0	831
93-0225-06	PW-2	6010	2/26/93	10.0	893
93-0225-07	PW-1	6010	2/26/93	10.0	1,480
93-0225-08	PW-1	6010	2/26/93	10.0	1,140

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

EPA METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	EFFLUENT	ESI-6	PW-2 2/10/93 10:44	PW-2 2/11/93 06:30	PW-2 2/11/93 14:22	
HAS SAMPLE #930225	01	02	04	05	06	
COMPOUND	RESULT ug/L	RESULT ug/L	RESULT ug/L	RESULT ug/L	RESULT ug/L	DL ug/L
CHLOROMETHANE	<10	<10	<10	<10	<10	<10
BROMOMETHANE	<10	<10	<10	<10	<10	<10
VINYL CHLORIDE	<10	36	11	<10	<10	<10
CHLOROETHANE	<10	<10	<10	<10	<10	<10
METHYLENE CHLORIDE	<10	<10	<10	<10	<10	<10
ACETONE	<10	<10	<10	<10	<10	<10
TRICHLOROFLUOROMETHANE	<10	<10	<10	<10	<10	<10
CARBON DISULFIDE	<10	<10	<10	<10	<10	<10
1,1-DICHLOROETHENE	<10	<10	<10	<10	<10	<10
1,1-DICHLOROETHANE	<10	<10	<10	<10	<10	<10
1,2-DICHLOROETHENE (TOTAL)	<10	1,900	410	190	190	<10
CHLOROFORM	<10	<10	<10	<10	<10	<10
1,2-DICHLOROETHANE	<10	<10	<10	<10	<10	<10
2-BUTANONE	<10	<10	<10	<10	<10	<10
1,1,1-TRICHLOROETHANE	<10	<10	18	16	15	<10
CARBON TETRACHLORIDE	<10	<10	<10	<10	<10	<10
VINYL ACETATE	<10	<10	<10	<10	<10	<10
BROMODICHLOROMETHANE	<10	<10	<10	<10	<10	<10
1,2-DICHLOROPROPANE	<10	<10	<10	<10	<10	<10
cis-1,3-DICHLOROPROPENE	<10	<10	<10	<10	<10	<10
TRICHLOROETHENE	<10	14,000	22,000	20,000	19,000	<10
DIBROMOCHLOROMETHANE	<10	<10	<10	<10	<10	<10
1,1,2-TRICHLOROETHANE	<10	<10	<10	<10	<10	<10
BENZENE	<10	<10	<10	<10	<10	<10
trans-1,3-DICHLOROPROPENE	<10	<10	<10	<10	<10	<10
2-CHLOROETHYLVINYL ETHER	<10	<10	<10	<10	<10	<10
BROMOFORM	<10	<10	<10	<10	<10	<10
4-METHYL-2-PENTANONE	<10	<10	<10	<10	<10	<10
2-HEXANONE	<10	<10	<10	<10	<10	<10
TETRACHLOROETHENE	<10	17	76	58	54	<10
1,1,2,2-TETRACHLOROETHANE	<10	<10	<10	<10	<10	<10
TOLUENE	<10	<10	<10	<10	<10	<10
CHLOROBENZENE	<10	<10	<10	<10	<10	<10
ETHYL BENZENE	<10	<10	<10	<10	<10	<10
STYRENE	<10	<10	<10	<10	<10	<10
XYLENE (TOTAL)	<10	<10	<10	<10	<10	<10
1,3-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
DATE SAMPLED:	2-11-93	2-10-93	2-10-93	2-11-93	2-11-93	
DATE RECEIVED:	2-12-93	2-12-93	2-12-93	2-12-93	2-12-93	
DATE ANALYZED:	2-16-93	2-16-93	2-16-93	2-16-93	2-16-93	

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

EPA METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	PW-1 2/9/93 3:30	PW-1 2/9/93 5:39	METHOD BLANK
HAS SAMPLE #930225	07	08	---

COMPOUND	RESULT ug/L	RESULT ug/L	RESULT ug/L	DL ug/L
CHLOROMETHANE	<10	<10	<10	<10
BROMOMETHANE	<10	<10	<10	<10
VINYL CHLORIDE	<10	<10	<10	<10
CHLOROETHANE	<10	<10	<10	<10
METHYLENE CHLORIDE	<10	<10	<10	<10
ACETONE	<10	<10	<10	<10
TRICHLOROFLUOROMETHANE	<10	<10	<10	<10
CARBON DISULFIDE	<10	<10	<10	<10
1,1-DICHLOROETHENE	<10	<10	<10	<10
1,1-DICHLOROETHANE	<10	<10	<10	<10
1,2-DICHLOROETHENE (TOTAL)	180	160	<10	<10
CHLOROFORM	<10	<10	<10	<10
1,2-DICHLOROETHANE	<10	<10	<10	<10
2-BUTANONE	<10	<10	<10	<10
1,1,1-TRICHLOROETHANE	<10	<10	<10	<10
CARBON TETRACHLORIDE	<10	<10	<10	<10
VINYL ACETATE	<10	<10	<10	<10
BROMODICHLOROMETHANE	<10	<10	<10	<10
1,2-DICHLOROPROPANE	<10	<10	<10	<10
cis-1,3-DICHLOROPROPENE	<10	<10	<10	<10
TRICHLOROETHENE	5,900	8,100	<10	<10
DIBROMOCHLOROMETHANE	<10	<10	<10	<10
1,1,2-TRICHLOROETHANE	<10	<10	<10	<10
BENZENE	<10	<10	<10	<10
trans-1,3-DICHLOROPROPENE	<10	<10	<10	<10
2-CHLOROETHYLVINYL ETHER	<10	<10	<10	<10
BROMOFORM	<10	<10	<10	<10
4-METHYL-2-PENTANONE	<10	<10	<10	<10
2-HEXANONE	<10	<10	<10	<10
TETRACHLOROETHENE	<10	<10	<10	<10
1,1,2,2-TETRACHLOROETHANE	<10	<10	<10	<10
TOLUENE	<10	<10	<10	<10
CHLOROBENZENE	<10	<10	<10	<10
ETHYL BENZENE	<10	<10	<10	<10
STYRENE	<10	<10	<10	<10
XYLENE (TOTAL)	<10	<10	<10	<10
1,3-DICHLOROBENZENE	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10
DATE SAMPLED:	2-09-03	2-09-03	---	
DATE RECEIVED:	2-12-93	2-12-93	---	
DATE ANALYZED:	2-16-93	2-16-93	2-16-93	

EMPIRE SOILS INVESTIGATIONS, INC.

HUNTINGDON ANALYTICAL SERVICES - CHAIN-OF-CUSTODY RECORD AND ANALYTICAL REQUEST FORM

PAGE OF

Client Name: Empire Soils Inc.
Address: ~~5-15167 South Park~~ ~~Hamburg, NY 14075~~

Client Contact: K. Shanahan
Phone: 649-8110

HAS Quote #
P.O. #

Project No.: BTA 92266
Project/Site Name: Dowcraft
Sampler's Signature: Kevin J. Shanahan
HAS Ref. No. ~~92-RR~~ 93-0225

Sample I.D.	Date	Time	Comp or Grab	Sample Location	HAS Seq. #	MTRIX	No. of Cont.	Container Size & Type: 40ml VOA's	500ml plastic	Analysis Requested/Remarks: 40ml VOA	500ml plastic
Effluent	2/11/93	14:25	G	Carbon Effluent	01 A+B	W	2	2		TCL Volatiles	—
ESI-6	2/10/93	0919	G	ESI-6	02	W	2	2		" "	—
ESI-9	2/11/93	1945	G	ESI-9	03	W	2		2		Al, Fe, Mn
PW-2	2/10/93	~~0630~~ 1044	G	PW-2	04	W	4	2	2	TCL Volatiles A+B	Al, Fe, Mn
PW-2	2/11/93	0630	G	PW-2	05	W	4	2	2	"	"
PW-2	2/11/93	1422	G	PW-2	06	W	4	2	2	"	"
PW-1	2/9/93	3:30	G	PW-1	07	W	4	2	2	"	"
PW-1	2/9/93	5:39	G	PW-1	08 MS	W	4	2	2	"	"

Relinquished by: Kevin J. Shanahan — Date/Time: 2/12/93 10am — Received by: Karen Kremer — 11:20
Relinquished by: — Date/Time: — Received for Lab by: Tim Larson — Date/Time: 2/12/93 1230
Relinquished by: Karen Kremer — Date/Time: 2/12/93 12:30 — Received by: — Date/Time: 2/12/93 12:30

Remarks: TOTAL + DISSOLVED METALS

C:\QPRO\COC

ENVIRONMENTAL ANALYTICAL REPORT

REPORT NUMBER 92-631

PREPARED FOR:

EMPIRE SOILS INVESTIGATIONS, INC.
S-5167 S. PARK AVENUE
HAMBURG, NEW YORK 14075

RE: BTA-92, DOWCRAFT

PREPARED BY:

HUNTINGDON ANALYTICAL SERVICES
DIVISION OF EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 250
MIDDLEPORT, NEW YORK 14105

MAY 1, 1992

HAS

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

REPORT NUMBER 92-631

STATEMENT OF WORK PERFORMED

I HEREBY DECLARE THAT THE WORK WAS PERFORMED UNDER MY SUPERVISION ACCORDING TO THE PROCEDURES OUTLINED BY THE FOLLOWING REFERENCES AND THAT THIS REPORT PROVIDES A CORRECT AND FAITHFUL RECORD OF THE RESULTS OBTAINED.

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- U.S. ENVIRONMENTAL PROTECTION AGENCY, "TEST METHODS OF EVALUATING SOLID WASTE - PHYSICAL/CHEMICAL METHODS", OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, SW-846, 2ND EDITION AND 3RD EDITION.

- NEW YORK STATE DEPARTMENT OF HEALTH, ANALYTICAL TOXICOLOGY LABORATORY HANDBOOK, AUGUST 1982.

Richard J. Ronan

RICHARD J. RONAN, PH.D. MAY 1, 1992
LABORATORY DIRECTOR, ENVIRONMENTAL

REPORT CODE LEGEND:

<DL	= LESS THAN DETECTION LIMIT
ND	= NOT DETECTED
NA	= NOT APPLICABLE
INP	= INFORMATION NOT PROVIDED
MB	= METHOD BLANK

HAS

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

Inorganic Wet Chemical Analyses

Analyte: pH

EPA Method No.: 150.1

Sample Date	HAS Sample #92-	Client I.D.	Date Prepared	Date Analyzed	Method Detection Limit	Result	Units	QC in %
4/16/92	631-001	ESI-10	4/21/92	4/21/92	0.10	7.02	S.U.	95**
4/16/92	631-002	ESI-11	4/21/92	4/21/92	0.10	7.39	S.U.	95**
4/16/92	631-003	ESI-12	4/21/92	4/21/92	0.10	7.34	S.U.	95**
4/16/92	631-004	ESI-20	4/21/92	4/21/92	0.10	7.93	S.U.	95** <1***
4/16/92	631-005	ESI-2	4/21/92	4/21/92	0.10	7.30	S.U.	95**
4/16/92	631-006	ESI-3	4/21/92	4/21/92	0.10	7.46	S.U.	95**
4/16/92	631-007	ESI-4	4/21/92	4/21/92	0.10	7.51	S.U.	95**

** This indicates that a 95% confidence limit was achieved with an EPA Quality Control Check analyzed with this sample.

*** This sample was analyzed in duplicate with the RPD indicated above.

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

Inorganic Wet Chemical Analyses

Analyte: pH

EPA Method No.: 150.1

Sample Date	HAS Sample #92-	Client I.D.	Date Prepared	Date Analyzed	Method Detection Limit	Result	Units	QC in %
4/16/92	631-008	ESI-5	4/21/92	4/21/92	0.10	7.77	S.U.	95**
							—	
4/16/92	631-009	ESI-9	4/21/92	4/21/92	0.10	7.56	S.U.	95**
4/16/92	631-010	ESI-8	4/21/92	4/21/92	0.10	7.23	S.U.	95**
4/16/92	631-011	ESI-1	4/21/92	4/21/92	0.10	7.27	S.U.	95**
4/16/92	631-012	ESI-7	4/21/92	4/21/92	0.10	7.48	S.U.	95**
4/16/92	631-013	ESI-6	4/21/92	4/21/92	0.10	7.49	S.U.	95**
								<1***
4/16/92	631-014	ESI-13	4/21/92	4/21/92	0.10	7.14	S.U.	95**

** This indicates that a 95% confidence limit was achieved with an EPA Quality Control Check analyzed with this sample.

*** This sample was analyzed in duplicate with the RPD indicated above.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-10
HAS Sample #92-0631-001
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	0.05	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.13	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	55.1	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	1.07	*95
LEAD	7421	4/23/92	4/28/92	0.005	<DL	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	5.82	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	1.04	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	4.27	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	25.1	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-11
HAS Sample #92-0631-002
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	3.27	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.18	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	66.9	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	6.45	*95
LEAD	7421	4/23/92	4/28/92	0.01	<DL	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	8.66	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	1.12	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	5.8	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	27.2	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-12
HAS Sample #92-0631-003
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	3.29	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	0.01	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.11	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	48.5	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	4.92	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.009	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	8.20	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.08	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	3.8	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	25.5	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-2D
HAS Sample #92-0631-004
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	0.62	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.13	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	60.1	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	0.73	*95
LEAD	7421	4/23/92	4/28/92	0.005	<DL	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	11.4	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.52	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	21.6	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	21.5	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-2
HAS Sample #92-0631-005
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	1.71	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.13	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	88.2	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	0.04	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	2.64	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.010	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	11.7	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.12	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	5.65	*95
SELENIUM**	7740	4/23/92	4/27/92	0.005	0.008	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	45.7	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.
**SELENIUM POST SPIKES WERE OUT OF RANGE FOR THIS SAMPLE. IT WILL BE REANALYZED AND AN AMENDED REPORTED FORWARDED.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-3
HAS Sample #92-0631-006
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	7.01	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.17	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	76.1	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	0.05	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	0.03	*95
IRON	6010	4/23/92	4/27/92	0.02	10.2	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.040	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	11.5	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.52	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	5.8	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	33.2	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	0.09	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-4
HAS Sample #92-0631-007
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	0.65	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.08	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	65.5	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	0.25	*95
LEAD	7421	4/23/92	4/28/92	0.005	<DL	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	8.73	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.01	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	4.3	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	36.4	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-5
HAS Sample #92-0631-008
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	1.08	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.10	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	53.7	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	1.07	*95
LEAD	7421	4/23/92	4/28/92	0.005	<DL	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	7.43	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.06	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	3.1	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	14.7	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-9
HAS Sample #92-0631-009
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	3.33	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.10	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	71.2	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	3.55	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.008	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	11.0	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.17	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	4.1	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	22.5	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-8
HAS Sample #92-0631-010
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	7.70	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.19	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	44.8	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	8.18	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.011	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	5.41	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.59	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	5.0	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	26.4	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	0.03	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT - ESI-1
HAS Sample #92-0631-011
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	MS %REC	MSD %REC	RPD
ALUMINUM	6010	4/23/92	4/27/92	0.03	1.03	*95		
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95		
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	104	104	<1.0
BARIUM	6010	4/23/92	4/27/92	0.01	0.08	87.1	89.1	2.1
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95		
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95		
CALCIUM	6010	4/23/92	4/27/92	0.02	63.8	*95		
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95		
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95		
COPPER	6010	4/23/92	4/27/92	0.01	<DL	80.0	86.0	7.2
IRON	6010	4/23/92	4/27/92	0.02	1.57	*95		
LEAD	7421	4/23/92	4/28/92	0.005	0.006	104	104	<1.0
MAGNESIUM	6010	4/23/92	4/27/92	0.04	6.69	*95		
MANGANESE	6010	4/23/92	4/27/92	0.01	0.18	*95		
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95	102	<1.0
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95		
POTASSIUM	6010	4/23/92	4/27/92	3.0	4.1	*95		
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95		
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95		
SODIUM	6010	4/23/92	4/27/92	0.05	38.2	*95		
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	90.6	91.2	<1.0
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95		
ZINC	6010	4/23/92	4/27/92	0.02	<DL	81.2	83.0	2.1

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-7
HAS Sample #92-0631-012
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	10.8	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.33	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	40.6	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	0.02	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	0.02	*95
IRON	6010	4/23/92	4/27/92	0.02	11.3	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.018	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	6.64	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	1.05	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	6.7	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	33.5	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	0.07	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-6
HAS Sample #92-0631-013
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	3.35	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	0.02	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.19	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	53.3	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	0.01	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	0.02	*95
IRON	6010	4/23/92	4/27/92	0.02	6.54	*95
LEAD	7421	4/23/92	4/28/92	0.01	0.02	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	9.66	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	4.43	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	4.6	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	37.4	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	0.02	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT - ESI-13
HAS Sample #92-0631-014
Date Sampled: 4/16/92

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	16.5	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	0.38	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	68.2	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	0.04	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	0.02	*95
IRON	6010	4/23/92	4/27/92	0.02	18.6	*95
LEAD	7421	4/23/92	4/28/92	0.005	0.03	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	13.8	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	0.61	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	7.3	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	223	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	0.10	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: METHOD BLANK
HAS Sample #92-0631-MB
Date Sampled: NA

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ALUMINUM	6010	4/23/92	4/27/92	0.03	<DL	*95
ANTIMONY	6010	4/23/92	4/27/92	0.05	<DL	*95
ARSENIC	7060	4/23/92	4/24/92	0.01	<DL	*95
BARIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
BERYLLIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CADMIUM	6010	4/23/92	4/27/92	0.005	<DL	*95
CALCIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
CHROMIUM	6010	4/23/92	4/27/92	0.01	<DL	*95
COBALT	6010	4/23/92	4/27/92	0.01	<DL	*95
COPPER	6010	4/23/92	4/27/92	0.01	<DL	*95
IRON	6010	4/23/92	4/27/92	0.02	<DL	*95
LEAD	7421	4/23/92	4/28/92	0.005	<DL	*95
MAGNESIUM	6010	4/23/92	4/27/92	0.04	<DL	*95
MANGANESE	6010	4/23/92	4/27/92	0.01	<DL	*95
MERCURY	7470	4/23/92	4/30/92	0.0002	<DL	*95
NICKEL	6010	4/23/92	4/27/92	0.04	<DL	*95
POTASSIUM	6010	4/23/92	4/27/92	3.0	<DL	*95
SELENIUM	7740	4/23/92	4/27/92	0.005	<DL	*95
SILVER	6010	4/23/92	4/27/92	0.01	<DL	*95
SODIUM	6010	4/23/92	4/27/92	0.05	<DL	*95
THALLIUM	7841	4/23/92	4/28/92	0.01	<DL	*95
VANADIUM	6010	4/23/92	4/27/92	0.02	<DL	*95
ZINC	6010	4/23/92	4/27/92	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

EPA METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION:	ESI-10	ESI-11	ESI-12	ESI-2D	ESI-2	ESI-3
HAS SAMPLE #92-631-	001	002	003	004	005	006
COMPOUND	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l
CHLOROMETHANE	<10	<10	<10	<10	<10	<10
BROMOMETHANE	<10	<10	<10	<10	<10	<10
VINYL CHLORIDE	160	87	<10	<10	<10	<10
CHLOROETHANE	<10	<10	<10	<10	<10	<10
METHYLENE CHLORIDE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
ACETONE	<10	<10	<10	<10	28	<10
TRICHLOROFLUOROMETHANE	<10	<10	<10	<10	<10	<10
CARBON DISULFIDE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-DICHLOROETHENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-DICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROETHENE (TOTAL)	590	620	160	<5.0	58	310
CHLOROFORM	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-BUTANONE	<10	<10	<10	<10	<10	<10
1,1,1-TRICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
CARBON TETRACHLORIDE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
VINYL ACETATE	<10	<10	<10	<10	<10	<10
BROMODICHLOROMETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROPROPANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,3-DICHLOROPROPENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TRICHLOROETHENE	87	590	650	100	340	2,800
DIBROMOCHLOROMETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-TRICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
BENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,3-DICHLOROPROPENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-CHLOROETHYLVINYL ETHER	<20	<20	<20	<20	<20	<20
BROMOFORM	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-METHYL-2-PENTANONE	<10	<10	<10	<10	<10	<10
2-HEXANONE	<10	<10	<10	<10	<10	<10
TETRACHLOROETHENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-TETRACHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TOLUENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
CHLOROBENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
ETHYL BENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
STYRENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
XYLENE (TOTAL)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
DATE SAMPLED:	4-16-92	4-16-92	4-16-92	4-16-92	4-16-92	4-16-92
DATE RECEIVED:	4-21-92	4-21-92	4-21-92	4-21-92	4-21-92	4-21-92
DATE ANALYZED:	4-27-92	4-27-92	4-27-92	4-27-92	4-27-92	4-27-92

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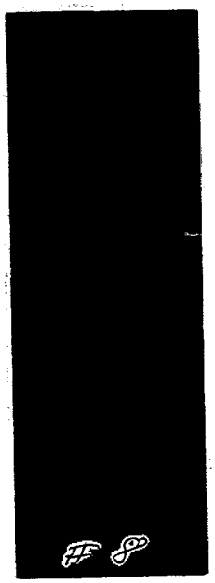
HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

EPA METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	ESI-4	ESI-5	ESI-9	ESI-8	ESI-1	ESI-7
HAS SAMPLE #92-631-	007	008	009	010	011	012
COMPOUND	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l
CHLOROMETHANE	<10	<10	<10	<10	<10	<10
BROMOMETHANE	<10	<10	<10	<10	<10	<10
VINYL CHLORIDE	<10	<10	<10	<10	<10	<10
CHLOROETHANE	<10	<10	<10	<10	<10	<10
METHYLENE CHLORIDE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
ACETONE	<10	<10	<10	<10	<10	<10
TRICHLOROFLUOROMETHANE	<10	<10	<10	<10	<10	<10
CARBON DISULFIDE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-DICHLOROETHENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1-DICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROETHENE (TOTAL)	<5.0	<5.0	<5.0	<5.0	<5.0	7.1
CHLOROFORM	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-BUTANONE	<10	<10	<10	<10	<10	<10
1,1,1-TRICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
CARBON TETRACHLORIDE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
VINYL ACETATE	<10	<10	<10	<10	<10	<10
BROMODICHLOROMETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROPROPANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
cis-1,3-DICHLOROPROPENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TRICHLOROETHENE	<5.0	<5.0	<5.0	<5.0	20	50
DIBROMOCHLOROMETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2-TRICHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
BENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
trans-1,3-DICHLOROPROPENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
2-CHLOROETHYLVINYL ETHER	<20	<20	<20	<20	<20	<20
BROMOFORM	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
4-METHYL-2-PENTANONE	<10	<10	<10	<10	<10	<10
2-HEXANONE	<10	<10	<10	<10	<10	<10
TETRACHLOROETHENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,1,2,2-TETRACHLOROETHANE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TOLUENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
CHLOROBENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
ETHYL BENZENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
STYRENE	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
XYLENE (TOTAL)	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
1,3-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10	<10	<10
DATE SAMPLED:	4-16-92	4-16-92	4-16-92	4-16-92	4-16-92	4-16-92
DATE RECEIVED:	4-21-92	4-21-92	4-21-92	4-21-92	4-21-92	4-21-92
DATE ANALYZED:	4-27-92	4-27-92	4-27-92	4-27-92	4-27-92	4-27-92



HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

EPA METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	ESI-6	ESI-13	METHOD BLANK
HAS SAMPLE #92-631-	013	014	—

COMPOUND	RESULT ug/l	RESULT ug/l	RESULT ug/l	MDL ug/l
CHLOROMETHANE	<10	<10	<10	<10
BROMOMETHANE	<10	<10	<10	<10
VINYL CHLORIDE	100	<10	<10	<10
CHLOROETHANE	<10	<10	<10	<10
METHYLENE CHLORIDE	<5.0	<5.0	<5.0	<5.0
ACETONE	<10	<10	<10	<10
TRICHLOROFLUOROMETHANE	<10	<10	<10	<10
CARBON DISULFIDE	<5.0	<5.0	<5.0	<5.0
1,1-DICHLOROETHENE	8.7	<5.0	<5.0	<5.0
1,1-DICHLOROETHANE	<5.0	12	<5.0	<5.0
1,2-DICHLOROETHENE (TOTAL)	1,900	<5.0	<5.0	<5.0
CHLOROFORM	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROETHANE	<5.0	<5.0	<5.0	<5.0
2-BUTANONE	<10	<10	<10	<10
1,1,1-TRICHLOROETHANE	5.0	51	<5.0	<5.0
CARBON TETRACHLORIDE	<5.0	<5.0	<5.0	<5.0
VINYL ACETATE	<10	<10	<10	<10
BROMODICHLOROMETHANE	<5.0	<5.0	<5.0	<5.0
1,2-DICHLOROPROPANE	<5.0	<5.0	<5.0	<5.0
cis-1,3-DICHLOROPROPENE	<5.0	<5.0	<5.0	<5.0
TRICHLOROETHENE	13,000	21	<5.0	20
DIBROMOCHLOROMETHANE	<5.0	<5.0	<5.0	<5.0
1,1,2-TRICHLOROETHANE	<5.0	<5.0	<5.0	<5.0
BENZENE	<5.0	<5.0	<5.0	<5.0
trans-1,3-DICHLOROPROPENE	<5.0	<5.0	<5.0	<5.0
2-CHLOROETHYLVINYL ETHER	<20	<20	<20	<20
BROMOFORM	<5.0	<5.0	<5.0	<5.0
4-METHYL-2-PENTANONE	<10	<10	<10	<10
2-HEXANONE	<10	<10	<10	<10
TETRACHLOROETHENE	13	5.0	<5.0	<5.0
1,1,2,2-TETRACHLOROETHANE	<5.0	<5.0	<5.0	<5.0
TOLUENE	<5.0	<5.0	<5.0	<5.0
CHLOROBENZENE	<5.0	<5.0	<5.0	<5.0
ETHYL BENZENE	<5.0	<5.0	<5.0	<5.0
STYRENE	<5.0	<5.0	<5.0	<5.0
XYLENE (TOTAL)	<5.0	<5.0	<5.0	<5.0
1,3-DICHLOROBENZENE	<10	<10	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<10	<10
DATE SAMPLED:	4-16-92	4-16-92	—	
DATE RECEIVED:	4-21-92	4-21-92	—	
DATE ANALYZED:	4-27-92	4-27-92	4-27-92	

HUNTINGDON ANALYTICAL SERVICES - CHAIN-OF-CUSTODY RECORD AND ANALYTICAL REQUEST FORM

Page ___ of ___

Client Name: Dowcraft Corporation
Address: 93 S. Dow St. FALCONER, N.Y.
Client Contact: Kevin Shanahan
Phone: 699-8110
HAS Quote #: ______
P.O. #: ______

Project No.: BTA-92-2
Project/Site Name: DOWCRAFT
Samplers (Signature): [signature]
HAS Ref.: 631

Sample I.D.	Date	Time	Comp.	Grab	Sample Location	HAS Seq. #	MATRIX	# of Containers	40 ml VOA	1000 ml PLASTIC	500 ml PLASTIC				Analysis Requested/ Remarks
ESI-10	4.16.92	10:45		X	SAME AS ID	001	W	4	2	1	1				TCL Volatiles, TAL Metals, pl
ESI-11	4.16.92	11:10		X		002	W	4	2	1	1				
ESI-12	4.16.92	11:40		X		003	W	4	2	1	1				
ESI-2D	4.16.92	12:20		X		004	W	4	2	1	1				
ESI-2	4.16.92	12:50		X		005	W	4	2	1	1				
ESI-3	4.16.92	1:20		X		006	W	4	2	1	1				
ESI-4	4.16.92	1:50		X		007	W	4	2	1	1				
ESI-5	4.16.92	2:25		X		008	W	4	2	1	1				
ESI-9	4.16.92	4:00		X		009	W	4	2	1	1				
ESI-8	4.16.92	4:40		X		010	W	4	2	1	1				
ESI-1	4.16.92	5:15		X		011	W	4	2	1	1				
ESI-7	4.16.92	5:50		X		012	W	4	2	1	1				
ESI-6	4.16.92	6:15		X		013	W	4	2	1	1				
ESI-13	4.16.92	6:40		X		014	W	4	2	1	1				

Relinquished by:	Date/ Time:	Received by:	Relinquished by:	Date/ Time:	Received By:
[signature] Zimmerman	4.16.92 9:[illegible]				

Relinquished by:	Date/ Time:	Received by:	Relinquished by:	Date/ Time:	Received By:

Relinquished by:	Date/ Time:	Received for Lab by:	Date/ Time:	Remarks:
		[signature]	4/17/92 [illegible]	

ENVIRONMENTAL ANALYTICAL REPORT

REPORT NUMBER 92-412

PREPARED FOR:

EMPIRE SOILS INVESTIGATIONS, INC.
S-5167 S. PARK AVENUE
HAMBURG, NEW YORK 14075

RE: BTA-90-179B, DOWCRAFT

PREPARED BY:

HUNTINGDON ANALYTICAL SERVICES
DIVISION OF EMPIRE SOILS INVESTIGATIONS, INC.
P.O. BOX 250
MIDDLEPORT, NEW YORK 14105

MARCH 24, 1992

HAS

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

REPORT NUMBER 92-412

STATEMENT OF WORK PERFORMED

I HEREBY DECLARE THAT THE WORK WAS PERFORMED UNDER MY SUPERVISION ACCORDING TO THE PROCEDURES OUTLINED BY THE FOLLOWING REFERENCES AND THAT THIS REPORT PROVIDES A CORRECT AND FAITHFUL RECORD OF THE RESULTS OBTAINED.

- 40 CFR PART 136, "GUIDELINES ESTABLISHING TEST PROCEDURES FOR THE ANALYSIS OF POLLUTANTS UNDER THE CLEAN WATER ACT", OCTOBER 26, 1984 (FEDERAL REGISTER) U. S. ENVIRONMENTAL PROTECTION AGENCY.

- U.S. ENVIRONMENTAL PROTECTION AGENCY, "TEST METHODS OF EVALUATING SOLID WASTE - PHYSICAL/CHEMICAL METHODS, " OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE, SW-846, 2ND EDITION AND 3RD EDITION.

- NEW YORK STATE DEPARTMENT OF HEALTH, ANALYTICAL TOXICOLOGY LABORATORY HANDBOOK, AUGUST 1982.

Richard J. Ronan

RICHARD J. RONAN, PH.D. MARCH 24, 1992
LABORATORY DIRECTOR, ENVIRONMENTAL

REPORT CODE LEGEND:

<DL	= LESS THAN DETECTION LIMIT
ND	= NOT DETECTED
NA	= NOT APPLICABLE
INP	= INFORMATION NOT PROVIDED
MB	= METHOD BLANK

HAS

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 601
PURGEABLE HALOCARBONS

SAMPLE IDENTIFICATION :	METHOD BLANK	ESI-2
HAS SAMPLE #92-412-	----	001
DATE ANALYZED:	3-11-92	3-11-92
COMPOUND	RESULT ug/l	RESULT ug/l
CHLOROMETHANE ----------	<1.0	<100
BROMOMETHANE ----------	<1.0	<100
VINYL CHLORIDE ----------	<1.0	<100
DICHLORODIFLUOROMETHANE -	<1.0	<100
CHLOROETHANE ----------	<1.0	<100
METHYLENE CHLORIDE ------	<0.50	<50
TRICHLOROFLUOROMETHANE --	<0.50	<50
1,1-DICHLOROETHENE ------	<0.50	<50
1,1-DICHLOROETHANE ------	<0.50	<50
total-1,2-DICHLOROETHENE	<0.50	390 *
CHLOROFORM ----------	<0.50	<50
1,2-DICHLOROETHANE ------	<0.50	<50
1,1,1-TRICHLOROETHANE ---	<0.50	<50
CARBON TETRACHLORIDE ----	<0.50	<50
BROMODICHLOROMETHANE ----	<0.50	<50
1,2-DICHLOROPROPANE -----	<0.50	<50
cis-1,3-DICHLOROPROPENE -	<0.50	<50
TRICHLOROETHENE ----------	<0.50	3,100 *
trans-1,3 DICHLOROPROPENE	<0.50	<50
DIBROMOCHLOROMETHANE ----	<0.50	<50
1,1,2-TRICHLOROETHANE ---	<0.50	<50
2-CHLOROETHYLVINYL ETHER	<5.0	<500
BROMOFORM ----------	<5.0	<500
1,1,2,2-TETRACHLOROETHANE	<0.50	<50
TETRACHLOROETHENE -------	<0.50	<50
CHLOROBENZENE ----------	<0.50	<50
1,4-DICHLOROBENZENE -----	<1.0	<100
1,2-DICHLOROBENZENE -----	<1.0	<100
1,3-DICHLOROBENZENE -----	<1.0	<100

* CONFIRMED BY GC/MS.

HUNTINGDON ANALYTICAL SERVICES - CHAIN-OF-CUSTODY RECORD AND ANALYTICAL REQUEST FORM

Page 1 of 1

Client Name: Empire Soils Investigations, Inc.
Address: 5-5167 South Park Avenue, Hamburg, New York 14075
Client Contact: Kevin J. Shanahan
Phone: (716)649-8110
HAS Quote #: 00530
P.O. #:

Project No.: BTA 90179B
Project/Site Name: DEWCRAFT
Samplers (Signature): Kevin Shanahan
HAS Ref. #: 412

Sample I.D.	Date	Time	Comp.	Grab	Sample Location	HAS Sequence #	Matrix	# of Containers	Container Size & Type	Analysis Requested/ Remarks
ESI-2	3/9/91	1510		X	ESI-2	001	W	2	40ml VOA	TCL Volatiles

Relinquished by: Kevin Shanahan — Date/Time: 3/9/92 1700 — Received by:
Relinquished by: — Date/Time: — Received by:
Relinquished by: — Date/Time: — Received for Lab by:
Relinquished by: — Date/Time: — Received by:
Relinquished by: — Date/Time: — Received by:
Relinquished by: — Date/Time: — Remarks:

HUNTINGDON ANALYTICAL SERVICES
Division of EMPIRE SOILS INVESTIGATIONS INC.
PO Box 250 Middleport New York 14105
Tel: (716) 735-3400 FAX (716) 735-3653

Environmental Analytical Report For:

EMPIRE SOILS INVESTIGATIONS, INC. - HAMBURG

PROJECT NAME: DOWCRAFT

HAS Ref. #91-345

February 28, 1991

HAS

HUNTINGDON ANALYTICAL SERVICES
ELAP #10833
ENVIRONMENTAL REPORT

HAS Reference Numbers: #91-345

February 28, 1991

Statement of Work Performed

I hereby declare that the work was performed under my supervision according to the procedures outlined by the following references and that this report provides a correct and faithful record of the results obtained.

- 40 CFR Part 136, "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," October 26, 1984 (Federal Register) U. S. Environmental Protection Agency.
- U. S. Environmental Protection Agency, "Test Methods of Evaluating Solid Waste - Physical/Chemical Methods, " Office of Solid Waste and Emergency Response, SW-846, 2nd Edition and 3rd Edition.
- New York State Department of Health, Analytical Toxicology Laboratory Handbook, August 1982.

Katherine A Syracuse

Katherine A. Syracuse
Lab Director, Environmental

REPORT CODE LEGEND:

<DL = Less than detection limit
ND = Not detected
NA = Not applicable
INP = Information not provided
MB = Method Blank

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 8010
PURGEABLE HALOCARBONS

SAMPLE IDENTIFICATION :	005 DRY WELL IN	004 DRY WELL OUT	METHOD BLANK
HAS SAMPLE #91-345-	001	002	----
DATE ANALYZED :	2/25/91	2/25/91	2/25/91
COMPOUND	RESULT ug/kg	RESULT ug/kg	RESULT ug/kg
CHLOROMETHANE ----------	<100	<100	<100
BROMOMETHANE ----------	<100	<100	<100
VINYL CHLORIDE ----------	<100	<100	<100
DICHLORODIFLUOROMETHANE -	<100	<100	<100
CHLOROETHANE ----------	<100	<100	<100
METHYLENE CHLORIDE ------	<50	<50	<50
TRICHLOROFLUOROMETHANE --	<50	<50	<50
1,1-DICHLOROETHENE ------	<50	<50	<50
1,1-DICHLOROETHANE ------	<50	<50	<50
TOTAL 1,2-DICHLOROETHENE	440	<50	<50
CHLOROFORM ----------	<50	<50	<50
1,2-DICHLOROETHANE ------	<50	<50	<50
1,1,1-TRICHLOROETHANE ---	<50	<50	<50
CARBON TETRACHLORIDE ----	<50	<50	<50
BROMODICHLOROMETHANE ----	<50	<50	<50
1,2-DICHLOROPROPANE -----	<50	<50	<50
cis-1,3-DICHLOROPROPENE -	<50	<50	<50
TRICHLOROETHENE ---------	310	120	<50
trans-1,3-DICHLOROPROPENE	<50	<50	<50
DIBROMOCHLOROMETHANE ----	<50	<50	<50
1,1,2-TRICHLOROETHANE ---	<50	<50	<50
2-CHLOROETHYLVINYL ETHER	<500	<500	<500
BROMOFORM ----------	<500	<500	<500
1,1,2,2-TETRACHLOROETHANE	<50	<50	<50
TETRACHLOROETHENE -------	<50	<50	<50
CHLOROBENZENE ----------	<50	<50	<50
1,4-DICHLOROBENZENE -----	<100	<100	<100
1,2-DICHLOROBENZENE -----	<100	<100	<100
1,3-DICHLOROBENZENE -----	<100	<100	<100

HUNTINGDON ANALYTICAL SERVICES - CHAIN-OF-CUSTODY RECORD AND ANALYTICAL REQUEST FORM

Client Name: EMPIRE SOILS INVESTIGATIONS
Client Contact: DAVE HARTY
HAS Quote #:

Address: S-5167 S. PARK AVE. HAMBURG, NY 14075
Phone: 649 8110
P.O. #:

Project No.: BTA 90179B
Project/Site Name: DOWCRAFT
Samplers (Signature): [signature]
HAS Ref. #99-345

Container Size & Type: 40 ml VOA Vials; 125 glass septum

Sample I.D.	Date	Time	Comp.	Grab	Sample Location	HAS Seq. #	MATRIX	# of Containers	40 ml VOA Vials	125 glass septum					Analysis Requested/ Remarks
DRYWELL IN	2/20/91	10:45		X	DRYWELL 004	001 A+B	S	2	2						601's
DRYWELL OUT	2/20/91	10:55		X	DRYWELL 005	002	S	1		1					601's

Relinquished by:	Date/ Time:	Received by:	Relinquished by:	Date/ Time:	Received By:
[signature]	2/20/91 11:45	[signature]			
[signature]	2/21/91 8:10 AM	[signature]			
Relinquished by:	Date/ Time:	Received for Lab by:	Date/ Time:	Remarks: [illegible]	

HUNTINGDON ANALYTICAL SERVICES
Division of EMPIRE SOILS INVESTIGATIONS INC.
PO Box 250 Middleport New York 14105
Tel: (716) 735-3400 FAX (716) 735-3653

Environmental Analytical Report For:

EMPIRE SOILS INVESTIGATIONS, INC. - HAMBURG

PROJECT NAME: DOWCRAFT

HAS Ref. #90-1653

November 27, 1990

HUNTINGDON ANALYTICAL SERVICES

Sample ID: METHOD BLANK
HAS Sample #90-1653-MB
Date Sampled: N/A

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	0.01	<DL	*95
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	0.01	<DL	*95
COPPER	6010	11/15/90	11/21/90	0.01	<DL	*95
LEAD	7421	11/15/90	11/19/90	0.005	<DL	*95
MERCURY	7470	11/27/90	11/27/90	0.0002	<DL	*95
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	*95
SELENIUM	7740	11/15/90	11/21/90	0.005	<DL	*95
SILVER	6010	11/15/90	11/21/90	0.01	<DL	*95
THALLIUM	7841	11/15/90	11/21/90	0.01	<DL	*95
ZINC	6010	11/15/90	11/21/90	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT ESI-1
HAS Sample #90-1658-001
Date Sampled: 11/14/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	MS %REC	MSD %REC	RPD
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	86.0	89.0	3.5
ARSENIC	7060	11/16/90	11/20/90	0.01	<DL	*95		
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	96.2	98.0	1.8
CADMIUM	6010	11/15/90	11/21/90	0.005	<DL	103	99.2	3.7
CHROMIUM	6010	11/15/90	11/21/90	0.01	0.05	73.0	74.0	1.0
COPPER	6010	11/15/90	11/21/90	0.01	0.01	93.7	94.8	1.1
LEAD	7421	11/16/90	11/19/90	0.005	0.006	*95		
MERCURY	7470	11/21/90	11/21/90	0.0002	<DL	*95		
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	95.4	96.2	<1.0
SELENIUM	7740	11/16/90	11/21/90	0.005	<DL	*95		
SILVER	6010	11/15/90	11/21/90	0.01	<DL	108	105	2.8
THALLIUM	7841	11/16/90	11/21/90	0.01	<DL	*95		
ZINC	6010	11/15/90	11/21/90	0.02	0.02	89.5	91.0	1.6

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: ESI-2
HAS Sample #90-1653-004
Date Sampled: 11/13/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	0.01	<DL	*95
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	0.01	<DL	*95
COPPER	6010	11/15/90	11/21/90	0.01	0.02	*95
LEAD	7421	11/15/90	11/19/90	0.005	<DL	*95
MERCURY	7470	11/27/90	11/27/90	0.0002	<DL	*95
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	*95
SELENIUM	7740	11/15/90	11/21/90	0.005	<DL	*95
SILVER	6010	11/15/90	11/21/90	0.01	<DL	*95
THALLIUM	7841	11/15/90	11/21/90	0.01	<DL	*95
ZINC	6010	11/15/90	11/21/90	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: ESI-3
HAS Sample #90-1653-003
Date Sampled: 11/13/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	MS %REC	MSD %REC	RPD
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	84.6	85.5	1.0
ARSENIC	7060	11/15/90	11/20/90	0.01	<DL	*95		
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	96.2	95.0	1.2
CADMIUM	6010	11/15/90	11/21/90	0.005	<DL	109	114	5.2
CHROMIUM	6010	11/15/90	11/21/90	0.01	0.03	92.2	91.7	<1.0
COPPER	6010	11/15/90	11/21/90	0.01	0.04	117	116	<1.0
LEAD	7421	11/15/90	11/19/90	0.010	0.030	*95		
MERCURY	7470	11/27/90	11/27/90	0.0002	<DL	*95		
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	91.8	93.4	1.7
SELENIUM	7740	11/15/90	11/21/90	0.005	<DL	*95		
SILVER	6010	11/15/90	11/21/90	0.01	<DL	112	112	<1.0
THALLIUM	7841	11/15/90	11/21/90	0.01	<DL	*95		
ZINC	6010	11/15/90	11/21/90	0.02	0.08	89.3	89.3	<1.0

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: ESI-4
HAS Sample #90-1653-002
Date Sampled: 11/13/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	0.01	0.02	*95
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	0.01	0.05	*95
COPPER	6010	11/15/90	11/21/90	0.01	0.06	*95
LEAD	7421	11/15/90	11/19/90	0.005	0.038	*95
MERCURY	7470	11/27/90	11/27/90	0.0002	<DL	*95
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	*95
SELENIUM	7740	11/15/90	11/21/90	0.005	<DL	*95
SILVER	6010	11/15/90	11/21/90	0.01	<DL	*95
THALLIUM	7841	11/15/90	11/21/90	0.01	<DL	*95
ZINC	6010	11/15/90	11/21/90	0.02	0.13	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: ESI-5
HAS Sample #90-1653-001
Date Sampled: 11/13/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	0.01	0.01	*95
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	0.005	0.013	*95
CHROMIUM	6010	11/15/90	11/21/90	0.01	0.03	*95
COPPER	6010	11/15/90	11/21/90	0.01	0.05	*95
LEAD	7421	11/15/90	11/19/90	0.005	0.060	*95
MERCURY	7470	11/27/90	11/27/90	0.0002	<DL	*95
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	*95
SELENIUM	7740	11/15/90	11/21/90	0.005	<DL	*95
SILVER	6010	11/15/90	11/21/90	0.01	<DL	*95
THALLIUM	7841	11/15/90	11/21/90	0.01	<DL	*95
ZINC	6010	11/15/90	11/21/90	0.02	0.06	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	DOWCRAFT SS-1	DOWCRAFT SS-2	DOWCRAFT SS-3	METHOD BLANK	
HAS SAMPLE #92-1858	005	006	007	-----	
COMPOUND	RESULT ug/Kg	RESULT ug/Kg	RESULT ug/Kg	RESULT ug/Kg	MDL ug/Kg
CHLOROMETHANE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
BROMOMETHANE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
VINYL CHLORIDE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
CHLOROETHANE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
METHYLENE CHLORIDE ------	<500	<500	<500	<500	<500
ACETONE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
TRICHLOROFLUOROMETHANE ---	<1,000	<1,000	<1,000	<1,000	<1,000
CARBON DISULFIDE ----------	<500	<500	<500	<500	<500
1,1-DICHLOROETHENE ------	<500	<500	<500	<500	<500
1,1-DICHLOROETHANE ------	<500	<500	<500	<500	<500
1,2-DICHLOROETHENE (TOTAL) -	<500	<500	<500	<500	<500
CHLOROFORM ----------	<500	<500	<500	<500	<500
1,2-DICHLOROETHANE ------	<500	<500	<500	<500	<500
2-BUTANONE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
1,1,1-TRICHLOROETHANE ---	<500	<500	<500	<500	<500
CARBON TETRACHLORIDE ----	<500	<500	<500	<500	<500
VINYL ACETATE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
BROMODICHLOROMETHANE ----	<500	<500	<500	<500	<500
1,2-DICHLOROPROPANE -----	<500	<500	<500	<500	<500
cis-1,3-DICHLOROPROPENE --	<500	<500	<500	<500	<500
TRICHLOROETHENE ----------	<500	<500	<500	<500	<500
DIBROMOCHLOROMETHANE ----	<500	<500	<500	<500	<500
1,1,2-TRICHLOROETHANE ---	<500	<500	<500	<500	<500
BENZENE ----------	<500	<500	<500	<500	<500
trans-1,3-DICHLOROPROPENE -	<500	<500	<500	<500	<500
2-CHLOROETHYLVINYL ETHER--	<2,000	<2,000	<2,000	<2,000	<2,000
BROMOFORM----------	<500	<500	<500	<500	<500
4-METHYL-2-PENTANONE ----	<1,000	<1,000	<1,000	<1,000	<1,000
2-HEXANONE ----------	<1,000	<1,000	<1,000	<1,000	<1,000
TETRACHLOROETHENE -------	<500	<500	<500	<500	<500
1,1,2,2-TETRACHLOROETHANE -	<500	<500	<500	<500	<500
TOLUENE ----------	<500	<500	<500	<500	<500
CHLOROBENZENE ----------	<500	<500	<500	<500	<500
ETHYL BENZENE ----------	<500	<500	<500	<500	<500
STYRENE ----------	<500	<500	<500	<500	<500
XYLENE (TOTAL) ----------	<500	<500	<500	<500	<500
1,3-DICHLOROBENZENE -----	<1,000	<1,000	<1,000	<1,000	<1,000
1,2-DICHLOROBENZENE -----	<1,000	<1,000	<1,000	<1,000	<1,000
1,4-DICHLOROBENZENE -----	<1,000	<1,000	<1,000	<1,000	<1,000
DATE RECEIVED:	11-15-93	11-15-93	11-15-93	----	----
DATE SAMPLED:	11-14-93	11-14-93	11-14-93	----	----
DATE ANALYZED:	11-17-93	11-17-93	11-17-93	11-17-93	----

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 8240
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	DOWCRAFT SS-1	DOWCRAFT SS-2	DOWCRAFT SS-3	ELLISON SS-1	METHOD BLANK	
HAS SAMPLE #90-1638	005	006	007	008	-----	
COMPOUND	RESULT ug/Kg	RESULT ug/Kg	RESULT ug/Kg	RESULT ug/Kg	RESULT ug/Kg	MDL ug/Kg
CHLOROMETHANE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
BROMOMETHANE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
VINYL CHLORIDE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
CHLOROETHANE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
METHYLENE CHLORIDE	<500	<500	<500	<50,000	<500	<500
ACETONE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
TRICHLOROFLUOROMETHANE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
CARBON DISULFIDE	<500	<500	<500	<50,000	<500	<500
1,1-DICHLOROETHENE	<500	<500	<500	<50,000	<500	<500
1,1-DICHLOROETHANE	<500	<500	<500	<50,000	<500	<500
1,2-DICHLOROETHENE (TOTAL)	<500	<500	<500	<50,000	<500	<500
CHLOROFORM	<500	<500	<500	<50,000	<500	<500
1,2-DICHLOROETHANE	<500	<500	<500	<50,000	<500	<500
2-BUTANONE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
1,1,1-TRICHLOROETHANE	<500	<500	<500	<50,000	<500	<500
CARBON TETRACHLORIDE	<500	<500	<500	<50,000	<500	<500
VINYL ACETATE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
BROMODICHLOROMETHANE	<500	<500	<500	<50,000	<500	<500
1,2-DICHLOROPROPANE	<500	<500	<500	<50,000	<500	<500
cis-1,3-DICHLOROPROPENE	<500	<500	<500	<50,000	<500	<500
TRICHLOROETHENE	<500	<500	<500	<50,000	<500	<500
DIBROMOCHLOROMETHANE	<500	<500	<500	<50,000	<500	<500
1,1,2-TRICHLOROETHANE	<500	<500	<500	<50,000	<500	<500
BENZENE	<500	<500	<500	<50,000	<500	<500
trans-1,3-DICHLOROPROPENE	<500	<500	<500	<50,000	<500	<500
2-CHLOROETHYLVINYL ETHER	<2,000	<2,000	<2,000	<200,000	<2,000	<2,000
BROMOFORM	<500	<500	<500	<50,000	<500	<500
4-METHYL-2-PENTANONE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
2-HEXANONE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
TETRACHLOROETHENE	<500	<500	<500	<50,000	<500	<500
1,1,2,2-TETRACHLOROETHANE	<500	<500	<500	<50,000	<500	<500
TOLUENE	<500	<500	<500	1,000,000	<500	<500
CHLOROBENZENE	<500	<500	<500	<50,000	<500	<500
ETHYL BENZENE	<500	<500	<500	<50,000	<500	<500
STYRENE	<500	<500	<500	<50,000	<500	<500
XYLENE (TOTAL)	<500	<500	<500	<50,000	<500	<500
1,3-DICHLOROBENZENE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
1,2-DICHLOROBENZENE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
1,4-DICHLOROBENZENE	<1,000	<1,000	<1,000	<100,000	<1,000	<1,000
DATE RECEIVED:	11-15-90	11-15-90	11-15-90	11-15-90	----	----
DATE SAMPLED:	11-14-90	11-14-90	11-14-90	11-14-90	----	----
DATE ANALYZED:	11-17-90	11-17-90	11-17-90	11-20-90	11-17-90	----

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

Inorganic Wet Chemical Analyses

Analyte: Percent Solid - dry weight

EPA Method No.: 160.3

Sample Date	HAS Sample #90-	Client I.D.	Date Prepared	Date Analyzed	Method Detection Limit	Result	Units	QC in %
11/14/90	1658-005	SS-1	11/21/90	11/26/90	0.1	78.0	% Solid	---
11/14/90	1658-006	SS-2	11/21/90	11/26/90	0.1	79.3	% Solid	---
11/14/90	1658-007	SS-3	11/21/90	11/26/90	0.1	86.8	% Solid	---

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

Inorganic Wet Chemical Analyses

Analyte: pH

EPA Method No.: SW-846 9045

Sample Date	HAS Sample #90-	Client I.D.	Date Prepared	Date Analyzed	Method Detection Limit	Result	Units	QC in %
11/14/90	1658-005	SS-1	11/16/90	11/16/90	0.10	6.48	S.U.	101*
11/14/90	1658-006	SS-2	11/16/90	11/16/90	0.10	6.70	S.U.	101*
11/14/90	1658-007	SS-3	11/16/90	11/16/90	0.10	7.59	S.U.	101*

* A known standard of the analyte of interest was analyzed along with this sample with the percent recovery indicated above.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: METHOD BLANK SOIL
HAS Sample #90-1658-MB
Date Sampled: N/A

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/l	QC
ANTIMONY	6010	11/15/90	11/21/90	0.05	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	0.01	<DL	*95
BERYLLIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	0.005	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	0.01	<DL	*95
COPPER	6010	11/15/90	11/21/90	0.01	<DL	*95
LEAD	6010	11/15/90	11/19/90	0.045	<DL	*95
MERCURY	7470	11/21/90	11/21/90	0.0002	<DL	*95
NICKEL	6010	11/15/90	11/21/90	0.04	<DL	*95
SELENIUM	7740	11/15/90	11/21/90	0.005	<DL	*95
SILVER	6010	11/15/90	11/21/90	0.01	<DL	*95
THALLIUM	7841	11/15/90	11/21/90	0.01	<DL	*95
ZINC	6010	11/15/90	11/21/90	0.02	<DL	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT SS-1
HAS Sample #90-1658-005
Date Sampled: 11/14/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/kg	QC
ANTIMONY	6010	11/15/90	11/21/90	12.70	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	2.53	11.4	*95
BERYLLIUM	6010	11/15/90	11/21/90	1.27	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	1.27	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	2.53	59.5	*95
COPPER	6010	11/15/90	11/21/90	2.53	141	*95
LEAD	7421	11/15/90	11/19/90	127.0	177	*95
MERCURY	7471	11/21/90	11/21/90	0.13	<DL	*95
NICKEL	6010	11/15/90	11/21/90	10.1	30.0	*95
SELENIUM	7740	11/15/90	11/21/90	1.27	<DL	*95
SILVER	6010	11/15/90	11/21/90	2.53	3.54	*95
THALLIUM	7841	11/15/90	11/21/90	2.53	<DL	*95
ZINC	6010	11/15/90	11/21/90	5.06	1300	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT SS-2
HAS Sample #90-1658-006
Date Sampled: 11/14/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/kg	QC
ANTIMONY	6010	11/15/90	11/21/90	12.7	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	2.53	7.09	*95
BERYLLIUM	6010	11/15/90	11/21/90	1.27	<DL	*95
CADMIUM	6010	11/15/90	11/21/90	1.27	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	2.53	81.4	*95
COPPER	6010	11/15/90	11/21/90	2.53	236	*95
LEAD	7421	11/15/90	11/19/90	127	251	*95
MERCURY	7471	11/21/90	11/21/90	0.13	<DL	*95
NICKEL	6010	11/15/90	11/21/90	10.10	24.9	*95
SELENIUM	7740	11/15/90	11/21/90	1.27	<DL	*95
SILVER	6010	11/15/90	11/21/90	2.53	4.73	*95
THALLIUM	7841	11/15/90	11/21/90	2.53	<DL	*95
ZINC	6010	11/15/90	11/21/90	5.06	630	*95

*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT

HUNTINGDON ANALYTICAL SERVICES

Sample ID: DOWCRAFT SS-3
HAS Sample #90-1658-007
Date Sampled: 11/14/90

ANALYTE	EPA METHOD	DATE PREPARED	DATE ANALYZED	DETECTION LIMIT	RESULT mg/kg	QC
ANTIMONY	6010	11/15/90	11/21/90	11.4	<DL	*95
ARSENIC	7060	11/15/90	11/20/90	2.27	10.5	*95
BERYLLIUM	6010	11/15/90	11/21/90	1.14	1.23	*95
CADMIUM	6010	11/15/90	11/21/90	1.14	<DL	*95
CHROMIUM	6010	11/15/90	11/21/90	2.27	115	*95
COPPER	6010	11/15/90	11/21/90	2.27	122	*95
LEAD	6010	11/15/90	11/21/90	10.2	469	*95
MERCURY	7471	11/21/90	11/21/90	0.12	<DL	*95
NICKEL	6010	11/15/90	11/21/90	9.09	40.4	*95
SELENIUM	7740	11/15/90	11/21/90	1.14	<DL	*95
SILVER	6010	11/15/90	11/21/90	2.27	7.45	*95
THALLIUM	7841	11/15/90	11/21/90	2.27	<DL	*95
ZINC	6010	11/15/90	11/21/90	4.55	548	*95

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*THIS INDICATES A 95% CONFIDENCE LIMIT ACHIEVED WITH AN EPA QUALITY CONTROL SOLUTION ANALYZED ALONG WITH YOUR SAMPLE.

ALL SOIL/SLUDGE SAMPLE RESULTS ARE BASED UPON DRY WEIGHT

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 624
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	ESI-5	ESI-4	ESI-3	ESI-2	METHOD BLANK	
HAS SAMPLE #90-1653	001	002	003	004	-----	
COMPOUND	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	MDL ug/l
CHLOROMETHANE	<10	<10	<50	<250	<10	<10
BROMOMETHANE	<10	<10	<50	<250	<10	<10
VINYL CHLORIDE	<10	<10	<50	<250	<10	<10
CHLOROETHANE	<10	<10	<50	<250	<10	<10
METHYLENE CHLORIDE	<5.0	<5.0	<25	<130	<5.0	<5.0
ACETONE	13	<10	<50	<250	<10	<10
TRICHLOROFLUOROMETHANE	<10	<10	<50	<250	<10	<10
CARBON DISULFIDE	<5.0	<5.0	<25	<130	<5.0	<5.0
1,1-DICHLOROETHENE	<5.0	<5.0	<25	<130	<5.0	<5.0
1,1-DICHLOROETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
1,2-DICHLOROETHENE (TOTAL)	<5.0	<5.0	<25	230	<5.0	<5.0
CHLOROFORM	<5.0	<5.0	<25	<130	<5.0	<5.0
1,2-DICHLOROETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
2-BUTANONE	<10	<10	<50	<250	<10	<10
1,1,1-TRICHLOROETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
CARBON TETRACHLORIDE	<5.0	<5.0	<25	<130	<5.0	<5.0
VINYL ACETATE	<10	<10	<50	<250	<10	<10
BROMODICHLOROMETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
1,2-DICHLOROPROPANE	<5.0	<5.0	<25	<130	<5.0	<5.0
cis-1,3-DICHLOROPROPENE	<5.0	<5.0	<25	<130	<5.0	<5.0
TRICHLOROETHENE	<5.0	<5.0	180	1,300	<5.0	<5.0
DIBROMOCHLOROMETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
1,1,2-TRICHLOROETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
BENZENE	<5.0	<5.0	<25	<130	<5.0	<5.0
trans-1,3-DICHLOROPROPENE	<5.0	<5.0	<25	<130	<5.0	<5.0
2-CHLOROETHYLVINYL ETHER	<20	<20	<100	<500	<20	<20
BROMOFORM	<5.0	<5.0	<25	<130	<5.0	<5.0
4-METHYL-2-PENTANONE	<10	<10	<50	<250	<10	<10
2-HEXANONE	<10	<10	<50	<250	<10	<10
TETRACHLOROETHENE	<5.0	<5.0	<25	<130	<5.0	<5.0
1,1,2,2-TETRACHLOROETHANE	<5.0	<5.0	<25	<130	<5.0	<5.0
TOLUENE	<5.0	<5.0	<25	<130	<5.0	<5.0
CHLOROBENZENE	<5.0	<5.0	<25	<130	<5.0	<5.0
ETHYL BENZENE	<5.0	<5.0	<25	<130	<5.0	<5.0
STYRENE	<5.0	<5.0	<25	<130	<5.0	<5.0
XYLENE (TOTAL)	<5.0	<5.0	<25	<130	<5.0	<5.0
1,3-DICHLOROBENZENE	<10	<10	<50	<250	<10	<10
1,2-DICHLOROBENZENE	<10	<10	<50	<250	<10	<10
1,4-DICHLOROBENZENE	<10	<10	<50	<250	<10	<10
DATE RECEIVED:	11-14-90	11-14-90	11-14-90	11-14-90	-----	-----
DATE SAMPLED:	11-13-90	11-13-90	11-13-90	11-13-90	-----	-----
DATE ANALYZED:	11-15-90	11-15-90	11-17-90	11-17-90	11-17-90	-----

HUNTINGDON ANALYTICAL SERVICES
ENVIRONMENTAL

METHOD 624
VOLATILE ORGANICS

SAMPLE IDENTIFICATION :	DOWCRAFT ESI-1	DOWCRAFT ROLLFORM ESI-1	DOWCRAFT ROLLFORM ESI-2	DOWCRAFT ROLLFORM ESI-3	METHOD BLANK	
HAS SAMPLE #90-1653	001	002	003	004	-----	
COMPOUND	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	RESULT ug/l	MDL ug/l
CHLOROMETHANE	<10	<1,000	<100	<50	<10	<10
BROMOMETHANE	<10	<1,000	<100	<50	<10	<10
VINYL CHLORIDE	<10	5,900	180	<50	<10	<10
CHLOROETHANE	<10	<1,000	<100	<50	<10	<10
METHYLENE CHLORIDE	<5.0	<500	<50	<25	<5.0	<5.0
ACETONE	<10	<1,000	<100	<50	<10	<10
TRICHLOROFLUOROMETHANE	<10	<1,000	<100	<50	<10	<10
CARBON DISULFIDE	<5.0	<500	<50	<25	<5.0	<5.0
1,1-DICHLOROETHENE	<5.0	<500	<50	<25	<5.0	<5.0
1,1-DICHLOROETHANE	<5.0	<500	<50	<25	<5.0	<5.0
1,2-DICHLOROETHENE (TOTAL)	<5.0	1,000	<50	<25	<5.0	<5.0
CHLOROFORM	<5.0	<500	<50	<25	<5.0	<5.0
1,2-DICHLOROETHANE	<5.0	<500	<50	<25	<5.0	<5.0
2-BUTANONE	<10	<1,000	<100	<50	<10	<10
1,1,1-TRICHLOROETHANE	<5.0	<500	<50	<25	<5.0	<5.0
CARBON TETRACHLORIDE	<5.0	<500	<50	<25	<5.0	<5.0
VINYL ACETATE	<10	<1,000	<100	<50	<10	<10
BROMODICHLOROMETHANE	<5.0	<500	<50	<25	<5.0	<5.0
1,2-DICHLOROPROPANE	<5.0	<500	<50	<25	<5.0	<5.0
cis-1,3-DICHLOROPROPENE	<5.0	<500	<50	<25	<5.0	<5.0
TRICHLOROETHENE	12	<500	<50	<25	<5.0	<5.0
DIBROMOCHLOROMETHANE	<5.0	<500	<50	<25	<5.0	<5.0
1,1,2-TRICHLOROETHANE	<5.0	<500	<50	<25	<5.0	<5.0
BENZENE	<5.0	<500	<50	<25	<5.0	<5.0
trans-1,3-DICHLOROPROPENE	<5.0	<500	<50	<25	<5.0	<5.0
2-CHLOROETHYLVINYL ETHER	<20	<2,000	<200	<100	<20	<20
BROMOFORM	<5.0	<500	<50	<25	<5.0	<5.0
4-METHYL-2-PENTANONE	<10	<1,000	<100	<50	<10	<10
2-HEXANONE	<10	<1,000	<100	<50	<10	<10
TETRACHLOROETHENE	<5.0	<500	<50	<25	<5.0	<5.0
1,1,2,2-TETRACHLOROETHANE	<5.0	<500	<50	<25	<5.0	<5.0
TOLUENE	<5.0	<500	<50	<25	<5.0	<5.0
CHLOROBENZENE	<5.0	<500	<50	<25	<5.0	<5.0
ETHYL BENZENE	<5.0	<500	<50	<25	<5.0	<5.0
STYRENE	<5.0	<500	<50	<25	<5.0	<5.0
XYLENE (TOTAL)	<5.0	<500	<50	<25	<5.0	<5.0
1,3-DICHLOROBENZENE	<10	<1,000	<100	<50	<10	<10
1,2-DICHLOROBENZENE	<10	<1,000	<100	<50	<10	<10
1,4-DICHLOROBENZENE	<10	<1,000	<100	<50	<10	<10
DATE RECEIVED:	11-15-90	11-15-90	11-15-90	11-15-90	-----	-----
DATE SAMPLED:	11-14-90	11-14-90	11-14-90	11-14-90	-----	-----
DATE ANALYZED:	11-17-90	11-17-90	11-20-90	11-20-90	11-20-90	-----

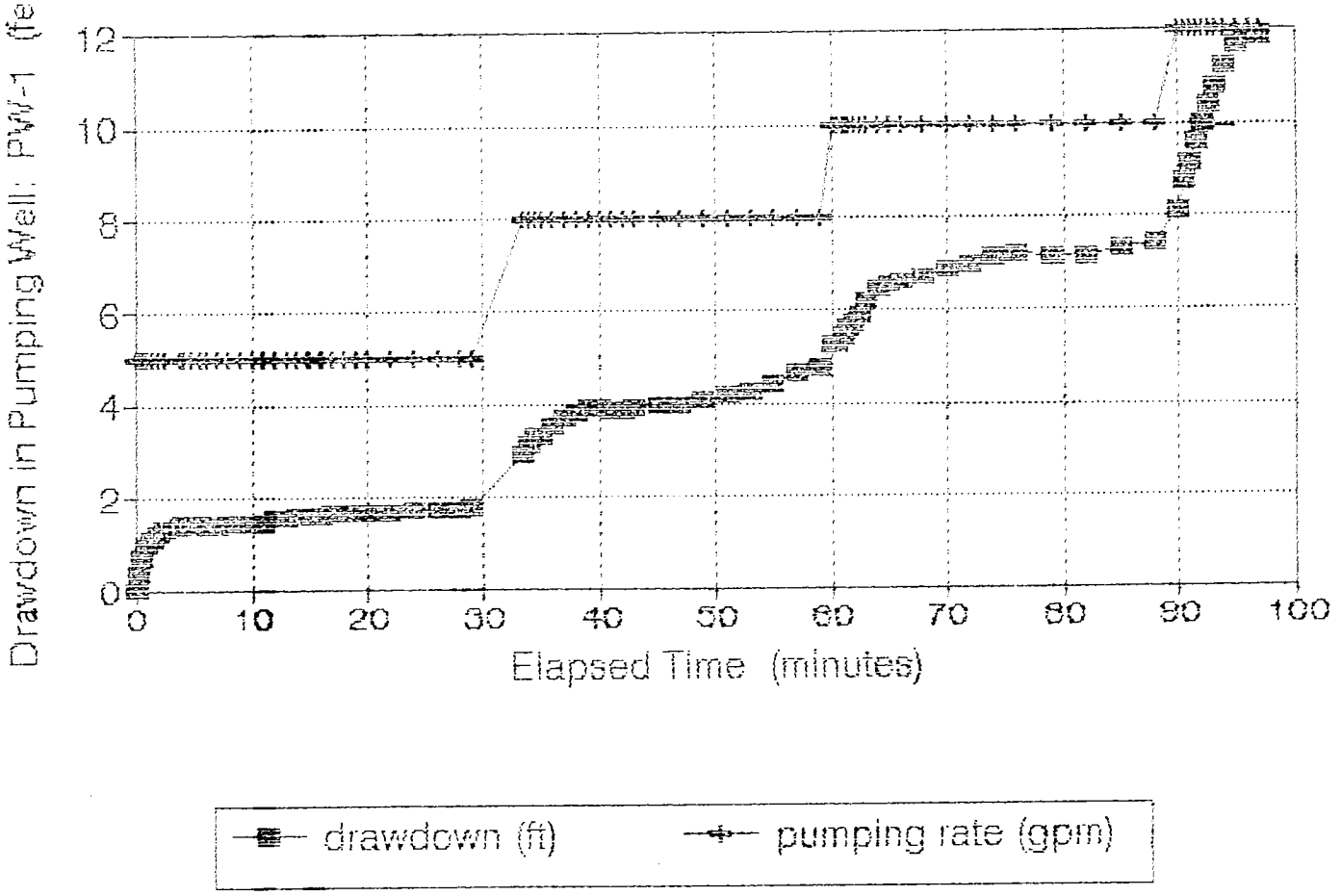
Huntingdon

Consulting Engineers & Environmental Scientists

APPENDIX G

DOWCRAFT

STEP TEST ON PW-1



2/9/93

STEP TEST ON PW-1

DRAWDOWN IN THE PUMPING WELL

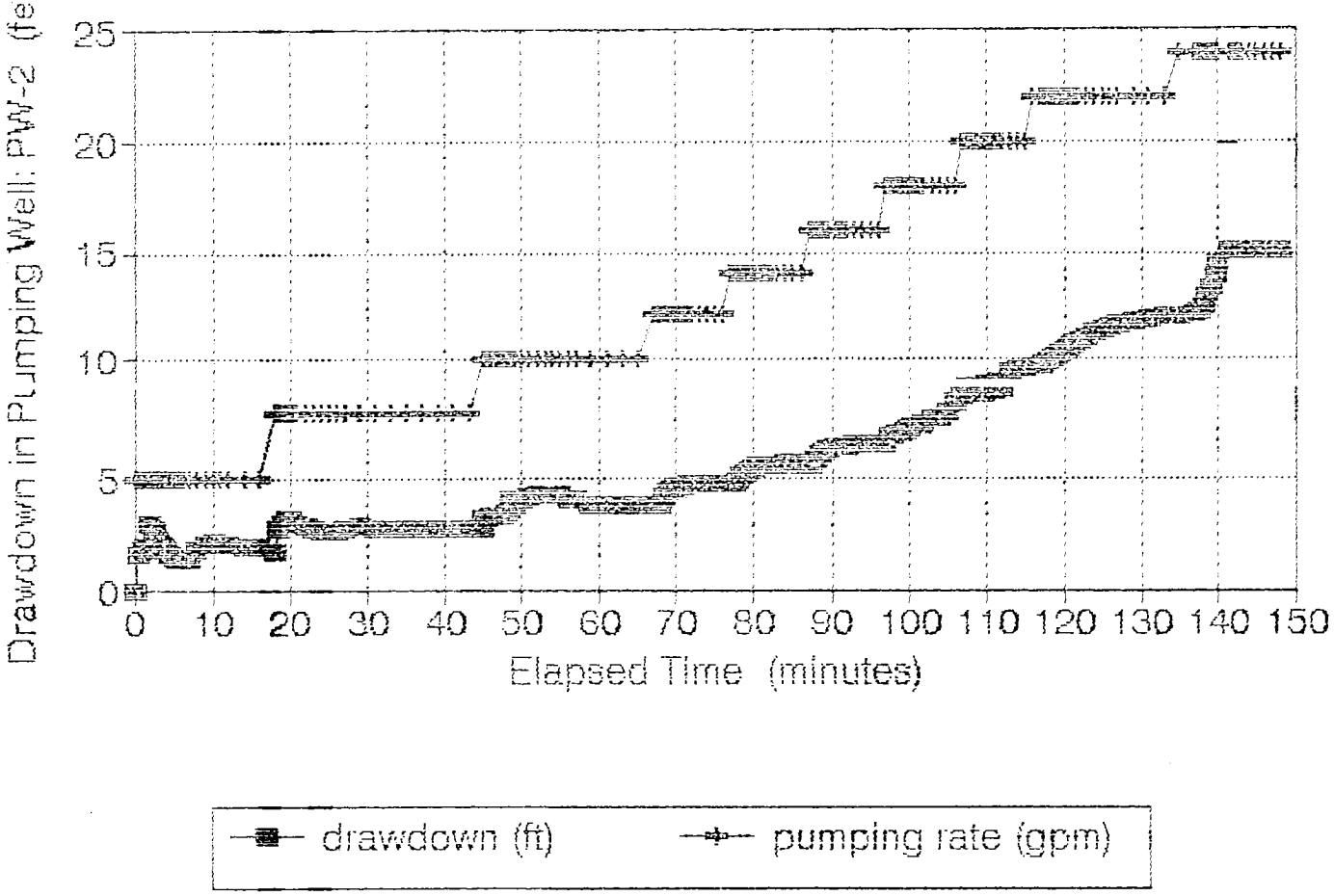
ELAPSED TIME (MIN)	DEPTH TO WATER (FT)	DRAWDOWN (FT)	PUMPING RATE (FT)
0.00	8.37	0.00	5.00
0.25	8.75	0.38	5.00
0.50	9.05	0.68	5.00
1.00	9.35	0.98	5.00
1.50	9.50	1.13	5.00
2.00	9.57	1.20	5.00
2.50	9.67	1.30	5.00
3.75	9.76	1.39	5.00
4.00	9.81	1.44	5.00
4.75	9.83	1.46	5.00
5.50	9.84	1.47	5.00
6.00	9.79	1.42	5.00
7.00	9.79	1.42	5.00
8.00	9.81	1.44	5.00
9.00	9.83	1.46	5.00
10.00	9.84	1.47	5.00
11.00	9.85	1.48	5.00
12.00	9.92	1.55	5.00
13.00	9.94	1.57	5.00
14.00	9.98	1.61	5.00
15.00	10.00	1.63	5.00
16.00	10.01	1.64	5.00
17.00	10.03	1.66	5.00
18.00	10.03	1.66	5.00
19.00	10.03	1.66	5.00
20.00	10.03	1.66	5.00
22.00	10.04	1.67	5.00
24.00	10.06	1.69	5.00
26.00	10.09	1.72	5.00
28.00	10.11	1.74	5.00
29.00	10.12	1.75	5.00
33.50	11.31	2.94	8.00
34.00	11.48	3.11	8.00
34.50	11.68	3.31	8.00
35.00	11.69	3.32	8.00
36.00	11.88	3.51	8.00
37.00	12.03	3.66	8.00
38.00	12.16	3.79	8.00
39.00	12.26	3.89	8.00
40.00	12.28	3.91	8.00
41.00	12.23	3.86	8.00
42.00	12.22	3.85	8.00
43.00	12.27	3.90	8.00
45.00	12.37	4.00	8.00
47.00	12.38	4.01	8.00
49.00	12.45	4.08	8.00
51.00	12.57	4.20	8.00
53.00	12.62	4.25	8.00
55.00	12.81	4.44	8.00

57.00	13.01	4.64	8.00
59.00	13.11	4.74	8.00
60.00	13.64	5.27	10.00
60.50	13.64	5.27	10.00
61.00	13.80	5.43	10.00
61.50	13.98	5.61	10.00
62.00	14.12	5.75	10.00
62.50	14.25	5.88	10.00
63.00	14.54	6.17	10.00
64.00	14.79	6.42	10.00
65.00	14.93	6.56	10.00
66.00	14.98	6.61	10.00
68.00	15.09	6.72	10.00
70.00	15.28	6.91	10.00
72.00	15.41	7.04	10.00
74.00	15.55	7.18	10.00
76.00	15.63	7.26	10.00
79.00	15.57	7.20	10.00
82.00	15.57	7.20	10.00
85.00	15.70	7.33	10.00
88.00	15.81	7.44	10.00
90.00	16.52	8.15	12.00
90.50	17.11	8.74	12.00
91.00	17.55	9.18	12.00
91.50	17.96	9.59	12.00
92.00	18.36	9.99	12.00
92.50	18.75	10.38	12.00
93.00	19.15	10.78	12.00
94.00	19.57	11.20	12.00
95.00	20.04	11.67	12.00
96.00	20.19	11.82	12.00
97.00	20.18	11.81	12.00
98.00	INTERMITANT PUMPING		

****

DOWNCRAFT

STEP TEST ON PW-2



2/10/93 STEP TEST ON PW-2
DRAWDOWN IN THE PUMPING WELL

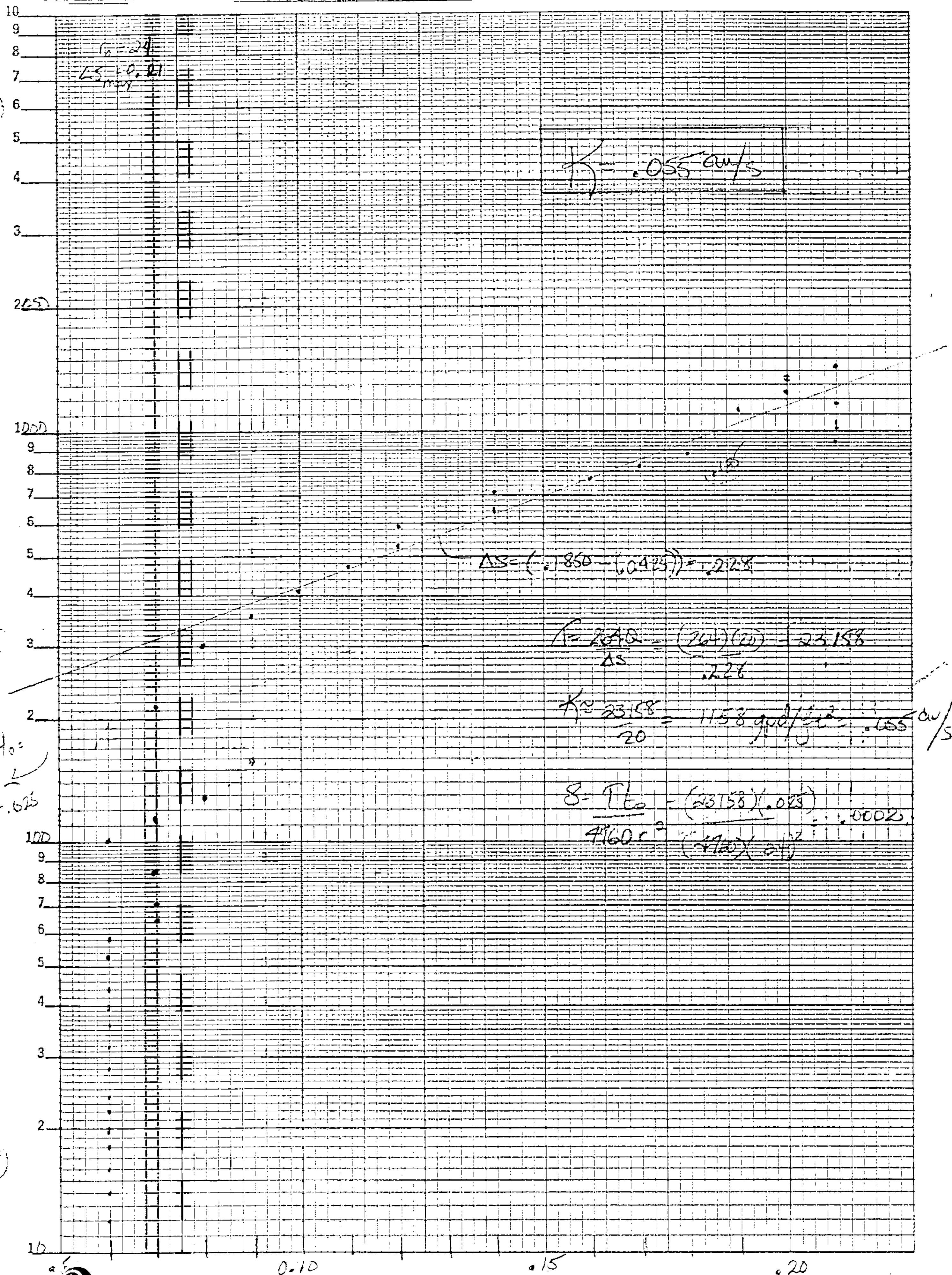
ELAPSED TIME (MIN)	DEPTH TO WATER (FT)	DRAWDOWN (FT)	PUMPING RATE (FT)
0.00	8.55	0.00	5.00
0.50	10.14	1.59	5.00
1.00	10.35	1.80	5.00
1.50	10.55	2.00	5.00
2.00	11.62	3.07	5.00
2.50	11.26	2.71	5.00
3.00	10.90	2.35	5.00
3.50	10.65	2.10	5.00
4.00	10.35	1.80	5.00
4.50	10.22	1.67	5.00
5.00	10.08	1.53	5.00
5.50	9.96	1.41	5.00
6.00	9.92	1.37	5.00
7.00	9.85	1.30	5.00
8.00	10.37	1.82	5.00
9.00	10.59	2.04	5.00
10.00	10.72	2.17	5.00
11.00	10.64	2.09	5.00
12.00	10.62	2.07	5.00
14.00	10.52	1.97	5.00
16.00	10.46	1.91	5.00
18.00	10.30	1.75	8.00
18.50	11.35	2.80	8.00
19.00	11.64	3.09	8.00
19.50	11.78	3.23	8.00
20.00	11.75	3.20	8.00
20.50	11.64	3.09	8.00
21.00	11.54	2.99	8.00
22.00	11.46	2.91	8.00
23.00	11.30	2.75	8.00
24.00	11.22	2.67	8.00
25.00	11.20	2.65	8.00
26.00	11.18	2.63	8.00
27.00	11.38	2.83	8.00
29.00	11.40	2.85	8.00
31.00	11.38	2.83	8.00
33.00	11.38	2.83	8.00
35.00	11.37	2.82	8.00
37.00	11.32	2.77	8.00
39.00	11.34	2.79	8.00
41.00	11.33	2.78	8.00
43.00	11.32	2.77	8.00
45.00	11.32	2.77	10.00
45.00	11.76	3.21	10.00
45.50	11.85	3.30	10.00
46.00	11.88	3.33	10.00

46.50	11.98	3.43	10.00
47.00	11.96	3.41	10.00
47.50	11.95	3.40	10.00
48.00	12.03	3.48	10.00
48.50	12.14	3.59	10.00
49.00	12.37	3.82	10.00
48.50	12.53	3.98	10.00
50.00	12.66	4.11	10.00
51.00	12.75	4.20	10.00
52.00	12.84	4.29	10.00
53.00	12.89	4.34	10.00
54.00	12.86	4.31	10.00
55.00	12.84	4.29	10.00
56.00	12.65	4.10	10.00
57.00	12.53	3.98	10.00
59.00	12.45	3.90	10.00
61.00	12.44	3.89	10.00
63.00	12.45	3.90	10.00
65.00	12.43	3.88	10.00
67.00	12.38	3.83	12.00
67.50	12.36	3.81	12.00
68.00	12.38	3.83	12.00
68.50	12.74	4.19	12.00
69.00	12.94	4.39	12.00
69.50	13.08	4.53	12.00
70.00	13.06	4.51	12.00
70.50	13.21	4.66	12.00
71.00	13.25	4.70	12.00
71.50	13.28	4.73	12.00
72.00	13.30	4.75	12.00
73.00	13.35	4.80	12.00
74.00	13.36	4.81	12.00
75.00	13.35	4.80	12.00
76.00	13.35	4.80	12.00
77.00	13.35	4.80	14.00
77.50	13.34	4.79	14.00
78.00	13.42	4.87	14.00
78.50	13.66	5.11	14.00
79.00	13.78	5.23	14.00
79.50	13.90	5.35	14.00
80.00	13.96	5.41	14.00
80.50	14.08	5.53	14.00
81.00	14.11	5.56	14.00
81.50	14.13	5.58	14.00
82.00	14.14	5.59	14.00
83.00	14.19	5.64	14.00
84.00	14.22	5.67	14.00
85.00	14.22	5.67	14.00
86.00	14.17	5.62	14.00
87.00	14.15	5.60	16.00
87.50	14.20	5.65	16.00
88.00	14.31	5.76	16.00
88.50	14.57	6.02	16.00
89.00	14.72	6.17	16.00
89.50	14.87	6.32	16.00
91.00	14.95	6.40	16.00

90.50	14.97	6.42	16.00
91.00	14.98	6.43	16.00
91.50	15.01	6.46	16.00
92.00	15.01	6.46	16.00
93.00	15.07	6.52	16.00
94.00	15.06	6.51	16.00
95.00	15.09	6.54	16.00
96.00	15.13	6.58	16.00
97.00	15.14	6.59	18.00
97.50	15.40	6.85	18.00
98.00	15.48	6.93	18.00
98.50	15.57	7.02	18.00
99.00	15.62	7.07	18.00
99.50	15.66	7.11	18.00
100.00	15.77	7.22	18.00
100.50	15.83	7.28	18.00
101.00	15.87	7.32	18.00
101.50	15.95	7.40	18.00
102.00	16.04	7.49	18.00
103.00	16.17	7.62	18.00
104.00	16.28	7.73	18.00
105.00	16.55	8.00	18.00
106.00	16.93	8.38	18.00
107.00	17.17	8.62	20.00
107.50	17.27	8.72	20.00
108.00	17.31	8.76	20.00
108.50	17.30	8.75	20.00
109.00	17.34	8.79	20.00
109.50	17.36	8.81	20.00
110.00	17.40	8.85	20.00
110.50	17.43	8.88	20.00
111.00	17.43	8.88	20.00
111.50	17.52	8.97	20.00
112.00	17.57	9.02	20.00
113.00	17.93	9.38	20.00
114.00	18.08	9.53	20.00
115.00	18.13	9.58	20.00
116.00	18.22	9.67	22.00
117.00	18.31	9.76	22.00
117.50	18.37	9.82	22.00
118.00	18.48	9.93	22.00
118.50	18.58	10.03	22.00
119.00	18.68	10.13	22.00
119.50	18.83	10.28	22.00
120.00	18.92	10.37	22.00
120.50	19.04	10.49	22.00
121.00	19.18	10.63	22.00
121.50	19.30	10.75	22.00
122.00	19.40	10.85	22.00
123.00	19.52	10.97	22.00
124.00	19.67	11.12	22.00
125.00	19.88	11.33	22.00
126.00	20.01	11.46	22.00
127.00	20.08	11.53	22.00
129.00	20.23	11.68	22.00
131.00	20.40	11.85	22.00

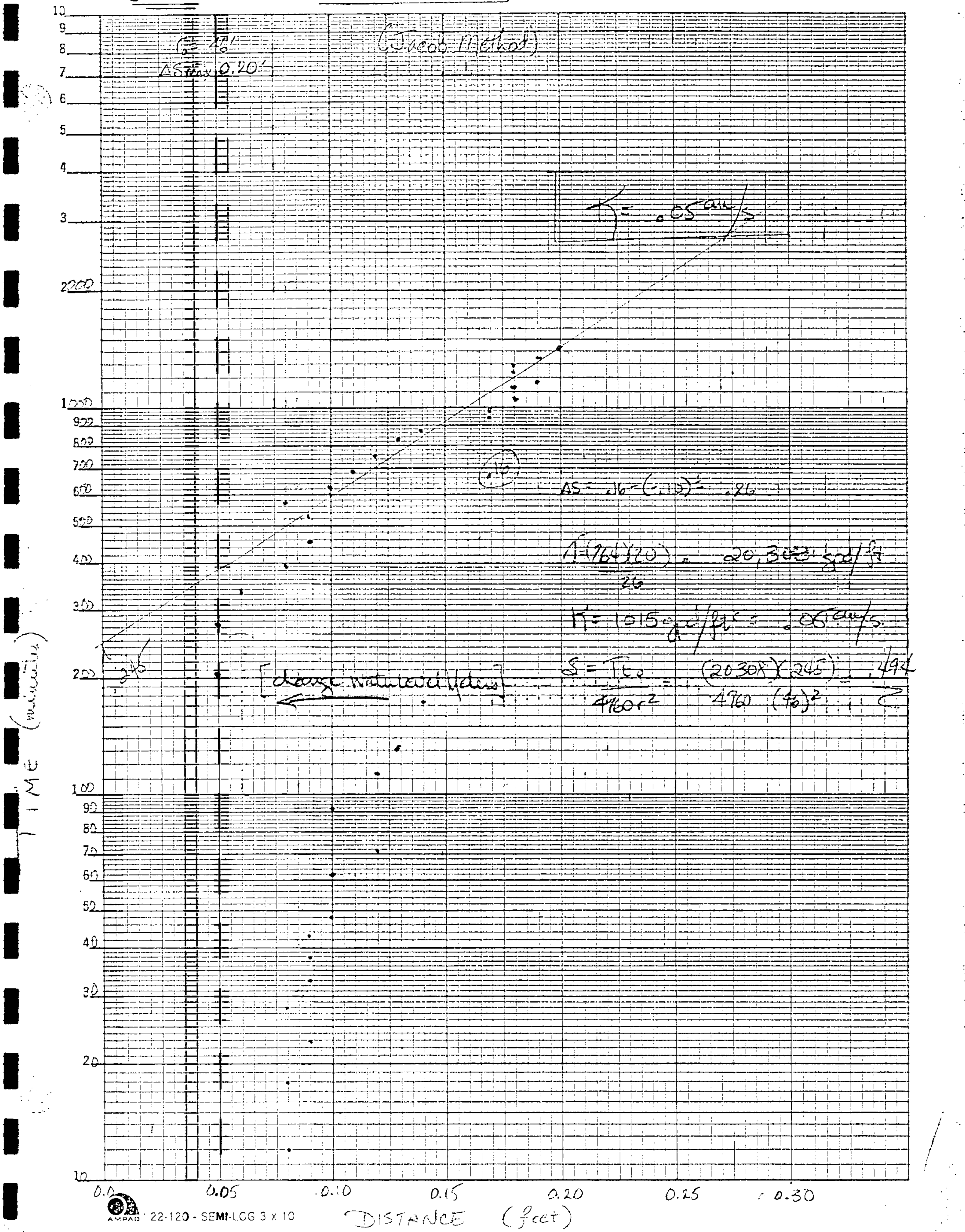
133.00	20.47	11.92	22.00
135.00	20.51	11.96	24.00
137.00	20.60	12.05	24.00
137.50	20.68	12.13	24.00
138.00	20.99	12.44	24.00
138.50	21.44	12.89	24.00
139.00	21.83	13.28	24.00
139.50	22.45	13.90	24.00
140.00	23.10	14.55	24.00
141.50	23.68	15.13	24.00
142.00	23.68	15.13	24.00
142.50	23.70	15.15	24.00
143.00	23.68	15.13	24.00
144.00	23.68	15.13	24.00
145.00	23.70	15.15	24.00
146.00	23.68	15.13	24.00
147.00	23.69	15.14	24.00
148.00	23.69	15.14	24.00

ESI-2: TIME DRAWDOWN - 24 HR TEST



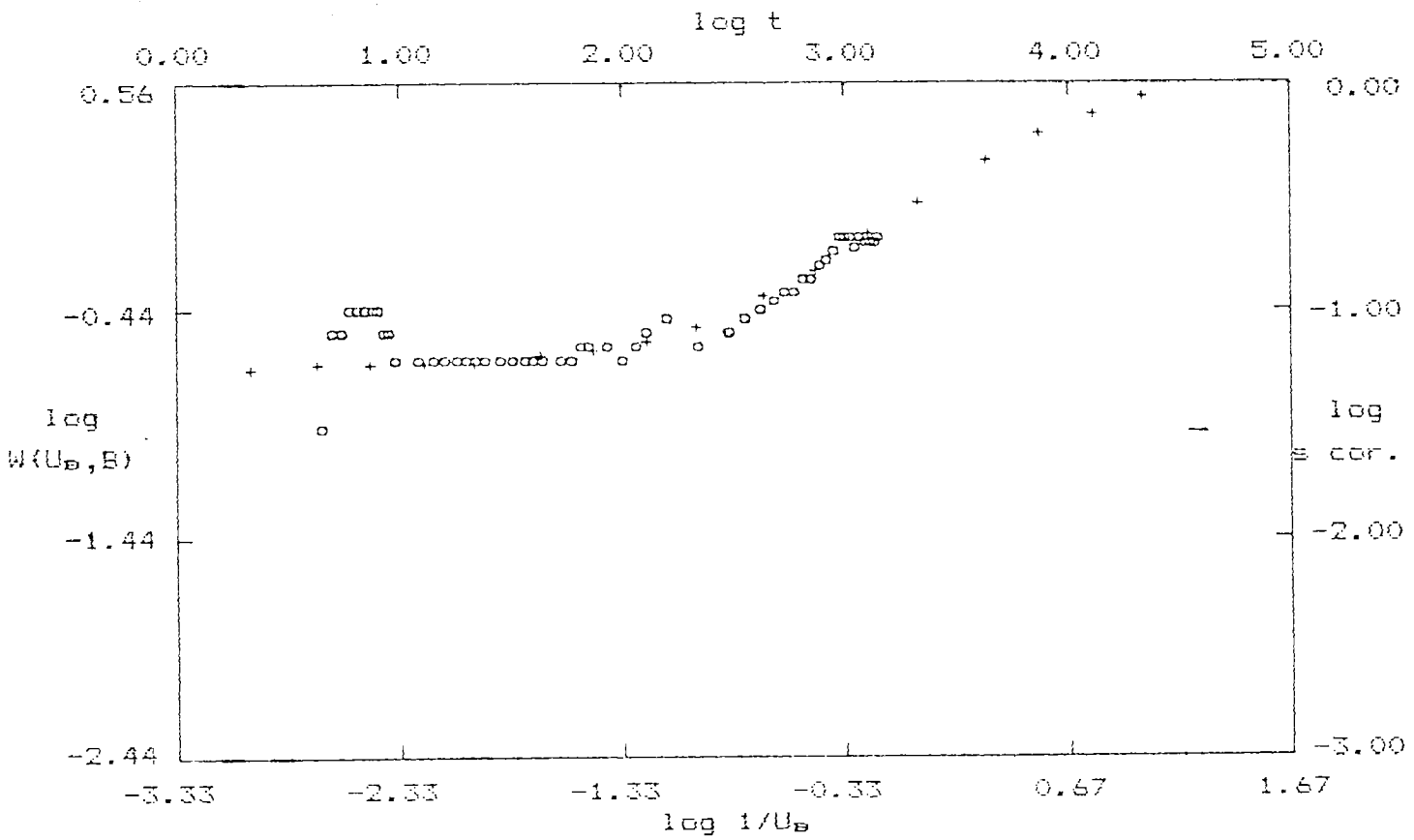
AMPAD 22-120 - SEMI-LOG 3 x 10

ESI-7: TIME DRAWDOWN - 24 HR TEST



AMPAD 22-120 - SEMI-LOG 3 x 10

ESI-2: DELAYED RESPONSE (β=1.5)



o - Data

\+ - Type Curve
Unconfined Delayed: beta = 1.50

SOLUTION

Transmissivity = 8.32E+003 gal/day/ft
Aquifer Thick. = 2.00E+001 ft
Hydraulic Cond.= 4.16E+002 gal/day/sq ft
Specific Yield = 2.87E+000

$K = 416 \text{ gpd/ft}^2 = .02 \text{ cm/s}.$

TABLE A

DOWCRAFT WATER LEVELS - PW-1: STEP TEST

2/9/93
BEGIN @ 15:53
END @ 17:32

WELL	ELEV TOR (msl)	SWL 14:30 pretest (ft)	WL 16:15 @5gpm (ft)	WL 17:15 @10gpm (ft)	WL 18:00 pump off (ft)	DD (ft)	WELL
PW-1	98.52	8.37	10.03	15.57	20.19 @17:32	11.82	PW-1
PW-2	98.63	8.49		8.61	8.63	0.14	PW-2
ESI-6	98.66	8.46	8.50	8.51	8.52	0.06	ESI-6
ESI-7	98.82	8.62	8.63	8.65	8.66	0.04	ESI-7
ESI-1	98.10	8.00		8.02	8.03	0.03	ESI-1
ESI-8	102.20	11.56	11.57	11.57	11.57	0.01	ESI-8
ESI-9	99.94	7.37	7.37	7.37	7.37	0.00	ESI-9
ESI-5	98.66	7.88	7.89	7.90	7.91	0.03	ESI-5
ESI-4	98.91	8.56	8.57	8.58	8.59	0.03	ESI-4
ESI-3	98.83	8.59	8.63	8.65	8.66	0.07	ESI-3
ESI-2D	98.46	7.87	7.92	7.94	7.96 (pump	0.09	ESI-2D
ESI-2	98.51	8.34	8.38	8.41	8.43 on)	0.09	ESI-2
ESI-12	98.89	8.72	8.80	8.82	8.84	0.12	ESI-12
ESI-11	99.02	9.12	9.12	9.16	9.18	0.06	ESI-11
ESI-10	99.00	9.18	9.20	9.23	9.23	0.05	ESI-10
ESI-13	97.26	FLOWING					ESI-13
RIVER		2.21					RIVER

DOWCRAFT WATER LEVELS - PW-2: STEP TEST

2/10/93
BEGIN @ 10:33:30
END @ 13:00

WELL	ELEV TOR (msl)	SWL 10:30am pretest (ft)	WL 11:00 @8gpm (ft)	WL 11:30 @10gpm (ft)	WL 11:50 @14gpm (ft)	WL 12:15 @18gpm (ft)	WL 12:40 @22gpm (ft)	WL 14:00 post recovery (ft)	DD (ft)
PW-2	98.63	8.55	11.38	12.53	13.35	16.04	20.08	8.60	11.53
PW-1	98.52	8.43	8.54	8.59	8.61	8.66	8.71	8.45	0.29
ESI-6	98.66	8.54	8.57	8.57	8.49	8.56	8.56	8.55	0.02
ESI-7	98.82	8.70	8.67	8.72	8.72	8.73	8.71	8.73	0.01
ESI-1	98.10	8.08	8.06	8.08	8.07	8.10	8.08	8.10	0.00
ESI-8	102.20	11.58	11.59	11.65	11.61	11.63	11.61	11.62	0.03
ESI-9	99.94	7.40	7.38	7.41	7.38	7.44	7.38	7.39	-0.02
ESI-5	98.66	8.02	7.97	7.99	7.96	8.01	7.93	7.93	-0.09
ESI-4	98.91	8.64	8.60	8.63	8.60	8.75	8.62	8.63	-0.02
ESI-3	98.83	8.66	8.62	8.68	8.63	8.67	8.68	8.67	0.02
ESI-2D	98.46	7.95	7.98	7.98	7.92	7.95	7.91	7.97	-0.04 ?
ESI-2	98.51	8.43	8.43	8.49	8.37	7.98(?)	6.28(?)	8.42	~~-0.43~~ 0
ESI-12	98.89	8.87	8.82	8.86	8.85	8.88	8.86	8.85	-0.01
ESI-11	99.02	9.19	9.12	9.21	9.19	9.24	9.23	9.16	0.04
ESI-10	99.00	9.28	9.23	9.29	9.27	9.30	9.29	9.24	0.01
ESI-13	97.26								0.00
RIVER	(Rel. Change)		2.25	2.25	2.25	2.27	2.25	2.25	~~2.25~~

NOTE Final Maximum drawdown on Pumping well PW-2 = 23.69-8.55 = 15.14

TABLE B

DOWCRAFT WATER LEVELS - 24 HOUR TEST

CAPTURE ZONE DATA
MAXIMUM DRAWDOWNS & RESULTING GROUNDWATER ELEVATIONS

WELL	ELEV TOR (msl)	SWL BT (ft)	SWL INIT (ft)	WL FINAL (ft)	DD FI-IN (ft)	DD FI-BT (ft) ↓USE	ELEV BT SWL (msl)	ELEV FIN WL (msl)
PW-2	98.63	8.58	8.58	20.20	11.62	11.62	90.05	78.43
ESI-6	98.66	8.55	8.50	8.78	0.23	0.28	90.11	89.88
ESI-7	98.82	8.73	8.73	8.93	0.20	0.20	90.09	89.89
ESI-1	98.10	8.10	8.10	8.28	0.18	0.18	90.00	89.82
ESI-8	102.20	11.62	11.62	11.77	0.15	0.15	90.58	90.43
ESI-9	99.94	7.39	7.42	7.42	0.03	0.00	92.55	92.52
ESI-5	98.66	7.93	7.91	8.01	0.08	0.10	90.73	90.65
ESI-4	98.91	8.63	8.65	8.79	0.16	0.14	90.28	90.12
ESI-3	98.83	8.67	8.65	8.88	0.21	0.23	90.16	89.95
PW-1	98.52	8.45	8.43	8.85	0.40	0.42	90.07	89.67
ESI-2D	98.46	7.97	7.96	8.09	0.12	0.13	90.49	90.37
ESI-2	98.51	8.42	8.42	8.63	0.21	0.21	90.09	89.88
ESI-12	98.89	8.85	8.89	9.02	0.17	0.13	90.04	89.87
ESI-11	99.02	9.16	9.24	9.38	0.22	0.14	89.86	89.64
ESI-10	99.00	9.24	9.31	9.42	0.18	0.11	89.76	89.58
ESI-13	97.26	7.41	7.41	7.60	0.19	0.19	89.85	89.66
RIVER	(Rel. Change)		2.25	2.31		0.06		

TABLE C

DOWCRAFT WATER LEVELS – 24 HOUR TEST

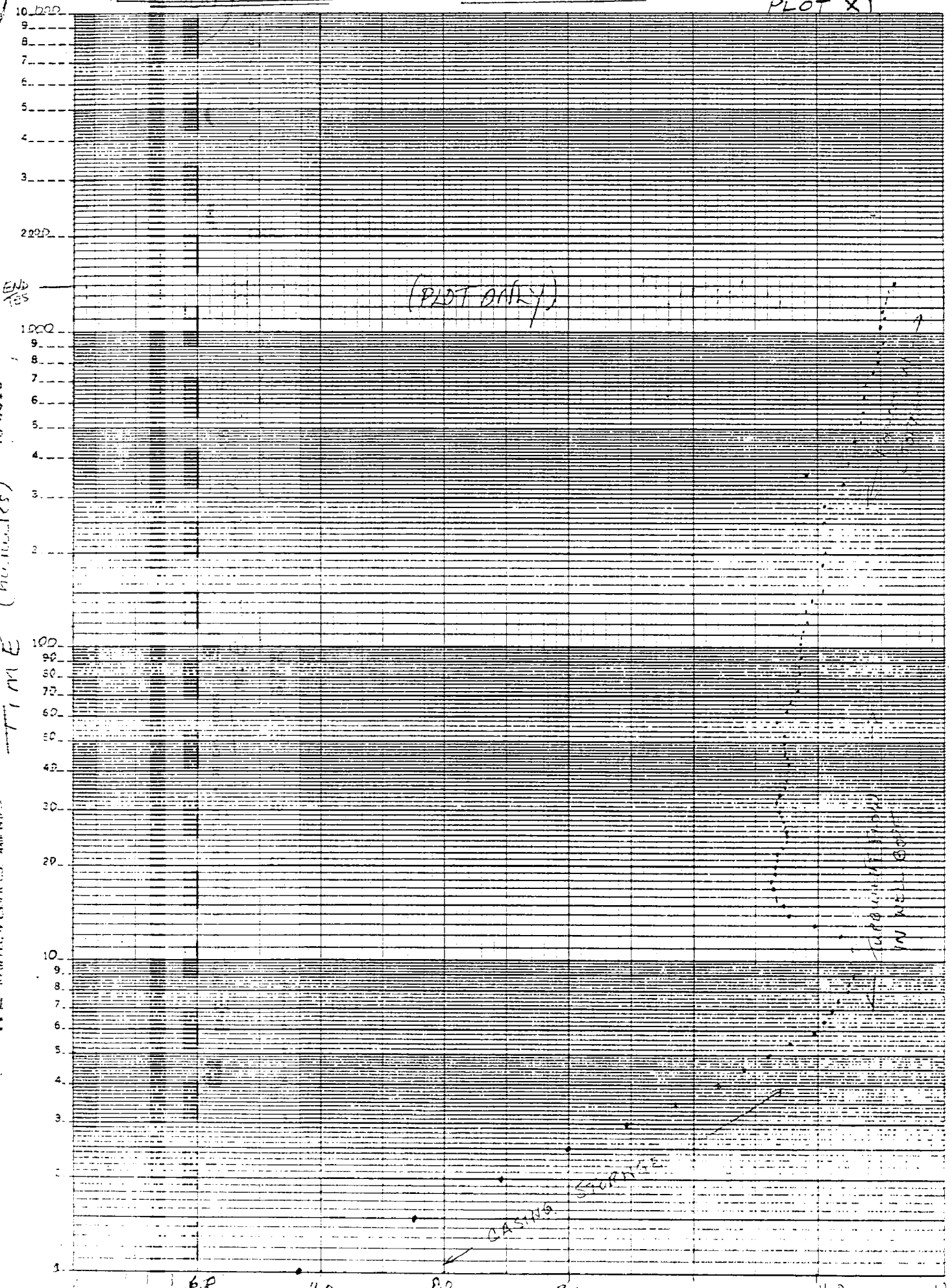
PUMP PW-2

DISTANCE-DRAWDOWN DATA

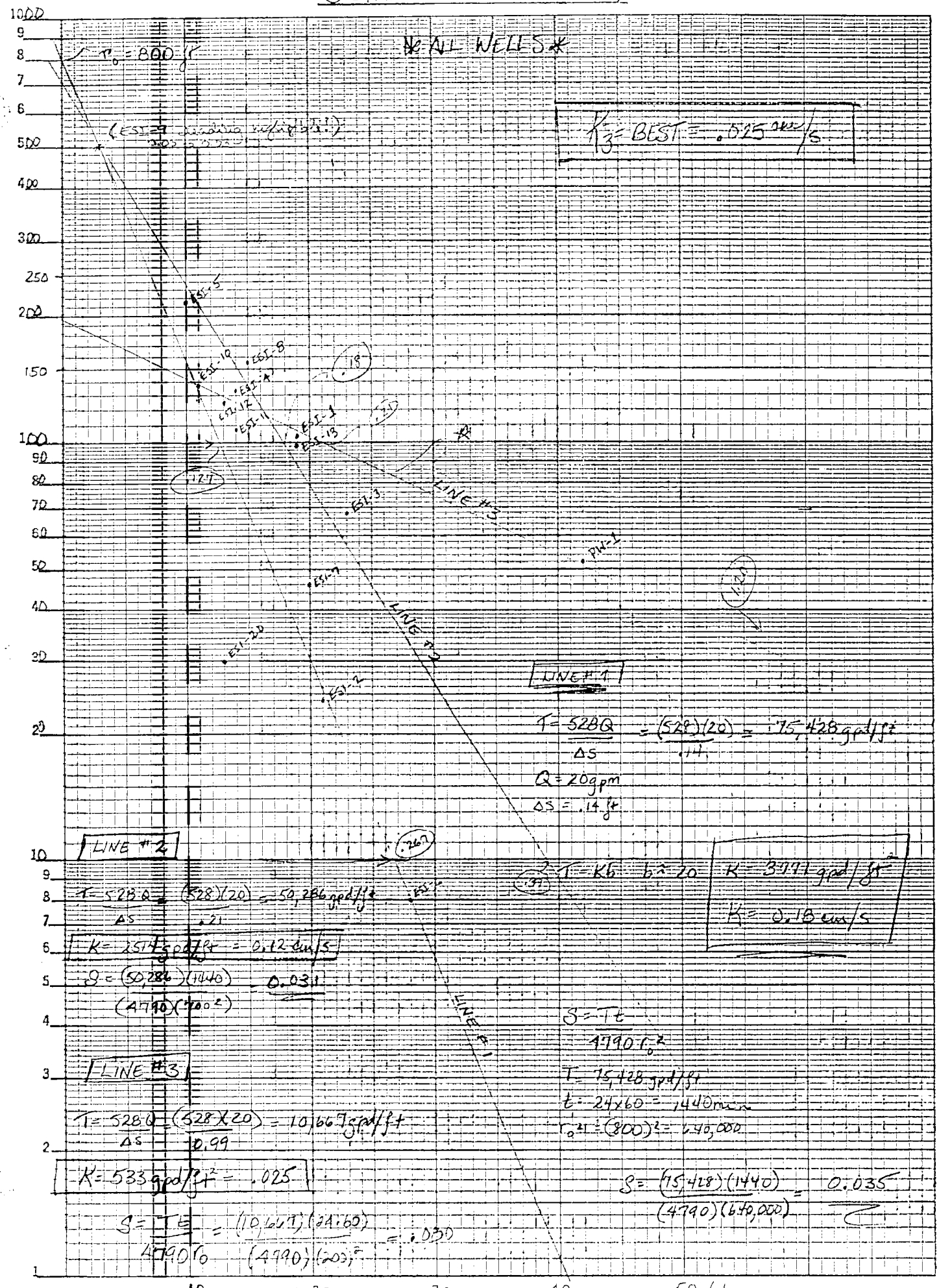
WELL		MAX DRAWDOWN (ft)	DIST to PW2 (ft)	WELL DEPTH (ft)	SCREEN INTV (ft)	ELEV TOR (msl)
PW-2	MAX DD	11.62	0	26.0	6-26	98.63
PW-1		0.42	52	27.0	5-27	98.52
ESI-6		0.28	8	13.5	3.5-13.5	98.66
ESI-3		0.23	68	15.0	5-15	98.83
ESI-2		0.21	24	15.0	5-15	98.51
ESI-7		0.20	46	14.5	4.5-14.5	98.82
ESI-13		0.19	98	?	?	97.26
ESI-1		0.18	104	15.0	5-15	98.10
ESI-8		0.15	156	18.0	8-18	102.20
ESI-11		0.14	109	15.0	10-15	99.02
ESI-4		0.14	133	15.0	5-15	98.91
ESI-12		0.13	125	15.0	10-15	98.89
ESI-20		0.13	30	60.0	35-45	98.46
ESI-10		0.11	138	15.0	10-15	99.00
ESI-5		0.10	213	15.0	5-15	98.66
RIVER		0.06	173	15.0	5-15	
ESI-9	MIN DD	0.00	506	15.0	5-15	99.94

PLOT 1

PW-2 (PUMPING WELL): TIME DRAWDOWN — 24 HR TEST
PLOT X1



DISTANCE - DRAWDOWN (JACOB)



K_3 = BEST = .025 cm/s

LINE #1

$T = \frac{528Q}{\Delta s} = \frac{(528)(20)}{.14} = 75{,}428$ gpd/ft

$Q = 20$ gpm

$\Delta s = .14$ ft

$T = Kb$ $b \approx 20$ $K = 3771$ gpd/ft^2

$K = 0.18$ cm/s

LINE #2

$T = \frac{528Q}{\Delta s} = \frac{(528)(20)}{.21} = 50{,}286$ gpd/ft

$K = \frac{2514 \text{ gpd/ft}}{} = 0.12$ cm/s

$S = \frac{(50{,}286)(1440)}{(4790)(700^2)} = 0.031$

LINE #3

$T = \frac{528Q}{\Delta s} = \frac{(528 \times 20)}{0.99} = 10{,}667$ gpd/ft

$K = 533$ gpd/ft^2 = .025

$S = \frac{Tt}{4790 r_o^2} = \frac{(10{,}667)(24 \times 60)}{(4790)(20^2)} = .030$

$T = 75{,}428$ gpd/ft

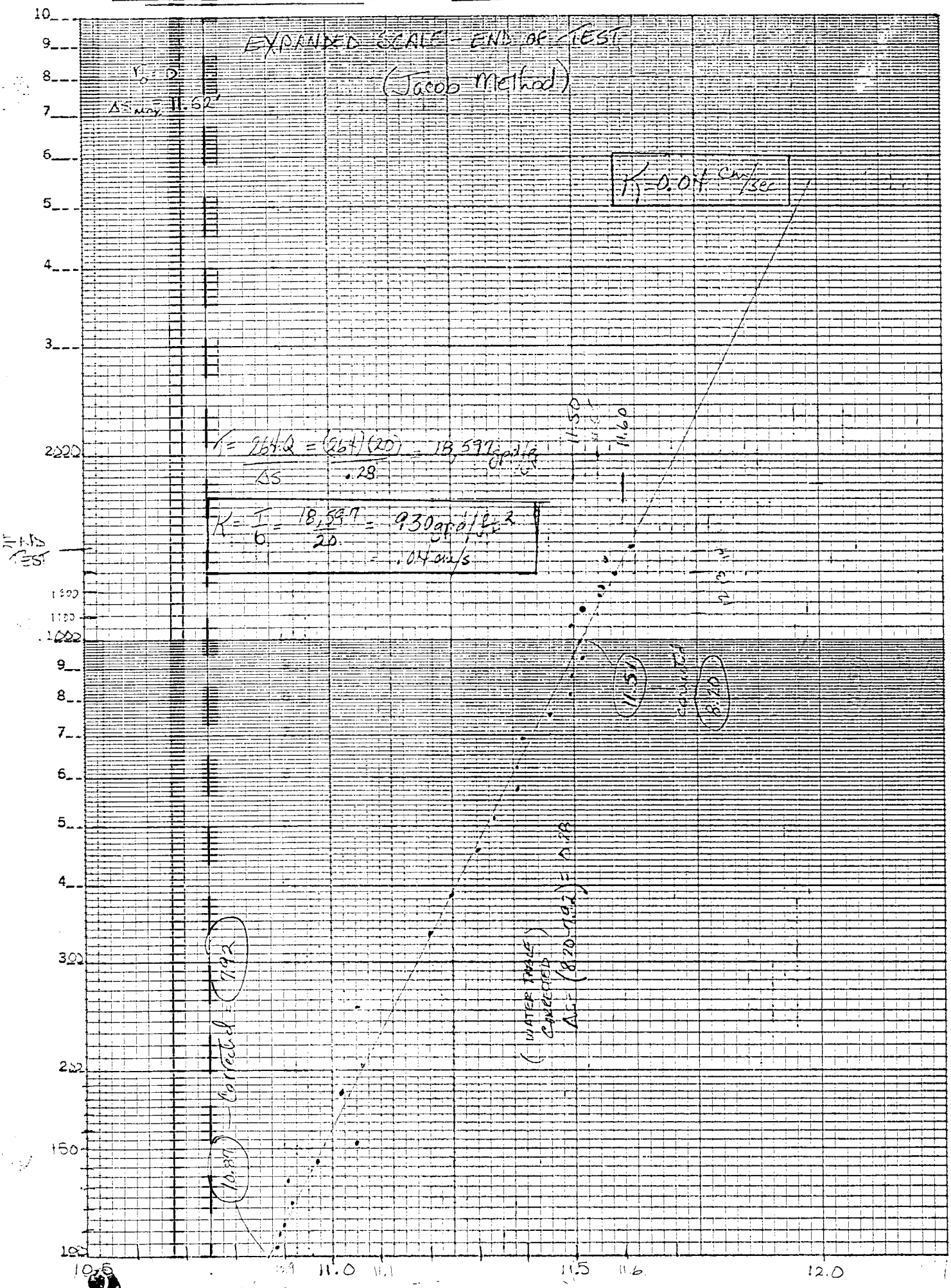
$t = 24 \times 60 = 1440$ min

$r_o^2 = (800)^2 = 640{,}000$

$S = \frac{(75{,}428)(1440)}{(4790)(640{,}000)} = 0.035$

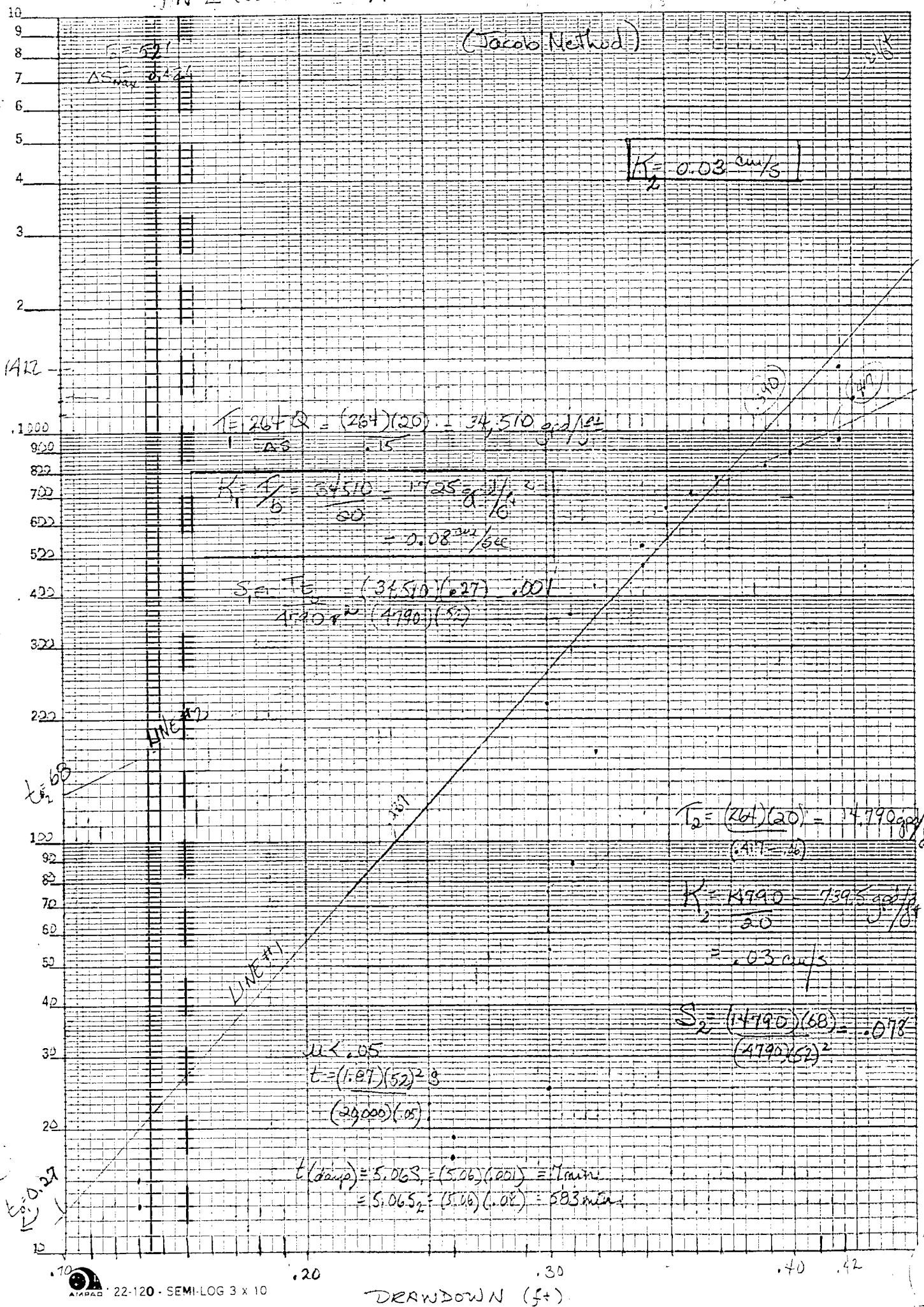
AMPAD 22-120 - SEMI-LOG 3 x 10

PW-2 (PUMPING WELL): TIME - DRAWDOWN



PW-1 (Observation): TIME-DRAWDOWN – 24 HR TEST

(Jacob Method)



$$T = \frac{264\,Q}{\Delta s} = \frac{(264)(20)}{.15} = 34{,}510 \text{ gpd/ft}$$

$$K_1 = \frac{T}{b} = \frac{34{,}510}{20} = 1725 \text{ gpd/ft}^2$$

$$= 0.08 \text{ cm/sec}$$

$$S_1 = \frac{2.25\,T t_0}{r^2} = \frac{(2.25)(34{,}510)(.27)}{(4790)(52)^2} = .001$$

$$T_2 = \frac{(264)(20)}{(.417 - .26)} = 34{,}790 \text{ gpd/ft}$$

$$K_2 = \frac{34790}{20} = 1739.5 \text{ gpd/ft}^2$$

$$= .03 \text{ cm/s}$$

$$S_2 = \frac{(2.25)(34790)(.68)}{(4790)(52)^2} = .078$$

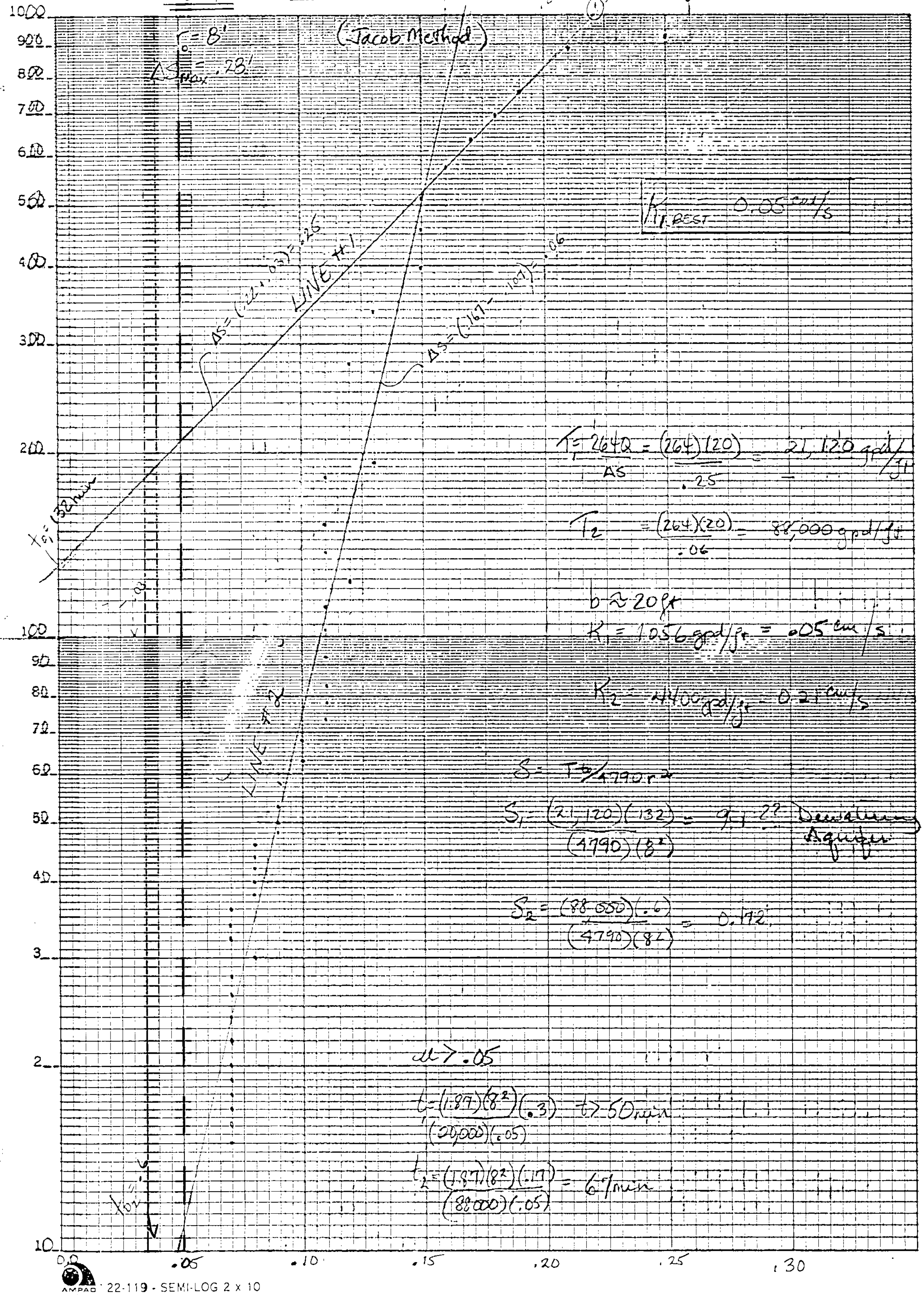
$u < .05$

$$t = \frac{(1.87)(52)^2 .3}{(29{,}000)(.05)}$$

$t(\text{days}) = 5.06 S_1 = (5.06)(.001) = 1 \text{ min}$

$= 5.06 S_2 = (5.06)(.08) = 583 \text{ min}$

ESI-6: TIME DRAWDOWN - 24 HR TEST



$K_{1\,BEST}$ = 0.05 cm/s

$T_1 = \frac{264Q}{\Delta S} = \frac{(264)(120)}{.25} = 21,120$ gpd/ft

$T_2 = \frac{(264)(20)}{.06} = 88,000$ gpd/ft

b ≈ 20 ft

K_1 = 1056 gpd/ft = .05 cm/s

K_2 = 4400 gpd/ft = 0.21 cm/s

$S = T t_0 / 4790 r^2$

$S_1 = \frac{(21,120)(132)}{(4790)(8^2)} = 9.1$?? Dewatering Aquifer

$S_2 = \frac{(88,000)(.6)}{(4790)(8^2)} = 0.172$

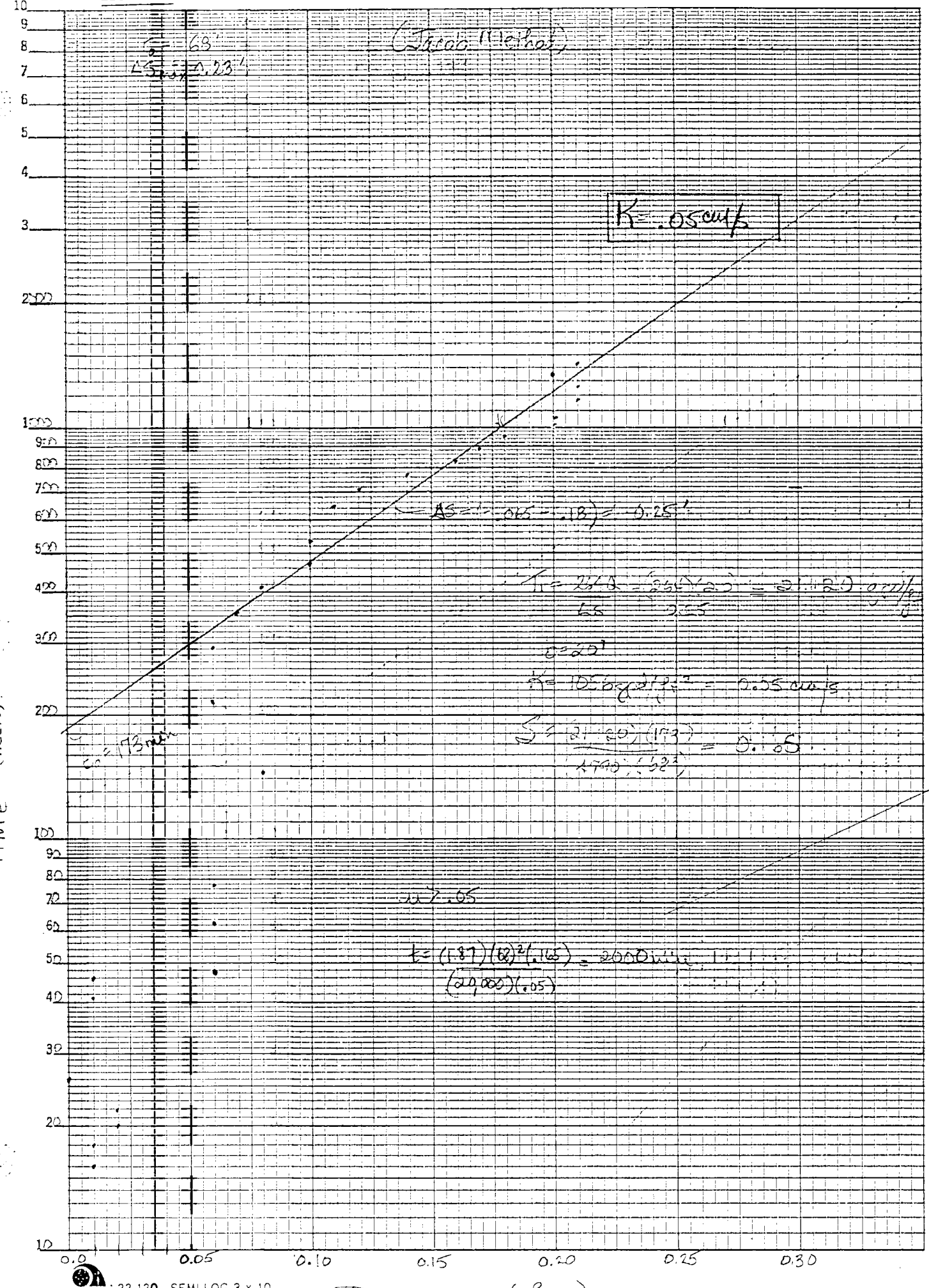
u > .05

$t_1 = \frac{(1.87)(8^2)(.3)}{(20,000)(.05)}$ t > 50 min

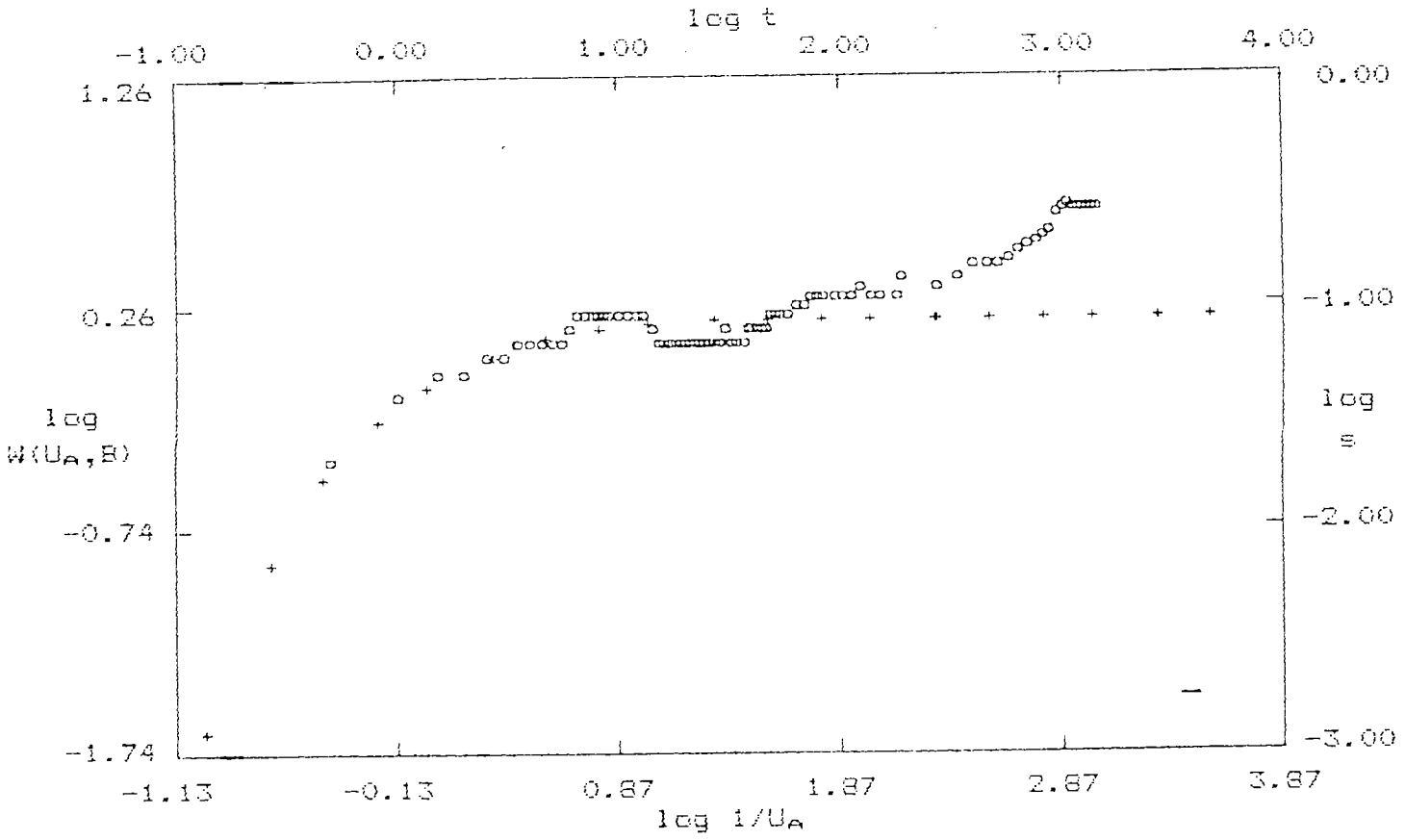
$t_2 = \frac{(1.87)(8^2)(.17)}{(88000)(.05)} = 67$ min

AMPAD 22-119 - SEMI-LOG 2 x 10

ESI-3: TIME DRAWDOWN - 24 HR TEST



ESI-6: ELASTIC RESPONSE (β = .10)



o - Data

\+ - Type Curve
Unconfined Elastic: beta = 0.10

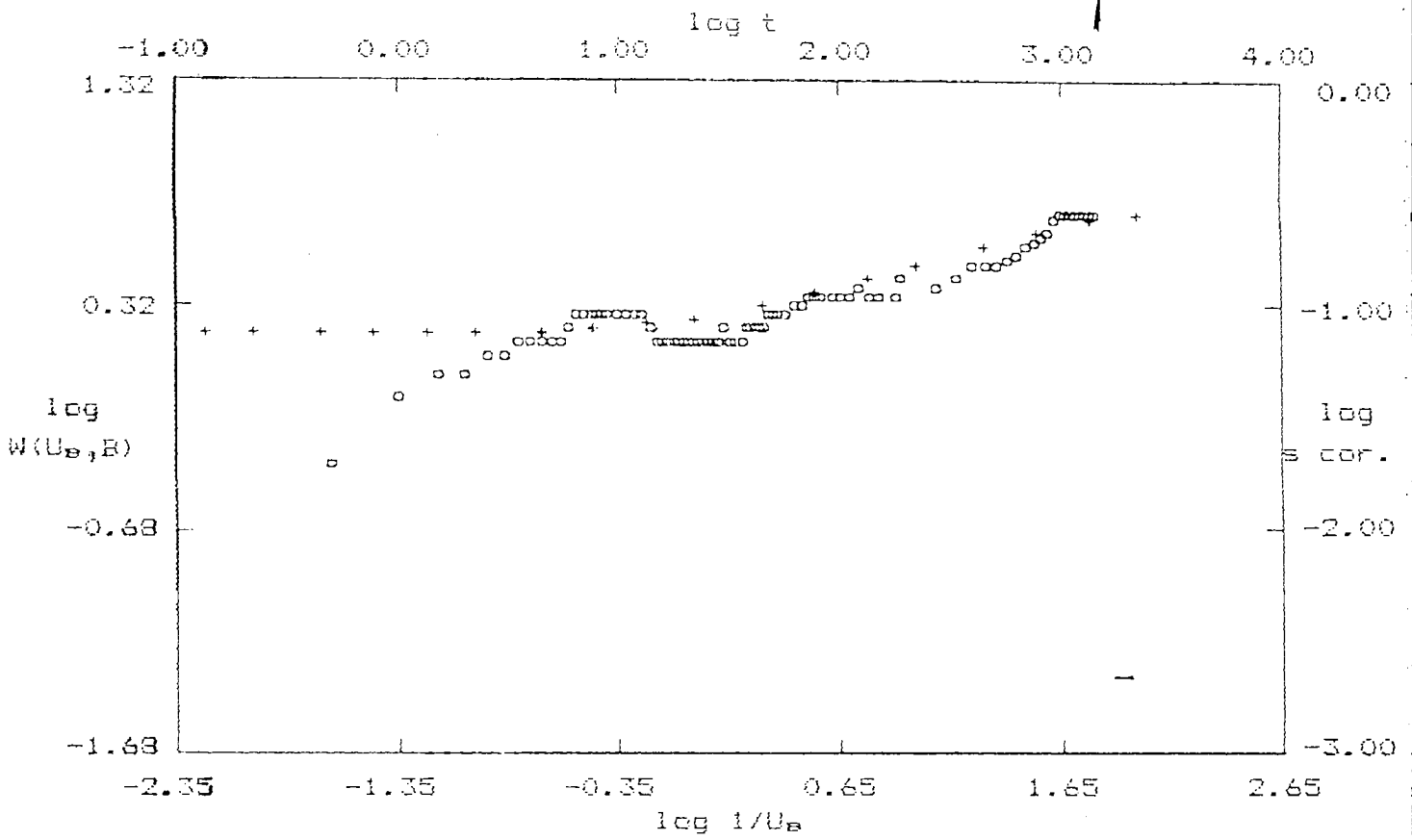
SOLUTION

Transmissivity = 4.17E+004 gal/day/ft
Aquifer Thick. = 2.00E+001 ft
Hydraulic Cond.= 2.08E+003 gal/day/sq ft
Storativity = 8.16E-002

$\beta = r^2/b^2 = 8^2/20^2 = 0.16$

$K = 208 \text{ gpd/ft}^2 = .010 \text{ cm/s}$

ESI-6: DELAYED RESPONSE ($\beta = .10$)



o - Data

\+ - Type Curve
Unconfined Delayed: beta = 0.10

SOLUTION

Transmissivity = 4.79E+004 gal/day/ft
Aquifer Thick. = 2.00E+001 ft
Hydraulic Cond.= 2.39E+003 gal/day/sq ft
Specific Yield = 1.55E+000

$$\beta = \frac{r^2}{b^2} = \frac{(8)^2}{(20)^2} = 0.16$$

$K = 239 \text{ gpd/ft}^2 = 0.011 \text{ cm/s}$

Data for Pump Test

ll Name: ESI-6 Date of Test: 2/10/93

ifer Thickness (b): 20.000 feet

ped Well Discharge(Q) = 20.000 gpm

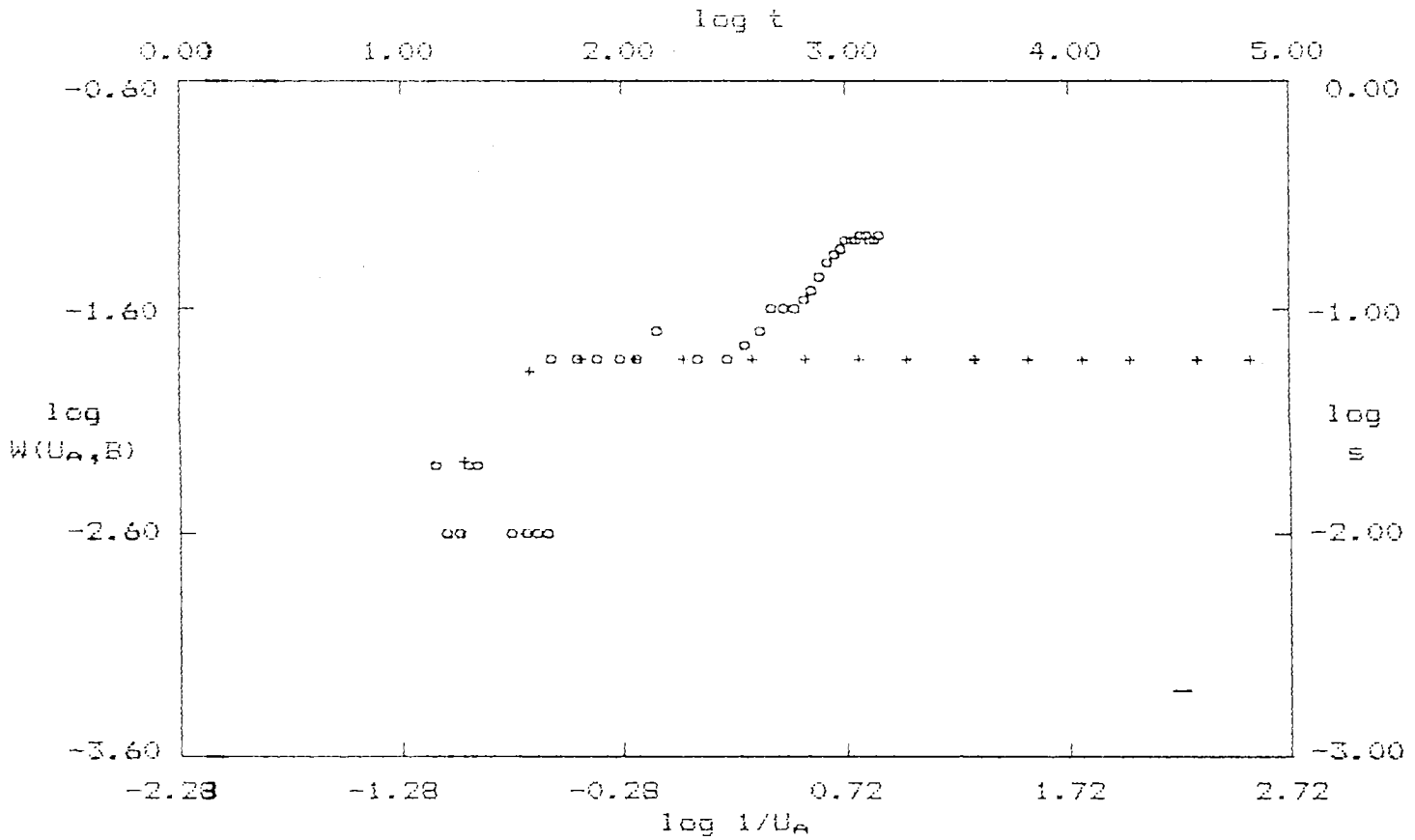
dius of Pumping Well = 0.083 feet

stance of Observation Well from Pumping Well = 8.000 feet

ntry No.	Time(t) (min.)	Drawdown(s) (ft.)	t / d^2 (min./sq.ft.)
1	0.500	0.020	7.8E-003
2	1.000	0.040	1.6E-002
3	1.500	0.050	2.3E-002
4	2.000	0.050	3.1E-002
5	2.500	0.060	3.9E-002
6	3.000	0.060	4.7E-002
7	3.500	0.070	5.5E-002
8	4.000	0.070	6.3E-002
9	4.500	0.070	7.0E-002
10	5.000	0.070	7.8E-002
11	5.500	0.070	8.6E-002
12	6.000	0.080	9.4E-002
13	6.500	0.090	1.0E-001
14	7.000	0.090	1.1E-001
15	7.500	0.090	1.2E-001
16	8.000	0.090	1.3E-001
17	8.500	0.090	1.3E-001
18	9.000	0.090	1.4E-001
19	10.000	0.090	1.6E-001
20	11.000	0.090	1.7E-001
21	12.000	0.090	1.9E-001
22	13.000	0.090	2.0E-001
23	14.000	0.080	2.2E-001
24	15.000	0.070	2.3E-001
25	16.000	0.070	2.5E-001
26	17.000	0.070	2.7E-001
27	18.000	0.070	2.8E-001
28	19.000	0.070	3.0E-001
29	20.000	0.070	3.1E-001
30	21.000	0.070	3.3E-001
31	22.000	0.070	3.4E-001
32	23.000	0.070	3.6E-001
33	24.000	0.070	3.8E-001
34	25.000	0.070	3.9E-001
35	26.000	0.070	4.1E-001
36	27.000	0.070	4.2E-001
37	28.000	0.070	4.4E-001
38	29.000	0.070	4.5E-001
39	30.000	0.080	4.7E-001
40	32.000	0.070	5.0E-001
41	34.000	0.070	5.3E-001
42	36.000	0.070	5.6E-001
43	38.000	0.080	5.9E-001
44	40.000	0.080	6.3E-001
45	42.000	0.080	6.6E-001
46	44.000	0.080	6.9E-001
47	46.000	0.080	7.2E-001
48	48.000	0.090	7.5E-001
49	50.000	0.090	7.8E-001
50	53.000	0.090	8.3E-001
51	58.000	0.090	9.1E-001
52	63.000	0.100	9.8E-001

54	73.000	0.110	1.1E+000
55	78.000	0.110	1.2E+000
56	83.000	0.110	1.3E+000
57	93.000	0.110	1.5E+000
58	103.000	0.110	1.6E+000
59	113.000	0.110	1.8E+000
60	123.000	0.120	1.9E+000
61	138.000	0.110	2.2E+000
62	153.000	0.110	2.4E+000
63	183.000	0.110	2.9E+000
64	192.000	0.130	3.0E+000
65	276.000	0.120	4.3E+000
66	337.000	0.130	5.3E+000
67	397.000	0.150	6.2E+000
68	457.000	0.150	7.1E+000
69	516.000	0.150	8.1E+000
70	575.000	0.160	9.0E+000
71	635.000	0.170	9.9E+000
72	695.000	0.180	1.1E+001
73	755.000	0.190	1.2E+001
74	815.000	0.200	1.3E+001
75	876.000	0.210	1.4E+001
76	937.000	0.250	1.5E+001
77	995.000	0.260	1.6E+001
78	1055.000	0.270	1.6E+001
79	1116.000	0.260	1.7E+001
80	1175.000	0.260	1.8E+001
81	1240.000	0.260	1.9E+001
82	1295.000	0.260	2.0E+001
83	1352.000	0.260	2.1E+001
84	1412.000	0.260	2.2E+001

ESI-3: ELASTIC RESPONSE (=7.0)



o - Data

+ - Type Curve
Unconfined Elastic: beta = 7.00

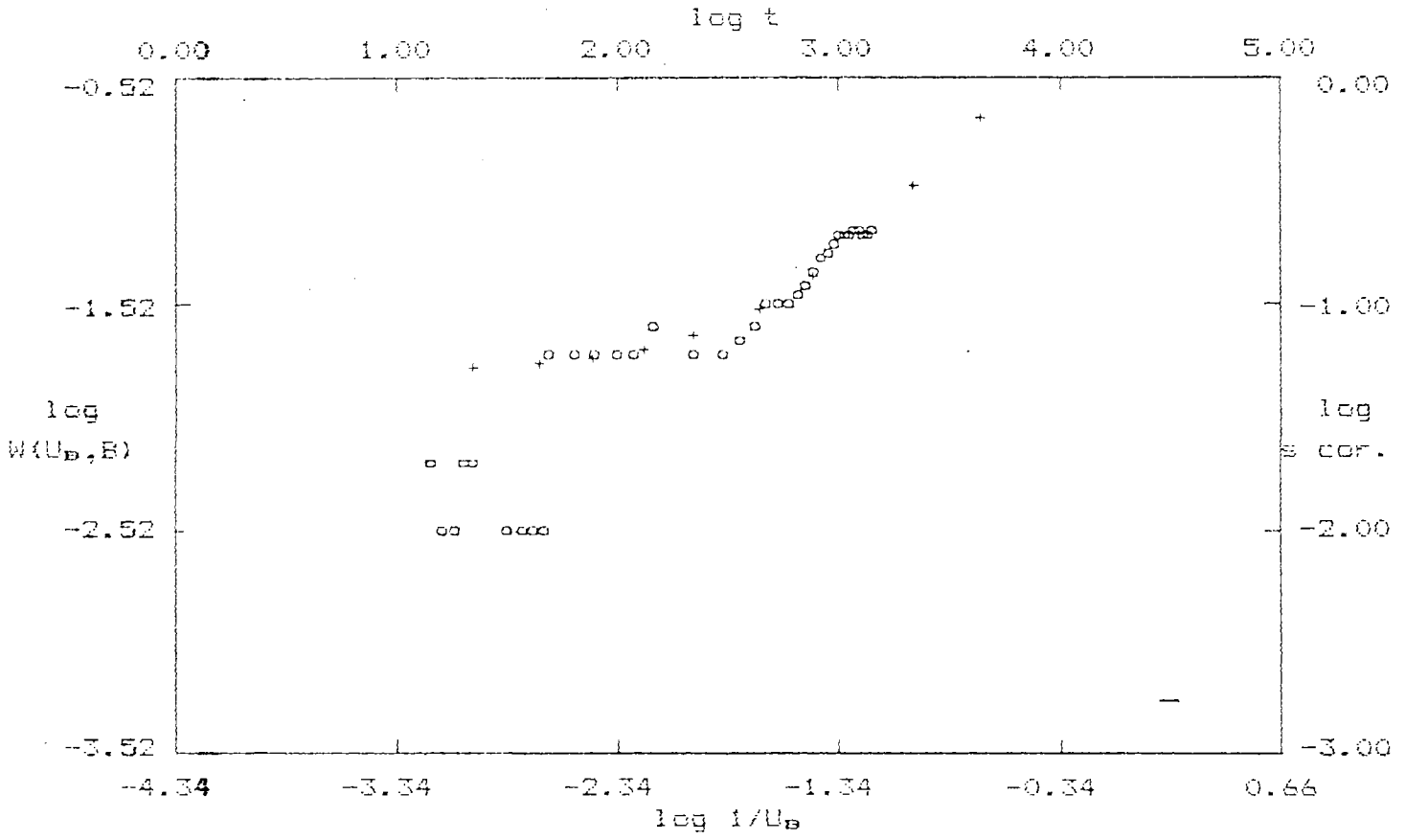
SOLUTION

Transmissivity = 5.76E+002 gal/day/ft
Aquifer Thick. = 2.00E+001 ft
Hydraulic Cond.= 2.88E+001 gal/day/sq ft
Storativity = 2.20E-003

$\beta = \frac{r^2}{b^2} = \frac{(68)^2}{(20)^2} = 11.56$

$T = 28.8 \text{ gpd/ft}^2 = .001 \text{ cm/s}$

ESI-3: DELAYED RESPONSE (=7.0)



o - Data

\+ - Type Curve
Unconfined Delayed: beta = 7.00

SOLUTION

Transmissivity = 6.92E+002 gal/day/ft
Aquifer Thick. = 2.00E+001 ft
Hydraulic Cond.= 3.46E+001 gal/day/sq ft
Specific Yield = 3.04E-001

$\beta = \frac{r^2}{b^2} = \frac{(68)^2}{(20)^2} = 11.56$

$K = 34.6 \text{ gpd/ft}^2 = .002 \text{ cm/s}$

Data for Pump Test

Well Name: ESI-3 Date of Test: 2/10/93
Aquifer Thickness (b): 20.000 feet
Pumped Well Discharge(Q) = 20.000 gpm
Radius of Pumping Well = 0.083 feet
Distance of Observation Well from Pumping Well = 68.000 feet

Entry No.	Time(t) (min.)	Drawdown(s) (ft.)	t / d^2 (min./sq.ft.)
1	14.000	0.020	3.0E-003
2	16.000	0.010	3.5E-003
3	18.000	0.010	3.9E-003
4	20.000	0.020	4.3E-003
5	22.000	0.020	4.8E-003
6	26.000	0.000	5.6E-003
7	31.000	0.010	6.7E-003
8	36.000	0.010	7.8E-003
9	41.000	0.010	8.9E-003
10	46.000	0.010	9.9E-003
11	48.000	0.060	1.0E-002
12	63.000	0.060	1.4E-002
13	78.000	0.060	1.7E-002
14	98.000	0.060	2.1E-002
15	118.000	0.060	2.6E-002
16	143.000	0.080	3.1E-002
17	218.000	0.060	4.7E-002
18	296.000	0.060	6.4E-002
19	353.000	0.070	7.6E-002
20	413.000	0.080	8.9E-002
21	467.000	0.100	1.0E-001
22	528.000	0.100	1.1E-001
23	586.000	0.100	1.3E-001
24	647.000	0.110	1.4E-001
25	705.000	0.120	1.5E-001
26	767.000	0.140	1.7E-001
27	828.000	0.160	1.8E-001
28	889.000	0.170	1.9E-001
29	950.000	0.180	2.1E-001
30	1005.000	0.200	2.2E-001
31	1064.000	0.200	2.3E-001
32	1123.000	0.200	2.4E-001
33	1181.000	0.210	2.6E-001
34	1246.000	0.210	2.7E-001
35	1301.000	0.200	2.8E-001
36	1359.000	0.200	2.9E-001
37	1407.000	0.210	3.0E-001
38	1417.000	0.210	3.1E-001
39		0.210	0.0E-308