2021 Hazardous Waste Scanning Project

File Form Naming Convention.

(*File_Type*).(*Program*).(*Site_Number*).(*YYYY-MM-DD*).(*File_Name*).pdf

Note 1: Each category is separated by a period "."
Note 2: Each word within category is separated by an underscore "_"

Specific File Naming Convention Label:

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INSTALLATION RESTORATION PROGRAM (IRP)

RI/FS

VOLUME IVA

Appendices A through E

Niagara Falls International Airport
Niagara Falls, New York

Science Applications International Corporation (SAIC)
One Sears Drive
Paramus, New Jersey 07652

MAY 1991

Remedial Investigation/ Feasibility Study (RI/FS) Report 1987-1990

PREPARED FOR

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE RESERVE
ROBINS AIR FORCE BASE, GEORGIA 31098-6001

UNITED STATES AIR FORCE
HUMAN SYSTEMS DIVISION (AFSC)
IRP PROGRAM OFFICE (HSD/YAQI)
BROOKS AIR FORCE BASE, TEXAS 78235-5000

JUN 1 1992
ENVIRONMENTAL CONSERVATION
REGION 9

APPENDIX A

Abbreviations Terminology

and

Topographic Map Symbols

ABBREVIATIONS

A	Hollow-Stem Augering
AF	Air Force
AFB	Air Force Base
AFFF	Aqueous Film Forming Foam
AFRES	Air Force Reserve
AFRF	Air Force Reserve Facility
Ag	Silver
ALS	Above Land Surface
AMSL	Above Mean Sea Level
ANG	Air National Guard
ANGB	Air National Guard Base
ARAR's	Applicable or Relevant Appropriate Requirements
As	Arsenic
ASTM	American Society for Testing and Materials
ATV	All Terrain Vehicle
Avg.	Average
AVGAS	Aviation Gasoline
b	Saturated Thickness
Bldg.	Building
BLS	Below Land Surface
BOMARC	Ballistic Operational Missile Air to Ground Radio Controlled
BPW	Base Production Well
BTOC	Below Top of Casing
BTR	Below Top of Riser
BW	Bailer Wash

ABBREVIATIONS (Cont'd)

BX	Base Exchange
C	Cuttings
CAG	Carcinogen Assessment Group
Cd	Cadmium
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
CFS	Cubic Feet Per Second
cm/sec	centimeter/second
CN	Cyanide
COC	Chain of Custody
Cr	Chromium
CRS	California Ring Sampler
Cu	Copper
DEQPPM	Defense Environmental Quality Program Policy Memorandum
DET	Detachment
DOD	Department of Defense
DOT	Department of Transportation
DOW	Description of Work
DPDO	Defense Property Disposal Office
DQO	Data Quality Objectives
DRMO	Defense Reutilization Marketing Office
EDM	Electronic Distance Meter
EIA	Environmental Impact Statement
EPA	Environmental Protection Agency
ERG	Environmental Research Group
FB	Field Blank

ABBREVIATIONS (Cont'd)

Fe	Iron
FIS	Fighter Interceptor Squadron
FIT	Field Investigation Team
FS	Feasibility Study
ft	feet
ft/day	feet per day
ft/sec	feet per second
ft/year	feet per year
gals	gallons
gal/min	gallons per minute
GC	Gas Chromatograph
gpd	gallons per day
gpm	gallons per minute
HARM	Hazard Assessment Rating Methodology
Hg	Mercury
HMTC	Hazardous Materials Technical Center
I	Hydraulic Gradient
ID	Inside Diameter
IRP	Installation Restoration Program
JP-4	Jet Propulsion Fuel No. 4
K	Hydraulic Conductivity
mg	milligrams
MGD	Million gallons per day
mg/Kg	Milligram per Kilogram
mg/L	milligrams per liter

ABBREVIATIONS (Cont'd)

ml	milliliters
MOGAS	Automobile Gasoline
MR	Mud Rotary
MS	Mass Spectrometry
MSL	Mean Sea Level
MW	Monitoring Well
n	Effective Porosity
NCP	National Contingency Plan
Ni	Nickel
NO_3	Nitrate Nitrogen
NORAD	North American Aerospace Defense Command
NPDES	National Pollutant Discharge Elimination System
NYANG	New York Air National Guard
OD	Outside Diameter
OEHL	Occupational & Environmental Health Laboratory
O&G	Oil and Grease
Pb	Lead
PID	Photoionization Detector
POC	Point of Contact
POL	Petroleum, Oils and Lubricants
ppb	parts per billion (equivalent to micrograms per liter-ug/L)
ppm	parts per million (equivalent to milligrams per liter-mg/L)
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control

ABBREVIATIONS (Cont’d)

RE	Recovery
RI	Remedial Investigation
SAIC	Science Applications International Corporation
SARA	Superfund Amendments and Reauthorization Act
SCANG	South Carolina Air National Guard
Se	Selenium
SI	Sample Interval
SOW	Statement of Work
SS	Split Spoon
SW/SD	Surface Water/Surface Sediment
T	Transmissivity
TAC	Tactical Air Command
TDS	Total Dissolved Solids
TFG	Tactical Fighter Group
TOC	Total Organic Carbon
TOX	Total Organic Halogens
ug/L	Micrograms per liter
USAF	United States Air Force
USAFE	United States Air Force Europe
USGS	United States Geological Survey
v	Velocity
VOA	Volatile Organics Analysis - EPA Methods 601-602
VOC	Volatile Organic Compounds
Zn	Zinc

TERMINOLOGY

Air Surging	A procedure for developing wells whereby compressed air is pumped down a well and allowed to bubble up through the water column in the well.
Alconox	A low residue detergent utilized for decontamination procedures.
Alluvium	General term for all detrital material deposited permanently or in transit by streams.
Anisotropic	Having physical properties that vary in different directions.
Annular Space	The space between a borehole and the outside of a well screen or casing.
Aquifer	A geologic formation, group of formations, or part of a formation that is capable of yielding water to a well or spring.
Argillaceous	Containing or consisting of clay.
Artesian	Pertaining to underground water that is confined by impervious material under pressure sufficient to raise it above the upper level of the saturated material.
Auger	A screwlike boring tool resembling a carpenter's auger bit but much larger, usually motor-driven, designed for use in clay, soil, and other relatively unconsolidated near-surface materials.
Bed	Any tabular body of rock lying in a position essentially parallel to the surface or surfaces on or against which it was formed, whether these be a surface of weathering and erosion, planes of stratification, or inclined fractures.
Bedding	The arrangement of rock in layers, strata, or beds.
Bedding Joint	Crack parallel with the bedding of a rock.
Bedrock	The more or less solid, undisturbed rock in place either at the surface or beneath surficial deposits of gravel, sand, or soil.
Beidellite	Clay mineral belonging to the montmorillonite group which is fairly common in soils.

TERMINOLOGY (Cont'd)

Bench	Relatively flat, horizontal, or gently inclined surface, usually relatively long and narrow, which is bounded on one side by a steeper ascending slope and on the other by a steeper descending slope.
Bentonite	Rock composed of any of the montmorillonite-beidellite group of clay minerals.
Berm	Relatively narrow, horizontal or gently sloping man-made bench or shelf.
Blow Count	The total number of strikes with a free-falling weight needed to drive a sampler a given distance into the ground.
Boring Log	Systematic and sequential record of geologic data obtained from a soil boring.
Calcareous	Consisting of or containing calcium carbonate.
Carbonaceous	Containing carbon as small disseminated particles mingled with inorganic constituents.
Channel	An abandoned or buried watercourse represented by deposits of gravel or sand.
Clay	Fine-grained aggregate consisting wholly or dominantly or microscopic and submicroscopic mineral particles.
Cleavage	Tendency to split or cleave along definite, smooth, parallel, closely spaced planes.
Cone of Depression	The depression, roughly conical in shape, produced in a water table or potentiometric surface by pumping or artesian flow.
Confining bed, layer, or unit	Body of distinctly less permeable material stratigraphically adjacent to one or more aquifers.
Consolidation	Any or all processes whereby loose, soft, or liquid earth materials become firm and coherent.
Cretaceous	The third and latest period of the mesozoic era.
Cross-section	Geologic diagram or actual field exposure showing the geologic formations and structures transected by a given plane.
Detritus	Any material worn or broken from rocks by mechanical means.

TERMINOLOGY (Cont'd)

Diffusion	The spreading out of molecules, atoms, or ions into a porous medium in a direction tending to equalize concentrations in all parts of the system.
Dip	Angle at which a stratum or any planar feature is inclined from the horizontal.
Discharge	Rate of flow at a given instant in terms of volume per unit of time.
Dolomite*	Common rock-forming rhombohedral mineral ($CaMg(CO_3)_2$) found in extensive beds as dolomite rock.
Downgradient	In the direction of decreasing hydraulic static head; the direction in which groundwater flows.
Drawdown	A lowering of the water table or potentiometric surface caused by pumping of groundwater from wells.
Effective Porosity	The amount of interconnected pore space through which fluids can pass.
EPA Method 601	GC test method for the determination of 29 purgeable halocarbons.
EPA Method 602	GC test method for the determination of 7 purgeable aromatics.
Epoch	Unit of geologic time, subdivision of a period.
Equigranular	Applied to rocks with fragments or crystals of nearly equal size.
Escarpment	Long cliff or steep slope facing in one general direction and continuing for a considerable distance.
Euhedral	Pertaining to crystals completely bounded by their own regularly developed crystal faces.
Evapotranspiration	A term embracing that portion of the precipitation returned to the air through direct evaporation or by transpiration of vegetation, no attempt being made to distinguish between the two.
Facies	A stratigraphic body as distinguished from other bodies of different appearance or composition.
Fill*	Man-made deposits of natural earth materials and waste materials.

TERMINOLOGY (Cont'd)

Fissility	Tendency possessed by some rocks of splitting into thin sheets either along bedding planes or along cleavage planes induced by fracture or flowage.
Flow Path	The direction or movement of groundwater as governed principally by the hydraulic gradient.
Fluvial	Of or pertaining to rivers or river action.
Formation	Fundamental unit of the local classification of rocks.
Fracture	Crack in rock large enough to be visible to the unaided eye.
Friable	Easily crumbled, pulverized, or reduced to powder.
Geomorphology	Science of land forms, dealing with the evolution and morphology of surface features.
Glaciation	Geologic work accomplished by ice, including erosion and deposition and the resulting effects of these processes on the land surface.
Glacier	Body of ice consisting of recrystallized snow, lying wholly or largely on land, and showing evidence of present or former flow.
Granoblastic	Texture in which the constituents are irregular and angular, and under a microscope resemble a mosaic.
Gravel	Loose or unconsolidated coarse granular material, larger than sand grains, resulting from erosion of rock by natural agencies.
Groundwater	Subsurface water in a zone of saturation.
Gypsum	Hydrous calcium sulfate ($CaSO_4 - 2H_2O$), the most common of the sulfate minerals.
Hard Stand	Parking area or ramp adjacent to taxiway where aircraft are parked or stored.
Hazardous Waste	A solid waste or combination of solid wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause or significantly contribute to an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness, or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.

TERMINOLOGY (Cont'd)

Heterogeneous	Differing in kind, having unlike properties, possessed of different characteristics.
Hydraulic Conductivity	A coefficient of proportionality describing the rate at which water can move through a permeable medium.
Hydraulic Gradient	The change in total head with a change in distance in a given direction. The direction is that which yields a maximum rate of decrease in head.
Impermeable	Not permitting passage, as a fluid through a solid.
Induration	Hardening of rocks due to heat, pressure, or the introduction of some cementing material.
Intercalated	Beds or layers of material that are interlaminated or inserted between layers of a contrasting character.
Interlaminated	Laminae occurring between or alternating with others of different character.
Interstice	Opening, void, or space between one thing and another.
Lacustrine	Of or pertaining to lakes.
Lag Gravel	Type of residual gravel composed of very hard rock fragments that are rolled or dragged along the bottom of a river at a slower rate than the finer grades of sediment.
Lamina	Thin layer of stratified rock.
Leachate	A solution resulting from the separation or dissolving of soluble or particulate constituents from solid waste or other man-placed medium by percolation of water.
Leaching	The process by which soluble materials in the soil, such as nutrients, pesticide chemicals or contaminants are washed into a layer of soil or are dissolved and carried away by water.
Lens	Body of rock material bounded by converging surfaces, at least one of which is curved.
Limestone	Bedded sedimentary deposit consisting chiefly of calcium carbonate ($CaCO_3$).
Lithology	The description of rocks, in hand specimen and in outcrop.

TERMINOLOGY (Cont'd)

Loam	Soil or earth composed of a mixture of clay, silt, and sand.
Matrix	Natural rock or early material in which pebbles, fossils, minerals or gems are embedded.
Miocene	The fourth of the five epochs of the Tertiary period, occurring between 12 and 26 million years ago.
Monitoring Well	A well used to measure groundwater levels and to obtain samples.
Montmorillonite	Group name for numerous clay minerals, including montmorillonite itself, beidellite, nontronite, hectorite and saponite, all characterized by a similar sheetlike internal structure, which are essentially extremely finely divided hydrous aluminum silicates.
Net Precipitation	The amount of annual precipitation minus annual evaporation.
Nontronite	Iron-rich clay mineral of the montmorillonite group.
Organic	Being, containing, or relating to carbon compounds, especially in which hydrogen is attached to carbon.
Outcrop	Part of a body of rocks that appears bare and exposed at the surface of the ground.
Outwash	Detrital material removed from a glacier by meltwater, and laid down by streams beyond the glacier itself.
Overland Flow	The flow of water over a land surface due to direct precipitation, generally occurring when the precipitation rate exceeds the infiltration capacity of the soil and depression storage is fuller.
Period	Fundamental unit of the geologic time scale.
Permeability	The capacity of a porous rock, soil, or sediment for transmitting a fluid without damage to the structure of the medium.
pH	Negative logarithm of hydrogen ion concentration.
Phaneritic	Pertaining to textures in rocks that are visible to the unaided eye.
Piezometric Surface	An imaginary surface that everywhere coincides with the static water level in the aquifer.

TERMINOLOGY (Cont'd)

Plasticity	Property of a material that enables it to undergo permanent deformation without appreciable volume change or elastic rebound, and without rupture.
Pleistocene	First epoch of the Quaternary period, in general including the time and deposits of the last great glacial epoch.
Porosity	Property of a rock containing interstices without regard to size, shape, intercommunication, or arrangement of openings.
Potentiometric Surface	A surface that represents the level to which water will rise in tightly cased wells. The water table is a particular potentiometric surface for an unconfined aquifer.
Quaternary	Latest and current period of geologic time.
Recharge	Intake, the process by which water is absorbed and is added to the zone of saturation, either directly into a formation, or indirectly by way of another formation. Also, the quantity of water that is added to the zone of saturation.
Regression	The retreat of water from a land surface and the consequent evidence of this retreat in the character and relations of the newer and older strata.
Riser	Length of PVC casing above the screen.
Sand	An aggregation of unlithified mineral or rock particles the diameters of which are usually considered to be less than 2mm and greater than 1/16mm.
Scarp	A straight slope of any height, generally no steeper than 45 degrees.
Shale	General term for lithified muds, clays, and silts that are fissile and break along planes parallel to the original bedding.
Silicates	Group containing most important and numerous of the rock-forming minerals, a combination of silicon oxygen with metallic or basic elements.
Silt	Muddy sediment, coarser than clay, but finer than sand, which has been carried or deposited by a body of water.

TERMINOLOGY (Cont'd)

Sorting	Separation and segregation of rock fragments according to size or specific gravity by natural processes, mainly by the action of running water.
Specific Capacity	An expression of the productivity of a well, obtained by dividing the rate of discharge of water from the well by the drawdown of the water level in the well.
Specific Gravity	The ratio of the mass of a body to the mass of an equal volume of water at 4°C or other specified temperatures.
Specific Yield	The ratio of the volume of water a rock or soil will yield by gravity drainage to the volume of the rock or soil.
Split Spoon	A type of soil sampler consisting of a length of hollow tubing split lengthwise and threaded at both ends. A drive head and a coupling hold the two halves together. The sampler is pounded into the soil a set distance. The sample is examined by removing the drive head and coupling and opening the split barrel.
Stratified	Arranged or formed in layers.
Stratum	Single layers of homogeneous gradational lithology deposited parallel to the original dip of the formation.
Striated	Marked with fine parallel grooves.
Strike	The direction of bearing of the outcrop of an inclined bed or structure on a level surface, perpendicular to the direction of the dip.
Stringer	Small, narrow veins or irregular threads of mineral traversing rock of different nature.
Terrace	A natural or artificial plain with the surface ascending on one side and descending on the other, may be formed by sediment deposition by water, wave cutting action, or crustal movements.
Tertiary	The first period of the Cenozoic era.
Till	That part of glacial drift deposited by ice without transportation or sorting by water, consisting generally of an unstratified, unsorted, unconsolidated to moderately consolidated mixture of clay, sand, gravel, and boulders.

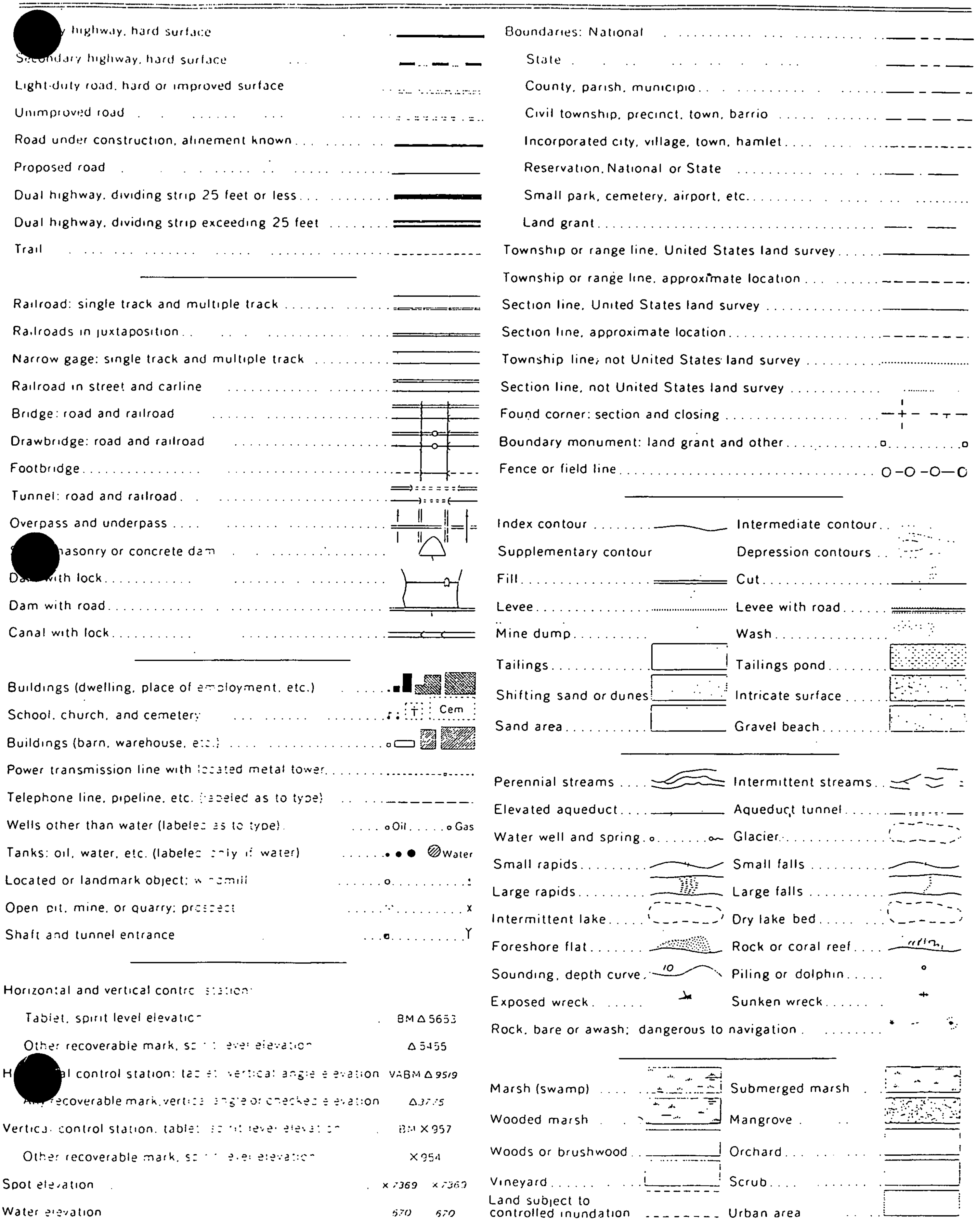
TERMINOLOGY (Cont'd)

Topographic Map	A detailed, graphic delineation of the natural and man-made features in a specified area, prepared in a way to show their relative positions and elevations.
Transgression	The gradual spread of water over a land surface and the consequent evidence of this invasion shown in the character and relations of newer and older strata.
Transmissivity	The rate at which water of a prevailing density and viscosity is transmitted through a unit width of an aquifer or confining bed under a unit of hydraulic gradient. Transmissivity can be calculated by multiplying the hydraulic conductivity by the aquifer's saturated thickness.
Upgradient	In the direction of increasing hydraulic static head; the direction opposite to the prevailing flow of groundwater.
Water Table	Upper surface of a zone of saturation except where that surface is formed by an impermeable body.
Well Log	Systematic and sequential record of geologic data obtained from a well.

* Bates and Jackson, 1980.

TOPOGRAPHIC MAP SYMBOLS

VARIATIONS WILL BE FOUND ON OLDER MAPS



[illegible]y highway, hard surface

Secondary highway, hard surface

Light-duty road, hard or improved surface

Unimproved road

Road under construction, alinement known

Proposed road

Dual highway, dividing strip 25 feet or less

Dual highway, dividing strip exceeding 25 feet

Trail

Railroad: single track and multiple track

Railroads in juxtaposition

Narrow gage: single track and multiple track

Railroad in street and carline

Bridge: road and railroad

Drawbridge: road and railroad

Footbridge

Tunnel: road and railroad

Overpass and underpass

[illegible]asonry or concrete dam

D[illegible]ith lock

Dam with road

Canal with lock

Buildings (dwelling, place of employment, etc.)

School, church, and cemetery — Cem

Buildings (barn, warehouse, etc.)

Power transmission line with located metal tower

Telephone line, pipeline, etc. (labeled as to type)

Wells other than water (labeled as to type) — o Oil ..... o Gas

Tanks: oil, water, etc. (labeled only if water) — Water

Located or landmark object; windmill

Open pit, mine, or quarry; prospect

Shaft and tunnel entrance

Horizontal and vertical control station:

Tablet, spirit level elevation — BM Δ 5653

Other recoverable mark, spirit level elevation — Δ 5455

H[illegible]al control station: tablet, vertical angle elevation — VABM Δ 9519

Any recoverable mark, vertical angle or checked elevation — Δ 3775

Vertical control station, tablet, spirit level elevation — BM X 957

Other recoverable mark, spirit level elevation — X 954

Spot elevation — x 7369 x 7369

Water elevation — 670 670

Boundaries: National

State

County, parish, municipio

Civil township, precinct, town, barrio

Incorporated city, village, town, hamlet

Reservation, National or State

Small park, cemetery, airport, etc.

Land grant

Township or range line, United States land survey

Township or range line, approximate location

Section line, United States land survey

Section line, approximate location

Township line, not United States land survey

Section line, not United States land survey

Found corner: section and closing

Boundary monument: land grant and other

Fence or field line

Index contour

Intermediate contour

Supplementary contour

Depression contours

Fill

Cut

Levee

Levee with road

Mine dump

Wash

Tailings

Tailings pond

Shifting sand or dunes

Intricate surface

Sand area

Gravel beach

Perennial streams

Intermittent streams

Elevated aqueduct

Aqueduct tunnel

Water well and spring

Glacier

Small rapids

Small falls

Large rapids

Large falls

Intermittent lake

Dry lake bed

Foreshore flat

Rock or coral reef

Sounding, depth curve — 10

Piling or dolphin

Exposed wreck

Sunken wreck

Rock, bare or awash; dangerous to navigation

Marsh (swamp)

Submerged marsh

Wooded marsh

Mangrove

Woods or brushwood

Orchard

Vineyard

Scrub

Land subject to controlled inundation

Urban area

APPENDIX B

Statement of Work

Contract Number: F33615-85-D-4543

Order Number: 0004

Variation Number: 04

Contractor: Science Applications International Corp.

Date of Modification: 03 Jul 90

Pen-and-ink changes:

Paragraph Changes:

1.4.4.8 Add to beginning of the paragraph.	Add: For the initial remedial investigation (RI) and the additional RI at Sites 7,9, and 13, determine by certified land surveyor the elevations and locations of all newly installed test wells, soil borings, and sampling points.
1.4.4	Replace With: Drill a maximum of 29 monitoring wells (See Annex A, Tables A-3-A for distribution by Site). Total footage for all wells in this task shall not exceed 1020 linear feet. Total screening for all wells shall not exceed 440 linear feet.
1.4.10.1 Add to end of paragraph.	Add: For the additional RI at Sites 7,9, and 13, collect a maximum of ten (10) groundwater samples and analyze for the parameters listed in Annex A, Table A-1-B.

1.4.12.5
Add to end of
paragraph after
f.

Add:
g. For the additional RI at Site 7, install a maximum of one (1) shallow monitoring well and collect one (1) groundwater sample and analyze for the parameters listed in Annex A, Table A-1-B.

1.4.12.9
Add to end of
paragraph after
e.

Add:
f. For the additional RI at Site 9, install a maximum of two (2) shallow downgradient wells.

g. Collect one (1) groundwater sample from the two new wells and one (1) sample from each of the four existing wells (a total of six (6) samples) and analyze for the parameters listed in Annex A, Table A-1-B.

1.4.12.11
Add to end of
paragraph after
g.

Add:
h. For the additional RI at Site 13, install a maximum of one (1) downgradient well and collect one (1) groundwater sample from the new well and one sample from each of the four (4) existing wells (a total of five samples). Analyze all samples for the parameters listed in Annex A, Table A-1-B.

1.9.1.2

Delete.

1.9.2.6

Replace With:
For the initial RI and the additional RI at Sites 7,9, and 13, in addition to the hard copy of the field and laboratory test results submitted with the R & D Status Reports, data collected in this effort shall be archived in compliance with the Installatio
Restoration Program Information Management System (IRPIMS) Data Loading Handbook, Version 2.1 (sent under separate cover) and transmitted to HSD/YAQ with the ITIR for laboratory data on the additional RI. See Item VI, Sequence No. 1, Paragraph 6.2.

1.9.2.7 Add to end of paragraph	Add: Upon completion of all the sample analysis for the additional RI at Sites 7,9, and 13, tabulate and incorporate all results into an Informal Technical Information Report and forward report to HSD/YAQ no later than three (3) weeks after all analyses have been completed (Item VI, Sequence No. 3, Paragraph 6.1). Use the format provided in the AFOEHL Handbook, Version 3.0 (transmitted under separate cover).
1.9.3.1	Delete.
1.9.3.2	Delete.
1.9.3.3	Delete.
1.9.3.4	Delete.

Page Changes:

Ad[illegible]nnex A, Table A-1-B, attached.
Replace Annex A, Table A-3 with Annex A, Table A-3-B, attached.
Add Annex A, Table A-4-B, attached.

VI. Replace 6.1 With:

Sequence No.	Para No.	Block 10	Block 11	Block 12	Block 13	Block 14
4 (Work Plan)	I.1.9.2.1	ONE/R	88Oct20	88Dec17	89Apr07	*****
4 (QAPP)	I.1.9.2.2	ONE/R	88Oct20	88Dec17	89Apr07	*****
3 (Health & Safety Plan)	I.1.9.2.3	ONE/R	88Oct20	88Dec17	89Apr07	4
3 (ITIR-Prelim. RA)	I.1.7.1	OTIME	*	*	-	4
3 (ITIR-Screen of RAs)	I.1.7.2	OTIME	*	*	-	4
3 (ITIR-Detail Anal. of RAs)	I.1.7.3	OTIME	*	*	-	4
3 (ITIR-Lab Analysis-Addit. RI)	I.1.9.2.7	OTIME	*	*	-	3
4 (Decision Documents)	I.1.6	ONE/R	90Jun04	90Aug06	90Oct24	****
4 (Tech RPT)	I.1.9.1	ONE/R	90Jun04	90Aug06	15Jan91	**
17 (Microf.)	I.1.9.1	OTIME	90Jun04	90Oct24	-	3

1.9.2.6 Change To:

Sequence No.	I.1.9.2.6	OTIME	*	*	-	3

ANNEX A, Table A-1-B

Approximate Number of Water Analy

For The Additional RI At Sites 7,9, and 13

PARAMETER	ANALYTICAL METHOD	Site 7	Site 9	Site 13	Total
Alkalinity - Carbonate, Bicarbonate, & Hydroxide (Field Test)	A401	1	5	4	10
Specific Conductance (Field Test)	E120.1	1	5	4	10
pH (Field Test)	E150.1	1	5	4	10
Total Dissolved Solids	E160.1	1	5	4	10
Temperature (Field Test)	E170.1	1	5	4	10
Common Anions (Chloride, Fluoride, Sulfate)	A429	1	5	4	10
Purgeable Halocarbons	E601	1	5	4	10
Purgeable Aromatics	SW5030/SW8020	1	5	4	10
Metal Screen (25 Metals)	E200.7	1			1
Arsenic	E206.2	1			1
Lead	E219.2	1			1
Mercury	E245.1	1			1
Selenium	E270.2	1			1
Petroleum Hydrocarbons	E418.1	1			1
Hardness	E130.1	1			1

Annex A, Table A-3 A

Number of Wells, Borings, Surface Water and Sediment Samples

PARAMETER	Sites 1,2,4, & 6	Site 3	Site 7	Sites 5 & 8	Site 12	Site 9	Site 10	Site 11	Site 13	Background	Total
Wells	6	6	1	7	-	1	2	–	4	--	27
Borings	6	--	1	–	2	1	–	2	4	2	18
Soil Gas (Days)	5	--	2	3	2	3					~~21~~ 15
Surface Water Samples	--	3	-	2	–	3					8
Sediment Samples	–	3	–	2	–	3					8

ANNEX A, Table A-4-B

Approximate Number of Groundwater Analyses by Site

For The Additional RI at Sites 7,9, & 13

Parameter	Detection Limit	ANALYTICAL METHOD	REPORTING UNITS	NUMBER OF ANALYSES	TRIP BLANKS	AMB COND BLANKS	EQUIP BLANKS	DUP/REP	SECOND COLUMN	TOTAL ANALY
Alkalinity - Carbonate, Bicarbonate, & Hydroxide (Field Test)	10	A403	mg/L	10						10
Specific Conductance (Field Test)	–	E120.1	umhos/cm	10						10
pH (Field Test)	–	E150.1	pH Units	10						10
Total Dissolved Solids	–	E160.1	mg/L	10						10
Temperature (Field Test)	–	E170.1	deg C	10						10
Common Anions (Chloride, Fluoride, Sulfate)	0.5	E300	mg/L	10						10
Petroleum Hydrocarbons	1	E418.1	mg/L	1	1	1	1	1		5
ICP Screen (25 metals)	(d)	E200.7	mg/L	1						1
Arsenic	0.005	E200.6	mg/L	1						1
Lead	0.005	E219.2	mg/L	1						1
Mercury	0.001	E245.1	mg/L	1						1
Selenium	0.005	E270.2	mg/l	1						1
Purgeable Aromatics	(h)	SW5030/SW8020	ug/l	10	1	2	1	2 1	8	25
Purgeable Halocarbons	(e)	E601	ug/l	10	1	2	1	2 1	8	25
Hardness		E130.1	mg/l	1						1

APPENDIX C

Well Data and Lithologic Logs

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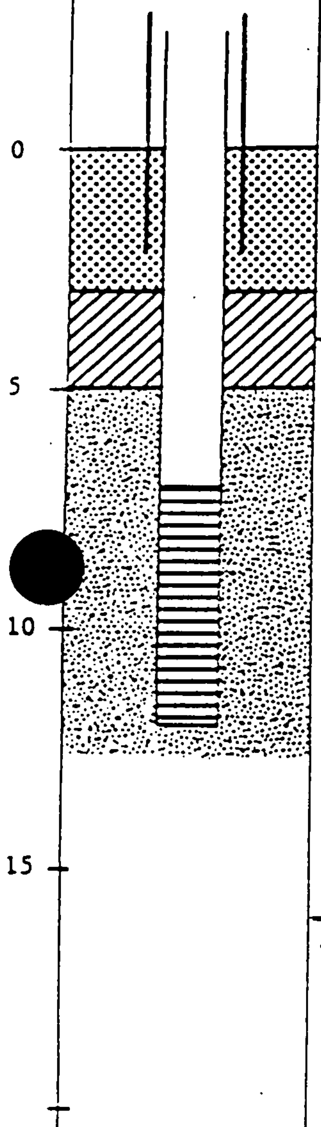
Westpark Drive, McLean, Virginia 22102

WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1-1



Drilling Summary:

Total Depth: 12.0' BLS
Drillers: J.Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 597.37'
Bit(s): Auger
Top of Casing: 600.87'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 1 pp. 31-36
Water Level: 7.97' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 15.5'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 7.0-12.0' BLS
Setting: 5.0-12.0' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement:Bentonite 19:1
Setting: 3.0-5.0' BLS
Setting: LS-3.0' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/18/84	1610	10/19/84	0910
Installation:	10/19/84	0919	10/19/84	1005
Water Level Reading:	10/30/84		11/9/84	0925
Development:	10/30/84	1455	10/30/84	1622

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 35.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1-1

Site Sketch

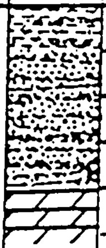
Location: ≈30' from NW corner of Bldg 518
Field Book No.: 1 pp 31-35
Log By: C. Kruger
Driller: J. Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 12.0' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/18/84	1610
Drilling Completed:	10/19/84	0910

Water Level: 7.97' BTC

Depth (feet)	Graphic log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less	DESCRIPTION
0					
L					
5				S.I. 3.0-4.5' BLS	Rec. 1.25'
		SS#1	37	silt, some clay, trace fine sand; reddish brown (5YR 5/4) with	
				some very pale brown (10YR 8/3) mottles; firm; dense; compact;	
				dry; laminated	
0		SS#2	16	S.I. 4.5-6.0' BLS	Rec. 1.5'
				clay, silt and fine sand; light yellowish brown (10YR 6/4) with	
				some reddish brown (5YR 5/3) mottles; firm; medium dense;	
				compact, dry; laminated	
				S.I. 7.1-8.6' BLS	Rec. 0.9'
5		SS#3	18	0.2' clay, silt and gravel; light yellowish brown (10YR 6/4);	
				loose; damp	
T				0.7' clay & silt, some gravel; reddish brown (5YR5/4); firm; loose; moist	
		SS#4		S.I. 9.0-10.5'	Rec. 0.6'
			32	0.1' silt and clay, some gravel; reddish brown (5YR 4/3); firm	
0					

DRILLING LOG

Depth (feet)	Graphic log	Sample type and Number	Blow Count (N)	DESCRIPTION
10				S.I. 10.5-12.0' BLS
		SS#5	209	fine sand and silt, some gravel; greyish brown (10YR 5/2);
				soft;loose; wet
12.5				=12.0' BLS bedrock

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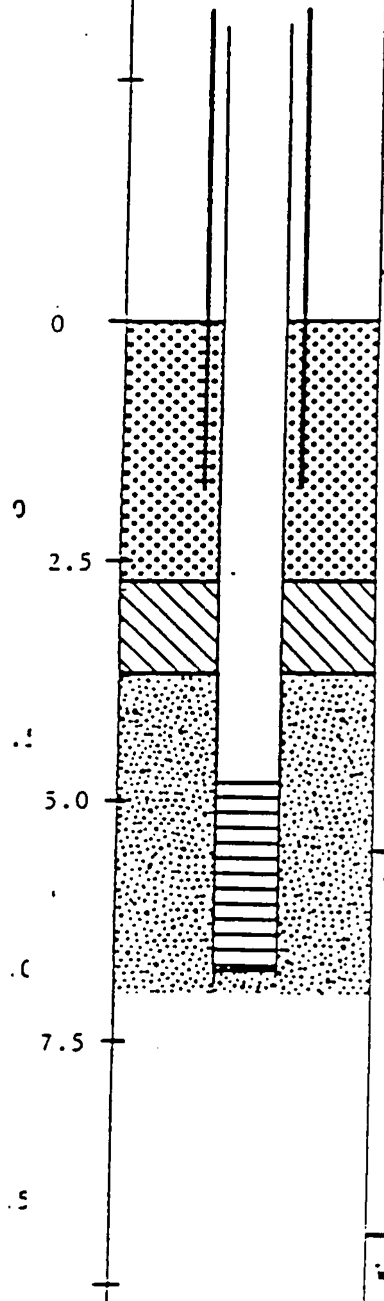
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1-2



Drilling Summary:

Total Depth: 6.7' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 594.83'
Bit(s): Auger
Top of Casing: 597.58'
Drilling Fluid Type: None
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 1 pp. 41-42
Water Level: 4.83' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 9.7'
Slot: 10/inch
Filter: Material: 4 Q sand
Setting: 4.7-6.7' BLS
Setting: 3.7-6.7" BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement:Bentonite 19:1
Setting: 2.7-3.7' BLS
Setting: LS-2.7' BLS
Surface Casing: 4.0" ID steel w/locks
Other:

Time Log:

	Started		Completed	
Drilling:	10/19/84	1506	10/19/84	1520
Installation:	10/19/84	1535	10/19/84	1601
Water Level Reading:	11/07/84	1526	11/09/84	0755
Development :	11/07/84	1526	11/09/84	0820

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 5.5 gal

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DRILLING LOG

Project: Niagara Falls AFRF Owner: USAF Well No.: 1-2

Location: 20' S of Bldg 600

Field Book No.: 1 pp 41-47

Log By: C. Kruger, A. Wickline

Driller: J. Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 6.7' BLS

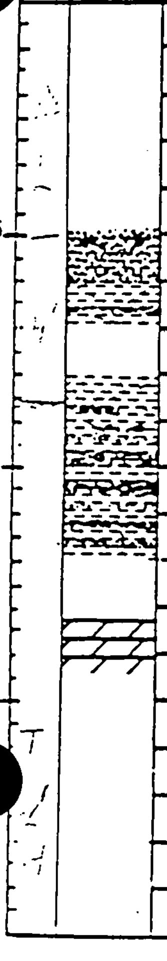
Reference Point Elevation:

	Date	Time
Drilling Started:	10/19/84	1506
Drilling Completed:	10/19/84	1535

Water Level: 4.83' BTC

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain size
and 50 to 40%
some 40 to 10%
trace 10% or less



Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
2.5		SS#1		S.I. 2.0-3.5' BLS Rec. 1.1'
			25	0.5' silt and fine sand; very dark grey (5YR 3/1) with some
				black (5YR 2.5/1) to white (5YR 8/1) mottles; firm;
				dense; compact; dry; some rootlets
				0.6' silt and clay, some fine gravel; reddish brown (5YR 5/4);
5.0		SS#2	44	firm; dense; compact; dry; laminated
				S.I. 4.0 - 6.0' BLS Rec. 1.6'
				0.55' silt and clay, some fine gravel, reddish brown (5YR 5/4);
				firm; dense; compact; dry
				0.55' silt, some gravel, trace fine sand; light reddish brown
				(5YR 6/4) with some dark greyish brown (10YR 4/2) and
7.5				brown (10 YR 5/3) mottles; firm; dense; compact; dry
				0.5' silt and clay, some gravel; dark reddish grey (5YR 4/2);
				loose; compact; moist
				= 6.7' BLS bedrock

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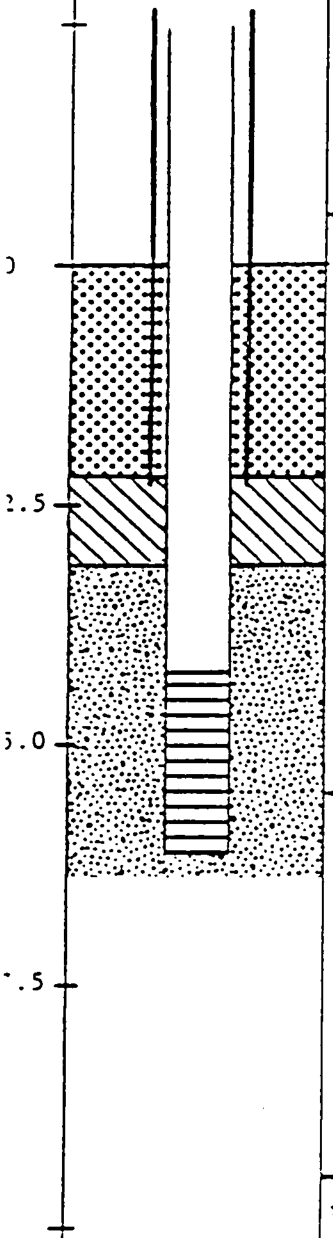
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1-3



Drilling Summary:

Total Depth: 6.2' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 594.34'
Bit(s): Auger
Top of Casing: 597.44'
Drilling Fluid Type: None
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 1 pp. 39-40
Water Level: 5.0' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 9.3'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 4.2-6.2' BLS
Setting: 3.2-6.2' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 2.2-3.2' BLS
Setting: LS-2.2' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/19/84	1340	10/19/84	1348
Installation:	10/19/84	1417	10/19/84	1428
Water Level Reading:	10/19/84	1400	11/09/84	0906
Development:	10/30/84	1622	11/07/84	1523

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 5.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1-3

Location: 40.0', SW of Bldg. 600, along McGuire
Field Book No.: 1 pp 39-40
Log By: C Kruger A Wickline
Driller: CME-45
Rig Type: 6.2' BLS
Reference Point:
Total Depth:
Reference Point Elevation:

	Date	Time
Drilling Started:	10/19/84	1
Drilling Completed:	10/19/84	1

Water Level: 5.0' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
0				
2.5				
				S.I. 4.5-6.1' BLS Rec. 0.5'
5		SS#1	12	0.35' silt and clay, some fine sand; black (5YR 2.5/1) with some light greenish grey (5GY 7/1) mottles; stiff; dense; compact; slightly damp
				0.15' silt and clay, some fine sand, some gravel; reddish brown (5YR 4/3) with some light yellowish brown (2.5Y 6/4) mottles; medium dense; compact; moist
7.5				
				= 6.2' bedrock

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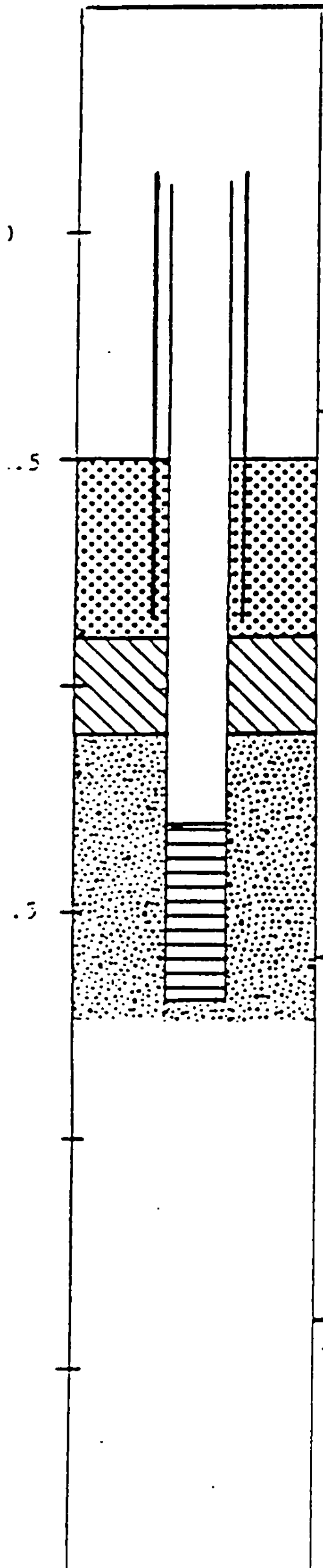
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 1-4



Drilling Summary:

Total Depth: 6.0' BLS Drillers: J. Genovese/Empire

Borehole Diameter(s): 6.0"

Rig Type: CME-45

Elevation: Land Surface: 594.88' Bit(s): Auger

Top of Casing: 597.43' Drilling Fluid Type: None

Supervisory Geologist: A.Wickline,C.Kruger Amount Use: -

Log Book No. 1 pp. 37-38 Water Level: 5.2 BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC

Diameter: 2.0" ID- 2.5" OD Diameter: 2.0" ID

Length: 9.0' Slot: 10/inch

Filter: Material: 40 sand Setting: 4.0-6.0' BLS

Setting: 3.0-6.0' BLS Seals: Type: Bentonite Pellets

Grout: Type: #1 Portland Cement: Bentonite 19:1 Setting: 2.0-3.0' BLS

Setting: LS-2.0' BLS Surface Casing: 4.0" ID steel w/lock

Other:

Time Log:

	Started		Completed	
Drilling:	10/19/84	1111	10/19/84	1155
Installation:	10/19/84	1246	10/19/84	1307
Water Level Reading:	10/19/84	1243	11/09/84	0916
Development :	10/30/84	1410	11/07/84	1509

Well Development:

Method/Equipment: Bailer

Static Depth to Water:

Pumping Depth to Water:

Pumping Rate:

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DRILLING LOG

Project: Niagara Falls AFRF   Owner: USAF   Well No.: 1-4

Location: W side of McGuire, W of Bldg 600

Field Book No.: 1 pp 37-38

Log By: C. Kruger

Driller: J. Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth 6.0' BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/19/84	111
Drilling Completed:	10/19/84	115

Water Level: 5.2' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
2.5				
5.0		SS#1	50+	S.I. 5.5-6.0' BLS Rec. 0.5'
	▨			0.4' silt and clay, some fine sand, some gravel; reddish
	▨			brown (5YR 5/4); firm; dense; compact; slightly damp
				0.1' silt and fine sand, some gravel; pinkish grey (5YR 6/2);
7.5				soft; loose; wet
				= 6.0' BLS bedrock

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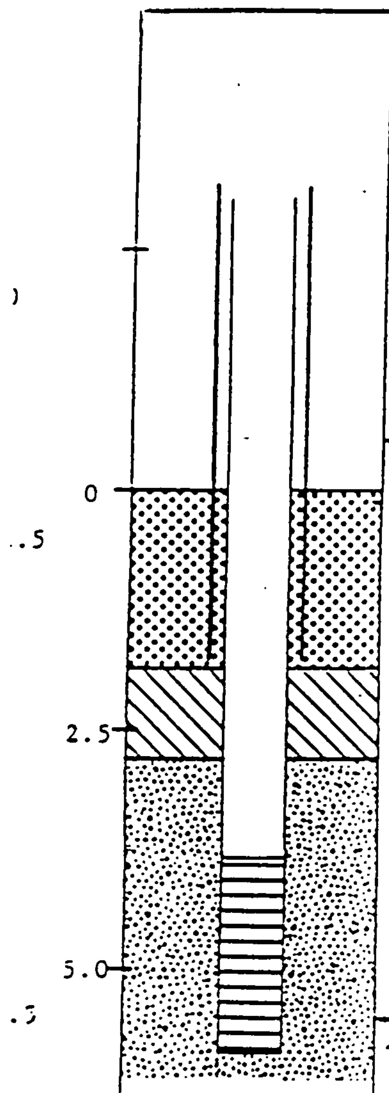
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 1-5



Drilling Summary:

Total Depth: 5.8' BLS Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 592.79' Bit(s): Auger
Top of Casing: 595.19' Drilling Fluid Type: None
Supervisory Geologist: A.Wickline,C.Kruger Amount Use: -
Log Book No. 1 pp. 44-45 Water Level: 4.8' STC

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD Diameter: 2.0" ID
Length: 8.8' Slot: 10/inch
Filter: Material: 4Q sand Setting: 3.8-5.8' BLS
Setting: 2.8-5.8' BLS Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1 Setting: 1.8-2.8' BLS
Setting: LS-1.8' BLS Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/22/84	0952	10/22/84	1006
Installation:	10/22/84	1036	10/22/84	1049
Water Level Reading:	11/07/84	1607	11/09/84	0830
Development :	11/07/84	1607	11/09/84	0850

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 3.7 gal

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DRILLING LOG

Project: Niagara Falls AFRF

Owner: USAF

Well No.: 1-5

Location: 120' S-SW of Bldg. 600

Field Book No.: 1 pp 44-45

Log By: C.Kruger.A.Wickline

Driller: J.Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 5.8' BLS

Reference Point Elevation:

Site Sketch

	Date	Time
Drilling Started:	10/22/84	09
Drilling Completed:	10/22/84	06

Water Level: 4.8' BTC

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				S.I. LS-1.5' BLS Rec. 0.7'
		SS#1	18	0.6' silt, trace fine to medium sand; very dark greyish brown (2.5Y3/2);firm:medium dense:slightly moist:rootlets
				0.1' silt and clay, some gravel:dark brown(10YR3/3) with intercalated strong brown(7.5YR5/6) laminae;firm:dense; compact:slightly moist:laminated
2.5				
5.0				
				S.I. 5.5-5.8' BLS Rec. 0.35'
		SS#2	59+	silt and fine sand, some clay, trace gravel;reddish brown (5YR 4/4) with some intercalated pink(5YR7/4) laminae;firm:medium dense to loose;dry
7.5				≈5.8' BLS bedrock

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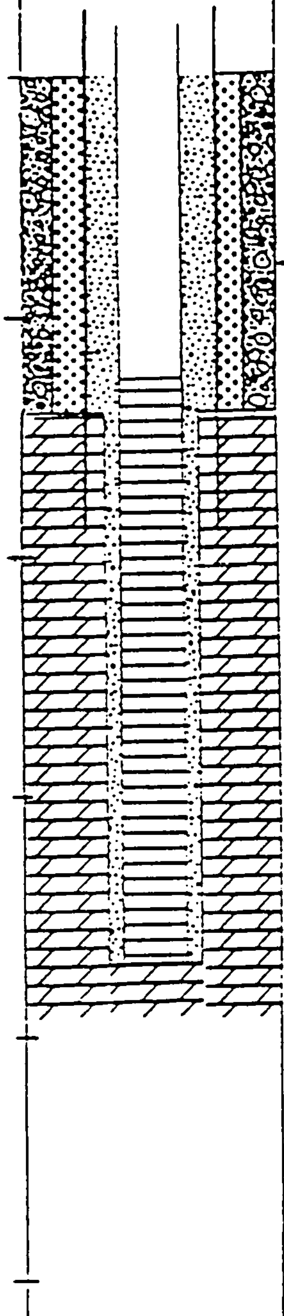
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: [illegible]



Drilling Summary:

Total Depth: 37.0' BLS Drillers: J. Genovese/Empire

Borehole Diameter(s): 9" 0-13.8' BLS, 6" 13.8-37' BLS

Rig Type: CME-45

Elevation: Land Surface: 603.46' Bit(s): Auger/Roller

Top of Casing: 605.46' Drilling Fluid Type: none/water

Supervisory Geologist: N. DeSalvo Amount Use:

Log Book No. 3 pp. 27-32,42.55 Water Level: 12.55' BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC

Diameter: 4.0" ID 4.5" OD Diameter: 4.0"ID

Length: 40' Slot: 10/inch

Filter: Material: 4Q sand Setting: 12-37' BLS

Setting: LS-37' BLS Seals: Type: none

Grout: Type: #1 Portland Cement: Bentonite 38:1 Setting: -

Setting: LS-13.8' BLS Surface Casing: 6" ID steel w/lock

Other:

Time Log:	Started		Completed	
Drilling:	10/30/84	0900	11/1/84	1530
Installation:	10/30/84	1032	11/5/84	0807
Water Level Reading:	11/5/84	1113	11/9/84	1200
Development:	11/5/84	1114	11/5/84	1128

Well Development:

Method/Equipment: CME-45 mounted pump

Static Depth to Water: 12.55' BTC

Pumping Depth to Water:

Pumping Rate:

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DRILLING LOG

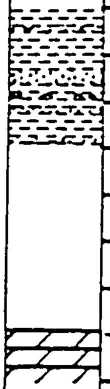
Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1D-1

Site Sketch

Location: ≈ 80' N-NE of Bldg 426
Field Book No.: 3 pp 27-32,42
Log By: N. DeSalvo
Driller: J. Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 37.0' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/30/84	0900
Drilling Completed:	11/1/84	1530

Water Level: 12.55' BTC

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50-40% some 40-10% trace 10% or less DESCRIPTION
				S.I. 4.0-5.5' BLS Rec. 1.5'
5		SS#1	22	silt and clay, some disseminated fine sand, some pockets of
				medium to coarse sand, trace gravel; mixed matrix of reddish
				brown (5YR 4/3), brown to dark brown (7.5YR 4/2), black
				(10YR 2/1) and grey to light grey (10YR 6/1) with sand pockets
				olive (5Y 5/4) to light grey (5Y 7/2) and gravel brown to
10				dark brown (7.5YR 4/4); stiff
				≈ 11.8' BLS bedrock
15				
20				

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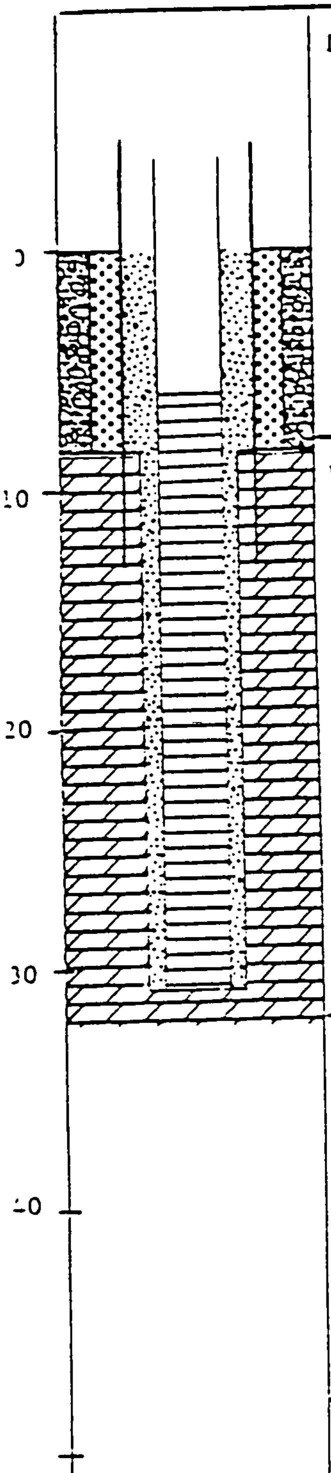
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF　Owner: USAF　Well No.: ID-1



Drilling Summary:

Total Depth: 31.0' BLS　Drillers: J. Genovese/ Empire

Borehole Diameter(s): 9" to 8.4'; 6" 8.4'-31'

Rig Type: CME-45

Elevation: Land Surface: 594.88'　Bit(s): Auger/roller

Top of Casing: 596.88'　Drilling Fluid Type: none/water

Supervisory Geologist: N. DeSalvo　Amount Use:

Log Book No. 3　pp. 22-24, 32, 55　Water Level: 31.0' BLS

Well Design:

Casing: Material: PVC　Screen: Material: PVC

Diameter: 4.0" ID 4.5" OD　Diameter: 4.0" ID

Length: 35'　Slot: 10/inch

Filter: Material: 40 sand　Setting: 6-31' BLS

Setting: LS-8.4' BLS　Seals: Type: none

Grout: Type: #1 Portland Cement: Bentonite 22:1　Setting: -

Setting: LS-8.4' BLS　Surface Casing: 6" ID steel w/Lock

Other:

Time Log:

	Started		Completed	
Drilling:	10/19/84	0935	10/30/84	1640
Installation:	10/30/84	1124	11/5/84	0842
Water Level Reading:	11/5/84	0845	11/9/84	1306
Development:	11/5/84	0849	11/5/84	0955

Well Development:

Method/Equipment: CME-45 mounted pump

Static Depth to Water: 12.55' BTC

Pumping Depth to Water:

Pumping Rate:

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 1D-2

Location: ≈25' S of SE corner of Bldg 600
Field Book No.: 3 pp 22-24
Log By: N. DeSalvo
Driller: J. Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 31.0' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/29/84	0935
Drilling Completed:	10/30/84	[illegible]

Water Level: 3.96' BTC

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
5				
				≈ 6.4' BLS bedrock
10				
15				

Page 1 of

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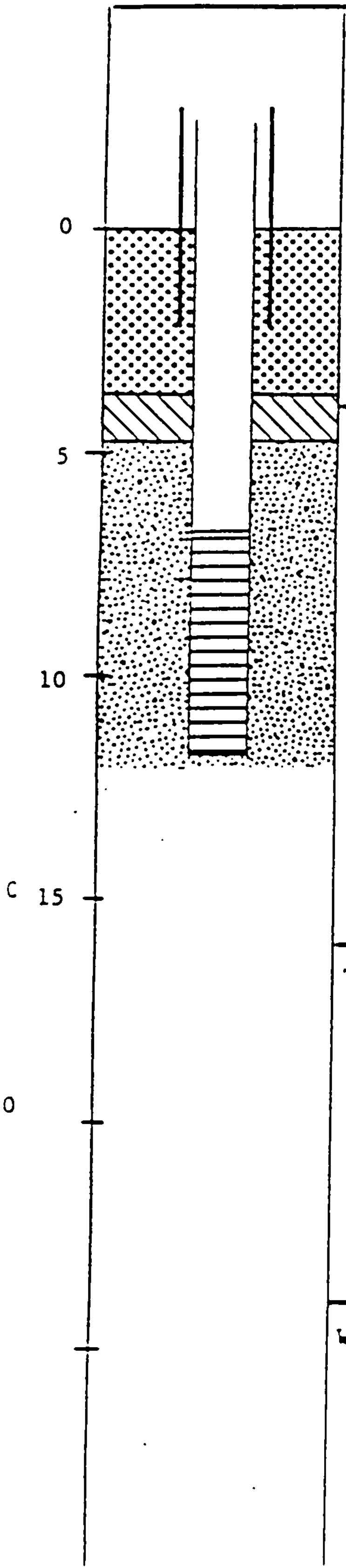
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 2-1



Drilling Summary:

Total Depth: 11.7' BLS Drillers: J.Genovese/Empire

Borehole Diameter(s): 6.0"

Rig Type: CME-45

Elevation: Land Surface: 601.15' Bit(s): Auger

Top of Casing: 603.55' Drilling Fluid Type: none

Supervisory Geologist: A.Wickline, C.Kruger Amount Use: -

Log Book No. 2 pp. 12-13 Water Level: 5.93' BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC

Diameter: 2.0" ID- 2.5" OD Diameter: 2.0" ID

Length: 14.2' Slot: 10/inch

Filter: Material: 40 sand Setting: 6.7-11.7' BLS

Setting: 4.7-11.7' BLS Seals: Type: Bentonite Pellets

Grout: Type: #1 Portland Cement: Bentonite 19:1 Setting: 3.7-4.7' BLS

Setting: LS-3.7' BLS Surface Casing: 4.0" ID steel w/lock

Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	1121	10/24/84	1144
Installation:	10/24/84	1150	10/24/84	1217
Water Level Reading:	11/07/84	1201	11/09/84	1257
Development :	11/07/84	1201	11/08/84	1537

Well Development:

Method/Equipment: Bailer

Static Depth to Water:

Pumping Depth to Water:

Pumping Rate:

Volume Pumped:

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DRILLING LOG

Project: Niagara Falls AFRF Owner: USAF Well No.: 2-1

Location: 40' NW of Tank C in POL yard

Field Book No.: 2 pp 12-13

Log By: C. Kruger

Driller: J. Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 11.7' BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/24/84	1
Drilling Completed:	10/24/84	1
Water Level:	5.93' BTC	

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
5				S.I. 6.0-7.5' Rec. 1.5'
		SS#1	29	silt and clay, trace gravel; reddish brown (5YR 4/3) with grey (7.5YR 5/0) mottles common; firm; dense; compact; dry; finely laminated; kerosene odor beginning at 6.7'BLS and strengthening with depth
10		SS#2	32	S.I. 10.0-11.5' BLS Rec. 0.6'
				silt and clay, some fine sand, some coarse to medium gravel; reddish brown (5YR 4/4); firm; medium dense; medium compact; damp
15				= 11.7' BLS bedrock

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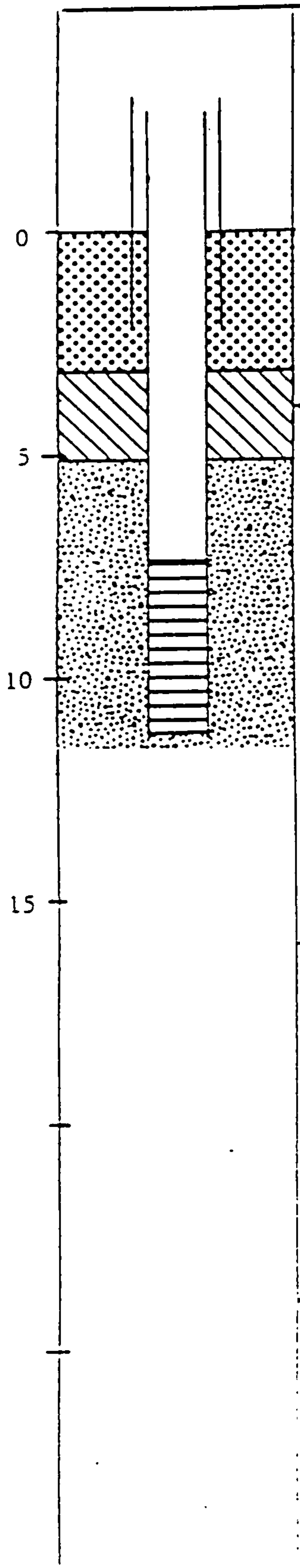
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 2-2



Drilling Summary:

Total Depth: 11.3' BLS
Drillers: Dave S./Empire
Borehole Diameter(s): 6"
Rig Type: CME-45
Elevation: Land Surface: 600.86'
Bit(s): Auger
Top of Casing: 603.54'
Drilling Fluid Type: none
Supervisory Geologist: N. DeSalvo
Amount Use:
Log Book No. 3 pp. 14-16
Water Level: 6.05' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5"OD
Diameter: 2.0"
Length: 14.0'
Slot: 10/inch
Filter: Material: 4Q Sand
Setting: 7.3-11.3' BLS
Setting: 5.2-11.3' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement
Setting: 3.2-5.2' BLS
Setting: LS-3.2' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	1447	10/24/84	1530
Installation:	10/24/84	1535	10/24/84	1630
Water Level Reading:	11/07/84	1403	11/9/84	1153
Development:	11/07/84	1405	11/8/84	1543

Well Development:

Method/Equipment: Bailer
Static Depth to Water: 6.05' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 7.5 gal

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DRILLING LOG

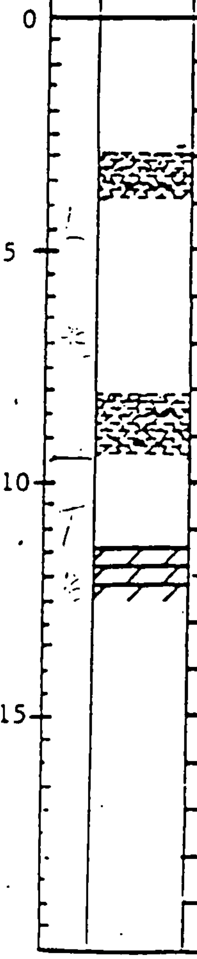
Project: Niagara Falls AFRF
Owner: USAF
Well No.: 2-2

Site Sketch

Location: ≈30' N-NE of Bldg. 421
Field Book No.: 3 pp 14-16
Log By: N. DeSalvo
Driller: Dave S./Empire
Rig Type: CME-45
Reference Point:
Total Depth: 11.3' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/24/84	1
Drilling Completed:	10/24/84	1

Water Level: 6.05' BTC



Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
0				
				S.I. 3.0-4.5' BLS Rec. 1.1'
		SS#1	22	silt and clay, some fine sand; reddish brown (5 YR 4/3) with
				common light reddish brown (5 YR 6/3) and yellowish brown
5				(10 YR 5/6) mottles; stiff, plastic; moist
				S.I. 8.0-9.5' BLS Rec. 1.4'
		SS#2	22	silt and clay, some fine sand; reddish brown (5 YR 4/3)
				with common to abundant light reddish brown (5 YR 6/3)
10				and yellowish brown (10 YR 5/6) mottles; stiff; plastic;
				moist; increasingly pronounced laminae; some sand lenses
				near bottom of sample
				= 11.3' BLS bedrock
15				

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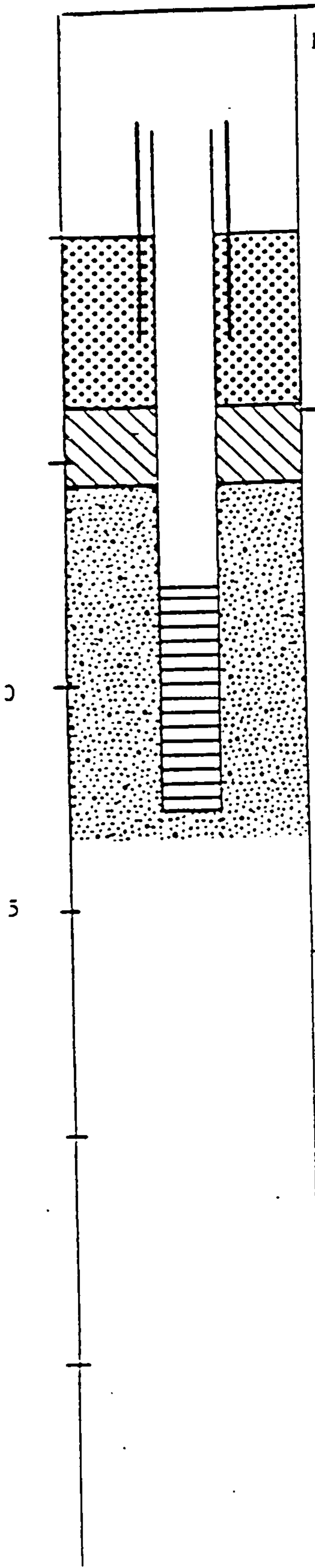
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 2-3



Drilling Summary:

Total Depth: 12.8' BLS
Drillers: J.Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 600.63'
Bit(s): Auger
Top of Casing: 603.08'
Drilling Fluid Type: None
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 2 pp. 10-11
Water Level: 4.25' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5" OD
Diameter: 2.0" ID
Length: 15.1'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 7.8-12.8' BLS
Setting: 5.8-12.8' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 3.8-5.8' BLS
Setting: LS-3.8' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	1009	10/24/84	1028
Installation:	10/24/84	1029	10/24/84	1102
Water Level Reading:	10/24/84	1055	11/09/84	1213
Development:	11/07/84	1327	11/07/84	1359

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 12.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 2-3

Location: 30' W-NW of Tank C in POL yard
Field Book No.: 2 pp 10-11
Log By: C.Kruger
Driller: J.Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 12.8' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/24/84	:00
Drilling Completed:	10/24/84	:02
Water Level:	4.25' BTC	

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				S.I. 4.5-6.0' BLS Rec. 1.5'
5		SS#1	38	silt and clay, some fine to medium sand; dark yellowish brown (10YR 4/4) with some dark grey (10YR 4/1) mottles; firm; dense; compact; dry; strong kerosene odor correlating with 0.5" lens of euhedral medium quartzose sand at 5.35' BLS
				S.I. 9.5-10.5' BLS Rec. 0.45'
10		SS#2	72	0.4' silt and fine sand, some clay, some gravel; reddish brown (5YR 5/4) with some dark reddish grey (5YR 4/2) mottles; firm; loose; moderately compact; wet
				0.05' dolomitic rock; very dark grey (7.5YR 3/0); dense; equigranular
15				
				= 12.8' bedrock

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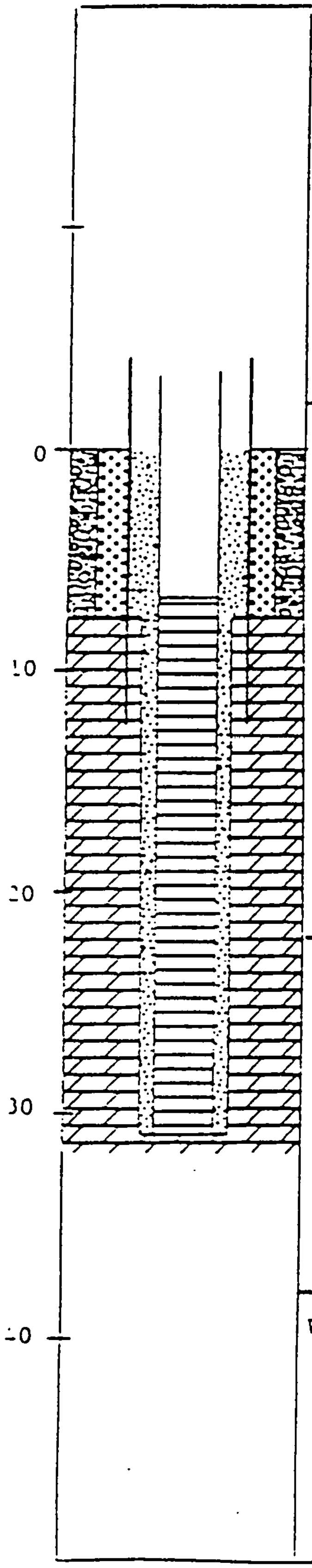
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 2D-1



Drilling Summary:

Total Depth: 31.6' BL Drillers: J. Genovese/Empire

Borehole Diameter(s): 9" 0-7.6' BLS; 6" 7.6-31.6' BLS

Rig Type: CME-45

Elevation: Land Surface: 597.43' Bit(s): Auger/Roller

Top of Casing: 599.63' Drilling Fluid Type: none/water

Supervisory Geologist: N. DeSalvo Amount Use:

Log Book No. 3 pp. 26-27, 35-36, 55 Water Level: 6.73' BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC

Diameter: 4.0" ID 4.5" OD Diameter: 4.0" ID

Length: 35' Slot: 10/inch

Filter: Material: 4Q sand Setting: 6.6-31.6' BLS

Setting: LS-31.6' BLS Seals: Type: none

Grout: Type: #1 Portland Cement: bentonite 10.1 Setting: -

Setting: LS-7.6' BLS Surface Casing: 6" steel w/lock

Other:

Time Log:

	Started		Completed	
Drilling:	10/29/84	1442	10/31/84	1209
Installation:	10/29/84	1640	11/5/84	0753
Water Level Reading:	11/5/84	0950	11/9/84	1259
Development:	11/5/84	0955	11/5/84	1059

Well Development:

Method/Equipment: CME-45 mounted pump

Static Depth to Water: 6.73' BTC

Pumping Depth to Water:

Pumping Rate:

Volume Pumped: 40 gal

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DRILLING LOG

Project: Niagara FAlls AFRF
Owner: USAF
Well No.: 2D-1

Site Sketch

Location: ~45' E of NE corner of Bldg 600
Field Book No.: 3 pp26-27,35-
Log By: N. DeSalvo
Driller: J. Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 31.6' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/29/84	1442
Drilling Completed:	10/31/84	120

Water Level: 6.73' BTC

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
5				
				≈5.6' BLS bedrock
10				
15				
20				

Page 1 of 1

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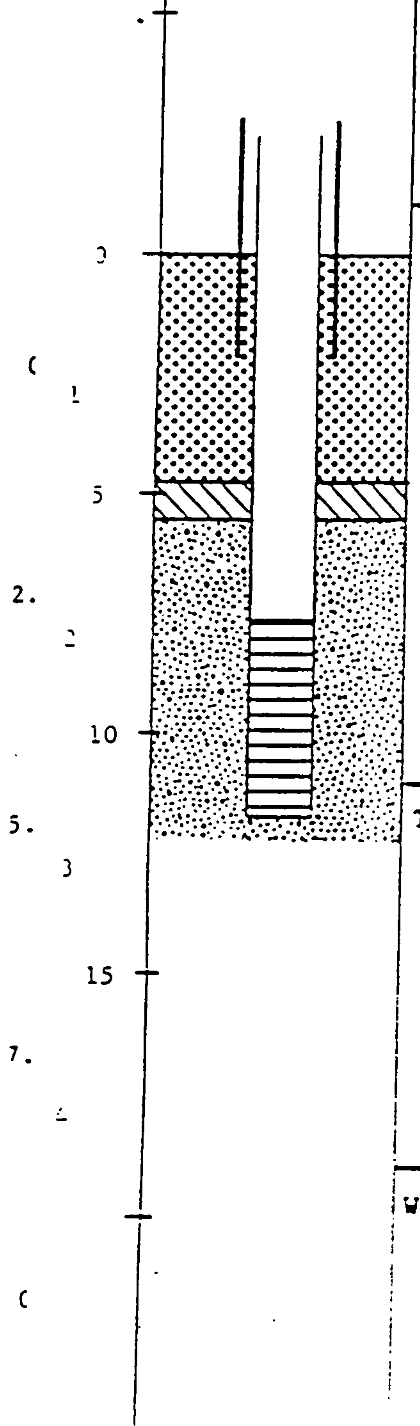
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 4-1



Drilling Summary:

Total Depth: 11.7' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 599.24'
Bit(s): Auger
Top of Casing: 601.66'
Drilling Fluid Type: none
Supervisory Geologist: A. Wickline, C. Kruger
Amount Use: -
Log Book No. 1 pp. 25-27
Water Level: 7.43' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 14.2'
Slot: 10/inch
Filter: Material: 40 sand
Setting: 7.7-11.7'
Setting: 5.7-11.7' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement:Bentonite 19:1
Setting: 4.7-5.7' BLS
Setting: LS-4.7' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/18/84	1013	10/18/84	1038
Installation:	10/18/84	1049	10/18/84	1139
Water Level Reading:	10/18/84	1043	11/9/84	1152
Development :	11/5/84	1145	11/5/84	1252

Well Development:

Method/Equipment: CME-45 mounted pump
Static Depth to Water: 7.43' BTC
Pumping Depth to Water:
Pumping Rate:

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 4-1

Location: N of Bldg 405
Field book No.: 1 pp 25-2
Log By: A.Wickline, C.Kruger
Driller: J.Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 11.7' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/18/84	1
Drilling Completed:	10/18/84	i
Water Level:	7.43' BTC	

Site Sketch

Depth (feet)	Graphic log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
4'				
				S.I. 4.5-6.0' BLS Rec. 1.3'
5		SS#1	43	silt and clay, trace fine gravel; dark grayish brown (10YR 4/
				with some grey (10YR 6/1) mottles; firm; dense; compact;
				dry; laminated; H-Nu reading nothing above background
				S.I. 9.5-11.0' BLS. Rec. 1.5'
10		SS#2	34	0.9' silt and clay, trace fine gravel; dark greyish brown
				(10YR 4/2) with strong brown (7.5YR 5/8) mottles common
				firm; dense; compact; dry
				0.6' sand and silt, some clay, some coarse to fine gravel; dark
				reddish grey (5YR 4/2); soft; medium dense; moist
15				
				= 11.7' BLS bedrock

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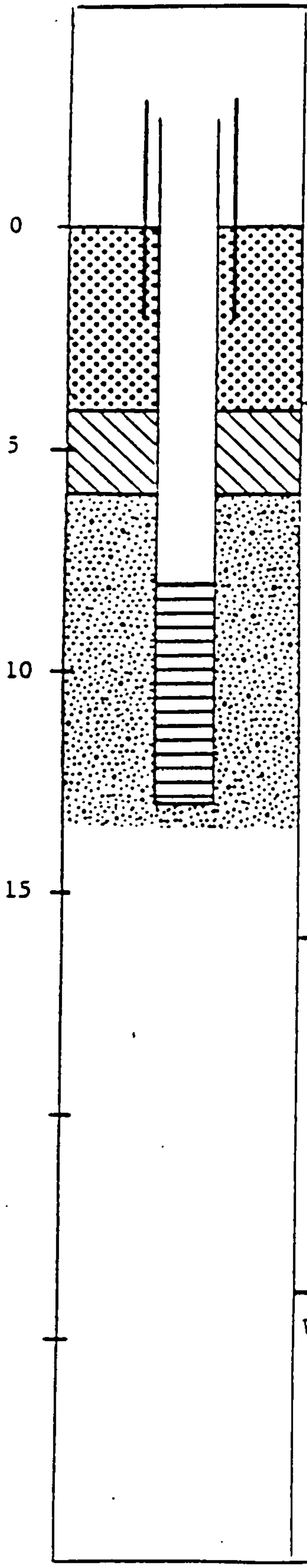
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 4-2



Drilling Summary:

Total Depth: 13.0' BLS
Drillers: J. Genovese/ Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 600.75'
Bit(s): Auger
Top of Casing: 602.58'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 1 pp. 27-29
Water Level: 10.2' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 15.5'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 8.0-13.0' BLS
Setting: 6.0-13.0' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 4.0-6.0' BLS
Setting: LS-4.0' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/18/84	1235	10/18/84	1253
Installation:	10/18/84	1303	10/18/84	1348
Water Level Reading:	11/7/84	1340	11/9/84	1159
Development :	11/2/84	1345	11/2/84	1429

Well Development:

Method/Equipment: CME-45 pump
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 6.5 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 4-2

Location: Island E of Bldg 405
Field Book No.: 1 pp27-28
Log By: C.Kruger,A.Wickline
Driller: J.Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 13.0' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/18/84	12
Drilling Completed:	10/18/84	12

Water Level: 10.2' BTC

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				S.I. 3.0-4.5' BLS Rec. 1.1'
		SS#1	25	silt and clay, some fine sand; dark greyish brown (10YR 4/2)
5				with some reddish black (10R 2.5/1) mottles; firm;
				dense; dry; laminated
				S.I. 8.0-9.5' BLS Rec. 1.25'
		SS#2	31	silt and fine sand, some gravel, trace clay; reddish brown
10				(5YR 4/3); compact; firm; damp to moist
				S.I. 12.9-13.0' BLS Rec. 0.1'
		SS#3	103+	silt and fine sand, some gravel; dark greyish brown (2.5Y
				4/2); loose; damp to wet
15				
				= 13.0' BLS bedrock

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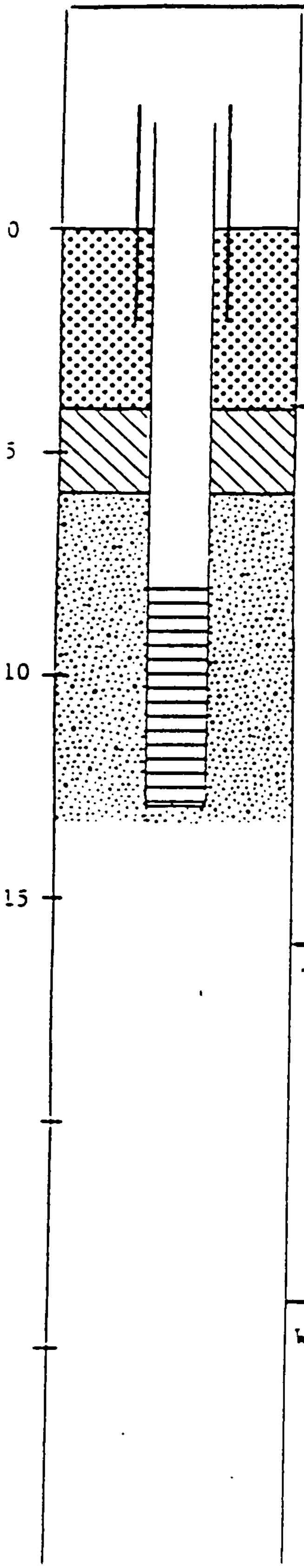
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 4-3



Drilling Summary:

Total Depth: 12.9' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 600.39'
Bit(s): Auger
Top of Casing: 602.32'
Drilling Fluid Type: none
Supervisory Geologist: A Wickline C Kruger
Amount Use: -
Log Book No. 1 pp. 29-31
Water Level: 9.8' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 15.4'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 7.9-12.9' BLS
Setting: 5.9-12.9' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 3.9-5.9' BLS
Setting: LS-3.9' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/18/84	1421	10/18/84	1449
Installation:	10//18/84	1456	10/18/84	1532
Water Level Reading:	10/18/84	1524	11/9/84	1207
Development :	11/2/84	1359	11/2/84	1426

Well Development:

Method/Equipment: CME-45 pump
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 9.5 gal

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DRILLING LOG

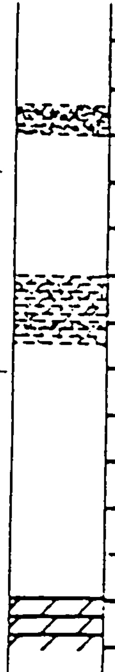
Project: Niagara Falls [illegible]
Owner: USAF
Well No.: 4-3

Location: Island S of Bldg 405
Field Book No.: 1 pp 29-3
Log By: A.Wickline, C.Kruger
Driller: J.Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 12.9' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/18/84	1
Drilling Completed:	10/18/84	1

Water Level: 9.8' BTC

Site Sketch



Depth (feet)	Graphic log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
				S.I. 1.5-3.0' BLS Rec. 0.6'
		SS#1	20	silt and clay, some fine sand and gravel; dark brown (10YR 4/3) with some light yellowish brown (2.5Y 6/4) mottles; firm; dense; compact; dry; H-Nu reading 300 ppm downhole
5				
				S.I. 6.0-7.5' BLS Rec. 1.5'
		SS#2	32	1.2' silt and clay, trace fine sand; brown (7.5YR 4/4, 7.5YR 5/4); firm; medium dense; slightly damp; laminated; H-Nu reading 50-150 ppm downhole
10				
				=12.9' BLS bedrock
15				

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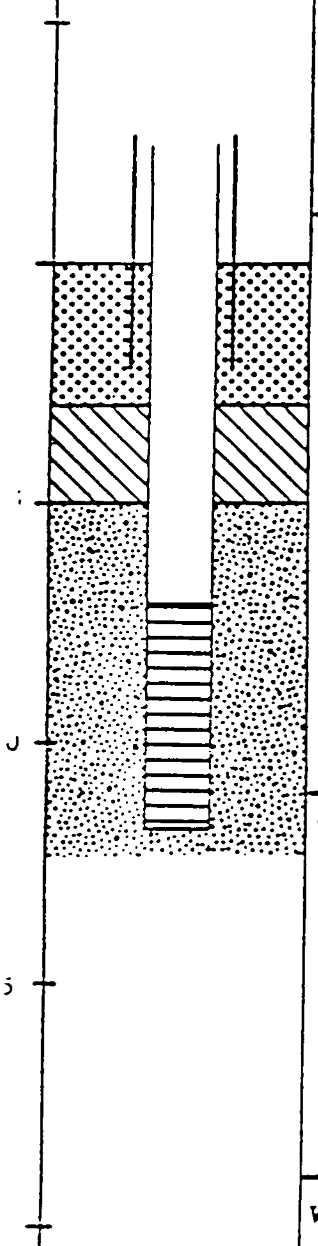
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 6-1



Drilling Summary:

Total Depth: 12.0'BLS
Drillers: J.Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 600.17'
Bit(s): Auger
Top of Casing: 602.59'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 2 pp. 19-20
Water Level: 5.4'BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" I.D.
Length: 14.5'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 7.0-12.0' BLS
Setting: 5.0-12.0' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 3.0-5.0'BLS
Setting: LS-3.0' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/25/84	0954	10/25/84	1021
Installation:	10/25/84	1047	10/25/84	1107
Water Level Reading:	11/07/84	1033	11/07/84	- 1307
Development :	11/07/84	1039	11/07/84	1448

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 9.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF Owner: USAF Well No.: 6-1

Location: ~50' W of Tank A in POL yard

Field Book No.: 2 pp 19-20

Log By: C. Kruger

Driller: I.Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 12.0' BLS

Reference Point Elevation:

Site Sketch

	Date	Time
Drilling Started:	10/25/84	095
Drilling Completed:	10/25/84	102
Water Level:	5.4' BTC	

Depth (feet)	Graphic log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
5				S.I. 6.0-8.0' BLS Rec. 2.0'
		SS#1	79	silt and clay, trace fine gravel; reddish brown (5YR 4/3)
	▨			with some light brownish grey mottles; firm; dense; compact;
	▨			dry
10				S.I. 10.5-12.0' BLS Rec. 1.05'
	▨	SS#2	48	silt, some gravel, some fine sand, some clay; reddish brown
	▨			(5YR 4/3); firm; medium dense; compact; damp
	▨			
				≈12.0' BLS bedrock
15				

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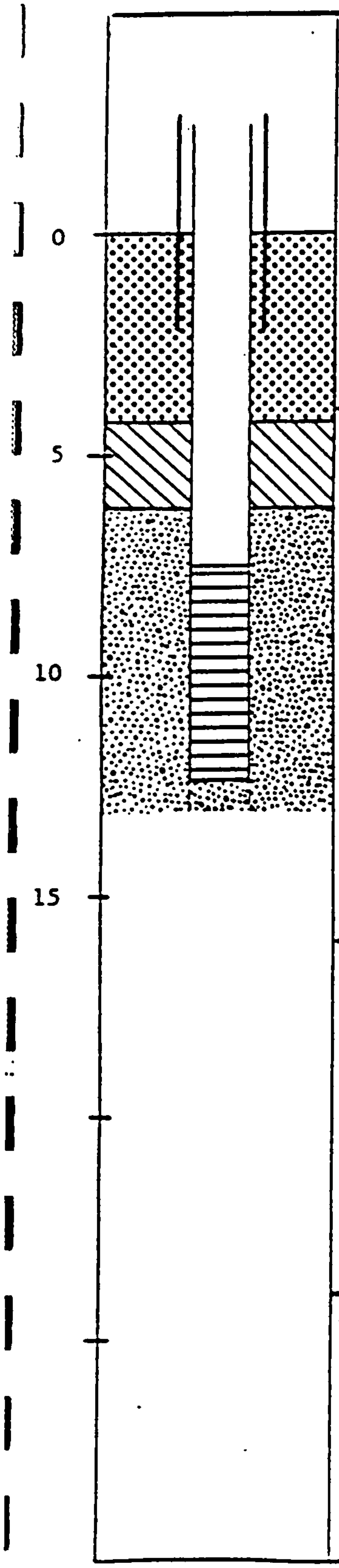
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 6-2



Drilling Summary:

Total Depth: 12.2' BLS
Drillers: J.Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 599.33'
Bit(s): Auger
Top of Casing: 602.03'
Drilling Fluid Type: none
Supervisory Geologist: A Wickline, C Kruger
Amount Use: -
Log Book No. 2 pp. 8-9
Water Level: 5.92'BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 14.7'
Slot: 10/inch
Filter: Material: 40 sand
Setting: 7.2-12.2' BLS
Setting: 6.2-12.2' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 4.2-6.2' BLS
Setting: LS-4.2' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	0849	10/24/84	0908
Installation:	10/24/84	0913	10/24/84	0950
Water Level Reading:	10/31/84	1050	11/09/84	1202
Development :	10/31/84	1050	10/31/84	1112

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 6.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 6-2

Location: ~ 40' SW of Tank A in POL yard
Field Book No.: 2 pp 8-9
Log By: C.Kruger
Driller: J. Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 12.2' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/24/84	0849
Drilling Completed:	10/24/84	0908

Water Level: 5.92' BTC

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				S.I. 3.0-4.5' BLS Rec. 0.7'
		SS#1	34	silt and clay: brown (7.5YR 5/2) with common pinkish grey (7.5YR 7/2) mottles; firm; dense; compact; dry
5				
				S.I. 8.0-9.5' BLS Rec. 0.75'
		SS#2	25	silt, clay and fine sand, some gravel; reddish brown (5YR 4/3); firm; medium dense; medium moist
10				
				≈12.2' BLS bedrock
15				

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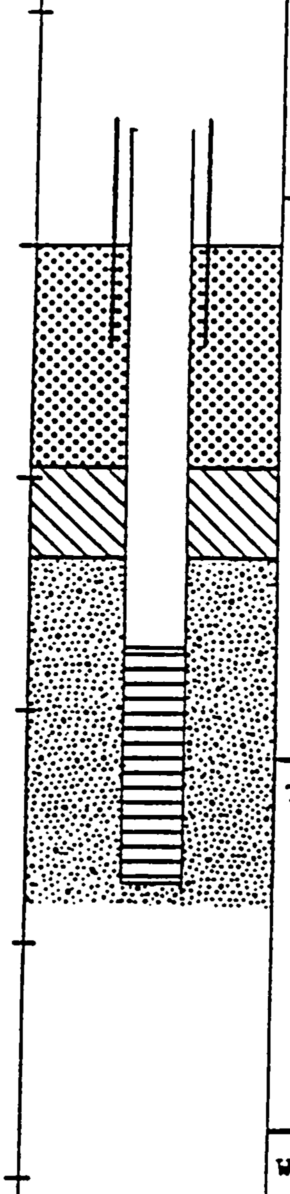
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 6-3



Drilling Summary:

Total Depth: 13.7] BLS
Drillers: J. Genovese
Borehole Diameter(s):
Rig Type: CME-45
Elevation: Land Surface: 599.46'
Bit(s): Auger
Top of Casing: 601.98'
Drilling Fluid Type: None
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -
Log Book No. 1 pp. 54-56
Water Level: 6.44' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 16.2'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 8.7-13.7' BLS
Setting: 6.7-13.7' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 4.7-6.7' BLS
Setting: LS - 4.7' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/23/84	0927	10/23/84	1105
Installation:	10/23/84	1108	10/23/84	1212
Water Level Reading:	10/25/84	0909	11/09/84	1314
Development :	10/31/84	1130	11/07/84	1128

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 13.5 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 6-3

Location: ~ 35' SW of Tank A in POL yard
Field Book No.: 1 pp 54-56
Log By: C Kruger
Driller: J Genovese
Rig Type: CME-45
Reference Point:
Total Depth: 13.7' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/23/84	09
Drilling Completed:	10/23/84	11

Water Level: 6.44' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	**Legend** S.I. Sampling Interval Rec. Recovery **Grain Size** and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
0				
				S.I. 4.5-6.0' BLS Rec. 0.55'
		SS#1	25	silt and clay, trace fine gravel; reddish brown (5YR 4/4)
5	▨			with pale brown (10YR 6/3) mottles; dense; firm; compact;
				dry; laminated
				S.I. 9.0-10.5' BLS Rec. 0.9'
10	▨	SS#2	30	0.7' silt and clay, some fine gravel; brown (7.5YR 4/2);
				medium dense; firm; compact; wet
				0.2' silt and clay, some fine to coarse gravel; brown (7.5YR
				4/2) dense; firm; compact; damp
	▨			
15				≈13.7' BLS bedrock

Page 1 of 1

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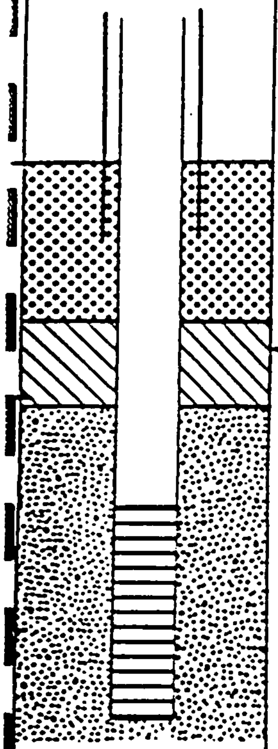
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 3-1



Drilling Summary:

Total Depth: 12.3' BLS
Drillers: Dave S./Empire
Borehole Diameter(s): 6"
Rig Type: CME-45
Elevation: Land Surface: 601.72'
Bit(s): Auger
Top of Casing: 604.42'
Drilling Fluid Type: none
Supervisory Geologist: N. DeSalvo
Amount Use: -
Log Book No. 3 pp. 1-6
Water Level: 6.79' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0"
Length: 15.3'
Slot: 10/inch
Filter: Material: 4Q Sand
Setting: 7.3' - 12.3' BLS
Setting: 5.3'-12.3' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement:Bentonite 19.1
Setting: 3.3'-5.3' BLS
Setting: LS-3.3' BLS
Surface Casing: 4/0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/23/84	1321	10/23/84	1400
Installation:	10/23/84	1406	10/23/84	1610
Water Level Reading:	11/2/84	0942	11/9/84	1701
Development :	11/2/84	0948	11/7/84	1010

Well Development:

Method/Equipment: CME-45 mounted pump/bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 5.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF

Owner: USAF

Well No.: 3-1

Location: ≈600' W of main gate N of Utzig Drive

Reference Point:

Reference Point Elevation:

Site Sketch

Field Book No.: 3 pp 1-6

Log By: N. DeSalvo

Driller: Dave S./Empire

Rig Type: CME-45

Total Depth: 12.3' BLS

	Date	Time
Drilling Started:	10/23/84	1321
Drilling Completed:	10/23/84	1610

Water Level: 6.79' BTC

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	**Legend** S.I. Sampling Interval Rec. Recovery **Grain Size** and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
				S.I. 4.5-6.5' BLS Rec. 0.6'
				0.1' silt loam; brown (10YR 4/3); firm; slightly plastic; moist
EL		SS#1	7	0.5' fine to medium sand, some silt and clay; black (10YR 2/1);
5				medium dense; slightly plastic; moist
		SS#2	20	S.I. 9.0-10.5' BLS Rec. 1.1'
10				0.5' clay, some silt, trace fine sand; brown (7.5YR 5/4); very
				stiff; plastic; moist
				0.6' clay and silt, some sand, trace gravel; pale olive (5Y 6/3)
				grading to reddish brown (2.5YR 4/4) at base of sample;
				plastic; moist
15				
				≈12.3' BLS bedrock
20				

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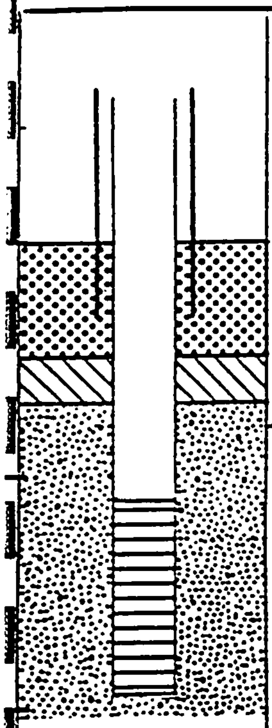
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 3-2



Drilling Summary:

Total Depth: 9.5' BLS
Drillers: Dave S./Empire
Borehole Diameter(s): 6"
Rig Type: CME-45
Elevation: Land Surface: 596.79'
Bit(s): Auger
Top of Casing: 600.02'
Drilling Fluid Type: none
Supervisory Geologist: N. DeSalvo
Amount Use: -
Log Book No. 3 pp. 12-14
Water Level: 7.02' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5" OD
Diameter: 2.0"
Length: 12.5'
Slot: 10/inch
Filter: Material: 4Q Sand
Setting: 5.5-9.5' BLS
Setting: 3.4-9.5' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement:Bentonite 19:1
Setting: 2.5-3.4' BLS
Setting: LS-2.5' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	1256	10/24/84	1345
Installation:	10/24/84	1350	10/24/84	1425
Water Level Reading:	10/24/84	1256	11/9/84	1051
Development :	11/8/84	1707	11/8/84	1751

Well Development:

Method/Equipment: Bailer
Static Depth to Water: 7.02' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 25.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 3-2

Site Sketch

Location: ≈100 E of Main Gate at SW corner of Utzig Drive and Walmore Road
Reference Point:
Reference Point Elevation:

Field Book No.: 3 pp12-14
Log By: N. DeSalvo
Driller: Dave S./Empire
Rig Type: CME-45
Total Depth: 9.5' BLS

	Date	Time
Drilling Started:	10/24/84	1256
Drilling Completed:	10/24/84	1425

Water Level: 7.02' BTC

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
2.5				
				S.I. 4.5-6.0' BLS Rec. 1.1'
		SS#1	23	clay and silt, some fine to medium sand, trace gravel:dark
				reddish brown(5YR3/4) with few light yellowish brown(2.5Y6/4)
				and light olive grey(5YR6/2) mottles:firm;plastic;wet
5.0	▨			≈4.5' BLS Water table
7.5				
				S.I. 9.5' BLS Rec. 0.2'
		SS#2	100	medium to coarse sand and gravel:greyish brown(2.5Y5/2):loose:
				non-plastic:wet
10.0	▨			≈9.5' BLS bedrock

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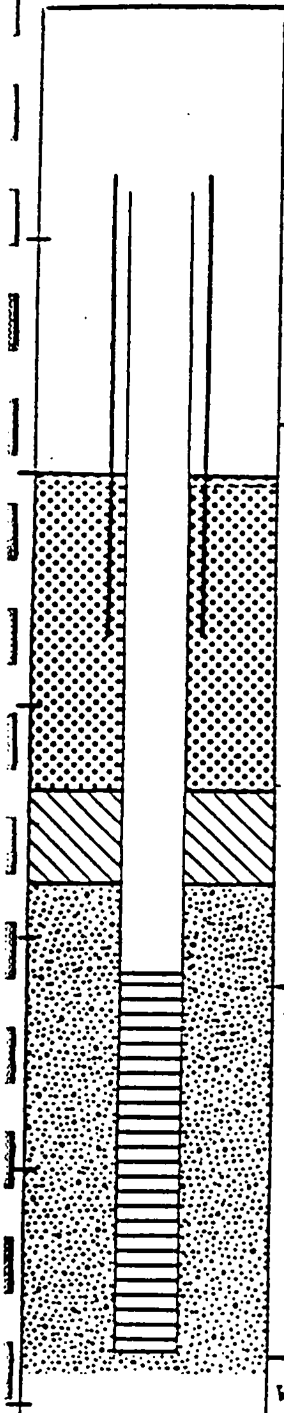
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 3-3



Drilling Summary:

Total Depth: 9.4' BLS Drillers: J.Genovese/Empire

Borehole Diameter(s): 6.0'

Rig Type: CME-45

Elevation: Land Surface: 590.41' Bit(s): Auger/Roller

Top of Casing: 593.23' Drilling Fluid Type: none/water

Supervisory Geologist: A.Wickline, C.Kruger Amount Use: -/~ 85 gal

Log Book No. 2 pp. 26-27 Water Level: 2.98' BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC

Diameter: 2.0" ID 2.5" OD Diameter: 2.0" ID

Length: 12.4' Slot: 10/inch

Filter: Material: 40 sand Setting: 5.4-9.4' BLS

Setting: 4.4-9.4' BLS Seals: Type: Bentonite Pellets

Grout: Type: #1 Portland Cement:Bentonite 19:1 Setting: 3.4-4.4' BLS

Setting: LS-3.4' BLS Surface Casing: 4.0" ID steel w/lock

Other:

Time Log:

	Started		Completed	
Drilling:	10/26/84	0924	10/26/84	1039
Installation:	10/26/84	1040	10/26/84	1048
Water Level Reading:	10/31/84	1500	11/09/84	1002
Development :	10/31/84	1511	10/31/84	1534

Well Development:

Method/Equipment: Bailer

Static Depth to Water:

Pumping Depth to Water:

Pumping Rate:

Volume Pumped: 7.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF

Owner: USAF

Well No.: 3-3

Location: ~ 75' S of Main Gate along perimeter fence

Field Book No.: 2 pp 26-27

Log By: C.Kruger, A.Wickline

Driller: J.Genovese/Empire

Rig Type: CME-45

Reference Point:

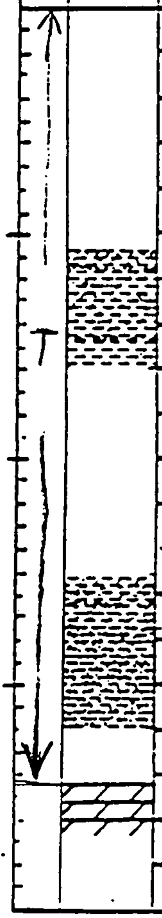
Total Depth: 9.4 BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/26/84	092
Drilling Completed:	10/26/84	103

Water Level: 2.98' BTC

Site Sketch



Depth (feet)	Sample Type and Number	Blow Count (N)	DESCRIPTION Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less
0	SS#1	16	S.I. 0-2.0' BLS Rec. 0.75'
			silt and clay, trace fine gravel: very dark greyish brown
			(10YR 3/2) with few brown (7.5YR 5/4) mottles in 1.8-2.0'
			BLS interval; firm; medium dense; compact; damp; rootlets;
			trace carbonaceous material
1.25			
	SS#2	33	S.I. 2.0-4.0' BLS
2.5			0.3' silt and clay, trace fine gravel: very dark greyish brown
			(10YR 3/2); soft; medium dense; plastic; damp to wet;
			rootlets; trace carbonaceous material
			0.55' silt and fine to very fine sand, trace fine gravel:
			reddish brown (5YR 5/4); firm; dense; faintly laminated;
3.75			damp; 3.7-4.0' BLS plastic and wet
			= 4.3' BLS bedrock
5.0			

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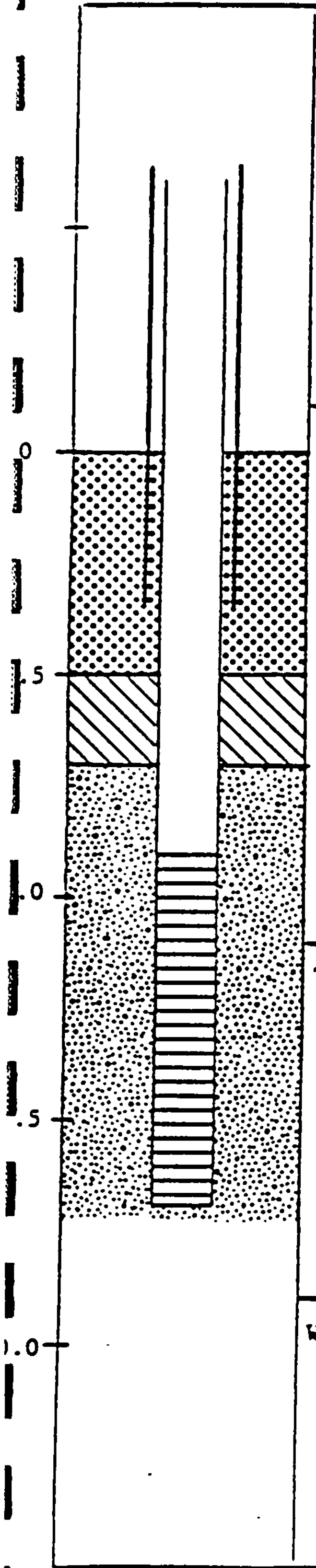
WELL CONSTRUCTION SUMMARY

Project: Niagara FAlls AFRF
Owner: USAF
Well No.: 3-4



Drilling Summary:

Total Depth: 8.5' BLS
Drillers: J.Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 588.71'
Bit(s): Auger/Roller
Top of Casing: 591.71'
Drilling Fluid Type: none/water
Supervisory Geologist: A.Wickline,G.Kruger
Amount Use: -/~ 75 gal
Log Book No. 2 pp. 23-25
Water Level: 3.45' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5" OD
Diameter: 2.0" ID
Length: 11.5'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 4.5-8.4 BLS
Setting: 3.5-8.5' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 2.5-3.5' BLS
Setting: LS-2.5' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/25/84	1523	10/25/84	1634
Installation:	10/26/84	0826	10/26/84	0839
Water Level Reading:	10/31/84	1440	11/09/84	0936
Development :	10/31/84	1450	11/09/84	0951

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 2.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF

Owner: USAF

Well No.: 1-4

Location: 20' W of pond near Walmore Road

Field Book No.: 2 pp 22-25

Log By: C. Kruger

Driller: J. Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 8.5' BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/25/84	152:
Drilling Completed:	10/25/84	163-

Water Level: 2.45' BTC

Site Sketch

Depth (feet)	Graphic log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
		Pushed		S.I. 0-1.5' BLS Rec. 1.1'
				0.45' silt and fine sand: reddish brown (5YR 4/3); firm;
				dense: compact: dry: rootlets
				0.4' silt, some clay: very dark grey (5YR 3/1): soft;
2.5				friable: compact: dry
				0.25' silt and clay, trace sand: grey (5YR 5/1): soft:
				loose: compact, dry
				S.I. 4.0-4.3' BLS Rec. 0.25'
			Refusal	silt and fine sand, some gravel, trace clay: reddish
				brown (5YR 4/4): firm: medium dense: compact; dry
5.0				to slightly damp
				≈4.3 BLS bedrock
7.5				
10.0				

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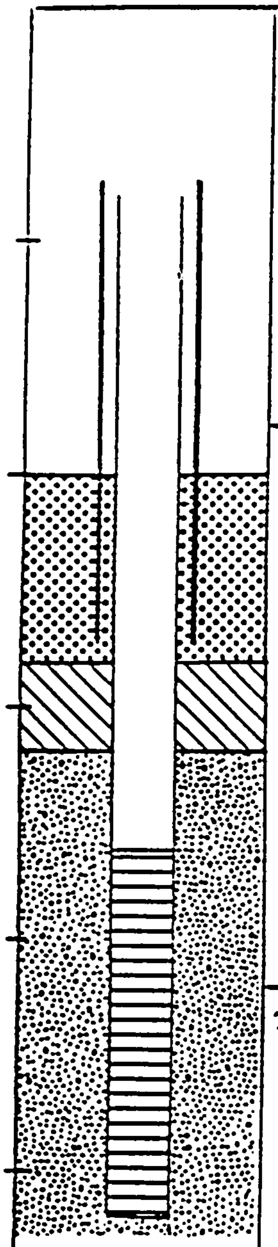
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 3-5



Drilling Summary:

Total Depth: 8.0' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 592.36'
Bit(s): Auger/Roller
Top of Casing: 595.36'
Drilling Fluid Type: none/water
Supervisory Geologist: A.Wickline, C.Kruger
Amount Use: -/~80 gal
Log Book No. 2 pp. 21-22
Water Level: 5.14' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5" OD
Diameter: 2.0" ID
Length: 11.0'
Slot: 10/inch
Filter: Material: 40 sand
Setting: 4.0-8.0' BLS
Setting: 3.0-8.0' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 2.0-3.0' BLS
Setting: LS-2.0' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/25/84	1312	10/25/84	1418
Installation:	10/25/84	1451	10/25/84	1513
Water Level Reading:	10/31/84	1323	11/09/84	1028
Development :	10/31/84	1323	11/02/84	0915

Well Development:

Method/Equipment: Bailer, CME-45 pump
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 40.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF Owner: USAF Well No.: 1-5

Location: 5.0' W of pond near Walmore Road

Field Book No.: 2 pp 21-22

Log By: C. Kruger

Driller: J. Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 8.0' BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/25/84	1312
Drilling Completed:	10/25/84	1418

Water Level: 5.14' BTC

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
some 40 to 10%
trace 10% or less

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	DESCRIPTION
0			Pushed	S.I. 0-1.5' BLS Rec. 0.7'
				silt, and fine sand, trace gravel; very dark greyish
				brown (2.5Y 3/2) with common light grey (2.5Y 7/2)
				mottles; firm; medium dense; compact; damp
2.5				S.I. 3.0-3.1 Rec. 0.1'
			Refusal	dolomitic bedrock; grey (4Y 5/1); fine-grained; dense;
				trace of silt-sized quartz grains
				≈ 3.0' BLS, bedrock
5.0				
				≈ 6.7' BLS, lost circulation
7.5				
10.0				

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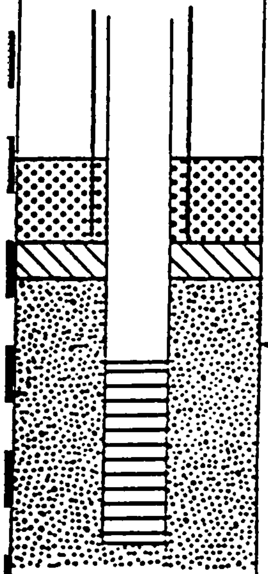
WELL CONSTRUCTION SUMMARY

Project: Niagara Falis AFRF
Owner: USAF
Well No.: 3-6



Drilling Summary:

Total Depth: 8.3' BLS
Drillers: Dave S./Empire
Borehole Diameter(s): 6"
Rig Type: CME-45
Elevation: Land Surface: 600.08'
Bit(s): Auger
Top of Casing: 602.90'
Drilling Fluid Type: none
Supervisory Geologist: N. DeSalvo
Amount Use: -
Log Book No. 3 pp. 6-12
Water Level: 8.12' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5" OD
Diameter: 2.0"
Length: 11.3'
Slot: 10/inch
Filter: Material: 4Q Sand
Setting: 4.3-8.3' BLS
Setting: 2.8-8.3' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement:Bentonite 19:1
Setting: 1.7-2.8' BLS
Setting: LS-1.7' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	0913	10/24/84	1059
Installation:	10/24/84	1104	10/24/84	1200
Water Level Reading:	11/9/84	1038	11/9/84	1038
Development :	11/1/84	1410	11/7/84	0938

Well Development:

Method/Equipment: CME-45 mounted pump
Static Depth to Water: 8.12' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 45 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 3-6

Location: ≈25' W of Kinross Street near junction with Utzig Drive
Reference Point:
Reference Point Elevation:

Field Book No.: 3 pp 6-12
Log By: N. DeSalvo
Driller: Dave S./Empire
Rig Type: CME-45
Total Depth: 8.3' BLS

	Date	Time
Drilling Started:	10/24/84	0913
Drilling Completed:	10/24/84	12
Water Level:	8.12' BTC	

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
0				
				S.I. 3.0-4.5' BLS Rec. 1.1'
L				0.1' silt loam; very dark greyish brown (10YR 3/2);
		SS#1	16	loose; non-plastic; moist
				0.9' clay and silt, some fine to medium sand; brown
5				(7.5 YR 4/2) with few yellowish brown (10YR 5/6) and
				light grey (10 YR 6/1) mottles; stiff; plastic; moist;
7?				wood chip artifact
				0.1' silt and fine to medium sand; some clay; black
				(10 YR 2/1); dense; plastic; moist
10				
				S.I. 7.0-8.3' BLS Rec. 0
		SS#2	100	Spoon wet and empty
				≃8.3' BLS bedrock
15				

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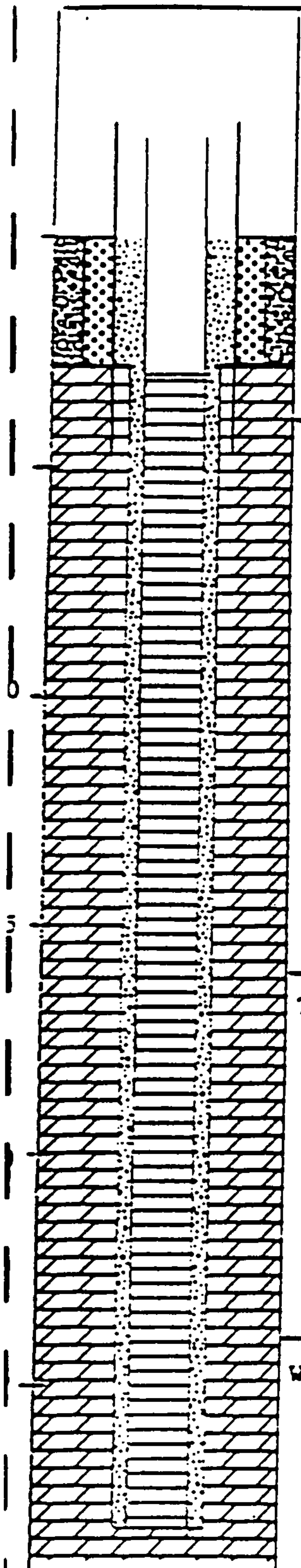
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 3D-1



Drilling Summary:

Total Depth: 28.0' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 9" 0-4.8' BLS, 4" 4.8-28' BLS
Rig Type: CME-45
Elevation: Land Surface: 591.26'
Bit(s): Auger/Roller
Top of Casing: 593.46'
Drilling Fluid Type: none/water
Supervisory Geologist: N. DeSalvo
Amount Use:
Log Book No. 3 pp. 25-26,36,41
Water Level: 3.91' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 3.0" ID 3.5" OD
Diameter: 3.0" ID
Length: 30.0'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 3-28' BLS
Setting: LS-28.0' BLS
Seals: Type: none
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: -
Setting: 0-4.8' BLS
Surface Casing: 6" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/29/84	1314	10/31/84	1617
Installation:	10/29/84	1345	11/2/84	0820
Water Level Reading:	11/2/84	0825	11/9/84	1016
Development :	11/2/84	0835	11/2/84	0858

Well Development:

Method/Equipment: CME-45 pump
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 70.0 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 3D-1

Location: ~35' W of pond on Cayuga Creek

Field Book No.: 3 pp 25-26,36,4

Log By: N. DeSalvo

Driller: J. Genovese/Empire

Rig Type: CME-45

Reference Point:

Total Depth: 28.0' BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/29/84	1314
Drilling Completed:	10/31/84	1617

Water Level: 3.91' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
0				
?				
				≈ 2.8' BLS bedrock
5				
10				
15				
20				

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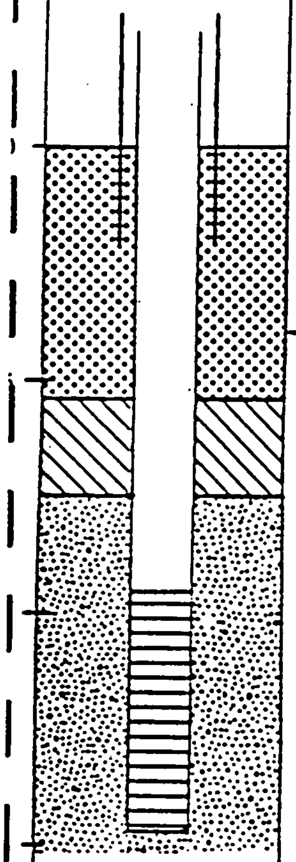
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 8-1



Drilling Summary:

Total Depth: 14.5' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 597.63'
Bit(s): Auger
Top of Casing: 600.05'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline,C.Kruger
Amount Use: -
Log Book No. 1 pp. 17-18
Water Level: 12.08' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5: OD
Diameter: 2.0" ID
Length: 17.0'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 9.5-14.5' BLS
Setting: 7.5-14.5' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 5.5-7.5' BLS
Setting: LS-5.5' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/17/84	1055	10/17/84	1125
Installation:	10/17/84	1130	10/17/84	1235
Water Level Reading:	10/17/84	1239	11/9/84	1050
Development :	10/26/84	1316	10/26/84	1435

Well Development:

Method/Equipment: Bailer/CME -45 pump
Static Depth to Water: 11.9' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 160 gal.

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DRILLING LOG

Project: Niagara Falls AFRF

Owner: USAF

Well No.: 8-1

Location: ~ 15' N of Bldg 202

Field Book No.: 1 pp 17-18

Log By: A. Wickline, C. Kruger

Driller: J. Genovese/ Empire

Rig Type: CME-45

Reference Point:

Total Depth: 14.5' BLS

Reference Point Elevation:

	Date	Time
Drilling Started:	10/17/84	1055
Drilling Completed:	10/17/84	1125

Water Level: 12.08' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to10% trace 10% or less	DESCRIPTION
0					
5				S.I. 6.0-7.5' BLS	Rec. 1.4'
		SS#1	40	0.5' silt and clay, some gravel; dark brown (7.5YR 4/2); firm;	
				dense; dry	
				0.9' silt, some clay, trace gravel; reddish brown (5YR 4/3) with	
10				few grey (7.5YR 6/0) mottles; firm; dense; damp	
				S.I. 12.5-14.0' BLS	Rec. 0.9
		SS#2	16	fine sand and gravel, some silt; dark brown (7.5YR 4/2); soft;	
				loose; saturated	
15				≈ 14.5' BLS bedrock	

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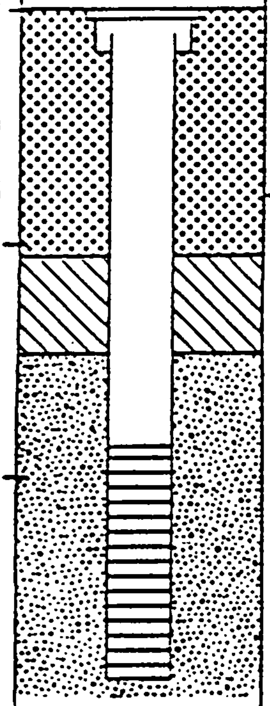
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 8-2



Drilling Summary:

Total Depth: 14.2' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 597.70'
Bit(s): Auger
Top of Casing: 597.25'
Drilling Fluid Type: none
Supervisory Geologist: A. Wickline; C. Kruger
Amount Use: -
Log Book No. 1 pp. 19-21
Water Level: 11.4' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 14.2"
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 9.2-14.2' BLS
Setting: 7.2-14.2' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 5.2-7.2' BLS
Setting: LS-5.2' BLS
Surface Casing: -
Other: Curb box used to protect well from snow removal equipment, set flush to land surface.

Time Log:

	Started		Completed	
Drilling:	10/17/84	1337	10/17/84	1402
Installation:	10/17/84	1410	10/17/84	1514
Water Level Reading:	10/18/84	1337	11/9/84	1015.
Development :	10/26/84	1253	10/26/84	1305

Well Development:

Method/Equipment: Bailer
Static Depth to Water: 9.2' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 5 gal

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DRILLING LOG

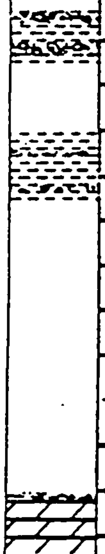
Project: Niagara Falls AFRF
Owner: USAF
Well No.: 8-2

Location: N of Bldg. 202 along roadside in NYANG Area
Field Book No.: 1 pp 19-21
Log By: A.Wickline,C.Kruger
Driller: J.Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 14.2' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/17/84	1337
Drilling Completed:	10/17/84	1514

Water Level: 9.2' BTC

Site Sketch



Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
				S.I. 3.0-4.5' BLS Rec. 1.2'
		SS#1	23	silt and clay, some gravel;brown(7.5YR5/4);very firm:dense:dry
5				
				S.I. 7.5-9.0' BLS Rec. 1.5'
		SS#2	24	silt and clay, trace gravel;dark brown(7.5YR4/2) with common
				black(10YR2/1), grey(10YR5/1) and light grey(10YR7/2) mottles:
10				very firm:dense:compact:dry:striated
				S.I. 14.1-14.2' BLS Rec. 0.1'
15		SS#3	refusal	sand and gravel, some silt:dark brown(10YR4/3);soft;loose:
				saturated
				=14.2' BLS bedrock

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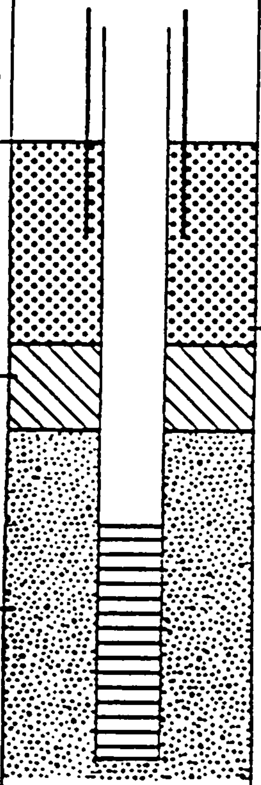
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 8-3



Drilling Summary:

Total Depth: 13.2' BLS Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 597.36' Bit(s): Auger
Top of Casing: 599.06' Drilling Fluid Type: none
Supervisory Geologist: A.Wickline,C.Kruger Amount Use: -
Log Book No. 1 pp. 21-23 Water Level: 11.7' BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD Diameter: 2.0" ID
Length: 15.7' Slot: 10/inch
Filter: Material: 4Q sand. Setting: 8.2-13.2' BLS
Setting: 6.2-13.2' BLS Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1 Setting: 4.2-6.2' BLS
Setting: LS-4.2' BLS Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/17/84	1612	10/17/84	1632
Installation:	10/17/84	1635	10/18/84	0917
Water Level Reading:	10/18/84	0750	11/9/84	1030
Development :	10/26/84	1455	10/26/84	1505

Well Development:

Method/Equipment: CME-45 mounted pump
Static Depth to Water: 11.7' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 0.5 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 8-3

Location: N of NW corner of Bldg 202 in NYANG area
Field Book No.: 1 pp 21-23
Log By: A. Wickline, C.Kruger
Driller: J. Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 13.2' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/17/84	1612
Drilling Completed:	10/17/84	1632

Water Level: 11.11' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
				S.I. 1.5-3.0' BLS Rec. 0.4'
		SS#1	18	0.1' fine sandy loam (top soil-fill), trace gravel; very dark
				greyish brown (10YR 3/2) with some light yellowish brown
				(10YR 6/4) mottles; firm; dense; moist
5				0.3' silt and clay, some fine sand, trace gravel; brown (7.5YR 5/2);
				soft; medium dense; wet; traces of plant material
				S.I. 11.0-12.5' BLS Rec. 0.8'
10		SS#2	17	fine sand, some silt and gravel; reddish brown (5YR 4/3);
				soft; medium dense; wet
				≈13.2' BLS bedrock
15				

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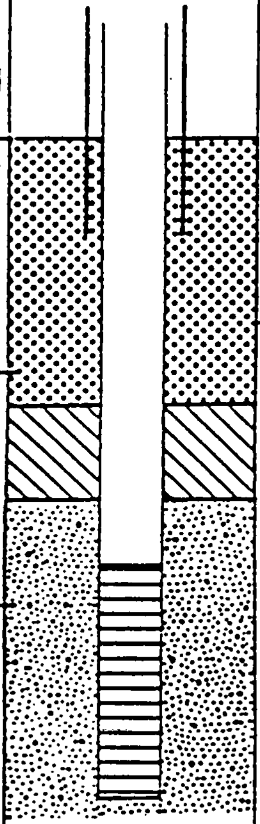
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 8-4



Drilling Summary:

Total Depth: 14.1' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0'
Rig Type: CME-45
Elevation: Land Surface: 598.60'
Bit(s): Auger
Top of Casing: 600.86'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline,C.Kruger
Amount Use: -
Log Book No. 1 pp. 14-15
Water Level: 12.82' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0"
Length: 16.6
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 9.1-14.1' BLS
Setting: 7.7-14.1' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 5.7-7.7' BLS
Setting: LS-5.7' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/17/84	0835	10/17/84	0855
Installation:	10/17/84	0900	10/17/84	1538
Water Level Reading:	10/26/84	1447	11/9/84	1022
Development :	10/26/84	1450	10/26/84	1453

Well Development:

Method/Equipment: CME-45 pump
Static Depth to Water: 12.87' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 0.5 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 8-4

Location: ~20' N of drainage ditch N of Bldg. 202
Reference Point:
Reference Point Elevation:

Field Book No.: 1 pp 14-17
Log By: A Wickline, C. Kruger
Driller: J. Genovese/Empire
Rig Type: CME-45
Total Depth: 14.1' BLS

	Date	Time
Drilling Started:	10/17/84	0835
Drilling Completed:	10/17/84	0855

Water Level: 12.82' BTC

Site Sketch

Legend
S.I. Sampling Interval
Rec. Recovery
Grain Size
and 50 to 40%
same 40 to 10%
trace 10% or less

Depth (feet)	Graphic log	Sample Type and Number	Blow Count (N)	DESCRIPTION
				S.I. 4.5-6.0' BLS Rec. 1.4'
5		SS#1	30	0.9' silt and fine sand, trace clay; dark brown (7.5YR 4/4) with grey (10YR 6/1) mottles common; firm; dense; striated
				0.5' silt and sand, trace gravel; dark brown (10YR 4/3) with grey (10YR 5/1) streaks; very stiff; very dense
10		SS#2	36-	S.I. 9.5-11.0' BLS Rec. 1.5'
			. .	1.0' fine sand and silt; trace gravel; greyish brown (10YR 5/2); soft; medium dense; dry; striated
				0.5' fine sand, some silt; dark brown (7.5YR 4/2); soft, medium dense; moist
15				≈ 14.1' BLS bedrock

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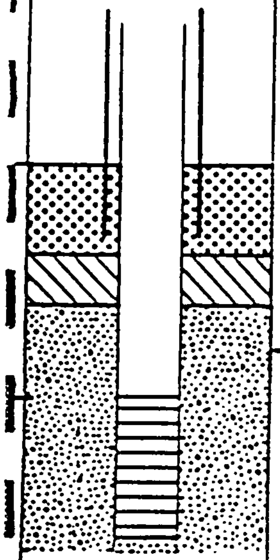
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF Owner: USAF Well No.: 9-1



Drilling Summary:

Total Depth: 8.0' BLS Drillers: Dave S./Empire

Borehole Diameter(s): 6"

Rig Type: CME-45

Elevation: Land Surface: 585.53' Bit(s): Auger

Top of Casing: 588.65' Drilling Fluid Type: none

Supervisory Geologist: N. DeSalvo Amount Use: -

Log Book No. 3 pp. 19-20 Water Level: 9.45' BTC

Well Design:

Casing: Material: PVC Screen: Material: PVC

Diameter: 2.0" ID- 2.5" OD Diameter: 2.0"

Length: 11.0' Slot: 10/inch

Filter: Material: 4Q Sand Setting: 5.0-8.0' BLS

Setting: 3.0-8.0' BLS Seals: Type: Bentonite Pellets

Grout: Type: #1 Portland Cement:Bentonite 19:1 Setting: 2.0-3.0' BLS

Setting: LS-2.0'BLS Surface Casing: 4.0" ID steel w/lock

Other:

Time Log:

	Started		Completed	
Drilling:	10/25/84	1059	10/25/84	1122
Installation:	10/25/84	1128	10/25/84	1206
Water Level Reading:	11/08/84	0913	11/9/84	1405
Development :	11/08/84	0915	11/8/84	0930

Well Development:

Method/Equipment: Bailer

Static Depth to Water: 9.45' BTC

Pumping Depth to Water:

Pumping Rate:

Volume Pumped: 1.9 gal

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DRILLING LOG

Project: Niagara Falls AFRF Owner: USAF Well No.: 9-1

Location: ~10' N of Fire Training Area at W end of Instrument Runway

Field Book No.: 3 pp 19-20

Log By: N. DeSalvo

Driller: Dave S./Empire

Rig Type: CME-45

Total Depth: 8.0' BLS

Reference Point:

Reference Point Elevation:

	Date	Time
Drilling Started:	10/25/84	1059
Drilling Completed:	10/25/84	1206

Water Level: 9.45' BTC

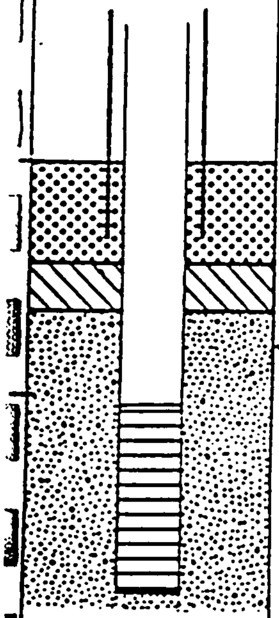
Site Sketch

Depth (feet)	Graphic log	Sample Type and Marker	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
0				
2.5				
				S.I. 4.0-5.5' BLS Rec. 1.4'
5.0	▨	SS#1	21	0.9' silt and clay, trace fine to medium sand: brown (7.5YR 4/2) with common light grey (10YR 6/1), very dark grey (10YR 3/1), reddish brown (2.5YR 4/4 and 2.5YR 5/4) mottles; stiff; plastic; moist
7.5				0.5' silt and clay, some medium to coarse sand; mixed matrix of grey (10YR 5/1), dark greyish brown (10YR 4/2) and reddish brown (5YR 4/4) with pocket of white (10YR 8/1, 10YR 8/2); stiff; plastic; moist
	▨			=8.0' BLS bedrock
10.0				

JRB ASSOCIATES
Company of Science Applications, Inc.
00 Westpark Drive, McLean, Virginia 22102

WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 9-2



Drilling Summary:

Total Depth: 9.2' BLS
Drillers: Dave S./Empire
Borehole Diameter(s): 6"
Rig Type: CME-45
Elevation: Land Surface: 585.77'
Bit(s): Auger
Top of Casing: 588.72'
Drilling Fluid Type: none
Supervisory Geologist: N. DeSalvo
Amount Use: -
Log Book No. 3 pp. 16-19
Water Level: 8.1' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID- 2.5" OD
Diameter: 2.0"
Length: 12.2'
Slot: 10/inch
Filter: Material: 40 sand
Setting: 5.2-9.2' BLS
Setting: 3.2-9.2' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1Portland Cement:Bentonite 19:1
Setting: 2.2-3.2' BLS
Setting: LS-2.2' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/25/84	0936	10/25/84	0955
Installation:	10/25/84	1000	10/25/84	1030
Water Level Reading:	11/08/84	0850	11/9/84	1358
Development :	11/08/84	0900	11/8/84	1024

Well Development:

Method/Equipment: Bailer
Static Depth to Water: 8.1' BTC
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 3.8 gal

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DRILLING LOG

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 9-2

Location: ~ 15' E of Fire Training Area at W end of Instrument Runway
Reference Point:
Reference Point Elevation:

Field Book No.: 3 pp 16-19
Log By: N. DeSalvo
Driller: Dave S./Empire
Rig Type: CME-45
Total Depth: 9.2' BLS

	Date	Time
Drilling Started:	10/25/84	0931
Drilling Completed:	10/25/84	1030

Water Level: 8.1' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50% to 40% some 40 to 10% trace 10% or less DESCRIPTION
5				S.I. 6.0-7.5' BLS Rec. 1.4'
	▨	SS#1	20	0.1' silt and fine to medium sand, some clay; yellowish red
	▨			(5YR 5/6); stiff; plastic; moist
				1.3' silt and clay, trace sand; reddish brown (5YR 4/4) with
	▨			common very dark grey (10YR 3/1), grey (10YR 5/1) and
10	▨			reddish brown (2.5YR 4/4) mottles; stiff; plastic; moist;
				laminated throughout
				≈ 9.2' BLS bedrock

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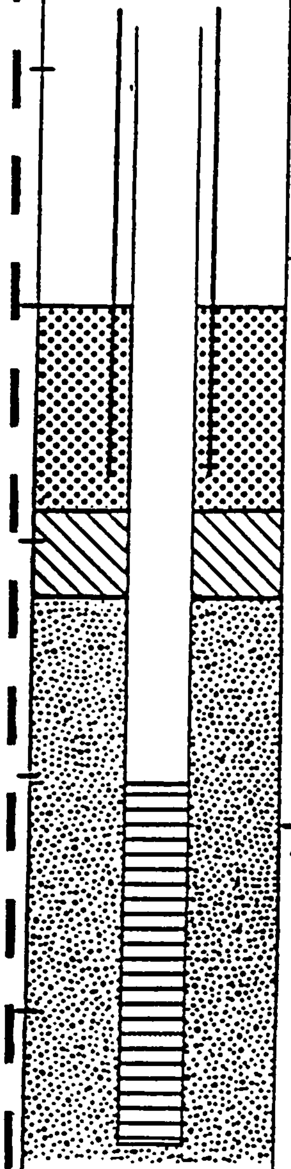
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 9-3



Drilling Summary:

Total Depth: 9.1' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 585.68'
Bit(s): Auger
Top of Casing: 588.68'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline,C.Kruger
Amount Use: -
Log Book No. 2 pp. 14-15
Water Level: 5.8' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 12.1'
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 5.1-9.1' BLS
Setting: 3.1-9.1' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 10.1
Setting: 2.1-3.1' BLS
Setting: LS-2.1' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	1425	10/24/84	1435
Installation:	10/24/84	1441	10/24/84	1504
Water Level Reading:	10/24/84	1539	11/9/84	1355
Development :	11/08/84	0831	11/8/84	1008

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 3.5 gal

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DRILLING LOG

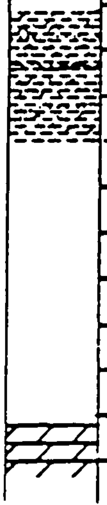
Project: Niagara Falls AFRF
Owner: USAF
Well No.: 9-3

Location: Fire Training Area at W end of ramp
Field Book No.: 2 pp 14-15
Log By: C Kruger
Driller: J.Genovese/Empire
Rig Type: CME-45
Reference Point:
Total Depth: 9.1' BLS
Reference Point Elevation:

	Date	Time
Drilling Started:	10/24/84	1425
Drilling Completed:	10/24/84	143

Water Level: 5.8' BTC

Site Sketch

Depth (feet)	Graphic Log	Sample Type and Number	Blow Count (N)	Legend S.I. Sampling Interval Rec. Recovery Grain Size and 50 to 40% some 40 to 10% trace 10% or less DESCRIPTION
2.5				
				S.I. 4.5-60.'BLS Rec. 1.4'
5.0		SS#1	34	silt and clay, trace coarse gravel, trace medium sand:reddish
				brown(5YR 4/4) with common dark grey(5YR 4/1) mottles:firm:
				dense:compact:dry:sand as thin stringers, clean, quartose
				≈9.1' BLS bedrock
7.5				
10.0				

Page 1 of 1

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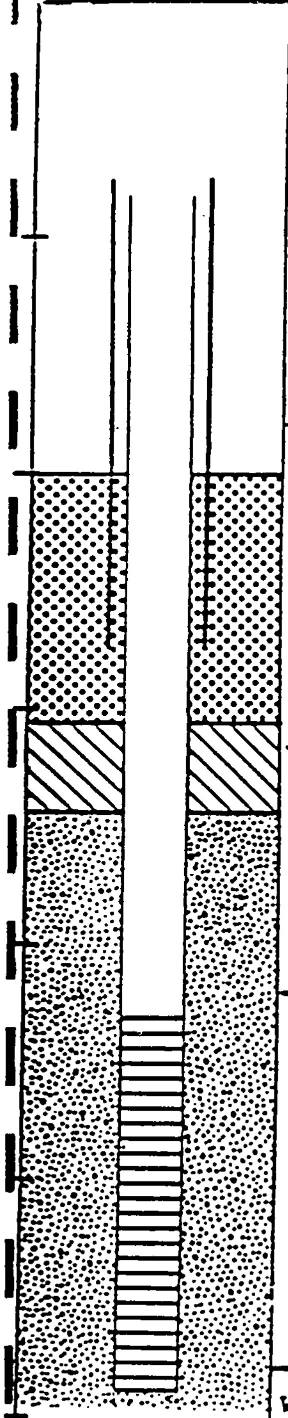
WELL CONSTRUCTION SUMMARY

Project: Niagara Falls AFRF
Owner: USAF
Well No.: 9-4



Drilling Summary:

Total Depth: 9.7' BLS
Drillers: J. Genovese/Empire
Borehole Diameter(s): 6.0"
Rig Type: CME-45
Elevation: Land Surface: 585.59'
Bit(s): Auger
Top of Casing: 588.59'
Drilling Fluid Type: none
Supervisory Geologist: A.Wickline,C.Kruger
Amount Use: -
Log Book No. 2 pp. 16-17
Water Level: 7.62' BTC

Well Design:

Casing: Material: PVC
Screen: Material: PVC
Diameter: 2.0" ID 2.5" OD
Diameter: 2.0" ID
Length: 12.7"
Slot: 10/inch
Filter: Material: 4Q sand
Setting: 5.7-9.7' BLS
Setting: 3.7-9.7' BLS
Seals: Type: Bentonite Pellets
Grout: Type: #1 Portland Cement: Bentonite 19:1
Setting: 2.7-3.7' BLS
Setting: LS-2.7' BLS
Surface Casing: 4.0" ID steel w/lock
Other:

Time Log:

	Started		Completed	
Drilling:	10/24/84	1510	10/24/84	1532
Installation:	10/24/84	1537	10/24/84	1557
Water Level Reading:	10/24/84	1545	11/9/84	1415
Development :	11/08/84	0936	11/8/84	1052

Well Development:

Method/Equipment: Bailer
Static Depth to Water:
Pumping Depth to Water:
Pumping Rate:
Volume Pumped: 4.2 gal

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 1-6
Location (NY. Coord.)
Northings : 1,135,015.462
Eastings : 406,554.858
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 598.73 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 8/22-26
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER
Driller : P. BENCE
Drilling Started : 1300 HR/7-28-89
Drilling Completed : 1520 HR/7-28-89

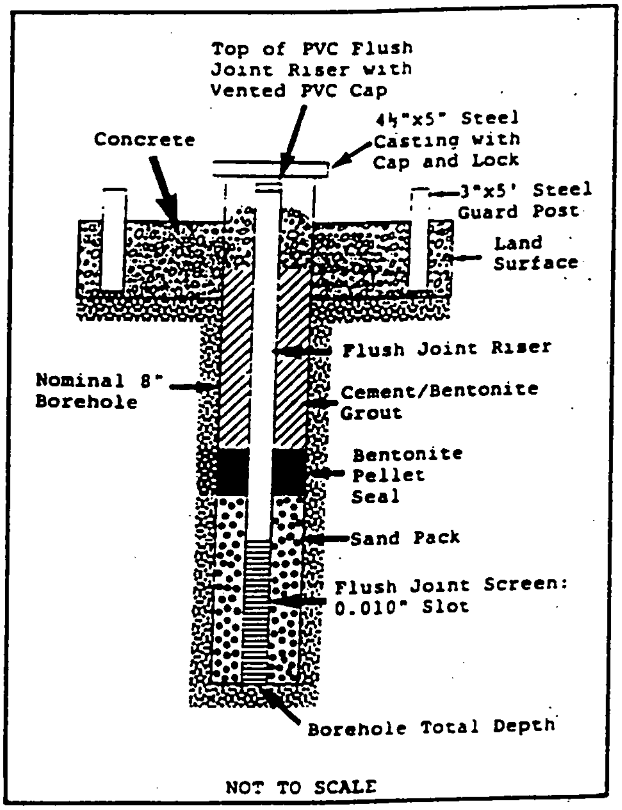
Development
Date : 8/9/89
Type : BAILER
Volume Purged : 1/2 GAL
(bailed well dry twice)

Water Level/Date: 8.82 BTOC /10-04-89
589.91 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
nd Surface		0.00	595.15
Top of PVC Flush Joint Riser Measured at Reference Point		+ 3.58	598.73
Cement/Bentonite Grout	Top	0.00	595.15
	Bottom	1.30	593.85
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 3.58	598.73
	Bottom	2.80	592.35
Bentonite 1/4" Pellet Seal	Top	1.30	593.85
	Bottom	2.30	592.85
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	2.80	592.35
	Bottom	5.70	589.45
4Q Sand Pack	Top	2.30	592.85
	Bottom	5.70	589.45
8" Borehole Total Depth		5.70	589.45



All measurements in feet unless otherwise noted
+ - Above Land Surface
B Below Land Surface
ean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 1-7
Location (NY. Coord.) :
Northings : 1,136,271.962
Eastings : 407,140.816
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 605.80 MSL
Type of Security : STEEL CASING WITH LOCKING CAP
Supervisory Geologist : J. VANDERSLICE
Log Book/Page No. : 2/75-79
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME-55; HOLLOW-STEM AUGER
Driller : A. KOSKE
Drilling Started : 1005 HR/7-18-89
Drilling Completed : 1135 HR/7-18-89

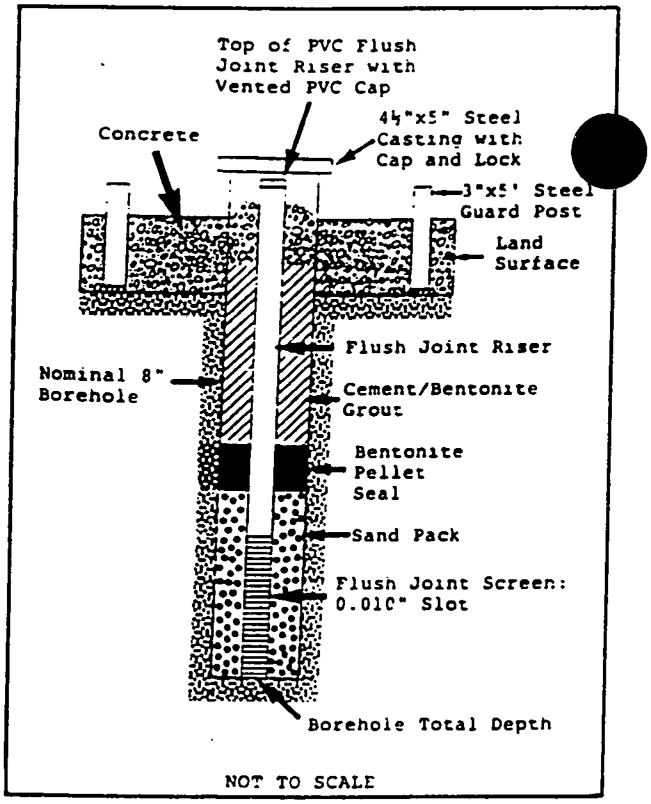
Development
Date : 7/25/89
Type : BAILER
Volume Purged : 16.75 GAL
(bailed well dry twice)

Water Level/Date: 11.81 BTOC/10-04-89
593.99 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	603.00
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.80	605.8
Cement/Bentonite Grout	Top	1.20	604.20
	Bottom	4.20	598.80
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.80	605.8
	Bottom	11.70	591.3
Bentonite 1/4" Pellet Seal	Top	4.20	598.80
	Bottom	6.20	596.80
2" I.D. Schedule 40 PVC Flush Joint Screen 0.020" Slot	Top	7.20	595.80
	Bottom	11.70	591.30
4Q Sand Pack	Top	6.20	596.80
	Bottom	11.70	591.30
8" Borehole Total Depth		11.70	591.30



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 2-4
Location (NY. Coord.)
Northings : 1,135,203.505
Eastings : 406,884.320
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 599.71 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 8/18-21
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER
Driller : P. BENCE
Drilling Started : 0805 HR/7-28-89
Drilling Completed : 1120 HR/7-28-89

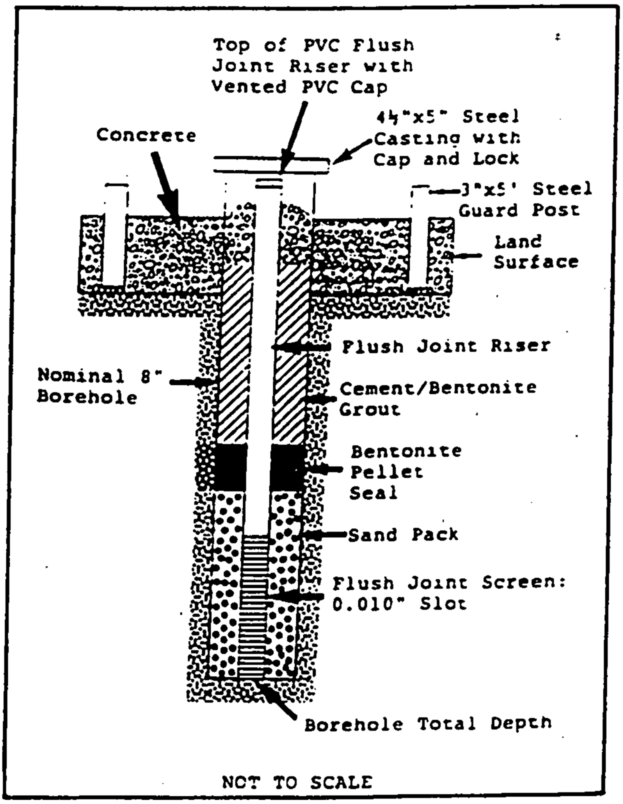
Development
Date : 8/9/89
Type : BAILER
Volume Purged : 1.0 GAL
(bailed well dry twice)

Water Level/Date: 5.83 BTOC /10-04-89
593.88 MSL

'Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
[illegible]d Surface			0.00	595.15
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.41	599.71
Cement/Bentonite Grout	Top		0.00	595.15
	Bottom		1.50	593.65
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.41	597.56
	Bottom		3.50	591.65
Bentonite 1/4" Pellet Seal	Top		1.50	593.65
	Bottom		2.50	592.65
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		3.50	591.65
	Bottom		5.20	589.95
4Q Sand Pack	Top		2.50	592.65
	Bottom		5.20	589.95
8" Borehole Total Depth			5.20	589.95



All measurements in feet unless otherwise noted
+ - Above Land Surface
B[illegible]elow Land Surface
[illegible]ean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No.	:	MW 3-7
Location (NY. Coord.)		
Northings	:	1,134,719.376
Eastings	:	408,019.089
Reference Point	:	TOP OF PVC CASING
Reference Point Elev.	:	590.85 MSL
Type of Security	:	STEEL CASING WITH
	:	LOCKING CAP
Supervisory Geologist	:	S. KELLER
Log Book/Page No.	:	8/3-8
Drilling Company	:	EMPIRE ~~SOILS~~ INVESTIGATION
Rig Type	:	FAILING F-6; HOLLOW-STEM AUGER
Driller	:	P. BENCE
Drilling Started	:	1000 HR/7-27-89
Drilling Completed	:	1430 HR/7-27-89

Development

Date : 7/28/88

Type : BAILER

Volume Purged : 1.2 GAl

(bailed well dry twice)

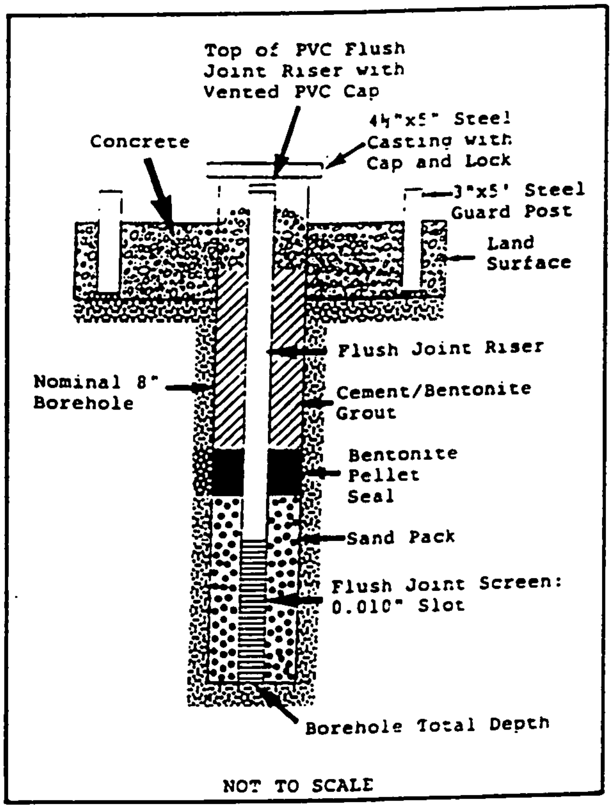
Water Level/Date: 6.79 BTOC /10-04-89

584.06 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	587.93
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.92	590.85
Cement/Bentonite Grout	Top	0.00	587.93
	Bottom	1.50	586.43
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.92	590.85
	Bottom	3.50	584.43
Bentonite 1/4" Pellet Seal	Top	1.50	586.43
	Bottom	2.50	585.43
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	3.50	584.43
	Bottom	5.00	582.93
4Q Sand Pack	Top	2.50	585.43
	Bottom	5.00	582.93
8" Borehole Total Depth		5.00	582.93



All measurements in feet unless otherwise noted

+ - Above Land Surface

BLS - Below Land Surface

MSL - Mean Sea Level Datum

BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ll No. : MW 4-4
Location (NY. Coord.)
Northings : 1,135,271.366
Eastings : 406,236.984
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 600.87 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log-Book/Page No. : 8/9-16
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER
Driller : P. BENCE
Drilling Started : 1510 HR/7-27-89
Drilling Completed : 1730 HR/7-27-89

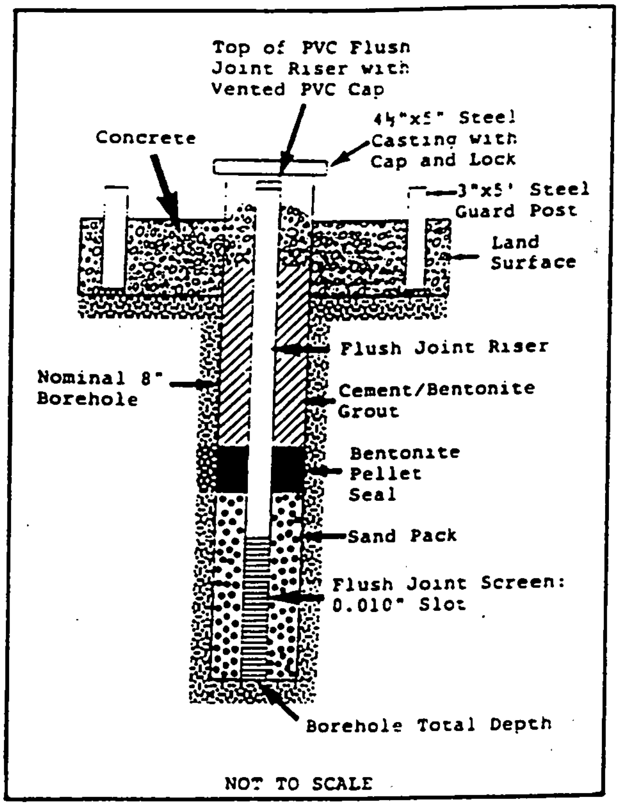
Development
Date : 8/9/89
Type : BAILER
Volume Purged : 3.5 GAL
(bailed well dry twice)

Water Level/Date: 8.65 BTOC /10-04-89
592.22 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	598.35
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.52	600.87
ment/Bentonite Grout	Top		0.00	598.35
	Bottom		3.10	595.25
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.52	600.87
	Bottom		5.10	593.25
Bentonite 1/4" Pellet Seal	Top		3.10	595.25
	Bottom		4.10	594.25
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		5.10	593.25
	Bottom		10.20	588.15
4Q Sand Pack	Top		4.10	594.25
	Bottom		10.20	588.15
8" Borehole Total Depth			10.20	588.15



NOT TO SCALE

All measurements in feet unless otherwise noted
+ - Above Land Surface
BSL - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 5-5
Location (NY. Coord.)
Northings : 1,135,978.964
Eastings : 402,436.767
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 600.37 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/136-145
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45;HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 1520-1700 HR/7-25-89
Drilling Completed : 0800-1150 HR/7-26-89

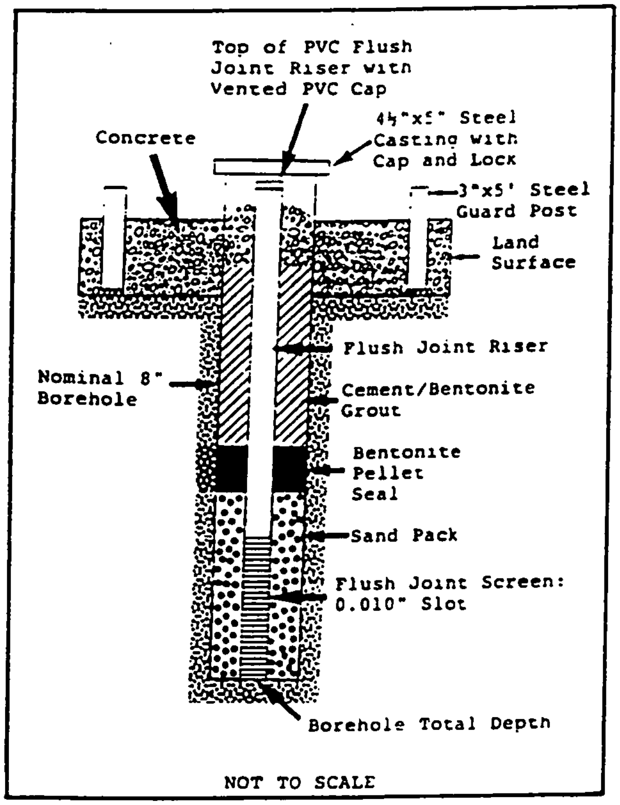
Development
Date : 7/28/89
Type : BAILER
Volume Purged : 5 GAL
(bailed well dry twice)

Water Level/Date: 15.36 BTOC /10-04-89
585.01 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	597.81
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.56	600.37
Cement/Bentonite Grout	Top	2.00	599.81
	Bottom	4.00	593.81
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.56	600.37
	Bottom	6.00	591.81
Bentonite 1/4" Pellet Seal	Top	4.00	593.81
	Bottom	5.00	592.81
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	6.00	591.81
	Bottom	15.10	582.71
4Q Sand Pack	Top	5.00	592.81
	Bottom	15.10	582.71
8" Borehole Total Depth		15.10	582.71



All measurements in feet unless otherwise noted
\+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ll No. : MW 8-5
cation (NY. Coord.)
Northings : 1,136,500.592
Eastings : 402,754.00.5
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 600.20 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/126-135
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45;HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 0900 HR/7-25-89
Drilling Completed : 1410 HR/7-25-89

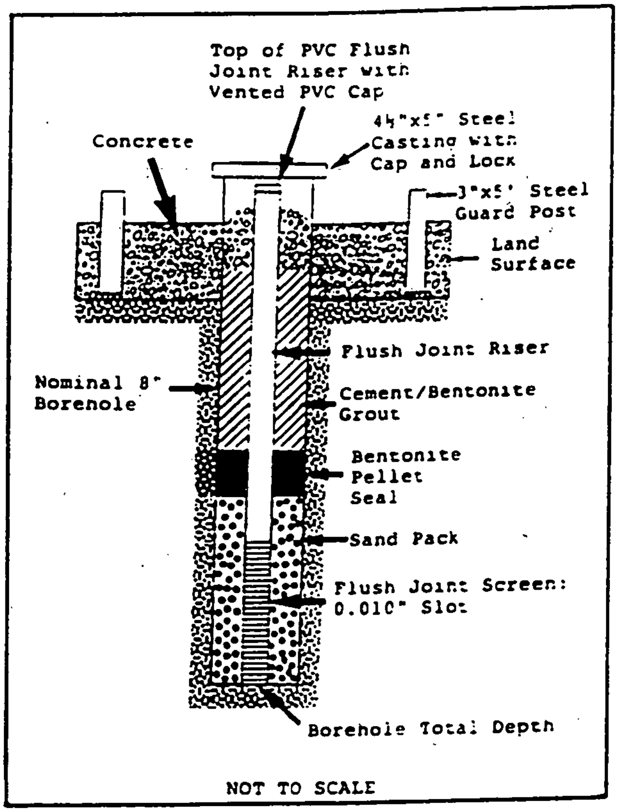
Development
Date : 8/1/89
Type : BAILER
Volume Purged : 4.5 GAL
(bailed well dry twice)

Water Level/Date: 13.71 BTOC /10-04-89
586.49 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	597.79
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.41	600.2
ent/Bentonite Grout	Top	2.00	599.79
	Bottom	4.00	593.79
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.41	600.2
	Bottom	6.00	591.79
Bentonite 1/4" Pellet Seal	Top	4.00	593.79
	Bottom	5.00	592.79
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	6.00	591.79
	Bottom	12.70	585.09
4Q Sand Pack	Top	5.00	592.79
	Bottom	12.70	585.09
8" Borehole Total Depth		12.70	585.09



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 8-6
Location (NY. Coord.)
Northings : 1,136,795.024
Eastings : 403,069.895
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 601.21 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/107-117
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45;HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 1410 HR/7-21-89
Drilling Completed : 1730 HR/7-21-89

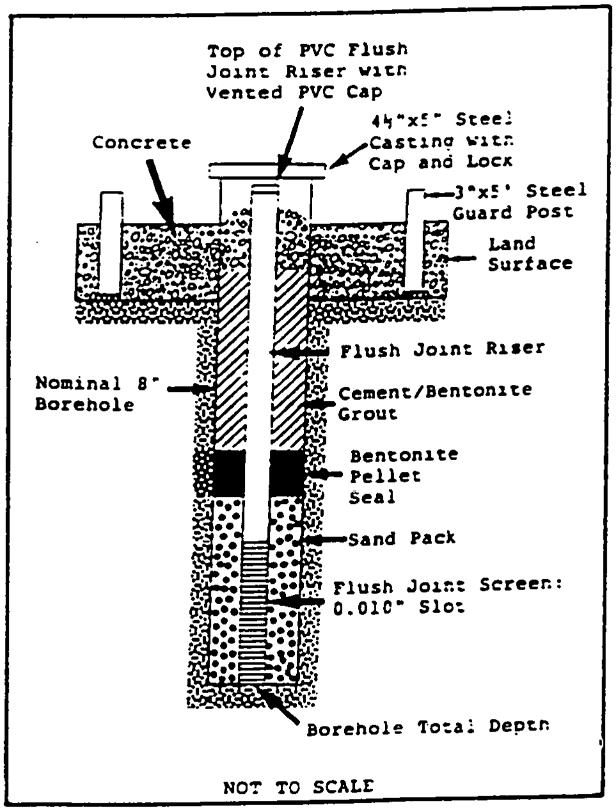
Development
Date : 7/26/89
Type : BAILER
Volume Purged : 7.5 GAL
(bailed well dry twice)

Water Level/Date: 14.88 BTOC/10-04-89
586.33 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	598.59
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.62	601.21
Cement/Bentonite Grout	Top	1.50	600.09
	Bottom	4.50	594.09
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.62	601.21
	Bottom	6.50	592.09
Bentonite 1/4" Pellet Seal	Top	4.50	594.09
	Bottom	5.50	593.09
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	6.50	592.09
	Bottom	14.20	584.39
4Q Sand Pack	Top	5.50	593.09
	Bottom	14.20	584.39
8" Borehole Total Depth		14.20	584.39



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ll No. : MW 9-5
cation (NY. Coord.)
Northings : 1,134,030.935
Eastings : 397,220.580
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 588.80 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 8/34-40
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER
Driller : P. BENCE
Drilling Started : 1340 HR/7-31-89
Drilling Completed : 1610 HR/7-31-89

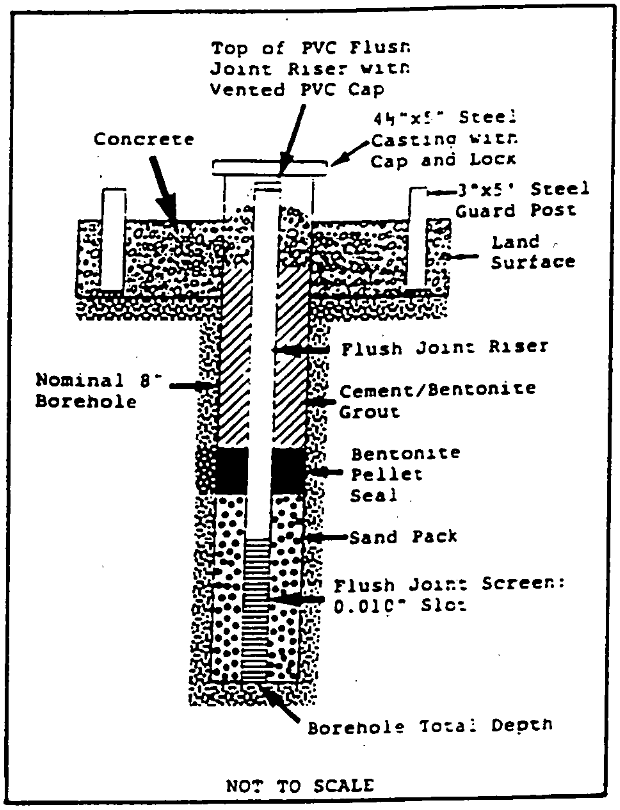
Development
Date : 8/12/89
Type : BAILER
Volume Purged : 3.5 GAL
(bailed well dry twice)

Water Level/Date: 7.79 BTOC /10-04-89
581.01 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	585.41
Top of PVC Flush Joint Riser Measured at Reference Point		+ 3.39	588.8
ment/Bentonite Grout	Top	0.00	585.41
	Bottom	1.20	584.21
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 3.39	588.8
	Bottom	2.70	582.71
Bentonite 1/4" Pellet Seal	Top	1.20	584.21
	Bottom	2.20	583.21
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	2.70	582.71
	Bottom	8.40	577.01
4Q Sand Pack	Top	2.20	583.21
	Bottom	8.40	577.01
8" Borehole Total Depth		8.40	577.01



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 9-6
Location (NY. Coord.)
Northings : 1,134,055.305
Eastings : 397,333.770
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 588.64 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 8/27-33
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER
Driller : P. BENCE
Drilling Started : 0935 HR/7-31-89
Drilling Completed : 1155 HR/7-31-89

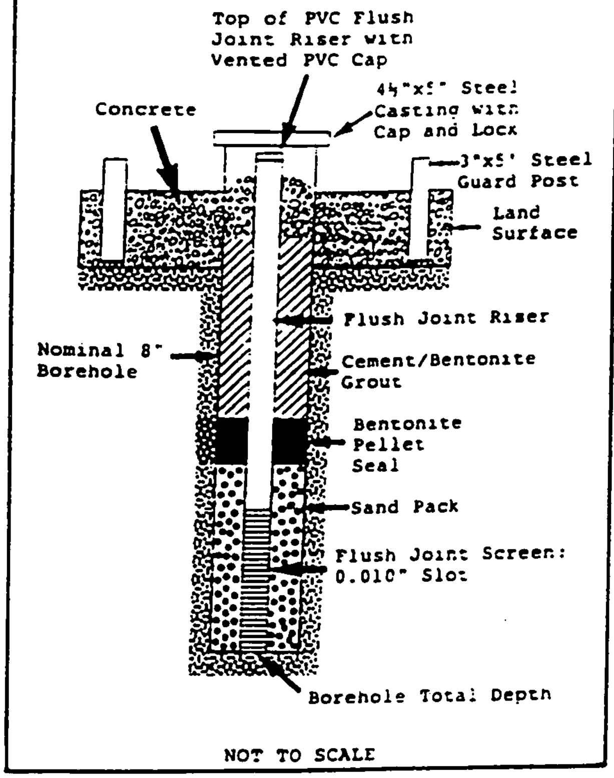
Development
Date : 8/2/89
Type : BAILER
Volume Purged : 3.0 GAL
(bailed well dry twice)

Water Level/Date: 6.37 BTOC /10-04-89
582.27 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			*0.00*	*585.44*
Top of PVC Flush Joint Riser Measured at Reference Point		+	*3.20*	*588.64*
Cement/Bentonite Grout	*Top*		*0.00*	*585.44*
	Bottom		*1.20*	*584.24*
2" I.D. Schedule 40 PVC Flush Joint Riser	*Top*	+	*3.20*	*588.64*
	Bottom		*2.70*	*582.74*
Bentonite 1/4" Pellet Seal	*Top*		*1.20*	*584.24*
	Bottom		*2.20*	*583.24*
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	*Top*		*2.70*	*582.74*
	Bottom		*7.30*	*578.14*
4Q Sand Pack	*Top*		*2.20*	*583.24*
	Bottom		*7.30*	*578.14*
8" Borehole Total Depth			*7.30*	*578.14*



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ell No. : MW 9-7
ocation (NY. Coord.)
Northings : 1,133,982.874
Eastings : 397,424.979
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 588.88 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. VANDERSLICE
Log Book/Page No. : 6/3-13
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 55; HOLLOW-STEM AUGER
Driller : A. KOSKE
Drilling Started : 1015 HR/7-24-89
Drilling Completed : 1130 HR/7-24-89

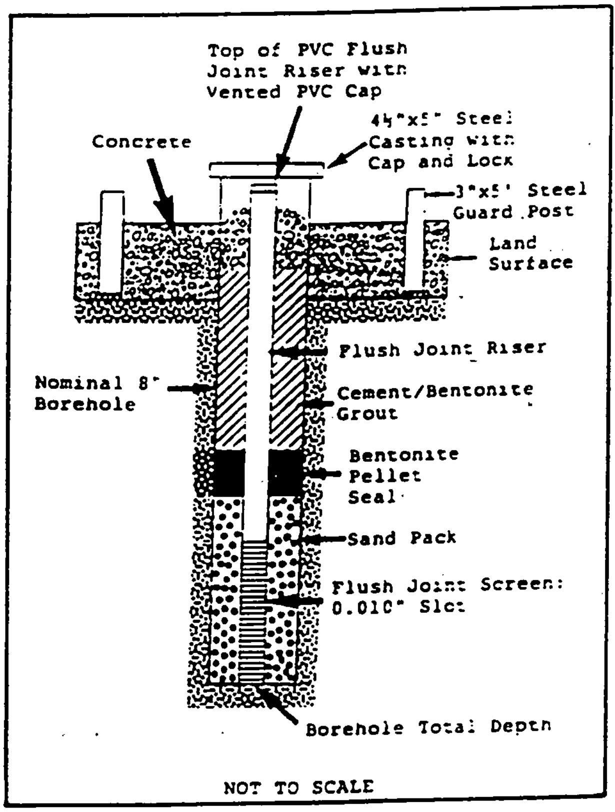
Development
Date : 7/28/89
Type : BAILER
Volume Purged : 18.5 GAL
(bailed well dry twice)

Water Level/Date: 7.44 BTOC /10-04-89
581.44 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	585.47
Top of PVC Flush Joint Riser Measured at Reference Point		+ 3.41	588.88
ment/Bentonite Grout	Top	1.70	587.17
	Bottom	2.70	582.77
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 3.41	588.88
	Bottom	4.70	580.77
Bentonite 1/4" Pellet Seal	Top	2.70	582.77
	Bottom	3.70	581.77
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	4.70	580.77
	Bottom	9.70	575.77
4Q Sand Pack	Top	3.70	581.77
	Bottom	9.70	575.77
8" Borehole Total Depth		9.70	575.77



All measurements in feet unless otherwise noted
\+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 9-8
Location (NY. Coord.)
Northings : 1,134,090.620
Eastings : 397,330.103
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 587.86 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. KING
Log Book/Page No. : 11/29-33
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 55; HOLLOW-STEM AUGER
Driller : A. KOSKE
Drilling Started : 1028 HR/4-13-90
Drilling Completed : 1055 HR/4-13-90

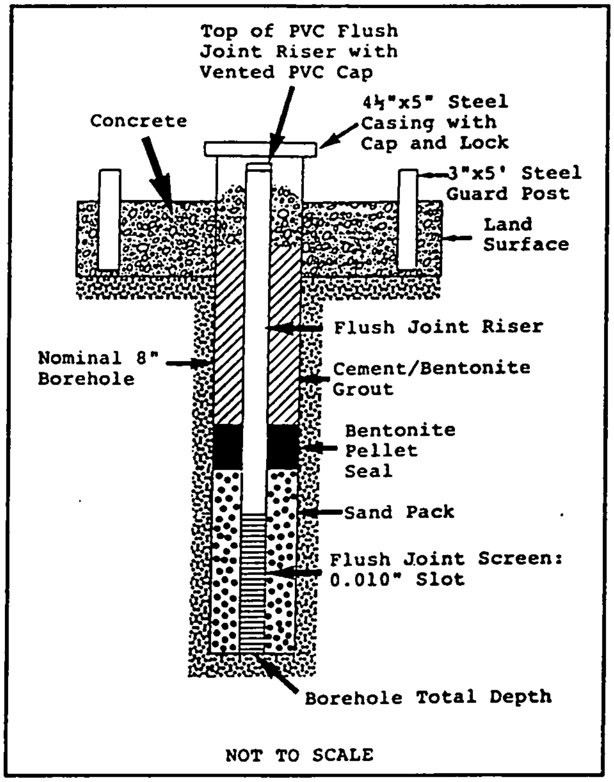
Development
Date : 4/16/90
Type : BAILER
Volume Purged : 2.0 GAL
(bailed well dry twice)

Water Level/Date: 6.47' BTOC/4-19-90
581.39 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	585.51
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.35	587.86
Cement/Bentonite Grout	Top	0.00	585.51
	Bottom	1.00	584.51
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.35	587.86
	Bottom	3.00	582.51
Bentonite 1/4" Pellet Seal	Top	1.00	584.51
	Bottom	2.00	583.51
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	3.00	582.51
	Bottom	8.00	577.51
4Q Sand Pack	Top	2.00	583.51
	Bottom	8.00	577.51
8" Borehole Total Depth		8.00	577.51



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

[illegible] No. : MW 9-9
[illegible]tion (NY. Coord.)
Northings : 1,134,079.683
Eastings : 397,284.665
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 587.63 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. KING
Log Book/Page No. : 11/32-39
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 55; HOLLOW-STEM AUGER
Driller : A. KOSKE
Drilling Started : 1145 HR/4-13-90
Drilling Completed : 1214 HR/4-13-90

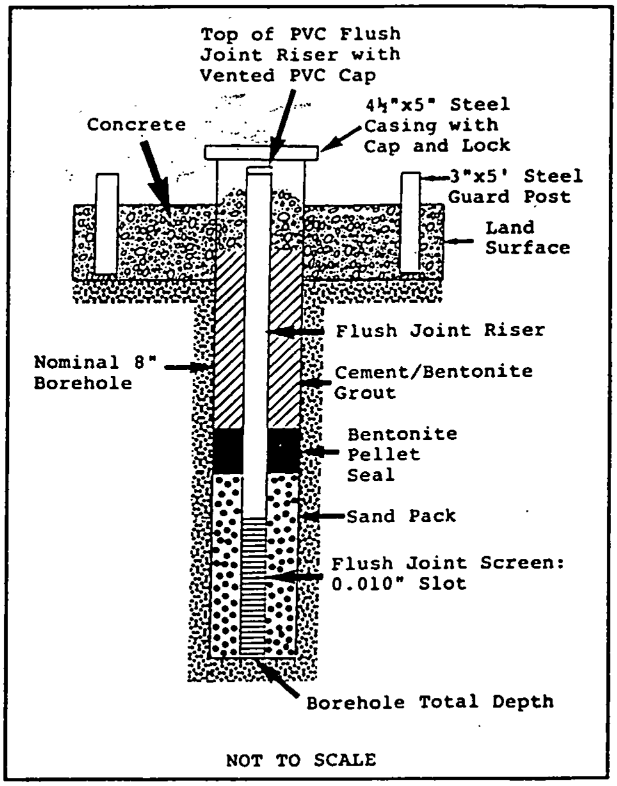
Development
Date : 4/16/90
Type : BAILER
Volume Purged : 2.0 GAL
(bailed well dry twice)

Water Level/Date: 4.19' BTOC/4-19-90
583.44 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	585.18
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.45	587.63
[illegible]ent/Bentonite Grout	Top		0.00	585.18
	Bottom		1.00	584.18
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.45	587.63
	Bottom		2.50	582.68
Bentonite 1/4" Pellet Seal	Top		1.00	584.18
	Bottom		2.00	583.18
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		2.50	582.68
	Bottom		7.50	577.68
4Q Sand Pack	Top		2.00	583.18
	Bottom		7.50	577.68
8" Borehole Total Depth			7.50	577.68



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 10-4
Location (NY. Coord.
Northings : 1,133,8.0.635
Eastings : 406,563.118
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 589.39 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/98-105
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45; HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 0825 HR/7-21-89
Drilling Completed : 1325 HR/7-21-89

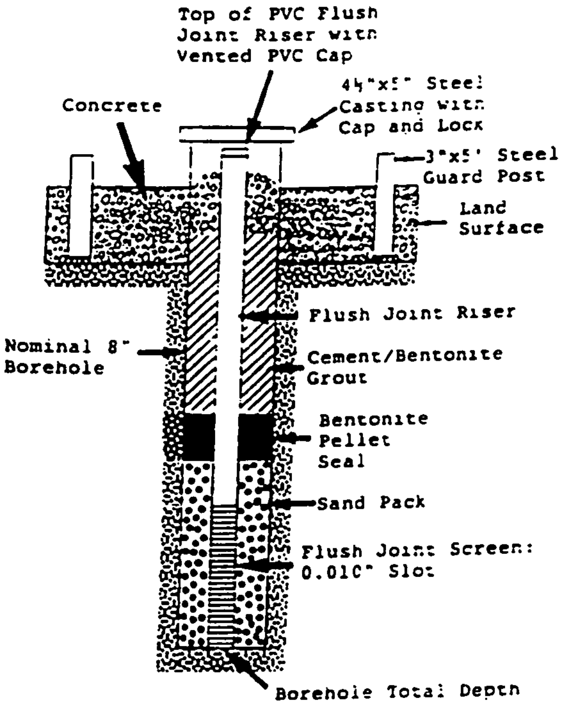
Development
Date : 7/25/89
Type : BAILER
Volume Purged : 17 GAL
(bailed well dry twice)

Water Level/Date: 7.44 BTOC /10-04-89
581.95 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	586.96
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.43	589.39
Cement/Bentonite Grout	Top	1.50	588.46
	Bottom	2.50	584.46
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.43	589.39
	Bottom	4.50	582.46
Bentonite 1/4" Pellet Seal	Top	2.50	584.46
	Bottom	3.50	583.46
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	4.50	582.46
	Bottom	7.90	579.06
4Q Sand Pack	Top	3.50	583.46
	Bottom	7.90	579.06
8" Borehole Total Depth		7.90	579.06



NOT TO SCALE

All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ll No. : MW 13-1
cation (NY. Coord.)
Northings : 1,135,368.599
Eastings : 402,262.472
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 598.91 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. VANDERSLICE
Log Book/Page No. : 2/111-115
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 55; HOLLOW-STEM AUGER
Driller : A. KOSKE
Drilling Started : 1004 HR/7-19-89
Drilling Completed : 1040 HR/7-19-89

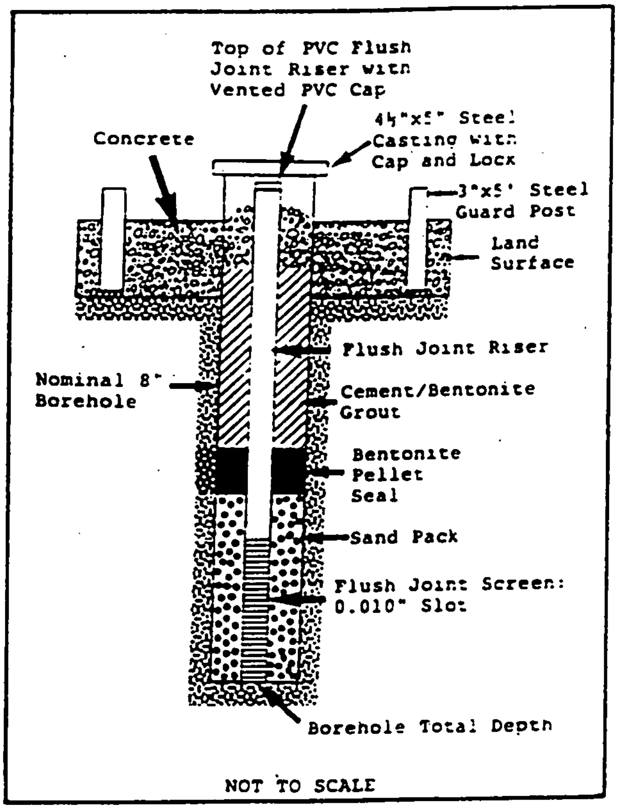
Development
Date : 7/25/89
Type : BAILER
Volume Purged : 5.2 GAL
(bailed well dry twice)

Water Level/Date: 9.62 BTOC /10-04-89
589.29 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	595.79
Top of PVC Flush Joint Riser Measured at Reference Point		+	3.12	598.91
ment/Bentonite Grout	Top		2.00	597.79
	Bottom		3.00	592.79
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	3.12	598.91
	Bottom		5.00	590.79
Bentonite 1/4" Pellet Seal	Top		3.00	592.79
	Bottom		4.00	591.79
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		5.00	590.79
	Bottom		7.30	588.49
4Q Sand Pack	Top		4.00	591.79
	Bottom		7.30	588.49
8" Borehole Total Depth			7.30	588.49



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 13-2
Location (NY. Coord.)
Northings : 1,135,367.348
Eastings : 402,380.496
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 597.99 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/74-80
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45; HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 1030 HR/7-19-89
Drilling Completed : 1545 HR/7-19-89

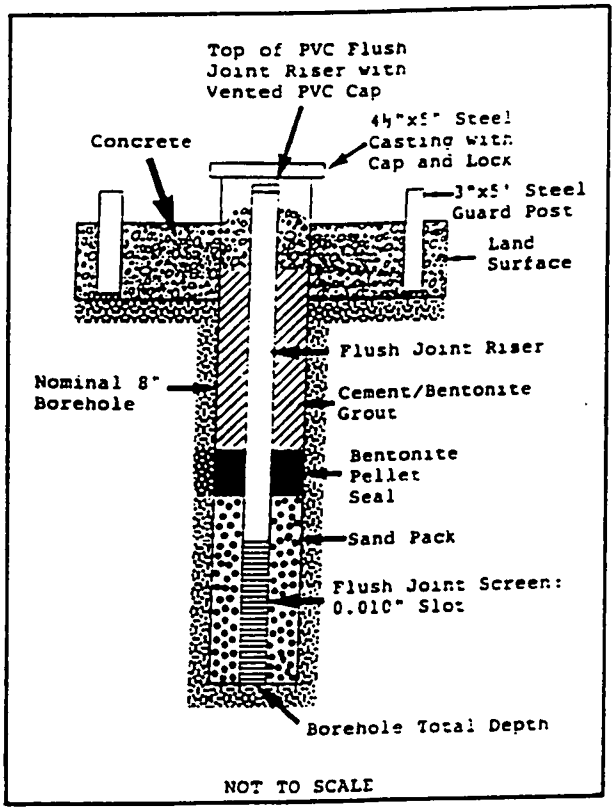
Development
Date : 7/25/89
Type : BAILER
Volume Purged : 2.65 GAL
(bailed well dry twice)

Water Level/Date: 10.08 BTOC /10-04-89
587.91 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	595.37
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.62	597.99
Cement/Bentonite Grout	Top	2.00	597.37
	Bottom	3.00	592.37
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.62	597.99
	Bottom	5.00	590.37
Bentonite 1/4" Pellet Seal	Top	3.00	592.37
	Bottom	4.00	591.37
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	5.00	590.37
	Bottom	7.50	587.87
4Q Sand Pack	Top	4.00	591.37
	Bottom	7.50	587.87
8" Borehole Total Depth		7.50	587.87



All measurements in feet unless otherwise noted
\+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

[illegible]ll No. : MW 13-3
[illegible]cation (NY. Coord.)
Northings : 1,135,217.733
Eastings : 402,303.392
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 598.67 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/89-97
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45; HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 1345 HR/7-20-89
Drilling Completed : 1645 HR/7-20-89

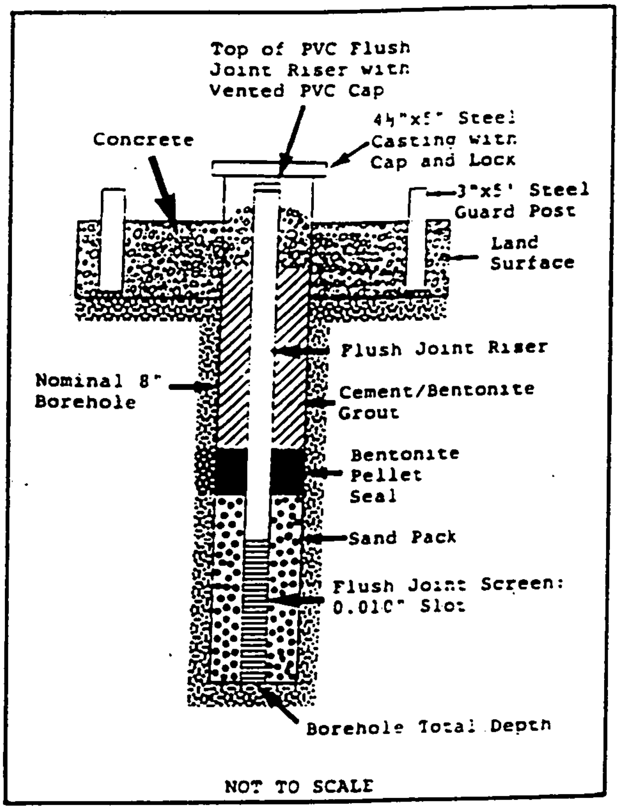
Development
Date : 7/25/89
Type : BAILER
Volume Purged : 3.7 GAL
(bailed well dry twice)

Water Level/Date: 8.09 BTOC/10-04-89
590.58 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	595.98
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.69	598.67
[illegible]ment/Bentonite Grout	Top		2.00	597.98
	Bottom		3.00	592.98
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.69	598.67
	Bottom		5.00	590.98
Bentonite 1/4" Pellet Seal	Top		3.00	592.98
	Bottom		4.00	591.98
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		5.00	590.98
	Bottom		9.00	586.98
4Q Sand Pack	Top		4.00	591.98
	Bottom		9.40	586.58
8" Borehole Total Depth			9.40	586.58



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 13-4
Location (NY. Coord.)
Northings : 1,135,211.071
Eastings : 402,351.638
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 598.38 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 3/82-87
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : CME 45; HOLLOW-STEM AUGER
Driller : K. FULLER
Drilling Started : 0810 HR/7-20-89
Drilling Completed : 1205 HR/7-20-89

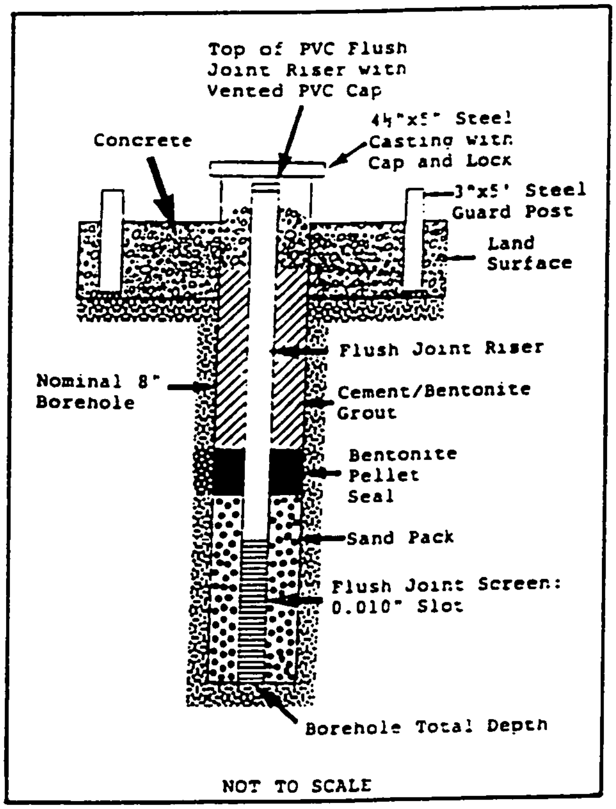
Development
Date : 7/25/89
Type : BAILER
Volume Purged : 4.0 GAL
(bailed well dry twice)

Water Level/Date: 9.31 BTOC /9-12-89
589.07 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	595.36
Top of PVC Flush Joint Riser Measured at Reference Point		✦	3.02	598.38
Cement/Bentonite Grout	Top		2.00	597.36
	Bottom		4.10	591.26
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	✦	3.02	598.38
	Bottom		6.10	589.26
Bentonite 1/4" Pellet Seal	Top		4.10	591.26
	Bottom		5.10	590.26
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		6.10	589.26
	Bottom		8.60	586.76
4Q Sand Pack	Top		5.10	590.26
	Bottom		8.60	586.76
8" Borehole Total Depth			8.60	586.76



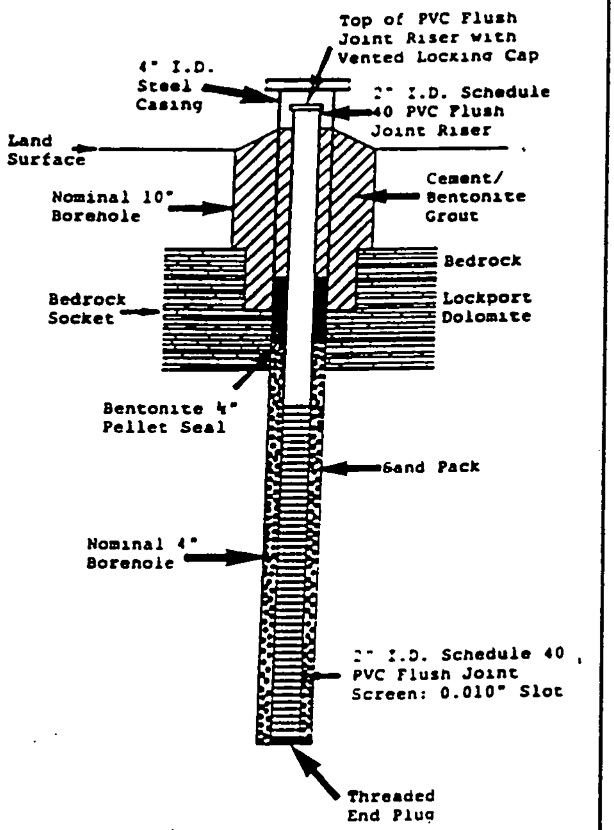
All measurements in feet unless otherwise noted
✦ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

[illegible]No.	:	MW 1-3D	Development	
[illegible]tion (NY. Coord.)	:		Date :	8/25/89
Northings	:	1,135,232.325	Type :	HAND PUMP
Eastings	:	406,557.556	Volume Purged :	100 GAL
Reference Point	:	TOP OF PVC CASING		
Reference Point Elev.	:	600.19 MSL		
Type of Security	:	STEEL CASING WITH LOCKING CAP	Water Level/Date:	7.49 BTOC/10-04-89 592.70 MSL
Supervisory Geologist	:	J. CARTER		
Log Book/Page No.	:	10/81-89, 99-102	Hydraulic Conductivity: NA	
Drilling Company	:	EMPIRE SOILS INVESTIGATION		
Rig Type	:	FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY		
Driller	:	D. PAULOWSKI		
Drilling Started	:	0800-1530 HR/8/17/89		
Drilling Completed	:	0830-1240 HR/8-23-89		

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	597.98
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.21	600.19
[illegible] Steel casing	Top	2.50	600.48
	Bottom	14.70	583.28
Cement/Bentonite Grout	Top	0.00	597.98
	Bottom	8.00	589.98
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.21	600.19
	Bottom	13.80	584.18
Bentonite 1/4" Pellet Seal	Top	8.00	589.98
	Bottom	12.00	585.98
Bedrock Socket	Top	11.00	586.98
	Bottom	14.70	583.28
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	13.80	584.18
	Bottom	34.10	563.88
4Q Sand Pack	Top	12.00	585.98
	Bottom	34.10	563.88
Borehole Total Depth		34.10	563.88



NOT TO SCALE

All measurements in feet unless otherwise noted
+ - A[illegible]e Land Surface
BL[illegible]w Land Surface
MSL[illegible]ean Sea Level Datum
BTOC - Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 1-4D
Location (NY. Coord.)
Northings : 1,135,014.684
Eastings : 406,542.358
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 597.84 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/74-80, 103-109
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : D. PAULOWSKI
Drilling Started : 0800-1630 HR/8-17-89
Drilling Completed : 0800-1130 HR/8-24-89

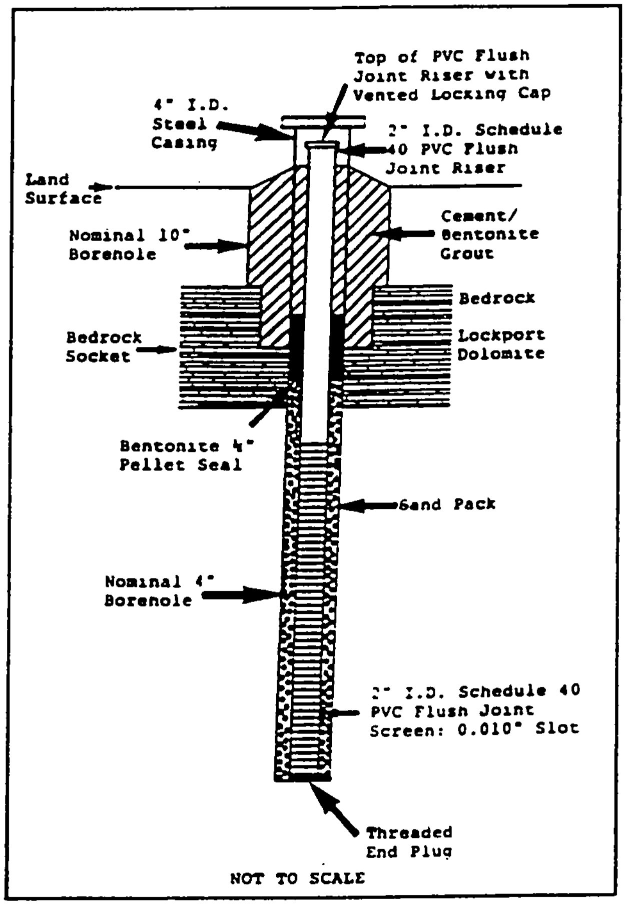
Development
Date : 8/25/89
Type : HAND PUMP
Volume Purged : 85 GAL

Water Level/Date: 10.97 BTOC/10-04-89
586.87 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	595.10
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.74	597.84
4" I.D. Steel casing	Top	+	2.90	598.00
	Bottom		10.20	584.90
Cement/Bentonite Grout	Top		0.00	595.10
	Bottom		3.80	591.30
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.74	597.84
	Bottom		9.00	586.1
Bentonite 1/4" Pellet Seal	Top		3.80	591.30
	Bottom		7.80	587.30
Bedrock Socket	Top		5.75	589.35
	Bottom		10.20	584.90
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		9.00	586.10
	Bottom		44.60	550.50
4Q Sand Pack	Top		7.80	587.30
	Bottom		44.60	550.50
Borehole Total Depth			44.60	550.50



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ell No. : MW 3-2D
ation (NY. Coord.)
Northings : 1,135,637.502
Eastings : 408,120.816
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 599.98 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/59-60, 95-98
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : D. PAULOWSKI
Drilling Started : 1000-1630 HR/8-16-89
Drilling Completed : 0800-1630 HR/8-22-89

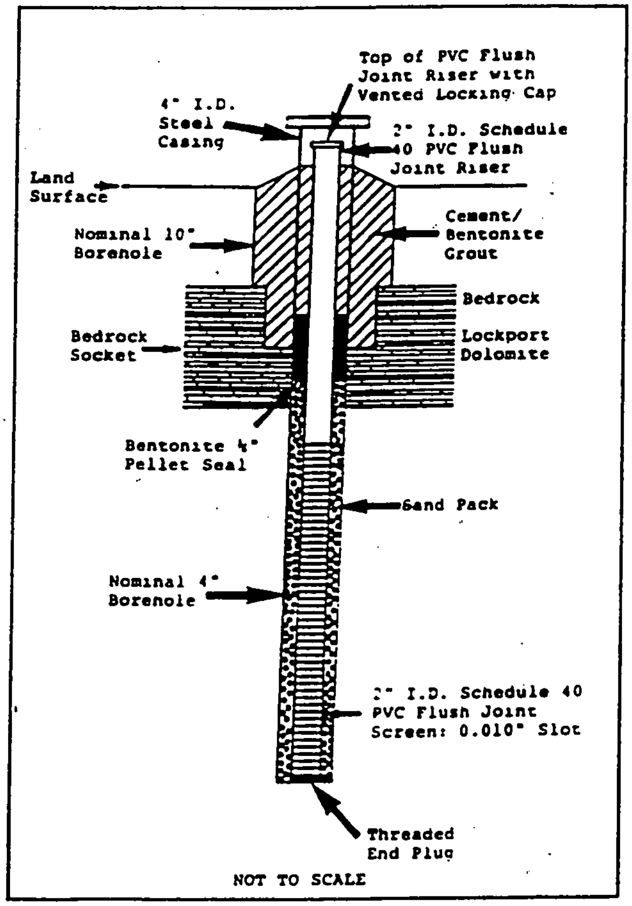
Development
Date : 8/23/89
Type : HAND PUMP
Volume Purged : 100 GAL

Water Level/Date: 10.92 BTOC /10-04-89
589.06 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	596.67
Top of PVC Flush Joint Riser Measured at Reference Point		+ 3.31	599.98
.D. Steel casing	Top	+ 3.50	600.17
	Bottom	12.40	584.27
Cement/Bentonite Grout	Top	0.00	596.67
	Bottom	5.00	591.67
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 3.31	599.98
	Bottom	9.50	587.17
Bentonite 1/4" Pellet Seal	Top	5.00	591.67
	Bottom	8.50	588.17
Bedrock Socket	Top	10.30	586.37
	Bottom	12.40	584.27
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	9.50	587.17
	Bottom	34.80	561.87
4Q Sand Pack	Top	8.50	588.17
	Bottom	34.80	561.87
Borehole Total Depth		34.80	561.87



All measurements in feet unless otherwise noted
+ - Above Land Surface
B elow Land Surface
M ean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 3-3D
Location (NY. Coord.)
Northings : 1,134,710.032
Eastings : 408,034.356
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 590.86 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/36-38, 71-74
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : P. BENCE
Drilling Started : 0800-1700 HR/8-10-89
Drilling Completed : 0800-1630 HR/8-17-89

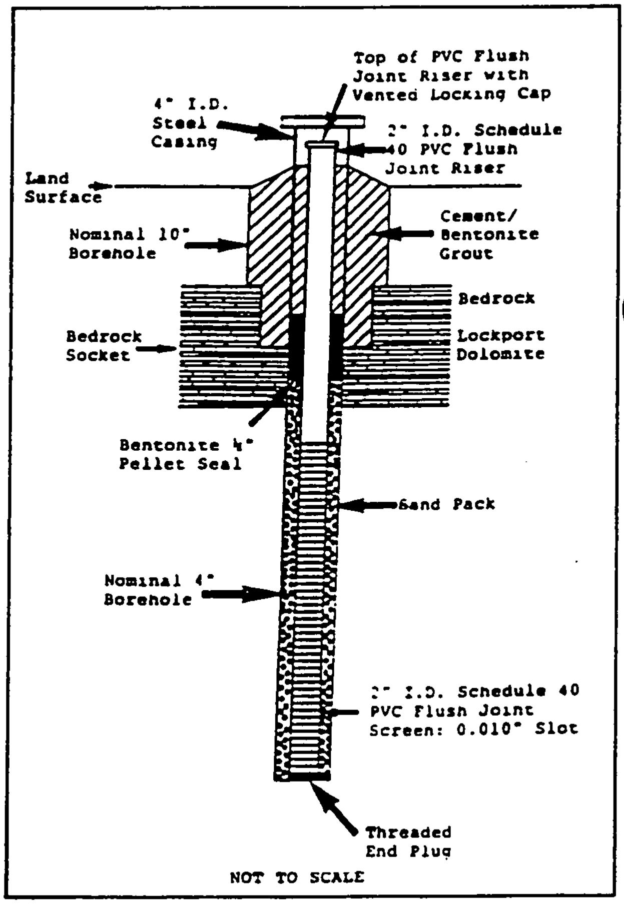
Development
Date : 8/18/89
Type : HAND PUMP
Volume Purged : 150 GAL

Water Level/Date: 5.08 BTOC /10-04-89
585.78 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	588.08
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.78	590.86
4" I.D. Steel casing	Top	+	2.80	590.88
	Bottom		9.55	578.53
Cement/Bentonite Grout	Top		0.00	588.08
	Bottom		2.25	585.83
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.78	590.86
	Bottom		7.50	580.58
Bentonite 1/4" Pellet Seal	Top		2.25	585.83
	Bottom		6.50	581.58
Bedrock Socket	Top		7.70	580.38
	Bottom		9.55	578.53
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		7.50	580.58
	Bottom		32.40	555.68
4Q Sand Pack	Top		6.50	581.58
	Bottom		32.40	555.68
Borehole Total Depth			32.40	555.68



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

[illegible]ell No. : MW 3-4D
[illegible]cation (NY. Coord.)
Northings : 1,135,159.979
Eastings : 407,978.091
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 590.73 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/39-43, 90-94
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : P. BENCE
Drilling Started : 0800-1530 HR/8-11-89
Drilling Completed : 0800-1630 HR/8-21-89

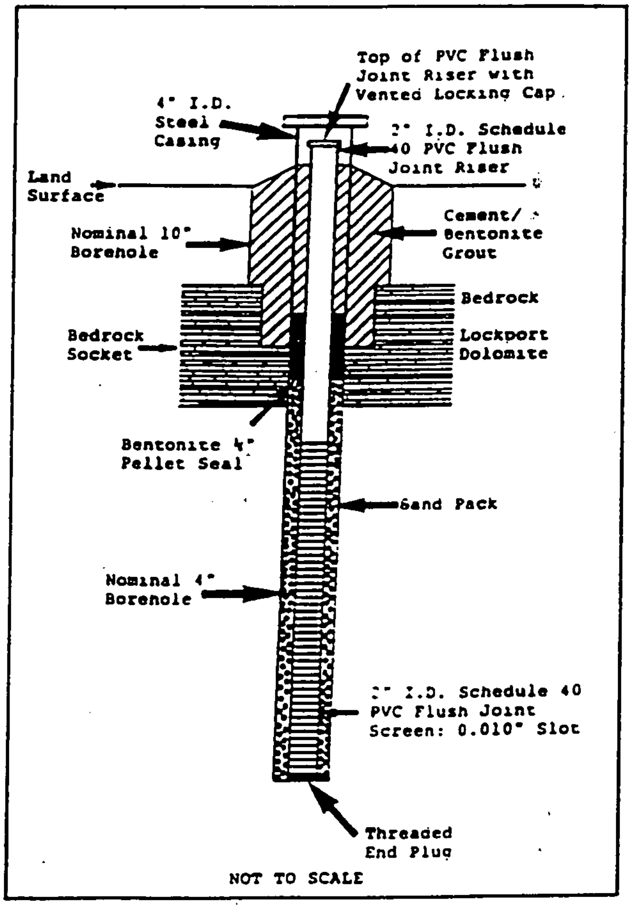
Development
Date : 8/22/89
Type : HAND PUMP
Volume Purged : 160 GAL

Water Level/Date: 1.76 BTOC /10-04-89
588.97 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	588.54
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.19	590.73
[illegible]I.D. Steel casing	Top	+	2.30	590.84
	Bottom		5.90	582.64
Cement/Bentonite Grout	Top		0.00	588.54
	Bottom		1.00	587.54
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.19	590.73
	Bottom		3.70	584.84
Bentonite 1/4" Pellet Seal	Top		1.00	587.54
	Bottom		3.00	585.54
Bedrock Socket	Top		3.80	584.74
	Bottom		5.90	582.64
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		3.70	584.84
	Bottom		29.00	559.54
4Q Sand Pack	Top		3.00	585.54
	Bottom		29.00	559.54
Borehole Total Depth			29.00	559.54



All measurements in feet unless otherwise noted
+ - Above Land Surface
[illegible]Below Land Surface
[illegible] Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 5-1D
Location (NY. Coord.)
Northings : 1,135,978.928
Eastings : 402,447.518
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 600.33 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/31-35, 110-111
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : D. PAULOWSKI
Drilling Started : 0800-1700 HR/8-10-89
Drilling Completed : 1200-1630 HR/8-24-89

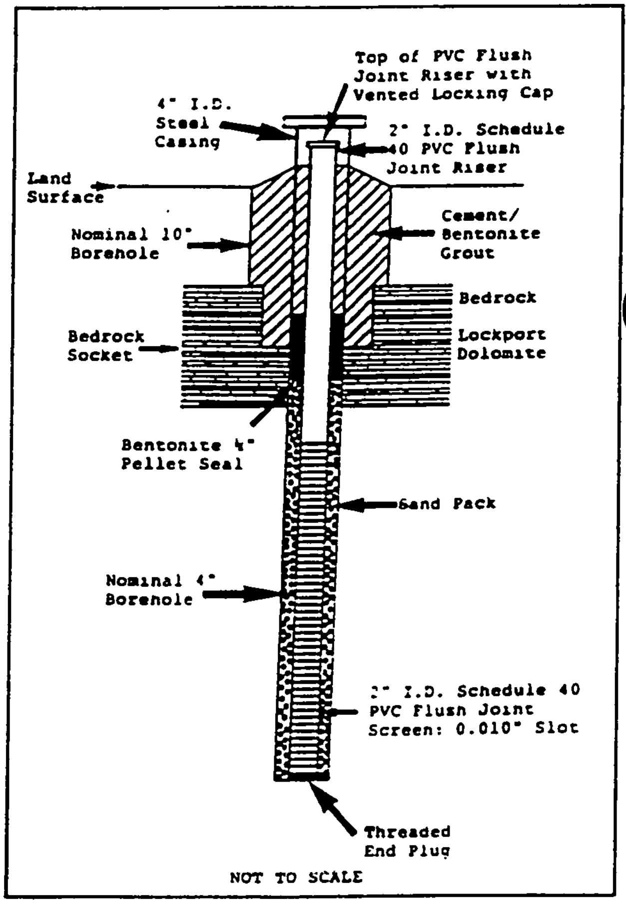
Development
Date : 8/25-89
Type : HAND PUMP
Volume Purged : 130 GAL

Water Level/Date: 15.43 BTOC /10-04-89
584.9 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	597.70
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.63	600.33
4" I.D. Steel casing	Top	+ 2.80	600.50
	Bottom	17.30	580.40
Cement/Bentonite Grout	Top	0.00	597.70
	Bottom	11.50	586.20
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.63	600.33
	Bottom	15.00	582.7
Bentonite 1/4" Pellet Seal	Top	11.50	586.20
	Bottom	14.00	583.70
Bedrock Socket	Top	15.20	582.50
	Bottom	17.30	580.40
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	15.00	582.70
	Bottom	35.40	562.30
4Q Sand Pack	Top	14.00	583.70
	Bottom	35.40	562.30
Borehole Total Depth		35.40	562.30



All measurements in feet unless otherwise noted
+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

[illegible]ll No. : MW 8-1D
[illegible]ation (NY. Coord.)
Northings : 1,136,497.692
Eastings : 402,768.155
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 599.90 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/21-27, 51-58
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : P. BENCE
Drilling Started : 0800-1630 HR/8-9-89
Drilling Completed : 0800-1600 HR/8-15-89

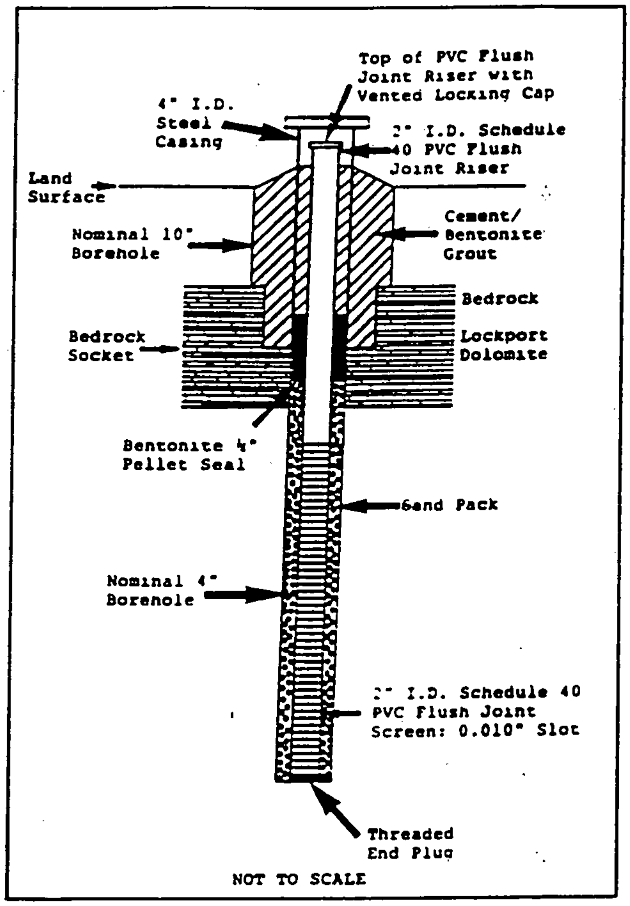
Development
Date : 8/16/89
Type : HAND PUMP
Volume Purged : 160 GAL

Water Level/Date: 13.98 BTOC/10-04-89
585.92 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	597.71
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.19	599.9
[illegible].D. Steel casing	Top	+	2.70	600.41
	Bottom		15.20	582.51
Cement/Bentonite Grout	Top		0.00	597.71
	Bottom		6.60	591.11
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.19	599.9
	Bottom		12.17	585.54
Bentonite 1/4" Pellet Seal	Top		6.60	591.11
	Bottom		11.05	586.66
Bedrock Socket	Top		13.30	584.41
	Bottom		15.20	582.51
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		12.17	585.54
	Bottom		37.47	560.24
4Q Sand Pack	Top		11.05	586.66
	Bottom		37.47	560.24
Borehole Total Depth			37.47	560.24



All measurements in feet unless otherwise noted
+ - Above Land Surface
[illegible]elow Land Surface
[illegible]ean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

Well No. : MW 8-2D
Location (NY. Coord.)
Northings : 1,136,688.638
Eastings : 403,035.454
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 600.57 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER, J. CARTER
Log Book/Page No. : 8/51-63; 10/11-19
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : P. BENCE
Drilling Started : 0840-1630 HR/8-3-89
Drilling Completed : 0900-1630 HR/8-8-89

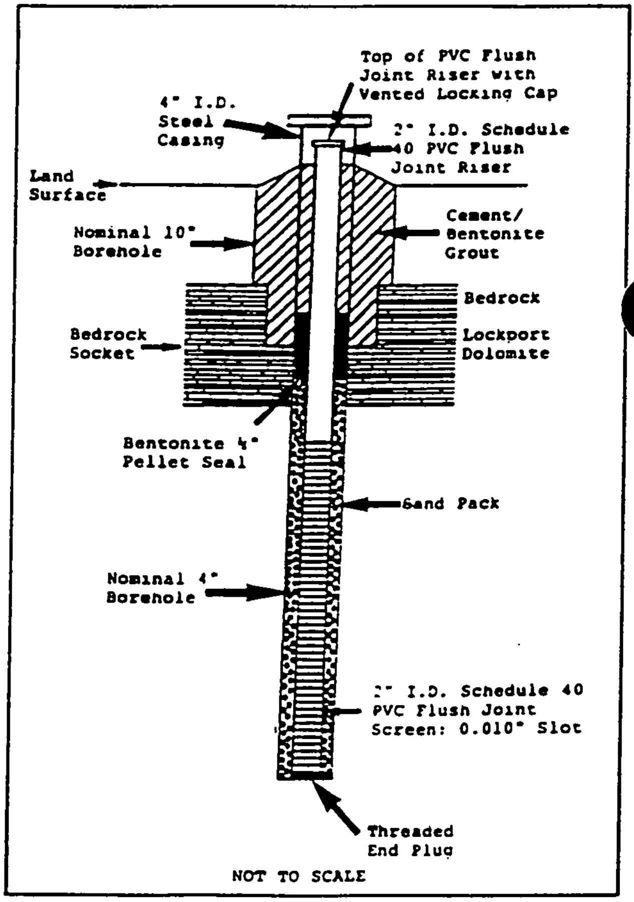
Development
Date : 8/11/89
Type : HAND PUMP
Volume Purged : 167 GAL

Water Level/Date: 14.34 BTOC /10-04-89
586.23 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

		BLS	MSL
Land Surface		0.00	598.48
Top of PVC Flush Joint Riser Measured at Reference Point		+ 2.09	600.57
4" I.D. Steel casing	Top	+ 2.30	600.78
	Bottom	14.60	583.88
Cement/Bentonite Grout	Top	0.00	598.48
	Bottom	7.70	590.78
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+ 2.09	600.57
	Bottom	13.60	584.88
Bentonite 1/4" Pellet Seal	Top	7.70	590.78
	Bottom	11.70	586.78
Bedrock Socket	Top	12.20	586.28
	Bottom	14.60	583.88
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top	13.60	584.88
	Bottom	28.80	569.68
4Q Sand Pack	Top	11.70	586.78
	Bottom	28.80	569.68
Borehole Total Depth		28.80	569.68



All measurements in feet unless otherwise noted
\+ - Above Land Surface
BLS - Below Land Surface
MSL - Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

ell No. : MW 8-3D
cation (NY. Coord.)
Northings : 1,136,789.644
Eastings : 403,081.967
-Reference Point : TOP OF PVC CASING
Reference Point Elev. : 601.14 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : J. CARTER
Log Book/Page No. : 10/2-9, 47-50
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : P. BENCE
Drilling Started : 0800-1700 HR/8-7-89
Drilling Completed : 0800-1445 HR/8-14-89

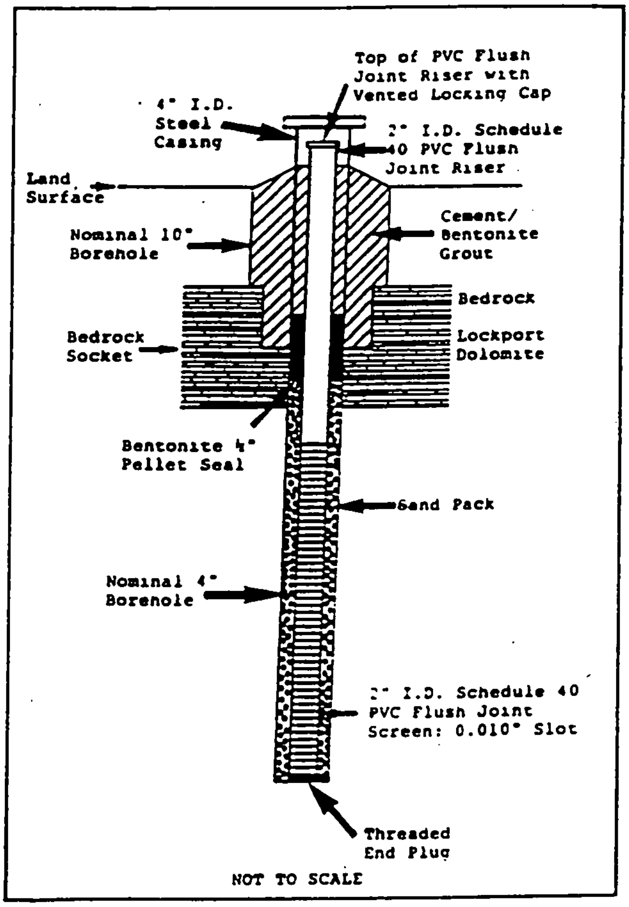
Development
Date : 8/15/89
Type : HAND PUMP
Volume Purged : 150 GAL

Water Level/Date: 14.93 BTOC /10-04-89
586.21 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	598.83
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.31	601.14
I.D. Steel casing	Top	+	2.50	601.33
	Bottom		16.30	582.53
Cement/Bentonite Grout	Top		0.00	598.83
	Bottom		10.20	588.63
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.31	601.14
	Bottom		15.30	583.53
Bentonite 1/4" Pellet Seal	Top		10.20	588.63
	Bottom		14.30	584.53
Bedrock Socket	Top		14.30	584.53
	Bottom		16.30	582.53
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		15.30	583.53
	Bottom		35.60	563.23
4Q Sand Pack	Top		14.30	584.53
	Bottom		35.60	563.23
Borehole Total Depth			35.60	563.23



All measurements in feet unless otherwise noted
+ Above Land Surface
Below Land Surface
- Mean Sea Level Datum
BTOC- Below Top of Casing

MONITORING WELL CONSTRUCTION SUMMARY

[illegible]ell No. : MW 10-1D
[illegible]cation (NY. Coord.)
[illegible]orthings : 1,133,805.763
Eastings : 406,571.706
Reference Point : TOP OF PVC CASING
Reference Point Elev. : 589.64 MSL
Type of Security : STEEL CASING WITH
: LOCKING CAP
Supervisory Geologist : S. KELLER
Log Book/Page No. : 8/46-48,65-68
Drilling Company : EMPIRE SOILS INVESTIGATION
Rig Type : FAILING F-6; HOLLOW-STEM AUGER & AIR ROTARY
Driller : P. BENCE
Drilling Started : 1340-1745 HR/8-1-89
Drilling Completed : 0900-1610 HR/8-4-89

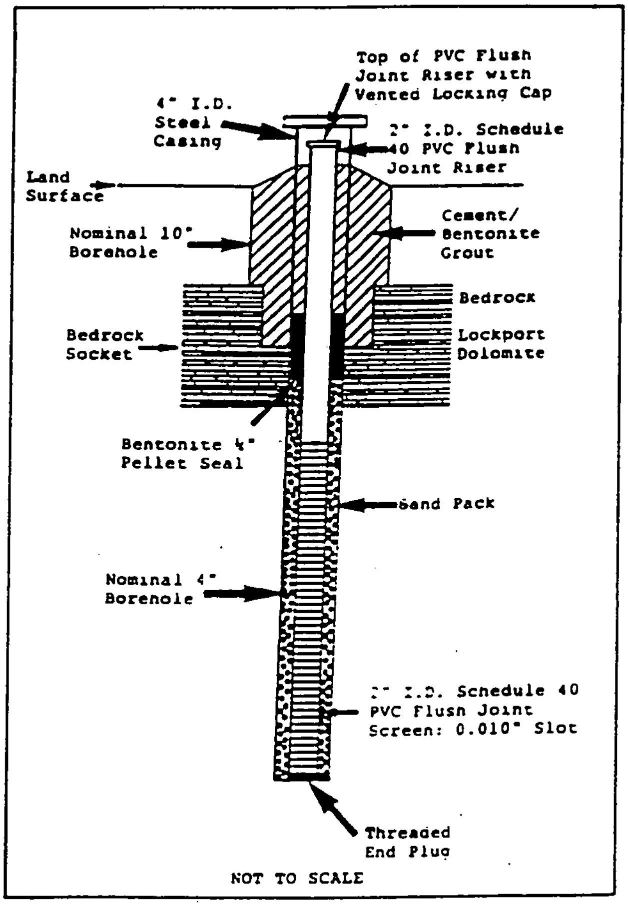
Development
Date : 8/8/89
Type : HAND PUMP
Volume Purged : 100 GAL

Water Level/Date: 7.48 BTOC/ 10-04-89
582.16 MSL

Hydraulic Conductivity: NA

MONITORING WELL AS-BUILT

			BLS	MSL
Land Surface			0.00	587.09
Top of PVC Flush Joint Riser Measured at Reference Point		+	2.55	589.64
[illegible]" I.D. Steel casing	Top	+	3.00	590.09
	Bottom		10.50	576.59
Cement/Bentonite Grout	Top		0.00	587.09
	Bottom		6.70	580.39
2" I.D. Schedule 40 PVC Flush Joint Riser	Top	+	2.55	589.64
	Bottom		12.66	574.43
Bentonite 1/4" Pellet Seal	Top		6.70	580.39
	Bottom		11.70	575.39
Bedrock Socket	Top		8.10	578.99
	Bottom		10.50	576.59
2" I.D. Schedule 40 PVC Flush Joint Screen 0.010" Slot	Top		12.66	574.43
	Bottom		32.90	554.19
4Q Sand Pack	Top		11.70	575.39
	Bottom		32.90	554.19
Borehole Total Depth			32.90	554.19



All measurements in feet unless otherwise noted
+ - Above Land Surface
[illegible] Below Land Surface
[illegible] Mean Sea Level Datum
B[illegible]C- Below Top of Casing

MONITORING WELL BORING LOG

WB-1-6

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-1-6-1	18,12,15,44	0.0-2.0	1.0	CL	CLAYEY GRAVELLY SILT; low-plastic; firm; dry; dk. reddish brown(5YR3/2).	bkgd	0
1.0	-								
2.0	-	WB-1-6-2	20,9,8,9	2.0-4.0	0.0		SAMPLE NOT RECOVERED		
3.0	-								
4.0	-	WB-1-6-3	5,8,16,9	4.0-6.0	1.7	CL	GRAVELLY SILT; trace very fine sand; low to med-plastic; soft; moist; reddish brown(5YR4/4).	bkgd	0
5.0	-								
6.0	-	WB-1-6-4	100/.1'	6.0-8.0	0.1	CL	GRAVELLY SILT; trace very fine sand; low to med-plastic; soft; moist; reddish brown(5YR4/4).	bkgd	0

BEDROCK 6.1'BLS

MONITORING WELL BORING LOG

WB-1-7

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-1-7-1	6,9,8,5	0-2	0.5	CL	SILTY CLAY; oxidation mottles; non-plastic; hard; dry; dk. gray brown(10YR4/2).	bkgd	0
1.0	-								
2.0	-	WB-1-7-2	5,11,12,16	2-4	1.5	CL	CLAYEY SILT; non-plastic; firm; dry; dk. red gray(5YR4/2).	bkgd	0
3.0	-								
4.0	-	WB-1-7-3	5,15,17,18	4-6	1.9	CL	CLAYEY SILT; calcified laminations; non-plastic; firm; dry; brown(7.5YR4/4).	bkgd	0
5.0	-								
6.0	-	WB-1-7-4	2,34,32,3	6-8	2.0	CL	SILTY CLAY; gray and red oxidation mottles; low-plastic; firm; dry; brown(7.5YR3/4).	bkgd	0
7.0	-								
8.0	-	WB-1-7-5	6,9,9,9	8-10	2.0	CL	SILTY CLAY; gray and red oxidation mottles; med-plastic; soft; moist; dk. brown(7.5YR3/2).	bkgd	0
9.0	-								
10.0	-	WB-1-7-6	2,5,7,9	10-12	1.8	CL	SILTY CLAY; trace sand; gray and red oxidation mottles; low-plastic; soft; wet; dk. brown(7.5YR3/2).	bkgd	0
11.0	-								
12.0	-	WB-1-7-7	100/.3'	12-14	1.0	CL	CLAYEY SILT; rock fragments; med-plastic; soft; wet; brown(7.5YR4/4).	bkgd	0
			BEDROCK 12.0'BLS						

MONITORING WELL BORING LOG

WB-1-3D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-1-3D-1	5,7,7,9	0.0-2.0	1.2	CL	CLAY; trace silt; oxidation mottles; non-plastic; firm; dry; dk. brown(7.5YR4/2).	bkgd	0
1.0	-								
2.0	-	WB-1-3D-2	13,17,17,18	2.0-4.0	1.4	CL	CLAY; some sand; low-plastic; soft; dry; dk. grayish brown(10YR4/2).	bkgd	0
3.0	-								
4.0	-	WB-1-3D-3	5,6,6,10	4.0-6.0	1.5	CL	CLAY; trace silt; mottles; med-plastic; soft; moist; dk. grayish brown(10YR4/2).	bkgd	0
5.0	-								
6.0	-	WB-1-3D-4	12,15,11,12	6.0-8.0	1.9	CH	CLAY; trace gravel; med to high-plastic; soft; wet; dk. brown(7.5YR3/4).	bkgd	0
7.0	-								
8.0	-	WB-1-3D-5	4,7,100/.4'	8.0-9.4	0.7	CL	SILTY CLAY; some gravel; non-plastic; soft; wet; dk. reddish brown(5YR3/4).	bkgd	0
9.0	-								
	-		BEDROCK 9.4' BLS						

MONITORING WELL BORING LOG

WB-1-4D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-1-4D-1	5,6,5,8	0-2.0	1.2	CL	CLAY; some sand and gravel; trace silt; oxidation mottles; non-plastic; firm; dry; dk. reddish brown(5YR3/2).	bkgd	0
1.0	-								
2.0	-	WB-1-4D-2	5,4,6,4	2.0-4.0	1.0	CH	CLAY; some sand and gravel; high-plastic; firm; wet; dk. reddish brown(5YR3/3).	bkgd	0
3.0	-								
4.0	-	WB-1-4D-3	5,4,5,100/.2'	4.0-6.0	1.1	CH	CLAY; some silt and gravel; trace sand; high-plastic; firm; wet; dk. reddish brown(5YR3/3).	bkgd	0
5.0	-								

BEDROCK 5.75' BLS

MONITORING WELL BORING LOG

WB-2-4

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)		LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-2-4-1	4,8,11,11	0.0-2.0	1.4	CL		CLAY; low-plastic; firm; dry; dk. reddish brown(5YR3/2).	bkgd	0
	-									
1.0	-									
	-									
2.0	-	WB-2-4-2	10,13,14,16	2.0-4.0	1.1	CL		CLAY TO SILTY CLAY; gray and rust mottles; med-plastic; firm; moist; dk. reddish brown(5YR3/2).	bkgd	0
	-									
3.0	-									
	-									
4.0	-	WB-2-4-3	7,7,13,100/.4'	4.0-6.0	1.2	CL	4.0-4.8	CLAY; med-plastic; firm; moist; dk. reddish brown(5YR3/4).	bkgd	0
	-						4.8-5.2	CLAYEY SILT; dolomite fragments; low-plastic; soft; wet; reddish brown(5YR5/4).		
5.0	-									
	-									

BEDROCK 5.2'BLS

MONITORING WELL BORING LOG

WB-3-2D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-3-2D-1	5,10,12	0-1.5	1.5	CL	CLAY; some sand and silt; trace gravel; non-plastic; firm; dry; dk. brown(7.5YR4/4).	bkgd	0
	-								
1.0	-								
	-	WB-3-2D-2	8,10,12	1.5-3.0	1.5	CL	SILTY CLAY; some sand; trace gravel; non-plastic; firm; dry; brown(7.5YR4/6).	bkgd	0
2.0	-								
	-								
3.0	-	WB-3-2D-3	8,12,14	3.0-4.5	1.5	CL	CLAY; some gravel; trace silt; med-plastic; firm; dry; reddish brown(5YR4/3).	bkgd	0
	-								
4.0	-								
	-	WB-3-2D-4	4,10,9	4.5-6.0	1.2	CL	CLAY; some gravel; trace sand; med-plastic; firm; dry; reddish brown(5YR4/3).	bkgd	0
5.0	-								
	-								
6.0	-	WB-3-2D-5	6,8,10	6.0-7.5	1.5	CH	CLAY; trace silt; oxidation mottles; high-plastic; firm; moist; dk. brown(7.5YR4/2) to dk. reddish gray(5YR4/2).	bkgd	0
	-								
7.0	-								
	-	WB-3-2D-6	5,9,14	7.5-9.0	1.5	CH	CLAY: some intermixed gravel; high-plastic; firm; wet; reddish brown(5YR4/4).	bkgd	0
8.0	-								
	-								
9.0	-	WB-3-2D-7	8,10,100/.3'	9.0-10.5	0.5	CH	CLAY; high-plastic; firm; wet;	bkgd	0
	-								
10.0	-								
			BEDROCK 10.3'BLS						

MONITORING WELL BORING LOG

WB-3-3D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0									
1.0									
2.0									
3.0									
4.0		WB-3-3D-1	4,5,5	4.0-5.5	0.7	CL	SILTY CLAY; some pebbles; non-plastic; firm; moist, wet at bottom of sample; reddish brown(5YR4/3).	bkgd	0
5.0									
6.0									
7.0									
			BEDROCK 7.7' BLS						
8.0									

MONITORING WELL BORING LOG

WB-3-4D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-3-4D-1	3,5,6	0-1.5	1.5	CL	SILTY CLAY; some sand; trace pebbles; oxidation mottles; non-plastic; firm; dry; brown(7.5YR4/4).	bkgd	0
	-								
1.0	-								
	-	WB-3-4D-2	3,5,4	1.5-3.0	1.0	CL	SANDY CLAY; clay laminations; oxidation mottles; non-plastic; firm; wet; gray(5YR5/1).	bkgd	0
2.0	-								
	-								
3.0	-	WB-3-3D-3	6,100/.3'	3.0-4.5	0.3	ML	SANDY SILT; some clay; non-plastic; firm; moist; pinkish gray(7.5YR6/2).	bkgd	0
	-								
4.0	-		BEDROCK 3.8' BLS						

MONITORING WELL BORING LOG

WB-3-7

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-3-7-1	5,9,7	0.0-1.5	1.1	CL	GRAVELLY CLAY; fill; low-plastic; firm; dry; brown(7.5YR5/4).	bkgd	0
	-								
1.0	-								
	-	WB-3-7-2	4,7,6	1.5-3.0	1.0	CL	SILTY CLAY; low to med-plastic; firm; moist; reddish brown(5YR4/4).	bkgd	0
2.0	-								
	-								
3.0	-	WB-3-7-3	3,3,2	3.0-4.5	1.2	CL	SILTY CLAY; gray silty blebs; high-plastic; soft; moist; yellowish red(5YR4/6).	bkgd	0
	-								
4.0	-								
	-	WB-3-7-4	2,27,40	4.5-6.0	1.0	CL	SILTY CLAY; rock fragments; trace sand; low-plastic; soft; wet; dk. reddish gray(5YR4/2).	bkgd	0
5.0	-								
	-								
6.0	-		BEDROCK 6.0'BLS						

MONITORING WELL BORING LOG

WB-4-4

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-4-4-1	4,7,9,12	0.0-2.0	1.0	CL	CLAY TO SILTY CLAY; low to med-plastic; firm; dry; dk. reddish brown(5YR3/4).	bkgd	0
	-								
1.0	-								
	-								
2.0	-	WB-4-4-2	7,18,8,7	2.0-4.0	0.9	CL	CLAY TO SILTY CLAY; subang rock fragments; med-plastic; firm; moist; reddish brown(5YR4/4).	bkgd	0
	-								
3.0	-								
	-								
4.0	-	WB-4-4-3	4,6,6,6	4.0-6.0	1.9	CL	CLAY TO SILTY CLAY; gray mottles; some pebbles; med-plastic; soft; moist; brown(7.5YR4/4).	bkgd	0
	-								
5.0	-								
	-								
6.0	-	WB-4-4-4	6,8,7,9	6.0-8.0	1.7	CL	CLAYEY SILT; subang rock fragments; med-plastic; soft; moist; brown(7.5YR4/4).	bkgd	0
	-								
7.0	-								
	-								
8.0	-	WB-4-4-5	3,5,5,11	8.0-10.0	0.1	CL	CLAYEY SILT; med-plastic; soft; wet; strong brown(7.5YR4/6).	bkgd	0
	-								
9.0	-								
	-								
10.0	-	WB-4-4-6	6,100/.2'	10.0-12.0	0.7	GM	CLAYEY GRAVELLY SILT; subang rock fracgments; med-plastic; soft; moist; dk. brown(7.5YR4/2).	bkgd	0
	-								
11.0	-								

BEDROCK 10.7'BLS

MONITORING WELL BORING LOG

WB-5-1D

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0									
1.0									
2.0									
3.0									
4.0									
5.0									
		WB-5-1D-1	3,8,18	5.7-7.2	1.3	CL	CLAY; some subr pebbles; oxidation mottles; med-plastic; firm; moist; reddish brown(5YR4/3).	bkgd	0
6.0									
7.0									
8.0									
9.0									
10.0									
11.0									
12.0									
13.0									
14.0									
15.0			BEDROCK 15.3' BLS						

MONITORING WELL BORING LOG

WB-5-5

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-5-5-1	5,7,7	0.0-1.5	1.0	GC	FILL(clay and gravel); low-plastic; firm; dry; reddish brown(5YR4/3).	bkgd	0
1.0	-								
	-	WB-5-5-2	6,6,6	1.5-3.0	1.2	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; dk. reddish brown(5YR3/4)	bkgd	0
2.0	-								
3.0	-	WB-5-5-3	4,8,9	3.0-4.5	0.7	CL	SILTY CLAY; silt laminae; low to med-plastic; firm; moist; brown(7.5YR5/2).	bkgd	0
4.0	-								
	-	WB-5-5-4	3,5,9	4.5-6.0	1.5	CL	CLAY; fissile; med-plastic; firm; moist; reddish brown(5YR5/4).	bkgd	0
5.0	-								
6.0	-	WB-5-5-5	14,12,12	6.0-7.5	1.5	CL	CLAY; silt laminae; med-plastic; firm; moist; reddish brown(5YR5/3).	bkgd	0
7.0	-								
	-	WB-5-5-6	4,5,7	7.5-9.0	1.5	CL	CLAY TO CLAYEY SILT; med-plastic; firm; moist; brown(7.5YR5/4).	bkgd	0
8.0	-								
9.0	-	WB-5-5-7	1,2,2,2	9.0-11.0	0.5	CH	CLAY TO CLAYEY SILT; high-plastic; soft; moist; brown(7.5YR4/4).	bkgd	0
10.0	-								
11.0	-	WB-5-5-8	2,2,3,4	11.0-13.0	1.0	CL	CLAYEY SILT; some fine sand; ang pebbles; low to med-plastic; soft; wet; dk. brown(7.5YR5/4).	bkgd	0
12.0	-								
13.0	-	WB-5-5-9	5,5,5,3	13.0-15.0	1.0	GM	GRAVELLY SILT; fine sand; low-plastic; soft; wet; brown(7.5YR5/2).	bkgd	0
14.0	-								
15.0	-	WB-5-5-10	100/.35'	15.0-17.0	0.35	GM	GRAVELLY SILT; fine sand; low-plastic; soft; wet; brown(7.5YR5/2).	bkgd	0

BEDROCK 15.1'BLS

MONITORING WELL BORING LOG

WB-8-1D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0									
1.0									
2.0									
3.0									
4.0									
5.0									
		WB-8-1D-1	6,15,15	5.4-7.4	1.0	CL	CLAY; some subr pebbles; oxidation mottles; med-plastic; firm to hard; dry; reddish brown(5YR4/3).	bkgd	0
6.0									
7.0									
		WB-8-1D-2	19,27,28	7.4-9.4	0.9	CL	CLAY; oxidation mottles; med-plastic; firm to hard; moist; reddish brown(5YR4/3).	bkgd	0
8.0									
9.0									
10.0									
11.0									
12.0									
13.0			BEDROCK 13.3' BLS						

MONITORING WELL BORING LOG

WB-8-2D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-8-2D-1	3,6,6	0.0-1.5	1.3	CL	CLAY TO SILTY CLAY; ang rock fragments; low-plastic; firm; dry; dk. reddish brown(5YR3/2).	bkgd	0
	-								
1.0	-								
	-	WB-8-2D-2	3,6,6	1.5-3.0	1.2	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; dk. reddish brown(5YR3/4).	bkgd	0
2.0	-								
	-								
3.0	-	WB-8-2D-3	3,6,10	3.0-4.5	1.5	CL	CLAY TO SILTY CLAY; fissile; oxidation mottles; med to high-plastic; firm; moist; dk. reddish brown(5YR3/3).	bkgd	0
	-								
4.0	-								
	-	WB-8-2D-4	5,11,17	4.5-6.0	1.5	CL	CLAY TO SILTY CLAY; some pebbles; med-plastic; firm; moist; dk. reddish brown(5YR3/4).	bkgd	0
5.0	-								
	-								
6.0	-	WB-8-2D-5	12,36,30	6.0-7.5	1.5	CL	CLAY; fissile; gray silt blebs; med-plastic; firm; moist; dk. reddish brown(5YR3/4).	bkgd	0
	-								
7.0	-								
	-	WB-8-2D-6	7,11,12	7.5-9.0	1.5	CL	SILTY CLAY; silt laminae; oxidation mottles; low to med-plastic; firm; moist; reddish brown(5YR4/4).	bkgd	0
8.0	-								
	-								
9.0	-	WB-8-2D-7	2,3,5	9.0-10.5	1.5	CL	SILTY CLAY; med-plastic; soft; moist-wet at 9.5'; dk. reddish brown(5YR3/3).	bkgd	0
	-								
10.0	-								
	-	WB-8-2D-8	1.0',5,7	10.5-12.5	1.0	CL	CLAYEY SILT; some fine sand; low to med-plastic; soft; wet; dk. reddish brown(5YR3/3).	5	0
11.0	-								
	-								
12.0	-								
	-	WB-8-2D-9	100/0.5'	12.5-14.5	0.5	SC	CLAYEY SILT TO VERY FINE SAND; trace ang rock fragments; med-plastic; soft; wet; yellowish red(5YR4/6).	44	0

BEDROCK 12.5' BLS

MONITORING WELL BORING LOG

WB-8-3D

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0									
1.0									
2.0									
3.0									
4.0									
5.0									
6.0									
7.0		WB-8-3D-1	14,18,17	7.0-9.0	1.4	CL	CLAY; some gravel; oxidation mottles; non-plastic; hard; dry;	bkgd	0
8.0									
9.0									
10.0									
11.0									
12.0									
13.0									
14.0									

BEDROCK 14.3' BLS

MONITORING WELL BORING LOG

WB-8-5

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)		LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-8-5-1	7,8,10	0.0-1.5	1.2	CL		CLAY; low-plastic; firm; dry; dk. reddish brown(5YR3/4).	bkgd	0
	-									
1.0	-									
	-	WB-8-5-2	6,9,10	1.5-3.0	0.8	CL		CLAY TO SILTY CLAY; low-plastic; firm; moist; reddish brown(5YR4/3).	bkgd	0
2.0	-									
	-									
3.0	-	WB-8-5-3	7,9,9	3.0-4.5	1.3	CL		CLAY TO SILTY CLAY; fissile; silt laminae; calcified veins; med-plastic; firm; moist; dk. reddish brown(5YR3/2).	bkgd	0
	-									
4.0	-									
	-	WB-8-5-4	3,5,12	4.5-6.0	1.3	CL		CLAY TO SILTY CLAY; fissile; calcified veins; med-plastic; firm; moist; yellowish red(5YR4/6).	bkgd	0
5.0	-									
	-									
6.0	-	WB-8-5-5	14,19,22	6.0-7.5	1.5	CL		CLAY TO SILTY CLAY; fissile; calcified veins; med-plastic; firm; moist; dk. redish gray(5YR4/2).	bkgd	0
	-									
7.0	-									
	-	WB-8-5-6	3,6,8	7.5-9.0	1.5	CL		CLAY TO SILTY CLAY; fissile; calcified veins; med-plastic; firm; moist; dk. yellowish brown(10YR3/4).	bkgd	0
8.0	-									
	-									
9.0	-	WB-8-5-7	3,5,5	9.0-10.5	1.2	CH	9.0-10.4	CLAY; high-plastic; firm; moist; reddish brown(5YR4/3).	bkgd	0
	-					ML	10.4-10.5	SILT; low-plastic; soft; wet;		
10.0	-									
	-	WB-8-8-8	3,31,100/.3'	10.5-12.0	0.0			Sample Not Recovered.		
11.0	-									
	-									
12.0	-									

BEDROCK 12.3'BLS

MONITORING WELL BORING LOG

WB-8-6

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-8-6-1	4,4,9	0.0-1.5	1.5	CL	CLAY TO SILTY CLAY; low-plastic; firm; dry; brown(7.5YR4/2).	bkgd	0
1.0	-								
	-	WB-8-6-2	5,8,10	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
2.0	-								
3.0	-	WB-8-6-3	5,6,11	3.0-4.5	1.2	CH	CLAY TO SILTY CLAY; silt laminae; high-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
4.0	-								
	-	WB-8-6-4	7,9,11	4.5-6.0	1.5	CH	CLAY TO SILTY CLAY; high-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
5.0	-								
6.0	-	WB-8-6-5	14,17,24	6.0-7.5	1.5	CH	CLAY TO SILTY CLAY; some pebbles; high-plastic; firm; moist; brown(7.5YR4/4).	bkgd	0
7.0	-								
	-	WB-8-6-6	7,9,12	7.5-9.0	1.5	CH	CLAY TO SILTY CLAY; high-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
8.0	-								
9.0	-	WB-8-6-7	4,5,5	9.0-10.5	1.5	CH	CLAY TO SILTY CLAY; high-plastic; soft; moist; brown(7.5YR4/2).	bkgd	0
10.0	-								
	-	WB-8-6-8	4,5,5	10.5-12.0	1.0	CL	CLAY; some very fine sand; med-plastic; soft; wet; brown(7.5YR4/4).	bkgd	0
11.0	-								
12.0	-	WB-8-6-9	2,2,4,5	12.0-14.0	1.0	SC CL	12-12.5' CLAYEY SAND; 12.5-14.0' CLAY; med-plastic; soft; wet; brown(7.5YR4/4).	bkgd	0
13.0	-								
14.0	-	WB-8-6-10	2,100/0.2'	14.0-16.0	0.7	CL	GRAVELLY CLAY; med-plastic; soft; wet; brown(7.5YR4/2).	bkgd	0
15.0	-								

BEDROCK 14.2'BLS

MONITORING WELL BORING LOG

WB-9-5

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-9-5-1	5,7,7	0.0-1.5	1.5	CL	CLAY TO SILTY CLAY; vertical fractures; low-plastic; firm; dry; dk. reddish brown(5YR3/3).	bkgd	0
	-								
1.0	-								
	-	WB-9-5-2	7,12,15	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; fissile; calcified veins; black staining along partings; red mottles; low-plastic; firm; dry; reddish brown(5YR4/4).	bkgd	0
2.0	-								
	-								
3.0	-	WB-9-5-3	4,9,11	3.0-4.5	1.3	CL	SILTY CLAY; fissile; silt laminations; med-plastic; firm; moist; reddish brown(5YR4/4).	bkgd	0
	-								
4.0	-								
	-	WB-9-5-4	7,22,11	4.5-6.0	1.5	CL	SILTY CLAY; silt laminations; calcified veins; low to med-plastic; firm; moist; reddish brown(5YR4/3).	bkgd	0
5.0	-								
	-								
6.0	-	WB-9-5-5	3,8,11	6.0-7.5	0.8	CL	SILTY CLAY; very fine sand laminae; gray mottles; calcified veins; high-plastic; soft; moist to wet along fractures; reddish brown(5YR4/4).	bkgd	0
	-								
7.0	-								
	-	W3-9-5-6	9,11,100/.1'	7.5-9.0	1.1	CL	GRAVELLY CLAYEY SILT; some very fine sand; high-plastic; soft; moist; reddish brown(5YR5/3).	bkgd	0
8.0	-								
	-								
9.0	-		BEDROCK 8.4'BLS						

MONITORING WELL BORING LOG

WB-9-6

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-9-6-1	9,5,5	0.0-1.5	1.5	CL	CLAY TO SILTY CLAY; blocky fractures; low-plastic; firm; dry; reddish brown(5YR3/4).	bkgd	0
	-								
1.0	-								
	-	WB-9-6-2	7,10,12	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; calcified veins; red and gray mottles; med-plastic; firm; moist; reddish brown(5YR3/4).	bkgd	0
2.0	-								
	-								
3.0	-	WB-9-6-3	16,16,21	3.0-4.5	1.5	CL	CLAY TO SILTY CLAY; calcified veins; black staining along fractures; med-plastic; firm; moist; reddish brown(5YR4/4).	100	0
	-								
4.0	-								
	-	WB-9-6-4	9,9,12	4.5-6.0	1.5	CL	CLAY TO SILTY CLAY; calcified veins; slightly fissle; oxidation mottles; med-plastic; firm; moist; reddish brown(5YR4/4).	bkgd	0
5.0	-								
	-								
6.0	-	WB-9-6-5	7,100/.5'	6.0-7.5	1.5	CL	CLAY TO SILTY CLAY; some pebbles; med-plastic; soft; moist; reddish brown(5YR4/4).	bkgd	0
	-								
7.0	-								

BEDROCK 7.3'BLS

MONITORING WELL BORING LOG

WB-9-7

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-9-7-1	3,7,6	0.0-1.5	1.0	OL	SILTY CLAY; root zone; non-plastic; firm; dry; black(5YR2.5/1).	bkgd	0
	-								
1.0	-								
	-	WB-9-7-2	3,7,10	1.5-3.0	1.5	CL	SILTY CLAY TO CLAYEY SILT; gray calcified veins; low-plastic; firm; dry; red brown(5YR4/4).	bkgd	0
2.0	-								
	-								
3.0	-	WB-9-7-3	4,8,10	3.0-4.5	1.5	CL	SILTY CLAY TO CLAYEY SILT; gray calcified veins; low-plastic; firm; moist; red brown(5YR4/4).	bkgd	0
	-								
4.0	-								
	-	WB-9-7-4	3,5,7	4.5-6.0	1.5	CL	CLAYEY SILT; calcified veins; low-plastic; firm; moist; red brown(5YR4/4).	bkgd	0
5.0	-								
	-								
6.0	-	WB-9-7-5	5,8,8	6.0-7.5	1.5	CL	CLAYEY SILT; some small pebbles; med-plastic; soft; wet; red brown(5YR4/4).	bkgd	0
	-								
7.0	-								
	-	WB-9-7-6	3,4,4	7.5-9.0	1.0	CL	CLAYEY SILT; large pebbles; mostly subang; med to high-plastic; soft; wet; red brown(5YR4/4).	bkgd	0
8.0	-								
	-								
9.0	-	WB-9-7-7	4,100/0'	9.0-10.5	0.6	CL	CLAYEY SILT; some pebbles; trace sand; 1-4mm; low-plastic; soft; wet; red brown(5YR4/4).	bkgd	0
	-								

BEDROCK 9.7'BLS

MONITORING WELL BORING LOG

WB-9-8

DEPTH ('BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL ('BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0		WB-9-8-1	2,4, 6,7	0.0-2.0	1.4	CL	SILTY CLAY; some to trace fine sand; mod to low plasticity; mottled; hard; moist; reddish brown to dark yellowish brown, then very dark gray; (5 YR 4/3 - 10 YR 3/4 - 10 YR 3/1)	bkgd	0
2.0		WB-9-8-2	8,17, 17,19	2.0-4.0	1.65	CL	SILTY CLAY; some to trace fine sand; mod to low plasticity; mottled; hard; moist; dark yellowish brown (10 YR 3/3 - 4/4)	bkgd	0
4.0		WB-9-8-3	6,9, 11,15	4.0-6.0	1.90	CL	SILTY CLAY; mod to low plasticity; mottled; hard; moist; crystallized partings; dark brown to dark yellowish brown (10 YR 3/3 - 4/4); occasionally reddish brown (5 YR 4/3)	bkgd	0
6.0		WB-9-8-4	13,20, 23,40	6.0-8.0	1.90	MH	CLAYEY GRAVELLY SILT; some fine sand; mod to high plasticity; mottled; hard; moist; dark brown to dark yellowish brown (10 YR 3/3 - 4/4); occasionally reddish brown (5 YR 4/3)	bkgd	0
8.0		WB-9-8-5	100/2	8.0-10.0	0.20	CL	GRAVELLY SILTY CLAY; some fine sand; low plasticity; hard; moist; dark brown to dark yellowish brown (10 YR 3/3 - 4/4)	bkgd	0

BEDROCK 8.0' BLS

MONITORING WELL BORING LOG

WB-9-9

DEPTH ('BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL ('BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0		WB-9-9-1	1,4, 5,7	0.0-2.0	1.4	OL	ORGANIC SILTY CLAY; root zone; mod to high plasticity; firm; moist; mottled; dark yellowish brown to very dark gray (10 YR 4/4 - 3/1)	bkgd	0
2.0		WB-9-9-2	7,14, 15,17	2.0-4.0	1.8	CL	SILTY CLAY; low to mod plasticity; hard; moist; mottled; crystalline horizons (gypsum); reddish brown to brown (5 YR 4/3 - 10 YR 5/3)	bkgd	0
4.0		WB-9-9-3	5,7, 9,14	4.0-6.0	1.8	CL	SILTY CLAY; crystalline horizons (gypsum); low to mod plasticity; hard; moist; mottled; reddish brown to brown (5 YR 4/3 - 10 YR 5/3 - 7.5 YR 5/2)	bkgd	0
6.0		WB-9-9-4	16,20, 22,100/3	6.0-8.0	1.6	CL	SILTY CLAY; crystalline horizons (gypsum); low to med plasticity; hard; moist; mottled; reddish brown to brown (5 YR 4/3 - 10 YR 5/3 - 7.5 YR 5/2)	bkgd	0

BEDROCK 7.5' BLS

MONITORING WELL BORING LOG

WB-10-1D

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0									
1.0									
2.0									
3.0									
4.0									
5.0									
		WB-10-1D-1	6,8,11	5.4-6.9	1.5	CL	CLAY TO SILTY CLAY; rock fragments; med-plastic; firm; moist; reddish brown(5YR5/3).	70	0
6.0									
7.0		WB-10-1D-2	18,15,100/.2'	6.9-8.1	1.2	GM	GRAVELLY SILT TO FINE SAND; abundant dolomite fragments; low to med-plastic; soft; wet; reddish brown(5YR4/4).	80	0
8.0									

BEDROCK 8.1'BLS

MONITORING WELL BORING LOG

WB-10-4

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0 1.0	- - -	WB-10-4-1	3,6,8	0.0-1.5	1.0	CL	CLAY TO SILTY CLAY; fissile; low to med-plastic; firm; moist; strong brown(7.5YR4/6).	bkgd	0
2.0	- - -	WB-10-4-2	8,8,13	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; fissile; low to med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
3.0 4.0	- - -	WB-10-4-3	9,5,12	3.0-4.5	1.5	CL	CLAY TO SILTY CLAY; fissile; med-plastic; firm; moist; reddish brown(5YR5/3).	bkgd	0
5.0	- - -	WB-10-4-4	6,9,11	4.5-6.0	1.5	CL	CLAYEY SILT; subr pebbles; low-plastic; soft; moist; yellowish red(5YR4/6).	bkgd	0
6.0 7.0	- - -	WB-10-4-5	9,12,15	6.0-7.5	1.5	CL	CLAYEY SILT; some pebbles; mottles; low to med-plastic; soft; wet; yellowish red(5YR4/6).	bkgd	0
8.0	- -	WB-10-4-6	9,100/.35'	7.5-9.5	0.85	CL	CLAYEY SILT; subang pebbles; low-plastic; soft; wet; yellowish red(5YR4/6).	bkgd	0
			BEDROCK 7.9'BLS						

MONITORING WELL BORING LOG

WB-13-1

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-13-1-1	4,6,6	0.0-1.5	1.4	CL	CLAYEY SILT TO SILTY CLAY; oxidation and gray mottles; non-plastic; hard; dry; dk. brown(7.5YR3/4).	bkgd	0
	-								
1.0	-								
	-	WB-13-1-2	4,8,10	1.5-3.0	1.3	CL	CLAYEY SILT TO SILTY CLAY; oxidation and gray mottles; non-plastic; hard; dry: dk. brown(7.5YR3/4).	bkgd	0
2.0	-								
	-								
3.0	-	WB-13-1-3	3,8,7	3.0-4.5	1.2	CL	CLAYEY SILT; trace sand; oxidation and gray mottles; low-plastic; soft; dry; dk. brown(10YR3/4).	bkgd	0
	-								
4.0	-								
	-	WB-13-1-4	3,4,7	4.5-6.0	1.3	CL	SILT TO CLAYEY SILT; trace sand; med to high-plastic; soft; moist; dk. yellow brown(10YR3/6).	bkgd	0
5.0	-								
	-								
6.0	-	WB-13-1-5	100/.5'	6.0-7.5	1.1	CL	SILT TO CLAYEY SILT; trace sand; 1-4mm rock fragments; low-plastic; soft; wet; dk. brown(10YR3/3).	bkgd	0
	-								
7.0	-								

BEDROCK 7.5'BLS

MONITORING WELL BORING LOG

WB-13-2

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)		LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-13-2-1	4,5,7	0.0-1.5	1.5	OL		ORGANIC CLAY; low-plastic; firm; dry; black(10YR2/1).	bkgd	0
1.0	-									
2.0	-	WB-13-2-2	NR	1.5-3.0	1.5	CL		CLAY TO SILTY CLAY; low to med-plastic; firm; moist; reddish brown(5YR4/3).	bkgd	0
3.0	-	WB-13-2-3	4,6,8	3.0-4.5	0.0			SAMPLE NOT RECOVERED.	bkgd	0
4.0	-									
5.0	-	WB-13-2-4	4,5,14	4.5-6.0	1.2	CL		CLAY TO SILTY CLAY; fissile; gray mottling; med-plastic; firm; moist; dk. reddish brown(5YR3/3).	bkgd	0
6.0	-	WB-13-2-5	12,15,17	6.0-7.5	1.5	CL	6.0-7.3'	SILTY CLAY; low-plastic; soft; wet; reddish brown(5YR4/4).	bkgd	0
7.0	-					ML	7.3-7.5'	CLAYEY SILT; low-plastic; soft; wet; reddish brown(5YR4/4).		
8.0	-	WB-13-2-6	NR	7.5-9.5	0.15	CL		CLAY; some ang rock fragments; low-plastic; firm; moist; dk. reddish brown(5YR3/2).	bkgd	0

BEDROCK 7.5'BLS

NR - Not Recorded

MONITORING WELL BORING LOG

WB-13-3

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-13-3-1	5,8,11	0.0-1.5	1.5	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; brown(7.5YR4/4).	bkgd	0
1.0	-								
2.0	-	WB-13-3-2	7,9,14	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; fissle; red and gray mottles; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
3.0	-	WB-13-3-3	6,6,9	3.0-4.5	1.5	CH	CLAY TO SILTY CLAY; fissle; high-plastic; firm; moist; dk. reddish brown(5YR4/3).	bkgd	0
4.0	-								
5.0	-	WB-13-3-4	4,7,9	4.5-6.0	1.5	CH	CLAY TO SILTY CLAY; high-plastic; firm; moist; reddish brown(5YR4/4).	bkgd	0
6.0	-	WB-13-3-5	24,18,19	6.0-7.5	0.5	CH	CLAY TO SILTY CLAY; high-plastic; firm; moist; reddish brown(5YR4/3).	bkgd	0
7.0	-								
8.0	-	WB-13-3-6	3,5,6	7.5-9.5	1.5	CH	CLAY TO SILTY CLAY; trace sand; angular; high-plastic; firm; moist; dk. reddish brown(5YR3/3).	bkgd	0
9.0	-	WB-13-3-7	100/0.4'	9.5-10.5	0.5	CL	CLAYEY SILT TO SILTY CLAY; med-plastic; soft; moist; dk. reddish brown(5YR3/3).	bkgd	0

BEDROCK 9.4'BLS

MONITORING WELL BORING LOG

WB-13-4

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	WB-13-4-1	4,5,4	0.0-1.5	1.5	CL	CLAY TO SILTY CLAY; low-plastic; firm; dry; reddish brown(5YR4/3).	bkgd	0
	-								
1.0	-								
	-	WB-13-4-2	8,11,10	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
2.0	-								
	-								
3.0	-	WB-13-4-3	3,4,12	3.0-4.5	1.5	CL	CLAY TO SILTY CLAY; vertical fractures; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
	-								
4.0	-								
	-	WB-13-4-4	NR	4.5-6.0	1.5	CL	CLAY TO SILTY CLAY; fissile; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
5.0	-								
	-								
6.0	-	WB-13-4-5	11,13,6	6.0-7.5	1.5	CL	CLAY TO SILTY CLAY; fissile; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
	-								
7.0	-								
	-	WB-13-4-6	8,10,100/1"	7.5-9.5	0.5	CL	CLAY TO SILTY CLAY; fissile; med-plastic; firm; moist to wet; brown(7.5YR4/2).	bkgd	0
8.0	-								
	-								
9.0	-	BEDROCK 8.6'BLS							

NR - Not Recorded

SOIL BORING LOG

B-1-1

LOCATION (NY. COORD.)

NORTHING : 1,135,088.015
EASTING : 406,667.316
SUPERVISORY GEOLOGIST : STEVE KELLER
LOG BOOK/PG. NO. : 3/71-73
DRILLING STARTED : 0858 hr/7-19-89
ABANDOMENT COMPLETED : 0925 hr/7-19-89
DRILLING CO. : EMPIRE SOILS
RIG TYPE : HOLLOW-STEM AUGER
DRILLER : K. FULLER

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-								
	-								
1.0	-								
	-	B-1-1-1	18,9,3	1.6-3.1	1.5		ROAD FILL, GRAVEL	bkgd	0
2.0	-								
	-								
3.0	-	B-1-1-2	5,3,4	3.1-4.6	1.5		ROAD FILL, GRAVEL	bkgd	0
	-								
4.0	-								
	-	B-1-1-3	100/0"	4.6-6.1	0.9	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; dk. reddish brown(5YR3/4).	bkgd	0
5.0	-								
	-								
6.0	-								
	End of boring								

SOIL BORING LOG

B-2-1

LOCATION (NY. COORD.)
NORTHING : 1,135,136.792
EASTING : 406,933.078
SUPERVISORY GEOLOGIST : JOHN VANDERSLICE
LOG BOOK/PG. NO. : 2/118-122
DRILLING STARTED : 1415 hr/7-17-89
ABANDOMENT COMPLETED : 1458 hr/7-17-89
DRILLING CO. : EMPIRE SOILS
RIG TYPE : HOLLOW-STEM AUGER
DRILLER : A. KOSKE

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-2-1-1	4,5,4	0.0-1.5	1.2	ML	SILT; trace sand; non-plastic; firm; dry; dk. brown(7.5YR3/4).	bkgd	0
	-								
1.0	-								
	-	B-2-1-2	4,5,6	1.5-3.0	1.3	CL	CLAYEY SILT; some sand; 1/8-1/4mm; low-plastic; soft; moist; dk. brown(7.5YR4/2).	bkgd	0
2.0	-								
	-								
3.0	-	B-2-1-3	3,5,6	3.0-4.5	1.5	CL	CLAYEY SILT; trace sand; dk. organic rich laminations; med-plastic; soft; moist; dk. brown(7.5YR4/2).	bkgd	0
	-								
4.0	-								
	-	B-2-1-4	2,2,22	4.5-6.0	1.5	CL	CLAYEY SILT TO SILTY SAND; rock fragments; med-plastic; soft; wet; brown(7.5YR4/2).	bkgd	0
5.0	-								
	-								
6.0	-								
	End of boring								

SOIL BORING LOG

B-2-2

LOCATION (NY. COORD.)

NORTHING	:	1,135,409.545
EASTING	:	406,921.181
SUPERVISORY GEOLOGIST	:	JOHN VANDERSLICE
LOG BOOK/PG. NO.	:	2/125-133
DRILLING STARTED	:	1521 hr/7-17-89
ABANDOMENT COMPLETED	:	1640 hr/7-17-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-2-2-1	3,5,4	0.0-1.5	1.5	OL	ORGANIC CLAYEY SILT; non-plastic; hard; dry; dk. brown(7.5YR3/2).	bkgd	0
	-								
1.0	-								
	-	B-2-2-2	3,5,7	1.5-3.0	1.5	CL	SILTY CLAY TO CLAYEY SILT; oxidation mottles; dk. gray and red laminations; med-plastic; soft; dry; brown(7.5YR4/2).	bkgd	0
2.0	-								
	-								
3.0	-	B-2-2-3	4,7,10	3.0-4.5	1.5	CL	CLAYEY SILT; trace sand; dk. gray rock fragments; non-plastic; hard; dry; brown(7.5YR4/4).	bkgd	0
	-								
4.0	-								
	-	B-2-2-4	6,11,11	4.5-6.0	1.5	CL	SLITY CLAY TO CLAY; gray laminations; med-plastic; firm; dry; dk. gray brown(2.5YR4/2).	bkgd	0
5.0	-								
	-								
6.0	-	B-2-2-5	10,10,11	6.0-7.5	1.5	CL	CLAY TO SILTY CLAY; trace sand; gray laminations; dk. green to black mottles; med-plastic; firm; moist; dk. gray brown(2.5YR4/2).	bkgd	0
	-								
7.0	-								
	-	B-2-2-6	4,6,7	7.5-9.0	1.3	SC	SANDY SILT; gray mottles; med-plastic; soft; moist; very dk. gray brown(2.5YR3/2).	bkgd	0
8.0	-								
	-								
9.0	-	B-2-2-7	3,7,8	9.0-10.5	0.9	CL	CLAYEY SILT; some sand; rock fragments; 1-3mm; very ang.; low-plastic; soft; wet; dk. brown(7.5YR3/2).	bkgd	0
	-								
10.0	-								
	-								

End of boring

SOIL BORING LOG

B-4-1

LOCATION (NY. COORD.)

NORTHING : 1,135,360.377
EASTING : 406,288.606
SUPERVISORY GEOLOGIST : STEVE KELLER
LOG BOOK/PG. NO. : 3/64-69
DRILLING STARTED : 1140 hr/7-18-89
ABANDONMENT COMPLETED : 1242 hr/7-18-89
DRILLING CO. : EMPIRE SOILS
RIG TYPE : HOLLOW-STEM AUGER
DRILLER : K. FULLER

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-								
	-						NO SAMPLE TAKEN (ASPHALT)		
1.0	-								
	-	B-4-1-1	2,3,6	1.5-3.0	1.5	CL	CLAY TO SILTY CLAY; slightly fissile; low-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
2.0	-								
	-								
3.0	-	B-4-1-2	5,7,18	3.0-4.5	1.5	CL	CLAYEY SILT; some pebbles; subr; low-plastic; soft; moist; dk. reddish brown(5YR3/4).	bkgd	0
	-								
4.0	-								
	-	B-4-1-3	3,9,11	4.5-6.0	1.5	CL	CLAYEY SILT; low-plastic; soft; moist; dk. reddish brown(5YR3/4).	100	0
5.0	-								
	-								
6.0	-	B-4-1-4	3,7,8	6.0-7.5	1.5	CL	CLAYEY SILT; med-plastic; firm; moist; reddish brown(5YR4/4).	100	0
	-								
7.0	-								
	-	B-4-1-5	3,6,11	7.5-9.0	1.5	CL	SILTY CLAY; some ang. pebbles; med-plastic; soft; moist; reddish black(5YR4/4).	20	0
8.0	-								
	-								
9.0	-	B-4-1-6	10,21,13	9.0-10.5	0.3	CL	CLAYEY SILT TO SILTY CLAY; pebbles; <2mm; low-plastic; soft; moist; reddish brown(5YR4/4).	bkgd	0
	-								
	End of boring								

SOIL BORING LOG

B-6-1

LOCATION (NY. COORD.)
NORTHING : 1,135,250.916
EASTING : 406,671.829
SUPERVISORY GEOLOGIST : JOHN VANDERSLICE
LOG BOOK/PG. NO. : 2/110-116
DRILLING STARTED : 0935 hr/7-17-89
ABANDOMENT COMPLETED : 1115 hr/7-17-89
DRILLING CO. : EMPIRE SOILS
RIG TYPE : HOLLOW-STEM AUGER
DRILLER : A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-6-1-1	4,7,8	0.0-1.5	1.5	OL	ORGANIC SILT; some clay; trace sand; organic material; non-plastic; hard; dry; dk. red brown(5YR3/2).	bkgd	0
	-								
1.0	-								
	-	B-6-1-2	6,10,10	1.5-3.0	1.5	CL	SILTY CLAY TO CLAYEY SILT; oxidation and gray mottles; low-plastic; firm; dry; dk. yellow brown(10YR3/4).	bkgd	0
2.0	-								
	-								
3.0	-	B-6-1-3	4,7,11	3.0-4.5	1.5	CL	SILTY CLAY TO CLAYEY SILT; rock fragments; 1-3mm; very angular; low-plastic; firm; moist; red brown(5YR4/4).	bkgd	0
	-								
4.0	-								
	-	B-6-1-4	10,11,12	4.5-6.0	1.5	CL	CLAYEY SILT; dk. gray rock fragments; very angular; low-plastic; soft; moist; red brown(5YR4/3).	bkgd	0
5.0	-								
	-								
6.0	-	B-6-1-5	9,14,13	6.0-7.5	1.2	CL	CLAYEY SILT; dk. gray rock fragments; very angular; low-plastic; firm; wet; red brown(5YR4/4).	bkgd	0
	-								
7.0	-								
	-	B-6-1-6	2,8,10	7.5-9.0	1.0	CL	CLAYEY SILT; trace sand; some pebbles; subr; low-plastic; firm; wet; red brown(5YR4/3).	bkgd	0
8.0	-								
	-								
	End of boring								

SOIL BORING LOG

B-6-2

LOCATION (NY. COORD.)

NORTHING	:	1,135,644.506
EASTING	:	406,526.463
SUPERVISORY GEOLOGIST	:	JOHN VANDERSLICE
LOG BOOK/PG. NO.	:	2/101-108
DRILLING STARTED	:	1143 hr/7-14-89
ABANDOMENT COMPLETED	:	1310 hr/7-14-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-6-2-1	4,5,6	0.0-1.5	1.5	CL	SILTY CLAY TO CLAYEY SILT; non-plastic; hard; dry; dk. brown(7.5YR3/2).	bkgd	0
	-								
1.0	-								
	-	B-6-2-2	4,6,7	1.5-3.0	0.9	CL	CLAYEY SILT TO SILTY CLAY; slightly fissile; oxidation mottles; non-plastic; firm; dry; dk. brown(7.5YR3/2).	bkgd	0
2.0	-								
	-								
3.0	-	B-6-2-3	3,6,9	3.0-4.5	1.3	CL	CLAYEY SILT; gray laminations; oxidation mottles; small pebbles; subr; 1-3mm; non-plastic; firm; dry; dk. gray(10YR4/1).	bkgd	0
	-								
4.0	-								
	-	B-6-2-4	4,8,10	4.5-6.0	1.5	CL	SILTY CLAY; dk. green to black mottles; gray laminations; non-plastic; firm; dry; dk. gray brown(10YR4/2).	bkgd	0
5.0	-								
	-								
6.0	-	B-6-2-5	13,18,18	6.0-7.5	1.5	CL	CLAYEY SILT; trace sand; oxidation and gray mottles; med-plastic; firm; moist to wet in fractures; very dk. gray brown(10YR3/2).	bkgd	0
	-								
7.0	-								
	-	B-6-2-6	3,6,7	7.5-9.0	1.5	SM	SILTY SAND TO SANDY SILT; gray and red mottles; gray fractures; non-plastic; firm; moist; gray brown(10YR5/2).	bkgd	0
8.0	-								
	-								
9.0	-	B-6-2-7	33,16,100/.5'	9.0-10.5	1.5	CL	SILT; some fine sand; rock fragments and small pebbles; 1-4mm; subr to ang; high-plastic; soft; wet; brown(7.5YR4/4).		
	-								
10.0	-								
	-								
	End of boring								

SOIL BORING LOG

B-7-1

LOCATION (NY. COORD.)

NORTHING	:	1,134,187.636
EASTING	:	405,621.817
SUPERVISORY GEOLOGIST	:	JOHN VANDERSLICE
LOG BOOK/PG. NO.	:	2/91-100
DRILLING STARTED	:	0934 hr/7-14-89
ABANDOMENT COMPLETED	:	1026 hr/7-14-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)		LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-7-1-1	3,7,8	0.0-1.5	1.3	CL		SILTY CLAY; oxidation laminations; non-plastic; hard; dry; very dk. brown(10YR3/2).	bkgd	0
	-									
1.0	-									
	-	B-7-1-2	5,7,9	1.5-3.0	1.5	CL		SILTY CLAY; oxidation laminations; low-plastic; firm; dry; dk. brown(7.5YR3/4).	bkgd	0
2.0	-									
	-									
3.0	-	B-7-1-3	4,13,5	3.0-4.5	1.3	CL	0.0-0.9'	SILTY SAND; 1/16-1/8mm; subr to r; non-plastic; hard; dry; red gray(5YR4/2).	30	0
	-					CL	0.9-1.5'	CLAYEY SILT; non-plastic; hard ; dry; red gray(5YR4/2).		
4.0	-									
	-	B-7-1-4	7,100/.3'	4.5-6.0	1.5	CL	0.0-0.5'	CLAYEY SILT; low-plastic; firm; moist; very dk. brown(2.5YR3/2).	100	0
5.0	-					SM	0.5-1.0'	SILTY SAND; low-plastic; firm; moist; dk. brown(7.5YR3/2).		
	-					CL	1.0-1.5'	CLAYEY SILT; rock chips and small pebbles; very angular; low-plastic; frim; moist; very dk. brown(2.5YR3/2).		
6.0	-									
	End of boring									

SOIL BORING LOG

B-9-1

LOCATION (NY. COORD.)

NORTHING	:	1,134,022.901
EASTING	:	397,278.096
SUPERVISORY GEOLOGIST	:	JOHN VANDERSLICE
LOG BOOK/PG. NO.	:	2/82-88
DRILLING STARTED	:	1530 hr/7-13-89
ABANDOMENT COMPLETED	:	1700 hr/7-13-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-9-1-1	2,3,4	0.0-1.5	1.3	CL	CLAYEY SILT, trace organics; non-plastic; firm; dry; dk. brown(10YR3/2).	bkgd	0
	-								
1.0	-								
	-	B-9-1-2	2,4,6	1.5-3.0	1.1	CL	SILTY CLAY, trace small pebbles; mostly angular; low-plastic; firm; dry; slightly fissile; brown(7.5YR4/2).	bkgd	0
2.0	-								
	-								
3.0	-	B-9-1-3	6,12,15	3.0-4.5	1.3	CL	0.0-0.5' SILT; gray laminations; non-plastic; firm; dry; dk. brown(10YR3/2)	bkgd	0
	-					CL	0.5-1.5' SILTY CLAY; low-plastic; firm; dry; calcified veins; dk. brown(10YR3/2).		
4.0	-								
	-	B-9-1-4	6,11,13	4.5-6.0	1.3	CL	SILTY CLAY, trace sand<1/16mm; med-plastic; firm; dry; gray and red oxidation mottles; dk. brown(2.5YR4/2).	bkgd	0
5.0	-								
	-								
6.0	-	B-9-1-5	10,16,15	6.0-7.5	1.2	CL	CLAYEY SILT; calcified veins; high-plastic; soft; moist; dk. gray brown(2.5Y4/2).	bkgd	0
	-								
7.0	-								
	-	B-9-1-6	3,5,5	7.5-9.0	1.45	CL	CLAYEY SILT, some sand; rock fragments; very angular; high-plastic; very soft; moist to wet; dk. yellow brown(10YR4/4).	bkgd	0
8.0	-								
	-								
9.0	-	B-9-1-7	100/0.3"	9.0-10.5	0.6	CL	CLAY, some pebbles; med-plastic; firm; moist; dk. yellowish brown(10YR3/4).	bkgd	0
	-								
	End of boring								

SOIL BORING LOG

B-11-1

LOCATION (NY. COORD.)
NORTHING : 1,134,862.439
EASTING : 401,339.157
SUPERVISORY GEOLOGIST : STEVE KELLER
LOG BOOK/PG. NO. : 3/47-53
DRILLING STARTED : 1003 hr/7-13-89
ABANDOMENT COMPLETED : 1102 hr/7-13-89
DRILLING CO. : EMPIRE SOILS
RIG TYPE : HOLLOW-STEM AUGER
DRILLER : A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-11-1-1	3,3,3	0.0-1.5	1.0	CL	SILT; some clay; low-plastic; firm; dry; dk. yellowish brown(10YR4/6).	bkgd	0
	-								
1.0	-								
	-	B-11-1-2	2,4,5	1.5-3.0	1.4	CL	SILTY CLAY; gray and oxidation mottles; slightly fissile; med-plastic; firm; moist; strong brown(7.5YR4/6).	bkgd	0
2.0	-								
	-								
3.0	-	B-11-1-3	3,7,7	3.0-4.5	1.4	CL	SILTY CLAY; oxidation mottles; med-plastic; firm; moist; dk. yellowish brown(10YR5/4).	bkgd	0
	-								
4.0	-								
	-	B-11-1-4	3,5,9	4.5-6.0	1.5	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; yellowish brown(10YR5/4).	bkgd	0
5.0	-								
	-								
6.0	-	B-11-1-5	15,17,18	6.0-7.5	1.2	CL	CLAYEY SILT; some fine sand; subang. rock fragments; low-plastic; soft; wet; yellowish red(5YR4/6).	bkgd	0
	-								
7.0	-								
	-	B-11-1-6	4,6,7	7.5-9.0	0.4	CL	GRAVELLY CLAYEY SILT; subang. rock fragments; low-plastic; soft; wet; brown(7.5YR4/2).	bkgd	0
8.0	-								
	-								
9.0	-	B-11-1-7	2,5,5	9.0-10.5	1.0	CL	GRAVELLY CLAYEY SILT; subang. rock fragments; low-plastic; soft; wet; brown(7.5YR4/2).	bkgd	0
	-								
10.0	-								
	End of boring								

SOIL BORING LOG

B-11-2

LOCATION (NY. COORD.)

NORTHING	:	1,134,767.987
EASTING	:	401,335.109
SUPERVISORY GEOLOGIST	:	STEVE KELLER
LOG BOOK/PG. NO.	:	3/37-46
DRILLING STARTED	:	0839 hr/7-13-89
ABANDOMENT COMPLETED	:	0948 hr/7-13-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-11-2-1	2,3,4	0.0-1.5	1.1	CL	CLAY TO SILTY CLAY; oxidation mottles; med-plastic; firm; moist; yellowish brown(10YR5/4).	bkgd	0
1.0	-								
	-	B-11-2-2	2,4,5	1.5-3.0	1.4	CL	CLAY TO SILTY CLAY; oxidation mottles; med-plastic; firm; moist; brown(7.5YR5/2).	bkgd	0
2.0	-								
3.0	-	B-11-2-3	3,5,9	3.0-4.5	1.3	CL	SILTY CLAY; oxidation mottles; med-plastic; firm; moist; dk. yellowish brown(7.5YR4/4).	bkgd	0
4.0	-								
	-	B-11-2-4	6,8,12	4.5-6.0	1.2	CL	SILTY CLAY; slightly fissile; gray laminations; med-plastic; firm; moist; dk.brown(7.5YR4/4).	bkgd	0
5.0	-								
6.0	-	B-11-2-5	2,5,18	6.0-7.5	1.5	CL	SILTY CLAY; ang. rock fragments; med-plastic; firm; moist; yellowish red(5YR4/6).	bkgd	0
7.0	-								
	-	B-11-2-6	3,6,14	7.5-9.0	0.4	CL	CLAYEY SILT; low-plastic; soft; wet; yellowish red(5YR4/6).	bkgd	0
8.0	-								
9.0	-	B-11-2-7	15,19,19	10.5-12.0/FS	0.9	CL	CALYEY SILT; subr pebbles; low-plastic; soft; wet; yellowish red(5YR4/6).	bkgd	0
10.0	-								
	-	B-11-2-8	5,19,16	10.0-11.5	1.5	CL	CLAYEY SILT; subr pebbles; low-plastic; soft; wet; dk. reddish brown(5YR3/4).	bkgd	0
11.0	-								
	End of boring								

SOIL BORING LOG

B-12-1

LOCATION (NY. COORD.)

NORTHING	:	1,135,342.544
EASTING	:	403,772.183
SUPERVISORY GEOLOGIST	:	STEVE KELLER
LOG BOOK/PG. NO.	:	3/30-36
DRILLING STARTED	:	1120 hr/7-12-89
ABANDOMENT COMPLETED	:	1243 hr/7-12-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-12-1-1	4,18,6	0.0-1.5	1.0		ROAD FILL; rock fragments; silt;	bkgd	0
	-								
1.0	-								
	-	B-12-1-2	4,6,9	1.5-3.0	1.3	CL	CLAY TO SILTY CLAY; fissile; vertical fractures; med to high-plastic; firm; moist; dk. brown(10YR3/3).	bkgd	0
2.0	-								
	-								
3.0	-	B-12-1-3	4,8,14	3.0-4.5	1.5	CL	CLAY TO SILTY CLAY; med-plastic; firm; moist; dk. brown(10YR3/3).	50	0
	-								
4.0	-								
	-	B-12-1-4	4,8,9	4.5-6.0	0.8	CL	CLAY TO SILTY CLAY; red and gray mottles; slightly fissile; med-plastic; firm; moist; dk. redddish brown(2.5YR2.5/4).	100	0
5.0	-								
	-								
6.0	-	B-12-1-5	NR	6.0-7.5	1.0	CH	CLAY TO SILTY CLAY; med to high-plastic; firm; moist; dk. brown(7.5YR3/2).	750	0
	-								
7.0	-								
	-	B-12-1-6	3,6,8	7.5-9.0	0.2	CL	CLAY TO SILTY CLAY; oxidation laminations; fissile; med-plastic; firm; moist; brown(7.5YR4/2).	500	0
8.0	-								
	-								
9.0	-	B-12-1-7	3,4,5	9.0-10.5	1.3	CH	CLAY TO SILTY CLAY; slightly fissile; high-plastic; soft; moist brown(7.5YR3/4).	100	0
	-								
10.0	-								
	-	B-12-1-8	3,4,5	10.5-12.0	1.0	CH	CLAY; trace silt; high-plastic; soft; moist; brown(7.5YR4/2).	22	0
11.0	-								
	-								
	End of boring								

NR - Not Recorded

SOIL BORING LOG

B-12-2

LOCATION (NY. COORD.)
NORTHING : 1,135,297.242
EASTING : 403,808.412
SUPERVISORY GEOLOGIST : STEVE KELLER
LOG BOOK/PG. NO. : 3/23-29
DRILLING STARTED : 0920 hr/7-12-89
ABANDOMENT COMPLETED : 1020 hr/7-12-89
DRILLING CO. : EMPIRE SOILS
RIG TYPE : HOLLOW-STEM AUGER
DRILLER : A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	B-12-2-1	8,23,12	0.0-1.5	1.5	GW	ROCK FRAGMENTS; low-plastic; soft; dry; brown(7.5YR5/2)	bkgd	0
	-								
1.0	-								
	-	B-12-2-2	5,8,12	1.5-3.0	0.0		Sample not recovered.		
2.0	-								
	-								
3.0	-	B-12-2-3	5,18,15	3.0-4.5	1.5	CL	CLAY TO SILTY CLAY; oxidation mottles; med-plastic; firm; moist; brown(7.5YR4/2).	bkgd	0
	-								
4.0	-								
	-	B-12-2-4	5,12,13	4.5-6.0	1.3	CL	CLAY TO SILTY CLAY; some pebbles; gray mottles; med-plastic; soft; moist; dk. reddish brown(5YR3/2).	bkgd	0
5.0	-								
	-								
6.0	-	B-12-2-5	9,17,19	6.0-7.5	1.3	CL	CLAY TO SILTY CLAY; fissile; gray mottles; med-plastic; soft; moist; dk. reddish brown(5YR3/3).	bkgd	0
	-								
7.0	-								
	-	B-12-2-6	3,6,6	7.5-9.0	1.5	CL	CLAY TO SILTY CLAY; med-plastic; soft; moist; dk. reddish brown(5YR3/3).	bkgd	0
8.0	-								
	-								
9.0	-								
	End of boring								

SOIL BORING LOG

BB-1 (background)

LOCATION (NY. COORD.)

NORTHING	:	1,137,058.032
EASTING	:	402,912.864
SUPERVISORY GEOLOGIST	:	STEVE KELLER
LOG BOOK/PG. NO.	:	3/12-21
DRILLING STARTED	:	1300 hr/7-11-89
ABANDOMENT COMPLETED	:	1432 hr/7-11-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft. BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft. BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	BB-1-1	NR	0.0-1.5	0.5	OL	TOP SOIL; med-plastic; firm; dry; dk. brown(7.5YR3/4)	bkgd	0
	-								
1.0	-								
	-	BB-1-2	1,5,9	1.5-3.0	1.2	CL	CLAY; med-plastic; firm; moist; dk. yellowish brown(10YR3/4).	bkgd	0
2.0	-								
	-								
3.0	-	BB-1-3	4,6,10	3.0-4.5	1.1	CL	CLAY; slightly fissile; med-plastic; firm; moist; yellowish red(5YR4/6).	bkgd	0
	-								
4.0	-								
	-	BB-1-4	4,15,24	4.5-6.0	1.2	CL	CLAY; med-plastic; hard; moist; dk. reddish brown(5YR3/4).	bkgd	0
5.0	-								
	-								
6.0	-	BB-1-5	14,23,18	6.0-7.5	1.5	CL	CLAY, some pebbles; slightly fissile; low-plastic; firm; moist; yellowish brown(10YR5/6).	bkgd	0
	-								
7.0	-								
	-	BB-1-6	4,12,13	7.5-9.0	1.3	CL	CLAY, some pebbles; med-plastic; firm; moist; dk. yellowish brown(10YR3/6).	bkgd	0
8.0	-								
	-								
9.0	-	BB-1-7	4,8,8	9.0-10.5	1.5	CL	CLAY, some pebbles; med-plastic; firm; moist; dk. yellowish brown(10YR3/4).	bkgd	0
	-								
10.0	-								
	-	BB-1-8	7,8,8	10.5-12.0	1.5	CL	CLAY, some gypsum; med-plastic; soft; moist; dk. yellowish brown(10YR3/4).	bkgd	0
11.0	-								
	-								
12.0	-	BB-1-9	2,3,4	12.0-13.5	1.5	CL	CLAY, some fine sand; low-plastic; very soft; wet; dk. yellowish brown(10YR3/4).	bkgd	0
	-								
13.0	-								
	-								
	End of boring								

NR - Not Recorded

SOIL BORING LOG

BB-2 (background)

LOCATION (N[illegible]D.)		
NORTHING	:	1,136,313.806
EASTING	:	407,138.725
SUPERVISORY GEOLOGIST	:	STEVE KELLER
LOG BOOK/PG. NO.	:	3/2-11
DRILLING STARTED	:	0820 hr/7-11-89
ABANDOMENT COMPLETED	:	1111 hr/7-11-89
DRILLING CO.	:	EMPIRE SOILS
RIG TYPE	:	HOLLOW-STEM AUGER
DRILLER	:	A. KOSKE

DEPTH (ft.BLS)	LITHOLOGIC SYMBOLS	SAMPLE NUMBER	BLOW COUNT	SAMPLE INTERVAL (ft.BLS)	RECOVERY (ft.)	SOIL TYPE (USCS)	LITHOLOGIC DESCRIPTION	OVA (PPM)	LEL (%)
0.0	-	BB-2-1	2,4,4	0.0-1.5	1.5	OH	CLAY; high-plastic; firm; moist; dk. brown(10YR3/6).	bkgd	0
	-								
1.0	-								
	-	BB-2-2	3,6,12	1.5-3.0	1.5	OH	CLAY; trace organics; high-plastic; firm; moist; dk. brown(10YR3/6).	bkgd	0
2.0	-								
	-								
3.0	-	BB-2-3	5,7,11	3.0-4.5	1.5	CH	CLAY; trace lt. gray and red mottles; high-plastic; firm; moist; brown(10YR5/3).	bkgd	0
	-								
4.0	-								
	-	BB-2-4	4,15,24	4.5-6.0	1.5	CL	CLAY TO SILTY CLAY; trace rock pebbles; trace organic and oxidation mottles; med-plastic; hard; moist; dk. brown(7.5YR3/4).	bkgd	0
5.0	-								
	-								
6.0	-	BB-2-5	24,40,33	6.0-7.5	1.5	CL	CLAY TO SILTY CLAY; ang. dolomite fragments; trace oxidation mottles; med-plastic; hard; moist; dk. brown(7.5YR3/4).	bkgd	0
	-								
7.0	-								
	-	BB-2-6	6,18,17	7.5-9.0	1.3	CH	CLAY; subr dolomite pebbles; gray laminations; med-plastic; firm; moist; dk. brown(7.5YR3/4).	bkgd	0
8.0	-								
	-								
9.0	-	BB-2-7	3,6,5	9.0-10.5	1.5	CH	CLAY; high-plastic; firm; moist; trace oxidation mottles; 9.0-10.0' dk. brown(7.5YR3/4). 10.0-10.5' reddish gray(5YR5/2).	bkgd	0
	-								
10.0	-								
	-	BB-2-8	2,4,5	10.5-12.0	1.5	CH	CLAY; high-plastic; firm; moist; dk. reddish gray(5YR4/2).	bkgd	0
11.0	-								
	-								
12.0	-	BB-2-9	2,18,100/2"	12.0-13.5	1.2	CH	CLAY; some sand; high-plastic; soft; wet; dk. reddish brown(5YR4/2).	bkgd	0
	-								
13.0	-								
	-								

End of boring

APPENDIX D

Raw Field Data

Well Development Forms
Water Level Measurement Forms
Discharge Measurements
Soil Gas & Headspace Analytical Data

WELL DEVELOPMENT FORMS

SAIC® An Employee-Owned Company

Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP RI/FS
Well Number and Location: MW-1-6 SITE 6
Development Crew: JOHN CARTER Driller (if applicable): -N/A-
Water Levels/Time: Initial: *7.95 /1011 Pumping: Final:
Total Well Depth: Initial: 5.78 'BLS Final: —
Date and Time: Begin: 8/9/89 1015 Completed: 8/9/89 1021
Development: Method(s): HAND BAILED DRY

Total Quantity of Water Removed: 0.50 gals

* FT BELOW TOP OF CASING

Date/Time and Pump Setting 8/9/89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production) VOLUME BAILED
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1017	BAIL DRY	14°C	1960	6.68	VERY CLEAR	.25 GAL
1021	↓				VERY CLEAR	.50 GAL
						NO SAND PRESENT.

Copy

*gallons per minute or bailer capacity

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White: File Pink: Field Manager Yellow: Supervisory Geologist Goldenrod: Field Book

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 1-7

Development Crew: Lamb / Arthur Driller (if applicable): Empire

Water Levels/Time: Initial: 6.42' BTOC Pumping: ______ Final: 12.2' BTOC

Total Well Depth: Initial: ______ Final: ______

Date and Time: Begin: 7/25/89 -1012 Completed: 8/9/89 - 1609

Development: Method(s): SURGE for 20 minutes, bail dry

Total Quantity of Water Removed: 16.75 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	volume ~~pe~~ removed
7/25 1012		14	8000	7.86	v. muddy	2
1027	bail	17.5	10570	8.01	v. muddy	2 (dry)
7/25 1511		14	6280	7.44	v. muddy	.5
1522		—	—	—	—	1.5
7/26 1445		14	4080	6.8	lt. muddy	.5
1500		16	7260	7.8	"	3.0
7/27 1017		14	3620	7.00	cldy brown	.5
1023		13	4760	7.12	"	2.5
7/27 1537		14	3590	6.95	v. cloudy brown	.5
1543		14	—			2.0
8/9 1027		9	2860	7.2	v. cldy dark brown	.25
1608		9	2960	7.04	cldy. brown	.25
1609		9				1.25

*gallons per minute or bailer capacity

16.75 gal.

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Well Development Form

(Field Sheet)

Project Name and Number: Niagara Falls IAP; RI/FS 1-835-06-858-10

Well Number and Location: MW 1-3D Site 1

Development Crew: J. Carter / J. Vanderslice Driller (if applicable): — NA —

Water Levels/Time: Initial: *7.32' / 0925 Pumping: ______ Final: *9.55 / 1006

Total Well Depth: Initial: 34.1' BLS Final: ——

Date and Time: Begin: 0837 / 8-25-89 Completed: 1001 / 8-25-89

Development: Method(s): 1-7" PVC Hand Pump; well surged from 20 min prior to pumping

Total Quantity of Water Removed: 100 gals

* Feet below top of Casing

Date/Time and Pump Setting 8-25-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
0932	13.5	~3 gal/min	3090	6.47	Clear	No Sand produce
0940	11		3140	6.52	"	
0945	14.0		3180	6.56	"	
0950	13.5		3080	6.55	"	
0956	14.0		3170	6.57	"	
1001	14.0		3170	6.57	"	
		graduated bucket				
Pumpset 3' off the Bottom of the well						

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: Niagara Falls IAP; RI/FS

Well Number and Location: MW 1-4D Site 1

Development Crew: J. Carter/J. Vanderslice Driller (if applicable): — N/A —

Water Levels/Time: Initial: *11.54/1030 Pumping: ________ Final: *13.28/1230

Total Well Depth: Initial: 45.95' BLS Final: ——

Date and Time: Begin: 8-25-89 / 1045 Completed: 8-25-89 / 1215

Development: Method(s): 1.7" Hand pump ; Surged well for 30 min Prior to pumping

Total Quantity of Water Removed: 85 gals

*Feet below top of Casing

Date/Time and Pump Setting 8-25-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1140	~2.5 gal/min	14	1620	6.58	Cldy	H_2S odor at top of well.
1143			1580	6.64	Sl cldy	
1148			1590	6.68	"	
1152			1650	6.66	v. sl. cldy	
1155			1620	6.67	Clear	
1200			1590	6.67	"	
1205			1620	6.67	"	
1210			1580	6.66	"	
1215	graduated Bucket		1620	6.67	"	
Set pump 3' ft from bottom of well casing						

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP RI/FS

Well Number and Location: MW-2-4 SITE 2

Development Crew: JOHN CARTER Driller (if applicable): -N/A-

Water Levels/Time: Initial: * 5.95/ Pumping: Final:

Total Well Depth: Initial: 5.33' BLS Final: —

Date and Time: Begin: 8/9/89 1031 Completed: 8/9/89 1037

Development: Method(s): HAND BAIL

Total Quantity of Water Removed: 1.0 gals

* FT. BELOW TOP OF CASING

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
8/9/89						VOLUME BAILED
1031	BAILED DRY	13.5°C	1960	6.92	CLEAR LT. BRN	.25 gAL
1037						1.0 gAL
						NO SAND

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP -1-835-06-858-10

Well Number and Location: MW 3-7

Development Crew: LAMB / ARTHUR Driller (if applicable): EMPIRE

Water Levels/Time: Initial: 6.62' BTOC Pumping: ______ Final: 7.20' BTOC

Total Well Depth: Initial: ______ Final: ______

Date and Time: Begin: 7/28/89 - 1025 Completed: 8/9/89 - 1057

Development: Method(s): SURGE & BAIL DRY

Total Quantity of Water Removed: 1.2 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/28 1047	Bail	19	8020	7.41	muddy	0.75
7/28 1539		20	5500	7.06	cloudy	0.10
8/5 1141		21	5600	7.11	cloudy	0.25
8/9 1057		18	4070	6.87	clear	0.10

*gallons per minute or bailer capacity

1.20 gallon

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Well Development Form

(Field Sheet)

Project Name and Number: Niagara Falls IAP RI/FS 1-835-06-858-10

Well Number and Location: MW 3-2D

Development Crew: John Vanderslice Driller (if applicable): -NA-

Water Levels/Time: Initial: *10.70'/1019 Pumping: ______ Final: *10.79'/1507

Total Well Depth: Initial: 34.8' BLS Final: —

Date and Time: Begin: 8-23-89 1019 Completed: 8-23-89 1456

Development: Method(s): 1.7" Hand Pump; Well Surged for 20min prior to Pumping

Total Quantity of Water Removed: 100 gals

*Below top of Casing

Date/Time and Pump Setting 8-23-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1407	~2 gal/min	13.0	1920	6.83	Clear	Very fine produce at the begining of pumping
1421		13.5	1780	6.85	"	
1431		13.0	1840	7.02	"	
1439		13.0	1800	6.99	"	
1447		13.0	1810	7.07	"	
1456		13.0	1810	7.02	"	
pump set 3' from bottom of well casing	graduated bucket					

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW-3-3D

Development Crew: Keim / Stock Driller (if applicable): Empire

Water Levels/Time: Initial: 1.73' BTOC Pumping: 13.7' BTOC Final: 1.80' BTOC

Total Well Depth: Initial: 34.7' BTOC Final: —

Date and Time: Begin: 8/18/89 – 0847 Completed: 8/18/89 – 1115

Development: Method(s): Surge for 30 minutes; Purge 150 gallons with hand pump

Total Quantity of Water Removed: 150 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	Volume pumped
0952	2 gpm	15	2000	6.92	sl. cloudy	15
1002		15	1690	6.98	"	25
1016		15	1730	6.93	Clear	45
1025		15.5	1750	6.95	"	60
1032		15	1720	6.95	"	75
1038		15	1730	6.95	"	90
1044		15	1730	7.00	"	105
1055		15	1740	7.00	"	120
1115		15	1740	7.00	"	150

*gallons per minute or bailer capacity

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Well Development Form
(Field Sheet)

Project Name and Number: Niagara Falls IAP RI/FS 1-835-06-858-10

Well Number and Location: MW 3-9D Site 3

Development Crew: John Vanderslice Driller (if applicable): N/A

Water Levels/Time: Initial: *1.58'/0908 Pumping: Final: *1.78'/1141

Total Well Depth: Initial: 29.0' BLS Final: ——

Date and Time: Begin: 8-22-89/1002 Completed: 1127/8-22-89

Development: Method(s): 1.7" Hand Pump, a set of Arms and a Soar back; Well surged for 20 min Prior to Pumping

Total Quantity of Water Removed: 160 gals

* Ft. below Top of Casing

Date/Time and Pump Setting 8-22-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1002	~2gpm	14.5	1520	6.90	Sl. cldy	~21 gal
1017		15.0	1420	6.91	V. Sl. cldy	~44 gal
1032			1400	6.90	"	~56 gal
1046			1430	7.00	Clear	~75 gal
1100			1420	7.10	"	~105 gal
1113			1450	7.10	"	~128 gal
1127		15.0	1450	7.10	"	~160 gal
	graduated bucket					Very little Sand Produce during development
Pumped set 2' off bottom off Well Casing						

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP RI/FS

Well Number and Location: ~~MW 4-4~~ EGS. MW-4-4 SITE 4

Development Crew: JOHN CARTER Driller (if applicable): -N/A-

Water Levels/Time: Initial: *8.62/1045 Pumping: Final:

Total Well Depth: Initial: 9.96' BLS Final: —

Date and Time: Begin: 8/9/89 1052 Completed: 8/9/89 1104

Development: Method(s): HAND BAIL; 20 MIN. SURGE PRIOR TO BAILING.

Total Quantity of Water Removed: 3.50 gals

* FT. BELOW TOP OF CASING

Date/Time and Pump Setting 8-9-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production) VOLUME BAILED
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1059	BAILED	13 °C	3010	7.00	BROWN MURKY	2 gal.
1104	DRY ↓				BROWN/MURKY	3.5 gal
						MINOR SAND ACCUMULATED IN BUCKET

*gallons per minute or bailer capacity

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Well Development Form
(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-838-06-858-10
Well Number and Location: MW 5-5
Development Crew: LAMB / ARTHUR Driller (if applicable): EMPIRE
Water Levels/Time: Initial: 13.44 Pumping: Final: 14.02
Total Well Depth: Initial: 17.58 BTOC Final:
Date and Time: Begin: 7/28/89 - 1327 Completed: 8/1/89 - 1638
Development: Method(s): SURGE & BAIL DRY

Total Quantity of Water Removed: 5 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/28 1352	Bail	15	6310	7.15	v. muddy	.25
1409		14	5580	7.33	"	3.25
8/1 1638		20.05	5430	7.16	v. muddy	1.5

*gallons per minute or bailer capacity

5 gallons

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Well Development Form

(Field Sheet)

Project Name and Number: Niagara Falls IAP RI/FS 1-835-06-858-10

Well Number and Location: MW 5-1D Site 5

Development Crew: J.Carter / J. Vanderslice Driller (if applicable): — N/A —

Water Levels/Time: Initial: *14.76/ 1525 Pumping: ______ Final: 14.95/1610

Total Well Depth: Initial: 35.4'BLS Final: —

Date and Time: Begin: 8-25-89 1530 Completed: 8-25-89 1605

Development: Method(s): 1.7" Hand Pump; 20 min surge prior to pumping

Total Quantity of Water Removed: 130 gals

*Feet below top of Casing

Date/Time and Pump Setting 8-25-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1530	~4gal/min	13.5	1810	6.75	cldy	little sand
1535		"	1820	"	Sl cldy	production
1540		"	1800	6.78	"	
1545		"	1750	6.76	"	
1550		"	1770	6.72	V.Sl.cldy	
1555		13.0	1760	6.74	"	
1600		"	1770	6.75	"	
1605		"	1790	6.78	Clear	
Set 3' from Botom of well Casing	graduated Bucket					

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 8-5

Development Crew: LAMB/ARTHUR Driller (if applicable): EMPIRE

Water Levels/Time: Initial: 10.86' BTOC Pumping: _____ Final: Dry

Total Well Depth: Initial: 14.85' BTOC Final: _____

Date and Time: Begin: 8/1/89 - 0948 Completed: 8/1/89 - 1034

Development: Method(s): SURGE & PURGE DRY

Total Quantity of Water Removed: 4.5 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
8/1 1013	Bail	16.5	4110	7.15	v. muddy	0.25
1023	|	15.5	3610	7.19	"	3.25
1034	|	—	—	—	—	1.0

*gallons per minute or bailer capacity

4.50 gallons

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 8-6

Development Crew: LAMB / ARTHUR Driller (if applicable): EMPIRE

Water Levels/Time: Initial: 12.72' BTOC Pumping: ____ Final: 12.93' BTOC

Total Well Depth: Initial: ____ Final: ____

Date and Time: Begin: 7/26/89 - 1323 Completed: 7/28/89 - 1301

Development: Method(s): SURGE & HAND BAIL DRY

Total Quantity of Water Removed: 7.5 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/26 1405	BAIL	13	13890	6.9	lt. muddy	3.0
7/27 0906		14	1180	6.99	cloudy	0.5
0914		14	1459	7.23	"	1.5
7/27 1418		14	1440	6.79	sl. cloudy	0.50
7/28 1301		12.5	5350	7.04	sl. cloudy	2.00

*gallons per minute or bailer capacity

7.5 gallons

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Well Development Form
(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10
Well Number and Location: MW-8-1D
Development Crew: Keim / Stook Driller (if applicable): Empire
Water Levels/Time: Initial: 13.14' BTOC Pumping: Final: 13.17' BTOC
Total Well Depth: Initial: Final:
Date and Time: Begin: 8/16/89 - 1405 Completed: 8/16/89 - 1540
Development: Method(s): SURGE - 30 minutes; purge 160 gallons with hand pump
Total Quantity of Water Removed: 160 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	vol. pumped
1445	3 gpm	13	1970	7.07	Clear	15
1452		13	1830	7.07		30
1458		13	1890	6.99		50
1503		13	1840	7.14		65
1512		13	1840	7.16		80
1517		13	1860	7.08		100
1523		13	1830	7.15		115
1528		13	1820	7.14		130
1537		13	1820	7.14		160

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP RI/FS

Well Number and Location: MW-8-2D SITE 8

Development Crew: L. LAMB/C. ARTHUR Driller (if applicable): -NA-

Water Levels/Time: Initial: *13.1 / 1140 Pumping: ______ Final: ______

Total Well Depth: Initial: 28.28 BLS Final: ______

Date and Time: Begin: 8/11/89 1140 Completed: 8/11/89 1402

Development: Method(s): 1.7" HAND PUMP; 20 MIN. SURGE PRIOR TO PUMPING.

Total Quantity of Water Removed: 167.0 gals

* FT. BELOW TOP OF CASING.

Date/Time and Pump Setting 8/11/89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1140	~3 gal/min	10.5	2080	6.84	SL. BRN. CLOUDY	MINOR SAND PRODUCED DURING DEVELOPING.
1157	↓	10.0	2110	6.75	SL. BRN. CLOUDY	
1319		13.0	2130	6.76	V. SL. CLOUDY	
1329		10.0	2020	6.87	CLEAR	
1339		9.0	2000	6.88	CLEAR	
1349		9.0	2040	6.86	CLEAR	
1354		10.0	1940	6.85	CLEAR	
1402	GRADUATED BUCKET	9.0	2040	6.87	CLEAR.	

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 80-3D

Development Crew: Stook / Keim / Carter Driller (if applicable):

Water Levels/Time: Initial: 13.88' BTOC Pumping: Final: 13.88' BTOC

Total Well Depth: Initial: Final:

Date and Time: Begin: 8/15 - 0835 Completed: 1100

Development: Method(s): surged for 40 minutes then purged with hand pump.

Total Quantity of Water Removed: 150 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production) volume pumped
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1010	~3gpm	13	2590	7.11	Clear	20 gal
1016	"	13	2340	7.06	"	35
1023	"	13	2350	7.07	"	55
1029	"	13	2350	7.11	"	75
1034	"	14	2360	7.10	"	90
1041	"	13	2360	7.11	"	110
1047	"	13	2360	7.11	"	125
1056	"	13	2360	7.12	"	150

*gallons per minute or bailer capacity

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Well Development Form
(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP RI/FS

Well Number and Location: MW-9-5 SITE 9

Development Crew: L. LAMB / C. ARTHUR Driller (if applicable): -N/A-

Water Levels/Time: Initial: *6.19 / 1419 Pumping: ________ Final: ________

Total Well Depth: Initial: 8.41' BLS Final: —

Date and Time: Begin: 8/2/89 1447 Completed: 8/2/89 1455

Development: Method(s): SURGE & BAIL DRY; 20 MIN SURGE PRIOR TO BAILING

Total Quantity of Water Removed: 3.50 gals

*ft. BELOW TOP OF CASING

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
8-2-89						VOLUME BAILED
1447	BAIL DRY	16°	1156	7.03	V. SL. CLOUDY	0.2 GAL
1455	↓					3.3 GAL

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: Niagara Falls IAP RI/FS

Well Number and Location: MW-9-6 SITE 9

Development Crew: L. LAMB/C. ARTHUR Driller (if applicable): -N/A-

Water Levels/Time: Initial: 6.84' BTOC Pumping: Final:

Total Well Depth: Initial: 10.56' BTOC Final: —

Date and Time: Begin: 8-2-89 1154 Completed: 8-2-89 1207

Development: Method(s): SURGE & BAIL DRY; 20 MIN SURGE PRIOR TO BAILING

Total Quantity of Water Removed: 3.0 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
8-2-89						VOLUME BAILED
1154	BAIL DRY	16°	8960	7.02	V. Sl. Cloudy	0.25 gal
1206						2.75 gal
1207						3.0 gal

*gallons per minute or bailer capacity

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Well Development Form
(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 9-7

Development Crew: LAMB/ARTHUR Driller (if applicable): EMPIRE

Water Levels/Time: Initial: 6.54' BTOC Pumping: ______ Final: 7.3' BTOC

Total Well Depth: Initial: 12.73' BTOC Final: ______

Date and Time: Begin: 7/28/89 - 1457 Completed: 8/10/89 - 1424

Development: Method(s): SURGE & BAIL DRY

Total Quantity of Water Removed: 18.5 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/28 1521	Bail	15.5	9660	7.01	sl. muddy	0.5
1530		14.5	9720	7.18	"	5.5
8/1 1053		17	6640	6.99	sl. muddy	5.0
8/4 0928		16.5	4830	6.9	sl. muddy	3.5
8/10 1424		15	4180	6.8	sl. cloudy	4.0

*gallons per minute or bailer capacity

18.5 gal

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Well Development Form
(Field Sheet)

Project Name and Number: Niagara Falls IAP;RI/FS

Well Number and Location: MW 10-1D Site 10

Development Crew: J.King / C. Arthur Driller (if applicable): — NA —

Water Levels/Time: Initial: * 6.80/1145 Pumping: ______ Final: *

Total Well Depth: Initial: 35.15' BLS Final: ——

Date and Time: Begin: 8-8-89 / 1151 Completed: 8-8-89 / 1509

Development: Method(s): 1.7" Hand pump; 20min. Surge prior to pumping.

Total Quantity of Water Removed: 100 gals

* feet below top of casing

Date/Time and Pump Setting 8-8-89	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
1202	2 gal/min	14.7	2070	7.00	Cldy	H_2S odor at top of well
1402	1.5 gal/min	14.4	1600	6.81	cldy	
1422	2 gal/min	12.2	1562	6.85	"	
1449	2 gal/min	17.2	1730	6.95	"	
1509	2 gal/min	12.8	1870	6.94	"	
	graduated Bucket					
Pump set 3' off bottom of well						

*gallons per minute or bailer capacity

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 10-4

Development Crew: LAMB / ARTHUR Driller (if applicable): EMPIRE

Water Levels/Time: Initial: ~~2~~ 6.42' BTOC Pumping: ____ Final: 6.24' BTOC

Total Well Depth: Initial: ____ Final: ____

Date and Time: Begin: 7/25/89 - 1342 Completed: 9/28/89 ~ 0956

Development: Method(s): SURGE & BAIL DRY

Total Quantity of Water Removed: 17 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/25 1404	BAIL	18	10990	7.34	v. muddy	.5
1414		18	10160	7.35	"	4.0
7/26 1126		16	5320	6.9	lt. muddy	3.0
7/27 0946		16	3480	6.74	sl. muddy	.25
0953		16	3770	6.87	"	2.75
7/27 1456		15	2580	6.65	cloudy	.25
1501		15	2250	6.68	muddy	3.25
7/28 0947		15	1760	7.00	v. cloudy	3.0

*gallons per minute or bailer capacity

17 gallons

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 13-1

Development Crew: Lamb/Arthur Driller (if applicable): Empire

Water Levels/Time: Initial: 8.75' BTOC Pumping: ______ Final: 9.42' BTOC

Total Well Depth: Initial: ______ Final: ______

Date and Time: Begin: 7/25/89-1121 Completed: 7/27/89-1614

Development: Method(s): Surge for 20 minutes; bail dry

Total Quantity of Water Removed: 5.2 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production) volume removed
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/25 1121		19	9950	7.45	v. muddy brown	0.5
1131		21.5	9460	7.39		1.5
7/26 1522		17	7120	7.1	muddy med. brown	0.5
1527		17	6110	7.0		1.0
7/27 1057		17	5090	6.82	muddy brown	0.2
1102		—				1.0
7/27 1609		16	4530	6.75	cloudy brown	0.2
1614		—	—	—		0.3

*gallons per minute or bailer capacity

5.2 gal

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW 13-2

Development Crew: Lamb / Arthur Driller (if applicable): Empire

Water Levels/Time: Initial: 9.10' BTOC Pumping: ________ Final: 9.63

Total Well Depth: Initial: 10.12 Final: ________

Date and Time: Begin: 7/25/89 - 1104 Completed: 7/28/89 - 0855

Development: Method(s): Surged & hand bail dry

Total Quantity of Water Removed: 2.65 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	
7/25 1127	bail	21.5	13760	7.42	v. muddy brown	0.5
7/25 1620 1624		21.5 —	9810 —	7.65 —	sl. muddy brown	0.2 0.3
7/26 1545 1552		18 —	1640 —	7.5 —	muddy med. brown	0.20 0.05
7/27 1124		19	10920	7.18	muddy brown	0.2
7/27 —						
7/28 0855		17	8810	7.51	sl. muddy brown	.1 .1

*gallons per minute or bailer capacity

2.65

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10
Well Number and Location: MW 13-3
Development Crew: LAMB/ARTHUR Driller (if applicable): EMPIRE
Water Levels/Time: Initial: 6.65' BTOC Pumping: Final: 8.88' BTOC
Total Well Depth: Initial: Final:
Date and Time: Begin: 7/25/89 - 1156 Completed: 7/28/89 - 0927
Development: Method(s): SURGE + BAIL DRY

Total Quantity of Water Removed: 3.7 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	vol.
7/25 1223	BAIL	24	18520	7.4	v. muddy	1.5 H_2S smell
7/26 1009		24.5	14730	7.0	v. muddy	0.5
7/26 1654		18	13830	7.3	lt. brown	0.5
7/27 1158		18	12140	7.01	brown cloudy	1.0
7/28 0927		17	7630	7.17	sl. cloudy	0.2

*gallons per minute or bailer capacity

3.7 gallons

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Well Development Form

(Field Sheet)

Project Name and Number: NIAGARA FALLS IAP 1-835-06-858-10

Well Number and Location: MW B-4

Development Crew: LAMB / ARTHR Driller (if applicable): EMPIRE

Water Levels/Time: Initial: 8.81'BTOC Pumping: ____ Final: 9.81'BTOC

Total Well Depth: Initial: ____ Final: ____

Date and Time: Begin: 7/25/89 - 1256 Completed: 7/28/89 - 0911

Development: Method(s): SURGE & HAND BAIL DRY

Total Quantity of Water Removed: 4.0 gals

Date/Time and Pump Setting	Discharge Rate* and Measurement Method	Field Measurements				Remarks (Including Sand Production)
		Temp (°C)	Specific Conductivity (umhos/cm)	pH (Standard Units)	Turbidity	volume
7/25 1217	BAIL	20.5	10950	6.9	v. muddy	1.5
7/26 1630		18	6440	7.2	v. muddy	1.0
7/27 1218		18	7120	6.80	muddy	1.0
7/27 —						
7/28 0911		17	6060	7.21	lt. brown	0.5

*gallons per minute or bailer capacity

4 gal

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Water Level Measurements

(Field Sheet)

Measurement Team: John King / John Vanderslice

Project Number and Location: Niagara Falls IAP.RI/FS
1-835-06-858-10

Measuring Method: Electronic well sounder

Measuring Point: Notch on top of PVC Casing

Well No.	Date	Time	Tape Reading		BTOC Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw 3-6	5-31-89	1326	Notch		5.28	
mw 3-1		1333			5.06	measurement of Stage one wells only
mw 3-5		1343			3.55	
mw 3D-1		1349			3.22	
mw 3-4		1356			2.95	
mw 3-3		1403			4.17	
mw 3-2		1410			5.92	
mw 1D-1		1424			10.56	
mw 4-3		1433			7.22	
mw 4-2		1436			6.81	
mw 4-1		1440			7.75	
mw 2D-1		1446			5.67	
mw 6-2		1455			5.56	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.

Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)

Remarks: Any conditions that may influence the water level measurements.

Disclaimer

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Water Level Measurements
(Field Sheet)

Measurement Team: John King / John Vanderslice

Project Number and Location: Niagara Falls IAP RI/FS
1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		BTOC Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw 10-3	5-31-89	1641	Notch	~~4.90~~	4.98	
mw ~~8-3~~ 10-2		1646			5.60	
mw ~~8-4~~ 10-1		1651			4.81	
mw ~~8-1~~ 8-3		1709			8.49	
mw 8-4		1717			10.27	
mw 8-1		1720			9.46	
mw 5-2		1729			7.69	
mw 5-4		1734			8.41	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements

(Field Sheet)

Measurement Team: John King / John Vanderslice

Project Number and Location: Niagara Falls IAP RI/FS
1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw 6-3	5-31-89	1458	Notch	~~6.09~~	6.09	
mw 6-1		1506			4.31	measurement of stage one wells only
mw 2-1		1509			4.52	
mw 2-3		1516			3.56	
mw 2-2		1520			5.30	
mw 1-1		1547			7.36	
mw 1-4		1554			5.00	
mw 1-3		1602			4.80	
mw 1-2		1605			4.46	
mw 1D-2		1608			3.81	
mw 1-5		1613			4.29	
mw 7-1		1627			5.20	
mw 7-2		1630			4.76	
mw 7-3		1633			8.62	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements

(Field Sheet)

Measurement Team: John J King

Project Number and Location: Niagara Falls IAP RI/FS
1-835-06-858-XX

Measuring Method: Tape and Popper

Measuring Point: Notch in riser pipe

Well No.	Date	Time	Tape Reading		BTOC Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
MW13-1	9-12-89	1027	Notch		9.62	
MW13-2	9-12-89	1039	"		10.21	Hitting soft sandy bottom
MW13-3	9-12-89	1044	"		8.15	" " " "
MW13-4	9-12-89	1051	"		9.26	" " " "
MW8-1	9-12-89	1126	"		11.71	
MW8-3	9-12-89	1135	"		12.65	
MW8-4	9-12-89	1145	"		14.38	
MW8-2D	9-12-89	1153	"		14.16	
MW8-6	9-12-89	1203	"		14.66	
MW8-3D	9-12-89	1217	"		14.70	
MW8-5	9-12-89	1400	"		13.52	
MW8-1D	9-12-89	1350	"		13.74	
MW5-2	9-12-89	1408	"		13.45'	
MW5-4	9-12-89	1414	"		14.19	
MW5-5	9-12-89	1426	"		15.20	
MW5-1D	9-12-89	1431	"		15.19	
MW9-3	9-12-89	1459	"		7.16	
MW9-7	9-12-89	1504	"		7.00	
MW9-6	9-12-89	1511	"		6.37	
MW9-5	9-12-89	1519	"		7.48	
MW9-4	9-12-89	1525	"		7.33	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.

Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)

Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements

(Field Sheet)

Measurement Team: J.R. CARTER IV

Project Number and Location: 1-835-06-858-xx, NIAGARA FALLS IAP

Measuring Method: ELECTRONIC WELL SOUNDER

Measuring Point: TOP OF PVC CASING (TOC) - NOTCH

Well No.	Date	Time	Tape Reading		Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
2-2	9/12/89	1440	TOC	8.13		NEEDS WEEP HOLE
2-3		1445		9.69		NEEDS WEEP HOLE
2-1		1450		7.17		NEEDS WEEP HOLE
6-1		1457		9.68		NEEDS WEEP HOLE
6-3		1500		7.05		NEEDS WEEP HOLE
6-2		1504		7.16		NEEDS WEEP HOLE
4-1		1512		9.01		" " "
4-2		1517		8.41		" " "
4-3		1522		8.8		" " "
4-4		1527		8.81		
1-1		1534		8.59		NEEDS WEEP HOLE
1-3D		1535		7.6		

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.

Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)

Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements

(Field Sheet)

Measurement Team: J.R. CARTER III

Project Number and Location: 1-835-06-858-XX ; NIAGARA FALLS IAP

Measuring Method: ELECTRONIC WELL SOUNDER

Measuring Point: TOP OF PVC CASING (TOC) - NOTCH

Well No.	Date	Time	Tape Reading		Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
3-7	9/12/89	1127	TOC	7.33		
3-3D		1134	TOC	1.92		
1-4		1145		—		UNSAMPLEABLE (DESTROYED)
1-6		1153		8.11		
1-4D		1155		12.42		
1-5		1200		5.44		NEEDS WEEP HOLE
1-D2		1205		5.59		NEEDS WEEP HOLE
1-2		1206		4.5		NEEDS LOCKING CASING CAP, WEEP HOLE (1.2 S.i
1-3		1210		6.34		NEEDS WEEP HOLE
2D-1		1425		8.7		NEEDS WEEP HOLE
2-4		1430		9.16		NEEDS BETTER NOTCH

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.

Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)

Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements

(Field Sheet)

Measurement Team: J.R. CARTER III

Project Number and Location: 1-835-06-558-XX; NIAGARA FALLS IAP

Measuring Method: ELECTRONIC WELL SOUNDER

Measuring Point: TOP OF PVC CASING (TOC) - NOTCH

Well No.	Date	Time	Tape Reading		Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
3D-1	9/12/89	1020	TOC	4.54		
3-5		1024	Stickup [illegible] ALS	4.24		NEEDS LOCKING CASING CAP, WEEP HOLE
3-4		1029	Stickup [illegible] AGS	2.88		NEEDS LOCKING CASING CAP, WEEP HOLE
3-4D		1031		1.73		
3-3		1036		5.99		NEEDS WEEP HOLE
3-2		1043	Stickup [illegible]' ALS	7.38		NEEDS LOCKING CASING CAP, WEEP HOLE
3-2D		1047		10.88		
3-1		1054		7.68		NEEDS WEEP HOLE
1-7		1107		11.6		NEEDS NOTCH
1D-1		1111		11.75		NEEDS WEEP HOLE
3-6		1117	Stickup 1.90' ALS	6.7		NEEDS LOCKING CASING CAP, WEEP HOLE

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

Disclaimer

Data entered on this form were obtained during field activities. All entries are preliminary in nature, do not represent SAIC's final assessment, and may be subject to revision.

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Water Level Measurements

(Field Sheet)

Measurement Team: J.R. CARTER III

Project Number and Location: 1835-06-858-xx, NIAGARA FALLS IAP

Measuring Method: ELECTRONIC WELL SOUNDER

Measuring Point: TOP OF PVC WELL CASING (TOC) - NOTCH

Well No.	Date	Time	Tape Reading		Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
10-2	9/12/89	1611	TOC	8.2		NEEDS WEEP HOLE
10-4		1612		7.51		
10-1D		1613		7.66		
10-1		1620		7.6		NEEDS WEEP HOLE
10-3		1623		7.74		NEEDS WEEP HOLE
7-1		1630		7.96		" " "
7-2		1633		8.42		" " "
7-3		1635		9.48		

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.

Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)

Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements
(Field Sheet)

Measurement Team: Rich Stook / John King

Project Number and Location: Niagara Falls IAP; RI/FS
1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		BToc Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw 9-3	10-4-89	0953	Notch		7.61	
mw 9-4	↓	1008	↓		7.80	
mw 9-5		1005			7.79	
mw 9-6		1001			6.71	
mw 9-7		0957			7.44	
mw 13-1		1032			9.59	
mw 13-2		1026			10.08	
mw 13-3		1016			8.09	
mw 13-4		1019			9.31	
mw 8-1		1053			14.27	
mw 8-2		1056			11.07	
mw 8-3		1059			12.89	
mw 8-5		1115			13.71	
mw 8-4		1046			14.63	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

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White: File Pink: Field Manager Yellow: Supervisory Geologist Goldenrod: Field Book

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SAIC® An Employee-Owned Company

Water Level Measurements

(Field Sheet)

Measurement Team: Rich Stook / John King

Project Number and Location: Niagara Falls IAP; RI/FS
1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw 8-6	10-4-89	1109	Notch		14.88	
mw 8-1D		1117			13.98	
mw 8-2D		1040			14.34	
mw 8-3D		1107			14.93	
mw 5-2		1124			13.58	
mw 5-4		1127			14.31	
mw 5-5		1136			15.36	
mw 5-1D		1139			15.43	
mw 10-2		1159			8.11	
mw 10-1		1211			7.76	
mw 10-3		1214			7.80	
mw 10-4		1206			7.44	
mw 10-1D		1204			7.48	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

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Water Level Measurements

(Field Sheet)

Measurement Team: Rich Stook / John King

Project Number and Location: Niagara Falls IAP; RI/FS
1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		BToC Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw 7-1	10-4-89	1224	Notch		7.95	-
mw 7-2		1227			8.43	
mw 7-3		1230			9.55	
mw 3-3D		0940			1.93	- water level above Land Surface
mw 3-7		0945			6.79	
mw 3-5		0958			4.14	1.89' of Riser cutoff
mw 3D-1		1005			4.45	
mw 3-4		1008			3.23	1.93' of Riser cutoff
mw 3-4D		1010			1.76	
mw 3-3		1018			5.08	
mw 3-6		1024			6.95	1.72' of Riser cutoff
mw 3-2		1031			6.68	1.80' of Riser cutoff
mw 3-2D		1036			10.92	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

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SAIC® An Employee-Owned Company

Water Level Measurements

(Field Sheet)

Measurement Team: Rich Stook / John King

Project Number and Location: Niagara Falls IAP; RI/FS
1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		BTOC Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
mw3-1	10-4-89	1042	Notch		6.99	
mw2-1		1053			7.48	
mw2-3		1058			6.99	
mw6-2		1102			6.64	
mw6-3		1106			7.17	
mw6-1		1110			6.75	
mw4-2		1118			8.43	
mw4-3		1120			8.76	
mw 4-4		1126			8.65	
mw 4-1		1131			8.89	
mw1-3D		1137			7.49	
mw 1-1		1140			8.50	
mw 2-4		1148			5.83	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

Disclaimer

Data entered on this form were obtained during field activities. All entries are preliminary in nature, do not represent SAIC's final assessment, and may be subject to revision.

Science Applications International Corporation ■ *8400 Westpark Drive, McLean, Virginia 22102*

White: File Pink: Field Manager Yellow: Supervisory Geologist Goldenrod: Field Book

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SAIC® An Employee-Owned Company

Water Level Measurements
(Field Sheet)

Measurement Team: Rich Stook / John King

Project Number and Location: Niagara Falls IAP; RI/FS 1-835-06-858-10

Measuring Method: Electronic Well Sounder

Measuring Point: Notch on top of PVC Riser

Well No.	Date	Time	Tape Reading		BTOC Depth to Water (ft)	Remarks
			Measure Pt.	Water Level		
MW2D-1	10-4-89	1150	Notch		9.07	
MW2-2		1200			8.38	
MW1-6		1206			8.82	
MW1-4D		1208			10.97	
MW1-3		1218			6.02	
MW1-2		1220			4.15	1.81' of PVC Riser cutoff
MW1D-2		1223			5.16	
MW1-5		1232			5.17	
MW1-7		1244			11.18	
MW1D-1		1247			12.46	

Measuring Point: Point where measurement was taken. Top of PVC casing (TOC); Top of Protective Steel Casing (TOSC); Land Surface (LS), etc.
Depth to Water: Measurements should be recorded to the nearest 0.01 ft. (e.g., 10.06 feet below TOC)
Remarks: Any conditions that may influence the water level measurements.

Tracer Research Corporation

PREPARED FOR:

Science Applications International Corporation
One Sears Drive
Paramus, New Jersey 07652

ON-SITE ANALYTICAL SUPPORT
NIAGARA FALLS IAP
NIAGARA FALLS, NEW YORK

JUNE 1989

SUBMITTED BY:

Tracer Research Corporation

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INTRODUCTION

Tracer Research Corporation (TRC) provided on-site analytical services in support of SAIC's activities at Niagara Falls IAP, Niagara Falls, New York. Services were performed on June 3, 4, 5 and 6, 1989 under contract to SAIC. On-site GC services were provided for the analyses soil and groundwater. Samples were collected from sites located on the Niagara Falls IAP.

A total of 11 soil samples and 27 groundwater samples were collected by SAIC and analyzed in the field by TRC. Samples were analyzed for the following compounds:

1,1,1-trichloroethane (TCA)
trichloroethene (TCE)
tetrachloroethene (PCE)
benzene
toluene
ethylbenzene
xylenes
total hydrocarbons

The compounds in this suite were chosen because of their suspected presence in the subsurface based on SAIC's findings. Xylenes are reported as the total of three isomers and total hydrocarbons are approximately C4-C9 aliphatic, alicyclic and aromatic hydrocarbons.

ANALYTICAL PROCEDURES

To perform on-site analytical work, Tracer Research Corporation (TRC) set-up a remote laboratory at Niagara Falls IAP. The lab was equipped with a Varian 3300 gas chromatograph and two Spectra Physics Chromjet SP4400 computing integrators. Analytical equipment was set-up to perform groundwater and soil headspace analysis on samples collected in conjunction with a drill-rig operation. Direct injection techniques were also used for groundwater analyses. Electrical power from the facility was provided (110 volts AC) to operate all of the gas chromatographic instruments and field equipment.

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID) and an electron capture detector (ECD), was used for the compound analyses. The ECD was used for the analyses of TCA, TCE and PCE while the FID was used to analyze for benzene, toluene, ethylbenzene, xylenes and total hydrocarbons. Separation of these compounds was achieved by running the samples on 1/8 inch OD packed columns with OV-101 as the stationary phase. Nitrogen was used as the carrier gas.

Halocarbon and hydrocarbon compounds detected in samples are identified by chromatographic retention time. Quantification of compounds is achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks are run periodically throughout the day as are syringe blanks to check for contamination in the headspace sampling equipment.

Soil samples were collected by split-spoon or a similar method and immediately prepared for analysis by TRC in the remote laboratory. Approximately 10 grams of soil and 10 mL of water was placed in a 40 mL teflon sealed VOA bottle leaving approximately 20 mL of headspace. Each VOA was then shaken vigorously for 30 seconds before the headspace was analyzed. This allows for the desorption of volatile compounds from the soil into the water and then the partitioning of these compounds into the headspace of the vial. Headspace vapor is subsampled (duplicate injections) in volumes ranging from 1 uL to 2 mL.

The GC was calibrated for headspace analysis by decanting 10 to 20 mL off of the known aqueous standard so as to leave approximately the same amount of headspace that was in the soil headspace samples. The bottle was then resealed and shaken vigorously for 30 seconds. An analysis of the headspace in the vial determines the Response Factor (RF) which is then used to accurately estimate soil concentrations. The headspace analysis technique allows for larger injection volumes.

Detection limits are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the detector. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses. The detection limits range down to 0.002 ug/kg for halocarbon compounds and 0.4 ug/kg for hydrocarbon compounds depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.003 ug/kg). This number is calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil samples.

- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Standard 40 mL VOA bottles are used only once and then washed with Alconox detergent and baked out at night. VOA blanks are run each day to check the solvent water and VOA for contaminants.

. Septa through which samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

. Analytical instruments are calibrated each day by the use of chemical standards prepared in water by serial dilution from commercially available pure chemicals. Calibration checks are also run after approximately every five samples.

. 2 cc subsampling syringes are checked for contamination prior to using each day by injecting nitrogen carrier gas into the gas chromatograph.

. All sampling and 2 cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

APPENDIX A: CONDENSED DATA

SAIC/N[illegible]A FALLS INTERNATIONAL GUARD/NIAGARA FALLS, NEW YO[illegible] JOB #F-046-89-SG

Sample	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl Benzene (ug/l)	Xylenes (ug/l)	Total Hydroc. (ug/l)
MW5-2	06/03	0.2	0.01	<0.004	<0.4	<0.4	<0.3	<40	87
MW5-4	06/03	0.09	2	0.01	<0.4	<0.4	<0.3	<9	55
MW8-1	06/03	0.5	126	1	<0.4	<0.4	<0.3	<8	80
MW8-2	06/03	<0.003	1	<0.004	18	<0.4	<0.3	<0.9	123
MW8-3	06/03	0.2	0.5	<0.004	<0.4	<0.4	<0.3	<18	58
MW8-4	06/03	0.5	4	0.4	<0.4	<0.4	<0.3	1	47
MW9-3	06/03	<0.0002	<0.002	<0.0003	<0.4	<0.4	<0.3	<6	14
MW7-1	06/04	<0.0003	1	<0.0002	<0.5	<0.7	<0.5	16	90
MW7-2	06/04	0.009	0.8	<0.0002	19	<0.3	<0.3	4	16
MW7-3	06/04	0.003	0.2	0.4	780	130	<0.5	<0.8	3,400
MW10-1	06/04	<0.3	2,000	<0.2	130	<0.7	<0.5	<0.8	1,000
MW10-2	06/04	<0.0003	5	<0.0002	340	<0.7	<0.5	<0.8	8,100
MW10-3	06/04	<0.05	23	<0.04	26	<0.7	<0.5	<0.8	170
MW4-1	06/05	0.02	0.02	0.007	<0.3	<0.8	<0.7	14	400
MW4-2	06/05	0.02	0.02	0.007	<0.3	<0.8	<0.7	4	50
MW4-3	06/05	0.05	<0.004	<0.0006	400	<0.8	<0.7	<10	2,700
MW6-1	06/05	0.03	0.04	0.006	<0.4	<0.4	<0.3	<0.5	90
MW6-2	06/05	0.01	<0.002	0.007	5	<0.4	<0.3	<0.5	850
MW6-3	06/05	0.006	0.02	0.003	<0.4	<0.4	<0.3	<0.5	820
MW20-1	06/06	<0.003	96	<0.0004	<0.4	<0.4	<0.4	<0.7	60
MW2-1	06/06	0.01	<0.0003	0.008	<0.4	<0.4	<0.4	<0.7	32
MW2-2	06/06	0.005	<0.003	0.007	<0.4	<0.4	<0.4	<0.7	8
MW2-3	06/06	0.02	<0.003	0.0009	<0.4	<0.4	<0.4	<0.7	6
MW10-2	06/07	<0.0006	0.009	<0.05	<0.6	<0.6	<0.4	<0.7	60
MW1-1	06/07	0.01	0.06	<0.05	<0.6	<0.6	<0.4	<0.7	90
MW1-3	06/07	<0.006	<0.001	<0.05	<0.6	<0.6	<0.4	<0.7	7
MW1-5	06/07	<0.006	<0.001	<0.05	<0.6	<0.6	<0.4	<0.6	7

Analyzed by: D. Johnson
Checked by: D. Johnson
Proofed by: L. Laplander

Tracer Research Corporation

SAIC/NIAGARA FALLS INTERNATIONAL GUARD/NEW YORK

Sample	Date	TCA (ug/kg)	TCE (ug/kg)	PCE (ug/kg)	Benzene (ug/kg)	Toluene (ug/kg)	Ethyl Benzene (ug/kg)	Xylenes (ug/kg)	Total Hydroc. (ug/kg)
SB9-1	06/03	0.03	<0.002	0.01	<0.5	<0.5	<0.5	<9	60
SB9-2	06/03	0.02	<0.002	0.01	<0.5	<0.5	<0.4	<0.7	340
SB9-4	06/03	0.02	<0.002	0.009	<0.6	<0.6	<0.5	<12	2
SB6-1	06/05	<0.02	<2	<0.01	<0.4	<1	<0.8	<1	5,600
SB6-2	06/05	<0.02	<0.005	<0.009	<2	<0.5	<0.4	<0.6	230
SB4-1	06/05	<0.03	<2	<0.01	<0.4	<1	<0.9	<1	400
SB2-1	06/06	<0.1	<0.2	<0.02	<0.5	<0.5	<0.4	<1	14
SB2-2	06/06	<0.08	<0.1	<0.02	<0.4	<0.4	<0.4	<0.6	40
SB2-3	06/06	<0.08	<0.1	<0.01	2	<0.4	<0.3	<0.5	24
SB1-2	06/07	0.02	<0.002	<0.06	<4	<4	<3	<4	230
SB1-1	06/07	0.001	<0.003	0.05	20,000	<130	<90	<150	38,000

Analyzed by: D. Johnson
Checked by: D. Johnson
Proofed by: K Kaplander

Tracer Research Corporation

PREPARED FOR:

Science Applications International Corporation
One Sears Drive
Paramus, New Jersey 07652

SHALLOW SOIL GAS INVESTIGATION
NIAGARA FALLS IAP
NIAGARA FALLS, NEW YORK

JUNE 1989

SUBMITTED BY:

Tracer Research Corporation

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INTRODUCTION

A shallow soil gas investigation was performed by Tracer Research Corporation (TRC) on several sites located at Niagara Falls IAP, Niagara Falls, New York. The investigation was conducted on April 18 through 20, 1989 under contract to Science Applications International Corporation (SAIC). The purpose of the investigation was to determine the distribution of subsurface VOCs on twelve sites in an effort to identify areas of contamination. TRC investigated three sites; Sites 1, 8 and 13. The original scope of work estimated 21 days of soil gas sampling; however, the investigation was discontinued after four days of preliminary work.

During the four days of surveying, a total of 42 soil gas samples were collected and analyzed in the field. Samples were analyzed for volatile compounds from the following suite:

1,1,1-trichloroethane (TCA)
trichloroethene (TCE)
tetrachloroethene (PCE)
benzene
toluene
ethylbenzene
xylenes
total hydrocarbons

The compounds in this suite were chosen because of their suspected presence in the subsurface and amenability to soil gas detection. Xylenes are reported as the total of the three xylene isomers and total hydrocarbons are approximately C4-C9 aliphatic, alicyclic and aromatic compounds.

SHALLOW SOIL GAS INVESTIGATION - METHODOLOGY

Shallow soil gas investigation refers to a method developed by TRC for investigating underground contamination from volatile organic chemicals (VOCs) such as industrial solvents, cleaning fluids and petroleum products by looking for their vapors in the shallow soil gas. The method involves pumping a small amount of soil gas out of the ground through a hollow probe driven into the ground and analyzing the gas for the presence of volatile contaminants. The presence of VOCs in shallow soil gas indicates the observed compounds may either be in the vadose zone near the probe or in groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities. These compounds readily partition out of the groundwater and into the soil gas as a result of their high gas/liquid partitioning coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The contamination acts as a source and the above ground atmosphere acts as a sink, and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the source and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because distribution of the contamination is usually broader in areal extent than the local geologic barriers and is defined using a large data base. The presence of geologic obstructions on a small scale tends to create anomalies in the soil gas-groundwater correlation, but generally does not obscure the broader areal picture of the contaminant distribution.

EQUIPMENT

Tracer Research Corporation utilized a one ton Ford analytical field van that was equipped with one gas chromatograph and two Spectra Physics SP4270 computing integrators. In addition, the van has two built-in gasoline powered generators that provide the electrical power (110 volts AC) to operate all of the gas chromatographic instruments and field equipment. A specialized hydraulic mechanism consisting of two cylinders and a set of jaws was used to drive and withdraw the sampling probes. A hydraulic hammer was used to assist in driving probes past cobbles and through unusually hard soil.

SAMPLING PROCEDURES

Sampling probes consist of 7 to 10-foot lengths of 3/4 inch diameter hollow steel pipe that are fitted with detachable drive points. Soil gas samples were collected by driving the steel probe to a depth of less than 3 feet into the ground. Once inserted into the ground, the above-ground end of the sampling probes were fitted with a steel reducer and a length of polyethylene tubing leading to a vacuum pump. To adequately purge the volume of air within the probe, 2 to 5 liters of gas were evacuated with a vacuum pump. During the soil gas evacuation, samples were collected in a glass syringe by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. Ten milliliters of gas were collected for immediate analysis in the TRC analytical field van. Soil gas was subsampled (duplicate injections) in volumes ranging from 1 uL to 2 mL, depending on the VOC concentration at any particular location.

ANALYTICAL PROCEDURES

A Varian 3300 gas chromatograph, equipped with a flame ionization detector (FID) and electron capture detector, was used for the soil gas analyses. The ECD was used for the analyses TCA, TCE and PCE while the FID was used to analyze for benzene, toluene, ethylbenzene, xylenes and total hydrocarbons. Compounds were separated on a 3' and 6' by 1/8" OD packed column with OV-101 as the stationary phase. Nitrogen was used as the carrier gas.

Hydrocarbon compounds detected in soil gas were identified by chromatographic retention time. Quantification of compounds was achieved by comparison of the detector response of the sample with the response measured for calibration standards (external standardization). Instrument calibration checks were run periodically throughout the day as were system blanks to check for contamination in the soil gas sampling equipment. Air samples were also routinely analyzed to check for background levels in the atmosphere.

Detection limits for the compounds of interest are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the analytical equipment. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses.

The detection limits range down to 0.01 ug/L for compounds such as benzene and toluene and approximately 0.0001 ug/L for the halogenated compounds depending on the conditions of the measurement, in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.01 ug/L). Detection limits obtained from GC analyses are calculated from the current response factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation's normal quality assurance procedures were followed in order to prevent any cross-contamination of soil gas samples.

. Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. Enough probes are carried on each van to avoid the need to reuse any during the day.

. Probe adaptors (steel reducer and tubing) are used once during the course of the day and cleaned at the end of each working day by baking in the GC oven. The tubing is replaced periodically as needed during the job to insure cleanliness and good fit.

. Silicone tubing (connecting the adaptor to the vacuum pump) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.

. Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.

. Septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

. Analytical instruments are calibrated each day by the use of chemical standards prepared in water by serial dilution from commercially available pure chemicals. Calibration checks are also run after approximately every five soil gas sampling locations.

. 2 cc subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.

. Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10 cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled air analysis.

. All sampling and 2 cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

. Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A negative pressure (vacuum) of 2 in. Hg less than the maximum capacity of the pump (evacuation rate >0.02 cfm) usually indicates that a reliable gas sample cannot be obtained because the soil has a very low air permeability.

APPENDIX A: CONDENSED DATA

SAIC/NI[illegible]A FALLS AFRF, NEW YORK/SITE 1

Sample	Depth	Date	Benzene (ug/l)	Toluene (ug/l)	Ethyl Benzene (ug/l)	Xylenes (ug/l)	Total Hydroc. (ug/l)
Air		04/18	0.03	<0.008	<0.01	<0.01	0.03
SG-1-1	1'	04/18	0.08	<0.02	<0.02	<0.02	0.08
SG-1-2	1'	04/18	0.04	<0.02	<0.02	<0.02	0.04
SG-1-3	2'	04/18	0.03	<0.02	<0.02	<0.02	0.04
SG-1-4	2.5'	04/18	0.04	0.02	<0.02	<0.02	0.04
SG-1-5	3'	04/18	0.01	<0.02	<0.02	<0.02	0.01
SG-1-6	3'	04/18	0.02	<0.02	<0.02	<0.02	0.02
SG-1-7	3'	04/18	0.5	0.2	<0.02	0.02	2
SG-1-8	1'	04/18	0.01	0.02	<0.02	<0.02	0.1
SG-1-9	1.5'	04/18	0.04	0.02	<0.02	<0.02	0.08
SG-1-10	1'	04/18	0.5	0.4	<0.02	0.2	2
SG-1-11	2'	04/18	0.4	0.4	0.8	0.6	2
Air		04/18	0.01	<0.02	<0.02	<0.02	0.01
Air		04/19	0.007	0.004	<0.01	<0.01	0.01
SG-1-12	2'	04/19	0.01	<0.02	<0.03	<0.03	<0.01
SG-1-13	2'	04/19	0.08	<0.02	<0.03	<0.03	0.08
SG-1-14	2'	04/19	0.04	0.02	<0.03	<0.03	0.08
SG-1-15	2'	04/19	0.02	<0.02	<0.03	<0.03	0.02
SG-1-16	2'	04/19	0.04	0.04	<0.03	0.03	0.2
SG-1-17	3'	04/19	0.02	0.02	<0.03	<0.03	0.04
SG-1-18	3'	04/19	0.2	0.1	0.1	<0.03	2
SG-1-19	2'	04/19	0.05	<0.02	<0.03	<0.03	0.05
SG-1-20	2.5'	04/19	1	0.5	0.1	<0.03	4
SG-1-21	2.5'	04/19	17	27	<0.02	<0.02	58
SG-1-22	2.5'	04/19	2	1	0.3	<0.03	6
SG-1-23	3'	04/19	0.02	<0.02	<0.03	<0.03	0.02
SG-1-24	2.5'	04/19	0.05	0.05	<0.03	<0.03	0.4
SG-1-25	2'	04/19	64	21	<0.4	<0.3	196
SG-1-26	1.5'	04/19	8	3	<0.08	<0.08	26
Air		04/19	0.01	<0.008	<0.008	<0.008	0.01
Air		04/20	0.005	<0.005	<0.006	<0.006	0.005
SG-1-27	2'	04/20	0.04	0.03	<0.01	<0.01	0.2
SG-1-28	2'	04/20	0.1	0.07	<0.01	<0.01	0.8

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by: J. Olexa

Checked by: C. Bissell

Proofed by: L. Laplander

Tracer Research Corporation

SAIC/NIAGARA FALLS AFRF, NEW YORK/SITE 13

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl Benzene (ug/l)	Xylenes (ug/l)	Total Hydroc. (ug/l)
Air		04/21	0.001	<0.0009	<0.0006	0.006	<0.01	<0.06	<0.06	0.006
SG-13-1	2'	04/21	0.002	0.03	<0.0006	0.02	0.4	<0.06	<0.06	0.2

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by: J. Olexa

Checked by: C. Bissell

Pro[illegible] by: L. Laplander

Tracer Research Corporation

SAIC/NI[illegible] FALLS AFRF, NEW YORK/SITE 8

Sample	Depth	Date	TCA (ug/l)	TCE (ug/l)	PCE (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl Benzene (ug/l)	Xylenes (ug/l)	Total Hydroc. (ug/l)
Air		04/20	0.002	<0.0009	<0.0007	0.01	<0.01	<0.01	<0.01	0.01
SG-8-1	3'	04/20	0.04	0.02	<0.007	0.02	0.02	<0.02	<0.02	0.04
Air		04/20	0.01	<0.0009	<0.0007	0.01	<0.01	<0.01	<0.01	0.01
SG-8-2	2'	04/20	0.1	0.08	<0.007	0.4	0.06	<0.01	<0.01	0.8
SG-8-3	2.5'	04/20	0.05	2	0.06	4	1	<0.04	<0.4	16
SG-8-4	2.5'	04/20	0.02	0.02	<0.007	0.01	<0.01	<0.01	<0.1	0.01
Air		04/20	0.006	<0.0009	<0.0007	0.01	<0.01	<0.01	<0.01	0.01
Air		04/21	0.003	<0.002	0.0006	<0.01	<0.01	<0.03	<0.03	<0.01
SG-8-5	1.5'	04/21	0.004	0.04	<0.0006	0.07	<0.01	<0.03	<0.03	0.07
SG-8-6	2.5'	04/21	0.002	0.04	<0.0006	0.1	<0.01	<0.06	<0.06	0.1
SG-8-7	2'	04/21	0.002	0.04	<0.0006	0.04	0.2	<0.06	<0.06	0.1
SG-8-8	1.5'	04/21	0.002	0.02	<0.0006	0.07	0.01	<0.06	<0.06	0.08
SG-8-9	1'	04/21	0.001	0.02	<0.0003	0.01	0.2	<0.06	<0.06	0.2
SG-8-10	2'	04/21	0.001	0.02	<0.0003	0.06	0.3	<0.06	<0.06	0.2
SG-8-11	1.5'	04/21	0.005	0.02	<0.0003	0.04	<0.01	<0.06	<0.06	0.04
SG-8-12	2'	04/21	0.006	0.02	<0.0003	0.04	0.4	<0.06	<0.06	0.4
SG-8-13	2'	04/21	0.007	0.04	<0.0003	0.01	<0.01	<0.06	<0.06	0.03
Air		04/21	0.003	0.01	<0.0006	0.01	<0.01	<0.06	<0.06	0.01
Air		04/21	0.002	<0.0009	<0.0006	0.006	<0.01	<0.06	<0.06	0.006

Tracer Research Corporation

Notations:
I interference with adjacent peaks
NA not analyzed

Analyzed by: J. Olexa

Checked by: C. Bissell

Proofed by: S. Laplander

Tracer Research Corporation

SOIL GAS CONTAMINANT
INVESTIGATION SERVICES

DECEMBER 1988

WHAT IS A SOIL GAS INVESTIGATION?

Soil gas contaminant investigation refers to a method developed by Tracer Research Corporation (TRC) for investigating subsurface contamination from volatile organic chemicals such as industrial solvents, cleaning fluids and petroleum products by looking for their vapors in the shallow soil gas. The method involves pumping a small amount of soil gas out of the ground through a hollow probe driven a few feet into the ground and analyzing the gas for the presence of volatile contaminants (Figure 1).

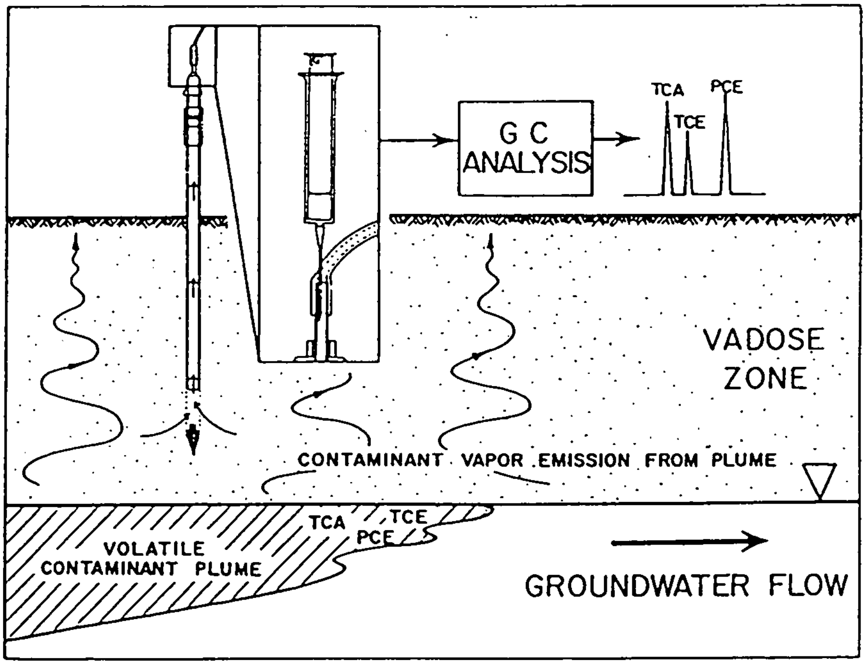


Figure 1: Schematic showing Soil Gas Technology

The presence of contaminants in the soil gas usually means that there is contamination from the observed volatile organic compounds (VOCs) either in the soil or in the groundwater below the probe. The soil gas technology is most effective in mapping low molecular weight halogenated solvent chemicals and petroleum hydrocarbons possessing high vapor pressures and low aqueous solubilities (see Figure 2).

		TCA	TCE	PCE	DCA	DCE	CH_2Cl_2	CHLOROFORM	CARBONTET	VINYL CHLORIDE	F-11	F113	METHANE	BTX	DIESEL	JP4	JET A	KETONES	ALCOHOLS
RESISTANCE TO DEGRADATION	GOOD	X	X	X				X	X		X	X	X						
	MODERATE				X	X	X												
	POOR									X				X	X	X	X	X	X
FAVORABLE LOW SOLUBILITY	GOOD	X	X	X					X		X	X	X						
	MODERATE				X	X	X	X		X				X	X	X	X		
	POOR																	X	X
FAVORABLE LOW BOILING POINT	GOOD	X	X	X	X	X	X	X	X	X	X	X	X						
	MODERATE													X		X		X	X
	POOR														X		X		

Figure 2: Compounds amenable to soil gas detection have low boiling points, low aqueous solubilities and are resistant to degradation.

These compounds readily evaporate out of the groundwater and diffuse into the soil gas as a result of their high gas/liquid partition coefficients. Once in the soil gas, VOCs diffuse vertically and horizontally through the soil to the ground surface where they dissipate into the atmosphere. The groundwater acts as a source and the above ground atmosphere acts as a sink and typically a concentration gradient develops between the two. The concentration gradient in soil gas between the water table and ground surface may be locally distorted by hydrologic and geologic anomalies (e.g. clays, perched water); however, soil gas mapping generally remains effective because the areal distribution of the observed compound is usually much larger in scale than the local anomalies and is defined using a large data base.

TIME AND COST SAVINGS BENEFITS

Soil gas contaminant mapping saves costs in a contamination investigation by providing a rapid means of detecting and delineating the contaminant distribution in groundwater. Standard drilling and sampling methods are cumbersome, costly, much slower and require more effort to obtain data points. By contrast, 15-25 soil gas samples can be collected and analyzed per day on most sites. Usually more can be learned about the contaminant distribution at a site in one day from the soil gas method than conventional drilling and sampling techniques could provide in several days of work. The method becomes even more cost-effective relative to conventional methods as the depth to water increases. In areas where the depth to water is 100 feet or greater, the cost savings increases expotentially because square miles of the field area can be mapped using soil gas for the cost of two or three monitoring wells.

SOURCE AREA IDENTIFICATION

A major application of the soil gas technology is locating contaminant source areas. The simple fact that numerous samples can be economically collected over a large area increases the possibility of uncovering or detecting sources that otherwise go unnoticed. The sampling operation is quick, nonobtrusive and produces only a very small hole in the soil that quickly disappears. The samples can easily be collected along city streets, sidewalks and residential neighborhoods without creating obstructions or attracting a great deal of attention.

Generally, a source capable of causing groundwater contamination will create above background readings for a radius of 170 meters (500 feet) around it. Typically, the vapor concentrations at the center of the source are hundreds or thousands of times higher than background levels and remain so for tens of years after the contamination occurs. Broad areal coverage can be achieved rapidly using transects with samples collected on 200 to 400 foot centers.

EQUIPMENT

TRC has designed and built a fleet of analytical field vans which are capable of hydraulically driving and pulling soil gas or groundwater probes and performing all chemical analyses on-site. The TRC analytical field vans are each operated by a two-person crew consisting of an analytical chemist and a hydrogeologist. A list of equipment used by TRC in a soil gas investigation is given below.

(A) General Equipment

- One ton Ford E350 chassis, 2 or 4 wheel drive
- Two built-in gasoline powered generators (110 volts/AC) for maximum reliability
- Hydraulic probe driving and removal equipment designed especially for soil gas probing
- 42 soil gas probes fabricated from a steel pipe
- Safety Equipment: first aid, fire, hazardous chemical protection
- Two vacuum pumps
- An electric hammer/drill capable of drilling through asphalt and several inches of concrete
- A peristaltic pump and polethylene tubing used for groundwater sampling

(B) Gas Chromatographic Equipment in Each Van

- At least one laboratory type gas chromatograph (Varian 3300 or Tracor 540) with temperature programable oven. (photovac and other field analytical instruments are included as needed)
- Two Spectra-Physics model SP4270 computing integrators
- Electron capture, flame ionization, photo ionization and thermoconductivity detectors on the various GCs.
- Analytical standards for purgable priority pollutants, pure compounds obtained from Chem Service, Inc. of West Chester, Pennsylvania
- Glass syringes ranging from 10 uL to 10 mL in volume
- Various packed and capillary gas chromatographic columns
- Gas cylinders containing compressed nitrogen, air and hydrogen
- 40 mL glass sampling vials in which the chemical standards are prepared and groundwater samples are collected
- Various fittings and tools required for normal operation

TRC has developed proprietary analytical technology that enables very rapid measurement of contaminants in either soil gas or water. Both are injected directly into the instrument without the use of purge and trap or preconcentrating technique. Using the TRC method, a typical measurement for most of the priority pollutant purgables requires approximately five minutes. An example is shown in Figure 3.

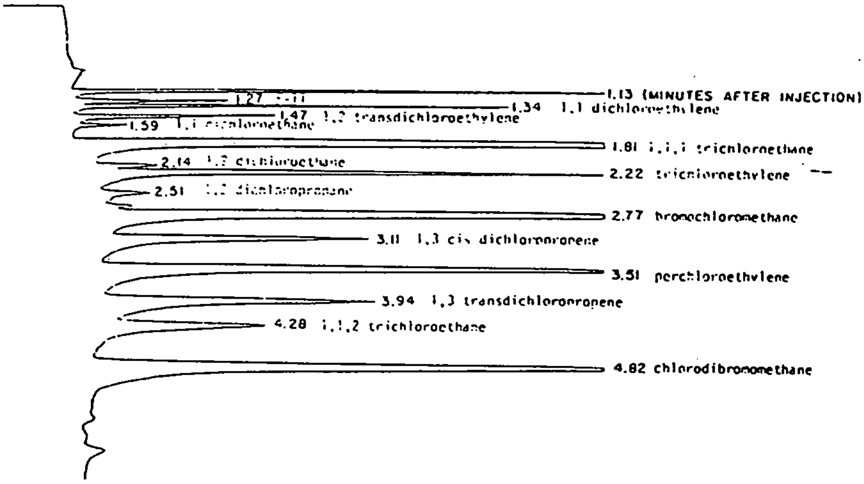


Figure 3: Chromatogram showing the analysis of 13 common volatile organic compounds. Analysis of soil gas or water are identical by the TRC method and usually require 5 minutes or less to perform

The sensitivity and precision are typically as good as conventional methods, but analysis is about a factor of 10 faster. The rapid analysis is extremely beneficial to the TRC soil gas operation. It allows the analysis to be performed in about the same period of time required to drive, sample and pull the probe. Thus, the soil gas sampling operation proceeds with maximum efficiency.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

TRC has developed a QA/QC program that has been accepted by EPA for use on Superfund sites. This program is followed on all TRC jobs.

CASE STUDIES

TRC has performed hundreds of contaminant investigations using the soil gas technology. Several examples are provided to illustrate the results that have been obtained at typical sites.

Case Study #1

Figure 4 shows an example where soil gas technology was used to locate a contamination source in the midwestern U.S. The depth to water was 120 feet. The soil materials were silty clays. The irrigation well I-1 in the southeast corner of the figure was contaminated with **TCA**. A large industrial complex existed on the west side of the road extending over a mile north and south of the well. The soil gas sampling was initiated along a north-south road between the well and the complex. The transect extended several thousand feet north and south of the contaminated well. One soil gas sample on the first transect detected **TCA** slightly above background (Point 633, Figure 4).

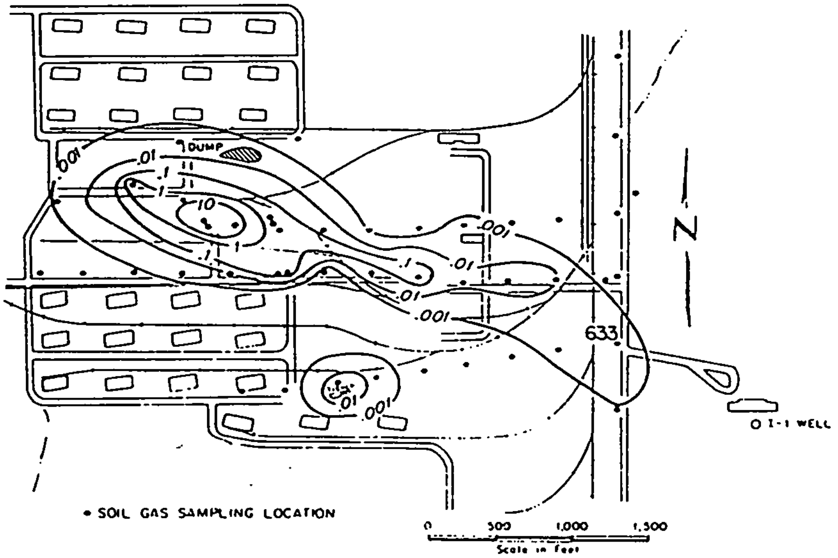


Figure 4:
TCA soil gas
concentration
contours

A second east-west transect was initiated along a convenient road into the complex a short distance north of Point 633. The samples along the second transect detected increasingly higher **TCA** concentrations. Because the soil gas analyses were performed in the field, the sampling plan could be easily directed to "zero in" on the source area. In this case the source was a business with a leaking **TCA** tank. The long axis of the detectable soil gas plume extended over 3000 feet from the source toward the contaminated well which was about one mile away. The investigation left very little doubt about the source of **TCA** contamination in the I-1 well.

This investigation represents a classical example of the utility of the soil gas technology. The general distribution of the contaminant can be defined quickly and easily at minimal cost (approximately $166.00 per probe). After the soil gas investigation, verification drilling and soil sampling can proceed very efficiently.

HYDROCARBON BEHAVIOR VS HALOCARBON

Hydrocarbons (fuels, paint solvents) behave differently than halocarbons (chlorinated solvents) in the subsurface because they are particularly susceptible to degradation in the upper portion of the soil profile where oxygen is present. As a result, soil gas measurements most effectively detect hydrocarbon product vapors when the soil gas samples are collected at depths below 10 feet. Table 1 shows a vertical profile in a sandy soil over groundwater contaminated with a halocarbon, perchloroethylene (PCE) and hydrocarbons including benzene and toluene. The depth to groundwater is approximately 20 feet. The PCE concentrations increase incrementally with depth, but the hydrocarbon components characteristically appear in significant concentrations only below a certain critical depth. This depth varies depending on the amount of product underground, the soil porosity and moisture content. In most cases, however, it occurs deeper than five (5) feet.

Table 1. Hydrocarbon Variation With Depth

Depth	PCE	Benzene	Toluene
5 feet	0.006[1]	<0.1	<0.1
10 feet	0.01	<0.1	<0.1
15 feet	0.03	200	30

All samples are expressed in ug/L.

Case Study #2

Figure 5 shows the concentration contours of **TOTAL HYDROCARBONS** in shallow soil gas (12 feet deep) underlying a gasoline service station in the Southwestern U.S. Total hydrocarbons are defined as benzene, toluene, xylenes and approximately C_4 - C_9 aliphatic and alicyclic compounds. Concentration contours indicate that the groundwater plume probably originates near the pump island and the underground storage tanks. Radial spreading of gasoline in soil gas from the two sources produced a single plume underlying the service station.

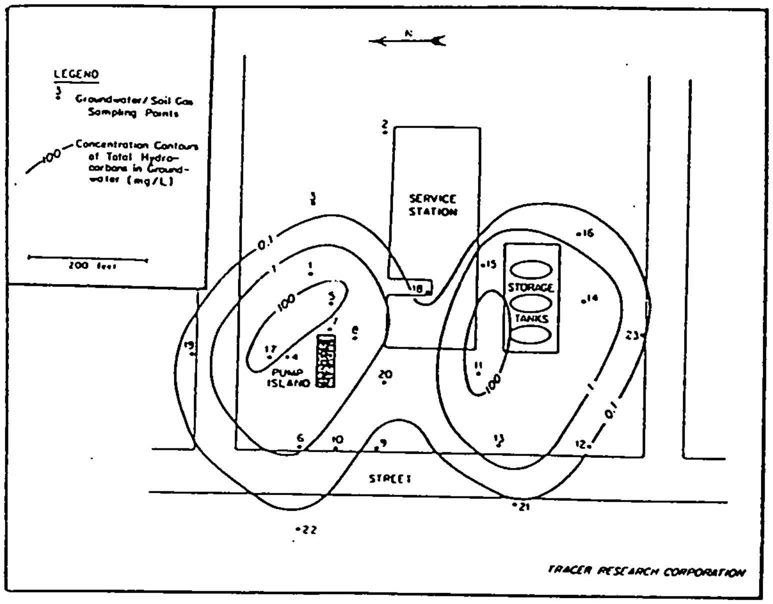


Figure 5: Distribution of total hydrocarbons in shallow soil gas underlying a gasoline service station.

SUMMARY

The examples discussed here illustrate that soil gas technology is a viable tool for mapping subsurface contamination. At sites where it is applicable, soil gas mapping can provide a rapid and cost effective means of investigating contamination over very large areas. In most instances, a preliminary soil gas investigation will result in a cost savings over the same job by directing conventional boring and sampling. In addition, the distribution of the contaminant can be mapped in greater detail using soil gas technology because more samples are collected per unit area than with conventional methods. Most industrial sites, landfill areas or other property of ten acres or less can be evaluated—in two or three days and subsequent on-site work can be completed in a rapid and cost effective manner.

FACTS ABOUT TRACER RESEARCH CORPORATION & SOIL GAS TECHNOLOGY

- TRC chemists and hydrogeologists developed the concept of soil gas detection of VOC groundwater contamination, developed the technology for commercial use and have been the largest supplier of the service, having performed hundreds of soil gas investigations at locations over the entire United States and parts of Mexico, Canada and the U.S. Virgin Islands.
- All personnel are specially trained in soil gas sampling and analysis and are dedicated full time to this service. Their experience enables them to provide the most efficient possible field data collection and analysis effort.
- TRC has set the industry standard for QA/QC in soil gas sampling and analytical technology. EPA has accepted TRC soil gas procedures for use at Superfund sites where legal action is expected.
- TRC provides only specialty services such as soil gas sampling and tracer leak detection, and thus is noncompetitive with full service geotechnical consulting firms.
- TRC hydraulic sampling equipment has been uniquely designed to perform the most efficient shallow soil gas and shallow groundwater sampling possible. It is compact, highly portable, and has no tall masts or derricks so work can be performed safely under overhead obstacles and lines.
- TRC vans contain all equipment required for collection and analysis of soil gas samples. TRC offers the fastest and most sensitive analytical capability in the industry for volatile organic compounds in soil gas. TRC equipment is readily available in all parts of the U.S. with very minimal mobilization costs.

PRICE SCHEDULE

Field Work $250.00/hour

Includes the use of one of Tracer Research Corporation's soil gas sampling analytical vans and a two person crew consisting of a specially trained analytical chemist and a hydrogeologist. All field data summary sheets are provided.

Per Diem

2 person crew at **$75.00/person/day**

Direct Expenses Approximately **$100.00/day**
(billed at cost)

Covers expended sampling supplies and equipment-sample probes, drive points, rental car, etc.

Report Preparation* **$80.00/hour**

TRC will provide an interpretive report with professionally drafted and contoured site maps. (Approximately 2 hours of report preparation is needed for every day of field work). Condensed data and a procedural report are prepared at no extra cost.

Mobilization/Demobilization

There is a one time - per job mobilization/demobilization charge. The amount charged is based on travel time to and from the job site. In nearly all instances, TRC can mobilize a unit to anywhere in the U.S. for less than $1,500.00. Average mobilization/demobilization fee is **less than $500.00**.

*optional

BACKGROUND OF KEY PERSONNEL OF TRC

Dr. Glenn Thompson received his B.S. (1970) and M.S. (1973) degrees in Geology from the University of Rhode Island and Memphis State University, respectively. He earned his Ph.D. in Geology at Indiana University in 1976. His dissertation centered on the development and testing of analytical and field methods needed to date groundwater by means of man-made atmospheric compounds, primarily fluorocarbons, that have entered the ground only in the last 60 years.

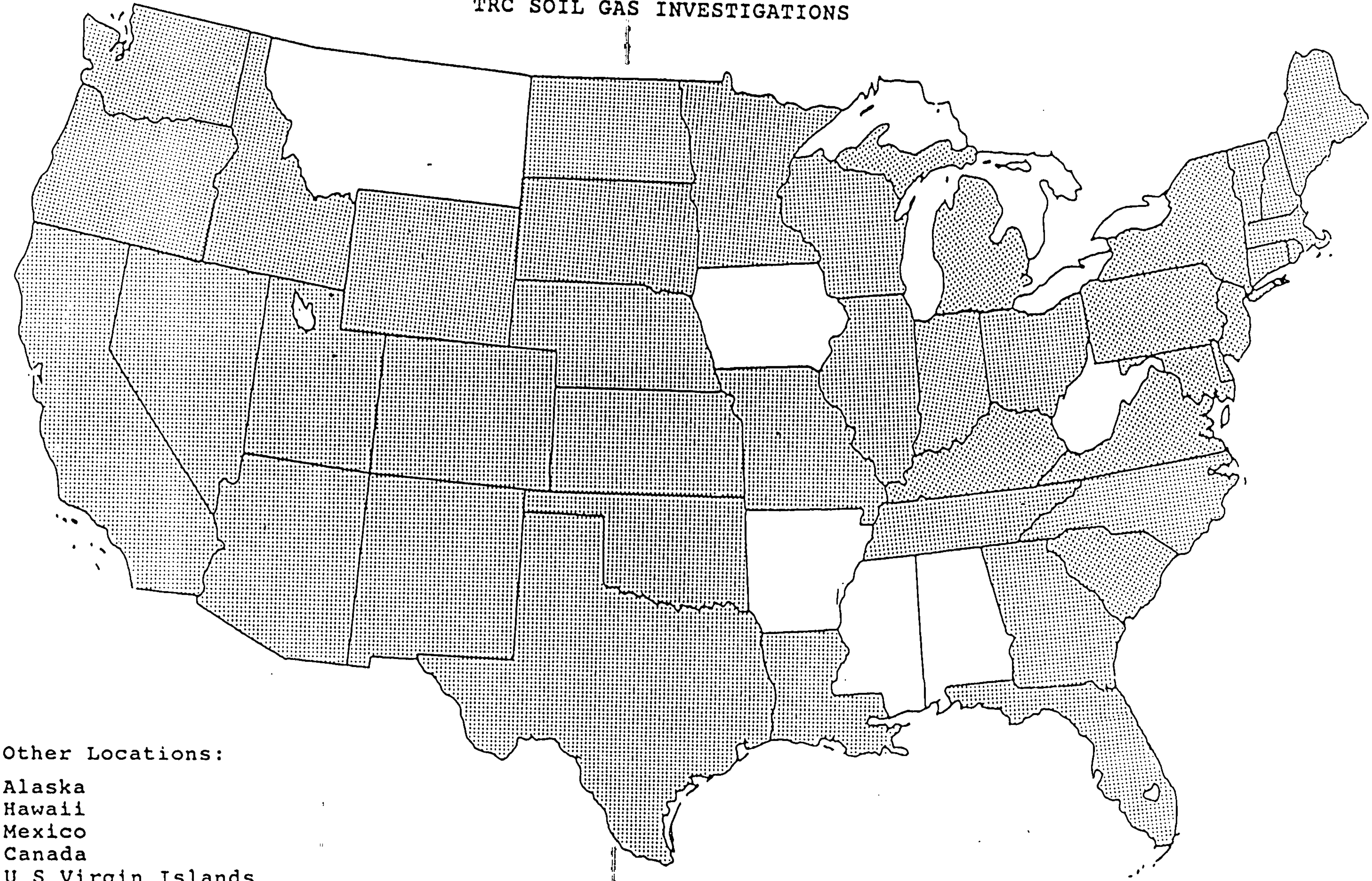
Dr. Thompson served as an Assistant Professor of Hydrology at the University of Arizona from 1977 to 1983. While at the University, he was principal investigator on 10 major research grants that resulted in publications on tracer technology, subsurface gas diffusion, behavior of organic compounds in the environment, solute transport in groundwater and tracer monitoring of hazardous waste burial sites.

He has had a great deal of experience using volatile compounds as groundwater tracers and eventually observed that the tracers evaporate from the water table surface and diffuse tens of feet upward into the soil gas of the unsaturated zone. These experiments with tracers led to the practical technology that is presented here. He founded and is currently President of Tracer Research Corporation.

OTHER TRACER RESEARCH CORPORATION SERVICES

- Underground storage tank Tracer Leak Testing and Monitoring that meets EPA requirements for precision testing and monitoring.
- Above-Ground Storage Tank Integrity Testing
- Pipe-Line Leak Location and Detection Services
- On-Site Field Analytical Support
- Tracer Technology for hydrological investigations and hazardous waste site monitoring.

GEOGRAPHICAL DISTRIBUTION
OF
TRC SOIL GAS INVESTIGATIONS



Other Locations:

Alaska
Hawaii
Mexico
Canada
U S Virgin Islands

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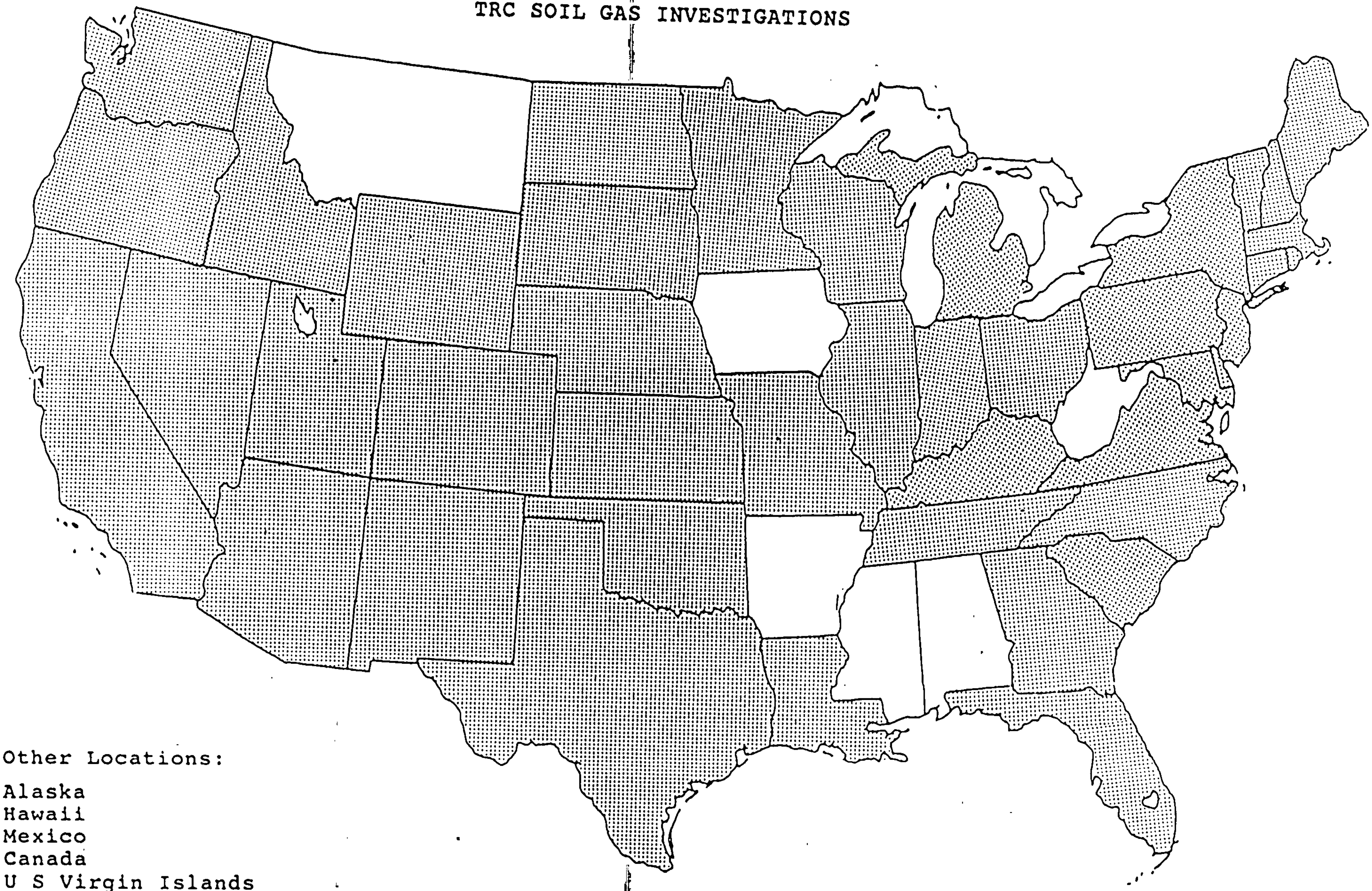
GEOGRAPHICAL DISTRIBUTION
OF
TRC SOIL GAS INVESTIGATIONS



Other Locations:

Alaska
Hawaii
Mexico
Canada
U S Virgin Islands

Tracer Research Corporation

BACKGROUND
AND
QUALITY ASSURANCE/QUALITY CONTROL
INFORMATION FOR
SOIL GAS ANALYSIS
AT
NIAGARA FALLS, AFRF, NEW YORK
RFQ 16-89016

Prepared For:

cience Applications International
8400 Westpark Drive
McLean, Virginia 22101

Submitted By:

Shannan Marty
Tracer Research Corporation

TABLE OF CONTENTS

Tracer Research Corporation

STATEMENT OF QUALIFICATIONS

Tracer Research Corporation (TRC) is uniquely qualified to undertake soil gas contaminant investigations due to the experience of its personnel and the special equipment and analytical technology that it had developed to perform this work.

Dr. Glenn Thompson has been involved for the past 12 years in research using ambient atmospheric halocarbons as well as artificially injected halocarbons to study the diffusion characteristics of unsaturated porous media. The contracts, reports and publications resulting from this work are listed in his resume contained in Appendix 1.

To the best of our knowledge, the personnel of TRC originated the concept of remote detection of groundwater contaminants by shallow soil gas analysis and have been at the forefront of adapting it for practical applications.

In addition to the experience of the staff, TRC has developed a fleet of mobile laboratory gas sampling vans that are capable of driving hollow steel probes into the ground, withdrawing soil gas and analyzing it in minutes for virtually any vapor component. The vans contain standard laboratory gas chromatographs equipped with a variety of detectors enabling identification of many volatile organic compounds. The mobile laboratory is equipped with dual channel integrators enabling data collection from any two gas chromatographic detectors simultaneously. Capillary and packed columns are used in the instrument as needed. Having rapid, highly sophisticated measurement capability in the field gives the investigative team the ability to produce real time data.

A. SOIL GAS SAMPLING PROCEDURES

Probes are driven into the ground by the hydraulic pusher/puller mechanism. If there is concrete or pavement over a sample location, TRC personnel use a Kango hammer drill to drill a 1-1/2" diameter hole through the surface material. This is useful for going through up to 6" of concrete or asphalt. After 3-5 probe volumes have been drawn through the probe using a vacuum pump, a gas sample is taken by a glass syringe which is inserted through a section of silicone tubing (leading to the pump) and into the stainless steel tubing in the adaptor (Figure 1). Gas samples only contact steel surfaces and are never in contact with potentially sorbing materials (i.e. tubing, hose, pump diaphragm). A vacuum gauge monitors the negative pressure in the evacuation line to assure that there is no impedence to gas flow caused by clayey or water-saturated soils.

Three 10 ml air samples are collected from each sampling probe after 1 to 4 minutes of pumping. These 10 ml samples are subsampled according to analytical requirements and replicates are injected into the gas chromatograph for documentation of reproducibility. More than two injections may be necessary where there are multiple contaminants which require different sample sizes for chromatographic analysis. TRC has determined that reproducibility of soil gas samples from the same probe is typically within 20% and always within a factor of two. This sampling error is well within the limits required to accurately map concentration contours in the vadose zone which normally range 3 to 6 orders of magnitude over a subsurface plume. Correlation coefficients between contaminant concentrations in soil gas and in groundwater are determined by sampling probes near existing monitor wells

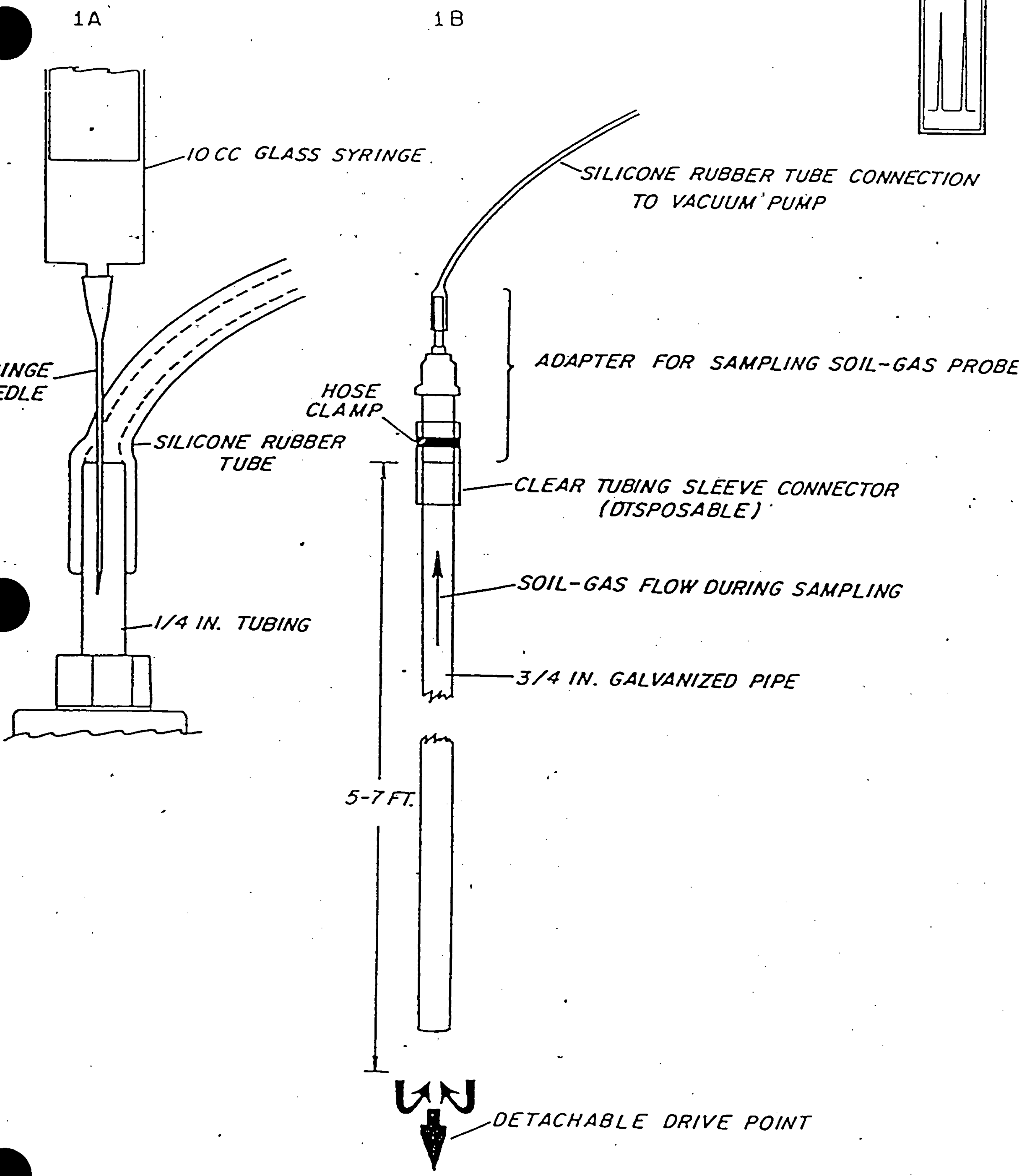


Figure 1

A. Close up of syringe soil gas sampling through evacuation line.

B. Diagram of soil gas sampling probe with adapter for sampling and evacuation of the probe after it is driven into the ground.

and are interpreted on an order-of-magnitude basis.

Once sampling has been completed, the probe is withdrawn and backfilled with native soil or granulated bentonite. Asphalt or concrete patch is used to cap holes that have been driven through paved or concrete areas.

In the event the van cannot be driven to a sample location, sampling probes can be hand-pounded into place and sampled using remote or battery operated equipment.

B. CHECKS FOR CONTAMINATION

Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled air analysis. System blanks are repeated after approximately every 10 soil gas sampling locations.

C. GROUNDWATER SAMPLING PROCEDURES

Water samples are collected by driving hollow probes with detachable points below the water table and then withdrawing the probes about 4 feet to permit water inflow into the resulting hole. A vacuum adaptor is placed on the top of the probe and is used to connect the probe to the peristaltic pump. A vacuum of up to 24 inches of mercury is applied to the interior of the probe and open hole, thus, the water is drawn up the probe and through the peristaltic pump. Normally, water can be sampled within 10 minutes. If the formation is unusually tight and does not yield water fast enough to fill the pipe and flow through the pump, a vacuum can be left on the formatin for an indefinite period. After remaining under vacuum for 15 to 20 minutes, usualy some water is drawn into the open hole or up into the pipe. The water thus accumulated is then removed by drawing a vacuum on a 1/4 inch polyethylene tube inserted down the probe to the bottom of the open hole. This procedure allows a water sample to be collected in a short time from very tight formations that might otherwise require hours or days to collect by conventional means. Loss of volatiles by evaporation is accordingly reduced when water is induced to flow into the very narrow hole, because it can be sampled with little exposure to air or none at all if the sample is pumped directly out of the probe and through the peristaltic pump. The polyethylene tubing is only used once and then discarded to avoid any cross-contamination problems.

Water samples are collected in 40 ml VOC vials which are filled to exclude any air and then capped with Teflon-lined septa caps. Water samples are permitted to stand up to several hours if necessary before chromatographic analysis in order to ensure that a sediment-free sample can be withdrawn from the top portion of the vial. Water samples were subsampled in volumes ranging from 0.2 ul to 5 ul, depending upon the contaminant concentrations at any particular location.

D. SPLIT SAMPLES PROCEDURE

Sample splits are collected in two-valve, flow through-type glass or internally electroplated stainless steel containers for analysis within 10 days of collection. Sample bottles are cleaned by purging with nitrogen at 100 C for 30 minutes. Once clean, the bottles are stored filled with nitrogen at ambient pressure.

Sample bottles are filled by placing them in the sample stream between teh probe and vacuum pump. Five sample bottles volumes are drawn through the container before the final sample is collected.

E. SAMPLING EQUIPMENT DECONTAMINATION

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. 42 probes are carried on each van to avoid the need to reuse any during the day.
- Probe adaptors (steel reducer and tubing) are used once during the course of the day and cleaned at the end of each working day by baking in the GC oven. The tubing is replaced periodically as needed during the job to insure cleanliness and good fit.
- Silicone tubing (connecting the adaptor to the vacuum pump) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.

ANALYTICAL CHEMISTRY PROCEDURES

A. METHOD

Halocarbon and hydrocarbon compounds detected in soil gas are identified by chromatographic retention time. Verification of compound identity is obtained by chromatographic analysis with columns of differing polarity and selectivity.

Quantification of compounds is achieved by comparison of the detector response to the sample with the response measured for calibration standards (external standardization). Instrument calibration checks are run periodically throughout the day as are system blanks to check for contamination in the soil gas sampling equipment. Air samples are also routinely analyzed to check for background levels in the atmosphere.

Proprietary modifications to the gas chromatograph allow direct aqueous injections of water for analysis. Results of both soil gas and water injection analysis are available to the site engineer within 30 minutes of sample collection.

B. CHECKS FOR CONTAMINATION

- 2 cc subsampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph.
- Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.

C. ANALYTICAL EQUIPMENT CALIBRATION

At the beginning of each day, standards are analyzed to calibrate the analytical equipment and determine daily response factors. Chemical standards are prepared in water from commercially available pure standards stored in methanol. Prior to running standards, water for standards is analyzed for purity. At least three standard injections are analyzed until resultant responses fall within 25% of each other. Response factors are then calculated based on these standard responses. Standards are repeated after every 5 samples to verify response.

D. ANALYTICAL PROCEDURES

Samples are collected in 10ml glass syringes and subsampled for analysis in volumes ranging from 1 ul to 2 ml. Injection volume is varied to insure that resultant masses of analyte fall within the linear response range of daily standards. All subsampling syringes and needles are used only once before decontamination.

E. DETECTION LIMITS

Detection limits are a function of the injection volume as well as the detector sensitivity for individual compounds. Thus, the detection limit varies with the sample size. Generally, the larger the injection size the greater the sensitivity. However, peaks for compounds of interest must be kept within the linear range of the detector. If any compound has a high concentration, it is necessary to use small injections, and in some cases to dilute the sample to keep it within linear range. This may cause decreased detection limits for other compounds in the analyses. The detection limits range down to 0.005 ug/L in soil gas for compounds such as benzene and 0.00005 ug/L in soil gas for compounds such as carbon tetrachloride depending on the conditions of the measurement; in particular, the sample size. If any component being analyzed is not detected, the detection limit for that compound in that analysis is given as a "less than" value (e.g. <0.1 ug/L). This number is calculated from the current reponse factor, the sample size, and the estimated minimum peak size (area) that would have been visible under the conditions of the measurement.

F. ANALYTICAL EQUIPMENT DECONTAMINATION

- All sampling and 2cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated.
- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.

DOCUMENTATION

A numbering system for soil gas is established prior to sampling and remains consistent throughout each phase of an investigation. Because chemical analyses are performed on-site, conventional chain of custody protocols are unnecessary. There are no soil gas samples to loose or preserve. Water samples are immediately labeled with the date, time, depth and location number of each probe. The probe location number is entered on each chromatogram and verified by TRC's field personnel. The analytical chemist is responsible for checking and interpreting each day's chromatograms. The field hydrogeologist is responsible for plotting probe locations on the map and entering the date, time and location number of sampling points into the log book. Calculations of contaminant concentrations for each probe location are compiled on TRC data sheets by the chemist and checked by the hydrogeologist. The standards and response factors used for calculations will be present on the same sheet with the sample data calculated from them. Each time during the investigation that the instrument is recalibrated, a new data sheet will be started. Thus, it will always be clear which standards are used for each calculation.

A. FIELD DATA SHEETS

An example field data sheet is attached to show how all pertinent information is recorded. The data sheets were designed to contain all the information needed to access the original chromatograms and to check every aspect of the calculations. The documentation as well as other QA procedures have been developed to satisfy the needs of EPA Superfund and other investigations where it is anticipated that the data may be exposed to legal scrutiny.

B. CHROMATOGRAMS

The GC operator will document each set of chromatograms with the following information:

1. Gas flows for H_2, N_2, and air
2. Tank pressures for H_2, N_2, and air
3. Temperatures
    a. injector
    b. column
    c. detector
4. Integrator Parameters
    a. injector
    b. peak markers
    c. baseline offset
5. Column
    a. type
    b. length and diameter
    c. packing material
    d. temperature
6. Operator
7. Date

If any system parameters change, the GC operator will document on the chromatograms that the changes occurred, and will list the actual changes on the chromatograms.

C. LOG BOOK

The field operator assistant will maintain a daily log book as well as individual field logs for each sample location recording the following information for each sample location:

1. Time (military notation) and weather
2. Ambient air and soil temperature
3. Sample number (determined by State)
4. Location (keyed to mapped location supplied by State and an approximate description, including street name)
5. Sampling depth
6. Evacuation time between samples
7. Flowrate (milliliters per minute)
8. Probe and adaptor numbers and volume of the sample probe
9. Number of sampling points used

10. Observations (including, but not limited to; ground conditions, concrete, asphalt, soil appearance, surface water, odors, and vegetation)
11. Backfill procedure and materials
12. Actual sample location marked on the site map (1 inch = 300 feet) provided by State
13. Barometric pressure
14. Relative degree at condensation in duplicate sample container

D. DAILY REPORT

Two hours before the end of each day's work, the GC operator supplies the on-site client representative with a condensed copy of the day's analyses plus condensed data for the last two hours of the previous day's work. This data, in addition to a map of the sample locations, will constitute TRC's daily report to the client.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

Tracer Research Corporation has a complete Quality Assurance/Quality Control Program for its soil gas contaminant investigation services. Included as part of this is a full Field Operation Manual with very detail QA/QC procedures. The steps outlined below summarize TRC's overall QA/QC program.

If needed a client can be provided with documentation detailing the entire program.

Reusable Sampling Equipment

- Steel probes are used only once during the day and then washed with high pressure soap and hot water spray or steam-cleaned to eliminate the possibility of cross-contamination. 42 probes are carried on each van to avoid the need to reuse any during the day.

- Probe adaptors (steel reducer and tubing) are used once during the course of the day and cleaned at the end of each working day by baking in the GC oven. The tubing is replaced periodically as needed during the job to insure cleanliness and good fit.
- Silicone tubing (connecting the adaptor to the vacuum pump) is replaced as needed to insure proper sealing around the syringe needle. This tubing does not directly contact soil gas samples.
- Glass syringes are usually used for only one sample per day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.
- Septa through which soil gas samples are injected into the chromatograph are replaced on a daily basis to prevent possible gas leaks from the chromatographic column.
- Analytical instruments are calibrated each day by the use of chemical standards prepared in water by serial dilution from commercially available pure chemicals. Calibration checks are also run after approximately every five soil gas sampling locations.
- 2 cc sampling syringes are checked for contamination prior to sampling each day by injecting nitrogen carrier gas into the gas chromatograph
- Prior to sampling each day, system blanks are run to check the sampling apparatus (probe, adaptor, 10cc syringe) for contamination by drawing ambient air from above ground through the system and comparing the analysis to a concurrently sampled air analysis. System blanks are repeated after approximately every 10 soil gas sampling locations.

- All sampling and 2cc subsampling syringes are decontaminated each day and no such equipment is reused before being decontaminated. Microliter size subsampling syringes are reused only after a nitrogen carrier gas blank is run to insure it is not contaminated by the previous sample.
- Soil gas pumping is monitored by a vacuum gauge to insure that an adequate gas flow from the vadose zone is maintained. A negative pressure (vacuum) of 2 in. Hg less than the maximum capabity of the pump (evacuation rate >0.02 cfm) usually indicates that a reliable gas sample cannot be obtained because the soil has a very low air permeability.
- All contaminated sampling equipment (probes, adaptors, syringes) is stored separately from clean equipment to prevent cross-contamination and accidental re-use.

APPENDIX

Tracer Research Corporation

RESUME OF DR. GLENN M. THOMPSON

Born: September 21, 1946

Education:

B.S. in Geology, 1970, University of Rhode Island
M.S. in Geology, 1973, Memphis State University
Ph.D. in Geology, 1976, Indiana University

Professional Experience:

Present -	President and Founder, Tracer Research Corporation Specializing in tracer studies and studies of subsurface halocarbon and hydrocarbon distribution.
[illegible]/77-12/83 -	Assistant Professor of Hydrology, Department of Hydrology and Water Resources, University of Arizona
9/70-1/77 -	Various teaching and research assistantship awards during graduate programs at MSU and IU.
[illegible]/73-7/73 -	Second Lieutenant U.S. Army, active duty for training in the Army Corps of Engineers, Fort Belvior, Virginia

Publications:

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TRACER RESEARCH CORPORATION'S

FIELD OPERATION PLAN

Submitted By:

____
Tracer Research Corporation

____
Date

SOIL GAS SAMPLING PROCEDURE

I. Probe Placement

A) A clean probe (pipe) is removed from the 'clean'storage tube on top of van.

B) The soil gas probe is placed in the jaws of hydraulic pusher/puller mechanism.

C) A sampling point is put on the bottom of the probe.

D) The hydraulic pushing mechanism is used to push the probe into the ground.

E) If the pusher mechanism won't push the probe into the ground a sufficient depth for sampling, the hydraulic hammer is used to pound the probe into the ground.

II. Sample Extraction

A) An adaptor (Figure 1) is put onto the top of the soil gas probe.

B) The vacuum pump is hooked onto the adaptor.

C) The vacuum pump is turned on and used to evacuate soil gas.

D) Evacuation will be at least 30 seconds but never more than 5 minutes for samples having evacuation pressures less than 15 inches of mercury. Evacuation times will be at least 1 minute, but no more than 5 minutes for probes reading greater than 15 inches of mercury

E) Gauges on the vacuum pump are checked for inches of mercury.

1. Gauge must read at least 2 inches of mercury less than maximum vacuum to be extracting sufficient soil gas to collect a valid sample.

III. Sample Collection

A) With vacuum pump running, a hypodermic syringe needle is inserted through the silicone rubber and down into the stainless steel tubing of adaptor (Figure 1).

B) Gas samples should only contact steel surfaces and never contact potentially sorbing materials (i.e., tubing, hose, pump diaphram).

C) The syringe is purged with soil gas then, without removing syringe needle from adaptor, a 2-10 ml soil gas sample is collected.

D) The syringe and needle are removed from the adaptor and the end of the needle is capped.

E) A second 10 ml sample is collected using the same procedure.

IV. Demobilization

A) The vacuum pump is turned off and unhooked from the adaptor.

B) The adaptor is removed and stored with equipment to be cleaned.

C) Using the hydraulic puller mechanism, the probe is removed from the ground.

D) The probe is stored in the "dirty" probe tube on top of the van.

E) The probe hole is backfilled, if required.

V. Log Book and U.S. EPA Field Sheet Notations For Sampling

A) Time (military notation)

B) Sample number (use client's numbering system)

C) Location (approximate description-i.e., street names)

D) Sampling depth

E) Evacuation time before sampling

F) Inches of mercury on vacuum pump gauge

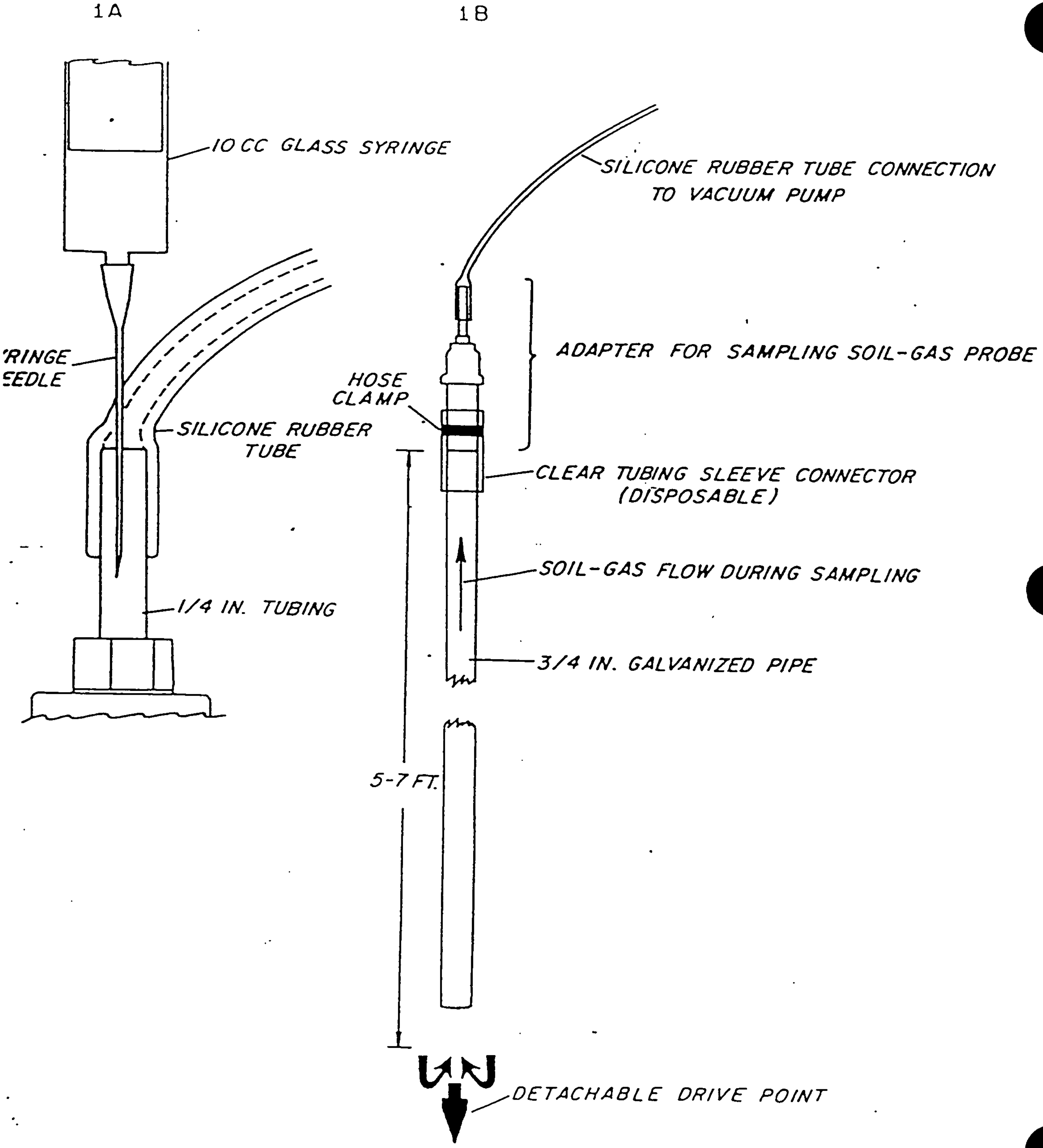


FIGURE 1

A. Close up of syringe soil gas sampling through evacuation line.

B. Diagram of soil gas sampling probe with adapter for sampling and evacuation of the probe after it is driven into the ground.

G) Probe and adaptor numbers

H) Number of sampling points used

I) Observations (i.e., ground conditions, concrete, asphalt, soil appearance, surface water, odors, vegetation, etc.)

J) Backfill procedure and materials, if used.

VI. Other Recordkeeping

A) Client-provided data sheets are filled out, if required

B) Sample location is marked on the site map

VII. Determination of Sampling Locations

A) Initial sample locations will be determined by client prior to start of job.

B) Remaining samples will be determined by client and TRC personnel based on results of initial sample locations.

ANALYTICAL PROCEDURES

Equipment

I. Varian 3300 and Tracor 540 Gas Chromatographs

A) Equipped with two Electron Capture Detectors (ECD), Flame Ionization Detector (FID) and Thermal Conductivity Detector. The instruments are modified by the addition of a dryer, composed of ionic polymer materials, situated between the injection and the head of the column. Thus, the sample is injected with a syringe through a septum into the injector where liquid samples are vaporized. The vapors proceed through the dryer where all water vapor from the liquid sample or soil gas sample is absorbed, then through the GC column to the detector. Soil gas samples up to 2 ml and water samples up to 10 ul can be analyzed by this method. This procedure is suitable for the analysis of nonpolar volatile compounds which includes most of the purgeable priority pollutants. This method is not suitable for analysis of polar compounds such as alcohols, ketones and ethers because they are partially or completely absorbed by the dryer.

B) The chromatographic column used by TRC for the analysis of halocarbons will be a 1/8" diameter packed column containing Alltech OV101. This separates most of the tri-chloro and tetra-chloro compounds that are encountered in soil gas investigations. In the event that assurance of the identity of a compound in any particular sample is required, it will be analyzed on a SP1000 column after the OV101 analysis. The TC detector uses poropack-Q and mole-sieve columns to detect compounds such as oxygen and carbon dioxide.

II. Two Spectra Physics SP 4270 Computing Integrators

The integrators are used to plot the chromatogram and measure the size of the chromatographic peaks. The integrators compute and record the area of each peak. The peak areas are used directly in calculation of contaminant concentration.

III. Chemical Standards From Chem Services, Inc. of Westchester, Pennsylvania.

A) TRC uses analytical standards that are preanalyzed of certified purities and lot numbered for quality control assurance. Each vial or gas cylinder is marked with an expiration date. All analytical standards are the highest grade available. Certified purities are typically 99%.

B) The Quality Assurance procedures used by Chem Service were described by the Laboratory Supervisor, Dr. Lyle Phipher. No written list of Quality Assurance procedures were made available to TRC.

However, the pertinent factors related to Quality Assurance were described as follows:

1) The primary measurement equipment at Chem Services the analytical balance, is serviced by the Mettler Balance Company on an annual basis and recalibrated with NBS traceable weights.

2) All chemicals purchased for use in making the standards are checked for purity by means of gas chromatography using a thermal conductivity detector. Their chemicals are purified as needed.

3) The information on the purification and analysis of the standards is made available upon request for any item they ship when the item is identified by lot number. All standards and chemicals are

shipped with their lot numbers printed on them.

The liquid standards used by TRC are made up in a two step dilution of the pure chemical furnished by Chem Services. Pure gas standards do not have to be diluted.

Procedures

I. Liquid Standards

A) A fresh standard is prepared each day. The standards are made by serial dilution.

1) First, a stock solution containing the standard in methanol is prepared at TRC offices in Tucson. The stock solution is prepared by pipetting the pure chemical into 250 ml of methanol in a volumetric flask at room temperature. The absolute mass is determined from the product of volume and density calculated at room temperature. Hamilton microliter syringes, with a manufacturer's stated accuracy of -1%, are used for pipetting. Information on density is obtained from the CRC. Once the stock solution is prepared, typically in concentration range of 50-1000 ppm, a working standard is prepared in water each day. The solute in the stock solution has a strong afinity to remain in methanol so there is no need to refrigerate the stock solution. Additionally, the solute tends not to biodegrade or volatize out of the stock solution.

2) The working standards are prepared in 42 ml VOA septum vials by diluting the appropriate ug/l quantity of the standard solution into 42 ml of water.

B) The standard water is analyzed for contamination before making the aqueous standard each day.

C) The aqueous standard is prepared in a clean vial using the same syringe each day. The syringe should only be used for that standard.

D) Final dilution of the calibration standards are made in water in a VOA vial having a Teflon coated septum cap instead of in a container with no air exposure. The VOA bottle permits mixing of the standard solution and subsequent syringe sampling all day long without opening the bottle or exposing it to air. The measurement uncertainty inherent in the use of a VOA bottle instead of a volumetric flask is approximately -1%.

E) The aqueous standard will contain the compounds of interest in the range of 5 to 100 ppb depending on the detectability of the individual components. The standard will be analyzed at least 3 times at the start of each day to determine the mean response factor (RF) for each component (Figure 2). The standard will be injected again after every fifth sample to check detector response and chromatographic performance of the instrument throughout the day.

F) The RF allows conversion of peak areas into concentrations for the contaminants of interest. The RF used is changed if the standard response varies 25%. If the standard injections vary by more than 25%, the standard injections are repeated. If the mean of the two standard injections represents greater than 25% difference then a third standard is injected and a new RF is calculated from the three standard injections. A new data sheet is started with the new RF's and calibration date.

$$\% \text{ difference} = \frac{\text{A area} - \text{B area}}{\text{A area}}$$

Where A = mean peak area of standard injection from first calibration

B = peak area of subsequent standard injection

G) The low ppb aqueous standards that are made fresh daily need not be refrigerated during the day. This is because they do not change significantly in a 24 hour period. On numerous occasions the unrefrigerated 24 hour old standards have been compared with fresh standards and no difference has been measurable. If the standards were made at high ppm levels in water, the problem of volatilization would probably be more pronounced in the absence of refrigeration.

H) Primary standards are kept in the hotel room when in the field

I) A client may provide analytical standards for additional calibration and verification

II. Syringe Blanks

A) Each ul syringe is blanked before use

B) 2 or 10 cc (glass) syringes will each be blanked if ambient air concentrations are 'hot' (greater than or equal to .01 ug/l) for components of interest.

C) If ambient air concentrations are <.01 ug/l for components of interest, a representative sample of at least two syringes of each size (both 10 and 20 cc) are blanked at the start of each day. If representative syringes are 'clean' (no detectable contaminants) remaining syringes need not be blanked. If any of representative syringes show contamination, all 2 and 10 cc syringes must be blanked prior to use.

D) Syringe blanks should be run with nitrogen

E) If necessary for any syringe to be used again before cleaning, blank it prior to its second use.

III. System Blanks

A) System blanks are ambient air drawn through the probe and complete sampling apparatus and analyzed by the same procedure as a soil gas sample. The probe is above the ground.

B) One system blank is run at the start of each day.

C) A system blank is run after every 10 samples.

D) A system blank will be run before reusing any sampling system component that has not been cleaned.

E) An ambient air sample will be collected concurrent with and at the same location as the system blank is collected.

F) The ambient air sample will also be analyzed. A comparison of results will be indicative of contamination within the sampling equipment.

G) The system blanks will be taken at locations away from actual soil gas sampling locations.

H) If ambient air/system blank samples indicate contaminant concentrations greater than 0.001 ug/l, above ambient air concentrations the contaminated portion of the sampling system will be located and removed. Any contaminated equipment will be decontaminated prior to use.

IV. Samples

A) All unknown samples will be analyzed at least twice.

B) More unknown samples will be run until reproducibility is within 25%, computed as follows:

$$\text{Difference} = \frac{A - B}{(A + B)/2}$$

Where: A is first measurement result
B is second measurement result

If the difference is greater than .25, a subsequent sample will be run until two measurements are made that have a difference of .25 or less. Those two measurements will be used in the final calculation for that sample.

C) The injection volume should be adjusted so that mass of analyte is as near as possible to that which is contained in the standard, at least within a factor of 10

D) Whenever possible the attenuation for unknown samples is kept constant through the day (so as to provide a visual check of integrations).

E) A water plug must be used as a gas seal in ul syringes

F) A seal must be established between syringes when subsampling

G) At very high concentrations air dilutions are acceptable once concentration of contaminants in air have been established.

H) All sample analysis (Figure 2) are documented.

I) Separate data sheet are used if chromatographic conditions change.

J) Everything is labeled in ug/l, mg/l, etc. PPM and PPB notations are to be avoided.

V. Daily System Preparation

A) Integrators parameters are initialized

- 1) Pt. evaluation
- 2) Attenuation
- 3) Peak markers
- 4) Auto zero
- 5) Baseline offset (min. 10% of full scale)

B) The baseline is checked for drift, noise, etc.

C) System parameters are set.

- 1) Gas flows (Note: N_2, air, H_2 tank pressure on Page 1 of chromatograms).
- 2) Temperatures (Note on page 1 of chromatograms - Figure 3).
    - a) Injector
    - b) Column
    - c) Detector

D) After last analysis of the day conditioned septa are rotated into injection ports used during the day and replaced with fresh septa.

E) Column and injector temperatures are run up to bake out residual contamination

F) Syringes are cleaned each day.

Date 4/12/85 Page 1 of 2

FIGURE 2

	① F113	1,1,1-TCA	TCE	PCE
standard conc.	② 10 μg/l	5 μg/l	10 μg/l	5 μg/
response from 5ul injection	1 9531 area	1 9297 area	1 11488 area	1 18060 are
	2 ③ 10368 area	2 9167 area	2 11141 area	2 17572 are
	3 10719 area	3 8887 area	3 11265 area	3 12985 are
RFs for this sheet	④ 4.90×10^{-15} g/area	2.74×10^{-15} g/area	4.43×10^{-15} g/area	1.54×10^{-15} g/are

⑤ sample	⑥ time	⑦ amt inj	⑧ area	⑨ μg/l	mean	area	μg/l	mean	area	μg/l	mean	area	μg/l	mean
SG1-5'	9:41	1cc	<1000	<.005		5400	0.01		351,625	2		26133	.04	
SG1-5'	9:47	1cc	<1000	<.005		5874	0.02		410,552	2		25134	.04	
W18	9:55	1ul	397	2		<300	<.8		40528	200		<300	<.5	
W18	10:03	1ul	392	2		<300	<.8		44715	200		<300	<.5	

EXPLANATION OF DATA SHEET:

1. Name of contaminant
2. Concentration of contaminant in calibration standard
3. Peak areas obtained from three 5 ul injections during calibration.
4. Response factor (RF) for obtained from the 3 calibration runs. The RFs are used for calculation of actual concentrations and are included on each data sheet.
5. Sample ID number. SG1-5' (soil gas sample 1 taken 5 feet deep. W18 (water sample).
6. Time of analysis. This number along with the data identifies the chromatogram from which the data was taken.
7. Amount of sample injection - information needed for the calculation of concentration.
8. Peak area - raw number produced by the peak integrator that is proportioned to the amount of contaminant in the sample.
9. Actual concentration presented in the sample of soil gas or water rounded to one significant figure.
10. Signature line for analyst and person that checks the data.

Notations:	RF	response factor
	I	interference with adjacent peaks
	NA	not analysed
	F	estimated peak area

⑩ Analysed by D. Marrin

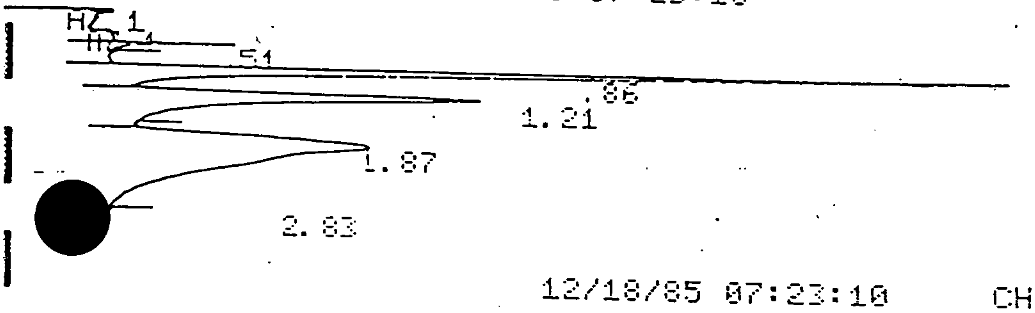
Checked by R. Trautz

```
READY
TE " 12/18/85
ME " 7:12:55
F          FE= 1.        MN= 0.
ES  ENTER' TO SKIP ENTRY
LE NAME="
ME            FUNCTION  VALUE
= .01         TF=" AZ    TV= 1
= .01         TF=" PM    TV= 1
=

THOD NUMBER:MN= 0

D OF DIALOG
=10
=100
= 8

ANNEL A       INJECT  12/18/85 07:15:46
```

Operator D-EVANS Date 12/18/85
Column No. ______ Length 6' Dia 1/8"
Coating OV-101 Conc 5%
Support Chromo W Mesh 80/100
Column TEMP: Iso 100 °c Program ______
Init (1) ______ °c hold ______ min Final (1) °c hold ______ min
CARRIER GAS N2 Rate 30 ml/min
Pressure: Inlet 50 Outlet 21
Hydrogen 30 ml/min Air 300 ml/min
DETECTOR: EC ______ TC ______ FID ✓ PID ______
Baseline 17 mV Range 12 Attn 1
Standard Composition (500) BENZENE (800) TOLUENE (1226) ETHYL BENZENE/XYLENES
0% CH4

```
 2.76                                                       AZ 1
ANNEL A       INJECT  12/18/85 07:23:10
```

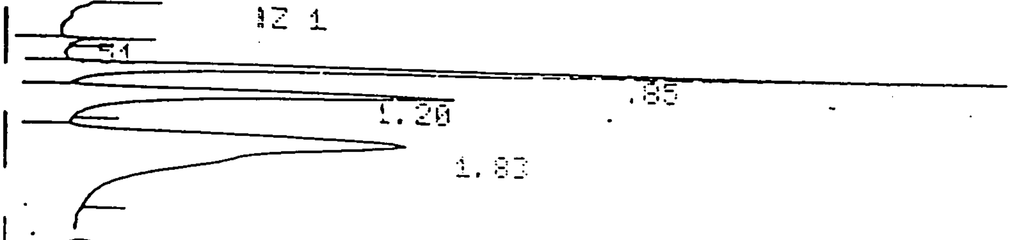
6ul BTX STD



```
                   12/18/85 07:23:10      CH= "A"   PS=  1.
LE  1.     METHOD  0.      RUN   1      INDEX   1
AK#        AREA%        RT        AREA  BC

 1          1.167      0.51       1817  01
 2         27.82       0.86      43300  08
 3         20.802      1.21      32376  05
 4         50.21       1.87      78148  01

TAL       100.                  155641
```

6ul BTX STD

```
ANNEL A       INJECT  12/18/85 07:25:38
```



```
ANN   A       INJECT  12/18/85 07:59:18
```

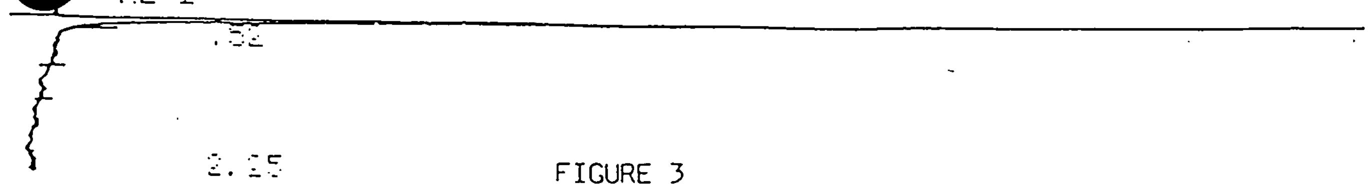


FIGURE 3

1) 2 and 10 cc syringes are cleaned with Alconox or equivalent detergent and brush

2) ul syringes are cleaned daily with IPA or MeOH and purged with N_2. Syringe Kleen is used to remove metal deposits in the barrel.

3) They are baked out overnight in the oven of the gas chromatograph at a minimum temperature of 60°C.

VI. Duplicate Field Sampling

A) A duplicate field sample is a second soil gas sample from the sample sampling location

B) A duplicate field sample will be taken after every 20 sample locations

VII. Sample Splits

If desired, TRC's client or any party, with the approval of TRC's client, may use sample splits to verify TRC's soil gas or groundwater sampling results.

A) Sample splits may be collected in two valve, flow through-type all glass or internally electroplated stainless steel containers for analysis within 10 days of collection.

1) Flow through sample collection bottles should be cleaned by purging with nitrogen at 100°C for at least 30 minutes. Once clean, the bottles should be stored filled with nitrogen at ambient pressure.

2) Sample bottles are filled by placing them in the sample stream between the probe and the vacuum pump. Five sample bottle volumes should be drawn through the container before the final sample is collected. The sample should be at ambient pressure.

B) Splits of the aqueous standards or the gas standards used by TRC for instrument calibration may be analyzed by the party requesting sample splits.

QUALITY ASSURANCE/QUALITY CONTROL PROCEDURES

I. Soil Gas Sampling & Related Equipment

A) Soil Gas Sampling Probes

1. There are two tubes on top of each TRC van to hold soil gas sampling probes (pipe). One tube is designated as the "dirty" tube and holds pipe after they have been used. The other tube is the "clean" tube and holds pipe after cleaning and before use.
2. Each van carries sufficient probes so that none have to be used more than once before cleaning.
3. Probes will be cleaned prior to initial use to remove any residual oils from the pipe cutting and threading process.
4. Probes are cleaned, both inside and outside by:
    - a) steam cleaning, or
    - b) hot water/high pressure wash at a commercial self-serve car wash establishment.
5. After cleaning, probes are put into the "clean" storage tube on top of the van.
6. Each probe is numbered and its number is noted in the log book entry for the sampling location it is used on.

B) Soil Gas Sampling Adaptors (Figure 1)

1. Each TRC van carries sufficient sampling adaptors to do one day's work without any reuse. Each adaptor is cleaned prior to reuse.

2. Adaptors are cleaned by washing in hot water and baking in the oven of the gas chromatograph for several hours at a minimum temperature of 60°C.
3. Each adaptor is numbered and its number is noted in the log book entry when it is used.

C) Soil Gas Sampling Documentation

1. TRC personnel operating the sampling part of an investigation keep a log book and U.S. EPA Field Sheets that notate information pertinent to each sampling location.

   This provides valuable reference for creating a record and interpreting soil gas and groundwater sample results as well as providing traceability for all sampling system components.

   a) Time (military notation)
   b) Sample number (use client's numbering system)
   c) Location (approximate description - i.e., street names)
   d) Sampling depth
   e) Evacuation time before sampling
   f) Inches of mercury on vacuum pump gauge
   g) Probe and adaptor numbers
   h) Number of sampling points used
   i) Observations (i.e., ground conditions, concrete, asphalt, soil appearance, surface water, smells, vegetation, etc.)
   j) Backfill procedure and materials, if used

   For groundwater sampling the following is also noted:

   k) Note how sample was collected
   l) How long vacuum applied before able to collect sample
   m) Appearance of sample (i.e., clear, very thick liquid-mud, etc.)

each component (Figure 2).

2. The standard is analyzed again after every fifth sample.
3. The RF is changed if standard response varies 25%. If the standard injection varies by more than 25%, the standard injection is repeated. If the mean of the two standard injections represents greater than a 25% difference then a third standard is injected and new RF is calculated from the three standard injections. A new data sheet with the new RF's and calibration data is started.

$$\% \text{ difference} = \frac{\text{A area} - \text{B area}}{\text{A area}}$$

Where A= mean peak area of standard injection first calibration

B= peak area of subsequent standard injection

4. The client may provide analytical standards for additional calibration and verification.

C) Field Samples

1. A field sample is a soil gas sample or groundwater sample
2. Each unknown sample is analyzed at least twice to ensure reproducibility
3. More samples should be analyzed until reproducibility is withing 25%, computed as follows:

$$\text{difference} = \frac{A - B}{(A = B)/2}$$

Where: A is first measurement result

B is second measurement result

If the difference is greater than .25, a subsequent sample will be run until two measurements are made that have a difference of .25 or less.

Those two measurements will be used in the final calculations for that sample.

4. A duplicate field sample will be taken at random in the investigation area at a frequency of not less than 1 for every 20 sample locations.

D) Chromatographic Information (Figure 3)

1) On the first page of each day chromatograms the following system parameters are noted:
    a) gas flows for H_2, N_2 and air
    b) tank pressures for H_2, N_2 and air
    c) temperatures
        1. injector
        2. column
        3. detector
    d) integrator parameters
        1. attenuation
        2. peak markers
        3. baseline offset
    e) column
        1. type
        2. length and diameter
        3. packing material
        4. temperature
    f) operator
    g) date

2) If any system parameters change, the chromatograms are stamped and changes noted.

E) Sample Documentation (Figure 2)

1) The field data sheets developed and used by TRC allow for full traceability of results. The response factors used and how they were calculated are noted. The sample number, time,

amount injected and the peak area are noted. The actual chromatogram can be traced from this information. The sample concentration noted is calculated using the RF, amount injected and peak area for the component of interest.

Contents:

REPORT PREPARED FOR

BASE CIVIL ENGINEER'S OFFICE

NIAGARA FALLS AIR FORCE MISSILE SITE

Purchase Order #63-3176

All necessary surveying and computations
to establish the geodetic coordinates of
two pre-selected points located on the base.

OFFICE COPY

PREPARED BY

JOHN E. MC INTOSH LAND SURVEYOR

429 Pine Street, Lockport, N.Y.
14 Main Street, Batavia, N.Y.
28 Mill Street, Mount Morris, N.Y.

June 19, 1963 Job # 1901

JOHN E. McINTOSH
No. 25590

GENERAL

Our Lockport Office was contacted by Lt. Finch, Base Civil Engineer, Saturday morning, June 8, 1963, as to whether we could perform the required survey work and how long a time would be required to complete the project.

After this initial conversation covering the requirements we proceeded to investigate what horizontal control points with sufficient accuracy existed in the area and what information was available on them.

We then again talked to Lt. Finch and explained that sufficiently accurate points did exist and that we had information as to their position and that we could perform the work but that it could not in all probability be completed until Tuesday, June 11th or Wednesday, June 12th. Upon hearing this information, Lt. Finch instructed us to proceed at full speed to complete the work as soon as possible.

We then proceeded on the project. Various members of our firm worked Sunday, Monday, Tuesday, Wednesday, Friday and the next Monday and Tuesday to complete the work.

The geodetic positions and New York West Zone Coordiantes were turned over to Lt. Finch on Thursday morning, June 13th. The map, our statement and this report were turned over to Lt. Finch on Thursday, June 20th.

BASE LINE POINTS

The Base Line Stations used to start and end our traverse were run, monumented and computed for the Niagara Falls Power Project by Uhl, Hall and Rich, Power Authority Engineers. The traverse closure on their work was 1 in 23,000. Their points were all coordinated using New York West Zone Coordinates. Their traverse was based upon existing 2nd order monuments set by the United States Lake Survey and existing 3rd order monuments set by the International Boundary Commission.

TRAVERSE RUN

Our traverse loop started at existing station "FRAN" located on the easterly side of Military Road, just north of Lockport Road. Our Station 1 is on the north-easterly corner of the New Railroad Bridge over Military Road. We then ran along the New York Central Railroad right-of-way to the south-west corner of the New Lockport Road Bridge over the Railroad. Our traverse continued along the Railroad right-of-way to the south-east corner of the New Tuscarora Road Bridge over the Railroad. We then turned south and ran direct to Station 4 on the New York Air National Guard concrete apron. We then ran westerly angling across the concrete taxi strip to Station 5 on the taxi strip at its most westerly point. The traverse then turns southerly and goes to Station 6 on the northerly shoulder of Porter Road. It then turns westerly and runs along Porter Road to Station 7 in front of the Amoco Gas Station at "Six Corners". We then run westerly along Porter Road to Station 8 on the south-west corner of the New Expressway Bridge over Porter Road. The traverse then continues along Porter Road to Station 9 on the north side of the New Bridge over the Niagara Junction Railroad tracks and finally closes into existing Station [illegible] on the south side of Porter Road near the Golf Course. The total length of our traverse was approximately 7.5 miles.

METHOD OF ANGLE AND DISTANCE MEASUREMENTS

All angles were turned with a "WILD T-1" repeating Theodolite. The angles were read in sets. Six times with the telescope direct and six times with the telescope reversed. The horizon was closed in all cases. The averages of all sets resulted in an excess of 1 second per angle or a closing error of 10 seconds. Each angles turned was then equally reduced to balance the angles.

All distances were measured using the Model 4 D Geodimeter. Where necessary slope measurements were corrected.

COMPUTATIONS

Our traverse was balanced and closed using standard United States Geological Survey methods. Our traverse closure was 1 in 30,000. The New York West Zone plane rectangular coordinates were then computed. These coordinates were then converted to Latitude and Longitude using standard U.S.G.S. methods. This conversion was performed only for Stations 4 and 5. All computed results are shown on the map prepared for this project.

CONCLUSION

The traverse exceeds second order and almost reaches first order as defined in the "Classification and Standards of Accuracy" Tables as adopted by the A.S.C.E. and A.C.S.M.

CONTROL STATION RECORD

McINTOSH & McINTOSH SURVEYORS
429 PINE STREET LOCKPORT, NEW YORK

Town Niagara County Niagara Party Chief
Draftsman
Job No. Date 6-10-63 Station "3" Checked By
Sheet No. 25

LATITUDE LONGITUDE

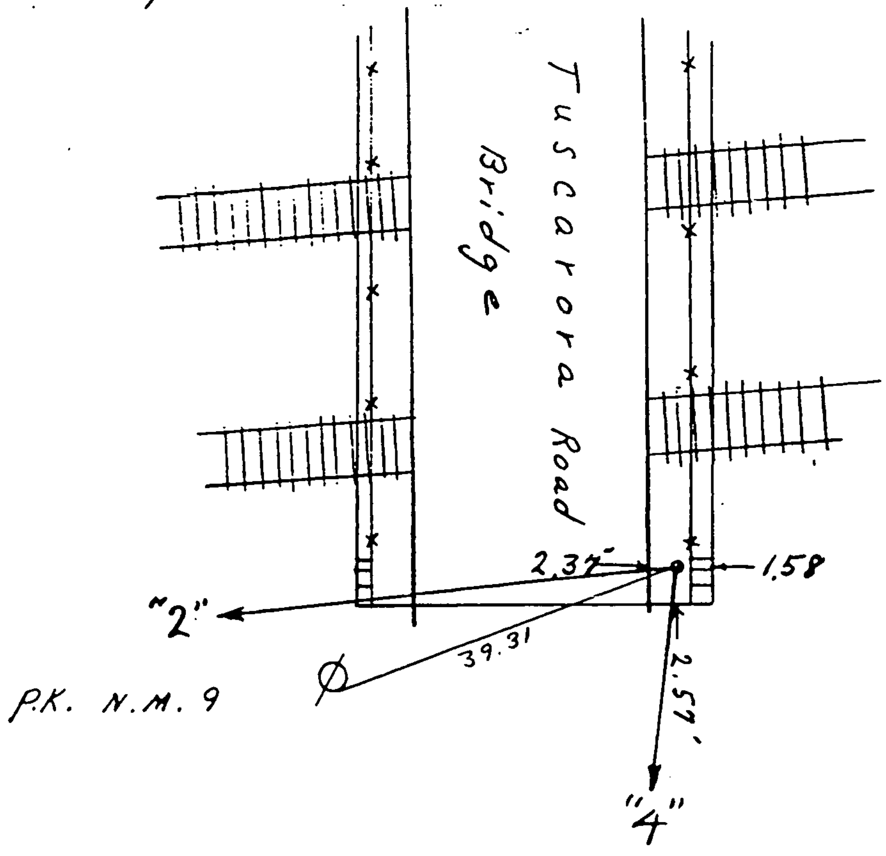
X (NORTH) 1,139,072.62 Y (EAST) 401,814.76

COORDINATE SYSTEM

TO STATION	AZIMUTH	BEARING	DISTANCE

Pt. "3" Drill hole in Conc. Abutment.

Found 6/71



CONTROL STATION RECORD

McINTOSH & McINTOSH SURVEYORS
429 PINE STREET LOCKPORT, NEW YORK

Town City Niagara Falls County Niagara

Job No. ______ Date 6-10-63 Station "4"

Party Chief ______
Draftsman ______
Checked By JEM
Sheet No. 26

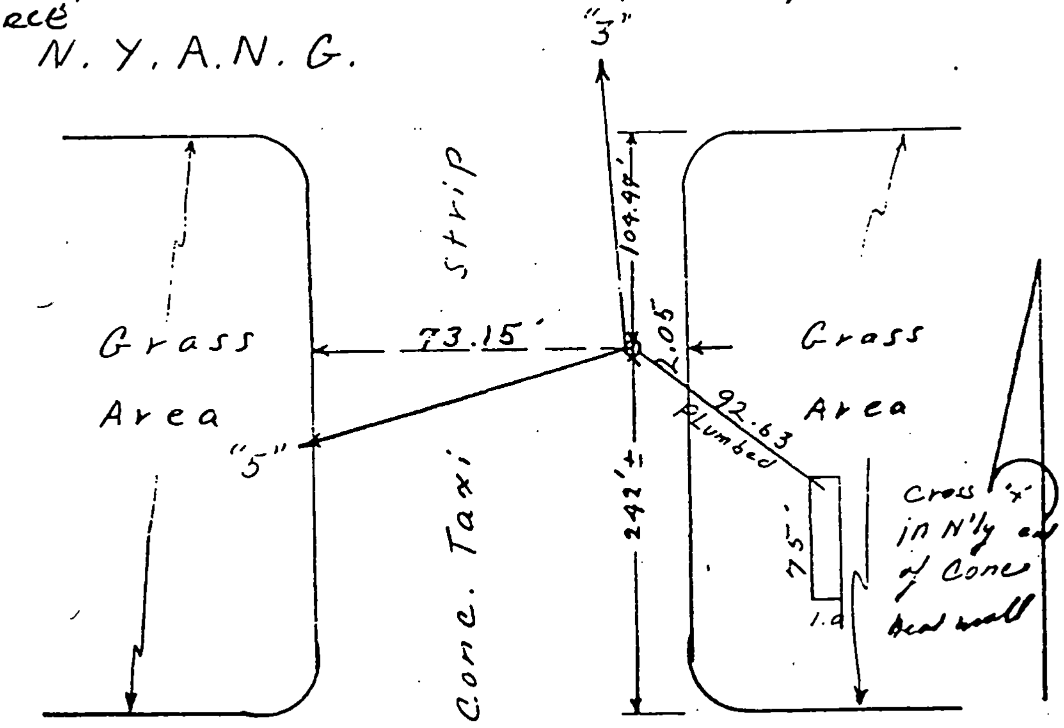
LATITUDE 43° 06'- 45.839" LONGITUDE 78° 56'- 59.681"

X (NORTH) 1,134,359.11 Y (EAST) 402,114.90

COORDINATE SYSTEM ______

TO STATION	AZIMUTH	BEARING	DISTANCE

Pt. "4" Drill hole Found 6/71
Air Force N.Y.A.N.G.



Pt. "4" is accesible from Tuscarora Rd. Entrance of S.E. of NY ang Hangar.

CONTROL STATION RECORD

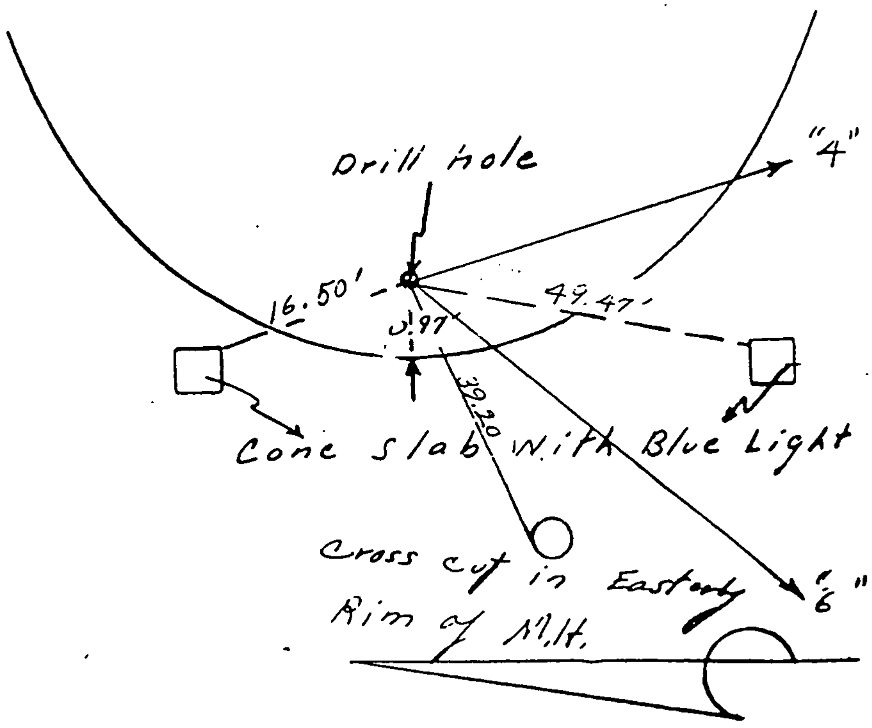
McINTOSH & McINTOSH SURVEYORS
429 PINE STREET LOCKPORT, NEW YORK

Town City Niagara Falls County Niagara
Job No. ______ Date 6-10-63 Station "5"
Party Chief
Draftsman
Checked By
Sheet No. 27

LATITUDE 43°-06'-36.864" LONGITUDE 78°-58'-00.518"
X (NORTH) 1,133,470.65 Y (EAST) 397,598.29
COORDINATE SYSTEM

TO STATION	AZIMUTH	BEARING	DISTANCE

Pt "5" Drill hole in Taxi strip.
Air Force
Near W'ly end of of M.H.
Found 6/71



NOTE:

BASE MAP DEPICTED HEREON WAS PROVIDED BY THE U.S. AIR FORCE AND THE INFORMATION SHOWN THEREON BY McINTOSH & McINTOSH, P.C. IS ONLY INFORMATION CONCERNING THE LOCATION AND ELEVATION OF THE MONITORING WELLS.

ALL COORDINATES DEPICTED ARE NEW YORK STATE WEST ZONE COORDINATES.

BENCH MARK ⚠1 - U.S.G.S. MONUMENT NORTH SIDE TERMINAL BUILDING 583.92

BENCH MARK ⚠2 - BUILDING 700 (FIRE CONTROL FACILITY) 592.08, CHISELED SQ. IN CONCRETE DOORWAY APRON AT S.W. CORNER OF WEST OVERHEAD DOOR OPENING.

NORTH

McINTOSH & McINTOSH, P.C.
CONSULTING ENGINEERS, LAND SURVEYORS, PLANNERS
LOCKPORT, NEW YORK
PHONE 434-8138
BUFFALO, NEW YORK
PHONE 625-8360

MAP SHOWING MONITORING WELL LOCATIONS AT NIAGARA FALLS AIR FORCE BASE

LOCATION TOWNS OF NIAGARA & WHEATFIELD, NIAGARA COUNTY, NEW YORK

DRAWN G. N. Z.
COMP.
DESC.
CHECKED

JOB No. 4757 - A
SCALE: 1" = 200'
DATE: DECEMBER 4, 1984

NOTE UNAUTHORIZED ALTERATION OR ADDITION SURVEY MAP IS A VIOLATION OF SECTION PROVISION 2 OF THE NEW YORK STATE EDUCA

REVISION	REVISIO
ADDED TABLE B, REVISED ELEV. 1-2, 3-2, 3-4, 3-5, 3-6 SEPTEMBER 14, 1989	

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757
DATE 12 3, 4 86

ZIMPFER
[illegible]

ELEVATION RUN
AROUND MONITORING WELLS
N.F. AIR FORCE BASE

①

	TOP	MID.	BTM		
BM 2		592.08			
+		2.695			
		594.775		594.775	
−		4.490		4.330	
T.P		590.285		590.445	
+		3.215		3.055	
		593.500		593.500	
−	1.337	1.189	1.041		
MON 7-1		592.311			
HI		593.500			
−	1.698	1.403	1.109		
MON 7-3		592.097			
HI		593.500			
−	1.742	1.593	1.440		
MON 7-2		591.907			
HI		593.500		593.500	
−		1.395		2.855	
T.P. HYD		592.105		590.645	
+		1.450		2.910	
HI		593.555		593.555	
−		4.630		4.400	
T.P.		588.925		589.155	
+		3.655		3.425	
HI		592.580		592.580	
−	2180	1.910	1631	167	
MON 10-3	2	590.670			
HI		592.580			
−	329	2.698	2.151		
MON 6-1		589.8[illegible]2			

②

HI		592.580			
−	2.469	2.181	1.892		
MON 10-2		590.399			
HI		592.580		592.580	
−		3.485		3.320	
T.P.		589.095		589.260	
+		5.460		5.280	
HI		594.555		594.540	
−		1.120		1.285	
T.P.	HYD ¼ of BLDG .620	593.435		593.255	
+		6.390		6.560	
HI		599.825		599.815	
−	3.590	4.638	3.689		
MON 1-5		595.187			
HI		599.825			
−	2.485	2.394	2.301		
MON 1-4		597.431			
HI		599.825			
−	2.949	2.380	1.809		
MON 1-3		597.445			
HI		599.825			
−	3.129	2.245	1.299		
MON 1-2		597.580			
HI		599.820			
−	3.951	2.940	1.934		
MON 1-D-2		596.885			

HI		599.825		599.815	
−		2 660		2 240	
T P.		597 165		597.575	
+		6 490		6 075	
HI		603 655		603 650	
−	3.070	2.781	2.490		
Mon 1-1		600.874			
HI		603.655		603.650	
−		3 485		3.245	
T.P		600.170		600 405	
+		5.195		4.935	
HI		605.365		605.360	
−	3.158	2.788	2 320		
Mon 4-2		602.577			
HI		605.365			
−	3.490	3.049	2.609		
Mon 4-3		602 316			
HI		605.365			
−	4 022	3.700	3.377		
Mon 4-1		601.665			
HI		605.365		605 360	
−		6.705		6.510	
T.P.		598.660		598.850	
+		6.180		5 980	
HI		604.840		604 830	
−	3.259	2.860	2.460		
Mon 6-3		601.980			

HI		604 840			
−	3 882	2 810	[illegible]		
Mon 6-2		602.030			
HI		604.840			
−	2.925	2.252	1 575		
Mon 6-1		602.588			
HI		604 840		604 830	
−	6	6.965		6 980	
T. P.		597.875		597.850	
+		6.300		6 315	
HI		604.175		604 165	
−	5 248	4.375	3.502		
MON 201	TOP OF CASING *	599.800			
HI		604.175	TRIPLE READ		
−	1.955	0.629			
MON 2-1		603.546			
HI		604.175			
−	1.831	1.099	0.369		
MON 2-3		603 076			
HI		604.175	TRIPLE READ		
−	1.475	0.640			
Mon 2-2		603.535			
HI		604.175		604.165	
−		3.140		2.880	
T.P		601.035		601.285	
+		4.465		4.210	
HI		605.500		605.495	

HI		605.500		605.495	
–		3625		3.410	
T.P		601 875		602.085	
+		4.140		3925	
HI		606.015		606.010	
–	3532	3 115	2.698		
Mon 3-6		602.900			
HI		606.015		606.010	
–		7.500		7.140	
TP ~~([illegible])~~		598.515		598870	
+		0.440		0.080	
HI		598955		598.950	
–	4180	3.590	3.000		
Mon 3.5		595365			
HI		598.955	TRAIL ROAD		
–	1 710	5.495			
Mon 3.01		593460			
HI		596.955		598 950	
–		6170		5.900	
T.P		592785		593 050	
+		2.840		2.570	
HI		595.625		595.620	
–	4461	3.919	3.377		
Mon 3-4		591.706			
HI		595.625		595.620	
–		3.970		3.770	
T.P.		591.655		591.850	

T.P		591.655		591.850	
+		6010		5810	
HI		597.665		597.660	
–	4821	4.435	4.030		
Mon 3.3		593.230			
HI		597.665		597.660	
–		1.995		1.595	
T P		595.670		596.065	
+		5330		4930	
HI		601.000		600.995	
–	1.449	0.978	0.505		
Mon 3.2		600.022			
HI		601.000		600.99[illegible]	
–		3040		2.700	
T.P		597.960		598.29[illegible]	
+		6.765		6.420	
HI		604.725		604.715	
–		3.805		3.450	
T P		600.920		601.265	
+		4.660		4.305	
HI		605.580		605.570	
–	1.491	1.162	0.831		
Mon 3-1		604418			
HI		60[illegible].580		[illegible]	
–		2680		2.410	
T P		602.900		603.160	
+		4050		3785	
HI		606.750		606.94[illegible]	

HI		606 950		606.945	
−		4.275		4 110	
T P		602 675		602 835	
+		4 820		4 660	
HI		607 495		607.495	
−	2 563	2.036	1 507		
MON 1		605.459			
HI		607 495		607 495	
−		4.900		4.750	
T P		602 595		602.745	
+		4.690		4 540	
HI		607 285		607.285	
−		5 795		5.390	
T. P		601 490		601 895	
+		6.265		5.860	
HI		607.755		607 755	
TBM	W/D & UTZ [illegible] [illegible]	3.470		4 945	
TBO		604 285		602.810	SHUT OFF
+		0.635		2 110	
HI		604 920		604.920	
−		3. 605	150	4 580	
TBM	NW 2 UTZ [illegible] FLINT	601 .315		600.340	
+		1. 835		2. 810	
HI		603 150		603 150	
−		5 045		6355	
TBM	150 FLINT HUSBY =	598 105		596795	
+		0.290		1.580	
HI		598 . 395		598 375	
−		6 .290		6.29	
BM 2		592.105		592 085	13. 592.08

TBM	UTZ [illegible] & FLINT	601315		600.340	
+		0.760		1 725	
HI		602.075		602 065	
−		6 555		6.515	
T.P.		595 520		595 550	
+		2. 975		2.940	
HI		598 495		598.490	
−		3 880		3.795	
T.P		594 615		594 695	
+		4.330		4245	
HI		598. 945		598940	
−		7.655		7.625	
T.P		591 290		591 315	
+		5 970		5 940	
HI		597.260		597 255	
−		3. 375		3. 310	
T.P		593 885		593 945	
+		8. 395		8.335	
HI		602 280		602. 280	
−	5.780	5032	4.285		
Mon 8-2		597 .248			
HI		602.280			
−	2.188	1 420	0.659		
Mon 8-4		600.860			
HI		602.280			
−	4 297	3220	2.140		
Mon 8-3		599 060			
HI		602.280			
−	2.843	2227	1.609		
MON 8-1		600.053			

(9)

HI		602.880		602.280	
–		4.285		4.425	
T.P		597.995		597.855	
+		4.275		4.415	
HI		602.270		602.270	
–	3.957	3.568	3.179		
MON 5-2		598.702			
HI		602.270			
–	3.442	2.836	2.230		
MON 5-1		599.434			
HI		602.270			
–	3.490	2.852	2.217		
MON 5-4		599.418			
HI		602.270			
–	3.881	3.208	2.535		
MON 5-3		599.062	LOCK # 2426		
HI		602.270		602.270	
–		4.090		3.720	
T.P		598.180		598.550	
+		6.495		6.130	
HI		604.675		604.680	
–		3.255		2.875	
T.P		601.420		601.805	
+		2.945		2.565	
HI		604.365		604.370	
–		3.595		3.730	
T.P		600.770		600.640	

(11)

T.P		600.770		600.640	
+		6.370		6.495	
HI		607.140		607.135	
–		7.770		7.920	
T.P.		599.370		599.215	
+		5.585		5.735	
HI		604.955		604.950	
–		9.990		10.090	
T.P.		594.965		594.860	
+		2.325		2.430	
HI		597.290		597.290	
–		6.130		6.055	
T.P		591.160		591.235	
+		4.650		4.575	
HI		595.810		595.810	
–		5.930		5.885	
T.P		589.880		589.925	
+		4.250		4.205	
HI		594.130		594.130	
–		4.755		4.620	
T.P		589.375		589.510	
+		4.795		4.660	
HI		594.170		594.170	
–		5.235		5.170	
T.P		588.935		589.000	
+		1.630		1.565	
		590.565		590.565	
–	2.565	1.978	1.390		
MON 9-4		588.587			
HI		590.565			
–	2.664	1.915	1.165		
MON 9-1		588.650			

HI		590.565			
–	2.388	1.845	1.305		
MON 9-2		588 720			
HI		590.565			
–	2.087	1.883	1.679		
MON 9-3		588 682			
			END		

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757 ①
DATE Nov 28 84

G.Z. & SA

②

⊼ 2nd ORDER #3, BACKSIGHT 2nd #2, SIGHT TP#1

STA	DIST	VERT ∡	HORZ ∡		
#2	6089.845	0-03-00	①	102-13-20	(L)
TP#1	2703.610	1-10-00	②	204-27-10	
			③	306-40-40	
			AVG.	102-13-33	
			①	102-13-30	(L)
			②	204-27-20	
			③	306-40-50	
			AVG.	102-13-37	✓

⊼ TP#1, BACKSIGHT 2nd #3, SIGHT TP#2

TP#2	854.995	0-02-00	①	139-30-05	
			②	279-00-10	
			③	58-29-55	+ 360
			AVG	139-29-58	✓
8-3	136.50	1-00-00	[136.479]	79-08-05	(R)
				280-51-55	(L)
8-2	189.69	0-20-00	[189.687]	92-40-05	(R)
				267-19-55	(L)
E-1	219.255	0-30-00	[219.247]	91-04-00	(R)
				268-56-00	(L)
8-4	211.235	0-10-00	[211.234]	81-12-05	(R)
				278-47-55	(L)

JOB NO. 4757
DATE

②

⊼ TP #2, BACKSIGHT TP #1, SIGHT TP #3

STA	DIST	VERT ∡	HORZ ∡		
TP #3	4245.245	0-05-00	①	71-44-10	Ⓡ
			②	143-28-20	
			③	215-12-40	
			AVG.	71-44-13	✓
5-3	276.455	0-12-00	[276.453]	49-55-40	Ⓛ
				310-04-20	Ⓡ
5-4	411.435	0-10-00	[411.433]	46-11-10	Ⓛ
				313-48-50	Ⓡ
5-1	444.650	0-10-00	[444.648]	40-34-30	Ⓛ
				319-25-30	Ⓡ
5-2	390.36	0-06-00	[390.359]	39-50-00	Ⓛ
				320-10-00	Ⓡ

⊼ TP #3, BACKSIGHT TP #2, SIGHT TP #5

TP #5	523.685	0-02-00	①	60-08-20	Ⓛ
			②	120-17-05	
			③	180-25-50	
			AVG	60-08-36	
			①	60-08-40	
			②	120-47-20	
			③	180-26-30	
			AVG	60-08-50	

⊼ TP #3, BACKSIGHT TP #2, SIGHT TP #4

STA	DIST	VERT ∡	HORIZ ∡		
TP #4	907.[illegible]5	0-25-00	①	146-48-[illegible]	
			②	293-37-20	
			③	80-26-55	
			AVG	146-48-58	
			①	146-48-[illegible]	
			②	293-37-00	
			③	80-25-10	
			AVG	146-48-23	
2-1	148.50	1-17-00	[148.463]	104-51-05	(L)
				255-08-55	(R)
2-3	261.415	0-50-00	[261.384]	98-32-[illegible]	(L)
				261-28-[illegible]	(R)

⊼ TP #4, BACKSIGHT TP #3, SIGHT TP #5

#5	1021.515	0-10-00	①	30-47-25	(L)
			②	61-34-50	
			③	92-22-00	
			AVG	30-47-20	✓
3-6	243.255	0-30-00	[243.246]	32-39-40	(L)
				327-20-20	(R)
10-1	1096.710	0-15-00	[1096.700]	32-09-30	(R)
				327-50-30	(L)
3-1	515.355	0-23-00	[515.343]	49-[illegible]	(R)
				31[illegible]	(L)
3-2	624.220	0-05-00	[624.219]	113-02-00	(R)
				246-58-00	(L)

DISCHARGE MEASUREMENTS

STREAM DISCHARGE MEASUREMENTS N RA FALLS IAP

3SW–4/3SD–4 9–27–89

{T} TIME HOURS	{N} STATION NO.	{a} TAPE READING (ft)	{W} SECTION WIDTH (ft)	{c} DEPTH READING (ft)	{d} MEAN DEPTH OF SECTION (ft)	{A} AREA SECTION (ft2)	{x} CURRENT METER READING (ft/sec)	{v} MEAN VELOCITY OF SECTION (ft/sec)	{Q} FLOW OF SECTION (ft3/sec)
0940	LEW	0.00		0			0.00		
			1.60		0.30	0.48		0.03	0.02
0944	1	1.60		0.6			0.05		
			0.40		0.60	0.24		0.05	0.01
0945	2	2.00		0.6			0.05		
			0.50		0.60	0.30		0.05	0.02
0949	3	2.50		0.6			0.05		
			0.50		0.68	0.34		0.04	0.01
0950	4	3.00		0.75			0.03		
			0.50		0.78	0.39		0.05	0.02
0952	5	3.50		0.8			0.07		
			0.50		0.81	0.41		0.08	0.03
0953	6	4.00		0.82			0.09		
			0.50		0.82	0.41		0.07	0.03
0956	7	4.50		0.82			0.04		
			0.50		0.81	0.41		0.04	0.01
0957	8	5.00		0.8			0.03		
			0.50		0.79	0.40		0.02	0.01
0958	9	5.50		0.78			0.01		
			0.50		0.77	0.38		0.03	0.01
0959	10	6.00		0.75			0.05		
			0.50		0.78	0.39		0.03	0.01
1000	11	6.50		0.8			0.01		
			0.50		0.75	0.38		0.03	0.01
1002	12	7.00		0.7			0.04		
			0.50		0.70	0.35		0.05	0.02
1003	13	7.50		0.7			0.05		
			0.50		0.70	0.35		0.07	0.02
1004	14	8.00		0.7			0.08		
			0.50		0.70	0.35		0.07	0.02
1005	15	8.50		0.7			0.05		
			0.50		0.70	0.35		0.06	0.02
1006	16	9.00		0.7			0.06		

STREAM DISCHARGE MEASUREMENTS NIAGARA FALLS IAP

3SW–4/3SD–4 9–27–89

{T} TIME HOURS	{N} STATION NO.	{a} TAPE READING (ft)	{W} SECTION WIDTH (ft)	{c} DEPTH READING (ft)	{d} MEAN DEPTH OF SECTION (ft)	{A} AREA SECTION (ft2)	{x} CURRENT METER READING (ft/sec)	{v} MEAN VELOCITY OF SECTION (ft/sec)	{Q} FLOW OF SECTION (ft3/sec)
			0.50		0.65	0.33		0.05	0.02
1007	17	9.50		0.6			0.04		
			0.50		0.58	0.29		0.03	0.01
1007	18	10.00		0.55			0.01		
			0.50		0.53	0.26		0.01	0.00
1007	19	10.50		0.5			0.01		
			0.50		0.50	0.25		0.01	0.00
1008	20	11.00		0.5			0.01		
			0.50		0.33	0.17		0.01	0.00
1008	REW	11.50		0			0		

TOTAL DISCHARGE FOR CROSS–SECTION 0.30 CUBIC FEET/SECOND

STREAM DISCHARGE MEASUREMENT GARA FALLS IAP

8SW–4/8SD–4 9–27–89

{T} TIME HOURS	{N} STATION NO.	{a} TAPE READING (ft)	{W} SECTION WIDTH (ft)	{c} DEPTH READING (ft)	{d} MEAN DEPTH OF SECTION (ft)	{A} AREA SECTION (ft2)	{x} CURRENT METER READING (ft/sec)	{v} MEAN VELOCITY OF SECTION (ft/sec)	{Q} FLOW OF SECTION (ft3/sec)
1537	LEW	0.00		1.00			0.80		
			0.20		1.00	0.20		0.84	0.17
1537	1	0.20		1.00			0.87		
			0.20		0.99	0.20		0.98	0.19
1537	2	0.40		0.98			1.08		
			0.20		0.99	0.20		1.14	0.23
1539	3	0.60		1.00			1.20		
			0.20		1.00	0.20		1.29	0.26
1540	4	0.80		1.00			1.38		
			0.20		1.00	0.20		1.35	0.27
1540	5	1.00		1.00			1.31		
			0.20		1.00	0.20		1.32	0.26
1540	6	1.20		1.00			1.33		
			0.20		1.03	0.21		1.33	0.27
1541	7	1.40		1.05			1.33		
			0.20		1.05	0.21		1.32	0.28
1542	8	1.60		1.05			1.30		
			0.20		1.05	0.21		1.24	0.26
1542	9	1.80		1.05			1.18		
			0.20		1.05	0.21		1.07	0.22
1542	10	2.00		1.05			0.95		
			0.20		1.03	0.21		0.85	0.17
1543	11	2.20		1.00			0.75		
			0.20		1.00	0.20		0.71	0.14
1543	12	2.40		1.00			0.66		
			0.20		1.00	0.20		0.58	0.12
1543	LEW	2.60		1.00			0.49		

TOTAL DISCHARGE FOR CROSS-SECTION 2.84 CUBIC FEET/SECOND

STREAM DISCHARGE MEASUREMENTS NIAGARA FALLS IAP

8SW-5/8SD-5 9-27-89

{T} TIME HOURS	{N} STATION NO.	{a} TAPE READING (ft)	{W} SECTION WIDTH (ft)	{c} DEPTH READING (ft)	{d} MEAN DEPTH OF SECTION (ft)	{A} AREA SECTION (ft2)	{x} CURRENT METER READING (ft/sec)	{v} MEAN VELOCITY OF SECTION (ft/sec)	{Q} FLOW OF SECTION (ft3/sec)
1518	REW	0.00		0.60			1.13		
			0.40		0.62	0.25		1.28	0.31
1519	1	0.40		0.63			1.42		
			0.40		0.62	0.25		1.27	0.31
1520	2	0.80		0.60			1.12		
			0.40		0.55	0.22		0.75	0.17
1521	3	1.20		0.50			0.38		
			0.40		0.98	0.39		0.37	0.14
1522	4	1.60		1.45			0.35		
			0.40		1.00	0.40		0.50	0.20
1522	5	2.00		0.55			0.64		
			0.40		0.58	0.23		0.90	0.21
1523	6	2.40		0.60			1.15		
			0.40		0.63	0.25		0.99	0.25
1523	7	2.80		0.65			0.83		
			0.40		0.63	0.25		1.07	0.27
1524	8	3.20		0.60			1.30		
			0.40		0.58	0.23		1.12	0.26
1525	9	3.60		0.55			0.94		
			0.40		0.55	0.22		1.07	0.24
1526	10	4.00		0.55			1.20		
			0.30		0.53	0.16		1.06	0.17
1526	LEW	4.30		0.50			0.92		

TOTAL DISCHARGE FOR CROSS-SECTION 2.51 CUBIC FEET/SECOND

STREAM DISCHARGE MEASUREMENTS [illegible]RA FALLS IAP

8SW-6/8SD-6 9-27-89

{T} TIME HOURS	{N} STATION NO.	{a} TAPE READING (ft)	{W} SECTION WIDTH (ft)	{c} DEPTH READING (ft)	{d} MEAN DEPTH OF SECTION (ft)	{A} AREA SECTION (ft2)	{x} CURRENT METER READING (ft/sec)	{v} MEAN VELOCITY OF SECTION (ft/sec)	{Q} FLOW OF SECTION (ft3/sec)
1500	REW	0.00		0.50			0.55		
			0.40		0.60	0.24		0.77	0.18
1501	1	0.40		0.70			0.98		
			0.40		0.67	0.27		0.96	0.26
1502	2	0.80		0.63			0.94		
			0.40		0.62	0.25		0.97	0.24
1503	3	1.20		0.60			0.99		
			0.40		0.60	0.24		1.02	0.24
1503	4	1.60		0.60			1.05		
			0.40		0.59	0.24		1.03	0.24
1504	5	2.00		0.58			1.00		
			0.40		0.58	0.23		1.04	0.24
1505	6	2.40		0.58			1.08		
			0.40		0.59	0.24		1.07	0.25
1506	7	2.80		0.60			1.05		
			0.40		0.60	0.24		1.01	0.24
1507	8	3.20		0.60			0.97		
			0.40		0.61	0.24		0.67	0.16
1507	9	3.60		0.62			0.37		
			0.40		0.69	0.27		0.41	0.11
1508	LEW	4.00		0.75			0.45		

TOTAL DISCHARGE FOR CROSS-SECTION 2.17 CUBIC FEET/SECOND

(5)

STA	DIST.	VERT ∡	HORIZ ∡		
2-3	542.360	0-50-00	[542.303]	137-02-00	(R)
				222-58-00	(L)
3-4	400.595	1-20-00	[400.487]	165-34-10	(R)
				194-25-50	(L)
3U-1	246.625	1-43-00	[246.524]	191-29-50	(R)
				168-31-10	(L)
3-5	206.035	1-37-00	[205.958]	190-44-35	(R)
				169-15-25	(L)
⊼ TP #5, BACKSIGHT #4, SIGHT TP #3					
			①	62-32-20	(L)
			②	125-05-00	
			③	187-37-35	
			AVG	62-32-32	
			①	62-32-20	(L)
			②	125-04-50	
			③	187-37-20	
			AVG	62-32-27	✓
⊼ TP #5, BACKSIGHT TP #4, SIGHT TP #6					
TP #6			①	90-07-40	(R)
			②	180-15-40	
			③	270-23-50	
			AVG	90-07-57	
			①	90-07-40	
			②	180-16-00	
			③	270-24-00	
			AVG.	90-08-00	

(6)

STA	DIST	VERT ∡	HORIZ ∡		
			①	53-04-[illegible]	
			②	180-16-00	
			③	270-24-00	
			AVG	90-08-00	✓
2-2	460.005	6-18-00	[459.998]	17-06-50	(L)
				342-53-10	
6-2	221.85	0-11-00	[221.849]	5-35-30	(L)
				354-24-30	(R)
6-3	90.115	1-30-00	[90.084]	19-45-45	(L)
				340-15-20	(R)
6-1	197.220	0-25-00	[197.215]	80-50-00	(L)
				279-10-00	(R)
4-1	321.53	0-02-00	[321.53]	152-26-50	(L)
				207-33-[illegible]	(R)
4-2	177.975	0-25-00	[177.970]	167-22-55	(L)
				192-37-05	(R)
4-3	210.660	0-27-00	[210.654]	175-44-40	(L)
				184-15-20	(R)
⊼ TP #3, BACKSIGHT TP #2, SIGHT TP #4					
			①	146-44-30	(L)
			②	293-37-20	
			③	80-25-50	
			AVG	146-44-[illegible]	✓✓
	SIGHT #5		①	60-08-30	
			②	120-17-00	
			③	180-25-40	
			AVG	60-08-33	✓✓

7.

STA	DIST	VERT ∡	HORIZ ∡		
26-1	576.717	0-17-00	[576.703]	96-50-10	(L)
				263-09-50	(R) ✓
⊼ TP#6, BACKSIGHT TP#5, SIGHT #7					
TP#6	303.14	0-35-00	①	173-27-00	(R)
TP#7	832.070	0-30-00	②	346-53-55	
			③	160-20-30	+360
			AVG.	173-26-50	(R)
			①	173-28-50	
			②	346-53-50	
			③	160-20-20	+360
			AVG	173-26-47	✓
1-1	220.345	0-07-00	[220.344]	2-24-00	(R)
				357-36-00	(L)
1-4	9.695	0-0-0	[9.695]	121-13-30	(R)
				238-46-30	(L)
1-3	115.515	1-28-00	[115.477]	58-37-30	(R)
				261-22-30	(L)
1-2	190.610	0-50-00	[190.590]	96-48-10	(R)
				263-11-50	(L)
10-2	203.245	1-00-00	[203.214]	97-13-20	(R)
				212-41-40	(L)
1-5	208.235	1-25-00	[208.171]	148-54-05	(R)
				211-05-55	(L)

8.

⊼ TP#7, BACKSIGHT TP#6, SIGHT TP#8					
STA	DIST	VERT ∡	HORIZ ∡		
TP#8	1002.515	0-05-00	①	84-23-40	(L)
			②	168-47-20	
			③	253-11-00	
			AVG	84-23-40	✓
NE BLK	171.065	0-20-00		61-57-00	(L)
SW "	185.185	0-20-00		68-26-30	(L)
10-3	235.915	0-38-00	[235.901]	177-11-40	(L)
				182-48-20	(R)
10-1	362.50	0-33-00	[362.483]	180-38-50	(L)
				179-21-10	(R)
10-2	334.515	0-30-00	[334.502]	168-42-50	(L)
⊼ @ TS-8; B.SITE TS-7				191-17-10	(R)
7-3	23.71	0-0-0		40-20-20	(R)
				319-39-40	(L)
7-2	44.730	0-0-0		9-33-00	(L)
				350-27-00	(R)
7-1	56.50	0-0-0		71-11-30	(L)
				288-48-30	(R)
⊼ TP#8, BACKSIGHT TP#7, SIGHT 2nd order #4					
2nd order #4	3498.605	0-02-00	①	178-58-4[illegible]	(L)
			②	357-57-30	
			③	176-51-10	+360
			AVG	178-58-43	✓
NOTE: 7-3 LOCK NOT OPEN					

⊼ 2nd order #4, Backsight TP#8, Sight 2nd order 5

Sta	Dist	Vert ∡	Horiz ∡		
2nd #5	4603.610	0-08-00	①	166-25-30	(R)
			②	332-51-40	
			③	139-17-00	
			AVG	166-25-40	✓

⊼ 2nd order #5, Backsight 2nd order #4

9-1	643.885	0-25-00	[643.868]	104-03-30	(L)
				255-56-30	(R)
9-2	539.875	0-30-00	[539.854]	96-36-00	(L)
				263-24-00	(R)
9-3	465.25	0-33-00	[465.229]	104-53-20	(L)
				255-06-40	(R)
9-4	592.32	0-27-00	[592.302]	115-06-40	(L)
				244-53-20	(R)
TP#9	4555.505	0-18-00	①	49-06-30	(L)
			②	98-13-20	
			③	147-20-10	
			AVG	49-06-43	
			①	49-06-30	
			②	98-13-20	
			③	147-20-10	
			AVG	49-06-43	
			①	49-06-30	
			②	98-13-00	
			③	147-19-50	
			AVG	49-06-37	✓

⑩

⊼ TP#9, Backsight 2nd #5 Sight 2nd #3

Sta	Dist	Vert ∡	Horiz ∡		
2nd #3	2557.67	1-12-00	①	159-52-40	(L)
			②	319-45-00	
			③	119-37-30	
			AVG	159-52-33	
			①	159-52-30	
			②	319-45-10	
			③	119-37-50	
			AVG	159-52-36	✓

⊼ 2nd #3, Backsight TP#9, Sight TP#1

			①	72-16-40	
			②	144-33-30	
			③	216-50-40	
			AVG	72-16-53	
			①	72-16-50	
			②	144-33-25	
			③	216-50-10	
			AVG	72-16-43	✓

⊼ 2nd #2, Backsight

	288.595	0-08-00	①	53-20-05	
		[288.594]	②	106-40-10	
			③	160-00-10	
			AVG	53-20-03	✓

⊼ TP#1, BACKSIGHT TP#2				
STA	DIST	VERT ∡	HORZ ∡	
NW #202	105.750	0-12-00	108-11-55	Ⓑ
SW #202	196.780	1-35.00	52-53-05	"
⊼ TP#2, BACKSIGHT TP#1				
NW #904	654.900	0-0-0	196-26-00	Ⓛ
NE #904	513.80	0-0-0	110-29-40	"
⊼ TP# 3, BACKSIGHT TP#5				
SW #426	31.6		178-30-20	Ⓛ
SE #426	61.78		144-29-40	Ⓛ
⊼ TP# 5, BACKSIGH TP#4				
NE #5C	123.40		96-0[illegible]-00	Ⓑ
NW #5B	261.60		150-43-30	"

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757

DATE Sept 12, 1989

G. Zimofer ①
J. Lamb
D. Mroske

Horz. & vert.
control & well
Locations for
Niagara Falls
Air Base

③ ⑭

⊼ @ 2ND ORDER PT 3 ; BS 2ND ORDER PT 2

RESET TRAV PT #1 = 260-00-44 @ 2703.04'

C.P.'S

SET TRAV PT #10 (I.P) ⑮

275-21-07 3297.28

(84-38-52 Horiz. close)

Set Trav PT # 11 (RR spike) → ⑯

227-01-42 6317.96

(132-58-17 Horiz close)

Distance to Backsite 5922.11

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. ____

DATE Sept. 13, 19[illegible]

G. Zimpfer ②
J. Lamb
D. Mrowka

DESCRIPTION; SPIKE IS 21.20 W + 1.0' S. OF SE COR OF CON PAD FOR JET FUEL TANK 6

W	+	Hi	-	elev.
8-1				600.05
8-2				597.25
8-3				599.06
8-4				600.86
8-1	3.68	603.73		
8-2	6.47	603.72		
8-3	4.66	603.72		
8-4	2.88	603.74		
8-20	Top Casing (PVC)		3.16	600.57
	Ground.		5.25	598.48
8-30	Top PVC		2.59	601.14
	ground		4.90	598.83
8-6	T. Pvc.		2.52	601.21
	grd.		5.14	598.59
8-10	T. pvc		3.83	599.90
	grd.		6.02	597.71
8-5	T. pvc.		3.53	600.20
	grd.		5.94	597.79

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
420 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757
DATE Sept. 13, 1989

③

Δ @ Trav. pt # 1 ⑤
B.S. 2nd order pt # 3 ③

vert. diff

Direct	+	3.99	3.98 Avg.
invert.	+	3.97	

object		∡ RT	Distance
well 8-20	87	81-19-01	222.37
8-30 well	88	70-04-22	320.50
8-6 well	86	67-52-24	315.43
8SD-1\8SW3	183	104-09-15	545.01
8SD-4\8SDA	184	64-11-23	355.07
8SD-5\83W-5	185	334-52-49	436.68
well 8-5	85	253-33-50	116.82
well 8-12	89	247-39-29	108.19
Trav pt #10	⑮	241-20-22	994.03
		(118-39-37 Horiz. close)	
Soil boring	200	30-20-29	488.92

	+	Hi	−	elev.	
surface water		603.73			
Sampling pts.					
8SD-\8SW3 : Hub			8.61	595.12	
	grd.		9.57	594.16	
8SD-4\8SDA					
	Top Hub		11.71	592.02	
	grd.		12.31	591.42	
8SD-5\8SW-5					
	Top Hub		9.39	594.34	
	grd.		10.37	593.36	
soil boring			3.97	599.76	
ET II	Bench	run.			
Vert	rod	Hi	Bench		Bench is
diff	Ht.		elev.		wall 8-1
	6.06		600.05		
direct +3.99					
vert +3.97		602.17			
Avg. +3.98					
Hydrant B10	TSO.		TBM#1 Hydrant B10		
hi. +3.08			elev.=	599.13 ✓	
inv. +3.04					
Avg. +3.06					

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4257

DATE Sept 13, 1985

④

	vert. diff.	Hi	Rod Ht	elev.
			6.06	
Well 5-2				598.70
direct	+2.08			
invert	+2.03			
AVG.	+2.05	602.71 ✓		
Well 5-4				599.42
direct	+2.77			
invert	+2.74			
AVG.	+2.75	602.73 ✓		
		use 602.72 ✓		
TBM #1				
direct	+2.55			
invert	+2.49			
AVG	+2.53		6.06 =	599.19
				vs 599.18
5-10 - top pvc				
direct	+3.69			
invert	+3.66			
AVG	+3.67		6.06	600.33
grd	+1.04		6.06	597.70
Well 5-5	Top PVC			
direct	+3.72			
invert	+3.70			
AVG.	+3.71		6.06	600.37
grd.	+1.15		6.06	597.61

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757
DATE Sept 13, 19[illegible]

⑤

⊼ @ Trav. pt #10 ⑮
B.S. 2nd order pt. #3 ③

Trav. pt. # 46-00-04 ⑤
313-59-55 Horiz. close.

wells

5-10	56	58-57-30	288.88
5-5	55	57-35-51	280.52
13-1	131	181-28-02	434.15
13-2	132	166-45-18	462.04
13-4	134	174-29-18	604.09
13-3	133	178-56-01	588.86
TRAV. pt #12	⑰	98-00-32	1487.38
		261-59-34	

	vert diff	Hi	rod Ht.	elev.
		602.72		
well 13-1	Top PVC			
direct	+ 2.27			
invert	+ 2.23			
AVG	+ 2.25		6.06	598.91
grd.	- 0.87		6.06	595.79
well 13-2	Top PVC.			
direct	+ 1.35			
invert	+ 1.31			
AVG.	+ 1.33		6.06	597.99
grd.	- 1.29		6.06	595.37
13-4	Top PVC			
direct	+ 1.74			
invert	+ 1.70			
AVG	+ 1.72		6.06	598.38
grd	- 1.30		6.06	595.36
well 13-3	Top PVC			
direct	+ 2.04			
invert	+ 1.98			
AVG	+ 2.01		6.06	598.67
grd.	- 0.68		6.06	595.98

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757'

DATE Sept 13, 1985

	Vert diff	Hi	Rod Ht.	elev	
			6.06		
		602.72			
TBM #2 SE corner conc. pad. → stw of Bldg. 906					
direct	-3.26				
invert	-3.35				
AVG.	-3.30		6.06	593.36 ✓✓	
TBm # 3					
direct	-4.68				
invert	-4.76				
AVG	-4.72		6.06	591.94 ✓	
New set up					
TBm #	3			591.94	
			6.06		
direct	+0.94				
invert	+0.94				
AVG	+0.94	598.00	597.06 ✓		
soil boring between Bldgs					
849 + 850 (N)					
direct	-1.24		6.06	589.76	
soil boring (S)					
direct	-1.77				
invert	-1.82		6.06	589.22	

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO ... 4257

DATE Sept 13, 1988

⑦

⊼ @ Trav. pt 12. ⑰

B.S. Trav. pt 10 ⑮

soil boring between Bldgs 849 + 850

260-32-35 433.27

⑳

SOIL BORING 1.0' WEST OF PT.

257-02-48 489.30

	Vert diff	Hi	Rod ht	elev.
TBm #2				593.36 ✓
			6.06	
direct	+0.02			
invert	-0.02			
Avg	+0.00	599.42 ✓		
TBm # 4				
North	corner	of 3.5'sq	conc. pad	
150±	South of	Bldg 750		
100±	west of	Bldg 750		
direct	-5.79			
invert	-5.97			
Avg	-5.88		6.06	587.48 ✓
Boring 93G N	+11.24		10.72	599.94
Boring 93G S	+11.46		10.72	600.16
TBm #5				
North	rim of	M.H.		
4'± North	of runway			
direct	+0.49			
invert	+0.36			
Avg	+0.43		6.06	593.79 ✓

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757

DATE Sept 13, 1989

⑧

T @ 2nd order pt #4 ⑬

B.S. 2nd order pt #3 ③

Boring 93G N	306-39-20	925.60	(13)
Boring 93G S	301-17-52	880.84	(10)
reset Transit #⑧	96-05-22	3498.56	⑫

	Vert. diff.	Hi	Rod Ht.	elev.
			6.06	
TBm #5				593.79
direct	+ 6.07			
invert	+ 5.97			
Avg.	+ 6.02	593.83 ✓		
well 9-3				588.68
direct	+ 1.20			
invert	+ 1.16			
Avg.	+ 1.18	593.56 ✓		
well 9-4				588.59
direct	+ 1.10			
invert	+ 1.06	use		
Avg.	+ 1.08	593.57 ✓		
well 9-7	Top PVC			
direct	+ 1.38			
invert	+ 1.36			
AVG.	+ 1.37		6.06	588.88
grd.	- 2.04		6.06	585.47
well 9-6	top pvc.			
direct	+ 1.15			
invert	+ 1.10			
Avg.	+ 1.13		6.06	588.64
grd.	- 2.07		6.06	585.44

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 97257

DATE Sept. 13, 1999

⑨

⊼ @ 2nd order pt #5 ①

2nd order pt #4 ⑬ 4603.60 comp

4603.73 meas

9-5	well	95	247-08-34	675.71
9-6	well	96	256-47-04	641.71
9-7	well	97	262-26-06	540.75
Boring		205	250-05-52	621.14
9sd3\9sw3		193	218-57-52	990.43
9sd2\9sw2		192	240°-32-21	750.40
9sd1\9sw1		191	261-22-52	701.16

	Vert dist	Hi	Rod Ht.	elev.
		593.57		
boring	-1.17			586.34
well 9-5	top pvc			
direct	+1.31			
invert	+1.26			
AVG	+1.29		6.06	588.80
grd.	-2.10		6.06	585.41
9sd3\9sw3				
Top hub	-3.38		6.06	584.13
grd	-4.25		6.06	583.26
9sd2\9sw2				
Top hub	-1.75		6.06	585.76
grd	-2.80		6.06	584.71
9sd1\9sw1				
Top hub	-2.46		6.06	585.05
grd.	-3.20		6.06	584.31

JOB NO. 4757

DATE Sept. 13, 1989

⑩

	Vert.diff	Hi	Rod Ht.	elev
			6.06	
TBM#4				587.48 ✓
direct	-1.16			
invert	-1.21			
AVG	-1.18	594.72	✓	
soil boring	+0.55			589.21
BM#2				
direct	+3.30	+3.44		
invert	+3.25	+3.41		
AVG	+3.28		592.08 vs	591.94

BM#2 description -
Bldg 700 chiseled sq. in concrete
doorway Apron At S.W corner of west over head door

7-1				592.31
direct	+3.75			
invert	+3.74			
AVG	+3.75	594.62	✓	
7.2 direct	+3.37			591.91
invert	+3.36			
AVG.	+3.37	594.60	✓	
7.3				592.10
direct	+3.44			
invert	+3.44			
AVG	+3.44	594.72	✓	

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 4757
DATE Sept. 13 1985

⑪

Λ @ Trav. pt #8 ⑫
B.S. 2nd order pt #4 ⑬

reset Trav. pt. 7	178-58-46		1002.20	11
soil boring	241-03-28	2.06	64.20	

	Vert. diff	Hi	Rod rr		
			6.06		
		594.72			
TBM #6	SE corner	conc.	Pad Bldg	725	
direct	+ 0.75				
invert	+ 0.71				
Avg	+ 0.73		6.06	589.39 ✓	
		end	9/13/89		

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y. ⑬

JOB NO. ____________

DATE

Well #	Vert. Dif	HI	Rod Ht.	ELEV.	
	(D)	(I)			
3-1	-2.17	-2.19	6.06	604.42	
3-2	+6.75	—	20.50	600.02 (N)	598.95
3-3	-13.44	-13.46	6.06	593.23	
3-4	-16.52	—	6.06	591.71 (N)	590.12
MW.301	-13.22	-13.22	6.06	593.46	
3-5	-13.14	-13.15	6.06	595.36 (N)	593.50
3-6	-5.34	-5.35	6.06	602.90 (N)	601.30
MW 101	-1.16	-1.20	6.06	605.4[illegible]	
	AVE HI 612.70				
Well 1-7					
CIR.	-.81		6.06		
INV.	-.87				
AVE.	-.84			605.80	
GRD.	-3.64			603.0	
Soil Boring #1	-3.31		6.06	603.33	
Well #320					
CIR.	+7.74		20.50		
INV.	+7.77				
AVE.	7.78			599.98	
GRD.	+4.47			596.67	
WATER SAMPLE	35P4/35W4		6.06		
HUB	-18.79			587.85	
GRD	-20.17			586.47	
	- 19.48				

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y. ⑬

JOB NO [illegible]
DATE Sept. 14, 19[illegible]

AT TRAV. PT #11 ⑮
BS 2nd Order PT. #3 ③

WELL 1-7	64-29-21	778.43	117
Soil Boring Site #1	63-53-46	839.46	[illegible]
Well # 320	137-27-41	1117.05	~~38~~ 135
WATER SAMP. 3SP4/3SW4	152-41-17	1118.05	38

612.70

Well#	Vert Diff.	H.I.	Rod Ht.	ELEV.
Well 3-40			6.06	
DIR.	-15.90			
INV.	-15.92			
AVE.	-15.91			590.73
GRD.	-19.10			588.54
WATER SAMPLE 3SD2/3SW2				
HUB	-20.01		6.06	586.63
GRD	-20.84			585.80
Well # 3-7			1.61	
DIR.	-20.25			
INV	-20.24			
AVE.	-20.24			590.85
GRD.	-23.16			587.93
Well# 3-3D			0.58	
DIR.	-21.24			
INV.	-21.29			
AVE.	-21.26			590.86
GRD.	-24.04			588.08
Soil Boring 2-1			6.06	
	-11.55			595.09
Soil Boring B2-2			6.06	
	-6.70			599.94

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

(14)

JOB NO. 4757
DATE 9-14-84

TO TRAV. PT#11
BS 2nd Order Pt #3 (Cont.)

Well 3-4D	163-56-37	1216.56	137
WATER SAMP 3SD2/3SW2	181-49-18	1180.65	39
Well # 3-7	182-38-23	1262.30	138
Well # 3-3D	182-33-32	1280.11	126
Soil Boring #2-1	248-34-48	356.22	208
Soil Boring #B2-2	286-55-17	118.07	209

Well #	Vert.Def.	H.I.	Rod Ht.	ELEV.
TBM	#7		6.06	
DIR.	-4.43			
INV.	-4.45			
AVE.	- 4.44			602.20

Description; Top of Shut
off hydrant AT S.W. cor.
of McGuire + Kinross St.

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y. ⑮

JOB NO. 4457
DATE 9-14-89

Δ@ TRAV. PT #11
BS 2nd Order Pt # 3 ([illegible])

EX. P.K.	305-09-26	478.78
Nail	54-50-33	④
TRAV. PT. #5	359-59-59	

Well #	Vert. Dif.	HI	Rod Ht.	ELEV.	
TBM #7			6.06	602.20	
DIR.	+3.25				
INV.	+3.25				
AVE.					
	(R)	(I)			
1-1	+1.92 +1.92	605.01	6.06	600.87	.01
4-3	+3.36 +3.34	605.03	6.06	602.32	.03
4-2	+3.63 +3.62	605.01	6.06	602.58	.02
6-3	+3.02 +3.02	605.02	6.06	601.98	.02
1-4	-1.54 -1.52	605.02	6.06	597.43	.02
	AVE.	605.02			
Well 2-4		605.02			
DIR.	+0.75		6.06		
INV.	+0.75				
AVE	+0.75			599.71	
GRD.	-1.66			597.30	
Soil Boring BG-1					
	-0.83		6.06	598.13	
BORING SITE BG-0					
	-3.96		6.06	595.00	
Well 1-6					
DIR.	-0.23				
INV.	-0.23				
AVE	-0.23			598.73	
GRD	-3.81			595.15	

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

(16)

JOB NO. 4757
DATE 9-14-86

I@ TRAV PT # 5 (EX PK) 9
BS TRAV. PT # 11 (RR SPK) 1

Well 2-4	39-58-49	337.10	25
BORING SITE BG-1	52-27-18	126.07	210
BORING SITE BG-0	86-17-22	251.79	211
WELL 1-6	112-19-22	302.88	116

60502

Well#	Vert Dif	HI	Rod Ht	ELEV.
WELL	1-40		16.44	
DIR.	+9.24			
INV.	+9.26			
AVE.	9.26		597.84	
GRD.	+6.52		595.10	
Well	1-30		6.06	
DIR.	+1.23			
INV.	+1.23			
AVE	+1.23		600.19	
GRD.	-.98		597.98	
Well	4-4		14.28	
DIR.	+10.14			
INV.	+10.12			
AVE.	+10.13			600.87
GRD.	+7.61			598.35
BORING	SITE	B4-1		
	+0.86		6.06	599.82
BORING	SITE	B6-2		
	+3.45		6.06	602.41
TBM #8				
DIR.	-4.21		6.06	
INV.	-4.27			
AVE.	-4.24			594.72 ✓

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y. (17)

JOB NO. 4752

DATE 9-14-89

TO TRAV PT #5 (EX EC)
BS TRAV. PT #11 (RR SP) (CONT)

WELL 1-4D	114-31-13	304.34	108
Well 1-3D	115-18-06	86.18	109
Well 4-4	192-06-07	331.53	44
BORING SITE B 4-1	208-53-39	274.99	212
BORING SITE B6-2	283-29-03	328.93	213
TRAV. PT. #7	107-47-39 252-12-21 360-00-00	1131.25	(N)

DESCRIP. TBM #8; TOP SHUT OFF HYDRANT @ N.E. COR. OF LOTUS DR. & McGUIRE ST.

Well#	Vert Dif	HI	Rod Ht	ELEV
				594.72
TBM #8			6.06	
DIR	+6.99			
REV.	+6.97			
AVE		593.80		
TBM #6			6.06	589.39
DIR.	+1.72			
REV	+1.71			
AVE	1.72	593.73		
10-1	(D) +2.25		6.06	589.88
	(R) +2.23	593.70		
10-2	(D) +2.76		6.06	590.40
	(R) +2.75	593.71		
10-3	(D) +3.01		6.06	590.67
	(R) +3.00	593.72✓		
WATER SAMPLE #SW-5				
HUB	-4.67		6.06	582.99
GRD.	-4.83		7.71	581.18
WELL	10-1D		6.06	
DIR.	+1.98			
REV.	+1.97			
AVE.	1.98✓			589.64
GRD.	-0.57			587.09

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. 911-4

DATE 9-14-87

TO TRAV. PT #7 (TP) (11)
BS TRAV. PT #5 (EX. PK) (5)

WATER SAMPLE
3SW5 97-11-22 [illegible]

WELL 10-1D 188-41-24 381.50 1.1

WELL #	Vert. Dif.	H.I.	Ref Ht	ELEV
WELL	10-4		6.06	
DIP.	+1.74			
INV.	+1.72			
AVE	+1.73			589.39
GRD.	-0.70			586.96

	+	HI	-	ELEV.
TBM#8	5.46	600.18		594.72
102	3.35	600.23		596.88
1-3	2.45	599.89		597.44
1-4	2.75	600.18	✓	597.43
1-5	4.98	600.17		595.19
1-2			4.37	595.81

McINTOSH & McINTOSH, P.C.
LICENSED LAND SURVEYORS
429 PINE ST., LOCKPORT, N. Y.

JOB NO. [illegible]
DATE 9-[illegible]

TO TRAV. PT #7 (IP) 11
BS TRAV. PT #5 ([illegible]) [illegible] 9

WELL 10-4 189-56-48 383.[illegible]5 115

TRAV PT. 273-51-02 [illegible]
#8 86-08-58
(IP) 360-00-00

```
COMMAND  211-
FROM PNT= 1
TO PNT= 300
 1     133470.6500  397598.2900                  2    137425.2990  399859.5580
 3     139072.9870  401815.0990                  4    137997.8280  395820.9150
 5     136573.8440  402845.0050                  6    135761.1860  402579.3300
 7     135773.0410  406824.6130                  8    135278.2280  407585.7110
 9     135318.1660  406565.1940                  10   135014.8050  406552.6250
 11    134184.9890  406613.2990                  12   134209.9200  405610.7080
 13    134359.1700  402115.3320                  14   137800.3990  396031.4110
 15    135800.6848  402220.1841 T.P.#10          16   135483.6008  407014.4187 T.P.#11
 17    135775.9932  403707.3591 T.P.#12          21   135629.6440  406863.0670
 22    135436.2360  407009.7820                  23   135514.6600  406864.1200
 24    135200.6320  406894.8570                  25   135203.5051  406884.3204 2-4
 31    135789.7240  407522.8560                  32   135626.7220  408103.5920
 33    135371.8160  408119.8780                  34   135150.4980  407965.2830
 35    135135.7510  407734.4290                  36   135499.9060  407485.5740
 37    135105.3560  407761.4650                  38   135341.3894  408123.3875 3SD4/3SW4
 39    134782.2740  407964.2447 3SD2/3SW2        40   134076.3042  407893.3733 3SD5/3SW5
 41    135477.9280  406286.1650                  42   135363.8050  406393.1760
 43    135342.0010  406355.8930                  44   135271.3662  406236.9838 4-4
 51    136172.0720  402409.3760                  52   136123.8070  402434.8080
 53    135996.0800  402433.5530                  54   136124.1820  402385.6510
 55    135978.9639  402436.7667 5-5              56   135978.9283  402447.5185 5-1D
 61    135511.4850  406604.2020                  62   135331.1320  406786.6640
 63    135345.1600  406651.1390                  71   134262.9340  405630.2480
 72    134216.2420  405654.9890                  73   134194.1280  405628.3930
 81    136653.5930  403049.2340                  82   136637.8760  403023.5580
 83    136648.6980  402959.1250                  84   136683.2540  403025.6960
 85    136500.5920  402754.0047 8-5              86   136795.0237  403069.8953 8-6
 87    136688.6384  403035.4536 8-2D             88   136789.6436  403081.9666 8-3D
 89    136497.6918  402768.1550 8-1D             91   134053.3040  397324.2810
 92    133984.8670  397433.9030                  93   133888.7340  397394.2220
 94    133948.3740  397248.1450                  95   134030.9349  397220.5800 9-5
 96    134055.3046  397333.7703 9-6              97   133982.8744  397424.9791 9-7
 101   135234.5840  406570.9750                  102  134984.4140  406740.7760
 103   134992.7760  406665.9810                  104  135009.4400  406560.7000
 105   134832.2540  406652.6770                  106  136273.6870  407125.4800
 107   134980.9340  406752.9970                  108  135014.6839  406542.3582 1-4D
 109   135232.3251  406557.5562 1-3D             111  133823.7930  406643.8150
 112   133853.0550  406571.9300                  113  133949.1560  406618.9650
 114   133805.7632  406571.7056 10-1D            115  133804.6350  406563.1175 10-4
 116   135015.4624  406554.8578 1-6              117  136271.9624  407140.8165 1-7
 131   135368.5992  402262.4716 13-1             132  135367.3478  402380.4963 13-2
 133   135217.7332  402303.3918 13-3             134  135211.0710  402351.6384 13-4
 135   135637.5017  408120.8161 3-2D             136  134710.0316  408034.3561 3-3D
 137   135159.9794  407978.0905 3-4D             138  134719.3760  408019.0886 3-7
 183   136651.9904  403384.4642 8SD3/8SW3        184  136838.5691  403081.6383 8SD4/8SW4
 185   136909.2909  402478.7177 8SD5/8SW5        191  134130.5769  397361.3895 9SD1/9SW1
 192   134102.9034  397194.1171 9SD2/9SW2        193  133933.3138  396722.1129 9SD3/9SW3
 200   137058.0320  402912.8635 8-8              201  135342.5438  403772.1830 BLDG 849 A
 202   135297.2419  403808.4120 BLDG 849 B       203  134863.4395  401339.1570 BLDG 936 C
 204   134767.9872  401335.1092 BLDG 936 D       205  134002.9008  397278.0963 8-9
 206   134187.6356  405621.8172 8-7              207  136313.8062  407138.7254 8-1
 208   135136.7919  406933.0784 E-2-1            209  135409.5446  406921.1806 E-2-2
 210   135250.9157  406671.8291 E-6-1            211  135088.0153  406667.3157 E-6-0
 212   135360.3765  406288.6064 E-4-1            213  135644.6064  406526.4632 E-6-2
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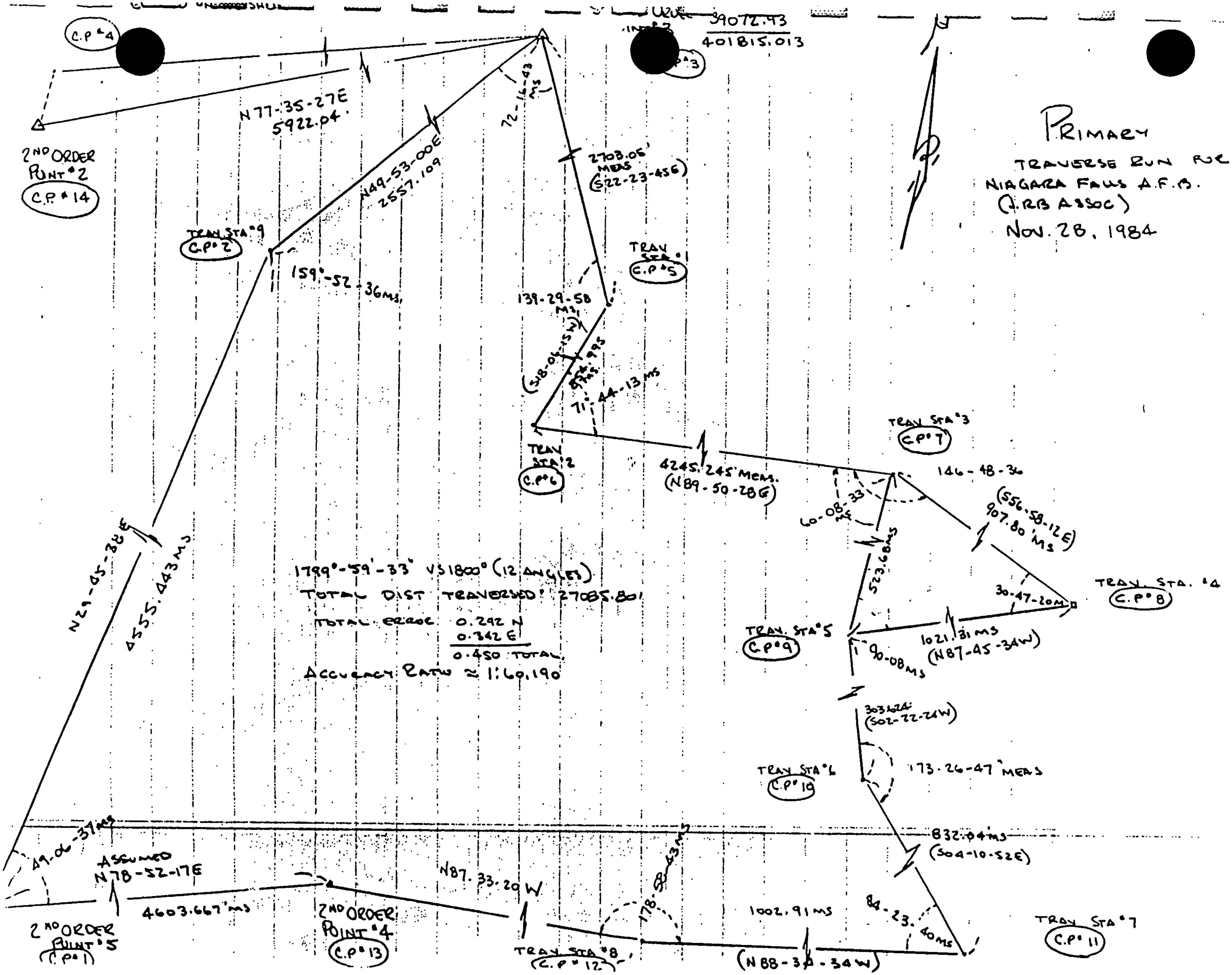


PRIMARY
TRAVERSE RUN FOR
NIAGARA FALLS A.F.B.
(A.RB ASSOC)
NOV. 28, 1984

1799°-59'-33" VS 1800° (12 ANGLES)
TOTAL DIST TRAVERSED: 27085.801
TOTAL ERROR 0.292 N
0.342 E
0.450 TOTAL
ACCURACY RATIO ≈ 1:60,190

3-5-5-5C

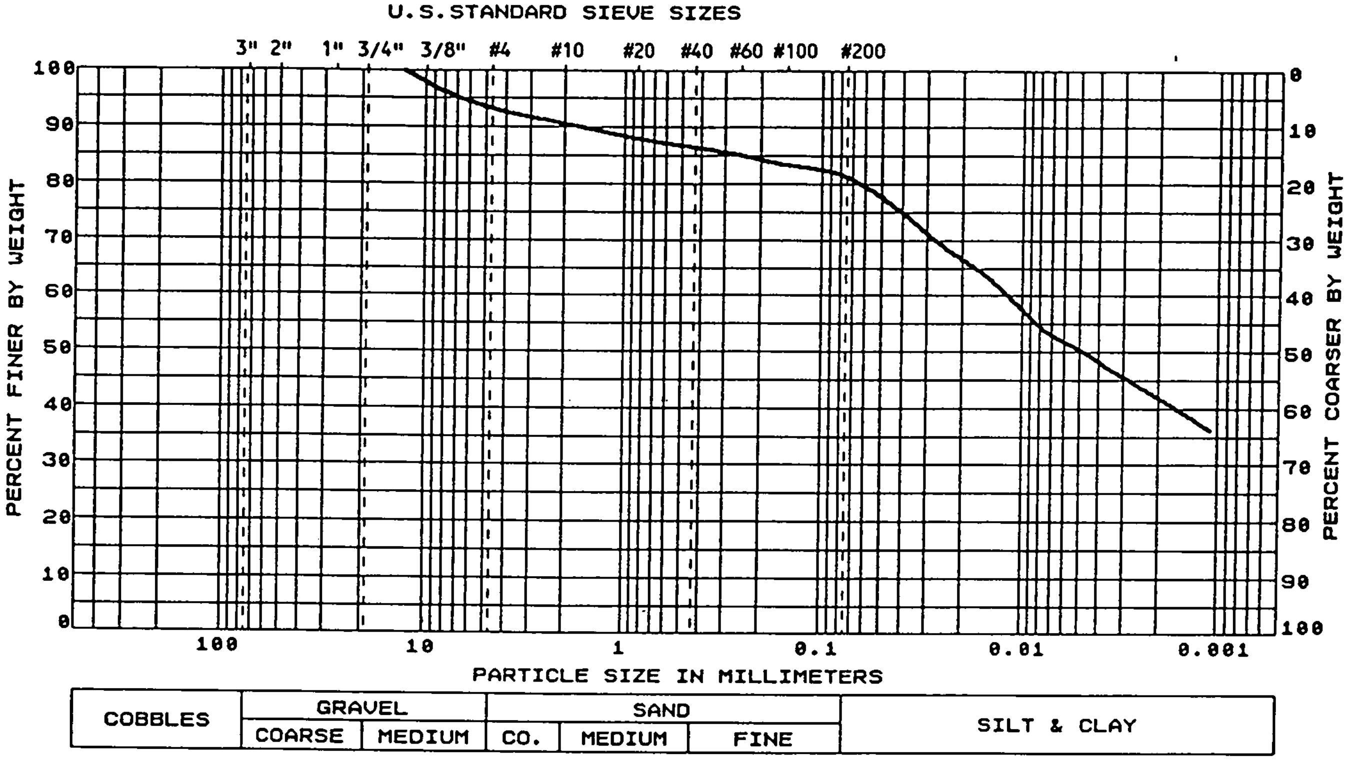
541.024

LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION
& PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genesee Street
Buffalo, New York 14225

JOB NO. 41-8905.09
DATE September 7, 1989
LAB NO. 9389
PAGE 2
PROJECT E & E P.O.#47214
SAMPLE ID 45942.01 +.02 WB5



U.S. STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		66.6	0.020
1-1/2"	37.5		50.4	0.005
1"	25		41.8	0.002
3/4"	19			0.001
1/2"	12.5	100.0		
3/8"	9.5	97.6		
#4	4.75	93.4		
#10	2.00	90.7		
#20	0.850	88.1		
#40	0.425	86.5		
#60	0.250	85.1		
#100	0.150	83.5		
#200	0.075	81.4		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 55
PLASTIC LIMIT 26
PLASTICITY INDEX 29
CLASSIFICATION FAT CLAY with SAND (CH)
WATER CONTENT (%) 8.8
DRY DENSITY (PCF)
SPECIFIC GRAVITY 2.67
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D4318, D2216, D4287; CORPS OF ENGRS EM-1110-2-1906

LAW ENVIRONMENTAL, INC.

M. A. OKelley

103-3-7-4C

541.024

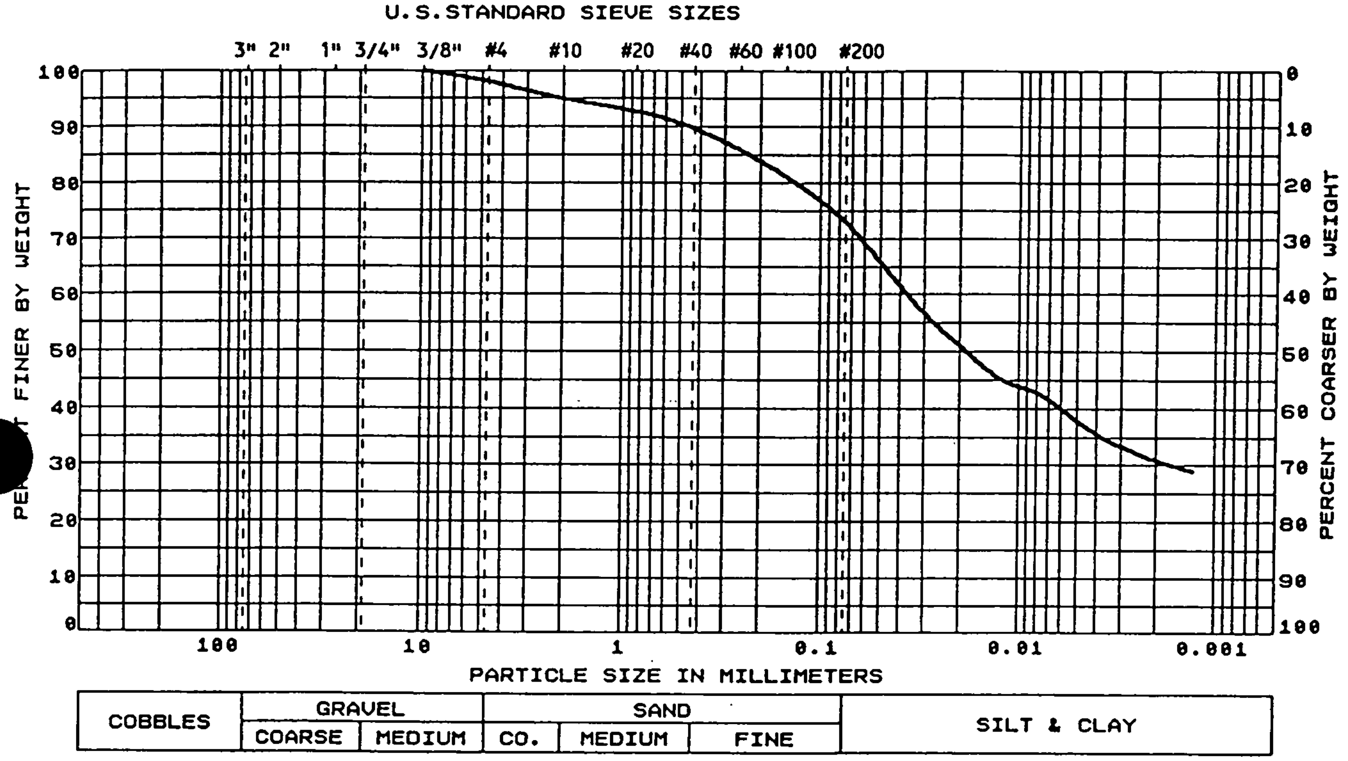
LAW ENVIRONMENTAL, INC.

112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genesee Street
Buffalo, New York 14225

JOB NO. 41-8905.09
DATE September 7, 1989
LAB NO. 9388
PAGE 1
PROJECT E & E P.O.#47214
SAMPLE ID 45941.01 +.02 WB3



U.S.STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		51.1	0.020
1-1/2"	37.5		37.9	0.005
1"	25		31.2	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5	100.0		
#4	4.75	98.1		
#10	2.00	95.1		
#20	0.850	92.8		
#40	0.425	89.7		
#60	0.250	85.9		
#100	0.150	81.3		
#200	0.075	72.9		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 33
PLASTIC LIMIT 19
PLASTICITY INDEX 14
CLASSIFICATION LEAN CLAY with SAND (CL)
WATER CONTENT (%) 27.5
DRY DENSITY (PCF)
SPECIFIC GRAVITY 2.67
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D4318, D2216, D4287; CORPS OF ENGRS EM-1110-2-1906

LAW ENVIRONMENTAL, INC.

M. A. OKelley

B-4-1-4C

541.021

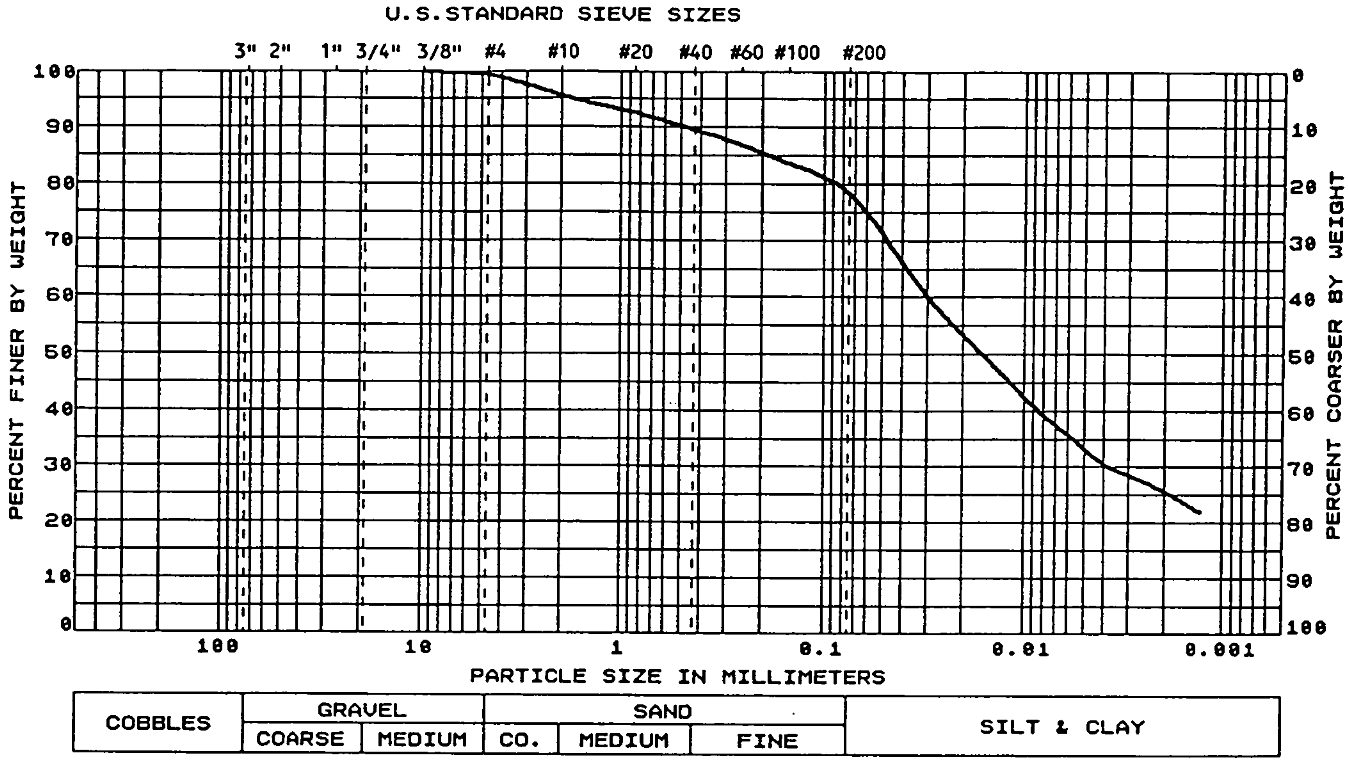
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genesee Street
Buffalo, New York 14225

JOB NO. 41-8985.09
LAB NO. 9387
PROJECT E & E P.O.#47214
SAMPLE ID 44965.01 +.02 B4

DATE September 7, 1989
PAGE 1



U.S.STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50		53.5	0.020
1-1/2"	37.5		33.3	0.005
1"	25		25.4	0.002
3/4"	19			0.001
1/2"	12.5			
3/8"	9.5	100.0		
#4	4.75	99.4		
#10	2.00	95.7		
#20	0.850	92.6		
#40	0.425	89.6		
#60	0.250	86.9		
#100	0.150	83.8		
#200	0.075	78.4		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 17
PLASTIC LIMIT 13
PLASTICITY INDEX 4
CLASSIFICATION SILTY CLAY with SAND (CL-ML)
WATER CONTENT (%) 10.0
DRY DENSITY (PCF)
SPECIFIC GRAVITY 2.68
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D4318, D2216, D4287; CORPS OF ENGRS EM-1110-2-1906

LAW ENVIRONMENTAL, INC.
M. A. O'Kelley

B-7-1-3C

541.019

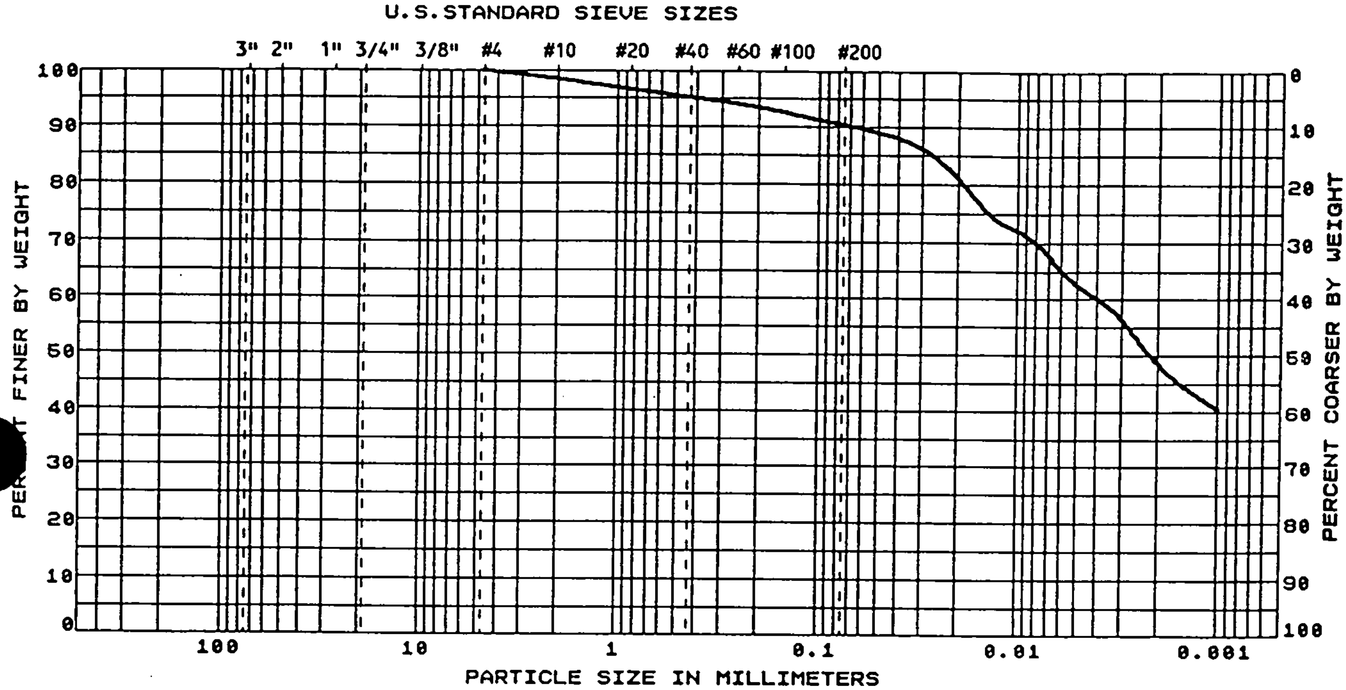
LAW ENVIRONMENTAL, INC.
112 TOWNPARK DRIVE
KENNESAW, GEORGIA 30144-5599
404-421-3400

PARTICLE SIZE DISTRIBUTION & PHYSICAL PROPERTIES

CLIENT Ecology and Environment, Inc.
4285 Genesee Street
Buffalo, New York 14225

JOB NO. 41-8905.09
LAB NO. 9386
PROJECT E & E P.O.#47214
SAMPLE ID 43618.01 +.02 B7

DATE September 7, 1989
PAGE 1



COBBLES	GRAVEL		SAND			SILT & CLAY
	COARSE	MEDIUM	CO.	MEDIUM	FINE	

U.S. STANDARD SIEVE SIZE		PERCENT PASSING		HYDROMETER
SIEVE NO.	SIEVE SIZE (MILLIMETERS)			PARTICLE DIAMETER (MILLIMETERS)
3"	75			0.050
2"	50			0.020
1-1/2"	37.5		62.7	0.005
1"	25		49.4	0.002
3/4"	19		40.5	0.001
1/2"	12.5			
3/8"	9.5			
#4	4.75	100.0		
#10	2.00	98.5		
#20	0.850	96.7		
#40	0.425	95.3		
#60	0.250	94.1		
#100	0.150	92.7		
#200	0.075	90.5		

POROSITY (%)
EFFECTIVE SIZE (mm)
COEFFICIENT OF UNIFORMITY
COEFFICIENT OF CURVATURE
LIQUID LIMIT 56
PLASTIC LIMIT 27
PLASTICITY INDEX 29
CLASSIFICATION FAT CLAY (CH)
WATER CONTENT (%) 19.1
DRY DENSITY (PCF)
SPECIFIC GRAVITY 2.97
HYDRAULIC CONDUCTIVITY (cm/sec - 20C)
TEST PROCEDURES: ASTM D422, D4318, D2216, D4287; CORPS OF ENGRS EM-1110-2-1906

LAW ENVIRONMENTAL, INC.
M.A. O'Kelley

INSTALLATION RESTORATION PROGRAM (IRP)

RI/FS

VOLUME IVB

Appendix F

Niagara Falls International Airport
Niagara Falls, New York

Science Applications International Corporation (SAIC)
One Sears Drive
Paramus, New Jersey 07652

MAY 1991

Remedial Investigation/ Feasibility Study (RI/FS) Report 1987-1990

PREPARED FOR

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE RESERVE
ROBINS AIR FORCE BASE, GEORGIA 31098-6001

UNITED STATES AIR FORCE
HUMAN SYSTEMS DIVISION (AFSC)
IRP PROGRAM OFFICE (HSD/YAQI)
BROOKS AIR FORCE BASE, TEXAS 78235-5000

APPENDIX F

IRP RI/FS

Volume I - Soil Data
Volume II - Groundwater Data
Volume III - Surface Water/Sediment Data
Volume IV - Additional RI Data

NIAGARA IAP RI/FS ITIR
VOLUME I
SOIL DATA

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TABLE OF CONTENTS (Cont'd)

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APPENDICES

ANALYSIS AND METHODS SUMMARIES

TABLES A-1 THRU A-2

INTRODUCTION

The Informal Technical Information Report (ITIR) for data generated from the sampling and analysis program at Niagara International Airport is organized into three volumes. Volume I contains all information pertaining to soil and well boring samples, including sample data for the drummed cuttings (reported in Appendix IB). Volume II reports all data for the groundwater samples, including the USGS well samples and samples taken from the bulk storage tanks containing development and purge water (reported in Appendix IIA and IIB, respectively). Surface water/sediment data is summarized in Volume III.

Each volume of the ITIR contains tables prepared in "Lotus 1-2-3" worksheet format, and identified alphabetically by type of information, subnumbered by table content, followed by an additional letter for each site. Included in each of the three volumes are tables summarizing the following information:

- o Sample and QC cross references; These tables cross-reference field sample numbers, sample description and laboratory ID numbers (Tables B-1x), and quality control (QC) sample type and applicable and associated field samples (Tables B-2x). These tables also provide page references for the various types of analyses. All volatile organic compound analyses are grouped together (for example, for groundwater samples, methods SW5030/8020, SW5030/8021, SW5030/8015 and/or E504.1 are listed under the heading volatile/purgeable organics), as are general chemistry parameters. Only the first page number of multiple page tables is listed.

- o Collection, extraction and/or analysis dates for all parameters: These sample tracking and holding time summary tables (C-1x, C-2x, C-3x, etc.) summarize all applicable analysis dates for each sample. In cases where more than one analysis is required for a specific analysis type, the latest analysis date is reported. For example, organic analysis by gas chromatography (GC) methods often require a primary and confirmation analysis-the later of the two analysis dates are reported. Similarly, metals are performed by inductively coupled plasma spectrophotometry (ICP) and graphite furnace atomic absorption (GFAA) methods, sometimes over several days - the latest analysis date is entered into the tables.

- o Tabulated analytical results for all parameters for all environmental and field QC samples: These analytical results tables (D-1x, D-2x, D-3x, etc.) summarize all analytical results for all samples from a given site. If a specific site was not analyzed for a particular parameter, it is excluded from the tables (and from the numbering sequence). After the tables for each site, tables for any applicable trip blanks, field blanks and equipment wash blanks are presented. For example, in Volume

II, pesticide results for groundwater samples from sites 3 and 13 and the equipment washes are the only tables presented, and are numbered D-4a through D-4b. Surrogate recoveries are reported for each sample, where applicable, for GC analyses. For additional details on GC analyses, please refer to the QA/QC summary (given on the following pages) for Volume II.

- QC sample analysis summaries - laboratory QC: Analytical results for laboratory precision and accuracy samples, in the form of matrix replicates (MR), matrix spikes (MS), or matrix spike/matrix spike duplicate (MS/MSD) pairs are presented in Tables E-1, E-2, etc. Laboratory method blank data for each relevant analysis type are listed in Tables F-1, F-2, etc.
- Overall precision and accuracy summary: Based on the total number of replicates, spikes or MS/MSD analyses for a particular parameter, the "G" Tables summarize the overall range of relative percent deviation (RPD) or percent recovery achieved by the laboratory. This is compared to the control limits for the QC analysis to determine the number of QC analyses within and outside of the limits.

Each volume is numbered sequentially beginning with the first table in the volume and ending with the last page of the last appendix. Each volume is prefaced by a table of contents, this introduction section and a QA/QC summary specific for the data contained in that volume. Chain-of-custody forms are included in an appendix to each volume. In addition, the Table of Contents for each volume identifies what other information may be contained in an appendix (for example, as mentioned earlier, drummed cutting sample results are presented in Appendix IA.)

QA/QC SUMMARY
VOLUME I

A formal, documented QA review has not yet been completed on the data from Niagara; these results will be summarized in the final report. The following items, however, pertain to the overall project, and in particular the soil boring data, and should be considered when reviewing the data contained in the ITIR. These issues often involve deviations from, or modifications to, the analytical and quality assurance/quality control protocols and procedures outlined in the Niagara IAP RI/FS Quality Assurance Project Plan (QAPP), Statement of Work (SOW) or Work Plan documents. In several cases, these modifications were made after consulting with OEHL project personnel, and the resulting decisions were documented in a letter; these correspondence are included as Appendix IA of Volume I of the ITIR.

Field Activities

Although trip blanks were not specifically included in the OEHL SOW Soil Sample Appendix Tables, they were defined in the field requirements section (Annex C). Therefore, trip blanks were included for the first three field shipments of soil samples. When the OEHL TPM (Mr. Sam Taffinder) was in the field (July 20, 1989), it was clarified that trip blanks were not required for soil sample shipments, and no further trip blanks were included. The analytical results for the three trip blanks initially collected are reported in Appendix IC.

The Niagara SOW specified a maximum of three intervals to be collected and analyzed for each soil boring. In the field (July 20, 1989), the OEHL TPM (Mr. Sam Taffinder) made a decision not to require all three samples if no significant readings were obtained on the OVA. A minimum of one sample, taken at the water/soil interface, would be collected for each boring or well boring.

Laboratory Activities

As originally outlined in the OEHL SOW and the Niagara QAPP, soil samples were to be analyzed for volatile organics by either SW846 Method 8240 (GC/MS) or SW846 Method 5030/8020 (GC, purgeable aromatics). Due to limitations arising from instrument configuration, the laboratory analyzed all soil samples by Method

SW8240. This was discussed with Major Philip Jung on September 14, 1989 and again with Captain John Erving on November 30, 1989.

Samples analyzed for volatile organics by SW846 Method 8240 were not originally quantitated for dichlorobenzenes or trichlorofluoromethane. The laboratory has relative retention time data and detection limits for these compounds, and was therefore able to search the runs to determine whether these analytes were present; if present, an estimated quantitation was reported. This was discussed with Captain John Erving in a telephone conversation on November 30, 1989.

Matrix spike/matrix spike duplicates for semivolatile analysis by SW846 Methods 3510/8270 did not include di-n-butyl phthalate as a spike compound. Although the QAPP includes this compound, it is no longer specified in the SW846 (3rd Edition) manual.

Although results for samples collected for physical/chemical properties parameters are not included in the ITIR but in the final report, it should be noted that while the chain-of-custody records show that plasticity index was requested by ASTM Method D424, it was actually performed by Method D4318. The change in method was accepted by OEHl as indicated in a letter to Mr. Sam Taffinder, July 11, 1989.

Samples to be analyzed as field duplicates were specified in the chain-of-custody records. For volatile organics analysis, several of the field duplicates were not analyzed by the laboratory.

Laboratory QC data was reported by the laboratory with the samples, and was generally identified by analysis date, batch number or sample number. These identifiers were enhanced by a preface indicating the general type of analysis (e.g., VO = volatile organic, SV = semivolatile organic, M = metals), and by a suffix indicating the type of QC sample (e.g., MB - method blank, MR - matrix replicate, MSD - matrix spike duplicate).

Control limits for surrogate recoveries, spike recoveries and replicate (or MS/MSD) RPD values are either laboratory generated, or in accordance with USEPA Contract Laboratory Program (CLP) method control limits. In all cases, the applicable control limit is reported along with the sample data.

Several soil samples analyzed for volatile organics by SW846 Method 8240 were determined by the laboratory to require a methanol extraction. These sample results are reported with MDLs which are approximately 100 times greater than a "straight" purge-and-trap. Raw data (chromatograms and quantitation reports) from the original analysis and the methanol dilution analysis were requested for review; this data is presented in Appendix IE.

Many samples analyzed for volatile organic analysis (SW846 Method 8240) have reported concentrations for methylene chloride and acetone, as well as other compounds. All samples are cross-referenced in Table B-2b to the applicable method blank; however, as a general observation, approximately half of the laboratory method blanks were contaminated with methylene chloride at concentrations ranging up to 11 ug/l (higher for methanol extractions, 1.7 mg/kg) and/or acetone, with concentrations up to 11 ug/l (higher for methanol extractions, 4.8 mg/kg).

Soil samples for several sites were requested for lead analysis by SW846 Method 3050/7421 (graphite furnace atomic absorption technique). Due to the concentration levels of lead found in the samples, furnace analysis, with its lower detection limits, was not required. This was discussed with, and approved by, the New York Department of Environmental Conservation, as indicated in a letter to Mr. Scott Menrath on November 30, 1989.

SYMBOLS/ABBREVIATIONS

NA = Not analyzed
N/A = Not applicable
* = Compound present below measurable detection limit
E = Estimated value, compound quantitated outside calibration range but within linear range.
OC = Value not within control limits
J = Estimated concentration below the method detection limit
NR = Not reported
MB = Method blank
MR = Matrix replicate
MS = Matrix spike
MSD = Matrix spike duplicate
RPD = Relative percent difference
MDL = Method detection limit
\+ = Methanol extraction, purge-and-trap volatile organic analysis

Other, additional symbols may be used which are defined on the specific table where they occur.

Table A-1

Analytical Methods*, Holding Times and Detection Limits
SOIL SAMPLES

Parameter	Method Number	Reporting Units	Holding Time	Method Detection Limit	Instrument Detection Limit
ORGANICS					
Volatile Organic Compounds	SW8240	mg/kg	14 Days	see Table A-1a	see Table A-1a
Semivolatile Organic Compounds	SW3550/SW8270	mg/kg	14 Days for Extraction/ 40 Days for Analysis	see Table A-1b	see Table A-1b
INORGANICS					
Petroleum Hydrocarbons	SW3550/E418.1	mg/kg	28 Days	5 mg/Kg	2 mg/L
Metal Screen(25 metals)	SW3050/SW6010	mg/kg	6 Months	see Table A-1c	see Table A-1c
Mercury	SW7471	mg/kg	28 Days	0.10 mg/Kg	0.00014 mg/L
Total Organic Carbon	SW9060	mg/kg	28 Days	Not defined for soils	

*The methods cited are from the following sources: "E" Methods
Methods for chemical analysis of water and wastes, EPA Manual 600/4-79-020
(USEPA, 1983-with additions)
Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, 40CFR 136, Appendix A
Inductively Coupled Plasma-Atomic Emissions Spectrometer method for Trace Elements Analysis of Water and Wastes, 40 CFR136,Appendix C
"SW" Methods
Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods, SW846, 3rd Edition (USEPA, 1986).

Table A-1a

Method Detection Limits/Instrument Detection Limits
Volatile Organic Compounds - Soil

8240 Compounds	MDL (mg/Kg)	IDL (mg/L)
Chloromethane	0.010	0.00441
Bromomethane	0.010	0.00492
Vinyl Chloride	0.010	0.00309
Chloroethane	0.010	0.00591
Methylene Chloride	0.005	0.00370
Acetone	0.010	0.00940
Carbon Disulfide	0.005	0.00290
1,1-Dichloroethene	0.005	0.00276
1,1-Dichloroethane	0.005	0.00238
trans-1,2-Dichloroethene	0.005	0.00260
Chloroform	0.005	0.00284
1,2-Dichloroethane	0.005	0.00235
2-Butanone	0.010	0.00630
1,1,1-Trichloroethane	0.005	0.00290
Carbon Tetrachloride	0.005	0.00320
Vinyl Acetate	0.010	0.00510
Bromodichloromethane	0.005	0.00260
1,2-Dichloropropane	0.005	0.00330
trans-1,3-Dichloropropene	0.005	0.00360
Trichloroethene	0.005	0.00290
Dibromochloromethane	0.005	0.00260
1,1,2-Trichloroethane	0.005	0.00450
Benzene	0.005	0.00320

Table A-1a(continued)

Method Detection Limits/Instrument Detection Limits
Volatile Organic Compounds - Soil

8240 Compounds	MDL (mg/Kg)	IDL (mg/L)
cis-1,3-Dichloropropene	0.005	0.00470
2-Chloroethylvinyl ether	0.010	0.00530
Bromoform	0.005	0.00400
4-Methyl-2-Pentanone	0.010	0.00600
2-Hexanone	0.010	0.00980
Tetrachloroethene	0.005	0.00380
1,1,2,2-Tetrachloroethane	0.005	0.00500
Toluene	0.005	0.00410
Chlorobenzene	0.005	0.00420
Ethylbenzene	0.005	0.00360
Styrene	0.005	0.00440
Total Xylenes	0.005	0.00300
1,2-Dichlorobenzene	0.005	NR
1,3-Dichlorobenzene	0.005	NR
1,4-Dichlorobenzene	0.005	NR
Trichlorofluoromethane	0.010	NR

NR - Not reported

Table A-1b

Method Detection Limits/Instrument Detection Limits
Semivolatile Organic Compounds - Soil
(SW3550/8270)

Compound	MDL (mg/Kg)	IDL (mg/L)
Bis(2-chloroethyl)ether	0.33	0.0048
1,3-Dichlorobenzene	0.33	0.0045
1,4-Dichlorobenzene	0.33	0.0042
1,2-Dichlorobenzene	0.33	0.0044
Bis(2-chloroisopropyl)ether	0.33	0.0061
N-Nitroso-di-n-propylamine	0.33	0.0054
Hexachloroethane	0.33	0.0024
Nitrobenzene	0.33	0.0028
Isophorone	0.33	0.0022
Bis(2-chloroethoxy)methane	0.33	0.0015
1,2,4-Trichlorobenzene	0.33	0.0056
Naphthalene	0.33	0.0022
Hexachlorobutadiene	0.33	0.0095
Hexachlorocyclopentadiene	0.33	0.0026
2-Chloronaphthalene	0.33	0.0015
Dimethyl phthalate	0.33	0.0024
Acenaphthylene	0.33	0.0024
Fluorene	0.33	0.0021
Acenaphthene	0.33	0.0022
2,4-Dinitrotoluene	0.33	0.0014
2,6-Dinitrotoluene	0.33	0.0036
Diethyl phthalate	0.33	0.0025
4-Chlorophenyl phenylether	0.33	0.0039
N-Nitrosodiphenylamine	0.33	0.0027

Table A-1b(continued)

Method Detection Limits/Instrument Detection Limits
Semivolatile Organic Compounds - Soil
(SW3550/8270)

Compound	MDL (mg/Kg)	IDL (mg/Kg)
4-Bromophenyl phenylether	0.33	0.0033
Hexachlorobenzene	0.33	0.0024
Phenanthrene	0.33	0.0027
Anthracene	0.33	0.0023
Di-n-Butyl phthalate	0.33	0.0056
Fluoranthene	0.33	0.0060
Benzidine	1.60	0.0195
Pyrene	0.33	0.0088
Butyl benzyl phthalate	0.33	0.0054
3,3'-Dichlorobenzidine	0.66	0.0088
Benzo(a)anthracene	0.33	0.0013
Bis(2-ethylhexyl)phthalate	0.33	0.0080
Chrysene	0.33	0.0017
Di-n-octyl phthalate	0.33	0.0087
Benzo(b)fluoranthene	0.33	0.0042
Benzo(k)fluoranthene	0.33	0.0064
Benzo(a)pyrene	0.33	0.0024
Indeno(1,2,3-cd)pyrene	0.33	0.0051
Dibenzo(a,h)anthracene	0.33	0.0043
Benzo(g,h,i)perylene	0.33	0.0032
Phenol	0.33	0.0037
2-Chlorophenol	0.33	0.0027
2-Nitrophenol	0.33	0.0032
2,4-Dimethyphenol	0.33	0.0032
2,4-Dichlorophenol	0.33	0.0054

Table A-1b(continued)

Method Detection Limits/Instrument Detection Limits
Semivolatile Organic Compounds - Soil
(SW3550/8270)

Compound	MDL (mg/Kg)	IDL (mg/Kg)
4-Chloro-3-methylphenol	0.33	0.0020
2,4,6-Trichlorophenol	0.33	0.0041
2,4-Dinitrophenol	1.60	0.0023
4-Nitrophenol	1.60	0.0023
4,6-Dinitro-2-methylphenol	1.60	0.0024
Pentachlorophenol	1.60	0.0190
Benzyl Alcohol	0.33	0.0049
2-Methylphenol	0.33	0.0052
4-Methylphenol	0.33	0.0018
Benzoic Acid	1.60	0.0233
4-chloroaniline	0.33	0.0033
2-Methylnaphthalene	0.33	0.0020
2,4,5-Trichlorophenol	1.60	0.0065
2-Nitroaniline	1.60	0.0022
3-Nitroaniline	1.60	0.0075
Dibenzofuran	0.33	0.0025
4-Nitroaniline	1.60	0.0011

Table A-1c

Method Detection Limits/Instrument Detection Limits
Metals - Soil

Compound	EPA Method	MDL (mg/Kg)	IDL (mg/L)
Aluminum	6010	20.0	0.043
Antimony	6010	12.0	0.033
Arsenic	6010	5.0	NR
Barium	6010	2.0	0.002
Beryllium	6010	0.4	0.002
Boron	6010	6.0	NR
Cadmium	6010	1.0	0.003
Calcium	6010	10.0	0.104
Chromium	6010	2.0	0.005
Cobalt	6010	2.0	0.008
Copper	6010	2.0	0.003
Iron	6010	5.0	0.009
Lead	6010	10.0	0.035
Magnesium	6010	10.0	0.098
Manganese	6010	1.0	0.001
Mercury	7471	0.1	0.00014
Molybdenum	6010	5.0	NR
Nickel	6010	3.0	0.004
Potassium	6010	100.0	0.381
Selenium	6010	10.0	NR
Silicon	6010	60.0	NR
Silver	6010	2.0	0.004
Sodium	6010	100.0	0.094
Thallium	6010	16.0	NR
Vanadium	6010	2.0	0.006
Zinc	6010	2.0	0.005

NR - Not reported

Table A-2

Analytical Methods*, Quality Control Checks and Total Number of Soil Analyses
SOIL SAMPLES SUMMARY

Parameter	Analytical Method	Reporting Units	Number of Analyses	Field Replicates	Analytical Replicates	Matrix Spikes	Reagent Blanks	MS/MSD Analysis	Total Analysis
ORGANICS									
Volatile Organic Compounds	SW8240	mg/kg	71	5	-	-	22	22	120
Semivolatile Organic Compounds	SW3550/SW8270	mg/kg	44	4	-	-	10	6	64
INORGANICS									
Petroleum Hydrocarbons	SW3550/E418.1	mg/kg	71	8	10	10	-	-	99
Metal Screen(25 metals)	SW3050/SW6010	mg/kg	51	7	5	5	7	-	75
Mercury	SW7471	mg/kg	28 (1)	5	5	5	-	-	43
Total Organic Carbon	SW9060	mg/kg	4	0	-	-	-	-	4
% Moisture	ASTM D2216	%	71	8	-	-	-	-	79

*The methods cited are from the following sources: "E" Methods
Methods for chemical analysis of water and wastes, EPA Manual 600/4-79-020
(USEPA, 1983-with additions)
Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater, 40CFR 136, Appendix A
Inductively Coupled Plasma-Atomic Emissions Spectrometer method for Trace Elements Analysis of Water and Wastes, 40 CFR136,Appendix C
"SW" Methods
Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods,
SW846, 3rd Edition (USEPA, 1986).

(1) An additional 13 Mercury analyses were performed although not required.

CROSS REFERENCES

TABLES B-1a THROUGH B-2d

Table B-1a
Site Specific Cross Reference
BACKGROUND BORINGS

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Semivolatile Organics	Metals/ TPH
BB-1-5A	BB-1, 6.0 - 7.5′	43264	NA	51,107	65,131
BB-1-5B	BB-1, 6.0 - 7.5′	43267	51,79	NA	65,131
BB-1-7A	BB-1, 9.0 - 10.5′	43265	NA	51,107	65,131
BB-1-7B	BB-1, 9.0 - 10.5′	43268	51,79	NA	65,131
BB-1-9A	BB-1, 12.0 - 13.5′	43266	NA	51,107	65,131
BB-1-9B	BB-1, 12.0 - 13.5′	43269	51,79	NA	65,131
BB-2-1A	BB-2, 0 - 1.5′	43270	NA	51,107	65,131
BB-2-1B	BB-2, 0 - 1.5′	43273	51,79	NA	65,131
BB-2-5A	BB-2, 6.0 - 7.5′	43271	NA	51,107	65,131
BB-2-5B	BB-2, 6.0 - 7.5′	43274	51,79	NA	65,131
BB-2-8A	BB-2, 10.5 - 12.0′	43272	NA	51,107	65,131
BB-2-8B	BB-2, 10.5 - 12.0′	43275	51,79	NA	65,131

Table B-1b
Site Specific Cross Reference
SITE 1

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/TPH
B-1-1-2B	B-1-1, 3.1 - 4.6′	44957	52,81	NA	66,132
B-1-1-3B	B-1-1, 4.6 - 5.7′	44958	52,81	NA	66,132

Table B-1c
Site Specific Cross Reference
SITE 2

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
B-2-1-1B	B-2-1, 0 - 1.5′	44322	53,83	NA	67,133
B-2-1-3B	B-2-1, 3.0 - 4.5′	44323	53,83	NA	67,133
B-2-1-4B	B-2-1, 4.5 - 6.0′	44324	53,83	NA	67,133
B-2-2-1B	B-2-2, 0 - 1.5′	44325	53,83	NA	67,133
B-2-2-4B	B-2-2, 4.5 - 6.0′	44326	53,83	NA	67,133
B-2-2-7B	B-2-2, 9.0 - 10.5′	44327	53,83	NA	67,133

Table B-1d
Site Specific Cross Reference
SITE 3

			Page(s)		
Field Sample ID	Sample Description	Laboratory ID	Volatile/Purgeable Organics	Semivolatile Organics	Metals/ TPH
WB-3-2D-4A	WB-3-2D, 4.5 - 6.0′	46929	NA	NA	68,134
WB-3-2D-4AR	WB-3-2D, 4.5 - 6.0′,Rep	46929 Rep	NA	NA	68,134
WB-3-2D-4B	WB-3-2D, 4.5 - 6.0′	46930	54,85	NA	68,134
WB-3-2D-4BR	WB-3-2D, 4.5 - 6.0′,Rep	46930 Rep	NA	NA	68,134
WB-3-2D-5A	WB-3-2D, 6.0 - 7.5′	46931	NA	NA	68,134
WB-3-2D-5B	WB-3-2D, 6.0 - 7.5′	46932	54,85	NA	68,134
WB-3-2D-6A	WB-3-2D, 7.5 - 9.0′	46933	NA	NA	68,134
WB-3-2D-6B	WB-3-2D, 7.5 - 9.0′	46934	54,85	NA	68,134
WB-3-3D-1A	WB-3-3D, 4.0 - 5.5′	46687	NA	NA	68,134
WB-3-3D-1B	WB-3-3D, 4.0 - 5.5′	46690	54,85	NA	68,134
WB-3-4D-1A	WB-3-4D, 0 - 1.5′	46735	NA	NA	68,134
WB-3-4D-1AR	WB-3-4D, 0 - 1.5′,Rep	46735 Rep	NA	NA	68,134
WB-3-4D-1B	WB-3-4D, 0 - 1.5′	46736	54,85	NA	68,134
WB-3-4D-1BR	WB-3-4D, 0 - 1.5′,Rep	46736 Rep	NA	NA	68,134
WB-3-4D-2A	WB-3-4D, 1.5 - 3.0′	46737	NA	NA	68,134
WB-3-4D-2B	WB-3-4D, 1.5 - 3.0′	46738	54,85	NA	68,134 (TOC, p. 145)
WB-3-7-4A	WB-3-7, 4.5 - 6.0′	45939	NA	NA	68,134
WB-3-7-4B	WB-3-7, 4.5 - 6.0′	45940	54,85	NA	68,134

Table B-1e
Site Specific Cross Reference
SITE 4

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Semivolatile Organics	Metals/ TPH	
B-4-1-3B	B-4-1, 4.5 - 6.0'	44328	55,87	NA	69,135	
B-4-1-3BR	B-4-1, 4.5 - 6.0',Rep	44328 Rep	55,87	NA	69,135	
B-4-1-4B	B-4-1, 6.0 - 7.5'	44329	55,87	NA	69,135	(TOC, p. 145)
B-4-1-5B	B-4-1, 7.5 - 9.0'	44330	55,87	NA	69,135	

Table B-1f
Site Specific Cross Reference
SITE 5

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
WB-5-1D-1A	WB-5-1D, 5.7 - 7.7′	46685	NA	56,110	70,136
WB-5-1D-1AR	WB-5-1D, 5.7 - 7.7′,Rep	46685 Rep	NA	56,110	70,136
WB-5-1D-1B	WB-5-1D, 5.7 - 7.7′	46686	56,89	NA	70,136
WB-5-1D-1BR	WB-5-1D, 5.7 - 7.7′,Rep	46686 Rep	56,89	NA	70,136
WB-5-5-6A	WB-5-5, 7.5 - 9.0′	45623	NA	56,110	70,136
WB-5-5-6B	WB-5-5, 7.5 - 9.0′	45624	56,89	NA	70,136 (TOC, p. 145)

Table B-1g
Site Specific Cross Reference
SITE 6

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
B-6-1-1B	B-6-1, 0 - 1.5′	44319	57,91	NA	71,137
B-6-1-3B	B-6-1, 3.0 - 4.5′	44320	57,91	NA	71,137
B-6-1-6B	B-6-1, 7.5 - 9.0′	44321	57,91	NA	71,137
B-6-2-1B	B-6-2, 0 - 1.5′	43615	57,91	NA	71,137
B-6-2-4B	B-6-2, 4.5 - 6.0′	43616	57,91	NA	71,137
B-6-2-7B	B-6-2, 9.0 - 10.5′	43617	57,91	NA	71,137
B-6-2-7BR	B-6-2, 9.0 - 10.5′,Rep	43617 Rep	NA	NA	NA

Table B-1h
Site Specific Cross Reference
SITE 7

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
B-7-1-1B	B-7-1, 0 - 1.5'	43612	58,93	NA	72,138
B-7-1-3B	B-7-1, 3.0 - 4.5'	43613	58,93	NA	72,138
B-7-1-4B	B-7-1, 4.5 - 6.0'	43614	58,93	NA	72,138 (TOC, p. 145)

Table B-1i
Site Specific Cross Reference
SITE 8

Field Sample ID	Sample Description	Laboratory ID	Page(s)		
			Volatile/Purgeable Organics	Semivolatile Organics	Metals/ TPH
WB-8-1D-1A	WB-8-1D, 7.4 - 9.4'	46688	NA	59,113	73,139
WB-8-1D-1B	WB-8-1D, 7.4 - 9.4'	46689	59,95	NA	73,139
WB-8-2D-7A	WB-8-2D, 9.0 - 10.5'	46351	NA	59,113	73,139
WB-8-2D-7AR	WB-8-2D, 9.0 - 10.5'	46351 Rep	NA	59,113	73,139
WB-8-2D-7B	WB-8-2D, 9.0 - 10.5'	46352	59,95	NA	73,139
WB-8-2D-7BR	WB-8-2D, 9.0 - 10.5'	46352 Rep	59,95	NA	73,139
WB-8-3D-1A	WB-8-3D, 7.0 - 9.0'	46498	NA	59,113	73,139
WB-8-3D-1B	WB-8-3D, 7.0 - 9.0'	46499	59,95	NA	73,139
WB-8-5A-1A	WB-8-5A, 0 - 1.5'	45617	NA	59,113	73,139
WB-8-5A-1B	WB-8-5A, 0 - 1.5'	45618	59,95	NA	73,139
WB-8-5A-4A	WB-8-5A, 4.5 - 6.0'	45619	NA	59,113	73,139
WB-8-5A-4B	WB-8-5A, 4.5 - 6.0'	45620	59,95	NA	73,139
WB-8-5A-7A	WB-8-5A, 9.0 - 10.5'	45621	NA	59,113	73,139
WB-8-5A-7B	WB-8-5A, 9.0 - 10.5'	45622	59,95	NA	73,139
WB-8-6-8A	WB-8-6, 10.5 - 12.0'	45141	NA	59,113	73,139
WB-8-6-8B	WB-8-6, 10.5 - 12.0'	45142	59,95	NA	73,139

Table B-1j
Site Specific Cross Reference
* SITE 9*

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
B-9-1-1A	B-9-1, 0 - 1.5′	43606	NA	60,116	74,140
B-9-1-1B	B-9-1, 0 - 1.5′	43609	60,97	NA	74,140
B-9-1-3A	B-9-1, 3.0 - 4.5′	43607	NA	60,116	74,140
B-9-1-3B	B-9-1, 3.0 - 4.5′	43610	60,97	NA	74,140
B-9-1-6A	B-9-1, 7.5 - 9.0′	43608	NA	60,116	74,140
B-9-1-6B	B-9-1, 7.5 - 9.0′	43611	60,97	NA	74,140
WB-9-5-6A	WB-9-5, 7.5 - 8.6′	46100	NA	60,116	74,140
WB-9-5-6B	WB-9-5, 7.5 - 8.6′	46101	60,97	NA	74,140
WB-9-6-3A	WB-9-6, 3.0 - 4.5′	46096	NA	60,116	74,140
WB-9-6-3B	WB-9-6, 3.0 - 4.5′	46097	60,97	NA	74,140
WB-9-6-4A	WB-9-6, 4.5 - 6.0′	46098	NA	60,116	74,140
WB-9-6-4B	WB-9-6, 4.5 - 6.0′	46099	60,97	NA	74,140
WB-9-7-6A	WB-9-7, 7.5 - 9.0′	45615	NA	60,116	74,140
WB-9-7-6B	WB-9-7, 7.5 - 9.0′	45616	60,97	NA	74,140

Table B-1k
Site Specific Cross Reference
SITE 10

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
WB-10-1D-1A	WB-10-1D, 5.4 - 6.9′	46104	NA	61,119	75,141
WB-10-1D-1B	WB-10-1D, 5.4 - 6.9′	46105	61,99	NA	75,141
WB-10-1D-2A	WB-10-1D, 6.9 - 8.1′	46102	NA	61,119	75,141
WB-10-1D-2B	WB-10-1D, 6.9 - 8.1′	46103	61,99	NA	75,141
WB-10-4-5A	WB-10-4, 6.0 - 7.5′	45139	NA	61,119	75,141
WB-10-4-5B	WB-10-4, 6.0 - 7.5′	45140	61,99	NA	75,141

Table B-1l
Site Specific Cross Reference
SITE 11

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Semivolatile Organics	Metals/ TPH
B-11-1-1A	B-11-1, 0 - 1.5′	43594	NA	62,122	76,142
B-11-1-1B	B-11-1, 0 - 1.5′	43597	62,101	NA	76,142
B-11-1-4A	B-11-1, 4.5 - 6.0′	43595	NA	62,122	76,142
B-11-1-4B	B-11-1, 4.5 - 6.0′	46598	62,101	NA	76,142
B-11-1-7A	B-11-1, 9.0 - 10.5′	46596	NA	62,122	76,142
B-11-1-7B	B-11-1, 9.0 - 10.5′	43599	62,101	NA	76,142
B-11-2-1A	B-11-2, 0 - 1.5′	43600	NA	62,122	76,142
B-11-2-1B	B-11-2, 0 - 1.5′	43603	62,101	NA	76,142
B-11-2-4A	B-11-2, 4.5 - 6.0′	43601	NA	62,122	76,142
B-11-2-4AR	B-11-2, 4.5 - 6.0′Rep	43601 Rep	NA	62,122	76,142
B-11-2-4B	B-11-2, 4.5 - 6.0′	43604	62,101	NA	76,142
B-11-2-4BR	B-11-2, 4.5 - 6.0′Rep	43604 Rep	NA	NA	76,142
B-11-2-8A	B-11-2, 10.5 - 12.0′	43602	NA	62,122	76,142
B-11-2-8B	B-11-2, 10.5 - 12.0′	43605	62,101	NA	76,142

Table B-1m
Site Specific Cross Reference
SITE 12

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals/ TPH
B-12-1-5A	B-12-1, 4.5 - 6.0'	43282	NA	63,125	77,143
B-12-1-5AR	B-12-1, 4.5 - 6.0'Rep	43282 Rep	NA	63,125	77,143
B-12-1-5B	B-12-1, 4.5 - 6.0'	43285	63,103	NA	77,143
B-12-1-5BR	B-12-1, 4.5 - 6.0'Rep	43285 Rep	63,103	NA	77,143
B-12-1-7A	B-12-1, 9.0 - 10.5'	43283	NA	63,125	77,143
B-12-1-7B	B-12-1, 9.0 - 10.5'	43286	63,103	NA	77,143
B-12-1-8A	B-12-1, 10.5 - 12.0'	43284	NA	63,125	77,143
B-12-1-8B	B-12-1, 10.5 - 12.0'	43287	63,103	NA	77,143
B-12-2-1A	B-12-2, 0 - 1.5'	43276	NA	63,125	77,143
B-12-2-1B	B-12-2, 0 - 1.5'	43279	63,103	NA	77,143
B-12-2-4A	B-12-2, 4.5 - 6.0'	43277	NA	63,125	77,143
B-12-2-4B	B-12-2, 4.5 - 6.0'	43280	63,103	NA	77,143
B-12-2-6A	B-12-2, 7.5 - 9.0'	43278	NA	63,125	77,143
B-12-2-6B	B-12-2, 7.5 - 9.0'	43281	63,103	NA	77,143

Table B-1n
Site Specific Cross Reference
SITE 13

			Page(s)		
Field Sample ID	Sample Description	Laboratory ID	Volatile/Purgeable Organics	Semivolatile Organics	Metals/ TPH
WB-13-1-5A	WB-13-1, 6.0 - 7.5′	44959	NA	64,128	78,144
WB-13-1-5B	WB-13-1, 6.0 - 7.5′	44960	64,105	NA	78,144
WB-13-2-4A	WB-13-2, 4.5 - 6.0′	44961	NA	64,128	78,144
WB-13-2-4B	WB-13-2, 4.5 - 6.0′	44963	64,105	NA	78,144
WB-13-2-5A	WB-13-2, 6.0 - 7.5′	44962	NA	64,128	78,144
WB-13-2-5B	WB-13-2, 6.0 - 7.5′	44964	64,105	NA	78,144
WB-13-3-1A	WB-13-3, 0 - 1.5′	45134	NA	64,128	78,144
WB-13-3-1B	WB-13-3, 0 - 1.5′	45135	64,105	NA	78,144
WB-13-3-6A	WB-13-3, 7.5 - 9.0′	45136	NA	64,128	78,144
WB-13-3-6AR	WB-13-3, 7.5 - 9.0′,Rep	45136 Rep	NA	NA	78,144
WB-13-3-6B	WB-13-3, 7.5 - 9.0′	45137	64,105	NA	78,144
WB-13-3-6BR	WB-13-3, 7.5 - 9.0′,Rep	45137 Rep	64,105	NA	78,144
WB-13-3-7A	WB-13-3, 9.0 - 9.4′	45138	64,105	64,128	78,144
WB-13-4-5A	WB-13-4, 6.0 - 7.5′	45132	NA	64,128	78,144
WB-13-4-5B	WB-13-4, 6.0 - 7.5′	45133	64,105	NA	78,144

Table B-2a
QC Sample Cross Reference
FIELD DUPLICATES

QC Sample ID	Analysis	Page(s)	--Applicable Samples-- Site	Field ID
B-12-1-5AR	Metals, Hg, Semivolatile Organics	63,77,125,143	BB	BB-1-5A BB-1-7A BB-1-9A BB-2-1A BB-2-5A BB-2-8A
			12	B-12-1-5A B-12-1-7A B-12-1-8A B-12-2-1A B-12-2-4A B-12-2-6A
B-12-1-5BR	TPH	77,143	BB	BB-1-5B BB-1-7B BB-1-9B BB-2-1B BB-2-5B BB-2-8B
			12	B-12-1-5B B-12-1-7B B-12-1-8B B-12-2-1B B-12-2-4B B-12-2-6B

Table B-2a (continued)
QC Sample Cross Reference
FIELD DUPLICATES

			--Applicable Samples--	
QC Sample ID	Analysis	Page(s)	Site	Field ID
B-12-1-5BR	Volatile Organics	63,103	BB	BB-1-5B
				BB-1-7B
				BB-1-9B
				BB-2-1B
				BB-2-5B
				BB-2-8B
			12	B-12-1-5B
				B-12-1-7B
				B-12-1-8B
				B-12-2-1B
				B-12-2-4B
				B-12-2-6B
			11	B-11-1-1B
				B-11-1-4B
				B-11-1-7B
				B-11-2-1B
				B-11-2-4B
				B-11-2-8B
			9	B-9-1-1B
				B-9-1-3B
				B-9-1-6B

Table B-2a (continued)
QC Sample Cross Reference
FIELD DUPLICATES

			--Applicable Samples--	
QC Sample ID	Analysis	Page(s)	Site	Field ID
B-11-2-4AR	Metals, Semivolatile Organics	62,76,122,142	13	WB-13-1-5A
				WB-13-2-4A
				WB-13-2-5A
				WB-13-3-1A
				WB-13-3-6A
				WB-13-3-7A
				WB-13-4-5A
			11	B-11-1-1A
				B-11-1-4A
				B-11-1-7A
				B-11-2-1A
				B-11-2-4A
				B-11-2-8A
			10	WB-10-4-5A
			9	B-9-1-1A
				B-9-1-3A
				B-9-1-6A
B-11-2-4BR	TPH	76,142	11	B-11-1-1B
				B-11-1-4B
				B-11-1-7B
				B-11-2-1B
				B-11-2-4B
				B-11-2-8B
			9	B-9-1-1B
				B-9-1-3B
				B-9-1-6B

Table B-2a (continued)
QC Sample Cross Reference
FIELD DUPLICATES

QC Sample ID	Analysis	Page(s)	--Applicable Samples-- Site	Field ID
B-4-1-3BR	Volatile Organics, TPH	55,69,87,135	7	B-7-1-1B
				B-7-1-3B
				B-7-1-4B
			6	B-6-1-1B
				B-6-1-3B
				B-6-1-6B
				B-6-2-1B
				B-6-2-4B
				B-6-2-7B
			2	B-2-1-1B
				B-2-1-3B
				B-2-1-4B
				B-2-2-1B
				B-2-2-4B
				B-2-2-7B
			4	B-4-1-3B
				B-4-1-4B
				B-4-1-5B
			1	B-1-1-2B
				B-1-1-3B

Table B-2a (continued)
QC Sample Cross Reference
FIELD DUPLICATES

			--Applicable Samples--	
QC Sample ID	Analysis	Page(s)	Site	Field ID
WB-13-3-6AR	Metals	78,144	13	WB-13-1-5A
				WB-13-2-4A
				WB-13-2-5A
				WB-13-3-1A
				WB-13-3-6A
				WB-13-3-7A
				WB-13-4-5A
			10	WB-10-4-5A
			8	WB-8-6-8A
WB-13-3-6BR	Volatile Organics, TPH	64,78,105,144	13	WB-13-1-5B
				WB-13-2-4B
				WB-13-2-5B
				WB-13-3-1B
				WB-13-3-6B
				WB-13-3-7A
				WB-13-4-5B
			10	WB-10-4-5B
			8	WB-8-6-8B
WB-8-2D-7AR	Metals, Hg Semivolatile Organics	59,73,113,139	9	WB-9-6-3A
				WB-9-6-4A
				WB-9-5-6A
			10	WB-10-1D-1A
				WB-10-1D-2A
			8	WB-8-[illegible]A

Table B-2a (continued)
QC Sample Cross Reference
FIELD DUPLICATES

QC Sample ID	Analysis	Page(s)	--Applicable Samples-- Site	Field ID
WB-8-2D-7BR	Volatile Organics, TPH	59,73,95,139	9	WB-9-5-6B WB-9-6-3B WB-9-6-4B
			10	WB-10-1D-1B WB-10-1D-2B
			8	WB-8-2D-7B
WB-5-1D-1AR	Metals, Hg, Semivolatile Organics	56,70,110,136	8	WB-8-1D-1A WB-8-3D-1A
			5	WB-5-1D-1A
			3	WB-3-3D-1A (excluding semivolatiles)
WB-5-1D-1BR	Volatile Organics, TPH	56,70,89,136	8	WB-8-1D-1B WB-8-3D-1B
			5	WB-5-1D-1A

Table B-2a (continued)
QC Sample Cross Reference
FIELD DUPLICATES

			--Applicable Samples--	
QC Sample ID	Analysis	Page(s)	Site	Field ID
WB-5-1D-1BR (cont.)	Volatile Organics, TPH	56,70,89,136	3	WB-3-2D-4B WB-3-2D-5B WB-3-2D-6B WB-3-3D-1A WB-3-4D-1A WB-3-4D-2A
WB-3-4D-1AR	Metals, Hg	68,134	3	WB-3-4D-1A WB-3-4D-2A
WB-3-4D-1BR	TPH	68,134	3	WB-3-4D-1A WB-3-4D-2A
WB-3-2D-4AR	Metals, Hg	68,134	3	WB-3-2D-4A WB-3-2D-5A WB-3-2D-6A
WB-3-2D-4BR	TPH	68,134	3	WB-3-2D-4B WB-3-2D-5B WB-3-2D-6B

Table B-2b
QC Sample Cross Reference
LAB METHOD BLANKS

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
M249MB	Metals	175	BB	BB-1-5A
				BB-1-7A
				BB-1-9A
				BB-2-1A
				BB-2-5A
				BB-2-8A
			12	B-12-1-5A
				B-12-1-5AR
				B-12-1-7A
				B-12-1-8A
				B-12-2-1A
				B-12-2-4A
				B-12-2-6A
			13	WB-13-1-5A
				WB-13-2-4A
				WB-13-2-5A
V0720MB1	Volatile organics	163	BB	BB-1-5B
				BB-1-7B
				BB-1-9B
				BB-2-1B
				BB-2-5B
			12	B-12-2-1B
				B-12-2-4B
V0722MB	Volatile organics	163	12	B-12-1-5B
				B-12-1-5BR
				B-12-1-7B
				B-12-2-6B

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
V0724MB1	Volatile organics	163	BB	BB-2-8B
			12	B-12-1-8B
SV0718MB1	Semivolatile organics	169	BB	BB-1-5A
SV0718MB2		169		BB-1-7A
				BB-1-9A
				BB-2-1A
				BB-2-5A
				BB-2-8A
			12	B-12-1-5A
				B-12-1-5AR
				B-12-1-7A
				B-12-1-8A
				B-12-2-1A
				B-12-2-4A
				B-12-2-6A
M0818MB	Metals	175	11	B-11-1-1A
				B-11-1-4A
				B-11-1-7A
				B-11-2-1A
				B-11-2-4A
				B-11-2-4AR
				B-11-2-8A
			9	B-9-1-1A
				B-9-1-3A
				B-9-1-6A

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
V0720MB2	Volatile organics	163	11	B-11-1-1B
				B-11-1-4B
				B-11-1-7B
				B-11-2-1B
				B-11-2-4B
				B-11-2-8B
V0721MB	Volatile organics	163	9	B-9-1-1B
				B-9-1-3B
				B-9-1-6B
			7	B-7-1-1B
V0724MB2	Volatile organics	163	6	B-6-2-1B
				B-6-2-4B
				B-6-2-7B
V0726MB1	Volatile organics	165	7	B-7-1-3B
				B-7-1-4B
SV0719MB	Semivolatile organics	169	11	B-11-1-1A
				B-11-1-4A
				B-11-1-7A
				B-11-2-1A
				B-11-2-4A
				B-11-2-4AR
				B-11-2-8A
			9	B-9-1-1A
				B-9-1-3A
				B-9-1-6A

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples----	
			Site	Field ID
V0726MB2	Volatile organics	165	4	B-4-1-5B
V0727MB	Volatile organics	165	6	B-6-1-1B B-6-1-3B B-6-1-6B
			2	B-2-1-3B B-2-1-4B B-2-2-1B
V0731MB	Volatile organics	165	2	B-2-1-1B B-2-2-4B B-2-2-7B
V0801MB	Volatile organics	167	4	B-4-1-3B B-4-1-3BR B-4-1-4B
V0728MB1	Volatile organics	165	1	B-1-1-2B
			13	WB-13-1-5B
SV0724MB	Semivolatile organics	169	13	WB-13-1-5A WB-13-2-4A
SV0726MB	Semivolatile organics	169	13	WB-13-2-5A

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
M381MB	Metals	175	3	WB-3-3D-1A
			5	WB-5-1D-1A
				WB-5-1D-1AR
			8	WB-8-1D-1A
				WB-8-3D-1A
			9	WB-9-5-6A
				WB-9-6-3A
				WB-9-6-4A
			10	WB-10-1D-1A
				WB-10-1D-2A
V0812MB	Volatile organics	167	9	WB-9-6-3B
V0811MB	Volatile organics	167	9	WB-9-5-6B
				WB-9-6-4B
			10	WB-10-1D-1B
				WB-10-1D-2B
SV0814MB1	Semivolatile organics	172	5	WB-5-1D-1A
SV0814MB2		172		WB-5-1D-1AR
			8	WB-8-1D-1A
				WB-8-3D-1A

Table 8-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
SV0814MB1	Semivolatile organics	172	9	WB-9-5-6A
SV0814MB2		172		WB-9-6-3A
(continued)				WB-9-6-4A
			10	WB-10-1D-1A
				WB-10-1D-2A
V0817MB1	Volatile organics	167	8	WB-8-2D-7B
				WB-8-2D-7BR
V0817MB2	Volatile organics	167	3	WB-3-3D-1B
			5	WB-5-1D-1B
				WB-5-1D-1BR
			8	WB-8-1D-1B
				WB-8-3D-1B
M248MB	Metals	175	8	WB-8-6-8A
			10	WB-10-4-5A
			13	WB-13-3-1A
				WB-13-3-6A
				WB-13-3-6AR
				WB-13-3-7A
				WB-13-4-5A

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples----	
			Site	Field ID
V0729MB1	Volatile organics	165	8	WB-8-6-8B
V0729MB2		165		
			10	WB-10-4-5B
			13	WB-13-3-1B
				WB-13-3-6B
				WB-13-3-6BR
				WB-13-3-7B
				WB-13-4-5B
V0729MB2	Volatile organics	165	1	B-1-1-3B
			13	WB-13-2-4B
				WB-13-2-5B
SV0803MB	Semivolatile organics	172	8	WB-8-6-8A
			10	WB-10-4-5A
			13	WB-13-3-1A
				WB-13-3-6A
				WB-13-3-7A
				WB-13-4-5A
M0809MB	Metals	175	3	WB-3-7-4A

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
V0808MB	Volatile organics	167	3	WB-3-7-4B
M338MB	Metals	175	3	WB-3-4D-1A WB-3-4D-1AR WB-3-4D-2A
			8	WB-8-2D-7A WB-8-2D-7AR
SV0809MB	Semivolatile organics	172	8	WB-8-2D-7A WB-8-2D-7AR
V0821MB	Volatile organics	167	3	WB-3-4D-1B WB-3-4D-2B
M0911MB	Metals	175	5	WB-5-5-6A
			8	WB-8-5A-1A WB-8-5A-4A WB-8-5A-7A
			9	WB-9-7-6A

Table B-2b (continued)

QC Sample Cross Reference
LAB METHOD BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
V0728MB2	Volatile organics	165	5	WB-5-5-6B
			8	WB-8-5A-1B
				WB-8-5A-4B
				WB-8-5A-7B
			9	WB-9-7-6B
SV0807MB	Semivolatile organics	172	5	WB-5-5-6A
			8	WB-8-5A-1A
				WB-8-5A-4A
				WB-8-5A-7A
			9	WB-9-7-6A
V0823MB	Volatile organics	167	3	WB-3-2D-4B
				WB-3-2D-5B
				WB-3-2D-6B

Table B-2c
QC Sample Cross Reference
LAB MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
V43287MS/	Volatile organics	146	BB	BB-1-5B
V43287MSD				BB-1-7B
				BB-1-9B
				BB-2-1B
				BB-2-5B
				BB-2-8B
			12	B-12-1-5B
				B-12-1-5BR
				B-12-1-7B
				B-12-1-8B
				B-12-2-1B
				B-12-2-4B
				B-12-2-6B
			BB	BB-1-5A
SV43271MS/	Semivolatile organics	152		BB-1-7A
SV43271MSD				BB-1-9A
				BB-2-1A
				BB-2-5A
				BB-2-8A
			12	B-12-1-5A
				B-12-1-5AR
				B-12-1-7A
				B-12-1-8A
				B-12-2-1A
				B-12-2-4A
				B-12-2-6A

Table B-2c (continued)

QC Sample Cross Reference
LAB MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

QC Sample ID	Analysis	Page(s)	---Applicable Samples----	
			Site	Field ID
V43604MS/ V43604MSD	Volatile organics	148	11	B-11-1-1B
				B-11-1-4B
				B-11-1-7B
				B-11-2-1B
				B-11-2-4B
				B-11-2-8B
			9	B-9-1-1B
				B-9-1-3B
				B-9-1-6B
			7	B-7-1-1B
			6	B-6-2-1B
				B-6-2-4B
				B-6-2-7B
V44958MS/ V44958MSD	Volatile organics	147	1	B-1-1-2B
				B-1-1-3B
			13	WB-13-1-5B
				WB-13-2-4B
				WB-13-2-5B
SV44962MS	Semivolatile organics	153	13	WB-13-1-5A
				WB-13-2-4A
				WB-13-2-5A

Table B-2c (continued)

QC Sample Cross Reference
LAB MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
V46105MS/ V46105MSD	Volatile organics	146	9	WB-9-5-6B WB-9-6-4B
			10	WB-10-1D-1B WB-10-1D-2B
V44324MS/ V44324MSD	Volatile organics	147	2	B-2-1-1B B-2-1-3B B-2-1-4B B-2-2-1B B-2-2-4B B-2-2-7B
			4	B-4-1-3B B-4-1-4B B-4-1-5B
			6	B-6-1-1B B-6-1-3B B-6-1-6B
SV46691MS/ SV46691MSD	Semivolatile organics	152	5	WB-5-1D-1A WB-5-1D-1AR
			8	WB-8-1D-1A WB-8-3D-1A
			9	WB-9-5-6A WB-9-6-3A WB-9-6-4A
			10	WB-10-1D-1A WB-10-1D-2A

Table B-2c (continued)

QC Sample Cross Reference
LAB MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
VDP163MS/ VDP163MSD	Volatile organics	150	3	WB-3-3D-1B
			5	WB-5-1D-1B
				WB-5-1D-1BR
			8	WB-8-1D-1B
				WB-8-2D-7B
				WB-8-2D-7BR
V45142MS/ V45142MSD	Volatile organics	148	8	WB-8-6-8B
			10	WB-10-4-5B
			13	WB-13-3-1B
				WB-13-3-6B
				WB-13-3-6BR
				WB-13-3-7B
				WB-13-4-5B
V46736MS/ V46736MSD	Volatile organics	149	3	WB-3-4D-1B
				WB-3-4D-12
V45618MS/ V45618MSD	Volatile organics	149	5	WB-5-5-6B
			8	WB-8-5A-1B
				WB-8-5A-4B
				WB-8-5A-7B
			9	WB-9-7-6B

Table B-2c (continued)

QC Sample Cross Reference
LAB MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
SV45638MS	Semivolatile organics	153	5	WB-5-5-6A
			8	WB-8-5A-1A WB-8-5A-4A WB-8-5A-7A
			9	WB-9-7-6A
V46932MS/ V46932MSD	Volatile organics	150	3	WB-3-2D-4B WB-3-2D-5B WB-3-2D-6B
V45910MS/ V459910MSD	Volatile Organics	151	3	WB-3-7-4B

Table B-2d
QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
PH43199MR PH43338MS	TPH	154	BB	BB-1-5B
			1	B-1-1-2B
				B-1-1-3B
			13	WB-13-1-5B
				WB-13-2-4B
				WB-13-2-5B
PH44329MR PH43598MS	TPH	154	4	B-4-1-3B
				B-4-1-4B
				B-4-1-5B
			12	B-12-1-5B
				B-12-1-7B
				B-12-1-8B
				B-12-2-1B
				B-12-2-4B
				B-12-2-6B
PH43339MR PH42341MS	TPH	155	BB	BB-1-7B
				BB-1-9B
				BB-2-1B
				BB-2-5B
				BB-2-8B
			2	B-2-1-1B
				B-2-1-3B
				B-2-1-4B
				B-2-2-1B
				B-2-2-4B
				B-2-2-7B

Table B-2d (continued)

QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
PH43339MR PH42341MS (continued)	TPH	155	6	B-6-1-1B B-6-1-3B B-6-1-6B
M43284MR M43284MS	Metals	155	BB	BB-1-5A BB-1-7A BB-1-9A BB-2-1A BB-2-5A BB-2-8A
			12	B-12-1-5A B-12-1-5AR B-12-1-7A B-12-1-8A B-12-2-1A B-12-2-4A B-12-2-6A
			13	WB-13-1-5A WB-13-2-4A WB-13-2-5A

Table B-2d (continued)

QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
PH43614MR PH43613MS	TPH	156	11	B-11-1-1B B-11-1-4B B-11-1-7B B-11-2-1B B-11-2-4B B-11-2-8B
			9	B-9-1-1B B-9-1-3B B-9-1-6B
			7	B-7-1-1B B-7-1-3B B-7-1-4B
			6	B-6-2-1B B-6-2-4B
PH44339MR PH44339MS	TPH	159	6	B-6-2-7B
PH46792MR PH46884MS	TPH	157	9	WB-9-5-6B WB-9-6-3B WB-9-6-4B

Table B-2d (continued)

QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
PH46113MR	TPH	157	3	WB-3-3D-1B
PH46995MS				WB-3-4D-1B
				WB-3-4D-1BR
				WB-3-4D-2B
			5	WB-5-1D-1B
				WB-5-1D-1BR
			8	WB-8-1D-1B
				WB-8-3D-1B
			10	WB-10-1D-1B
				WB-10-1D-2B
M46685MR	Metals	156	3	WB-3-3D-1A
				WB-3-2D-4A
				WB-3-2D-4AR
				WB-3-2D-5A
				WB-3-2D-6A
M46685MS				
			5	WB-5-1D-1A
				WB-5-1D-1AR
			8	WB-8-1D-1A
				WB-8-3D-1A
			9	WB-9-5-6A
				WB-9-6-3A
				WB-9-6-4A
			10	WB-10-1D-1A
				WB-10-1D-2A

Table B-2d (continued)

QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
PH45946MR PH45947MS	TPH	158	3	WB-3-7-4B
			8	WB-8-6-8B
			9	WB-9-7-6B
			10	WB-10-4-5B
			13	WB-13-3-1B WB-13-3-6B WB-13-3-6BR WB-13-3-7B WB-13-4-5B
M43594MR M43594MS	Metals	158	3	WB-3-7-4A
			8	WB-8-6-8A
			9	B-9-1-1A B-9-1-3A B-9-1-6A
			10	WB-10-4-5A
			11	B-11-1-1A B-11-1-4A B-11-1-7A B-11-2-1A B-11-2-4A B-11-2-4AR B-11-2-8A

Table B-2d (continued)

QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

QC Sample ID	Analysis	Page(s)	---Applicable Samples----	
			Site	Field ID
M43594MR M43594MS (continued)	Metals	158	13	WB-13-3-1A WB-13-3-6A WB-13-3-6AR WB-13-3-7A WB-13-4-5A
M43595MR M43595MS	Mercury	159	3	WB-3-7-4A
			8	WB-8-6-8A
			10	WB-10-4-5A
			13	WB-13-3-1A WB-13-3-6A WB-13-3-6AR WB-13-3-7A WB-13-4-5A
M46351MR M46351MS	Metals	161	3	WB-3-4D-1A WB-3-4D-1AR WB-3-4D-2A
			8	WB-8-2D-7A WB-8-2D-7AR

Table B-2d (continued)

QC Sample Cross Reference
LAB REPLICATE/MATRIX SPIKE SAMPLES

			---Applicable Samples----	
QC Sample ID	Analysis	Page(s)	Site	Field ID
PH45624MR PH45976MS	TPH	160	5	WB-5-5-6B
			8	WB-8-2D-7B
				WB-8-2D-7BR
				WB-8-5A-1B
				WB-8-5A-4B
				WB-8-5A-7B
M45615MR M45615MS	Metals	160	5	WB-5-5-6A
			8	WB-8-5A-1A
				WB-8-5A-4A
				WB-8-5A-7A
			9	WB-9-7-6A
M45621MR M45621MS	Mercury	162	5	WB-5-5-6A
			8	WB-8-5A-1A
				WB-8-5A-4A
				WB-8-5A-7A
			9	WB-9-7-6A
PH45642MR PH46934MS	TPH	161	3	WB-3-2D-4B
				WB-3-2D-4BR
				WB-3-2D-5B
				WB-3-2D-6B

SAMPLE TRACKING

TABLES C-1a THROUGH C-2n

Table C-1a

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
BACKGROUND BORINGS

Field Sample ID	Sampling Date	-----Volatile Organics----- Hold Time	Analysis Date	Elapsed Time	---Semivolatile Organics--- Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
BB-1-5A,B	07/11/89	14 Days	07/20/89	9 Days	14 Days	07/18/89	7 Days	40 Days	07/31/89	20 Days
BB-1-7A,B	07/11/89	14 Days	07/20/89	9 Days	14 Days	07/18/89	7 Days	40 Days	07/31/89	20 Days
BB-1-9A,B	07/11/89	14 Days	07/20/89	9 Days	14 Days	07/18/89	7 Days	40 Days	07/31/89	20 Days
BB-2-1A,B	07/11/89	14 Days	07/20/89	9 Days	14 Days	07/18/89	7 Days	40 Days	07/31/89	20 Days
BB-2-5A,B	07/11/89	14 Days	07/20/89	9 Days	14 Days	07/18/89	7 Days	40 Days	07/31/89	20 Days
BB-2-8A,B	07/11/89	14 Days	07/24/89	13 Days	14 Days	07/18/89	7 Days	40 Days	07/31/89	20 Days

Table C-1b

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 1

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-1-1-2B	07/19/89	14 Days	07/28/89	9 Days	NA	NA	NA	NA	NA	NA
B-1-1-3B	07/19/89	14 Days	07/29/89	10 Days	NA	NA	NA	NA	NA	NA

Table C-1c

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 2

Field Sample ID	Sampling Date	Volatile Organics Hold Time	Volatile Organics Analysis Date	Volatile Organics Elapsed Time	Semivolatile Organics Extraction Hold Time	Semivolatile Organics Extract Date	Semivolatile Organics Elapsed Time	Semivolatile Organics Analysis Hold Time	Semivolatile Organics Analysis Date	Semivolatile Organics Elasped Time
B-2-1-1B	07/17/89	14 Days	07/31/89	14 Days	NA	NA	NA	NA	NA	NA
B-2-1-3B	07/17/89	14 Days	07/28/89	11 Days	NA	NA	NA	NA	NA	NA
B-2-1-4B	07/17/89	14 Days	07/28/89	11 Days	NA	NA	NA	NA	NA	NA
B-2-2-1B	07/17/89	14 Days	07/28/89	11 Days	NA	NA	NA	NA	NA	NA
B-2-2-4B	07/17/89	14 Days	07/31/89	14 Days	NA	NA	NA	NA	NA	NA
B-2-2-7B	07/17/89	14 Days	07/31/89	14 Days	NA	NA	NA	NA	NA	NA

Table C-1d

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 3

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
WB-3-2D-4A,B	08/16/89	14 Days	08/23/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-2D-4AR,BR	08/16/89	14 Days	NA	NA	NA	NA	NA	NA	NA	NA
WB-3-2D-5A,B	08/16/89	14 Days	08/23/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-2D-6A,B	08/16/89	14 Days	08/23/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-3D-1A,B	08/10/89	14 Days	08/17/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-4D-1A,B	08/11/89	14 Days	08/18/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-4D-1AR,BR	08/11/89	14 Days	NA	NA	NA	NA	NA	NA	NA	NA
WB-3-4D-2A,B	08/11/89	14 Days	08/18/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-7-4A,B	07/27/89	14 Days	08/08/89	12 Days	NA	NA	NA	NA	NA	NA

Table C-1d

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 3

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
WB-3-2D-4A,B	08/16/89	14 Days	08/23/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-2D-4AR,BR	08/16/89	14 Days	NA	NA	NA	NA	NA	NA	NA	NA
WB-3-2D-5A,B	08/16/89	14 Days	08/23/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-2D-6A,B	08/16/89	14 Days	08/23/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-3D-1A,B	08/10/89	14 Days	08/17/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-4D-1A,B	08/11/89	14 Days	08/18/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-4D-1AR,BR	08/11/89	14 Days	NA	NA	NA	NA	NA	NA	NA	NA
WB-3-4D-2A,B	08/11/89	14 Days	08/18/89	7 Days	NA	NA	NA	NA	NA	NA
WB-3-7-4A,B	07/27/89	14 Days	08/08/89	12 Days	NA	NA	NA	NA	NA	NA

Table C-1e

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 4

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-4-1-3B	07/18/89	14 Days	08/01/89	14 Days	NA	NA	NA	NA	NA	NA
B-4-1-3BR	07/18/89	14 Days	08/01/89	14 Days	NA	NA	NA	NA	NA	NA
B-4-1-4B	07/18/89	14 Days	08/01/89	14 Days	NA	NA	NA	NA	NA	NA
B-4-1-5B	07/18/89	14 Days	07/26/89	8 Days	NA	NA	NA	NA	NA	NA

Table C-1f

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 5

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
WB-5-1D-1A,B	08/10/89	14 Days	08/17/89	7 Days	14 Days	08/14/89	4 Days	40 Days	08/30/89	20 Days
WB-5-1D-1AR,BR	08/10/89	14 Days	08/17/89	7 Days	14 Days	08/14/89	4 Days	40 Days	08/30/89	20 Days
WB-5-5-6A,B	07/25/89	14 Days	07/28/89	3 Days	14 Days	08/07/89	13 Days	40 Days	08/25/89	31 Days

Table C-1g

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 6

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-6-1-1B	07/17/89	14 Days	07/27/89	10 Days	NA	NA	NA	NA	NA	NA
B-6-1-3B	07/17/89	14 Days	07/28/89	11 Days	NA	NA	NA	NA	NA	NA
B-6-1-6B	07/17/89	14 Days	07/28/89	11 Days	NA	NA	NA	NA	NA	NA
B-6-2-1B	07/14/89	14 Days	07/24/89	10 Days	NA	NA	NA	NA	NA	NA
B-6-2-4B	07/14/89	14 Days	07/24/89	10 Days	NA	NA	NA	NA	NA	NA
B-6-2-7B	07/14/89	14 Days	07/24/89	10 Days	NA	NA	NA	NA	NA	NA
B-6-2-7BR	07/14/89	14 Days	NA	NA	NA	NA	NA	NA	NA	NA

Table C-1h

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 7

		-----Volatile Organics-----			---Semivolatile Organics---					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-7-1-1B	07/14/89	14 Days	07/21/89	7 Days	NA	NA	NA	NA	NA	NA
B-7-1-3B	07/14/89	14 Days	07/27/89	13 Days	NA	NA	NA	NA	NA	NA
B-7-1-4B	07/14/89	14 Days	07/27/89	13 Days	NA	NA	NA	NA	NA	NA

Table C-1i

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 8

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
WB-8-1D-1A,B	08/09/89	14 Days	08/17/89	8 Days	14 Days	08/14/89	5 Days	40 Days	08/30/89	21 Days
WB-8-2D-7A,B	08/03/89	14 Days	08/17/89	14 Days	14 Days	08/09/89	6 Days	40 Days	08/30/89	27 Days
WB-8-2D-7AR,BR	08/03/89	14 Days	08/17/89	14 Days	14 Days	08/09/89	6 Days	40 Days	08/30/89	27 Days
WB-8-3D-1A,B	08/07/89	14 Days	08/17/89	10 Days	14 Days	08/14/89	7 Days	40 Days	08/30/89	23 Days
WB-8-5A-1A,B	07/25/89	14 Days	07/28/89	3 Days	14 Days	08/07/89	13 Days	40 Days	08/25/89	31 Days
WB-8-5A-4A,B	07/25/89	14 Days	07/28/89	3 Days	14 Days	08/07/89	13 Days	40 Days	08/25/89	31 Days
WB-8-5A-7A,B	07/25/89	14 Days	07/28/89	3 Days	14 Days	08/07/89	13 Days	40 Days	08/25/89	31 Days
WB-8-6-8A,B	07/21/89	14 Days	07/29/89	8 Days	14 Days	08/03/89	13 Days	40 Days	08/14/89	24 Days

Table C-1j

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 9

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-9-1-1A,B	07/13/89	14 Days	07/21/89	8 Days	14 Days	07/19/89	6 Days	40 Days	07/29/89	16 Days
B-9-1-3A,B	07/13/89	14 Days	07/21/89	8 Days	14 Days	07/19/89	6 Days	40 Days	08/02/89	20 Days
B-9-1-6A,B	07/13/89	14 Days	07/21/89	8 Days	14 Days	07/19/89	6 Days	40 Days	08/02/89	20 Days
WB-9-5-6A,B	07/31/89	14 Days	08/11/89	11 Days	14 Days	08/14/89	14 Days	40 Days	08/29/89	29 Days
WB-9-6-3A,B	07/31/89	14 Days	08/12/89	12 Days	14 Days	08/14/89	14 Days	40 Days	08/26/89	26 Days
WB-9-6-4A,B	07/31/89	14 Days	08/11/89	11 Days	14 Days	08/14/89	14 Days	40 Days	08/29/89	29 Days
WB-9-7-6A,B	07/24/89	14 Days	07/28/89	4 Days	14 Days	08/07/89	14 Days	40 Days	08/25/89	32 Days

Table C-1k

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 10

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
WB-10-1D-1A,B	08/01/89	14 Days	08/11/89	10 Days	14 Days	08/14/89	13 Days	40 Days	08/29/89	28 Days
WB-10-1D-2A,B	08/01/89	14 Days	08/11/89	10 Days	14 Days	08/14/89	13 Days	40 Days	08/29/89	28 Days
WB-10-4-5A,B	07/21/89	14 Days	07/29/89	8 Days	14 Days	08/03/89	13 Days	40 Days	08/14/89	24 Days

Table C-1l

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 11

		-----Volatile Organics-----			---------------------Semivolatile Organics---------------------					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-11-1-1A,B	07/13/89	14 Days	07/20/89	7 Days	14 Days	07/19/89	6 Days	40 Days	07/29/89	16 Days
B-11-1-4A,B	07/13/89	14 Days	07/20/89	7 Days	14 Days	07/19/89	6 Days	40 Days	07/29/89	16 Days
B-11-1-7A,B	07/13/89	14 Days	07/20/89	7 Days	14 Days	07/19/89	6 Days	40 Days	07/29/89	16 Days
B-11-2-1A,B	07/13/89	14 Days	07/20/89	7 Days	14 Days	07/19/89	6 Days	40 Days	07/29/89	16 Days
B-11-2-4A,B	07/13/89	14 Days	07/20/89	7 Days	14 Days	07/19/89	6 Days	40 Days	08/02/89	20 Days
B-11-2-4AR,BR	07/13/89	14 Days	NA	NA	14 Days	07/19/89	6 Days	40 Days	08/04/89	22 Days
B-11-2-8A,B	07/13/89	14 Days	07/20/89	7 Days	14 Days	07/19/89	6 Days	40 Days	07/29/89	16 Days

Table C-1m

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 12

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
B-12-1-5A,B	07/12/89	14 Days	07/22/89	10 Days	14 Days	07/18/89	6 Days	40 Days	08/01/89	20 Days
B-12-1-5AR,BR	07/12/89	14 Days	07/22/89	10 Days	14 Days	07/18/89	6 Days	40 Days	08/01/89	20 Days
B-12-1-7A,B	07/12/89	14 Days	07/22/89	10 Days	14 Days	07/18/89	6 Days	40 Days	08/01/89	20 Days
B-12-1-8A,B	07/12/89	14 Days	07/24/89	12 Days	14 Days	07/18/89	6 Days	40 Days	08/01/89	20 Days
B-12-2-1A,B	07/12/89	14 Days	07/20/89	8 Days	14 Days	07/18/89	6 Days	40 Days	07/31/89	19 Days
B-12-2-4A,B	07/12/89	14 Days	07/20/89	8 Days	14 Days	07/18/89	6 Days	40 Days	07/31/89	19 Days
B-12-2-6A,B	07/12/89	14 Days	07/22/89	10 Days	14 Days	07/18/89	6 Days	40 Days	07/31/89	19 Days

Table C-1n

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
SITE 13

		-----Volatile Organics-----			---------------------Semivolatile Organics---------------------					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
WB-13-1-5A,B	07/19/89	14 Days	07/28/89	9 Days	14 Days	07/24/89	5 Days	40 Days	08/09/89	21 Days
WB-13-2-4A,B	07/19/89	14 Days	07/29/89	10 Days	14 Days	07/24/89	5 Days	40 Days	08/09/89	21 Days
WB-13-2-5A,B	07/19/89	14 Days	07/29/89	10 Days	14 Days	07/26/89	7 Days	40 Days	08/09/89	21 Days
WB-13-3-1A,B	07/20/89	14 Days	07/29/89	9 Days	14 Days	08/03/89	14 Days	40 Days	08/14/89	25 Days
WB-13-3-6A,B	07/20/89	14 Days	07/29/89	9 Days	14 Days	08/03/89	14 Days	40 Days	08/14/89	25 Days
WB-13-3-6AR,BR	07/20/89	14 Days	07/29/89	9 Days	14 Days	NA	NA	40 Days	NA	NA
WB-13-3-7A	07/20/89	14 Days	07/29/89	9 Days	14 Days	08/03/89	14 Days	40 Days	08/14/89	25 Days
WB-13-4-5A,B	07/20/89	14 Days	07/29/89	9 Days	14 Days	08/03/89	14 Days	40 Days	08/14/89	25 Days

Table C-2a

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
BACKGROUND BORINGS

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
BB-1-5A,B	07/11/89	6 Months	08/08/89	28 Days	28 Days	08/04/89	24 Days	28 Days	08/01/89	21 Days
BB-1-7A,B	07/11/89	6 Months	08/08/89	28 Days	28 Days	08/04/89	24 Days	28 Days	08/03/89	23 Days
BB-1-9A,B	07/11/89	6 Months	08/08/89	28 Days	28 Days	08/04/89	24 Days	28 Days	08/03/89	23 Days
BB-2-1A,B	07/11/89	6 Months	08/08/89	28 Days	28 Days	08/04/89	24 Days	28 Days	08/03/89	23 Days
BB-2-5A,B	07/11/89	6 Months	08/08/89	28 Days	28 Days	08/04/89	24 Days	28 Days	08/03/89	23 Days
BB-2-8A,B	07/11/89	6 Months	08/08/89	28 Days	28 Days	08/04/89	24 Days	28 Days	08/03/89	23 Days

Table C-2b

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 1

Field Sample ID	Sampling Date	Metals Hold Time	Metals Analysis Date	Metals Elapsed Time	Mercury Hold Time	Mercury Analysis Date	Mercury Elasped Time	TPH Hold Time	TPH Analysis Date	TPH Elapsed Time
B-1-1-2B	07/19/89	NA	NA	NA	NA	NA	NA	28 Days	08/01/89	13 Days
B-1-1-3B	07/19/89	NA	NA	NA	NA	NA	NA	28 Days	08/01/89	13 Days

Table C-2c

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 2

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
B-2-1-1B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-2-1-3B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-2-1-4B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-2-2-1B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-2-2-4B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-2-2-7B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days

Table C-2d

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 3

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
WB-3-2D-4A,B	08/16/89	6 Months	10/02/89	47 Days	28 Days	09/01/89	16 Days	28 Days	08/28/89	12 Days
WB-3-2D-4AR,BR	08/16/89	6 Months	10/02/89	47 Days	28 Days	09/01/89	16 Days	28 Days	08/28/89	12 Days
WB-3-2D-5A,B	08/16/89	6 Months	10/02/89	47 Days	28 Days	09/01/89	16 Days	28 Days	08/28/89	12 Days
WB-3-2D-6A,B	08/16/89	6 Months	10/02/89	47 Days	28 Days	09/01/89	16 Days	28 Days	08/28/89	12 Days
WB-3-3D-1A,B	08/10/89	6 Months	10/02/89	53 Days	28 Days	08/31/89	21 Days	28 Days	08/25/89	15 Days
WB-3-4D-1A,B	08/11/89	6 Months	09/18/89	38 Days	28 Days	08/31/89	20 Days	28 Days	08/25/89	14 Days
WB-3-4D-1AR,BR	08/11/89	6 Months	09/18/89	38 Days	28 Days	08/31/89	20 Days	28 Days	08/25/89	14 Days
WB-3-4D-2A,B	08/11/89	6 Months	09/18/89	38 Days	28 Days	08/31/89	20 Days	28 Days	08/25/89	14 Days
WB-3-7-4A,B	07/27/89	6 Months	08/17/89	21 Days	28 Days	08/21/89	25 Days	28 Days	08/14/89	18 Days

Table C-2e

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 4

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
B-4-1-3B	07/18/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	21 Days
B-4-1-3BR	07/18/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	21 Days
B-4-1-4B	07/18/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	21 Days
B-4-1-5B	07/18/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	21 Days

Table C-2f

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 5

Field Sample ID	Sampling Date	Metals Hold Time	Metals Analysis Date	Metals Elapsed Time	Mercury Hold Time	Mercury Analysis Date	Mercury Elapsed Time	TPH Hold Time	TPH Analysis Date	TPH Elapsed Time
WB-5-1D-1A,B	08/10/89	6 Months	10/02/89	53 Days	28 Days	08/31/89	21 Days	28 Days	08/25/89	15 Days
WB-5-1D-1AR,BR	08/10/89	6 Months	10/02/89	53 Days	28 Days	08/31/89	21 Days	28 Days	08/25/89	15 Days
WB-5-5-6A,B	07/25/89	6 Months	09/23/89	60 Days	28 Days	08/21/89	27 Days	28 Days	08/22/89	28 Days

Table C-2g

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 6

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
B-6-1-1B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-6-1-3B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-6-1-6B	07/17/89	NA	NA	NA	NA	NA	NA	28 Days	08/03/89	17 Days
B-6-2-1B	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	25 Days
B-6-2-4B	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	25 Days
B-6-2-7B	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	08/10/89	27 Days
B-6-2-7BR	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	NA	NA

Table C-2h

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 7

Field Sample ID	Sampling Date	Metals Hold Time	Metals Analysis Date	Metals Elapsed Time	Mercury Hold Time	Mercury Analysis Date	Mercury Elasped Time	TPH Hold Time	TPH Analysis Date	TPH Elapsed Time
B-7-1-1B	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	25 Days
B-7-1-3B	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	25 Days
B-7-1-4B	07/14/89	NA	NA	NA	NA	NA	NA	28 Days	08/08/89	25 Days

Table C-2i

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 8

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
WB-8-1D-1A,B	08/09/89	6 Months	10/02/89	54 Days	28 Days	08/31/89	22 Days	28 Days	08/25/89	16 Days
WB-8-2D-7A,B	08/03/89	6 Months	09/18/89	46 Days	28 Days	08/31/89	28 Days	28 Days	08/22/89	19 Days
WB-8-2D-7AR,BR	08/03/89	6 Months	09/18/89	46 Days	28 Days	08/31/89	28 Days	28 Days	08/22/89	19 Days
WB-8-3D-1A,B	08/07/89	6 Months	10/02/89	56 Days	28 Days	08/31/89	24 Days	28 Days	08/25/89	18 Days
WB-8-5A-1A,B	07/25/89	6 Months	09/13/89	50 Days	28 Days	08/21/89	27 Days	28 Days	08/22/89	28 Days
WB-8-5A-4A,B	07/25/89	6 Months	09/13/89	50 Days	28 Days	08/21/89	27 Days	28 Days	08/22/89	28 Days
WB-8-5A-7A,B	07/25/89	6 Months	09/13/89	50 Days	28 Days	08/21/89	27 Days	28 Days	08/22/89	28 Days
WB-8-6-8A,B	07/21/89	6 Months	08/17/89	27 Days	28 Days	08/15/89	25 Days	28 Days	08/14/89	24 Days

Table C-2J

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 9

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
B-9-1-1A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-9-1-3A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-9-1-6A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
WB-9-5-6A,B	07/31/89	6 Months	10/02/89	63 Days	NA	NA	NA	28 Days	08/24/89	24 Days
WB-9-6-3A,B	07/31/89	6 Months	10/02/89	63 Days	NA	NA	NA	28 Days	08/24/89	24 Days
WB-9-6-4A,B	07/31/89	6 Months	10/02/89	63 Days	NA	NA	NA	28 Days	08/24/89	24 Days
WB-9-7-6A,B	07/24/89	6 Months	09/13/89	51 Days	NA	NA	NA	28 Days	08/14/89	21 Days

Table C-2k

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 10

Field Sample ID	Sampling Date	Metals Hold Time	Metals Analysis Date	Metals Elapsed Time	Mercury Hold Time	Mercury Analysis Date	Mercury Elasped Time	TPH Hold Time	TPH Analysis Date	TPH Elapsed Time
WB-10-1D-1A,B	08/01/89	6 Months	10/02/89	62 Days	NA	NA	NA	28 Days	08/25/89	24 Days
WB-10-1D-2A,B	08/01/89	6 Months	10/02/89	62 Days	NA	NA	NA	28 Days	08/25/89	24 Days
WB-10-4-5A,B	07/21/89	6 Months	08/17/89	27 Days	NA	NA	NA	28 Days	08/14/89	24 Days

Table C-2l

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 11

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
B-11-1-1A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-11-1-4A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-11-1-7A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-11-2-1A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-11-2-4A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-11-2-4AR,BR	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days
B-11-2-8A,B	07/13/89	6 Months	08/17/89	35 Days	NA	NA	NA	28 Days	08/08/89	26 Days

Table C-2m

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 12

Field Sample ID	Sampling Date	Metals			Mercury			TPH		
		Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
B-12-1-5A,B	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days
B-12-1-5AR,BR	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days
B-12-1-7A,B	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days
B-12-1-8A,B	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days
B-12-2-1A,B	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days
B-12-2-4A,B	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days
B-12-2-6A,B	07/12/89	6 Months	08/08/89	27 Days	28 Days	08/08/89	27 Days	28 Days	08/08/89	27 Days

Table C-2n

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
SITE 13

		Metals			Mercury			TPH		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time	Hold Time	Analysis Date	Elapsed Time
WB-13-1-5A,B	07/19/89	6 Months	08/08/89	20 Days	NA	NA	NA	28 Days	08/01/89	13 Days
WB-13-2-4A,B	07/19/89	6 Months	08/08/89	20 Days	NA	NA	NA	28 Days	08/01/89	13 Days
WB-13-2-5A,B	07/19/89	6 Months	08/08/89	20 Days	NA	NA	NA	28 Days	08/01/89	13 Days
WB-13-3-1A,B	07/20/89	6 Months	08/17/89	28 Days	NA	NA	NA	28 Days	08/14/89	25 Days
WB-13-3-6A,B	07/20/89	6 Months	08/17/89	28 Days	NA	NA	NA	28 Days	08/14/89	25 Days
WB-13-3-6AR,BR	07/20/89	6 Months	08/17/89	28 Days	NA	NA	NA	28 Days	08/14/89	25 Days
WB-13-3-7A	07/20/89	6 Months	08/17/89	28 Days	NA	NA	NA	28 Days	08/14/89	25 Days
WB-13-4-5A,B	07/20/89	6 Months	08/17/89	28 Days	NA	NA	NA	28 Days	08/14/89	25 Days

ANALYTICAL RESULTS FOR ENVIRONMENTAL SAMPLES

TABLES D-1a THROUGH D-3n

Table D-1a

Organic Analysis Results: Volatile Organic Compounds
BACKGROUND BORING

Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Field Sample ID		BB-1-5B	BB-1-7B	BB-1-9B	BB-2-1B	BB-2-5B	BB-2-8B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		16	23	10	15	12	25
Chloromethane	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Bromomethane	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Vinyl Chloride	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Chloroethane	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Methylene Chloride	0.005	0.006	0.0065	0.0056	0.007	0.0091	0.008
Acetone	0.010	0.014	0.017	0.016	< 0.012*	< 0.011	0.056
Carbon Disulfide	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,1-Dichloroethene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,1-Dichloroethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
trans-1,2-Dichloroethene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Chloroform	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,2-Dichloroethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
2-Butanone	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
1,1,1-Trichloroethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Carbon Tetrachloride	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Vinyl Acetate	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Bromodichloromethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,2-Dichloropropane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
trans-1,3-Dichloropropene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Trichloroethene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Dibromochloromethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,1,2-Trichloroethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Benzene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067

* Compound present below measurable detection limit.

Table D-1a (continued)

Organic Analysis Results: Volatile Organic Compounds
BACKGROUND BORING

Field Sample ID		BB-1-5B	BB-1-7B	BB-1-9B	BB-2-1B	BB-2-5B	BB-2-8B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		16	23	10	15	12	25
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
2-Chloroethylvinyl ether	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Bromoform	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
4-Methyl-2-Pentanone	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
2-Hexanone	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Tetrachloroethene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,1,2,2-Tetrachloroethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Toluene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Chlorobenzene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Ethylbenzene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Styrene	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Total Xylenes	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
1,2-Dichlorobenzene	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
1,3-Dichlorobenzene	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
1,4-Dichlorobenzene	0.010	< 0.012	< 0.013	< 0.011	< 0.012	< 0.011	< 0.013
Trichlorofluoromethane	0.005	< 0.006	< 0.0065	< 0.0056	< 0.0059	< 0.0057	< 0.0067
Surrogates:							
1,2-Dichloroethane-d4	70-121	89	86	85	85	89	87
Toluene-d8	81-117	97	100	117	99	103	114
4-Bromofluorobenzene	74-121	95	95	96	87	95	93

* Compound present below measurable detection limit.

Table D-1b

Organic Analysis Results: Volatile Organic Compounds
SITE 1

Field Sample ID		B-1-1-2B	B-1-1-3B
Sample Matrix		Soil	Soil
Percent Moisture (%)		3	12
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.010	< 0.011
Bromomethane	0.010	< 0.010	< 0.011
Vinyl Chloride	0.010	< 0.010	< 0.011
Chloroethane	0.010	< 0.010	< 0.011
Methylene Chloride	0.005	< 0.0052	0.010
Acetone	0.010	0.025	0.150
Carbon Disulfide	0.005	< 0.0052	< 0.0057
1,1-Dichloroethene	0.005	< 0.0052	< 0.0057
1,1-Dichloroethane	0.005	< 0.0052	< 0.0057
trans-1,2-Dichloroethene	0.005	< 0.0052	< 0.0057
Chloroform	0.005	< 0.0052	< 0.0057
1,2-Dichloroethane	0.005	< 0.0052	< 0.0057
2-Butanone	0.010	< 0.010	< 0.011*
1,1,1-Trichloroethane	0.005	< 0.0052	< 0.0057
Carbon Tetrachloride	0.005	< 0.0052	< 0.0057
Vinyl Acetate	0.010	< 0.010	< 0.011
Bromodichloromethane	0.005	< 0.0052	< 0.0057
1,2-Dichloropropane	0.005	< 0.0052	< 0.0057
trans-1,3-Dichloropropene	0.005	< 0.0052	< 0.0057
Trichloroethene	0.005	< 0.0052	< 0.0057
Dibromochloromethane	0.005	< 0.0052	< 0.0057
1,1,2-Trichloroethane	0.005	< 0.0052	< 0.0057
Benzene	0.005	< 0.0052	< 0.0057

* Compound present below measurable detection limit.

Table D-1b (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 1

Field Sample ID	B-1-1-2B	B-1-1-3B
Sample Matrix	Soil	Soil
Percent Moisture (%)	3	12

Compound	MDL (mg/Kg) Wet Wt. Control Limits	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0052	< 0.0057
2-Chloroethylvinyl ether	0.010	< 0.010	< 0.011
Bromoform	0.005	< 0.0052	< 0.0057
4-Methyl-2-Pentanone	0.010	< 0.010	< 0.011
2-Hexanone	0.010	< 0.010	< 0.011
Tetrachloroethene	0.005	< 0.0052	< 0.0057
1,1,2,2-Tetrachloroethane	0.005	< 0.0052	< 0.0057
Toluene	0.005	< 0.0052	< 0.0057*
Chlorobenzene	0.005	< 0.0052	< 0.0057
Ethylbenzene	0.005	< 0.0052	< 0.0057
Styrene	0.005	< 0.0052	< 0.0057
Total Xylenes	0.005	< 0.0052	< 0.0057
1,2-Dichlorobenzene	0.010	< 0.010	< 0.011
1,3-Dichlorobenzene	0.010	< 0.010	< 0.011
1,4-Dichlorobenzene	0.010	< 0.010	< 0.011
Trichlorofluoromethane	0.005	< 0.010*	< 0.011*
Surrogates:			
1,2-Dichloroethane-d4	70-121	103	92
Toluene-d8	81-117	122 OC	99
4-Bromofluorobenzene	74-121	110	90

* Compound present below measurable detection limit.

Table D-1c

Organic Analysis Results: Volatile Organic Compounds
SITE 2

Field Sample ID		B-2-1-1B	B-2-1-3B	B-2-1-4B	B-2-2-1B	B-2-2-4B	B-2-2-7B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	19	18	10	14	21
	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Compound							
Chloromethane	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Bromomethane	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Vinyl Chloride	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Chloroethane	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Methylene Chloride	0.005	< 0.0081*	0.025	0.026	0.022	0.0081	0.014
Acetone	0.010	0.047	0.017	0.018	0.013	0.017	0.018
Carbon Disulfide	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,1-Dichloroethene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,1-Dichloroethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
trans-1,2-Dichloroethene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Chloroform	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,2-Dichloroethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
2-Butanone	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
1,1,1-Trichloroethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Carbon Tetrachloride	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Vinyl Acetate	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Bromodichloromethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,2-Dichloropropane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
trans-1,3-Dichloropropene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Trichloroethene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Dibromochloromethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,1,2-Trichloroethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Benzene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056*	< 0.0058	< 0.0064

* Compound present below measurable detection limit.

Table D-1c (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 2

Field Sample ID		B-2-1-1B	B-2-1-3B	B-2-1-4B	B-2-2-1B	B-2-2-4B	B-2-2-7B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	19	18	10	14	21
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
2-Chloroethylvinyl ether	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Bromoform	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
4-Methyl-2-Pentanone	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
2-Hexanone	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Tetrachloroethene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,1,2,2-Tetrachloroethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Toluene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056*	< 0.0058*	< 0.0064*
Chlorobenzene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Ethylbenzene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Styrene	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Total Xylenes	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
1,2-Dichlorobenzene	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
1,3-Dichlorobenzene	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
1,4-Dichlorobenzene	0.010	< 0.0165	< 0.0125	< 0.0125	< 0.011	< 0.012	< 0.013
Trichlorofluoromethane	0.005	< 0.0081	< 0.0062	< 0.0061	< 0.0056	< 0.0058	< 0.0064
Surrogates:							
1,2-Dichloroethane-d4	70-121	102	100	102	98	97	95
Toluene-d8	81-117	100	109	105	113	99	108
4-Bromofluorobenzene	74-121	91	94	96	102	98	91

* Compound present below measurable detection limit.

Table D-1d

Organic Analysis Results: Volatile Organic Compounds
SITE 3

Field Sample ID		WB-3-2D-4B	WB-3-2D-5B	WB-3-2D-6B	WB-3-3D-1B	WB-3-4D-1B	WB-3-4D-2B	WB-3-7-4B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		17	22	16	14	12	13	17
	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Compound								
Chloromethane	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Bromomethane	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Vinyl Chloride	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Chloroethane	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Methylene Chloride	0.005	< 0.0060	0.015	0.014	0.007	0.012	< 0.0069	< 0.0060*
Acetone	0.010	0.016	0.023	0.021	0.022	0.017	< 0.011*	0.013
Carbon Disulfide	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
1,1-Dichloroethene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
1,1-Dichloroethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
trans-1,2-Dichloroethene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Chloroform	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058*	< 0.0068	< 0.0069	< 0.0060
1,2-Dichloroethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
2-Butanone	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
1,1,1-Trichloroethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Carbon Tetrachloride	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Vinyl Acetate	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Bromodichloromethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
1,2-Dichloropropane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
trans-1,3-Dichloropropene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Trichloroethene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Dibromochloromethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
1,1,2-Trichloroethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Benzene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060

* Compound present below measurable detection limit.

Table D-1d (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 3

Field Sample ID		WB-3-2D-4B	WB-3-2D-5B	WB-3-2D-6B	WB-3-3D-1B	WB-3-4D-1B	WB-3-4D-2B	WB-3-7-4B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		17	22	16	14	12	13	17
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
2-Chloroethylvinyl ether	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Bromoform	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
4-Methyl-2-Pentanone	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
2-Hexanone	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Tetrachloroethene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
1,1,2,2-Tetrachloroethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Toluene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068*	< 0.0069	< 0.0060
Chlorobenzene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Ethylbenzene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Styrene	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Total Xylenes	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
1,2-Dichlorobenzene	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
1,3-Dichlorobenzene	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
1,4-Dichlorobenzene	0.010	< 0.012	< 0.013	< 0.012	< 0.012	< 0.011	< 0.011	< 0.012
Trichlorofluoromethane	0.005	< 0.0060	< 0.0064	< 0.0060	< 0.0058	< 0.0068	< 0.0069	< 0.0060
Surrogates:								
1,2-Dichloroethane-d4	70-121	109	100	95	86	98	100	101
Toluene-d8	81-117	105	104	102	94	102	99	93
4-Bromofluorobenzene	74-121	103	104	95	91	97	98	91

* Compound present below measurable detection limit.

Table D-1e

Organic Analysis Results: Volatile Organic Compounds
SITE 4

Field Sample ID			B-4-1-3B	B-4-1-3BR	B-4-1-4B	B-4-1-5B
Sample Matrix			Soil	Soil	Soil	Soil
Percent Moisture (%)			15	14	12	9
	MDL (mg/Kg) Wet Wt.	Methanol MDL (mg/Kg) Wet Wt.	Results+ (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Bromomethane	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Vinyl Chloride	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Chloroethane	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Methylene Chloride	0.005	1.000	1.400	2.600	1.600	0.011
Acetone	0.010	2.000	4.400	6.900	3.400	0.082
Carbon Disulfide	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
1,1-Dichloroethene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
1,1-Dichloroethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
trans-1,2-Dichloroethene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Chloroform	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
1,2-Dichloroethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
2-Butanone	0.010	2.000	< 2.400	< 2.300	< 2.300	0.019
1,1,1-Trichloroethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Carbon Tetrachloride	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Vinyl Acetate	0.010	2.000	< 1.200	< 1.200	< 1.150	< 0.011
Bromodichloromethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
1,2-Dichloropropane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
trans-1,3-Dichloropropene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Trichloroethene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Dibromochloromethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
1,1,2-Trichloroethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Benzene	0.005	1.000	< 1.200	< 1.200	< 1.150	0.013

* Compound present below measurable detection limit.

Table D-1e (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 4

Field Sample ID			B-4-1-3B	B-4-1-3BR	B-4-1-4B	B-4-1-5B
Sample Matrix			Soil	Soil	Soil	Soil
Percent Moisture (%)			15	14	12	9
	MDL (mg/Kg) Wet Wt.	Methanol MDL (mg/Kg) Wet Wt.	Results+ (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
2-Chloroethylvinyl ether	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Bromoform	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
4-Methyl-2-Pentanone	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
2-Hexanone	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Tetrachloroethene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
1,1,2,2-Tetrachloroethane	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Toluene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055*
Chlorobenzene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Ethylbenzene	0.005	1.000	< 1.200	< 1.200	1.500	0.056
Styrene	0.005	1.000	< 1.200	< 1.200	< 1.150	< 0.0055
Total Xylenes	0.005	1.000	< 1.200*	< 1.200*	3.100	0.087
1,2-Dichlorobenzene	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
1,3-Dichlorobenzene	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
1,4-Dichlorobenzene	0.010	2.000	< 2.400	< 2.300	< 2.300	< 0.011
Trichlorofluoromethane	0.005	1.000	< 2.400*	< 2.300*	< 2.300*	< 0.0055
Surrogates:						
1,2-Dichloroethane-d4	70-121		70	92	97	86
Toluene-d8	81-117		104	94	106	94
4-Bromofluorobenzene	74-121		109	100	108	100

* Compound present below measurable detection limit.

\+ Results represent a methanol extraction/purge and trap analysis.

Table D-1f

Organic Analysis Results: Volatile Organic Compounds
SITE 5

Field Sample ID		WB-5-1D-1B	WB-5-1D-1BR	WB-5-5-6B
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		20	20	23
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
	--------	---------	---------	---------
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.0125	< 0.0125	< 0.0130
Bromomethane	0.010	< 0.0125	< 0.0125	< 0.0130
Vinyl Chloride	0.010	< 0.0125	< 0.0125	< 0.0130
Chloroethane	0.010	< 0.0125	< 0.0125	< 0.0130
Methylene Chloride	0.005	0.0062	0.027	0.0078
Acetone	0.010	0.015	0.063	0.034
Carbon Disulfide	0.005	< 0.00625	< 0.00625	< 0.0065
1,1-Dichloroethene	0.005	< 0.00625	< 0.00625	< 0.0065
1,1-Dichloroethane	0.005	< 0.00625	< 0.00625	< 0.0065
trans-1,2-Dichloroethene	0.005	< 0.00625	< 0.00625	< 0.0065
Chloroform	0.005	< 0.00625	< 0.00625	< 0.0065
1,2-Dichloroethane	0.005	< 0.00625	< 0.00625	< 0.0065
2-Butanone	0.010	< 0.0125	< 0.0125	< 0.0130
1,1,1-Trichloroethane	0.005	< 0.00625	< 0.00625	< 0.0065
Carbon Tetrachloride	0.005	< 0.00625	< 0.00625	< 0.0065
Vinyl Acetate	0.010	< 0.0125	< 0.0125	< 0.0130
Bromodichloromethane	0.005	< 0.00625	< 0.00625	< 0.0065
1,2-Dichloropropane	0.005	< 0.00625	< 0.00625	< 0.0065
trans-1,3-Dichloropropene	0.005	< 0.00625	< 0.00625	< 0.0065
Trichloroethene	0.005	< 0.00625	< 0.00625	< 0.0065
Dibromochloromethane	0.005	< 0.00625	< 0.00625	< 0.0065
1,1,2-Trichloroethane	0.005	< 0.00625	< 0.00625	< 0.0065
Benzene	0.005	< 0.00625	< 0.00625	< 0.0065

* Compound present below measurable detection limit.

Table D-1f (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 5

Field Sample ID		WB-5-1D-1B	WB-5-1D-1BR	WB-5-5-6B
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		20	20	23

Compound	MDL (mg/Kg) Wet Wt. --------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.00625	< 0.00625	< 0.0065
2-Chloroethylvinyl ether	0.010	< 0.0125	< 0.0125	< 0.0130
Bromoform	0.005	< 0.00625	< 0.00625	< 0.0065
4-Methyl-2-Pentanone	0.010	< 0.0125	< 0.0125	< 0.0130
2-Hexanone	0.010	< 0.0125	< 0.0125	< 0.0130
Tetrachloroethene	0.005	< 0.00625	< 0.00625	< 0.0065
1,1,2,2-Tetrachloroethane	0.005	< 0.00625	< 0.00625	< 0.0065
Toluene	0.005	< 0.00625	< 0.00625	< 0.0065
Chlorobenzene	0.005	< 0.00625	< 0.00625	< 0.0065
Ethylbenzene	0.005	< 0.00625	< 0.00625	< 0.0065
Styrene	0.005	< 0.00625	< 0.00625	< 0.0065
Total Xylenes	0.005	< 0.00625	< 0.00625	< 0.0065
1,2-Dichlorobenzene	0.010	< 0.0125	< 0.0125	< 0.0130
1,3-Dichlorobenzene	0.010	< 0.0125	< 0.0125	< 0.0130
1,4-Dichlorobenzene	0.010	< 0.0125	< 0.0125	< 0.0130
Trichlorofluoromethane	0.005	< 0.00625	< 0.00625	< 0.0065
Surrogates:				
1,2-Dichloroethane-d4	70-121	88	100	95
Toluene-d8	81-117	94	122 OC	103
4-Bromofluorobenzene	74-121	89	100	96

Table D-1g

Organic Analysis Results: Volatile Organic Compounds
SITE 6

Field Sample ID		B-6-1-1B	B-6-1-3B	B-6-1-6B	B-6-2-1B	B-6-2-4B	B-6-2-7B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		9	16	14	13	18	24
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Bromomethane	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Vinyl Chloride	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Chloroethane	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Methylene Chloride	0.005	< 0.0055*	0.0095	0.0093	< 0.0060	< 0.0065	< 0.0070
Acetone	0.010	0.015	< 0.012*	0.015	0.014	0.016	0.059
Carbon Disulfide	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,1-Dichloroethene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,1-Dichloroethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
trans-1,2-Dichloroethene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Chloroform	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,2-Dichloroethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
2-Butanone	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
1,1,1-Trichloroethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Carbon Tetrachloride	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Vinyl Acetate	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Bromodichloromethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,2-Dichloropropane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
trans-1,3-Dichloropropene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Trichloroethene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Dibromochloromethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,1,2-Trichloroethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Benzene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070

* Compound present below measurable detection limit.

Table D-1g (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 6

Field Sample ID		B-6-1-1B	B-6-1-3B	B-6-1-6B	B-6-2-1B	B-6-2-4B	B-6-2-7B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		9	16	14	13	18	24
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
2-Chloroethylvinyl ether	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Bromoform	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
4-Methyl-2-Pentanone	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
2-Hexanone	0.010	< 0.011	< 0.012	< 0.012	< 0.0115	< 0.0125	< 0.0135
Tetrachloroethene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,1,2,2-Tetrachloroethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Toluene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Chlorobenzene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Ethylbenzene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Styrene	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Total Xylenes	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
1,2-Dichlorobenzene	0.010	< 0.011	< 0.012	< 0.012	< 0.0120	< 0.0125	< 0.0135
1,3-Dichlorobenzene	0.010	< 0.011	< 0.012	< 0.012	< 0.0120	< 0.0125	< 0.0135
1,4-Dichlorobenzene	0.010	< 0.011	< 0.012	< 0.012	< 0.0120	< 0.0125	< 0.0135
Trichlorofluoromethane	0.005	< 0.0055	< 0.0060	< 0.0059	< 0.0060	< 0.0065	< 0.0070
Surrogates:							
1,2-Dichloroethane-d4	70-121	96	110	100	110	112	113
Toluene-d8	81-117	113	112	108	104	112	115
4-Bromofluorobenzene	74-121	105	102	110	101	107	107

* Compound present below measurable detection limit.

Table D-1h

Organic Analysis Results: Volatile Organic Compounds
SITE 7

Field Sample ID			B-7-1-1B	B-7-1-3B	B-7-1-4B
Sample Matrix			Soil	Soil	Soil
Percent Moisture (%)			12	4	15
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Methanol MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results+ (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results+ (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Chloromethane	0.010	2.000	< 0.0115	< 2.100	< 2.400
Bromomethane	0.010	2.000	< 0.0115	< 2.100	< 2.400
Vinyl Chloride	0.010	2.000	< 0.0115	< 2.100	< 2.400
Chloroethane	0.010	2.000	< 0.0115	< 2.100	< 2.400
Methylene Chloride	0.005	1.000	< 0.0060*	4.100	3.800
Acetone	0.010	2.000	< 0.0115*	7.500	5.400
Carbon Disulfide	0.005	1.000	< 0.0060	< 1.050	< 1.200
1,1-Dichloroethene	0.005	1.000	< 0.0060	< 1.050	< 1.200
1,1-Dichloroethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
trans-1,2-Dichloroethene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Chloroform	0.005	1.000	< 0.0060	< 1.050	< 1.200
1,2-Dichloroethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
2-Butanone	0.010	2.000	< 0.0115	< 2.100	< 2.400
1,1,1-Trichloroethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
Carbon Tetrachloride	0.005	1.000	< 0.0060	< 1.050	< 1.200
Vinyl Acetate	0.010	2.000	< 0.0115	< 1.050	< 1.200
Bromodichloromethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
1,2-Dichloropropane	0.005	1.000	< 0.0060	< 1.050	< 1.200
trans-1,3-Dichloropropene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Trichloroethene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Dibromochloromethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
1,1,2-Trichloroethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
Benzene	0.005	1.000	< 0.0060	< 1.050	< 1.200

* Compound present below measurable detection limit.

Table D-1h (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 7

Field Sample ID			B-7-1-1B	B-7-1-3B	B-7-1-4B
Sample Matrix			Soil	Soil	Soil
Percent Moisture (%)			12	4	15
	MDL (mg/Kg) Wet Wt.	Methanol MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.
Compound	Control Limits	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	1.000	< 0.0060	< 1.050	< 1.200
2-Chloroethylvinyl ether	0.010	2.000	< 0.0115	< 2.100	< 2.400
Bromoform	0.005	1.000	< 0.0060	< 1.050	< 1.200
4-Methyl-2-Pentanone	0.010	2.000	< 0.0115	< 2.100	< 2.400
2-Hexanone	0.010	2.000	< 0.0115	< 2.100	< 2.400
Tetrachloroethene	0.005	1.000	< 0.0060	< 1.050	< 1.200
1,1,2,2-Tetrachloroethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
Toluene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Chlorobenzene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Ethylbenzene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Styrene	0.005	1.000	< 0.0060	< 1.050	< 1.200
Total Xylenes	0.005	1.000	< 0.0060	1.800	< 1.200*
1,2-Dichlorobenzene	0.010	2.000	< 0.0115	< 2.100	< 2.400
1,3-Dichlorobenzene	0.010	2.000	< 0.0115	< 2.100	< 2.400
1,4-Dichlorobenzene	0.010	2.000	< 0.0115	< 2.100	< 2.400
Trichlorofluoromethane	0.005	1.000	< 0.0060	< 1.050	< 1.200
Surrogates:					
1,2-Dichloroethane-d4	70-121		89	91	109
Toluene-d8	81-117		92	111	108
4-Bromofluorobenzene	74-121		96	105	125 OC

* Compound present below measurable detection limit.

+ Results represent a methanol extraction/purge and trap analysis.

Table D-1i

Organic Analysis Results: Volatile Organic Compounds
SITE 8

Field Sample ID		WB-8-1D-1B	WB-8-2D-7B	WB-8-2D-7BR	WB-8-3D-1B	WB-8-5A-1B	WB-8-5A-4B	WB-8-5A-7B	WB-8-6-8B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		14	26	26	12	11	12	16	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Bromomethane	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Vinyl Chloride	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Chloroethane	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Methylene Chloride	0.005	0.007	< 0.0068*	0.0094	0.0057	< 0.0056	0.0068	< 0.006*	< 0.0068
Acetone	0.010	0.020	0.028	0.061	0.033	< 0.011	0.074	0.045	0.030
Carbon Disulfide	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,1-Dichloroethene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,1-Dichloroethane	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
trans-1,2-Dichloroethene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Chloroform	0.005	< 0.0058	< 0.0068*	< 0.0068*	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,2-Dichloroethane	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
2-Butanone	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
1,1,1-Trichloroethane	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Carbon Tetrachloride	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Vinyl Acetate	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Bromodichloromethane	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,2-Dichloropropane	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
trans-1,3-Dichloropropene	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Trichloroethene	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Dibromochloromethane	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,1,2-Trichloroethane	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Benzene	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068

* Compound present below measurable detection limit.

Table D-1i (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 8

Field Sample ID		WB-8-1D-1B	WB-8-2D-7B	WB-8-2D-7BR	WB-8-3D-1B	WB-8-5A-1B	WB-8-5A-4B	WB-8-5A-7B	WB-8-6-8B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		14	26	26	12	11	12	16	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0058	< 0.0068	< 0.0135	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
2-Chloroethylvinyl ether	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Bromoform	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
4-Methyl-2-Pentanone	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
2-Hexanone	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Tetrachloroethene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,1,2,2-Tetrachloroethane	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Toluene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Chlorobenzene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Ethylbenzene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Styrene	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Total Xylenes	0.005	< 0.0058	< 0.0068	< 0.0068	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
1,2-Dichlorobenzene	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
1,3-Dichlorobenzene	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
1,4-Dichlorobenzene	0.010	< 0.012	< 0.0135	< 0.0135	< 0.0115	< 0.011	< 0.011	< 0.012	< 0.0135
Trichlorofluoromethane	0.005	< 0.0058	NR	NR	< 0.0057	< 0.0056	< 0.0057	< 0.006	< 0.0068
Surrogates:									
1,2-Dichloroethane-d4	70-121	90	90	95	86	99	76	96	84
Toluene-d8	81-117	102	103	102	81	103	82	106	100
4-Bromofluorobenzene	74-121	90	95	92	87	100	84	103	87

Table D-1j

Organic Analysis Results: Volatile Organic Compounds
SITE 9

Field Sample ID			B-9-1-1B	B-9-1-3B	B-9-1-6B	WB-9-5-6B	WB-9-6-3B	WB-9-6-4B	WB-9-7-6B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			15	13	24	8	20	15	21
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Methanol MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results+ (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Chloromethane	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Bromomethane	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Vinyl Chloride	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Chloroethane	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Methylene Chloride	0.005	1.000	0.021	0.021	0.013	0.0054	< 1.250*	0.016	< 0.0064
Acetone	0.010	2.000	0.032	0.023	0.047	0.032	< 2.500	0.069	0.038
Carbon Disulfide	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
1,1-Dichloroethene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
1,1-Dichloroethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
trans-1,2-Dichloroethene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Chloroform	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060*	< 0.0064
1,2-Dichloroethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
2-Butanone	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	0.021	< 0.0130
1,1,1-Trichloroethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Carbon Tetrachloride	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Vinyl Acetate	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 1.250	< 0.0120	< 0.0130
Bromodichloromethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
1,2-Dichloropropane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
trans-1,3-Dichloropropene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Trichloroethene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Dibromochloromethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
1,1,2-Trichloroethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Benzene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	0.013	< 0.0064

* Compound present below measurable detection limit.

Table D-1j (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 9

Field Sample ID			B-9-1-1B	B-9-1-3B	B-9-1-6B	WB-9-5-6B	WB-9-6-3B	WB-9-6-4B	WB-9-7-6B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			15	13	24	8	20	15	21
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Methanol MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results+ (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
2-Chloroethylvinyl ether	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Bromoform	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
4-Methyl-2-Pentanone	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
2-Hexanone	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Tetrachloroethene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
1,1,2,2-Tetrachloroethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Toluene	0.005	1.000	< 0.0060*	< 0.0060*	< 0.0070	< 0.0055*	< 1.250*	0.0082	< 0.0064
Chlorobenzene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Ethylbenzene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250*	0.0082	< 0.0064
Styrene	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Total Xylenes	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250*	0.0100	< 0.0064
1,2-Dichlorobenzene	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
1,3-Dichlorobenzene	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0,0130
1,4-Dichlorobenzene	0.010	2.000	< 0.0120	< 0.0115	< 0.0135	< 0.0110	< 2.500	< 0.0120	< 0.0130
Trichlorofluoromethane	0.005	1.000	< 0.0060	< 0.0060	< 0.0070	< 0.0055	< 1.250	< 0.0060	< 0.0064
Surrogates:									
1,2-Dichloroethane-d4	70-121		88	94	82	118	96	101	90
Toluene-d8	81-117		88	98	89	109	102	98	98
4-Bromofluorobenzene	74-121		90	102	93	127 OC	100	96	91

* Compound present below measurable detection limit.

+ Results represent a methanol extraction/purge and trap analysis.

Table D-1k

Organic Analysis Results: Volatile Organic Compounds
SITE 10

Field Sample ID		WB-10-1D-1B	WB-10-1D-2B	WB-10-4-5B
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		11	13	11
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.0115	< 0.0115	< 0.0115
Bromomethane	0.010	< 0.0115	< 0.0115	< 0.0115
Vinyl Chloride	0.010	< 0.0115	< 0.0115	< 0.0115
Chloroethane	0.010	< 0.0115	< 0.0115	< 0.0115
Methylene Chloride	0.005	< 0.0057	< 0.00575	< 0.0057*
Acetone	0.010	0.019	0.028	0.019
Carbon Disulfide	0.005	< 0.0057	< 0.00575	< 0.0057
1,1-Dichloroethene	0.005	< 0.0057	< 0.00575	< 0.0057
1,1-Dichloroethane	0.005	< 0.0057	< 0.00575	< 0.0057
trans-1,2-Dichloroethene	0.005	< 0.0057	< 0.00575	< 0.0057
Chloroform	0.005	< 0.0057	< 0.00575	< 0.0057
1,2-Dichloroethane	0.005	< 0.0057	< 0.00575	< 0.0057
2-Butanone	0.010	< 0.0115	< 0.0115	< 0.0115
1,1,1-Trichloroethane	0.005	< 0.0057	< 0.00575	< 0.0057
Carbon Tetrachloride	0.005	< 0.0057	< 0.00575	< 0.0057
Vinyl Acetate	0.010	< 0.0115	< 0.0115	< 0.0115
Bromodichloromethane	0.005	< 0.0057	< 0.00575	< 0.0057
1,2-Dichloropropane	0.005	< 0.0057	< 0.00575	< 0.0057
trans-1,3-Dichloropropene	0.005	< 0.0057	< 0.00575	< 0.0057
Trichloroethene	0.005	0.010	0.068	0.190
Dibromochloromethane	0.005	< 0.0057	< 0.00575	< 0.0057
1,1,2-Trichloroethane	0.005	< 0.0057	< 0.00575	< 0.0057
Benzene	0.005	< 0.0057	< 0.00575	< 0.0057

* Compound present below measurable detection limit.

Table D-1k (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 10

Field Sample ID		WB-10-1D-1B	WB-10-1D-2B	WB-10-4-5B
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		11	13	11
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0057	< 0.00575	< 0.0057
2-Chloroethylvinyl ether	0.010	< 0.0115	< 0.0115	< 0.0115
Bromoform	0.005	< 0.0057	< 0.00575	< 0.0057
4-Methyl-2-Pentanone	0.010	< 0.0115	< 0.0115	< 0.0115
2-Hexanone	0.010	< 0.0115	< 0.0115	< 0.0115
Tetrachloroethene	0.005	< 0.0057	< 0.00575	< 0.0057
1,1,2,2-Tetrachloroethane	0.005	< 0.0057	< 0.00575	< 0.0057
Toluene	0.005	< 0.0057*	< 0.00575*	< 0.0057
Chlorobenzene	0.005	< 0.0057	< 0.00575	< 0.0057
Ethylbenzene	0.005	< 0.0057	< 0.00575	< 0.0057
Styrene	0.005	< 0.0057	< 0.00575	< 0.0057
Total Xylenes	0.005	< 0.0057	< 0.00575	< 0.0057
1,2-Dichlorobenzene	0.010	< 0.0115	< 0.0115	< 0.0115
1,3-Dichlorobenzene	0.010	< 0.0115	< 0.0115	< 0.0115
1,4-Dichlorobenzene	0.010	< 0.0115	< 0.0115	< 0.0115
Trichlorofluoromethane	0.005	< 0.0057	< 0.00575	< 0.0057
Surrogates:				
1,2-Dichloroethane-d4	70-121	114	109	85
Toluene-d8	81-117	97	102	94
4-Bromofluorobenzene	74-121	114	116	89

* Compound present below measurable detection limit.

Table D-1l

Organic Analysis Results: Volatile Organic Compounds
SITE 11

Field Sample ID		B-11-1-1B	B-11-1-4B	B-11-1-7B	B-11-2-1B	B-11-2-4B	B-11-2-8B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	20	12	14	20	10
Compound	MDL (mg/Kg) Wet Wt. Control Limits	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery
Chloromethane	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Bromomethane	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Vinyl Chloride	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Chloroethane	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Methylene Chloride	0.005	< 0.0081	0.011	0.014	0.012	0.0088	0.0089
Acetone	0.010	0.140	0.018	0.042	0.015	0.031	0.021
Carbon Disulfide	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,1-Dichloroethene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,1-Dichloroethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
trans-1,2-Dichloroethene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Chloroform	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,2-Dichloroethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
2-Butanone	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
1,1,1-Trichloroethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Carbon Tetrachloride	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Vinyl Acetate	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Bromodichloromethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,2-Dichloropropane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
trans-1,3-Dichloropropene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Trichloroethene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Dibromochloromethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,1,2-Trichloroethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Benzene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056

* Compound present below measurable detection limit.

Table D-1l (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 11

Field Sample ID		B-11-1-1B	B-11-1-4B	B-11-1-7B	B-11-2-1B	B-11-2-4B	B-11-2-8B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	20	12	14	20	10
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
2-Chloroethylvinyl ether	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Bromoform	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
4-Methyl-2-Pentanone	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
2-Hexanone	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Tetrachloroethene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,1,2,2-Tetrachloroethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Toluene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Chlorobenzene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Ethylbenzene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Styrene	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Total Xylenes	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
1,2-Dichlorobenzene	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
1,3-Dichlorobenzene	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
1,4-Dichlorobenzene	0.010	< 0.0165	< 0.0125	< 0.0115	< 0.0120	< 0.0125	< 0.0115
Trichlorofluoromethane	0.005	< 0.0081	< 0.0063	< 0.0057	< 0.0058	< 0.0063	< 0.0056
Surrogates:							
1,2-Dichloroethane-d4	70-121	97	99	90	83	99	100
Toluene-d8	81-117	106	104	96	88	101	104
4-Bromofluorobenzene	74-121	96	96	91	81	95	98

* Compound present below measurable detection limit.

Table D-1m

Organic Analysis Results: Volatile Organic Compounds
SITE 12

Field Sample ID		B-12-1-5B	B-12-1-5BR	B-12-1-7B	B-12-1-8B	B-12-2-1B	B-12-2-4B	B-12-2-6B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		23	17	23	21	5	19	19
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Chloromethane	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Bromomethane	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Vinyl Chloride	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Chloroethane	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Methylene Chloride	0.005	0.014	0.011	0.019	0.0065	0.011	0.0086	0.011
Acetone	0.010	0.084	0.060	0.140	< 0.014	0.030	0.052	0.085
Carbon Disulfide	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
1,1-Dichloroethene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
1,1-Dichloroethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
trans-1,2-Dichloroethene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	0.048	< 0.0062
Chloroform	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
1,2-Dichloroethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0052
2-Butanone	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
1,1,1-Trichloroethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Carbon Tetrachloride	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Vinyl Acetate	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Bromodichloromethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
1,2-Dichloropropane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
trans-1,3-Dichloropropene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Trichloroethene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	0.550 E	0.046
Dibromochloromethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
1,1,2-Trichloroethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Benzene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	0.012	< 0.0062

* Compound present below measurable detection limit.

E = Estimated value, compound quantitated outside calibration range but within linear range.

Table D-1m (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 12

Field Sample ID		B-12-1-5B	B-12-1-5BR	B-12-1-7B	B-12-1-8B	B-12-2-1B	B-12-2-4B	B-12-2-6B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		23	17	23	21	5	19	19
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
2-Chloroethylvinyl ether	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Bromoform	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
4-Methyl-2-Pentanone	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
2-Hexanone	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Tetrachloroethene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053*	< 0.0062	0.033
1,1,2,2-Tetrachloroethane	0.005	< 0.0065*	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Toluene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Chlorobenzene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Ethylbenzene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Styrene	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Total Xylenes	0.005	< 0.0065*	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
1,2-Dichlorobenzene	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
1,3-Dichlorobenzene	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
1,4-Dichlorobenzene	0.010	< 0.013	< 0.012	< 0.013	< 0.013	< 0.011	< 0.012	< 0.012
Trichlorofluoromethane	0.005	< 0.0065	< 0.006	< 0.0065	< 0.0063	< 0.0053	< 0.0062	< 0.0062
Surrogates:								
1,2-Dichloroethane-d4	70-121	101	108	107	88	93	93	93
Toluene-d8	81-117	110	110	98	115	103	117	111
4-Bromofluorobenzene	74-121	86	97	105	90	97	87	93

* Compound present below measurable detection limit.

Table D-1n

Organic Analysis Results: Volatile Organic Compounds
SITE 13

Field Sample ID		WB-13-1-5B	WB-13-2-4B	WB-13-2-5B	WB-13-3-1B	WB-13-3-6B	WB-13-3-6BR	WB-13-3-7A	WB-13-4-5B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		24	18	13	12	21	22	15	20
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Bromomethane	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Vinyl Chloride	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013*	< 0.013*	< 0.012*	< 0.0125
Chloroethane	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Methylene Chloride	0.005	0.018	0.011	0.020	< 0.0057	< 0.0065	0.0069	< 0.0059*	0.0175
Acetone	0.010	0.042	0.060	0.047	0.026	0.039	0.050	0.029	0.038
Carbon Disulfide	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
1,1-Dichloroethene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
1,1-Dichloroethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
trans-1,2-Dichloroethene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Chloroform	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
1,2-Dichloroethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
2-Butanone	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
1,1,1-Trichloroethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Carbon Tetrachloride	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Vinyl Acetate	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Bromodichloromethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
1,2-Dichloropropane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
trans-1,3-Dichloropropene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Trichloroethene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065*	< 0.0064*	< 0.0059	< 0.00625
Dibromochloromethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
1,1,2-Trichloroethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Benzene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625

* Compound present below measurable detection limit.

Table D-1n (continued)

Organic Analysis Results: Volatile Organic Compounds
SITE 13

Field Sample ID		WB-13-1-5B	WB-13-2-4B	WB-13-2-5B	WB-13-3-1B	WB-13-3-6B	WB-13-3-6BR	WB-13-3-7A	WB-13-4-5B
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		24	18	13	12	21	22	15	20
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
2-Chloroethylvinyl ether	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Bromoform	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
4-Methyl-2-Pentanone	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
2-Hexanone	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Tetrachloroethene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065*	< 0.0064*	< 0.0059	< 0.00625
1,1,2,2-Tetrachloroethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Toluene	0.005	< 0.0066	< 0.0061*	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059*	< 0.00625
Chlorobenzene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Ethylbenzene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Styrene	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Total Xylenes	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059*	< 0.00625
1,2-Dichlorobenzene	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
1,3-Dichlorobenzene	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
1,4-Dichlorobenzene	0.010	< 0.013	< 0.012	< 0.011	< 0.0115	< 0.013	< 0.013	< 0.012	< 0.0125
Trichlorofluoromethane	0.005	< 0.0066	< 0.0061	< 0.0057	< 0.0057	< 0.0065	< 0.0064	< 0.0059	< 0.00625
Surrogates:									
1,2-Dichloroethane-d4	70-121	108	94	106	91	86	83	88	101
Toluene-d8	81-117	127 OC	106	116	101	100	102	99	112
4-Bromofluorobenzene	74-121	108	97	112	97	88	88	94	105

* Compound present below measurable detection limit.

Table D-2a

Organic Analysis Results: Semivolatile Organics
BACKGROUND BORING

Field Sample ID		BB-1-5A	BB-1-7A	BB-1-9A	BB-2-1A	BB-2-5A	BB-2-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		16	23	10	15	12	25
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
1,3-Dichlorobenzene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
1,4-Dichlorobenzene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
1,2-Dichlorobenzene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
bis(2-chloroisopropyl)ether	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
N-Nitroso-di-propylamine	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Hexachloroethane	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Nitrobenzene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Isophorone	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
bis(2-chloroethoxy)methane	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
1,2,4-Trichlorobenzene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Naphthalene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Hexachlorobutadiene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Hexachlorocyclopentadiene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2-Chloronaphthalene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Dimethyl phthalate	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Acenaphthylene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Fluorene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Acenaphthene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,4-Dinitrotoluene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,6-Dinitrotoluene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Diethyl phthalate	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
4-Chlorophenyl phenylether	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
N-Nitrosodiphenylamine	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44

Table D-2a (continued)

Organic Analysis Results: Semivolatile Organics
BACKGROUND BORING

Field Sample ID		BB-1-5A	BB-1-7A	BB-1-9A	BB-2-1A	BB-2-5A	BB-2-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		16	23	10	15	12	25
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Hexachlorobenzene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Phenanthrene	0.33	< 0.39	< 0.43	< 0.37	< 0.39*	< 0.38	< 0.44
Anthracene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Di-n-Butyl phthalate	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Fluoranthene	0.33	< 0.39	< 0.43	< 0.37	< 0.39*	< 0.38	< 0.44
Benzidine	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
Pyrene	0.33	< 0.39	< 0.43	< 0.37	< 0.39*	< 0.38	< 0.44
Butyl benzyl phthalate	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.88
3,3′-Dichlorobenzidine	0.66	< 0.79	< 0.86	< 0.73	< 0.78	< 0.75	< 0.44
Benzo(a)anthracene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Bis(2-ethylhexyl)phthalate	0.33	< 0.39*	< 0.43*	< 0.37*	< 0.39*	0.39	< 0.44*
Chrysene	0.33	< 0.39	< 0.43	< 0.37	< 0.39*	< 0.38	< 0.44
Di-n-octyl phthalate	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Benzo(b)fluoranthene	0.33	< 0.39	< 0.43	< 0.37	< 0.39*	< 0.38	< 0.44
Benzo(k)fluoranthene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Benzo(a)pyrene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Indeno(1,2,3-cd)pyrene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Dibenzo(a,h)anthracene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Benzo(g,h,i)perylene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Phenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39*	< 0.38	< 0.44
2-Chlorophenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2-Nitrophenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,4-Dimethyphenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,4-Dichlorophenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44

* Compound present below measurable detection limit.

Table D-2a (continued)

Organic Analysis Results: Semivolatile Organics
BACKGROUND BORING

Field Sample ID		BB-1-5A	BB-1-7A	BB-1-9A	BB-2-1A	BB-2-5A	BB-2-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		16	23	10	15	12	25
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,4,6-trichlorophenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,4-dinitrophenol	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
4-nitrophenol	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
4,6-dinitro-2-methylphenol	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
Pentachlorophenol	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
Benzyl alcohol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2-methylphenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
4-methylphenol	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
Benzoic acid	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
4-chloroaniline	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2-methylnaphthalene	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
2,4,5-trichlorophenol	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
2-nitroaniline	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
3-nitroaniline	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
Dibenzofuran	0.33	< 0.39	< 0.43	< 0.37	< 0.39	< 0.38	< 0.44
4-nitroaniline	1.60	< 1.90	< 2.10	< 1.80	< 1.90	< 1.80	< 2.10
Surrogates:							
Nitrobenzene-d5	23-120	72	64	76	82	68	61
2-fluorobiphenyl	30-115	87	74	99	102	85	82
Terphenyl-d14	18-137	76	67	82	77	77	71
2-fluorophenol	24-113	73	62	79	81	68	66
Phenol-d5	24-113	98	82	98	100	87	90
2,4,6-tribromophenol	19-122	69	55	74	73	62	61

Table D-2b

Organic Analysis Results: Semivolatile Organics
SITE 5

Field Sample ID		WB-5-1D-1A	WB-5-1D-1AR	WB-5-5-6A
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		20	20	23
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.415	< 0.415	< 0.430
1,3-Dichlorobenzene	0.33	< 0.415	< 0.415	< 0.430
1,4-Dichlorobenzene	0.33	< 0.415	< 0.415	< 0.430
1,2-Dichlorobenzene	0.33	< 0.415	< 0.415	< 0.430
bis(2-chloroisopropyl)ether	0.33	< 0.415	< 0.415	< 0.430
N-Nitroso-di-propylamine	0.33	< 0.415	< 0.415	< 0.430
Hexachloroethane	0.33	< 0.415	< 0.415	< 0.430
Nitrobenzene	0.33	< 0.415	< 0.415	< 0.430
Isophorone	0.33	< 0.415	< 0.415	< 0.430
bis(2-chloroethoxy)methane	0.33	< 0.415	< 0.415	< 0.430
1,2,4-Trichlorobenzene	0.33	< 0.415	< 0.415	< 0.430
Naphthalene	0.33	< 0.415	< 0.415	< 0.430
Hexachlorobutadiene	0.33	< 0.415	< 0.415	< 0.430
Hexachlorocyclopentadiene	0.33	< 0.415	< 0.415	< 0.430
2-Chloronaphthalene	0.33	< 0.415	< 0.415	< 0.430
Dimethyl phthalate	0.33	< 0.415	< 0.415	< 0.430
Acenaphthylene	0.33	< 0.415	< 0.415	< 0.430
Fluorene	0.33	< 0.415	< 0.415	< 0.430
Acenaphthene	0.33	< 0.415	< 0.415	< 0.430
2,4-Dinitrotoluene	0.33	< 0.415	< 0.415	< 0.430
2,6-Dinitrotoluene	0.33	< 0.415	< 0.415	< 0.430
Diethyl phthalate	0.33	< 0.415	< 0.415	< 0.430
4-Chlorophenyl phenylether	0.33	< 0.415	< 0.415	< 0.430
N-Nitrosodiphenylamine	0.33	< 0.415	< 0.415	< 0.430

* Compound present below measurable detection limit.

Table D-2b (continued)

Organic Analysis Results: Semivolatile Organics
SITE 5

Field Sample ID		WB-5-1D-1A	WB-5-1D-1AR	WB-5-5-6A
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		20	20	23
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.415	< 0.415	< 0.430
Hexachlorobenzene	0.33	< 0.415	< 0.415	< 0.430
Phenanthrene	0.33	< 0.415	< 0.415	< 0.430
Anthracene	0.33	< 0.415	< 0.415	< 0.430
Di-n-Butyl phthalate	0.33	< 0.415	< 0.415	< 0.430
Fluoranthene	0.33	< 0.415	< 0.415	< 0.430
Benzidine	1.60	< 2.000	< 2.000	< 2.100
Pyrene	0.33	< 0.415	< 0.415	< 0.430
Butyl benzyl phthalate	0.33	< 0.415	< 0.415	< 0.430
3,3'-Dichlorobenzidine	0.66	< 0.825	< 0.825	< 0.860
Benzo(a)anthracene	0.33	< 0.415	< 0.415	< 0.430
Bis(2-ethylhexyl)phthalate	0.33	< 0.415*	< 0.415*	< 0.430
Chrysene	0.33	< 0.415	< 0.415	< 0.430
Di-n-octyl phthalate	0.33	< 0.415	< 0.415	< 0.430
Benzo(b)fluoranthene	0.33	< 0.415	< 0.415	< 0.430
Benzo(k)fluoranthene	0.33	< 0.415	< 0.415	< 0.430
Benzo(a)pyrene	0.33	< 0.415	< 0.415	< 0.430
Indeno(1,2,3-cd)pyrene	0.33	< 0.415	< 0.415	< 0.430
Dibenzo(a,h)anthracene	0.33	< 0.415	< 0.415	< 0.430
Benzo(g,h,i)perylene	0.33	< 0.415	< 0.415	< 0.430
Phenol	0.33	< 0.415	< 0.415	< 0.430
2-Chlorophenol	0.33	< 0.415	< 0.415	< 0.430
2-Nitrophenol	0.33	< 0.415	< 0.415	< 0.430
2,4-Dimethyphenol	0.33	< 0.415	< 0.415	< 0.430
2,4-Dichlorophenol	0.33	< 0.415	< 0.415	< 0.430

* Compound present below measurable detection limit.

Table D-2b (continued)

Organic Analysis Results: Semivolatile Organics
SITE 5

Field Sample ID		WB-5-1D-1A	WB-5-1D-1AR	WB-5-5-6A
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		20	20	23
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.415	< 0.415	< 0.430
2,4,6-trichlorophenol	0.33	< 0.415	< 0.415	< 0.430
2,4-dinitrophenol	1.60	< 2.000	< 2.000	< 2.100
4-nitrophenol	1.60	< 2.000	< 2.000	< 2.100
4,6-dinitro-2-methylphenol	1.60	< 2.000	< 2.000	< 2.100
Pentachlorophenol	1.60	< 2.000	< 2.000	< 2.100
Benzyl alcohol	0.33	< 0.415	< 0.415	< 0.430
2-methylphenol	0.33	< 0.415	< 0.415	< 0.430
4-methylphenol	0.33	< 0.415	< 0.415	< 0.430
Benzoic acid	1.60	< 2.000	< 2.000	< 2.100
4-chloroaniline	0.33	< 0.415	< 0.415	< 0.430
2-methylnaphthalene	0.33	< 0.415	< 0.415	< 0.430
2,4,5-trichlorophenol	1.60	< 2.000	< 2.000	< 2.100
2-nitroaniline	1.60	< 2.000	< 2.000	< 2.100
3-nitroaniline	1.60	< 2.000	< 2.000	< 2.100
Dibenzofuran	0.33	< 0.415	< 0.415	< 0.430
4-nitroaniline	1.60	< 2.000	< 2.000	< 2.100
Surrogates:				
Nitrobenzene-d5	23-120	60	62	88
2-fluorobiphenyl	30-115	76	72	110
Terphenyl-d14	18-137	78	86	120
2-fluorophenol	24-113	60	57	86
Phenol-d5	24-113	70	74	94
2,4,6-tribromophenol	19-122	68	70	75

* Compound present below measurable detection limit.

Table D-2c

Organic Analysis Results: Semivolatile Organics
SITE 8

Field Sample ID		WB-8-1D-1A	WB-8-2D-7A	WB-8-2D-7AR	WB-8-3D-1A	WB-8-5A-1A	WB-8-5A-4A	WB-8-5A-7A	WB-8-6-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		14	26	26	12	11	12	16	26
	MDL (mg/Kg) Wet Wt. --------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------	Results (mg/Kg) Dry Wt. ---------
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
1,3-Dichlorobenzene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
1,4-Dichlorobenzene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
1,2-Dichlorobenzene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
bis(2-chloroisopropyl)ether	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
N-Nitroso-di-propylamine	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Hexachloroethane	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Nitrobenzene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Isophorone	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
bis(2-chloroethoxy)methane	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
1,2,4-Trichlorobenzene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Naphthalene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Hexachlorobutadiene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Hexachlorocyclopentadiene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2-Chloronaphthalene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Dimethyl phthalate	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Acenaphthylene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Fluorene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Acenaphthene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,4-Dinitrotoluene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,6-Dinitrotoluene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Diethyl phthalate	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
4-Chlorophenyl phenylether	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
N-Nitrosodiphenylamine	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450

* Compound present below measurable detection limit.

Table D-2c (continued)

Organic Analysis Results: Semivolatile Organics
SITE 8

Field Sample ID		WB-8-1D-1A	WB-8-2D-7A	WB-8-2D-7AR	WB-8-3D-1A	WB-8-5A-1A	WB-8-5A-4A	WB-8-5A-7A	WB-8-6-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		14	26	26	12	11	12	16	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Hexachlorobenzene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Phenanthrene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Anthracene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Di-n-Butyl phthalate	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Fluoranthene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Benzidine	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
Pyrene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Butyl benzyl phthalate	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
3,3'-Dichlorobenzidine	0.66	< 0.770	< 0.890	< 0.890	< 0.750	< 0.740	< 0.750	< 0.780	< 0.900
Benzo(a)anthracene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Bis(2-ethylhexyl)phthalate	0.33	< 0.390	< 0.450*	< 0.450*	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450*
Chrysene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Di-n-octyl phthalate	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Benzo(b)fluoranthene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Benzo(k)fluoranthene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Benzo(a)pyrene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Indeno(1,2,3-cd)pyrene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Dibenzo(a,h)anthracene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Benzo(g,h,i)perylene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Phenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2-Chlorophenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2-Nitrophenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,4-Dimethyphenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,4-Dichlorophenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450

* Com[illegible]present below measurable detection limit.

Table D-2c (continued)

Organic Analysis Results: Semivolatile Organics
SITE 8

Field Sample ID		WB-8-1D-1A	WB-8-2D-7A	WB-8-2D-7AR	WB-8-3D-1A	WB-8-5A-1A	WB-8-5A-4A	WB-8-5A-7A	WB-8-6-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		14	26	26	12	11	12	16	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,4,6-trichlorophenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,4-dinitrophenol	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
4-nitrophenol	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
4,6-dinitro-2-methylphenol	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
Pentachlorophenol	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
Benzyl alcohol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2-methylphenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
4-methylphenol	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
Benzoic acid	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
4-chloroaniline	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2-methylnaphthalene	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
2,4,5-trichlorophenol	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
2-nitroaniline	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
3-nitroaniline	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
Dibenzofuran	0.33	< 0.390	< 0.450	< 0.450	< 0.375	< 0.370	< 0.375	< 0.390	< 0.450
4-nitroaniline	1.60	< 1.900	< 2.200	< 2.200	< 1.850	< 1.800	< 1.800	< 1.900	< 2.200
Surrogates:									
Nitrobenzene-d5	23-120	70	82	64	74	34	64	30	74
2-fluorobiphenyl	30-115	84	86	76	86	46	76	42	88
Terphenyl-d14	18-137	108	112	86	88	40	80	38	93
2-fluorophenol	24-113	65	79	60	67	33	61	33	72
Phenol-d5	24-113	84	90	70	82	34	65	34	91
2,4,6-tribromophenol	19-122	85	91	59	81	25	50	26	76

* Compound present below measurable detection limit.

Table D-2d

Organic Analysis Results: Semivolatile Organics
SITE 9

Field Sample ID		B-9-1-1A	B-9-1-3A	B-9-1-6A	WB-9-5-6A	WB-9-6-3A	WB-9-6-4A	WB-9-7-6A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		15	13	24	8	20	15	21
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
1,3-Dichlorobenzene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
1,4-Dichlorobenzene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
1,2-Dichlorobenzene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
bis(2-chloroisopropyl)ether	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
N-Nitroso-di-propylamine	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Hexachloroethane	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Nitrobenzene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Isophorone	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
bis(2-chloroethoxy)methane	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
1,2,4-Trichlorobenzene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Naphthalene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	0.650	< 0.39	< 0.42
Hexachlorobutadiene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Hexachlorocyclopentadiene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2-Chloronaphthalene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Dimethyl phthalate	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Acenaphthylene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Fluorene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Acenaphthene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,4-Dinitrotoluene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,6-Dinitrotoluene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Diethyl phthalate	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
4-Chlorophenyl phenylether	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
N-Nitrosodiphenylamine	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42

* Compound present below measurable detection limit.

Table D-2d (continued)

Organic Analysis Results: Semivolatile Organics
SITE 9

Field Sample ID Sample Matrix Percent Moisture (%)		B-9-1-1A Soil 15	B-9-1-3A Soil 13	B-9-1-6A Soil 24	WB-9-5-6A Soil 8	WB-9-6-3A Soil 20	WB-9-6-4A Soil 15	WB-9-7-6A Soil 21
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Hexachlorobenzene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Phenanthrene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Anthracene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Di-n-Butyl phthalate	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Fluoranthene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Benzidine	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
Pyrene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Butyl benzyl phthalate	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
3,3′-Dichlorobenzidine	0.66	< 0.78	< 0.76	< 0.87	< 0.72	< 0.825	< 0.78	< 0.84
Benzo(a)anthracene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Bis(2-ethylhexyl)phthalate	0.33	< 0.39*	0.39	< 0.45	< 0.36	< 0.415*	< 0.39*	< 0.42
Chrysene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Di-n-octyl phthalate	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Benzo(b)fluoranthene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Benzo(k)fluoranthene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Benzo(a)pyrene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Indeno(1,2,3-cd)pyrene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Dibenzo(a,h)anthracene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Benzo(g,h,i)perylene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Phenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2-Chlorophenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2-Nitrophenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,4-Dimethyphenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,4-Dichlorophenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42

* Compound present below measurable detection limit.

Table D-2d (continued)

Organic Analysis Results: Semivolatile Organics
SITE 9

Field Sample ID		B-9-1-1A	B-9-1-3A	B-9-1-6A	WB-9-5-6A	WB-9-6-3A	WB-9-6-4A	WB-9-7-6A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		15	13	24	8	20	15	21
Compound	MDL (mg/Kg) Wet Wt. Control Limits	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,4,6-trichlorophenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,4-dinitrophenol	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
4-nitrophenol	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
4,6-dinitro-2-methylphenol	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
Pentachlorophenol	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
Benzyl alcohol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2-methylphenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
4-methylphenol	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
Benzoic acid	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
4-chloroaniline	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2-methylnaphthalene	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
2,4,5-trichlorophenol	1.60	< 1.90	< 1.90	< 2.10	< 1.75	0.500	< 0.39	< 0.42
2-nitroaniline	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
3-nitroaniline	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
Dibenzofuran	0.33	< 0.39	< 0.38	< 0.44	< 0.36	< 0.415	< 0.39	< 0.42
4-nitroaniline	1.60	< 1.90	< 1.90	< 2.10	< 1.75	< 2.000	< 1.90	< 2.10
Surrogates:								
Nitrobenzene-d5	23-120	66	74	73	60	56	70	40
2-fluorobiphenyl	30-115	72	85	80	62	54	72	54
Terphenyl-d14	18-137	67	81	81	64	68	66	58
2-fluorophenol	24-113	59	67	66	54	55	64	42
Phenol-d5	24-113	77	97	98	60	69	72	45
2,4,6-tribromophenol	19-122	64	71	64	54	87	82	33

* Compound present below measurable detection limit.

Table D-2e

Organic Analysis Results: Semivolatile Organics
SITE 10

Field Sample ID		WB-10-1D-1A	WB-10-1D-2A	WB-10-4-5A
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		11	13	11
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.37	< 0.38	< 0.37
1,3-Dichlorobenzene	0.33	< 0.37	< 0.38	< 0.37
1,4-Dichlorobenzene	0.33	< 0.37	< 0.38	< 0.37
1,2-Dichlorobenzene	0.33	< 0.37	< 0.38	< 0.37
bis(2-chloroisopropyl)ether	0.33	< 0.37	< 0.38	< 0.37
N-Nitroso-di-propylamine	0.33	< 0.37	< 0.38	< 0.37
Hexachloroethane	0.33	< 0.37	< 0.38	< 0.37
Nitrobenzene	0.33	< 0.37	< 0.38	< 0.37
Isophorone	0.33	< 0.37	< 0.38	< 0.37
bis(2-chloroethoxy)methane	0.33	< 0.37	< 0.38	< 0.37
1,2,4-Trichlorobenzene	0.33	< 0.37	< 0.38	< 0.37
Naphthalene	0.33	< 0.37	< 0.38	< 0.37
Hexachlorobutadiene	0.33	< 0.37	< 0.38	< 0.37
Hexachlorocyclopentadiene	0.33	< 0.37	< 0.38	< 0.37
2-Chloronaphthalene	0.33	< 0.37	< 0.38	< 0.37
Dimethyl phthalate	0.33	< 0.37	< 0.38	< 0.37
Acenaphthylene	0.33	< 0.37	< 0.38	< 0.37
Fluorene	0.33	< 0.37	< 0.38	< 0.37
Acenaphthene	0.33	< 0.37	< 0.38	< 0.37
2,4-Dinitrotoluene	0.33	< 0.37	< 0.38	< 0.37
2,6-Dinitrotoluene	0.33	< 0.37	< 0.38	< 0.37
Diethyl phthalate	0.33	< 0.37	< 0.38	< 0.37
4-Chlorophenyl phenylether	0.33	< 0.37	< 0.38	< 0.37
N-Nitrosodiphenylamine	0.33	< 0.37	< 0.38	< 0.37

* Compound present below measurable detection limit.

Table D-2e (continued)

Organic Analysis Results: Semivolatile Organics
SITE 10

Field Sample ID		WB-10-1D-1A	WB-10-1D-2A	WB-10-4-5A
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		11	13	11
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.37	< 0.38	< 0.37
Hexachlorobenzene	0.33	< 0.37	< 0.38	< 0.37
Phenanthrene	0.33	< 0.37	< 0.38	< 0.37
Anthracene	0.33	< 0.37	< 0.38	< 0.37
Di-n-Butyl phthalate	0.33	< 0.37	< 0.38	< 0.37
Fluoranthene	0.33	< 0.37	< 0.38	< 0.37
Benzidine	1.60	< 1.80	< 1.85	< 1.80
Pyrene	0.33	< 0.37	< 0.38	< 0.37
Butyl benzyl phthalate	0.33	< 0.37	< 0.38	< 0.37
3,3'-Dichlorobenzidine	0.66	< 0.75	< 0.76	< 0.74
Benzo(a)anthracene	0.33	< 0.37	< 0.38	< 0.37
Bis(2-ethylhexyl)phthalate	0.33	< 0.37*	< 0.38*	< 0.37*
Chrysene	0.33	< 0.37	< 0.38	< 0.37
Di-n-octyl phthalate	0.33	< 0.37	< 0.38	< 0.37
Benzo(b)fluoranthene	0.33	< 0.37	< 0.38	< 0.37
Benzo(k)fluoranthene	0.33	< 0.37	< 0.38	< 0.37
Benzo(a)pyrene	0.33	< 0.37	< 0.38	< 0.37
Indeno(1,2,3-cd)pyrene	0.33	< 0.37	< 0.38	< 0.37
Dibenzo(a,h)anthracene	0.33	< 0.37	< 0.38	< 0.37
Benzo(g,h,i)perylene	0.33	< 0.37	< 0.38	< 0.37
Phenol	0.33	< 0.37	< 0.38	< 0.37
2-Chlorophenol	0.33	< 0.37	< 0.38	< 0.37
2-Nitrophenol	0.33	< 0.37	< 0.38	< 0.37
2,4-Dimethyphenol	0.33	< 0.37	< 0.38	< 0.37
2,4-Dichlorophenol	0.33	< 0.37	< 0.38	< 0.37

* Compound present below measurable detection limit.

Table D-2e (continued)

Organic Analysis Results: Semivolatile Organics
SITE 10

Field Sample ID		WB-10-1D-1A	WB-10-1D-2A	WB-10-4-5A
Sample Matrix		Soil	Soil	Soil
Percent Moisture (%)		11	13	11
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.37	< 0.38	< 0.37
2,4,6-trichlorophenol	0.33	< 0.37	< 0.38	< 0.37
2,4-dinitrophenol	1.60	< 1.80	< 1.85	< 1.80
4-nitrophenol	1.60	< 1.80	< 1.85	< 1.80
4,6-dinitro-2-methylphenol	1.60	< 1.80	< 1.85	< 1.80
Pentachlorophenol	1.60	< 1.80	< 1.85	< 1.80
Benzyl alcohol	0.33	< 0.37	< 0.38	< 0.37
2-methylphenol	0.33	< 0.37	< 0.38	< 0.37
4-methylphenol	0.33	< 0.37	< 0.38	< 0.37
Benzoic acid	1.60	< 1.80	< 1.85	< 1.80
4-chloroaniline	0.33	< 0.37	< 0.38	< 0.37
2-methylnaphthalene	0.33	< 0.37	< 0.38	< 0.37
2,4,5-trichlorophenol	1.60	< 1.80	< 1.85	< 1.80
2-nitroaniline	1.60	< 1.80	< 1.85	< 1.80
3-nitroaniline	1.60	< 1.80	< 1.85	< 1.80
Dibenzofuran	0.33	< 0.37	< 0.38	< 0.37
4-nitroaniline	1.60	< 1.80	< 1.85	< 1.80
Surrogates:				
Nitrobenzene-d5	23-120	58	46	79
2-fluorobiphenyl	30-115	60	50	92
Terphenyl-d14	18-137	64	52	66
2-fluorophenol	24-113	48	42	75
Phenol-d5	24-113	60	50	94
2,4,6-tribromophenol	19-122	54	54	83

* Compound present below measurable detection limit.

Table D-2f

Organic Analysis Results: Semivolatile Organics
SITE 11

Field Sample ID		B-11-1-1A	B-11-1-4A	B-11-1-7A	B-11-2-1A	B-11-2-4A	B-11-2-4AR	B-11-2-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	20	12	14	20	18	10
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
1,3-Dichlorobenzene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
1,4-Dichlorobenzene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
1,2-Dichlorobenzene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
bis(2-chloroisopropyl)ether	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
N-Nitroso-di-propylamine	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Hexachloroethane	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Nitrobenzene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Isophorone	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
bis(2-chloroethoxy)methane	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
1,2,4-Trichlorobenzene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Naphthalene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Hexachlorobutadiene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Hexachlorocyclopentadiene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2-Chloronaphthalene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Dimethyl phthalate	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Acenaphthylene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Fluorene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Acenaphthene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,4-Dinitrotoluene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,6-Dinitrotoluene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Diethyl phthalate	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
4-Chlorophenyl phenylether	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
N-Nitrosodiphenylamine	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37

* Compound present below measurable detection limit.

Table D-2f (continued)

Organic Analysis Results: Semivolatile Organics
SITE 11

Field Sample ID		B-11-1-1A	B-11-1-4A	B-11-1-7A	B-11-2-1A	B-11-2-4A	B-11-2-4AR	B-11-2-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	20	12	14	20	18	10
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Hexachlorobenzene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Phenanthrene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Anthracene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Di-n-Butyl phthalate	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Fluoranthene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Benzidine	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
Pyrene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Butyl benzyl phthalate	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
3,3'-Dichlorobenzidine	0.66	< 1.10	< 0.83	< 0.75	< 0.77	< 0.83	< 0.81	< 0.74
Benzo(a)anthracene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Bis(2-ethylhexyl)phthalate	0.33	< 0.54*	0.49	0.47	< 0.39*	0.59	< 0.40*	0.42
Chrysene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Di-n-octyl phthalate	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Benzo(b)fluoranthene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Benzo(k)fluoranthene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Benzo(a)pyrene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Indeno(1,2,3-cd)pyrene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Dibenzo(a,h)anthracene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Benzo(g,h,i)perylene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Phenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2-Chlorophenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2-Nitrophenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,4-Dimethyphenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,4-Dichlorophenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37

* Compound present below measurable detection limit.

Table D-2f (continued)

Organic Analysis Results: Semivolatile Organics
SITE 11

Field Sample ID		B-11-1-1A	B-11-1-4A	B-11-1-7A	B-11-2-1A	B-11-2-4A	B-11-2-4AR	B-11-2-8A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		38	20	12	14	20	18	10
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,4,6-trichlorophenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,4-dinitrophenol	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
4-nitrophenol	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
4,6-dinitro-2-methylphenol	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
Pentachlorophenol	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
Benzyl alcohol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2-methylphenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
4-methylphenol	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
Benzoic acid	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
4-chloroaniline	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2-methylnaphthalene	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
2,4,5-trichlorophenol	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
2-nitroaniline	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
3-nitroaniline	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
Dibenzofuran	0.33	< 0.54	< 0.42	< 0.38	< 0.39	< 0.42	< 0.40	< 0.37
4-nitroaniline	1.60	< 2.60	< 2.00	< 1.90	< 1.90	< 2.00	< 1.95	< 1.80
Surrogates:								
Nitrobenzene-d5	23-120	48	58	47	43	51	52	65
2-fluorobiphenyl	30-115	57	66	54	52	61	60	72
Terphenyl-d14	18-137	59	70	80	49	58	64	78
2-fluorophenol	24-113	44	58	48	44	48	43	66
Phenol-d5	24-113	64	80	75	58	79	70	83
2,4,6-tribromophenol	19-122	55	60	59	45	66	54	72

* Compound present below measurable detection limit.

Table D-2g

Organic Analysis Results: Semivolatile Organics
SITE 12

Field Sample ID		B-12-1-5A	B-12-1-5AR	B-12-1-7A	B-12-1-8A	B-12-2-1A	B-12-2-4A	B-12-2-6A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		23	17	23	21	5	19	19
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
1,3-Dichlorobenzene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
1,4-Dichlorobenzene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
1,2-Dichlorobenzene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
bis(2-chloroisopropyl)ether	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
N-Nitroso-di-propylamine	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Hexachloroethane	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Nitrobenzene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Isophorone	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
bis(2-chloroethoxy)methane	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
1,2,4-Trichlorobenzene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Naphthalene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Hexachlorobutadiene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Hexachlorocyclopentadiene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
2-Chloronaphthalene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Dimethyl phthalate	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Acenaphthylene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Fluorene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Acenaphthene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
2,4-Dinitrotoluene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
2,6-Dinitrotoluene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Diethyl phthalate	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
4-Chlorophenyl phenylether	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
N-Nitrosodiphenylamine	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41

* Compound present below measurable detection limit.

Table D-2g (continued)

Organic Analysis Results: Semivolatile Organics
SITE 12

Field Sample ID		B-12-1-5A	B-12-1-5AR	B-12-1-7A	B-12-1-8A	B-12-2-1A	B-12-2-4A	B-12-2-6A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		23	17	23	21	5	19	19
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Hexachlorobenzene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Phenanthrene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	0.38	< 0.41	< 0.41
Anthracene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Di-n-Butyl phthalate	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Fluoranthene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	0.37	< 0.41	< 0.41
Benzidine	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
Pyrene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	0.44	< 0.41	< 0.41
Butyl benzyl phthalate	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
3,3'-Dichlorobenzidine	0.66	< 0.86	< 0.80	< 0.86	< 0.84	< 0.70	< 0.82	< 0.82
Benzo(a)anthracene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Bis(2-ethylhexyl)phthalate	0.33	< 0.43*	< 0.40*	< 0.43*	< 0.42*	0.38	< 0.41*	0.43
Chrysene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Di-n-octyl phthalate	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Benzo(b)fluoranthene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Benzo(k)fluoranthene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Benzo(a)pyrene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Indeno(1,2,3-cd)pyrene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Dibenzo(a,h)anthracene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35	< 0.41	< 0.41
Benzo(g,h,i)perylene	0.33	< 0.43	< 0.40	< 0.43	< 0.42	< 0.35*	< 0.41	< 0.41
Phenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35*	< 0.41	< 0.41
2-Chlorophenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2-Nitrophenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2,4-Dimethyphenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2,4-Dichlorophenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41

* Compound present below measurable detection limit.

Table D-2g (continued)

Organic Analysis Results: Semivolatile Organics
SITE 12

Field Sample ID		B-12-1-5A	B-12-1-5AR	B-12-1-7A	B-12-1-8A	B-12-2-1A	B-12-2-4A	B-12-2-6A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		23	17	23	21	5	19	19
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2,4,6-trichlorophenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2,4-dinitrophenol	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
4-nitrophenol	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
4,6-dinitro-2-methylphenol	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
Pentachlorophenol	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
Benzyl alcohol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2-methylphenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
4-methylphenol	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
Benzoic acid	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
4-chloroaniline	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2-methylnaphthalene	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
2,4,5-trichlorophenol	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
2-nitroaniline	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
3-nitroaniline	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
Dibenzofuran	0.33	< 0.43	< 0.40	< 0.43	< 0.47	< 0.35	< 0.41	< 0.41
4-nitroaniline	1.60	< 2.10	< 1.90	< 2.10	< 2.00	< 1.70	< 2.00	< 2.00
Surrogates:								
Nitrobenzene-d5	23-120	80	64	66	71	89	62	61
2-fluorobiphenyl	30-115	85	74	78	83	111	77	81
Terphenyl-d14	18-137	78	60	59	63	93	75	79
2-fluorophenol	24-113	66	55	54	57	82	62	63
Phenol-d5	24-113	96	80	79	83	117 OC	83	88
2,4,6-tribromophenol	19-122	81	70	71	70	78	61	63

Table D-2h

Organic Analysis Results: Semivolatile Organics
SITE 13

Field Sample ID		WB-13-1-5A	WB-13-2-4A	WB-13-2-5A	WB-13-3-1A	WB-13-3-6A	WB-13-3-7A	WB-13-4-5A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		24	18	13	12	21	15	20
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
1,3-Dichlorobenzene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
1,4-Dichlorobenzene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
1,2-Dichlorobenzene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
bis(2-chloroisopropyl)ether	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
N-Nitroso-di-propylamine	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Hexachloroethane	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Nitrobenzene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Isophorone	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
bis(2-chloroethoxy)methane	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
1,2,4-Trichlorobenzene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Naphthalene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Hexachlorobutadiene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Hexachlorocyclopentadiene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2-Chloronaphthalene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Dimethyl phthalate	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Acenaphthylene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Fluorene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Acenaphthene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,4-Dinitrotoluene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,6-Dinitrotoluene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Diethyl phthalate	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
4-Chlorophenyl phenylether	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
N-Nitrosodiphenylamine	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42

* Compound present below measurable detection limit.

Table D-2h (continued)

Organic Analysis Results: Semivolatile Organics
SITE 13

Field Sample ID		WB-13-1-5A	WB-13-2-4A	WB-13-2-5A	WB-13-3-1A	WB-13-3-6A	WB-13-3-7A	WB-13-4-5A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		24	18	13	12	21	15	20
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Hexachlorobenzene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Phenanthrene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Anthracene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Di-n-Butyl phthalate	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Fluoranthene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Benzidine	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
Pyrene	0.33	< 0.43	< 0.40*	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Butyl benzyl phthalate	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
3,3'-Dichlorobenzidine	0.66	< 0.87	< 0.80	< 0.75	< 0.75	< 0.84	< 0.78	< 0.825
Benzo(a)anthracene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Bis(2-ethylhexyl)phthalate	0.33	< 0.43*	< 0.40*	0.40	< 0.375*	< 0.42*	< 0.39*	< 0.42*
Chrysene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Di-n-octyl phthalate	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Benzo(b)fluoranthene	0.33	< 0.43	< 0.40*	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Benzo(k)fluoranthene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Benzo(a)pyrene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Indeno(1,2,3-cd)pyrene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Dibenzo(a,h)anthracene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Benzo(g,h,i)perylene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Phenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2-Chlorophenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2-Nitrophenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,4-Dimethyphenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,4-Dichlorophenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42

* Compound present below measurable detection limit.

Table D-2h (continued)

Organic Analysis Results: Semivolatile Organics
SITE 13

Field Sample ID		WB-13-1-5A	WB-13-2-4A	WB-13-2-5A	WB-13-3-1A	WB-13-3-6A	WB-13-3-7A	WB-13-4-5A
Sample Matrix		Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)		24	18	13	12	21	15	20
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,4,6-trichlorophenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,4-dinitrophenol	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
4-nitrophenol	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
4,6-dinitro-2-methylphenol	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
Pentachlorophenol	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
Benzyl alcohol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2-methylphenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
4-methylphenol	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
Benzoic acid	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
4-chloroaniline	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2-methylnaphthalene	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
2,4,5-trichlorophenol	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
2-nitroaniline	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
3-nitroaniline	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
Dibenzofuran	0.33	< 0.43	< 0.40	< 0.38	< 0.375	< 0.42	< 0.39	< 0.42
4-nitroaniline	1.60	< 2.10	< 2.00	< 1.80	< 1.850	< 2.10	< 1.90	< 2.00
Surrogates:								
Nitrobenzene-d5	23-120	74	66	88	80	81	79	80
2-fluorobiphenyl	30-115	85	81	93	91	86	87	82
Terphenyl-d14	18-137	86	82	102	80	73	76	69
2-fluorophenol	24-113	56	57	74	72	65	72	62
Phenol-d5	24-113	87	87	91	95	85	91	84
2,4,6-tribromophenol	19-122	70	74	77	87	79	69	77

* Compound present below measurable detection limit.

Table D-3a
Inorganic Analysis Results: Metals, TPH
BACKGROUND BORING

Field Sample ID			BB-1-5A,B	BB-1-7A,B	BB-1-9A,B	BB-2-1A,B	BB-2-5A,B	BB-2-8A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			16	23	10	15	12	25
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	9000	13600	2300	15600	9000	8160
Antimony	Sb	6.0	< 7.1	< 7.8	< 6.7	< 7.1	< 6.8	< 8.0
Arsenic	As	5.0	< 6.0	< 6.5	< 5.6	< 5.9	< 5.7	< 6.7
Barium	Ba	1.0	58.2	95.3	28.4	88.4	112	163
Beryllium	Be	0.2	< 0.24	< 0.26	< 0.22	< 0.24	< 0.23	< 0.27
Boron	B	1.0	< 2.4	< 2.3	< 2.2	< 2.4	< 2.3	< 2.7
Cadmium	Cd	0.5	< 0.6	< 0.65	< 0.56	< 0.59	< 0.57	< 0.67
Calcium	Ca	50.0	44400	48500	213000	2120	48300	54800
Chromium	Cr	1.0	12.3	18.0	3.29	19.6	11.8	11.2
Cobalt	Co	1.0	6.87	11.3	2.10	11.1	6.09	6.99
Copper	Cu	1.0	16.2	21.0	11.3	9.92	15.9	16.1
Iron	Fe	2.5	19600	30400	5060	31700	18600	19200
Lead	Pb	5.0	13.6	19.5	12.6	26.0	9.96	12.3
Magnesium	Mg	50.0	13800	10500	51900	4050	13200	15500
Manganese	Mn	0.5	390	528	386	801	428	452
Mercury(7471)	Hg	0.1	< 0.12	< 0.13	< 0.11	< 0.12	< 0.11	< 0.13
Molybdenum	Mo	1.0	< 1.2	< 1.3	< 1.1	< 1.2	< 1.1	< 1.3
Nickel	Ni	1.5	16.9	25.1	4.41	17.0	14.9	15.5
Potassium	K	50.0	1480	2310	496	2100	1540	1330
Selenium	Se	10.0	< 12	< 13	< 11	< 12	< 11	< 13
Silicon	Si	100.0	223	292	240	345	265	341
Silver	Ag	1.0	< 1.2	< 1.3	< 1.1	< 1.2	< 1.1	< 1.3
Sodium	Na	50.0	134	154	122	49.6	124	149
Thallium	Tl	10.0	< 12	< 13	< 11	< 12	< 11	< 13
Vanadium	V	1.0	16.9	26.2	5.30	32.0	16.8	16.1
Zinc	Zn	1.0	59.4	57.7	864	53.3	61.2	54.5
Total Petroleum Hydrocarbons	TPH	5.0	< 6.0	< 6.5	< 5.6	< 5.9	< 5.7	20

Table D-3b
Inorganic Analysis Results: Metals, TPH
SITE 1

Field Sample ID			B-1-1-2B	B-1-1-3B
Sample Matrix			Soil	Soil
Percent Moisture (%)			3	12

Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	NA	NA
Antimony	Sb	6.0	NA	NA
Arsenic	As	5.0	NA	NA
Barium	Ba	1.0	NA	NA
Beryllium	Be	0.2	NA	NA
Boron	B	1.0	NA	NA
Cadmium	Cd	0.5	NA	NA
Calcium	Ca	50.0	NA	NA
Chromium	Cr	1.0	NA	NA
Cobalt	Co	1.0	NA	NA
Copper	Cu	1.0	NA	NA
Iron	Fe	2.5	NA	NA
Lead	Pb	5.0	NA	NA
Magnesium	Mg	50.0	NA	NA
Manganese	Mn	0.5	NA	NA
Mercury(7471)	Hg	0.1	NA	NA
Molybdenum	Mo	1.0	NA	NA
Nickel	Ni	1.5	NA	NA
Potassium	K	50.0	NA	NA
Selenium	Se	10.0	NA	NA
Silicon	Si	100.0	NA	NA
Silver	Ag	1.0	NA	NA
Sodium	Na	50.0	NA	NA
Thallium	Tl	10.0	NA	NA
Vanadium	V	1.0	NA	NA
Zinc	Zn	1.0	NA	NA
Total Petroleum Hydrocarbons	TPH	5.0	18000	1100

Table D-3c
Inorganic Analysis Results: Metals, TPH
SITE 2

Field Sample ID			B-2-1-1B	B-2-1-3B	B-2-1-4B	B-2-2-1B	B-2-2-4B	B-2-2-7B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			38	19	18	10	14	21
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	NA	NA	NA	NA	NA	NA
Antimony	Sb	6.0	NA	NA	NA	NA	NA	NA
Arsenic	As	5.0	NA	NA	NA	NA	NA	NA
Barium	Ba	1.0	NA	NA	NA	NA	NA	NA
Beryllium	Be	0.2	NA	NA	NA	NA	NA	NA
Boron	B	1.0	NA	NA	NA	NA	NA	NA
Cadmium	Cd	0.5	NA	NA	NA	NA	NA	NA
Calcium	Ca	50.0	NA	NA	NA	NA	NA	NA
Chromium	Cr	1.0	NA	NA	NA	NA	NA	NA
Cobalt	Co	1.0	NA	NA	NA	NA	NA	NA
Copper	Cu	1.0	NA	NA	NA	NA	NA	NA
Iron	Fe	2.5	NA	NA	NA	NA	NA	NA
Lead	Pb	5.0	NA	NA	NA	NA	NA	NA
Magnesium	Mg	50.0	NA	NA	NA	NA	NA	NA
Manganese	Mn	0.5	NA	NA	NA	NA	NA	NA
Mercury(7471)	Hg	0.1	NA	NA	NA	NA	NA	NA
Molybdenum	Mo	1.0	NA	NA	NA	NA	NA	NA
Nickel	Ni	1.5	NA	NA	NA	NA	NA	NA
Potassium	K	50.0	NA	NA	NA	NA	NA	NA
Selenium	Se	10.0	NA	NA	NA	NA	NA	NA
Silicon	Si	100.0	NA	NA	NA	NA	NA	NA
Silver	Ag	1.0	NA	NA	NA	NA	NA	NA
Sodium	Na	50.0	NA	NA	NA	NA	NA	NA
Thallium	Tl	10.0	NA	NA	NA	NA	NA	NA
Vanadium	V	1.0	NA	NA	NA	NA	NA	NA
Zinc	Zn	1.0	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons	TPH	5.0	290	9.4	8.8	6.6	< 5.9	9.4

Table D-3d
Inorganic Analysis Results: Metals, TPH
SITE 3

Field Sample ID			WB-3-2D-4A,B	WB-3-2D-4AR,BR	WB-3-2D-5A,B	WB-3-2D-6A,B	WB-3-3D-1A,B	WB-3-4D-1A,B	WB-3-4D-1AR,BR	WB-3-4D-2A,B	WB-3-7-4A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			17	17	22	16	14	12	12	13	17
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	12000	13200	14000	4260	7160	9530	18500	12500	14400
Antimony	Sb	6.0	< 7.1	< 7.1	< 7.7	< 7.1	< 7.00	< 6.8	< 6.8	< 6.9	< 7.25
Arsenic	As	5.0	< 6.0	< 6.0	< 6.4	< 6.0	< 5.90	< 11	< 11	< 11	< 6.00
Barium	Ba	1.0	66.9	78.6	137	55.2	58.4	88.1	80.3	76.0	102
Beryllium	Be	0.2	< 0.24	< 0.24	< 0.26	< 0.24	< 0.24	< 0.22	0.31	< 0.23	0.596
Boron	B	1.0	< 1.2	< 1.2	< 1.3	< 1.2	< 1.17	< 1.1	< 1.1	< 1.1	81.7
Cadmium	Cd	0.5	< 0.6	< 0.6	< 0.64	1.4	< 0.59	1.1	2.8	0.91	1.66
Calcium	Ca	50.0	25400	29000	39600	105000	62300	3770	3240	1990	13000
Chromium	Cr	1.0	18.3	17.8	20.4	5.8	11.2	19.3	18.1	12.6	15.4
Cobalt	Co	1.0	12.5	10.8	10.3	2.0	7.16	8.4	8.6	5.9	12.3
Copper	Cu	1.0	20.0	18.3	20.6	8.4	13.7	8.3	8.6	6.6	28.8
Iron	Fe	2.5	26600	28300	34500	11600	17300	14500	51700	15100	34200
Lead	Pb	5.0	15.4	25.5	28.2	23.2	17.9	25.9	39.6	15.1	60.7
Magnesium	Mg	50.0	13400	12900	13700	39100	18500	4420	3990	3290	7780
Manganese	Mn	0.5	457	413	525	542	801	414	565	279	692
Mercury(7471)	Hg	0.1	< 0.12	< 0.12	< 0.13	< 0.12	< 0.117	< 0.11	< 0.11	< 0.11	< 0.120
Molybdenum	Mo	1.0	< 1.8	2.8	< 1.9	< 1.8	3.31	< 11	< 11	< 11	< 1.20
Nickel	Ni	1.5	27.6	24.8	27.9	7.1	16.4	13.8	13.0	11.8	20.0
Potassium	K	50.0	1770	1770	2410	796	1130	1540	1400	952	766
Selenium	Se	10.0	<12.0	<12.0	<13.0	<12.0	<11.7	< 11	< 11	< 11	<12.0
Silicon	Si	100.0	711	677	796	740	884	461	428	392	1670
Silver	Ag	1.0	< 1.20	< 1.20	< 1.30	< 1.20	< 1.17	< 1.1	< 1.1	< 1.1	< 1.20
Sodium	Na	50.0	154	152	169	127	129	105	96.4	952	71.1
Thallium	Tl	10.0	<12.0	<12.0	<13.0	<12.0	<11.7	< 11	< 11	< 11	<12.0
Vanadium	V	1.0	25.5	24.8	26.9	9.0	15.5	28.3	37.2	18.2	30.1
Zinc	Zn	1.0	66.1	59.9	187	206	295	426	409	548	687
Total Petroleum Hydrocarbons	TPH	5.0	< 6.0	< 6.0	< 6.4	< 6.0	< 5.9	8.9	< 5.7	< 5.7	< 6.0

Table D-3e
Inorganic Analysis Results: Metals, TPH
SITE 4

Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Field Sample ID			B-4-1-3B	B-4-1-3BR	B-4-1-4B	B-4-1-5B
Sample Matrix			Soil	Soil	Soil	Soil
Percent Moisture (%)			15	14	12	9
Aluminum	Al	10.0	NA	NA	NA	NA
Antimony	Sb	6.0	NA	NA	NA	NA
Arsenic	As	5.0	NA	NA	NA	NA
Barium	Ba	1.0	NA	NA	NA	NA
Beryllium	Be	0.2	NA	NA	NA	NA
Boron	B	1.0	NA	NA	NA	NA
Cadmium	Cd	0.5	NA	NA	NA	NA
Calcium	Ca	50.0	NA	NA	NA	NA
Chromium	Cr	1.0	NA	NA	NA	NA
Cobalt	Co	1.0	NA	NA	NA	NA
Copper	Cu	1.0	NA	NA	NA	NA
Iron	Fe	2.5	NA	NA	NA	NA
Lead	Pb	5.0	NA	NA	NA	NA
Magnesium	Mg	50.0	NA	NA	NA	NA
Manganese	Mn	0.5	NA	NA	NA	NA
Mercury(7471)	Hg	0.1	NA	NA	NA	NA
Molybdenum	Mo	1.0	NA	NA	NA	NA
Nickel	Ni	1.5	NA	NA	NA	NA
Potassium	K	50.0	NA	NA	NA	NA
Selenium	Se	10.0	NA	NA	NA	NA
Silicon	Si	100.0	NA	NA	NA	NA
Silver	Ag	1.0	NA	NA	NA	NA
Sodium	Na	50.0	NA	NA	NA	NA
Thallium	Tl	10.0	NA	NA	NA	NA
Vanadium	V	1.0	NA	NA	NA	NA
Zinc	Zn	1.0	NA	NA	NA	NA
Total Petroleum Hydrocarbons	TPH	5.0	21	20	120	6.2

Table D-3f
Inorganic Analysis Results: Metals, TPH
SITE 5

Field Sample ID			WB-5-1D-1A,B	WB-5-1D-1AR,BR	WB-5-5-6A,B
Sample Matrix			Soil	Soil	Soil
Percent Moisture (%)			20	20	23
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	14100	14400	18.6
Antimony	Sb	6.0	< 7.50	< 7.50	7.79
Arsenic	As	5.0	< 6.25	< 6.25	< 6.50
Barium	Ba	1.0	181	172	262
Beryllium	Be	0.2	< 0.25	< 0.25	< 0.26
Boron	B	1.0	< 1.25	< 1.25	< 1.30
Cadmium	Cd	0.5	< 0.625	< 0.625	< 0.65
Calcium	Ca	50.0	60600	63600	57.1
Chromium	Cr	1.0	18.0	17.6	23.4
Cobalt	Co	1.0	6.91	8.51	14.0
Copper	Cu	1.0	13.1	16.6	111
Iron	Fe	2.5	30200	34800	32.6
Lead	Pb	5.0	9.22	< 6.25	22.6
Magnesium	Mg	50.0	9470	9100	15.7
Manganese	Mn	0.5	420	404	505
Mercury(7471)	Hg	0.1	< 0.125	< 0.125	< 0.13
Molybdenum	Mo	1.0	< 1.25	< 1.25	< 1.3
Nickel	Ni	1.5	18.5	20.2	32.7
Potassium	K	50.0	2160	2220	2300
Selenium	Se	10.0	<12.5	<12.5	< 13
Silicon	Si	100.0	651	622	652
Silver	Ag	1.0	< 1.25	< 1.25	< 1.3
Sodium	Na	50.0	160	140	214
Thallium	Tl	10.0	<12.5	<12.5	< 13
Vanadium	V	1.0	24.9	25.6	32.1
Zinc	Zn	1.0	43.8	44.8	141
Total Petroleum Hydrocarbons	TPH	5.0	< 6.25	< 6.25	< 6.5

Table D-3g
Inorganic Analysis Results: Metals, TPH
SITE 6

Field Sample ID Sample Matrix Percent Moisture (%)			B-6-1-1B Soil 9	B-6-1-3B Soil 16	B-6-1-6B Soil 14	B-6-2-1B Soil 13	B-6-2-4B Soil 18	B-6-2-7B Soil 24
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	NA	NA	NA	NA	NA	NA
Antimony	Sb	6.0	NA	NA	NA	NA	NA	NA
Arsenic	As	5.0	NA	NA	NA	NA	NA	NA
Barium	Ba	1.0	NA	NA	NA	NA	NA	NA
Beryllium	Be	0.2	NA	NA	NA	NA	NA	NA
Boron	B	1.0	NA	NA	NA	NA	NA	NA
Cadmium	Cd	0.5	NA	NA	NA	NA	NA	NA
Calcium	Ca	50.0	NA	NA	NA	NA	NA	NA
Chromium	Cr	1.0	NA	NA	NA	NA	NA	NA
Cobalt	Co	1.0	NA	NA	NA	NA	NA	NA
Copper	Cu	1.0	NA	NA	NA	NA	NA	NA
Iron	Fe	2.5	NA	NA	NA	NA	NA	NA
Lead	Pb	5.0	NA	NA	NA	NA	NA	NA
Magnesium	Mg	50.0	NA	NA	NA	NA	NA	NA
Manganese	Mn	0.5	NA	NA	NA	NA	NA	NA
Mercury(7471)	Hg	0.1	NA	NA	NA	NA	NA	NA
Molybdenum	Mo	1.0	NA	NA	NA	NA	NA	NA
Nickel	Ni	1.5	NA	NA	NA	NA	NA	NA
Potassium	K	50.0	NA	NA	NA	NA	NA	NA
Selenium	Se	10.0	NA	NA	NA	NA	NA	NA
Silicon	Si	100.0	NA	NA	NA	NA	NA	NA
Silver	Ag	1.0	NA	NA	NA	NA	NA	NA
Sodium	Na	50.0	NA	NA	NA	NA	NA	NA
Thallium	Tl	10.0	NA	NA	NA	NA	NA	NA
Vanadium	V	1.0	NA	NA	NA	NA	NA	NA
Zinc	Zn	1.0	NA	NA	NA	NA	NA	NA
Total Petroleum Hydrocarbons	TPH	5.0	79	8.8	6.5	< 5.7	< 6.1	< 6.6

Table D-3h
Inorganic Analysis Results: Metals, TPH
SITE 7

Field Sample ID			B-7-1-1B	B-7-1-3B	B-7-1-4B
Sample Matrix			Soil	Soil	Soil
Percent Moisture (%)			12	4	15

Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	NA	NA	NA
Antimony	Sb	6.0	NA	NA	NA
Arsenic	As	5.0	NA	NA	NA
Barium	Ba	1.0	NA	NA	NA
Beryllium	Be	0.2	NA	NA	NA
Boron	B	1.0	NA	NA	NA
Cadmium	Cd	0.5	NA	NA	NA
Calcium	Ca	50.0	NA	NA	NA
Chromium	Cr	1.0	NA	NA	NA
Cobalt	Co	1.0	NA	NA	NA
Copper	Cu	1.0	NA	NA	NA
Iron	Fe	2.5	NA	NA	NA
Lead	Pb	5.0	NA	NA	NA
Magnesium	Mg	50.0	NA	NA	NA
Manganese	Mn	0.5	NA	NA	NA
Mercury(7471)	Hg	0.1	NA	NA	NA
Molybdenum	Mo	1.0	NA	NA	NA
Nickel	Ni	1.5	NA	NA	NA
Potassium	K	50.0	NA	NA	NA
Selenium	Se	10.0	NA	NA	NA
Silicon	Si	100.0	NA	NA	NA
Silver	Ag	1.0	NA	NA	NA
Sodium	Na	50.0	NA	NA	NA
Thallium	Tl	10.0	NA	NA	NA
Vanadium	V	1.0	NA	NA	NA
Zinc	Zn	1.0	NA	NA	NA
Total Petroleum Hydrocarbons	TPH	5.0	11	570	230

Table D-3i
Inorganic Analysis Results: Metals, TPH
SITE 8

Field Sample ID			WB-8-1D-1A,B	WB-8-2D-7A,B	WB-8-2D-7AR,BR	WB-8-3D-1A,B	WB-8-5A-1A,B	WB-8-5A-4A,B	WB-8-5A-7A,B	WB-8-6-8A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			14	26	26	12	11	12	16	26
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	15900	23200	20900	9980	5210	14000	15300	6020
Antimony	Sb	6.0	< 7.00	< 8.10	< 8.10	< 6.90	< 6.80	< 6.80	< 7.20	< 8.10
Arsenic	As	5.0	< 5.90	< 6.80	< 6.80	< 5.70	< 5.70	< 5.70	< 6.00	< 6.80
Barium	Ba	1.0	132	199	155	101	39.8	153	92.4	112
Beryllium	Be	0.2	< 0.24	< 0.28	< 0.27	< 0.23	< 0.23	< 0.23	< 0.24	< 0.68
Boron	B	1.0	< 1.17	< 1.35	< 1.35	< 1.14	< 1.15	< 1.15	< 1.20	21.8
Cadmium	Cd	0.5	< 0.59	1.07	0.847	< 0.57	< 0.57	< 0.57	< 0.60	< 0.68
Calcium	Ca	50.0	51200	64400	57700	52000	191000	130000	137000	57700
Chromium	Cr	1.0	22.9	23.8	24.2	15.0	7.55	17.6	16.0	10.6
Cobalt	Co	1.0	9.81	12.0	12.9	4.78	3.52	11.2	9.61	7.23
Copper	Cu	1.0	17.3	26.6	24.2	17.0	8.08	19.9	17.1	14.6
Iron	Fe	2.5	30400	35500	32500	23500	10000	24400	2783	16900
Lead	Pb	5.0	28.5	20.7	21.5	10.7	26.3	14.3	13.8	10.2
Magnesium	Mg	50.0	13700	14100	14200	16600	99500	27400	9.98	12700
Manganese	Mn	0.5	470	546	568	419	400	467	460	581
Mercury(7471)	Hg	0.1	< 0.117	< 0.135	< 0.135	< 0.114	< 0.113	< 0.114	< 0.119	< 0.135
Molybdenum	Mo	1.0	3.01	< 1.35	< 1.35	< 1.14	< 1.15	< 1.15	< 1.20	< 1.35
Nickel	Ni	1.5	28.0	27.3	28.8	15.7	8.32	23.9	20.7	14.6
Potassium	K	50.0	3220	3890	4090	1930	449	1760	1640	1410
Selenium	Se	10.0	<11.7	<13.5	<13.5	<11.4	<11.3	<11.4	<11.9	<13.5
Silicon	Si	100.0	845	464	611	635	476	975	1000	1870
Silver	Ag	1.0	< 1.17	< 1.35	< 1.35	< 1.14	< 1.15	< 1.15	< 1.20	< 1.35
Sodium	Na	50.0	166	219	228	114	108	145	149	153
Thallium	Tl	10.0	<11.7	<13.5	<13.5	<11.4	<11.3	<11.4	<11.9	<13.5
Vanadium	V	1.0	30.6	30.9	32.7	20.4	10.6	24.8	22.5	15.7
Zinc	Zn	1.0	65.5	69.9	69.7	56.1	117	54.4	50.8	41.9
Total Petroleum Hydrocarbons	TPH	5.0	< 5.9	< 6.8	< 6.8	240	52	170	12	< 6.8

Table D-3j
Inorganic Analysis Results: Metals, TPH
SITE 9

Field Sample ID			B-9-1-1A,B	B-9-1-3A,B	B-9-1-6A,B	WB-9-5-6A,B	WB-9-6-3A,B	WB-9-6-4A,B	WB-9-7-6A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			15	13	24	8	20	15	21
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	17000	22900	30400	3720	17700	11800	3350
Antimony	Sb	6.0	< 7.10	< 7.00	< 8.00	< 6.60	< 7.50	< 7.10	< 7.60
Arsenic	As	5.0	< 6.00	< 5.75	< 6.75	< 5.50	< 6.25	< 5.90	< 6.40
Barium	Ba	1.0	122	201	123	43.5	228	106	43.5
Beryllium	Be	0.2	0.498	0.275	< 0.30	< 0.22	< 0.25	< 0.24	< 0.26
Boron	B	1.0	< 3.60	< 3.50	< 4.00	< 1.10	< 1.25	< 1.20	< 1.30
Cadmium	Cd	0.5	< 0.60	< 0.60	< 0.70	< 0.55	< 0.625	< 0.60	< 0.64
Calcium	Ca	50.0	3560	54600	105000	114000	62100	88800	314000
Chromium	Cr	1.0	26.5	20.7	21.4	6.99	48.6	17.5	4.62
Cobalt	Co	1.0	14.1	11.1	13.2	1.84	25.8	8.00	2.54
Copper	Cu	1.0	20.8	19.8	22.5	8.42	45.1	12.8	10.9
Iron	Fe	2.5	30300	38200	53800	8660	43800	22700	7300
Lead	Pb	5.0	26.0	15.2	17.5	7.80	43.5	8.08	21.3
Magnesium	Mg	50.0	5900	19800	28100	52600	16100	9070	134000
Manganese	Mn	0.5	553	454	586	515	1310	404	595
Mercury(7471)	Hg	0.1	< 0.120	< 0.115	< 0.135	NR	NR	NR	NR
Molybdenum	Mo	1.0	< 1.20	< 1.20	< 1.50	< 1.10	< 1.25	< 1.20	< 1.30
Nickel	Ni	1.5	26.8	25.9	26.7	5.99	63.0	21.0	6.32
Potassium	K	50.0	1560	2390	2700	841	5990	2260	735
Selenium	Se	10.0	<12.0	<11.5	<13.5	<10.9	<12.5	<11.8	<12.7
Silicon	Si	100.0	3230	1250	1020	686	1490	654	514
Silver	Ag	1.0	< 1.20	< 1.20	< 1.35	< 1.10	< 1.25	< 1.20	< 1.30
Sodium	Na	50.0	174	238	243	126	404	166	189
Thallium	Tl	10.0	<12.0	<11.5	<13.5	<10.9	<12.5	<11.8	<12.7
Vanadium	V	1.0	34.9	28.9	29.6	8.79	73.4	21.8	7.43
Zinc	Zn	1.0	182	56.3	107	250	132	46.5	157
Total Petroleum Hydrocarbons	TPH	5.0	18	36	28	20	140	< 5.9	< 6.4

NR - Not Required

Table D-3k
Inorganic Analysis Results: Metals, TPH
SITE 10

Field Sample ID			WB-10-1D-1A,B	WB-10-1D-2A,B	WB-10-4-5A,B
Sample Matrix			Soil	Soil	Soil
Percent Moisture (%)			11	13	11
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	7830	3960	7120
Antimony	Sb	6.0	< 6.75	< 6.90	< 6.80
Arsenic	As	5.0	< 5.70	< 5.75	< 5.70
Barium	Ba	1.0	1420	49.5	94.9
Beryllium	Be	0.2	< 0.23	< 0.23	0.556
Boron	B	1.0	< 1.13	< 1.15	76.2
Cadmium	Cd	0.5	< 0.57	< 0.58	1.55
Calcium	Ca	50.0	82000	116000	67600
Chromium	Cr	1.0	11.2	650	14.4
Cobalt	Co	1.0	5.32	1.62	11.5
Copper	Cu	1.0	9.78	7.17	26.8
Iron	Fe	2.5	17000	7830	31900
Lead	Pb	5.0	10.8	10.9	56.6
Magnesium	Mg	50.0	17800	48300	7250
Manganese	Mn	0.5	680	500	645
Mercury(7471)	Hg	0.1	NR	NR	NR
Molybdenum	Mo	1.0	< 1.15	< 1.15	< 1.15
Nickel	Ni	1.5	15.0	7.24	18.6
Potassium	K	50.0	1310	732	715
Selenium	Se	10.0	<11.3	<11.5	<11.3
Silicon	Si	100.0	673	967	1080
Silver	Ag	1.0	< 1.15	< 1.15	< 1.15
Sodium	Na	50.0	144	109	66.3
Thallium	Tl	10.0	<11.3	<11.5	<11.5
Vanadium	V	1.0	15.6	8.22	28.1
Zinc	Zn	1.0	174	360	640
Total Petroleum Hydrocarbons	TPH	5.0	< 5.6	30	< 5.7

NR - Not required

Table D-31
Inorganic Analysis Results: Metals, TPH
SITE 11

Field Sample ID			B-11-1-1A,B	B-11-1-4A,B	B-11-1-7A,B	B-11-2-1A,B	B-11-2-4A,B	B-11-2-4AR,BR	B-11-2-8A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			38	20	12	14	20	18	10
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	22900	8980	3390	23500	14500	14800	2880
Antimony	Sb	6.0	< 9.70	< 7.50	< 6.90	< 7.00	< 7.50	< 7.40	< 7.00
Arsenic	As	5.0	< 8.10	< 6.25	< 5.70	< 6.00	< 6.25	< 6.10	< 5.75
Barium	Ba	1.0	130	53.0	54.4	151	130	72.4	42.8
Beryllium	Be	0.2	< 0.35	< 0.25	< 0.25	0.391	< 0.25	< 0.25	< 0.25
Boron	B	1.0	< 1.65	< 1.25	< 1.20	< 1.20	< 1.25	< 1.25	< 3.50
Cadmium	Cd	0.5	< 0.85	< 0.65	< 0.60	< 0.60	< 0.65	< 0.65	< 0.60
Calcium	Ca	50.0	4680	92400	134000	3180	31900	36600	167000
Chromium	Cr	1.0	30.3	11.4	4.26	28.5	20.8	21.3	3.91
Cobalt	Co	1.0	10.2	9.70	2.52	56.3	12.6	10.4	2.49
Copper	Cu	1.0	16.3	22.1	15.4	17.9	27.0	21.2	11.1
Iron	Fe	2.5	34400	19900	7830	39600	31100	38200	5750
Lead	Pb	5.0	41.6	15.4	31.8	32.6	23.2	16.2	15.3
Magnesium	Mg	50.0	5800	14100	57200	6070	13100	11800	57600
Manganese	Mn	0.5	319	1110	580	2880	545	399	468
Mercury(7471)	Hg	0.1	< 0.20	< 0.125	< 0.120	< 0.120	< 0.125	< 0.125	< 0.115
Molybdenum	Mo	1.0	< 1.65	2.11	< 1.20	< 1.20	< 1.25	< 1.25	< 1.20
Nickel	Ni	1.5	23.9	34.9	5.89	28.5	27.5	26.0	5.43
Potassium	K	50.0	1970	1220	734	1830	2590	2390	568
Selenium	Se	10.0	<16.5	<12.5	<11.5	<12.0	<12.5	<12.5	<11.5
Silicon	Si	100.0	4040	1600	654	1300	1240	1090	948
Silver	Ag	1.0	< 1.65	< 1.25	< 1.20	< 1.20	< 1.25	< 1.25	< 1.20
Sodium	Na	50.0	107	179	144	81.0	182	168	151
Thallium	Tl	10.0	<16.5	<12.5	<11.5	<12.0	<12.5	<12.5	<11.5
Vanadium	V	1.0	44.8	21.8	7.56	42.0	30.2	27.3	6.17
Zinc	Zn	1.0	76.0	58.4	486	66.0	67.1	68.3	242
Total Petroleum Hydrocarbons	TPH	5.0	130	7.1	< 5.7	29	20	19	11

Table D-3m
Inorganic Analysis Results: Metals, TPH
SITE 12

Field Sample ID			B-12-1-5A,B	B-12-1-5AR,BR	B-12-1-7A,B	B-12-1-8A,B	B-12-2-1A,B	B-12-2-4A,B	B-12-2-6A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			23	17	23	21	5	19	19
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	15100	16600	13700	14100	12600	16200	12500
Antimony	Sb	6.0	< 7.8	< 7.2	< 7.8	< 7.6	< 6.3	< 7.4	< 7.4
Arsenic	As	5.0	< 6.5	< 6.0	< 6.5	< 6.3	< 5.3	< 6.2	< 6.2
Barium	Ba	1.0	55.4	219	117	112	121	332	90.2
Beryllium	Be	0.2	0.26	0.33	< 0.26	< 0.25	< 0.21	< 0.26	< 0.25
Boron	B	1.0	< 2.6	< 2.4	< 2.6	< 2.5	< 2.1	< 2.5	< 2.5
Cadmium	Cd	0.5	< 0.65	< 0.60	< 0.65	< 0.63	< 0.53	< 0.62	< 0.62
Calcium	Ca	50.0	30000	31000	38800	50400	41500	40400	43100
Chromium	Cr	1.0	19.5	20.4	17.9	22.0	17.2	20.5	15.8
Cobalt	Co	1.0	15.8	10.9	9.01	9.49	10.4	8.69	8.62
Copper	Cu	1.0	18.4	17.0	19.0	16.7	17.9	17.9	17.9
Iron	Fe	2.5	29700	32600	26600	28200	26200	31400	26600
Lead	Pb	5.0	15.1	16.4	17.0	18.5	29.7	18.4	14.4
Magnesium	Mg	50.0	9030	11400	13000	9470	14200	9060	4610
Manganese	Mn	0.5	618	394	443	492	423	385	385
Mercury(7471)	Hg	0.1	< 0.13	< 0.12	< 0.13	< 0.13	< 0.11	< 0.12	< 0.12
Molybdenum	Mo	1.0	< 1.3	< 1.2	< 1.3	< 1.3	< 1.1	< 1.2	< 1.2
Nickel	Ni	1.5	27.7	25.9	22.2	26.6	23.2	25.2	21.2
Potassium	K	50.0	2270	2830	2360	2630	2340	2620	2110
Selenium	Se	10.0	< 13	< 12	< 13	< 13	< 11	< 12	< 12
Silicon	Si	100.0	332	183	218	292	292	254	340
Silver	Ag	1.0	< 1.3	< 1.2	< 1.3	< 1.3	< 1.1	< 1.2	< 1.2
Sodium	Na	50.0	132	135	139	161	109	156	140
Thallium	Tl	10.0	< 13	< 12	< 13	< 13	< 11	< 12	< 12
Vanadium	V	1.0	24.9	26.9	23.4	24.6	24.0	26.7	22.1
Zinc	Zn	1.0	55.6	55.2	52.5	51.4	81.3	63.4	51.4
Total Petroleum Hydrocarbons	TPH	5.0	< 6.5	< 6.0	12	7.5	23	7.0	110

Table D-3n
Inorganic Analysis Results: Metals, TPH
SITE 13

Field Sample ID			WB-13-1-5A,B	WB-13-2-4A,B	WB-13-2-5A,B	WB-13-3-1A,B	WB-13-3-6A,B	WB-13-3-6AR,BR	WB-13-3-7A	WB-13-4-5A,B
Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Percent Moisture (%)			24	18	13	12	21	22	15	20
Parameter	Code	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	5030	14700	10400	11900	13400	11000	8590	14100
Antimony	Sb	6.0	< 7.9	< 7.3	< 6.9	< 6.9	< 7.6	< 7.6	< 7.1	< 7.5
Arsenic	As	5.0	< 6.6	< 6.1	< 5.7	< 5.7	< 6.4	< 6.33	< 5.9	< 6.25
Barium	Ba	1.0	19.1	121	66.2	204	110	114	74.8	112
Beryllium	Be	0.2	< 0.26	< 0.24	< 0.23	< 0.60	< 0.64	< 0.63	< 0.60	< 0.625
Boron	B	1.0	< 2.6	< 2.4	< 2.3	< 1.15	< 1.30	< 1.26	< 1.2	< 1.25
Cadmium	Cd	0.5	< 0.66	< 0.61	< 0.57	< 0.60	< 0.64	< 0.63	< 0.6	< 0.625
Calcium	Ca	50.0	72500	69800	39300	85700	63000	48700	106000	52300
Chromium	Cr	1.0	7.0	18.2	14.9	13.9	17.5	16.8	10.9	17.5
Cobalt	Co	1.0	4.2	10.8	8.0	9.1	14.7	14.5	6.61	12.5
Copper	Cu	1.0	8.3	18.0	17.2	16.4	22.2	21.3	14.9	21.9
Iron	Fe	2.5	11200	28600	25800	21300	22900	25400	18000	27100
Lead	Pb	5.0	26.6	23.2	27.9	19.2	17.0	19.2	12.4	18.0
Magnesium	Mg	50.0	43000	23500	12800	14300	20300	16600	49900	10800
Manganese	Mn	0.5	343	720	521	727	837	683	446	801
Mercury(7471)	Hg	0.1	< 0.13	< 0.12	< 0.11	NR	NR	NR	NR	NR
Molybdenum	Mo	1.0	< 1.3	< 1.2	< 1.1	< 1.2	< 1.3	< 1.26	< 1.2	< 1.25
Nickel	Ni	1.5	9.4	27.4	19.0	19.1	29.1	26.7	15.9	35.9
Potassium	K	50.0	658	1950	1340	1270	2010	1890	1360	1870
Selenium	Se	10.0	< 13	< 12	< 11	<11.5	<12.7	<12.6	<11.8	<12.5
Silicon	Si	100.0	457	276	222	851	2120	2630	1780	1440
Silver	Ag	1.0	< 1.3	< 1.2	< 1.1	< 1.15	< 1.3	< 1.26	< 1.2	< 1.25
Sodium	Na	50.0	134	152	103	178	187	195	168	165
Thallium	Tl	10.0	< 13	< 12	< 11	<11.5	< 13	<12.6	< 12	<12.5
Vanadium	V	1.0	9.9	24.6	19.1	19.5	24.0	23.1	15.9	24.5
Zinc	Zn	1.0	514	59.4	79.0	102	157	156	106	88.2
Total Petroleum Hydrocarbons	TPH	5.0	< 6.6	< 6.1	< 5.7	21	< 6.4	< 6.4	< 5.9	< 6.3

NR - Not required

Table D-4
TOC Analysis Results

Field Sample ID	WB-3-4D-2B	B-4-1-4B	WB-5-5-6B	B-7-1-4B
Sample Matrix	Soil	Soil	Soil	Soil
Percent Moisture (%)	13	12	23	15
Sample Date	8/11/89	7/18/89	7/25/89	7/14/89
Analysis Date	8/29/89	8/15/89	8/21/89	7/19/89
Elapsed Time	18 Days	28 Days	27 Days	5 Days
Parameter	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Total Organic Carbon	2300	>10000	25000	2600

PRECISION/ACCURACY RESULTS

TABLES E-1 THROUGH E-3

Table E-1
Matrix Spike/Matrix Spike Duplicate Results: Volatile Organic Compounds

Laboratory ID	V43287MS	V43287MSD		V46105MS	V46105MSD			
Sample Matrix	Soil	Soil		Soil	Soil			
							Control Limits	
Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Results (% Recovery)	Results (% Recovery)	RPD	(% Recovery)	RPD
1,1-Dichloroethene	79	87	10	72	68	6	59-172	22
Trichloroethene	93	107	14	97	98	1	62-137	24
Chlorobenzene	112	138 OC	21	98	92	6	60-133	21
Toluene	124	137	10	75	70	7	59-139	21
Benzene	69	119	53 OC	89	88	1	64-142	21
Surrogates:								
1,2-Dichloroethane-d4	101	96	N/A	120	114	N/A	70-121	N/A
Toluene-d8	116	108	N/A	102	98	N/A	81-117	N/A
4-Bromofluorobenzene	95	100	N/A	124 OC	121	N/A	74-121	N/A

Table E-1
Matrix Spike/Matrix Spike Duplicate Results: Volatile Organic Compounds

Laboratory ID	V44958MS	V44958MSD		V44324MS	V44324MSD			
Sample Matrix	Soil	Soil		Soil	Soil			
	Results	Results		Results	Results		Control Limits	
Parameter	(% Recovery)	(% Recovery)	RPD	(% Recovery)	(% Recovery)	RPD	(% Recovery)	RPD
1,1-Dichloroethene	80	87	8	85	81	5	59-172	22
Trichloroethene	100	97	3	83	81	2	62-137	24
Chlorobenzene	105	106	1	113	107	5	60-133	21
Toluene	99	106	7	115	99	15	59-139	21
Benzene	103	102	1	119	115	3	64-142	21
Surrogates:								
1,2-Dichloroethane-d4	88	94	N/A	106	98	N/A	70-121	N/A
Toluene-d8	96	110	N/A	109	97	N/A	81-117	N/A
4-Bromofluorobenzene	91	91	N/A	102	96	N/A	74-121	N/A

Table E-1
Matrix Spike/Matrix Spike Duplicate Results: Volatile Organic Compounds

Laboratory ID	V43604MS	V43604MSD		V45142MS	V45142MSD			
Sample Matrix	Soil	Soil		Soil	Soil			
Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Results (% Recovery)	Results (% Recovery)	RPD	Control Limits (% Recovery)	RPD
1,1-Dichloroethene	87	87	0	84	82	2	59-172	22
Trichloroethene	107	102	5	98	97	1	62-137	24
Chlorobenzene	106	111	5	118	108	9	60-133	21
Toluene	110	109	1	110	111	1	59-139	21
Benzene	109	104	5	104	103	1	64-142	21
Surrogates:								
1,2-Dichloroethane-d4	93	91	N/A	84	85	N/A	70-121	N/A
Toluene-d8	96	98	N/A	100	102	N/A	81-117	N/A
4-Bromofluorobenzene	91	88	N/A	90	82	N/A	74-121	N/A

Table E-1

Matrix Spike/Matrix Spike Duplicate Results: Volatile Organic Compounds

Laboratory ID	V45618MS	V45618MSD		V46736MS	V46736MSD			
Sample Matrix	Soil	Soil		Soil	Soil			
							Control Limits	
Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Results (% Recovery)	Results (% Recovery)	RPD	(% Recovery)	RPD
1,1-Dichloroethene	73	80	9	78	74	5	59-172	22
Trichloroethene	101	104	3	96	93	3	62-137	24
Chlorobenzene	113	110	3	94	94	-	60-133	21
Toluene	103	100	3	94	94	-	59-139	21
Benzene	105	107	2	96	94	2	64-142	21
Surrogates:								
1,2-Dichloroethane-d4	99	98	N/A	86	86	N/A	70-121	N/A
Toluene-d8	100	99	N/A	91	88	N/A	81-117	N/A
4-Bromofluorobenzene	103	97	N/A	83	79	N/A	74-121	N/A

Table E-1
Matrix Spike/Matrix Spike Duplicate Results: Volatile Organic Compounds

Laboratory ID	V46932MS	V46932MSD		VDP163MS	VDP163MSD			
Sample Matrix	Soil	Soil		Soil	Soil			
Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Results (% Recovery)	Results (% Recovery)	RPD	Control Limits (% Recovery)	RPD
1,1-Dichloroethene	93	91	2	88	86	2	59-172	22
Trichloroethene	97	108	11	101	105	4	62-137	24
Chlorobenzene	102	102	-	111	115	4	60-133	21
Toluene	96	96	-	97	102	5	59-139	21
Benzene	100	101	1	98	102	4	64-142	21
Surrogates:								
1,2-Dichloroethane-d4	98	88	N/A	97	96	N/A	70-121	N/A
Toluene-d8	100	93	N/A	107	98	N/A	81-117	N/A
4-Bromofluorobenzene	96	92	N/A	108	101	N/A	74-121	N/A

Table E-1
Matrix Spike/Matrix Spike Duplicate Results: Volatile Organic Compounds

Laboratory ID V45910MS V45910MSD
Sample Matrix Soil Soil

Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Control Limits (% Recovery)	RPD
Laboratory ID	V45910MS	V45910MSD			
Sample Matrix	Soil	Soil			
1,1-Dichloroethene	98	91	7	59-172	22
Trichloroethene	101	96	5	62-137	24
Chlorobenzene	117	121	3	60-133	21
Toluene	109	107	2	59-139	21
Benzene	108	115	6	64-142	21
Surrogates:					
1,2-Dichloroethane-d4	110	109	N/A	70-121	N/A
Toluene-d8	98	100	N/A	81-117	N/A
4-Bromofluorobenzene	100	104	N/A	74-121	N/A

Table E-2

Matrix Spike/Matrix Spike Duplicate Results: Semivolatile Organic Compounds

Laboratory ID	SV43271MS	SV43271MSD		SV46691MS	SV46691MSD			
Sample Matrix	Soil	Soil		Soil	Soil			
Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Results (% Recovery)	Results (% Recovery)	RPD	Control Limits (% Recovery)	RPD
1,2,4-Trichlorobenzene	55	63	14	76	52	38 OC	38-107	23
Acenaphthene	57	66	15	83	58	35 OC	31-137	19
2,4-Dinitrotoluene	56	63	12	66	43	42	28- 89	47
Pyrene	59	81	31	98	75	26	35-142	36
N-Nitroso-di-n-propylamine	59	66	11	58	37 OC	44 OC	41-126	38
1,4-Dichlorobenzene	60	59	17	74	48	43 OC	28-104	27
Pentachlorophenol	56	59	5	78	50	44	17-109	47
Phenol	62	66	6	100 OC	72	33	26- 90	35
2-Chlorophenol	47	54	14	83	60	32	25-102	50
4-Chloro-3-methylphenol	57	63	10	86	60	36 OC	26-103	33
4-Nitrophenol	73	72	1	70	44	46	11-114	50
Surrogates:								
Nitrobenzene-d5	54	68	N/A	76	50	N/A	23-120	N/A
2-Fluorobiphenyl	60	76	N/A	86	56	N/A	30-115	N/A
Terphenyl-d14	50	68	N/A	82	56	N/A	18-137	N/A
2-Fluorophenol	47	57	N/A	82	58	N/A	24-113	N/A
Phenol-d5	59	72	N/A	100	70	N/A	24-113	N/A
2,4,6-Tribromophenol	64	72	N/A	85	54	N/A	19-122	N/A

Table E-2

Matrix Spike/Matrix Spike Duplicate Results: Semivolatile Organic Compounds

Laboratory ID	SV44962MS	-		SV45638MS				
Sample Matrix	Soil	Soil		Soil	Soil			
Parameter	Results (% Recovery)	Results (% Recovery)	RPD	Results (% Recovery)	Results (% Recovery)	RPD	Control Limits (% Recovery)	RPD
1,2,4-Trichlorobenzene	75	NA	N/A	65	NA	N/A	38-107	23
Acenaphthene	73	NA	N/A	87	NA	N/A	31-137	19
2,4-Dinitrotoluene	65	NA	N/A	76	NA	N/A	28- 89	47
Pyrene	88	NA	N/A	85	NA	N/A	35-142	36
N-Nitroso-di-n-propylamine	69	NA	N/A	76	NA	N/A	41-126	38
1,4-Dichlorobenzene	69	NA	N/A	59	NA	N/A	28-104	27
Pentachlorophenol	69	NA	N/A	100	NA	N/A	17-109	47
Phenol	57	NA	N/A	80	NA	N/A	26- 90	35
2-Chlorophenol	57	NA	N/A	85	NA	N/A	25-102	50
4-Chloro-3-methylphenol	68	NA	N/A	80	NA	N/A	26-103	33
4-Nitrophenol	66	NA	N/A	85	NA	N/A	11-114	50
Surrogates:								
Nitrobenzene-d5	78	NA	N/A	84	NA	N/A	23-120	N/A
2-Fluorobiphenyl	76	NA	N/A	94	NA	N/A	30-115	N/A
Terphenyl-d14	86	NA	N/A	88	NA	N/A	18-137	N/A
2-Fluorophenol	64	NA	N/A	86	NA	N/A	24-113	N/A
Phenol-d5	72	NA	N/A	106	NA	N/A	24-113	N/A
2,4,6-Tribromophenol	65	NA	N/A	91	NA	N/A	19-122	N/A

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix Parameter	Code	43199 Original Analysis (mg/Kg)	PH43199MR Replicate Analysis (mg/Kg)	RPD	PH43338MS Spike Recovery (%)	44329 Original Analysis (mg/Kg)	PH44329MR Replicate Analysis (mg/Kg)	RPD	PH43598MS Spike Recovery (%)	Control Limits (% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Boron	B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Mercury(7471)	Hg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Total Petroleum Hydrocarbons	TPH	130	124	4.7	111	103	107	3.8	90	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix		43339	PH43339MR		PH42341MS	43284	M43284MR		M43284MS	Control Limits	
Parameter	Code	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	(% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	14100	15400	9	NS	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	<7.6	<7.6	-	21 OC	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	<6.3	<6.3	-	59 OC	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	112	125	11	78	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	<0.25	<0.25	-	82	75-125	30
Boron	B	N/A	N/A	N/A	N/A	<2.5	36.3	200 OC	123	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	<0.63	<0.63	-	74 OC	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	50400	50300	0.2	NS	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	22	19	15	53 OC	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	9.49	10.8	13	77	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	16.7	18.6	11	81	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	28200	30300	7	NS	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	NA	NA	N/A	NA	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	18.5	18.2	2	66 OC	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	9470	9240	2	NS	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	492	509	3	110	75-125	30
Mercury(7471)	Hg	N/A	N/A	N/A	N/A	<0.13	<0.13	-	112	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	<1.3	<1.3	-	68 OC	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	26.6	25.8	3	68 OC	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	2630	2530	4	NS	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	<13	<13	-	59 OC	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	292	282	3	NS	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	<13	<13	-	36 OC	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	161	146	10	NS	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	<13	<13	-	66 OC	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	24.6	25.7	4	77	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	51.4	56.8	10	82	75-125	30
Total Petroleum Hydrocarbons	TPH	18	8.2	75 OC	86	N/A	N/A	N/A	N/A	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix Parameter	Code	43614 Original Analysis (mg/Kg)	PH43614MR Replicate Analysis (mg/Kg)	RPD	PH43613MS Spike Recovery (%)	46685 Original Analysis (mg/Kg)	M46685MR Replicate Analysis (mg/Kg)	RPD	M46685MS Spike Recovery (%)	Control Limits (% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	14100	14400	2.1	NS	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	<7.50	<7.50	-	19 OC	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	<6.25	<6.25	-	62 OC	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	181	172	5.1	63 OC	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	<0.25	<0.25	-	64 OC	75-125	30
Boron	B	N/A	N/A	N/A	N/A	<1.25	<1.25	-	89	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	<0.625	<0.625	-	78	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	60600	63600	4.8	NS	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	18.0	17.6	2.2	74 OC	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	6.91	8.51	21	64 OC	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	13.1	16.6	24	69 OC	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	30200	34800	14	NS	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	NA	NA	N/A	NA	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	9.22	<6.25	200 OC	75	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	9470	9100	4	NS	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	420	404	3.9	++	75-125	30
Mercury(7471)	Hg	N/A	N/A	N/A	N/A	<0.125	<0.125	-	92	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	<1.25	<1.25	-	64 OC	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	18.5	20.2	8.8	66 OC	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	2160	2220	2.7	NS	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	<12.5	<12.5	-	62 OC	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	651	622	4.6	NS	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	<1.25	<1.25	-	32 OC	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	160	140	13	NS	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	<12.5	<12.5	-	68 OC	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	24.9	25.6	2.8	67 OC	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	43.8	44.8	2.2	64 OC	75-125	30
Total Petroleum Hydrocarbons	TPH	230	260	12	145 OC	N/A	N/A	N/A	N/A	46-142	28

NS = Not Spiked

++ = Spike level inappropriate

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix		46792	PH46792MR		PH46884MS	46113	PH46113MR		PH46995MS	Control Limits	
Parameter	Code	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	(% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Boron	B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Mercury(7471)	Hg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Total Petroleum Hydrocarbons	TPH	728	744	2.2	75	482	394	20	95	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix		45946	PH45946MR		PH45947MS	43594	M43594MR		M43594MS	Control Limits	
Parameter	Code	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	(% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	22900	22800	<1	NS	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	<9.7	<9.7	-	54 OC	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	<8.1	<8.1	-	67 OC	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	130	132	2	93	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	<0.35	<0.35	-	98	75-125	30
Boron	B	N/A	N/A	N/A	N/A	<1.65	<1.65	-	NS	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	<0.85	<0.85	-	96	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	4680	4650	<1	NS	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	30.3	29.5	3	94	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	10.2	10.4	2	87	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	16.3	17.4	6	90	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	34400	35900	4	NS	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	NA	NA	N/A	NA	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	41.6	36.0	14	78	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	5800	5900	2	NS	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	319	344	8	112	75-125	30
Mercury(7471)	Hg	N/A	N/A	N/A	N/A	NA	NA	NA	102	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	<1.65	<1.65	-	91	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	23.9	23.2	3	90	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	1970	2020	2	NS	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	<16.5	<16.5	-	88	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	4040	3270	21	NS	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	<1.65	<1.65	-	81	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	107	109	2	NS	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	<16.5	<16.5	-	89	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	44.8	45.0	<1	92	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	76.0	80.0	5	86	75-125	30
Total Petroleum Hydrocarbons	TPH	<5	<5	-	97	N/A	N/A	N/A	N/A	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID		43595	M43595MR		M43595MS	44339	PH44339MR		PH44339MS		
Sample Matrix											
Parameter	Code	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Control Limits (% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Boron	B	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Mercury(7471)	Hg	<0.125	<0.125	0	102	N/A	N/A	N/A	N/A	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	75-125	30
Total Petroleum Hydrocarbons	TPH	N/A	N/A	N/A	N/A	<5	<5	-	92	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix Parameter	Code	45624 Original Analysis (mg/Kg)	PH45624MR Replicate Analysis (mg/Kg)	RPD	PH45976MS Spike Recovery (%)	45615 Original Analysis (mg/Kg)	M45615MR Replicate Analysis (mg/Kg)	RPD	M45615MS Spike Recovery (%)	Control Limits (% Recovery)	RPD
Aluminum	Al	N/A	N/A	N/A	N/A	3350	3660	8.8	NS	75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A	<7.6	<7.6	-	55 OC	75-125	30
Arsenic	As	N/A	N/A	N/A	N/A	<6.4	<6.4	-	68 OC	75-125	30
Barium	Ba	N/A	N/A	N/A	N/A	43.5	52.4	18.6	77	75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A	<0.26	<0.26	-	68 OC	75-125	30
Boron	B	N/A	N/A	N/A	N/A	<1.30	<1.30	-	84	75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A	<0.64	<0.64	-	79	75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A	314000	289000	8.3	NS	75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A	4.62	5.47	16.8	79	75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A	2.54	3.40	31 OC	74 OC	75-125	30
Copper	Cu	N/A	N/A	N/A	N/A	10.9	11.3	3.6	76	75-125	30
Iron	Fe	N/A	N/A	N/A	N/A	7300	7990	9.0	NA	75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A	NA	NA	N/A	NS	75-125	30
Lead	Pb	N/A	N/A	N/A	N/A	21.3	19.9	6.8	74 OC	75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A	134000	122000	9.4	NS	75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A	595	567	4.8	92	75-125	30
Mercury(7471)	Hg	N/A	N/A	N/A	N/A	NA	NA	NA	NS	75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A	<1.30	<1.30	-	88	75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A	6.32	6.75	6.6	68 OC	75-125	30
Potassium	K	N/A	N/A	N/A	N/A	735	759	3.2	NS	75-125	30
Selenium	Se	N/A	N/A	N/A	N/A	<12.7	<12.7	-	80	75-125	30
Silicon	Si	N/A	N/A	N/A	N/A	514	481	6.6	NS	75-125	30
Silver	Ag	N/A	N/A	N/A	N/A	<1.30	<1.30	-	84	75-125	30
Sodium	Na	N/A	N/A	N/A	N/A	189	176	7.1	NS	75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A	<12.7	<12.7	-	72 OC	75-125	30
Vanadium	V	N/A	N/A	N/A	N/A	7.43	7.82	5.1	75	75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A	157	177	12	80	75-125	30
Total Petroleum Hydrocarbons	TPH	<6.5	<6.5	-	118	N/A	N/A	N/A	N/A	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix		46351	M46351MR		M46351MS	45642	PH45642MR		PH46934MS		
Parameter	Code	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Control Limits (% Recovery)	RPD
Aluminum	Al	23200	20900	10	NS	N/A	N/A	N/A	N/A	75-125	30
Antimony	Sb	<8.1	<8.1	-	32 OC	N/A	N/A	N/A	N/A	75-125	30
Arsenic	As	<6.80	<6.80	-	71 OC	N/A	N/A	N/A	N/A	75-125	30
Barium	Ba	199	155	25	111	N/A	N/A	N/A	N/A	75-125	30
Beryllium	Be	<0.28	<0.28	-	83	N/A	N/A	N/A	N/A	75-125	30
Boron	B	<1.35	<1.35	-	112	N/A	N/A	N/A	N/A	75-125	30
Cadmium	Cd	1.07	0.847	23	73 OC	N/A	N/A	N/A	N/A	75-125	30
Calcium	Ca	64400	57700	11	NS	N/A	N/A	N/A	N/A	75-125	30
Chromium	Cr	23.8	24.2	1.7	79	N/A	N/A	N/A	N/A	75-125	30
Cobalt	Co	12.0	12.9	7.2	80	N/A	N/A	N/A	N/A	75-125	30
Copper	Cu	26.6	24.2	9.4	67 OC	N/A	N/A	N/A	N/A	75-125	30
Iron	Fe	35500	32500	8.8	NS	N/A	N/A	N/A	N/A	75-125	30
Lead(7421)	Pb	NA	NA	N/A	NA	N/A	N/A	N/A	N/A	75-125	30
Lead	Pb	20.7	21.5	3.8	75	N/A	N/A	N/A	N/A	75-125	30
Magnesium	Mg	14100	14200	0.7	NS	N/A	N/A	N/A	N/A	75-125	30
Manganese	Mn	546	568	3.9	32 OC	N/A	N/A	N/A	N/A	75-125	30
Mercury(7471)	Hg	<0.10	<0.10	-	93	N/A	N/A	N/A	N/A	75-125	30
Molybdenum	Mo	<1.35	<1.35	-	87	N/A	N/A	N/A	N/A	75-125	30
Nickel	Ni	27.3	28.8	5.3	79	N/A	N/A	N/A	N/A	75-125	30
Potassium	K	3890	4090	5	NS	N/A	N/A	N/A	N/A	75-125	30
Selenium	Se	<13.5	<13.5	-	77	N/A	N/A	N/A	N/A	75-125	30
Silicon	Si	464	611	27	NS	N/A	N/A	N/A	N/A	75-125	30
Silver	Ag	<1.35	<1.35	-	82	N/A	N/A	N/A	N/A	75-125	30
Sodium	Na	219	228	4	NS	N/A	N/A	N/A	N/A	75-125	30
Thallium	Tl	<13.5	<13.5	-	74 OC	N/A	N/A	N/A	N/A	75-125	30
Vanadium	V	30.9	32.7	5.7	78	N/A	N/A	N/A	N/A	75-125	30
Zinc	Zn	69.9	69.7	0.3	82	N/A	N/A	N/A	N/A	75-125	30
Total Petroleum Hydrocarbons	TPH	N/A	N/A	N/A	N/A	80500	82300	2.2	98	46-142	28

NS = Not Spiked

Table E-3

Matrix Spike/Matrix Spike Duplicate Results: Metals, TPH

Laboratory ID Sample Matrix Parameter	Code	45621 Original Analysis (mg/Kg)	M45621MR Replicate Analysis (mg/Kg)	RPD	M45621MS Spike Recovery (%)	Original Analysis (mg/Kg)	Replicate Analysis (mg/Kg)	RPD	Spike Recovery (%)	Control Limits (% Recovery)	Control Limits RPD
Aluminum	Al	N/A	N/A	N/A	N/A					75-125	30
Antimony	Sb	N/A	N/A	N/A	N/A					75-125	30
Arsenic	As	N/A	N/A	N/A	N/A					75-125	30
Barium	Ba	N/A	N/A	N/A	N/A					75-125	30
Beryllium	Be	N/A	N/A	N/A	N/A					75-125	30
Boron	B	N/A	N/A	N/A	N/A					75-125	30
Cadmium	Cd	N/A	N/A	N/A	N/A					75-125	30
Calcium	Ca	N/A	N/A	N/A	N/A					75-125	30
Chromium	Cr	N/A	N/A	N/A	N/A					75-125	30
Cobalt	Co	N/A	N/A	N/A	N/A					75-125	30
Copper	Cu	N/A	N/A	N/A	N/A					75-125	30
Iron	Fe	N/A	N/A	N/A	N/A					75-125	30
Lead(7421)	Pb	N/A	N/A	N/A	N/A					75-125	30
Lead	Pb	N/A	N/A	N/A	N/A					75-125	30
Magnesium	Mg	N/A	N/A	N/A	N/A					75-125	30
Manganese	Mn	N/A	N/A	N/A	N/A					75-125	30
Mercury(7471)	Hg	<0.119	<0.119	0	95					75-125	30
Molybdenum	Mo	N/A	N/A	N/A	N/A					75-125	30
Nickel	Ni	N/A	N/A	N/A	N/A					75-125	30
Potassium	K	N/A	N/A	N/A	N/A					75-125	30
Selenium	Se	N/A	N/A	N/A	N/A					75-125	30
Silicon	Si	N/A	N/A	N/A	N/A					75-125	30
Silver	Ag	N/A	N/A	N/A	N/A					75-125	30
Sodium	Na	N/A	N/A	N/A	N/A					75-125	30
Thallium	Tl	N/A	N/A	N/A	N/A					75-125	30
Vanadium	V	N/A	N/A	N/A	N/A					75-125	30
Zinc	Zn	N/A	N/A	N/A	N/A					75-125	30
Total Petroleum Hydrocarbons	TPH	N/A	N/A	N/A	N/A					46-142	28

METHOD BLANK RESULTS

TABLES F-1 THROUGH F-3

Table F-1

Method Blank Results
Volatile Organics

Laboratory ID		V0720MB1	V0720MB2	V0721MB	V0722MB	V0724MB1	V0724MB2
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Chloromethane	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromomethane	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Vinyl Chloride	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chloroethane	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Methylene Chloride	0.005	0.007	0.005	0.006	< 0.005	< 0.005*	< 0.005
Acetone	0.010	< 0.010*	< 0.010	< 0.010*	< 0.010	0.011	< 0.010
Carbon Disulfide	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,2-Dichloroethene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloroethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2-Butanone	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,1,1-Trichloroethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Carbon Tetrachloride	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl Acetate	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromodichloromethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloropropane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,3-Dichloropropene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

* Compound present below measurable detection limit.

Table F-1 (continued)

Method Blank Results
Volatile Organics

Laboratory ID		V0720MB1	V0720MB2	V0721MB	V0722MB	V0724MB1	V0724MB2
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2-Chloroethylvinyl ether	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromoform	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4-Methyl-2-Pentanone	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2-Hexanone	0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-Tetrachloroethane	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toluene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Styrene	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total Xylenes	0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichlorobenzene	0.010	NR	NR	< 0.010	NR	NR	< 0.010
1,3-Dichlorobenzene	0.010	NR	NR	< 0.010	NR	NR	< 0.010
1,4-Dichlorobenzene	0.010	NR	NR	< 0.010	NR	NR	< 0.010
Trichlorofluoromethane	0.010	NR	NR	< 0.005	NR	NR	< 0.005
Surrogates:							
1,2-Dichloroethane-d4	70-121	90	91	96	97	89	106
Toluene-d8	81-117	99	97	103	94	108	107
4-Bromofluorobenzene	74-121	91	98	108	89	104	109

* Compound present below measurable detection limit.
NR = Not reported

Table F-1 (continued)

Method Blank Results
Volatile Organics

Laboratory ID		V0726MB1	V0726MB2	V0727MB	V0728MB1	V0728MB2	V0729MB1	V0729MB2	V0731MB
	MDL (mg/Kg) Wet Wt.	Results+ (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromomethane	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Vinyl Chloride	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Chloroethane	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Methylene Chloride	0.005	1.700	< 0.005*	0.005	0.006	0.005	0.011	< 0.005	< 0.005*
Acetone	0.010	3.600	0.018	< 0.010*	0.013	0.014	0.013	< 0.010*	< 0.010*
Carbon Disulfide	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,2-Dichloroethene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2-Butanone	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,1,1-Trichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Carbon Tetrachloride	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl Acetate	0.010	< 1.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromodichloromethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloropropane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,3-Dichloropropene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Benzene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005

* Compound present below measurable detection limit.

\+ Results represent a methanol extraction/purge and trap analysis.

Table F-1 (continued)

Method Blank Results
Volatile Organics

Laboratory ID		V0726MB1	V0726MB2	V0727MB	V0728MB1	V0728MB2	V0729MB1	V0729MB2	V0731MB
	MDL (mg/Kg) Wet Wt.	Results+ (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
2-Chloroethylvinyl ether	0.010	< 2.000	< 0.005	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Bromoform	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
4-Methyl-2-Pentanone	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
2-Hexanone	0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-Tetrachloroethane	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Toluene	0.005	< 1.000*	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Styrene	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total Xylenes	0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichlorobenzene	0.010	< 2.000	NR	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,3-Dichlorobenzene	0.010	< 2.000	NR	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
1,4-Dichlorobenzene	0.010	< 2.000	NR	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Trichlorofluoromethane	0.010	< 1.000	NR	< 0.005	< 0.010*	< 0.010	< 0.005	< 0.010*	< 0.005
Surrogates:									
1,2-Dichloroethane-d4	70-121	93	92	96	105	90	103	90	103
Toluene-d8	81-117	98	99	103	117	99	112	97	108
4-Bromofluorobenzene	74-121	104	97	105	116	99	110	97	106

* Compound present below measurable detection limit.
\+ Results represent a methanol extraction/purge and trap analysis.
NR - Not reported

Table F-1 (continued)

Method Blank Results
Volatile Organics

Laboratory ID		V0801MB	V0808MB	V0811MB	V0812MB	V0817MB1	V0817MB2	V0821MB	V0823MB
Compound	MDL (mg/Kg) Wet Wt. --------- Control Limits	Results+ (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results+ (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Chloromethane	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Bromomethane	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Vinyl Chloride	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Chloroethane	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Methylene Chloride	0.005	< 1.000*	0.006	< 0.005*	< 1.000*	< 0.005	< 0.005	< 0.005	< 0.005
Acetone	0.010	< 2.000*	0.013	< 0.010*	4.800	< 0.010*	< 0.010*	0.010	0.010
Carbon Disulfide	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,2-Dichloroethene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005*	< 0.005	< 0.005
2-Butanone	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
1,1,1-Trichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Carbon Tetrachloride	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Vinyl Acetate	0.010	< 1.000	< 0.010	< 0.010	< 1.000	< 0.010	< 0.010	< 0.010	< 0.010
Bromodichloromethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloropropane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
trans-1,3-Dichloropropene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Trichloroethene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Benzene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005

* Compound present below measurable detection limit.

\+ Results represent a methanol extraction/purge and trap analysis.

Table F-1 (continued)

Method Blank Results
Volatile Organics

Laboratory ID		V0801MB	V0808MB	V0811MB	V0812MB	V0817MB1	V0817MB2	V0821MB	V0823MB
	MDL (mg/Kg) Wet Wt.	Results+ (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results+ (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
2-Chloroethylvinyl ether	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Bromoform	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
4-Methyl-2-Pentanone	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
2-Hexanone	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-Tetrachloroethane	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Toluene	0.005	< 1.000	< 0.005	< 0.005*	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Styrene	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Total Xylenes	0.005	< 1.000	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
1,2-Dichlorobenzene	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
1,3-Dichlorobenzene	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
1,4-Dichlorobenzene	0.010	< 2.000	< 0.010	< 0.010	< 2.000	< 0.010	< 0.010	< 0.010	< 0.010
Trichlorofluoromethane	0.010	< 2.000*	< 0.005	< 0.005	< 1.000	< 0.005	< 0.005	< 0.005	< 0.005
Surrogates:									
1,2-Dichloroethane-d4	70-121	90	90	111	92	95	92	87	105
Toluene-d8	81-117	99	94	97	100	96	96	90	98
4-Bromofluorobenzene	74-121	100	95	112	98	100	100	90	103

* Compound present below measurable detection limit.
\+ Results represent a methanol extraction/purge and trap analysis.

Table F-2

Method Blank Results
Semivolatile Organics

Laboratory ID		SV0718MB1	SV0718MB2	SV0719MB	SV0724MB	SV0726MB
	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
Compound						
bis(2-chloroethyl)ether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,3-Dichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,4-Dichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,2-Dichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
bis(2-chloroisopropyl)ether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
N-Nitroso-di-propylamine	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachloroethane	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Nitrobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Isophorone	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
bis(2-chloroethoxy)methane	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,2,4-Trichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Naphthalene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachlorobutadiene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachlorocyclopentadiene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2-Chloronaphthalene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Dimethyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Acenaphthylene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Fluorene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Acenaphthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4-Dinitrotoluene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,6-Dinitrotoluene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Diethyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
4-Chlorophenyl phenylether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
N-Nitrosodiphenylamine	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33

* Compound present below measurable detection limit.

Table F-2 (continued)

Method Blank Results
Semivolatile Organics

Laboratory ID		SV0718MB1	SV0718MB2	SV0719MB	SV0724MB	SV0726MB
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Phenanthrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Anthracene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Di-n-Butyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Fluoranthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzidine	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Pyrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Butyl benzyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
3,3'-Dichlorobenzidine	0.66	< 0.66	< 0.60	< 0.66	< 0.66	< 0.66
Benzo(a)anthracene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Bis(2-ethylhexyl)phthalate	0.33	< 0.33*	< 0.33*	< 0.33*	< 0.33*	0.33
Chrysene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Di-n-octyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(b)fluoranthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(k)fluoranthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(a)pyrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Indeno(1,2,3-cd)pyrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Dibenzo(a,h)anthracene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(g,h,i)perylene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Phenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33
2-Chlorophenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33
2-Nitrophenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33
2,4-Dimethyphenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33
2,4-Dichlorophenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33

* Compound present below measurable detection limit.

Table F-2 (continued)

Method Blank Results
Semivolatile Organics

Laboratory ID		SV0718MB1	SV0718MB2	SV0719MB	SV0724MB	SV0726MB
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
	--------	---------	---------	---------	---------	---------
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33
2,4,6-trichlorophenol	0.33	< 0.33	< 0.30	< 0.33	< 0.33	< 0.33
2,4-dinitrophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
4-nitrophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
4,6-dinitro-2-methylphenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Pentachlorophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Benzyl alcohol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.30
2-methylphenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.30
4-methylphenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.30
Benzoic acid	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
4-chloroaniline	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.30
2-methylnaphthalene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.30
2,4,5-trichlorophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
2-nitroaniline	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
3-nitroaniline	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Dibenzofuran	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.30
4-nitroaniline	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Surrogates:						
Nitrobenzene-d5	23-120	88	85	76	95	100
2-fluorobiphenyl	30-115	101	101	88	83	106
Terphenyl-d14	18-137	93	89	104	105	108
2-fluorophenol	24-113	80	82	86	70	100
Phenol-d5	24-113	103	103	111	90	111
2,4,6-tribromophenol	19-122	72	73	93	128H	93

* Compound present below measurable detection limit.

Table F-2 (continued)

Method Blank Results
Semivolatile Organics

Laboratory ID		SV0803MB	SV0807MB	SV0809MB	SV0814MB1	SV0814MB2
Compound	MDL (mg/Kg) Wet Wt. Control Limits	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery	Results (mg/Kg) Dry Wt. Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,3-Dichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,4-Dichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,2-Dichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
bis(2-chloroisopropyl)ether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
N-Nitroso-di-propylamine	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachloroethane	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Nitrobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Isophorone	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
bis(2-chloroethoxy)methane	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
1,2,4-Trichlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Naphthalene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachlorobutadiene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachlorocyclopentadiene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2-Chloronaphthalene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Dimethyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Acenaphthylene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Fluorene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Acenaphthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4-Dinitrotoluene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,6-Dinitrotoluene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Diethyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
4-Chlorophenyl phenylether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
N-Nitrosodiphenylamine	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33

* Compound present below measurable detection limit.

Table F-2 (continued)

Method Blank Results
Semivolatile Organics

Laboratory ID		SV0803MB	SV0807MB	SV0809MB	SV0814MB1	SV0814MB2
Compound	MDL (mg/Kg) Wet Wt. -------- Control Limits	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery	Results (mg/Kg) Dry Wt. --------- Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Hexachlorobenzene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Phenanthrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Anthracene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Di-n-Butyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Fluoranthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzidine	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Pyrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Butyl benzyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
3,3'-Dichlorobenzidine	0.66	< 0.66	< 0.66	< 0.66	< 0.66	< 0.66
Benzo(a)anthracene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Bis(2-ethylhexyl)phthalate	0.33	< 0.33*	< 0.33*	0.36	< 0.33*	< 0.33*
Chrysene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Di-n-octyl phthalate	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(b)fluoranthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(k)fluoranthene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(a)pyrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Indeno(1,2,3-cd)pyrene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Dibenzo(a,h)anthracene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzo(g,h,i)perylene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Phenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2-Chlorophenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2-Nitrophenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4-Dimethyphenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4-Dichlorophenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33

* Compound present below measurable detection limit.

Table F-2 (continued)

Method Blank Results
Semivolatile Organics

Laboratory ID		SV0803MB	SV0807MB	SV0809MB	SV0814MB1	SV0814MB2
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4,6-trichlorophenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4-dinitrophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
4-nitrophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
4,6-dinitro-2-methylphenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Pentachlorophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Benzyl alcohol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2-methylphenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
4-methylphenol	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
Benzoic acid	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
4-chloroaniline	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2-methylnaphthalene	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
2,4,5-trichlorophenol	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
2-nitroaniline	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
3-nitroaniline	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Dibenzofuran	0.33	< 0.33	< 0.33	< 0.33	< 0.33	< 0.33
4-nitroaniline	1.60	< 1.60	< 1.60	< 1.60	< 1.60	< 1.60
Surrogates:						
Nitrobenzene-d5	23-120	76	92	100	58	48
2-fluorobiphenyl	30-115	89	104	118	62	56
Terphenyl-d14	18-137	93	108	140	70	74
2-fluorophenol	24-113	73	85	89	56	51
Phenol-d5	24-113	99	96	105	77	49
2,4,6-tribromophenol	19-122	82	96	121	83	101

* Compound present below measurable detection limit.

Table F-3

Method Blank Results
Metals

Laboratory ID

Parameter	Code	MDL (mg/Kg) Wet Wt.	M249MB Results (mg/Kg) Dry Wt.	M0818MB Results (mg/Kg) Dry Wt.	M381MB Results (mg/Kg) Dry Wt.	M248MB Results (mg/Kg) Dry Wt.	M338MB Results (mg/Kg) Dry Wt.	M0809MB Results (mg/Kg) Dry Wt.	M0911MB Results (mg/Kg) Dry Wt.
Aluminum	Al	10.0	< 10	< 10	20.3	< 10	< 10	< 10	< 10
Antimony	Sb	6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0	< 6.0
Arsenic	As	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Barium	Ba	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Beryllium	Be	0.2	< 0.20	< 0.20	< 0.20	< 0.50	< 0.70	< 0.20	< 0.50
Boron	B	1.0	4.0	< 3.0	1.49	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	Cd	0.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Calcium	Ca	50.0	<20.0	<20.0	<50.0	<50.0	<20.0	<50.0	<50.0
Chromium	Cr	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cobalt	Co	1.0	< 1.0	< 0.50	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Copper	Cu	1.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Iron	Fe	2.5	11.0	< 2.50	13.8	< 2.50	< 2.50	< 2.50	< 2.50
Lead	Pb	5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Magnesium	Mg	50.0	<20.0	<20.0	<50.0	< 5.0	<20.0	< 5.0	<50.0
Manganese	Mn	0.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Mercury(7471)	Hg	0.1	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Molybdenum	Mo	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Nickel	Ni	1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Potassium	K	50.0	<40.0	<40.0	<50.0	<50.0	<40.0	<50.0	<50.0
Selenium	Se	10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Silicon	Si	100.0	7.10	<100	30.0	<100	<20.0	< 1.0	<100
Silver	Ag	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sodium	Na	50.0	<20.0	<20.0	<50.0	<50.0	<20.0	<50.0	<50.0
Thallium	Tl	10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0	<10.0
Vanadium	V	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	Zn	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

QC SUMMARIES

TABLES G-1a THROUGH G-2

Table G-1a
QC Summary: Precision and Accuracy
Volatile Organic Compounds
Soil

Parameter	Accuracy: Total Number Analyses	Accuracy: Percent Recovery Ranges	Accuracy: Control Limits	Accuracy: Number Within Control Limits	Accuracy: Number Outside Control Limits	Precision: Total Number Analyses	Precision: RPD Ranges	Precision: Control Limits	Precision: Number Within Control Limits	Precision: Number Outside Control Limits
Volatile Organic Compounds										
1,1-Dichloroethene	22	68- 98	59-172	22	0	11	0-10	0-22	11	0
Trichloroethene	22	81-108	62-137	22	0	11	1-14	0-24	11	0
Chlorobenzene	22	92-138	60-133	21	1	11	0-21	0-21	11	0
Toluene	22	70-137	59-139	22	0	11	0-15	0-21	11	0
Benzene	22	69-119	64-142	22	0	11	1-53	0-21	10	1
Total	110			109	1	55			54	1

Table G-1b
QC Summary: Precision and Accuracy
Semivolatile Organic Compounds
Soil

	Accuracy					Precision				
Parameter	Total Number Analyses	Percent Recovery Ranges	Control Limits	Number Within Control Limits	Number Outside Control Limits	Total Number Analyses	RPD Ranges	Control Limits	Number Within Control Limits	Number Outside Control Limits
Semivolatile Organic Compounds										
1,2,4-Trichlorobenzene	6	52- 76	38-107	6	0	2	14-38	0-23	1	1
Acenaphthene	6	58- 87	31-137	6	0	2	15-35	0-19	1	1
2,4-Dinitrotoluene	6	43- 76	28- 89	6	0	2	12-42	0-47	2	0
Pyrene	6	59- 98	35-142	6	0	2	26-31	0-36	2	0
N-Nitroso-di-n-propylamine	6	37- 76	41-126	5	1	2	11-44	0-38	1	1
1,4-Dichlorobenzene	6	48- 74	28-104	6	0	2	17-43	0-27	1	1
Pentachlorophenol	6	50-100	17-109	6	0	2	5-44	0-47	2	0
Phenol	6	57-100	26- 90	5	1	2	6-33	0-35	2	0
2-Chlorophenol	6	47- 85	25-102	6	0	2	14-32	0-50	2	0
4-Chloro-3-methylphenol	6	57- 86	26-103	6	0	2	10-36	0-33	1	1
4-Nitrophenol	6	44- 85	11-114	6	0	2	1-46	0-50	2	0
	66			64	2	22			17	5

Table G-1c
QC Summary: Precision and Accuracy
Metals, TPH - Soil

	Accuracy					Precision				
Parameter	Total Number Analyses	Percent Recovery Ranges	Control Limits	Number Within Control Limits	Number Outside Control Limits	Total Number Analyses	RPD Ranges	Control Limits	Number Within Control Limits	Number Outside Control Limits
Aluminum	NS	NS	NS	N/A	N/A	5	0.4-10	0-30	5	0
Antimony	5	19- 55	75-125	0	5	5	0	0-30	5	0
Arsenic	5	59- 71	75-125	0	5	5	0	0-30	5	0
Barium	5	63-111	75-125	3	2	5	2-25	0-30	5	0
Beryllium	5	64- 98	75-125	3	2	5	0	0-30	5	0
Boron	4	84-123	75-125	4	0	5	0-200	0-30	5	0
Cadmium	5	73- 96	75-125	3	2	5	0-23	0-30	5	0
Calcium	NS	NS	NS	N/A	N/A	5	0.2-11	0-30	5	0
Chromium	5	53- 94	75-125	3	2	5	1.7-16.8	0-30	5	0
Cobalt	5	64- 87	75-125	3	2	5	2-31	0-30	4	1
Copper	5	67- 90	75-125	3	2	5	3.6-24	0-30	5	0
Iron	NS	NS	NS	N/A	N/A	5	4-14	0-30	5	0
Lead	5	66- 78	75-125	3	2	5	2-200	0-30	4	1
Magnesium	NS	NS	NS	N/A	N/A	5	0.7-9.4	0-30	5	0
Manganese	4	32-112	75-125	3	1	5	3-8	0-30	5	0
Mercury(7471)	5	92-112	75-125	5	0	5	0	0-30	5	0
Molybdenum	5	64- 91	75-125	3	2	5	0	0-30	5	0
Nickel	5	66- 90	75-125	2	3	5	3-8.8	0-30	5	0
Potassium	NS	NS	NS	N/A	N/A	5	2-5	0-30	5	0
Selenium	5	59- 88	75-125	2	3	5	0	0-30	5	0
Silicon	NS	NS	NS	N/A	N/A	5	3-27	0-30	5	0
Silver	5	32- 84	75-125	3	2	5	0	0-30	5	0
Sodium	NS	NS	NS	N/A	N/A	5	2-13	0-30	5	0
Thallium	5	66- 89	75-125	1	4	5	0	0-30	5	0
Vanadium	5	67- 92	75-125	4	1	5	0.4-5.1	0-30	5	0
Zinc	5	64- 84	75-125	4	1	5	0.3-12	0-30	5	0
Total Petroleum Hydrocarbons	10	75-145	46-142	9	1	10	0-20	0-28	10	0
Total	103			61	42	140			138	2

Table G-2

QC Summary: Surrogate Recoveries - Soil

Parameter	Total Number Analyses	Percent Recovery Ranges	Control Limits	Number Within Control Limits	Number Outside Control Limits
Volatile Organic Compounds					
1,2-Dichloroethane-d4	76	70-118	70-121	76	0
Toluene-d8	76	81-127	81-117	73	3
4-Bromofluorobenzene	76	81-127	74-121	74	2
Semivolatile Organic Compounds					
Nitrobenzene-d5	48	30- 89	23-120	48	0
2-Fluorobiphenyl	48	42-111	30-115	48	0
Terphenyl-d14	48	38-120	18-137	48	0
2-Fluorophenol	48	33- 86	24-113	48	0
Phenol-d5	48	34-117	24-113	47	1
2,4,6-Tribromophenol	48	25- 91	19-122	48	0
Total	516			510	6

APPENDIX IA

CORRESPONDENCE

SAIC
Science Applications International Corporation

June 8, 1989

Sam A Taffinder, Technical Program Manager
Department of the Air Force
USAF Occupational and Environmental Health Laboratory, AFSC
Brooks Air Force Base, Texas 78235-5501

Subject: Niagara Falls International Airport (IAP) RI/FS Project

Dear Mr. Taffinder:

As per my conversation with Major Jung on May 26, 1989, the following revisions pertain to the Niagara Falls IAP Quality Assurance Project Plan (QAPP). These modifications were not incorporated into the QAPP, which is already in its final draft. To avoid delay in approving and implementing the QAPP for this project, and in accordance with Major Jung's instructions, these revisions are summarized below.

Groundwater and surface water samples which are to be analyzed for purgeable halocarbons and purgeable aromatics by methods E601 and SW846 5030/8020, respectively, will instead be analyzed by SW846 Method 5030/8021. This wide-bore capillary column method uses, in series, both of the GC detectors specific to the individual methods; thus one analysis is required instead of two. Positive identification will be confirmed by analyzing the sample by Method E601 and/or SW846 5030/8020. Groundwater samples to be analyzed only for purgeable aromatics will be analyzed according to SW846 Method 5030/8020.

In the Niagara IAP QAPP, Table 1-11 refers to developing a surrogate for SW846 Method 8015. As I explained to Major Jung, a suitable surrogate is not available, and although the method recommends using an internal/surrogate standard, it contains no reference to an applicable compound. Therefore, no such standard will be used in analyzing samples for methyl ethyl ketone, methyl isobutyl ketone, diethyl ether and ethanol by SW846 Method 8015.

Should there be any questions regarding these modifications to the analytical scope of work for the Niagara Falls IAP project, please feel free to contact me.

Very truly yours,
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Rita Marie Schmon-Stasik
QA Project Officer

RS/da

cc: John King, SAIC Paramus
Major Jung, USAF OEHL

One Sears Drive, Paramus, NJ 07652 (201) 599-0100
Other SAIC Offices: Albuquerque, Chicago, Dayton, Denver, Huntsville, La Jolla, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, San Francisco, Tucson, and Washington, D.C.

SAIC
Science Applications International Corporation

July 11, 1989

Mr. Sam A. Taffinder
Department of the Air Force
USAF Occupational and Environmental
Health Laboratory, AFSC
Brooks Air Force Base, Texas 78235-5501

Subject: Niagara Falls International Airport (IAP) RI/FS Project

Dear Mr. Taffinder:

The following method modifications have been proposed by the subcontractor laboratory for the Niagara Falls IAP project: plasticity index will be determined by ASTM Method D4318 (Atterberg limits), instead of the method referenced in the SOW, ASTM D424; and fluoride analyses will be performed by Method E340.2 (ion selective electrode) if interferences are encountered in the requested ion chromatography method A429. As per my conversation with Major Philip Jung on July 11, 1989, both methods are technically acceptable. The cost for the new methods remains the same as the cost for the original methods.

Should there be any questions regarding these modifications, please contact me as soon as possible.

Very truly yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

RSchmon-Stasik

Rita M. Schmon-Stasik
QA Project Officer

RMSS/djv

cc: John King, SAIC, Paramus, NJ
Major Jung, USAF OEHL, Brooks Air Force Base, TX

One Sears Drive, Paramus, NJ 07652 (201) 599-0100
Other SAIC Offices: Albuquerque, Chicago, Dayton, Denver, Huntsville, La Jolla, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, San Francisco, Tucson, and Washington, D.C.

Science Applications International Corporation

August 29, 1989

Mr. Sam A. Taffinder
Department of the Air Force
USAF Occupational and Environmental
Health Laboratory, AFSC
Brooks Air Force Base, TX 78235-5501

Dear Mr. Taffinder:

According to the Niagara International Airport (IAP) IRP Stage 2 Statement of Work (SOW), groundwater and surface water samples are to be analyzed for common anions by Standard Method A429. Chloride, fluoride, nitrate, sulfate and orthophosphate are to be determined by this method. As per my conversation with Major Philip Jung on August 24, 1989, orthophosphate is not expected to be a major constituent of the groundwater/surface waters at the pH expected for the Niagara IAP samples. Sample collection procedures for orthophosphate require field filtration, which is time-consuming. Therefore, in accordance with Major Jung's recommendation, water samples from Niagara IAP will be collected without taking the routine precautions for orthophosphate (i.e. no field filtration). Orthophosphate will, however, still be determined along with chloride, fluoride, sulfate and nitrate by the specified analytical methodology.

Should there be any questions regarding this sampling effort modification for orthophosphate, please contact me, or John King, at the number below as soon as possible.

Very truly yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

RMSchmon-Stasik

Rita M. Schmon-Stasik
QA Project Officer

RSS/ec

cc: John King, SAIC, Paramus, NJ
Major Jung, USAF OEHL, Brooks Air Force Base, TX

One Sears Drive, Paramus, NJ 07652 (201) 599-0100
Other SAIC Offices: Albuquerque, Chicago, Dayton, Denver, Huntsville, La Jolla, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, San Francisco, Tucson, and Washington, D.C.

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September 12, 1989

Mr. Sam A. Taffinder
Department of the Air Force
USAF Occupational and Environmental
Health Laboratory, AFSC
Brooks Air Force Base, TX 78235-5501

SUBJECT: Niagara International Airport IRP RI/FS
SAIC Project No: 1-835-06-858-XX

Dear Mr. Taffinder:

According to the Niagara International Airport (IAP) IRP Stage 2 Statement of Work (SOW), groundwater samples at some sites are to be analyzed for ethylene dibromide by EPA Method 502.1. The cited detection limit for the analysis is 0.03 ug/L. According to our subcontract laboratory, Ecology and Environment, this detection limit will be difficult to achieve using the referenced method, but can be reached using EPA Method 504.1. This alternate procedure is a technically acceptable, EPA/NYDOH approved methodology for ethylene dibromide analysis (as per Major Philip Jung, USAF OEHL, in a phone conversation on 8 September 1989 with Ms. Rita Schmon-Stasik, SAIC Project QAO). Therefore SAIC would like to request a modification to the Niagara IAP SOW specifying ethylene dibromide analysis be performed by EPA Method 504.1. The price will remain the same as originally proposed.

The field effort for groundwater sampling begins this week at Niagara IAP. Since the two methods for ethylene dibromide require different preservation techniques and have different holding times, we will proceed with sample collection according to EPA Method 504.1. We would appreciate confirmation of this Niagara IAP SOW modification as soon as possible.

Should there be any questions regarding this method for ethylene dibromide, please contact me at the number below. Thank you in advance for your prompt attention to this matter.

Very truly yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Arthur S Shattuck for

Barry S. Langer P.E.
Project Manager

BSL/ec
CC: Major P. Jung, USAF OEHL, Brooks Air Force Base, TX
J. King, SAIC - Paramus, NJ
R.M. Schmon-Stasik, SAIC - Paramus, NJ

One Sears Drive, Paramus, NJ 07652 (201) 599-0100
Other SAIC Offices: Albuquerque, Chicago, Dayton, Denver, Huntsville, La Jolla, Los Angeles, McLean, Oak Ridge, Orlando, San Diego, San Francisco, Tucson, and Washington, D.C.

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November 30, 1989

Mr. Scott Menrath
New York Department of
Environmental Conservation
50 Wolf Road
Room 223
Albany, NY 12233-7251

Subject: Niagara Falls International Airport RI/FS Project

Dear Mr. Menrath:

During our conversation earlier today, clarification was requested regarding New York requirements for analyses being performed as part of the USAF/OEHL IRP RI/FS at the Niagara Falls AFR Facility. Soil boring samples were analyzed for lead by ICP (SW846 methods 3050/6010) and were not re-analyzed by graphite furnace if the lead concentrations were above the detection limits. Additionally, groundwater samples were analyzed for ethylene dibromide (EDB) by EPA Method E504.1 with a method detection limit of 0.3 ug/l. As per our discussion, both the lead and EDB analyses are considered acceptable to New York for this project.

Your assistance in resolving these issues is greatly appreciated. As you suggested, I may contact you again in the future should the need arise.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Rita Marie Schmon-Stasik
Project QA Coordinator

RSS/dg

cc: John J. King, SAIC
Capt. John Erving, USAF/OEHL

One Sears Drive, Paramus, NJ 07652 (201) 599-0100

APPENDIX IB

DRUMMED CUTTINGS

APPENDIX IB

DRUMMED CUTTINGS RESULTS

Table IB-1

Site Specific Cross Reference

DRUMMED CUTTINGS

Field Sample ID	Sample Description	Laboratory ID	Page(s) Volatile/Purgeable Organics	Page(s) Semivolatile Organics	Page(s) Metals
DC-1	Drum B	52393	186, 188	186, 190	187, 193
DC-2	Drum F	52394	186, 188	186, 190	187, 193
DC-3	Drum G	52395	186, 188	186, 190	187, 193
DC-4	Drum H	52396	186, 188	186, 190	187, 193

Table IB-2a

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
DRUMMED CUTTINGS

		-----Volatile Organics-----			---------------------Semivolatile Organics---------------------					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
DC-1	10/03/89	14 Days	10/11/89	8 days	14 Days	10/11/89	8 days	40 Days	10/30/89	27 days
DC-2	10/03/89	14 Days	10/10/89	7 days	14 Days	10/11/89	8 days	40 Days	10/30/89	27 days
DC-3	10/03/89	14 Days	10/11/89	8 days	14 Days	10/11/89	8 days	40 Days	10/30/89	27 days
DC-4	10/03/89	14 Days	10/17/89	14 days	14 Days	10/11/89	8 days	40 Days	10/30/89	27 days

Table IB-2b

Sample Tracking of Analysis Dates and Required Holding Time
Inorganic Analysis
DRUMMED CUTTINGS

		Metals			Mercury		
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Hold Time	Analysis Date	Elasped Time
DC-1	10/03/89	6 Months	10/19/89	16 days	28 Days	10/18/89	15 days
DC-2	10/03/89	6 Months	10/19/89	16 days	28 Days	10/18/89	15 days
DC-3	10/03/89	6 Months	10/19/89	16 days	28 Days	10/18/89	15 days
DC-4	10/03/89	6 Months	10/19/89	16 days	28 Days	10/18/89	15 days

Table IB-3

Organic Analysis Results: Volatile Organic Compounds
CRUMMED CUTTINGS

Field Sample ID		DC-1	DC-2	DC-3	DC-4
Sample Matrix		Soil	Soil	Soil	Soil
Percent Moisture (%)		10	19	23	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Bromomethane	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Vinyl Chloride	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Chloroethane	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Methylene Chloride	0.005	< 0.0056	0.011	< 0.0065	0.015
Acetone	0.010	< 0.011*	< 0.012*	0.022	< 0.0068
Carbon Disulfide	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
1,1-Dichloroethene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
1,1-Dichloroethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
trans-1,2-Dichloroethene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Chloroform	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
1,2-Dichloroethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
2-Butanone	0.010	< 0.011	< 0.012	< 0.013	< 0.014
1,1,1-Trichloroethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Carbon Tetrachloride	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Vinyl Acetate	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Bromodichloromethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
1,2-Dichloropropane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
trans-1,3-Dichloropropene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Trichloroethene	0.005	< 0.0056*	< 0.0062	< 0.0065	< 0.0068
Dibromochloromethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
1,1,2-Trichloroethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Benzene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068

* Compound present below measurable detection limit.

Table IB-3 (continued)

Organic Analysis Results: Volatile Organic Compounds
DRUMMED CUTTINGS

Field Sample ID		DC-1	DC-2	DC-3	DC-4
Sample Matrix		Soil	Soil	Soil	Soil
Percent Moisture (%)		10	19	23	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
2-Chloroethylvinyl ether	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Bromoform	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
4-Methyl-2-Pentanone	0.010	< 0.011	< 0.012	< 0.013	< 0.014
2-Hexanone	0.010	< 0.011	< 0.012	< 0.013	< 0.014
Tetrachloroethene	0.005	< 0.0056*	< 0.0062	< 0.0065	< 0.0068
1,1,2,2-Tetrachloroethane	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Toluene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Chlorobenzene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Ethylbenzene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Styrene	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Total Xylenes	0.005	< 0.0056	< 0.0062	< 0.0065	< 0.0068
Surrogates:					
1,2-Dichloroethane-d4	70-121	108	92	106	94
Toluene-d8	81-117	102	105	102	122 OC (1)
4-Bromofluorobenzene	74-121	94	76	93	74

* Compound present below measurable detection limit.

(1) This sample was analyzed twice, with the surrogate recovering being high both times, this indicates matrix effect.

Table IB-4

Organic Analysis Results: Semivolatile Organics
DRUMMED CUTTINGS

Field Sample ID		DC-1	DC-2	DC-3	DC-4
Sample Matrix		Soil	Soil	Soil	Soil
Percent Moisture (%)		10	19	23	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
bis(2-chloroethyl)ether	0.33	< 0.370	< 0.410	< 0.430	< 0.450
1,3-Dichlorobenzene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
1,4-Dichlorobenzene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
1,2-Dichlorobenzene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
bis(2-chloroisopropyl)ether	0.33	< 0.370	< 0.410	< 0.430	< 0.450
N-Nitroso-di-propylamine	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Hexachloroethane	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Nitrobenzene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Isophorone	0.33	< 0.370	< 0.410	< 0.430	< 0.450
bis(2-chloroethoxy)methane	0.33	< 0.370	< 0.410	< 0.430	< 0.450
1,2,4-Trichlorobenzene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Naphthalene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Hexachlorobutadiene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Hexachlorocyclopentadiene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2-Chloronaphthalene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Dimethyl phthalate	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Acenaphthylene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Fluorene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Acenaphthene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,4-Dinitrotoluene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,6-Dinitrotoluene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Diethyl phthalate	0.33	< 0.370	< 0.410	< 0.430	< 0.450
4-Chlorophenyl phenylether	0.33	< 0.370	< 0.410	< 0.430	< 0.450
N-Nitrosodiphenylamine	0.33	< 0.370	< 0.410	< 0.430	< 0.450

* Compound present below measurable detection limit.

Table IB-4 (continued)

Organic Analysis Results: Semivolatile Organics
DRUMMED CUTTINGS

Field Sample ID		DC-1	DC-2	DC-3	DC-4
Sample Matrix		Soil	Soil	Soil	Soil
Percent Moisture (%)		10	19	23	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Bromophenyl phenylether	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Hexachlorobenzene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Phenanthrene	0.33	< 0.370	< 0.410*	< 0.430	< 0.450
Anthracene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Di-n-Butyl phthalate	0.33	< 0.370*	< 0.410*	< 0.430*	< 0.450*
Fluoranthene	0.33	< 0.370	< 0.410*	< 0.430	< 0.450
Benzidine	1.60	< 1.800	< 2.000	< 2.100	< 2.200
Pyrene	0.33	< 0.370	< 0.410*	< 0.430	< 0.450
Butyl benzyl phthalate	0.33	< 0.370	< 0.410	< 0.430	< 0.450
3,3′-Dichlorobenzidine	0.66	< 0.730	< 0.820	< 0.860	< 0.890
Benzo(a)anthracene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Bis(2-ethylhexyl)phthalate	0.33	0.730	0.740	< 0.430*	0.570
Chrysene	0.33	< 0.370	< 0.410*	< 0.430	< 0.450
Di-n-octyl phthalate	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Benzo(b)fluoranthene	0.33	< 0.370	< 0.410*	< 0.430	< 0.450
Benzo(k)fluoranthene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Benzo(a)pyrene	0.33	< 0.370	< 0.410*	< 0.430	< 0.450
Indeno(1,2,3-cd)pyrene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Dibenzo(a,h)anthracene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Benzo(g,h,i)perylene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Phenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2-Chlorophenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2-Nitrophenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,4-Dimethyphenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,4-Dichlorophenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450

* Compound present below measurable detection limit.

Table IB-4 (continued)

Organic Analysis Results: Semivolatile Organics
DRUMMED CUTTINGS

Field Sample ID		DC-1	DC-2	DC-3	DC-4
Sample Matrix		Soil	Soil	Soil	Soil
Percent Moisture (%)		10	19	23	26
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
4-Chloro-3-methylphenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,4,6-trichlorophenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,4-dinitrophenol	1.60	< 1.800	< 2.000	< 2.100	< 2.200
4-nitrophenol	1.60	< 1.800	< 2.000	< 2.100	< 2.200
4,6-dinitro-2-methylphenol	1.60	< 1.800	< 2.000	< 2.100	< 2.200
Pentachlorophenol	1.60	< 1.800	< 2.000	< 2.100	< 2.200
Benzyl alcohol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2-methylphenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
4-methylphenol	0.33	< 0.370	< 0.410	< 0.430	< 0.450
Benzoic acid	1.60	< 1.800	< 2.000	< 2.100	< 2.200
4-chloroaniline	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2-methylnaphthalene	0.33	< 0.370	< 0.410	< 0.430	< 0.450
2,4,5-trichlorophenol	1.60	< 1.800	< 2.000	< 2.100	< 2.200
2-nitroaniline	1.60	< 1.800	< 2.000	< 2.100	< 2.200
3-nitroaniline	1.60	< 1.800	< 2.000	< 2.100	< 2.200
Dibenzofuran	0.33	< 0.370	< 0.410	< 0.430	< 0.450
4-nitroaniline	1.60	< 1.800	< 2.000	< 2.100	< 2.200
Surrogates:					
Nitrobenzene-d5	23-120	80	52	70	86
2-fluorobiphenyl	30-115	96	72	86	58
Terphenyl-d14	18-137	84	66	74	88
2-fluorophenol	24-113	64	46	57	72
Phenol-d5	24-113	85	59	68	84
2,4,6-tribromophenol	19-122	82	48	64	68

* Compound present below measurable detection limit.

Table IB-5

Inorganic Analysis Results: EP Toxicity Metals
DRUMMED CUTTINGS

Sample ID			DC-1	DC-2	DC-3	DC-4
Sample Matrix			Soil	Soil	Soil	Soil
Percent Moisture (%)						
Parameter	Code	MDL (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)	Results (mg/L)
Arsenic	As	0.05	< 0.5	< 0.5	< 0.5	< 0.5
Barium	Ba	0.01	< 5.0	< 5.0	< 5.0	< 5.0
Cadmium	Cd	0.005	< 0.1	< 0.1	< 0.1	< 0.1
Chromium	Cr	0.010	< 0.50	< 0.50	< 0.50	< 0.50
Lead	Pb	0.05	< 0.50	< 0.50	< 0.50	< 0.50
Mercury	Hg	0.0002	< 0.0008	< 0.0008	< 0.0008	< 0.0008
Selenium	Se	0.05	< 0.5	< 0.5	< 0.5	< 0.5
Silver	Ag	0.01	< 0.5	< 0.5	< 0.5	< 0.5

SAIC Science Applications International Corporation
An Employee-Owned Company

Chain of C[illegible]ody Record

Date 10-4-89 Page 2 of 2

Ship[illegible]o.

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (201) 599-0100
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Volatile Organic Compounds SW5030/8240	EP Toxicity (Metals Only) 40CFR261.24	Semi Volatile Organics SW3550/8270	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	DC-1	10-3-89	1600	Drum B	+	+	+	3	
	Soil	DC-2	10-3-89	1600	Drum F	+	+	+	3	
	Soil	DC-3	10-3-89	1600	Drum G	+	+	+	3	
	Soil	DC-4	10-3-89	1600	Drum H	+	+	+	3	

Total Number of Containers: 42

Shipment Method: Lab Courier

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 10-4-89
Time 1832

Date
Time

Relinquished by
Signature
Printed Name
Company
Date
Time

Date
Time

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734-2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building 3, San Diego, CA 92121
(619) 535-7438

APPENDIX IC

TRIP BLANK RESULT

APPENDIX IC

TRIP BLANK RESULTS

Table IC-1
QC Sample Cross Reference
TRIP BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples----	
			Site	Field ID
TB #1 (TB43288)	Volatiles	198, 199	BB	BB-1-5B
				BB-1-7B
				BB-1-9B
				BB-2-1B
				BB-2-5B
				BB-2-8B
			12	B-12-1-5B
				B-12-1-5BR
				B-12-1-7B
				B-12-1-8B
				B-12-2-1B
				B-12-2-4B
				B-12-2-6B
TB #2 (TB43619)	Volatiles	198, 199	11	B-11-1-1B
				B-11-1-4B
				B-11-1-7B
				B-11-2-1B
				B-11-2-4B
				B-11-2-4BR
				B-11-2-8B
			9	B-9-1-1B
				B-9-1-3B
				B-9-1-6B
			7	B-7-1-1B
				B-7-1-3B
				B-7-1-4B

Table IC-1 (continued)

QC Sample Cross Reference
TRIP BLANKS

QC Sample ID	Analysis	Page(s)	---Applicable Samples---- Site	Field ID
TB #2 (TB43619) (continued)	Volatiles	198, 199	6	B-6-2-1B
				B-6-2-4B
				B-6-2-7B
				B-6-2-7BR
TB #3 (TB44331)	Volatiles	198, 199	6	B-6-1-1B
				B-6-1-3B
				B-6-1-6B
			2	B-2-1-1B
				B-2-1-3B
				B-2-1-4B
				B-2-2-1B
				B-2-2-4B
				B-2-2-7B
			4	B-4-1-3B
				B-4-1-3BR
				B-4-1-4B
				B-4-1-5B

Table IC-2

Sample Tracking of Analysis Dates and Required Holding Times
Organic Analysis
TRIP BLANKS

		Volatile Organics			Semivolatile Organics					
Field Sample ID	Sampling Date	Hold Time	Analysis Date	Elapsed Time	Extraction Hold Time	Extract Date	Elapsed Time	Analysis Hold Time	Analysis Date	Elasped Time
TB #1	07/12/89	14 Days	07/17/89	5 Days	NA	NA	NA	NA	NA	NA
TB #2	07/14/89	14 Days	07/18/89	4 Days	NA	NA	NA	NA	NA	NA
TB #3	07/18/89	14 Days	07/26/89	8 Days	NA	NA	NA	NA	NA	NA

Table IC-3

Organic Analysis Results: Volatile Organic Compounds
TRIP BLANK

Laboratory ID		TB #1	TB #2	TB #3
Sample Matrix		Aqueous	Aqueous	Aqueous
Percent Moisture (%)				
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
Chloromethane	0.010	< 0.010	< 0.010	< 0.010
Bromomethane	0.010	< 0.010	< 0.010	< 0.010
Vinyl Chloride	0.010	< 0.010	< 0.010	< 0.010
Chloroethane	0.010	< 0.010	< 0.010	< 0.010
Methylene Chloride	0.005	0.011	0.005	< 0.005*
Acetone	0.010	0.029	0.019	0.014
Carbon Disulfide	0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethene	0.005	< 0.005	< 0.005	< 0.005
1,1-Dichloroethane	0.005	< 0.005	< 0.005	< 0.005
trans-1,2-Dichloroethene	0.005	< 0.005	< 0.005	< 0.005
Chloroform	0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloroethane	0.005	< 0.005	< 0.005	< 0.005
2-Butanone	0.010	< 0.010	< 0.010	< 0.010
1,1,1-Trichloroethane	0.005	< 0.005	< 0.005	< 0.005
Carbon Tetrachloride	0.005	< 0.005	< 0.005	< 0.005
Vinyl Acetate	0.010	< 0.010	< 0.010	< 0.010
Bromodichloromethane	0.005	< 0.005	< 0.005	< 0.005
1,2-Dichloropropane	0.005	< 0.005	< 0.005	< 0.005
trans-1,3-Dichloropropene	0.005	< 0.005	< 0.005	< 0.005
Trichloroethene	0.005	< 0.005	< 0.005	< 0.005
Dibromochloromethane	0.005	< 0.005	< 0.005	< 0.005
1,1,2-Trichloroethane	0.005	< 0.005	< 0.005	< 0.005
Benzene	0.005	< 0.005	< 0.005	< 0.005

* Compound [illegible] below measurable detection limit.

Table IC-3 (continued)

Organic Analysis Results: Volatile Organic Compounds
TRIP BLANK

Laboratory ID		TB #1	TB #2	TB #3
Sample Matrix		Aqueous	Aqueous	Aqueous
Percent Moisture (%)				
	MDL (mg/Kg) Wet Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.	Results (mg/Kg) Dry Wt.
Compound	Control Limits	Surrogate % Recovery	Surrogate % Recovery	Surrogate % Recovery
cis-1,3-Dichloropropene	0.005	< 0.005	< 0.005	< 0.005
2-Chloroethylvinyl ether	0.010	< 0.005	< 0.005	< 0.005
Bromoform	0.005	< 0.005	< 0.005	< 0.005
4-Methyl-2-Pentanone	0.010	< 0.010	< 0.010	< 0.010
2-Hexanone	0.010	< 0.010	< 0.010	< 0.010
Tetrachloroethene	0.005	< 0.005	< 0.005	< 0.005
1,1,2,2-Tetrachloroethane	0.005	< 0.005	< 0.005	< 0.005
Toluene	0.005	< 0.005	< 0.005	< 0.005
Chlorobenzene	0.005	< 0.005	< 0.005	< 0.005
Ethylbenzene	0.005	< 0.005	< 0.005	< 0.005
Styrene	0.005	< 0.005	< 0.005	< 0.005
Total Xylenes	0.005	< 0.005	< 0.005	< 0.005
Surrogates:				
1,2-Dichloroethane-d4	70-121	103	92	85
Toluene-d8	81-117	105	98	97
4-Bromofluorobenzene	74-121	105	100	94

* Compound present below measurable detection limit.
NR - Not reported

MeOH ext

```
                              QUANT REPORT

rator ID: USER8               Quant Rev: 6    Quant Time:  890812 14:03
:put File: ^D0674::Q6                         Injected at:  890812 13:29
a File:   >D0674::D6                    Dilution Factor:        1.00000
e: 541.025  46,097.01
c: 7001D 08/12/89PBM 100UL(5.12G/10ML MEOH) 5MLS DI + 10U

File: COND19::D2
le: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
t Calibration: 890812 12:32

           Compound                  R.T.  Scan#    Area      Conc     Units    q
 ---------------------------------- ----- ----- --------  -------  -------  ---
*Bromochloromethane                  8.07   182    31262     50.00  UG/L      64
 Trichlorofluoromethane              3.41    62      726      1.10  UG/L     100
 Methylene Chloride                  4.22    83     3046      3.46  UG/L yes  84
 Acetone                             3.33    60     2019      9.44  UG/L     100
 Acetone                             3.56    66     4128     19.30  UG/L yes 100
 Acetone                             4.26    84    13564     63.42  UG/L     100
 1,2-Dichloroethane-d4               9.46   218    45889     47.78  UG/L 96   84
*1,4-Difluorobenzene                10.75   251   148838     50.00  UG/L     100
 Vinyl Acetate                       5.74   122     7299      2.44  UG/L     100
 Vinyl Acetate                       7.10   157     1609       .94  UG/L     100
 1,1,2-Trichloroethane              15.09   363     3873      4.14  UG/L No   38
 1,1,2-Trichloroethane              15.99   386     1015      1.09  UG/L      91
 Benzene                             9.50   219     1123       .41  UG/L      73
 Bromoform                          20.61   505      100       .07  UG/L     100
*Chlorobenzene-d5                   17.50   425   132650     50.00  UG/L     100
 4-Methyl-2-pentanone               13.54   323   379469    238.55  UG/L     100
 4-Methyl-2-pentanone               13.85   331   396011    248.95  UG/L No  100
 4-Methyl-2-pentanone               14.94   359   310774    195.36  UG/L     100
 2-Hexanone                         13.54   323   362313    353.08  UG/L     100
 2-Hexanone                         13.85   331   394836    384.77  UG/L     100
 2-Hexanone                         17.50   425   393236    383.21  UG/L     100
 1,1,2,2-Tetrachloroethane          20.92   513     4482      2.62  UG/L     100
 1,1,2,2-Tetrachloroethane          21.54   529     3324      1.94  UG/L No  100
 1,1,2,2-Tetrachloroethane          21.97   540    10857      6.35  UG/L     100
 Toluene                            14.20   340     2538      1.23  UG/L yes  96
 Toluene-d8                         13.50   322     7680      2.74  UG/L      44
 Toluene-d8                         14.05   336   143068     51.06  UG/L 102  81
 Chlorobenzene                      17.50   425     3330      1.49  UG/L      72
 Ethylbenzene                       17.97   437     1733      1.32  UG/L yes 100
 Ethylbenzene                       18.32   446    10588      8.06  UG/L     100
 Styrene                            21.70   533      774       .31  UG/L      15
 Styrene                            21.93   539      277       .11  UG/L      18
 Xylene (total)                     18.32   446    10587      6.97  UG/L yes  85
 Xylene (total)                     19.25   470     4423      2.91  UG/L yes  96
 Xylene (total)                     21.70   533     3369      2.22  UG/L      13
 Bromofluorobenzene                 20.57   504    98957     50.15  UG/L 100  99
 Bromofluorobenzene                 21.54   529     2215      1.12  UG/L      25

*Compound is ISTD
```

3.46 × 500 ÷ 5.12 = 338 ug/kg

APPENDIX ID

CHAIN OF CUSTODY FORMS

Science Applications International Corporation
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Chain of Custody Record

Date 7-12-89 Page 1 of 3

Shipment No. 1

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Luyer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King (Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

					Requested Parameters														
Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 Metals) SW3050/6010	Mercury SW7471	Semivolatile Organic Compounds SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020					Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	BB-1-5A	7/11/89	1405	Background 1	X	X	X										2	Note Date Samples were
	Soil	BB-1-7A	7/11/89	1429	Background 1	X	X	X										2	Collected W/ Respect To
	Soil	BB-1-9A	7/11/89	1443	Background 1	X	X	X										2	Holding Times!
	Soil	BB-1-5B	7/11/89	1405	Background 1				X	X	X	X						1	
	Soil	BB-1-7B	7/11/89	1429	Background 1				X	X	X	X						1	
	Soil	BB-1-9B	7/11/59	1443	Background 1				X	X	X	X						1	
	Soil	BB-2-1A	7/11/89	0858	Background 2	X	X	X										2	
	Soil	BB-2-5A	7/11/89	0955	Background 2	X	X	X										2	
	Soil	BB-2-8A	7/11/89	1036	Background 2	X	X	X										2	

Cooler Temp: At lab

Shipment Method: Lab Courier

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/12/89
Time 1729

Received by
Signature M Burnett
Printed Name MIKE BURNETT
Company E + E
Date 7-12
Time 1745

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734 2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
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(201) 599-0100]

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(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Buil [illegible] San Diego, CA 92121
(619) 535-7438

Science Applications International Corporation ■ 8400 Westpark Drive McLean, Virginia 22102

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Chain of Custody Record

Date 7-12-89 Page 2 of 3

Shipment No. 1

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name 1-835-06-858-XX
Job/P.O. No. Niggara Falls IAP RI/FS

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Requested Parameters

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 Metal) SW3050/6010	Mercury SW7471	Semivolatile Organic Compounds SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020						° Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	BB-2-1B	7-11-89		Background 2				X	X	X	X							1	Note Date Samples Were
	Soil	BB-2-5B	7-11-89		Background 2				X	X	X	X							1	Collected W/ Respect To
	Soil	BB-2-8B	7-11-89		Background 2				X	X	X	X							1	Holding Times
	Soil	B-12-2-1A	7-12-89	0929	Site 12	X	X	X											2	
	Soil	B-12-2-4A	7-12-89	1002	Site 12	X	X	X											2	
	Soil	B-12-2-6A	7-12-89	1036	Site 12	X	X	X											2	
	Soil	B-12-2-1B	7-12-89	0929	Site 12				X	X	X								1	
	Soil	B-12-2-4B	7-12-89	1002	Site 12				X	X	X								1	
	Soil	B-12-2-6B	7-12-89	1036	Site 12				X	X	X								1	
																				Cooler Temp: At Lab

Shipment Method: Lab Courier

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/12/89
Time 1727

Received by
Signature M Burnett
Printed Name MIKE BURNETT
Company E+E
Date 7-12
Time 1745

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
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5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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Date 7-12-89 Page 3 of 3

Shipment No. 1

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Requested Parameters														NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
						Metal Screen (23 Metal) SW3050/6010	Mercury SW 7471	Semivolatile Organic Compounds SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020						Temperature			
	Soil	B-12-1-5A (R)	7-12-89	1214	Site 12	X	X	X												2	Note Date Samples Were
	Soil	B-12-1-7A	7-12-89	1242	Site 12	X	X	X												2	Collected W/ Respect To
	Soil	B-12-1-8A	7-12-89	1254	Site 12	X	X	X												2	Holding Times
	Soil	B-12-1-5B (R)	7-12-89	1214	Site 12				X	X	X									1	B-12-1-5 gets a replicate
	Soil	B-12-1-7B	7-12-89	1242	Site 12				X	X	X									1	sampling
	Soil	B-12-1-8B	7-12-89	1254	Site 12				X	X	X									1	
		Trip Blank #1							X			X								2	
		Cooler Blank #1																X		1	40°F - Coolant Blank at Shipment

Cooler Temp: At Lab

Relinquished by
John J King
Signature
John J. King
Printed Name
SAIC
Company

Date 7/12/89
Time 1729

Received by
M Burnett
Signature
MIKE BURNETT
Printed Name
E + E
Company

Date 7-12
Time 1745

Relinquished by

Signature

Printed Name

Company

Date

Time

Received by

Signature

Printed Name

Company

Date

Time

Total Number of Containers: 39

Shipment Method: Lab Courier

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
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6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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(619) 535-7438

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Date 7-14-89 Page 1 of 4

Ship[illegible]o. 2

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020	Total Organic Carbon SW9060		OVA Readings (ppm) *1			Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	B-11-1-1A	7/13/89	1110	Site 11	X	X	X							1				2	Note Date Samples Were
	Soil	B-11-1-4A	7/13/89	1038	"	X	X	X							1				2	Collected W/Respect To
	Soil	B-11-1-7A	7/13/89	1115	"	X	X	X							1				2	Holding Times!
	Soil	B-11-1-1B	7/13/89	1110	"				X	X	X				1				1	
	Soil	B-11-1-4B	7/13/89	1038	"				X	X	X				1				1	
	Soil	B-11-1-7B	7/13/89	1115	"				X	X	X				1				1	Cooler Temp at Shipment = 39°F
	Soil	B-11-2-1A	7/13/89	0848	Site 11	X	X	X							1				2	(R) - Replicate
	Soil	B-11-2-4A(R)	7/13/89	0914	"	X	X	X							1.5				2	
	Soil	B-11-2-8A	7/13/89	1055	"	X	X	X							1				2	
	Soil	B-11-2-1B	7/13/89	0848	"				X	X	X				1				1	
	Soil	B-11-2-4B(R)	7/13/89	0914	"				X	X	X				1.5				1	
	Soil	B-11-2-8B	7/13/89	1055	"				X	X	X				1				1	Cooler Temp At Lab:

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/14/89
Time 1745

Received by
Signature Rick Marsh
Printed Name RICK MARSH
Company ECOLOGY & ENVIRONMENT
Date 7/14/89
Time 1747

Total Number of Containers:

Shipment Method: Lab Courier

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

*1 OVA Reading 1-1.5ppm - Background

Instructions
1. Fill out form completly except for shaded areas (lab use only).
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6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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Date 7-14-89 Page 2 of 4

Shipment No. 2

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls TAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King (Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020	Total Organic Carbon SW9060		OVA Readings (ppm) *,			Temperature	No. of Containers	Observations, Comments, Special Instructions
	Soil	B-9-1-1A	7/13/89	1542	Site 9	+	+	+							<1				2	Note Date Samples Were
	Soil	B-9-1-3A	7/13/89	1610	"	+	+	+							<1				2	Collected W/Respect To
	Soil	B-9-1-6A	7/13/89	1638	"	+	+	+							<1				2	Holding Times!
	Soil	B-9-1-1B	7/13/89	1542	"				+	+	+				<1				1	
	Soil	B-9-1-3B	7/13/89	1610	"				+	+	+				<1				1	
	Soil	B-9-1-6B	7/13/89	1638	"										<1				1	Cooler Temp At Shipment 39°F
	Soil	B-7-1-1B	7/14/89	0937	Site 7					X	X	X			1½				1	(R) Replicate
	Soil	B-7-1-3B	7/14/89	0954	"					X	X	X			30				1	
	Soil	B-7-1-4B	7/14/89	1004	"					X	X	X	X		100				1	B-7-1-4B get TOC also
	Soil	B-6-2-1B	7/14/89	1147	Site 6					X	X	X			1½				1	
	Soil	B-6-2-4B	7/14/89	1208	"					X	X	X			1½				1	
	Soil	B-6-2-7B(R)	7/14/89	1238	"					X	X	X			1½				1	Cooler Temp AT Lab:

000205

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/14/89
Time 1745

Received by
Signature R. Marsh
Printed Name R. MARSH
Company E&E
Date 7/14/89
Time 1747

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

*OVA Readings 1-1.5ppm - Background

Instructions
1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
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5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

Shipment Method: Lab Courier

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734-2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ Paramus
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Bo[illegible], San Diego, CA 92121
(619) 535-7438

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Chain of C[illegible]ody Record

Date 7-14-89   Page 3 of 4

Shipm[illegible] 2

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King   (Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 Metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020	Total Organic Carbon SW9060		OVA Readings (ppm)			Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	WTR	TB#2	7-14-89		—				X			X			N/A				2	Note Date Samples Were
	WTR	CB#2	7-14-89		—										N/A			X	2	Collected W/ Respect To
																				Holding Times!
																				Cooler Temp At Shipment = 39°F

000206

Cooler Temp At Lab:

Relinquished by	Date	Received by	Date
Signature: John J King	7/14/89	Signature: R Marsh	7/14/89
Printed Name: John J King	Time	Printed Name: R. MARSH	Time
Company: SAIC	1745	Company: E & E	1747

Relinquished by	Date	Received by	Date
Signature		Signature	
Printed Name	Time	Printed Name	Time
Company		Company	

Total Number of Containers:

Shipment Method: Lab Courier

Instructions

1. Fill out form completly except for shaded areas (lab use only).
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Date 7-14-89 Page 4 of 4

Shipment No. 2

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAL RI/FS
Job/P.O. No. 1-835-06-850-XX

Sampler (Signature) John J King (Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Soil Moisture ASTM D2216	Density ASTM D854	Grain Size ASTM D422	Plasticity ASTM D424										NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	B-7-1-3C	7-14-89		Site 7	X	X	X	X										2	
																				Cooler Temp At Shipment = 39°F

Cooler Temp At Lab:

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/14/89
Time 1745

Received by
Signature R. Marsh
Printed Name R. MARSH
Company E&E
Date 7/14/89
Time 1747

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

Shipment Method: Lab Courier

Instructions

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3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
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5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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Date 7-18-89 Page 1 of 2

Ship[illegible]o. 3

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King (Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

						Requested Parameters														
Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 Metals) SW3050/6010	Lead SW3050/7420	Semi VOCs SW3550/8270	VOCs SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020	Total Organic Carbon SW9060				OVA Readings* (ppm)	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	B-6-1-1B	7/17/89	0941	Site 6					X	X	X					1.5		1	Cooler Temp At ~~Lab~~ Shipment: 39°F
	Soil	B-6-1-3B	7/17/89	0947	"					X	X	X					1.5		1	
	Soil	B-6-1-6B	7/17/89	1041	"					X	X	X					1.5		1	
																	~~1.5~~			
	Soil	B-2-1-1B	7/17/89 ~~7/14/89~~	1417	Site 2					X	X	X					1.5		1	
	Soil	B-2-1-3B	7/17/89	1428	"					X	X	X					1.5		1	
	Soil	B-2-1-4B	7/17/89	1437	"					X	X	X					1.5		1	
																	~~1.5~~			
	Soil	B-2-2-1B	7/17/89	1528	Site 2					X	X	X					1.5		1	
	Soil	B-2-2-4B	7/17/89	1551	"					X	X	X					1.5		1	
	Soil	B-2-2-7B	7/17/89	1617	"					X	X	X					1.5		1	
																				Measure Temp Upon Opening At Lab
																				Blank Cooler Temp At Lab:

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/18/89
Time 1724

Received by
Signature M Burnett
Printed Name MIKE BURNETT
Company E+E
Date 7-18
Time 1724

*Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

*OVA Reading of 1.5-2 ppm Background

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

Shipment Method: Lab Courier

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Date 7-18-89 Page 2 of 2

Shipment No. 3

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name: Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 Metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/~~82~~ 8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Organics SW5030/8020	Total Organic Carbon SW9060				OVA Readings* (ppm)	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	B-4-1-3B(R)	7/18/89	1156	Site 4					X	X	X					100		1	Cooler Temp At ~~Lab~~ Shipment: 39°F
	Soil	B-4-1-4B	7/18/89	1217	"					X	X	X	X				100		1	B-4-1-3(R)B needs to be Replicated
	Soil	B-4-1-5B	7/18/89	1233	"					X	X	X					20		1	~~B-4-1-5B~~
																				B-4-1-4B - Gets TOC analysis
	WTR	TB#3	7/18/89		—							X							2	
	WTR	CB#3	7/18/89		—													X	1	
																				Measure Temp Upon Opening At Lab
																				Blank Cooler Temp At Lab: —

000209

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/18/89
Time 1724

Received by
Signature
Printed Name MIKE BREVETT
Company E+E
Date 7-18
Time 1724

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers: 15

*OVA Readings of 1.5-2.0 ppm = Background

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

Shipment Method: Lab Courier

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734 2000

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building, San Diego, CA 92121
(619) 535-7438

Science Applications International Corporation
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Chain of [illegible]tody Record

Date 7-20-89 Page 1 of 2

Ship[illegible]o.

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541
Project Manager Barry Langer
Project Name: Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-856-XX

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesse St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Havard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Requested Parameters: Metal Screen (23 metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020					OVA Reading (ppm) *1	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	B-1-1-2B	7-19-89	0905	Site 1					X	X	X					2		1	Cooler Blank Temp At Shipment 38°F
	Soil	B-1-1-3B	7-19-89	0925	"					X	X	X					20		1	
	Soil	WB-13-1-5A	7-19-89	1041	Site 13	X	X	X					.4		1	
	Soil	WB-13-1-5B	7-19-89	1041	Site 13				X	X	X						.4		1	
	Soil	WB-13-2-4A	7-19-89	1147	Site 13	X	X	X									2		1	
	Soil	WB-13-2-5A	7-19-89	1201	"	X	X	X									2		1	
	Soil	WB-13-2-4B	7-19-89	1147	"				X	X	X						2		1	
	Soil	WB-13-2-5B	7-19-89	1201	"				X	X	X						2		1	
	WTR	CB*4	7-19-89	—	—													X	1	Record Cooler Blank (CB*4) Temp
																				Upon Arrival At Lab ____ °F

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/20/89
Time

Received by
Signature
Printed Name MIKE BURRETT
Company E+E
Date 7-20-89
Time 17 05

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

*1 Background OVA Readings = 1.5-2.0 ppm

Shipment Method: Lab Courier

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734-2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

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1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building 3, San Diego, CA 92121
(619) 535-7438

White Laboratory Pink Project Manager Yellow Project QAO Goldenrod Field Sample Ma...

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Chain of Custody Record

Date 7-20-89 Page ~~3~~ 2 of ~~3~~ 2

Shipment No. 4

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541
Project Manager Barry Langer
Project Name: Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

						Requested Parameters														
Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Soil Moisture Content (ASTM D2216)	Density (ASTM D854)	Grain Size (ASTM D422)	Plasticity (ASTM D4234)								OVA Readings (ppm) *1	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	B-4-~~4~~-4C	7-18-89	1217	Site 4	X	X	X	X								100		2	Cooler Temp At Shipment 38 °F

Record Blank Cooler Temp Upon Arrival At Lab °F

Relinquished by	Date	Received by	Date
Signature John J King Printed Name John J King Company SAIC	7/20/89 Time	Signature M Burnett Printed Name MIKE BURNETT Company E+E	7-20-89 Time 1705
Relinquished by Signature Printed Name Company	Date Time	Received by Signature Printed Name Company	Date Time

Total Number of Containers: 11

*1 Background OVA Readings ≅ 1.5-2 ppm

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

Shipment Method: Lab Courier

SAIC Location (circle)

Washington, D.C.
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(703) 734-2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ Paramus
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S[illegible] Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building 3, San Diego, CA 92121
(619) 535-7438

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Date 7-21-89 Page 1 of 1

Ship[illegible]o. 5

Name John J King
Address 1-Sears Dr Paramus NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Sampler (Signature) John J King
(Printed Name) John J King

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 Metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020	Mercury SW 7471					OVA Readings (ppm) *1	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
✓	Soil	WB-13-4-5A	7-20-89	1016	Site 13	X	X	X										1		1	Cooler Blank Temp At Shipment 35 °F
✓	Soil	WB-13-4-5B	7-20-89	1016	11				X	X	X							1		1	
																					Only 1 sleeve recovered for
✓	Soil	WB-13-3-1A	7-20-89	1407	Site 13	X	X	X										1.5		1	WB-13-3-7; do all analyses
✓	Soil	WB-13-3-1B	7-20-89	1407	11				X	X	X							1.5		1	WB-13-3-6A+B also gets
✓	Soil	WB-13-3-6A (R)	7-20-89	1456	11	X	X	X										9.4		1	replicated
✓	Soil	WB-13-3-6B (R)	7-20-89	1456	11				X	X	X							9.4		1	
✓	Soil	WB-13-3-7A	7-20-89	1508	11	X	X	X	X	X	X							10		1	
✓	Soil	WB-10-4-5A	7-21-89	1055	Site 10	X	X	X										.6		1	
✓	WTR	GW-MW13-3PH	7-20-89	1710	Site 13				X									—		2	
✓	Soil	WB-10-4-5B	7-21-89	1055	Site 10				X	X	X							.6		1	
✓	WTR	CB#5	7-20-89	—	—													—	X	1	Record Cooler Blank (CB# 5)
	~~Soil~~	~~WB-8-6-8A~~	~~7-21-89~~	~~1527~~	~~Site 8~~	~~X~~		~~X~~					~~X~~					~~8~~			Temp Upon Arrival At Lab °F
	~~Soil~~	~~WB-8-6-8B~~	~~7-21-89~~	~~1527~~	~~Site 8~~					~~X~~	~~X~~	~~X~~						~~8~~			

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 7/21/89
Time 1722

Received by
Signature
Printed Name William H. Howard
Company E+E
Date 7-21-89
Time 1720

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers: 12

*1 Background OVA Readings = 1.0-1.5 ppm

Shipment Method: Lab Courier

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only: Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734 2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building 3, San Diego, CA 92121
(619) 535-7438

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Chain of Custody Record

Date 7/25/89 Page 1 of 1

Shipment No. 6

Name Michael M. Bolen
Address 1 SEARS DRIVE PARAMUS, NJ 07652
Phone Number Field (716) 285-2541 / Office (201) 599-0100
Project Manager Barry Langer
Project Name NIAGARA FALLS IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Laboratory Name Ecology + Environment
Address 4285 Genesee St
BUFFALO, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Sampler (Signature) M. Bolen (Printed Name) Michael M. Bolen

Requested Parameters

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	METAL SCREEN (23) SW3050/6010	LEAD SW3050/7420	MERCURY SW 7471	SEMIVOLATILE ORG. COMP. SW 3550/8270	Volatile Organic Comp. SW 5030/8240	PETROLEUM HYDROCARBONS SW 3550/E418.1	Soil MOISTURE CONTENT ASTM D2216	AROMATIC VOLATILE COMPOUNDS SW5030/8020		Total organic Carbon SW9060		OVA READINGS (PPM)	TEMPERATURE	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	WB-9-7-6A	7/24/89	1127	Site 9	X	X		X								0		1	
	Soil	WB-9-7-6B	7/24/89	1127	Site 9					X	X	X					0		1	
	Soil	WB-8-5A-1A	7/25/89	0947	Site 8	X		X	X								5		1	
	Soil	WB-8-5A-1B	7/25/89	0947	Site 8						X	X	X				5		1	
	Soil	WB-8-5A-4A	7/25/89	1018	Site 8	X		X	X								1.5		1	
	Soil	WB-8-5A-4B	7/25/89	1018	Site 8						X	X	X				1.5		1	
	Soil	WB-8-5A-7A	7/25/89	1056	Site 8	X		X	X								1.5		2	COMBINE SLEEVES
	Soil	WB-8-5A-7B	7/25/89	1056	Site 8						X	X	X				1.5		1	30% Full
	WTR	CB#6	7/25/89	—	—													X	1	AT PICKUP 35 °F
	Soil	WB-5-5-6A	7/25/89	1625	Site 5	X		X	X										1	
	Soil	WB-5-5-6B	7/25/89	1625	Site 5						X	X	X		X		02		1	

TEMP. UPON ARRIVAL AT LAB ———

Relinquished by
M. Bolen
Signature
Michael M. Bolen
Printed Name
SAIC
Company

Date

Time

Received by
M. BURRETT
Signature
M. Burrett
Printed Name
E+E
Company

Date 7-25-89

Time 1700

Relinquished by

Signature

Printed Name

Company

Date

Time

Received by

Signature

Printed Name

Company

Date

Time

Total Number of Containers: 12 ~~10~~ ~~11~~ QV

Shipment Method: LAB COURIER

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734-2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599 0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, B, San Diego, CA 92121
(619) 535 7438

Science Applications International Corporation
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Chain of [illegible]tody Record

Date 7-28-89 Page 1 of 1

Ship[illegible]o.

Name John E. Vanderslice
Address One Sears Dr., Paramus, NJ 07652
Phone Number Field (716) 285-2541/office (201) 599-0100
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) (Printed Name)

Laboratory Name Ecology & Environment
Address 4285 Genesee St.
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23) SW 3050/6010	Lead SW 3050/7420	Mercury SW 7471	Semi Volatile Organics SW 3550/8270	Volatile organic Compounds SW 5030/8240	Petroleum Hydrocarbons SW 3550/E418.1	Soil moisture Content ASTM D 2216	Aromatic Volatile Comp. SW 5030/8020	Density ASTM D 854	Grain Size ASTM D 422	Plasticity ASTM D 424	OVA Reading (ppm)*	Temperature	NO. OF CONTAINERS
	Soil	WB-3-7-9A	7/27/89	1136	Site 3	X	X	X									1		2
	Soil	WB-3-7-9B	7/27/89	1136	. .					X	X	X					1		1
	Soil	WB-3-7-9C	7/27/89	1136	. .							X		X	X	X	1		2
	Soil	WB-5-5-5C	7/25/89	1620	Site 5							X		X	X	X	1		2
	Wtr	CB#7	7/28/89		–												N/A	X	1

OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS

Cooler Temp at Shipment =35 °F

Cooler Temp at Lab ___

Relinquished by
John E. Vanderslice
Signature
John E. Vanderslice
Printed Name
SAIC
Company
Date 7/28/89
Time 1700

Received by
M BURRETT
Signature
M
Printed Name
E+E
Company
Date 7-28-89
Time 1715

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers:

* OVA Readings 1 ppm Background

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

Shipment Method: Lab Courier

SAIC Location (circle)

Washington, D.C.
8400 Westpark Dr., McLean, VA 22102
(703) 734 2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

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One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

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Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building 3, San Diego, CA 92121
(619) 535-7438

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Sample Manager

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Date 8-1-89 Page 1 of 1

Shipment No. 8

Name John J King
Address 1 Sears Dr Paramus, NJ
Phone Number (201) 599-0100
Project Manager Barry Langer
Project Name Niagara IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) John J King (Printed Name) John J King

Laboratory Name Ecology & Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Requested Parameters

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 metals) SW3050/6010	Lead SW3050/7420	Semi Vols SW3550/8270	Volatile Organics SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture ASTM D2216						OVA Readings (ppm) *	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	WB-9-6-3A	7-31-89	1000	Site 9	X	X	X									100		2	Cooler Blank Temp At Pickup 35 °F
	Soil	WB-9-6-3B	7-31-89	1000	"				X	X	X						100		1	
	Soil	WB-9-6-4A	7-31-89	1012	"	X	X	X									1.5		2	
	Soil	WB-9-6-4B	7-31-89	1012	"				X	X	X						1.5		1	
	Soil	WB-9-5-6A	7-31-89	1452	"	X	X	X									.8		2	
	Soil	WB-9-5-6B	7-31-89	1452	"				X	X	X						.8		1	
	Soil	WB-10-1D-2A	8-1-89	1532	Site 10	X	X	X									80		2	
	Soil	WB-10-1D-2B	8-1-89	1532	"				X	X	X						80		1	
	Soil	WB-10-1D-1A	8-1-89	1520	"	X	X	X									70		1	
	Soil	WB-10-1D-1B	8-1-89	1520	"				X	X	X						70		1	
																				Record Cooler Blank (CB#8) Temp
	WTR	CB#8	7-31-89	—														X	1	Upon Arrival At Lab °F

Relinquished by
John J King
Signature
John J King
Printed Name
SAIC
Company

Date 8-1-89
Time 1720

Received by
M BURNETT
Signature
M Burnett
Printed Name
E+E
Company

Date 8-1-89
Time 1722

Total Number of Containers: 15

Shipment Method: Lab Courier

* Background OVA Readings ~.8-1.5 ppm

Relinquished by
Signature
Printed Name
Company

Date
Time

Received by
Signature
Printed Name
Company

Date
Time

Instructions
1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

Washington, D.C.
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Oakridge
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(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

Denver
1626 Cole Boulevard, Suite 270, Golden, CO 80401
(303) 231-9094

Seattle
13400B Northup Way, S38, [illegible], WA 98005
(206) 747-7899

San Diego
4224 Campus Point, Building 3, San Diego, CA 92121
(619) 535-7438

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Chain of [redacted]ody Record

Date Aug. 4, 1989 Page 1 of 1

Ship[redacted] 9

Name John J King
Address 1 Sears Dr. Paramus, NJ
Phone Number (201) 599-0100
Project Manager Larry Langer
Project Name: Niagara IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) (Printed Name) Laurie Lamb

Laboratory Name Ecology and Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No. (R)	Date	Time	Site/Zone	Metal Screen (22 metals) SW3050/6010	Mercury SW7471	Semivolatile Organic Compounds SW3550/8270	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020	Total Organic Carbon SW9060					OVA Readings (ppm) *	Temperature	No. of Containers	Observations, Comments, Special Instructions
	~~Soil~~	~~WB-8-20-7A~~	~~8-3-89~~	~~1024~~	~~8~~	X	X	X									~~1.0~~		~~2~~	Cooler Blank Temp at Pickup 37°F
	~~Soil~~	~~WB-8-20-7B~~	~~8-3-89~~	~~1024~~	~~8~~				X	X	X	X					~~1.0~~		~~1~~	
	Soil	WB-8-20-7A(R)	8-3-89	1024	8	X	X	X				LK					1.0		2	WB-8-20-7A+B both get
	Soil	WB-8-20-7B(R)	8-3-89	1024	8				X	X	X	X					1.0		1	replicated in lab
																				Record Cooler Blank (CB#9)
	WTR	CB#9	8-4-89	—														X	1	Temp Upon Arrival at Lab ___°F

Relinquished by
Signature John J King
Printed Name John J King
Company SAIC
Date 8-4-89
Time 1500

Received by
Signature
Printed Name
Company
Date
Time

Relinquished by
Signature Scott Straus
Printed Name
Company
Date 8-4-89
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers: 4

Shipment Method: Lab Courier

* Background OVA Readings = .8-1.5 ppm

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

SAIC Location (circle)

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(703) 734-2500

Oakridge
800 Oakridge Tnpk., Oakridge, TN 37830
(615) 482-9031

[✓ *Paramus*
One Sears Drive, Paramus, NJ 07652
(201) 599-0100]

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(303) 231-9094

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(206) 747-7899

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(619) 535-7438

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Chain of Custody Record

Date 8-8-89 Page 1 of 1

Shipment No. 10

Name John J King
Address 1 Sears Dr Paramus, NJ 07652
Phone Number (716) 285-2541 (Field)
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature)
(Printed Name) Laurie Lamb

Laboratory Name Ecology and Enviro
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Requested Parameters: Metal Screen (23 metals) SW3050/6010	Mercury SW7471	Semivolatile Organic Compounds SW3550/8270	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020						OVA Readings (ppm)	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	WB-8-30-1A	8-7-89	1015	8	X	X	X									1.0		2	Cooler Blank Temp at Pickup 32 °F
	Soil	WB-8-30-1B	8-7-89	1015	8				X	X	X						1.0		1	
																				Record Cooler Blank (CB#10) Temp
	WTR	CB#10	8-8-89	—	—													X	1	Upon Arrival at Lab ______ °F

Relinquished by J. R. Carter III
Signature
JOHN R. CARTER III
Printed Name
SAIC
Company

Date 8/8/89
Time 1630

Received by M. BURRETT
Signature M Burrett
Printed Name E+E
Company

Date 8-8-89
Time 1710

Relinquished by
Signature
Printed Name
Company

Date
Time

Received by
Signature
Printed Name
Company

Date
Time

Total Number of Containers: 4

Shipment Method: Lab Courier

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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(201) 599-0100]

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(206) 747-7899

San Diego
4224 Campus Point, Bui[illegible], San Diego, CA 92121
(619) 535-7438

White: Laboratory Pink: Project Manager Yellow: Project QAO Gold: [illegible]

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Date 8-10-89 Page 1 of 1

Shipment No. 11

Name John J King
Address 1 Sears Dr Paramus, NJ
Phone Number (201) 599-0100
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) J. R. Carter III (Printed Name) JOHN R. CARTER III

Laboratory Name Ecology + Environment
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

						Requested Parameters													
Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23 metals) SW3050/6010	Lead SW3050/7420	Mercury SW 7471	Semivolatile Organic Compounds SW3550/8270	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW3550/E418.1	Soil Moisture Content ASTM D2216	Aromatic Volatile Compounds SW5030/8020				*OVA Readings (ppm)	Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	WB5-1D-1A(R)	8-10-89	0900	5	X		X	X								2.0		2	Cooler Blnk Temp at Pickup 34°
		WB-5-1D-1B(R)	8-10-89	0900	5						X	X	X				2.0		1	(R):
		WB-3-3D-1A	8-10-89	1435	3	X	X	X									1.0		2	WB-5-1D-1A & B both get
		WB-8-1D-1A	8-9-89	1030	8	X		X	X								1.0		2	replicated in the lab.
		WB-8-1D-1B	8-9-89	1030	8						X	X	X				1.0		1	
		WB-3-3D-1B	8-10-89	1435	3					X	X	X					1.0		1	
																				Record Cooler Blank (CB#11) Temp
	WTR	CB#11	8-10-89	—	—													X	1	Upon Arrival at Lab °F

Relinquished by
Signature J. R. Carter III
Printed Name JOHN R. CARTER III
Company SAIC
Date 8/10/89
Time 1730

Received by
Signature John Stack
Printed Name JOHN STACK
Company
Date 8/10/89
Time 5:35 PM

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Total Number of Containers: 10

*Background OVA 1.0 - 2.0 ppm.

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

Shipment Method: Lab Courier

SAIC Location (circle)

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(703) 734-2500

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(615) 482-9031

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(201) 599-0100]

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(303) 231-9094

Seattle
13400B Northup Way, S38, Bellevue, WA 98005
(206) 747-7899

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(619) 535-7438

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Date 8-11-89 Page 1 of 1

Shipment No. 12

Name John J King
Address 1 Sears Dr Paramus, NJ
Phone Number (201) 599-0100
Project Manager Barry Langer
Project Name Niagara Falls IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) (Printed Name) Laurie Lamb

Laboratory Name Ecology+Environm
Address 4285 Genesee St
Buffalo, NY 14225
Phone (716) 631-0360
Contact Name Bill Howard

Requested Parameters

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	Metal Screen (23metals) SW 3050/6010	Lead SW3050/7420	Mercury SW 7471	Volatile Organic Compounds SW5030/8240	Petroleum Hydrocarbons SW 3550/E418.1	Soil Moisture Content ASTM D2216	Total Organic Carbon SW 9060						Temperature	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	Soil	WB-3-4D-1A(D)	8-11-89	0910	3	X	X	X											2	Cooler Blank Temp @ Pickup
	Soil	WB-3-4D-1B(D)	8-11-89	0910	3				X	X	X								1	36 °F
	Soil	WB-3-4D-2A	8-11-89	0917	3	X	X	X											2	WB-3-4D-1A+B both get
	Soil	WB-3-4D-2B	8-11-89	0917	3				X	X	X	X							1	replicated in the lab
																				Record Cooler Blank (CB#12) Temp
	WTR	CB#12	8-11-89	—	—													X	1	Upon arrival at Lab

000219

Relinquished by:	Date	Received by:	Date
Signature	8-11-89	John M Stack E+E Signature	8-11-89
Laurie Lamb Printed Name	Time 1530	JOHN M. STACK Printed Name	Time 1531
SAIC Company		ECOLOGY + ENVIRONMENT Company	

Relinquished by	Date	Received by	Date
Signature		Signature	
Printed Nam	Time	Printed Name	Time
Company		Company	

Total Number of Containers: 7

Shipment Method: Lab Courier

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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(615) 482-9031

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(201) 599-0100]

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(303) 231-9094

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13400B Northup Way, S[illegible]levue, WA 98005
(206) 747-7899

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(619) 535-7438

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Chain of C[illegible]ody Record

Date 8/16/89 Page 1 of 1

Ship[illegible]o. 13

Name JOHN J. KING
Address 1 SEARS DR. PARAMUS NJ
Phone Number 201-599-0100
Project Manager BARRY LANGER
Project Name NIAGRA FALLS IAP RI/FS
Job/P.O. No. 1-835-06-858-XX

Sampler (Signature) J. R. Carter III (Printed Name) JOHN R. CARTER III

Laboratory Name ECOLOGY & ENVIRON
Address 4285 GENESEE ST
BUFFALO, N.Y. 14225
Phone (716) 631-0360
Contact Name BILL HOWARD

Laboratory No.	Matrix	Sample No.	Date	Time	Site/Zone	METALS SCREEN (23) SW 3050/6010	LEAD SW 3050/7420	MERCURY SW 7471	VOLATILE ORGANIC COMPOUNDS SW 5030/8240	PETROLEUM HYDROCARBONS SW 3550/EA418.1	SOIL MOISTURE CONTENT ASTM D2216							TEMPERATURE	NO. OF CONTAINERS	OBSERVATIONS, COMMENTS, SPECIAL INSTRUCTIONS
	SOIL	WB-3-2D4A(R)	8/16/89	1101	3	X	X	X											2	WB-3-2D-4A,B BOTH
	SOIL	WB-3-2D4B(R)	8/16/89	1101	3				X	X	X								1	GET REPLICATED IN LAB
	SOIL	WB-3-2D-5A		1110	3	X	X	X	~~35~~										1	
	SOIL	WB-3-2D-5B		1110	3				X	X	X								1	
	SOIL	WB3-2D-6A		1130	3	X	X	X											1	
	SOIL	WB-3-2D-6B		1130	3				X	X	X								1	
																				COOLER TEMP AT PICKUP:
																				36 °F
																				RECORD COOLANT BLANK
	WATER	CB #13	8/16/89	—	—												-	X	1	TEMP UPON LAB ARRIVAL= °F

Relinquished by
Signature J. R. Carter III
Printed Name JOHN R. CARTER III
Company SAIC
Date 8/16/89
Time 1725

Received by
Signature John M. Stack
Printed Name JOHN M. STACK
Company Ecology + Environment
Date 8/16/89
Time 5:25PM

Total Number of Containers: 8

Shipment Method: LAB COURIER

Relinquished by
Signature
Printed Name
Company
Date
Time

Received by
Signature
Printed Name
Company
Date
Time

Instructions

1. Fill out form completly except for shaded areas (lab use only).
2. Complete in ballpoint pen. Draw one line through errors and initial.
3. Request analyses using EPA method method numbers only. Consult the project QAPP for instructions. Complete as shown.
4. Reference all field QC samples to the applicable site or zone.
5. Note all applicable preservatives.
6. Group all sample containers and requested analyses from one sampling location together. Do not list individually.

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(206) 747-7899

San Diego
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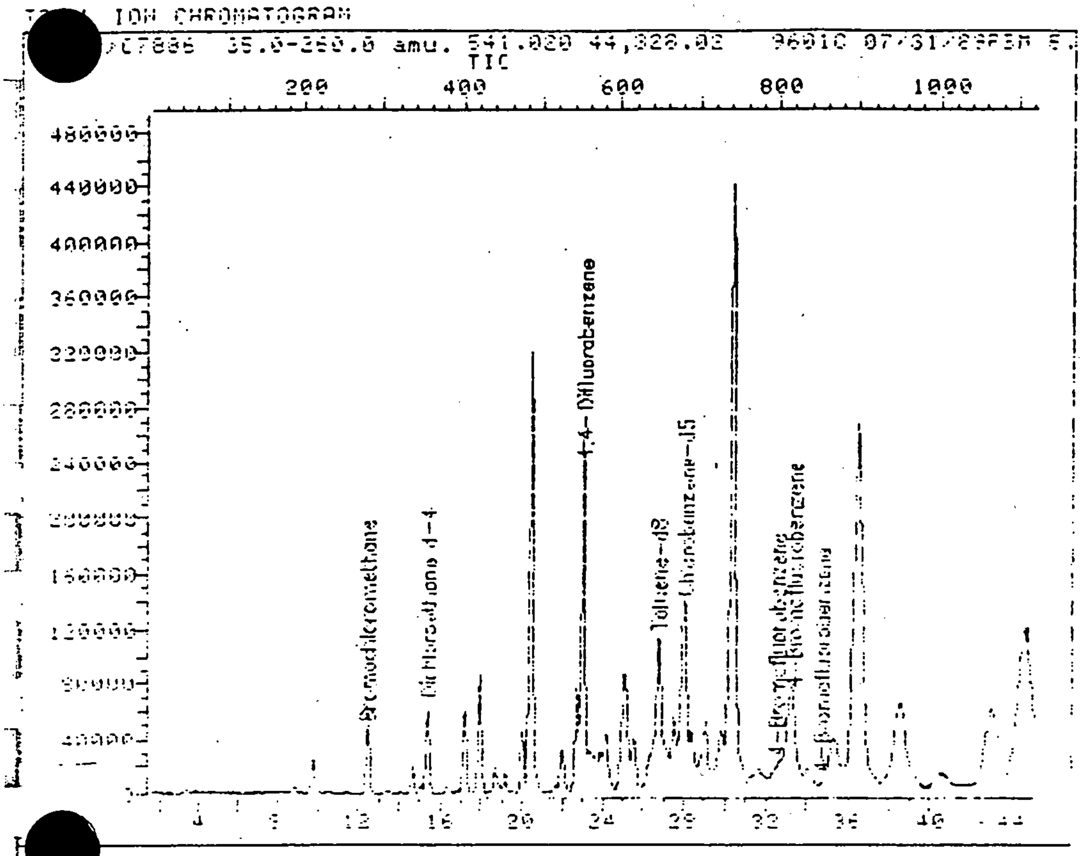
(619) 535-7438

Appendix 1E

TOTAL ION CHROMATOGRAM



```
Data File: >C7886::D5          Quant Output File: >C7886::
Name: 541.020 44,328.02
Misc: 9601C 07/31/89PM 5.30G + 5MLS DI + 10ULS IS

Id File: CAN093::D7
Title: VOA ID FILE FOR SOILS ON 9601C (INT. CAL.)
Last Calibration: 890731 11:44

Operator ID: USFR2
Quant Time:  890731 16:23
Injected at: 890731 15:38
```

Standard ✓
Hold Time Violation
Clock
Contamination

```
                                  QUANT REPORT

erator ID: USER2                  Quant Rev: 6     Quant Time: 890731 16:23
itput File: ^C7886::D7                              Injected at: 890731 15:38
ata File:   >C7886::D5                          Dilution Factor:      1.00000
me: 541.020 44,328.02
sc: 9601C 07/31/89PBM 5.30G + 5MLS DI + 10ULS IS/SS

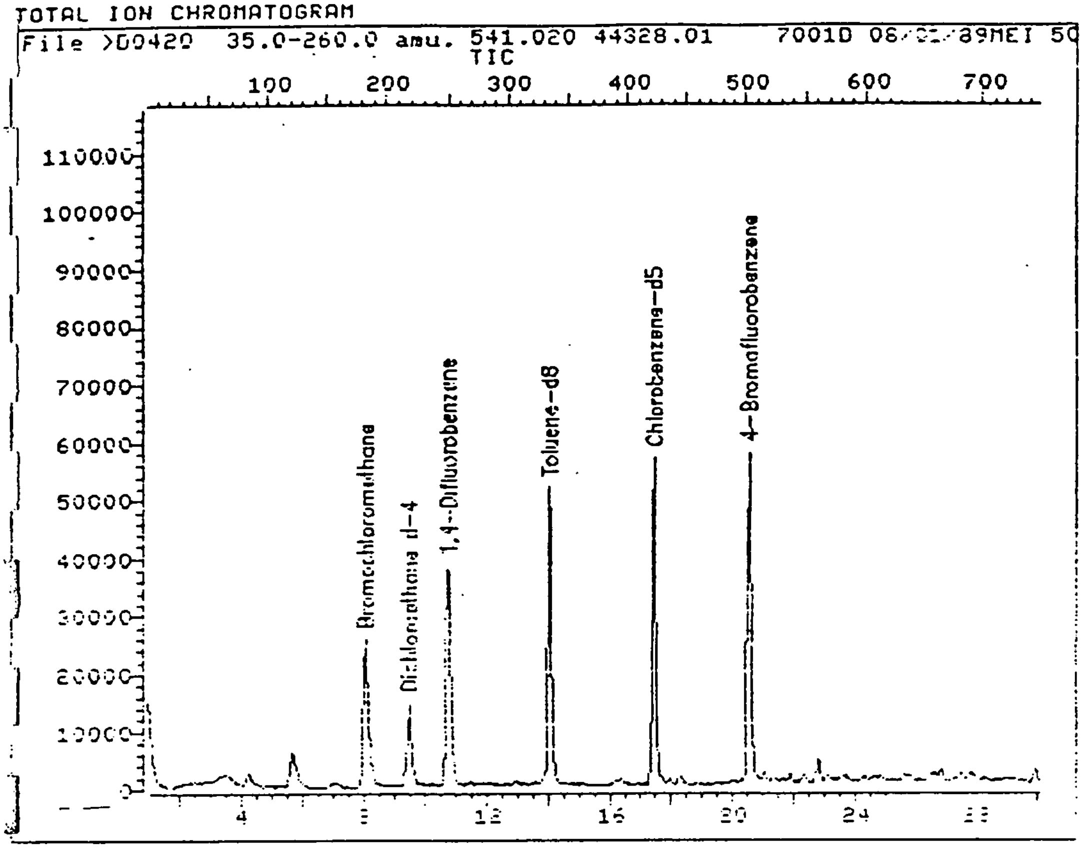
 File: CONC93::D7
tle: VOA ID FILE FOR SOILS ON 9601C (INT. CAL.)
ast Calibration: 890731 11:44

               Compound                   R.T.  Scan#    Area       Conc    Units    q
 ------------------------------------   -----  -----  --------  --------  -------  ---
1) *Bromochloromethane                   12.42   280     80540 ✓  250.00  NGS       83
)  Vinyl Chloride                         4.79    83       134       .57  NGS      100
)  Methylene Chloride                     8.90   189     11545     33.72  NGS       89
7) Acetone                                9.44   203      471^       .97  NGS       51
)  Acetone                                9.79   212    204112    419.30  NGS       73
)  Carbon Disulfide                      10.52   231     16737     13.72  NGS  ✓   100
)  1,2-Dichloroethane-d4                 15.37   356    181743    228.75  NGS 92 ✓  85
)  1,2-Dichloroethane                    15.44   358      8188      8.29  NGS       52
)  ~~2~~-Butanone                        14.63   337      3437     25.98  NGS      100
)  2-Butanone                            15.02   347      1169      8.84  NGS      100
)  2-Butanone                            15.37   356     21265    155.95  NGS      100
)  *1,4-Difluorobenzene                  23.04   554    331860 ✓  250.00  NGS       1
)  1,1,1-Trichloroethane                 16.20   393      1454      1.87  NGS       7
9) Vinyl Acetate                         16.34   381     32980     23.85  NGS      100
)  Vinyl Acetate                         17.15   402     28137     20.35  NGS      100
)  Vinyl Acetate                         17.92   422     32231     23.31  NGS      100
)  Bromodichloromethane                  17.19   403      5683      7.80  NGS       40
)  Bromodichloromethane                  17.96   423      1862      2.59  NGS       77
)  cis-1,3-Dichloropropene               20.40   486     26772     29.37  NGS      100
6) Benzene                               20.44   487   1303776    924.08  NGS       96
)  trans-1,3-Dichloropropene             20.40   486     26772     52.28  NGS      100
)  2-Chloroethylvinylether               22.61   543       609      2.15  NGS      100
)  2-Chloroethylvinylether               22.77   547      1125      3.98  NGS      100
0) *Chlorobenzene-d5                     28.05   683    272447 ✓  250.00  NGS      100
)  4-Methyl-2-pentanone                  23.00   553     49077     49.94  NGS      100
)  4-Methyl-2-pentanone                  23.81   574     51787     52.70  NGS      100
)  4-Methyl-2-pentanone                  24.16   583     26718     27.19  NGS      100
)  2-Hexanone                            25.05   606    155835    178.01  NGS      100
)  2-Hexanone                            25.56   619     96057    109.73  NGS      100
)  2-Hexanone                            26.02   631      1990      2.27  NGS      100
)  1,1,2,2-Tetrachloroethane             25.02   605     39031     57.24  NGS      100
)  1,1,2,2-Tetrachloroethane             25.56   619     12335     18.09  NGS      100
)  1,1,2,2-Tetrachloroethane             26.29   638     32942     48.31  NGS      100
5) Toluene                               26.91   654     23102     25.46  NGS       91
)  Toluene-d8                            26.72   649    362319    262.27  NGS 105   89
)  Chlorobenzene                         27.86   678     38851     34.43  NGS       4
)  Chlorobenzene                         29.05   709     20689     18.72  NGS
)  Ethylbenzene                          30.38   743    807757   1375.19  NGS E    10
)  Xylene (total)                        35.26   869     73388    107.74  NGS       91
)  Xylene (total)                        3[illegible] [illegible]9  609770  895.18  NGS  98
)  Xylene (total)                        36.54   902   496271^    728.55  NGS       87
)  Bromofluorobenzene                    32.51   798      7094      9.18  NGS      100
)  Bromofluorobenzene                    33.32   819    215330    278.77  NGS 112 ✓ 100
```

```
           Compound                    R.T.  Scan#    Area      Conc    Units    q
------------------------------------  -----  -----  --------  --------  -------  ---
1)  Bromofluorobenzene                 34.68   854      9133     11.82  NGS      100
* Compound is ISTD
```

B-4-1-3B
methanol
extract

TOTAL ION CHROMATOGRAM



```
Data File: >D0420::D4            Quant Output File: ^D0420::Q6
Name: 541.020 44328.01
Misc: 7001D 08/01/89MEI 50ULS(5.77G/10MS) SMLS  + 1 UL IS SS

Id File: CON019::D2
Title: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
Last Calibration: 890801 15:18

Operator ID: USER3
Quant Time:  890801 21:50
Injected at: 890801 21:17
```

MeOH Ext

```
                              QUANT REPORT

e   r ID: USER8             Quant Rev: 6     Quant Time:   890801 21:50
put File: ^D0420::Q6                        Injected at:   890801 21:17
a File:    >D0420::D4                    Dilution Factor:        1.00000
me: 541.020 44328.01
sc: .7001D 08/01/89MEI 50ULS(5.57G/10MS)/5MLS   + 10UL IS/SS

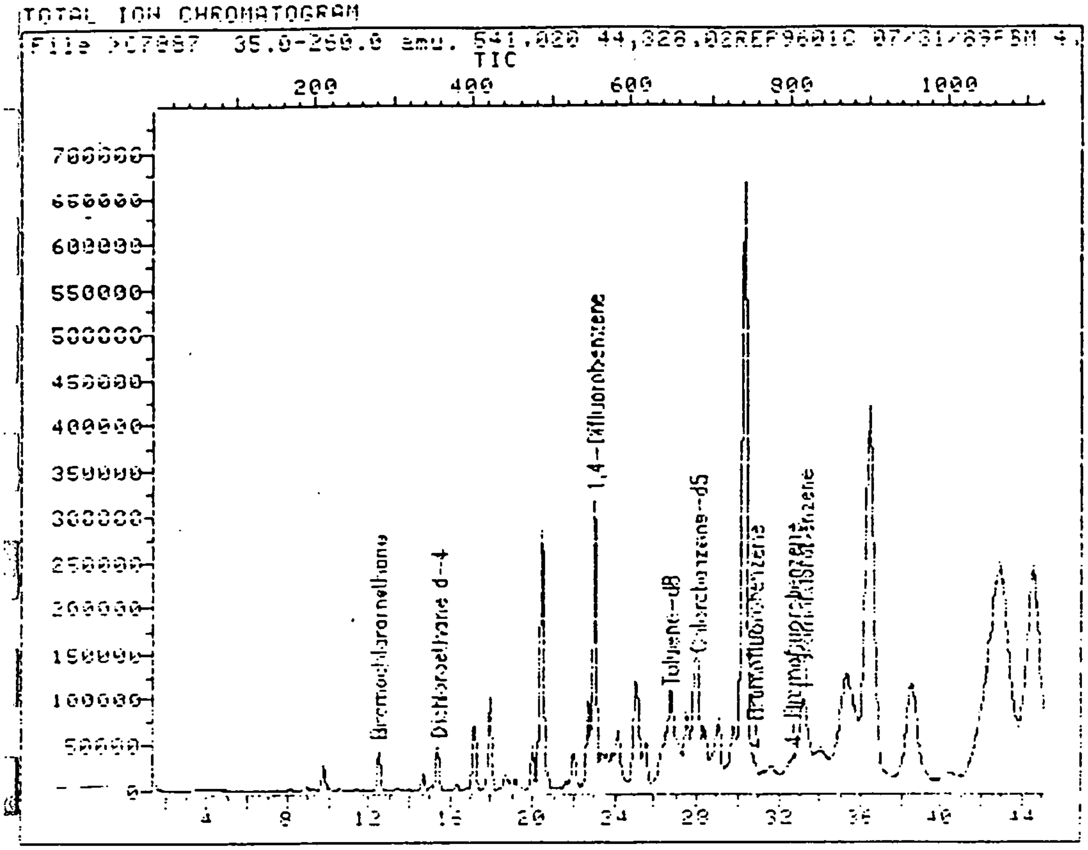
File: COND19::D2
tle: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
t Calibration: 890801 15:18

            Compound              R.T. Scan#    Area      Conc     Units    q
 ------------------------------ ----- ----- --------- --------- ------- ---
 *Bromochloromethane             8.07   182     34777     50.00  UG/L     69
~~  Trichlorofluoromethane         3.37    61      6276      6.61  UG/L    100~~
  Methylene Chloride             4.23    83      7197      6.71  UG/L yes 90
~~  Acetone                        2.91    49      1947      4.90  UG/L    100~~
~~  Acetone                        3.26    58      2711      6.83  UG/L    100~~
~~  Acetone                        3.60    67      8253     20.80~~  UG/L yes 100   [illegible]
  1,2-Dichloroethane-d4          9.50   217     32229     35.15  UG/L 70   89
 *1,4-Difluorobenzene           10.74   249    168185     50.00  UG/L    100
~~  Vinyl Acetate                  5.70   121     18201      6.11~~  UG/L    100
~~  Bromoform                     20.52   501       151       .10~~  UG/L    100
 *Chlorobenzene-d5              17.49   423    149777     50.00  UG/L    100
  4-Methyl-2-pentanone          12.95   306      2720      1.57  UG/L    100
   Methyl-2-pentanone           13.55   321      1623       .94  UG/L    100
   Methyl-2-pentanone           13.85   ~~329      2986      1.72  UG/L~~    100
~~  2-Hexanone                    13.85   329      2986      2.58  UG/L~~    100
~~  2-Hexanone                    17.49   423      3997      3.46  UG/L~~    100
  2-Hexanone                    17.77   ~~430      1639~~      1.42  ~~UG/L~~    100
  Toluene-d8                    14.04   334    154923     51.90  UG/L 104  73
~~  Ethylbenzene                  18.00   436      1243       .73  UG/L~~    100
~~  Ethylbenzene                  18.31   444      1968~~      1.23  UG/L    100
~~  Xylene (total)                18.00   436      1243~~       .66  UG/L     85
~~  Xylene (total)                18.31   444      1968      1.04  UG/L~~ yes  69   [illegible]
  Bromofluorobenzene            20.56   502    104415     54.29  UG/L 108  91

Compound is ISTD
```

6.71 × 1000 ÷ 5.57 = 1200 ug/Kg

B-4-1-3B Rep



```
Data File: >C7887::05            Quant Output File: [illegible]
Name: 541.02U 44,328.02REP
Misc: 9601C 07/31/89PAM 4.75G + 5MLS DI + 100UL IS/SS

id File: CONC93::D7
Title: VOA ID FILE FOR SOILS ON 9601C (INT. CAL.)
Last Calibration: 890731 11:44

Operator ID: USER2
Quant Time:  890731 17:18
Injected at: 890731 16:32
```

```
                              QUANT REPORT

pe   tor ID: USER2                Quant Rev: 6     ~~Quant Time~~:  890731 17:18
tput File: ^C7887::D7                              Injected at:  890731 16:32
ata File:   >C7887::D5                         Dilution Factor:  1.00000
ame: 541.020 44,328.02REP
sc: 9601C 07/31/89PAM 4.75G + 5MLS DI + 10ULS IS/SS ✓

D File: CONC93::D7
tle: VOA ID FILE FOR SOILS ON 9601C (INT. CAL.)
st Calibration: 890731 11:44

          Compound                    R.T.  Scan#    Area       Conc    Units     q
 ------------------------------------ ----- ----- --------- --------- ------- ---
 ) *Bromochloromethane                12.46 [illegible] [illegible] ✓ 250.00 NGS  91
4)  Vinyl Chloride                     4.17    67 [illegible]      1.03 NGS       100
 )  Vinyl Chloride                     5.64   105       137        .82 NGS       100
 )  Methylene Chloride                 8.86   185 [illegible]     53.01 NGS        96
6)  Methylene Chloride                 9.21 [illegible] [illegible] 30.43 NGS      93
 )  Acetone                            9.75   211 [illegible]    490.85 NGS        79
 )  Carbon Disulfide                  10.52 [illegible] [illegible] 18.86 NGS     100
 )  1,1-Dichloroethane                12.50   282       244        .72 NGS  [illegible]
 )  1,2-Dichloroethane-d4             15.40 [illegible] [illegible] [illegible] NGS 92  [illegible]
 )  1,2-Dichloroethane                15.29 [illegible] [illegible] [illegible] [illegible] [illegible]
 )  1,2-Dichloroethane                15.44 [illegible] [illegible] [illegible] [illegible] [illegible]
 )  2-Butanone                        14.63 [illegible] [illegible] [illegible] [illegible] 100
 )  2-Butanone                        15.02 [illegible] [illegible] [illegible] [illegible] 100
 )  2-Butanone                        15.37 [illegible] [illegible] [illegible] [illegible] 100
 ) *1,4-Difluorobenzene               23.00 [illegible] [illegible] ✓ [illegible] [illegible] 100
 )  Vinyl Acetate                     16.33 [illegible] [illegible] [illegible] [illegible] 100
 )  Vinyl Acetate                     17.19 [illegible] [illegible] [illegible] NGS   100
 )  Vinyl Acetate                     17.92 [illegible] [illegible] [illegible] [illegible] 100
 )  Bromodichloromethane              17.19 [illegible] [illegible]   14.7 NGS  [illegible]
 )  Benzene                           20.44   497 [illegible] [illegible] NGS E  [illegible]
 )  trans-1,3-Dichloropropene         20.44   497 [illegible] [illegible] NGS  [illegible]
 )  2-Chloroethylvinylether           21.87 [illegible] [illegible]   1.97 [illegible] 100
 )  2-Chloroethylvinylether           21.99 [illegible] [illegible]   1.14 NGS     100
4)  2-Chloroethylvinylether           22.69 [illegible] [illegible]  12.49 NGS     100
 ) *Chlorobenzene-d5                  28.05 [illegible] [illegible] ✓ 250.00 NGS   100
 )  4-Methyl-2-pentanone              23.00 [illegible] [illegible]  79.37 NGS     100
 )  4-Methyl-2-pentanone              23.81 [illegible] [illegible] [illegible] NGS 100
 )  4-Methyl-2-pentanone              24.16 [illegible] [illegible] [illegible] NGS 100
 )  2-Hexanone                        24.59 [illegible] [illegible] [illegible] NGS 100
 )  2-Hexanone                        25.05   606 [illegible] [illegible] NGS    100
 )  2-Hexanone                        25.52 [illegible] [illegible] [illegible] [illegible] 100
 )  1,1,2,2-Tetrachloroethane         25.01 [illegible] [illegible] [illegible] NGS 100
 )  1,1,2,2-Tetrachloroethane         25.60 [illegible] [illegible] [illegible] [illegible] [illegible]
 )  1,1,2,2-Tetrachloroethane         26.25   637 [illegible] [illegible] [illegible] [illegible]
 )  Toluene                           26.91 [illegible] [illegible] [illegible] [illegible] [illegible]
 )  Toluene                           27.47 [illegible] [illegible] [illegible] [illegible] [illegible]
 )  Toluene-d8                        26.72 [illegible] [illegible] [illegible] NGS 104 [illegible]
 )  Chlorobenzene                     27.19 [illegible] [illegible] [illegible] [illegible] [illegible]
 )  Ethylbenzene                      30.34 [illegible] [illegible] [illegible] [illegible] E [illegible]
 )  Styrene                           34.14   840 [illegible] [illegible] [illegible] [illegible]
 )  Styrene                           34.64   853 [illegible]   1.95 NGS  [illegible]
 )  Styrene                           34.84 [illegible] [illegible] [illegible] NGS   95
 )  Xylene (total)                    35.26 [illegible] [illegible] [illegible] NGS [illegible]
```

Analyst
Sequence Error
Insufficient IS
Contaminated Blank

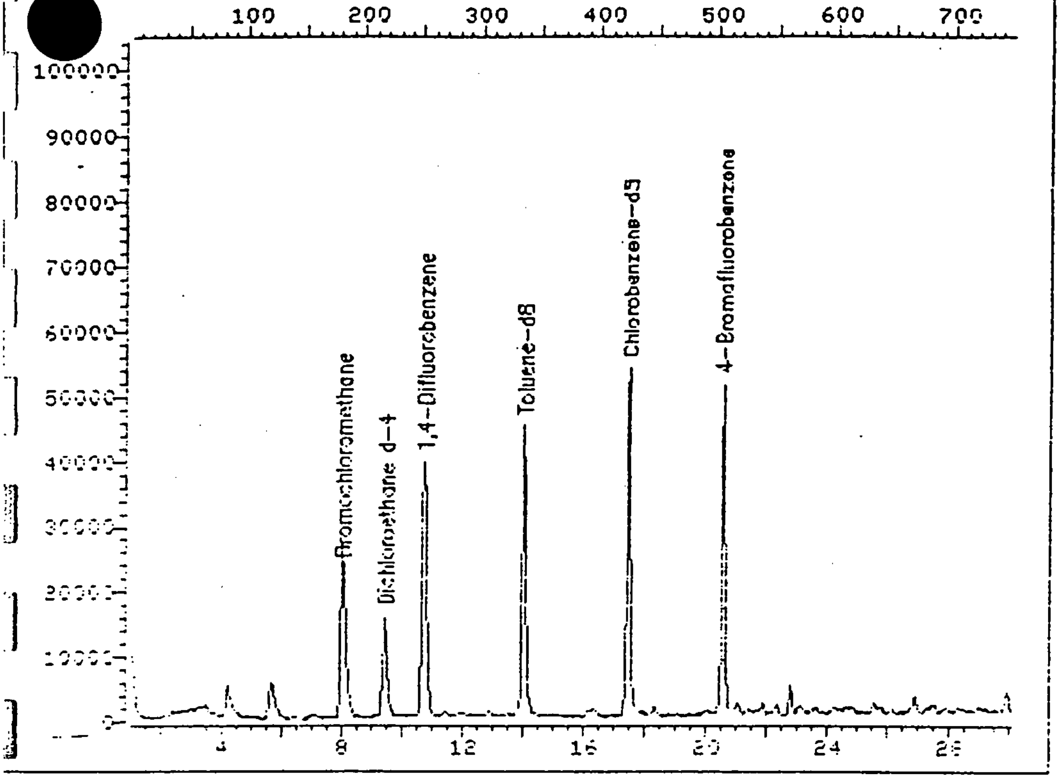
```
                Compound                   R.T. Scan#    Area       Conc     Units     q
 ------------------------------ ----- ----- -------- -------- ------- ---
0)  Xylene (total)                   36.46   900  1632043  3288.44 NGS
0)  Xylene (total)                   38.25   946    1392^     2.80 NGS       3
1)  Bromofluorobenzene               30.80   754     7816    13.89 NGS      100
1)  Bromofluorobenzene               32.62   801    28099    49.93 NGS      100
1)  Bromofluorobenzene               33.24   817   160992   286.07 NGS 114✓ 100

* Compound is ISTD
```

B-4-1-3B Rep

Methanol
extract

```
TOTAL ION CHROMATOGRAM
File >D0421   35.0-260.0 amu. 541.020 44328.01 REP7001D 08/01/89MEI 50
                              TIC
```



```
ta File: >D0421::D4          Quant Output File: >D0421::Q4
Name: 541.020 44328.01 REP
Misc: 7001D 08/01/89MEI 50ULS(5.71G/10MS)/5MLS  + 10UL IS/SS

Id File: COND19::D2
Title: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
Last Calibration: 890801 15:18

Operator ID: USER8
Quant Time:  890801 22:40
Injected at: 890801 22:04
```

YVW0H CX+

QUANT REPORT

```
rator ID: USER8             Quant Rev: 6    Quant Time:   890801 22:40
tput File: ^D0421::Q6                        Injected at:  890801 22:04
a File:   >D0421::D4                       Dilution Factor:     1.00000
e: 541.020 44328.01 REP
sc: 7001D 08/01/89MEI 50ULS(5.71G/10MS)/5MLS  + 10UL IS/SS

File: COND19::D2
le: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
st Calibration: 890801 15:18
```

Compound	R.T.	Scan#	Area	Conc	Units	q
*Bromochloromethane	8.03	181	36165	50.00	UG/L	75
~~Chloromethane~~	~~4.26~~	~~84~~	~~570~~	~~.57~~	~~UG/L~~	~~100~~
~~Trichlorofluoromethane~~	~~3.41~~	~~62~~	~~2322~~	~~2.35~~	~~UG/L~~	~~100~~
Methylene Chloride	4.22	83	14147	12.68	UG/L yes	94
~~Acetone~~	~~2.48~~	~~33~~	~~2792~~	~~6.76~~	~~UG/L~~	~~100~~
Acetone	3.56	65	17932	33.74	UG/L yes	100
~~Acetone~~	~~4.14~~	~~81~~	~~2268~~	~~5.49~~	~~UG/L~~	~~100~~
1,2-Dichloroethane-d-	9.46	218	44256	46.42	UG/L 93	80
*1,4-Difluorobenzene	10.74	251	154976	50.00	UG/L	100
~~Vinyl Acetate~~	~~5.70~~	~~121~~	~~16251~~	~~5.96~~	~~UG/L~~	~~100~~
~~1,2-Dichloropropane~~	~~10.74~~	~~251~~	~~34716~~	~~24.19~~	~~UG/L~~	~~41~~
*Chlorobenzene-d5	17.50	425	147719	50.00	UG/L	100
~~4-Methyl-2-pentanone~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~1.57~~	~~UG/L~~	~~100~~
~~4-Methyl-2-pentanone~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~2.37~~	~~UG/L~~	~~100~~
~~4-Methyl-2-pentanone~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~.97~~	~~UG/L~~	~~100~~
~~2-Hexanone~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~3.59~~	~~UG/L~~	~~100~~
~~2-Hexanone~~	~~16.14~~	~~[illegible]~~	~~1672~~	~~1.49~~	~~UG/L~~	~~100~~
~~2-Hexanone~~	~~17.70~~	~~429~~	~~3741~~	~~3.33~~	~~UG/L~~	~~100~~
Toluene-d8	14.04	336	135473	46.69	UG/L 93	78
~~Ethylbenzene~~	~~17.96~~	~~437~~	~~1302~~	~~.64~~	~~UG/L~~	~~100~~
~~Ethylbenzene~~	~~16.71~~	~~[illegible]~~	~~2007~~	~~1.54~~	~~UG/L~~	~~100~~
~~Xylene (total)~~	~~[illegible]~~	~~437~~	~~1302~~	~~.71~~	~~UG/L~~	~~35~~
~~Xylene (total)~~	~~16.71~~	~~[illegible]~~	~~[illegible]~~	~~1.14~~	~~UG/L~~ yes	~~68~~
~~Xylene (total)~~	~~21.67~~	~~533~~	~~173~~	~~.10~~	~~UG/L~~	~~47~~
Bromofluorobenzene	20.57	504	51919	49.61	UG/L 99	99

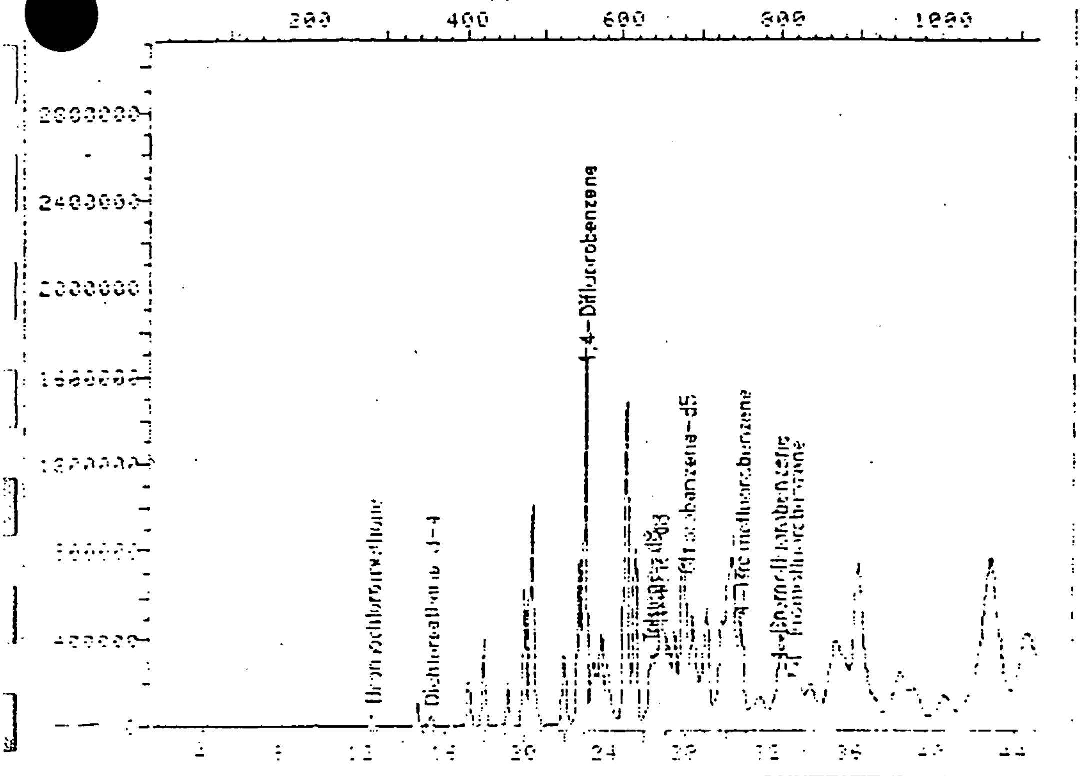
HP?

Compound is ISTD

IN CONTROL

B-4-1-4B

```
TOTAL ION CHROMATOGRAM
File >C7388  35.0-260.0 amu. 541.020 44,329.02   8601C 07/31/89PM
```



```
Data File: [illegible]::05          Quant Output File: [illegible]
Name: [illegible]
Misc: [illegible] 07/31/89PM 1.0G + 5ML DI + [illegible]

ID File: [illegible]::07
Title: VOA ID FILE FOR SOILS ON 8601C (INT. CAL.)
Last Calibration: 890731 11:44

Operator ID: JEFF2
Quant Time: 890731 18:12
Injected at: 890731 17:26
```

OUT OF CONTROL Analyst: [illegible]

CC Standard ___
Surrogate ✓
Spike ___
EPA Known ✓
Duplicate ___

Hold Time Violation ___
Run Outside Clock ___
Sequence Error ___
Insufficient QC ___
Contaminated Blank ___

[✓ [illegible]] Reanalysis Request

[illegible] [✓ YES] NO

[illegible]

Kerr McGee

B-4-1-4B

```
                                QUANT REPORT

erator ID: USER2               Quant Rev: 6     Quant Time:   890731 18:12
tput File: ^C7888::D7                          Injected at:   890731 17:26
ta File:   >C7888::D5                      Dilution Factor:        1.00000
me: 541.020 44,329.02
sc: 9601C 07/31/89PBM 1.01G + 5MLS DI + 10ULS IS/SS

 File: CONC93::D7
tle: VOA ID FILE FOR SOILS ON 9601C (INT. CAL.)
st Calibration: 890731 11:44

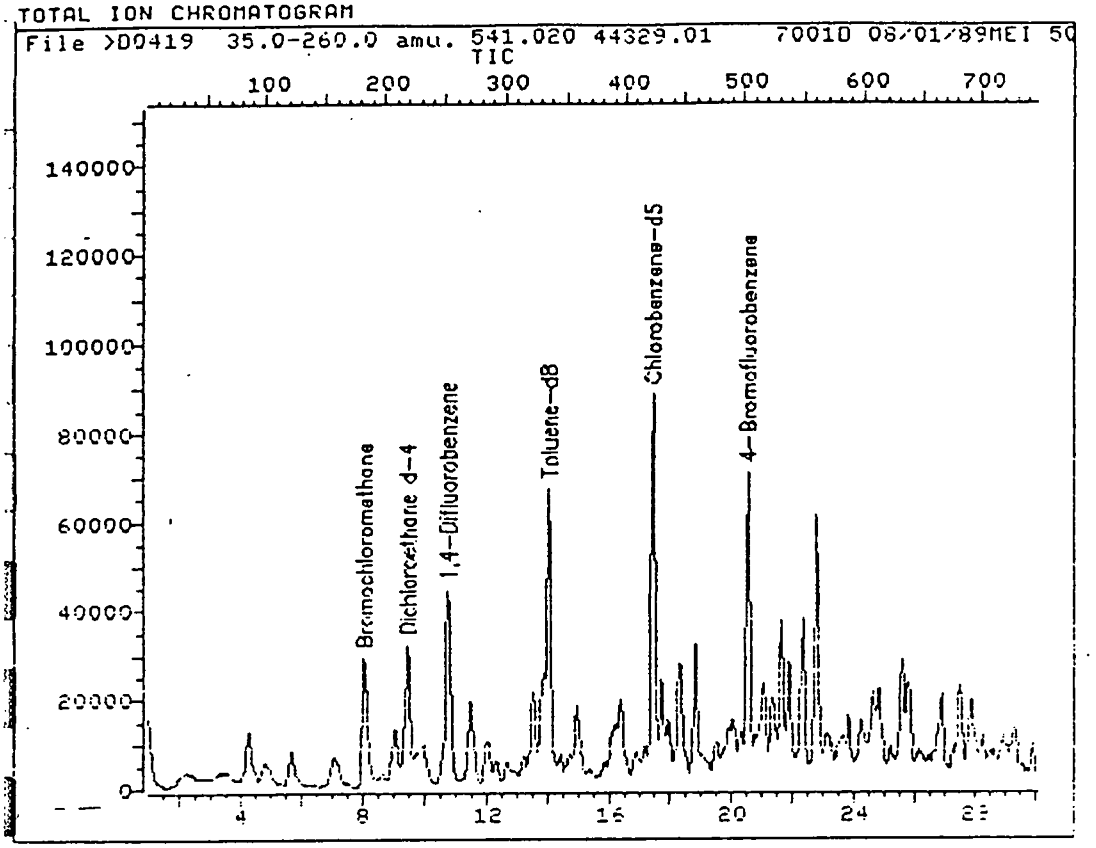
             Compound                R.T.  Scan#    Area      Conc   Units    q
 ----------------------------------- ----- -----  --------  -------  ------- ---
 ) *Bromochloromethane               12.50   282    80256✓   250.00 NGS      91
 ) Methylene Chloride                 8.86   188    10028     29.54 NGS      83
 ) Acetone                            8.90   189     1494      3.08 NGS       5
 ) Acetone                            9.79   212    59529    122.72 NGS      78
 ) Acetone                           10.33   226     1307      2.69 NGS      78
 ) Carbon Disulfide                  10.52   231     3032      2.49 NGS     100
 ) 1,1-Dichloroethane                12.46   281      762       .79 NGS      34
 ) 1,2-Dichloroethane-d4             15.37   356   185535    234.35 NGS      89
 ) 1,2-Dichloroethane                15.44   358     5233      5.31 NGS      24
 ) - 2-Butanone                      14.63   337    21794    161.52 NGS     100
 ) 2-Butanone                        15.32   356     5747     39.81 NGS     100
 ) 2-Butanone                        16.33   381     6626     40.26 NGS     100
 ) *1,4-Difluorobenzene              23.04   554   318951✓   250.00 NGS     10
 ) Vinyl Acetate                     16.33   381    74[illegible]     56.28 NGS     1
 ) Vinyl Acetate                     17.30   406   146184    110.49 NGS     100
 ) Vinyl Acetate                     17.96   423   112114     84.29 NGS     100
 ) Bromodichloromethane              17.19   403    22121     32.21 NGS      37
 ) Bromodichloromethane              17.92   422     8335     12.14 NGS      40
 ) 1,2-Dichloropropane               19.12   453     1081      2.07 NGS       1
 ) 1,2-Dichloropropane               19.24   456      823      1.57 NGS       1
 ) cis-1,3-Dichloropropene           20.40   486    22493     25.80 NGS     100
 ) Benzene                           20.44   487  1039257    220.47 NGS      86
 ) trans-1,3-Dichloropropene         20.40   486    22493     45.93 NGS     100
 ) 2-Chloroethylvinylether           21.99   527     8253     30.50 NGS     100
 ) 2-Chloroethylvinylether           22.22   533     2481      9.17 NGS     100
 ) 2-Chloroethylvinylether           22.73   546    19116  ✓  70.67 NGS     100
 ) *Chlorobenzene-d5                 28.09   683   295805✓   250.00 NGS     100
 ) 4-Methyl-2-pentanone              23.43   564   491015    460.39 NGS     100
 ) 4-Methyl-2-pentanone              23.85   575   671482    629.28 NGS     100
 ) 4-Methyl-2-pentanone              24.16   583   405624    380.22 NGS     100
 ) 2-Hexanone                        24.63   595      644       .68 NGS     100
 ) 2-Hexanone                        25.10   607  3148897   3312.77 NGS     100
 ) 2-Hexanone                        25.56   619  2430311   2556.95 NGS     100
 ) 1,1,2,2-Tetrachloroethane         25.06   606   340071    459.55 NGS     100
 ) 1,1,2,2-Tetrachloroethane         25.64   621    73303     99.04 NGS     100
 ) 1,1,2,2-Tetrachloroethane         26.30   638   260032    351.07 NGS     100
 ) Toluene                           26.53   644     1554      1.59 NGS      60
 ) Toluene                           26.96   655    40690     51.42 NGS      9
 ) Toluene                           27.59   670     5844      6.58 NGS
 ) Toluene-d8                        26.30   638    21895     14.60 NGS      44
 ) Toluene-d8                        26.72   649   394439    260.97 NGS      94
 ) Chlorobenzene                     27.86   678   329782    274.86 NGS      44
 ) Chlorobenzene                     28.36   691   324434    272.07 NGS      48
```

```
               Compound                R.T.  Scan#   Area     Conc     Units     q
--------------------------------------  ----- -----  -------- -------- -------  ---
7) Chlorobenzene                        29.10   710    222736   185.64 NGS       57
 )  Ethylbenzene                        30.34   742   1276034  2002.12 NGS      100
3)  Ethylbenzene                        31.08   761       772     1.21 NGS      100
8)  Ethylbenzene                        31.16   763      1080     1.69 NGS      100
 )  Styrene                             34.22   842     3591^     2.89 NGS       49
 )  Xylene (total)                      35.27   869    497477   672.65 NGS       80
0)  Xylene (total)                      36.32   896   2672231  3613.21 NGS       93
 )  Xylene (total)                      37.52   927      1869     2.53 NGS        1
 )  Bromofluorobenzene                  30.77   753     50872    40.66 NGS      100
 )  Bromofluorobenzene                  32.51   798     80768    96.31 NGS      100
 )  Bromofluorobenzene                  33.73   819    331203   394.93 NGS      100

* Compound is ISTD
```

B-4-1-4B
methanol
extract

TOTAL ION CHROMATOGRAM



```
Data File: >D0419::D4               Quant Output File:  D0419::Q4
Name: 541.020 44329.01
Misc: 70010 08/01/89MEI 50ULS(5.02G/10MS)/5MLS  + 10UL IS/SS

Id File: COND19::D2
Title: VOA ID FILE FOR WATERS ON 70010 (CONT. CAL.)
Last Calibration: 890801 15:18

Operator ID: USER8
Quant Time:  890801 21:11
Injected at: 890801 20:38
```

YVL0HCX7

```
                          QUANT REPORT

  r ID: USER8          Quant Rev: 6    Quant Time:   890801 21:11
t File: ^D0419::06                    Injected at:   890801 20:38
a File:   >D0419::04              Dilution Factor:       1.00000
ame: 541.020 44329.01
sc: 7001D 08/01/89MEI 50ULS(5.02G/10MS)/5MLS  + 10UL IS/SS

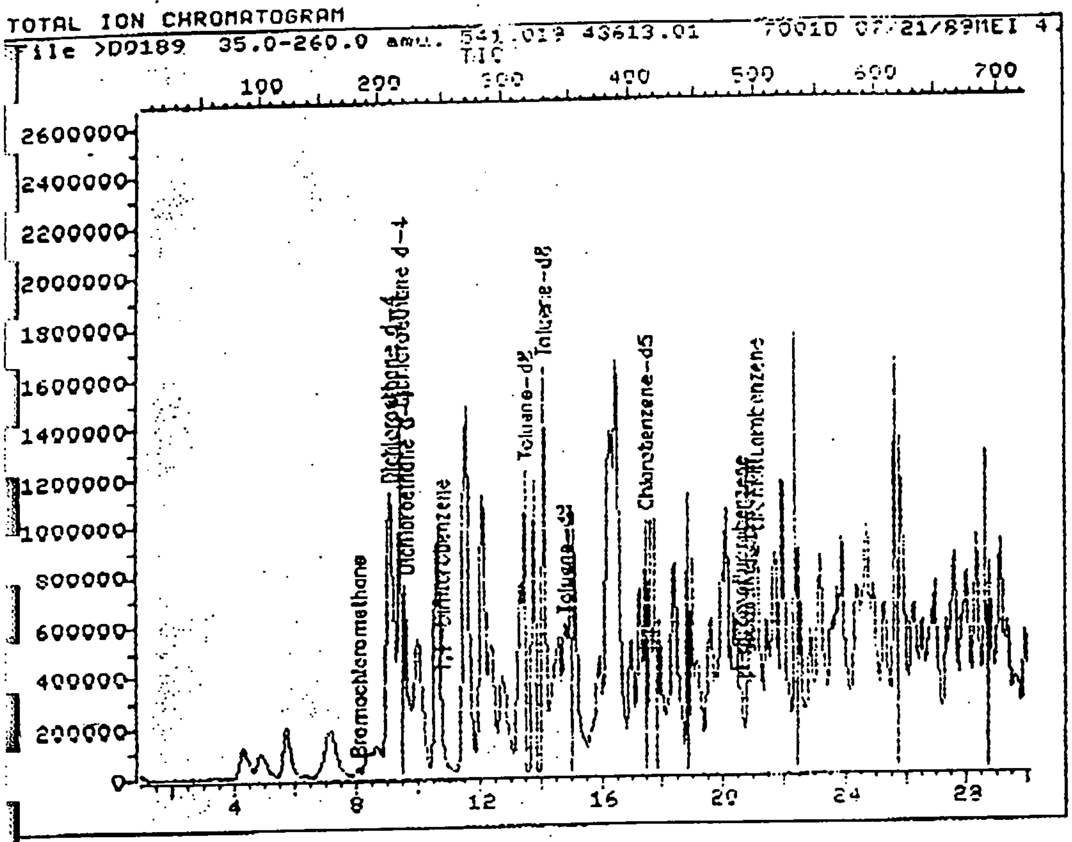
 File: COND19::D2
itle: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
t Calibration: 890801 15:18

       Compound                  R.T.  Scan#    Area      Conc     Units   q
   ---------------------------- ----- -----  --------  --------  ------- ---
)  *Bromochloromethane            8.07   182     41848     50.00   UG/L    76
)  ~~Chloromethane                  4.22    83       109       .09   UG/L   100~~
   ~~Trichlorofluoromethane         3.41    62      7304      6.39   UG/L   100~~
)   Methylene Chloride            4.22    83      3853      6.86   UG/Lyes 82
)   ~~Acetone                       2.93    44       386       .81   UG/L   100~~
)   Acetone                       3.60    67      7236     15.15   UG/Lyes100
)  ~~Acetone                        4.30    85     56385    117.86   UG/L   100~~
)   1,2-Dichloroethane-d4         9.47   218     53361     48.36   UG/L97✓ 77
)  *1,4-Difluorobenzene          10.75   251    183535     50.00   UG/L   100
)  ~~Vinyl Acetate                  5.70   121     22794      7.01   UG/L   100~~
)   ~~Vinyl Acetate                 6.17   132      1141       .33   UG/L   100~~
)   ~~Vinyl Acetate                 7.17   155     14693      4.58~~   UG/L   100
)   ~~enzene                        9.42   216      3400       .94~~   UG/L    94
)   lorobenzene-d5               17.53   423    171630     50.00   UG/L   100
)   ~~4-Methyl-2-pentanone         13.54   323     57946     24.13~~   UG/L   100
)  ~~4-Methyl-2-pentanone          13.85   331     57520     28.92   UG/L   100~~
)   ~~4-Methyl-2-pentanone         14.33   337     43434     24.37   UG/L~~   100
)  ~~2-Hexanone                    13.85   331     57570     43.44   UG/L~~   100
)  ~~2-Hexanone                    17.53   423     52518     47.18~~   UG/L   100
)   2-Hexanone                   ~~18.83   452     55788     49.54~~   UG/L   100
)   ~~1,1,2,2-Tetrachloroethane    20.81   510      1249       .52~~   UG/L   100
)   ~~1,1,2,2-Tetrachloroethane    21.11   516      1790       .75   UG/L~~   100
)   ~~1,1,2,2-Tetrachloroethane    21.93   537      5113      2.13   UG/L   100~~
)   ~~Toluene                      14.20   340      1118       .39   UG/L~~    61
)   Toluene-d8                   14.05   336    131358     53.02   UG/L106 ✓71
)   Ethylbenzene                 17.96   435     11845     26.46   UG/Lyes 100
)  ~~Ethylbenzene                  18.31   444     27071     15.86   UG/L   100~~
)  ~~Styrene                       21.65   530      2542       .24   UG/L    13~~
)  ~~Styrene                       21.83   536      1446       .42   UG/L     5~~
)  ~~Styrene                       22.82   560      4112~~      1.19   UG/L     1
)  ~~Xylene (total)                17.96   435     11844      5.43   UG/L~~    96
)  ~~Xylene (total)                18.31   444     27070     13.47   UG/L~~yes 70 HJA
)  ~~Xylene (total)                21.59   531     10067~~      4.66   UG/L     1
)   Bromofluorobenzene           20.57   502    113840     53.93   UG/L108 ✓1

 Compound is ISTD
```

000235

B-7-1-3B



TOTAL ION CHROMATOGRAM
File >D0189 35.0-260.0 amu. 541.019 43613.01 TIC 7001D 07/21/89MEI 4

Data File: >D0189::D6 Quant Output File: ^D0189::Q3
Name: 541.019 43613.01
Misc: 7001D 07/21/89MEI 4.18G/5MLS - 10UL IS/SS

Id File: COND97::D2
Title: VOA ID FILE FOR HEATED SAMPLES ON 7001D (CONT.CAL.)
Last Calibration: 890721 16:04

Operator ID: USER8
Quant Time: 890721 20:12
Injected at: 890721 19:34

```
DEC 21 '89 8:08

                                   QUANT REPORT

rator ID: USER8                    Quant Rev: 6    Quant Time:   890721 20:12
put File: ^D0189::03                                Injected at:  890721 19:34
 File:   >D0189::06                           Dilution Factor:       1.00000
: 541.019 43613.01
c: 7001D 07/21/89MEI 4.18G/5MLS + 10UL IS/SS

File: COND97::D2
le: VOA ID FILE FOR HEATED SAMPLES ON 7001D (CONT.CAL.)
 Calibration: 890721 16:04

      Compound                       R.T.  Scan#     Area      Conc    Units     q
 -------------------------------- ----- -----  --------  --------  -------  ---
*Bromochloromethane                   8.07   182     40242    250.00 NGS       67
 Chloromethane                        4.26    84      2733     13.23 NGS      100
 Vinyl Chloride                       4.34    86       146       .92 NGS      100
 Acetone                              3.49    63     23912    174.86 NGS       79
 1,2-Dichloroethane-d4                9.12   209      6577     28.63 NGS       66
 1,2-Dichloroethane-d4                9.47   218     29696    129.29 NGS       89
 1,2-Dichloroethane-d4                9.61   220     14019     61.03 NGS       92
 1,2-Dichloroethane                  10.04   231      1699      6.65 NGS       96
 2-Butanone                           7.88   177       477      7.11 NGS      100
 2-Butanone                           8.42   191     22238    331.33 NGS      100
 4-Difluorobenzene                   10.74   249    181262    250.00 NGS      100
 nyl Acetate                          5.74   122    982213    625.26 NGS      100
 Vinyl Acetate                        7.22   140    843943    906.35 NGS      100
 Dibromochloromethane                17.19   406     1175^      2.97 NGS       72
 2-Chloroethylvinylether             12.69   298      1511      7.20 NGS      100
 2-Chloroethylvinylether             13.83   329      2217     10.56 NGS      100
 2-Chloroethylvinylether             14.09   328      6648     31.66 NGS      100
*Chlorobenzene-d5                    17.50   414     75268    250.00 NGS      100
 4-Methyl-2-pentanone                12.10   284   3361241   9028.06 NGS      100
 4-Methyl-2-pentanone                13.31   315   2640709   7092.76 NGS      100
 4-Methyl-2-pentanone                13.76   323   2450895   6582.93 NGS      100
 2-Hexanone                          13.31   315   2640709   9355.42 NGS      100
 2-Hexanone                          13.76   323   2450895   8682.95 NGS      100
 2-Hexanone                          17.27   408   2391703   8473.25 NGS      100
 1,1,2,2-Tetrachloroethane           20.97   498    113680    398.48 NGS      100
 1,1,2,2-Tetrachloroethane           21.55   513     97346    341.23 NGS      100
 1,1,2,2-Tetrachloroethane           22.02   525    339199   1188.99 NGS      100
 Toluene                             14.24   332      2369      9.49 NGS       72
 Toluene-d8                          13.50   320     55340    175.40 NGS      100
 Toluene-d8                          14.09   328    277142    878.41 NGS      100
 Toluene-d8                          14.79   346     93280    295.65 NGS      100
 Chlorobenzene                       17.50   414     10691     37.70 NGS       72
 Chlorobenzene                       17.65   416     17204     60.66 NGS       72
 Ethylbenzene                        18.03   424      2625     16.78 NGS      100
 hylbenzene                          18.34   432    113313    724.46 NGS      100
 rene                                21.71   517     62561    204.68 NGS
 yrene                               21.94   523     44523    145.66 NGS
 Styrene                             22.37   534     26571     86.93 NGS
 Xylene (total)                      18.03   424      2506     13.52 NGS
 Xylene (total)                      19.30   455     37207    200.74 NGS
 Xylene (total)                      20.62   489       191      1.03 NGS
 Bromofluorobenzene                  20.58   488    129205    607.51 NGS
 Bromofluorobenzene                  20.82   494    20556^     96.65 NGS
```

✓ ✓ ✓

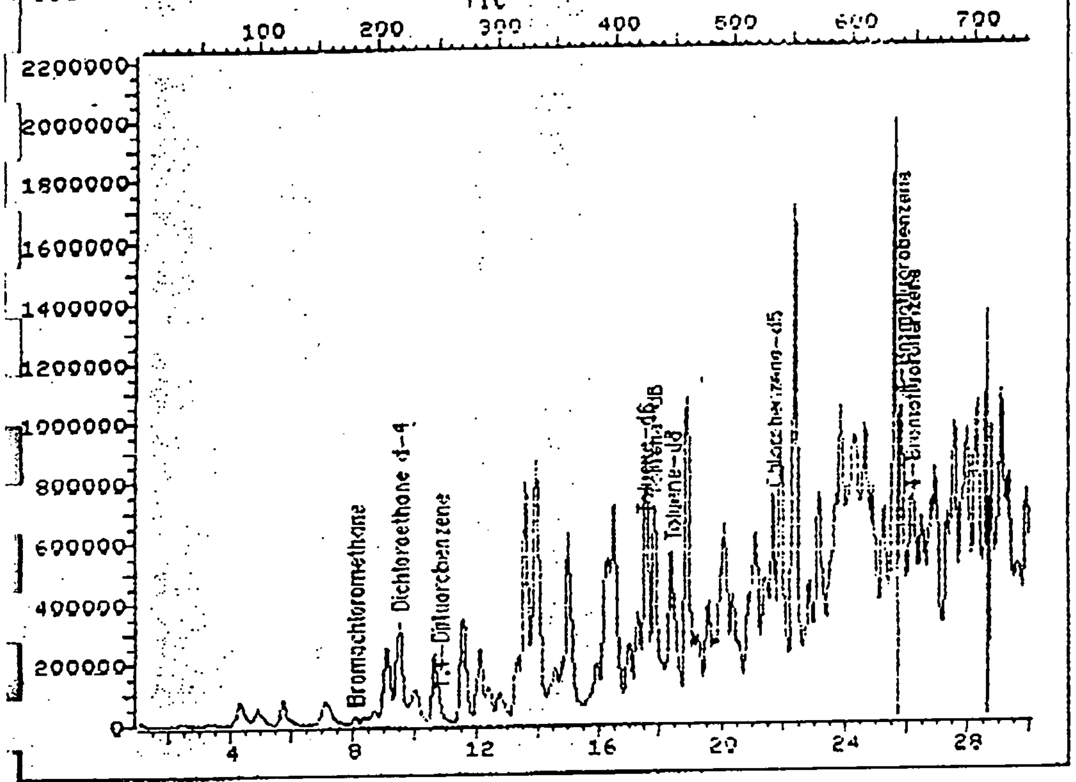
Drop out

IS

B-7-1-48

TOTAL ION CHROMATOGRAM

File >D0190 35.0-260.0 amu. 541.019 43614.01 TIC 7001D 07/21/89MEI 4



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Name: 541.019 43614.01

Misc: 7001D 07/21/89MEI 4.15G/5MLS + 10UL IS/SS

Id File: COND97::D2

Title: VOA ID FILE FOR HEATED SAMPLES ON 7001D (CONT.CAL.)

Last Calibration: 890721 16:04

Operator ID: USER8

Quant Time: 890721 20:55

Injected at: 890721 20:17

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                              QUANT REPORT

erator ID: USER8                Quant Rev: 6     Quant Time:   890721 20:55
tput File: ^D0190::Q3                           Injected at:   890721 20:17
ta File:    >D0190::D6                       Dilution Factor:      1.00000
me: 541.019 43614.01
isc: 7001D 07/21/89MEI 4.15G/5MLS + 10UL IS/SS

 File: COND97::D2
itle: VOA ID FILE FOR HEATED SAMPLES ON 7001D (CONT.CAL.)
st Calibration: 890721 16:04

          Compound                 R.T.  Scan#    Area      Conc   Units    q
 -------------------------------  -----  -----  --------  -------  -------  ---
 *Bromochloromethane               8.05   181     31333   250.00  NGS       79
  Chloromethane                    4.32    85      1782    11.08  NGS      100
  Acetone                          3.46    63     35624   334.57  NGS       90
  1,2-Dichloroethane-d4            9.48   218     42580   238.09  NGS       91
  2-Butanone                       7.89   177       323     6.18  NGS      100
  2-Butanone                       8.40   190      4400    84.20  NGS      100
 *1,4-Difluorobenzene             10.77   251    127506   250.00  NGS      100
  Vinyl Acetate                    5.72   121    232909   355.59  NGS      100
  Vinyl Acetate                    6.38   138      1169     1.78  NGS      100
  Vinyl Acetate                    7.19   159    194012   296.20  NGS      100
  ibromochloromethane             16.15   389      2874    10.32  NGS       71
  ibromochloromethane             16.40   396      2164     7.77  NGS       85
  Benzene                          9.48   218     43683    88.39  NGS       90
  2-Chloroethylvinylether         13.60   324      1595    10.80  NGS      100
  2-Chloroethylvinylether         13.91   332      2905    19.67  NGS      100
 *Chlorobenzene-d5                21.74   533    133357   250.00  NGS      100
  4-Methyl-2-pentanone            14.96   359   1800782  2729.92  NGS      100
  4-Methyl-2-pentanone            17.53   425   2017568  3058.56  NGS      100
  4-Methyl-2-pentanone            18.89   460   2393087  3627.84  NGS      100
  2-Hexanone                      17.53   425   2278159  4555.34  NGS      100
  2-Hexanone                      18.89   460   2393087  4785.15  NGS      100
  2-Hexanone                      22.44   551   2648162  5295.19  NGS      100
  1,1,2,2-Tetrachloroethane       25.67   634    127716   252.68  NGS      100
  1,1,2,2-Tetrachloroethane       25.82   636     92905   183.80  NGS      100
  1,1,2,2-Tetrachloroethane       26.87   663    384972   761.63  NGS      100
  Toluene-d8                      17.49   424     57942   103.65  NGS      100
  Toluene-d8                      17.80   432    263855   472.01  NGS      100
  Toluene-d8                      18.39   447     99601   178.18  NGS      100
  Ethylbenzene                    21.70   532    188839   681.43  NGS      100
  Ethylbenzene                    21.93   538    135208   487.90  NGS      100
  Ethylbenzene                    22.36   549    127789   461.13  NGS      100
  Styrene                         23.88   588     70135   129.51  NGS
  Styrene                         24.70   609     73352   135.45  NGS
  Styrene                         25.86   637     56890   105.05  NGS       20
  Xylene (total)                  23.33   574      1759     5.36  NGS       81
  omofluorobenzene                25.86   637    113738   301.97  NGS       15
  omofluorobenzene                26.21   646    125076^  331.93  NGS       12
  1,3-DICHLOROBENZENE             29.00   716     44240 44240.00  NO CALIB  75
  1,3-DICHLOROBENZENE             29.35   725    130497 130497.0  NO CALIB  97
  1,4-DICHLOROBENZENE             29.00   716     44240 44240.00  NO CALIB  75
  1,4-DICHLOROBENZENE             29.35   725    130497 130497.0  NO CALIB  9

 Compound is ISTD
```
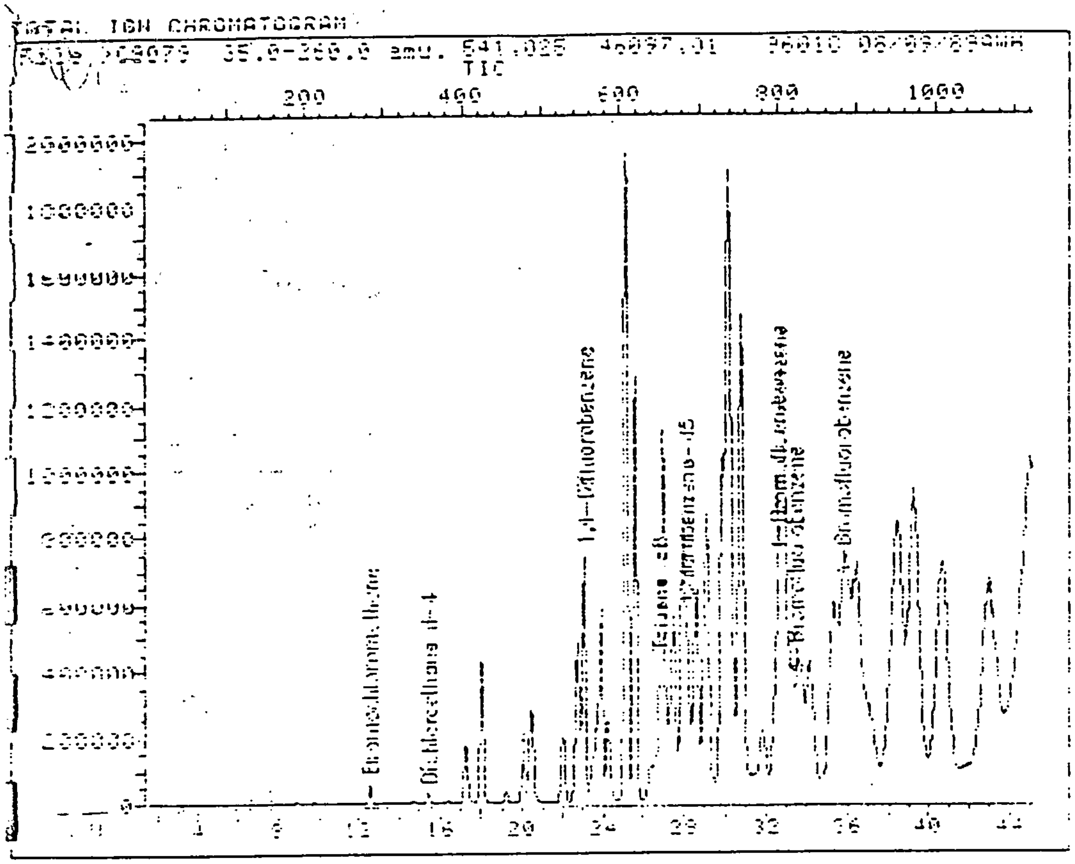

Much of this could be carryover from 4361B!

WB-9-6-3B



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Misc: 96010 08/09/89AWH    4.9G/5MLS DI + 100LS IS
ID File: CPN097::D7
Title: VOA ID FILE FOR SOILS ON 96010 (INT. CAL.)
Last Calibration: 890809 23:21
Operator ID: [illegible]
Quant Time: 890810 02:33
Injected at: 890810 01:47
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CC Standard ___
Surrogate ___
Spike ___
[illegible] Known ___
Duplicate ___

Hold Time Violation ___
Run Outside Clock ___
Sequence Error ___
Insufficient [illegible] ___
Contaminated Blank ___

Analysis Conducted Correct
Corrected:
Complete Discrepancy Form

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                                           QUANT REPORT

pe    or ID: USER2                         Quant Rev: 6         Quant Time: 890810 02:33
mp    File: ^C8079::Q6                                          Injected at: 890810 01:47
ta File:    >C8079::D7                                          Dilution Factor:  1.00000
ame: 541.025  46097.01
isc: .9601C 08/09/89AWH    4.90G/5MLS DI + 10ULS IS/SS

/ File: CONC93::D7
itle: VOA ID FILE FOR SOILS ON 9601C (INT. CAL.)
st Calibration: 890809 23:21

          Compound                  R.T.  Scan#    Area      Conc    Units    q
-------------------------------   -----  -----  --------  --------  ----------
*Bromochloromethane                12.54   28[illegible]   46405    250.00 NGS      89
 Methylene Chloride                 8.93   190     20350     59.99 NGS      98
 Acetone                            9.79   212     45343    191.59 NGS      69
 Carbon Disulfide                  10.44   234      1212      2.03 NGS     100
 Carbon Disulfide                  10.75   237       190       .32 NGS     100
 1,1-Dichloroethane                12.57   284      1028      1.99 NGS     [illegible]
 1,2-Dichloroethane-d4             15.44   358    127069    293.36 NGS      84
 2-Butanone                        14.74   340      1103     23.10 NGS     100
 2-Butanone                        15.44   358      2089     43.75 NGS     100
 2-Butanone                        16.41   383      1887     39.5[illegible] NGS     100
*1,4-Difluorobenzene               2[illegible]   5[illegible]    285264    2[illegible] NGS     100
 Vinyl Acetate                     16.41   383     22[illegible]9   [illegible]     100
     l Acetate                     17.04   4[illegible]5     78[illegible]   1[illegible]0.[illegible] NGS     100
     l Acetate                     19.[illegible]   4[illegible]5   13[illegible]42   [illegible] NGS     [illegible]
 Bromodichloromethane              17.0[illegible]   408     17317     44.5[illegible] NGS     [illegible]
 Bromodichloromethane              18.[illegible]9   474      8985     [illegible] NGS     [illegible]
 Benzene                           20.48   4[illegible]8    249696    319.20 NGS      78
 trans-1,3-Dichloropropene         20.90   499      4824    [illegible] NGS     [illegible]
 2-Chloroethylvinylether           22.07   508      2791    127.34 NGS     [illegible]
 2-Chloroethylvinylether           22.[illegible]5   547     11054     48.69 NGS     [illegible]
*Chlorobenzene-d5                  28.[illegible]8   654    157778    250.00 NGS     100
 4-Methyl-2-pentanone              23.46   565    344841    597.66 NGS     [illegible]
 4-Methyl-2-pentanone              23.89   576   1117080   2259.84 NGS     [illegible]
 4-Methyl-2-pentanone              24.[illegible]   595    805736   1629.[illegible] NGS     [illegible]
 2-Hexanone                        25.17   609   5728408  14754.61 NGS     100
 2-Hexanone                        25.59   620   4505159  11289.06 NGS     100
 1,1,2,2-Tetrachloroethane         25.17   609    142429    372.66 NGS     100
 1,1,2,2-Tetrachloroethane         25.47   620     97442    254.96 NGS     100
 1,1,2,2-Tetrachloroethane         26.37   649     81966    214.46 NGS     100
 Toluene                           27.07   657    105554    208.71 NGS      98
 Toluene-d8                        26.79   651   2295400    294.06 NGS     [illegible]
 Chlorobenzene                     27.40   669     34481     54.87 NGS      97
 Chlorobenzene                     27.77   677    164876    271.84 NGS      99
 Chlorobenzene                     [illegible]   [illegible]    [illegible]   [illegible] NGS     [illegible]
 Ethylbenzene                      30.4[illegible]   744    739[illegible]61   1032.32 NGS     [illegible]
 Xylene (total)                    35.[illegible]   867   [illegible]   [illegible] NGS     [illegible]
  lene (total)                     35.[illegible]4   871   [illegible]   [illegible] NGS     [illegible]
      ene (total)                  35.[illegible]   899   [illegible]   7152.98 NGS     [illegible]
       [illegible]fluorobenzene    [illegible]   [illegible]   [illegible]   [illegible] NGS     [illegible]
 Bromofluorobenzene                [illegible]   [illegible]   [illegible]   [illegible] NGS     [illegible]
 Bromofluorobenzene                [illegible]   [illegible]    68[illegible]   [illegible] NGS     [illegible]

Compound is ISTD
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EXTENDED RANGE!

117

E

E

118

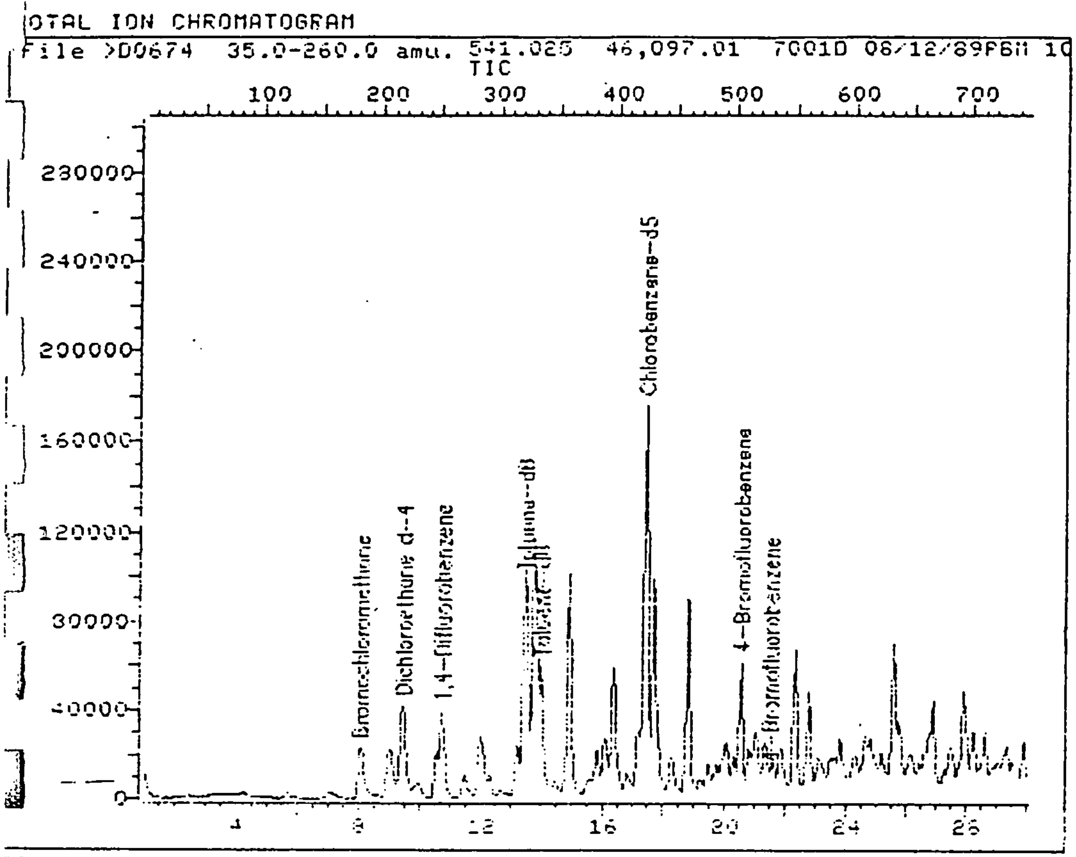
E

E

MATRIX interference

WB-9-6-3B

methanol extract



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Id File: COND19::D2
Title: VOA ID FILE FOR WATERS ON 7001D (CONT. CAL.)
Last Calibration: 890812 12:32

Operator ID: USER8
Quant Time:  890812 14:03
Injected at: 890812 13:29
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X VC↑ 50%

Sequence Error

Contaminated Blank

Complete Discrepancy Form

YES