TECHNICAL REPORT

Remedial Investigation Report

Volume II of II
(Appendices)

Solvents Recovery Service of New England, Inc.
Superfund Site
Southington, Connecticut

Prepared For:
SRSNE PRP Group

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Appendix A

Field Investigation Activities

Appendix A - Field Investigation Activities

A.1 General

The field investigation(s) that were undertaken to complete the RI for the SRSNE Site were performed in a phased process of data gap identification, data acquisition, and data evaluation. The majority of the field data required to complete the RI were obtained between August 1996 and February 1997. However, following the preliminary review of the data obtained during that period, a data gap was identified in delineation of the off-site VOC plume. This data gap was filled through the installation, sampling, and hydraulic monitoring of a final monitoring well cluster (MW-710) between May and June 1997.

The RI Field Investigation Activities are summarized in Table 1 and Figure 3 of this RI Report. Completing the RI involved the following field tasks to fill data gaps discussed in Section 4.0 of the RI Work Plan, which was submitted to USEPA on November 20, 1995 (BBL, November 1995):

- Test Pit Installation;
- Soil Boring and Characterization;
- Bedrock Drilling and Characterization;
- Monitoring Well Installation;
- Well Development Specific Capacity Testing;
- Well and Piezometer Sampling;
- Ground-Water Sampling from Wells and Piezometers, NAPL Monitoring and Sampling, and Surface-Water Sampling;
- Equipment Decontamination; and
- Sample Analysis/Data Validation.

Attachment A-1 to this appendix presents a complete, detailed Sample Log of the laboratory samples obtained during the completion of the RI, including:

- Bedrock samples;
- Soil samples;
- Direct-push (Hydropunch™) and auger-grab ground-water samples; and
- Ground-water and DNAPL samples obtained from wells and piezometers, and surface-water samples.

The protocols for field performance of these tasks were described in the Field Sampling Plan (BBL, August 1996) associated with the final Project Operations Plan (POP) (BBL, August 1996), or in addenda to the RI Work Plan. Section 4.0 of the RI Work Plan (BBL, November 1995) described in detail the objectives and rationale for each type of data acquisition performed during the completion of the RI.

To address USEPA and CT DEP comments regarding the Draft RI Work Plan and Draft POP (BBL, January 1996), BBL prepared an RI Work Plan Addendum (BBL, February 13, 1996), RI Work Plan Addendum No. 2 (BBL, June 7, 1996), and RI Work Plan Addendum No. 3 (BBL, June 18, 1996). On August 14, 1996, USEPA conditionally approved the following documents:

- RI Work Plan (BBL, November 1995);
- Draft POP (BBL, January 1996);
- RI Work Plan Addendum (BBL, February 13, 1996);
- RI Work Plan Addendum No. 2 (BBL, June 7, 1996); and
- RI Work Plan Addendum No. 3 (BBL, June 18, 1996).

BBL addressed USEPA's comments through the submittal of a Final POP (BBL, August 1996). Beyond the scope of work described in the above-listed, USEPA-approved documents, several additional modifications were made to the scope of work, as described below.

A.2 Modifications of Scope of Investigation from USEPA-Approved Work Plan

During the course of the field investigation, modifications to the USEPA-approved RI Work Plan (including the POP and Addenda Nos. 1 through 3), were found to be necessary or determined to be appropriate to acquire the data necessary to complete the RI. The additional modifications were addressed either through the preparation and submittal of additional addenda to the RI Work Plan or through conference calls or meetings with USEPA and CT DEP, or letters from the SRSNE PRP Group to the regulatory agencies, as discussed below.

A.2.1 Modifications Described in Additional RI Work Plan Addenda

BBL prepared RI Work Plan Addenda Nos. 4 through 7 to describe additional modifications to the original scope of the investigation, including the following substantive changes:

- RI Work Plan Addendum No. 4 (BBL, September 23, 1996) presented a list of specific geochemical and biological parameters that were quantified in ground-water samples during the RI, and their data quality objectives and data uses.

- RI Work Plan Addendum No. 5 (BBL, November 5, 1996) proposed the installation of one additional deep overburden monitoring well (MW-704DR) and specific capacity testing of selected existing deep overburden monitoring wells to help further evaluate the deep overburden ground-water quality and hydraulic conductivity in the northern portion of the Town of Southington Well Field, specific capacity testing of the former Cianci water-supply well, and the installation of a shallow bedrock well (MW-709R) and deep bedrock monitoring well (MW-709DR) within the 8-inch diameter, open-bedrock borehole of the former Cianci Well. USEPA approved RI Work Plan Addendum No. 5 on November 11, 1996.

- RI Work Plan Addendum No. 6 (BBL, December 16, 1996) proposed the collection and analysis of surface-water samples from the Quinnipiac River and the effluent from the 30-inch culvert that passes beneath the former Cianci Property during two sampling events (high and low level), and presented a Standard Operating Procedure for surface-water sampling. USEPA approved RI Work Plan Addendum No. 6 with the following conditions: 1) a sample of the influent to the 30-inch culvert will also be obtained during each surface-water sampling event; and 2) the available water-quality, geologic, and hydraulic data will be used to develop a realistic conceptual model of the ground-water/surface-water interactions.

- RI Work Plan Addendum No. 7 (BBL, March 27, 1997) proposed the installation of one additional monitoring well cluster (MW-710 series) to complete the delineation of the off-site VOC plume associated with the SRSNE Site in the area southeast of the site. USEPA approved RI Work Plan Addendum No. 7 on April 10, 1997.

A.2.2 Modifications Addressed via Conference Call, Meeting, and/or Letter

In addition to the modifications memorialized through formal addenda to the RI Work Plan, other substantive deviations from the RI Work Plan that were necessary to complete the RI were communicated to USEPA through other means, including the following activities:

- Test pit TP-702 soil sampling activities were performed during the implementation of the Detailed Wetlands Mitigation Design (BBL, September 1995) on June 19, 1996, prior to the completion of the Project Operations Plan (BBL, August 1996). This schedule modification for test pit TP-702 sampling was considered appropriate because the excavation associated with wetland construction provided a sizable exposure of undisturbed soil to characterize the soil stratigraphy. This modification was discussed with and approved by USEPA and CT DEP at a meeting with the SRSNE PRP Group in Boston on June 10, 1996. A videotape of the soil strata observed in the TP-702 excavation, and the associated soil sampling locations for permeability testing, was provided to USEPA's consultant, HNUS, on July 2, 1996.

- Twenty-five additional soil samples were collected at test pit TP-701 by Bernard Kueper, Ph.D., P.E., and were tested for permeability at the Department of Civil Engineering of Queens University in Kingston, Ontario. Dr. Kueper obtained and tested the permeability of the additional soil samples to provide additional soil hydraulic conductivity data, and to provide more resolution of the small-scale overburden hydraulic conductivity variability than obtained using five split-spoon liner sleeves at each test pit. Representatives of USEPA and CT DEP were present at the site during soil sampling by BBL and Dr. Kueper at test pit TP-701 on September 12, 1996.

- Deep bedrock well MW-705DR was installed to a depth of approximately 60 feet rather than 90 feet below the top of bedrock due to the recognition of a dense, non-aqueous phase liquid (DNAPL) during bedrock drilling. In addition, packer testing was not performed at the MW-705DR bedrock corehole. Instead, the uppermost, weathered bedrock was packer-tested at the adjacent MW-705R corehole. These modifications were considered prudent as a precaution against potential remobilization via borehole short-circuiting or hydraulic stresses. Lastly, a stainless-steel well screen and sump were used as part of the well construction for deep bedrock well MW-705DR due to the potential incompatibility of highly concentrated solvents compounds and PVC plastic. These modifications were discussed between BBL and USEPA's consultant, HNUS, on September 4, 1996. USEPA and CT DEP approved these modifications during a site visit on September 12, 1996.

- At overburden depth intervals where direct-push (Hydropunch™) ground-water sampling or a grab sample of overburden ground water was specified in the RI Work Plan, but the soil characteristics (e.g., density, low permeability, till) precluded ground-water sampling, saturated soil samples were obtained and analyzed for screening of VOC concentrations in the saturated zone to provide a basis for selecting overburden monitoring well screen depths. The saturated soil samples were submitted for VOC analysis via SW-846 Method 8010/8020. In a bi-weekly conference call with the SRSNE PRP Group on September 26, 1996, USEPA and CT DEP approved this approach to overburden VOC screening for the purpose of identifying appropriate depths for monitoring well screens.

- Downhole fracture logging was performed using a digital, optical Borehole Image Processing System (BIPS) rather than an acoustic televiewer (ATV) device. BIPS was preferred to ATV because BIPS provides a vivid digital, optical representation of the bedrock borehole wall, and reportedly provides better resolution of bedrock fracture characteristics. Borehole fracture logging using BIPS was performed at the MW-702DR and MW-704DR deep bedrock pilot holes and the former Cianci Well on October 21, 1996. This activity was observed by USEPA and CT DEP representatives, who approved the use of BIPS rather than ATV based on the quality of the BIPS data observed in the field on October 21, 1996. While BIPS had been intended to supplement ATV logging, USEPA and CT DEP agreed in the field that obtaining BIPS data from three boreholes was preferable to obtaining duplicate BIPS and ATV data from only one or two boreholes.

- The original deep bedrock monitoring well MW-707DR was grouted and replaced because the borehole drilled to install shallow bedrock monitoring well MW-707R apparently intersected the MW-707DR well. BBL described in detail the field observations, interpretations, and field confirmation supporting the apparent intersection of the wells, the proposed plan to abandon and replace well MW-707DR, and the proposed plan to verify the integrity of well MW-707R, during a bi-weekly conference call with USEPA and CT DEP on November 21, 1996 and in a letter to USEPA dated November 25, 1996. The replacement well MW-707DR was completed on December 18, 1996. Well MW-707R was determined to be in satisfactory condition and was maintained as part of the monitoring well array for the RI.

- Soil samples were collected at 5-foot intervals, rather than continuously (according to the DNAPL Contingency Plan presented in the FSP), during the overburden drilling at borehole MW-708DR. This borehole was moved from a proposed location along Queen Street, where property access was not granted, to the Oak Hill Cemetery, where the likelihood of DNAPL was considered remote. USEPA approved the modified location and soil sampling approach for the MW-708 well cluster in a telephone discussion with *de maximis, inc.*, on January 7, 1997 (January 1997 Progress Report, BBL, February 7, 1997);

- The first round of ground-water and surface-water elevation measurements was completed on January 21, 1997, prior to the completion of the MW-708 well cluster installation. Following the installation of the MW-708 wells, a supplemental round of measurements was obtained at all available monitoring wells east of the Quinnipiac River within the RI Study Area on February 11, 1997. Based on the on February 11, 1997, heads measured at the MW-708 cluster and the average changes observed between January 21, 1997, and February 11, 1997, within the shallow and deep overburden and the shallow and deep bedrock hydrostratigraphic units, correction factors were calculated and used to estimate the heads at the MW-708 cluster location on January 21, 1997. This approach was approved by USEPA and CT DEP in a bi-weekly conference call on November 8, 1996.

The remainder of this appendix briefly describes the field investigation activities that were performed to complete the RI for the SRSNE Site. The field procedures used during the RI field investigation were carried out in accordance with the USEPA-approved FSP (BBL, August 1996) or as described in modifications to the scope of work described above.

A.3 Test Pit Installation

To allow a detailed assessment of the permeability, heterogeneity, thickness, continuity, orientation, and texture of soil layers and allow sampling of discrete soil horizons for permeability testing, two test pits (TP-701 and TP-702) were installed on the former Cianci Property at the approximate locations shown on Figure 3. Each test pit was installed to a depth of approximately 7 feet, and exposed approximately 5 feet of natural, undisturbed soil. Each test pit included two vertical surfaces oriented perpendicular in plan view to evaluate the orientation of the soil layers. These vertical surfaces were 10- to 16-feet long at test pit TP-701 and 25- to 45-feet long at test pit TP-702. Test pit TP-701 was installed by East Coast-Thomas Environmental of Wallingford, Connecticut on September 12, 1996. Test Pit TP-702 was excavated by Environmental Remediation, Inc., of East Hartford, Connecticut, during the implementation of the Detailed Wetlands Mitigation Design (BBL, September 1995) on June 19, 1996. A complete Sample Log of test-pit soil samples submitted for laboratory analysis, sample depth, date, time, and analysis is presented as Attachment A-1 to this appendix.

At each test pit, the stratigraphy exposed in each major, vertical test-pit surface was photographed and/or videotaped to document the locations of key features, for example:

- Stratigraphic contacts;
- Stratigraphic discontinuities; and
- Locations of specific strata of differing texture where samples were obtained for lab permeability testing.

Each major, exposed surface was also sketched in the field with respect to the test-pit dimensions and the location, depth, orientation, thickness, and length of key strata, including all strata sampled for permeability testing. The soil strata observed in each test pit exhibited several different orientations due to the presence of cross bedding within some soil layers, potential soft-sediment deformation structures, and discontinuities (areas where strata "pinched-out").

At each test pit, BBL obtained five relatively undisturbed soil samples by pushing 6-inch long, 1-inch diameter, cylindrical, brass, split-spoon liner sleeves horizontally into the vertical wall of the test pit. These samples were submitted to Core Laboratories, Inc., for permeability testing. The samples obtained from each test pit appeared to span the complete range of qualitative soil texture observed in the test pit, from coarsest to finest. The location, depth, and layer thickness at each sample location was sketched and recorded by the field geologist. In addition, at test pit TP-701, Dr. Kueper obtained 25 soil samples approximately one cm thick each from individual stratigraphic layers by carefully scraping and removing soil using a trowel. The samples obtained by Dr. Kueper were tested for permeability at the geotechnical laboratory of the Department of Civil Engineering at Queens University.

The stratigraphic and permeability data obtained from test pits TP-701 and TP-702 provide a detailed understanding of the overburden soil structure, orientation, heterogeneity, and permeability distribution characteristics that would influence the applicability of in-situ soil-flushing remedial technologies.

Appendix B of this RI Report presents representative photographs and summarizes the key findings from test pits TP-701 and TP-702. Appendix C of this RI Report presents the geotechnical report on the soil samples obtained by BBL at each test pit. Figure 21 of this RI Report summarizes the permeability data for the soil samples obtained by BBL and Dr. Kueper at the test pits.

A.4 Soil Boring and Characterization

Thirty soil borings were installed by East Coast-Thomas between August 27, 1996 and June 10, 1997, as part of the RI drilling and well installation activities. Three borings (SB-701, SB-702, and SB-703) were drilled and sampled in the Containment Area on the former Cianci Property to obtain a total of 13 samples of vadose and saturated soils (Figure 3). One soil boring was drilled and sampled during the installation of corehole RC-701 on the former Cianci Property, where bedrock core samples were obtained for matrix VOC and solute-transport characterization. Nine pilot borings were advanced through the overburden into the deep bedrock at the nine main monitoring well installation areas during the installation of an initial deep bedrock pilot hole and monitoring well (locations MW-701DR through MW-708DR, and MW-710DR on Figure 3). Finally, 17 soil borings were performed during the installation of additional monitoring wells. Soil borings were installed using hollow-stem auger method or driven-casing methods. During the advancement of soil borings, soil and/or direct-push Hydropunch™ ground-water samples were obtained, as described below.

A.4.1 Soil Sampling

Soil samples were obtained from soil borings using a conventional 2-inch diameter split-spoon sampler with or without 6-inch long, internal, brass, split-spoon liner sleeves in accordance with ASTM D1586-84, Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Split-spoon liners were used to obtain soil samples for physical analyses requiring relatively undisturbed soil. At the SB-701, SB-702, SB-703, RC-701, MW-705DR, and MW-706DR locations, which were installed in the potential NAPL zone estimated in the RI Work Plan, soil samples were obtained continuously for geologic characterization, laboratory analysis, and/or and evaluation of potential DNAPLs according to the DNAPL Contingency Plan presented in the FSP. A complete Sample Log of the soil samples submitted for laboratory analysis, sample depth, date, time, and analysis is presented as Attachment A-1 to this appendix. Soils encountered at each boring location are described on the subsurface logs presented in Appendix E to this RI Report. Soil geotechnical data are summarized in Appendix C to this RI Report. Vadose zone soil VOC data are presented on Table 9 of this RI Report.

Soil borings at deep bedrock pilot holes MW-701DR, MW-702DR, MW-703DR, MW-704DR, MW-707DR, MW-708DR, and MW-710DR were sampled approximately every 5 feet through the overburden for geologic description and, in some cases, laboratory analysis. Soil borings SB-701, SB-702, SB-703, and the RC-701 corehole were grouted to ground surface upon $_{completion}$ using neat cement grout. The deep bedrock pilot holes (-DR series) were later completed as deep bedrock monitoring wells.

Soil samples filled specific data needs at each drilling location, as summarized in Table 1 of this RI Report. The soils at pilot holes RC-701, MW-701DR, MW-702DR, MW-705DR, MW-706DR, and MW-708DR were sampled primarily for field screening, DNAPL contingency evaluation, and geologic characterization.

At soil borings SB-701, SB-702, and SB-703, split-spoon soil samples were obtained continuously for geologic characterization and NAPL screening in accordance with the DNAPL Contingency Plan. In addition, a total of 13 laboratory samples were obtained at soil borings SB-701, SB-702, and SB-703. Three vadose-zone (unsaturated) soil samples were obtained from soil borings SB-701, SB-702, and SB-703 for analysis of VOCs, f_{oc}, porosity, and bulk density. Additionally, one vadose-zone soil sample was collected from SB-702 for analysis of VOCs. These vadose-zone data support the evaluation of the VOC contribution to ground water from the vadose zone. Nine saturated outwash and till soil samples were obtained from a variety of depth intervals at soil borings SB-701, SB-702, and SB-703 for analysis of f_{oc}, porosity, and bulk density, to provide overburden solute-transport parameters necessary to characterize soil-water partitioning of VOCs and evaluate the practicability of NAPL-zone ground-water restoration via in-situ soil flushing. Also, three till samples were obtained from soil borings SB-701, SB-702, and SB-703 for laboratory permeability tests, and provide a basis to evaluate the effectiveness of the till as a capillary barrier to downward DNAPL migration. Each of these three soil borings was grouted to ground surface using neat cement grout upon the completion of soil sampling.

At the MW-703DR and MW-704DR pilot holes, installed in the off-site plume area, split-spoon soil samples were obtained every 5 feet for geologic characterization of the overburden stratigraphy. Five soil samples were obtained at each of the MW-703DR and MW-704DR pilot holes (10 samples total) for laboratory analysis of solute-transport parameters necessary for development of a management strategy for the off-site VOC plume in the overburden, including f_{oc}, porosity, and bulk density. Five soil samples that qualitatively spanned the complete range of texture (from coarsest to finest) were also obtained from the MW-704DR pilot hole for grain-size (sieve) analysis.

Finally, at the MW-703DR, MW-707DR, and MW-710DR locations, a total of 18 saturated soil samples were obtained at 10-foot depth intervals in lieu of direct-push (Hydropunch™) ground-water samples for laboratory analysis of VOCs by SW-846 Method 8010/8020. These soil samples were obtained where the soil characteristics (e.g., fine-grain size, high density) precluded direct-push sampling. The saturated soil VOC

results were used in conjunction with direct-push (Hydropunch™) ground-water VOC results to identify overburden well screen depths, in accordance with the RI Work Plan.

The VOC and f_{oc} soil samples were shipped to Galson Laboratories, Inc., of East Syracuse, New York (Galson) for analysis. Geotechnical soil samples were shipped to Core Laboratories of Corpus Christi, Texas (Core Labs) for analysis of porosity, bulk density, permeability, and grain-size distribution.

A.4.2 Direct-Push (Hydropunch™) and Auger-Grab Ground-Water Sampling and Saturated Soil Sampling

During the installation of pilot holes in the off-site areas (MW-703DR, MW-704DR, MW-707DR, and MW-710DR), a total of 34 direct-push (Hydropunch™)or auger-grab ground-water samples and saturated soil samples were obtained at 10-foot depth intervals in the overburden. Direct-push ground-water sampling or auger-grab sampling provided a cost-effective means to assess the three-dimensional nature of the off-site VOC plume. Where soil conditions precluded ground-water sampling, saturated soil samples were obtained. These ground-water and/or soil samples were used to identify appropriate screen depths for proposed overburden ground-water monitoring wells at the MW-703DR, MW-704DR, MW-707DR, and MW-710DR locations, where new monitoring wells were installed to fill specific data gaps in the overburden monitoring array, and the saturated overburden is relatively thick. A complete log of samples submitted for laboratory analysis, sample depth, date, time, and analysis is presented as Attachment A-1 to this appendix.

Where soil characteristics allowed, in-situ ground-water samples were obtained by driving a direct-push (Hydropunch™) sampling device through the bottom of the hollow-stem augers or driven casing, in accordance with the procedures specified in the FSP. Alternately, at the MW-704DR location, the deep overburden soil density precluded direct-push sampling at two depth intervals. In accordance with the RI Work Plan, to obtain a sample of ground water for VOC screening, the augers or driven casing were purged of one casing volume, and a grab sample of ground water was obtained from the bottom of the augers or casing using a bottom-loading bailer. Direct-push ground-water samples and auger grab samples were shipped to Galson for analysis of VOCs by USEPA Method 601/602 with rapid (48-hour) turnaround. These data are summarized in Table A-1 with this appendix.

At overburden depth intervals where direct-push (Hydropunch™) sampling or auger-grab sampling of overburden ground water was specified in the RI Work Plan, but the soil characteristics (e.g., density, low permeability, till) precluded ground-water sampling, saturated soil samples were obtained and analyzed for screening of VOC concentrations in the saturated zone to provide a basis for selecting overburden monitoring well screen depths. The saturated soil samples were submitted for VOC analysis via SW-846 Method 8010/8020.

Overburden monitoring wells were installed at appropriate depth intervals to intersect zones where VOCs were detected at the highest concentrations, if any. Conversely, if no VOCs were detected in any in-situ ground-water or equivalent soil samples at a given drilling location, the overburden wells were installed at depths determined by overburden textural characteristics, such as relatively coarse-grained materials.

A.5 Bedrock Drilling and Characterization

Fifteen bedrock borings and coreholes were installed by East Coast-Thomas as part of the RI drilling and well installation activities. Nine deep bedrock pilot borings, MW-701DR through MW-708DR and MW-710DR, were installed at the nine main monitoring well installation areas (Figure 13). Each deep bedrock pilot hole was completed as a deep bedrock ground-water monitoring well. In addition, five bedrock borings were performed to install five shallow bedrock ground-water monitoring wells (MW-704R, MW-705R, MW-707R, MW-708R, and

MW-710R). Also, one bedrock corehole (RC-701) was performed to obtain bedrock matrix samples for VOC characterization.

Bedrock boreholes were installed using the rotary method with a roller bit or core barrel. A core barrel was used to obtain bedrock samples for characterization and/or analysis. A complete Sample Log of bedrock samples, sample depth, date, time, and analysis is presented as Attachment A-1 to this appendix. Packer testing was performed at each deep bedrock pilot hole to identify bedrock flow zones and quantify bedrock hydraulic conductivity. In addition, down-hole fracture logging was performed by COLOG, Inc. of Golden, Colorado, using a BIPS instrument at two deep bedrock pilot holes (MW-702DR and MW-704DR) and at an existing open-bedrock well (the former Cianci Well) to measure in-situ bedrock fracture spacing and estimated aperture, and bedrock fracture and bedding orientations. Bedrock sampling, packer testing, and downhole fracture logging are described in more detail below.

A.5.1 Bedrock Sampling

Bedrock samples were obtained continuously from the top of weathered bedrock to the base of the borehole at the MW-702DR, MW-704DR, and MW-705DR pilot holes to allow a detailed characterization of bedrock lithology, fracture characteristics, texture, grain-size, color, evidence for bioturbation or cross bedding, and bedding thickness, and to provide bedrock samples for laboratory analysis. Samples of weathered bedrock (uppermost 5 feet), shallow bedrock (between approximately 5 and 25 feet below the top of weathered bedrock), and deep bedrock (more than 25 feet below the top of weathered bedrock), were obtained using the rotary core barrel technique. Bedrock core sampling was performed in accordance with the procedures specified in the FSP. A complete Sample Log of bedrock samples submitted for laboratory analysis, sample depth, date, time, and analysis is presented as Attachment A-1 to this appendix. Bedrock core descriptions are presented on the subsurface logs in Appendix E of this RI Report. Bedrock geotechnical data and f_{oc} are summarized in Appendix C to this RI Report. Bedrock matrix VOC data are presented on Table 11 within this RI Report.

At deep bedrock pilot hole locations MW-702DR, MW-704DR, and MW-705DR, bedrock core samples were obtained from the top of the weathered bedrock to approximately 90 feet below the top of bedrock at MW-702DR and MW-704DR, and approximately 63 feet below the top of bedrock at MW-705DR. The MW-705DR pilot hole was completed at the shallower depth because the interpreted presence of DNAPL in the bedrock, based on the observation of a sheen and elevated photoionization detector (PID) readings associated with the drilling recirculation water, at a depth of approximately 60 feet below the top of rock. At each of these drilling locations, or at adjacent shallow bedrock coreholes, one sample of weathered bedrock, two samples of shallow bedrock, and two samples of deep bedrock were obtained. A supplemental bedrock corehole was installed at the MW-702DR location to obtain a sample of weathered bedrock, because at deep bedrock pilot hole MW-702DR the hollow-stem augers needed to be seated substantially into the bedrock to establish an effective seal at the base of the overburden and allow coring of the pilot hole. Bedrock samples were submitted for analysis of f_{oc} by Galson and analysis of geotechnical parameters (matrix porosity, permeability, and bulk density) by Core Labs to support solute-transport analysis, including sorption-based VOC mass assessment and matrix-diffusion-based retardation estimates.

The purpose of corehole RC-701 was to obtain bedrock core samples to evaluate whether VOCs had diffused into the matrix of the bedrock in an area where bedrock ground-water concentrations were expected to be relatively high. Corehole RC-701 was performed in the probable bedrock NAPL zone and, therefore, was installed with particular caution. Continuous soil samples were obtained in the field and evaluated in accordance with the DNAPL Contingency Plan presented in the FSP. In addition, during the advancement of the corehole, wash-water circulation was minimized to the extent practicable, and the return water was observed for the

presence of a NAPL sheen. A sheen was observed for a brief duration at approximately 5 feet below the top of bedrock, but was interpreted to be sufficiently limited to allow continued advancement of the RC-701 borehole. One core sample of weathered bedrock and 2 core samples of the shallow bedrock were obtained at RC-701 for analysis of VOC content within the bedrock matrix and solute-transport parameters that control organic-carbon-based sorption and matrix diffusion (f_{oc}, matrix porosity, matrix permeability, and matrix bulk density). The RC-701 corehole was limited to the upper 20 feet of the bedrock, and was grouted to ground surface immediately upon completion using neat cement grout. Bedrock samples for VOCs and f_{oc} were shipped to Galson for analysis. Bedrock samples for matrix porosity, permeability, and bulk density were shipped to Core Labs for analysis.

All bedrock matrix core samples submitted for VOC or f_{oc} analysis were crushed in the field, and the VOC samples were preserved via methanol immersion, prior to shipping the samples for analysis.

A.5.2 Packer Testing

Packer tests, also known as water pressure tests (Ziegler, 1976; USAR, 1977), were performed to develop a hydraulic conductivity profile for the bedrock stratigraphic column, to identify appropriate (permeable) zones for installing bedrock monitoring well screens, and to supplement the hydrogeologic database with additional bedrock hydraulic conductivity data. Bedrock packer tests were performed at all but one of the deep bedrock pilot holes drilled during the completion of this RI (MW-701DR through MW-704DR, MW-706DR through MW-708DR, and MW-710DR). Packer tests were not conducted at the MW-705DR borehole due to the interpreted presence of a substantial accumulation of DNAPL in that bedrock corehole and the timely conversion of that borehole to a DNAPL collection/monitoring well. However, packer tests were performed within the weathered bedrock at the adjacent shallow bedrock monitoring well (MW-705R). The resulting hydraulic conductivity data from the new pilot hole locations were used to select appropriate zones to install bedrock monitoring wells. Bedrock packer test data and equipment calibration data are presented in Appendix F of this RI Report. Bedrock packer test results are summarized on Table 6 of this RI Report.

Packer tests were performed from the top of the competent bedrock to the base of each deep bedrock pilot hole, generally 90 feet below the top of weathered bedrock. Because the hydraulic conductivity of the weathered (approximately top 5 feet of) bedrock was not measured during the previous investigations at the site, special attention was paid to weathered bedrock packer testing at the MW-702DR supplemental borehole, the MW-704DR pilot hole, and the MW-705R corehole. At these locations, the top of the weathered bedrock was identified based on split-spoon sampling through hollow-stem augers or driven casing during the advancement of the deep bedrock borehole or corehole. The augers or casing were advanced to the interpreted depth of the top of weathered bedrock, and one 10- to 15-foot core sample was obtained to verify the identification of the top of weathered rock (rather than a boulder within the overburden), to provide weathered bedrock samples for laboratory analysis, and to provide a short section of weathered bedrock suitable for packer testing. Weathered bedrock packer test results provided a direct comparison with packer test conductivity values derived from tests deeper in the bedrock pilot hole to evaluate whether the weathered bedrock could represent a zone of preferential ground-water flow that would warrant discrete, weathered-bedrock monitoring well installation.

Packer testing was performed in accordance with the procedures specified in the FSP. For the weathered bedrock packer tests at the MW-702DR supplemental borehole, the MW-704DR pilot hole, and the MW-705R corehole, approximately 5-foot intervals of weathered bedrock were tightly sealed between inflatable rubber packers, and potable water was pumped into the tested weathered bedrock interval isolated by the inflated packers. For the remaining bedrock packer tests, which were performed at each of the new deep bedrock pilot holes except MW-705DR, continuous, 10-foot long packer test intervals were tested. Each 10-foot interval was tightly sealed

between inflatable rubber packers, and potable water was pumped into the tested bedrock interval isolated by the inflated packers. The packer test pumping rate, water pressure, and test section geometry provide a basis to estimate the average hydraulic conductivity within the tested section (Ziegler, 1976; USAR, 1977). Packer test pressures were limited in an effort to prevent fracture dilation that would result in overestimation of bedrock hydraulic conductivity.

The two flow meters used to measure the water flow ("take") into the tested rock interval were both calibrated versus bucket-and-stopwatch flow measurements. The data relating the meter flow and the actual flow were plotted to obtain a mathematical expression to correct the field measure flows, as appropriate, for use in the hydraulic conductivity calculations (See Appendix F of this RI Report). For packer test intervals that did not indicate a quantifiable "take" of water during testing, a maximum potential hydraulic conductivity estimate was made based on the low end of the flow rate quantification range.

Frictional hydraulic head losses within the packer test equipment assembly were quantified by calibrating the packer test pipe assembly. The head losses observed for various flow rates for two lengths of test pipe were used to obtain a mathematical expression relating head loss and flow rate for the two tested pie lengths. For a given pipe length used in actual packer testing, the head loss for a given flow rate was estimated mathematically by interpolation or extrapolation of the head losses observed for the same flow rate for the two calibrated pipe lengths. The calculated head loss due to friction was then subtracted from the total differential head to determine the effective differential head applied to the tested bedrock interval prior to computing hydraulic conductivity estimates (See Appendix F to this RI Report).

In some instances, the higher calculated pressures for the packer testing sequence were unable to be achieved due to slippage of the packer apparatus in the borehole. The cause of the slippage was interpreted as slick borehole walls due to the processes of bedrock drilling or coring and/or calculated test pressures that exceeded the holding capability of the inflated packers. Packer slippage is common during testing of very deep bedrock intervals due to the high hydrostatic head, which counteracts the packer inflation pressure that provides the seal on the bedrock borehole. Throughout the packer-testing activities, the water level within the drill casing above the inflated packer assembly and the flow rate were monitored to verify that water was not leaking around the packers. Data obtained from tests where slippage was observed were not used to estimate bedrock hydraulic conductivity values.

A.5.3 Downhole Fracture Logging

To provide a direct means to detect and document the in-situ spacing, orientation, and estimated aperture of in-situ bedrock fractures, downhole fracture logging was performed at deep bedrock pilot holes MW-702DR and MW-704DR, where continuous core samples were also obtained, and at the former Cianci Well (MW-709DR). In-situ bedrock fracture data obtained at these locations are summarized as bedrock fracture tables, stereonet plots, and rose diagrams of fracture orientations, statistics, and examples of BIPS digital images in Appendix G to this RI Report.

Downhole fracture logging was performed at the site on October 21, 1996, by COLOG, Inc., of Golden, Colorado, using a digital, optical BIPS device. This activity was observed by USEPA and CT DEP representatives, who approved the use of BIPS rather than an acoustic televiewer based on the quality of the BIPS data observed in the field. Also, while BIPS had been intended to supplement ATV logging, USEPA and CT DEP agreed in the field that obtaining BIPS data from three boreholes was preferable to obtaining duplicate BIPS and ATV data from only one or two boreholes.

BIPS data were obtained by slowly lowering the digital, self-illuminating digital optical probe into the borehole on a coaxial cable that was fed over a pulley. The cable and pulley system were used to continuously record the depth monitored by the BIPS instrument. The BIPS probe has an internal compass to continuously define the azimuth of features detected optically on the walls of the borehole, including bedrock bedding, color, grain size, and structures such as cross bedding and fractures. The data were observed in real time on a computer monitor in COLOG, Inc.'s field vehicle to evaluate the quality of the image and the approximate depths of prominent bedrock features. The primary fracture orientation appeared to be eastward, subparallel to the regional stratigraphic dip within the red-brown, New Haven Arkose bedrock. The data were simultaneously recorded in a digital format. COLOG, Inc., later processed the digital data to determine bedrock fracture depths, orientations, and estimated apertures. Bedrock fracture aperture estimates from BIPS, however, are considered relatively imprecise. Alternately, quantitative estimates of bedrock hydraulic fractures were made based on BIPS fracture spacing and packer-test permeability.

A.6 Monitoring Well Installation

Twenty-eight new ground-water monitoring wells were installed in overburden soil borings or bedrock boreholes during the completion of this RI to fill data gaps in the previous ground-water monitoring array, to assess deep bedrock ground-water conditions, and to provide ground-water elevation and ground-water quality information. Monitoring well construction specifications are presented in detail on the subsurface logs in Appendix E and are summarized in Table 1 of this RI Report.

Overburden monitoring wells were installed through hollow-stem augers or driven casing. Bedrock wells were installed through augers or casing into an open bedrock borehole advanced using either a core bit or roller bit. With the exception of MW-705DR, monitoring wells were constructed using 2-inch-diameter Schedule 40, polyvinyl chloride (PVC) screens (0.010-inch machine slotted) and risers. Well MW-705DR was installed with a #304 stainless steel screen (0.010-inch wire-wrapped) and 2-foot long blank sump grouted into the bottom of the borehole. Well screens were 15 feet long at the water table, 10 feet in the remainder of the overburden, and 10 to 30 feet in bedrock, depending on relative permeability based on packer testing. A washed sand filter pack (#0 Morie Sand) was placed from the bottom of the screen to approximately 2 to 4 feet above the top of the screen. A hydrated bentonite seal was placed above the sand filter pack, and the remainder of the borehole was filled with hydrated bentonite slurry to 4 or 5 feet below ground surface. During the installation of the sandpacks and bentonite seals at all newly installed wells, the volumes of backfill materials were monitored and the top of the fill materials were constantly measured using a weighted engineers' tape. An approximately 2-foot thick layer of clean washed sand was then placed above the bentonite seal. Each new well was completed above ground surface in a locking, steel protective casing. The protective casing was seated approximately 1.5 feet into the clean sand, and the remainder of the borehole was filled with a concrete surface seal. Ground-water monitoring wells were installed and completed at ground surface in accordance with the procedures specified in the FSP.

Horizontal and vertical survey control were established for each new well by Conklin and Soroka, Inc., of Cheshire, Connecticut, including the top of the PVC riser, the top of the protective casing, and the ground surface adjacent to the well, based on the existing baseline for the SRSNE Site and the National Geodetic Vertical Datum (NGVD) of 1929.

At each deep bedrock pilot hole (MW-701DR through MW-704DR and MW-706DR through MW-708DR), a deep bedrock monitoring well was installed following the completion of core sampling, packer testing, and BIPS, as necessary. Deep bedrock monitoring wells will provide ground-water quality data and hydraulic vertical gradient data necessary to:

- Characterize the three-dimensional extent of the off-site VOC plume;
- Evaluate whether the deep bedrock represents a potential migration pathway to private water-supply wells; and
- Develop a three-dimensional flow-net for bedrock ground water necessary to identify zones of bedrock discharge to the overburden.

MW-705DR was installed as a deep bedrock DNAPL collection sump and monitoring well. Due to the presence of DNAPL at a depth of approximately 100 feet below grade (60 feet below the top of bedrock), advancement of the MW-705 DR corehole was terminated at approximately 62.5 feet below top of bedrock. The additional 2.5 feet of depth were drilled to allow the installation of a blank sump below the interpreted DNAPL depth. A 2-foot long, 2-inch diameter, # 304 stainless steel sump was grouted in place at the bottom of the corehole with a 10-foot long, 0.010-inch slot, # 304 stainless steel screen. The riser was constructed with 2-inch diameter schedule 40 PVC. A washed sand filter pack (#0 Morie Sand) was placed from the bottom of the screen to approximately 2 feet above the top of the screen. A hydrated bentonite seal was placed above the sand filter pack, and the remainder of the borehole was filled with hydrated bentonite slurry to 4 or 5 feet below ground surface. The day after installing well MW-705DR, a supplemental grab sample of ground water was obtained from the bottom of well MW-705DR using a bottom-loading bailer for analysis of VOCs by Method 8010/8020. The analytical results of this sample, presented on Table A-2 of this appendix, confirmed the interpreted high concentration of solvent VOCs at that location in the bedrock.

Following the installation of each deep bedrock monitoring well, additional monitoring wells were installed, as appropriate, at the MW-703, MW-704, MW-705, MW-707, MW-708, and MW-710 locations. Because the overburden and bedrock formations were characterized during the drilling of the initial, deep bedrock pilot hole, geologic sampling was not required during the installation of additional monitoring wells at the proposed well cluster locations. Shallow bedrock monitoring wells were installed to a depth identified based on packer testing at the adjacent deep bedrock pilot hole. Shallow bedrock wells were installed to provide ground-water quality and ground-water elevation data where data gaps existed in the ground-water monitoring array. Ground-water elevation data from these wells were used to develop plan-view and vertical-profile flow nets to evaluate the horizontal and vertical directions of ground-water flow.

Overburden monitoring wells were installed to provide ground-water quality and ground-water elevation data at locations where data gaps exist in the overburden monitoring array. Ground-water elevation data from these wells were used to develop plan-view and vertical-profile flow nets to evaluate the horizontal and vertical directions of ground-water flow.

After the completion of MW-707 well cluster, it was discovered that MW-707R had likely intersected with MW-707DR at depth. Use of a borehole inclinometer on both MW-707R and MW-707DR confirmed that MW-707R had intersected MW-707DR during drilling and installation. Subsequently, MW-707DR was grouted and abandoned and reinstalled at a new location within the MW-707 cluster. The pH, turbidity, and the visual physical characteristics of the ground water from MW-707R were monitored prior to and after the grouting of MW-707DR, and indicated no adverse effect at MW-707R during the grouting of original well MW-707DR.

In addition to installing wells at boreholes drilled during this RI, two new bedrock monitoring wells were installed in the 8-inch diameter, open bedrock, former Cianci Water Supply Well (Figure 3 of this RI Report). Following BIPS logging and specific capacity testing (described below), shallow and deep bedrock wells MW-709R and MW-709DR, respectively, were installed within the former Cianci Well by East Coast-Thomas on November 13, 1996. Well MW-709DR was first lowered to the base of the former Cianci Well borehole at 134 feet below grade. A sandpack was placed around the 14-foot long MW-709DR well screen, to a height of approximately 2 feet above the top of the screen. A bentonite pellet seal was placed from approximately 118 feet to 72 feet below grade to

hydraulically separate the MW-709DR and MW-709R well screens. The 20-foot long, MW-709R well screen was installed within a sandpack above the intervening bentonite seal. An upper bentonite seal was then placed from approximately 48 feet to 2.5 feet below grade. The effectiveness of the intervening bentonite seal between wells MW-709R and MW-709DR is demonstrated by head differences in excess of one foot and the different ground-water quality data obtained from these two wells

A.7 Well Development and Specific Capacity Testing

Each newly installed monitoring well was developed to remove fine sediment from the well and to enhance the hydraulic connection between the well and the surrounding geologic medium. Well development was performed by gently surging the well using a bailer, and purging using either a submersible pump or Waterra pump. Development at each well was considered sufficient when the turbidity of the purged water had stabilized, and a minimum of five well volumes had been removed. The total ground-water volume removed during development at each new well ranged from 42 to 810 gallons. The total number of well volumes removed ranged from 5 to 148.

The turbidity levels after development at the new overburden wells were variable, ranging from 4.1 to 381 nephelometric turbidity units (NTU). Owing to the lower silt content in the outwash and coarse drift deposits in the Town Well Field, overburden wells in that area were generally developed to turbidity values less than 50 NTU. In contrast, wells MW-708S and MW-708M, which were installed east of Queen Street, exhibited turbidity in excess of 300 NTU even after removing up to 150 gallons (up to 30 well volumes) from these wells. In addition, some of the bedrock wells installed during the completion of the RI could not be reduced to low turbidity levels even after extensive development, due to the high silt content of the bedrock. For example, the final turbidity values for bedrock wells MW-703DR, MW-707R, and MW-709R remained above 1,000 NTU, even after removing up to 135 gallons from each of these wells. The bedrock well turbidity measurements following development ranged from 2.8 to >1,000 NTU, with a mean value of approximately 320 NTU. This moderately high mean turbidity value is consistent with BBL's observations during bedrock piezometer development associated with the installation of the NTCRA 1 Ground-Water Containment System.

To characterize the hydraulic conductivity of the overburden and bedrock in the off-site plume area, specific capacity tests (Walton, 1962; ASTM D5472) were performed at the new wells within the MW-703 and MW-704 clusters and MW-707D. Additional specific capacity tests were conducted at existing monitoring wells MW-1, MW-2, MW-121B, MW-204B, MW-501B, MW-502, P-101B, and the former Cianci Well (which was later converted to monitoring wells MW-709DR and MW-709R). Specific capacity tests entailed pumping a well at a constant rate for approximately four to five hours and measuring the drawdown inside the tested well for the duration of the specific capacity test. To optimize the efficiency of data acquisition, specific capacity tests were performed at the end of monitoring well development and/or as part of purging prior to ground-water sampling. The relationship between the specific capacity test duration and pumping rate, the measured drawdown, and the geometry of the well intake section (wetted sand filter pack) were used to estimate the hydraulic conductivity of the water-bearing formation surrounding the well intake section. Specific capacity test results are considerably more reliable than slug test results for estimating hydraulic conductivity, and may approach the accuracy of pumping tests for specific capacity test durations on the order of five hours (Rovey and Cherkauer, 1995). Specific capacity tests were performed in accordance with the procedures specified in the FSP. Specific capacity test data reduction is summarized in Appendix H, and the resulting hydraulic conductivity values are presented in Table 7 of this RI Report.

As part of specific capacity testing at the MW-703 and MW-704 clusters, and the former Cianci Well, pre-pumping and pumping water-level data were measured at all wells in the cluster (including the tested well) and also at other wells in proximity to the tested well to provide a preliminary assessment of the hydraulic connection, if any,

between different geologic units and an assessment of the extent of the hydraulic response within the formation around the tested well. The hydraulic conductivity and response data between wells in a cluster provided substantial data for evaluating off-site VOC plume management alternatives. Hydraulic responses observed at wells installed at different depths during specific capacity tests provided a basis to estimate the vertical hydraulic conductivity of the overburden, the overburden-bedrock interface, and the bedrock. In addition, hydraulic responses observed around well MW-704DR provided a basis to estimate the horizontal anisotropy of the deep overburden. These analyses are presented in Appendix H of this RI Report.

A.8 Ground-Water Sampling from Wells and Piezometers, NAPL Monitoring and Sampling, and Surface-Water Sampling

Four grab samples of ground water were obtained during the subsurface investigation to provide supplemental ground-water characterization data at the former Cianci Well and the MW-705DR location. However, to provide a thorough understanding of the dissolved VOC distribution in the study area, one comprehensive round of ground-water samples [approximately 194 samples, not including the associated quality assurance/quality control (QA/QC) samples] was obtained from essentially all accessible ground-water monitoring wells, piezometers, and extraction wells as part of the RI field investigation between November 1996 and June 1997. To assess the distribution and characteristics of free-phase, recoverable NAPL, LNAPL and DNAPL thicknesses were measured at wells in the potential NAPL zone estimated in the RI Work Plan (BBL, November 1995), and three DNAPL samples were obtained from new deep bedrock monitoring well MW-705DR. Lastly, to assess the surface-water quality associated with the Quinnipiac River and the 30-inch culvert that passes beneath the former Cianci Property, two rounds of surface-water samples (nine samples each round, not including the associated QA/QC samples) were obtained. A complete Sample Log of ground-water and DNAPL samples from wells and piezometers, and surface-water samples submitted for laboratory analysis, sample date, time, and analysis is presented as Attachment A-1 to this appendix. Appendix P of this RI Report presents a summary table of the ground-water and surface-water VOCs and alcohols analytical results. This summary table reflects the results of blank-correction to eliminate false positives, which was performed consistent with data validation procedures specified by the USEPA Contract Laboratory Program - National Functional Guidelines for Organic Data Review (2/94), as discussed below in Section A.11.

A.8.1 Ground-Water Sampling from Wells and Piezometers

On September 6, 1996, one day after installing well MW-705DR, a supplemental grab sample of ground water was obtained from the bottom of well MW-705DR using a bottom-loading bailer, and shipped to Galson for analysis of VOCs by Method 8010/8020. The analytical results of this sample, presented on Table A-2 of this appendix, confirmed the interpreted high concentration of solvent VOCs at that location in the bedrock. Three grab samples of ground water were obtained from the top, middle, and bottom of the water column in the former Cianci Well using a bottom-loading bailer on October 9, 1996, prior to specific capacity testing. The analytical results of these samples, also presented on Table A-2 of this appendix, confirmed the historically observed high concentration of VOCs at that well. A sample of the potable water used during drilling was submitted for analysis of VOCs by CLP-RAS Methods and alcohols by SW-846 Method 8015. This sample indicated low concentrations of chlorinated compounds typically observed in public drinking water.

Between November 19 and December 30, 1996, approximately 184 ground-water samples (not including the associated QA/QC samples) were obtained from nearly accessible wells and piezometers in the RI study area for analysis of VOCs by CLP-RAS Methods and alcohols by SW-846 Method 8015. This sampling round, supplemented by additional samples discussed further in this paragraph, provided a comprehensive snapshot of ground-water quality conditions. Four additional ground-water samples (and necessary QA/QC samples) were

obtained at the newly-completed MW-708 well cluster, and two additional, supplemental samples were obtained from wells MW-707R and MW-209A on February 7, 1997. Well MW-707R was resampled because the analysis of the initial sample obtained on December 13, 1996, had an elevated detection level due to dilution by the laboratory, and the secondary analysis was performed outside of the holding time. Well MW-209A was resampled because the analysis of the original sample obtained on December 4, 1996, had an elevated detection level due to dilution by the laboratory. Following the installation and development of the MW-710 well cluster, three additional ground-water samples, and associated QA/QC samples, were obtained at these wells on June 13, 1997. Finally, one additional ground-water sample was obtained from well MW-705DR on June 19, 1997, to quantify the empirical, effective solubility of VOCs in the DNAPL observed in that well. The original MW-705DR ground-water sample was analyzed for VOCs by CLP-RAS Methods and alcohols by SW-846 Method 8015, and contained excessive VOCs due to the apparent entrainment of DNAPL in the sample. The supplemental ground-water sample (and one DNAPL sample) was obtained from well MW-705DR on June 19, 1997, by gently lowering a bottom-loading bailer to into the wells screen above the DNAPL (in the blank sump), then slowly removing the bailer. This supplemental ground-water sample was analyzed by Modified SW-846 Method 8260, and provided good chemical characterization data from that well, as summarized on Table 5 of this RI Report. Following their installation and development, wells MW-701S, MW-701R, and MW-710DR were also sampled on June 13, 1997, for VOC analysis.

With the exception of the grab samples and the supplemental ground-water sample obtained at well MW-705DR, each well sampled was purged prior to sampling following traditional procedures, i.e., until three to five well volumes were removed, or until the well was purged dry (then allowed to partially or fully recharge prior to sampling). Well purging was accomplished using a decontaminated submersible (Grundfos™ or Whale™) pump with polyethylene tubing, or an inertia (Waterra™) pump with high density polyethylene Waterra tubing. During purging, ground-water field parameters such as temperature, pH, and specific conductance were recorded every one half to one well volume. Ground-water samples were obtained after these field parameters stabilized to within 10 percent on successive readings, and a minimum of three well volumes had been removed. Within the time required to purge three well volumes, field parameters were usually stable. Traditional ground-water samples were obtained by lowering the pumping rate to the extent practical and collecting samples directly from the pump tubing. Ground-water samples were submitted to Galson for analysis of TCL VOCs via CLP-RAS (10/92 Low Concentration Organics in Water, including ketones and tetrahydrofuran) and alcohols via SW-846 Method 8015.

To assess natural attenuation as a remedy for the VOC plumes associated with the site, additional ground-water samples from wells P-1A, P-1B, P-6, P-8A, P-8B, MW-414, MW-415, MW-502, and each of the wells in the MW-703 and MW-704 clusters were analyzed for the following parameters: total and dissolved Fe and Mn; nitrate; ammonia; sulfate; sulfide; TOC; orthophosphate; chloride; phospholipid fatty acids; methane; ethane; and ethane. Additional ground-water field parameters, dissolved oxygen and oxidation reduction potential (ORP), were measured using a flow-through cell. Orthophosphate and dissolved metal samples were filtered by pumping ground water from the well directly through a disposable, in-line, 0.45 micron filter.

Finally, to allow a comparison between sample results obtained using traditional and low-flow purging and sampling techniques, six additional samples were also collected at wells P-4A, P-4B, P-5A, P-5B, MW-704S, and MW-704R following the USEPA Region 1 Draft Low-Flow Purging and Sampling Method (USEPA, August 1995), immediately prior to performing traditional purging and sampling at these wells. Low-flow purging and sampling was performed using a Grundfos™ submersible pump constructed of stainless steel and Teflon, with Teflon-lined polyethylene tubing. Low-flow purging was performed at the minimum practicable flow rate (0.1 to 0.2 L/min) with the pump located at the center of the well screen. Low flow samples were obtained directly from the discharge end of the tubing following stabilization of the field parameters. With the exception of

turbidity measurements, the field parameters were measured using a flow-through cell that precluded contact between discharge water and the atmosphere (D.O., pH, specific conductance, temperature).

While the majority of the wells sampled by both traditional and low-flow methods sustained sufficient pumping rates for continuous low-flow pumping, during low-flow purging at well P-5B, the well was purged dry at a rate of 0.15 L/min. As recommended by the USEPA Region I Quality Assurance Unit, BBL took the following actions to obtain a low-flow sample from well P-5B:

1. The pump was shut off when the water level reached the well screen.

2. The lowest pumping rate achievable by the pump (0.15 L/min) was recorded.

3. The water level inside the well was determined to be rising, indicating recharge of fresh ground water into the well; thus, the well was considered suitable for immediate sampling.

4. The pump was restarted and a ground-water sample was obtained from the discharge line from the pump.

Steps 1, 3, and 4 were repeated to obtain the traditional sample from well P-5B.

Throughout the ground-water sampling activities, appropriate QA/QC samples were obtained in accordance with the QAPP. Ground-water sampling, documentation, preservation, handling, and shipment were performed in accordance with the procedures specified in the FSP. Ground-water samples were analyzed in accordance with the POP. Early in the comprehensive ground-water sampling event, USEPA conducted a QA/QC audit of the sampling procedures (USEPA, December 1996). USEPA noted that the sampling procedures were consistent with the protocols stated in the USEPA-approved RI Work Plan and FSP. However, USEPA offered additional suggestions that were promptly incorporated into the remaining sampling activities, as noted in a letter from BBL to USEPA dated January 20, 1997.

Between the completion of this RI and issuance of the ROD, additional ground-water sampling will be performed to assess seasonal variability in ground-water quality conditions and to confirm that the field conditions assumed in the FS are representative. The ground-water sampling rationale and procedures during the implementation of the future sampling activities are described in the Interim Monitoring and Sampling Plan included as Appendix U to this RI Report.

A.8.2 NAPL Monitoring and Sampling

To help evaluate the location and extent of potentially recoverable NAPL at the site, NAPL monitoring was performed at wells within the former Cianci Property and the Operations Area.

Prior to purging wells sampled in the Operations Area and the former Cianci Property, the top of fluid column and the bottom of the well were checked for the presence of LNAPL or DNAPL, respectively, using a bottom-loading bailer. NAPL presence was indicated as thin, dark brown to black, with an oily sheen and solvent odor, or as a measurable column of NAPL in the bottom-loading bailer. Prior to purging wells containing NAPL, the NAPL was removed by bailing. NAPL was observed at the following wells:

Well	NAPL Observation
CPZ-7R	Sheen at top of water column and bottom of well

CPZ-9R	0.01 feet LNAPL at top of water column, sheen at bottom of well
MW-705DR	2.0 feet DNAPL in sump of well
MWD-601	0.2 feet DNAPL in sump of well
P-1B	0.01 feet LNAPL at top of water column, sheen at bottom of well
P-2B	Sheen at top of water column and bottom of well
RW-5	Sheen at bottom of well

NAPL observed at these wells was removed to the extent practicable by bailing using a bottom-loading bailer prior to purging the well for sampling. While the NAPL volumes observed were generally insufficient to collect a sample of NAPL for laboratory analysis, three DNAPL samples were obtained from well MW-705DR for analysis of physical parameters (January 29, 1997) and chemical constituents (December 27, 1996, and June 19, 1997). The DNAPL sample obtained from well MW-705DR on December 27, 1996, for chemical characterization did not yield any detectible VOCs due to the high dilution factor and narrow calibration range used in the analysis for VOCs by CLP-RAS Method 10/92 Low Concentration Organics in Water. One DNAPL sample and one ground-water sample were obtained on June 19, 1997 for analysis of VOCs by modified SW-846 Method 8260; the analytical results from these samples are summarized on Table 5 of this RI Report.

A.8.3 Surface-Water Sampling

In accordance with RI Work Plan Addendum No. 6, two rounds of surface-water samples were obtained on December 30, 1996, and July 8, 1997. During each sampling event, seven surface-water samples were obtained from the Quinnipiac River, and two samples (influent and effluent) were be obtained from the 30-inch underground culvert outfall at the locations shown on Figure 42 of this RI Report. The surface-water sampling locations along the Quinnipiac River covered a previously-sampled section of the river extending from downstream (SW-A, -B, and -C) to upstream (SW-G) of the SRSNE Site. The proposed sampling locations were selected to provide a direct comparison between surface-water concentrations in the river and the ground-water analytical results from shallow overburden monitoring wells situated adjacent to the river. The proposed sampling locations, therefore, are appropriate to support a realistic conceptual model of ground-water/surface-water interactions associated with the Quinnipiac River.

The surface-water sampling procedures, described in detail in RI Work Plan Addendum No. 6, were consistent with the surface-water sampling methods previously implemented by HNUS (May, 1994). Each sample obtained from the river or the culvert was transferred from the sample collection jar into appropriate sample vials for shipment to Galson for analysis of Target Compound List (TCL) VOCs by CLP-RAS Methods and alcohols by SW-846 Method 8015. Each surface-water sampling location was marked in the field using a survey stake. These locations were horizontally and vertically located by survey to support future data presentation. The sample analysis and QA/QC methods associated with the surface-water samples were identical to those associated with sampling ground-water from wells and piezometers, except that: (1) equipment rinse blanks were obtained from the decontaminated dip sampler used to obtain the surface-water samples; and (2) as surface-water represents a sample matrix distinct from ground water, surface-water samples were shipped and analyzed in sample delivery groups separate from ground-water sample delivery groups. With these two exceptions, surface-water samples were handled, documented, preserved, shipped, and analyzed identical to ground-water samples from wells and piezometers.

A.9 Ground-Water Elevation Monitoring

Two comprehensive rounds of ground-water elevation measurements were made during the completion of this RI, using all (227) accessible monitoring wells, piezometers, extraction wells, and surface-water measurement points

in the study area. Ground-water elevation data were measured with reference to the surveyed top of PVC riser at each well or piezometer, using a decontaminated, electronic water-level indicator. Surface-water elevations were determined by measuring down to the water surface from several pre-surveyed reference points. Ground-water elevation measurements were completed within a single day to provide a snapshot of ground-water elevation and hydraulic gradient conditions on January 21, 1997 and July 7, 1977. During the January 21, 1997 measurement round, the MW-708 well cluster was in the process of installation. A secondary round of water levels was collected after the installation of the MW-708 cluster on February 11, 1997, and included all wells east of the Quinnipiac River between Lazy Lane and Flanders Street. These measurements were used to correct for temporal drift in head values between January 21, 1997 and February 11, 1997, and to provide a mechanism to estimate the heads at the MW-708 well cluster location on January 21, 1997.

Ground-water elevation measurements were used to develop plan-view and vertical profile flow nets depicting the three-dimensional ground-water flow regime within and between the overburden and bedrock formations. Ground-water elevation contour maps and profiles were used to identify hydraulic divides and zones of bedrock ground-water discharge to the overburden. Also ground-water elevation data will help to characterize the relationship, if any, between the SRSNE Site and private water-supply wells in the residential area west of the site.

In addition to comprehensive ground-water elevation measurement rounds, continuous ground-water elevation data were obtained at new shallow and deep bedrock monitoring wells MW-704R, MW-704DR, MW-707R, MW-707DR, MW-708R, and MW-708DR. Dedicated transducer and datalogger units (In-Situ, Inc. Trolls™) were installed at these locations, and were used to automatically record continuous water-level conditions over periods ranging from approximately eight to 20 weeks. The long-term, continuous hydrograph plots from each clustered pair of monitored wells demonstrated similar temporal trends, indicating that shallow and deep bedrock are hydraulically connected.

A.10 Equipment Decontamination

Throughout the RI, any equipment used to sample soil or ground water for chemical laboratory analysis was decontaminated prior to use in accordance with the decontamination procedures specified in the FSP. In addition, downhole drilling equipment was decontaminated between monitoring well clusters and between individual soil borings within the Containment Area by pressurized hot-water (steam) cleaning. Liquids used in decontamination were collected and pumped through the NTCRA 1 Ground-Water Treatment System.

A.11 Sample Analysis/Data Validation

As specified in the POP, laboratory analyses followed USEPA CLP RAS methods or other appropriate standard methods. Field analyses were performed in accordance with the applicable protocols included in the FSP. Validatable analytical data packages were prepared by Galson to allow data validation, if necessary.

Upon inspection of the ground-water and surface-water analytical data received from Galson for the comprehensive ground-water and surface-water sampling round associated with the SRSNE Site Remedial Investigation, during which 264 samples (including QA/QC) were collected between November 20, 1996 and February 7, 1997, a number of GC/MS target VOCs were observed in the rinse blanks and trip blanks. Similar results were observed in analytical results from the July 1997 surface-water samples. To assess the impact of blank contamination on the data usability and to determine if any additional data quality issues exist that might indicate the need for full data validation, BBL conducted a general review of the data quality. In addition to rinse and trip blanks, method blanks, surrogate recoveries, matrix spike and matrix spike duplicate (MS/MSD) recoveries, and matrix spike blank (MSB) recoveries were examined for deviations that might indicate systemic problems.

An expected number of deviations were observed in the surrogates, MS/MSDs, and MSBs, with no indications of a systemic problem. Inspection of the method blanks revealed a pattern of contamination similar to that observed in the rinse and trip blanks. Based on the results of this data review, it was determined that complete data validation was not required, but the data should be corrected for blank contamination to screen out false positives in the reported data. BBL performed blank corrections for the ground-water and surface-water VOC data, consistent with the USEPA Contract Laboratory Program - National Functional Guidelines for Organic Data Review (2/94). The blank-corrected analytical results are tabulated in Appendix P.

TABLE A-1

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DIRECT-PUSH GROUND-WATER AND SATURATED SOIL VOC DATA

Location Client I.D. Matrix Depth Interval	MW-703DR H001 Water (HP) 10'-11'	MW-703DR H003 Water (HP) 20'-21'	MW-703DR H004 Water (HP) 30'-31'	MW-703DR H005 Water (HP) 40'-41'	MW-703DR S020 Soil 50'-52'	MW-703DR S022 Soil 59'-61'	MW-703DR S023 Soil 69'-71'	MW-703DR S025 Soil 79'-79.5'
Benzene	<0.2	<0.2	<0.2	<0.2	<0.6	<0.5	<0.6	<0.6
Bromodichloromethane	<0.6	<0.6	<0.6	0.5	<0.6	<0.5	<0.6	<0.6
Bromoform	<0.1	<0.1	<0.1	0.3	<0.6	<0.5	<0.6	<0.6
Chlorobenzene	<0.1	<0.1	<0.1	<0.1	<0.6	<0.5	<0.6	<0.6
Chloroethane	<0.3	<0.3	<0.3	<0.3	<0.6	<0.5	<0.6	<0.6
Chloroform	<0.09	<0.09	<0.09	0.5B	<0.6	<0.5	<0.6	<0.6
Chloromethane	<0.4	<0.4	<0.4	<0.4	<0.6	<0.5	<0.6	<0.6
Dibromochloromethane	<0.09	<0.09	<0.09	0.6	<0.6	<0.5	<0.6	<0.6
1,1-Dichloroethane	<0.1	<0.1	2.4	0.3	<0.6	<0.5	<0.6	<0.6
1,2-Dichloroethane	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5	<0.6	<0.6
1,1-Dichloroethene	<0.3	<0.3	0.4	<0.3	<0.6	<0.5	<0.6	<0.6
trans 1,2-dichloroethene	<0.2	<0.2	<0.2	<0.2	<0.6	<0.5	<0.6	<0.6
Ethylbenzene	<0.2	<0.2	<0.2	0.3	<0.6	<0.5	<0.6	<0.6
Methylene Chloride	0.2B	0.2B	0.3B	0.2B	2.8	2.3	0.6	3.6
Tetrachloroethylene	<0.2	0.5	<0.2	0.6	<0.6	<0.5	<0.6	<0.6
Toluene	0.8B	0.6B	0.4B	1.2B	<0.6	<0.5	<0.6	<0.6
1,1,1-Trichloroethane	<0.2	<0.2	3.4	0.4	<0.6	<0.5	<0.6	<0.6
1,1,2-Trichloroethane	<0.2	<0.2	<0.1	<0.1	<0.6	<0.5	<0.6	<0.6
Trichloroethene	<0.1	<0.1	0.8	5.4	<0.6	<0.5	<0.6	<0.6
Vinyl Chloride	<0.3	<0.3	<0.3	<0.3	<0.6	<0.5	<0.6	<0.6
m,p-Xylene	<0.4	<0.4	<0.4	<0.4	<0.6	<0.5	<0.6	<0.6
o-xylene	<0.2	<0.2	<0.2	<0.2	<0.6	<0.5	<0.6	<0.6
TOTAL VOCs	0.0	0.5	7.0	8.4	2.8	2.3	0.6	3.6

See Notes on Page 4.

TABLE A-1

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DIRECT-PUSH GROUND-WATER AND SATURATED SOIL VOC DATA

Location Client I.D. Matrix Depth Interval	MW-704DR H009 Water (HP) 11'-12'	MW-704DR H010 Water (HP) 21'-22'	MW-704DR H012 Water (HP) 31'-32'	MW-704DR H013 Water (HP) 41'-42'	MW-704DR H014 Water (auger)* 54'-58'	MW-704DR H016 Water (auger)* 63'-68'
Benzene	<0.2	<0.2	<0.2	2.0	<0.2	<0.2
Bromodichloromethane	<0.6	<0.6	3.2	<0.6	2.1	0.4
Bromoform	<0.1	<0.1	0.8	<0.1	0.3	<0.5
Chlorobenzene	<0.1	<0.1	<0.1	1.1	<0.1	<0.1
Chloroethane	<0.3	<0.3	0.3	4.6	<0.3	<0.3
Chloroform	<0.09	<0.09	3.1	0.5	2.8B	0.4B
Chloromethane	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Dibromochloromethane	<0.09	<0.09	2.8	<0.09	1.2	0.4
1,1-Dichloroethane	<0.1	<0.1	<0.1	1.7	<0.1	0.2
1,2-Dichloroethane	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
1,1-Dichloroethene	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
trans 1,2-dichloroethene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methylene Chloride	0.2B	0.1B	0.4B	0.4B	0.2B	0.1B
Tetrachloroethylene	0.3	<0.2	0.5	0.5	0.4	0.3
Toluene	0.6B	0.3B	0.5B	0.3B	7.6	0.3B
1,1,1-Trichloroethane	<0.2	<0.2	<0.2	0.4	<0.2	<0.2
1,1,2-Trichloroethane	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
Trichloroethene	0.5	0.3	2.8	3.7	1.6	1.5
Vinyl Chloride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
m,p-xylene	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
o-xylene	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TOTAL VOCs	0.8	0.3	13.5	14.5	13.2	2.8

See Notes on Page 4.

TABLE A-1

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DIRECT-PUSH GROUND-WATER AND SATURATED SOIL VOC DATA

Location	MW-707DR	MW-707DR	MW-707DR	MW-707DR	MW-707DR	MW-707DR	MW-707DR	MW-707DR	MW-707DR
Client I.D.	H006	H007	S026	S027	S028	S029	S030	S031	S032
Matrix	Water	Water	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Depth Interval	15'-16'	25'-26'	35'-36'	44'-46'	54'-56'	64'-66'	74'-76'	84'-86'	93'-95'
Benzene	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	<0.06	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	<0.09	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane	<0.4	<0.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	<0.09	<0.09	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	<0.1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	<0.06	<0.06	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
trans 1,2-dichloroethene	<0.06	<0.06	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	<0.2	0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	0.3B	0.2B	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	<0.2	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.7B	0.9B	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.8	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	<0.3	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
m,p-xylene	<0.4	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
o-xylene	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
TOTAL VOCs	0.8	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0

See Notes on Page 4.

TABLE A-1

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DIRECT-PUSH GROUND-WATER AND SATURATED SOIL VOC DATA

Location Client I.D. Matrix Depth Interval	MW-710DR H018 Water (HP) 26'-27'	MW-710DR H019 Water (HP) 36'-37'	MW-710DR H020 Water (HP) 46'-47'	MW-710DR H022 Water (HP) 56'-57'	MW-710DR S049 Soil 64'-66'	MW-710DR S050 Soil 74'-76'	MW-710DR S051 Soil 84'-86'	MW-710DR S052 Soil 94'-96'	MW-710DR S053 Soil 104'-106'	MW-710DR S054 Soil 114'-116'	MW-710DR S055 Soil 124'-126'
Benzene	0.3	<0.2	<0.2	<0.2	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Bromodichloromethane	0.4	0.9	<0.06	0.5	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Bromoform	<0.1	<0.1	<0.1	<0.1	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Chlorobenzene	<0.1	<0.1	<0.1	<0.1	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Chloroethane	<0.3	<0.3	<0.3	<0.3	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Chloroform	0.8TB	1.3TB	0.2TB	1.1B	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Chloromethane	<0.4	<0.4	<0.4	0.5	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Dibromochloromethane	0.3	0.9	<0.09	0.3	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
1,1-Dichloroethane	<0.1	<0.1	<0.1	<0.1	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
1,2-Dichloroethane	<0.06	<0.06	<0.06	<0.06	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
1,1-Dichloroethene	<0.3	<0.3	<0.3	<0.3	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
trans 1,2-dichloroethene	<0.2	<0.2	<0.2	<0.2	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Ethylbenzene	<0.2	<0.2	<0.2	<0.2	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Methylene Chloride	0.7B	0.7B	0.7B	0.6B	4.1B	8.0B	5.0B	3.8B	4.6B	5.1B	3.8B
Tetrachloroethylene	0.4	0.5	0.4	0.9	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Toluene	0.2	0.3	<0.2	0.3	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
1,1,1-Trichloroethane	<0.2	<0.2	0.5	<0.2	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
1,1,2-Trichloroethane	<0.1	<0.1	<0.1	<0.1	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Trichloroethene	<0.2	<0.2	0.9	<0.2	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
Vinyl Chloride	<0.3	<0.3	<0.3	<0.3	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
m,p-Xylene	<0.4	<0.4	<0.4	<0.4	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
o-Xylene	<0.2	<0.2	<0.2	<0.2	<0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.5
TOTAL VOCs	1.6	2.6	1.8	2.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Notes:
1. HP = Hydropunch™ sample.
2. * = Auger grab sample.
3. Hydropunch and auger grab results are in units of micrograms per liter (ug/L) equivalent to parts per billion (ppb); soil results are in units of micrograms per kilogram (ug/kg) equivalent to parts per billion (ppb).
4. Hydropunch™ and auger grab samples were analyzed using EPA method 601/602; soil samples were analyzed using SW-846 method 8010/8020.
5. Total VOCs does not include compounds detected in QA/QC blanks.

TABLE A-2

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

GROUND-WATER GRAB SAMPLE VOC DATA

Location	Cianci Well	Cianci Well	Cianci Well	MW-705DR
Client I.D.	G002	G003	G004	G001
Matrix	Water	Water	Water	Water
Depth Interval	Top	Middle	Bottom	90'-100'
Benzene	4.8	6.4	<0.2	200
Bromodichloromethane	<0.1	<0.3	43	<60
Chloroform	<0.2	<0.4	200B	270
1,1-Dichloroethane	6.1	5.9	<25	<130
1,2-Dichloroethane	6.0	7.2	<25	250
1,1-Dichloroethene	14	28	36	<280
trans 1,2-Dichloroethene	0.8	<1.0	<25	<200
Ethylbenzene	3.9	33	38	440
Methylene Chloride	0.8B	4.5B	<25	9000B
Tetrachloroethene	24	72	120	2100
Toluene	100	180	210	5900
1,1,1-Trichloroethane	26	42	54	2400
1,1,2-Trichloroethane	2.0	2.0	<25	<100
Trichloroethene	100	190	1600	84000
Vinyl Chloride	20	36	37	<310
m,p-Xylene	33	90	84	680
o-Xylene	20	35	31	320
TOTAL VOCs	360.6	727.5	2253	96560

Notes:
Units are microgram per liter (ug/L) equivalent to parts per billion (ppb).
Samples were analyzed using EPA method 601/602.
Total VOCs does not include compounds detected in QA/QC blanks.

ATTACHMENT A - 1

SAMPLE LOG - BEDROCK SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c	Specific Location (d)						
R001	C-R-MW705DR-01-S(42)	C	R	MW705DR	01	S	42	8/30/96	13:20	TOC sample for lab analysis, BD, permeability, and porosity.
R002	C-R-MW705DR-02-S(53-54)	C	R	MW705DR	02	S	(53-54)	9/3/96	7:25	TOC sample for lab analysis, BD, permeability, and porosity.
R003	C-R-MW705DR-03-S(60-61)	C	R	MW705DR	03	S	(60-61)	9/3/96	8:02	TOC sample for lab analysis, BD, permeability, and porosity.
R004	C-R-MW705DR-03-D(60-61)	C	R	MW705DR	03	D	(60-61)	9/3/96	8:15	Blind duplicate of R003 for TOC.
R005	C-R-MW705DR-04-S(101)	C	R	MW705DR	04	S	(101)	9/4/96	13:20	TOC sample, BD, permeability, and porosity. VOC by 8240 meth. immers.
R006	C-R-MW705DR-05-S(102)	C	R	MW705DR	05	S	(102)	9/4/96	13:25	TOC sample only.
R007	C-R-MW705DR-06-S(99)	C	R	MW705DR	06	S	(99)	9/4/96	14:25	BD, permeability, and porosity.
R008	C-R-RC701-01-S(54-55)	C	R	RC701	01	S	(54-55)	9/12/96	8:50	VOCs by 8240. Jar WT = 111.8 g, Jar & Rock = 21.7 g, w/Meth = 286 g + TOC, BD, perm. & porosity.
R009	C-R-RC701-02-S(61-62)	C	R	RC701	02	S	(61-62)	9/12/96	12:50	VOCs by 8240. Jar WT = 111.8 g, Jar & Rock = 206.1 g, w/Meth = 279.2 g + TOC, BD, perm. & porosity.
R009 MS/MSD	C-R-RC701-02-MS/MSD(61-62)	C	R	RC701	02	MS/MSD	(61-62)	9/12/96	12:50	VOCs by 8240. Jar WT = 112.8 g, Jar & Rock = 214.8 g, w/Meth = 290 g
R010	C-R-RC701-03-S(67-68)	C	R	RC701	03	S	(67-68)	9/12/96	13:00	VOCs by 8240. Jar WT = 112.4 g, Jar & Rock = 215 g, w/Meth = 286 g +TOC, BD, perm. & porosity.
R011	C-R-RC701-03-D(67-68)	C	R	RC701	03	D	(67-68)	9/12/96	13:10	VOCs by 8240. Jar WT = 112.3, Jar & Rock = 220.4, w/Meth = 290 g. Blind dup of R010.
R012	W-R-MW704DR-01-S(79-79.75)	W	R	MW704DR	01	S	(79-79.75)	10/10/96	17:25	TOC, BD, permeability & porosity.
R013	W-R-MW704DR-02-S(86.5-87.5)	W	R	MW704DR	02	S	(86.5-87.5)	10/10/96	18:30	TOC, BD, permeability & porosity.
R014	W-R-MW704DR-03-S(99.5-100)	W	R	MW704DR	03	S	(99.5-100)	10/11/96	7:50	TOC, BD, permeability & porosity.
R015	W-R-MW704D-04-S(117.5-118.5)	W	R	MW704DR	04	S	(117.5-118.	10/11/96	11:00	TOC, BD, permeability & porosity.
R016	W-R-MW704DR-05-S(163-164)	W	R	MW704DR	05	S	(163-164)	10/11/96	16:00	TOC, BD, permeability & porosity.
R017	O-R-MW702-01-S(30-31)	O	R	MW702	01	S	(30-31)	10/12/96	12:40	TOC, BD, permeability & porosity.
R018	O-R-MW702-02-S(42-43)	O	R	MW702	02	S	(42-43)	10/12/96	13:40	TOC, BD, permeability & porosity.
R019	O-R-MW702-03-S(64.9-65.5)	O	R	MW702	03	S	(64.9-65.5)	10/12/96	16:55	TOC, BD, permeability & porosity.
R020	O-R-MW702-04-S(101-102)	O	R	MW702	04	S	(101-102)	10/14/96	13:55	TOC, BD, permeability & porosity.
R021	O-R-MW702-05-S(23-24)	O	R	MW702	05	S	(23-24)	11/4/96	12:30	TOC, BD, permeability, & porosity from MW-702 supplemental borehole
R022	C-R-RC701-01-R(54-55)	C	R	RC701	01	R	(54-55)	11/5/96	11:00	Methanol FB for 8240 VOCs.

SAMPLE LOG - SOIL SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Lab Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
S001	C-S-SB701-01S(2-4)	C	S	SB701	01	S	2-4	8/27/96	10:09	Taken from interval directly above saturated — at 3.9' BGS for TOC, BD, porosity, and VOCs
S002	C-S-SB701-02S(8-10)	C	S	SB701	02	S	8-10	8/27/96	11:30	TOC, bulk density (BD) & porosity (8.5-9)
S003	C-S-SB701-03S(12-14)	C	S	SB701	03	S	12-14	8/27/96	11:52	TOC, BD & porosity (13.5-14)
S004	C-S-SB701-03R(12-14)	C	W	SB701	03	R	12-14	8/27/96	12:05	Taken from split-spoon after 12-14 interval for VOCs
S005	C-S-SB701-04S(18-20)	C	S	SB701	04	S	18-20	8/27/96	12:45	TOC, BD, porosity, and permeability of till (19-19.5)
S006	C-S-SB702-01S(0-2)	C	S	SB702	01	S	0-2	8/27/96	15:15	TOC, BD & porosity (1-1.5)
S007	C-S-SB702-01D(0-2)	C	S	SB702	01	D	0-2	8/27/96	15:20	Blind dup for TOC from 0-2 interval
S008	C-S-SB702-02S(2-4)	C	S	SB702	02	S	2-4	8/27/96	15:40	VOCs, TOC, BD, and porosity
S008 MS/MSD	C-S-SB702-02MS/MSD(2-4)	C	S	SB702	02	MS/MSD	2-4	8/27/96	15:45	VOC MS/MSD
S009	C-S-SB702-02D(2-4)	C	S	SB702	02	D	2-4	8/27/96	15:30	Blind dup for VOC from 2-4' interval
S010	C-S-SB702-03S(6-8)	C	S	SB702	03	S	6-8	8/27/96	16:12	TOC, BD & porosity (6-8, 7-7.5)
S011	C-S-SB702-04S(10-12)	C	S	SB702	04	S	10-12	8/27/96	16:50	TOC, BD & porosity (10-12, 11-11.5)
S012	C-S-SB702-05S(18-20)	C	S	SB702	05	S	18-20	8/27/96	8:05	TOC, BD, porosity & permeability of till (18-20, 18.5-19)
S013	C-S-SB703-01S(2-4)	C	S	SB703	01	S	2-4	8/28/96	9:55	VOCs, TOC, BD & porosity (2-4, 3-3.5)
S014	C-S-SB703-02S(4-6)	C	S	SB703	02	S	4-6	8/28/96	10:13	TOC, BD & porosity (4-6, 4.5-5)
S015	C-S-SB703-03S(14-16)	C	S	SB703	03	S	14-16	8/28/96	11:20	TOC, BD & porosity (14-16, 14.15)
S016	C-S-SB703-04S(20-22)	C	S	SB703	04	S	20-22	8/28/96	12:05	TOC, BD, porosity, & permeability (20-22, 21.5-22)
S017	W-S-MW703DR-01-S(24-26)	W	S	MW703DR	01	S	24-26	9/28/96	8:35	TOC, BD & porosity (24-26, 25-25.5)
S018	W-S-MW703DR-02-S(34-36)	W	S	MW703DR	02	S	34-36	9/26/96	9:50	TOC, BD & porosity (34-36, 35-35.5)
S019	W-S-MW703DR-03-S(44-46)	W	S	MW703DR	03	S	44-46	9/26/96	11:10	TOC, BD & porosity (44-46, 44.5-45)
S020	W-S-MW703DR-04-S(50-52)	W	S	MW703DR	04	S	50-52	9/26/96	14:10	VOA 8010/8020 from 50-52
S021	W-S-MW703DR-05-S(54-56)	W	S	MW703DR	05	S	54-56	9/26/96	14:35	TOC, BD & porosity from 54-56 (55-55.5)
S022	W-S-MW703DR-06-S(59-61)	W	S	MW703DR	06	S	59-61	9/26/96	15:20	VOA 8010/8020 from 59-61
S023	W-S-MW703DR-07-S(64-71)	W	S	MW703DR	07	S	69-71	9/26/96	9:30	VOA 8010/8020 from 69-71
S024	W-S-MW703DR-08-S(74-76)	W	S	MW703DR	08	S	74-76	9/27/96	10:50	TOC, BD & porosity from 74-76 (74.5-75)
S025	W-S-MW703DR-09-S(79-79.5)	W	S	MW703DR	07	S	79-79.5	9/27/96	11:15	VOC 8010/8020
S026	W-S-MW707DR-01-S(35-36)	W	S	MW707DR	01	S	35-36	9/27/96	13:17	VOC 8010/8020 from 35-36
S027	W-S-MW707DR-02-S(44-46)	W	S	MW707DR	02	S	44-46	9/27/96	14:16	VOC 8010/8020 from 44-46
S028	W-S-MW707DR-03-S(54-56)	W	S	MW707DR	03	S	54-56	9/27/96	9:45	VOC 8010/8020 from 54-56
S029	W-S-MW707DR-04-S(64-66)	W	S	MW707DR	04	S	64-66	9/30/96	10:30	VOC 8010/8020 from 64-66
S030	W-S-MW707DR-05-S(74-76)	W	S	MW707DR	05	S	74-76	9/30/96	11:25	VOC 8010/8020 from 74-76
S031	W-S-MW707DR-06-S(84-86)	W	S	MW707DR	06	S	84-86	9/30/96	13:40	VOC 8010/8020 from 84-86
S032	W-S-MW707DR-07-S(93-95)	W	S	MW707DR	07	S	93-95	9/30/96	15:30	VOC 8010/8020 from 93-95
S033	W-S-MW704DR-01-S(14-16)	W	S	MW704DR	01	S	14-16	9/30/96	12:58	TOC, BD, porosity & grain size from 14-16 @ MW704DR (15-15.5)
S034	W-S-MW704DR-02-S(19-21)	W	S	MW704DR	02	S	19-21	10/7/96	13:40	TOC, BD, porosity & grain size from 19-21 @ MW704DR (20-20.5)
S035	W-S-MW704DR-03-S(24-26)	W	S	MW704DR	03	S	24-26	10/7/96	14:30	TOC, BD, porosity & grain size from 24-26 @ MW704DR (25.5-26)
S036	W-S-MW704DR-04-S(34-36)	W	S	MW704DR	04	S	34-36	10/7/96	15:25	TOC, BD, porosity & grain size from 34-36 @ MW704DR (35.5-36)
S037	W-S-MW704D-05-S(55-57)	W	S	MW704D	05	S	55-57	10/7/96	16:40	TOC, BD, porosity & grain size from 55-57 @ MW704D (55-55.5)
S038	W-S-MW704D-05-D(55-57)	W	S	MW704D	05	D	55-57	11/6/96	15:35	Blind dup of above for TOC
S039	C-S-TP701-01-S(4.4)	C	S	TP701	01	S	4.4	11/6/96	14:00	Test pit permeability
S040	C-S-TP701-02-S(4.5)	C	S	TP701	02	S	4.5	9/12/96	11:00	Test pit permeability
S041	C-S-TP701-03-S(4.6)	C	S	TP701	03	S	4.6	9/12/96	11:15	Test pit permeability
S042	C-S-TP701-04-S(4.7)	C	S	TP701	04	S	4.7	9/12/96	11:30	Test pit permeability
S043	C-S-TP701-05-S(4.8)	C	S	TP701	05	S	4.8	9/12/96	11:45	Test pit permeability
S044	C-S-TP702-01-S(4)	C	S	TP702	01	S	4	9/12/96	12:00	Test pit permeability
S045	C-S-TP702-02-S(4)	C	S	TP702	02	S	4	6/19/96	13:00	Test pit permeability
S046	C-S-TP702-03-S(6)	C	S	TP702	03	S	6	6/19/96	13:05	Test pit permeability
S047	C-S-TP702-04-S(5)	C	S	TP702	04	S	5	6/19/96	13:10	Test pit permeability
S048	C-S-TP702-05-S(5)	C	S	TP702	05	S	5	6/19/96	13:15	Test pit permeability
S049	P-S-MW710DR-01-S(64-66)	P	S	MW710DR	01	S	64-66	5/29/97	9:10	VOC 8010/8020 from 64-66
S050	P-S-MW710DR-02-S(74-76)	P	S	MW710DR	02	S	74-76	5/29/97	10:37	VOC 8010/8020 from 74-76
S051	P-S-MW710DR-03-S(84-86)	P	S	MW710DR	03	S	84-86	5/29/97	11:35	VOC 8010/8020 from 84-86
S052	P-S-MW710DR-04-S(94-96)	P	S	MW710DR	04	S	94-96	5/29/97	13:20	VOC 8010/8020 from 94-96
S053	P-S-MW710DR-05-S(104-106)	P	S	MW710DR	05	S	104-106	5/29/97	14:15	VOC 8010/8020 from 104-106
S054	P-S-MW710DR-06-S(114-116)	P	S	MW710DR	06	S	114-116	5/29/97	15:15	VOC 8010/8020 from 114-116
S055	P-S-MW710DR-07-S(124-126)	C	S	MW710DR	07	S	124-126	5/29/97	16:50	VOC 81010/8020 from 124-126

SAMPLE LOG - DIRECT-PUSH (HYDROPUNCH) OR AUGER GRAB SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c)	Specific Location (d)						
H001	W-H-MW703DR-01-S(10-11)	W	H	MW707DR	01	S	(10-11)	9/25/96	1630	Hyrdropunch from 10-11' for VOA 601/602
H002	W-H-MW703DR-01-T(10-11)	W	H	MW703DR	01	T	(10-11)	9/25/96	1700	Trip blank for 9/25/96 for VOA 601/602
H003	W-H-MW703DR-02-S(20-21)	W	H	MW703DR	02	S	(20-21)	9/26/96	0800	Hydropunch from 20-21' for VOA 601/602
H004	W-H-MW703DR-03-S(30-31)	W	H	MW703DR	03	S	(30-31)	9/26/96	0900	Hydropunch from 30-31' for VOA 601/602
H005	W-H-MW703DR-04-S(40-41)	W	H	MW703DR	04	S	(40-41)	9/26/96	1045	Hydropunch from 40-41' for VOA 601/602
H006	W-H-MW707DR-01-S(15-16)	W	H	MW707DR	01	S	(15-16)	9/27/96	0900	Hydropunch from 15-16' for VOA 601/602
H007	W-H-MW707DR-02-S(25-26)	W	H	MW707DR	02	S	(25-26)	9/27/96	1010	Hydropunch from 25-26' for VOA 601/602
H008	W-H-MW707DR-03-T(25-26)	W	H	MW707DR	03	T	(25-26)	9/27/96	1140	Trip Blank
H009	W-H-MW704DR-01-S(11-12)	W	H	MW704DR	01	S	(11-12)	10/7/96	1230	Hydropunch from 11-12' BGS @MW-704DR for VOA 601/602
H010	W-H-MW704DR-02-S(21-22)	W	H	MW704DR	02	S	(21-22)	10/7/96	1350	Hydropunch from 21-22'
H011	W-H-MW704DR-02-T(21-22)	W	H	MW704DR	02	T	(21-22)	10/7/96	1355	Trip Blank
H012	W-H-MW704DR-03-S(31-32)	W	H	MW704DR	03	S	(31-32)	10/7/96	1500	Hydropunch
H013	W-H-MW704DR-04-S(41-42)	W	H	MW704DR	04	S	(41-42)	10/7/96	1557	Hydropunch
H014	W-H-MW704DR-05-S(54-58)	W	H	MW704DR	05	S	(54-58)	10/9/96	0730	Grab sample from bottom of augers @ 54-58'
H015	W-H-MW704DR-05-T(54-58)	W	H	MW704DR	05	T	(54-58)	10/9/96	1000	Trip Blank
H016	W-H-MW704DR-06-S(63-68)	W	H	MW704DR	06	S	(63-68)	10/10/96	1125	Grab sample from bottom of casing
H017	W-H-MW704DR-06-T(63-68)	W	H	MW704DR	06	T	(63-68)	10/10/96	1130	Trip Blank
H018	P-H-MW710DR-01-S(26-27)	W	H	MW710DR	01	S	(26-27)	5/28/97	1105	Hydropunch from 26-27' for VOA 601/602
H019	P-H-MW710DR-02-S(36-37)	W	H	MW710DR	02	S	(36-37)	5/28/97	1159	Hydropunch from 36-37' for VOA 601/602
H020	P-H-MW710DR-03-S(46-47)	W	H	MW710DR	03	S	(46-47)	5/28/97	1435	Hydropunch from 46-47' for VOA 601/602
H021	P-H-MW710DR-03-T(46-47)	W	H	MW710DR	03	T	(46-47)	5/28/97	1505	Trip Blank
H022	P-H-MW710DR-04-S(56-57)	W	H	MW710DR	04	S	(56-57)	5/29/97	0800	Hydropunch from 56-57' for VOA 601/602
H023	P-H-MW710DR-04-T(56-57)	W	H	MW710DR	04	T	(57-57)	5/29/97	1700	Trip Blank

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G001	C-G-MW705DR-01-S	C	G	MW705DR	01	S	NA	9/6/96	1605	VOA 601/602
G002	C-G-CIANCI-01-S-34	C	G	CIANCI	01	S	34	10/9/96	1545	VOA 601/602 from TOP(LNAPL) of Cianci well
G003	C-G-CIANCI-02-S-82	C	G	CIANCI	02	S	82.5	10/9/96	1600	VOA 601/602 from middle of Cianci well
G004	C-G-CIANCI-03-S-131	C	G	CIANCI	03	S	131	10/9/96	1615	VOA 8010/8020 from bottom of Cianci well
G005	C-G-DRILLWATER-01-P-0	C	G	DRILL WATER	01	P	0	11/19/96	0845	VOC CLP-RAS & Alcohols for drill water from treatment building
G006	P-G-CW878-01-S-47.3	P	G	CW878	01	S	47.3	11/19/96	1036	VOC CLP-RAS & Alcohols
G007	P-G-CW778-01-S-	P	G	CW778	01	S		11/19/96	1040	VOC CLP-RAS & Alcohols
G008	P-G-TW1-01-S-13	P	G	TW1	01	S	13	11/19/96	1125	VOC CLP-RAS & Alcohols
G009	P-G-TW2-01-S-10	P	G	TW2	01	S	10	11/19/96	1240	VOC CLP-RAS & Alcohols
G010	P-G-TW4-01-S-13	P	G	TW4	01	S	13	11/19/96	1305	VOC CLP-RAS & Alcohols
G011	P-G-TW4-01-T-13	P	G	TW4	01	T	13	11/19/96	1400	VOC CLP-RAS & Alcohols Trip Blank
G012	P-G-MW206B-01-S-84	P	G	MW206B	01	S	84	11/19/96	1517	VOC CLP-RAS & Alcohols
G013	P-G-CW978-01-S-27.5	P	G	CW978	01	S	27.5	11/19/96	1600	VOC CLP-RAS & Alcohols
G014	P-G-CW978-01-R-0	P	G	CW978	01	R	0	11/20/96	0730	VOC CLP-RAS & Alcohols, Rinse Blank
G015	P-G-MW206A-01-S-110.5	P	G	MW206A	01	S	110.5	11/20/96	1550	VOC CLP-RAS & Alcohols
G016	W-G-CW178-01-S-37.5	W	G	CW178	01	S	37.5	11/20/96	0915	VOC CLP-RAS & Alcohols
G017	W-G-CW575-01-S-34.5	W	G	CW575	01	S	34.5	11/20/96	0945	VOC CLP-RAS & Alcohols
G018	W-G-CW675-01-S-42.5	W	G	CW675	01	S	42.5	11/20/96	1020	VOC CLP-RAS & Alcohols
G019	W-G-CW478-01-S-57.5	W	G	CW478	01	S	57.5	11/20/96	1145	VOC CLP-RAS & Alcohols
G020	W-G-CW378-01-S-17.5	W	G	CW378	01	S	17.5	11/20/96	1210	VOC CLP-RAS & Alcohols
G021	W-G-P13-01-S-9.9	W	G	P13	01	S	9.9	11/20/96	1407	VOC CLP-RAS & Alcohols
G021MS	W-G-P13-01-MS-9.9	W	G	P13	01	MS	9.9	11/20/96	1409	VOC CLP-RAS & Alcohols
G021MSD	W-G-P13-01-MSD-9.9	W	G	P13	01	MSD	9.9	11/20/96	1410	VOC CLP-RAS & Alcohols
G022	W-G-MW124C-01-S-40.9	W	G	MW124C	01	S	40.9	11/20/96	1510	VOC CLP-RAS & Alcohols
G023	W-G-MW124C-01-D-40.9	W	G	MW124C	01	D	40.9	11/20/96	1520	VOC CLP-RAS & Alcohols
G024	W-G-MW124C-01-T-40.9	W	G	MW124C	01	T	40.9	11/20/96	1615	VOC CLP-RAS & Alcohols Trip Blank
G025	W-G-MW205A-01-S-128.5	W	G	MW205A	01	S	128.5	11/21/96	1200	VOC CLP-RAS & Alcohols
G026	W-G-MW205B-01-S-44.5	W	G	MW205B	01	S	44.5	11/21/96	0845	VOC CLP-RAS & Alcohols
G027	W-G-CW375-01-S-30.5	W	G	CW375	01	S	30.5	11/21/96	1045	VOC CLP-RAS & Alcohols
G028	W-G-CW578-01-S-69.5	W	G	CW578	01	S	69.5	11/21/96	1135	VOC CLP-RAS & Alcohols
G029	W-G-CW678-01-S-80.5	W	G	CW678	01	S	80.5	11/21/96	1210	VOC CLP-RAS & Alcohols
G030	W-G-MW127B-01-S-42	W	G	MW127B	01	S	42.0	11/21/96	1400	VOC CLP-RAS & Alcohols
G031	W-G-MW127C-01-S-96.5	W	G	MW127C	01	S	96.5	11/21/96	1600	VOC CLP-RAS & Alcohols
G032	W-G-CW475-01-S-32.5	W	G	CW475	01	S	32.5	11/21/96	1525	VOC CLP-RAS & Alcohols
G033	W-G-MW128-01-S-60	W	G	MW128	01	S	60	11/21/96	1630	VOC CLP-RAS & Alcohols
G034	W-G-MW128-01-T-60	W	G	MW128	01	T	60	11/21/96	1645	VOC CLP-RAS & Alcohols Trip Blank
G035	C-G-MWL301-01-S-6	C	G	MWL301	01	S	6	11/22/96	0755	VOC CLP-RAS & Alcohols
G036	C-G-MWL302-01-S-6	C	G	MWL302	01	S	6	11/22/96	0825	VOC CLP-RAS & Alcohols
G037	C-G-MWL303-01-S-6	C	G	MWL303	01	S	6	11/22/96	0855	VOC CLP-RAS & Alcohols
G038	C-G-MWL306-01-S-6	C	G	MWL306	01	S	6	11/22/96	0955	VOC CLP-RAS & Alcohols
G039	C-G-MWL312-01-S-6	C	G	MWL312	01	S	6	11/22/96	1055	VOC CLP-RAS & Alcohols
G040	C-G-P10-01-S-11.5	C	G	P10	01	S	11.5	11/22/96	1125	VOC CLP-RAS & Alcohols
G041	C-G-P12-01-S-11.5	C	G	P12	01	S	11.5	11/22/96	1240	VOC CLP-RAS & Alcohols
G042	C-G-P12A-01-S-40	C	G	P12A	01	S	40	11/22/96	1218	VOC CLP-RAS & Alcohols

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designtation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G042MS	C-G-P12A-01-MS-40	C	G	P12A	01	MS	40	11/22/96	1218	VOC CLP-RAS & Alcohols MS
G042MSD	C-G-P12A-01-MSD-40	C	G	P12A	01	MSD	40	11/22/96	1218	VOC CLP-RAS & Alcohols MSD
G043	P-G-MW126C-01-S-29	P	G	MW126C	01	S	29	11/22/96	1420	VOC CLP-RAS & Alcohols
G044	P-G-MW126C-01-D-29	P	G	MW126C	01	D	29	11/22/96	1429	VOC CLP-RAS & Alcohols Blind Duplicate of MW-126C
G045	P-G-MW126C-01-T-29	P	G	MW126C	01	T	29	11/22/96	1423	VOC CLP-RAS & Alcohols Trip Blank
G046	P-G-MW126B-01-S-10	P	G	MW126B	01	S	10	11/22/96	1425	VOC CLP-RAS & Alcohols
G047	P-G-MW126B-01-R-10	P	G	MW126B	01	R	10	11/22/96	1510	VOC CLP-RAS & Alcohols Rinse blank from pump
G048	P-G-WE1-01-S-34.3	P	G	WE1	01	S	34.3	12/2/96	1330	VOC CLP-RAS & Alcohols
G049	P-G-WE2-01-S-8.3	P	G	WE2	01	S	8.3	12/2/96	1405	VOC CLP-RAS & Alcohols
G051	O-G-P4A-1-S-25	O	G	P4A	01	S	25	12/2/96	1550	VOC CLP-RAS & Alcohols
G052	O-G-P4A-1-D-25	O	G	P4A	01	D	25	12/2/96	1600	VOC CLP-RAS & Alcohols, duplicate of P-4A
G053	O-G-P4A-1-T-0	O	G	P4A	01	T	0	12/2/96	1610	VOC CLP-RAS & Alcohols, trip blank
G054	P-G-TW12-01-S-34.5	P	G	TW12	01	S	34.5	12/3/96	0730	VOC CLP-RAS & Alcohols
G055	O-G-P4A-01-L-25	O	G	P4A	01	L	25	12/3/96	0800	VOC CLP-RAS & Alcohols, low flow
G056	O-G-MW702DR-01-S-100	O	G	MW702DR	01	S	100	12/3/96	1200	VOC CLP-RAS & Alcohols
G057	P-G-MW201B-01-S-15	P	G	MW201B	01	S	15	12/3/96	1030	VOC CLP-RAS & Alcohols
G058	P-G-MW201A-01-S-59	P	G	MW201A	01	S	59	12/3/96	1230	VOC CLP-RAS & Alcohols
G059	P-G-MW208A-01-S-59	P	G	MW208A	01	S	116	12/3/96	1210	VOC CLP-RAS & Alcohols
G060	C-G-P07-01-S-14	C	G	P7	01	S	14	12/3/96	1220	VOC CLP-RAS & Alcohols
G061	P-G-MW501C-01-S-25	P	G	MW501C	01	S	25	12/3/96	1310	VOC CLP-RAS & Alcohols
G061MS	P-G-MW501C-01-MS-25	P	G	MW501C	01	MS	25	12/3/96	1310	VOC CLP-RAS & Alcohols
G061MSD	P-G-MW501C-01-MSD-25	P	G	MW501C	01	MSD	25	12/3/96	1310	VOC CLP-RAS & Alcohols
G062	P-G-MW501A-01-S-88.5	P	G	MW501A	01	S	88.5	12/3/96	1445	VOC CLP-RAS & Alcohols
G063	C-G-DP05-01-S-3	C	G	DP5	01	S	3	12/3/96	1515	VOC CLP-RAS & Alcohols
G064	C-G-DP06-01-S-3	C	G	DP6	01	S	3	12/3/96	1540	VOC CLP-RAS & Alcohols
G065	C-G-DP06-01-T-3	C	G	DP6	01	T	3	12/3/96	1600	VOC CLP-RAS & Alcohols, trip blank
G066	P-G-MW501A-01-R-88.5	P	G	MW501A	01	R	88.5	12/3/96	1615	VOC CLP-RAS & Alcohols, rinse blank
G067	P-G-MW701DR-01-S-702	P	G	MW701DR	01	S	102	12/4/96	0859	VOC CLP-RAS & Alcohols
G068	P-G-MW209A-01-S-28	P	G	MW209A	01	S	28	12/4/96	0915	VOC CLP-RAS & Alcohols
G069	P-G-MW209B-01-S-13.5	P	G	MW209B	01	S	13.5	12/4/96	0928	VOC CLP-RAS & Alcohols
G070	P-G-P15-01-S-29	P	G	P15	01	S	29	12/4/96	1015	VOC CLP-RAS & Alcohols
G071	P-G-P102C-01-S-8	P	G	P102C	01	S	8	12/4/96	1155	VOC CLP-RAS & Alcohols
G072	P-G-P102A-01-S-86	P	G	P102A	01	S	86	12/4/96	1255	VOC CLP-RAS & Alcohols
G073	P-G-P11B-01-S-8	C	G	P11B	01	S	8	12/4/96	1531	VOC CLP-RAS & Alcohols
G074	C-G-P11B-01-D-8	C	G	P11B	01	D	8	12/4/96	1549	VOC CLP-RAS & Alcohols by 8015
G075	C-G-P11B-01-T-8	C	G	P11B	01	T	8	12/4/96	1600	VOC CLP-RAS & Alcohols by 8015, trip blank
G076	W-6-MW04-01-S-61	W	G	MW04	01	S	61	12/5/96	0923	VOC CLP-RAS & Alcohols by 8015
G077	W-6-MW04-01-T-61	W	G	MW04	01	T	61	12/5/96	0930	VOC CLP-RAS & Alcohols by 8015, trip blank
G078	W-G-MW03-01-S-67.5	W	G	MW03	01	S	67.5	12/5/96	1040	VOC CLP-RAS & Alcohols by 8015
G078MS	W-G-MW03-01-MS-67.5	W	G	MW03	01	MS	67.5	12/5/96	1040	VOC CLP-RAS & Alcohols by 8015 MS
G078MSD	W-G-MW03-01-MSD-67.5	W	G	MW03	01	MSD	67.5	12/5/96	1040	VOC CLP-RAS & Alcohols by 8015 MSD
G079	C-G-MW408-01-S-42	C	G	MW408	01	S	42	12/5/96	1210	VOC CLP-RAS & Alcohols by 8015
G080	P-G-TW3-01-S-11	P	G	TW03	01	S	42	12/5/96	1210	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c)	Specific Location (d)						
G081	W-G-MW204B-01-S-68	W	G	MW204B	01	S	68	12/5/96	1240	VOC CLP-RAS & Alcohols by 8015
G082	W-G-MW02-01-S-	W	G	MW02	01	S		12/5/96	1440	VOC CLP-RAS & Alcohols by 8015
G083	W-G-MW707S-01-S-25	W	G	MW707S	01	S	25	12/5/96	1405	VOC CLP-RAS & Alcohols by 8015
G084	W-G-MW707M-01-S-63	W	G	MW707M	01	S	63	12/5/96	1436	VOC CLP-RAS & Alcohols by 8015
G085	P-G-MW203A-01-S-155	P	G	MW203A	01	S	155	12/5/96	1457	VOC CLP-RAS & Alcohols by 8015
G086	P-G-MW203B-01-S-100	P	G	MW203B	01	S	100	12/5/96	1545	VOC CLP-RAS & Alcohols by 8015
G087	P-G-MW203B-01-R-100	P	G	MW203B	01	R	100	12/5/96	1620	VOC CLP-RAS & Alcohols by 8015, rinse blank from 203B tubing
G088	C-G-MW123A-01-S	C	G	MW123A	01	S	NA	12/6/96	0830	VOC CLP-RAS & Alcohols by 8015
G089	C-G-MW125A-01-S	C	G	MW125A	01	S	NA	12/6/96	0900	VOC CLP-RAS & Alcohols by 8015
G090	C-G-MWL305-01-S	C	G	MWL305	01	S	NA	12/6/96	1130	VOC CLP-RAS & Alcohols by 8015
G091	C-G-MWL309-01-S	C	G	MWL309	01	S	NA	12/6/96	1230	VOC CLP-RAS & Alcohols by 8015
G092	C-G-MWL314-01-S	C	G	MWL314	01	S	NA	12/6/96	1300	VOC CLP-RAS & Alcohols by 8015
G093	C-G-MWL313-01-S	C	G	MWL313	01	S	NA	12/6/96	1400	VOC CLP-RAS & Alcohols by 8015
G094	P-G-P102B-01-S	P	G	P102B	01	S	NA	12/6/96	1320	VOC CLP-RAS & Alcohols by 8015
G095	W-G-MW707D-01-S	W	G	MW707D	01	S	NA	12/6/96	1440	VOC CLP-RAS & Alcohols by 8015
G096	P-G-MW501B-01-S	P	G	MW501B	01	S	NA	12/6/96	1515	VOC CLP-RAS & Alcohols by 8015
G097	W-G-MW501B-01-T	P	G	MW501B	01	T	NA	12/6/96	1520	VOC CLP-RAS & Alcohols by 8015, trip blank
G098	W-G-MW703S-01-S	W	G	MW703S	01	S	NA	12/9/96	1300	VOC CLP-RAS & Alcohols by 8015 & bio
G099	W-G-MW703D-01-S	W	G	MW703D	01	S	NA	12/9/96	1400	VOC CLP-RAS & Alcohols by 8015 & bio
G100	W-G-MW703DR-01-S	W	G	MW703DR	01	S	NA	12/9/96	1500	VOC CLP-RAS & Alcohols by 8015 & bio
G101	P-G-TW5-01-S	P	G	TW5	01	S	NA	12/9/96	1230	VOC CLP-RAS & Alcohols by 8015
G102	P-G-CW1078-01-S	P	G	CW-10-78	01	S	NA	12/9/96	1308	VOC CLP-RAS & Alcohols by 8015
G103	P-G-CW1078-01-D	P	G	CW-10-78	01	D	NA	12/9/96	1355	VOC CLP-RAS & Alcohols by 8015, blind duplicate of CW-10-78 (G102)
G104	C-G-MW705D-01-S	C	G	MW705D	01	S	NA	12/9/96	1511	VOC CLP-RAS & Alcohols by 8015
G105	C-G-MW705R-01-S	C	G	MW705R	01	S	NA	12/9/96	1545	VOC CLP-RAS & Alcohols by 8015
G106	C-G-MW705R-01-T	C	G	MW705R	01	T	NA	12/9/96	1600	VOC CLP-RAS & Alcohols by 8015, trip blank
G107	C-G-P11A-01-S	C	G	P11A	01	S	NA	12/10/96	1010	VOC CLP-RAS & Alcohols by 8015
G108	P-G-P101C-01-S	P	G	P101C	01	S	NA	12/10/96	1103	VOC CLP-RAS & Alcohols by 8015
G108MS	P-G-P101C-01-MS	P	G	P101C	01	MS	NA	12/10/96	1103	VOC CLP-RAS & Alcohols by 8015 MS
G108MSD	P-G-P101C-01-MSD	P	G	P101C	01	MSD	NA	12/10/96	1103	VOC CLP-RAS & Alcohols by 8015 MSD
G109	P-G-P101A-01-S	P	G	P101A	01	S	NA	12/10/96	1145	VOC CLP-RAS & Alcohols by 8015
G110	P-G-MW706DR-01-S	P	G	MW706DR	01	S	NA	12/10/96	1150	VOC CLP-RAS & Alcohols by 8015
G111	C-G-MW415-01-S	C	G	MW415	01	S	NA	12/10/96	1230	VOC CLP-RAS & Alcohols by 8015 & bio
G112	C-G-MW415-01-D	C	G	MW415	01	D	NA	12/10/96	1200	Blind duplicate for bio only
G113	C-G-MW414-01-S	C	G	MW414	01	S	NA	12/10/96	1130	VOC CLP-RAS & Alcohols by 8015 &bio
G114	O-G-P8A-01-S	O	G	P8A	01	S	NA	12/10/96	1000	VOC CLP-RAS & Alcohols by 8015 &bio
G115	O-G-P8B-01-S	O	G	P8B	01	S	NA	12/10/96	0900	VOC CLP-RAS & Alcohols by 8015 &bio
G116	C-G-P6-01-S	C	G	P6	01	S	NA	12/10/96	1500	VOC CLP-RAS & Alcohols by 8015 & bio
G117	W-G-SRS4-01-S	W	G	SRS4	01	S	NA	12/10/96	0920	VOC CLP-RAS & Alcohols by 8015
G118	C-G-TW7A-01-S	C	G	TW7A	01	S	NA	12/10/96	1410	VOC CLP-RAS & Alcohols by 8015
G119	C-G-MW416-01-S	C	G	MW416	01	S	NA	12/10/96	1520	VOC CLP-RAS & Alcohols by 8015
G120	C-G-MW416-01-T	C	G	MW416	01	T	NA	12/10/96	1530	VOC CLP-RAS & Alcohols by 8015, trip blank
G121	C-G-MW416-01-R	C	G	MW416	01	R	NA	12/10/96	1545	VOC CLP-RAS & Alcohols by 8015, rinse blank from hose
G122	W-G-MW6-01-S	W	G	MW6	01	S	NA	12/11/96	0920	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c)	Specific Location (d)						
G123	W-G-SRS3-01-S	W	G	SRS3	01	S	NA	12/11/96	0920	VOC CLP-RAS & Alcohols by 8015
G124	W-G-MW7-01-S	W	G	MW7	01	S	NA	12/11/96	1043	VOC CLP-RAS & Alcohols by 8015
G125	W-G-MW7-01-D	W	G	MW7	01	D	NA	12/11/96	1058	VOC CLP-RAS & Alcohols by 8015, blind duplicate of G124
G126	W-G-SRS5-01-S	W	G	SRS5	01	S	NA	12/11/96	1115	VOC CLP-RAS & Alcohols by 8015
G126MS	W-G-SRS5-01-MS	W	G	SRS5	01	MS	NA	12/11/96	1115	VOC CLP-RAS & Alcohols by 8015
G126MSD	W-G-SRS5-01-MSD	W	G	SRS5	01	MSD	NA	12/11/96	1115	VOC CLP-RAS & Alcohols by 8015
G127	W-G-SRS6-01-S	W	G	SRS6	01	S	NA	12/11/96	1145	VOC CLP-RAS & Alcohols by 8015
G128	W-G-MW5-01-S	W	G	MW5	01	S	NA	12/11/96	1210	VOC CLP-RAS & Alcohols by 8015
G129	W-G-DN3-01-S	W	G	DN3	01	S	NA	12/11/96	1315	VOC CLP-RAS & Alcohols by 8015
G130	W-G-SRS1-01-S	W	G	SRS1	01	S	NA	12/11/96	1418	VOC CLP-RAS & Alcohols by 8015
G131	O-G-P2B-01-S	O	G	P2B	01	S	NA	12/11/96	1450	VOC CLP-RAS & Alcohols by 8015
G132	W-G-CWB77-01-S	W	G	CWB77	01	S	NA	12/11/96	1505	VOC CLP-RAS & Alcohols by 8015
G133	W-G-CWB7701-T	W	G	CWB77	01	T	NA	12/11/96	1530	VOC CLP-RAS & Alcohols by 8015, trip blank
G134	C-G-MW709R-01-S	C	G	MW709R	01	S	NA	12/12/96	0839	VOC CLP-RAS & Alcohols by 8015
G135	C-G-MW709DR-01-S	C	G	MW709DR	01	S	NA	12/12/96	0915	VOC CLP-RAS & Alcohols by 8015
G136	C-G-MW709DR-01-T	C	G	MW709DR	01	T	NA	12/12/96	0800	VOC CLP-RAS & Alcohols by 8015, trip blank
G137	O-G-P2A-01-S	O	G	P2A	01	S	NA	12/12/96	0815	VOC CLP-RAS & Alcohols by 8015
G138	O-G-P16-01-S	O	G	P16	01	S	NA	12/12/96	0845	VOC CLP-RAS & Alcohols by 8015
G139	O-G-PZO7-01-S	O	G	PZO7	01	S	NA	12/12/96	0945	VOC CLP-RAS & Alcohols by 8015
G140	O-G-PZR7-01-S	O	G	PZR7	01	S	NA	12/12/96	1030	VOC CLP-RAS & Alcohols by 8015
G141	P-G-MW202A-01-S	P	G	MW202A	01	S	NA	12/12/96	1410	VOC CLP-RAS & Alcohols by 8015
G142	P-G-MW202B-01-S	P	G	MW202B	01	S	NA	12/12/96	1145	VOC CLP-RAS & Alcohols by 8015
G143	P-G-MW202B-01-R	D	G	MW202B	01	R	NA	12/12/96	1200	VOC CLP-RAS & Alcohols by 8015, rinse blank of MW202B tubing
G144	C-G-MWL304-01-S	C	G	MWL304	01	S	NA	12/12/96	1058	VOC CLP-RAS & Alcohols by 8015
G145	C-G-MWL308-01-S	C	G	MWL308	01	S	NA	12/12/96	1209	VOC CLP-RAS & Alcohols by 8015
G146	W-G-MW121C-01-S	W	G	MW121C	01	S	NA	12/12/96	1430	VOC CLP-RAS & Alcohols by 8015
G147	W-G-MW121A-01-S	W	G	MW121A	01	S	NA	12/12/96	1520	VOC CLP-RAS & Alcohols by 8015
G148	O-G-P4B-01-L	O	G	P4B	01	L	NA	12/12/96	1450	VOC CLP-RAS & Alcohols by 8015 (low-flow)
G149	O-G-P4B-01-S	O	G	P4B	01	S	NA	12/12/96	1500	VOC CLP-RAS & Alcohols by 8015 (traditional)
G150	W-G-MW121B-01-S	W	G	MW121B	01	S	NA	12/13/96	1218	VOC CLP-RAS & Alcohols by 8015
G151	C-G-P5A-01-L	C	G	P5A	01	L	NA	12/13/96	1040	VOC CLP-RAS & Alcohols by 8015 (low-flow)
G152	C-G-P5A-01-S	C	G	P5A	01	S	NA	12/13/96	1100	VOC CLP-RAS & Alcohols by 8015 (traditional)
G153	C-G-P5B-01-L	C	G	P5B	01	L	NA	12/13/96	1220	VOC CLP-RAS & Alcohols by 8015 (low-flow)
G154	C-G-P5B-01-S	C	G	P5B	01	S	NA	12/13/96	1300	VOC CLP-RAS & Alcohols by 8015 (traditional)
G155	W-G-MW707R-01-S	W	G	MW707R	01	S	NA	12/13/96	1330	VOC CLP-RAS & Alcohols by 8015
G156	C-G-MWL311-01-S	C	G	MWL311	01	S	NA	12/13/96	1328	VOC CLP-RAS & Alcohols by 8015
G157	C-G-MWL311-01-T	C	G	MWL311	01	T	NA	12/13/96	1400	VOC CLP-RAS & Alcohols by 8015, trip blank
G158	C-G-MW123C-01-S	C	G	MW123C	01	S	NA	12/16/96	1200	VOC CLP-RAS & Alcohols by 8015
G159	C-G-MWL307-01-S	C	G	MWL307	01	S	NA	12/16/96	1245	VOC CLP-RAS & Alcohols by 8015
G160	C-G-MWL307-01-D	C	G	MWL307	01	D	NA	12/16/96	1300	VOC CLP-RAS & Alcohols by 8015, duplicate of MWL307
G161	C-G-MW409-01-S	C	G	MW409	01	S	NA	12/16/96	1320	VOC CLP-RAS & Alcohols by 8015
G162	C-G-P3B-01-S	C	G	P3B	01	S	NA	12/16/96	1410	VOC CLP-RAS & Alcohols by 8015
G163	C-G-MW413-01-S	C	G	MW413	01	S	NA	12/16/96	1445	VOC CLP-RAS & Alcohols by 8015
G164	C-G-TW08A-01-S	C	G	TW08A	01	S	NA	12/16/96	1515	VOC CLP-RAS & Alcohols by 8015

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REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G165	C-G-TW08A-01-T	C	G	TW08A	01	T	NA	12/16/96	1530	VOC CLP-RAS & Alcohols by 8015, trip blank
G167	W-G-MW704M-01-S	W	G	MW704M	01	S	NA	12/17/96	0920	VOC CLP-RAS & Alcohols by 8015 & bio sampling
G168	W-G-MW704M-01-R	W	G	MW704M	01	R	NA	12/17/96	0940	VOC CLP-RAS & Alcohols by 8015 & bio sampling, rinse blank
G169	W-G-MW704DR-01-S	W	G	MW704DR	01	S	NA	12/17/96	1300	VOC CLP-RAS & Alcohols by 8015 & bio sampling
G169MS	W-G-MW704DR-01-MS	W	G	MW704DR	01	MS	NA	12/17/96	1300	VOC CLP-RAS & Alcohols by 8015, just VOCs and alcohol
G169MSD	W-G-MW704DR-01-MSD	W	G	MW704DR	01	MSD	NA	12/17/96	1300	VOC CLP-RAS & Alcohols by 8015, just VOCs & alcohol
G170	W-G-MW704S-01-L	W	G	MW704S	01	L	NA	12/17/96	1205	VOC CLP-RAS & Alcohols by 8015 & bio low-flow
G171	W-G-MW704S-01-S	W	G	MW704S	01	S	NA	12/17/96	1305	VOC CLP-RAS & Alcohols by 8015 (traditional)
G172	W-G-MW704R-01-L	W	G	MW704R	01	L	NA	12/17/96	1410	VOC CLP-RAS & Alcohols by 8015 & bio (low-flow)
G173	W-G-MW704R-01-S	W	G	MW704R	01	S	NA	12/17/96	1530	VOC CLP-RAS & Alcohols by 8015 (traditional)
G174	W-G-MW704R-01-T	W	G	MW704R	01	T	NA	12/17/96	1600	VOC CLP-RAS & Alcohols by 8015, trip blank
G175	W-G-MW704D-01-S	W	G	MW704D	01	S	NA	12/18/96	0850	VOC CLP-RAS & Alcohols by 8015 & bio (traditional)
G176	O-G-P1A-01-S	O	G	P1A	01	S	NA	12/18/96	1055	VOC & Alcohol & bio
G176MS	O-G-P1A-01-MS	O	G	P1A	01	MS	NA	12/18/96	1055	VOC & Alcohol & bio MS
G176MSD	O-G-P1A-01-MSD	O	G	P1A	01	MSD	NA	12/18/96	1055	VOC, Alcohols MSD
G177	O-G-P1B-01-S	O	G	P1B	01	S	NA	12/18/96	1145	VOC & Alcohols & bio
G178	O-G-P1B-01-D	O	G	P1B	01	D	NA	12/18/96	1200	VOC, Alcohols & bio, duplicate of P1B for VOCs and Alcohols
G179	C-G-MW502-01-S	C	G	MW502	01	S	NA	12/18/96	1210	VOC & Alcohols, and Bio
G180	C-G-P14-01-S	C	G	P14	01	S	NA	12/18/96	1355	VOC & Alcohols
G181	C-G-CPZ10R-01-S	C	G	CPZ10R	01	S	NA	12/18/96	1454	VOC & Alcohols
G182	C-G-CPZ1R-01-S	C	G	CPZ1R	01	S	NA	12/18/96	1520	VOC & Alcohols
G183	C-G-CPZ2R-01-S	C	G	CPZ2R	01	S	NA	12/18/96	1550	VOC & Alcohols
G184	C-G-CPZ2R-01-T	C	G	CPZ2R	01	T	NA	12/18/96	1615	VOC & Alcohols, trip blank
G185	P-G-DP1-01-S	P	G	DP1	01	S	NA	12/19/96	0905	VOC CLP-RAS & Alcohols by 8015
G186	P-G-P101B-01-S	P	G	P101B	01	S	NA	12/19/96	1215	VOC CLP-RAS & Alcohols by 8015
G187	P-G-MW129-01-S	P	G	MW129	01	S	NA	12/19/96	1115	VOC CLP-RAS & Alcohols by 8015
G188	C-G-CPZ1-01-S	C	G	CPZ1	01	S	NA	12/19/96	1140	VOC CLP-RAS & Alcohols by 8015
G189	C-G-CPZ-2A-01-S	C	G	CPZ2A	01	S	NA	12/19/96	1210	VOC CLP-RAS & Alcohols by 8015
G190	C-G-CPZ3R-01-S	C	G	CPZ3R	01	S	NA	12/19/96	1235	VOC CLP-RAS & Alcohols by 8015
G191	C-G-CPZ3-01-S	C	G	CPZ3	01	S	NA	12/19/96	1315	VOC CLP-RAS & Alcohols by 8015
G192	C-G-CPZ3-01-R	C	G	CPZ3	01	R	NA	12/19/96	1320	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Hose
G193	C-G-DP4-01-S	C	G	DP4	01	S	NA	12/19/96	1230	VOC CLP-RAS & Alcohols by 8015
G194	C-G-DP3-01-S	C	G	DP3	01	S	NA	12/19/96	1500	VOC CLP-RAS & Alcohols by 8015
G195	C-G-DP2-01-S	C	G	DP2	01	S	NA	12/19/96	1440	VOC CLP-RAS & Alcohols by 8015
G196	C-G-CPZ4A-01-S	C	G	CPZ4A	01	S	NA	12/19/96	1345	VOC CLP-RAS & Alcohols by 8015
G197	C-G-CPZ7-01-S	C	G	CPZ7	01	S	NA	12/19/96	1420	VOC CLP-RAS & Alcohols by 8015
G198	C-G-CPZ7R-01-5	C	G	CPZ7R	01	S	NA	12/19/96	1515	VOC CLP-RAS & Alcohols by 8015
G199	C-G-CPZ74-01-T	C	G	CPZ7R	01	T	NA	12/19/96	1600	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G200	W-G-MW204A-01-S	W	G	MW204A	01	S	NA	12/20/96	0742	VOC CLP-RAS & Alcohols by 8015
G201	C-G-MW125C-01-S	C	G	MW125C	01	S	NA	12/20/96	0930	VOC CLP-RAS & Alcohols by 8015
G202	C-G-MW125C-01-D	C	G	MW125C	01	D	NA	12/20/96	0945	VOC CLP-RAS & Alcohols by 8015 Blind Dups
G203	C-G-P3A-01-S	C	G	P3A	01	S	NA	12/20/96	1030	VOC CLP-RAS & Alcohols by 8015
G203MS	C-G-P3A-01-MS	C	G	P3A	01	MS	NA	12/20/96	1030	VOC CLP-RAS & Alcohols by 8015 MS

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c)	Specific Location (d)						
G203MSD	C-G-P3A-01-MSD	C	G	P3A	01	MSD	NA	12/20/96	1030	VOC CLP-RAS & Alcohols by 8015 MSD
G204	C-G-MW1-01-S	C	G	MW1	01	S	NA	12/20/96	1200	VOC CLP-RAS & Alcohols by 8015
G205	C-G-CPZ10-01-S	C	G	CPZ10	01	S	NA	12/20/96	1150	VOC CLP-RAS & Alcohols by 8015
G206	C-G-CPZ9R-01-S	C	G	CPZ9R	01	S	NA	12/20/96	1220	VOC CLP-RAS & Alcohols by 8015
G207	C-G-CPZ9-01	C	G	CPZ9	01	S	NA	12/20/96	1245	VOC CLP-RAS & Alcohols by 8015
G208	C-G-CPZ8-01-S	C	G	CPZ8	01	S	NA	12/20/96	1315	VOC CLP-RAS & Alcohols by 8015
G209	C-G-CPZ8-01-R	C	G	CPZ8	01	R	NA	12/20/96	1320	VOC CLP-RAS & Alcohols by 8015 Rinse Blank
G210	C-G-CPZ8R-01-S	C	G	CPZ8R	01	S	NA	12/20/96	1340	VOC CLP-RAS & Alcohols by 8015
G211	C-G-CPZ6R-01-S	C	G	CPZ6R	01	S	NA	12/20/96	1430	VOC CLP-RAS & Alcohols by 8015
G212	W-G-CW278-01-S	W	G	CW278	01	S	NA	12/20/96	1352	VOC CLP-RAS & Alcohols by 8015
G213	C-G-CPZ6-01-S	C	G	CPZ6	01	S	NA	12/20/96	1505	VOC CLP-RAS & Alcohols by 8015
G214	C-G-CPZ6-01-T	C	G	CPZ6	01	T	NA	12/20/96	1530	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G215	W-G-CPZ2-01-S	W	G	CPZ2	01	S	NA	12/26/96	0845	VOC CLP-RAS & Alcohols by 8015
G216	W-G-CPZ4-01-S	W	G	CPZ4	01	S	NA	12/26/96	0918	VOC CLP-RAS & Alcohols by 8015
G217	W-G-CPZ4R-01-S	W	G	CPZ4R	01	S	NA	12/26/96	0955	VOC CLP-RAS & Alcohols by 8015
G218	C-G-CPZ5-01-S	C	G	CPZ5	01	S	NA	12/26/96	1050	VOC CLP-RAS & Alcohols by 8015
G219	C-G-CPZ5R-01-S	C	G	CPZ5R	01	S	NA	12/26/96	1130	VOC CLP-RAS & Alcohols by 8015
G220	C-G-CPZ6A-01-S	C	G	CPZ6A	01	S	NA	12/26/96	1148	VOC CLP-RAS & Alcohols by 8015
G221	C-G-MWD601-01-S	C	G	MWD601	01	S	NA	12/26/96	1241	VOC CLP-RAS & Alcohols by 8015
G222	C-G-MW705DR-02-S	C	G	MW705DR	02	S	NA	12/26/96	1353	VOC CLP-RAS & Alcohols by 8015
G223	C-G-RW7-01-S	C	G	RW7	01	S	NA	12/26/96	1407	VOC CLP-RAS & Alcohols by 8015
G224	C-G-RW7-01-D	C	G	RW7	01	D	NA	12/26/96	1425	VOC CLP-RAS & Alcohols by 8015 Blind Dup
G225	C-G-RW1-01-S	C	G	RW1	01	S	NA	12/26/96	1500	VOC CLP-RAS & Alcohols by 8015
G225MS	C-G-RW1-01-MS	C	G	RW1	01	MS	NA	12/26/96	1500	VOC CLP-RAS & Alcohols by 8015 MS
G225MSD	C-G-RW1-01-MSD	C	G	RW1	01	MSD	NA	12/26/96	1500	VOC CLP-RAS & Alcohols by 8015 MSD
G226	C-G-RW1-01-R	C	G	RW1	01	R	NA	12/26/96	1509	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Bailer
G227	C-G-RW1-01-T	C	G	RW1	01	T	NA	12/26/96	1512	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G228	C-G-RW12-01-S	C	G	RW12	01	S	NA	12/26/96	1545	VOC CLP-RAS & Alcohols by 8015
G229	C-G-RW8-01-S	C	G	RW8	01	S	NA	12/27/96	0823	VOC CLP-RAS & Alcohols by 8015
G230	C-G-RW9-01-S	C	G	RW9	01	S	NA	12/27/96	0850	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c)	Specific Location (d)						
G231	C-G-RW2-01-S	C	G	RW2	01	S	NA	12/27/96	0945	VOC CLP-RAS & Alcohols by 8015
G232	C-G-RW10-01-S	C	G	RW10	01	S	NA	12/27/96	1022	VOC CLP-RAS & Alcohols by 8015
G233	C-G-RW3-01-S	C	G	RW3	01	S	NA	12/27/96	1115	VOC CLP-RAS & Alcohols by 8015
G234	C-G-RW11-01-S	C	G	RW11	01	S	NA	12/27/96	1128	VOC CLP-RAS & Alcohols by 8015
G235	C-G-RW4-01-S	C	G	RW4	01	S	NA	12/27/96	1148	VOC CLP-RAS & Alcohols by 8015
G236	C-G-RW4-01-D	C	G	RW4	01	D	NA	12/27/96	1200	VOC CLP-RAS & Alcohols by 8015 Blind Dup of RW-4
G237	C-G-RW6-01-S	C	G	RW6	01	S	NA	12/27/96	1215	VOC CLP-RAS & Alcohols by 8015
G237MS	C-G-RW6-01-MS	C	G	RW6	01	MS	NA	12/27/96	1215	VOC CLP-RAS & Alcohols by 8015 MS
G237MSD	C-G-RW6-01-MSD	C	G	RW6	01	MSD	NA	12/27/96	1215	VOC CLP-RAS & Alcohols by 8015 MSD
G238	C-G-RW5-01-S	C	G	RW5	01	S	NA	12/27/96	1245	VOC CLP-RAS & Alcohols by 8015
G239	C-G-RW5-01-R	C	G	RW5	01	R	NA	12/27/96	1300	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Bailer used @ RW5
G240	C-G-RW5-01-T	C	G	RW5	01	T	NA	12/27/96	1315	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G241	C-G-MW705DR-03-S	C	G	MW705DR	03	S	NA	12/27/96	1530	VOC CLP-RAS & Alcohols by 8015 of Pure DNAPL
G242	W-G-MW707DR-01-S	W	G	MW707DR	01	S	NA	12/30/96	1358	VOC CLP-RAS & Alcohols by 8015
G243	W-G-SWA-01-S	W	G	SWA	01	S	NA	12/30/96	0750	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G244	W-G-SWB-01-S	W	G	SWB	01	S	NA	12/30/96	0830	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G245	W-G-SWC-01-S	W	G	SWC	01	S	NA	12/30/96	0845	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G246	C-G-SWD-01-S	C	G	SWD	01	S	NA	12/30/96	0900	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G247	C-G-SWE-01-S	C	G	SWE	01	S	NA	12/30/96	0915	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G248	C-G-SWE-01-D	C	G	SWE	01	D	NA	12/30/96	1200	VOC CLP-RAS & Alcohols by 8015 Blind Dup
G249	C-G-SWF-01-S	C	G	SWF	01	S	NA	12/30/96	0945	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G249MS	C-G-SWF-01-MS	C	G	SWF	01	MS	NA	12/30/96	0945	VOC CLP-RAS & Alcohols by 8015 MS
G249MSD	C-G-SWF-01-MSD	C	G	SWF	01	MSD	NA	12/30/96	0945	VOC CLP-RAS & Alcohols by 8015 MSD
G250	C-G-SWG-01-S	C	G	SWG	01	S	NA	12/30/96	1020	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G251	C-G-INFLUENT-01-S	C	G	INFLUENT	01	S	NA	12/30/96	1130	VOC CLP-RAS & Alcohols by 8015, Influent to 30-inch culvert under former Cianci Property
G252	C-G-EFFLUENT-01-S	C	G	EFFLUENT	01	S	NA	12/30/96	1140	VOC CLP-RAS & Alcohols by 8015, Effluent from 30-inch culvert under former Cianci Property
G253	C-G-EFFLUENT-01-R	C	G	EFFLUENT	01	R	NA	12/30/96	1215	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Jar
G254	C-G-EFFLUENT-01-T	C	G	EFFLUENT	01	T	NA	12/30/96	1500	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G255	C-G-MW705DR-04-S	C	G	MW705DR	04	S	NA	01/29/97	1400	DNAPL Physical Properties
G256	P-G-MW708DR-01-S	P	G	MW708DR	01	S	NA	02/07/97	1105	VOC CLP-RAS & Alcohols by 8015
G257	P-G-MW708S-01-S	P	G	MW708S	01	S	NA	02/07/97	1030	VOC CLP-RAS & Alcohols by 8015
G257MS	P-G-MW708S-01-MS	P	G	MW708S	01	MS	NA	02/07/97	1030	VOC CLP-RAS & Alcohols by 8015 MS
G257MSD	P-G-MW708S-01-MSD	P	G	MW708S	01	MSD	NA	02/07/97	1030	VOC CLP-RAS & Alcohols by 8015 MSD
G258	P-G-MW708R-01-S	P	G	MW708R	01	S	NA	02/07/97	1207	VOC CLP-RAS & Alcohols by 8015
G259	P-G-MW708R-01-D	P	G	MW708R	01	D	NA	02/07/97	1238	VOC CLP-RAS & Alcohols by 8015, Blind Duplicate
G260	P-G-MW708M-01-S	P	G	MW708M	01	S	NA	02/07/97	1235	VOC CLP-RAS & Alcohols by 8015
G261	P-G-MW209A-02-S	P	G	MW209A	02	S	NA	02/07/97	1400	VOC CLP-RAS & Alcohols by 8015
G262	W-G-MW707R-02-S	W	G	MW707R	02	S	NA	02/07/97	1500	VOC CLP-RAS & Alcohols by 8015
G263	W-G-MW707R-02-R	W	G	MW707R	02	R	NA	02/07/97	1530	VOC CLP-RAS & Alcohols by 8015, Rinse Blank of Waterra tubing
G264	W-G-MW707R-02-T	W	G	MW707R	02	T	NA	02/07/97	1535	VOC CLP-RAS & Alcohols by 8015, Trip Blank

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G265	P-G-MW710DR-01-S	P	G	MW710DR	01	S	NA	06/13/97	1330	VOC CLP-RAS & Alcohols by 8015
G266	P-G-MW710R-01-S	P	G	MW710R	01	S	NA	06/13/97	1240	VOC CLP-RAS & Alcohols by 8015
G267	P-G-MW710R-01-D	P	G	MW710R	01	D	NA	06/13/97	1200	VOC CLP-RAS & Alcohols by 8015, Blind Duplicate
G268	P-G-MW710S-01-S	P	G	MW710S	01	S	NA	06/13/97	1136	VOC CLP-RAS & Alcohols by 8015
G268MS	P-G-MW710S-01-MS	P	G	MW710S	01	MS	NA	06/13/97	1136	VOC CLP-RAS & Alcohols by 8015 MS
G268MSD	P-G-MW710S-01-MSD	P	G	MW710S	01	MSD	NA	06/13/97	1136	VOC CLP-RAS & Alcohols by 8015 MSD
G269	P-G-MW710S-01-R	P	G	MW710S	01	R	NA	06/13/97	1000	VOC CLP-RAS & Alcohols by 8015, Rinse Blank from Whale pump
G270	P-G-MW710S-01-T	P	G	MW710S	01	T	NA	06/13/97	1005	VOC CLP-RAS & Alcohols by 8015, Trip Blank
G271	C-G-MW705DR-05-S	C	G	MW705DR	05	S	90-93'	06/19/97	1155	Ground-water grab sample for VOC by Modified 8260
G272	C-G-MW705DR-06-S	C	G	MW705DR	06	S	99-100'	06/19/97	1200	DNAPL grab sample for VOC by Modified 8260
G273	W-G-SWA-02-R	W	G	SWA	02	R	NA	07/08/97	915	VOC CLP-RAS & Alcohols by 8015, Rinse Blank from new sample collection jar (dip sampler)
G274	W-G-SWA-02-S	W	G	SWA	02	S	NA	07/08/97	955	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G275	W-G-SWB-02-S	W	G	SWB	02	S	NA	07/08/97	1019	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G276	W-G-SWC-02-S	W	G	SWC	02	S	NA	07/08/97	1045	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G276MS	W-G-SWC-02-MS	W	G	SWC	02	MS	NA	07/08/97	1045	VOC CLP-RAS & Alcohols by 8015 MS
G276MSD	W-G-SWC-02-MSD	W	G	SWC	02	MSD	NA	07/08/97	1045	VOC CLP-RAS & Alcohols by 8015 MSD
G277	C-G-SWD-02-S	C	G	SWD	02	S	NA	07/08/97	1110	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G278	C-G-SWE-02-S	C	G	SWE	02	S	NA	07/08/97	1140	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G279	C-G-SWF-02-D	C	G	SWF	02	D	NA	07/08/97	1215	VOC CLP-RAS & Alcohols by 8015, Blind Duplicate of G280
G280	C-G-SWF-02-S	C	G	SWF	02	S	NA	07/08/97	1200	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G281	C-G-SWG-02-S	C	G	SWG	02	S	NA	07/08/97	1220	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G282	C-G-INFLUENT-02-S	C	G	INFLUENT	02	S	NA	07/08/97	1240	VOC CLP-RAS & Alcohols by 8015, Influent to 30-inch culvert under former Cianci Property
G283	C-G-EFFLUENT-02-S	C	G	EFFLUENT	02	S	NA	07/08/97	1315	VOC CLP-RAS & Alcohols by 8015, Effluent from 30-inch culvert under former Cianci Property
G284	C-G-EFFLUENT-02-T	C	G	EFFLUENT	02	T	NA	07/08/97	1320	VOC CLP-RAS & Alcohols by 8015, Trip Blank
G285	C-G-INFLUENT-03-S	C	G	INFLUENT	03	S	NA	07/08/97	1545	VOC CLP-RAS, Ground-Water component of Influent to 30-inch culvert under former Cianci Property
G286	C-G-INFLUENT-04-S	C	G	INFLUENT	04	S	NA	07/08/97	1546	VOC CLP-RAS, 4-inch, perf. PVC Pipe component of Influent to 30-inch culvert under Cianci Property
G287	C-G-DS1-01-S	C	G	DS1	01	S	NA	07/08/97	1550	VOC CLP-RAS, Surface Water from Drainage Ditch along west side of RR Tracks, 85 ft south of Lazy Ln.
G288	C-G-LLC-01-S	C	G	LLC	01	S	NA	07/08/97	1555	VOC CLP-RAS, Surface Water from Lazy Lane Culvert along west side of RR Tracks, 15 ft so. of Lazy Ln.

Notes:

(!) Lab (Container) Name is the designation that is written on the sample containers sent to the laboratory, consisting of the matrix type designation and the sequential number of the sample within the running total of that type of sample obtained during the investigation.

(a) See Section 4.0 of Field Sampling Plan for Sample Designation details, which are summarized below.

(b) O = SRSNE Operations Area, C = former Cianci Property, W = Town of Soutington Wellfield, P = other areas on perimeter of RI Study Area.

(c) G = well or piezometer ground-water sample, H = in-situ (Hydropunch) groundwater sample, S = soil, R = bedrock.

(d) Non-hyphenated name for sampling location, routine name for the well, boring, test pit, etc, e.g., MW501, TP702, RW12, CPZ10R, MW704M, MWD601, P101C, CW578.

(e) Two-digit number of the sample within the sequence of sampling events, rounds, or depth intervals at a specific location. Start with "01," and continue upward in increments of 1 (e.g., "02," "03," "04," ....."83," "84," ...)

(f) S = primary field sample, R = rinse blank, T = trip blank, D = duplicate, MS = matrix spike, MSD = matrix spike duplicate, L = supplemental ground-water sample obtained using USEPA Region 1 Low-Flow Purging and Sampling Procedure, P = potable drilling water sample.

(g) Optional number for depth (interval) or sample below grade, e.g. "(10-12) for a sample obtained in the 10 to 12 foot depth interval.

Appendix B

Test Pit Photos and Soil Sample Descriptions

PHOTOGRAPHS OF TEST PIT TP-701
SEPTEMBER 12, 1996

1) View of TP-701 toward E, showing two 16-foot long, vertical, perpendicular cuts, 3.5- to 4-foot deep each. Bench in center of test pit is approximately 10-foot by 10-foot, and 2- to 3-feet high. Total depth ranges from 5.5 to 7.0 feet. Cuts at center-left face west (surface oriented N8E). Cuts at right face north (surface oriented N85E). Soil layers above bench (from top down) include: 1 to 1.5 feet of topsoil and red-brown, silty, sandy fill; 0.3 foot thick relict soil horizon with root mat; 1 to 1.5 feet of massive, tan, fine sand; and 1 to 1.5 feet of massive, tan-gray silt. Soil layers below bench are finely stratified sand and silts, shown in detail in Photos 2 and 3. Test pit dewatered by approximately 2 feet below water table using pump shown in upper right (rate approximately 20 gpm). Dr. Bernard Kueper used a trowel to carefully scrape 25 sub-horizontal soil samples parallel to the bedding, approximately 1 cm thick each, for lab permeability testing.

2) View of north-facing bench cut at TP-701, showing dipping strata of: dark gray-brown silt; tan fine-to medium sand; and gray, finely cross-bedded sand with silt laminae. Two-inch thick dark gray-brown silt stratum at the depth of trowel blade has apparent dip of 7E on this N85E vertical surface (shown) and apparent dip of 3N in the N8E vertical surface. Orientation of this layer is N22W, 7E. Two-inch thick silt layer pinches out within a distance of 5 inches in a cut into the bench. Fine, 1 cm thick, silt laminations centered between shovel blade, trowel blade, and left boot, exposed in cut into the bench have orientation of N0E, 18E. Finely cross-bedded sand and silt laminae shown above water line, with eastward apparent dip (see Photo 3).

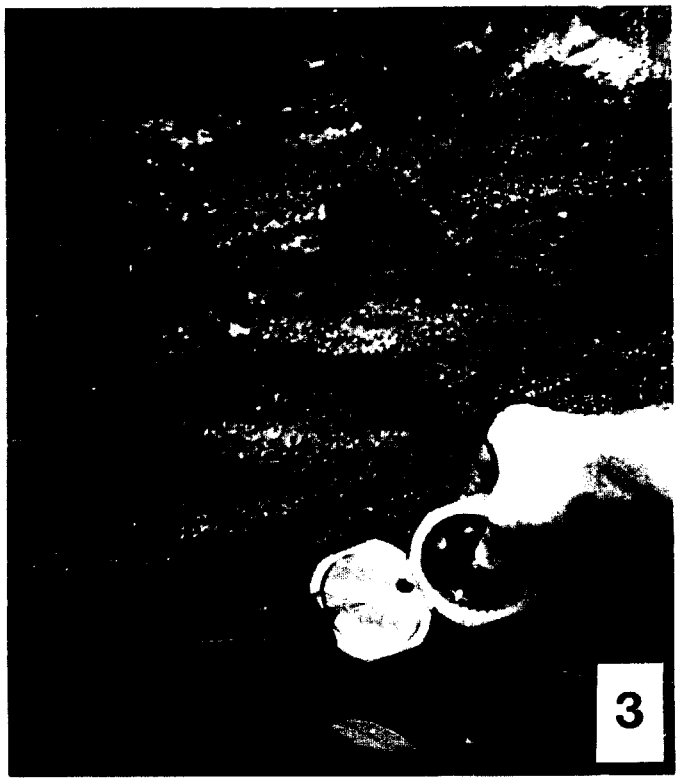
3) Detail of north-facing bench cut of TP-701, showing finely cross-bedded sand and silt laminae shown above water line, with apparent dip of 24E in this vertical surface oriented N85E. Apparent dip is 18S in the N8E vertical surface. Orientation of this layer is N40E,32E.

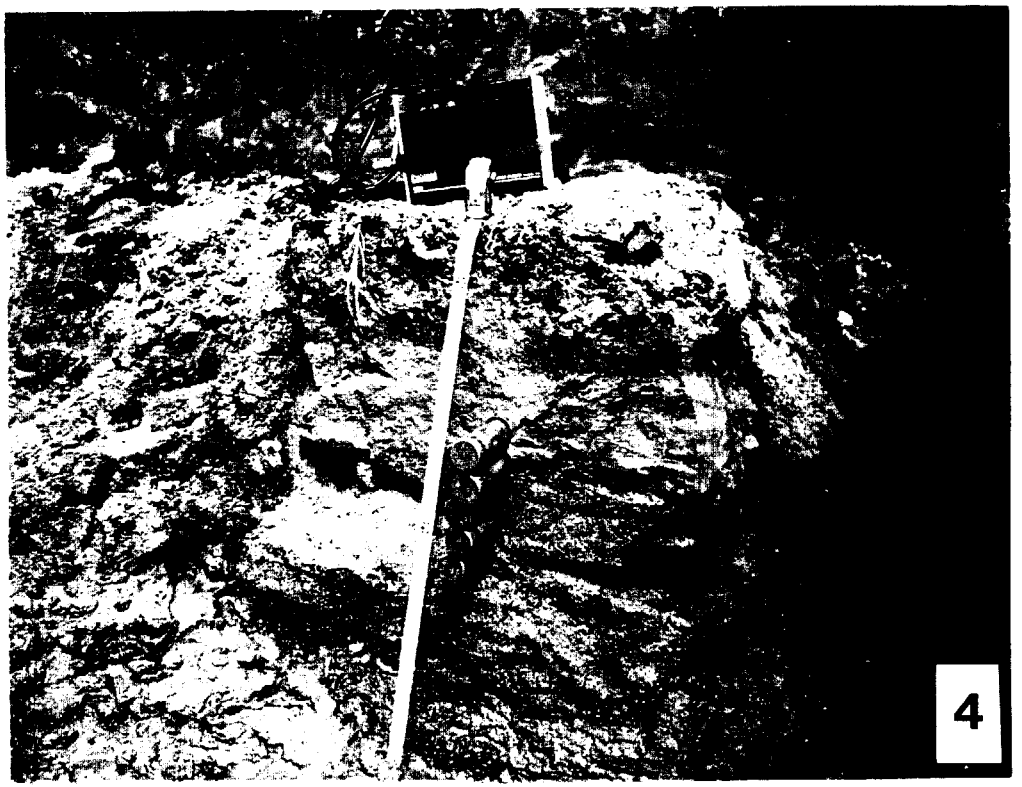
4) BBL soil sampling locations at test pit TP-701. Samples obtained using 6-inch long, 1-inch diameter brass sleeves with plastic caps. Samples obtained in close proximity to assess hydraulic conductivity range over short vertical distance.

Sample	Lab Sample Designation	Container Name	Depth (ft)	Description
1	C-S-TP701-01-S-4.4	S039	4.4	Brown-gray silt, little fine sand, trace fine gravel, moist to wet. K_{lab} = 8.11x10-4 cm/sec.
2	C-S-TP701-02-S-4.5	S040	4.5	Lt. greenish gray, medium to coarse sand, little silt, wet. K_{lab} = 2.48x10-4 cm/sec.
3	C-S-TP701-03-S-4.6	S041	4.6	Lt. brown to olive, medium to coarse sand consisting of biotite and garnet, wet. K_{lab} = 1.75x10-4 cm/sec.
4	C-S-TP701-04-S-4.7	S042	4.7	Lt. greenish brown, medium to coarse sand, wet. K_{lab} = 2.51x10-4 cm/sec.
5	C-S-TP701-05-S-4.8	S043	4.8	Olive gray, fine to coarse sand, wet. K_{lab} = 6.86x10-4 cm/sec.

PHOTOGRAPHS OF TEST PIT TP-701
SEPTEMBER 12, 1996

ORIGINALS IN COLOR
Available at the US EPA New England Superfund Records Center,
Boston, MA





PHOTOGRAPHS OF TEST PIT TP-702
JUNE 19, 1996

1) View of TP-702 toward NE, showing two approximately vertical, perpendicular cuts approximately 7-ft high each. Twenty-five foot long cut at left faces west (surface oriented N20E). Forty-five foot long cut at center-right faces south (surface oriented N65W). Top 2.5 ft of soil is fill. Light-colored, discontinuous stratum in middle of each cut consists of coarse sand and gravel, and has apparent dip of 2S in surface oriented N20E, 0 in surface oriented N65W. Orientation of this stratum therefore is N70W, 2S. Orange pin-flags in south-facing cut indicate soil sampling locations for permeability analysis.

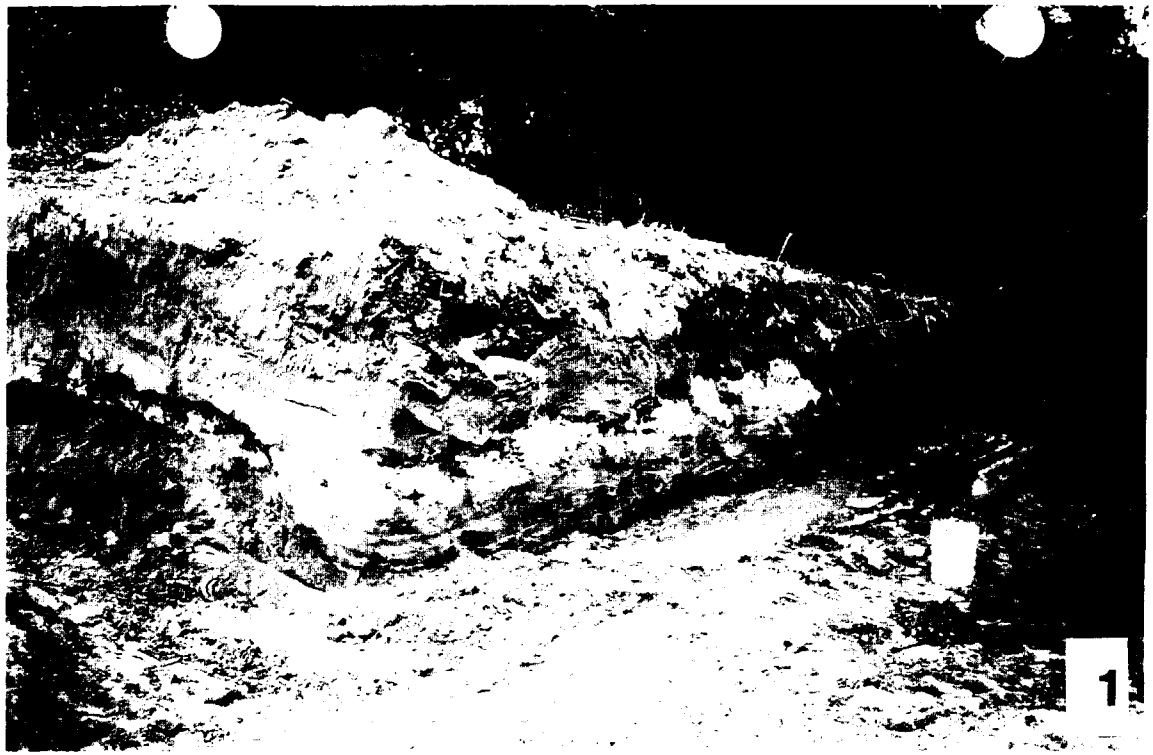
2) Close-up of south-facing cut of TP-702 with sampling locations and Brunton compass for scale. Four main strata from top down include: a) Approximately 2.5 feet of light gray to dark brown, silty, sandy topsoil and fill; b) Approximately 1.5 to 2.0 feet of brown, fine to medium sand; c) Approximately 0.0 to 1.5 feet of white to light tan, coarse sand and gravel, which pinches out locally resulting in approximately 2 to 6-foot long "pods," with basal apparent dips of 40W to 35E; and d) Approximately 1.5 to 2.5 feet of red-brown, fine to medium sand and silt, with discontinuous, approximately 1- to 3-inch thick strata of red silt. Samples for lab permeability testing include:

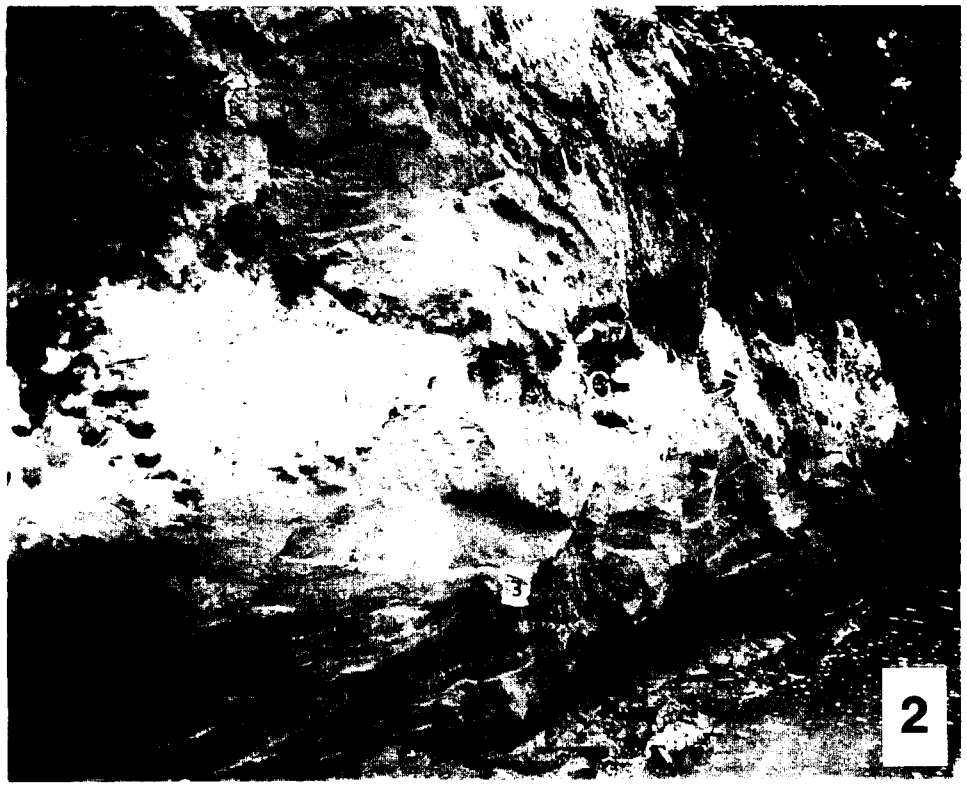
Sample	Lab Sample Designation	Container Name	Depth (ft)	Description
1	C-S-TP702-01-S-4	S044	4.5	White to tan coarse sand and fine to coarse gravel, trace fine sand, dry. K_{lab} = 1.34x10-3 cm/sec.
2	C-S-TP702-02-S-4	S045	4.5	White to tan medium to coarse sand, trace fine gravel, dry. K_{lab} = 3.35x10-4 cm/sec.
3	C-S-TP702-03-S-6	S046	6.0	Brown fine to medium sand, trace silt, moist. K_{lab} = 2.02x10-3 cm/sec.
4	C-S-TP702-04-S-5	S047	5.5	Red-brown fine sand and silt, moist. K_{lab} = 1.88x10-3 cm/sec.
5	C-S-TP702-05-S-5	S048	5.5	Red-brown silt, little fine sand, moist. K_{lab} = 7.91x10-5 cm/sec.

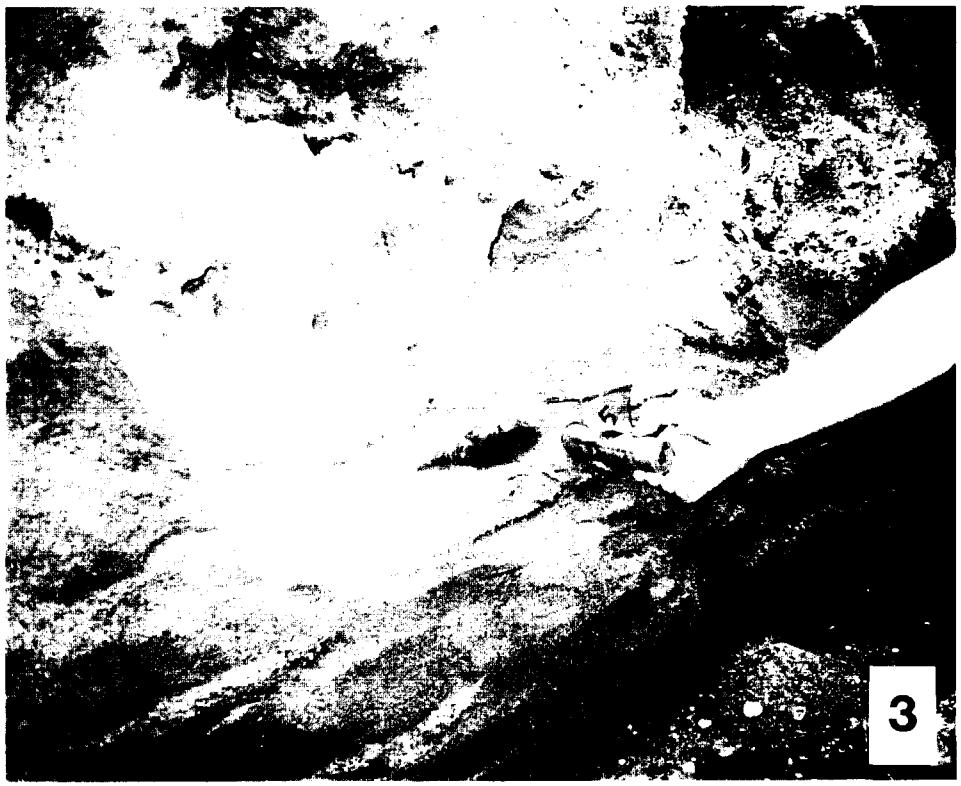
3) Soil sampling method to obtain relatively undisturbed samples, using 6-inch long, 1-inch diameter brass sleeves with plastic caps.

PHOTOGRAPHS OF TEST PIT TP-702
JUNE 19, 1996

ORIGINALS IN COLOR
Available at the US EPA New England Superfund Records Center, Boston, MA







Appendix C

Soil and Bedrock Sample Log, Geotechnical Data Report, and TOC Data

SAMPLE LOG - BEDROCK SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c	Specific Location (d)						
R001	C-R-MW705DR-01-S(42)	C	R	MW705DR	01	S	42	8/30/96	13:20	TOC sample for lab analysis, BD, permeability, and porosity.
R002	C-R-MW705DR-02-S(53-54)	C	R	MW705DR	02	S	(53-54)	9/3/96	7:25	TOC sample for lab analysis, BD, permeability, and porosity.
R003	C-R-MW705DR-03-S(60-61)	C	R	MW705DR	03	S	(60-61)	9/3/96	8:02	TOC sample for lab analysis, BD, permeability, and porosity.
R004	C-R-MW705DR-03-D(60-61)	C	R	MW705DR	03	D	(60-61)	9/3/96	8:15	Blind duplicate of R003 for TOC.
R005	C-R-MW705DR-04-S(101)	C	R	MW705DR	04	S	(101)	9/4/96	13:20	TOC sample, BD, permeability, and porosity. VOC by 8240 meth. immers.
R006	C-R-MW705DR-05-S(102)	C	R	MW705DR	05	S	(102)	9/4/96	13:25	TOC sample only.
R007	C-R-MW705DR-06-S(99)	C	R	MW705DR	06	S	(99)	9/4/96	14:25	BD, permeability, and porosity.
R008	C-R-RC701-01-S(54-55)	C	R	RC701	01	S	(54-55)	9/12/96	8:50	VOCs by 8240. Jar WT = 111.8 g, Jar & Rock = 21.7 g, w/Meth = 286 g + TOC, BD, perm. & porosity.
R009	C-R-RC701-02-S(61-62)	C	R	RC701	02	S	(61-62)	9/12/96	12:50	VOCs by 8240. Jar WT = 111.8 g, Jar & Rock = 206.1 g, w/Meth = 279.2 g + TOC, BD, perm. & porosity.
R009 MS/MSD	C-R-RC701-02-MS/MSD(61-62)	C	R	RC701	02	MS/MSD	(61-62)	9/12/96	12:50	VOCs by 8240. Jar WT = 112.8 g, Jar & Rock = 214.8 g, w/Meth = 290 g
R010	C-R-RC701-03-S(67-68)	C	R	RC701	03	S	(67-68)	9/12/96	13:00	VOCs by 8240. Jar WT = 112.4 g, Jar & Rock = 215 g, w/Meth = 286 g +TOC, BD, perm. & porosity.
R011	C-R-RC701-03-D(67-68)	C	R	RC701	03	D	(67-68)	9/12/96	13:10	VOCs by 8240. Jar WT = 112.3, Jar & Rock = 220.4, w/Meth = 290 g. Blind dup of R010.
R012	W-R-MW704DR-01-S(79-79.75)	W	R	MW704DR	01	S	(79-79.75)	10/10/96	17:25	TOC, BD, permeability & porosity.
R013	W-R-MW704DR-02-S(86.5-87.5)	W	R	MW704DR	02	S	(86.5-87.5)	10/10/96	18:30	TOC, BD, permeability & porosity.
R014	W-R-MW704DR-03-S(99.5-100)	W	R	MW704DR	03	S	(99.5-100)	10/11/96	7:50	TOC, BD, permeability & porosity.
R015	W-R-MW704D-04-S(117.5-118.5)	W	R	MW704DR	04	S	(117.5-118.	10/11/96	11:00	TOC, BD, permeability & porosity.
R016	W-R-MW704DR-05-S(163-164)	W	R	MW704DR	05	S	(163-164)	10/11/96	16:00	TOC, BD, permeability & porosity.
R017	O-R-MW702-01-S(30-31)	O	R	MW702	01	S	(30-31)	10/12/96	12:40	TOC, BD, permeability & porosity.
R018	O-R-MW702-02-S(42-43)	O	R	MW702	02	S	(42-43)	10/12/96	13:40	TOC, BD, permeability & porosity.
R019	O-R-MW702-03-S(64.9-65.5)	O	R	MW702	03	S	(64.9-65.5)	10/12/96	16:55	TOC, BD, permeability & porosity.
R020	O-R-MW702-04-S(101-102)	O	R	MW702	04	S	(101-102)	10/14/96	13:55	TOC, BD, permeability & porosity.
R021	O-R-MW702-05-S(23-24)	O	R	MW702	05	S	(23-24)	11/4/96	12:30	TOC, BD, permeability, & porosity from MW-702 supplemental borehole
R022	C-R-RC701-01-R(54-55)	C	R	RC701	01	R	(54-55)	11/5/96	11:00	Methanol FB for 8240 VOCs.

SAMPLE LOG - SOIL SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Lab Sample Designation	Elements of Sample Designtation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
S001	C-S-SB701-01S(2-4)	C	S	SB701	01	S	2-4	8/27/96	10:09	Taken from interval directly above saturated --- at 3.9' BGS for TOC, BD, porosity, and VOCs
S002	C-S-SB701-02S(8-10)	C	S	SB701	02	S	8-10	8/27/96	11:30	TOC, bulk density (BD) & porosity (8.5-9)
S003	C-S-SB701-03S(12-14)	C	S	SB701	03	S	12-14	8/27/96	11:52	TOC, BD & porosity (13.5-14)
S004	C-S-SB701-03R(12-14)	C	W	SB701	03	R	12-14	8/27/96	12:05	Taken from split-spoon after 12-14 interval for VOCs
S005	C-S-SB701-04S(18-20)	C	S	SB701	04	S	18-20	8/27/96	12:45	TOC, BD, porosity, and permeability of till (19-19.5)
S006	C-S-SB702-01S(0-2)	C	S	SB702	01	S	0-2	8/27/96	15:15	TOC, BD & porosity (1-1.5)
S007	C-S-SB702-01D(0-2)	C	S	SB702	01	D	0-2	8/27/96	15:20	Blind dup for TOC from 0-2 interval
S008	C-S-SB702-02S(2-4)	C	S	SB702	02	S	2-4	8/27/96	15:40	VOCs, TOC, BD, and porosity
S008 MS/MSD	C-S-SB702-02MS/MSD(2-4)	C	S	SB702	02	MS/MSD	2-4	8/27/96	15:45	VOC MS/MSD
S009	C-S-SB702-02D(2-4)	C	S	SB702	02	D	2-4	8/27/96	15:30	Blind dup for VOC from 2-4' interval
S010	C-S-SB702-03S(6-8)	C	S	SB702	03	S	6-8	8/27/96	16:12	TOC, BD & porosity (6-8, 7-7.5)
S011	C-S-SB702-04S(10-12)	C	S	SB702	04	S	10-12	8/27/96	16:50	TOC, BD & porosity (10-12, 11-11.5)
S012	C-S-SB702-05S(18-20)	C	S	SB702	05	S	18-20	8/27/96	8:05	TOC, BD, porosity & permeability of till (18-20, 18.5-19)
S013	C-S-SB703-01S(2-4)	C	S	SB703	01	S	2-4	8/28/96	9:55	VOCs, TOC, BD & porosity (2-4, 3-3.5)
S014	C-S-SB703-02S(4-6)	C	S	SB703	02	S	4-6	8/28/96	10:13	TOC, BD & porosity (4-6, 4.5-5)
S015	C-S-SB703-03S(14-16)	C	S	SB703	03	S	14-16	8/28/96	11:20	TOC, BD & porosity (14-16, 14.15)
S016	C-S-SB703-04S(20-22)	C	S	SB703	04	S	20-22	8/28/96	12:05	TOC, BD, porosity, & permeability (20-22, 21.5-22)
S017	W-S-MW703DR-01-S(24-26)	W	S	MW703DR	01	S	24-26	9/28/96	8:35	TOC, BD & porosity (24-26, 25-25.5)
S018	W-S-MW703DR-02-S(34-36)	W	S	MW703DR	02	S	34-36	9/26/96	9:50	TOC, BD & porosity (34-36, 35-35.5)
S019	W-S-MW703DR-03-S(44-46)	W	S	MW703DR	03	S	44-46	9/26/96	11:10	TOC, BD & porosity (44-46, 44.5-45)
S020	W-S-MW703DR-04-S(50-52)	W	S	MW703DR	04	S	50-52	9/26/96	14:10	VOA 8010/8020 from 50-52
S021	W-S-MW703DR-05-S(54-56)	W	S	MW703DR	05	S	54-56	9/26/96	14:35	TOC, BD & porosity from 54-56 (55-55.5)
S022	W-S-MW703DR-06-S(59-61)	W	S	MW703DR	06	S	59-61	9/26/96	15:20	VOA 8010/8020 from 59-61
S023	W-S-MW703DR-07-S(64-71)	W	S	MW703DR	07	S	69-71	9/26/96	9:30	VOA 8010/8020 from 69-71
S024	W-S-MW703DR-08-S(74-76)	W	S	MW703DR	08	S	74-76	9/27/96	10:50	TOC, BD & porosity from 74-76 (74.5-75)
S025	W-S-MW703DR-09-S(79-79.5)	W	S	MW703DR	07	S	79-79.5	9/27/96	11:15	VOC 8010/8020
S026	W-S-MW707DR-01-S(35-36)	W	S	MW707DR	01	S	35-36	9/27/96	13:17	VOC 8010/8020 from 35-36
S027	W-S-MW707DR-02-S(44-46)	W	S	MW707DR	02	S	44-46	9/27/96	14:16	VOC 8010/8020 from 44-46
S028	W-S-MW707DR-03-S(54-56)	W	S	MW707DR	03	S	54-56	9/27/96	9:45	VOC 8010/8020 from 54-56
S029	W-S-MW707DR-04-S(64-66)	W	S	MW707DR	04	S	64-66	9/30/96	10:30	VOC 8010/8020 from 64-66
S030	W-S-MW707DR-05-S(74-76)	W	S	MW707DR	05	S	74-76	9/30/96	11:25	VOC 8010/8020 from 74-76
S031	W-S-MW707DR-06-S(84-86)	W	S	MW707DR	06	S	84-86	9/30/96	13:40	VOC 8010/8020 from 84-86
S032	W-S-MW707DR-07-S(93-95)	W	S	MW707DR	07	S	93-95	9/30/96	15:30	VOC 8010/8020 from 93-95
S033	W-S-MW704DR-01-S(14-16)	W	S	MW704DR	01	S	14-16	9/30/96	12:58	TOC, BD, porosity & grain size from 14-16 @ MW704DR (15-15.5)
S034	W-S-MW704DR-02-S(19-21)	W	S	MW704DR	02	S	19-21	10/7/96	13:40	TOC, BD, porosity & grain size from 19-21 @ MW704DR (20-20.5)
S035	W-S-MW704DR-03-S(24-26)	W	S	MW704DR	03	S	24-26	10/7/96	14:30	TOC, BD, porosity & grain size from 24-26 @ MW704DR (25.5-26)
S036	W-S-MW704DR-04-S(34-36)	W	S	MW704DR	04	S	34-36	10/7/96	15:25	TOC, BD, porosity & grain size from 34-36 @ MW704DR (35.5-36)
S037	W-S-MW704D-05-S(55-57)	W	S	MW704D	05	S	55-57	10/7/96	16:40	TOC, BD, porosity & grain size from 55-57 @ MW704D (55-55.5)
S038	W-S-MW704D-05-D(55-57)	W	S	MW704D	05	D	55-57	11/6/96	15:35	Blind dup of above for TOC
S039	C-S-TP701-01-S(4.4)	C	S	TP701	01	S	4.4	11/6/96	14:00	Test pit permeability
S040	C-S-TP701-02-S(4.5)	C	S	TP701	02	S	4.5	9/12/96	11:00	Test pit permeability
S041	C-S-TP701-03-S(4.6)	C	S	TP701	03	S	4.6	9/12/96	11:15	Test pit permeability
S042	C-S-TP701-04-S(4.7)	C	S	TP701	04	S	4.7	9/12/96	11:30	Test pit permeability
S043	C-S-TP701-05-S(4.8)	C	S	TP701	05	S	4.8	9/12/96	11:45	Test pit permeability
S044	C-S-TP702-01-S(4)	C	S	TP702	01	S	4	9/12/96	12:00	Test pit permeability
S045	C-S-TP702-02-S(4)	C	S	TP702	02	S	4	6/19/96	13:00	Test pit permeability
S046	C-S-TP702-03-S(6)	C	S	TP702	03	S	6	6/19/96	13:05	Test pit permeability
S047	C-S-TP702-04-S(5)	C	S	TP702	04	S	5	6/19/96	13:10	Test pit permeability
S048	C-S-TP702-05-S(5)	C	S	TP702	05	S	5	6/19/96	13:15	Test pit permeability
S049	P-S-MW710DR-01-S(64-66)	P	S	MW710DR	01	S	64-66	5/29/97	9:10	VOC 8010/8020 from 64-66
S050	P-S-MW710DR-02-S(74-76)	P	S	MW710DR	02	S	74-76	5/29/97	10:37	VOC 8010/8020 from 74-76
S051	P-S-MW710DR-03-S(84-86)	P	S	MW710DR	03	S	84-86	5/29/97	11:35	VOC 8010/8020 from 84-86
S052	P-S-MW710DR-04-S(94-96)	P	S	MW710DR	04	S	94-96	5/29/97	13:20	VOC 8010/8020 from 94-96
S053	P-S-MW710DR-05-S(104-106)	P	S	MW710DR	05	S	104-106	5/29/97	14:15	VOC 8010/8020 from 104-106
S054	P-S-MW710DR-06-S(114-116)	P	S	MW710DR	06	S	114-116	5/29/97	15:15	VOC 8010/8020 from 114-116
S055	P-S-MW710DR-07-S(124-126)	C	S	MW710DR	07	S	124-126	5/29/97	16:50	VOC 81010/8020 from 124-126

CORE LABORATORIES

Company : Blasland & Bouck Engineers, P. C.
Project : SRSNE
08331.003

File Number : 57171-15450
Date : 10-Jan-97
Analyst : KS

GEOTECHNICAL ANALYSIS RESULTS

LAB IDENTIFICATION	SAMPLE IDENTIFICATION	POROSITY (EFFECTIVE) (API RP40) %	DRY BULK DENSITY[1] gm/cc	DESCRIPTION
15450-1	S001 (2.0' - 4.0')	30.1	1.87	Sand, brown, coarse grained, w/pebbles
15450-2	S002 (8.0' - 10.0')	38.1	1.68	Sand, brown, vfine-coarse grained, w/pebbles
15450-3	S003 (12.0' - 14.0')	17.7	2.25	Sand, brown, vfine grained, w/pebbles
15450-4	S005 (18.0' - 20.0')	20.4	2.16	Sand, brown, vfine grained
15450-5	S006 (0.0' - 2.0')	26.8	1.96	Sand, brown, vfine grained, silty, clayey
15450-6	S010 (6.0' - 8.0')	28.6	1.93	Sand, brown, vfine-coarse grained, w/pebbles
15450-7	S011 (10.0' - 12.0')	28.1	1.91	Sand, brown, coarse grained
15450-8	S012 (18.0' - 20.0')	18.9	2.21	Sand, brown, vfine grained, w/pebbles
15450-9	S013 (2.0' - 4.0')	23.9	2.04	Sand, brown, vfine-fine grained
15450-10	S014 (4.0' - 6.0')	33.9	1.77	Sand, black, vfine-medium grained
15450-11	S015 (14.0' - 16.0')	21.3	2.19	Sand, red-brown, vfine grained, clayey
15450-12	S016 (20.0' - 22.0')	19.8	2.16	Sand, brown, vfine grained, sclayey
15450-13	S017 (24.0' - 26.0')	33.2	1.82	Sand, red-brown, vfine grained, sclayey
15450-14	S018 (34.0' - 36.0')	40.4	1.61	Sand, brown, coarse grained, calcareous, w/pebbles
15450-15	S019 (44.0' - 46.0')	19.8	2.21	Sand, red-brown, vfine grained, sclayey, calcareous, w/pebbles

[1] Dry Bulk Density (API RP40) = (Dry Sample Mass)/(Sample Bulk Volume)

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CORE LABORATORIES

Company : Blasland & Bouck Engineers, P. C.
Project : SRSNE
08331.003

File Number : 57171-15450
Date : 10-Jan-97
Analyst : KS

GEOTECHNICAL ANALYSIS RESULTS

LAB IDENTIFICATION	SAMPLE IDENTIFICATION	POROSITY (EFFECTIVE) (API RP40) %	DRY BULK DENSITY[1] gm/cc	DESCRIPTION
15450-16	S021 (54.0' - 56.0')	35.1	1.75	Sand, brown, medium-coarse grained, w/pebbles
15450-17	S024 (74.0' - 76.0')	17.7	2.24	Siltstone, red-brown, vclayey, w/pebbles
15450-18	S033 (14.0' - 16.0')	33.7	1.79	Siltstone, red-brown, clayey, calcareous
15450-19	S034 (19.0' - 21.0')	33.2	1.78	Sand, red-brown, vfine-medium grained, sclayey, calcareous
15450-20	S035 (24.0' - 26.0')	40.2	1.64	Siltstone, red-brown, clayey, calcareous, w/pebbles
15450-21	S036 (34.0' - 36.0')	22.7	2.11	Sand, red-brown, vfine-coarse grained, w/pebbles
15450-22	S037 (55.0' - 57.0')	40.0	1.63	Sand, brown, vfine-coarse grained, sclayey, calcareous, w/pebbles

[1] Dry Bulk Density (API RP40) = (Dry Sample Mass)/(Sample Bulk Volume)

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CORE LABORATORIES

Company: Blasland & Bouck Engineers, P. C.
Project : SRSNE
08331.003

File Number : 57171-15450
Date : 10-Jan-97
Analyst : KS

GEOTECHNICAL REPORT
HYDRAULIC CONDUCTIVITY

Sample Number (Lab)	Sample Indentification (Field)	Hydraulic Conductivity (m/s @ 20 C)	Hydraulic Conductivity (cm/s @ 20 C)	Effective Consolidation Stress (psi) Min	Effective Consolidation Stress (psi) Max	Saturation *B* Coefficient	Average Hydraulic Gradient	Total Back Pressure (psi)
4	S005 (18.0' -20.0')	3.98E-09	3.98E-07	5	7	1.00	17.82	45.0
8	S012 (18.0' - 20.0')	6.35E-09	6.35E-07	5	7	1.00	22.88	45.0
12	S016 (20.0' - 22.0')	1.18E-08	1.18E-06	5	7	1.00	22.48	45.0
23	S039 (4.4')	8.11E-06	8.11E-04	5	7	1.00	20.17	45.0
24	S040 (4.5')	2.48E-06	2.48E-04	5	7	1.00	26.40	45.0
25	S041 (4.6')	1.75E-06	1.75E-04	5	7	1.00	23.16	45.0
26	S042 (4.7')	2.51E-06	2.51E-04	5	7	1.00	19.83	45.0
27	S043 (4.8')	6.86E-06	6.86E-04	5	7	1.00	26.23	45.0
28	S044	1.34E-05	1.34E-03	5	7	1.00	23.91	45.0
29	S045	3.35E-06	3.35E-04	5	7	1.00	26.92	45.0
30	S046	2.02E-05	2.02E-03	5	7	1.00	19.83	45.0
31	S047	1.88E-05	1.88E-03	5	7	1.00	19.59	45.0
32	S048	7.91E-07	7.91E-05	5	7	1.00	18.69	45.0

Note:
Tests were performed according to ASTM standard D-5084

Permeant - Deaired water

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CORE LABORATORIES

Company : Blasland & Bouck Eng
Project : SRSNE

File Number : 57161-12066
Date : 2-Jan-97
Analysts : Ligon

Sieve & Laser Particle Size Analysis

Summary

Sample I.D.	Median Grain Size (mm)	PARTICLE SIZE DISTRIBUTION, (% grain volume)								Silt & Clay Size (% grain vol)
		Granule Size	Very Coarse Size	Coarse Size	Medium Size	Fine Size	Very Fine Size	Silt Size	Clay Size	
S033	0.043	0.00	0.00	0.00	0.00	0.35	27.05	68.49	4.11	72.60
S034	0.166	0.00	0.00	1.27	23.04	42.66	20.33	11.77	0.93	12.70
S035	0.033	0.00	0.00	17.56	11.66	9.75	6.83	44.02	10.18	54.20
S036	1.429	37.98	16.54	11.24	4.92	4.85	5.66	16.13	2.68	18.81
S037	0.879	43.59	4.29	4.92	8.66	7.91	7.96	20.37	2.30	22.67

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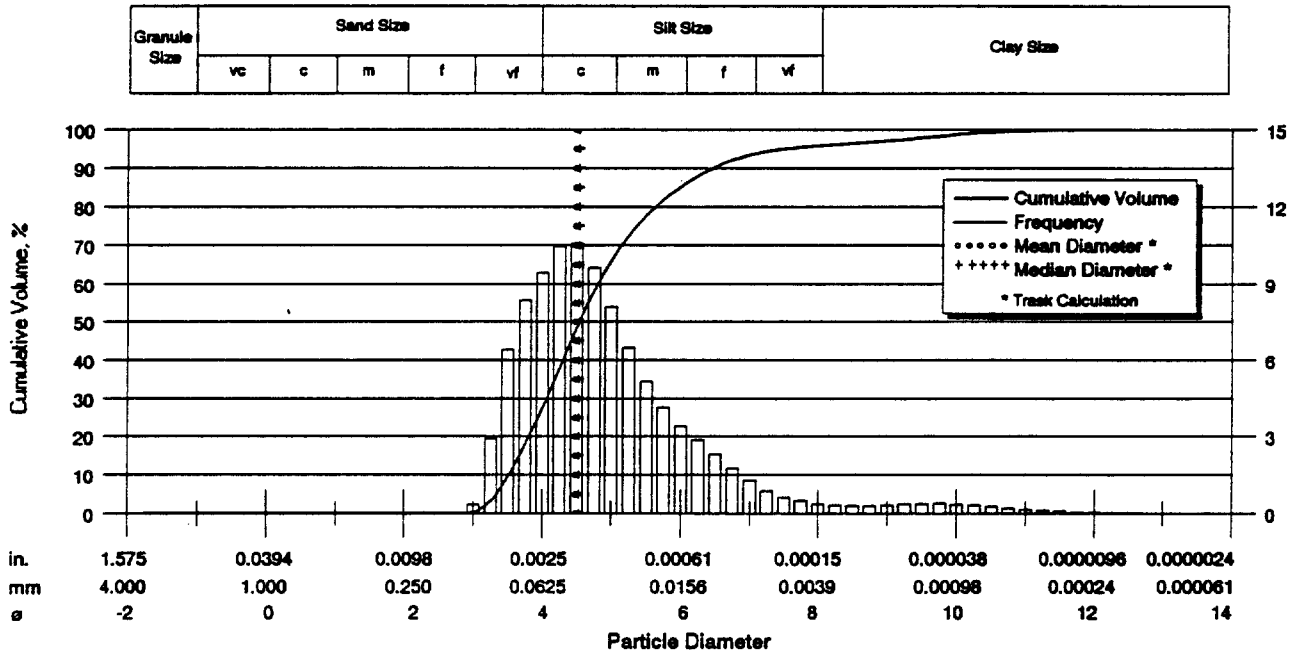
CORE LABORATORIES

Company	Blasland & Bouck Eng	Sample	S033	File Number	57161-12066
Project	SRSNE	Depth	14-16	Date	2-Jan-97
				Analysts	Ligon

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	Diameter [U.S. Sieve]	[in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	0.00	0.00
	8	0.0936	2.38	-1.25	0.00	0.00
V Coarse Sand	12	0.0662	1.68	-0.75	0.00	0.00
	16	0.0468	1.19	-0.25	0.00	0.00
	20	0.0331	0.84	0.25	0.00	0.00
Coarse Sand	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.00	0.00
	35	0.0197	0.50	1.00	0.00	0.00
	40	0.0165	0.42	1.25	0.00	0.00
Medium Sand	45	0.0138	0.35	1.50	0.00	0.00
	50	0.0118	0.30	1.75	0.00	0.00
	60	0.0098	0.25	2.00	0.00	0.00
	70	0.0083	0.210	2.25	0.00	0.00
Fine Sand	80	0.0070	0.177	2.50	0.00	0.00
	100	0.0059	0.149	2.75	0.00	0.00
	120	0.0049	0.125	3.00	0.35	0.35
	140	0.0041	0.105	3.25	2.91	3.26
Very Fine Sand	170	0.0035	0.088	3.50	6.39	9.65
	200	0.0029	0.074	3.75	8.33	17.98
	230	0.0025	0.063	4.00	9.42	27.40
	270	0.0021	0.053	4.25	10.45	37.85
Silt	325	0.0017	0.044	4.50	10.60	48.45
	400	0.0015	0.037	4.75	9.60	58.05
	450	0.0012	0.031	5.00	8.08	66.13
	500	0.0010	0.025	5.32	8.03	74.16
	635	0.0008	0.020	5.64	6.01	80.17
		0.00061	0.0156	6.00	5.13	85.30
		0.00031	0.0078	7.00	8.18	93.48
		0.00015	0.0039	8.00	2.41	95.89
		0.000079	0.0020	9.00	1.26	97.15
Clay		0.000039	0.00098	10.0	1.51	98.66
		0.000019	0.00049	11.0	0.95	99.61
		0.0000094	0.00024	12.0	0.32	99.93
		0.0000047	0.00012	13.0	0.07	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in	0.0017	0.0014	0.0015
Mean, mm	0.0448	0.0360	0.0382
Mean, phi	4.4816	4.7978	4.7111
Median, in	0.0017	0.0017	0.0017
Median, mm	0.0431	0.0431	0.0431
Median, phi	4.5378	4.5378	4.5378
Standard Deviation, in	0.0638	0.0182	0.0172
Standard Deviation, mm	1.6357	0.4660	0.4409
Standard Deviation, phi	-0.7099	1.1017	1.1813
Skewness	0.8564	0.7962	0.3288
Kurtosis	0.2677	0.8886	1.2012

* calculated using mm values
* *calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0039	0.0991	3.3343
10	0.0034	0.0877	3.5113
16	0.0030	0.0772	3.6961
25	0.0025	0.0652	3.9397
50	0.0017	0.0431	4.5378
75	0.0009	0.0244	5.3595
84	0.0007	0.0168	5.8995
90	0.0004	0.0115	6.4446
95	0.0002	0.0055	7.4956

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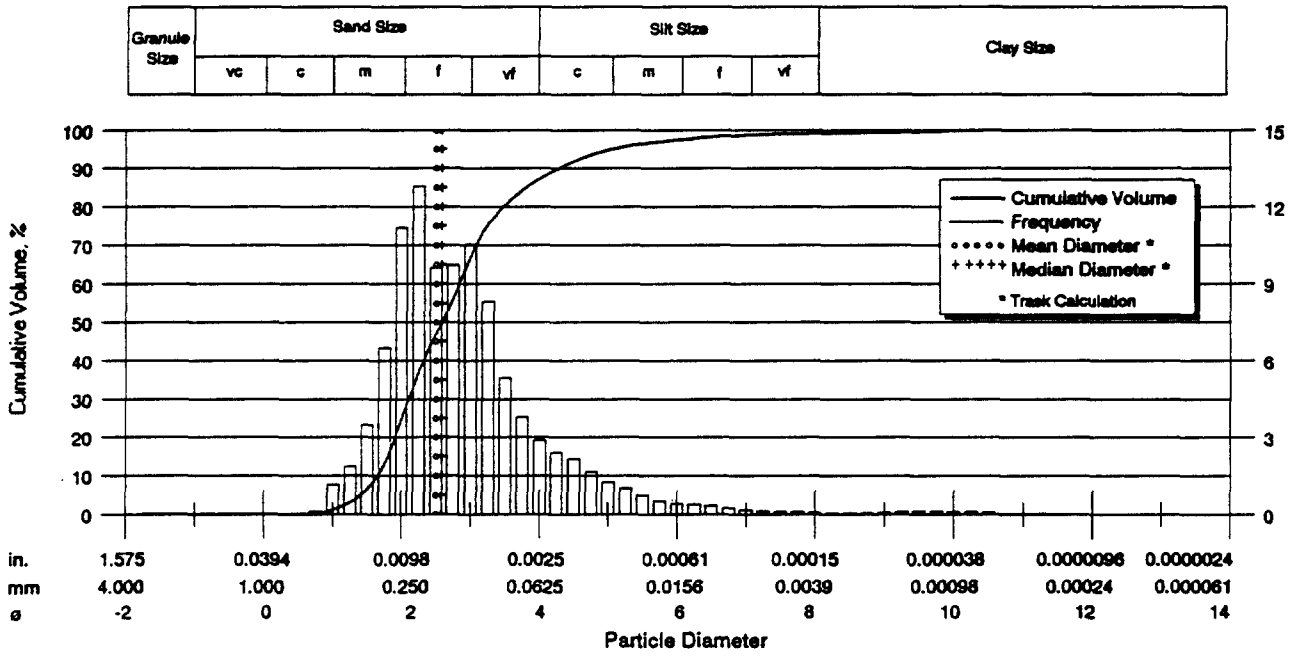
CORE LABORATORIES

Company	Blasland & Bouck Eng	Sample	S034	File Number	57161-12066
Project	SRSNE	Depth	19-21	Date	2-Jan-97
				Analyst	Ligon

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	0.00	0.00
	8	0.0936	2.38	-1.25	0.00	0.00
V Coarse Sand	12	0.0662	1.68	-0.75	0.00	0.00
	16	0.0468	1.19	-0.25	0.00	0.00
Coarse Sand	20	0.0331	0.84	0.25	0.00	0.00
	25	0.0280	0.71	0.50	0.00	0.00
	30	0.0232	0.59	0.75	0.12	0.12
	35	0.0197	0.50	1.00	1.15	1.27
Medium Sand	40	0.0165	0.42	1.25	1.85	3.12
	45	0.0138	0.35	1.50	3.50	6.62
	50	0.0118	0.30	1.75	6.51	13.13
	60	0.0098	0.25	2.00	11.18	24.31
Fine Sand	70	0.0083	0.210	2.25	12.80	37.11
	80	0.0070	0.177	2.50	9.61	46.72
	100	0.0059	0.149	2.75	9.71	56.43
	120	0.0049	0.125	3.00	10.54	66.97
Very Fine Sand	140	0.0041	0.105	3.25	8.30	75.27
	170	0.0035	0.088	3.50	5.33	80.60
	200	0.0029	0.074	3.75	3.80	84.40
	230	0.0025	0.063	4.00	2.90	87.30
Silt	270	0.0021	0.053	4.25	2.41	89.71
	325	0.0017	0.044	4.50	2.15	91.86
	400	0.0015	0.037	4.75	1.67	93.53
	450	0.0012	0.031	5.00	1.25	94.78
	500	0.0010	0.025	5.32	1.23	96.01
	635	0.0008	0.020	5.64	0.84	96.85
		0.00061	0.0156	6.00	0.64	97.49
		0.00031	0.0078	7.00	1.20	98.69
		0.00015	0.0039	8.00	0.38	99.07
Clay		0.000079	0.0020	9.00	0.24	99.31
		0.000039	0.00098	10.0	0.43	99.74
		0.000019	0.00049	11.0	0.23	99.97
		0.0000094	0.00024	12.0	0.03	100.00
		0.0000047	0.00012	13.0	0.00	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in	0.0069	0.0057	0.0060
Mean, mm	0.1769	0.1464	0.1527
Mean, phi	2.4993	2.7724	2.7111
Median, in	0.0065	0.0065	0.0065
Median, mm	0.1663	0.1663	0.1663
Median, phi	2.5884	2.5884	2.5884
Standard Deviation, in	0.0597	0.0202	0.0191
Standard Deviation, mm	1.5303	0.5185	0.4910
Standard Deviation, phi	-0.6138	0.9475	1.0261
Skewness	0.9489	0.6765	0.2730
Kurtosis	0.2645	0.9239	1.2171

* calculated using mm values
* *calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0147	0.3772	1.4065
10	0.0125	0.3199	1.6445
16	0.0110	0.2823	1.8249
25	0.0097	0.2479	2.0123
50	0.0065	0.1663	2.5884
75	0.0041	0.1058	3.2400
84	0.0030	0.0759	3.7199
90	0.0020	0.0514	4.2817
95	0.0012	0.0301	5.0522

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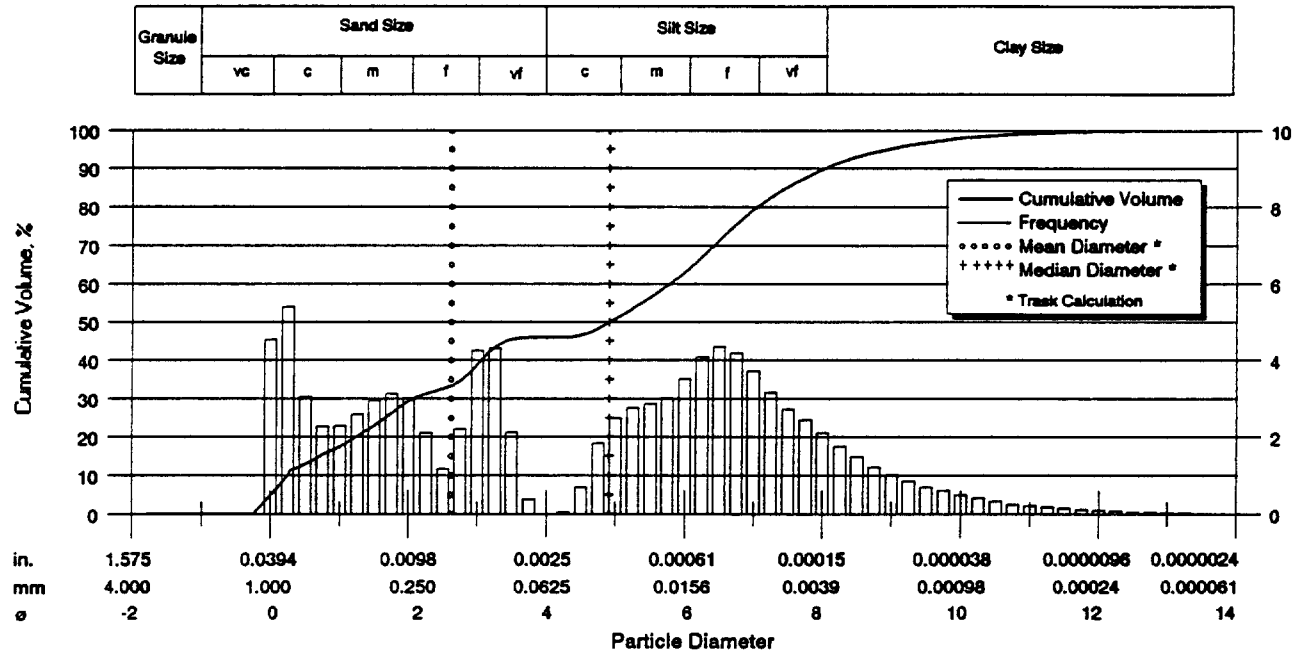
CORE LABORATORIES

Company	Blasland & Bouck Eng	Sample	S035	File Number	57161-12066
Project	SRSNE	Depth	24-26	Date	2-Jan-97
				Analysts	Ligon

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	0.00	0.00
	8	0.0936	2.38	-1.25	0.00	0.00
V Coarse Sand	12	0.0662	1.68	-0.75	0.00	0.00
	16	0.0468	1.19	-0.25	0.00	0.00
	20	0.0331	0.84	0.25	9.94	9.94
Coarse Sand	25	0.0280	0.71	0.50	3.04	12.98
	30	0.0232	0.59	0.75	2.28	15.26
	35	0.0197	0.50	1.00	2.30	17.56
	40	0.0165	0.42	1.25	2.59	20.15
Medium Sand	45	0.0138	0.35	1.50	2.94	23.09
	50	0.0118	0.30	1.75	3.13	26.22
	60	0.0098	0.25	2.00	3.00	29.22
	70	0.0083	0.210	2.25	2.12	31.34
Fine Sand	80	0.0070	0.177	2.50	1.17	32.51
	100	0.0059	0.149	2.75	2.21	34.72
	120	0.0049	0.125	3.00	4.25	38.97
	140	0.0041	0.105	3.25	4.32	43.29
Very Fine Sand	170	0.0035	0.088	3.50	2.12	45.41
	200	0.0029	0.074	3.75	0.39	45.80
	230	0.0025	0.063	4.00	0.00	45.80
	270	0.0021	0.053	4.25	0.05	45.85
Silt	325	0.0017	0.044	4.50	0.73	46.58
	400	0.0015	0.037	4.75	1.82	48.40
	450	0.0012	0.031	5.00	2.48	50.88
	500	0.0010	0.025	5.32	3.58	54.46
	635	0.0008	0.020	5.64	3.70	58.16
		0.00061	0.0156	6.00	4.89	63.05
		0.00031	0.0078	7.00	16.34	79.39
		0.00015	0.0039	8.00	10.43	89.82
		0.000079	0.0020	9.00	5.49	95.31
Clay		0.000039	0.00098	10.0	2.67	97.98
		0.000019	0.00049	11.0	1.23	99.21
		0.0000094	0.00024	12.0	0.54	99.75
		0.0000047	0.00012	13.0	0.22	99.97
		0.0000039	0.00010	13.3	0.03	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in	0.0064	0.0023	0.0019
Mean, mm	0.1637	0.0582	0.0483
Mean, phi	2.6107	4.1018	4.3727
Median, in	0.0013	0.0013	0.0013
Median, mm	0.0332	0.0332	0.0332
Median, phi	4.9146	4.9146	4.9146
Standard Deviation, in	0.2249	0.0040	0.0049
Standard Deviation, mm	5.7663	0.1032	0.1257
Standard Deviation, phi	-2.5277	3.2763	2.9922
Skewness	2.7643	-0.1423	-0.1762
Kurtosis	0.1844	0.3639	0.7245

* calculated using mm values
**calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5	0.0395	1.0139	-0.0200
10	0.0328	0.8400	0.2515
16	0.0220	0.5643	0.8255
25	0.0124	0.3179	1.6535
50	0.0013	0.0332	4.9146
75	0.0004	0.0096	6.7088
84	0.0002	0.0060	7.3781
90	0.0001	0.0038	8.0236
95	0.0001	0.0021	8.9170

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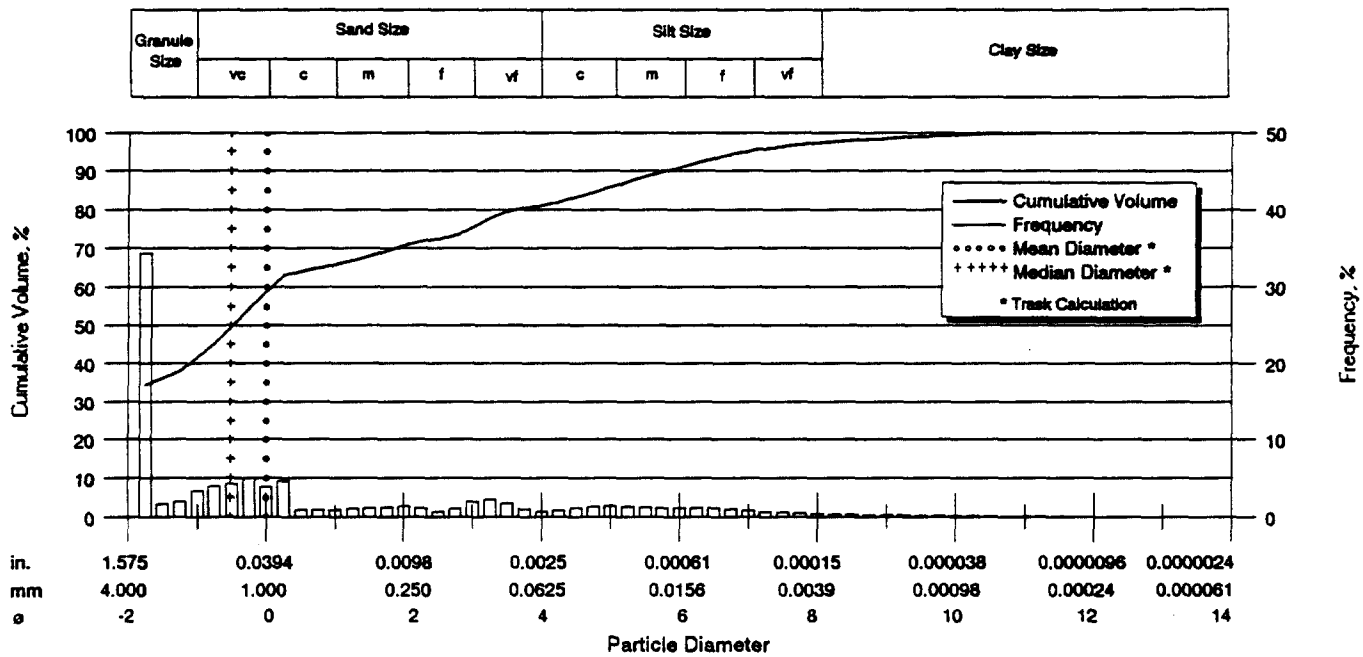
CORE LABORATORIES

Company	Blasland & Bouck Eng	Sample	S036	File Number	57161-12066
Project	SRSNE	Depth	34-36	Date	2-Jan-97
				Analysts	Ligon

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	34.27	34.27
	8	0.0936	2.38	-1.25	3.71	37.98
V Coarse Sand	12	0.0662	1.68	-0.75	7.26	45.24
	16	0.0468	1.19	-0.25	9.28	54.52
Coarse Sand	20	0.0331	0.84	0.25	8.49	63.01
	25	0.0280	0.71	0.50	0.88	63.89
	30	0.0232	0.59	0.75	0.91	64.80
	35	0.0197	0.50	1.00	0.96	65.76
Medium Sand	40	0.0165	0.42	1.25	1.08	66.84
	45	0.0138	0.35	1.50	1.14	67.98
	50	0.0118	0.30	1.75	1.26	69.24
	60	0.0098	0.25	2.00	1.44	70.68
Fine Sand	70	0.0083	0.210	2.25	1.13	71.81
	80	0.0070	0.177	2.50	0.66	72.47
	100	0.0059	0.149	2.75	1.06	73.53
	120	0.0049	0.125	3.00	2.00	75.53
Very Fine Sand	140	0.0041	0.105	3.25	2.31	77.84
	170	0.0035	0.088	3.50	1.73	79.57
	200	0.0029	0.074	3.75	0.97	80.54
	230	0.0025	0.063	4.00	0.65	81.19
Silt	270	0.0021	0.053	4.25	0.84	82.03
	325	0.0017	0.044	4.50	1.17	83.20
	400	0.0015	0.037	4.75	1.37	84.57
	450	0.0012	0.031	5.00	1.42	85.99
	500	0.0010	0.025	5.32	1.74	87.73
	635	0.0008	0.020	5.64	1.56	89.29
		0.00061	0.0156	6.00	1.67	90.96
		0.00031	0.0078	7.00	4.20	95.16
		0.00015	0.0039	8.00	2.16	97.32
Clay		0.000079	0.0020	9.00	1.20	98.52
		0.000039	0.00098	10.0	0.83	99.35
		0.000019	0.00049	11.0	0.43	99.78
		0.0000094	0.00024	12.0	0.16	99.94
		0.0000047	0.00012	13.0	0.06	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in			
Mean, mm			
Mean, phi			
Median, in	0.0557	0.0557	0.0557
Median, mm	1.4293	1.4293	1.4293
Median, phi	-0.5153	-0.5153	-0.5153
Standard Deviation, in			
Standard Deviation, mm			
Standard Deviation, phi			
Skewness			
Kurtosis			

* calculated using mm values
* *calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5			
10			
16			
25			
50	0.0557	1.4293	-0.5153
75	0.0051	0.1301	2.9424
84	0.0016	0.0399	4.6466
90	0.0007	0.0180	5.7944
95	0.0003	0.0081	6.9501

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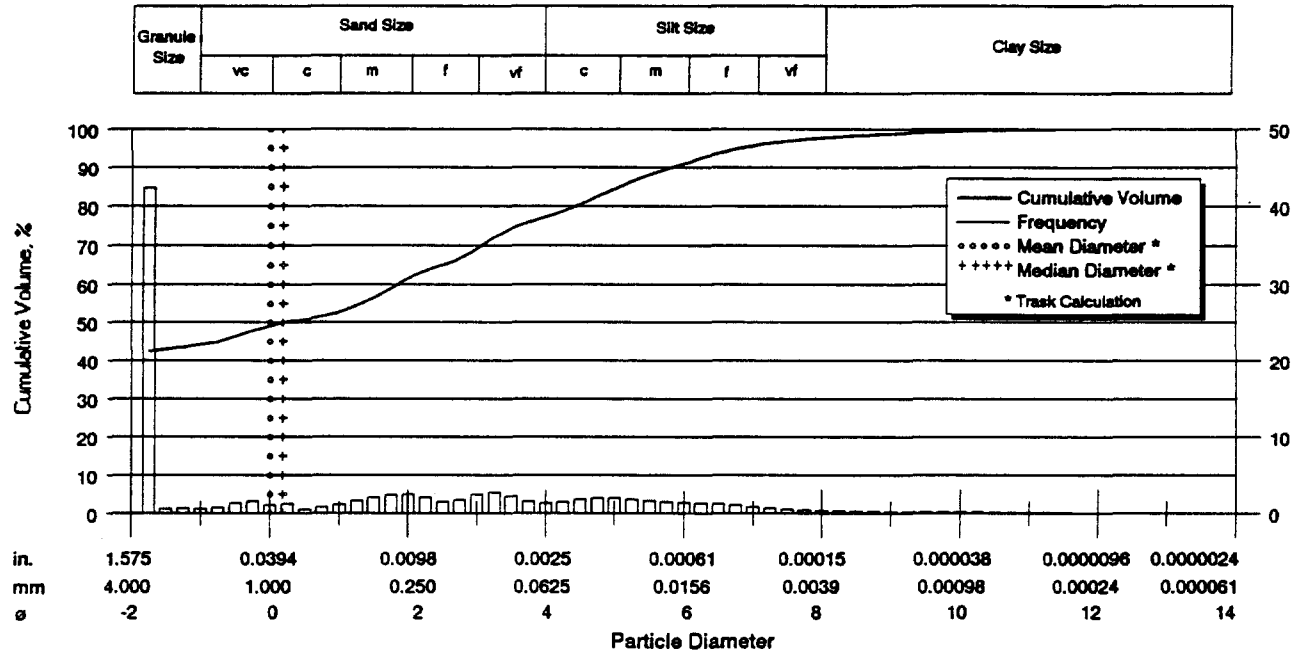
CORE LABORATORIES

Company	Blasland & Bouck Eng	Sample	S037	File Number	57161-12066
Project	SRSNE	Depth	55-57	Date	2-Jan-97
				Analysts	Ligon

Sieve and Laser Particle Size Analysis



Particle Size Distribution

	[U.S. Sieve]	Diameter [in]	[mm]	[phi]	Volume, % [Inc.]	[Cum.]
Granule	6	0.1324	3.36	-1.75	42.36	42.36
	8	0.0936	2.38	-1.25	1.22	43.59
V Coarse Sand	12	0.0662	1.68	-0.75	1.31	44.89
	16	0.0468	1.19	-0.25	2.98	47.88
	20	0.0331	0.84	0.25	2.38	50.26
Coarse Sand	25	0.0280	0.71	0.50	0.51	50.77
	30	0.0232	0.59	0.75	0.87	51.64
	35	0.0197	0.50	1.00	1.16	52.80
	40	0.0165	0.42	1.25	1.65	54.45
Medium Sand	45	0.0138	0.35	1.50	2.11	56.56
	50	0.0118	0.30	1.75	2.40	58.96
	60	0.0098	0.25	2.00	2.50	61.46
	70	0.0083	0.210	2.25	2.06	63.52
Fine Sand	80	0.0070	0.177	2.50	1.51	65.03
	100	0.0059	0.149	2.75	1.79	66.82
	120	0.0049	0.125	3.00	2.55	69.37
	140	0.0041	0.105	3.25	2.74	72.11
Very Fine Sand	170	0.0035	0.088	3.50	2.24	74.35
	200	0.0029	0.074	3.75	1.62	75.97
	230	0.0025	0.063	4.00	1.36	77.33
	270	0.0021	0.053	4.25	1.51	78.84
Silt	325	0.0017	0.044	4.50	1.83	80.67
	400	0.0015	0.037	4.75	2.00	82.67
	450	0.0012	0.031	5.00	1.99	84.66
	500	0.0010	0.025	5.32	2.35	87.01
	635	0.0008	0.020	5.64	2.04	89.05
		0.00061	0.0156	6.00	2.07	91.12
		0.00031	0.0078	7.00	4.57	95.69
		0.00015	0.0039	8.00	2.01	97.70
		0.000079	0.0020	9.00	0.99	98.69
Clay		0.000039	0.00098	10.0	0.70	99.39
		0.000019	0.00049	11.0	0.41	99.80
		0.0000094	0.00024	12.0	0.15	99.95
		0.0000047	0.00012	13.0	0.05	100.00
		0.0000039	0.00010	13.3	0.00	100.00

Sorting Statistics

Parameter	Trask*	Inman**	Folk**
Mean, in			
Mean, mm			
Mean, phi			
Median, in	0.0343	0.0343	0.0343
Median, mm	0.8788	0.8788	0.8788
Median, phi	0.1865	0.1865	0.1865
Standard Deviation, in			
Standard Deviation, mm			
Standard Deviation, phi			
Skewness			
Kurtosis			

* calculated using mm values
* *calculated using phi values

Percentiles [volume, %]	Particle Diameter [in]	[mm]	[phi]
5			
10			
16			
25			
50	0.0343	0.8788	0.1865
75	0.0032	0.0830	3.5914
84	0.0013	0.0332	4.9148
90	0.0007	0.0179	5.8028
95	0.0004	0.0090	6.7963

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CORE LABORATORIES

Company : BBL, Inc.
Well : SRSNE
Field :
County :

CL File No : 57151-18496
Date : 6-Dec-1996
Analysts : Weir

PLUG ANALYSIS

Core Lab Sample Number	Sample I.D.	Porosity %	Permeability cm/sec	Permeability cm2	Permeability Klinkenberg mD	Bulk Density g/cm3	Grain Density g/cm3
1	R001	5.5	3.689E-08	4.244E-13	0.043	2.57	2.71
2	R002	12.1	3.308E-06	3.805E-11	3.856	2.37	2.69
3	R003	10.2	9.181E-08	1.056E-12	0.107	2.43	2.71
4	R005	9.4	7.722E-09	8.882E-14	0.009	2.49	2.75
5	R007	7.5	1.888E-08	2.171E-13	0.022	2.55	2.76
6	R008	12.7	8.340E-07	9.593E-12	0.972	2.37	2.72
7	R009	5.3	1.459E-08	1.678E-13	0.017	2.59	2.73
8	R010	12.9	2.028E-06	2.333E-11	2.364	2.33	2.67
9	R012	5.6	4.290E-09	4.935E-14	0.005	2.59	2.75
10	R013	5.4	7.722E-09	8.882E-14	0.009	2.62	2.77
11	R014	12.8	2.574E-07	2.961E-12	0.300	2.37	2.72
12	R015	6.0	1.364E-07	1.569E-12	0.159	2.59	2.76
13	R016	6.5	8.666E-08	9.968E-13	0.101	2.51	2.68
14	R017	6.1	6.006E-09	6.908E-14	0.007	2.62	2.79
15	R018	4.4			<0.001	2.64	2.76
16	R019	4.7	2.334E-07	2.684E-12	0.272	2.58	2.71
17	R020	6.6	2.402E-08	2.763E-13	0.028	2.53	2.71
18	R021	5.6	6.006E-09	6.908E-14	0.007	2.62	2.77

Bedrock porosity measurements are effective porosity (API Method RP-40).

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SAMPDATE	ANALDATE	LABSAMPID	CLIENTID	SAMPTYPE	PARAMETER	CAS NO.	RESULT	FLAGS	DL	UNITS
08/27/96	9/20/96	L32053-1	S001	Soil	Total Organic Carbon	000-00-0	7090		10	mg/kg
08/27/96	9/20/96	L32053-2	S002	Soil	Total Organic Carbon	000-00-0	373		10	mg/kg
08/27/96	9/20/96	L32053-3	S003	Soil	Total Organic Carbon	000-00-0	0	U	10	mg/kg
08/27/96	9/20/96	L32053-5	S005	Soil	Total Organic Carbon	000-00-0	114		10	mg/kg
08/27/96	9/20/96	L32053-6	S006	Soil	Total Organic Carbon	000-00-0	4370		10	mg/kg
08/27/96	9/20/96	L32053-7	S007	Soil	Total Organic Carbon	000-00-0	6330		10	mg/kg
08/30/96	9/27/96	L32126-1	R001	Soil	Total Organic Carbon	000-00-0	28900		10	mg/kg
09/03/96	9/27/96	L32185-1	R002	Soil	Total Organic Carbon	000-00-0	483		10	mg/kg
09/03/96	9/27/96	L32185-2	R003	Soil	Total Organic Carbon	000-00-0	443		10	mg/kg
09/03/96	9/27/96	L32185-3	R004	Soil	Total Organic Carbon	000-00-0	331		10	mg/kg
09/04/96	9/27/96	L32185-4	R005	Soil	Total Organic Carbon	000-00-0	643		10	mg/kg
09/04/96	9/30/96	L32185-5	R006	Soil	Total Organic Carbon	000-00-0	838		10	mg/kg
09/12/96	10/4/96	L32368-1	R008	Bulk	Total Organic Carbon	000-00-0	10200		10	mg/kg
09/12/96	10/4/96	L32368-2	R009	Bulk	Total Organic Carbon	000-00-0	11300		10	mg/kg
09/12/96	10/4/96	L32368-5	R010	Bulk	Total Organic Carbon	000-00-0	11200		10	mg/kg
09/26/96	10/18/96	L32692-1	S017	Soil	Total Organic Carbon	000-00-0	4020		10	mg/kg
09/26/96	10/18/96	L32692-2	S018	Soil	Total Organic Carbon	000-00-0	514		10	mg/kg
09/26/96	10/18/96	L32692-3	S019	Soil	Total Organic Carbon	000-00-0	2690		10	mg/kg
09/26/96	10/18/96	L32692-4	S021	Soil	Total Organic Carbon	000-00-0	5970		10	mg/kg
09/27/96	10/18/96	L32692-5	S024	Soil	Total Organic Carbon	000-00-0	16700		10	mg/kg
08/27/96	9/20/96	L32053-12	S010	Soil	Total Organic Carbon	000-00-0	9880		10	mg/kg
08/27/96	9/20/96	L32053-13	S011	Soil	Total Organic Carbon	000-00-0	1630		10	mg/kg
08/27/96	9/20/96	L32053-14	S012	Soil	Total Organic Carbon	000-00-0	557		10	mg/kg
08/27/96	9/20/96	L32053-15	S013	Soil	Total Organic Carbon	000-00-0	13200		10	mg/kg
08/27/96	9/20/96	L32053-16	S014	Soil	Total Organic Carbon	000-00-0	7850		10	mg/kg
08/27/96	9/20/96	L32053-17	S015	Soil	Total Organic Carbon	000-00-0	484		10	mg/kg
08/27/96	9/20/96	L32053-18	S016	Soil	Total Organic Carbon	000-00-0	694		10	mg/kg

SAMPDATE	ANALDATE	LABSAMPID	CLIENTID	SAMPTYPE	PARAMETER	CAS NO.	RESULT	FLAGS	DL	UNITS
10/07/96	10/27/96	L32867-1	S033	Soil	Total Organic Carbon	000-00-0	4930		10	mg/kg
10/07/96	10/24/96	L32867-2	S034	Soil	Total Organic Carbon	000-00-0	2260		10	mg/kg
10/07/96	10/24/96	L32867-3	S035	Soil	Total Organic Carbon	000-00-0	2830		10	mg/kg
10/07/96	10/24/96	L32867-4	S036	Soil	Total Organic Carbon	000-00-0	2000		10	mg/kg
10/10/96	11/06/96	L32985-1	R012	Bulk	Total Organic Carbon	000-00-0	2400		10	mg/kg
10/10/96	11/06/96	L32985-2	R013	Bulk	Total Organic Carbon	000-00-0	3340		10	mg/kg
10/11/96	11/06/96	L32985-3	R014	Bulk	Total Organic Carbon	000-00-0	3550		10	mg/kg
10/11/96	11/06/96	L32985-4	R015	Bulk	Total Organic Carbon	000-00-0	2020		10	mg/kg
10/11/96	11/06/96	L32985-5	R016	Bulk	Total Organic Carbon	000-00-0	973		10	mg/kg
10/12/96	11/06/96	L33014-1	R017	Bulk	Total Organic Carbon	000-00-0	2190		10	mg/kg
10/12/96	11/06/96	L33014-2	R018	Bulk	Total Organic Carbon	000-00-0	200		10	mg/kg
10/12/96	11/06/96	L33014-3	R019	Bulk	Total Organic Carbon	000-00-0	8610		10	mg/kg
10/14/96	11/06/96	L33014-4	R020	Bulk	Total Organic Carbon	000-00-0	9880		10	mg/kg
11/04/96	11/27/96	L33547-1	R021	Bulk	Total Organic Carbon	000-00-0	481		10	mg/kg
11/06/96	11/27/96	L33587-1	SO37	Soil	Total Organic Carbon	000-00-0	732		10	mg/kg
11/06/96	11/27/96	L33587-2	SO38	Soil	Total Organic Carbon	000-00-0	670		10	mg/kg

Appendix D

Summary of Comprehensive Hydrogeologic Database: Geologic, Well Construction, Water Level, and Hydraulic Conductivity Data

SUMMARY TABLE OF COMPREHENSIVE HYDROGEOLOGIC DATABASE

SRSNE SITE -- SOUTHINGTON, CONNECTICUT

Location	Easting (X)	Northing (Y)	Ground Elev.	Meas. Pt. Elev. (T/C)	Depth to Till	Depth to Bedrock	Till Elev.	Top of Rock Elev.	GW Depth, Est'd	GW Elev. 10/93	GW Elev. 5/93	GW Elev. 11/15/94	GW Elev. 3/20/95	GW Elev. 12/30/96	GW Elev. 1/21/97	Correction Factor for 1/21/97	GW Elev. 2/11/97	Change 1/21/97 - 2/11/97	GW Elev. 7/7/97	OVB K (ft/d)	BDRK K (ft/d)	Screen Top Depth	Screen Bottom Depth	Screen Midpt. Depth	Screen Top Elev.	Screen Bottom Elev.	Screen Midpoint Elev.	Well Formation	Repres. WT Elev.	Fractional Depth in OVB	Depth Below Top of Rock	Yield (GPM)	Drdn (FT)	Comments
B-1	565031	266419	166.9		7.5	13.5	159.4	153.4																										
B-11	565362	266566	157.8		26.0	30.0	131.8	127.8																										
B-12	565455	266583	156.3		18.0	26.0	138.3	130.3																										
B-13	565518	267127	154.8		22.0	33.0	132.8	121.8																										
B-14	565095	266283	166.6		12.0	13.0	154.6	153.6																										
B-16	565089	266347	166.5		9.0	15.5	157.5	151.0																										
B-3	565438	266110	150.3			42.0		108.3																										
B-4	565036	266607	167.1		13.0	16.3	154.1	150.8																										
B-401	565281	266230	156.7		16.0	21.0	140.7	135.7																										
B-402	565290	266324	157.7		17.5	20.0	140.2	137.7																										
B-403	565283	266428	158.1		15.0	22.0	143.1	136.1																										
B-404	565274	266515	158.8		19.0	20.0	139.8	138.8																										
B-405	565304	266618	159.3		18.5	26.0	140.8	133.3																										
B-5	565015	266370	166.9		5.0		161.9																											
B-7	565032	266366	166.9		7.0		159.9																											
B-8	565103	266209	166.7		8.5	10.5	158.2	156.2																										
CPZ-1	565212	266107	157.4	159.73	19.0	29.0	138.4	128.4	3.4						152.76				150.22	15		4.6	19.6	12.1	152.9	137.9	145.4	C	154.0	0.34				
CPZ-2	565216	266045	156.4	158.64	24.0	28.0	132.4	128.4	3.4						154.53				151.74	2.7		9.6	19.6	14.6	146.8	136.8	141.8	C	153.0	0.46				
CPZ-3	565290	266163	156.7	159.49	29.0	33.0	127.7	123.7	2.7						147.95				146.3	17		9.2	24.2	16.7	147.6	132.6	140.1	C	154.0	0.46				
CPZ-4	565322	266092	155.2	158.80	28.0	32.5	127.2	122.7	2.2						151.20				148.86	3.2		8.7	23.7	16.2	146.5	131.5	139.0	C	153.0	0.46				
CPZ-5	565376	266312	156.0	158.60	22.0	24.0	134.0	132.0	0.0						140.36				141.71	63		9.1	24.1	16.6	146.9	131.9	139.4	C	156.0	0.69				
CPZ-6	565460	266325	152.3	154.47	37.0	42.0	115.3	110.3	0.3						150.80				150.08	0.34		10.2	25.2	17.7	142.1	127.1	134.6	C	152.0	0.42				
CPZ-7	565343	266467	156.8	159.54	28.0	30.0	128.8	126.8	0.0						151.99				152.57	0.024		3.9	23.9	13.9	152.9	132.9	142.9	C	157.0	0.47				
CPZ-8	565397	266529	157.3	160.35	26.0	27.0	131.3	130.3	3.3						154.43				153.97	10		10.5	20.5	15.5	146.8	136.8	141.8	C	154.0	0.52				
CPZ-9	565229	266575	158.3	160.56	21.0	27.0	137.3	131.3	1.3						155.44				154.85	15		9.7	19.7	14.7	148.7	138.7	143.7	C	157.0	0.52				
CPZ-10	565237	266643	158.5	160.97	19.5	29.0	139.0	129.5	0.5						157.52				156.55	9.9		9.1	19.1	14.1	149.4	139.4	144.4	C	158.0	0.48				
CPZ-1R	565209	266103	157.4	161.32	19.0	29.0	138.4	128.4	3.4						158.18			0.49	158.77			41.1	61.1	51.1	116.3	96.4	106.3	R	154.0		22.1			
CPZ-2R	565217	266039	156.7	160.14	24.0	28.0	132.7	128.7	3.7						160.07			0.22	156.73			40.1	60.1	50.1	116.7	96.7	106.7	R	153.0		22.1			
CPZ-3R	565286	266158	156.7	160.83	29.0	33.0	127.7	123.7	2.7						154.06				152.3			43.2	63.2	53.2	113.4	93.4	103.4	R	154.0		20.2			
CPZ-4R	565322	266085	154.9	158.73	28.0	32.5	126.9	122.4	1.9						153.39				150.85		0.0023	45.9	65.9	55.9	109.0	89.0	99.0	R	153.0		23.4			
CPZ-5R	565374	266319	155.7	158.52	22.0	24.0	133.7	131.7	0.0						148.22				147.51		0.020	42.0	62.0	52.0	113.7	93.7	103.7	R	156.0		28.0			
CPZ-6R	565480	266318	152.4	154.49	37.0	42.0	115.4	110.4	0.4										148.85			50.1	70.1	60.1	102.3	82.3	92.3	R	152.0		18.1			
CPZ-7R	565338	266472	156.8	158.61	28.0	30.0	128.8	126.8	0.0						156.37				154.65			41.0	61.0	51.0	115.8	95.8	105.8	R	157.0		21.0			
CPZ-8R	565395	266533	157.5	160.80	26.0	27.0	131.5	130.5	3.5						154.08				153.06			41.7	61.7	51.7	115.8	95.8	105.8	R	154.0		24.7			
CPZ-9R	565244	266575	158.4	162.45	20.0	23.0	138.4	135.4	1.4						160.54				157.95			34.2	54.2	44.2	124.2	104.2	114.2	R	157.0		21.2			
CPZ-10R	565233	266642	158.7	160.97	19.5	29.0	139.2	129.7	0.7						160.70				158.68			40.3	60.3	50.3	118.4	98.4	108.4	R	158.0		21.3			
CPZ-2A	565219	266090	156.3	158.86	19.0	29.0	137.3	127.3	2.3						154.80				152.04	10		7.3	22.3	14.8	149.1	134.1	141.6	C	154.0	0.47				
CPZ-4A	565300	266147	156.1	159.47	29.0	33.0	127.1	123.1	2.1						151.40				149.57			8.3	23.3	15.8	147.9	132.9	140.4	C	154.0	0.44				
CPZ-6A	565396	266321	155.4	158.17	22.0	24.0	133.4	131.4	0.4						151.39				150.65	0.45		9.1	24.1	16.6	146.2	131.2	138.7	C	155.0	0.69				
CW-10-78	565317	264256	149.9	151.35				60.0					146.38		146.38				145.77	16		45.0	50.0	47.5	104.9	99.9	102.4	C	146.4	0.51				
CW-11-78						28.0																22.0	27.0	24.5				C	0.0					
CW-14			148.8																										0.0					
CW-15			145.7																										0.0					
CW-1-65																													0.0					
CW-17			149.9																										0.0					
CW-1-75						53.0																	25.0					C	0.0					
CW-1-78	565213	265075	157.8	158.46				105.0	11.5				147.50		147.40				146.2	11		35.0	40.0	37.5	122.8	117.8	120.3	C	147.5	0.64				
CW-20-65			142.8																										0.0					
CW-2-75	565407	265677	152.6	153.69				97.0	4.5						148.40				146.98			36.0	46.0	41.0	116.6	106.6	111.6	C	148.1	0.71				
CW-2-78	565073	265036	161.0	163.81		27.0		134.0	14.2	145.80	147.41				147.52				146.2	170		22.0	27.0	24.5	139.0	134.0	136.5	C	147.4	0.81				
CW-2-A-75																						50.0	55.0	52.5				C	0.0					
CW-3-65					65.0	78.0																	60.0					C	0.0					
CW-3-75	565678	265115	152.0	153.04	30.0		122.0	60.0	6.7						146.74				145.76	21		27.5	32.5	30.0	124.5	119.5	122.0	C	145.3	0.27				
CW-3-78	565162	264652	145.9	150.56							145.23				145.30				144.59	220		15.0	20.0	17.5	130.9	125.9	128.4	C	145.2	0.30				
CW-4-65						44.0																	40.0					C	0.0					
CW-4-75	565312	265355	150.6	151.42	14.0		136.6		2.5	146.40	147.85				148.21				146.88	150		30.0	35.0	32.5	120.6	115.6	118.1	C	148.1	0.81				
CW-4-78	565155	264650	145.7	147.28				80.0	0.5						145.41				144.63	410		55.0	60.0	57.5	90.7	85.7	88.2	C	145.2	0.87				
CW-5-65						48.0																	48.0					C	0.0					
CW-5-75	565266	265030	152.8	153.12				100.0	5.9						146.83				145.48	53		32.0	37.0	34.5	120.6	115.6	118.1	C	146.7	0.61				
CW-5-78	565251	264543	152.6	153.11		72.0		74.5					146.56		150.35				149.56	77		67.0	72.0	69.5	79.5	74.5	77.0	C	146.6	0.97				
CW-6-65						70.0																	70.0					C	146.0					
CW-6-75	565222	264832	150.1	151.31				80.0	4.4				145.64		145.59				144.83	1.7		40.0	45.0	42.5	110.1	105.1	107.6	C	146.0	0.58				
CW-6-78	565396	264625	146.0	147.43		83.0		63.0							146.22				145.04	63		78.0	83.0	80.5	68.0	63.0	65.5	C	144.5	0.97				
CW-7-65																							53.0					C	0.0					
CW-7-75	565316	264843	150.8	151.10				70.0							145.77				144.91			54.5	59.5	57.0	96.3	91.3	93.8	C	146.0	0.69				
CW-7-78	565366	264159	151.1	153.39				55.0					146.52		146.53				145.8	3000		25.0	30.0	27.5	126.1	121.1	123.6	C	146.5	0.25				
CW-7A	565314	264843	150.8	151.13				70.0	4.8				145.87		145.43				144.75			59.0	65.0	62.0	91.8	85.8	88.8	C	146.0	0.75				
CW-8-78	565457	264171	150.9	153.06				55.0			146.23		147.08		147.09				146.39	23		44.8	49.8	47.3	106.2	101.2	103.7	C	147.1	0.47				
CW-9-78	565527	264271	150.0	152.27				55.0							146.01				145.44	200		25.0	30.0	27.5	125.0	120.0	122.5	C	145.0	0.25				
CW-A-77	565362	266056	154.6	156.63																									0.0					
CW-B-77	565310	265711	150.5	151.72		37.0		115.0							148.29				146.81	0.070		18.0	23.0	20.5	132.5	127.5	130.0	C	147.8	0.54				
CW-OBS-196	565364	264416	146.7	151.26				70.0																					0.0					
Prod. Well #4	565430	264271	150.0					60.0												950		48.0	63.0	55.5	102.0	87.0	94.5	C	145.5	0.60				
Prod. Well #6	565245	264766	149.0					80.0												1200		57.0	67.0	62.0	92.0	82.0	87.0	C	146.0	0.89				
DN-1	565227	266248			8.0	21.5														1.7	1.7	5.0	25.0	15.0				C	0.0					
DN-2	565211	266093	156.6	158.65	8.0	17.0	148.6	139.6		153.99	156.83		157.13							2.6		8.0	18.0	13.0	148.6	138.6	143.6	C	157.1	0.77				
DN-3	565128	266040			13.0	19.0														2.6		8.8	21.8	15.3				C	0.0					
DP-1	565620	266146	147.7	150.11		55.7	147.7	92.0	0.7						146.34				145.55			0.6	3.1	1.8	147.1	144.6	145.9	C	147.0	0.10				
DP-2	565597	266323	147.8	149.33		50.8	147.8	97.0	0.0						147.05				146.23			1.5	5.5	4.0	146.3	141.3	143.8	C	148.0	0.08				
DP-3	565578	266481	148.2	149.95		49.1	148.2	99.1	1.2						147.06				147.10			1.2	6.2	3.7	146.9	141.9	144.4	C	147.0	0.05				
DP-4	565524	266655	149.1	150.87		NA			0.0						148.76				148.27			1.2	6.2	3.7	147.9	142.9	145.4	C	150.0					
DP-5	565602	267100	147.9	149.71		37.9	147.9	110.0	0.0						147.47				146.8			1.2	6.2	3.7	146.7	141.7	144.2	C	148.0	0.10				
DP-6	565599	266886	147.9	150.04		42.9	147.9	105.0	0.0						147.33				146.48			0.9	5.9	3.4	147.0	142.0	144.5	C	148.0	0.08				
DP-7	565520	266887	154.5	155.42		44.5	154.5	110.0	5.5													2.1	7.1	4.6	152.4	147.4	149.9	C	149.0	0.90				
DP-8	565523	267085	155.4	155.85		37.4	155.4	118.0	7.4													7.1	12.1	9.6	148.3	143.3	145.8	C	148.0	0.07				
HP-1					7.0	23.0																5.0	25.0	15.0				C	0.0					
MW-01	565281	265950	155.0	157.73	27.5	38.5	127.5	116.5				150.38	152.55		151.31				149.33			23.5	48.5	36.0	131.5	106.5	119.0	OF	152.6	0.93				
MW-02	565307	265338	150.3	153.18	26.0	54.0	124.3	96.3				146.61	147.82		147.87				146.51	34		39.0	69.0	54.0	111.3	81.3	96.3	OF	147.8	1.00				
MW-03	565509	265065	149.8	153.11	34.0		115.8	44.0							148.19				146.09	37		52.5	82.5	67.5	97.3	67.3	82.3	C	0.0	0.50				
MW-04	565622	265470	148.8	151.62	51.0	66.5	97.8	82.3							148.55				147.37	7.5		46.0	76.0	61.0	102.8	72.8	87.8	OF	149.4	0.92				
MW-05	565651	266030	147.4	150.67	34.0	63.5	113.4	83.9		147.32	149.38	147.97	149.37		149.36				148.09		3.0	66.5	76.5	71.5	80.9	70.9	75.9	R	150.0		8.0			
MW-06	565660	266017	148.2	150.84	34.0	63.5	113.4	83.9							149.64				148.42	0.23		24.0	64.0	44.0	124.2	84.2	104.2	C	150.0	0.69				
MW-07	565646	266028	147.3	150.36	34.0	63.5	113.4	83.9				147.68	149.01		149.03				147.72	2.2		14.5	44.5	29.5	132.8	102.8	117.8	C	150.0	0.49				
MW-08	565654	266015	147.2	150.19	34.0	63.5	113.4	83.9		149.60	151.76				PLUGGED				147.81			5.0	25.0	15.0	142.2	122.2	132.2	C	151.8	0.29				
MW-121A	565539	265834	150.5	153.06	54.0	58.0	96.5	92.5		147.11	148.62	148.22	148.81		148.86				147.74		0.58	74.0	95.0	84.5	76.5	55.5	66.0	R	148.8		26.5			
MW-121B	565532	265817	151.0	153.05	54.0	58.0	96.5	92.5		146.54	148.24	147.20	148.30		148.45				147.28	400		42.0	52.0	47.0	109.0	99.0	104.0	C	148.3	0.79				
MW-121C	565535	265826	151.1	153.08	54.0	58.0	96.5	92.5		146.87	148.90	147.23	148.83		148.75				147.55		0.084	58.7	68.7	63.7	92.4	82.4	87.4	R	148.9		5.1			
MW-123A	565260	266128	156.3	158.50	16.0	32.0	140.7	124.7		155.90	158.50				161.07				156.4		0.6	55.0	85.0	70.0	101.3	71.3	86.3	R	158.5		38.4			
MW-123C	565274	266126	156.7	158.55	16.0	32.0	140.7	124.7		152.86	155.39	154.04	155.80		153.12				151.12	0.33		10.0	15.0	12.5	146.7	141.7	144.2	C	155.8	0.37				
MW-124C	565238	265852	156.0	158.51	27.5	33.0	128.5	123.0		152.40	158.50	154.48	158.01		155.33				152.04		0.02	35.9	45.9	40.9	120.1	110.1	115.1	R	158.5		7.9			

SUMMARY TABLE OF COMPREHENSIVE HYDROGEOLOGIC DATABASE

SRSNE SITE -- SOUTHINGTON, CONNECTICUT

Location	Easting (X)	Northing (Y)	Ground Elev.	Meas. Pt. Elev. (TIC)	Depth to Till	Depth to Bedrock	Till Elev.	Top of Rock Elev.	GW Depth, Est'd	GW Elev. 10/93	GW Elev. 5/93	GW Elev. 11/15/94	GW Elev. 3/20/95	GW Elev. 12/30/95	GW Elev. 1/21/97	Correction Factors for 1/21/97	GW Elev. 2/11/97	Change 1/21/97 - 2/11/97	GW Elev. 7/7/97	OVB K (f/d)	BDRK K (f/d)	Screen Top Depth	Screen Bottom Depth	Screen Midpt Depth	Screen Top Elev.	Screen Bottom Elev.	Screen Midpoint Elev.	Well Formation	Repres. WT Elev.	Fractional Depth in OVB	Depth Below Top of Rock	Yield (GPM)	Drdn (FT)	Comments
MW-125A	565403	266393	155.8	158.10	25.0	35.0	130.8	120.8		155.29	156.26	156.69	157.90		154.61				154.38		4.2	60.0	65.0	62.5	95.8	90.8	93.3	F	157.9		27.5			
MW-125C	565402	266382	156.0	158.18	25.0	35.0	130.8	120.8		152.46	154.20	156.95	155.05		151.80				151.46		0.63	40.5	50.5	45.5	115.5	105.5	110.5	F	156.9		10.4			
MW-126B	565124	267009	162.8	162.46		21.0		141.8			159.93	159.30	160.15		160.11				159.21	170		7.5	12.5	10.0	155.3	150.3	152.8	C	160.2	0.40				
MW-126C	565123	267011	162.8	162.62		21.0		141.8			161.82	160.14	162.28		161.75				158.88		27	24.0	34.0	29.0	138.8	128.8	133.8	F	162.3		8.0			
MW-127B	565403	265067	147.9	149.84	47.5	90.0	100.4	57.9		146.09	147.14	146.31	147.34		147.38				146.2	110		37.0	47.0	42.0	110.9	100.9	105.9	C	147.3	0.46				
MW-127C	565404	265081	147.6	150.05	47.5	90.0	100.4	57.9		146.05	147.17	146.30	147.40		147.40				146.18		0.32	91.5	101.5	96.5	56.1	46.1	51.1	F	147.4		6.8			
MW-128	565211	265319	155.4	157.24	38.0	52.0	117.4	103.4		146.45	148.71	147.09	148.94		148.76				147.15		0.016	55.0	65.0	60.0	100.4	90.4	95.4	F	148.9		8.0			
MW-129	563666	266975	227.5	226.62	4.5	10.5	223.0	217.0			224.66				225.88				223.67		0.1	13.9	23.9	18.9	213.7	203.7	208.7	F	224.9		8.3			
MW-201A	565732	267690	154.3	156.97	42.5	54.0	112.0	100.3		148.64	149.02		149.23		149.05		149.18	0.13	148.12		0.14	54.0	64.0	59.0	100.3	90.3	95.3	F	149.2		5.0			
MW-201B	565737	267694	154.5	156.82	42.5	54.0	112.0	100.3		148.94	148.47		148.74		148.57		148.69	0.12	147.77	97		10.0	20.0	15.0	144.5	134.5	139.5	C	148.9	0.19				
MW-202A	566031	267225	156.3	155.90	80.0	118.0	76.3	38.3		148.02	150.41	148.64	150.14		150.29		150.36	0.07	148.92			119.0	129.0	124.0	37.3	27.3	32.3	F	150.4		6.0			
MW-202B	566037	267225	156.3	156.10	80.0	118.0	76.3	38.3		148.19	149.83	148.43	149.85		149.68		149.97	0.29	148.5	12		82.5	92.5	87.5	73.8	63.8	68.8	C	149.9	0.73				
MW-203A	566355	265360	186.8	188.39	74.0	150.0	114.8	38.8		148.65	152.75	150.21			152.62		153.01	0.39	151.12			150.0	160.0	155.0	38.8	28.8	33.8	F	152.8		5.0			
MW-203B	566351	265359	186.5	188.23	74.0	150.0	114.8	38.8		148.63	152.71	149.82	151.31		152.86		153.05	0.19	151.38	3.7		95.0	105.0	100.0	93.5	83.5	88.5	C	152.7	0.56				
MW-204A	565669	265566	148.8	150.97	79.0	82.0	69.8	66.8		146.64	148.41	147.27	148.46		148.66				147.44		15	69.0	114.0	101.5	59.8	34.8	47.3	F	148.5		19.5			
MW-204B	565652	265569	148.7	150.63	79.0	82.0	69.7	66.7		146.41	148.23	147.21	148.27		148.41				147.2	160		68.0	78.0	73.0	80.7	70.7	75.7	C	148.3	0.89				
MW-205A	565559	264997	150.3	152.70	84.0	120.0	66.3	30.3		145.75	146.48	146.09	146.93		146.92				145.93		0.18	123.5	133.5	128.5	26.8	16.8	21.8	F	146.9		8.5			
MW-205B	565551	264992	150.0	152.18	84.0	120.0	66.3	30.3		145.84	146.58	145.98	146.80		146.86				145.87	170		39.0	49.0	44.0	111.0	101.0	106.0	C	146.8	0.35				
MW-206A	565732	264158	153.1	152.71	74.0	112.0	79.1	41.1		146.23	146.75	145.87	146.92		146.96				146.23			115.5	125.5	120.5	37.6	27.6	32.6	F	146.9		8.5			
MW-206B	565726	264159	153.2	152.90	74.0	112.0	79.1	41.1		146.30	146.71	146.28	146.90		146.94				146.19	350		79.0	89.0	84.0	74.2	64.2	69.2	C	146.9	0.73				
MW-207A	565484	264175	150.7	152.98	91.0	102.0	59.7	48.7			68.66				PLUGGED				NA			103.0	113.0	108.0	47.7	37.7	42.7	F	68.7		6.0			
MW-208A	565678	263622	156.8	156.55	74.0	108.0	82.8	48.8		146.61	148.03	146.98	148.03		148.14				147.38		0.61	111.0	121.0	116.0	45.8	35.8	40.8	F	148.0		8.0			
MW-209A	564562	266263	196.1	198.25	4.5	17.0	191.6	179.1		174.32		176.15			176.49				175.92		2	18.0	38.0	28.0	178.1	158.1	168.1	F	176.2		11.0			
MW-209B	564582	266258	195.8	198.31	4.5	17.0	191.6	179.1		181.40	182.62	198.31			182.46				182.02			12.0	15.0	13.5	183.8	180.8	182.3	C	198.3	0.83				
MW-408	565318	266324	157.0	159.56	18.5	26.5	138.5	130.5				154.21	155.47		149.10				148.94		0.36	31.6	51.2	41.4	125.4	105.8	115.6	F	155.5		14.9			
MW-409	565320	266332	157.1	159.60	18.5	26.5	138.5	130.5				156.29	157.30		154.72				153.9	11		6.7	16.3	11.5	150.4	140.8	145.6	C	157.3	0.43				
MW-410	565305	266329	157.0	160.01	15.0	24.0	142.2	133.2							156.00				154.05	13.6		7.1	11.7	9.4	149.9	145.3	147.6	C	156.0	0.37				
MW-411	565299	266341	157.2	160.29	15.0	24.0	142.2	133.2							151.41				150.68			31.3	50.9	41.1	125.9	106.3	116.1	F	156.0		17.1			
MW-412	565302	266335	157.1	159.74	15.0	24.0	142.2	133.2							147.28				147.02	2.2		16.0	21.0	18.5	141.1	136.1	138.6	C	156.0	0.76				
MW-413	565278	266350	158.0	160.66	22.5	25.4	135.8	132.9				156.39	157.50		155.10				154.15	5.9		14.8	19.8	17.3	143.2	138.2	140.7	C	157.5	0.68				
MW-414	565273	266339	158.3	161.37	22.5	25.4	135.8	132.9				155.27	156.59		151.72				151.05			30.2	49.8	40.0	128.1	108.5	118.3	F	156.6		14.6			
MW-415	565275	266346	158.2	160.86	22.5	25.4	135.8	132.9				156.48	157.53		155.22				154.28	57		6.8	11.8	9.3	151.3	146.3	148.8	C	157.5	0.35				
MW-416	565264	266291	157.4	160.06	18.5	25.0	138.9	132.4				155.61	157.06		156.14				151.04		0.18	29.4	49.4	39.4	128.0	108.0	118.0	F	157.1		14.4			
MW-501A	565838	266346	169.3	169.15	60.0	82.0	109.3	87.3	24.0						149.97		150.20	0.23	148.43			86.0	91.0	88.5	83.3	78.3	80.8	C	145.3		6.5			
MW-501B	565837	266343	169.3	169.17	60.0	82.0	109.3	87.4	24.0						150.00		150.23	0.23	148.61	5.4		55.0	65.0	60.0	114.3	104.3	109.3	C	145.3	0.62				
MW-501C	565838	266350	169.2	168.94	60.0	82.0	109.2	87.2	24.0						147.84		148.02	0.18	146.76	27		20.0	30.0	25.0	149.2	139.2	144.2	C	145.2	0.02				
MW-502	565495	266270	153.1	155.62	26.0	41.5	127.1	111.6							150.13				148.15	0.5		15.0	35.0	25.0	138.1	118.1	128.1	C	151.0	0.94				
MW-701DR	564579	266254	196.2	198.71	5.0	20.5	191.2	175.7							182.21				180.79		2.7	93.7	103.7	98.7	102.5	92.5	97.5	F			78.2			
MW-702DR	564912	266075	179.1	181.30	16.0	20.0	163.1	159.1							166.35				160.92		0.5	93.3	102.8	98.1	85.8	76.3	81.1	F			78.1			
MW-703D	565300	265097	153.0	155.42	39.5	84.0	113.5	69.0							147.41				145.97	3.4		74.0	84.0	79.0	79.0	-5.0	74.0	C		0.80				
MW-703DR	565299	265073	153.0	155.20	39.5	84.0	113.5	69.0							147.42				146.01		2.1	144.3	174.3	159.3	8.7	-21.3	-6.3	F			75.3			
MW-703S	565299	265087	153.4	155.68	39.5	84.0	113.9	69.4							147.06				145.81	82.2		25.0	35.0	30.0	128.4	118.4	123.4	C		0.20				
MW-704D	565540	265591	150.5	153.37	40.0	75.0	110.5	75.5							148.15				147.01	45.4		53.0	63.0	58.0	97.5	87.5	92.5	C		0.80				
MW-704DR	565552	265565	150.6	153.06	40.0	75.0	110.5	75.5							148.58				147.56		0.16	102.0	132.0	117.0	48.6	18.6	33.6	F			42.0			
MW-704M	565557	265574	150.6	152.55	40.0	75.0	110.6	75.6							148.16				147.03	27.2		37.0	47.0	42.0	113.6	103.6	108.6	C		0.50				
MW-704R	565568	265583	150.5	152.00	40.0	75.0	110.5	75.5							148.29				147.17		0.6219	79.0	89.0	84.0	71.5	61.5	66.5	F			9.0			
MW-704S	565557	265583	150.5	152.69	40.0	75.0	110.5	75.5							148.07				147.66	0.99		4.0	19.0	11.5	146.5	131.5	139.0	C		0.20				
MW-705D	565421	266754	159.4	161.58	27.3	40.0	132.1	119.4							157.28				156.7	0.72		25.0	35.0	30.0	134.4	124.4	129.4	C		0.80				
MW-705DR	565429	266750	158.8	160.89	27.3	40.0	131.5	118.8							157.50				155.76		0.40	90.0	100.0	95.0	68.8	58.8	63.8	F			55.0			
MW-705R	565422	266744	159.5	161.50	27.3	40.0	132.2	119.5							155.76				154.94		0.15	44.0	54.0	49.0	115.5	105.5	110.5	F			9.0			
MW-706DR	565668	266216	147.8	149.91	53.0	60.0	94.8	87.8							149.96		149.96	0.00	148.69		0.24	116.5	126.5	121.5	31.3	21.3	26.3	F			61.5			
MW-707D	565599	265102	153.8	156.00	30.0	100.0	123.8	53.8							147.14				146.02	180		84.9	94.9	89.9	68.9	58.9	63.9	C		0.80				
MW-707DR	565567	265124	154.7	156.72	30.0	100.0	124.7	54.7							147.80		Actual data		146.46		0.065	162.0	192.0	177.0	-7.3	-37.3	-22.3	F			77.3			
MW-707M	565605	265109	153.4	155.12	30.0	100.0	123.4	53.4							147.20		at MW-708		146.09	24		58.0	68.0	63.0	95.4	85.4	90.4	C		0.50				
MW-707R	565599	265115	153.9	155.85	30.0	100.0	123.9	53.9							147.74		cluster on	Corr.	146.57		4.8178	115.0	125.0	120.0	38.9	28.9	33.9	F			20.0			
MW-707S	565608	265116	153.2	154.94	30.0	100.0	123.2	53.2							147.07		2/11/97	Factors	145.98	42		20.0	30.0	25.0	133.2	123.2	128.2	C		0.20				
MW-708S	566241	266418	222.1	224.57	111	175	110.2	46.2							150.84	<-Est. based	151.04	0.20	149.54	11		83	93	88	138.2	128.2	133.2	C		0.2				
MW-708M	566245	266405	223.3	225.08	111	175	111.4	47.4							151.34	<-on 2/11/97	151.59	0.25	149.38	0.42		116	126	121	105.4	95.4	101.4	C		0.5				
MW-708R	566254	266408	223.2	225.60	111	175	111.3	47.3							152.22	<-data at wells	152.53	0.31	150.84		0.14	179.4	189.4	184.4	42.9	32.9	37.9	F			9.4			
MW-708DR	566251	266424	221.9	224.85	111	175	110	46							150.86	<-East of Rtr.	150.86	0.00	149.43		0.037	236.1	266.1	251.1	-15.1	-45.1	-30.1	F			70.1			
MW-709R	565403	267092	161.6	161.53		30		131.6							157.46				156.11		0.032	50	70	60	111.6	91.6	101.6	F			30			
MW-709DR	565403	267092	161.6	161.53		30		131.6							159.26				157.25		0.071	120	134	127	41.6	27.6	34.6	F			97			
MW-710S	566112	264847	165.0	164.93	56.0	127.0	109.0	38.0											148.20	74		32.2	42.2	37.2	132.8	122.8	127.8	C		0.2				
MW-710R	566110	264836	165.0	164.58	56.0	127.0	109.0	38.0											147.45		4.0	133.5	143.5	138.5	31.5	21.5	26.5	F			11.5			
MW-710DR	566113	264857	165.0	164.99	56.0	127.0	109.0	38.0											146.97		0.01	186.5	206.5	196.5	-21.5	-41.5	-31.5	F			69.5			
MWD-601	565228	266572	158.3	160.45	19.0	29.0	139.3	129.3	1.3						155.23				154.82	3.4		21.4	26.4	23.9	136.9	131.9	134.4	C	157.0	0.81				
MWL-301	565261	266598	158.8	160.57	22.5	26.0	136.3	132.8		156.13	156.97	156.97			157.06				156.43	1.4		1.0	11.0	6.0	157.8	147.8	152.8	C	157.0	0.17				
MWL-302	565359	266603	159.2	161.72						155.06	155.87	155.65	155.83		155.34				155.13	0.29		1.0	11.0	6.0	158.2	143.2	153.2	C	155.9	0.20				
MWL-303	565457	266604	157.0	158.81						149.71	150.54	150.10	151.67		150.69				149.77			1.0	11.0	6.0	156.0	146.0	151.0	C	151.7	0.20				
MWL-304	565265	266466	158.0	160.22						156.06	157.48	156.79			155.70				155	1.4		1.0	11.0	6.0	157.0	147.0	152.0	C	157.5	0.20				
MWL-305	565354	266450	157.6	159.30		21.0		136.6		155.39	156.37	156.54	157.31		154.06				154.08	1.6		1.0	11.0	6.0	156.6	146.6	151.6	C	157.3	0.28				
MWL-306	565502	266450	153.8	155.48						150.13	149.88	149.67	151.40		149.80				148.3	0.33		1.0	11.0	6.0	152.8	142.8	147.8	C	151.4	0.20				
MWL-307	565259	266297	157.7	159.29	18.5	25.0	138.9	132.4		155.93	157.25	156.34	156.73		155.13				154	8.2		1.0	11.0	6.0	156.7	146.7	151.7	C	157.3	0.22				
MWL-308	565354	266304	155.9	157.88	26.0	38.0	127.2	117.2		155.16	156.70	155.85	156.88		154.25				153.58	8.1		1.0	11.0	6.0	154.9	144.9	149.9	C	156.9	0.18				
MWL-309	565505	266302	152.8	154.77	26.0	39.0	126.7	113.7		151.70	150.22		151.79		150.50				150.09	0.22		1.0	11.0	6.0	151.8	141.8	146.8	C	151.8	0.13				
MWL-310	565251	266147	157.3	159.74	16.0	32.0	140.7	124.7		154.53	156.28				153.06				150.97			0.5	10.5	5.5	156.8	146.8	151.8	C	156.3	0.14				
MWL-311	565351	266149	155.5	157.47						151.88	152.87	151.56	152.98		151.48				149.19	0.91		1.0	11.0	6.0	154.5	144.5	149.5	C	153.0	0.20				
MWL-312	565509	266154	153.8	155.83							150.25	148.60	150.49		149.92				148.41	1.9		1.0	11.0	6.0	152.8	142.8	147.8	C	150.5	0.20				
MWL-313	565352	266992	154.5	156.61						146.96	150.93	148.61	151.70		150.36				147.36	6.7		1.0	11.0	6.0	153.5	143.5	148.5	C	151.7	0.20				
MWL-314	565502	266001	153.7	155.53						146.57	148.62	147.36	149.03		149.26				147.39	9.8		1.0	11.0	6.0	152.7	142.7	147.7	C	149.0	0.20				
P-10	565316	266803	160.8	162.84	12.0	27.0	148.8	133.8		156.52	158.35	158.00	158.69		158.52				157.7	63		9.0	14.0	11.5	151.9	146.9	149.4	C	158.7	0.37				
P-101A	565674	266226	148.1	150.49	51.0	64.0	97.3	84.3		147.62	149.68	148.28	149.63		149.74		150.08	0.34	148.58		0.1	66.0	96.0	81.0	82.1	52.1	67.0	F	149.7		17.3			
P-101B	565675	266232	148.2	150.62	51.0	64.0	97.3	84.3		147.56	149.62	148.27	149.62		149.77		150.07	0.30	148.58	29		34.0	44.0	39.0	114.2	104.2	109.2	C	149.6	0.62				
P-101C	565676	266238	148.3	150.73	51.0	64.0	97.3	84.3		147.49	149.92	148.42	147.42		147.08		147.38	0.30	146.21	0.83		3.0	13.0	8.0	145.3	135.3	140.3	C	147.5	0.11				
P-102A	565702	266458	148.8	151.01	39.0	69.0	109.7	79.7		147.63	149.85	148.49	149.86		149.54		150.25	0.71	148.76			81.0	91.0	86.0	67.8	57.8	62.8	F	149.9		16.9			
P-102B	565702	266465	148.7	151.06	39.0	69.0	109.7	79.7		147.83	149.80	148.54	149.86		149.86		150.13	0.27	148.69	0.45		29.0	39.0	34.0	119.7	109.7	114.7	C	149.9	0.50				
P-102C	565702	266472	148.7	151.20	39.0	69.0	109.7	79.7		147.22	147.49		147.85		147.69		147.88	0.19	146.84	0.16		3.0	13.0	8.0	145.7	135.7	140.7	C	147.8	0.10				
P-11A	565583	266220	151.8	153.84	31.0	56.0	121.2	96.2		147.70	149.88	148.77	150.19		149.63				148.38		0.02	58.0	68.0	63.0	93.8	83.8	88.8	F	150.2		7.4			
P-11B	565583	266220	152.2	155.25	31.0	56.0	121.2	96.2		147.34	149.41	148.42	149.56		149.47				148.37	4.7		9.0	14.0	11.5	143.2	138.2	140.7	C	149.6	0.17				
P-12	565321	267115	161.3	164.56	21.0	31.0	140.3	130.3		155.75	158.56	157.70	158.98		158.53				157.58	15		9.0	14.0	11.5	152.3	147.3	149.8	C	159.0	0.32				
P-12A	565321	267105	161.2	163.62	21.0	31.0	140.3	130.3		155.37	158.30	157.29	158.45		158.22				157.18			30.0	50.0	40.0	131.2	111.2	121.2	F	158.4		9.1			
P-13	565242	265851	155.9	158.43	27.5	33.0	128.5	123.0		147.06	148.74	148.05	149.05		148.87				147.71	0.64		4.9	14.9	9.9	151.0	141.0	146.0	C	149.1	0.12				
P-14	565582	266212	152.0	154.23	31.0	56.0	121.2	96.2		147.82	150.50	149.10	150.40		149.57				148.6		0.05	79.0	89.0	84.0	73.0	63.0	68.0	F	150.5		28.3			
P-15	564917	265631	179.2	181.65	14.0	20.5	165.2	158.7							161.85				160.63		0.09	24.0	34.0	29.0	155.2	145.2	150.2	F	0.0		8.5			
P-16	565129	266518	165.3	165.03	14.0	17.6	151.3	147.0		156.35	157.92	157.05	158.34		157.01				155.77	7.7		7.5	12.5	10.0	157.8	152.8	155.3	C	158.3	0.30				
P-1A	565124	266367	166.2	165.71	13.5	17.0	152.7	149.2		156.80	161.52	158.58	162.38		160.90				157.89		4.5	26.0	36.0	31.0	140.2	130.2	135.2	F	162.4		14.0			
P-1B	565125	266372	166.2	165.69	13.5	17.0	152.7	149.2		155.25	158.27	156.99	158.70		156.97				155.57	4.4		10.8	15.8	13.3	155.4	150.4	152.9	C	158.7	0.61				
P-2A	565118	266221	168.4	165.94	12.0	21.5	154.4	144.9		147.11	161.94	158.22	163.78		162.22				158.32		2	22.0	32.0	27.0	144.4	134.4	139.4	F	163.6		5.5			
P-2B	565116	266223	168.4	166.03	12.0	21.5	154.4	144.9		147.51	160.70	157.46	161.18		159.60				156.71	33		11.0	16.0	13.5	155.4	150.4	152.9	C	161.2	0.51				
P-3A	565576	266459	148.2	150.22	25.0	50.0	123.1	98.1			150.10				151.06				149.59		0.14	54.5	64.5	59.5	93.7	83.7	88.7	F	150.1		9.4			

SUMMARY TABLE OF COMPREHENSIVE HYDROGEOLOGIC DATABASE

SRSNE SITE -- SOUTHINGTON, CONNECTICUT

Location	Easting (X)	Northing (Y)	Ground Elev.	Meas. Pt. Elev. (TOC)	Depth to Till	Depth to Bedrock	Till Elev.	Top of Rock Elev.	GW Depth, Est'd	GW Elev. 10/93	GW Elev. 5/93	GW Elev. 11/15/94	GW Elev. 3/20/95	GW Elev. 12/20/95	GW Elev. 1/21/97	Correction Factors for 1/21/97	GW Elev. 2/11/97	Changes 1/21/97 - 2/11/97	GW Elev. 7/7/97	OVB K (f/d)	BDRK K (f/d)	Screen Top Depth	Screen Bottom Depth	Screen Midpt Depth	Screen Top Elev.	Screen Bottom Elev.	Screen Midpoint Elev.	Well Formation	Repres. WT. Elev.	Fractional Depth in OVB	Depth Below Top of Rock	Yield (GPM)	Drdn (FT)	Comments
P-3B	565670	266467	148.1	150.09	25.0	50.0	123.1	98.1		148.26	148.71	148.84	148.79		149.43				148.46	0.1		13.0	17.0	15.0	135.1	131.1	133.1	O	149.8	0.32				
P-4A	565009	266294	167.9	169.75	11.0	17.5	156.6	150.1		159.64	166.55	161.24	168.34		165.89				161.11		0.16	20.0	30.0	25.0	147.9	137.9	142.9	F	168.3		7.2			
P-4B	565011	266294	167.6	169.79	11.0	17.5	156.6	150.1		160.72	164.34	160.68	164.93		163.51				160.98	0.78		9.8	14.8	12.3	157.8	152.8	155.3	O	164.9	0.65				
P-5A	565394	266291	155.3	157.67	28.0	38.0	127.2	117.2		151.23	153.22	153.24	154.47		150.04				149.55		0.09	42.5	52.5	47.5	112.8	102.8	107.8	F	154.5		9.4			
P-5B	565391	266283	155.2	158.28	28.0	38.0	127.2	117.2		153.56	154.47	154.42	155.28		152.43				152.37	0.04		4.0	9.0	6.5	151.2	146.2	148.7	O	155.3	0.17				
P-6	565500	266294	152.7	153.93	26.0	39.0	126.7	113.7		149.62	151.46		152.09		150.31				149.23		1	47.5	57.5	52.5	105.2	95.2	100.2	F	152.1		13.5			
P-7	565439	266805	158.1	160.31	27.0	47.5	131.1	110.6		155.67	157.18	156.71	157.45		157.43				156.54	4.9		11.5	16.5	14.0	146.6	141.6	144.1	O	157.4	0.29				
P-8	564918	266064	179.7	181.25	16.0	23.5	163.7	156.2		158.35		161.25	169.65		167.02				160.71	0.2		14.9	19.9	17.4	164.8	159.8	162.3	O	169.7	0.55				
P-8A	564921	266067	179.7	181.62	16.0	23.5	163.7	156.2			167.37	160.59	169.48		167.34				160.82		0.3	58.0	70.0	64.0	121.7	109.7	115.7	F	169.5		40.6			
P-9	565412	266584	157.7	159.49	18.0	34.0	139.7	123.7		154.05	154.49				154.34				154.09			8.0	13.0	10.5	149.7	144.7	147.2	O	154.5	0.24				
PW-406	565291	266337	157.7	160.40		24.0		133.7							150.52				150.07			29.8	49.8	39.8	127.9	107.9	117.9	F	157.7		15.8			
PW-407	565291	266331	157.4	160.31		24.0		133.7							155.07				154.12	18		5.7	17.7	11.7	151.7	139.7	145.7	O	157.7	0.50				
PZO-1	565335	266384	157.4	158.54		21.0									153.76				153.33			11.0	16.0	13.5				O	0.0	0.50				
PZO-2	565351	266370	157.1	159.85		21.0									153.34				153.08			11.0	16.0	13.5				O	0.0	0.50				
PZO-3	565313	266507	157.5	160.40	20.6	25.0									154.48				153.96			12.6	17.6	15.1				O	0.0	0.50				
PZO-4	565395	266243			28.0	34.0																12.5	17.5	15.0				O	0.0	0.50				
PZO-5	564621	267042	197.6	197.16	13.0	15.5	184.6	182.1	3.6						193.88				193.31			7.7	12.7	10.2	189.9	184.9	187.4	O	194.0	0.56				
PZO-6	564176	265978	222.0	221.68	8.0	10.0	214.0	212.0	9.0						< 221.43				< 221.43			5.6	9.6	7.6	216.4	212.4	214.4	O	213.0	0.90				
PZO-7	564651	266483	167.3	169.93	6.0	7.0	161.3	160.3	5.3						164.95				162.07	7.4		4.1	6.1	5.1	163.1	161.1	162.1	O	162.0	0.90				
PZR-1	565331	266363	157.4	157.94		21.0									149.53				149.28			29.5	34.5	32.0				F	0.0					
PZR-2	565349	266365	157.1	159.16		21.0									151.62				150.64			29.0	34.0	31.5				F	0.0					
PZR-3	565264	266622			22.5	26.0																30.0	35.0	32.5				F	0.0					
PZR-4	565355	266269	157.0	157.85	26.0	34.0									150.66				149.75			33.0	38.0	35.5				F	0.0					
PZR-5	564616	267042	197.7	197.60	13.0	15.5	184.7	182.2	6.7						190.77				189.49			31.2	46.2	38.7	166.5	151.5	159.0	F	191.0		23.2			
PZR-6	564177	265975	221.9	221.55	8.0	10.0	213.9	211.9	15.9						207.52				206.15			27.3	42.3	34.8	194.7	179.7	187.2	F	206.0		24.8			
PZR-7	564948	266483	167.5	170.21	6.0	7.0	161.5	160.5	6.5						166.84				161.6			26.8	41.8	34.3	140.7	125.7	133.2	F	161.0		27.3			
RC-701	565501	266399	153.2		36	50	117.2	103.2																										
RW-1	565265	266133	157.1	157.56	19	30	139.1	127.1	3.14						137.66				132.86			14.5	27	20.75	142.64	130.14	136.39	O	154	0.655621742				
RW-2	565377	266268	156.2	156.51	28	34	128.2	122.2	1.21						130.36				133.01			19	31.5	25.25	137.21	124.71	130.96	O	155					
RW-3	565365	266384	156.8	157.24	21	31	135.8	125.8	0.79						138.14				133.39			18	28	23	138.79	128.79	133.79	O	156	0.735187024				
RW-4	565314	266498	157.3	158.19	21	25	136.3	132.3	0.31						141.77				145.04			9.9	21	15.45	147.41	136.31	141.86	O	157	0.613203726				
RW-5	565250	266570	158.5	159.90	20	23	138.5	135.5	1.51						145.49				141.54			10.21	20.21	15.21	148.3	138.3	143.3	O	157	0.637505817				
RW-6	565225	266413	156.9	159.23	19	26	139.9	132.9	1.89						144.00				142.81			10.14	20.14	15.14	148.75	138.75	143.75	O	157	0.549564498				
	565223	266113	157.0	157.16	16	21	141	136	3.04						141.51				142.44			8.58	18.58	13.58	148.46	138.46	143.46	O	154	0.566859688				
RW-8	565304	266179	156.3	156.92	24	27.5	132.3	128.8	2.34						140.09				132.68			11	26	18.5	145.34	130.34	137.84	O	154	0.642269348				
RW-9	565344	266238	156.6	156.68	17	32	139.6	124.6	1.64						130.65				129.08			10.81	30.81	20.81	145.83	125.83	135.83	O	155	0.631422925				
RW-10	565370	266333	156.2	156.47	26	36	130.2	120.2	0.19						130.79				131.82			8.27	33.27	20.77	147.92	122.92	135.42	O	156	0.574699605				
RW-11	565354	266446	156.9	157.82	23	26.5	133.9	130.4	0						136.25				136.02			8.84	23.84	16.34	148.07	133.07	140.57	O	157	0.617901467				
RW-12	565281	266181	157.4	158.50	23	32	134.4	125.4	3.36						138.15				136.46			12.5	27.5	20	144.96	129.96	137.36	O	154	0.581005587				
SB-701	565285	266219	156.8		16	23.45	140.8	133.4											146.29															
SB-702	565288	266346	157.5		17.5	23.61	140	133.9											147.14															
SB-703	565261	266512	158.4		21	18.55	137.4	139.9																										
SG-1	565357	264465																																
SG-701	565635	266250		148.89											146.47		146.24	-0.23																
SG-702	565506	267057		148.89											147.48																			
SC-1																													0.0					
SC-2																													0					
SRS-1	565194	265871	159.9	160.86	5	22.5	154.9	137.4							154.01				158.3	5.2		17	22	19.5	142.89	137.89	140.39	O	152	0.794661191				
SRS-2	565200	265871	159.6	160.68	5	22.5	154.9	137.4							153.77				150.98			5.5	10.5	8	154.14	149.14	151.64	O	152	0.024640857				
SRS-3	565394	265864	151.4	152.67	22	42.5	129.4	108.9							149.80				148.25			31	41	36	120.38	110.38	115.38	O	149	0.837986042				
SRS-4	565392	265868	151.5	152.98	22	42.5	129.4	108.9							148.35				146.51	2.3		5	15	10	146.51	136.51	141.51	O	149	0.186689993				
SRS-5	565529.69	265997	152.6	154.35	32	0	120.6	97							148.70				147.5	6.6		7	37	22	145.57	115.57	130.57	O	149	0.384615385				
SRS-6	565577.6	266010	152.8	153.88		58		94.81							149.07				147.78			30.09	59.84	49.965	122.72	82.97	102.845	O	148.5	0.659035088				
SW-A	565964	265255		149.64										147.02	148.12				144.75											0.01				
SW-A Bank	565954	265254	147.6	151.41																														
SW-B	565749	265688		150.32										147.11	146.21				145.87											0.01				
SW-B Bank	565747	265684	148.3	152.14																														
SW-C	565685	265974		150.59										147.31	146.34				145.8											0.01				
SW-C Bank	565677	265975	148.7	151.97																														
SW-D	565622	266151		150.54										147.31	146.21				146.58											0.01				
SW-D Bank	565615	266149	147.9	150.84																														
SW-E	565682	266278		150.37										147.42	146.49				145.63											0.01				
SW-E Bank	565683	266291	147.8	151.87																														
SW-F	565629	266472		150.41										147.57	146.60				145.88											0.01				
SW-F Bank	565623	266471	148.4	152.71																														
SW-G	565609	267092		149.79										147.52	146.67				145.98											0.01				
SW-G Bank	565608	267093	148.4	151.72																														
Culv. In Invert	565228	266591		154.73																														
Culv. Out Invert	565504	266590		149.59																														
SW-701	565681	267171		155.33											147.21				146.78											0.01				
SW-702	565590	263894		153.52											148.22				148.15											0.01				
SW-703	565552	264184		153.73											145.43				145.38											0.01				
SW-704	564661	264208		154.53											144.80				143.94											0.01				
TP-701	565268	266640	159.2																															
TP-702	565515	266668																																
TRW-3	565242	265907.25			21	33	136.6	124.6														9.45	50.43	29.94	148.15	97.17	127.66	OR	149.5	0.877108434				
TRW-4						37																10.6	51.72	31.16				OR	0					
TRW-5						40																24.1	55	39.55				OR	0					
TRW-6	565427	265965.5				45		108														23.82	60	41.91	129.18	93	111.09	OR	151	0.928139535				
TRW-7					32																	9.36	35	22.18				O	0					
TRW-8	565646	266055.5	147.3		27	67	120.3	80.3														26.62	82.69	54.655	120.68	64.61	92.645	OR	148	0.817651403				
TW-01	565344	264065	150.5	152.21		103		47.5			146.46				146.59				145.93	28		10	20	15	140.5	130.5	135.5	O	146.46	0.110751819				
TW-02	565355	263770	149.8	151.81		103		46.8			144.23				146.85				146.15	91		5.5	15.5	10.5	144.3	134.3	139.3	O	144.23	0.050800431				
TW-03	565268.61	264027.431	150.1	150.92		103		47.1			146.92	145.82	146.73		146.71				146.04	17		8	18	13	142.1	132.1	137.1	O	146.92	0.098377079				
TW-04	565245	263814	148.9	151.01	6	103	142.9	45.9			146.98				146.87				146.26	110		5	15	10	143.9	133.9	138.9	O	146.98	0.079936584				
TW-05	565149	264350	151.1	152.72				72			146.09	145.40	146.19		146.09				145.4	100		10	20	15	141.1	131.1	136.1	O	146.19	0.136002157				
TW-06			149.0	151.68																		4.5	14.5	9.5	144.5	134.5	139.5	O	144.4					
TW-07A	565393	266384	156.2	158.72	18	39	138.2	117.2		153.30	154.68	154.29	155.10		152.74				152.34	7.6		15.8	25.8	20.8	140.4	130.4	135.4	O	155.1	0.519788918				
TW-07B	565387	266385	156.1	158.54	18	39	138.1	117.1				153.74	153.70							0.6	0.6	36.8	46.8	41.8	119.3	109.3	114.3	OR	153.74	1.076419214				
TW-08A	565213	266406	157.9	160.55	6	20.25	151.9	137.7		158.19	157.58		157.84		155.86				154.9	18		4	14	9	153.9	143.9	148.9	O	157.84	0.442793462				
TW-08B	565213	266406	158.0	160.22	6	20.25	152	137.8													0.6	21.5	31.5	26.5	136.5	126.5	131.5	R	0		5.25			
TW-09	564984	266593	171.5	174.16	3	14.5	168.5	157													1.44	19.5	29.5	24.5	152	142	147	R	0		10			
TW-10	564882	266403	180.6	182.12	0.75	12	179.8	168.6													8	25.5	35.5	30.5	155.1	145.1	150.1	R	0		18.5			
TW-11	565292	265956	155.6	157.39	27.5	38.5	128.1	117.1				153.15	153.67		151.68				148.61	17		5.5	15.5	10.5	150.1	140.1	145.1	O	153.67	0.234345092				
TW-12	565269	267366	175.0	177.15	3		172	125			158.83	156.32	158.62		158.19				156.57	0.75		29.5	39.5	34.5	145.5	135.5	140.5	O	158.83	0.539101992				
TW-14			148.0																			13.5	23.5	18.5	134.5	124.5	129.5		0					
TW-15			150.9																			13	23	18	137.9	127.9	132.9		0					
TW-16			203.2																			60	70	65	143.2	133.2	138.2		0					
TW-17			155.6																			10	30	20	145.6	125.6	135.6		0					
TW-18			156.2																			15	25	20	141.2	131.2	136.2		0					

SUMMARY TABLE OF COMPREHENSIVE HYDROGEOLOGIC DATABASE

SRSNE SITE -- SOUTHINGTON, CONNECTICUT

Location	Easting (X)	Northing (Y)	Ground Elev.	Meas. Pt. Elev. (TIC)	Depth to Till	Depth to Bedrock	Till Elev.	Top of Rock Elev.	GW Depth, Est'd	GW Elev. 10/93	GW Elev. 5/93	GW Elev. 11/15/94	GW Elev. 3/20/95	GW Elev. 12/30/96	GW Elev. 1/21/97	Correction Factors for 1/21/97	GW Elev. 2/11/97	Change 1/21/97 - 2/11/97	GW Elev. 7/7/97	OVB K (ft/d)	BDRK K (ft/d)	Screen Top Depth	Screen Bottom Depth	Screen Midpt Depth	Screen Top Elev.	Screen Bottom Elev.	Screen Midpoint Elev.	Well Formation	Repres. WT Elev.	Fractional Depth in OVB	Depth Below Top of Rock	Yield (GPM)	Drdn (FT)	Comments
TW-19			156.9																			9.5	19.5	14.5	147.4	137.4	142.4		0					
TW-20			149.6																			9.5	19.5	14.5	140.1	130.1	135.1		0					
USGS				152.82											148.15																			
W-1 (N)			160.0																										0					
W-2 (S)			159.9																										0					
WE-1	565220	286787	163.0	163.01	8	27	155	136		157.32	161.21	159.27	161.49		160.83				159.07		4	27	41.5	34.25	136	121.5	128.75	R	161.49		7.25			
WE-2	565220	286808	162.1	162.29	8	27	154.1	135.1		157.02	159.04	158.23	159.15		159.00				159.2	1.2		3	13.5	8.25	159.1	148.6	153.85	O	159.15	0.22037422				
WE-3	565140	286142	164.2		3	17.5	161.2	146.7		155.33	158.69										1.3	26	31	28.5	136.2	133.2	134.7	R	158.69		9.5			
WE-4	565140	286142	164.7		3	17.5	161.2	147.2		154.94	158.82									0.85		14	19	16.5	150.7	145.7	148.2	O	158.82	0.726402189				
WE-5	565139	286144	165.1		3.0	17.5	161.2	147.6												1.5		1.5	11.5	6.5	163.6	153.6	158.6	O	158.8	0.02				
WE-6	564936	286481	169.3		0.0	3.0	169.3	166.3														4.8	5.8	5.3	164.5	163.5	164.0	R	0.0		2.3			
WE-7	565109	286137	163.7		8.5	15.0	155.2	148.7														5.0	18.0	11.5	158.7	145.7	152.2	OR	159.9	0.69				
WE-9	565107	286138	163.6		8.5	15.0	161.2	148.7												1.7		12.0	17.0	14.5	151.6	146.6	149.1	OR	159.9	0.96				
Regional wells found in USGS/CTDEP survey documents																																		
S-18	564029.78	280987.276	174			9																25	30	27.5										
S-25	561236.01	285652.935	241			10.5			4													70	90	80										
S-26	561456.98	285630.012	254			12.5			4													15	35	25										
S-28	564134.64	289815.258	154		14	21			2													86	91	88.5										
S-29	564303.43	289625.264	153			17			3													25	30	27.5										
S-30	565320.63	290659.297	166		112	119			4													73	78	75.5										
S-31	565344.66	290935.003	167		102.5	113.5			4													45	50	47.5										
S-32	566114.46	291377.539	168		77.5	94			2													2.5	82.5	42.5										
S-61	567806.84	260295.463	170			66			4																									
S-62	564470.45	284590.046	165		1				9																	28								
S-64	567506.92	260708.373	170			66			2																									
S-71			180			22			1																									
S-72	571040.6	289140.186	200																															
S-73	571038.47	286653.738	210																															
S-74	565963.56	286697.555	160																															
S-76	567043.09	262627.246	170			70			3																									
S-111	570055.61	284097.719	210		37	45			1																									
S-112	569865.38	280197.151	185		45	50			3																									depth to rock may be boulder
S-134	569635.62	285305.525	235		29	30			30																									refusal at 30'
S-135	569345.08	284730.146	220		24	30			32																									
S-142	568415.88	283017.892	180		30	40			11																									
S-143	568809.52	281179.101	190		52	57			15																									refusal at 57'
S-145	567064.41	279361.5	170		119	120			10																									refusal at 120'
S-153	565014.11	279592.533	180		62	71			29.0																									
S-155	565992.36	282602.658	155			49			34.0																									
S-156	565072.97	283132.072	155			77			9.0																									
S-157	565635.63	284694.146	150		65	70			5																									
S-158	565670.75	286042.898	150		97	100			11																									refusal at 100'
S-160	566809.54	284337.08	190		73	75			43																									
S-165	563609.22	291128.673	160		60	67			7																									
S-235	571294.43	289495.682	200			60			4											3120			32									1250	10	
S-277	560918.66	290042.826	265			22			16												0.24		99									8	83	
S-284	564323.79	281203.628	150						10														82									70		
S-314	566645.96	289623.337	200			7			35												0.17		146									10	111	
S-315	566670.07	282286.104	170						1												3.1		64									80	125	ddn greater than well depth
S-328	566845.2	282140.506	180						13														58									100		
S-331	566662.96	282255.251	175						13											652			69									510	14	pumped 168 hr, csg. diam. 18"
S-334	565631.43	284226.327	145																	1100			65									750	17	
S-335	564226.76	280885.918	145																	294			66									602	23	
S-341	569489.66	291896.427	240			8			40												0.31		140									15	97	
S-343			322			30			19												0.34		120									10	81	
S-345			200			60														1420			48									523	5	
S-347	559615.08	289784.657	265			35															0.68		105									10	51	
S-353	562028.83	285595.267	265			50			20												0.1		202									8	130	
S-359	563158.67	285237.484	295			20			14												0.06		160									5	146	
Southington Water Department Wells																																		
MW-84-8	565290.3	283757.9	149.00		80	91	69.00	58.00														38	88											
MW-84-9	565217.2	283543.0	150.00		88	104	62.00	46.00														45	95											
Ideal Forging Wells																																		
B-2	565500.1	283624.1	156.20		84	94	72.20	62.20	146													70	90											
B-8	565565.8	283457.7	157.00		86		71.00		147													2.5	82.5											
B-6	565710.9	283315.4	160.40		82		78.40		147.3													73	78											
B-7	565549.5	283249.2	159.20		51		108.20		145.6													45	50											

Notes All distance, depth, and elevation measurements in feet.

Appendix E

Subsurface Logs

Date Start/Finish: 08/27/96 - 08/27/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** Hollow Stem Auger **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobil B-59 **Spoon Size:** 2-in.	**Northing:** 286218.7429 **Easting:** 565264.5604 **Borehole Depth:** 20.0 ft. **Ground Surface Elev.:** 156.8 ft. **Geologist:** Aaron D. Svitana	**Soil Boring No: SB-701** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geologic Column	Stratigraphic Description	Soil Boring Construction
depth	gs elevation 156.8 ft.								**GROUND SURFACE**	
		001		26 24 29 32	53	1.5	0.0		Red/brown fine SAND, some Silt, little Gravel, moist, very dense.	
	155	S001 002		24 21 18 16	39	1.2	7.0		Red/brown very fine to fine SAND, little Silt, trace gravel, saturated at 3.9' bgs, dense.	
5		03		5 5 7 8	12	1.5	25		Light gray/light olive green fine to medium SAND, saturated, medium dense.	8.25-in diameter HSA borehole
	150	04		38 45 40 16	85	1.5	130		Very dense.	
		S002 05		5 4 3 3	7	1.7	24		Red SILT, some fine Sand, trace Clay, odor.	
10		06		6 8 13 17	21	1.7	63		Medium stiff.	Cement/Bentonite grout ground surface to 20.0' below grade
	145								Red CLAY, some Silt, trace Gravel, medium dense.	
		S003 07		11 13 45 21	58	1.7	24		Red SILT, some Clay and fine to medium Sand, trace Gravel, hard.	
									Top of TILL at approximately 13.0' bgs.	
15		08		12 15	39	1.2	22		Red SILT and very fine SAND, some gray gravel, hard. (Till)	

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Remarks:

Borehole grouted to ground surface upon completion.

Saturated Zones

Date / Time	Elevation	Depth
8-27-96		3.9 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Soil Boring No: SB-701

Total Depth = 20.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geologic Column	Stratigraphic Description	Soil Boring Construction
		08		12 15	39	1.2	22		Red SILT and very fine SAND, some gray gravel, hard. (Till)	8.25-in diameter HSA borehole
	140	09		28 32 100/0.2	32	1.0	63		Granite boulder weathered in place at 17.2' bgs.	
		10		32 23 23 27	46	1.3	1.3		Red TILL (Silt and very fine Sand, trace Gravel).	Cement/Bentonite grout-ground surface to 20.0' below grade
20									End of boring at 20.0' bgs.	
	135									
25										
	130									
30										
	125									
35										

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth
8-27-96		3.9 ▼

Date Start/Finish: 08/27/96 - 08/28/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** Hollow Stem Auger **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 286345.7810 **Easting:** 565287.9917 **Borehole Depth:** 20.0 ft. **Ground Surface Elev.:** 157.5 ft. **Geologist:** Aaron D. Svitana	**Soil Boring No: SB-702** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH (depth)	ELEVATION (gs elevation 157.5 ft.)	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geologic Column	Stratigraphic Description	Soil Boring Construction
									GROUND SURFACE	
		S006 S007 01		8 27 24 18	51	1.5	0.0		Brown/tan very fine to fine SAND, little SILT, trace Gravel, moist, very dense.	
	155	S008 S009 02		7 11 11 16	22	1.5	6		Brown fine to medium SAND, some Silt, moist, medium dense, odor. Tan medium SAND, little Silt.	
5		03		12 13 17 20	30	2.0	11		Red SILT, some very fine SAND, moist to wet, very stiff. Gray/light olive brown fine to coarse SAND, some Silt and Gravel, saturated.	8.25-in diameter HSA borehole
	150	S010 04		30 33 35 37	68	2.0	18		Red fine to coarse SAND and SILT, some gravel, hard.	
10		05		53 76 30 33	106	2.0	96		Grading to light gray/tan fine to coarse SAND, some Gravel at 9.5' bgs , very dense. Dense.	Cement/Bentonite grout-ground surface to 20.0' below grade
		S011 06		12 19 15 17	34	1.8	98			
	145	07		18 17 13 11	30	2.0	159		Light gray fine to coarse SAND and SILT, some Gravel, very stiff.	
15		08		14 7	13	2.0	150		Grading to very fine to medium SAND and SILT, stiff.	

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Remarks:

Borehole grouted to ground surface upon completion.

Saturated Zones

Date / Time	Elevation	Depth
8-27-96		5.0 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Soil Boring No: SB-702

Total Depth = 20.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geologic Column	Stratigraphic Description	Soil Boring Construction
		08		14 7	13	2.0	150		Very fine to medium SAND and SILT, trace gravel at 15.5' bgs, stiff.	8.25-in diameter HSA borehole
	140	09		23 26 30 31	56	2.0	140		Top of Till at approximately 18.0' bgs. Red TILL (Silt and very fine Sand, trace Gravel). Little Clay.	Cement/Bentonite grout-ground surface to 20.0' below grade
		S012 10		16 29 49 31	78	2.0	2.4			
20									End of boring at 20.0' bgs.	
	135									
25										
	130									
30										
	125									
35										

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth
8-27-96		5.0 ▼

Date Start/Finish: 08/28/96 - 08/28/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** Hollow Stem Auger **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobil B-59 **Spoon Size:** 2-in.	**Northing:** 286511.9133 **Easting:** 565260.7177 **Borehole Depth:** 22.0 ft. **Ground Surface Elev.:** 158.4 ft. **Geologist:** Aaron D. Svitana	**Soil Boring No: SB-703** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH (depth)	ELEVATION (gs elevation 158.4 ft.)	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geologic Column	Stratigraphic Description	Soil Boring Construction
									GROUND SURFACE	
		01		16 18 22 19	40	1.8	0.0		Brown SILT and fine SAND, some fill Gravel, hard. Red brown/gray SILT, some very fine Sand, little Clay, moist.	
	155	S013 02		12 11 9 9	20	1.2	1.2		Brown SILT and fine SAND, some Gravel, very stiff. Gray fine to medium SAND, little Silt, saturated at 4.0' bgs.	▼
5		S014 03		4 2 12 16	14	1.3	13		Red/brown SILT and very fine SAND, trace Clay, stiff. Gray fine to coarse SAND, trace Silt, odor.	8.25-in diameter HSA borehole
		04		12 18 32 41	50	1.5	0.0		Gray medium to coarse SAND, some Gravel, very dense, very light odor.	
	150	05		85 51 29 34	78	1.5	0.0		Red medium to coarse SAND and GRAVEL, some Silt, very dense. Gray/light gray fine to coarse SAND, little Gravel. Red SILT and very fine SAND, some Clay, trace Gravel.	
10		06		13 25 18 17	43	0.5	12		Red/gray fine to medium SAND, some Silt and Gravel, dense. Piece of gray granitic boulder clogging spoon.	Cement/Bentonite grout-ground surface to 22.0' below grade
	145	07		13 30 18 27	48	2.0	0.0		Two coarsening upward sequences comprised of red/gray fine to coarse SAND, little Silt grading to fine gravels and medium Sand, dense.	
15		S015 08		16 22	45	1.8	0.0		One coarsening upward sequence as above, dense.	

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Remarks:

Borehole grouted to ground surface upon completion.

Saturated Zones

Date / Time	Elevation	Depth
8-28-96		4.0 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Soil Boring No: SB-703

Total Depth = 22.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Geologic Column	Stratigraphic Description	Soil Boring Construction
		S015 08		16 22	45	1.8	0.0		Red/gray fine to medium GRAVEL. Red fine to medium SAND, little Silt, trace Gravel. One coarsening upward sequence of red/gray fine to coarse SAND, dense.	8.25-in diameter HSA borehole
		09		18 18 24 36	42	2.0	0.0		Top of Till at approximately 17.0' bgs. Red fine SAND, little Silt and Gravel. (Till)	
	140	010		23 25 27 32	52	1.0	28		Red/gray fine to coarse SAND, trace Gravel, very dense. (Till)	Cement/Bentonite grout ground surface to 22.0' below grade
20		S016 11		16 28 25 32	53	1.8	25		Red TILL (Fine to medium sand, some silt, little gravel), medium dense.	
									End of boring at 22.0' bgs.	
	135									
25										
	130									
30										
	125									
35										

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Remarks:

Saturated Zones

Date / Time	Elevation	Depth
8-28-96		4.0 ▼

Date Start/Finish: 09/10/96 - 09/12/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and HQ Core Bit **Bedrock Drill Bit Size:** 4.0-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobil B-59 **Spoon Size:** 2-in.	**Northing:** 286399.2602 **Easting:** 565501.4460 **Borehole Depth:** 70.0 ft. **Ground Surface Elev.:** 153.2 ft. **Geologist:** Aaron D. Svitana	**Soil Boring No: RC-701** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Soil Boring Construction
depth	gs elevation 153.2 ft.									GROUND SURFACE	
		01		2 7 4 4	11	1.0	0			Brown fine SAND, little Silt, trace Gravel, moist, medium dense.	
	150	02		10 11 14 18	25	0.7	0			Tan/brown color change.	
5		03		6 7 11 17	18	1.7	12			Tan SILT, little fine Sand, trace Clay, moist, stiff, strong odor. Dark brown/gray fine SAND, little Silt, saturated.	8.25-in diameter HSA borehole
		04		6 7 6 9	13	1.5	0			Red fine SAND and SILT.	
	145	05		8 10 13 15	23	1.2	7.2			Red SILT, some Clay,trace fine Sand, very stiff.	
10		06		16 12 11 11	23	0.4	7				Cement/5 % Bentonite grout ground surface to 70 feet below grade
	140	07		4 6 10 12	18	0.9	39			Red/gray SILT, some Clay grading to SILT, very stiff, moderate odor.	
15		08		4 7	21	1.4	3.6			Red SILT, piece of weathered arkose boulder in tip of spoon.	

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Remarks:

8.25-in. OD HSA 0-52.0 ft. bgs. 4.0-in. HQ Core Barrel 52-70.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
9-10-96 / 10:15		5.0 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Soil Boring No: RC-701

Total Depth = 70.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Soil Boring Construction
		08		4 7	21	1.4	3.6			Red SILT, piece of weathered arkose boulder in tip of spoon.	
		09		15 18 24 29	42	1.0	10			Red fine to medium Sand and GRAVEL, little Silt, dense. Gray weathered granite boulder.	
	135	10		45 40 15 14	55	2.0	25			Red fine to medium SAND, trace Gravel, very dense, slight odor. Loose.	
20		11		9 4 3 3	7	2.0	58				8.25-in diameter HSA borehole
	130	12		14 13 11 9	24	1.5	101			Red SILT, some to trace fine Gravel, very stiff, slight odor.	
25		13		14 13 11 9	24	2.0	54			Fine to medium GRAVEL, some coarse Sand, medium dense, moderate odor. SILT, trace Clay, slight odor.	Cement/5 % Bentonite grout ground surface to 70 feet below grade
		14		10 12 14 16	26	1.9	50			Coarse SAND, some fine Gravel, trace Silt, medium dense. SILT, little Gravel, trace Sand.	
	125	15		13 16 24 34	40	2.0	59			Stiff, slight odor.	
30		16		2 2 4 5	6	2.0	156			Fine to coarse SAND, little Gravel, slight odor. Coarse SAND grading to fine to medium SAND, loose. Grading to medium coarse SAND, dense.	
	120	17		12 18 21 15	39	0.5	116			Fine SAND.	
		18		100/5	NA	2.0	14.2			Medium to coarse SAND and fine GRAVEL, odor. Feldspathic SANDSTONE.	
35		*									

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Remarks:
* = Interval augered through boulder (s).

Water Levels

Date / Time	Elevation	Depth
9-10-96 / 10:15		5.0 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Soil Boring No: RC-701

Total Depth = 70.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Soil Boring Construction
		*								Augered to 34.5-38' bgs.	
	115	19		21 23 18 15	41	2.0	76			Red coarse SAND, some Silt, dense. Fine to coarse GRAVEL, some coarse Sand and Silt. Coarse SAND grading to fine SAND at 39.2' bgs. Fragment of red weathered arkose in tip of spoon.	8.25-in diameter HSA borehole
40		20		23 35 100/5	NA	0.5	15			Gray fragments of Granitic boulder. Augered past boulder.	
		*									
	110	21		25 100/0.5	NA	0.6	38			Red weathered/fractured ARKOSE boulder, some fine to medium Sand. Augered past gray weathered GRANITE boulder (s) to 46.0' bgs.	
45		*									Cement/5 % Bentonite grout ground surface to 70 feet below grade
		22		40 100/0.4	NA	0.5	26			Red TILL (Silt, some fine to medium Sand, little arkose).	
		*									
	105	23		100/0.2	NA	0.25	34			0.2' of gray crumbly Granite, some red Till.	
		*									
50		24		100/0.3	NA	0.25	34			Red weathered fine ARKOSE, some gray clasts. Top of weathered bedrock.	
		*									
	100	01 R008		10 10 10	97%	3	63			Red, hard, mica enriched felsic SANDSTONE.	4.0-in diameter HQ corehole
55											

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Remarks:
Weathered bedrock at 50.0' bgs. Casing spun to 52' bgs. Coring started at 52' bgs. * = Interval augered through boulder (s).

Water Levels

Date / Time	Elevation	Depth
9-10-96 / 10:15		5.0 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Soil Boring No: RC-701

Total Depth = 70.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Soil Boring Construction
				8						Red, hard, mica enriched felsic SANDSTONE.	
				7						Gray/red CONGLOMERATE, matrix primarily quartz and feldspayhic Sandstone.	
		02		15	83%	4.2	0				
	95										
				10							
60				6							4.0-in diameter HQ corehole
		R009								Feldspathic SANDSTONE, fractures show evidence of red Silt.	
				8	77%	4.5	0				
	90	03		7							
										Broken zone.	
65										Gray/green/red quartz and feldspathic SANDSTONE.	Cement/5 % Bentonite grout ground surface to 70 feet below grade
				2.5						Red CONGLOMERATE, matrix predominately feldspathic Sandstone.	
										Red feldspathic SANDSTONE.	
		R010 04 R011		3.5	88%	4.6	0			Red/gray CONGLOMERATE, matrix predominately red feldspathic Sandstone.	
	85			3							
70										Bottom of HQ corehole at 70.0 bgs.	
	80										
75											

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Remarks:

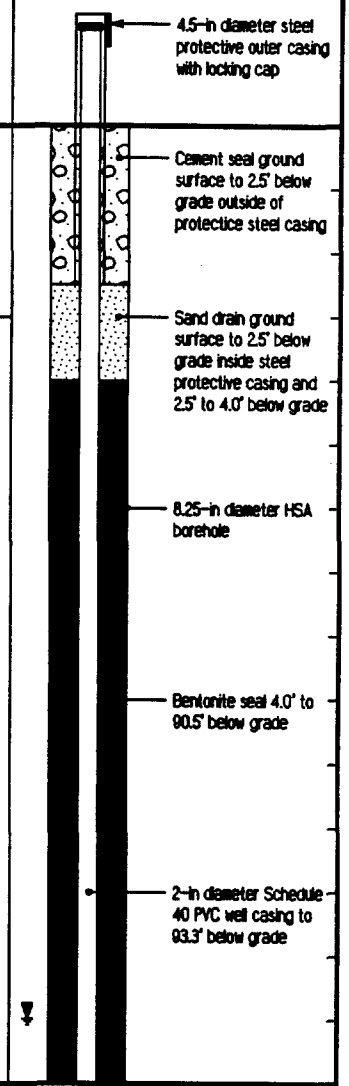
Water Levels

Date / Time	Elevation	Depth
9-10-96 / 10:15		5.0 ▼

Date Start/Finish: 09/10/96 - 09/13/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME-75 **Spoon Size:** 2-in.	**Northing:** 286253.5349 **Easting:** 564578.9967 **TIC Elev.:** 198.71 ft. **Borehole Depth:** 110.0 ft. **Ground Surface Elev.:** 196.2 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-701DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 196.2 ft.									
										GROUND SURFACE
	195	*								TOPSOIL (Silty Sand), based on description from MW-209A.
5	190	01		5 21 19 20	40	2.0	NA			Top of TILL at approximately 3.0' below grade, based on description from MW-209A (approximately 10.0' to the north of MW-701DR). Red fine to medium SAND, little Silt, trace Gravel, dry, dense. (Till)
		*								
10	185	02		31 21 15 17	38	1.5	NA			Red, medium to coarse, subrounded SAND, little Gravel, trace Silt, dry. (Till)
		*								
15										

Monitoring Well Construction



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Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-30.0 ft. bgs. 4.0-in. Rollerbit 30-110.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	182.21	16.50 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-701DR

Total Depth = 110.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	180	03		18 50/0.3	NA	0.8	NA			Red, fine, subrounded SAND, piece of Granite boulder in tip of spoon, dry. (Till)	8.25-in diameter HSA borehole
		*									
20										Red fine to medium SAND, dry. (Till)	
	175	04		18 15/0.2	NA	0.8	NA			Red crumbly extremely weathered New Haven Arkose bedrock from 20.5' - 20.8' below grade.	2-in diameter Schedule 40 PVC well casing to 93.3' below grade
		*									
25		05		8 70/0.8	NA	0.8	NA			Red crumbly extremely weathered New Haven Arkose bedrock.	
	170	*									Bentonite seal 4.0' to 90.5' below grade
		06		15 100/0.5	NA	0.4	NA			Moderately weathered New Haven Arkose bedrock.	
30				4						4.0-in. diameter Rollerbit used from 30' - 110' below grade. No samples taken. No fracture data obtained.	
	185			3						New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole
				2							
				2							
35				3							

Remarks:
* = Interval augered through.

Water Levels

Date / Time	Elevation	Depth
01/21/97	182.21	16.50 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-701DR

Total Depth = 110.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				3						4.0-in. diameter Rollerbit used from 30' - 110' below grade. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole; 2-in diameter Schedule 40 PVC well casing to 93.3' below grade; Bentonite seal 4.0' to 90.5' below grade
	160			3							
				3							
				3							
				3							
				3							
40				3							
	155			3							
				2							
				3							
				3							
45				3							
	150			3							
				3							
				2							
				2							
50				2							
	145			3							
				3							
				4							
55				3							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	182.21	16.50 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-701DR

Total Depth = 110.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				3						4.0-in. diameter Rollerbit used from 30' - 110' below grade. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole; 2-in diameter Schedule 40 PVC well casing to 93.3' below grade; Bentonite seal 4.0' to 90.5' below grade
	140			3							
				3							
				3							
				3							
60				3							
	135			2							
				2							
				2							
				3							
65				3							
	130			3							
				3							
				2							
				2							
70				3							
	125			3							
				3							
				2							
75				2							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	182.21	16.50 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-701DR

Total Depth = 110.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				2						4.0-in. diameter Rollerbit used from 30' - 110' below grade. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole
	120			3							
				2							
				3							
				2							
80				2							
	115			2							
				2							2-in diameter Schedule 40 PVC well casing to 93.3' below grade
				3							
				3							
85				3							
	110			3							Bentonite seal 4.0' to 90.5' below grade
				3							
				3							
90				3							
	105			2							Grade #0 Morie sand pack 90.5' to 107.8' below grade
				2							
				3							
				3							2-in diameter 0.010-in slotted Schedule 40 PVC well screen 93.3' to 107.8' below grade
95				3							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	182.21	16.50 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-701DR

Total Depth = 110.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				3						4.0-in. diameter Rollerbit used from 30' - 110' below grade. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole
	100			3							
				3							
				3							Grade #0 Morie sand pack 90.5' to 107.8' below grade
				2							
100				2							
	95			2							2-in diameter 0.010-in slotted Schedule 40 PVC well screen 93.3' to 107.8' below grade
				2							
				3							
				3							
105				3							
	90			2							
				2							
				3							4-in long Schedule 40 PVC bottom cap
				3							New Haven Arkose bedrock fragments 107.8' to 110.0' below grade
110										Bottom of rollerbit borehole at 110.0' below grade.	
	85										
115											

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Remarks:
Borehole collapsed from 107.8 ft. to 110.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	182.21	16.50 ▼

Date Start/Finish: 10/11/96 - 10/11/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and HQ Core Bit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME-75 **Spoon Size:** 2-in.	**Northing:** 286074.7119 **Easting:** 564912.4655 **TIC Elev.:** 181.30 ft. **Borehole Depth:** 112.0 ft. **Ground Surface Elev.:** 179.1 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-702DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
depth	gs elevation 179.1 ft.									GROUND SURFACE	4.5-in diameter steel protective outer casing with locking cap
	175	*								Silty, Sandy TOPSOIL and Gravelly SAND, based on description from monitoring well P-8A (approximately 12.0' to the southeast of MW-702DR).	Cement seal ground surface to 2.5' below grade outside of protectice steel casing Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
5		01		4 8 7 40	15	1.6	0			Brown fine Sand, little Silt, trace organic matter, dry, dense.	8.25-in diameter HSA borehole
	170	*								Top of TILL at approximately 6.0' bgs. Light olive brown fine SAND grading to medium subangular SAND, trace red arkose Gravel. (Till) Gray granitic crumbly boulder at 6.7' bgs, moist to dry.	2-in diameter schedule 40 PVC well casing to 80.25' below grade
10		02		17 26 25 22	51	2.0	0			Red medium subangular SAND, little fine SAND, trace gravel, dry, very dense. (Till) Red fine SAND, some Silt, little Gravel, slightly moist. (Till)	Bentonite seal 4.0' to 77.0' below grade
	165	*									
15											

Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-30.0 ft. bgs. 4.0-in. HQ Core Barrel 30-112.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	166.35	14.95 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-702DR

Total Depth = 112.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		24 30 20 12	50	0.8	0			Red fine SAND, some SILT, Little Gravel, slightly moist. (Till)	8.25-in diameter HSA borehole
		*									
	160										
20		04		15 16 21 14	37	1.2	0			Gray diorite boulder from 21.0-21.7' bgs.	2-in diameter schedule 40 PVC well casing to 80.25' below grade
		*								Top of rock at 21.7' bgs. Red, crumbly, extremely weathered, mica rich Arkose, dry, dense.	
		R021									
	155									One piece of red Arkose; one piece gray Sandstone from 24.0-24.1' bgs.	
25		05		50/0.1	NA	0.1	0				Bentonite seal 4.0' to 77.5' below grade
		*									
		01		12.5	30%	0.6	0			Red feldspathic SANDSTONE with reduction spots. Bottom of core moderately pitted.	
	150			3.5							
30		R017		5						No reduction spots.	
		02		4	83%	6.1	NA			Red and gray color change 31.5-32.0' bgs.	4.0-in diameter HQ corehole
				3							
				4							
	145			3.5							
35											

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Remarks:

* = Interval augered through. Top of rock data from supplemental MW-702DR corehole drilled 11/4/96, total depth of 32 feet for weathered bedrock sample (R021) and packer test. Twelve fractures encountered from 21.7 to 30.0 ft.

Water Levels

Date / Time	Elevation	Depth
01/21/97	166.35	14.95 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-702DR

Total Depth = 112.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		02		3, 3.5	83%	6.1	NA			0.2' gray Conglomerate layer oriented 10° from horizontal, clasts feldspar, quartz and hornblend, 35.0-35.2' bgs.	4.0-in diameter HQ corehole
40	140	03		3.5, 4, 3, 3.5, 4	98%	9.9	NA			One large (3" diameter) gray green reduction spot.	2-in diameter schedule 40 PVC well casing to 80.25' below grade
		R018		3							
45	135	04		3, 3, 2.5, 2.5, 3, 2	94%	9.75	NA			Slightly coarser feldspathic SANDSTONE.	Bentonite seal 4.0' to 77.0' below grade
50	130			6.5, 8, 5.5, 5, 4						Red and green/gray SANDSTONE (reduction zone) with 0.25-in Silt clasts; Red SILTSTONE (sharp contact at 10° from horizontal); Red SILTSTONE and fine SANDSTONE; crossbedding with green/gray reduction spots parallel to cross bedding at 49° bgs.	
55	125			2.5						Red feldspathic SANDSTONE with generally vertical Silt filled burrows. Mottled green/gray reduction spots.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	166.35	14.95 ▼

Project: 083.31
Script: srsne2
Date: 08/08/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-702DR

Total Depth = 112.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		04		2.5, 2	94%	9.75	NA			Coarsening down of Sandstone to CONGLOMERATE at 55.5' bgs. Clasts of feldspathic and quartz with one basaltic (<2" length).	
		05		1.5, 1.5, 1.5, 1.5, 1.5, 2, 2	92%	9.9	NA			Apparent bedding at 5-10° from horizontal.	4.0-in diameter HQ corehole
60	120									Layer of 2-3" gravel clasts deposited parallel to bedding.	2-in diameter schedule 40 PVC well casing to 80.25' below grade
	115									Red coarsening downward CONGLOMERATE, distinct layering and moderate imbrication.	
65		R019		2						Gray/red clast supported CONGLOMERATE, some what crumbly.	Bentonite seal 4.0' to 77.0' below grade
				1.5, 2.5						Red feldspathic SANDSTONE/SILTSTONE, bioturbation and gray/green reduction spots, vary sharp contact with above.	
70	110	06		2, 4, 3.5, 2.5, 2.5, 1.5, 1.25	99%	NA	NA			Red feldspathic SANDSTONE with crossbedding.	
75	105			1.5						Trace elongate horneblend crystals, moderately imbricated.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	166.35	14.95 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-702DR

Total Depth = 112.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		06		1.5, 1.5	99%	NA	NA			Red feldspathic SANDSTONE.	Bentonite seal 4.0' to 77.0' below grade
	100	07		2, 2.5, 3, 4, 2.5, 3	NA	NA	NA			Red matrix supported CONGLOMERATE, moderately imbricated.	2-in diameter schedule 40 PVC well casing to 80.25' below grade
80										Feldspathic SANDSTONE/SILTSTONE, irregular contact with above (45° from horizontal.)	
										Red/gray CONGLOMERATE, cross bedded.	
	95			2, 2, 3, 3						Red feldspathic SANDSTONE, bedding at 10°.	4.0-in diameter HQ corehole
85										Reduction spots, bioturbated at 86.75' bgs with horizontal gray burrows, remineralized.	
	90	08		4.25, 4.75, 4.75, 6, 4.25, 3, 2.5, 2	NA	NA	NA				Grade #0 Morie sand pack 77.0' to 110.55' below grade.
90											2-in diameter 0.010-in slotted Schedule 40 PVC well screen 80.25' to 110.25' below grade
	85									Red CONGLOMERATE, matrix of feldspathic	
95											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	166.35	14.95 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-702DR

Total Depth = 112.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		08		3	NA	NA	NA			Sandstone, slight imbrication.	
				2.5						Feldspathic SANDSTONE.	
				2						CONGLOMERATE.	4.0-in diameter HQ corehole
				3						Feldspathic SANDSTONE coarsening downward.	
	80			2							Grade #0 Morie sand pack 77.0' to 110.55' below grade.
100				3							
		R020		3						Red/gray CONGLOMERATE; clasts primarily feldspathic with trace red Mudstone clasts.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 80.25' to 110.25' below grade
				3						Feldspathic SANDSTONE.	
				2						Gray/green feldspathic SANDSTONE, bioturbated.	
	75	09		2	NA	NA	NA				
105				3						Change to red.	
				3							
				3						Gray/green fine to medium CONGLOMERATE, bioturbated.	
				2						Red feldspathic SANDSTONE.	
	70	10		2						Red/gray/green mottling.	
110				2						Coarsening down.	
				2						Red CONGLOMERATE, clasts of feldspathic Sandstone and Quartzite.	4-in long Schedule 40 PVC bottom cap
				2							Conglomerate fragments 110.55' to 112.0' below grade
										Bottom of HQ corehole at 112.0' bgs.	
	65										
115											

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Remarks:
Borehole collapsed from 110.55 ft. to 112.0 ft. bgs.

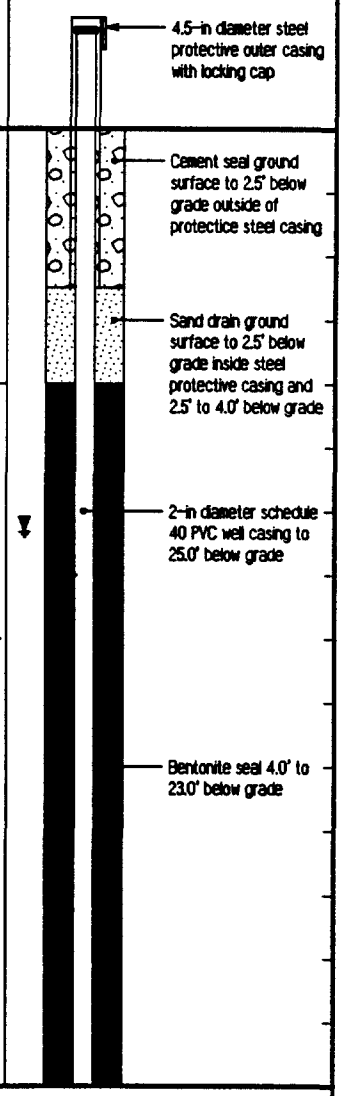
Water Levels

Date / Time	Elevation	Depth
01/21/97	166.35	14.95 ▼

Date Start/Finish: 09/25/96 - 10/02/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285086.9398 **Easting:** 565299.1059 **TIC Elev.:** 155.68 ft. **Borehole Depth:** 35.5 ft. **Ground Surface Elev.:** 153.4 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-703S** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.4 ft.									GROUND SURFACE
	150	*								
5		01		9 13 17 20	30	1.8	0			Light brown fine to coarse subangular SAND, trace Gravel, moist to wet, medium dense.
		*								
	145	02		9 10 13 12	23	1.7	0			Dark brown fine, moderatley well sorted, subrounded SAND, saturated, medium dense.
10										
	140	*								
15		03		10	24	1.5	0			Red/brown fine, mica rich, subrounded SAND, trace Silt.

Monitoring Well Construction



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Remarks:

No samples taken at MW-703S. Geologic description based on MW-703DR. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-25.5 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.06	8.62 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703S

Total Depth = 35.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		10	24	1.5	0			Red/brown fine, mica rich, subrounded SAND, trace Silt.	
		*									
	135	04		3 4 5 22	9	2.0	0			Brown fine to medium subrounded SAND, loose. Red/brown fine SAND, little Silt, grading to fine to medium SAND.	2-in diameter schedule 40 PVC well casing to 25.0' below grade
20		*									Bentonite seal 4.0' to 23.0' below grade
	130	05		16 8 11 15	19	2.0	0			Red/brown fine SAND, trace Silt, medium dense. Red very fine SAND, mica rich, little silt.	
25		*									
	125	06		9 12 14 21	26	2.0	0			0.1' red fine subrounded GRAVEL, medium dense.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 25.0' to 35.0' below grade
30		*									Grade #0 Morie sand pack 23.0' to 35.5' below grade
	120	07		9 10	21	2.0	0			Reddish/olive brown, medium to coarse subangular to subrounded SAND, little Gravel.	
35											

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.06	8.62 ▼

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Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703S

Total Depth = 35.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
										Fine to medium SAND.	4-in long Schedule 40 PVC bottom cap
										Bottom of borehole at 35.5' bgs.	
	115										
40											
	110										
45											
	105										
50											
	100										
55											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.06	8.62 ▼

Date Start/Finish: 09/25/96 - 10/02/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285097.4700 **Easting:** 565300.1384 **TIC Elev.:** 155.42 ft. **Borehole Depth:** 85.0 ft. **Ground Surface Elev.:** 153.0 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-703D** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.0 ft.									GROUND SURFACE
	150	*								
5		01		9 13 17 29	30	1.8	0			Light brown fine to coarse subangular SAND, trace Gravel, moist to wet, medium dense.
	145	*								
10		02		9 10 13 12	23	1.7	0			Dark brown fine, moderatley well sorted, subrounded SAND, saturated, medium dense.
	140	*								
15		03		10	24	1.5	0			Red/brown fine, mica rich, subrounded SAND, trace Silt.

Monitoring Well Construction

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Remarks:

No samples taken at MW-703D. Geologic description based on MW-703DR. * = Interval augered through. TIC = Top of inner casing.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.41	8.01 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703D

Total Depth = 85.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		10	24	1.5	0			Red/brown fine, mica rich, subrounded SAND, trace Silt.	
		*									
	135	04		3 4 5 22	9	2.0	0			Brown fine to medium subrounded SAND, loose. Red/brown fine SAND, little Silt, grading to fine to medium SAND.	
20											2-in diameter schedule 40 PVC well casing to 74.0' below grade
		*									
	130										
		05		16 8 11 15	19	2.0	0			Red/brown fine SAND, trace Silt, medium dense. Red very fine SAND, mica rich, little silt.	Bentonite seal 4.0' to 72.0' below grade
25											
		*									
	125	06		9 12 14 21	26	2.0	0			0.1' red fine subrounded GRAVEL, medium dense.	
30											
		*									
	120										
35		07			21	2.0	0			Reddish/olive brown, medium to coarse subangular to subrounded SAND, little Gravel.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.41	8.01 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703D

Total Depth = 85.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07			21	2.0	0			Fine to medium SAND.	
		*								Red medium to coarse well sorted SAND.	
	115	08		4 26 23 15	49	2.0	0				
40										Red TILL (Silt and very fine Sand, little Gravel, trace Clay), medium dense.	2-in diameter schedule 40 PVC well casing to 74.0' below grade
		*									
	110										
45		09		34 100/0.5	NA	0.9	0				Bentonite seal 4.0' to 72.0' below grade
		*									
	105									Red TILL (fine to medium Sand, some Silt), dense.	
		010		37 22 15 17	37	2.0	0			TILL with gray basalt boulder/Gravel.	
50										Red fine to medium Gravel, some medium to coarse Sand. (Till)	
		011		10 21 27 17	48	1.0	0			Red TILL (fine Sand, some Silt), dense.	
	100	*									
55		012			29	2.0	0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.41	8.01 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703D

Total Depth = 85.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		012			29	2.0	0				
	95	*									
60		013		22 21 21 31	42	2.0	0			Red TILL (medium to coarse Sand, some Silt), very tight. Red TILL (tight Silt, some fine Sand, little Gravel).	2-in diameter schedule 40 PVC well casing to 74.0' below grade
	90	*									
65		014		100/0.3	NA	1.0	0			Dark gray basalt in tip of spoon.	Bentonite seal 4.0' to 72.0' below grade
	85	*									
70		015		100/0.5	NA	0.5	0			Red TILL with fragment of black/gray basalt. Red/gray TILL (fine Sand, some Silt).	
	80	*									Grade #0 Morie sand pack 72.0' to 85.0' below grade
75		016		34 51 100/0.5	NA	1.2	0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.41	8.01 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703D

Total Depth = 85.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		016		34 51 100/0.5	NA	L2	0			Red TILL with fragments of extremely weathered arkose boulders in tip of spoon.	Grade #0 Morie sand pack 72.0' to 85.0' below grade; 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 74.0' to 84.0' below grade; 4-in long Schedule 40 PVC bottom cap
75											
80		*									
70											
		017		100/0.2	NA	NA	0			Red crumbly, extremely weathered SANDSTONE.	
										No sample taken.	
85										Bottom of borehole at 85' bgs.	
65											
90											
60											
95											

BBL
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Remarks:

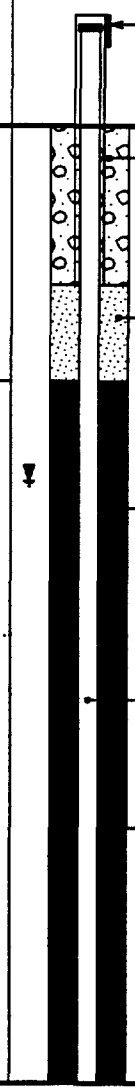
Water Levels

Date / Time	Elevation	Depth
01/21/97	147.41	8.01 ▼

Date Start/Finish: 09/25/96 - 10/02/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285072.8330 **Easting:** 565299.4695 **TIC Elev.:** 155.20 ft. **Borehole Depth:** 175 ft. **Ground Surface Elev.:** 153.0 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-703DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.0 ft.									GROUND SURFACE
	150	*								
5		01		9 13 17 29	30	1.8	0			Light brown fine to coarse subangular SAND, trace Gravel, moist to wet, medium dense.
	145	*								
10		02		9 10 13 12	23	1.7	0			Dark brown fine, moderatley well sorted, subrounded SAND, saturated, medium dense.
		H001								
	140	*								
15		03		10	24	1.5	0			Red/brown fine, mica rich, subrounded SAND, trace Silt.

Monitoring Well Construction



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Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-89.0 ft. bgs. 4.0-in. Rollerbit 89-175.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		10	24	1.5	0			Red/brown fine, mica rich, subrounded SAND, trace Silt.	
		*									8.25-in diameter HSA borehole
	135									Brown fine to medium subrounded SAND, loose.	
		04		3 4 5 22	9	2.0	0			Red/brown fine SAND, little Silt, grading to fine to medium SAND.	
20		H003									2-in diameter schedule 40 PVC well casing to 144.3' below grade
	130	*									
		05 S017		16 8 11 15	19	2.0	0			Red/brown fine SAND, trace Silt, medium dense.	
25										Red very fine SAND, mica rich, little silt.	Bentonite seal 4.0' to 139.4' below grade
		*									
	125	06		9 12 14 21	26	2.0	0			0.1' red fine subrounded GRAVEL, medium dense.	
30		H004									
	120	*									
35		07 S018			21	2.0	0			Reddish/olive brown, medium to coarse subangular to subrounded SAND, little Gravel.	

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Remarks:
* = Interval augered through.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07 S018			21	2.0	0			Fine to medium SAND.	
		*								Red medium to coarse well sorted SAND.	8.25-in diameter HSA borehole
	115	08		4 26 23 15	49	2.0	0				
40		H005								Red TILL (Silt and very fine Sand, little Gravel, trace Clay), medium dense.	2-in diameter schedule 40 PVC well casing to 144.3' below grade
	110	*									
45		09 S019		34 100/0.5	NA	0.9	0				Bentonite seal 4.0' to 139.4' below grade
		*									
	105	010		37 22 15 17	37	2.0	0			Red TILL (fine to medium Sand, some Silt), dense. TILL with gray basalt boulder/Gravel.	
50		H006 011 S020		10 21 27 17	48	1.0	0			Red fine to medium Gravel, some medium to coarse Sand. (Till) Red TILL (fine Sand, some Silt), dense.	
	100	*									
55		012 S021			29	2.0	0				

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Remarks:
* = Interval augered through.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		012 S021			29	2.0	0				
	95	*									8.25-in diameter HSA borehole
60		S022 013		22 21 21 31	42	2.0	0			Red TILL (medium to coarse Sand, some Silt), very tight. Red TILL (tight Silt, some fine Sand, little Gravel).	2-in diameter schedule 40 PVC well casing to 144.3' below grade
	90	*									
65		014		100/0.3	NA	1.0	0			Dark gray basalt in tip of spoon.	Bentonite seal 4.0' to 139.4' below grade
	85	*									
70		S023 015		100/0.5	NA	0.5	0			Red TILL with fragment of black/gray basalt. Red/gray TILL (fine Sand, some Silt).	
	80	*									
75		016 S024		34 51 100/0.5	NA	1.2	0				

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Remarks:
* = Interval augered through.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		016 S024		34 51 100/0.5	NA	L2	0				
	75										8.25-in diameter HSA borehole
		S025								Red TILL with fragments of extremely weathered arkose boulders in tip of spoon.	
80		*									2-in diameter schedule 40 PVC well casing to 144.3' below grade
	70										
		017		100/0.2	NA	NA	0			Red crumbly, extremely weathered SANDSTONE.	
85											Bentonite seal 4.0' to 139.4' below grade
		*									
	65										
				5						4.0-in. diameter Rollerbit used from 89' - 112' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
90				4							
				3							4.0-in diameter Rollerbit borehole
				5							
	60			5							
				4							
95											

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Remarks:
* = Interval augered through. Top of bedrock 84.0 ft. bgs. 8.25-in. OD HSA 0-89.0 ft. bgs. 4.0-in. Rollerbit 89-175.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ▼

Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				5							
				5							4.0-in diameter Rollerbit borehole
				5							
	55			4							
				4							
100				4							2-in diameter schedule 40 PVC well casing to 144.3' below grade
				4							
				4							
	50			4							
				4						4.0-in. diameter Rollerbit used from 89' - 112' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
105				5							Bentonite seal 4.0' to 139.4' below grade
				5							
				4							
	45			4							
				5.5							
110				2.5							
				2.5							
				2							
	40			2							
115				2							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				3							
				3.5							4.0-in diameter Rollerbit borehole
				2.5							
	35			3							
				3							
120				4							2-in diameter schedule 40 PVC well casing to 144.3' below grade
				5							
				4							
	30			5							
				4							
125				3						4.0-in. diameter Rollerbit used from 89' - 112' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Bentonite seal 4.0' to 139.4' below grade
				3							
				3							
	25			3							
				3							
130				3							
				3							
				4							
	20			3							
135				4							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				4							
				4							Bentonite seal 4.0' to 139.4' below grade
				4							
	15			4							
				4							4.0-in diameter Rollerbit borehole
140				5							
				5							
				4.5							2-in diameter schedule 40 PVC well casing to 144.3' below grade
	10			5.5							
				5							
145				4						4.0-in. diameter Rollerbit used from 89' - 112' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 144.3' to 174.3' below grade
				4							
				4							
	5			4							
				4							
150				4							Grade #0 Morie sand pack 139.4' to 174.6' below grade
				5							
				5							
	0			5							
155				4							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-703DR

Total Depth = 175 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				4							
				5							4.0-in diameter Rollerbit borehole
				5							
-5				5							
				5							
180				4							
				3							
				3							
-10				3							
				2							
185				3						4.0-in. diameter Rollerbit used from 89' - 112' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 144.3' to 174.3' below grade
				4							
				5							
-15				5							
				5							
190				4							Grade #0 Morie sand pack 139.4' to 174.6' below grade
				5							
				4							
-20				4							
				4						Bottom of rollerbit borehole at 175' bgs.	4-in long Schedule 40 PVC bottom cap
195											

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Remarks:

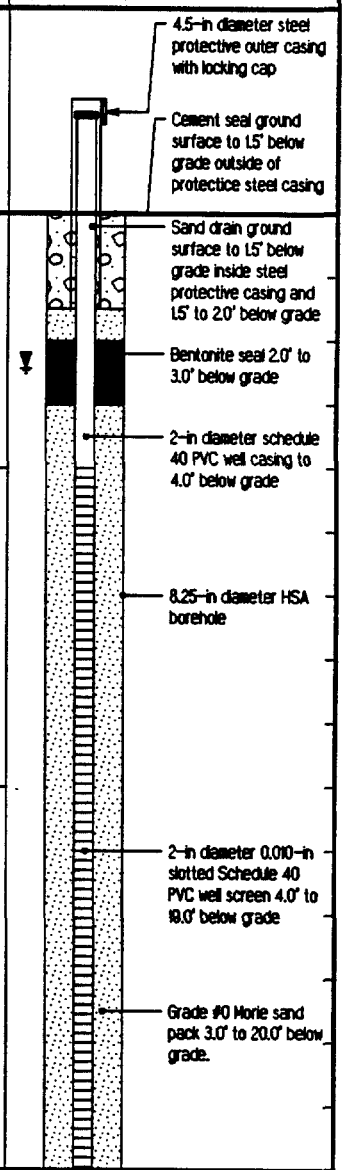
Water Levels

Date / Time	Elevation	Depth
01/21/97	147.42	7.78 ▼

Date Start/Finish: 10/07/96 - 10/14/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285583.4156 **Easting:** 565557.1725 **TIC Elev.:** 152.69 ft. **Borehole Depth:** 20.0 ft. **Ground Surface Elev.:** 150.5 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-704S** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 150.5 ft.									GROUND SURFACE
	150	*								
5	145	01		17 50/0.4	NA	0.6	0			Light olive gray/red fine to medium SAND, some fine to medium Gravel, trace Silt, moist. Boulder at 5' bgs.
		*								
10	140	02		5 7 11 11	18	1.5	0			Red fine subrounded SAND and SILT, trace Clay, saturated, medium dense.
		*								
15		03		4 4	13	1.5	0			

Monitoring Well Construction



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Remarks:

Geologic descriptions based on MW-704DR. No samples taken at MW-704S. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-20.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.07	4.62 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704S

Total Depth = 20.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	135	03		9 13	13	1.5	0			Red fine subrounded SAND and SILT, trace Clay, trace fine Gravel, medium dense.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 4.0' to 19.0' below grade Grade #0 Morie sand pack 3.0' to 20.0' below grade.
		*									
		04		3 4		1.0	0			Red fine SAND, little to trace Silt, loose.	4-in long Schedule 40 PVC bottom cap
20	130									Bottom of borehole at 20' bgs.	
25	125										
30	120										
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.07	4.62 ▼

Date Start/Finish: 10/07/96 - 10/14/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285574.2696 **Easting:** 565557.0877 **TIC Elev.:** 152.55 ft. **Borehole Depth:** 48.0 ft. **Ground Surface Elev.:** 150.6 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-704M** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 150.6 ft.									GROUND SURFACE
	150	*								
5	145	01		17 50/0.4	NA	0.6	0			Light olive gray/red fine to medium SAND, some fine to medium Gravel, trace Silt, moist. Boulder at 5' bgs.
		*								
10	140	02		5 7 11 11	18	1.5	0			Red fine subrounded SAND and SILT, trace Clay, saturated, medium dense.
		*								
15		03		4 4	13	1.5	0			

Monitoring Well Construction

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Remarks:

Geologic descriptions based on MW-704DR. No samples taken at MW-704M. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-48.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.16	4.39 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704M

Total Depth = 48.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	135	03		9 13	13	1.5	0			Red fine subrounded SAND and SILT, trace Clay, trace fine Gravel, medium dense.	8.25-in diameter HSA borehole
		*									
20	130	04		3 4 3 5	7	2.0	0			Red fine SAND, little to trace Silt, loose.	2-in diameter schedule 40 PVC well casing to 37.0' below grade
		*								Red fine SAND and SILT, little Clay.	
25	125	05		12 8 9 12	17	1.7	0			Grading to red fine SAND, little Silt, medium dense.	Bentonite seal 4.0' to 34.8' below grade
		*								Red SILT, little Clay, trace Sand.	
30	120	06		107 38 25 18	63	1.5	0			Red SILT and fine SAND, some Gravel, hard. Boulder at 29' bgs.	
		*								Red and gray, fine to medium GRAVEL, some Silt, little fine to coarse Sand.	
35		07			23	1.5	0			Red-light olive/brown, medium to coarse SAND, some fine Sand, medium dense.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.16	4.39 ▼

Client:
SRSNE PRP Group

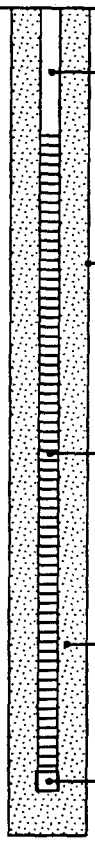
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704M

Total Depth = 48.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
	115	07			23	1.5	0			Red fine to medium GRAVEL, some coarse Sand, little fine to medium Sand.
		*								
40	110	08		14 9 11 14	20	1.0	0			Red fine to medium SAND and SILT, little fine Gravel, stiff.
										Red TILL (fine to medium Sand and Silt, some coarse subrounded Sand, little Gravel), stiff.
		*								
45	105	09		100/0.3	NA	0.1	0			0.1' red, fine, extremely weathered Arkose.
		*								
										Bottom of borehole at 48' bgs.
60	100									
55										

Monitoring Well Construction



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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.16	4.39 ▼

Date Start/Finish: 10/07/96 - 10/28/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and HQ Core Bit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285591.0403 **Easting:** 565540.2456 **TIC Elev.:** 153.37 ft. **Borehole Depth:** 63.3 ft. **Ground Surface Elev.:** 150.5 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-704D** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 150.5 ft.									
										GROUND SURFACE
	150	*								
5	145	01		17 50/0.4	NA	0.6	0			Light olive gray/red fine to medium SAND, some fine to medium Gravel, trace Silt, moist. Boulder at 5' bgs.
		*								
10	140	02		5 7 11 11	18	1.5	0			Red fine subrounded SAND and SILT, trace Clay, saturated, medium dense.
		H009								
		*								
15		03 S033		4 4	13	1.5	0			

Monitoring Well Construction

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Remarks:

Geologic descriptions based on MW-704DR. No samples taken at MW-704D. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-63.3 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.15	5.22 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704D

Total Depth = 83.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	135	03 S033		9 13	13	1.5	0			Red fine subrounded SAND and SILT, trace Clay, trace fine Gravel, medium dense.	8.25-in diameter HSA borehole
		*									
20	130	04 S034		3 4 3 5	7	2.0	0			Red fine SAND, little to trace Silt, loose.	2-in diameter schedule 40 PVC well casing to 53.0' below grade
		H010								Red fine SAND and SILT, little Clay.	
		*									
25	125	05 S035		12 8 9 12	17	1.7	0			Grading to red fine SAND, little Silt, medium dense.	Bentonite seal 4.0' to 51.0' below grade
		*								Red SILT, little Clay, trace Sand.	
30	120	06		107 38 25 18	63	1.5	0			Red SILT and fine SAND, some Gravel, hard. Boulder at 29' bgs.	
		H012								Red and gray, fine to medium GRAVEL, some Silt, little fine to coarse Sand.	
		*									
35		07 S036			23	1.5	0			Red-light olive/brown, medium to coarse SAND, some fine Sand, medium dense.	

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.15	5.22 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704D

Total Depth = 63.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	115	07 S036			23	1.5	0			Red fine to medium GRAVEL, some coarse Sand, little fine to medium Sand.	8.25-in diameter HSA borehole
		*									
40	110	08		14 9 11 14	20	1.0	0			Red fine to medium SAND and SILT, little fine Gravel, stiff.	2-in diameter schedule 40 PVC well casing to 53.0' below grade
										Red TILL (fine to medium Sand and Silt, some coarse subrounded Sand, little Gravel), stiff.	
		H013									
		*									
										0.1' red, fine, extremely weathered Arkose.	
45	105	09		100/0.3	NA	0.1	0				Bentonite seal 4.0' to 51.0' below grade
		*									
		1		2.8	NA	0.5				Gray diabase/basalt boulder.	
				10							
50	100			4						No sample taken from 50' to 75' bgs.	
										Sand, Gravel, Boulders (Coarse Drift)	Grade #0 Morie sand pack 51.0' to 63.3' below grade.
											2-in diameter 0.010-in slotted Schedule 40 PVC well screen 53.0' to 63.0' below grade
55		2		3	NA	NA					

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.15	5.22 ▼

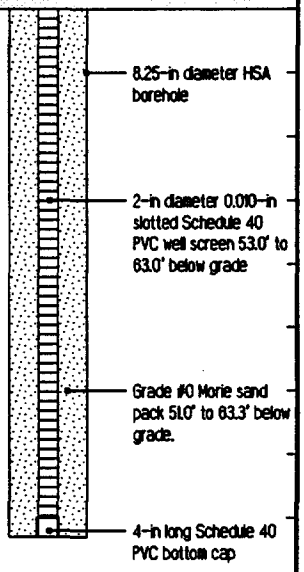
Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704D

Total Depth = 63.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	95	2		3 3 3	NA	NA				Sand, Gravel, Boulders (Coarse Drift)	8.25-in diameter HSA borehole 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 53.0' to 63.0' below grade Grade #0 Morie sand pack 51.0' to 63.3' below grade. 4-in long Schedule 40 PVC bottom cap
60	90										
										Bottom of borehole at 63.3' bgs.	
65	85										
70	80										
	75										



Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.15	5.22 ⊻

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Project: 083.31
Script: srsne2
Date: 04/23/97

Date Start/Finish: 10/07/96 - 10/28/96
Drilling Company: East Coast - Thomas

Drilling Method: HSA and HQ Core Bit
Bedrock Drill Bit Size: 4-in.
Auger Size: 8.25-in. OD HSA
Rig Type: Mobile B-59
Spoon Size: 2-in.

Northing: 285582.6951
Easting: 565568.3036
TIC Elev.: 152.00 ft.

Borehole Depth: 89.3 ft.
Ground Surface Elev.: 150.5 ft.

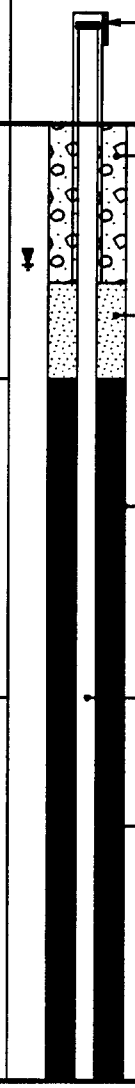
Geologist: Aaron D. Svitana

Monitoring Well No: MW-704R

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 150.5 ft.									GROUND SURFACE
	150	*								
5	145	01		17 50/0.4	NA	0.6	0			Light olive gray/red fine to medium SAND, some fine to medium Gravel, trace Silt, moist. Boulder at 5' bgs.
		*								
10	140	02		5 7 11 11	18	1.5	0			Red fine subrounded SAND and SILT, trace Clay, saturated, medium dense.
		H009								
		*								
		03 S033		4 4	13	1.5	0			
15										



Monitoring Well Construction

- 4.5-in diameter steel protective outer casing with locking cap
- Cement seal ground surface to 2.5' below grade outside of protectice steel casing
- Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
- 8.25-in diameter HSA borehole
- 2-in diameter schedule 40 PVC well casing to 79.0' below grade
- Bentonite seal 4.0' to 77.0' below grade

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Remarks:

Geologic descriptions and drilling rates based on MW-704DR. No samples taken at MW-704R. 8.25-in. OD HSA 0-77 ft. bgs and 4.0-in. HQ Core Barrel 77-89.3 ft. bgs at MW-704R.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.29	3.71 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704R

Total Depth = 89.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	135	03 S033		9 13	13	1.5	0			Red fine subrounded SAND and SILT, trace Clay, trace fine Gravel, medium dense.	8.25-in diameter HSA borehole
		*									
20	130	04 S034		3 4 3 5	7	2.0	0			Red fine SAND, little to trace Silt, loose.	2-in diameter schedule 40 PVC well casing to 79.0' below grade
		H010								Red fine SAND and SILT, little Clay.	
		*									
25	125	05 S035		12 8 9 12	17	1.7	0			Grading to red fine SAND, little Silt, medium dense.	Bentonite seal 4.0' to 77.0' below grade
										Red SILT, little Clay, trace Sand.	
		*									
30	120	06		107 38 25 18	63	1.5	0			Red SILT and fine SAND, some Gravel, hard. Boulder at 29' bgs.	
										Red and gray, fine to medium GRAVEL, some Silt, little fine to coarse Sand.	
		H012									
		*									
35		07 S036			23	1.5	0			Red-light olive/brown, medium to coarse SAND, some fine Sand, medium dense.	

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Remarks:
* = Interval augered through. TIC = Top of inner casing.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.29	3.71 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704R

Total Depth = 89.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	115	07 S036			23	1.5	0			Red fine to medium GRAVEL, some coarse Sand, little fine to medium Sand.	8.25-in diameter HSA borehole
		*									
40	110	08		14 9 11 14	20	1.0	0			Red fine to medium SAND and SILT, little fine Gravel, stiff.	2-in diameter schedule 40 PVC well casing to 79.0' below grade
										Red TILL (fine to medium Sand and Silt, some coarse subrounded Sand, little Gravel), stiff.	
		H013									
		*									
										0.1' red, fine, extremely weathered Arkose.	
45	105	09		100/0.3	NA	0.1	0				Bentonite seal 4.0' to 77.0' below grade
		*									
				2.8						Gray diabase/basalt boulder.	
		1		10	NA	0.5					
50	100			4						No sample taken from 50' to 75' bgs.	
										Sand, Gravel, Boulders (Coarse Drift)	
55		2		3	NA	NA					

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.29	3.71 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704R

Total Depth = 89.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	95	2		3, 3, 3	NA	NA				Sand, Gravel, Boulders (Coarse Drift)	8.25-in diameter HSA borehole
60	90			NA							2-in diameter schedule 40 PVC well casing to 79.0' below grade
65	85	3		6, 4, 3, 4, 5, 4, 3, 2, 3	NA	NA					Bentonite seal 4.0' to 77.0' below grade
70	80										
75											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.29	3.71 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704R

Total Depth = 89.3 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
	75			3						Top of bedrock at 75.6' bgs.
		3		3	NA	NA				
				3						
				3.5						0.1' red Clay and Silt, some Gravel pieces.
		R012		5.5						Red fine SANDSTONE, 0.3' bioturbation.
80	70			6.5						Mica enrichment.
				3.5						Some green clasts at 81.5' bgs. One horizontal joint.
				3	89%	7.67				
		4		3						Slighty coarse-grained SANDSTONE.
				3						Elongate white clasts oriented primarily horizontal.
85	65			2						Red feldspathic SANDSTONE. Horizontal joint at 85.2' bgs.
				2.5						Mica enrichment.
		R013		3	98%					Two joints at 15° from horizontal.
				3.5						Red/gray, coarsening down, fine to medium quartz and feldspathic SANDSTONE. Two horizontal joints.
90	60									Bottom of HQ Corehole at 89.3' bgs.
95										

Monitoring Well Construction

- 8.25-in diameter HSA borehole
- Bentonite seal 4.0' to 77.0' below grade
- 2-in diameter schedule 40 PVC well casing to 79.0' below grade
- 4.0-in diameter HQ corehole
- 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 79.0' to 89.0' below grade
- Grade #0 Morie sand pack 77.0' to 89.3' below grade.
- 4-in long Schedule 40 PVC bottom cap

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Remarks:

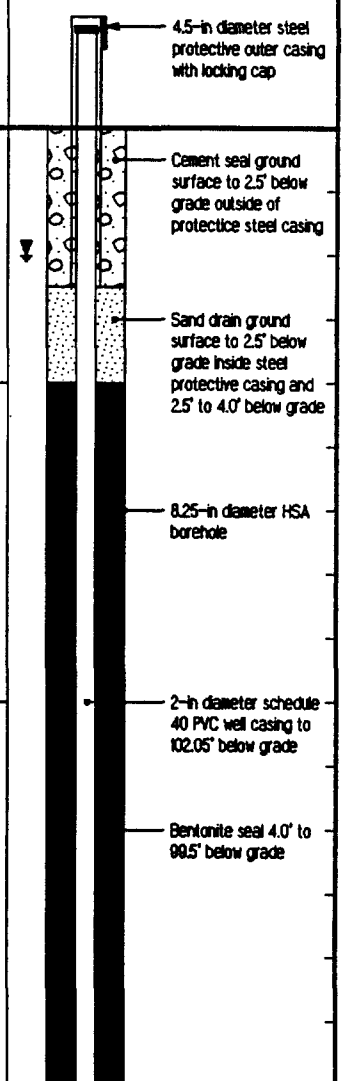
Water Levels

Date / Time	Elevation	Depth
01/21/97	148.29	3.71 ▼

Date Start/Finish: 10/07/96 - 10/28/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and HQ Core Bit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 285564.5480 **Easting:** 565552.0834 **TIC Elev.:** 153.06 ft. **Borehole Depth:** 166.5 ft. **Ground Surface Elev.:** 150.6 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-704DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 150.6 ft.									GROUND SURFACE
	150	*								
5	145	01		17 50/0.4	NA	0.6	0			Light olive gray/red fine to medium SAND, some fine to medium Gravel, trace Silt, moist. Boulder at 5' bgs.
		*								
10	140	02		5 7 11 11	18	1.5	0			Red fine subrounded SAND and SILT, trace Clay, saturated, medium dense.
		H009								
		*								
15		03 S033		4 4	13	1.5	0			

Monitoring Well Construction



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Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-57 ft. bgs. 4.25-in. OD HW Casing 0-78 ft. bgs. 4.0-in. HQ Core Barrel 78-165.5 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 188.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	135	03 S033		9 13	13	1.5	0			Red fine subrounded SAND and SILT, trace Clay, trace fine Gravel, medium dense.	8.25-in diameter HSA borehole
		*									
20	130	04 S034		3 4 3 5	7	2.0	0			Red fine SAND, little to trace Silt, loose.	2-in diameter schedule 40 PVC well casing to 102.05' below grade
		H010								Red fine SAND and SILT, little Clay.	
		*									
25	125	05 S035		12 8 9 12	17	1.7	0			*Grading to red fine SAND, little Silt, medium dense.*	Bentonite seal 4.0' to 99.5' below grade
										Red SILT, little Clay, trace Sand.	
		*									
30	120	06		107 38 25 18	63	1.5	0			Red SILT and fine SAND, some Gravel, hard. Boulder at 29' bgs.	
										Red and gray, fine to medium GRAVEL, some Silt, little fine to coarse Sand.	
		H012									
		*									
35		07 S036			23	1.5	0			Red-light olive/brown, medium to coarse SAND, some fine Sand, medium dense.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 186.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	115	07 S036			23	1.5	0			Red fine to medium GRAVEL, some coarse Sand, little fine to medium Sand.	8.25-in diameter HSA borehole
		*									
40	110	08		14 9 11 14	20	1.0	0			Red fine to medium SAND and SILT, little fine Gravel, stiff.	2-in diameter schedule 40 PVC well casing to 102.05' below grade
										Red TILL (fine to medium Sand and Silt, some coarse subrounded Sand, little Gravel), stiff.	
		H013									
		*									
45	105	09		100/0.3	NA	0.1	0			0.1' red, fine, extremely weathered Arkose.	Bentonite seal 4.0' to 99.5' below grade
		*									
		1		2.8	NA	0.5				Gray diabase/basalt boulder. Cored 48-51.0' bgs using HQ core barrel.	
50	100			10							
				4						No sample taken from 50' to 75' bgs.	
										Sand, Gravel, Boulders (Coarse Drift)	
										Advanced borehole using 4-in. diameter spun casing from 48' to 78' bgs with 4-in. rollerbit.	
55		2		3	NA	NA					

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Remarks:

Initial attempt at HQ coring was made from 48-51' bgs, but was unsuccessful. Similar attempts were made from 55-58' and 63-66' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 186.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	95	2		3, 3, 3	NA	NA				Purged casing and obtained ground-water grab sample H014 (54'-58'). Advanced borehole using 4-in. diameter spun casing from 58' to 66' bgs, then used rollerbit 63'to 66' bgs. Sand, Gravel, Boulders (Coarse Drift)	8.25-in diameter HSA borehole
60	90			NA							2-in diameter schedule 40 PVC well casing to 102.05' below grade
65	85	3		6, 4, 3.5, 3, 4, 5, 4, 3, 2, 3	NA	NA				Purged casing and obtained ground-water grab sample H015 (63'-68'). Drilling rates from 63' to 78' bgs indicate rollerbit times during advancement and cleaning of 4-in. spun casing.	Bentonite seal 4.0' to 99.5' below grade
70	80										
75											

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Remarks:
Advanced borehole using 4-in. diameter spun casing from 48' to 78' bgs with 4-in. rollerbit.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 166.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	75			3						Top of bedrock at 75.6' bgs.	
		3		3	NA	NA				HQ core sampling of bedrock begins at 78.0' bgs.	8.25-in diameter HSA borehole
				3							
				3.5						0.1' red Clay and Silt, some Gravel pieces. Red fine SANDSTONE, 0.3' bioturbation. Mica enrichment.	
		R012		5.5							4.0-in diameter HQ corehole
80	70			6.5							
				3.5						Some green clasts at 81.5' bgs. One horizontal joint.	
				3	89%	7.67					
		4		3						Slighty coarse-grained SANDSTONE.	2-in diameter schedule 40 PVC well casing to 102.05' below grade
				3						Elongate white clasts oriented primarily horizontal. Red feldspathic SANDSTONE.	
85	65			2						Horizontal joint at 85.2' bgs.	
				2.5						Mica enrichment.	
		R013								Two joints at 15° from horizontal.	
				3							Bentonite seal 4.0' to 99.5' below grade
				3.5						Red/gray, coarsening down, fine to medium quartz and feldspathic SANDSTONE. Two horizontal joints.	
				3						Red SILTSTONE to fine SANDSTONE, some gray/green reduction spots. Sharp contact with above.	
90	60			3	98%	10.0				Red feldspathic SANDSTONE, grading to Conglomerate with feldspathic and quartz clasts.	
		5		3.5							
				3							
				3							
95				3							

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Remarks:
Advanced borehole using 4-in. diameter spun casing from 48' to 78' bgs with 4-in. rollerbit.

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 166.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	55	5		3	98%	10.0					4.0-in diameter HQ corehole
										Red feldspathic SANDSTONE, grading to Sandstone/Conglomerate as above.	
				4							
				3						Red SANDSTONE with mica enrichment.	Bentonite seal 4.0' to 99.5' below grade
				3.5							
100										Horizontal joints at 100' and 100.5' bgs.	2-in diameter schedule 40 PVC well casing to 102.05' below grade
	50			3							
										One joint at 45° from horizontal.	
		6		3	98%	10.0					
										Red/gray color.	
				3							
				3							
										0.2' horizontal joint filled with Clay/Silt.	
				3.5							
105											2-in diameter 0.010-in slotted Schedule 40 PVC well screen 102.05' to 132.05' below grade
	45			3							
				3.5						Red mica enriched feldspathic SANDSTONE/SILTSTONE, gray/green reduction spots at 106.5' bgs.	
				3							
				3.5							
				3.5							
110											
	40	7		3.5	96%	9.58					
				3.5						Two horizontal joints.	
				3							Grade #0 Morie sand pack 99.5' to 134.0' below grade.
				3						Red mica enriched feldspathic SANDSTONE.	
				3						Horizontal joint.	
115											

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engineers & scientists

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 166.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	35	7		3	96%	9.58				Grading to slighty coarser SANDSTONE. Two horizontal joints.	4.0-in diameter HQ corehole
										One horizontal joint, one joint at 10° from horizontal.	
		R015		4.5						Red feldspathic SANDSTONE with horneblend crystals. Gray/green reduction spots and elongate horizontal and vertical tubes. Horizontal joint.	
				5.5							
				7							
120	30			7						Red matrix supported CONGLOMERATE, feldspathic and quartz clasts.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 102.05' to 132.05' below grade
				6	96%	9.92					
		8		3.5						0.2' gray Sandstone/Siltstone oriented at 10-15° from horizontal.	
				2.5							
				3						Red mica enriched feldspathic SANDSTONE.	
125	25			3							Grade #0 Morie sand pack 99.5' to 134.0' below grade.
				3						Coarsening slightly from fine to medium grained.	
				3							
				3.5						0.2' red Conglomerate.	
				3							
130	20	9		3	90%	9.92					
				3							
				3.5							4-in long Schedule 40 PVC bottom cap
				3						Red matrix supported CONGLOMERATE, clasts of feldspar, little elongate mudstone clasts, cross bedding.	
135				3							Bentonite seal 134.0' to 165.5' below grade

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48

Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 166.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	15	9		3	99%	9.92				Red/gray feldspathic SANDSTONE, some elongate mud clasts parallel to (5°) bedding. Remineralized burrow at 136' bgs.	4.0-in diameter HQ corehole
				3							
				3						Gray/red CONGLOMERATE, feldspathic and red mudstone clasts <1".	
				3						Red/gray fine to coarse SANDSTONE grading to gray Conglomerate, slight imbrication and cross bedding.	
140	10			3							Bentonite seal 134.0' to 165.5' below grade
		10		3	98%	9.79				Horizontal joint.	
				4							
				4						Red feldspathic SANDSTONE. Mica enrichment and bioturbation at 143' bgs.	
				4							
145	5			4						Gray/green reduction spots. One joint at 30° from horizontal.	
				4							
				5							
				5						Red-gray/green bioturbated SANDSTONE.	
				5						Red feldspathic SANDSTONE.	
150	0	11		5	98%	9.92					
				5							
				2.6							
				2.6							
155				2.6						Gray/green reduction spots.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-704DR

Total Depth = 166.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	-5	11		2.6	98%	9.92					4.0-in diameter HQ corehole
		12		4.2	100%	10.0				Red fine SANDSTONE, coarsening down.	
				4.2							
				4.2							
160	-10			4.2						Red/gray CONGLOMERATE. One joint at 10° from horizontal.	Bentonite seal 134.0' to 165.5' below grade
				4.2						Gray/red matrix supported CONGLOMERATE, clasts primarily feldspar and quartz, little elongate mudstone clasts 1.5" diameter. One horizontal joint at 161.7' bgs.	
				3							
		RQ18		3							
				3						Some large clasts up to 3" diameter.	
165	-15			3							
										Bottom of HQ Corehole at 166.5' bgs.	
170	-20										
175											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	148.58	4.48 ▼

Date Start/Finish: 09/05/96 - 09/05/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 286754.4170 **Easting:** 565421.4869 **TIC Elev.:** 161.58 ft. **Borehole Depth:** 37.0 ft. **Ground Surface Elev.:** 159.4 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-705D** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 159.4 ft.									GROUND SURFACE
		01		4 6 9 9	15	1.5	0			Brown/red SILT and fine SAND, trace gravel and wood fragments, moist, stiff.
		02		4 6 5 9	11	1.2	0			Red very fine to medium SAND, some Silt, trace gravel, moist, medium dense.
	155	03		10 10 6 10	16	1.0	0			Red to light brown color change.
5		04		10 15 19 23	34	1.8	0			Red to light brown, poorly sorted fine to coarse SAND and fine to medium GRAVEL, moist, dense.
		05		6 10 13 15	23	1.2	0			Light brown/light gray, well sorted medium SAND, moist, medium dense. Red SILT and very fine SAND, some fine to medium Gravel, moist, very stiff. Very fine to fine Sand, little Gravel, trace Silt, saturated.
	150									
10		06		5 5 10 10	15	1.8	0			Grading to light olive brown SILT, some Clay, trace Gravel, medium dense.
										Red fine to medium SAND, little Silt.
		07		9 10 14 14	24	2.0	0			Poorly sorted fine to coarse SAND and GRAVEL grading to light olive brown Silt, trace Clay, medium dense.
	145	08		19 31	62	1.1	0			Red SILT, some fine Sand, little Clay, hard.
15										

Monitoring Well Construction

- 4.5-in diameter steel protective outer casing with locking cap
- Cement seal ground surface to 2.5' below grade outside of protectice steel casing
- Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
- 8.25-in diameter HSA borehole
- Bentonite seal 4.0' to 22.5' below grade
- 2-in diameter schedule 40 PVC well casing to 25.0' below grade

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Remarks:

Geologic description based on MW-705DR. No samples taken at MW-705D. TIC = Top of inner casing. 8.25-in. OD HSA 0-37.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.28	4.30 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705D

Total Depth = 37.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		08		19 31	62	1.1	0			Augered past piece of boulder (fine grain red arkose) in tip of spoon.	
		09		100/0.2	NA	0.5	0				Bentonite seal 4.0' to 22.5' below grade
	140	10		25 34 36 32	70	1.5	0			Red fine to medium SAND and GRAVEL, little Silt, very dense.	
20		11		19 25 32 19	57	1.3	0				2-in diameter schedule 40 PVC well casing to 25.0' below grade
		12		12 18 21 30	39	2.0	0			Medium to coarse SAND, some Gravel, grading to fine to medium GRAVEL, dense. Fine to medium SAND, little Silt, trace Gravel, hard.	
	135	13		30 32 39 41	71	2.0	0			Medium to coarse SAND, little Gravel, very dense. SILT and very coarse SAND to fine GRAVEL, trace fine Sand.	Grade #0 Morie sand pack 22.5' to 37.0' below grade
25		14		19 26 35 51	61	2.0	0			Poorly sorted coarse SAND to fine GRAVEL, very dense. Fine to medium SAND. Red TILL; Silt, little Gravel and fine Sand.	
	130	15		32 48 62 58	110	2.0	0				2-in diameter 0.010-in slotted Schedule 40 PVC well screen 25.0' to 35.0' below grade
30		16		17 30 39 25	69	1.7	0				
		17		30 17 22 37	49	2.0	0			Medium to coarse SAND, little fine Gravel, dense, grading to medium to coarse Sand at 33.25' bgs. (Till) TILL. Gray crumbly weathered GRANITE.	8.25-in diameter HSA borehole
	125	18		18 21	43	2.0	0			Red medium to coarse SAND, some fine Gravel grading, dense. (Till)	
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.28	4.30 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705D

Total Depth = 37.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		18		18 21	43	2.0	0			Red TILL; Silt and fine Sand, little Gravel, trace Clay.	4-in long Schedule 40 PVC bottom cap
		19		42 54	54	1.0	0			Fine to coarse SAND, little Silt, trace Gravel, dense.	Grade #0 Morie sand pack 22.5' to 37.0' below grade
										Bottom of borehole at 37.0' bgs.	
	120										
40											
	115										
45											
	110										
50											
	105										
55											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.28	4.30 ▼

Project: 083.31

Script: srsne2
Date: 04/23/97

Date Start/Finish: 09/05/96 - 09/09/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and HQ Core Bit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 286744.1326 **Easting:** 565422.3351 **TIC Elev.:** 161.50 ft. **Borehole Depth:** 55.0 ft. **Ground Surface Elev.:** 159.5 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-705R** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH (depth / gs elevation 159.5 ft.)	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
										GROUND SURFACE
		01		4 6 9 9	15	1.5	0			Brown/red SILT and fine SAND, trace gravel and wood fragments, moist, stiff.
		02		4 6 5 9	11	1.2	0			Red very fine to medium SAND, some Silt, trace gravel, moist, medium dense.
5	155	03		10 10 6 10	16	1.0	0			Red to light brown color change.
		04		10 15 19 23	34	1.8	0			Red to light brown, poorly sorted fine to coarse SAND and fine to medium GRAVEL, moist, dense. Light brown/light gray, well sorted medium SAND, moist, medium dense.
10	150	05		6 10 13 15	23	1.2	0			Red SILT and very fine SAND, some fine to medium Gravel, moist, very stiff. Very fine to fine Sand, little Gravel, trace Silt, saturated.
		06		5 5 10 10	15	1.8	0			Grading to light olive brown SILT, some Clay, trace Gravel, medium dense. Red fine to medium SAND, little Silt.
		07		9 10 14 14	24	2.0	0			Poorly sorted fine to coarse SAND and GRAVEL grading to light olive brown Silt, trace Clay, medium dense.
15	145	08		19 31	62	1.1	0			Red SILT, some fine Sand, little Clay, hard.

Monitoring Well Construction

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Remarks:

Geologic description based on MW-705DR. No samples taken at MW-705R. TIC = Top of inner casing. 8.25-in. OD HSA 0-40.0 ft. bgs. 4.0-in. HQ Core Barrel 40-55.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	155.76	5.74

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705R

Total Depth = 55.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		08		19 31	62	1.1	0			Augered past piece of boulder (fine grain red arkose) in tip of spoon.	8.25-in diameter HSA borehole
		09		100/0.2	NA	0.5	0				
	140	10		25 34 36 32	70	1.5	0			Red fine to medium SAND and GRAVEL, little Silt, very dense.	
20		11		19 25 32 19	57	1.3	0				Bentonite seal 4.0' to 42.0' below grade
		12		12 18 21 30	39	2.0	0			Medium to coarse SAND, some Gravel, grading to fine to medium GRAVEL, dense. Fine to medium SAND, little Silt, trace Gravel, hard.	
	135	13		30 32 39 41	71	2.0	0			Medium to coarse SAND, little Gravel, very dense. SILT and very coarse SAND to fine GRAVEL, trace fine Sand.	2-in diameter schedule 40 PVC well casing to 44.0' below grade
25		14		19 26 35 51	61	2.0	0			Poorly sorted coarse SAND to fine GRAVEL, very dense. Fine to medium SAND.	
		15		32 48 62 56	110	2.0	0			Red TILL; Silt, little Gravel and fine Sand.	
	130	16		17 30 39 25	69	1.7	0				
30		17		30 17 22 37	49	2.0	0			Medium to coarse SAND, little fine Gravel, dense, grading to medium to coarse Sand at 33.25' bgs. (Till) TILL. Gray crumbly weathered GRANITE.	
	125	18		18 21	43	2.0	0			Red medium to coarse SAND, some fine Gravel grading, dense. (Till)	
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	155.76	5.74 ▼

Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

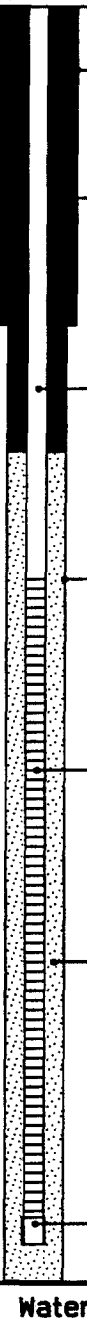
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705R

Total Depth = 55.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		18		18 21	43	2.0	0			Red TILL; Silt and fine Sand, little Gravel, trace Clay.
		19		42 54 55 58	109	1.8	0			Fine to coarse SAND, little Silt, trace Gravel, dense.
		20		41 50 50 61	100	0.7	0			Very fine SAND. Piece of red arkose is blocking tip of spoon.
40	120	100		100/0.2		0.2	0			
		01		6	58	3.41	0			Red highly weathered mica enriched SANDSTONE grading from fine to coarse. Silty material in fractures.
45	115	02		7.7	81	4.16	0			
50	110	03		1.77	100	4.5	0			Red matrix supported CONGLOMERATE, fine grain Sandstone matrix, clasts primarily quartz and fine to medium feldspathic Gravel. Gray/red matrix supported CONGLOMERATE.
55	105	04		1.5	100	2.0	0			Gray/red medium to coarse feldspathic SANDSTONE, moderately hard. Bottom of HQ corehole at 55.0' bgs.

Monitoring Well Construction



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Remarks:

Split spoon attempted at 40' bgs to confirm weathered bedrock. Coring commences at 40' bgs. Rate of penetration (minutes/foot) equals average for core run.

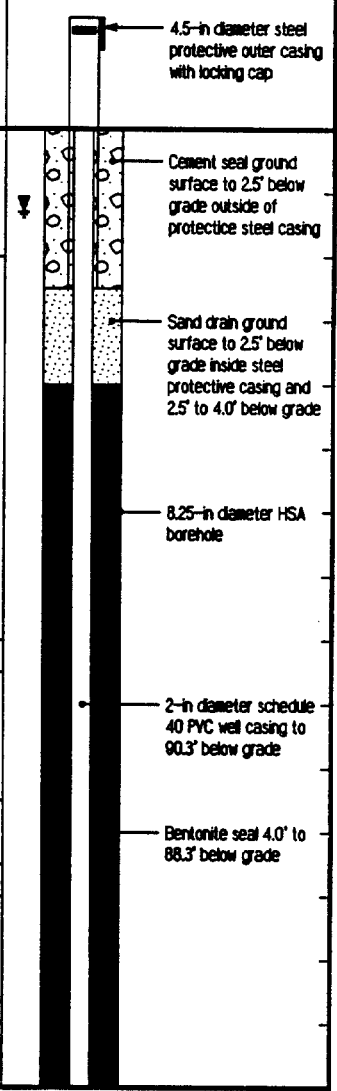
Water Levels

Date / Time	Elevation	Depth
01/21/97	155.76	5.74 ▼

Date Start/Finish: 08/28/96 - 09/05/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and HQ Core Bit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 286749.5633 **Easting:** 565429.3497 **TIC Elev.:** 160.89 ft. **Borehole Depth:** 103.0 ft. **Ground Surface Elev.:** 158.8 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-705DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 158.8 ft.									GROUND SURFACE
		01		4 6 9 9	15	1.5	0			Brown/red SILT and fine SAND, trace gravel and wood fragments, moist, stiff.
	155	02		4 6 5 9	11	1.2	0			Red very fine to medium SAND, some Silt, trace gravel, moist, medium dense.
5		03		10 10 6 10	16	1.0	0			Red to light brown color change.
		04		10 15 19 23	34	1.8	0			Red to light brown, poorly sorted fine to coarse SAND and fine to medium GRAVEL, moist, dense. Light brown/light gray, well sorted medium SAND, moist, medium dense.
	150	05		6 10 13 15	23	1.2	0			Red SILT and very fine SAND, some fine to medium Gravel, moist, very stiff. Very fine to fine Sand, little Gravel, trace Silt, saturated.
10		06		5 5 10 10	15	1.8	0			Grading to light olive brown SILT, some Clay, trace Gravel, medium dense. Red fine to medium SAND, little Silt.
	145	07		9 10 14 14	24	2.0	0			Poorly sorted fine to coarse SAND and GRAVEL grading to light olive brown Silt, trace Clay, medium dense.
15		08		19 31	62	1.1	0			Red SILT, some fine Sand, little Clay, hard.

Monitoring Well Construction



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Remarks:

TIC = Top of inner casing. 8.25-in. OD HSA 0-53.0 ft. bgs. 4.0-in. HQ Core Barrel 53-103.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.50	3.39 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705DR

Total Depth = 103.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		08		19 31	62	1.1	0			Red SILT, some fine Sand, little Clay, hard.	
		09		100/0.2	NA	0.5	0			Augered past piece of boulder (fine grain red arkose) in tip of spoon.	8.25-in diameter HSA borehole
	140	10		25 34 36 32	70	1.5	0			Red fine to medium SAND and GRAVEL, little Silt, very dense.	
20		11		19 25 32 19	57	1.3	0				2-in diameter schedule 40 PVC well casing to 90.3' below grade
		12		12 18 21 30	39	2.0	0			Medium to coarse SAND, some Gravel, grading to fine to medium GRAVEL, dense. Fine to medium SAND, little Silt, trace Gravel, hard.	
	135	13		30 32 39 41	71	2.0	0			Medium to coarse SAND, little Gravel, very dense.	
25										SILT and very coarse SAND to fine GRAVEL, trace fine Sand.	Bentonite seal 4.0' to 88.3' below grade
		14		19 26 35 51	61	2.0	0			Poorly sorted coarse SAND to fine GRAVEL, very dense. Fine to medium SAND.	
	130	15		32 48 62 58	110	2.0	0			Red TILL; Silt, little Gravel and fine Sand.	
30		16		17 30 39 25	69	1.7	0				
		17		30 17 22 37	49	2.0	0			Medium to coarse SAND, little fine Gravel, dense, grading to medium to coarse Sand at 33.25' bgs. (Till)	
	125									TILL. Gray crumbly weathered GRANITE.	
35		18		18 21	43	2.0	0			Red medium to coarse SAND, some fine Gravel grading, dense. (Till)	

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Remarks:
Split spoon refusal on boulder at 16.5' bgs. Augered through to 18' bgs and continued sampling.

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.50	3.39 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705DR

Total Depth = 103.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		18		18 21	43	2.0	0			Red TILL; Silt and fine Sand, little Gravel, trace Clay.	
		19		42 54 55 58	109	1.8	0			Fine to coarse SAND, little Silt, trace Gravel, dense.	8.25-in diameter HSA borehole
	120	20		41 50 50 61	100	0.7	0			Very fine SAND. Piece of red arkose is blocking tip of spoon.	
40		21		100/0.2	NA	NA	0			Red fine to medium ARKOSE, little fine Sand, trace Silt, extremely weathered. No recovery 40.2'-41.5' bgs.	2-in diameter schedule 40 PVC well casing to 90.3' below grade
		01 R001		9.5	49	1.5	0			Red/Gray SANDSTONE grading to gray matrix supported Conglomerate, hard, moderately weathered. Red SANDSTONE, moderately weathered fine to medium, mica enriched, feldspathic, hard. Broken zone at 42.3' to 42.5' bgs.	
	115									No samples taken. Spun augers to 53.0' bgs to seat them securely in bedrock. Extremely soft bedrock from 48'-51.5' bgs.	
45										See soil boring log MW-705R for stratigraphic description.	Bentonite seal 4.0' to 88.3' below grade
				NA	0.0	NS	NA				
	110										
60											
	105	02 R002		3.5	80	2.0	0			Grayish/red medium to coarse feldspathic SANDSTONE.	4.0-in diameter HQ corehole
55											

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Remarks:

NA = Not Available. NS = No Sample.
Weathered bedrock encountered at 40' bgs. HQ coring initiated at 40.2' bgs. Rate of penetration (minutes/foot) represents an average for the cored interval.

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.50	3.39 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705DR

Total Depth = 103.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03 R003+ R004		3.6	98	4.9	0			Red, hard fine to coarse feldspathic SANDSTONE coarsening to 6' bgs.	4.0-in diameter HQ corehole; 2-in diameter schedule 40 PVC well casing to 90.3' below grade
60	100										
65	95	04		4	100	10.0	0			Trace feldspar clasts up to 0.5" diameter.	Bentonite seal 4.0' to 88.3' below grade
70	90									Gray/red, quartz rich SANDSTONE, hard, some flat elongated red Siltstone clasts 0.25-1.0" long.	
										Red SILTSTONE lense with gray Siltstone/Mudstone clasts up to 2.5" diameter.	
		05		4	98	10.0	0			Gray/red fine to coarse feldspathic mica enriched SANDSTONE, little flat red Siltstone clasts <1" length.	
75	85									Gray matrix supported CONGLOMERATE, quartz and mica rich matrix with red Siltstone/Mudstone clasts <0.75" diameter. (Possibly diabase)	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.50	3.39 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705DR

Total Depth = 103.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		05		4	96	10.0	0			Gray matrix supported CONGLOMERATE, quartz and mica rich matrix with red Siltstone/Mudstone clasts <0.75" diameter (Possibly diabase). Red mica rich SILTSTONE.	4.0-in diameter HQ corehole; 2-in diameter schedule 40 PVC well casing to 90.3' below grade
80	80										
		06		5-6	80	8.25	0			Red matrix supported CONGLOMERATE, Siltstone/feldspathic Sandstone matrix. Red feldspathic and mica enriched SANDSTONE, grading to Siltstone and fine sandstone. Quartzite cobble. Red/gray laminated fine to medium feldspathic SANDSTONE (laminations are 5-10 deg. from horiz.), grading to matrix supported Conglomerate.	Bentonite seal 4.0' to 88.3' below grade; Grade #0 Morie sand pack 88.3' to 100.3' below grade.
75	75										
85											
90	70										
		07		6-7	89	8.45	0			Red matrix supported CONGLOMERATE, siltstone and fine feldspathic Sandstone matrix, coarsening down sequence. Broken zone at 94.3' to 94.7' bgs.	2-in diameter 0.010-in slotted #304 stainless steel well screen 90.3' to 100.3' below grade
95	65										

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.50	3.39 ▼

Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

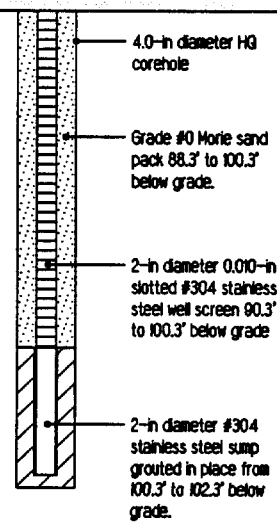
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-705DR

Total Depth = 103.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		07		6-7	89	8.45	0			Red feldspathic SANDSTONE grading to matrix supported Conglomerate with coarse Sand and fine quartz and feldspathic Gravel. Bottom interval not well cemented.
60		R006								
100		08		7	NA	0.0	NA			Inferred fracture zone exhibiting fine to medium, well rounded tan/red Sand from 99.5' to 100.0' bgs. Sheen noted on drilling water, odor. Red fine to medium, mica rich SANDSTONE.
		R005			100	2.8*	3.6/46			
		09								
55										Bottom of HQ corehole at 103' bgs.
105										
50										
110										
45										
115										

Monitoring Well Construction



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Remarks:
* = Return likely exhibits core cut during Run Number 08 due to core barrel jamming.

Water Levels

Date / Time	Elevation	Depth
01/21/97	157.50	3.39 ▼

Date Start/Finish: 09/16/96 - 09/24/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** Mobile B-59 **Spoon Size:** 2-in.	**Northing:** 286215.7199 **Easting:** 565667.5670 **TIC Elev.:** 149.91 ft. **Borehole Depth:** 153.0 ft. **Ground Surface Elev.:** 147.8 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-706DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH (depth)	ELEVATION (gs elevation 147.8 ft.)	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
										GROUND SURFACE
		01		2 3 3 3	6	1.1	0			Dark gray/brown SILT and very fine SAND, little fine to medium Sand and organic matter, moist, medium stiff.
	145	02		3 2 4 18	6	1.0	0			Light gray subrounded quartz SAND, wet, loose. Granite boulder in tip of spoon.
5		03		5 8 8 9	16	1.5	0			Dark gray SILT, some fine to medium Sand, trace organic matter, very stiff. Gray fine to medium angular GRAVEL, some Silt and fine to coarse Sand. Red fine SAND, some Silt, medium dense.
		04		7 5 14 9	19	2.0	0			
	140	05		3 7 9 14	16	1.4	0			Red fine to medium subrounded SAND and fine to medium subangular gray GRAVEL. No Gravel. Red fine SAND.
10		06		8 10 11 14	21	1.5	0			Fine SAND and SILT, trace Clay, very stiff.
	135	07		14 17 18 21	35	2.0	6			Fine to medium subrounded SAND, dense.
15		08		9 16	28	2.0	6			Fine SAND, trace Silt.

Monitoring Well Construction

- 4.5-in diameter steel protective outer casing with locking cap
- Cement seal ground surface to 2.5' below grade outside of protectice steel casing
- Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
- 8.25-in diameter HSA borehole
- 2-in diameter schedule 40 PVC well casing to 116.5' below grade
- Bentonite seal 4.0' to 114.2' below grade

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Remarks:

TIC = Top of inner casing. 8.25-in. OD HSA 0-62.5 ft. bgs. 4.0-in. Rollerbit 62.5-153.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		08		12 15	28	2.0	6			Fine SAND and SILT, trace Clay.	
		09		10 14 17 9	31	2.0	0			Some Silt. Fine SAND and SILT, trace Clay; grading to fine Sand, hard.	8.25-in diameter HSA borehole
	130	10		12 15 19 22	34	2.0	0			Red/gray SILT and fine SAND, little Clay.	
20		11		4 8 13 2	21	1.5	2			Very faint odor. Red SILT, little to trace Clay, mica enriched, very stiff.	2-in diameter schedule 40 PVC well casing to 116.5' below grade
	125	12		5 11 13 18	24	2.0	2			SILT and CLAY, some fine Sand, trace Gravel. At 23.9' bgs, faint odor.	
25		13		13 19 42 15	61	2.0	4			Red/gray SILT, some Clay, hard. Gray fine to medium GRAVEL, some Silt and fine to coarse Sand, highly weathered arkose fragment.	Bentonite seal 4.0' to 114.2' below grade
		14		18 21 28 35	49	2.0	14			Red/gray SILT, some Clay, hard. Medium to very coarse subrounded SAND grading to fine to medium, oblate Gravel. Slight to moderate odor.	
	120	15		13 19 28 18	47	1.4	2			SILT, some Clay, hard. Red SILT, some fine SAND, little Gravel. Medium to very coarse SAND, little fine Gravel, dense.	
30		16		8 14 16 17	30	2.0	4			SILT, little fine Gravel, trace Sand. Fine to medium Gravel, some medium to coarse Sand, dense, slight odor.	
	115	17		14 21 31 48	52	2.0	2			Red SILT and fine SAND, little Gravel, trace Sand, very stiff.	
35		18		49 20	49	0.7	54			SILT, some fine Sand, little fine Gravel, trace Clay. Fine to medium GRAVEL, some coarse Sand and	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-706DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		18		29 27	49	0.7	54			Silt, dense, odor. Red fragment of weathered arkose, red/gray GRAVEL. .	8.25-in diameter HSA borehole
		19		21 26 31 34	57	2.0	64			Red and gray fine to coarse, angular to rounded GRAVEL, some coarse Sand, little Silt, very dense.	
	110	20		17 31 29 25	60	2.0	21				
40		21		37 35 31 29	66	2.0	34			Red fine to medium, subrounded, well sorted SAND grading to fine Gravel, moderate odor.	2-in diameter schedule 40 PVC well casing to 116.5' below grade
	105	22		15 14 15 19	29	1.0	21			Red/gray very coarse SAND and fine GRAVEL, some Silt, medium dense, slight odor.	
45		23		15 23 28 39	51	0.5	31			Red and gray, very poorly sorted, medium SAND to subangular GRAVEL, slight odor.	Bentonite seal 4.0' to 114.2' below grade
	100	24		33 23 21 19	44	0.7	7				
		25		6 17 21 22	38	1.7	8			Red fine to coarse SAND, dense.	
50										Red and gray fine subangular GRAVEL, some medium to coarse Sand, slight odor.	
		26		32 48 100/0.5	NA	1.5	5			Red medium to coarse SAND, little fine Gravel.	
		*								Red and gray, medium, subangular to angular GRAVEL, some coarse Sand, trace Silt, slight odor.	
	95	27		22 29 34 41	63	1.7	6			Red fine to medium SAND grading to fine to medium Gravel, little Silt, slight odor.	
55										TILL (red and gray fine to medium Gravel, some Silt).	

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Remarks:
* = Interval augered through.

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-706DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		28		71 54	NA	1.0	2			Red TILL (fine to medium Gravel (gneiss/basalt) and Silt).	8.25-in diameter HSA borehole
		*									
	90	29		71 54 100/0.5	NA	1.3	0			TILL, extremely weathered arkose at 58.2' bgs.	
		*									
		30		100/0.5	NA	0.3	2			Red TILL (Silt and Gravel, little Clay), dense.	
		*								Top of weathered bedrock	
60		31		100/0.2		0.2	0			Red extremely weathered fine feldspathic SANDSTONE. New Haven Arkose bedrock	2-in diameter schedule 40 PVC well casing to 116.5' below grade
		*									
	85									4-in. diameter rollerbit from 62.5' to 153.0' bgs. No samples taken.	
				1							
				3.5							
65		1		3.5			0.66				Bentonite seal 4.0' to 114.2' below grade
				3.5							
				3.5							
	80										
				4							
				3							
70		2		2.5			0				4.0-in diameter Rollerbit borehole
				2							
				4							
	75										
				3							
		3					0				
				4.5							
75											

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Remarks:

* = Interval augered through. During rollerbit advancement down pressure is between 400-450 lbs and RPM = 130.

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-706DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		3		4			0			4.0-in. diameter Rollerbit used from 62.5- 153.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole
				4.5							
	70			4							
		4		3			0				2-in diameter schedule 40 PVC well casing to 116.5' below grade
80				2							
				2							
				2							
	65			1							
		5		2			0				Bentonite seal 4.0' to 114.2' below grade
				2.5							
85				1.5							
				2							
	60			3.5							
		6		1.5			0				
				3							
90				2.5							
				3							
	55			1.5							
		7		3			0				
95				4							

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Remarks:
Water circulation was lost momenterily at 72.5' and 88.5' bgs. Return water was brown. Same for 89-90', 92' and 97.5' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-706DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		7		3			0			4.0-in. diameter Rollerbit used from 62.5- 153.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole
				3							
	50			2							
		8		1.5			0				2-in diameter schedule 40 PVC well casing to 116.5' below grade
				3							
100				3.5							
				2							
	45			3							
		9		2.5			0				Bentonite seal 4.0' to 114.2' below grade
				3.5							
105				2.5							
				3.5							
	40			2							
		10		4.5			0				
				4							
110				4							
	35			4							
		12		5			0				
115				4							

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Remarks:

Water was lost at 105'-106' and 107'-107.5'. Same for 109', 110'-110.5', 116.5'-117.5' and 120'-120.5' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-706DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		12		4			0				2-in diameter schedule 40 PVC well casing to 116.5' below grade
				4							
	30			5.5							4.0-in diameter Rollerbit borehole
		13		3			0				
				3							
20				5.5							2-in diameter 0.010-in slotted Schedule 40 PVC well screen 116.5' to 126.5' below grade
				3.5							
	25			4						4.0-in. diameter Rollerbit used from 62.5- 153.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
		14		2			0				
				2.5							Grade #0 Morie sand pack 114.2' to 130.0' below grade.
25				3							
				2.5							4-in long Schedule 40 PVC bottom cap
	20			3							
		15		3			0				
				2							
30				3							
				2.5							Bentonite seal 130.0' to 165.5' below grade
	15			3							
		16		3			0				
				3.5							
35											

Remarks:

Loosing water at 128'-129', 132'-133', 136'-137', 144'-145' and 148'-1 49' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05

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Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-706DR

Total Depth = 153.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		16		3			0				
				3							
				2							
	10	17		2.5			0				4.0-in diameter Rollerbit borehole
				3.5							
140				7							
				3.5							
				3.5							
	5	18		4			0			4.0-in. diameter Rollerbit used from 62.5- 153.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
				5							
145				4.5							Bentonite seal 130.0' to 165.5' below grade
				3.5							
	0			4							
		19		6			0				
				6.5							
150				5.5							
				5							
	-5			4.5							
155										Bottom of Rollerbit borehole at 153.0' bgs.	

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Remarks:

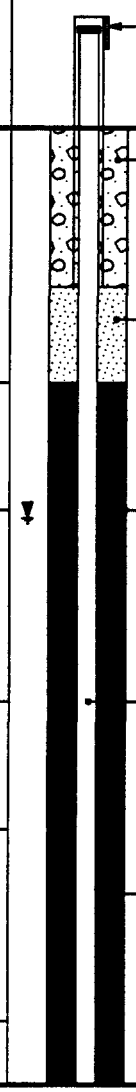
Water Levels

Date / Time	Elevation	Depth
01/21/97	149.96	-0.05 ▼

Date Start/Finish: 10/09/96 - 10/09/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75	**Northing:** 285115.0353 **Easting:** 565598.8352 **TIC Elev.:** 154.94 ft. **Borehole Depth:** 30.5 ft. **Ground Surface Elev.:** 153.2 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-707S** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.2 ft.									GROUND SURFACE
	150	*								
5		01		2 2 5 6	7	2.0	0			Light olive brown fine to medium SAND, moist, loose.
	145	*								
10		02		3 3 3 5	6	1.5	0			Reddish brown fine to medium SAND and SILT, little medium to coarse Sand, trace Gravel, moist, loose. Trace Clay, saturated.
	140	*								
15		03		6 9	18	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.

Monitoring Well Construction



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Remarks:

Geologic description based on MW-707DR. No samples taken at MW-707S. 8.25-in. OD HSA 0-30.5 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.07	7.87 ▼

Client:
SRSNE PRP Group

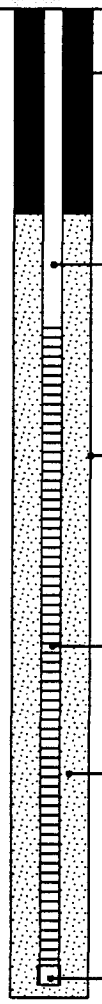
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707S

Total Depth = 30.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		03		6 9	18	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.
		*								
	135									
20		04		11 12 9 7	21	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.
		*								
	130									
25		05		5 5 5 11	10	NA	0			Reddish brown fine to coarse, poorly sorted SAND, little Gravel, trace Silt, loose.
		*								
	125									
30		06		15 19 26 25	45	1.7	0			Medium to coarse SAND, little granitic Gravel, dense.
										Red TILL (Silt and fine to medium Sand, little Gravel), dense.
										Bottom of borehole at 30.5' bgs.
	120									
35										

Monitoring Well Construction



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Remarks:
* = Interval augered through. TIC = Top of inner casing.

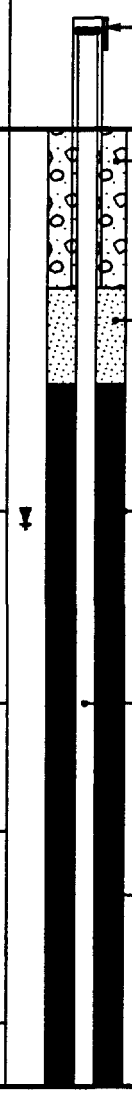
Water Levels

Date / Time	Elevation	Depth
01/21/97	147.07	7.87 ▼

Date Start/Finish: 10/10/96 - 10/10/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 285109.1250 **Easting:** 565606.0951 **TIC Elev.:** 155.12 ft. **Borehole Depth:** 69.0 ft. **Ground Surface Elev.:** 153.4 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-707M** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.4 ft.									**GROUND SURFACE**
	150	*								Brown Sand, dry.
5		01		2 2 5 6	7	2.0	0			Light olive brown fine to medium SAND, moist, loose.
	145	*								
10		02		3 3 3 5	6	1.5	0			Reddish brown fine to medium SAND and SILT, little medium to coarse Sand, trace Gravel, moist, loose. Trace Clay, saturated.
	140	*								
15		03		6 9	18	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and

Monitoring Well Construction



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Remarks:

Geologic description based on MW-707DR. No samples taken at MW-707M. 8.25-in. OD HSA 0-69.0 ft. bgs. 3" rollerbit used to clean out augers, maintain straight hole.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.20	7.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707M

Total Depth = 69.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		6 9	18	2.0	0			Silt, medium dense.	8.25-in diameter HSA borehole
	135	*									
20		04		11 12 9 7	21	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.	2-in diameter schedule 40 PVC well casing to 58.0' below grade
	130	*									
25		05		5 5 5 11	10	NA	0			Reddish brown fine to coarse, poorly sorted SAND, little Gravel, trace Silt, loose.	Bentonite seal 4.0' to 56.0' below grade
	125	*									
30		06		15 19 26 25	45	1.7	0			Medium to coarse SAND, little granitic Gravel, dense. Red TILL (Silt and fine to medium Sand, little Gravel), dense.	
	120	*									
35		07		34 32	59	1.2	0				

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Remarks:
* = Interval augered through. TIC = Top of inner casing.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.20	7.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707M

Total Depth = 69.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		34 32	59	1.2	0			TILL (Silt and fine to medium Sand, little Gravel), very dense.	8.25-in diameter HSA borehole
	115	*									
40		08		4 8 16 19	24	0.7	0			TILL (fine Gravel and Silt, little weathered arkose boulder), medium dense.	2-in diameter schedule 40 PVC well casing to 58.0' below grade
	110	*									
45		09		9 14 22 21	36	1.0	0			TILL (fine to medium Gravel, some Silt, little Sand), dense, trace soft crumbly fragments of extremely weathered arkose.	Bentonite seal 4.0' to 58.0' below grade
	105	*									
50		010		20 17 21 29	38	1.0	0			TILL (very coarse Sand to fine Gravel, some Silt), dense.	
	100	*									
55		011		41 15	32	0.8	0			TILL (very coarse Sand to fine Gravel and Silt), fragment of basalt in tip of spoon.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.20	7.92 ▼

Project: 083.31
Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

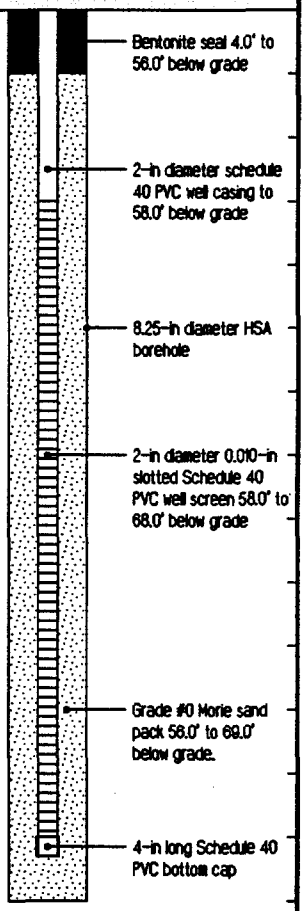
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707M

Total Depth = 69.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		011		41 15	32	0.8	0			
		*								
	95									
60		012		5 3 7 10	15	1.0	0			Red TILL (very coarse Sand to medium Gravel, little Silt), not very dense.
		*								
	90									
65		013		7 10 14 18	24	0.8	0			TILL.
		*								
	85									
70										Bottom of borehole at 69.0' bgs.
	80									
75										

Monitoring Well Construction



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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.20	7.92 ▼

Project: 083.31
Script: srsne2
Date: 04/23/97

Date Start/Finish: 10/11/96 - 10/11/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 285102.4879 **Easting:** 565599.0166 **TIC Elev.:** 156.00 ft. **Borehole Depth:** 95.2 ft. **Ground Surface Elev.:** 153.8 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-707D** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.8 ft.									**GROUND SURFACE**
		*								Brown fine SAND, dry.
	150									
5		01		2 2 5 6	7	2.0	0			Light olive brown fine to medium SAND, moist, loose.
		*								
	145									
10		02		3 3 3 5	6	1.5	0			Reddish brown fine to medium SAND and SILT, little medium to coarse Sand, trace Gravel, moist, loose. Trace Clay, saturated.
		*								
	140									
15		03		6 9	18	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and

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Remarks:

Geologic description based on MW-707DR. No samples taken at MW-707D. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-95.2 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.14	8.86 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707D

Total Depth = 95.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		6 9	18	2.0	0			Silt, medium dense.	8.25-in diameter HSA borehole
		*									
	135										
20		04		11 12 9 7	21	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.	2-in diameter schedule 40 PVC well casing to 84.9' below grade
		*									
	130										
25		05		5 5 5 11	10	NA	0			Reddish brown fine to coarse, poorly sorted SAND, little Gravel, trace Silt, loose.	Bentonite seal 4.0' to 82.5' below grade
		*									
	125										
30		06		15 19 26 25	45	1.7	0			Medium to coarse SAND, little granitic Gravel, dense. Red TILL (Silt and fine to medium Sand, little Gravel), dense.	
		*									
	120										
35		07		34 32	59	1.2	0				

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.14	8.86 ▼

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Project: 083.31
Script: srsne2
Date: 08/06/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707D

Total Depth = 95.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		34 32	59	1.2	0			TILL (Silt and fine to medium Sand, little Gravel), very dense.	8.25-in diameter HSA borehole
		*									
	115										
40		08		4 8 16 19	24	0.7	0			TILL (fine Gravel and Silt, little weathered arkose boulder), medium dense.	2-in diameter schedule 40 PVC well casing to 84.9' below grade
		*									
	110										
45		09		9 14 22 21	36	1.0	0			TILL (fine to medium Gravel, some Silt, little Sand), dense, trace soft crumbly fragments of extremely weathered arkose.	Bentonite seal 4.0' to 82.5' below grade
		*									
	105										
50		010		20 17 21 29	38	1.0	0			TILL (very coarse Sand to fine Gravel, some Silt), dense.	
		*									
	100										
55		011		41 15	32	0.8	0			TILL (very coarse Sand to fine Gravel and Silt), fragment of basalt in tip of spoon.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.14	8.86 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707D

Total Depth = 95.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011		41 15	32	0.8	0				8.25-in diameter HSA borehole
		*									
	95										
60		012		5 3 7 10	15	1.0	0			Red TILL (very coarse Sand to medium Gravel, little Silt), not very dense.	2-in diameter schedule 40 PVC well casing to 84.9' below grade
		*									
	90										
65		013		7 10 14 16	24	0.8	0			TILL.	Bentonite seal 4.0' to 82.5' below grade
		*									
	85										
70		014		7 9 12 17	21	0.5	0			TILL (very coarse Sand to fine Gravel, some Silt), medium dense, trace soft crumbly fragments of extremely weathered arkose.	
		*									
	80										
75		015		10 28	58	0.7	0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.14	8.86

Client:
SRSNE PRP Group

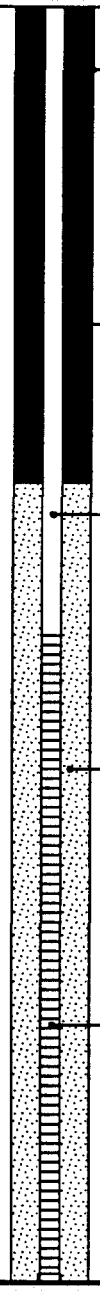
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707D

Total Depth = 95.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		015		10 28	58	0.7	0			Red TILL (very coarse Sand to fine Gravel, some Silt), medium dense.
		*								
	75									
80		016		16 26 34 36	60	1.7	0			TILL (Silt, some fine Gravel, little fine to coarse Sand), dense.
		*								
	70									
85		017		28 18 18 24	36	0.6	0			Trace fragments of soft extremely weathered arkose boulder.
		*								
	65									
90		018		16 14 22 34	36	0.5	0			
		*								
	60	019		40 41 28 21	69	1.0	0			TILL (Silt and fine to medium Gravel, some Clay, trace Sand), very dense.
95										

Monitoring Well Construction



- 8.25-in diameter HSA borehole
- Bentonite seal 4.0' to 82.5' below grade
- 2-in diameter schedule 40 PVC well casing to 84.9' below grade
- Grade #0 Morie sand pack 82.5' to 95.2' below grade.
- 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 84.9' to 94.9' below grade

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.14	8.86 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707D

Total Depth = 95.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
										Bottom of borehole at 95.2' bgs.	4-in long Schedule 40 PVC bottom cap
	55										
100											
	50										
105											
	45										
110											
	40										
115											

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Remarks:

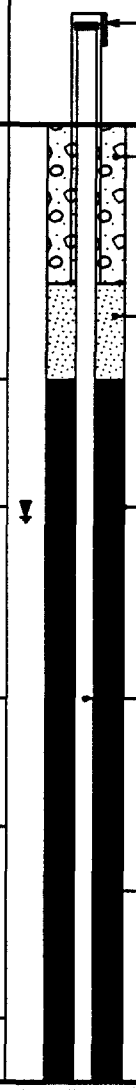
Water Levels

Date / Time	Elevation	Depth
01/21/97	147.14	8.86 ▼

Date Start/Finish: 10/15/96 - 10/18/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 285115.0353 **Easting:** 565598.8352 **TIC Elev.:** 155.85 ft. **Borehole Depth:** 128.5 ft. **Ground Surface Elev.:** 153.9 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No:** MW-707R **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 153.9 ft.									GROUND SURFACE
		*								
	150									
5		01		2 2 5 6	7	2.0	0			Light olive brown fine to medium SAND, moist, loose.
		*								
	145									
10		02		3 3 3 5	6	1.5	0			Reddish brown fine to medium SAND and SILT, little medium to coarse Sand, trace Gravel, moist, loose. Trace Clay, saturated.
		*								
	140									
15		03		6 9	18	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and

Monitoring Well Construction



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Remarks:

Geologic description based on MW-707DR. No samples taken at MW-707R. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-105.0 ft. bgs. 4.0-in. Rollerbit 105-128.5 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707R

Total Depth = 128.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		H006		6 9	18	2.0	0			Silt, medium dense.	8.25-in diameter HSA borehole
		*									
	135										
20		04		11 12 9 7	21	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.	2-in diameter schedule 40 PVC well casing to 115.0' below grade
		*									
	130										
25		05 H007		5 5 5 11	10	2.0	0			Reddish brown fine to coarse, poorly sorted SAND, little Gravel, trace Silt, loose.	Bentonite seal 4.0' to 112.8' below grade
		*									
	125										
30		06		15 19 26 25	45	1.7	0			Medium to coarse SAND, little granitic Gravel, dense.	
										Red TILL (Silt and fine to medium Sand, little Gravel), dense.	
		*									
	120										
35		07 S026		34 32	59	1.2	0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707R

Total Depth = 128.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07 S026		34 32	59	1.2	0			TILL (Silt and fine to medium Sand, little Gravel), very dense.	8.25-in diameter HSA borehole
		*									
	115										
40		08		4 8 16 19	24	0.7	0			TILL (fine Gravel and Silt, little weathered arkose boulder), medium dense.	2-in diameter schedule 40 PVC well casing to 115.0' below grade
		*									
	110										
45		09 S027		9 14 22 21	36	1.0	0			TILL (fine to medium Gravel, some Silt, little Sand), dense, trace soft crumbly fragments of extremely weathered arkose.	Bentonite seal 4.0' to 112.8' below grade
		*									
	105										
50		010		20 17 21 29	38	1.0	0			TILL (very coarse Sand to fine Gravel, some Silt), dense.	
		*									
	100										
55		011 S028		41 15	32	0.8	0			TILL (very coarse Sand to fine Gravel and Silt), fragment of basalt in tip of spoon.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707R

Total Depth = 128.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011 S028		41 15	32	0.8	0				8.25-in diameter HSA borehole
		*									
	95									Red TILL (very coarse Sand to medium Gravel, little Silt), not very dense.	
60		012		5 3 7 10	15	1.0	0				2-in diameter schedule 40 PVC well casing to 115.0' below grade
		*									
	90									Red TILL (very coarse Sand to medium Gravel, little Silt), not very dense.	
65		S029 013		7 10 14 16	24	0.8	0				Bentonite seal 4.0' to 112.8' below grade
		*									
	85									TILL (very coarse Sand to fine Gravel, some Silt), medium dense, trace soft crumbly fragments of extremely weathered arkose.	
70		014		7 9 12 17	21	0.5	0				
		*									
	80										
75		015 S030		10 28	58	0.7	0				

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707R

Total Depth = 128.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		015 S030		10 28	58	0.7	0			Red TILL (very coarse Sand to fine Gravel, some Silt), medium dense.	8.25-in diameter HSA borehole
		*									
	75									TILL (Silt, some fine Gravel, little fine to coarse Sand), dense.	
80		016		18 26 34 36	60	1.7	0				2-in diameter schedule 40 PVC well casing to 115.0' below grade
		*									
	70									Trace fragments of soft extremely weathered arkose boulder.	
85		S031 017		28 18 18 24	36	0.6	0				Bentonite seal 4.0' to 112.8' below grade
		*									
	65										
90		018		16 14 22 34	36	0.5	0				
		*									
	60	S042 019		40 41 28 21	69	1.0	0			TILL (Silt and fine to medium Gravel, some Clay, trace Sand), very dense.	
95											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707R

Total Depth = 128.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		*								Some fragments of weathered arkose boulders.	8.25-in diameter HSA borehole
	55										
100		020		7 32 40 100/0.3	72	1.1	0			Top of bedrock at 100.0' bgs.	2-in diameter schedule 40 PVC well casing to 115.0' below grade
										Red soft extremely to highly weathered fine SANDSTONE. New Haven Arkose bedrock.	
		*									
				3							
	50			3							Bentonite seal 4.0' to 112.8' below grade
105				3						4.0-in. diameter rollerbit 105.0' to 128.5' bgs. No samples taken.	
				3							4.0-in diameter Rollerbit borehole
				3							
				3.5							
	45			2.5							
110				3							
				3							
				3							
				2.5							
	40			3.5							Grade #0 Morie sand pack 112.8' to 128.5' below grade.
115											

BBL
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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707R

Total Depth = 128.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				2.5							4.0-in diameter Rollerbit borehole
				3.5							
				3							
				4							
	35			4							2-in diameter 0.010-in slotted Schedule 40 PVC well screen 115.0' to 125.0' below grade
120				3							
				3							
				3						4.0-in. diameter Rollerbit used from 105.0'to 128.5' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Grade #0 Morie sand pack 112.8' to 128.5' below grade.
				3							
	30			4							
125				3							4-in long Schedule 40 PVC bottom cap
				4							
				4							
	25									Bottom of rollerbit borehole at 128.5' bgs.	
130											
	20										
135											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.74	8.11 ▼

Date Start/Finish: 09/27/96 - 12/18/96 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 285123.7283 **Easting:** 565567.3318 **TIC Elev.:** 156.72 ft. **Borehole Depth:** 194.2 ft. **Ground Surface Elev.:** 154.7 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-707DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH (depth)	ELEVATION (gs elevation 154.7 ft.)	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
										GROUND SURFACE
		*								
5	150	01		2 2 5 6	7	2.0	0			Light olive brown fine to medium SAND, moist, loose.
		*								
10	145	02		3 3 3 5	6	1.5	0			Reddish brown fine to medium SAND and SILT, little medium to coarse Sand, trace Gravel, moist, loose. Trace Clay, saturated.
		*								
15	140	03		6 9	18	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and

Monitoring Well Construction

- 4.5-in diameter steel protective outer casing with locking cap
- Cement seal ground surface to 2.5' below grade outside of protectice steel casing
- Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
- 8.25-in diameter HSA borehole
- 2-in diameter schedule 40 PVC well casing to 162.9' below grade
- Bentonite seal 4.0' to 158.0' below grade

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Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-103.0 ft. bgs. 4.0-in. Rollerbit 103-194.2 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		H006		6 9	18	2.0	0			Silt, medium dense.	8.25-in diameter HSA borehole
		*									
20	135	04		11 12 9 7	21	2.0	0			Red to light olive brown medium to coarse SAND, little fine Sand, trace fine to medium Gravel and Silt, medium dense.	2-in diameter schedule 40 PVC well casing to 162.9' below grade
		*									
25	130	05 H007		5 5 5 11	10	2.0	0			Reddish brown fine to coarse, poorly sorted SAND, little Gravel, trace Silt, loose.	Bentonite seal 4.0' to 158.0' below grade
		*									
30	125	06		15 19 26 25	45	1.7	0			Medium to coarse SAND, little granitic Gravel, dense. Red TILL (Silt and fine to medium Sand, little Gravel), dense.	
		*									
35	120	07 S026		34 32	59	1.2	0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07 S026		34 32	59	1.2	0			TILL (Silt and fine to medium Sand, little Gravel), very dense.	8.25-in diameter HSA borehole
		*									
40	115	08		4 8 16 19	24	0.7	0			TILL (fine Gravel and Silt, little weathered arkose boulder), medium dense.	2-in diameter schedule 40 PVC well casing to 162.9' below grade
		*									
45	110	09 S027		9 14 22 21	36	1.0	0			TILL (fine to medium Gravel, some Silt, little Sand), dense, trace soft crumbly fragments of extremely weathered arkose.	Bentonite seal 4.0' to 158.0' below grade
		*									
50	105	010		20 17 21 29	38	1.0	0			TILL (very coarse Sand to fine Gravel, some Silt), dense.	
		*									
55	100	011 S028		41 15	32	0.8	0			TILL (very coarse Sand to fine Gravel and Silt), fragment of basalt in tip of spoon.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011 S028		41 15	32	0.8	0				8.25-in diameter HSA borehole
		*									
60	95	012		5 3 7 10	15	1.0	0			Red TILL (very coarse Sand to medium Gravel, little Silt), not very dense.	2-in diameter schedule 40 PVC well casing to 162.9' below grade
		*									
65	90	S029 013		7 10 14 16	24	0.8	0			Red TILL (very coarse Sand to medium Gravel, little Silt), not very dense.	Bentonite seal 4.0' to 158.0' below grade
		*									
70	85	014		7 9 12 17	21	0.5	0			TILL (very coarse Sand to fine Gravel, some Silt), medium dense, trace soft crumbly fragments of extremely weathered arkose.	
		*									
75	80	015 S030		10 28	58	0.7	0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		015 S030		10 28	58	0.7	0			Red TILL (very coarse Sand to fine Gravel, some Silt), medium dense.	8.25-in diameter HSA borehole
		*									
80	75	016		16 26 34 36	60	1.7	0			TILL (Silt, some fine Gravel, little fine to coarse Sand), dense.	2-in diameter schedule 40 PVC well casing to 162.9' below grade
		*									
85	70	S031 017		28 18 18 24	36	0.6	0			Trace fragments of soft extremely weathered arkose boulder.	Bentonite seal 4.0' to 158.0' below grade
		*									
90	65	018		16 14 22 34	36	0.5	0				
		*									
95	60	S032 019		40 41 28 21	69	1.0	0			TILL (Silt and fine to medium Gravel, some Clay, trace Sand), very dense.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Project: 083.31

Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		*								Some fragments of weathered arkose boulders.	8.25-in diameter HSA borehole
100	55	020		7 32 40 100/0.3	72	L1	0			Top of bedrock at 100.0' bgs. Red soft extremely to highly weathered fine SANDSTONE. New Haven Arkose bedrock.	2-in diameter schedule 40 PVC well casing to 162.9' below grade
		*								4-in. diameter rollerbit 103.0' to 193.0' bgs. No samples taken.	
				3							
105	50			3							Bentonite seal 4.0' to 158.0' below grade
				3							
				3							
				3							
				3.5							
110	45			2.5							4.0-in diameter Rollerbit borehole
				3							
				3							
				3							
				2.5							
115	40			3.5							

Remarks:

Augers seated at 103' bgs. Augers reseated at 108' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				2.5							4.0-in diameter Rollerbit borehole
				3.5							
				3							
				4							
	35			4							
20				3							2-in diameter schedule 40 PVC well casing to 162.9' below grade
				3							
				3						4.0-in. diameter Rollerbit used from 103.0' to 193.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
				3							
				3							
	30			4							
25				3							Bentonite seal 4.0' to 158.0' below grade
				4							
				4							
				4							
	25			4							
30				3							
				3							
				3							
				3							
	20			2.5							
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92

Project: 083.31

Script: srsne2
Date: 04/23/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				3.5							4.0-in diameter Rollerbit borehole
				3							
				3							
				2							
	15			3							
140				3							2-in diameter schedule 40 PVC well casing to 162.9' below grade
				3							
				2						4.0-in. diameter Rollerbit used from 103.0'to 193.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
				3							
	10			3							
145				3							Bentonite seal 4.0' to 158.0' below grade
				3							
				3							
				4							
	5			4							
150				2							
				4							
				3							
				4							
155	0			5							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				4							Bentonite seal 4.0' to 158.0' below grade
				6							
				3							
				3							2-in diameter schedule 40 PVC well casing to 162.9' below grade
	-5			3							
160				3							
				3							
				3						4.0-in. diameter Rollerbit used from 103.0'to 193.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
				4							4.0-in diameter Rollerbit borehole
	-10			3							
155				4							
				4							
				3							2-in diameter 0.010-in slotted Schedule 40 PVC well screen 162.9' to 192.9' below grade
				2							
	-15			2							
150				3							
				3.5							Grade #0 Morie sand pack 158.0' to 194.2' below grade.
				3.5							
				4							
145	-20			4							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-707DR

Total Depth = 194.2 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
				4							4.0-in diameter Rollerbit borehole
				3.5							
				2.5							
				2							
	-25			3							
180				3							2-in diameter 0.010-in slotted Schedule 40 PVC well screen 182.9' to 192.9' below grade
				2						4.0-in. diameter Rollerbit used from 103.0' to 193.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
				4							
				4							
	-30			3							
185				3							Grade #0 Morie sand pack 158.0' to 194.2' below grade.
				4							
				3							
				3							
	-35			3.5							
190				2.5							
				3							
				3							4-in long Schedule 40 PVC bottom cap
	-40									Bottom of rollerbit borehole at 194.2' bgs.	
195											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	147.80	8.92 ▼

Date Start/Finish: 02/03/97 - 02/04/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 286418.0584 **Easting:** 566241.4812 **TIC Elev.:** 224.57 ft. **Borehole Depth:** 95.0 ft. **Ground Surface Elev.:** 222.1 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-708S** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
depth	gs elevation 222.1 ft.									GROUND SURFACE	4.5-in diameter steel protective outer casing with locking cap
	220	*									Cement seal ground surface to 2.5' below grade outside of protectice steel casing Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
5		01		7 9 6 7	15	2.0	0			Red medium to coarse SAND, some Gravel, trace Silt, dry.	8.25-in diameter HSA borehole
	215	*									2-in diameter schedule 40 PVC well casing to 83.0' below grade
10		02		10 5 5 11	10	1.0	0			Red to red grey medium subangular to subrounded SAND, some coarse Sand, trace Gravel, little to trace Gravel, dry.	
	210	*									Bentonite seal 4.0' to 80.3' below grade
15											

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Remarks:

Geologic description based on MW-708DR. No samples taken at MW-708S. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-95.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.79	73.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708S

Total Depth = 95.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		5 6 6 7	12	2.0	0			Red to light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	205	*									
20		04		7 7 8 3	15	1.5	0			Red/light olive grey coarse to very coarse SAND, some medium Sand, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 83.0' below grade
										Weathered Granite Cobble.	
	200	*									
25		05		5 5 5 7	10	0.8	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	Bentonite seal 4.0' to 80.3' below grade
	195	*									
30		06		12 16 4 13	21	2.0	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	
										Red/light olive grey coarse to very coarse SAND, trace Gravel.	
	190	*									
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.79	73.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708S

Total Depth = 95.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		10 15 12 18	27	1.2	0			Light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	185	*									
40		08		6 10 11 12	21	0.8	0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 83.0' below grade
	180	*									
45		09		18 24 27 19	51	0.5	0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	Bentonite seal 4.0' to 80.3' below grade
	175	*									
50		010		12 7 10 10	17	1.5	0			Light olive grey fine to medium SAND, moist.	
	170	*									
55											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.79	73.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708S

Total Depth = 95.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011		13 12 13 15	25	1.75	0			Tan/pink very fine to fine SAND. Light olive grey/pink medium to coarse SAND. Light olive grey fine SAND, very moist.	8.25-in diameter HSA borehole
	185	*									
60		012		3 11 12 13	23	1.5	0			Light olive grey fine SAND, very moist.	2-in diameter schedule 40 PVC well casing to 83.0' below grade
	180	*									
65		013		8 9 8 10	17	1.0	0			Light olive grey/pink fine to medium SAND, very moist.	Bentonite seal 4.0' to 80.3' below grade
	155	*									
70		014		8 8 9 10	17	1.0	0			Light olive grey/pink fine to medium SAND, wet. Saturated.	▼
	150	*									
75											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.79	73.78 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708S

Total Depth = 95.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		015		4 12 14 21	26	2.0	0			Red/light olive grey fine to medium SAND, grading to a fine SAND at 76.2' bgs.
	145	*								
80		016		7 9 15 17	24	2.0	0			Red very fine to medium SAND.
	140	*								
85		017		2 5 12 15	17	2.0	0			Red medium SAND, some fine Sand. Red very fine to fine SAND.
	135	*								
90		018		9 9 10 17	19	1.0	0			Red fine SAND, little Silt. Grades to Red SILT and fine SAND.
	130	*								
95										Bottom of rollerbit borehole at 95.0' bgs.

Monitoring Well Construction

- 8.25-in diameter HSA borehole
- Bentonite seal 4.0' to 80.3' below grade
- 2-in diameter schedule 40 PVC well casing to 83.0' below grade
- 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 83.0' to 93.0' below grade
- Grade #0 Morie sand pack 80.3' to 95.0' below grade.
- 4-in long Schedule 40 PVC bottom cap

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.79	73.78 ▼

Date Start/Finish: 01/21/97 - 01/24/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 286405.1453 **Easting:** 566244.5483 **TIC Elev.:** 226.08 ft. **Borehole Depth:** 189.0 ft. **Ground Surface Elev.:** 223.3 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-708M** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
depth	gs elevation 223.3 ft.									GROUND SURFACE	4.5-in diameter steel protective outer casing with locking cap
	220	*									Cement seal ground surface to 2.5' below grade outside of protectice steel casing Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
5		01		7 9 6 7	15	2.0	0			Red medium to coarse SAND, some Gravel, trace Silt, dry.	8.25-in diameter HSA borehole
	215	*									2-in diameter schedule 40 PVC well casing to 118.0' below grade
10		02		10 5 5 11	10	1.0	0			Red to red grey medium subangular to subrounded SAND, some coarse Sand, trace Gravel, little to trace Gravel, dry.	Bentonite seal 4.0' to 113.4' below grade
	210	*									
15											

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Remarks:

Geologic description based on MW-708DR. No samples taken at MW-708M. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-189.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		5 6 6 7	12	2.0	0			Red to light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	205	*									
20		04		7 7 8 3	15	1.5	0			Red/light olive grey coarse to very coarse SAND, some medium Sand, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 116.0' below grade
										Weathered Granite Cobble.	
	200	*									
25		05		5 5 5 7	10	0.8	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	Bentonite seal 4.0' to 113.4' below grade
	195	*									
30		06		12 16 4 13	21	2.0	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	
										Red/light olive grey coarse to very coarse SAND, trace Gravel.	
	190	*									
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		10 15 12 18	27	1.2	0			Light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	185	*									
40		08		6 10 11 12	21	0.8	0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 116.0' below grade
	180	*									
45		09		18 24 27 19	51	0.5	0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	Bentonite seal 4.0' to 113.4' below grade
	175	*									
50		010		12 7 10 10	17	1.5	0			Light olive grey fine to medium SAND, moist.	
	170	*									
55											

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engineers & scientists

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011		13 12 13 15	25	1.75	0			Tan/pink very fine to fine SAND. Light olive grey/pink medium to coarse SAND. Light olive grey fine SAND, very moist.	8.25-in diameter HSA borehole
	165	*									
60		012		3 11 12 13	23	1.5	0			Light olive grey fine SAND, very moist.	2-in diameter schedule 40 PVC well casing to 116.0' below grade
	160	*									
65		013		8 9 8 10	17	1.0	0			Light olive grey/pink fine to medium SAND, very moist.	Bentonite seal 4.0' to 113.4' below grade
	155	*									
70		014		8 8 9 10	17	1.0	0			Light olive grey/pink fine to medium SAND, wet. Saturated.	
	150	*									
75											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

Client:
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Location:
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		015		4 12 14 21	26	2.0	0			Red/light olive grey fine to medium SAND, grading to a fine SAND at 76.2' bgs.	8.25-in diameter HSA borehole
	145	*									
80		016		7 9 15 17	24	2.0	0			Red very fine to medium SAND.	2-in diameter schedule 40 PVC well casing to 116.0' below grade
	140	*									
85		017		2 5 12 15	17	2.0	0			Red medium SAND, some fine Sand. / Red very fine to fine SAND.	Bentonite seal 4.0' to 113.4' below grade
	135	*									
90		018		9 9 10 17	19	1.0	0			Red fine SAND, little Silt. / Grades to Red SILT and fine SAND.	
	130	*									
95											

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Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		019		13 20 22 23	42	2.0	0			Red very fine grained SAND and SILT.	8.25-in diameter HSA borehole
	125	*									
100		020		2 10 13 21	23	2.0	0			Red very fine SAND, trace Silt.	2-in diameter schedule 40 PVC well casing to 116.0' below grade
	120	*									
105		021		2 10 10 12	20	2.0	0			Red very fine SAND, trace Silt.	Bentonite seal 4.0' to 113.4' below grade
										Red SILT, little very fine Sand.	
	115	*									
110		022		9 12 23 42	40	1.5	0			Red very fine SAND, trace Silt. Some Silt, dense, wet.	
	110	*									Grade #0 Morie sand pack 113.4' to 130.0' below grade.
115											

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Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

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Location:
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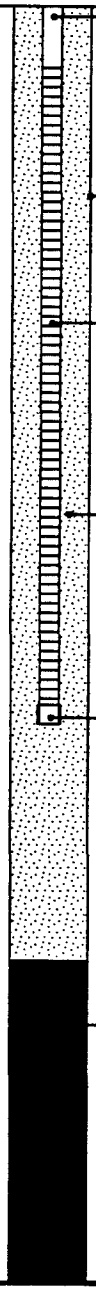
Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		023		18 21 34 37	55	1.3	0			Red fine Sand, little to trace Silt, grades to very fine SAND, trace Silt. Red very fine to fine SAND, little medium Sand, trace Silt.
	105	*								
120		024		9 23 31 57	54	1.0	0			Red TILL (fine Sand, some Silt, trace medium Sand).
	100	*								
125		025		13 20 30 37	50	1.5	0			Red TILL (alternating 0.4' thick layers of very fine to fine SAND and red SILT, trace Sand).
	95	*								
130		026		25 33 41 29	76	0.5	0			Red TILL (SILT, some very fine Sand, trace Clay).
	90	*								
135										

Monitoring Well Construction



- 2-in diameter schedule 40 PVC well casing to 116.0' below grade
- 8.25-in diameter HSA borehole
- 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 116.0' to 126.0' below grade
- Grade #0 Morie sand pack 113.4' to 130.0' below grade.
- 4-in long Schedule 40 PVC bottom cap
- Bentonite seal 130.0' to 189.0' below grade

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Water Levels

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Client:
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Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		027		15 18 25 30	43	1.8	0			Red TILL (very fine SAND, some Silt).	8.25-in diameter HSA borehole
	85	*									
140		028		38 57 62 84	121	1.5	0			Red TILL (very fine SAND, some Silt, little medium Sand, trace Gravel).	Bentonite seal 130.0' to 189.0' below grade
	80	*									
145		029		22 32 33 28	65	1.0	0			Red TILL (very fine to fine SAND, trace Silt and Gravel), very dense.	
	75	*									
150		030		13 37 65 60	102	1.0	0			Red TILL (very fine to fine SAND, trace Silt and Gravel), very dense.	
	70	*									
155											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		031		21 30 49 53	88	1.0	0			Red TILL (very fine SAND, little medium to coarse Sand, trace Silt and Gravel).	8.25-in diameter HSA borehole
	65	*									
160		032		23 41 48 52	89	0.75	0			Red TILL (very fine SAND, little medium to coarse Sand, trace Silt and Gravel).	Bentonite seal 130.0' to 189.0' below grade
	60	*									
165		033		25 25 30 32	55	1.0	0			Red TILL (fine to medium SAND, some Silt, little Gravel).	
	55	*									
170		034		23 38 47 58	85	1.0	0			Red TILL (fine to medium SAND, some Silt, little Gravel).	
		*								Trace fragments of soft extremely weathered arkose boulder.	
	50	035		50/0.2		1.0	0			Piece of grey Diabase.	
175		01		15							

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ⊻

Project: 083.31

Script: srsne2
Date: 09/05/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708M

Total Depth = 189.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		01		5, 6, 50/0.1						Top of bedrock at 100.0' bgs.	8.25-in diameter HSA borehole
		036		5			0			Red fine-grained SANDSTONE. New Haven Arkose bedrock. Rollerbit to 287.5' bgs. No samples taken.	
45		02		5, 5, 5, 5, 5			0				Bentonite seal 130.0' to 189.0' below grade
180											
40		03		5, 5, 5, 5, 5			0				
185											
35		04		4, 4			0				
										Bottom of rollerbit borehole at 189.0' bgs.	
190											
30											
195											

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Remarks:

Water Levels

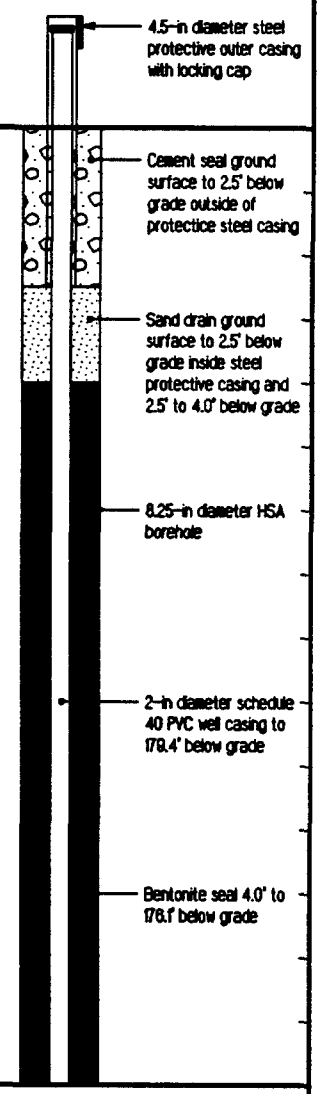
Date / Time	Elevation	Depth
01/21/97	151.34	74.74 ⊻

Project: 083.31
Script: srsne2
Date: 09/05/97

Date Start/Finish: 01/27/97 - 02/03/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 3-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 286408.1643 **Easting:** 566253.5638 **TIC Elev.:** 225.60 ft. **Borehole Depth:** 197.0 ft. **Ground Surface Elev.:** 223.2 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-708R** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 223.2 ft.									GROUND SURFACE
	220	*								
5		01		7 9 8 7	15	2.0	0			Red medium to coarse SAND, some Gravel, trace Silt, dry.
	215	*								
10		02		10 5 5 11	10	1.0	0			Red to red grey medium subangular to subrounded SAND, some coarse Sand, trace Gravel, little to trace Gravel, dry.
	210	*								
15										

Monitoring Well Construction



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Remarks:

Geologic description based on MW-708DR. No samples taken at MW-708R. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-162.0 ft. bgs. 4.0-in. Rollerbit 162-197.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		5 6 6 7	12	2.0	0			Red to light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	205	*									
20		04		7 7 8 3	15	1.5	0			Red/light olive grey coarse to very coarse SAND, some medium Sand, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 179.4' below grade
										Weathered Granite Cobble.	
	200	*									
25		05		5 5 5 7	10	0.8	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	Bentonite seal 4.0' to 176.1' below grade
	195	*									
30		06		12 16 4 13	21	2.0	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	
										Red/light olive grey coarse to very coarse SAND, trace Gravel.	
	190	*									
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		10 15 12 18	27	1.2	0			Light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	185	*									
40		08		6 10 11 12	21	0.8	0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	180	*									
45		09		18 24 27 19	51	0.5	0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	Bentonite seal 4.0' to 178.1' below grade
	175	*									
50		010		12 7 10 10	17	1.5	0			Light olive grey fine to medium SAND, moist.	
	170	*									
55											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

Project: 083.31
Script: srsne2
Date: 09/05/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011		13 12 13 15	25	1.75	0			Tan/pink very fine to fine SAND. Light olive grey/pink medium to coarse SAND. Light olive grey fine SAND, very moist.	8.25-in diameter HSA borehole
	165	*									
60		012		3 11 12 13	23	1.5	0			Light olive grey fine SAND, very moist.	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	160	*									
65		013		8 9 8 10	17	1.0	0			Light olive grey/pink fine to medium SAND, very moist.	Bentonite seal 4.0' to 176.1' below grade
	155	*									
70		014		8 8 9 10	17	1.0	0			Light olive grey/pink fine to medium SAND, wet. Saturated.	
	150	*									
75											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		015		4 12 14 21	26	2.0	0			Red/light olive grey fine to medium SAND, grading to a fine SAND at 78.2' bgs.	8.25-in diameter HSA borehole
	145	*									
80		016		7 9 15 17	24	2.0	0			Red very fine to medium SAND.	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	140	*									
85		017		2 5 12 15	17	2.0	0			Red medium SAND, some fine Sand. Red very fine to fine SAND.	Bentonite seal 4.0' to 176.1' below grade
	135	*									
90		018		9 9 10 17	19	1.0	0			Red fine SAND, little Silt. Grades to Red SILT and fine SAND.	
	130	*									
95											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
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Project: 083.31

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Client:
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Location:
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Monitoring Well No: MW-708R

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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		019		13 20 22 23	42	2.0	0			Red very fine grained SAND and SILT.	8.25-in diameter HSA borehole
	125	*									
100		020		2 10 13 21	23	2.0	0			Red very fine SAND, trace Silt.	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	120	*									
105		021		2 10 10 12	20	2.0	0			Red very fine SAND, trace Silt.	Bentonite seal 4.0' to 176.1' below grade
										Red SILT, little very fine Sand.	
	115	*									
110		022		9 12 23 42	40	1.5	0			Red very fine SAND, trace Silt. Some Silt, dense, wet.	
	110	*									
115											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
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		023		18 21 34 37	55	1.3	0			Red fine Sand, little to trace Silt, grades to very fine SAND, trace Silt. Red very fine to fine SAND, little medium Sand, trace Silt.	8.25-in diameter HSA borehole
	105	*									
120		024		9 23 31 57	54	1.0	0			Red TILL (fine Sand, some Silt, trace medium Sand).	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	100	*									
125		025		13 20 30 37	50	1.5	0			Red TILL (alternating 0.4' thick layers of very fine to fine SAND and red SILT, trace Sand).	Bentonite seal 4.0' to 176.1' below grade
	95	*									
130		026		25 33 41 29	76	0.5	0			Red TILL (SILT, some very fine Sand, trace Clay).	
	90	*									
135											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
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Project: 083.31
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Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		027		15 18 25 30	43	1.8	0			Red TILL (very fine SAND, some Silt).	8.25-in diameter HSA borehole
	85	*									
140		028		38 57 62 84	121	1.5	0			Red TILL (very fine SAND, some Silt, little medium Sand, trace Gravel).	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	80	*									
145		029		22 32 33 28	65	1.0	0			Red TILL (very fine to fine SAND, trace Silt and Gravel), very dense.	Bentonite seal 4.0' to 176.1' below grade
	75	*									
150		030		13 37 65 60	102	1.0	0			Red TILL (very fine to fine SAND, trace Silt and Gravel), very dense.	
	70	*									
155											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

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Location:
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Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		031		21 39 49 53	88	1.0	0			Red TILL (very fine SAND, little medium to coarse Sand, trace Silt and Gravel).	8.25-in diameter HSA borehole
	65	*									
160		032		23 41 48 52	89	0.75	0			Red TILL (very fine SAND, little medium to coarse Sand, trace Silt and Gravel).	2-in diameter schedule 40 PVC well casing to 179.4' below grade
	60	*									
165		033		25 25 30 32	55	1.0	0			Red TILL (fine to medium SAND, some Silt, little Gravel).	3.0-in diameter Rollerbit borehole
	55	*									
170		034		23 38 47 58	85	1.0	0			Red TILL (fine to medium SAND, some Silt, little Gravel).	Bentonite seal 4.0' to 176.1' below grade
		*								Trace fragments of soft extremely weathered arkose boulder.	
	50	035		50/0.2		1.0	0			Piece of grey Diabase.	
175		01		15						Top of bedrock at 174.0' bgs. Red fine-grained SANDSTONE.	

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engineers & scientists

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		01		5, 6, 50						4.0-in. diameter Rollerbit used from 100' - 197' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Bentonite seal 4.0' to 176.1' below grade; 2-in diameter schedule 40 PVC well casing to 179.4' below grade
		038		50/0.1			0				
	45	02		5, 5, 5, 5			0				3.0-in diameter Rollerbit borehole
180											
	40	03		5, 5, 5, 5, 5			0				2-in diameter 0.010-in slotted Schedule 40 PVC well screen 179.4' to 189.4' below grade; Grade #0 Morie sand pack 176.1' to 190.0' below grade.
185											
	35	04		4, 4, 3, 5, 3			0				4-in long Schedule 40 PVC bottom cap
190											
	30	05		4, 4, 4			0				Bedrock fragments 190.0' to 197.0' bgs
195											

Remarks:
Borehole collapsed from 190.0' to 197.0' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

BBL
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Project: 083.31
Script: srsne2
Date: 09/05/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708R

Total Depth = 197.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		05		4 4			0			4.0-in. diameter Rollerbit used from 100' - 197' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Bedrock fragments 190.0' to 197.0' bgs
										Bottom of rollerbit borehole at 197.0' bgs.	
25											
200											
20											
205											
15											
210											
10											
215											

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Remarks:
Borehole collapsed from 190.0' to 197.0' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	152.23	73.37 ▼

Date Start/Finish: 01/08/97 - 01/20/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 286423.5725 **Easting:** 566250.8429 **TIC Elev.:** 224.85 ft. **Borehole Depth:** 267.5 ft. **Ground Surface Elev.:** 221.9 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-708DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
depth	gs elevation 221.9 ft.									GROUND SURFACE	4.5-in diameter steel protective outer casing with locking cap
	220	*									Cement seal ground surface to 2.5' below grade outside of protectice steel casing Sand drain ground surface to 2.5' below grade inside steel protective casing and 2.5' to 4.0' below grade
5		01		7 9 8 7	15	2.0	0			Red medium to coarse SAND, some Gravel, trace Silt, dry.	8.25-in diameter HSA borehole
	215	*									2-in diameter schedule 40 PVC well casing to 236.1' below grade
10		02		10 5 5 11	10	1.0	0			Red to red grey medium subangular to subrounded SAND, some coarse Sand, trace Gravel, little to trace Gravel, dry.	
	210	*									Bentonite seal 4.0' to 231.8' below grade
15											

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Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-173.0 ft. bgs. 4.0-in. Rollerbit 173-267.5 ft. bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		5 6 8 7	12	2.0	0			Red to light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
	205	*									
20		04		7 7 8 3	15	1.5	0			Red/light olive grey coarse to very coarse SAND, some medium Sand, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 236.1' below grade
										Weathered Granite Cobble.	
	200	*									
25		05		5 5 5 7	10	0.8	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	Bentonite seal 4.0' to 231.8' below grade
	195	*									
30		06		12 16 4 13	21	2.0	0			Red/light olive grey medium to coarse SAND, little Gravel, moist.	
										Red/light olive grey coarse to very coarse SAND, trace Gravel.	
	190	*									
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 287.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	185	07		10 15 12 16	27	1.2	0			Light olive grey coarse to very coarse SAND, little Gravel, moist.	8.25-in diameter HSA borehole
		*									
40	180	08		6 10 11 12	21	0.8	0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	2-in diameter schedule 40 PVC well casing to 236.1' below grade
		*									
45	175	09		18 24 27 19	51	0.5	0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	Bentonite seal 4.0' to 231.8' below grade
		*									
50	170	010		12 7 10 10	17	1.5	0			Light olive grey fine to medium SAND, moist.	
		*									
55											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 287.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		011		13 12 13 15	25	1.75	0			Tan/pink very fine to fine SAND. Light olive grey/pink medium to coarse SAND. Light olive grey fine SAND, very moist.	8.25-in diameter HSA borehole
	165	*									
60		012		3 11 12 13	23	1.5	0			Light olive grey fine SAND, very moist.	2-in diameter schedule 40 PVC well casing to 236.1' below grade
	160	*									
65		013		8 9 8 10	17	1.0	0			Light olive grey/pink fine to medium SAND, very moist.	Bentonite seal 4.0' to 231.8' below grade
	155	*									
70		014		8 8 9 10	17	1.0	0			Light olive grey/pink fine to medium SAND, wet. Saturated.	
	150	*									
75											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	145	015		4 12 14 21	26	2.0	0			Red/light olive grey fine to medium SAND, grading to a fine SAND at 78.2' bgs.	8.25-in diameter HSA borehole
		*									
80	140	016		7 9 15 17	24	2.0	0			Red very fine to medium SAND.	2-in diameter schedule 40 PVC well casing to 236.1' below grade
		*									
85	135	017		2 5 12 15	17	2.0	0			Red medium SAND, some fine Sand. Red very fine to fine SAND.	Bentonite seal 4.0' to 231.8' below grade
		*									
90	130	018		9 9 10 17	19	1.0	0			Red fine SAND, little Silt. Grades to Red SILT and fine SAND.	
		*									
95											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Project: 083.31
Script: srsne2
Date: 09/05/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		019		13 20 22 23	42	2.0	0			Red very fine grained SAND and SILT.	8.25-in diameter HSA borehole
	125	*									
100		020		2 10 13 21	23	2.0	0			Red very fine SAND, trace Silt.	2-in diameter schedule 40 PVC well casing to 236.f below grade
	120	*									
105		021		2 10 10 12	20	2.0	0			Red very fine SAND, trace Silt.	Bentonite seal 4.0' to 231.8' below grade
	115									Red SILT, little very fine Sand.	
		*									
110		022		9 12 23 42	40	1.5	0			Red very fine SAND, trace Silt. Some Silt, dense, wet.	
	110	*									
115											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 287.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		023		18 21 34 37	55	1.3	0			Red fine SAND, little to trace Silt, grades to very fine SAND, trace Silt.	8.25-in diameter HSA borehole
	105									Red very fine to fine SAND, little medium Sand, trace Silt.	
		*									
20		024		9 23 31 57	54	1.0	0			Red TILL (fine SAND, some Silt, trace medium Sand).	2-in diameter schedule 40 PVC well casing to 236.1' below grade
	100										
		*									
25		025		13 20 30 37	50	1.5	0			Red TILL (alternating 0.4' thick layers of very fine to fine SAND and red SILT, trace Sand).	Bentonite seal 4.0' to 231.8' below grade
	95										
		*									
30		026		25 33 41 29	76	0.5	0			Red TILL (SILT, some very fine Sand, trace Clay).	
	90										
		*									
35											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Project: 083.31
Script: srsne2
Date: 09/05/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		027		15 18 25 30	43	1.8	0			Red TILL (very fine SAND, some Silt).	8.25-in diameter HSA borehole
	85	*									
140		028		38 57 62 84	121	1.5	0			Red TILL (very fine SAND, some Silt, little medium Sand, trace Gravel).	2-in diameter schedule 40 PVC well casing to 236.1' below grade
	80	*									
145		029		22 32 33 28	65	1.0	0			Red TILL (very fine to fine SAND, trace Silt and Gravel), very dense.	Bentonite seal 4.0' to 231.8' below grade
	75	*									
150		030		13 37 65 60	102	1.0	0			Red TILL (very fine to fine SAND, trace Silt and Gravel), very dense.	
	70	*									
155											

Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

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Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 287.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		031		21 39 49 53	88	1.0	0			Red TILL (very fine SAND, little medium to coarse Sand, trace Silt and Gravel).	8.25-in diameter HSA borehole
	65	*									
180		032		23 41 48 52	89	0.75	0			Red TILL (very fine SAND, little medium to coarse Sand, trace Silt and Gravel).	2-in diameter schedule 40 PVC well casing to 236.1' below grade
	60	*									
185		033		25 25 30 32	55	1.0	0			Red TILL (fine to medium SAND, some Silt, little Gravel).	Bentonite seal 4.0' to 231.8' below grade
	55	*									
190		034		23 38 47 58	85	1.0	0			Red TILL (fine to medium SAND, some Silt, little Gravel).	
	50	*								Trace fragments of soft extremely weathered arkose boulder.	
		035		50/0.2		1.0	0			Piece of grey Diabase. Top of bedrock at 174.0' bgs.	
175		01		15						Red fine-grained SANDSTONE.	4.0-in diameter Rollerbit borehole

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 287.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		01		5							4.0-in diameter Rollerbit borehole
				6							
	45			5							
		036		50/0.1			0			4.0-in. diameter Rollerbit used from 100' - 287.5' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
		02		5							
				5							
180				5			0				2-in diameter schedule 40 PVC well casing to 236.1' below grade
				5							
	40										
		03		5							
				5							
				5			0				
185				5							Bentonite seal 4.0' to 231.8' below grade
				5							
	35										
		04		4							
				4							
				3			0				
190				5							
				3							
	30										
		05		4							
				4			0				
195				4							

Remarks:
Augers seated at 177.0' bgs.

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

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Project: 083.31
Script: srsne2
Date: 09/05/97

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		05		4, 4			0				4.0-in diameter Rollerbit borehole
25		06		5, 4, 4, 5, 4			0				2-in diameter schedule 40 PVC well casing to 236.f below grade
200	20	07		3, 3, 3, 3, 2			0			4.0-in. diameter Rollerbit used from 100' - 267.5' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Bentonite seal 4.0' to 231.8' below grade
205	15	08		4, 3, 3, 4, 4			0				
210	10	09		3, 3, 3			0				
215											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		09		3, 2			0				4.0-in diameter Rollerbit borehole
	5	10		4, 4, 4			0				
220		11		3, 2							2-in diameter schedule 40 PVC well casing to 236.f below grade
	0	12		3, 3, 4, 3, 3			0			4.0-in. diameter Rollerbit used from 100' - 267.5' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
225											Bentonite seal 4.0' to 231.8' below grade
	-5	13		4, 3, 3			0				
230		14		3, 3							
	-10	15		3, 4, 4			0				Grade #0 Morie sand pack 231.8' to 267.5' below grade.
235											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 287.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		15		4, 3			0				2-in diameter schedule 40 PVC well casing to 236.f below grade
	-15	16		3, 3, 3, 3, 3			0				
240											4.0-in diameter Rollerbit borehole
	-20	17		3, 3, 3, 3, 3			0			4.0-in. diameter Rollerbit used from 100' - 287.5' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
245											2-in diameter 0.010-in slotted Schedule 40 PVC well screen 236.f to 286.f below grade
	-25	18		3, 3, 3, 3, 3			0				
250											Grade #0 Morie sand pack 231.8' to 287.5' below grade.
	-30	19		4, 4, 4			0				
255											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ⊻

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-708DR

Total Depth = 267.5 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		19		4, 4			0				4.0-in diameter Rollerbit borehole
	-35	20		4, 5, 5, 5, 5			0			4.0-in. diameter Rollerbit used from 100' - 267.5' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 236.1' to 268.1' below grade
260	-40	21		4, 4, 4, 4, 4			0				Grade #0 Morie sand pack 231.8' to 267.5' below grade.
265	-45									Bottom of rollerbit borehole at 267.5' bgs.	4-in long Schedule 40 PVC bottom cap
270	-50										
275											

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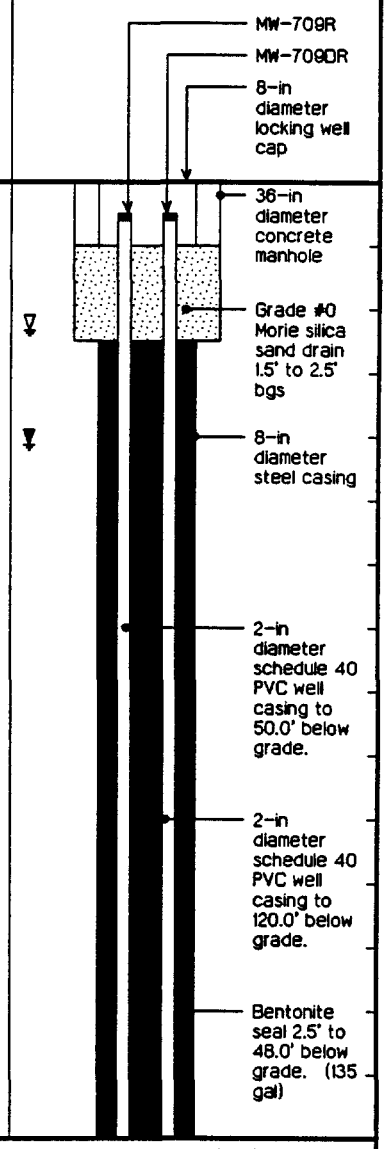
Remarks:

Water Levels

Date / Time	Elevation	Depth
01/21/97	150.86	73.99 ▼

Date Start/Finish: 11/13/96 **Borehole Depth:** 134.0 ft.	**Northing:** 565402.9955 **Easting:** 287091.8174 **TIC Elev.:** 161.53 ft. (R) **TIC Elev.:** 161.53 ft. (DR) **Ground Surface Elev.:** 161.6 ft.	**Well No. MW-709R and MW-709DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Well Construction
depth bgs	gs elevation 161.6 ft.										
										GROUND SURFACE	
	160									Monitoring wells set in pre-exsisting 8-in. diameter former Cianci water-supply well.	
5	155	NA	NA	NA	NA	NA	NA				
10	150										
15											



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Remarks:

TIC = Top of inner casing.

Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07
DR - 01/21/97	159.26	2.27

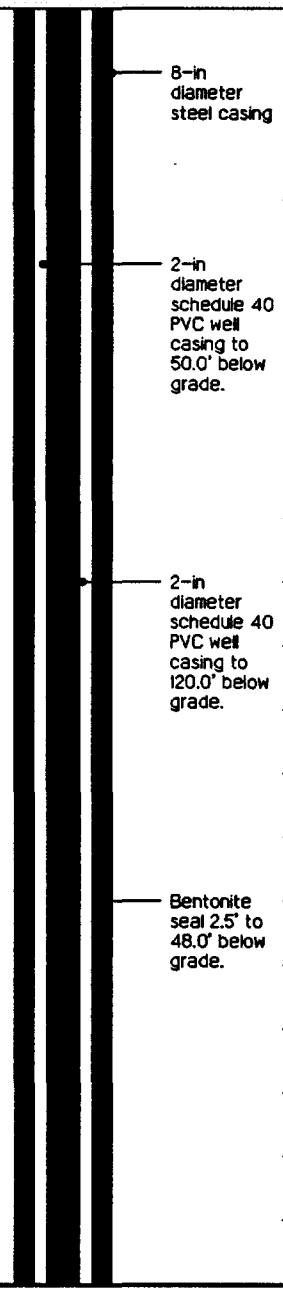
Location:
SRSNE Site
Southington, CT

Client:
SRSNE PRP Group

Well No. MW-709R and MW-709DR

Total Depth = 134.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Well Construction
										Monitoring wells set in pre-exsisting 8-in. diameter former Cianci water-supply well.	
	145										
20											
	140										
25		NA	NA	NA	NA	NA	NA				
	135										
30											
	130										
35											



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Remarks:

Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07 ▼
DR - 01/21/97	159.26	2.27 ▽

Location:
SRSNE Site
Southington, CT

Client:
SRSNE PRP Group

Well No. MW-709R and MW-709DR

Total Depth = 134.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Well Construction
										Bedrock lithology and fracture depths determined through BIPS imaging completed by COLOG, Inc. on 10/21/96.	8-in diameter steel casing
	125									Red/gray feldspathic SANDSTONE.	Open bedrock borehole
										Fracture at 36.8' bgs.	
40											2-in diameter schedule 40 PVC well casing to 50.0' below grade.
	120										
										Fracture at 42.1' bgs.	2-in diameter schedule 40 PVC well casing to 120.0' below grade.
										Fracture at 43.0' bgs.	
45		NA	NA	NA	NA	NA	NA				
	115										Bentonite seal 2.5' to 48.0' below grade.
											Grade #0 Morie sand pack 48.0' to 72.0' below grade. (725 lbs)
50											
										Fracture at 50.7' bgs.	
	110										2-in diameter 0.010-in slotted Schedule 40 PVC well screen 50.0' to 70.0' below grade.
										Fracture at 53.3' bgs.	
										Fracture at 53.8' bgs.	
55										Fracture at 54.5' bgs.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07
DR - 01/21/97	159.26	2.27

Location:
SRSNE Site
Southington, CT

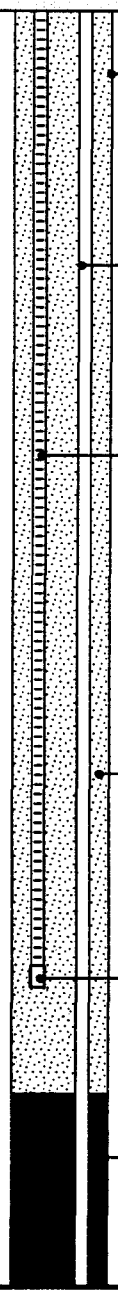
Client:
SRSNE PRP Group

Well No. MW-709R and MW-709DR

Total Depth = 134.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
	105									Red/gray feldspathic SANDSTONE.
										Fracture at 58.4' bgs.
										Fracture at 58.9' bgs.
60										Fracture at 60.1' bgs.
	100									
65		NA	NA	NA	NA	NA	NA			
	95									
70										
	90									
										Fracture at 73.0' bgs.
										Fracture at 73.3' bgs.
75										

Well Construction



- Open bedrock borehole
- 2-in diameter schedule 40 PVC well casing to 120.0' below grade.
- 2-in diameter 0.010-in slotted Schedule 40 PVC well screen 50.0' to 70.0' below grade
- Grade #0 Morie sand pack 48.0' to 72.0' below grade.
- 4-in long Schedule 40 PVC bottom cap
- Bentonite seal 72.0' to 118.0' below grade. (105 gal)

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Remarks:

Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07 ⊽
DR - 01/21/97	159.26	2.27 ⊽

Location:
SRSNE Site
Southington, CT

Client:
SRSNE PRP Group

Well No. MW-709R and MW-709DR

Total Depth = 134.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Well Construction
	85									Red/gray feldpathic SANDSTONE.	Open bedrock borehole
80										Fracture at 79.9' bgs.	Bentonite seal 72.0' to 118.0' below grade.
	80										
										Fracture at 83.7' bgs.	
85		NA	NA	NA	NA	NA	NA				2-in diameter schedule 40 PVC well casing to 120.0' below grade.
	75										
										Fracture at 88.3' bgs.	
90											
	70										
95											

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Remarks:

Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07 ⊻
DR - 01/21/97	159.26	2.27 ⊻

Location:
SRSNE Site
Southington, CT

Client:
SRSNE PRP Group

Well No. MW-709R and MW-709DR

Total Depth = 134.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
	65									Red/gray feldspathic SANDSTONE.
100										
	60									Fracture at 101.8' bgs.
										Fracture at 103.2' bgs.
										Fracture at 103.6' bgs.
105		NA	NA	NA	NA	NA	NA			
	55									Fracture at 107.3' bgs.
										Fracture at 108.5' bgs.
110										Fracture at 110.3' bgs.
	50									
										Fracture at 112.7' bgs.
										Fracture at 113.4' bgs.
										Fracture at 114.2' bgs.
115										

Well Construction

BBL
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Remarks:

Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07 ↧
DR - 01/21/97	159.26	2.27 ↧

Location:
SRSNE Site
Southington, CT

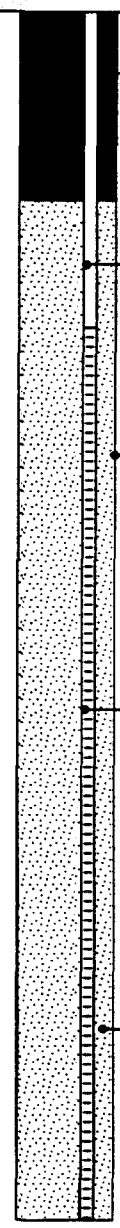
Client:
SRSNE PRP Group

Well No. MW-709R and MW-709DR

Total Depth = 134.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In.	N	Recovery (ft.)	PID (ppm) Headspace	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
										Fracture at 115.7' bgs.
	45									Fracture at 116.2' bgs.
										Fracture at 117.9' bgs.
120										Fracture at 120.4' bgs.
	40									Red/gray feldspathic SANDSTONE.
		NA	NA	NA	NA	NA	NA			
125										
	35									
130										
	30									
										Bottom of borehole at 134.0' bgs.
135										

Well Construction



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Remarks:

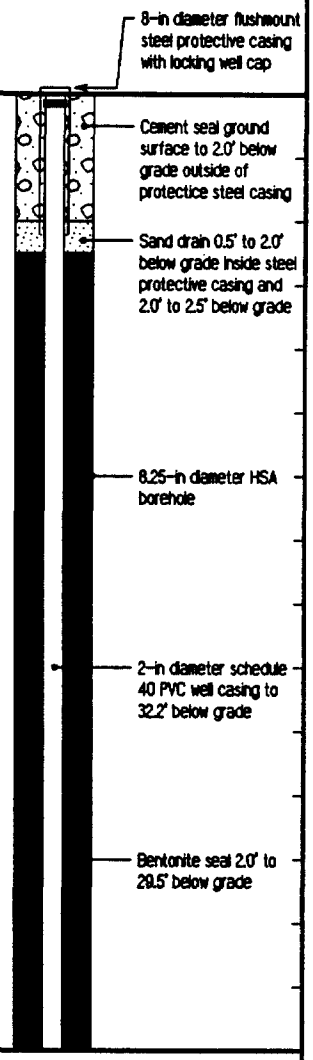
Water Levels

Date / Time	Elevation	Depth
R - 01/21/97	157.46	4.07 ⊻
DR - 01/21/97	159.26	2.27 ⊻

Date Start/Finish: 06/10/97 - 06/10/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** Hollow Stem Auger **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 284846.9779 **Easting:** 566111.9482 **TIC Elev.:** 164.93 ft. **Borehole Depth:** 43.0 ft. **Ground Surface Elev.:** 165.0 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-710S** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH (depth)	ELEVATION (gs elevation 165.0 ft.)	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
	165									GROUND SURFACE
		*								
				2 3	5					
		*								
5	160	01		2 3 2 3	5	1.0	0.0			Red fine to medium SAND, trace coarse SAND and Silt, moist.
		*								
10	155	02		4 2 4 5	6	1.3	0.0			Red medium to coarse SAND, little very coarse Sand, trace fine Gravel, moist.
		*								
15	150									

Monitoring Well Construction



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Remarks:

Geologic description based on MW-710DR. No samples taken at MW-710S. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-43.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710S

Total Depth = 43.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	150										
		03		3 2 4 4	8	1.8	0.0			Red to light olive grey medium to coarse SAND, grading to fine to medium SAND at 16.0' bgs, moist.	8.25-in diameter HSA borehole
		*									
20	145	04		3 2 3 4	5	1.7	0.0			Red fine to medium SAND, little coarse Sand, saturated.	2-in diameter schedule 40 PVC well casing to 32.2' below grade
		*									
25	140	05		4 6 5 5	11	1.8	0.0			Red fine to medium SAND, little coarse Sand, saturated.	Bentonite seal 4.0' to 29.5' below grade
		H018									
		*									
30	135	06		2 7 5 5	12	2.0	0.0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	Grade #0 Morie sand pack 29.5' to 43.0' below grade
		*									2-in diameter 0.010-in slotted Schedule 40 PVC well screen 32.2' to 42.2' below grade
35	130	07		10 7	20	2.0	0.0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

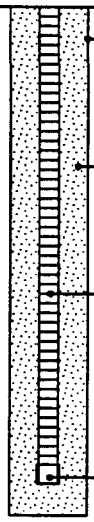
Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710S

Total Depth = 43.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
		07		13 17	20	2.0	0.0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.
		H019								Red fine to medium SAND and SILT, some Gravel, saturated.
		*								
40	125	08		8 17 18 21	35	2.0	0.0			Red medium to coarse SAND, some very coarse Sand, trace fine Gravel.
		*								
										Bottom of borehole at 43.0' bgs.
45	120									
60	115									
55	110									

Monitoring Well Construction



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Remarks:

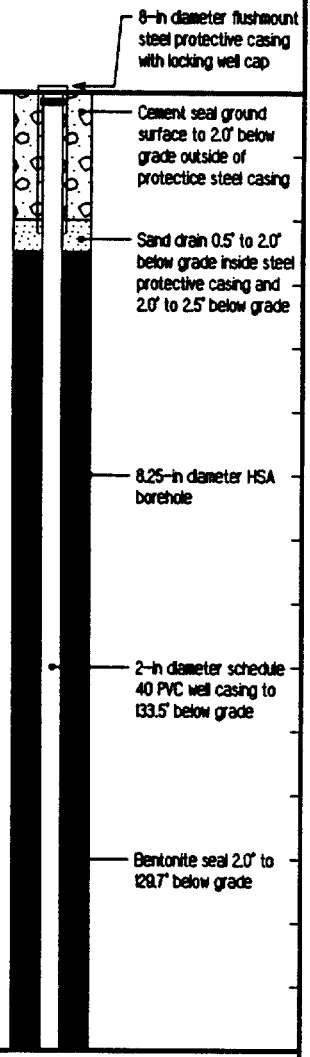
Water Levels

Date / Time	Elevation	Depth

Date Start/Finish: 06/06/97 - 06/09/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 284835.6588 **Easting:** 566109.5591 **TIC Elev.:** 164.58 ft. **Borehole Depth:** 147.0 ft. **Ground Surface Elev.:** 165.0 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No:** MW-710R **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 165.0 ft.									
	165									GROUND SURFACE
		*								
				2 3	5					
		*								
5	160	01		2 3 2 3	5	1.0	0.0			Red fine to medium SAND, trace coarse SAND and Silt, moist.
		*								
10	155	02		4 2 4 5	6	1.3	0.0			Red medium to coarse SAND, little very coarse Sand, trace fine Gravel, moist.
		*								
15	150									

Monitoring Well Construction



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Remarks:

*Geologic description based on MW-710DR. No samples taken at MW-710R. * = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-127.0 ft. bgs. 4.0-in. Rollerbit 127.0-147.0 ft. bgs.*

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	150	03		3 2 4 4	6	1.8	0.0			Red to light olive grey medium to coarse SAND, grading to fine to medium SAND at 18.0' bgs, moist.	8.25-in diameter HSA borehole
		*									
20	145	04		3 2 3 4	5	1.7	0.0			Red fine to medium SAND, little coarse Sand, saturated.	2-in diameter schedule 40 PVC well casing to 133.5' below grade
		*									
25	140	05		4 6 5 5	11	1.8	0.0			Red fine to medium SAND, little coarse Sand, saturated.	Bentonite seal 4.0' to 129.7' below grade
		H018									
		*									
30	135	06		2 7 5 5	12	2.0	0.0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	
		*									
35	130	07		10 7	20	2.0	0.0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		13 17	20	2.0	0.0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	
										Red fine to medium SAND and SILT, some Gravel, saturated.	8.25-in diameter HSA borehole
		H019									
		*									
40	125	08		8 17 18 21	35	2.0	0.0			Red medium to coarse SAND, some very coarse Sand, trace fine Gravel.	2-in diameter schedule 40 PVC well casing to 133.5' below grade
		*									
45	120	09		7 13 20 31	33	2.0	0.0			Red coarse to very course SAND, some medium SAND, little fine Gravel.	Bentonite seal 4.0' to 129.7' below grade
		H020									
		*									
50	115	10		13 19 21 27	40	2.0	0.0			Red coarse to very course SAND, some medium SAND, little fine Gravel.	
		*									
55	110	11		14 19	55	2.0	0.0			Red coarse to very course SAND, some medium SAND, little fine Gravel.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		11		31 34	55	2.0	0.0			Red TILL (fine to medium SAND, some Silt, trace to little Gravel, very dense), compact.	8.25-in diameter HSA borehole
		H022									
		*									
60	105	12		51 25 43 32	68	2.0	0.0			Red TILL (medium to coarse SAND, little fine Sand, Silt and Gravel, dense), compact.	2-in diameter schedule 40 PVC well casing to 133.5' below grade
		*									
65	100	S049 13		5 24 100/0.3		1.3	0.0			Red TILL (medium to coarse SAND and SILT, some fine SAND, little Gravel, very dense), tight.	Bentonite seal 4.0' to 129.7' below grade
		*									
70	95	14		29 51 42 41	93	0.5	0.0			Red TILL (medium to coarse SAND and SILT, some fine SAND, little Gravel, very dense), tight.	
		*									
75	90	S050 15		14 21	50	1.0	0.0			Red TILL (medium to coarse SAND, some Silt, some to little Gravel, trace fine Sand).	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		S050 15		29 33	50	1.0	0.0				8.25-in diameter HSA borehole
		*									
80	85	16		26 20 19 24	39	0.8	0.0			Red TILL (medium to coarse SAND, some Silt and fine Sand, little to trace Gravel).	2-in diameter schedule 40 PVC well casing to 133.5' below grade
		*									
85	80	S051 17		27 22 25 39	47	1.2	0.0			Red TILL (very fine SAND and Silt, some fine medium Sand, trace Gravel), very compact.	Bentonite seal 4.0' to 129.7' below grade
		*									
90	75	18		29 24 51 43	55	1.0	0.0			Red TILL (very fine SAND and Silt, some fine medium Sand, trace Gravel), very compact.	
		*									
95	70	S052 19		24 45	78	1.3	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		S052 19		33 17	78	1.3	0.0				8.25-in diameter HSA borehole
		*									
100	65	20		35 23 26 38	49	1.0	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight.	2-in diameter schedule 40 PVC well casing to 133.5' below grade
		*									
105	60	S053 21		42 44 39 34	83	2.0	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight.	Bentonite seal 4.0' to 129.7' below grade
		*									
110	55	22		39 40 44 61	88	1.0	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight. Red TILL (very fine SAND and Silt).	
		*									
115	50	S054 23		28 100/0.3		1.0	0.0			Red TILL (very fine SAND and Silt, some pieces of extremely weathered red arkose Sandstone).	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		S054 23		100/0.4		1.0	0.0				8.25-in diameter HSA borehole
		*									
120	45	24		51 25 33 42	58	1.5	0.0			Red TILL (fine to medium SAND and Silt, trace coarse Sand, some extremely weathered arkose Sandstone in tip of spoon).	2-in diameter schedule 40 PVC well casing to 133.5' below grade
		*									
125	40	S055 25		35 100/0.5						Red TILL (fine to medium SAND and Silt, trace coarse Sand, some Basalt/Diorite fragments in tip of spoon).	Bentonite seal 4.0' to 129.7' below grade
		*									
		26		100/0.3		0.3	0.0			Grey weathered DIORITE and SILT.	
		01		6						Top of bedrock at 127.5' bgs.	4.0-in diameter Rollerbit borehole
130	35	02		3 3 2 3			0.0			4.0-in. diameter Rollerbit used from 127.0' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Grade #0 Morie sand pack 129.7' to 144.5' below grade
		03		3 6			0.0				2-in diameter 0.010-in slotted Schedule 40 PVC well screen 133.5' to 143.5' below grade
135	30										

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engineers & scientists

Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710R

Total Depth = 147.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		7, 6, 4			0.0				4.0-in diameter Rollerbit borehole
		04		6, 3, 3, 3, 3			0.0			Fractures interpreted based on drill rig response.	Grade #0 Morie sand pack 129.7' to 144.5' below grade
140	25										2-in diameter 0.010-in slotted Schedule 40 PVC well screen 133.5' to 143.5' below grade
		05		4, 4, 4, 4			0.0			4.0-in. diameter Rollerbit used from 127.0' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4-in long Schedule 40 PVC bottom cap
145	20										Bedrock fragments 144.5' to 147.0' below grade
										Bottom of rollerbit borehole at 147.0' bgs.	
150	15										
155	10										

Remarks:
Corehole collapsed from 144.5' to 147.0' bgs.

Water Levels

Date / Time	Elevation	Depth

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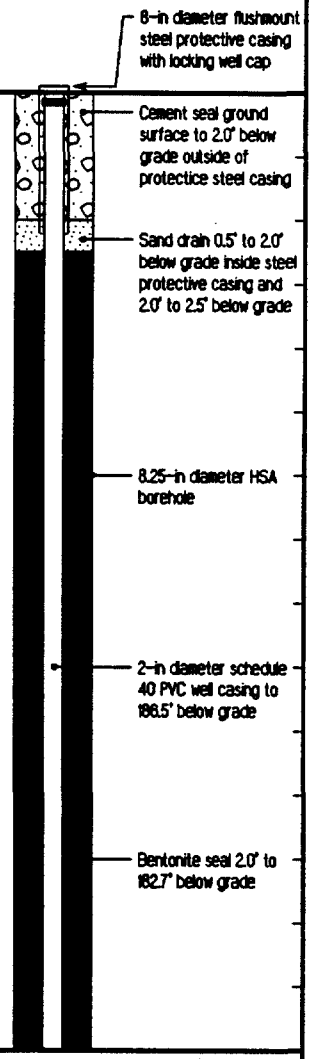
Date Start/Finish: 05/28/97 - 06/03/97 **Drilling Company:** East Coast - Thomas **Drilling Method:** HSA and Rollerbit **Bedrock Drill Bit Size:** 4-in. **Auger Size:** 8.25-in. OD HSA **Rig Type:** CME 75 **Spoon Size:** 2-in.	**Northing:** 284856.6075 **Easting:** 566122.9486 **TIC Elev.:** 164.99 ft. **Borehole Depth:** 222.0 ft. **Ground Surface Elev.:** 165.0 ft. **Geologist:** Aaron D. Svitana	**Monitoring Well No: MW-710DR** **Client:** SRSNE PRP Group **Location:** SRSNE Site Southington, CT

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description
depth	gs elevation 165.0 ft.									
	165									GROUND SURFACE
		*								
				2 3	5					
		*								
5	160	01		2 3 2 3	5	1.0	0.0			Red fine to medium SAND, trace coarse SAND and Silt, moist.
		*								
10	155	02		4 2 4 5	6	1.3	0.0			Red medium to coarse SAND, little very coarse Sand, trace fine Gravel, moist.
		*								
15	150									

Monitoring Well Construction



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Remarks:

* = Interval augered through. TIC = Top of inner casing. 8.25-in. OD HSA 0-127.5 ft. bgs. 4.0-in. Rollerbit 127.5-222.0 ft. bgs.

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
	150	03		3 2 4 4	6	1.8	0.0			Red to light olive grey medium to coarse SAND, grading to fine to medium SAND at 18.0' bgs, moist.	8.25-in diameter HSA borehole
		*									
20	145	04		3 2 3 4	5	1.7	0.0			Red fine to medium SAND, little coarse Sand, saturated.	2-in diameter schedule 40 PVC well casing to 186.5' below grade
		*									
25	140	05		4 6 5 5	11	1.8	0.0			Red fine to medium SAND, little coarse Sand, saturated.	Bentonite seal 4.0' to 182.7' below grade
		H018									
		*									
30	135	06		2 7 5 5	12	2.0	0.0			Light olive grey/pink/tan medium to coarse SAND, little Gravel, moist.	
		*									
35	130	07		10 7	20	2.0	0.0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
SRSNE PRP Group

Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		13 17	20	2.0	0.0			Light olive grey/pink medium to coarse SAND and GRAVEL, moist.	
										Red fine to medium SAND and SILT, some Gravel, saturated.	8.25-in diameter HSA borehole
		H019									
		*									
40	125	08		8 17 18 21	35	2.0	0.0			Red medium to coarse SAND, some very coarse Sand, trace fine Gravel.	2-in diameter schedule 40 PVC well casing to 188.5' below grade
		*									
45	120	09		7 13 20 31	33	2.0	0.0			Red coarse to very course SAND, some medium SAND, little fine Gravel.	Bentonite seal 4.0' to 182.7' below grade
		H020									
		*									
60	115	10		13 19 21 27	40	2.0	0.0			Red coarse to very course SAND, some medium SAND, little fine Gravel.	
		*									
55	110	11		14 19	55	2.0	0.0			Red coarse to very course SAND, some medium SAND, little fine Gravel.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

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Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		11		31 34	55	2.0	0.0			Red TILL (fine to medium SAND, some Silt, trace to little Gravel, very dense), compact.	8.25-in diameter HSA borehole
		H022									
		*									
60	105	12		51 25 43 32	68	2.0	0.0			Red TILL (medium to coarse SAND, little fine Sand, Silt and Gravel, dense), compact.	2-in diameter schedule 40 PVC well casing to 188.5' below grade
		*									
65	100	S049 13		5 24 100/0.3		1.3	0.0			Red TILL (medium to coarse SAND and SILT, some fine SAND, little Gravel, very dense), tight.	Bentonite seal 4.0' to 182.7' below grade
		*									
70	95	14		29 51 42 41	93	0.5	0.0			Red TILL (medium to coarse SAND and SILT, some fine SAND, little Gravel, very dense), tight.	
		*									
75	90	S050 15		14 21	50	1.0	0.0			Red TILL (medium to coarse SAND, some Silt, some to little Gravel, trace fine Sand).	

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Water Levels

Date / Time	Elevation	Depth

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Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		S050 15		29 33	50	1.0	0.0				8.25-in diameter HSA borehole
		*									
80	85	16		26 20 19 24	39	0.8	0.0			Red TILL (medium to coarse SAND, some Silt and fine Sand, little to trace Gravel).	2-in diameter schedule 40 PVC well casing to 188.5' below grade
		*									
85	80	S051 17		27 22 25 39	47	1.2	0.0			Red TILL (very fine SAND and Silt, some fine medium Sand, trace Gravel), very compact.	Bentonite seal 4.0' to 182.7' below grade
		*									
90	75	18		29 24 51 43	55	1.0	0.0			Red TILL (very fine SAND and Silt, some fine medium Sand, trace Gravel), very compact.	
		*									
95	70	S052 19		24 45	78	1.3	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight.	

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Remarks:

Water Levels

Date / Time	Elevation	Depth

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Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		S052 19		33 17	78	1.3	0.0				8.25-in diameter HSA borehole
		*									
100	65	20		35 23 26 36	49	1.0	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight.	2-in diameter schedule 40 PVC well casing to 186.5' below grade
		*									
105	60	S053 21		42 44 39 34	83	2.0	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight.	Bentonite seal 4.0' to 182.7' below grade
		*									
110	55	22		39 40 44 61	88	1.0	0.0			Red TILL (very fine SAND and Silt, some fine Sand, trace very coarse Sand), tight. Red TILL (very fine SAND and Silt).	
		*									
115	50	S054 23		28 100/0.3		1.0	0.0			Red TILL (very fine SAND and Silt, some pieces of extremely weathered red arkose Sandstone).	

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Remarks:

Water Levels

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Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		S054 23		100/0.4		1.0	0.0				8.25-in diameter HSA borehole
		*									
20	45	24		51 25 33 42	58	1.5	0.0			Red TILL (fine to medium SAND and Silt, trace coarse Sand, some extremely weathered arkose Sandstone in tip of spoon).	2-in diameter schedule 40 PVC well casing to 188.5' below grade
		*									
25	40	S055 25		35 100/0.5						Red TILL (fine to medium SAND and Silt, trace coarse Sand, some Basalt/Diorite fragments in tip of spoon).	Bentonite seal 4.0' to 182.7' below grade
		*									
		26		100/0.3		0.3	0.0			Grey weathered DIORITE and SILT.	
		01		6						Top of bedrock at 127.5' bgs.	4.0-in diameter Rollerbit borehole
30	35	02		3			0.0			4.0-in. diameter Rollerbit used from 127.5' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
				3							
				2							
				3							
		03		3			0.0				
35	30			6							

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Remarks:

Water Levels

Date / Time	Elevation	Depth

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Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		03		7, 6, 4			0.0				4.0-in diameter Rollerbit borehole
140	25	04		6, 3, 3, 3, 3			0.0			Fractures interpreted based on drill rig response.	2-in diameter schedule 40 PVC well casing to 186.5' below grade
										4.0-in. diameter Rollerbit used from 127.5' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	
145	20	05		4, 4, 4, 4, 3			0.0			Soft zone.	Bentonite seal 4.0' to 182.7' below grade
150	15	06		4, 4, 4, 4, 4			0.0				
155	10	07		4, 3			0.0				

Remarks:

Water Levels

Date / Time	Elevation	Depth

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Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		07		4, 4, 3			0.0				4.0-in diameter Rollerbit borehole
180	5	08		4, 4, 3, 3, 4			0.0			Soft zone.	2-in diameter schedule 40 PVC well casing to 198.5' below grade
185	0	09		3, 3, 3, 3, 4			0.0			4.0-in. diameter Rollerbit used from 127.5' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock. Soft zone.	Bentonite seal 4.0' to 182.7' below grade
190	-5	10		3, 3, 3, 3, 3			0.0				
195	-10	11		3, 4			0.0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth

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SRSNE Site
Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		11		4, 4, 3			0.0				4.0-in diameter Rollerbit borehole
180	-15	12		4, 4, 3, 3, 3			0.0			Soft zone.	2-in diameter schedule 40 PVC well casing to 186.5' below grade
										4.0-in. diameter Rollerbit used from 127.5' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	Bentonite seal 4.0' to 182.7' below grade
185	-20	13		3, 4, 3, 3, 3			0.0				Grade #0 Morie sand pack 182.7' to 206.8' below grade
190	-25	14		3, 4, 4, 4			0.0				2-in diameter 0.010-in slotted Schedule 40 PVC well screen 186.5' to 206.5' below grade
										Soft zone.	
195	-30	15		3, 3			0.0				

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Remarks:

Water Levels

Date / Time	Elevation	Depth

Client:
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Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		15		3, 3, 3			0.0				4.0-in diameter Rollerbit borehole
		16		3, 4, 3, 3, 3			0.0			Soft zone.	Grade #0 Morie sand pack 182.7' to 206.8' below grade
200	-35										
		18		4, 4, 4, 3, 4, 3, 3, 3, 3			0.0			4.0-in. diameter Rollerbit used from 127.5' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	2-in diameter 0.010-in slotted Schedule 40 PVC well screen 186.5' to 206.5' below grade
205	-40										
										Fractures interpreted based on drill rig response. Temporary water loss observed.	4-in long Schedule 40 PVC bottom cap
210	-45										Bedrock fragments 206.8' to 222.0' below grade
		19		3, 3			0.0				
215	-50										

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Remarks:
Corehole collapsed from 222.0' to 206.8' bgs.

Water Levels

Date / Time	Elevation	Depth

Client:
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Location:
SRSNE Site
Southington, CT

Monitoring Well No: MW-710DR

Total Depth = 222.0 ft.

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Blows/6 In. or Minutes/Foot	N Value or RQD	Recovery (ft.)	PID (ppm)	Bedrock Fracture Data	Geologic Column	Stratigraphic Description	Monitoring Well Construction
		19		4 3 3			0.0			4.0-in. diameter Rollerbit used from 127.5' - 222.0' bgs. No samples taken. No fracture data obtained. New Haven Arkose bedrock.	4.0-in diameter Rollerbit borehole
		20		3 3			0.0				
220	-55	21		3 3			0.0				Bedrock fragments 206.8' to 222.0' below grade
										Bottom of rollerbit borehole at 220.0' bgs.	
225	-60										
230	-65										
235	-70										

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Remarks:
Corehole collapsed from 222.0' to 206.8' bgs.

Water Levels

Date / Time	Elevation	Depth

Appendix F

Packer Test Data Reduction Tables and Equipment Calibration Plots

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-701DR	09/11/96	1.1	33.1	43.4	20.6	4.6	11	0.0	5	4	4500	38	0.75	25.4	0.0	< 0.6	< 0.1	50	< 10	< 52	< 5.0E-05	
MW-701DR	09/11/96	1.2	33.1	43.4	20.6	4.6	20	0.0	5	4	4500	38	0.75	46.2	0.0	< 0.6	< 0.1	71	< 5	< 37	< 3.5E-05	
MW-701DR	09/11/96	1.3	33.1	43.4	20.6	4.6	29	0.0	5	4	4500	38	0.75	67.0	0.0	< 0.6	< 0.1	92	< 4	< 28	< 2.7E-05	< 2.7E-05
MW-701DR	09/11/96	1.4	33.1	43.4	20.6	4.6	20	0.0	5	4	4500	38	0.75	46.2	0.0	< 0.6	< 0.1	71	< 5	< 37	< 3.5E-05	No measureable
MW-701DR	09/11/96	1.5	33.1	43.4	20.6	4.6	11	0.0	5	4	4500	38	0.75	25.4	0.0	< 0.6	< 0.1	50	< 10	< 52	< 5.0E-05	flow
MW-701DR	09/11/96	2.1	43.1	53.4	20.6	4.6	14	2.0	5	4	4500	48	0.75	32.3	0.4	1.0	0.2	57	13	78	7.5E-05	
MW-701DR	09/11/96	2.2	43.1	53.4	20.6	4.6	25	6.6	5	4	4500	48	0.75	57.8	1.3	1.8	0.5	82	13	99	9.6E-05	
MW-701DR	09/11/96	2.3	43.1	53.4	20.6	4.6	36	12.4	5	4	4500	48	0.75	83.2	2.5	2.9	1.0	107	14	120	1.2E-04	7.5E-05
MW-701DR	09/11/96	2.4	43.1	53.4	20.6	4.6	25	8.6	5	4	4500	48	0.75	57.8	1.7	2.2	0.6	82	16	119	1.2E-04	Washout
MW-701DR	09/11/96	2.5	43.1	53.4	20.6	4.6	14	4.9	5	4	4500	48	0.75	32.3	1.0	1.5	0.4	57	20	119	1.2E-04	
MW-701DR	09/11/96	3.1	53.1	63.4	20.5	4.6	17	29.7	5	4	4500	58	0.75	39.3	5.9	6.0	3.7	61	64	444	4.3E-04	
MW-701DR	09/11/96	3.2	53.1	63.4	20.6	4.6	31	50.4	5	4	4500	58	0.75	71.6	10.1	10.1	8.7	88	59	515	5.0E-04	
MW-701DR	09/11/96	3.3	53.1	63.4	20.6	4.6	44	77.6	5	4	4500	58	0.75	101.6	15.5	15.5	17.8	109	64	641	6.2E-04	5.1E-04
MW-701DR	09/11/96	3.4	53.1	63.4	20.6	4.6	31	32.8	3	4	4500	58	0.75	71.6	10.9	10.9	10.0	87	64	567	5.5E-04	Laminar
MW-701DR	09/11/96	3.5	53.1	63.4	20.6	4.6	17	19.0	3	4	4500	58	0.75	39.3	6.3	6.3	4.0	60	67	472	4.6E-04	
MW-701DR	09/11/96	4.1	63.1	73.4	20.6	4.6	20	19.5	5	4	4500	68	0.75	46.2	3.9	4.2	2.2	69	38	270	2.6E-04	
MW-701DR	09/11/96	4.2	63.1	73.4	20.6	4.6	36	28.3	5	4	4500	68	0.75	83.2	5.7	5.7	3.8	105	29	247	2.4E-04	
MW-701DR	09/11/96	4.3	63.1	73.4	20.6	4.6	51	38.4	5	4	4500	68	0.75	117.8	7.7	7.7	6.1	137	27	252	2.4E-04	2.7E-04
MW-701DR	09/11/96	4.4	63.1	73.4	20.6	4.6	36	31.4	5	4	4500	68	0.75	83.2	6.3	6.3	4.4	104	32	272	2.6E-04	Turbulent
MW-701DR	09/11/96	4.5	63.1	73.4	20.6	4.6	20	21.1	5	4	4500	68	0.75	46.2	4.2	4.4	2.5	69	40	290	2.8E-04	
MW-701DR	09/11/96	5.1	73.1	83.4	20.5	4.6	23	4.2	5	4	4500	78	0.75	53.1	0.8	1.4	0.4	78	11	80	7.7E-05	
MW-701DR	09/11/96	5.2	73.1	83.4	20.5	4.6	41	6.5	5	4	4500	78	0.75	94.7	1.3	1.8	0.6	119	8	68	6.6E-05	
MW-701DR	09/11/96	5.3	73.1	83.4	20.6	4.6	59	11.7	5	4	4500	78	0.75	136.3	2.3	2.7	1.2	160	8	77	7.4E-05	7.6E-05
MW-701DR	09/11/96	5.4	73.1	83.4	20.6	4.6	41	8.1	5	4	4500	78	0.75	94.7	1.6	2.1	0.8	119	9	79	7.6E-05	Turbulent
MW-701DR	09/11/96	5.5	73.1	83.4	20.6	4.6	23	3.9	5	4	4500	78	0.75	53.1	0.8	1.3	0.4	78	10	77	7.4E-05	
MW-701DR	09/11/96	6.1	83.1	93.4	20.5	4.6	26	0.0	5	4	4500	88	0.75	60.1	0.0	< 0.6	< 0.1	85	< 4	< 31	< 3.0E-05	
MW-701DR	09/11/96	6.2	83.1	93.4	20.5	4.6	48	0.0	5	4	4500	88	0.75	110.9	0.0	< 0.6	< 0.1	136	< 2	< 19	< 1.9E-05	
MW-701DR	09/11/96	6.3	83.1	93.4	20.5	4.6	55	10.4	5	4	4500	88	0.75	127.1	2.1	2.5	1.1	151	8	75	7.2E-05	< 1.9E-05
MW-701DR	09/11/96	6.4	83.1	93.4	20.7	4.6	46	2.8	5	4	4500	88	0.75	106.3	0.6	1.1	0.3	131	4	39	3.8E-05	Dilation
MW-701DR	09/11/96	6.5	83.1	93.4	20.5	4.6	26	0.0	5	4	4500	88	0.75	60.1	0.0	< 0.6	< 0.1	85	< 4	< 31	< 3.0E-05	
MW-701DR	09/11/96	7.1	93.1	103.4	20.6	4.6	29	78.3	5	4	4500	98	0.75	67.0	15.7	15.7	26.1	66	98	1065	1.0E-03	
MW-701DR	09/11/96	7.2	93.1	103.4	20.3	4.6	52	92.1	4	4	4500	98	0.75	120.1	23.0	23.0	50.0	95	80	1090	1.1E-03	
MW-701DR	09/11/96	7.3	93.1	103.4	20.4	4.6	58	125.1	5	4	4500	98	0.75	134.0	25.0	25.0	57.5	101	78	1110	1.1E-03	9.7E-04
MW-701DR	09/11/96	7.4	93.1	103.4	20.4	4.6	52	66.6	3	4	4500	98	0.75	120.1	22.2	22.2	47.0	98	77	1019	9.8E-04	Turbulent
MW-701DR	09/11/96	7.5	93.1	103.4	20.6	4.6	29	43.4	3	4	4500	98	0.75	67.0	14.5	14.5	22.8	69	90	938	9.1E-04	

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-702DR	11/04/96	9.1	22.0	27.5	11.7	3.2	7	0.0	3	4	7100	25	0.75	16.2	0.0	< 0.6	< 0.1	31	< 28	< 133	< 1.3E-04	
MW-702DR	11/04/96	9.2	22.0	27.5	11.7	3.2	13	0.0	3	4	7100	25	0.75	30.0	0.0	< 0.6	< 0.1	45	< 15	< 92	< 8.9E-05	
MW-702DR	11/04/96	9.3	22.0	27.5	11.7	3.2	18	5.8	5	4	7100	25	0.75	41.6	1.2	1.7	0.3	56	32	212	2.0E-04	< 8.9E-05
MW-702DR	11/04/96	9.4	22.0	27.5	11.7	3.2	13	0.0	3	4	7100	25	0.75	30.0	0.0	< 0.6	< 0.1	45	< 15	< 92	< 8.9E-05	Dilation
MW-702DR	11/04/96	9.5	22.0	27.5	11.7	3.2	7	0.0	3	4	7100	25	0.75	16.2	0.0	< 0.6	< 0.1	31	< 28	< 133	< 1.3E-04	
MW-702DR	10/30/96	1.1	31.0	41.0	8.1	4.2	10	0.0	3	4	4600	35	0.75	23.1	0.0	< 0.6	< 0.1	35	< 11	< 76	< 7.3E-05	
MW-702DR	10/30/96	1.2	31.0	41.0	8.1	4.2	19	0.0	3	4	4600	35	0.75	43.9	0.0	< 0.6	< 0.1	56	< 6	< 48	< 4.6E-05	
MW-702DR	10/30/96	1.3	31.0	41.0	8.1	4.2	27	0.0	3	4	4600	35	0.75	62.4	0.0	< 0.6	< 0.1	75	< 4	< 36	< 3.5E-05	< 3.5E-05
MW-702DR	10/30/96	1.4	31.0	41.0	8.1	4.2	19	0.0	3	4	4600	35	0.75	43.9	0.0	< 0.6	< 0.1	56	< 6	< 48	< 4.6E-05	No measureable
MW-702DR	10/30/96	1.5	31.0	41.0	8.1	4.2	11	0.0	3	4	4600	35	0.75	25.4	0.0	< 0.6	< 0.1	38	< 10	< 71	< 6.9E-05	flow
MW-702DR	10/30/96	2.1	35.5	45.5	10.1	4.3	12	0.0	3	4	4600	40	0.75	27.7	0.0	< 0.6	< 0.1	42	< 9	< 63	< 6.1E-05	
MW-702DR	10/30/96	2.2	35.5	45.5	10.1	4.3	21	0.0	3	4	4600	40	0.75	48.5	0.0	< 0.6	< 0.1	63	< 5	< 42	< 4.1E-05	
MW-702DR	10/30/96	2.3	35.5	45.5	10.1	4.3	30	0.0	3	4	4600	40	0.75	69.3	0.0	< 0.6	< 0.1	84	< 4	< 32	< 3.1E-05	< 3.1E-05
MW-702DR	10/30/96	2.4	35.5	45.5	10.1	4.3	21	0.0	3	4	4600	40	0.75	48.5	0.0	< 0.6	< 0.1	63	< 5	< 42	< 4.1E-05	No measureable
MW-702DR	10/30/96	2.5	35.5	45.5	10.1	4.3	12	0.0	3	4	4600	40	0.75	27.7	0.0	< 0.6	< 0.1	42	< 9	< 63	< 6.1E-05	flow
MW-702DR	10/30/96	3.1	45.5	55.5	10.6	4.3	15	0.0	3	4	4600	50	0.75	34.7	0.0	< 0.6	< 0.1	49	< 7	< 54	< 5.2E-05	
MW-702DR	10/30/96	3.2	45.5	55.5	10.6	4.3	27	2.8	5	4	4600	50	0.75	62.4	0.6	1.1	0.2	77	8	68	6.5E-05	
MW-702DR	10/30/96	3.3	45.5	55.5	10.6	4.3	38	8.5	5	4	4600	50	0.75	87.8	1.7	2.2	0.6	102	11	98	9.4E-05	< 5.2E-05
MW-702DR	10/30/96	3.4	45.5	55.5	10.6	4.3	27	5.8	5	4	4600	50	0.75	62.4	1.2	1.7	0.4	77	12	100	9.7E-05	Dilation
MW-702DR	10/30/96	3.5	45.5	55.5	10.6	4.3	15	0.0	3	4	4600	50	0.75	34.7	0.0	< 0.6	< 0.1	49	< 7	< 54	< 5.2E-05	
MW-702DR	10/30/96	4.1	55.5	65.5	10.5	4.3	18	0.0	3	4	4600	60	0.75	41.6	0.0	< 0.6	< 0.1	56	< 6	< 47	< 4.6E-05	
MW-702DR	10/30/96	4.2	55.5	65.5	10.5	4.3	32	0.0	3	4	4600	60	0.75	73.9	0.0	< 0.6	< 0.1	89	< 3	< 30	< 2.9E-05	
MW-702DR	10/30/96	4.3	55.5	65.5	10.5	4.3	45	0.0	3	4	4600	60	0.75	104.0	0.0	< 0.6	< 0.1	119	< 2	< 22	< 2.2E-05	< 2.2E-05
MW-702DR	10/30/96	4.4	55.5	65.5	10.5	4.3	32	0.0	3	4	4600	60	0.75	73.9	0.0	< 0.6	< 0.1	89	< 3	< 30	< 2.9E-05	No measureable
MW-702DR	10/30/96	4.5	55.5	65.5	10.5	4.3	18	0.0	3	4	4600	60	0.75	41.6	0.0	< 0.6	< 0.1	56	< 6	< 47	< 4.6E-05	flow
MW-702DR	10/30/96	5.1	65.5	75.5	10.4	4.3	21	0.0	3	4	4600	70	0.75	48.5	0.0	< 0.6	< 0.1	63	< 5	< 42	< 4.1E-05	
MW-702DR	10/30/96	5.2	65.5	75.5	10.5	4.3	37	0.0	3	4	4600	70	0.75	85.5	0.0	< 0.6	< 0.1	100	< 3	< 27	< 2.6E-05	
MW-702DR	10/30/96	5.3	65.5	75.5	10.4	4.3	53	2.9	5	4	4600	70	0.75	122.4	0.6	1.2	0.3	137	4	39	3.7E-05	< 2.6E-05
MW-702DR	10/30/96	5.4	65.5	75.5	10.5	4.3	37	0.0	3	4	4600	70	0.75	85.5	0.0	< 0.6	< 0.1	100	< 3	< 27	< 2.6E-05	Dilation
MW-702DR	10/30/96	5.5	65.5	75.5	10.5	4.3	21	0.0	3	4	4600	70	0.75	48.5	0.0	< 0.6	< 0.1	63	< 5	< 42	< 4.1E-05	
MW-702DR	10/30/96	6.1	75.5	85.5	10.5	4.3	24	0.0	3	4	4600	80	0.75	55.4	0.0	< 0.6	< 0.1	70	< 5	< 38	< 3.7E-05	
MW-702DR	10/30/96	6.2	75.5	85.5	10.5	4.3	42	0.0	3	4	4600	80	0.75	97.0	0.0	< 0.6	< 0.1	112	< 3	< 24	< 2.3E-05	
MW-702DR	10/30/96	6.3	75.5	85.5	10.5	4.3	60	0.0	3	4	4600	80	0.75	138.6	0.0	< 0.6	< 0.1	153	< 2	< 17	< 1.7E-05	< 1.7E-05
MW-702DR	10/30/96	6.4	75.5	85.5	10.5	4.3	42	0.0	3	4	4600	80	0.75	97.0	0.0	< 0.6	< 0.1	112	< 3	< 24	< 2.3E-05	No measureable
MW-702DR	10/30/96	6.5	75.5	85.5	10.5	4.3	24	0.0	3	4	4600	80	0.75	55.4	0.0	< 0.6	< 0.1	70	< 5	< 38	< 3.7E-05	flow
MW-702DR	10/30/96	7.1	85.5	95.5	10.4	4.3	27	0.0	3	4	4600	90	0.75	62.4	0.0	< 0.6	< 0.1	77	< 4	< 35	< 3.3E-05	
MW-702DR	10/30/96	7.2	85.5	95.5	10.4	4.3	51	0.0	3	4	4600	90	0.75	117.8	0.0	< 0.6	< 0.1	132	< 2	< 20	< 1.9E-05	
MW-702DR	10/30/96	7.3	85.5	95.5	10.4	4.3	68	0.0	3	4	4600	90	0.75	157.1	0.0	< 0.6	< 0.1	172	< 2	< 16	< 1.5E-05	< 1.5E-05
MW-702DR	10/30/96	7.4	85.5	95.5	10.4	4.3	51	0.0	3	4	4600	90	0.75	117.8	0.0	< 0.6	< 0.1	132	< 2	< 20	< 1.9E-05	No measureable
MW-702DR	10/30/96	7.5	85.5	95.5	10.4	4.3	27	0.0	3	4	4600	90	0.75	62.4	0.0	< 0.6	< 0.1	77	< 4	< 35	< 3.3E-05	flow
MW-702DR	10/30/96	8.1	95.5	105.5	10.6	4.2	30	0.0	3	4	4600	100	0.75	69.3	0.0	< 0.6	< 0.1	84	< 4	< 32	< 3.1E-05	
MW-702DR	10/30/96	8.2	95.5	105.5	10.6	4.2	52	0.0	3	4	4600	100	0.75	120.1	0.0	< 0.6	< 0.1	135	< 2	< 20	< 1.9E-05	
MW-702DR	10/30/96	8.3	95.5	105.5	10.6	4.2	75	0.0	3	4	4600	100	0.75	173.3	0.0	< 0.6	< 0.1	188	< 1	< 14	< 1.4E-05	< 1.4E-05
MW-702DR	10/30/96	8.4	95.5	105.5	10.6	4.2	52	0.0	3	4	4600	100	0.75	120.1	0.0	< 0.6	< 0.1	135	< 2	< 20	< 1.9E-05	No measureable
MW-702DR	10/30/96	8.5	95.5	105.5	10.6	4.2	30	0.0	3	4	4600	100	0.75	69.3	0.0	< 0.6	< 0.1	84	< 4	< 32	< 3.1E-05	flow

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

Data from 22.0-27.5 foot interval obtained at supplmental corehole ajdacent to MW-702DR location.

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-703DR	10/01/96	1.1	90.5	100.5	7.1	4.1	29	38.0	3	4.0	4600	94.6	0.75	67.0	12.7	12.7	17.8	60	81	964	9.3E-04	
MW-703DR	10/01/96	1.2	90.5	100.5	7.2	4.1	50	37.7	3	4.0	4600	94.6	0.75	115.5	12.6	12.6	17.6	109	47	529	5.1E-04	
MW-703DR	10/01/96	1.3	90.5	100.5	7.2	4.1	72	70.6	3	4.0	4600	94.6	0.75	166.3	23.5	23.5	50.6	127	61	853	8.2E-04	7.5E-04
MW-703DR	10/01/96	1.4	90.5	100.5	7.1	4.1	50	54.1	3	4.0	4600	94.6	0.75	115.5	18.0	18.0	32.3	94	67	879	8.5E-04	Approximately
MW-703DR	10/01/96	1.5	90.5	100.5	7.1	4.1	29	29.4	3	4.0	4600	94.6	0.75	67.0	9.8	9.8	11.5	67	63	676	6.5E-04	Laminar
MW-703DR	10/01/96	2.1	100.5	110.5	6.9	4.1	32	0.0	3	4.0	4600	104.6	0.75	73.9	0.0	< 0.6	< 0.1	85	< 3	< 31	< 3.0E-05	
MW-703DR	10/01/96	2.2	100.5	110.5	7.0	4.1	55	0.0	3	4.0	4600	104.6	0.75	127.1	0.0	< 0.6	< 0.1	138	< 2	< 19	< 1.9E-05	
MW-703DR	10/01/96	2.3	100.5	110.5	7.0	4.1	79	0.0	3	4.0	4600	104.6	0.75	182.5	0.0	< 0.6	< 0.1	193	< 1	< 14	< 1.3E-05	< 1.3E-05
MW-703DR	10/01/96	2.4	100.5	110.5	7.0	4.1	55	0.0	3	4.0	4600	104.6	0.75	127.1	0.0	< 0.6	< 0.1	138	< 2	< 19	< 1.9E-05	No measureable
MW-703DR	10/01/96	2.5	100.5	110.5	7.0	4.1	32	0.0	3	4.0	4600	104.6	0.75	73.9	0.0	< 0.6	< 0.1	85	< 3	< 31	< 3.0E-05	Flow
MW-703DR	10/01/96	3.1	110.5	120.5	7.1	4.1	34	0.0	3	4.0	4600	114.6	0.75	78.5	0.0	< 0.6	< 0.1	90	< 3	< 30	< 2.9E-05	
MW-703DR	10/01/96	3.2	110.5	120.5	7.1	4.1	60	0.0	3	4.0	4600	114.6	0.75	138.6	0.0	< 0.6	< 0.1	150	< 2	< 18	< 1.7E-05	
MW-703DR	10/01/96	3.3	110.5	120.5	7.1	4.2	75	0.0	2	4.0	4600	114.7	0.75	173.3	0.0	< 0.6	< 0.1	184	< 1	< 14	< 1.4E-05	< 1.4E-05
MW-703DR	10/01/96	3.4	110.5	120.5	7.1	4.2	60	0.0	2	4.0	4600	114.7	0.75	138.6	0.0	< 0.6	< 0.1	150	< 2	< 18	< 1.7E-05	No measureable
MW-703DR	10/01/96	3.5	110.5	120.5	7.2	4.2	34	0.0	2	4.0	4600	114.7	0.75	78.5	0.0	< 0.6	< 0.1	90	< 3	< 30	< 2.9E-05	Flow
MW-703DR	10/01/96	4.1	120.5	130.5	7.1	4.1	37	0.0	3	4.0	4600	124.6	0.75	85.5	0.0	< 0.6	< 0.1	97	< 3	< 28	< 2.7E-05	< 1.6E-05
MW-703DR	10/01/96	4.2	120.5	130.5	7.0	4.1	65	0.0	3	4.0	4600	124.6	0.75	150.2	0.0	< 0.6	< 0.1	161	< 2	< 17	< 1.6E-05	No measureable
MW-703DR	10/01/96	4.5	120.5	130.5	7.0	4.2	37	0.0	3	4.0	4600	124.7	0.75	85.5	0.0	< 0.6	< 0.1	97	< 3	< 28	< 2.7E-05	Flow
MW-703DR	10/01/96	5.1	130.5	140.5	7.1	4.1	41	0.0	3	4.0	4600	134.6	0.75	94.7	0.0	< 0.6	< 0.1	106	< 3	< 25	< 2.4E-05	
MW-703DR	10/01/96	5.2	130.5	140.5	7.0	4.1	71	2.1	5	4.0	4600	134.6	0.75	164.0	0.4	1.0	0.3	175	3	26	2.6E-05	< 2.4E-05
MW-703DR	10/01/96	5.5	130.5	140.5	7.1	4.3	41	0.0	3	4.0	4600	134.8	0.75	94.7	0.0	< 0.6	< 0.1	106	< 3	< 25	< 2.4E-05	Dilation
MW-703DR	10/01/96	6.1	140.5	150.5	7.2	4.1	44	0.1	3	4.0	4600	144.6	0.75	101.6	0.0	0.7	0.2	113	3	27	2.6E-05	
MW-703DR	10/01/96	6.2	140.5	150.5	7.0	4.2	70	0.0	3	4.0	4600	144.7	0.75	161.7	0.0	< 0.6	< 0.1	173	< 2	< 15	< 1.5E-05	< 1.5E-05
MW-703DR	10/01/96	6.5	140.5	150.5	7.0	4.1	44	0.0	3	4.0	4600	144.6	0.75	101.6	0.0	< 0.6	< 0.1	113	< 2	< 24	< 2.3E-05	Void Filling
MW-703DR	10/01/96	7.1	150.5	160.5	7.1	4.1	47	0.0	2	4.0	4600	154.6	0.75	108.6	0.0	< 0.6	< 0.1	120	< 2	< 22	< 2.2E-05	< 1.7E-05
MW-703DR	10/01/96	7.2	150.5	160.5	6.6	4.2	62	0.0	3	4.0	4600	154.7	0.75	143.2	0.0	< 0.6	< 0.1	154	< 2	< 17	< 1.7E-05	No measureable
MW-703DR	10/01/96	7.5	150.5	160.5	6.5	4.2	47	0.0	3	4.0	4600	154.7	0.75	108.6	0.0	< 0.6	< 0.1	119	< 2	< 22	< 2.2E-05	Flow
MW-703DR	10/01/96	8.1	160.5	170.5	7.1	4.1	50	0.0	2	4.0	4600	164.6	0.75	115.5	0.0	< 0.6	< 0.1	127	< 2	< 21	< 2.0E-05	
MW-703DR	10/01/96	8.2	160.5	170.5	7.0	4.1	60	0.6	5	4.0	4600	164.6	0.75	138.6	0.1	0.7	0.2	150	2	23	2.2E-05	< 2.0E-05
MW-703DR	10/01/96	8.5	160.5	170.5	7.1	4.1	50	0.0	3	4.0	4600	164.6	0.75	115.5	0.0	< 0.6	< 0.1	127	< 2	< 21	< 2.0E-05	Dilation

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

Bottom of augers at 89 ft bgs during MW-703DR packer testing.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

Calculated target pressures were unable to be achieved due to slippage of packer assembly in the borehole for tests between 120.5 and 170.5 ft depth. Packers were inflated with 180 psi of nitrogen.

PACKER TEST DATA REDUCTION

Remedial Investigation
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Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-704DR	10/28/96	1.1	76.0	81.5	0.3	2.8	24	0.0	5	4	7100	79	0.75	55.4	0.0	< 0.6	0.1	58	8	< 70	< 6.8E-05	
MW-704DR	10/28/96	1.2	76.0	81.5	0.3	2.8	41	8.1	5	4	7100	79	0.75	94.7	1.6	2.1	0.8	97	17	153	1.5E-04	
MW-704DR	10/28/96	1.3	76.0	81.5	0.3	2.8	59	45.1	5	4	7100	79	0.75	136.3	9.0	9.0	8.8	131	52	491	4.7E-04	< 6.8E-05
MW-704DR	10/28/96	1.4	76.0	81.5	0.3	2.8	41	39.5	5	4	7100	79	0.75	94.7	7.9	7.9	7.1	91	65	618	6.0E-04	Washout
MW-704DR	10/28/96	1.5	76.0	81.5	0.3	2.8	24	42.2	4	4	7100	79	0.75	55.4	10.5	10.5	11.5	47	149	1592	1.5E-03	
MW-704DR	10/25/96	2.1	79.0	89.0	1.4	6.3	25	21.1	5	4	4600	85	0.75	57.8	4.2	4.4	2.8	63	33	326	3.2E-04	
MW-704DR	10/25/96	2.2	79.0	89.0	1.4	6.3	44	30.2	5	4	4600	85	0.75	101.6	6.0	6.0	4.8	105	26	266	2.6E-04	
MW-704DR	10/25/96	2.3	79.0	89.0	1.4	6.3	63	42.5	5	4	4600	85	0.75	145.5	8.5	8.5	8.4	145	25	270	2.6E-04	2.9E-04
MW-704DR	10/25/96	2.4	79.0	89.0	1.4	6.3	44	33.0	5	4	4600	85	0.75	101.6	6.6	6.6	5.5	104	28	293	2.8E-04	Approximately
MW-704DR	10/25/96	2.5	79.0	89.0	1.4	6.3	25	20.9	5	4	4600	85	0.75	57.8	4.2	4.4	2.8	63	33	324	3.1E-04	Laminar
MW-704DR	10/25/96	3.1	82.0	92.0	2.1	3.5	26	0.0	3	4	4600	86	0.75	60.1	0.0	< 0.6	0.1	66	4	< 41	< 3.9E-05	
MW-704DR	10/25/96	3.2	82.0	92.0	2.1	3.5	46	0.0	3	4	4600	86	0.75	106.3	0.0	< 0.6	0.1	112	2	< 24	< 2.3E-05	
MW-704DR	10/25/96	3.3	82.0	92.0	2.1	3.5	65	0.0	3	4	4600	86	0.75	150.2	0.0	< 0.6	0.1	156	2	< 17	< 1.7E-05	< 1.7E-05
MW-704DR	10/25/96	3.4	82.0	92.0	2.1	3.5	46	0.0	3	4	4600	86	0.75	106.3	0.0	< 0.6	0.1	112	2	< 24	< 2.3E-05	No Measureable
MW-704DR	10/25/96	3.5	82.0	92.0	2.0	3.5	26	0.0	3	4	4600	86	0.75	60.1	0.0	< 0.6	0.1	66	4	< 41	< 3.9E-05	Flow
MW-704DR	10/25/96	4.1	92.0	102.0	2.0	3.5	29	0.0	3	4	4600	96	0.75	67.0	0.0	< 0.6	0.1	72	4	< 37	< 3.6E-05	
MW-704DR	10/25/96	4.2	92.0	102.0	2.0	3.5	51	0.0	3	4	4600	96	0.75	117.8	0.0	< 0.6	0.1	123	2	< 22	< 2.1E-05	
MW-704DR	10/25/96	4.3	92.0	102.0	2.0	3.5	73	0.0	3	4	4600	96	0.75	168.6	0.0	< 0.6	0.1	174	1	< 15	< 1.5E-05	< 1.5E-05
MW-704DR	10/25/96	4.4	92.0	102.0	2.0	3.5	51	0.0	3	4	4600	96	0.75	117.8	0.0	< 0.6	0.1	123	2	< 22	< 2.1E-05	No Measureable
MW-704DR	10/25/96	4.5	92.0	102.0	2.0	3.5	29	0.0	3	4	4600	96	0.75	67.0	0.0	< 0.6	0.1	72	4	< 37	< 3.6E-05	Flow
MW-704DR	10/25/96	5.1	102.0	112.0	2.0	3.5	32	0.0	3	4	4600	106	0.75	73.9	0.0	< 0.6	0.1	79	3	< 34	< 3.3E-05	
MW-704DR	10/25/96	5.2	102.0	112.0	2.0	3.5	56	0.0	3	4	4600	106	0.75	129.4	0.0	< 0.6	0.1	135	2	< 20	< 1.9E-05	
MW-704DR	10/25/96	5.3	102.0	112.0	2.0	3.5	80	0.0	3	4	4600	106	0.75	184.8	0.0	< 0.6	0.1	190	1	< 14	< 1.4E-05	< 1.4E-05
MW-704DR	10/25/96	5.4	102.0	112.0	2.0	3.5	56	0.0	3	4	4600	106	0.75	129.4	0.0	< 0.6	0.1	135	2	< 20	< 1.9E-05	No Measureable
MW-704DR	10/25/96	5.5	102.0	112.0	2.0	3.5	32	0.0	3	4	4600	106	0.75	73.9	0.0	< 0.6	0.1	79	3	< 34	< 3.3E-05	Flow
MW-704DR	10/25/96	6.1	112.0	122.0	2.1	3.5	35	0.0	3	4	4600	116	0.75	80.9	0.0	< 0.6	0.1	86	3	< 31	< 3.0E-05	
MW-704DR	10/25/96	6.2	112.0	122.0	2.1	3.5	61	0.0	3	4	4600	116	0.75	140.9	0.0	< 0.6	0.1	146	2	< 18	< 1.8E-05	
MW-704DR	10/25/96	6.3	112.0	122.0	2.1	3.5	88	0.5	5	4	4600	116	0.75	203.3	0.1	0.7	0.2	209	2	16	1.5E-05	1.5E-05
MW-704DR	10/25/96	6.4	112.0	122.0	2.1	3.5	61	0.0	3	4	4600	116	0.75	140.9	0.0	< 0.6	0.1	146	2	< 18	< 1.8E-05	Assumed
MW-704DR	10/25/96	6.5	112.0	122.0	2.1	3.5	35	0.0	3	4	4600	116	0.75	80.9	0.0	< 0.6	0.1	86	3	< 31	< 3.0E-05	Laminar
MW-704DR	10/25/96	7.1	122.0	132.0	2.1	3.5	38	0.0	3	4	4600	126	0.75	87.8	0.0	< 0.6	0.1	93	3	< 29	< 2.8E-05	< 1.6E-05
MW-704DR	10/25/96	7.2	122.0	132.0	2.0	3.7	68	0.0	3	4	4600	126	0.75	157.1	0.0	< 0.6	0.1	163	2	< 16	< 1.6E-05	No Measureable
MW-704DR	10/25/96	7.5	122.0	132.0	2.1	3.7	38	0.0	3	4	4600	126	0.75	87.8	0.0	< 0.6	0.1	93	3	< 29	< 2.8E-05	Flow
MW-704DR	10/25/96	8.1	132.0	142.0	2.1	3.5	41	0.0	3	4	4600	136	0.75	94.7	0.0	< 0.6	0.1	100	3	< 27	< 2.6E-05	
MW-704DR	10/25/96	8.2	132.0	142.0	2.1	3.5	72	0.0	3	4	4600	136	0.75	166.3	0.0	< 0.6	0.1	172	2	< 16	< 1.5E-05	
MW-704DR	10/25/96	8.3	132.0	142.0	2.1	3.6	90	0.0	3	4	4600	136	0.75	207.9	0.0	< 0.6	0.1	213	1	< 12	< 1.2E-05	< 1.2E-05
MW-704DR	10/25/96	8.4	132.0	142.0	2.1	3.6	72	0.0	3	4	4600	136	0.75	166.3	0.0	< 0.6	0.1	172	2	< 16	< 1.5E-05	No Measureable
MW-704DR	10/25/96	8.5	132.0	142.0	2.1	3.6	41	0.0	3	4	4600	136	0.75	94.7	0.0	< 0.6	0.1	100	3	< 27	< 2.6E-05	Flow
MW-704DR	10/24/96	9.1	142.0	152.0	2.0	3.5	44	0.0	3	4	4600	146	0.75	101.6	0.0	< 0.6	0.1	107	2	< 25	< 2.4E-05	
MW-704DR	10/24/96	9.2	142.0	152.0	2.0	3.5	77	0.0	3	4	4600	146	0.75	177.9	0.0	< 0.6	0.1	183	1	< 15	< 1.4E-05	
MW-704DR	10/24/96	9.3	142.0	152.0	2.0	3.8	86	0.0	3	4	4600	146	0.75	198.7	0.0	< 0.6	0.1	204	1	< 13	< 1.3E-05	< 1.3E-05
MW-704DR	10/24/96	9.4	142.0	152.0	2.0	3.8	77	0.0	3	4	4600	146	0.75	177.9	0.0	< 0.6	0.1	183	1	< 15	< 1.4E-05	No Measureable
MW-704DR	10/24/96	9.5	142.0	152.0	2.0	3.8	44	0.0	3	4	4600	146	0.75	101.6	0.0	< 0.6	0.1	107	2	< 25	< 2.4E-05	Flow
MW-704DR	10/24/96	10.1	152.0	162.0	2.1	3.5	47	0.0	3	4	4600	156	0.75	108.6	0.0	< 0.6	0.1	114	2	< 23	< 2.3E-05	
MW-704DR	10/24/96	10.2	152.0	162.0	2.1	3.5	82	0.0	3	4	4600	156	0.75	189.4	0.0	< 0.6	0.1	195	1	< 14	< 1.3E-05	
MW-704DR	10/24/96	10.3	152.0	162.0	2.1	3.6	90	0.0	5	4	4600	156	0.75	207.9	0.0	< 0.6	0.1	213	1	< 12	< 1.2E-05	< 1.2E-05
MW-704DR	10/24/96	10.4	152.0	162.0	2.1	3.6	82	0.0	3	4	4600	156	0.75	189.4	0.0	< 0.6	0.1	195	1	< 14	< 1.3E-05	No Measureable
MW-704DR	10/24/96	10.5	152.0	162.0	2.1	3.6	47	0.0	3	4	4600	156	0.75	108.6	0.0	< 0.6	0.1	114	2	< 23	< 2.3E-05	Flow

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

Calculated maximum test pressure unable to be achieved due to packer assembly slippage at depth of 122-132 ft bgs.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff.	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-705R	09/06/96	1.1	42.0	47.0	0.6	3.0	13	0.0	2	3	8300	45	0.75	30.0	0.0	< 0.6	< 0.1	34	< 17	< 143	< 1.4E-04	
MW-705R	09/06/96	1.2	42.0	47.0	0.6	3.0	23	0.3	5	3	8300	45	0.75	53.1	0.1	0.7	0.1	57	11	100	9.6E-05	
MW-705R	09/06/96	1.3	42.0	47.0	0.6	3.0	33	1.6	5	3	8300	45	0.75	76.2	0.3	0.9	0.2	80	10	95	9.2E-05	< 1.4E-04
MW-705R	09/06/96	1.4	42.0	47.0	0.6	3.0	23	0.0	1	3	8300	45	0.75	53.1	0.0	< 0.6	< 0.1	57	< 9	< 85	< 8.2E-05	Dilation
MW-705R	09/06/96	1.5	42.0	47.0	0.6	3.0	13	0.0	1	3	8300	45	0.75	30.0	0.0	< 0.6	< 0.1	34	< 17	< 143	< 1.4E-04	
MW-705R	09/06/96	2.1	45.5	50.5	0.6	4.2	14	0.0	1	3	8300	50	0.75	32.3	0.0	< 0.6	< 0.1	37	< 15	< 130	< 1.3E-04	
MW-705R	09/06/96	2.2	45.5	50.5	0.6	4.2	25	0.0	1	3	8300	50	0.75	57.8	0.0	< 0.6	< 0.1	62	< 9	< 77	< 7.5E-05	
MW-705R	09/06/96	2.3	45.5	50.5	0.6	4.2	36	0.1	1	3	8300	50	0.75	83.2	0.1	0.7	0.1	88	7	68	6.5E-05	< 7.5E-05
MW-705R	09/06/96	2.4	45.5	50.5	0.6	4.2	25	0.0	1	3	8300	50	0.75	57.8	0.0	< 0.6	< 0.1	62	< 9	< 77	< 7.5E-05	Dilation
MW-705R	09/06/96	2.5	45.5	50.5	0.6	4.2	14	0.0	1	3	8300	50	0.75	32.3	0.0	< 0.6	< 0.1	37	< 15	< 130	< 1.3E-04	

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

PACKER DATA TEST REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-706	09/23/96	1.1	72.0	82.0	-0.2	2.5	23	14.7	5	4	4600	75	0.75	53.1	2.9	3.3	1.6	54	27	280	2.7E-04	
MW-706	09/23/96	1.2	72.0	82.0	-0.4	2.5	40	23.7	5	4	4600	75	0.75	92.4	4.7	4.9	3.1	91	23	247	2.4E-04	
MW-706	09/23/96	1.3	72.0	82.0	-0.6	2.5	58	45.1	5	4	4600	75	0.75	134.0	9.0	9.0	8.5	127	29	326	3.1E-04	2.8E-04
MW-706	09/23/96	1.4	72.0	82.0	-0.0	2.5	40	28.5	5	4	4600	75	0.75	92.4	5.7	5.8	4.0	91	27	293	2.8E-04	Assumed
MW-706	09/23/96	1.5	72.0	82.0	0.0	2.5	23	0.0	3	4	4600	75	0.75	53.1	0.0	< 0.6	< 0.1	56	< 5	< 48	< 4.6E-05	Laminar
MW-706	09/23/96	2.1	76.5	86.5	-0.0	3.8	24	0.0	3	4	4600	80	0.75	55.4	0.0	< 0.6	< 0.1	59	< 5	< 45	< 4.4E-05	
MW-706	09/23/96	2.2	76.5	86.5	-0.5	3.8	42	3.4	5	4	4600	80	0.75	97.0	0.7	1.2	0.3	100	6	57	5.5E-05	
MW-706	09/23/96	2.3	76.5	86.5	-0.7	3.8	60	24.8	5	4	4600	80	0.75	138.6	5.0	5.1	3.5	138	16	170	1.6E-04	< 4.4E-05
MW-706	09/23/96	2.4	76.5	86.5	-1.7	3.8	42	23.9	5	4	4600	80	0.75	97.0	4.8	4.9	3.3	96	22	237	2.3E-04	Washout
MW-706	09/23/96	2.5	76.5	86.5	-1.8	3.8	24	15.9	5	4	4600	80	0.75	55.4	3.2	3.5	1.8	56	27	289	2.8E-04	
MW-706	09/23/96	3.1	86.5	96.5	-0.1	3.8	27	0.0	3	4	4600	90	0.75	62.4	0.0	< 0.6	< 0.1	66	< 4	< 40	< 3.9E-05	
MW-706	09/23/96	3.2	86.5	96.5	-0.1	3.8	48	0.0	3	4	4600	90	0.75	110.9	0.0	< 0.6	< 0.1	115	< 2	< 23	< 2.3E-05	
MW-706	09/23/96	3.3	86.5	96.5	-0.1	3.8	68	0.0	3	4	4600	90	0.75	157.1	0.0	< 0.6	< 0.1	161	< 2	< 17	< 1.6E-05	< 1.6E-05
MW-706	09/23/96	3.4	86.5	96.5	-0.0	3.8	48	0.0	3	4	4600	90	0.75	110.9	0.0	< 0.6	< 0.1	115	< 2	< 23	< 2.3E-05	No Measureable
MW-706	09/23/96	3.5	86.5	96.5	-0.0	3.8	27	0.0	3	4	4600	90	0.75	62.4	0.0	< 0.6	< 0.1	66	< 4	< 40	< 3.9E-05	Flow
MW-706	09/23/96	4.1	96.5	106.5	-0.2	3.8	30	0.0	3	4	4600	100	0.75	69.3	0.0	< 0.6	< 0.1	73	< 4	< 37	< 3.5E-05	< 2.0E-05
MW-706	09/23/96	4.2	96.5	106.5	-0.1	3.8	53	0.0	3	4	4600	100	0.75	122.4	0.0	< 0.6	< 0.1	126	< 2	< 21	< 2.0E-05	No Measureable
MW-706	09/23/96	4.5	96.5	106.5	-0.0	3.9	30	0.0	3	4	4600	100	0.75	69.3	0.0	< 0.6	< 0.1	73	< 4	< 37	< 3.5E-05	Flow
MW-706	09/23/96	5.1	106.5	116.5	-0.1	3.8	32	0.0	3	4	4600	110	0.75	73.9	0.0	< 0.6	< 0.1	78	< 3	< 34	< 3.3E-05	< 1.9E-05
MW-706	09/23/96	5.2	106.5	116.5	-0.0	3.8	58	0.0	3	4	4600	110	0.75	134.0	0.0	< 0.6	< 0.1	138	< 2	< 19	< 1.9E-05	No Measureable
MW-706	09/23/96	5.5	106.5	116.5	-0.0	3.9	32	0.0	3	4	4600	110	0.75	73.9	0.0	< 0.6	< 0.1	78	< 3	< 34	< 3.3E-05	Flow
MW-706	09/23/96	6.1	116.5	126.5	0.1	3.8	36	6.2	5	4	4600	120	0.75	83.2	1.2	1.7	0.7	86	9	93	9.0E-05	
MW-706	09/23/96	6.2	116.5	126.5	0.1	3.8	63	12.9	5	4	4600	120	0.75	145.5	2.6	3.0	1.8	148	9	92	8.9E-05	8.4E-05
MW-706	09/23/96	6.5	116.5	126.5	0.1	3.9	36	5.6	5	4	4600	120	0.75	83.2	1.1	1.6	0.7	86	8	87	8.4E-05	Void Filling
MW-706	09/23/96	7.1	126.5	136.5	0.1	3.8	39	0.0	3	4	4600	130	0.75	90.1	0.0	< 0.6	< 0.1	94	< 3	< 28	< 2.7E-05	< 1.8E-05
MW-706	09/23/96	7.2	126.5	136.5	-0.5	3.9	60	0.0	3	4	4600	130	0.75	138.6	0.0	< 0.6	< 0.1	142	< 2	< 19	< 1.8E-05	No Measureable
MW-706	09/23/96	7.5	126.5	136.5	-0.6	3.9	39	0.0	3	4	4600	130	0.75	90.1	0.0	< 0.6	< 0.1	93	< 3	< 29	< 2.8E-05	Flow
MW-706	09/23/96	8.1	136.5	146.5	0.3	3.8	42	0.0	3	4	4600	140	0.75	97.0	0.0	< 0.6	< 0.1	101	< 3	< 26	< 2.6E-05	
MW-706	09/23/96	8.2	136.5	146.5	0.3	3.9	60	0.2	3	4	4600	140	0.75	138.6	0.1	0.7	0.2	143	2	22	2.1E-05	< 2.6E-05
MW-706	09/23/96	8.5	136.5	146.5	0.3	3.9	42	0.0	3	4	4600	140	0.75	97.0	0.0	< 0.6	< 0.1	101	< 3	< 26	< 2.6E-05	Dilation

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

Nearby shallow bedrock well PW-101A overflowed during test of intervals 72 to 82 ft and 76.5 to 86.5 ft bgs.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

Packers slipped during attempted highest pressure test increment of depth intervals 96.5 to 106.5 ft, 106.5 to 116.5 ft, 126.5 to 136.5 ft, 136.5 to 146.5 ft bgs. Therefore, did not use test increments 3 or 4.

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-707DR	10/04/96	1.1	112.5	122.5	7.2	4.0	17	62.0	5	4	4600	117	0.75	39.3	12.4	12.4	20.1	30	136	1875	1.8E-03	1.8E-03
MW-707DR	10/04/96	2.1	116.7	126.7	7.2	3.7	18	61.0	5	4	4600	120	0.75	41.6	12.2	12.2	20.0	32	126	1732	1.7E-03	1.7E-03
MW-707DR	10/04/96	3.1	126.7	136.7	7.3	3.7	40	0.0	3	4	4600	130	0.75	92.4	0.0	< 0.6	< 0.1	103	< 3	< 26	< 2.5E-05	
MW-707DR	10/04/96	3.2	126.7	136.7	7.3	3.7	69	2.2	5	4	4600	130	0.75	159.4	0.4	1.0	0.3	170	3	28	2.7E-05	
MW-707DR	10/04/96	3.3	126.7	136.7	7.3	3.8	75	6.4	5	4	4600	130	0.75	173.3	1.3	1.8	0.8	184	4	45	4.3E-05	< 2.5E-05
MW-707DR	10/04/96	3.4	126.7	136.7	7.3	3.8	69	3.7	5	4	4600	130	0.75	159.4	0.7	1.3	0.5	170	3	35	3.4E-05	Dilation
MW-707DR	10/04/96	3.5	126.7	136.7	7.3	3.8	40	0.0	3	4	4600	130	0.75	92.4	0.0	< 0.6	< 0.1	103	< 3	< 26	< 2.5E-05	
MW-707DR	10/04/96	4.1	136.7	146.7	6.9	3.7	42	0.0	3	4	4600	140	0.75	97.0	0.0	< 0.6	< 0.1	107	< 3	< 25	< 2.4E-05	
MW-707DR	10/04/96	4.2	136.7	146.7	6.9	3.7	74	0.0	3	4	4600	140	0.75	170.9	0.0	< 0.6	< 0.1	181	< 1	< 15	< 1.4E-05	< 1.4E-05
MW-707DR	10/04/96	4.5	136.7	146.7	6.9	3.8	42	0.0	3	4	4600	140	0.75	97.0	0.0	< 0.6	< 0.1	108	< 3	< 25	< 2.4E-05	No Meas. Flow
MW-707DR	10/04/96	5.1	146.7	156.7	7.2	3.7	46	0.0	3	4	4600	150	0.75	106.3	0.0	< 0.6	< 0.1	117	< 2	< 23	< 2.2E-05	
MW-707DR	10/04/96	5.2	146.7	156.7	7.2	3.7	74	0.0	3	4	4600	150	0.75	170.9	0.0	< 0.6	< 0.1	182	< 1	< 15	< 1.4E-05	< 1.4E-05
MW-707DR	10/04/96	5.5	146.7	156.7	7.2	3.7	46	0.0	3	4	4600	150	0.75	106.3	0.0	< 0.6	< 0.1	117	< 2	< 23	< 2.2E-05	No Meas. Flow
MW-707DR	10/03/96	6.1	156.7	166.7	6.6	3.7	48	0.0	3	4	4600	160	0.75	110.9	0.0	< 0.6	< 0.1	121	< 2	< 22	< 2.1E-05	
MW-707DR	10/03/96	6.2	156.7	166.7	6.6	3.7	85	0.0	3	4	4600	160	0.75	196.4	0.0	< 0.6	< 0.1	207	< 1	< 13	< 1.2E-05	
MW-707DR	10/03/96	6.3	156.7	166.7	6.6	3.7	87	0.0	5	4	4600	160	0.75	201.0	0.0	< 0.6	< 0.1	211	< 1	< 13	< 1.2E-05	< 1.2E-05
MW-707DR	10/03/96	6.4	156.7	166.7	6.6	3.7	85	0.0	3	4	4600	160	0.75	196.4	0.0	< 0.6	< 0.1	207	< 1	< 13	< 1.2E-05	No Meas. Flow
MW-707DR	10/03/96	6.5	156.7	166.7	6.6	3.7	48	0.0	3	4	4600	160	0.75	110.9	0.0	< 0.6	< 0.1	121	< 2	< 22	< 2.1E-05	
MW-707DR	10/03/96	7.1	166.7	176.7	6.3	3.7	51	0.0	3	4	4600	170	0.75	117.8	0.0	< 0.6	< 0.1	128	< 2	< 21	< 2.0E-05	
MW-707DR	10/03/96	7.2	166.7	176.7	6.4	3.8	72	6.1	5	4	4600	170	0.75	166.3	1.2	1.7	0.9	176	4	45	4.4E-05	< 2.0E-05
MW-707DR	10/03/96	7.5	166.7	176.7	6.4	3.8	51	0.0	3	4	4600	170	0.75	117.8	0.0	< 0.6	< 0.1	128	< 2	< 21	< 2.0E-05	Dilation
MW-707DR	10/03/96	8.1	176.7	186.7	6.8	3.8	54	0.0	5	4	4600	180	0.75	124.7	0.0	< 0.6	< 0.1	135	< 2	< 20	< 1.9E-05	
MW-707DR	10/03/96	8.2	176.7	186.7	6.8	3.8	70	0.0	5	4	4600	180	0.75	161.7	0.0	< 0.6	< 0.1	172	< 2	< 15	< 1.5E-05	< 1.5E-05
MW-707DR	10/03/96	8.5	176.7	186.7	6.8	3.8	54	0.0	3	4	4600	180	0.75	124.7	0.0	< 0.6	< 0.1	135	< 2	< 20	< 1.9E-05	No Meas. Flow

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

Maximum achievable pressure at depth interval 112.5 to 122.5 ft bgs was 17 psi.
Maximum achievable pressure at depth interval 116.7 to 126.7 ft bgs was 18 psi.

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-708DR	01/16/97	1.1	178.0	188.0	66.3	8.3	32	57.8	5	4	4600	186	0.75	73.9	11.6	11.6	26.0	123	67	434	4.2E-04	4.2E-04
MW-708DR	01/16/97	2.1	183.0	193.0	67.8	3.3	56	0.6	5	4	4600	186	0.75	129.4	0.1	0.1	0.008	200	0.4	3	2.7E-06	
MW-708DR	01/16/97	2.2	183.0	193.0	67.7	3.4	80	18.4	5	4	4600	186	0.75	184.8	3.7	3.7	3.6	252	9	67	6.5E-05	1.9E-06
MW-708DR	01/16/97	2.5	183.0	193.0	67.7	3.4	56	0.3	5	4	4600	186	0.75	129.4	0.1	0.1	0.002	200	0.2	1	1.1E-06	Dilation
MW-708DR	01/16/97	3.1	193.0	203.0	67.6	3.3	59	0.0	3	4	4600	196	0.75	136.3	0.0	< 0.04	0.001	207	0.1	< 1	< 7.7E-07	
MW-708DR	01/16/97	3.2	193.0	203.0	67.6	3.4	65	0.2	5	4	4600	196	0.75	150.2	0.0	0.0	0.001	221	0.1	1	7.2E-07	< 7.6E-07
MW-708DR	01/16/97	3.3	193.0	203.0	67.6	3.4	59	0.0	3	4	4600	196	0.75	136.3	0.0	< 0.04	0.001	207	0.1	< 1	< 7.7E-07	Laminar
MW-708DR	01/16/97	4.1	203.0	213.0	68.7	3.3	62	0.5	5	4	4600	206	0.75	143.2	0.1	0.1	0.005	215	0.3	2	1.9E-06	1.4E-06
MW-708DR	01/16/97	4.2	203.0	213.0	68.7	3.4	62	0.3	5	4	4600	206	0.75	143.2	0.1	0.1	0.002	215	0.2	1	1.0E-06	Laminar
MW-708DR	01/16/97	5.1	213.0	223.0	67.7	3.5	60	0.2	5	4	4600	216	0.75	138.6	0.0	0.04	0.001	210	0.1	1	7.6E-07	7.6E-07
MW-708DR	01/16/97	6.1	223.0	233.0	68.7	3.4	62	1.0	5	4	4600	226	0.75	143.2	0.2	0.2	0.02	215	1	4	4.1E-06	4.1E-06
MW-708DR	01/16/97	7.1	233.0	243.0	67.2	3.3	71	2.2	5	4	4600	236	0.75	164.0	0.4	0.4	0.1	234	1	9	8.3E-06	9.7E-06
MW-708DR	01/16/97	7.2	233.0	243.0	67.1	3.4	71	2.9	5	4	4600	236	0.75	164.0	0.6	0.6	0.2	234	2	11	1.1E-05	Laminar
MW-708DR	01/16/97	8.1	243.0	253.0	66.7	3.3	74	0.0	5	4	4600	246	0.75	170.9	0.0	< 0.04	0.001	241	0.09	< 1	< 6.6E-07	
MW-708DR	01/16/97	8.2	243.0	253.0	66.6	3.4	78	1.3	5	4	4600	246	0.75	180.2	0.3	0.3	0.04	250	1	5	4.6E-06	< 6.6E-07
MW-708DR	01/16/97	8.3	243.0	253.0	66.6	3.4	74	0.1	5	4	4600	246	0.75	170.9	0.0	0.04	0.001	241	0.09	1	6.6E-07	Dilation
MW-708DR	01/16/97	9.1	253.0	263.0	69.7	3.3	77	5.6	5	4	4600	256	0.75	177.9	1.1	1.1	0.6	250	3	21	2.0E-05	2.0E-05

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

Calculated maximum test pressure unable to be achieved due to packer assembly slippage at depths of 183 to 193, 193 to 203, 203 to 213, 213 to 223, 223 to 233, 233 to 243, 243 to 253, and 253 to 263 ft bgs.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

PACKER TEST DATA REDUCTION

Remedial Investigation
SRSNE Superfund Site -- Southington, Connecticut

Corehole	Test Date	Test Increm.	Depth To Top (ft)	Depth to Bottom (ft)	Static Water Depth (ft)	Gauge Height (ft)	Gauge Rdg. (psi)	Total Intake (gal)	Test Time (min)	Hole Diam. (in)	Packer Coeff. *	Pipe Length (ft)	Pipe Diam. (in)	Gauge Rdg. (ft H20)	Meter Flow (gpm)	Actual Flow (gpm)	Frict. Loss (ft) **	Diff. Head (ft)	Ludgeon Value	K (ft/yr)	K (cm/s)	Comments
MW-710DR	06/04/97	1.1	131.1	141.1	16.0	6.0	30	82.6	5	4	4600	137	0.75	69.3	16.5	16.5	37.2	54	103	1405	1.4E-03	1.4E-03
MW-710DR	06/04/97	2.1	136.1	146.1	16.1	6.1	30	82.8	5	4	4600	142	0.75	69.3	16.6	16.6	38.5	53	103	1437	1.4E-03	1.4E-03
MW-710DR	06/04/97	3.1	146.1	156.1	16.0	6.1	45	0.0	3	4	4600	152	0.75	104.0	0.0	< 0.04	0.001	126	0.1	< 1	< 1.3E-06	
MW-710DR	06/04/97	3.2	146.1	156.1	16.0	6.1	79	0.0	3	4	4600	152	0.75	182.5	0.0	< 0.04	0.001	205	0.1	< 1	< 7.8E-07	
MW-710DR	06/04/97	3.3	146.1	156.1	16.0	6.1	113	1.6	5	4	4600	152	0.75	261.0	0.3	0.3	0.04	283	1	5	5.0E-06	< 1.3E-06
MW-710DR	06/04/97	3.4	146.1	156.1	16.0	6.1	79	0.0	3	4	4600	152	0.75	182.5	0.0	< 0.04	0.001	205	0.1	< 1	< 7.8E-07	Dilation
MW-710DR	06/04/97	3.5	146.1	156.1	16.0	6.1	45	0.0	3	4	4600	152	0.75	104.0	0.0	< 0.04	0.001	126	0.1	< 1	< 1.3E-06	
MW-710DR	06/04/97	4.1	156.1	166.1	16.0	6.1	48	3.5	5	4	4600	162	0.75	110.9	0.7	0.7	0.2	133	3	24	2.3E-05	
MW-710DR	06/04/97	4.2	156.1	166.1	16.0	6.1	84	5.0	5	4	4600	162	0.75	194.0	1.0	1.0	0.3	216	2	21	2.1E-05	
MW-710DR	06/04/97	4.3	156.1	166.1	15.8	6.4	100	13.1	5	4	4600	163	0.75	231.0	2.6	2.6	1.8	251	5	48	4.6E-05	2.6E-05
MW-710DR	06/04/97	4.4	156.1	166.1	16.0	6.4	84	4.2	5	4	4600	163	0.75	194.0	0.8	0.8	0.2	216	2	18	1.7E-05	Laminar
MW-710DR	06/04/97	4.5	156.1	166.1	16.0	6.4	48	3.2	5	4	4600	163	0.75	110.9	0.6	0.6	0.2	133	2	22	2.1E-05	
MW-710DR	06/04/97	5.1	166.1	176.1	16.2	6.1	51	0.0	3	4	4600	172	0.75	117.8	0.0	< 0.04	< 0.001	140	< 0.1	< 1	< 1.1E-06	
MW-710DR	06/04/97	5.2	166.1	176.1	16.2	6.1	89	1.5	5	4	4600	172	0.75	205.6	0.3	0.3	0.04	228	1	6	5.9E-06	< 1.1E-06
MW-710DR	06/04/97	5.3	166.1	176.1	16.0	6.3	51	0.0	3	4	4600	172	0.75	117.8	0.0	< 0.04	< 0.001	140	< 0.1	< 1	< 1.1E-06	Dilation
MW-710DR	06/04/97	6.1	176.1	186.1	16.3	6.1	54	0.1	5	4	4600	182	0.75	124.7	0.0	< 0.04	< 0.001	147	< 0.1	< 1	< 1.1E-06	
MW-710DR	06/04/97	6.2	176.1	186.1	16.3	6.5	76	3.7	5	4	4600	183	0.75	175.6	0.7	0.7	0.2	198	2	17	1.7E-05	6.7E-06
MW-710DR	06/04/97	6.3	176.1	186.1	15.1	6.5	54	0.4	5	4	4600	183	0.75	124.7	0.1	0.1	0.004	146	0.3	3	2.4E-06	Laminar
MW-710DR	06/04/97	7.1	186.1	196.1	16.7	6.5	57	0.7	5	4	4600	193	0.75	131.7	0.1	0.1	0.01	155	0.5	4	4.0E-06	
MW-710DR	06/04/97	7.2	186.1	196.1	15.9	6.6	90	17.5	5	4	4600	193	0.75	207.9	3.5	3.5	3.4	227	7	71	6.9E-05	4.9E-06
MW-710DR	06/04/97	7.3	186.1	196.1	16.6	6.6	57	1.0	5	4	4600	193	0.75	131.7	0.2	0.2	0.02	155	1	6	5.7E-06	Dilation
MW-710DR	06/04/97	8.1	196.1	206.1	16.8	6.1	60	0.7	5	4	4600	202	0.75	138.6	0.1	0.1	0.01	161	0.4	4	3.9E-06	
MW-710DR	06/04/97	8.2	196.1	206.1	16.8	6.1	105	15.1	5	4	4600	202	0.75	242.6	3.0	3.0	2.7	263	5	53	5.1E-05	3.9E-06
MW-710DR	06/04/97	8.3	196.1	206.1	16.7	6.2	60	0.7	5	4	4600	202	0.75	138.6	0.1	0.1	0.01	162	0.4	4	3.9E-06	Dilation

NOTES:

* Packer coefficient values calculated based on equation in: United States Department of Interior, Bureau of Reclamation. 1977. Design of Small Dams. Water Resources Technical Publication, U.S. Government Printing Office, Washington, D.C., p. 196.

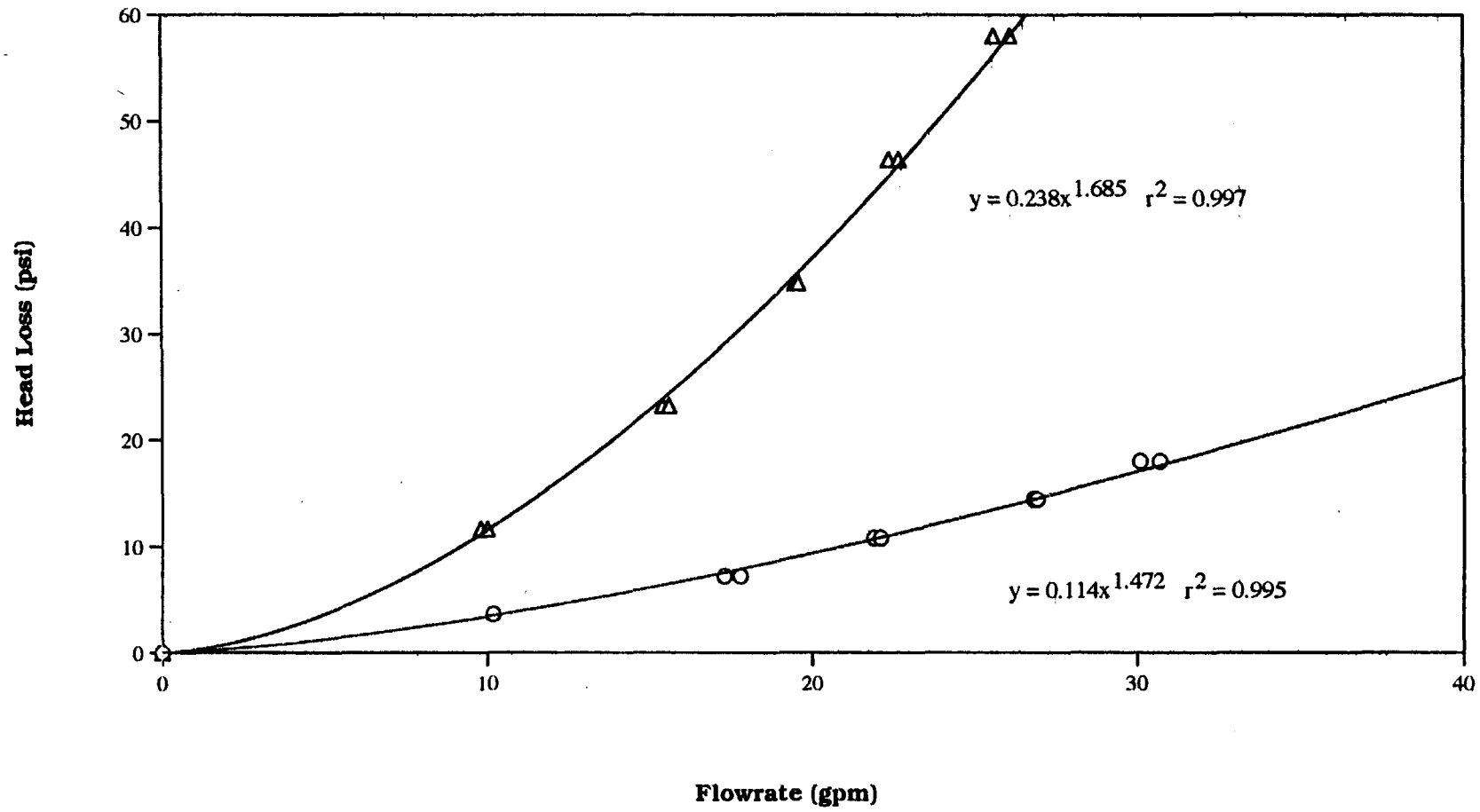
Calculated maximum test pressure unable to be achieved due to high permeability at depths of 131.1 to 141.1, and 136.1 to 146.1 ft bgs.

Calculated maximum test pressure unable to be achieved due to packer assembly slippage at depths of 166.1 to 176.1, 176.1 to 186.1, 186.1 to 196.1, and 196.1 to 206.1 ft bgs.

** Frictional head loss estimated for pipe assembly length and the observed packer test flow rates, based on the results of packer-assembly calibration performed in the field by BBL.

Plot 1

Pipe Head Loss Versus Flowrate (Power Function)

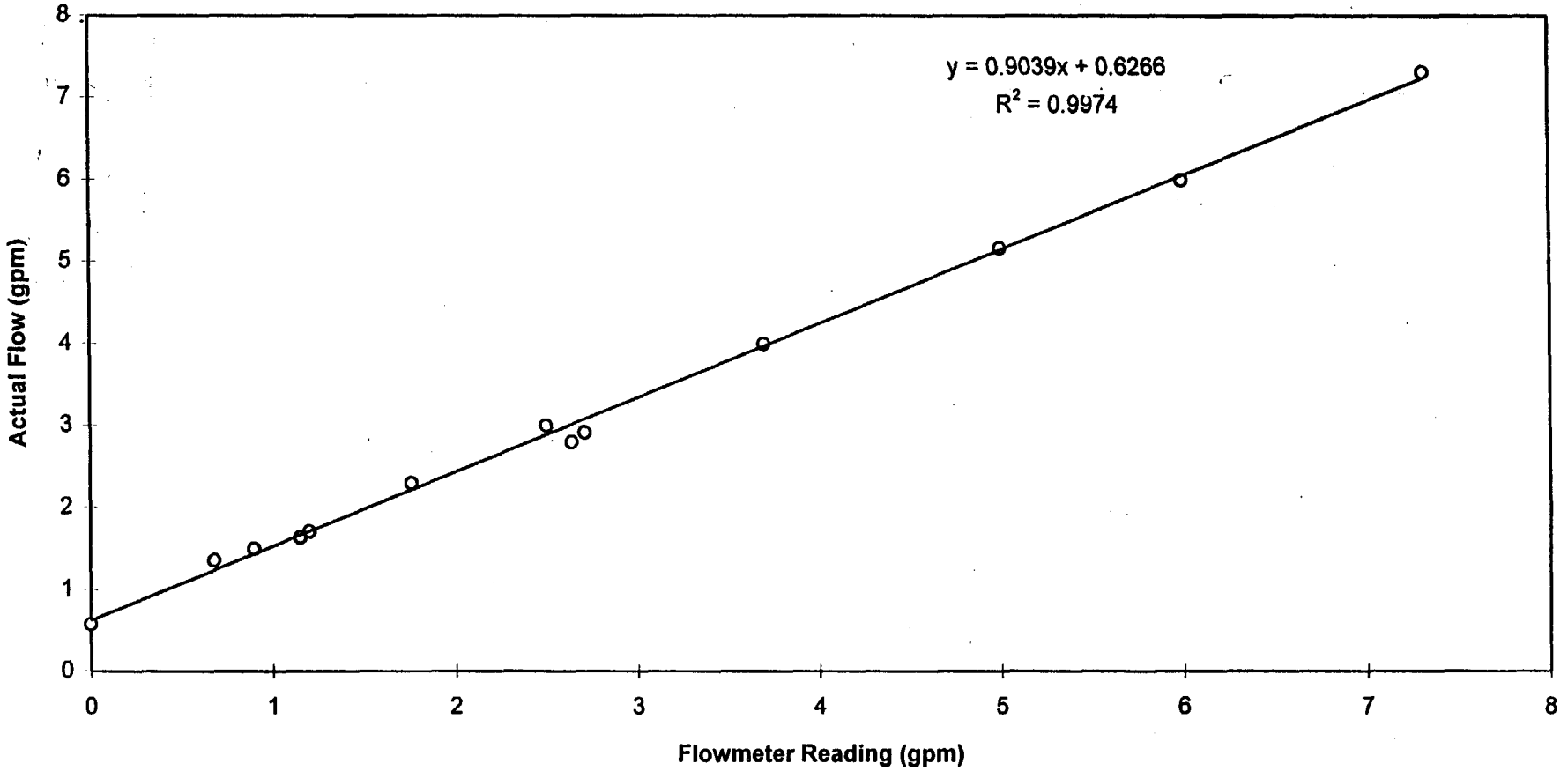


○	Head Loss (psi) @ 10.5′ PIPE
△	Head Loss (psi) @ 99.5′ PIPE

Note: Used these power law curves to estimate head loss for any flow rate for 10.5- and 99.5-foot long pipes. Linearly interpolated between (or extrapolated beyond) these power law curves to estimate head loss versus flow for any pipe lengths other than 10.5- and 99.5-feet long.

Plot 2

Calibration Data for Flowmeter No. 1

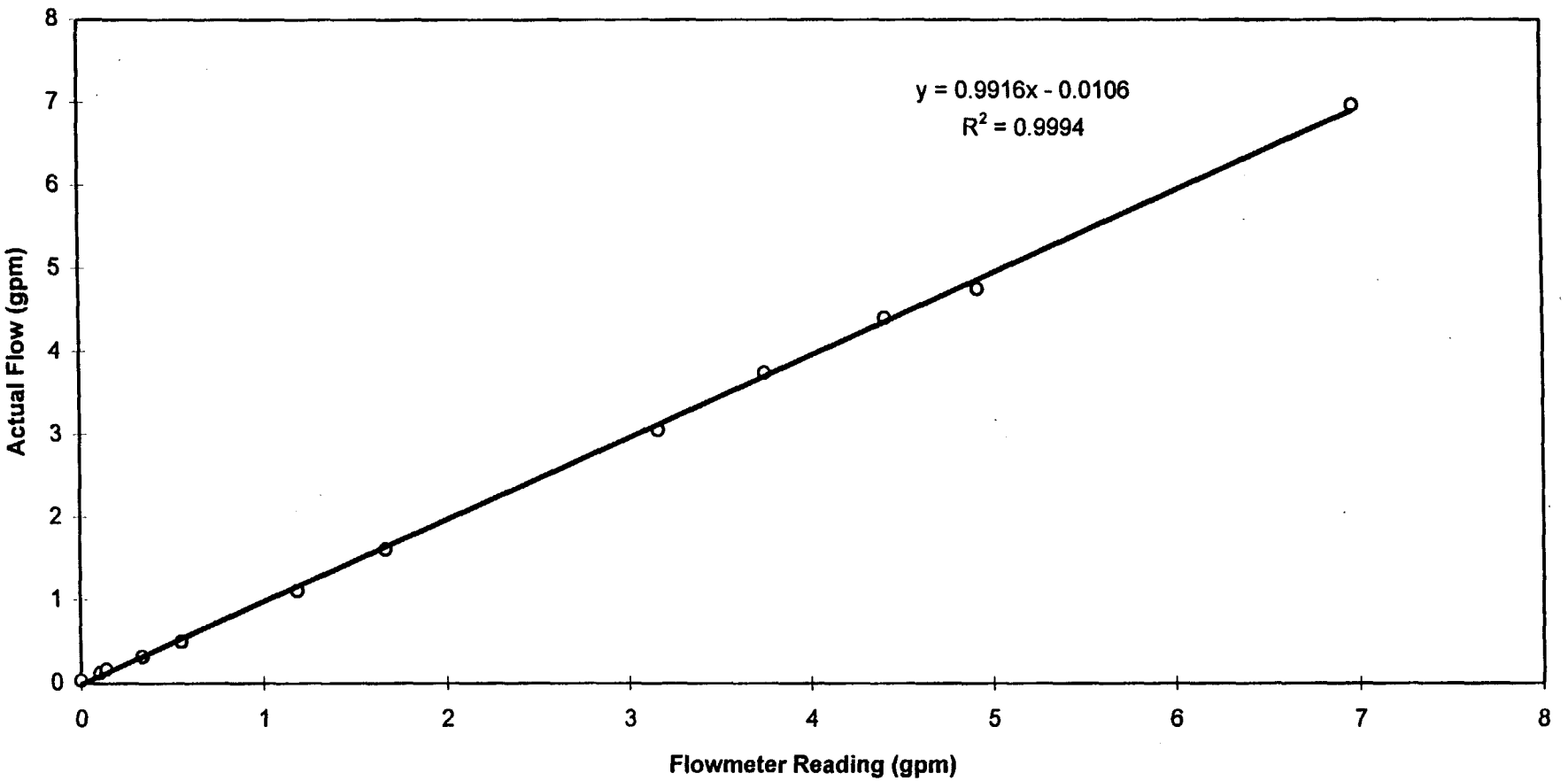


Calibration performed at 38 - 40 psi.

Note: Flowmeter No. 1 used for packer testing at MW-701DR through MW-707DR locations. Equation from linear regression used to correct meter readings to actual flow measurements in packer test data reduction.

Plot 3

Calibration Data for Flowmeter No. 2



Calibration performed at 35 - 45 psi.

Note: Flowmeter No. 2 used for packer testing at MW-708DR and MW-710DR locations. Based on linear regression analysis shown on this plot, meter readings were used (without adjustment) in packer test data reduction.

Appendix G

Summary of Geophysical (BIPS) Corehole Logging Results

"BIPS" Data Analysis

Project: SRSNE
Southington, CT

Prepared for:

Blasland, Bouck & Lee, Inc.

4 December, 1996

Preparer:

Joseph T. Nelson
Sr. Geophysical Engineer

Reviewer:

Michael J. Culig
Operations Manager

Colog, Inc.

Summary of Figures/Tables

SECTION	FIGURES/TABLES
MW-702	Fracture Table, Stereonets, Rose Diagrams.
MW-704	Fracture Table, Stereonets, Rose Diagrams
CIANCI	Fracture Table, Stereonets, Rose Diagrams
SITE	Stereonets and Rose Diagrams for all three wells.

Ranking System For "BIPS" Features

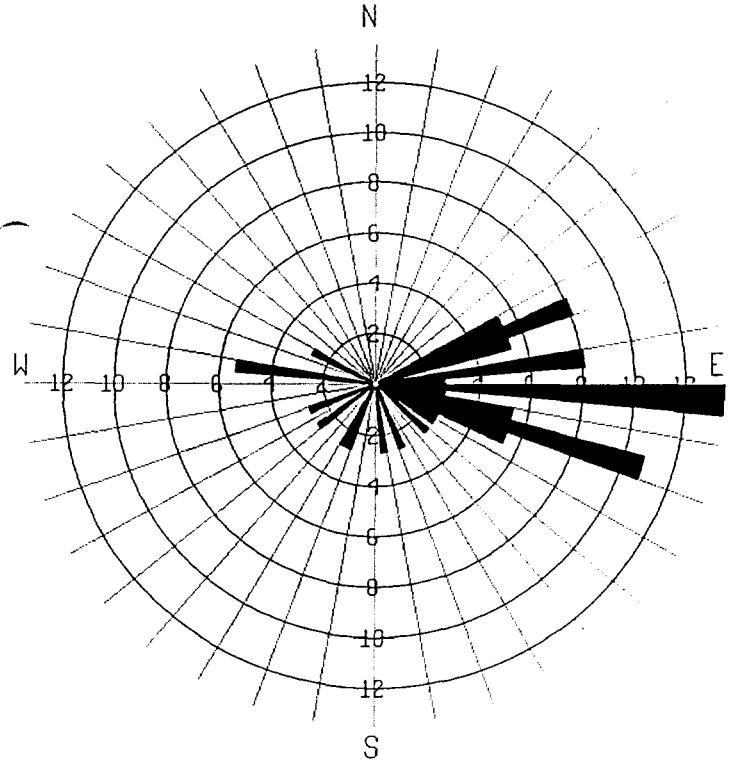
Rank	Observation
0	Probable bedding feature or foliation
1	Weak feature (possibly bedding) - not continuous around the borehole
2	Clean distinct feature
3	Distinct feature with apparent aperture
4	Very distinct, wide fracture or fractures, possibly interconnected
5	Major fracture zone with large openings and multiple interconnected features

This ranking system is based on a system developed and applied by Paillet (USGS, WRD, Borehole Geophysics Research Project) as a subjective evaluation of permeability potential. In general, the higher the rank, the greater the likelihood of fracture interconnection and subsequent increased permeability.

SRSNE Site
Well: MW702
Blasland, Bouck Lee
21 Oct 1996

Depth	Depth (ft)	Dip	Corr. Dip	Dip	Fracture	Aperture
		Direction	Direction*	Angle	Rank	Width
(meters)	(feet)	(degrees)	(degrees)	(degrees)	(0-5)	(mm)
12.68	41.6	80	66	21	1	<1
13.50	44.3	98	84	17	1	<1
13.80	45.3	63	49	27	1	<1
14.30	46.9	109	95	24	1	<1
14.35	47.1	104	90	22	1	<1
15.84	52.0	81	67	22	2	1
15.88	52.1	93	79	26	2	1
16.00	52.5	104	90	10	3	1
16.02	52.5	132	118	18	3	3
16.43	53.9	70	56	38	1	<1
16.86	55.3	80	66	40	1	<1
17.28	56.7	203	189	13	2	1
17.48	57.4	120	106	16	1	<1
17.53	57.5	115	101	19	1	<1
17.68	58.0	114	100	18	1	<1
17.93	58.8	68	54	22	1	<1
18.28	60.0	94	80	20	1	<1
18.64	61.2	72	58	27	1	<1
18.77	61.6	107	93	18	1	<1
19.37	63.5	156	142	9	2	2
19.72	64.7	92	78	18	1	<1
20.99	68.9	275	261	6	2	2
22.04	72.3	234	220	3	2	1
23.07	75.7	94	80	27	1	<1
23.08	75.7	68	54	8	2	2
23.40	76.8	296	282	5	2	2
24.99	82.0	107	93	27	1	<1
25.28	82.9	246	232	12	2	1
25.73	84.4	111	97	20	1	<1
25.77	84.5	105	91	21	1	<1
28.29	92.8	279	265	5	2	1
28.70	94.2	67	53	28	1	<1
28.84	94.6	63	49	17	1	<1
29.83	97.9	208	194	12	2	<1
30.81	101.1	93	79	22	1	<1
30.87	101.3	89	75	28	1	<1
32.04	105.1	173	159	20	1	<1

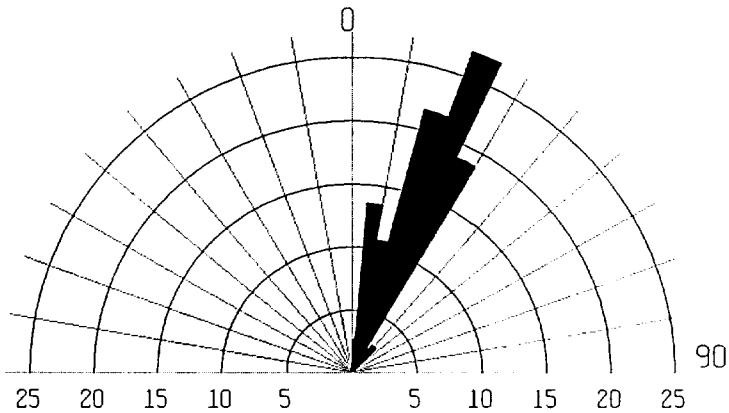
*Corrected Dip Directions were adjusted 14 degrees to reflect True North.



DIP DIRECTION, Well MW-702

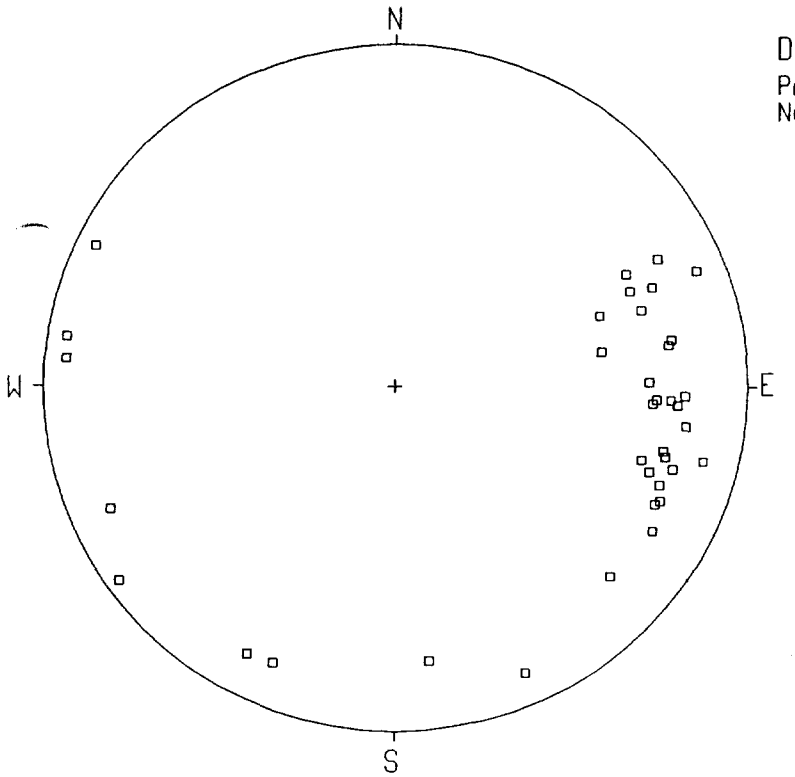
Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	37
Maximum Percentage	13 5 Percent
Mean Percentage	4 8 Percent
Standard Deviation	3 07 Percent
Vector Mean	103 62 Degrees
Confidence Interval	19 36 Degrees
R-mag	0 60

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



DIP ANGLE, Well MW-702

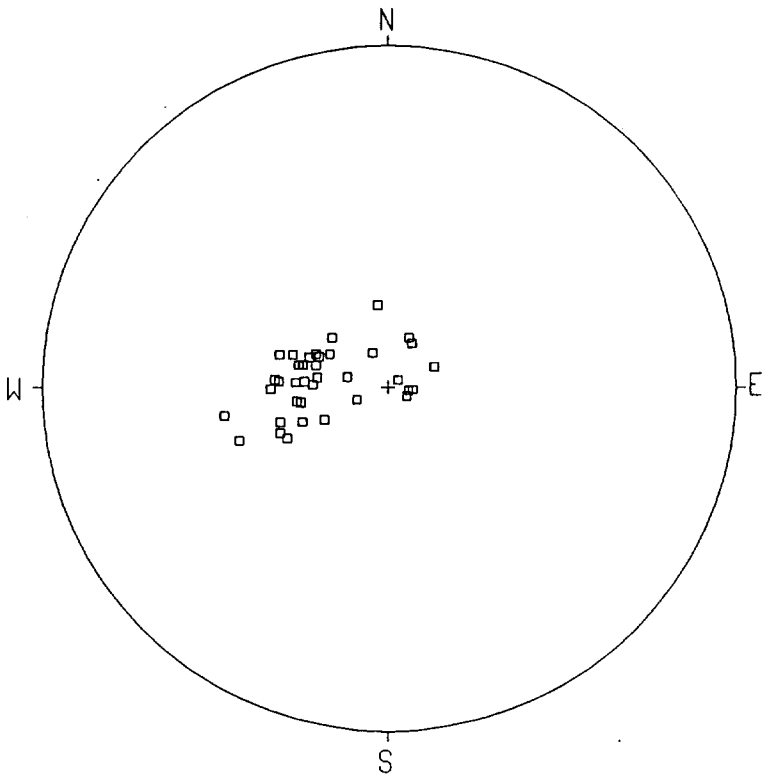
Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	37
Maximum Percentage	27 0 Percent
Mean Percentage	12 5 Percent
Standard Deviation	9 47 Percent
Vector Mean	19 08 Degrees
Confidence Interval	2 62 Degrees
R-mag	0 99



DIP VECTORS, Well MW-702

Projection	Schmidt
Number of Sample Points	37

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



POLES TO FRACTURES, Well MW-702

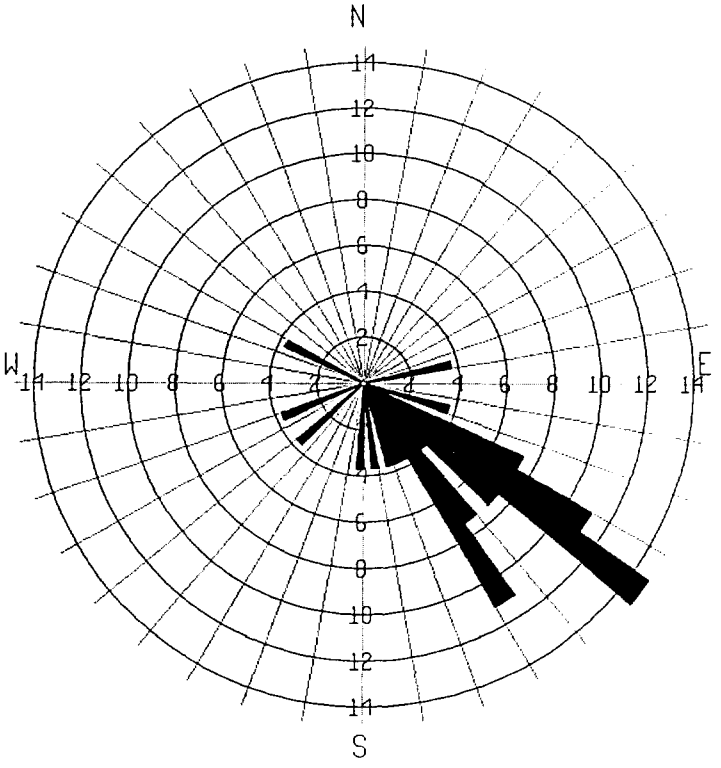
Projection	Schmidt
Number of Sample Points	37

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.

SRSNE Site
Well: MW704
Blasland, Bouck Lee
21 Oct 1996

Depth	Depth	Dip	Corr. Dip	Dip	Fracture	Aperture
		Direction	Direction*	Angle	Rank	Width
(meters)	(feet)	(degrees)	(degrees)	(degrees)	(0-5)	(mm)
24.35	79.9	225	211	17	2	2
26.16	85.8	153	139	15	2	<1
28.24	92.6	245	231	26	2	<1
29.26	96.0	128	114	19	1	<1
29.73	97.5	123	109	18	1	<1
29.80	97.8	140	126	21	1	<1
31.01	101.7	299	285	43	2	2
31.50	103.4	173	159	17	3	2
31.52	103.4	106	92	29	3	2
31.83	104.4	119	105	23	1	<1
34.80	114.2	180	166	21	2	2
35.18	115.4	155	141	15	3	2
35.30	115.8	146	132	18	3	2
35.37	116.0	141	127	21	2	<1
35.51	116.5	131	117	25	2	2
35.52	116.5	127	113	27	2	2
36.64	120.2	126	112	35	1	<1
37.31	122.4	122	108	13	1	<1
38.45	126.1	115	101	19	1	<1
41.44	136.0	77	63	44	1	<1
42.16	138.3	132	118	27	1	<1
42.44	139.2	124	110	21	1	<1
43.38	142.3	147	133	23	1	<1
45.28	148.6	146	132	34	1	<1
45.71	150.0	137	123	32	1	<1
48.17	158.0	127	113	14	1	<1
49.00	160.8	163	149	48	2	<1

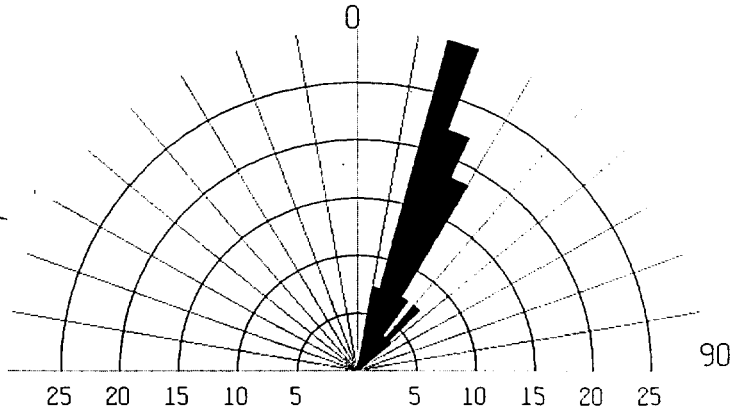
*Corrected Dip Directions were adjusted 14 degrees to reflect True North.



DIP DIRECTION, Well MW-709

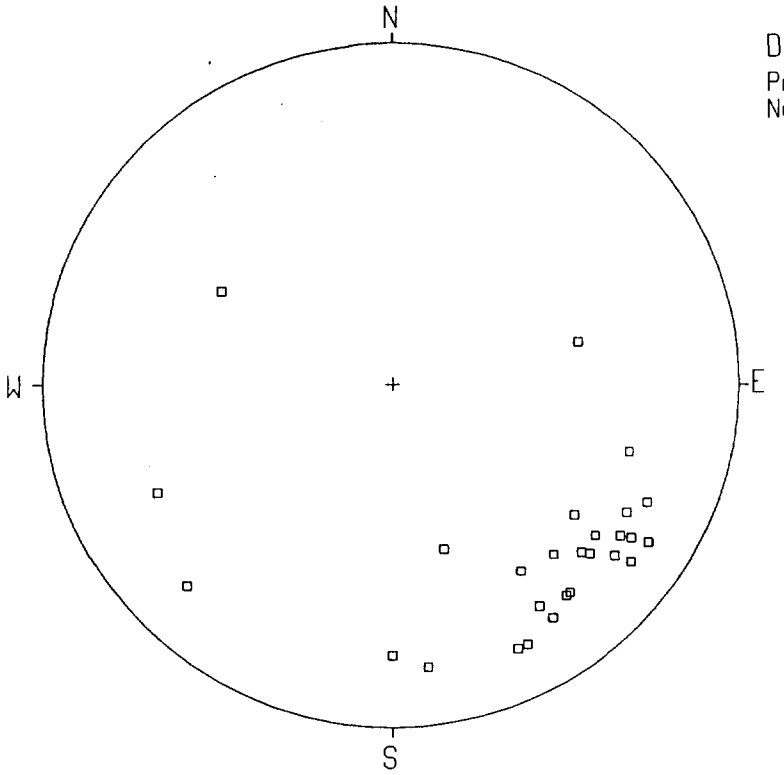
Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	27
Maximum Percentage	14 8 Percent
Mean Percentage	5 9 Percent
Standard Deviation	3 48 Percent
Vector Mean	141 01 Degrees
Confidence Interval	14 69 Degrees
R-mag	0 79

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



DIP ANGLE, Well MW-704

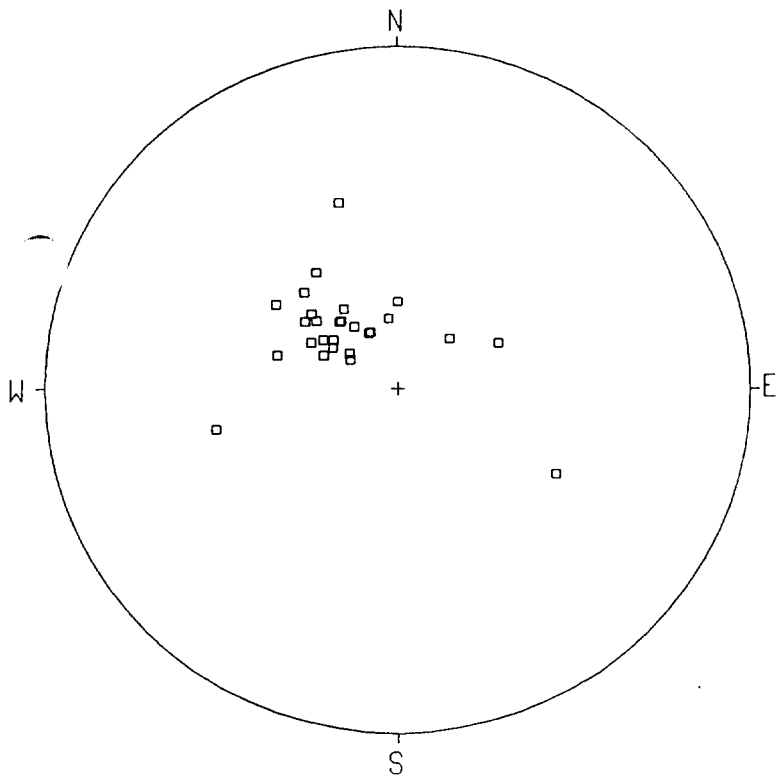
Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	27
Maximum Percentage	29 6 Percent
Mean Percentage	12 5 Percent
Standard Deviation	9 69 Percent
Vector Mean	24 59 Degrees
Confidence Interval	3 07 Degrees
R-mag	0 99



DIP VECTORS, Well MW-709

Projection	Schmidt
Number of Sample Points	27

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



POLES TO FRACTURES, Well MW-704

Projection Schmidt

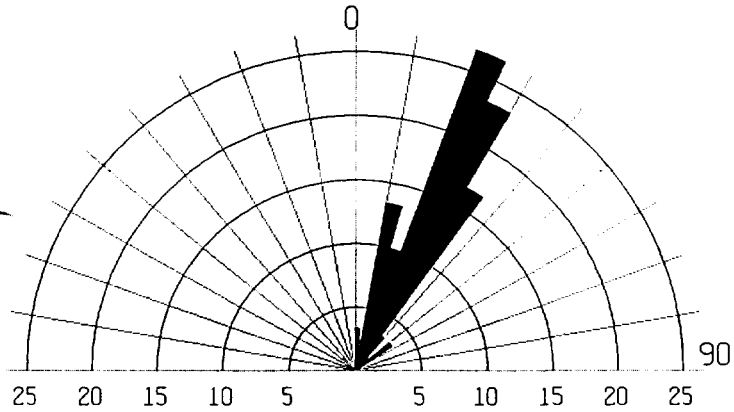
Number of Sample Points 27

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.

SRSNE Site
Well: CIANCI
Blasland, Bouck Lee
21 Oct 1996

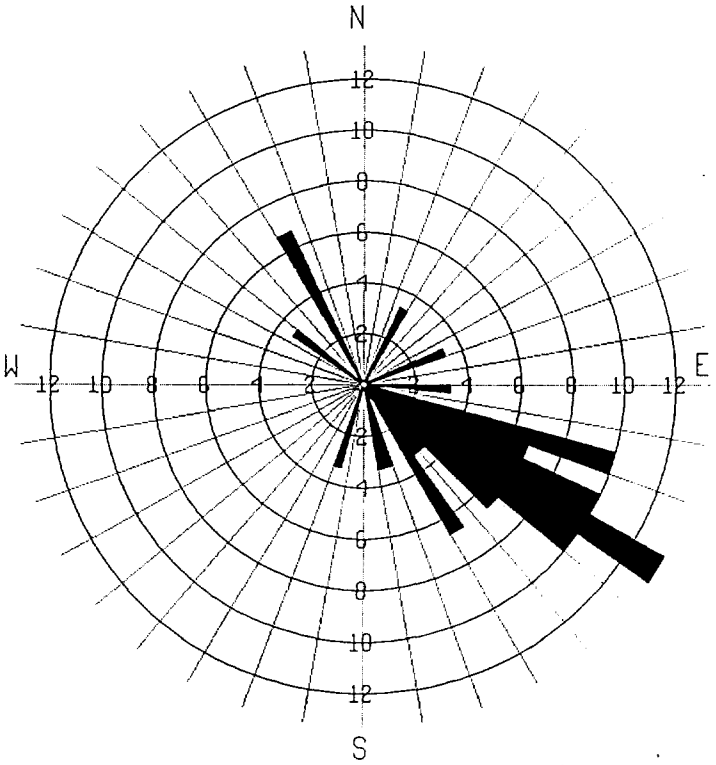
Depth (meters)	Depth (ft) (feet)	Dip Direction (degrees)	Corr. Dip Direction* (degrees)	Dip Angle (degrees)	Fracture Rank (0-5)	Aperture Width (mm)
10.98	36.0	199	185	3	2	1
11.22	36.8	122	108	53	2	<1
12.83	42.1	160	146	20	2	<1
13.11	43.0	29	15	10	2	<1
15.45	50.7	127	113	33	2	<1
16.25	53.3	138	124	22	1	<1
16.39	53.8	108	94	14	2	<1
16.62	54.5	334	320	11	1	<1
17.80	58.4	121	107	11	2	1
17.95	58.9	333	319	25	2	1
18.32	60.1	168	154	17	2	<1
20.43	67.0	309	295	25	2	1
22.24	73.0	146	132	23	1	<1
22.35	73.3	144	130	30	2	<1
24.34	79.9	107	93	31	2	<1
25.51	83.7	66	52	18	2	<1
26.91	88.3	116	102	21	1	<1
31.04	101.8	112	98	26	1	<1
31.45	103.2	119	105	20	1	<1
31.57	103.6	112	98	24	1	<1
32.71	107.3	149	135	24	1	<1
33.08	108.5	127	113	28	1	<1
33.63	110.3	119	105	18	1	<1
34.34	112.7	93	79	22	1	<1
34.58	113.4	132	118	25	1	<1
34.80	114.2	121	107	30	1	<1
35.26	115.7	128	114	29	1	<1
35.42	116.2	121	107	25	1	<1
35.93	117.9	107	93	36	1	<1
36.70	120.4	131	117	31	1	<1

*Corrected Dip Directions were adjusted 14 degrees to reflect True North.



DIP ANGLE, Well CIANCI

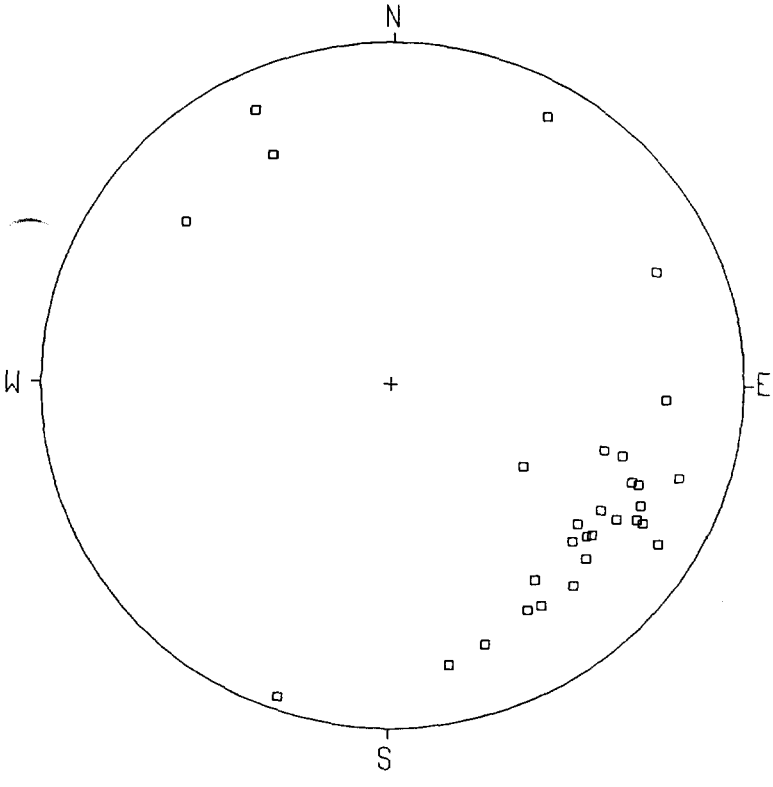
Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	30
Maximum Percentage	26 7 Percent
Mean Percentage	12 5 Percent
Standard Deviation	9 22 Percent
Vector Mean	23 48 Degrees
Confidence Interval	2 91 Degrees
R-mag	0 99



DIP DIRECTION, Well CIANCI

Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	30
Maximum Percentage	13 3 Percent
Mean Percentage	5 9 Percent
Standard Deviation	3 23 Percent
Vector Mean	120 85 Degrees
Confidence Interval	17 31 Degrees
R-mag	0 70

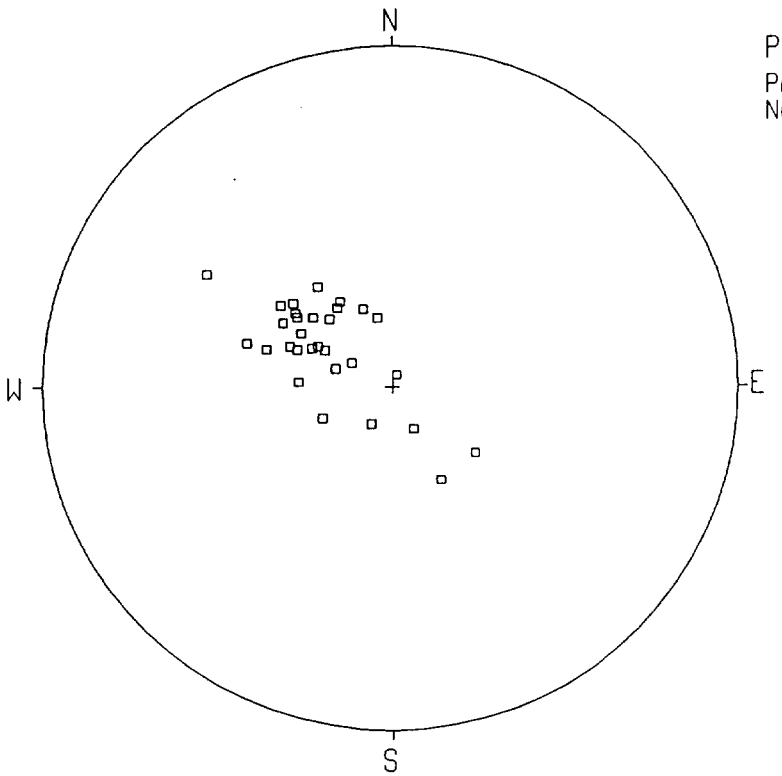
This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



DIP VECTORS, Well CIANCI

Projection	Schmidt
Number of Sample Points	30

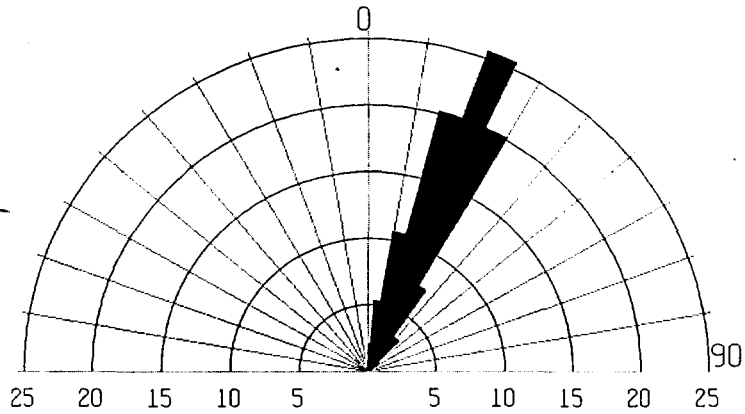
This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



POLES TO FRACTURES, Well CIANCI

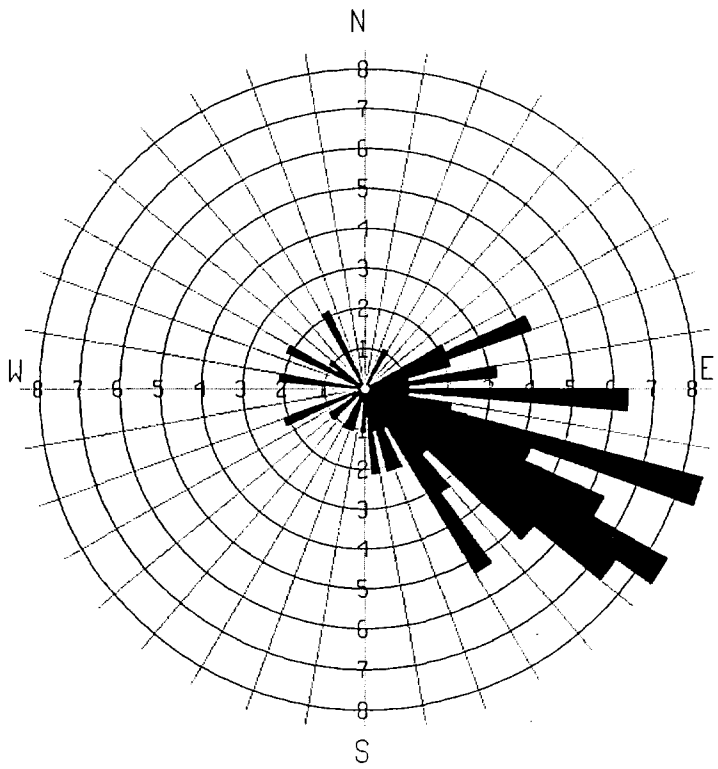
Projection	Schmidt
Number of Sample Points	30

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



DIP ANGLE, Wells MW-702, MW-704, CIANCI

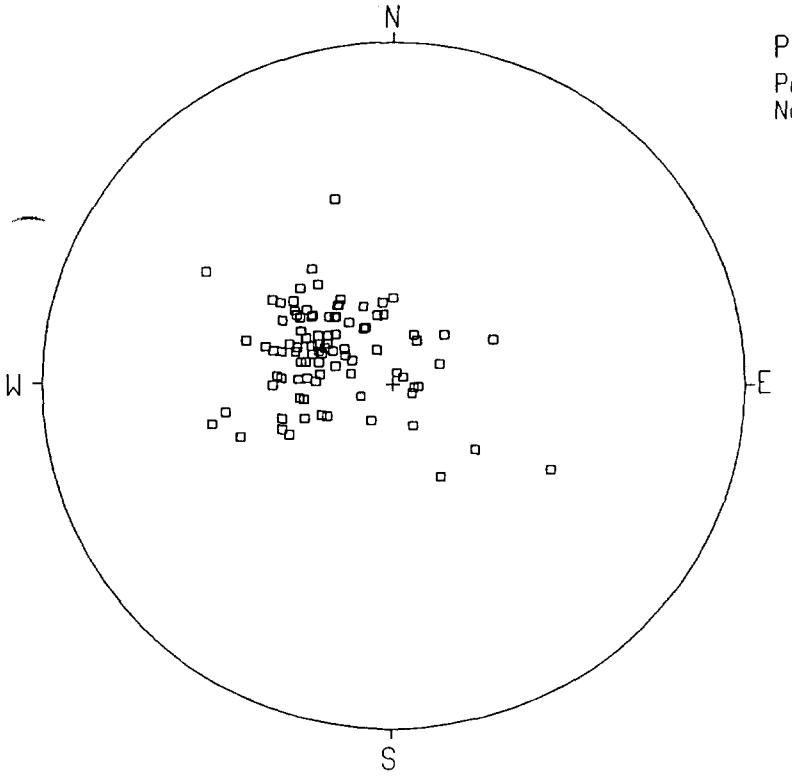
Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	94
Maximum Percentage	25 5 Percent
Mean Percentage	9 1 Percent
Standard Deviation	8 85 Percent
Vector Mean	22 06 Degrees
Confidence Interval	1 64 Degrees
R-mag	0 99



DIP DIRECTION, Wells MW-702, MW-704, CIANCI

Calculation Method	Frequency
Class Interval	5 Degrees
Filtering	Deactivated
Data Type	Unidirectional
Rotation Amount	0 0 Degrees
Population	94
Maximum Percentage	8 5 Percent
Mean Percentage	2 9 Percent
Standard Deviation	2 26 Percent
Vector Mean	121 53 Degrees
Confidence Interval	10 66 Degrees
R-mag	0 66

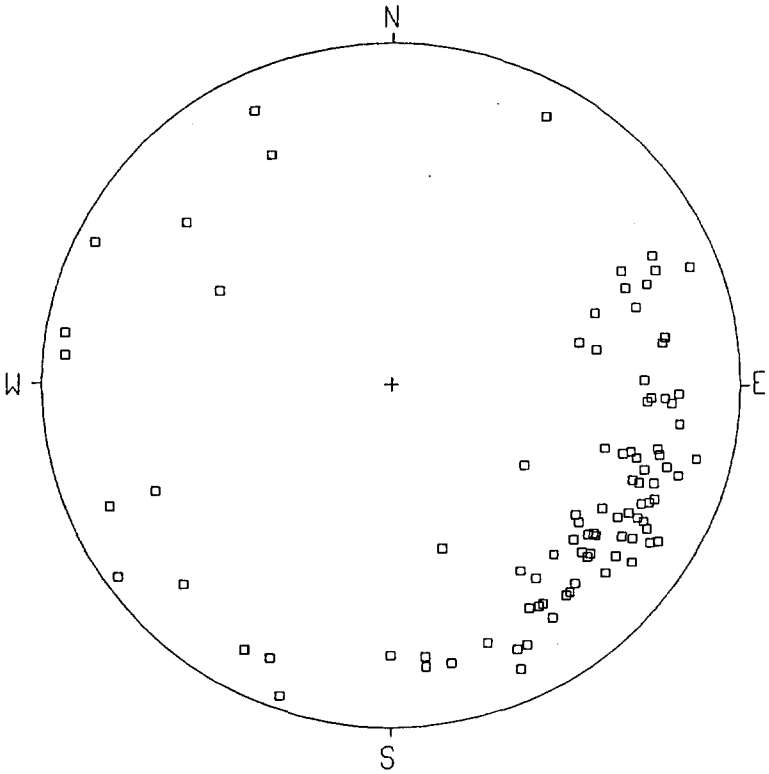
This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



POLES TO FRACTURES, MW-702, MW-704, CIAW-7

Projection	Schmidt
Number of Sample Points	94

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.



DIP VECTORS, MW-702, MW-704, CIANCI

Projection	Schmidt
Number of Sample Points	94

This plot does not account for 14° magnetic declination. Corrected data would plot 14° counter-clockwise of depictions on this plot.

Examples of BIPS Digital Images

31a.tif

Loc.:
SRSNE

No.: MW-704

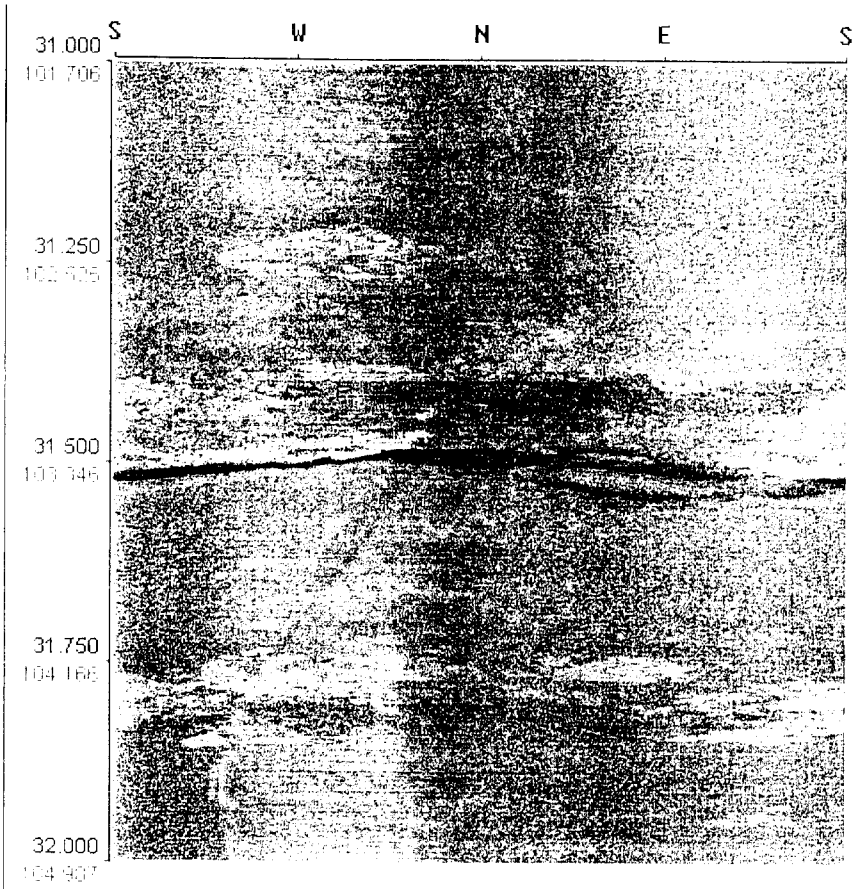
Date:96/10/21
Time:14:34:00

Start:
1.600 m
End:
49.944 m

V-Scale: 1/5
H-Scale: 1/1

Diam:102mm
Azmt: 0.0
Inc : -90.0
Span:1

R: -30
G: +30
B: +30



ORIGINAL IN COLOR.

Available at the US EPA New England Superfund Records Center, Boston, MA

31-an.tif

Loc.:
SRSNE

No.: MW-704

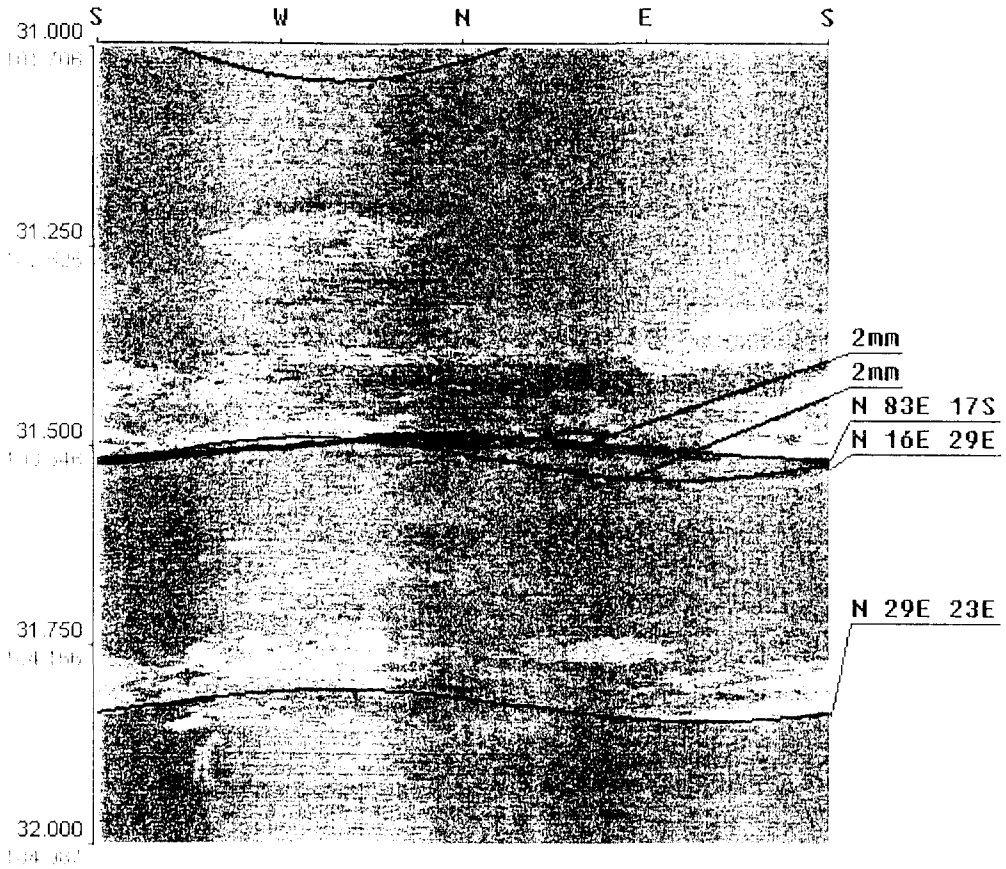
Date:96/10/21
Time:14:34:00

Start:
1.600 m
End:
49.944 m

V-Scale: 1/5
H-Scale: 1/1

Diam:102mm
Azmt: 0.0
Inc : -90.0
Span:1

R: -30
G: +30
B: +30



ORIGINAL IN COLOR.
Available at the US EPA New England Superfund Records Center, Boston, MA

31-3d.tif

Loc.:
SRSNE

No.: MW-704

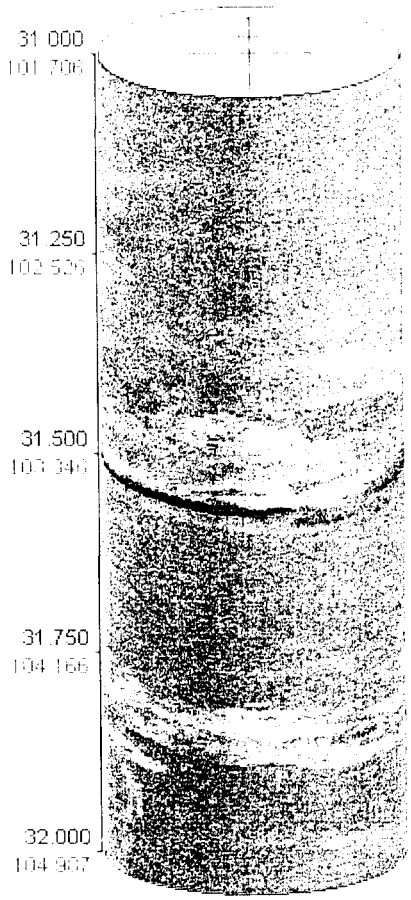
Date:96/10/21
Time:14:34:00

Start:
1.600 m
End:
49.944 m

V-Scale: 1/5
H-Scale: 1/1

Diam:152mm
Azmt: 0.0
Inc : -90.0
Span:1

R: -30
G: +30
B: +30



ORIGINAL IN COLOR.

Available at the US EPA New England Superfund Records Center, Boston, MA

Appendix H

Specific-Capacity Test and Rising-Head Recovery Test Results and Analysis

Specific Capacity Test Data Reduction

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: CIANCI
Site: SRSNE -- Southington, CT
Date: 11/7/96

Q(actual)	4.0 gpm	t	240 min	Q (comp)	4.0 gpm
S (est)	0.01	s	6.89 ft	T (comp)	686 gpd/ft
r(w)	0.34 ft	LS	100 ft	K	3.3E-04 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	1000	5.6260
2	837	4.7908
3	758	4.3797
4	720	4.1811
5	702	4.0860
6	694	4.0408
7	690	4.0193
8	688	4.0092
9	687	4.0043
10	686	4.0021
11	686	4.0010
12	686	4.0005
13	686	4.0002
14	686	4.0001
15	686	4.0000
16	686	4.0000
17	686	4.0000
18	686	4.0000
19	686	4.0000
20	686	4.0000
21	686	4.0000
22	686	4.0000
23	686	4.0000
24	686	4.0000
25	686	4.0000
26	686	4.0000
27	686	4.0000
28	686	4.0000
29	686	4.0000
30	686	4.0000

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-01
Site: SRSNE -- Southington, CT
Date: 12/20/96

Q(actual)	0.85 gpm	t	240 min	Q (comp)	0.85 gpm
S (est)	0.01	s	3.01 ft	T (comp)	309 gpd/ft
r(w)	0.34 ft	LS	25 ft	K	5.9E-04 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	400	1.0754
2	378	1.0219
3	361	0.9811
4	348	0.9501
5	339	0.9266
6	332	0.9089
7	326	0.8954
8	322	0.8853
9	319	0.8776
10	317	0.8718
11	315	0.8675
12	313	0.8642
13	312	0.8617
14	312	0.8599
15	311	0.8585
16	311	0.8574
17	310	0.8566
18	310	0.8560
19	310	0.8555
20	310	0.8552
21	310	0.8549
22	310	0.8548
23	310	0.8546
24	309	0.8545
25	309	0.8544
26	309	0.8544
27	309	0.8543
28	309	0.8543
29	309	0.8542
30	309	0.8542

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-2
Site: SRSNE -- Southington, CT
Date: 12/5/96

Q(actual)	2.04 gpm	t	240 min	Q (comp)	2.04 gpm
S (est)	0.01	s	0.40 ft	T (comp)	7410 gpd/ft
r(w)	0.34 ft	LS	30 ft	K	1.2E-02 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	7400	2.0391
2	7400	2.0391
3	7401	2.0392
4	7401	2.0393
5	7401	2.0393
6	7401	2.0394
7	7401	2.0395
8	7402	2.0395
9	7402	2.0396
10	7402	2.0396
11	7402	2.0397
12	7403	2.0397
13	7403	2.0398
14	7403	2.0398
15	7403	2.0399
16	7403	2.0399
17	7403	2.0400
18	7404	2.0400
19	7404	2.0400
20	7404	2.0401
21	7404	2.0401
22	7404	2.0402
23	7404	2.0402
24	7405	2.0402
25	7405	2.0403
26	7405	2.0403
27	7405	2.0403
28	7405	2.0404
29	7405	2.0404
30	7405	2.0404

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-121B
Site: SRSNE -- Southington, CT
Date: 12/13/96

Q(actual)	2.00 gpm	t	240 min	Q (comp)	2.00 gpm
S (est)	0.01	s	0.11 ft	T (comp)	29308 gpd/ft
r(w)	0.34 ft	LS	10 ft	K	1.4E-01 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	1000	0.0898
2	20102	1.4095
3	26006	1.7899
4	28107	1.9238
5	28870	1.9722
6	29148	1.9898
7	29250	1.9963
8	29287	1.9986
9	29300	1.9995
10	29305	1.9998
11	29307	1.9999
12	29308	2.0000
13	29308	2.0000
14	29308	2.0000
15	29308	2.0000
16	29308	2.0000
17	29308	2.0000
18	29308	2.0000
19	29308	2.0000
20	29308	2.0000
21	29308	2.0000
22	29308	2.0000
23	29308	2.0000
24	29308	2.0000
25	29308	2.0000
26	29308	2.0000
27	29308	2.0000
28	29308	2.0000
29	29308	2.0000
30	29308	2.0000

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-204B
Site: SRSNE -- Southington, CT
Date: 12/5/96

Q(actual)	2.18 gpm	t	240 min	Q (comp)	2.18 gpm
S (est)	0.01	s	0.27 ft	T (comp)	12199 gpd/ft
r(w)	0.34 ft	LS	10 ft	K	5.8E-02 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	12200	2.1793
2	12200	2.1793
3	12200	2.1793
4	12200	2.1793
5	12199	2.1792
6	12199	2.1792
7	12199	2.1792
8	12199	2.1792
9	12199	2.1792
10	12199	2.1792
11	12199	2.1792
12	12199	2.1792
13	12199	2.1792
14	12199	2.1792
15	12199	2.1792
16	12199	2.1792
17	12199	2.1792
18	12199	2.1792
19	12199	2.1792
20	12199	2.1792
21	12199	2.1792
22	12199	2.1792
23	12199	2.1792
24	12199	2.1792
25	12199	2.1792
26	12199	2.1792
27	12199	2.1792
28	12199	2.1792
29	12199	2.1792
30	12199	2.1792

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-501B
Site: SRSNE -- Southington, CT
Date: 12/6/96

Q(actual)	2.00 gpm	t	240 min	Q (comp)	2.00 gpm
S (est)	0.01	s	5.72 ft	T (comp)	391 gpd/ft
r(w)	0.34 ft	LS	10 ft	K	1.9E-03 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	1000	4.6706
2	733	3.5258
3	580	2.8561
4	495	2.4737
5	447	2.2597
6	421	2.1415
7	407	2.0768
8	400	2.0416
9	395	2.0225
10	393	2.0122
11	392	2.0066
12	391	2.0036
13	391	2.0019
14	391	2.0010
15	391	2.0006
16	391	2.0003
17	391	2.0002
18	391	2.0001
19	391	2.0000
20	391	2.0000
21	391	2.0000
22	391	2.0000
23	391	2.0000
24	391	2.0000
25	391	2.0000
26	391	2.0000
27	391	2.0000
28	391	2.0000
29	391	2.0000
30	391	2.0000

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-502
Site: SRSNE -- Southington, CT
Date: 12/13/96

Q(actual)	0.15 gpm	t	240 min	Q (comp)	0.15 gpm
S (est)	0.01	s	2.05 ft	T (comp)	67 gpd/ft
r(w)	0.34 ft	LS	20 ft	K	1.6E-04 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	80	0.1754
2	77	0.1705
3	75	0.1665
4	74	0.1633
5	72	0.1607
6	71	0.1587
7	70	0.1570
8	70	0.1556
9	69	0.1545
10	69	0.1536
11	68	0.1529
12	68	0.1523
13	68	0.1519
14	68	0.1515
15	68	0.1512
16	67	0.1510
17	67	0.1508
18	67	0.1506
19	67	0.1505
20	67	0.1504
21	67	0.1503
22	67	0.1503
23	67	0.1502
24	67	0.1502
25	67	0.1501
26	67	0.1501
27	67	0.1501
28	67	0.1501
29	67	0.1501
30	67	0.1500

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-703S
Site: SRSNE -- Southington, CT
Date: 11/12/96

Q(actual)	2.84 gpm	t	240 min	Q (comp)	2.84 gpm
S (est)	0.01	s	0.56 ft	T (comp)	7359 gpd/ft
r(w)	0.34 ft	LS	12 ft	K	2.9E-02 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	7364	2.8419
2	7364	2.8419
3	7364	2.8418
4	7363	2.8417
5	7363	2.8417
6	7363	2.8416
7	7363	2.8415
8	7363	2.8415
9	7363	2.8414
10	7362	2.8414
11	7362	2.8413
12	7362	2.8413
13	7362	2.8412
14	7362	2.8412
15	7362	2.8412
16	7362	2.8411
17	7362	2.8411
18	7362	2.8410
19	7361	2.8410
20	7361	2.8410
21	7361	2.8409
22	7361	2.8409
23	7361	2.8409
24	7361	2.8408
25	7361	2.8408
26	7361	2.8408
27	7361	2.8407
28	7361	2.8407
29	7361	2.8407
30	7360	2.8407

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-703D
Site: SRSNE -- Southington, CT
Date: 11/13/96

Q(actual)	2.96 gpm	t	240 min	Q (comp)	2.96 gpm
S (est)	0.01	s	10.04 ft	T (comp)	322 gpd/ft
r(w)	0.34 ft	LS	13 ft	K	1.2E-03 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	323	2.9681
2	322	2.9614
3	322	2.9603
4	322	2.9600
5	322	2.9600
6	322	2.9600
7	322	2.9600
8	322	2.9600
9	322	2.9600
10	322	2.9600
11	322	2.9600
12	322	2.9600
13	322	2.9600
14	322	2.9600
15	322	2.9600
16	322	2.9600
17	322	2.9600
18	322	2.9600
19	322	2.9600
20	322	2.9600
21	322	2.9600
22	322	2.9600
23	322	2.9600
24	322	2.9600
25	322	2.9600
26	322	2.9600
27	322	2.9600
28	322	2.9600
29	322	2.9600
30	322	2.9600

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-704S
Site: SRSNE -- Southington, CT
Date: 11/11/96

Q(actual)	0.60 gpm	t	240 min	Q (comp)	0.60 gpm
S (est)	0.01	s	4.93 ft	T (comp)	119 gpd/ft
r(w)	0.34 ft	LS	16 ft	K	3.5E-04 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	120	0.6043
2	120	0.6033
3	120	0.6027
4	120	0.6024
5	120	0.6022
6	120	0.6021
7	120	0.6021
8	120	0.6020
9	119	0.6020
10	119	0.6020
11	119	0.6020
12	119	0.6020
13	119	0.6020
14	119	0.6020
15	119	0.6020
16	119	0.6020
17	119	0.6020
18	119	0.6020
19	119	0.6020
20	119	0.6020
21	119	0.6020
22	119	0.6020
23	119	0.6020
24	119	0.6020
25	119	0.6020
26	119	0.6020
27	119	0.6020
28	119	0.6020
29	119	0.6020
30	119	0.6020

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-704M
Site: SRSNE -- Southington, CT
Date: 11/12/96

Q(actual)	3.23 gpm	t	240 min	Q (comp)	3.23 gpm
S (est)	0.01	s	1.64 ft	T (comp)	2625 gpd/ft
r(w)	0.34 ft	LS	13 ft	K	9.6E-03 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	2626	3.2311
2	2626	3.2310
3	2626	3.2309
4	2626	3.2308
5	2626	3.2307
6	2626	3.2306
7	2625	3.2306
8	2625	3.2305
9	2625	3.2304
10	2625	3.2304
11	2625	3.2303
12	2625	3.2303
13	2625	3.2303
14	2625	3.2302
15	2625	3.2302
16	2625	3.2302
17	2625	3.2302
18	2625	3.2302
19	2625	3.2301
20	2625	3.2301
21	2625	3.2301
22	2625	3.2301
23	2625	3.2301
24	2625	3.2301
25	2625	3.2301
26	2625	3.2301
27	2625	3.2301
28	2625	3.2300
29	2625	3.2300
30	2625	3.2300

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-704D
Site: SRSNE -- Southington, CT
Date: 11/13/96

Q(actual)	2.99 gpm	t	240 min	Q (comp)	2.99 gpm
S (est)	0.01	s	0.83 ft	T (comp)	5073 gpd/ft
r(w)	0.34 ft	LS	13 ft	K	1.8E-02 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	500	0.3632
2	3127	1.9183
3	4198	2.5131
4	4675	2.7739
5	4892	2.8914
6	4990	2.9449
7	5035	2.9693
8	5056	2.9805
9	5065	2.9857
10	5070	2.9880
11	5072	2.9891
12	5073	2.9896
13	5073	2.9898
14	5073	2.9899
15	5073	2.9900
16	5073	2.9900
17	5073	2.9900
18	5073	2.9900
19	5073	2.9900
20	5073	2.9900
21	5073	2.9900
22	5073	2.9900
23	5073	2.9900
24	5073	2.9900
25	5073	2.9900
26	5073	2.9900
27	5073	2.9900
28	5073	2.9900
29	5073	2.9900
30	5073	2.9900

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-704DR
Site: SRSNE -- Southington, CT
Date: 11/13/96

Q(actual)	1.58 gpm	t	63.5 min	Q (comp)	1.58 gpm
S (est)	0.0001	s	60.77 ft	T (comp)	36 gpd/ft
r(w)	0.17 ft	LS	31 ft	K	5.5E-05 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	1	0.0626
2	153	5.9969
3	109	4.3734
4	81	3.3233
5	63	2.6551
6	52	2.2366
7	46	1.9779
8	42	1.8198
9	40	1.7240
10	38	1.6663
11	37	1.6316
12	37	1.6108
13	36	1.5984
14	36	1.5910
15	36	1.5866
16	36	1.5839
17	36	1.5823
18	36	1.5814
19	36	1.5808
20	36	1.5805
21	36	1.5803
22	36	1.5802
23	36	1.5801
24	36	1.5801
25	36	1.5800
26	36	1.5800
27	36	1.5800
28	36	1.5800
29	36	1.5800
30	36	1.5800

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: MW-707D
Site: SRSNE -- Southington, CT
Date: 12/6/96

Q(actual)	2.02 gpm	t	240 min	Q (comp)	2.02 gpm
S (est)	0.01	s	0.25 ft	T (comp)	12192 gpd/ft
r(w)	0.34 ft	LS	10 ft	K	5.8E-02 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	11100	1.8492
2	11267	1.8750
3	11409	1.8967
4	11529	1.9151
5	11631	1.9307
6	11717	1.9439
7	11789	1.9551
8	11851	1.9645
9	11903	1.9725
10	11947	1.9792
11	11985	1.9850
12	12016	1.9898
13	12043	1.9939
14	12066	1.9974
15	12085	2.0004
16	12102	2.0028
17	12115	2.0050
18	12127	2.0068
19	12137	2.0083
20	12145	2.0096
21	12153	2.0106
22	12159	2.0116
23	12164	2.0123
24	12168	2.0130
25	12172	2.0136
26	12175	2.0140
27	12177	2.0144
28	12180	2.0148
29	12181	2.0151
30	12183	2.0153

QSTRANS.WK1 by M.J. Gefell, Updated, February 1993.

Based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

SPECIFIC CAPACITY TEST DATA REDUCTION

Well: P-101B
Site: SRSNE -- Southington, CT
Date: 12/19/96

Q(actual)	0.74 gpm	t	240 min	Q (comp)	0.74 gpm
S (est)	0.01	s	0.45 ft	T (comp)	2164 gpd/ft
r(w)	0.34 ft	LS	10 ft	K	1.0E-02 cm/sec

Iteration	T, gpd/ft	computed Q, gpm
1	2000	0.6901
2	2052	0.7063
3	2087	0.7174
4	2111	0.7250
5	2128	0.7302
6	2139	0.7338
7	2147	0.7363
8	2152	0.7380
9	2156	0.7391
10	2159	0.7399
11	2161	0.7405
12	2162	0.7408
13	2163	0.7411
14	2163	0.7413
15	2163	0.7414
16	2164	0.7415
17	2164	0.7415
18	2164	0.7416
19	2164	0.7416
20	2164	0.7416
21	2164	0.7416
22	2164	0.7416
23	2164	0.7417
24	2164	0.7417
25	2164	0.7417
26	2164	0.7417
27	2164	0.7417
28	2164	0.7417
29	2164	0.7417
30	2164	0.7417

Rising Head Recovery Test Data Reduction

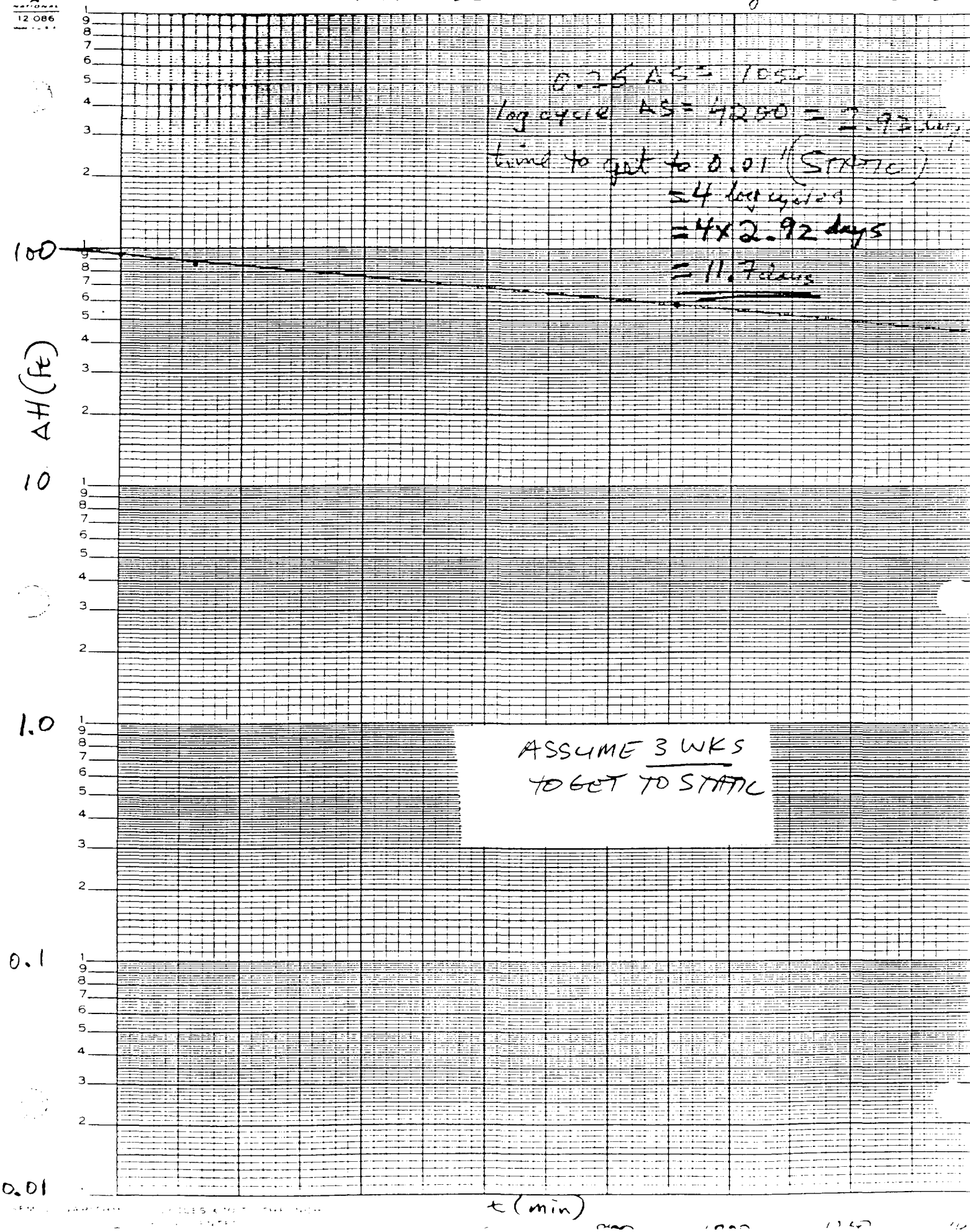
SLUGCOMP.WK1 BBL, 3/88
Modified 12/21/89, 6/10/92, 5/14/93

Project:	SRSNE SITE
Project No.:	083.31
Well No.:	MW-703DR
Test Date:	NOVEMBER 14 – 15, 1996
Formation Tested:	NEW HAVEN ARKOSE
Rising (R) or Falling Head (F):	R

		(cm)		Computation	Time Lag	Variable Head
Reference Stickup (ft)	1.5	45.72		2.54 Rc (eff)		2.28E-07 K
Static water depth from stickup (ft)	6.45	196.60	150.88 SW	180.00 L/Rw		0.004834 K
Depth to bottom of screen from ground level (ft)	175.0	5334.00	5183.12 H	0.87 H/D	115322.30 T	
			4419.60 Ts	5.60 A	900.00 AH	
Boring Diameter (in)	4.0	10.16	5.08 Rw	1.00 B	0.47 HR	
Riser Diameter (in)	2.0	5.08	2.54 Rc	6.20 C	7.50 BH	
Screen Diameter (in)	2.0	5.08	5.08 DS	5.01 Pp'	2.3E-07 K	
Screen Length (ft)	30.00	914.40	914.40 L	5.01 Pp	0.00 K	
Depth to Boundary	200	6096.00	5945.12 D	4.59 RR'ab		
Delta H at Time 0 (ft)	93.70	2855.98	2855.98 H0	5.18 RR'c		
Delta H at Time t (ft)	58.55	1784.60	1784.60 Ht	4.59 RR		
Time t (seconds)	54540		54540.00 T	1.4E-07 KK		
Assumed Kh/Kv Ratio	100		10.00 M	0.0 K		
Porosity of Filter Pack	0.3		0.30 P			

	gpd/ft2	cm/sec
K, (Bouwer-Rice)	0.003	1E-07 ←
K, (Hvorslev Time Lag)	0.0	2.3E-07
K, (Hvorslev Variable Head)	0.0	2.3E-07

MW-703DK RECOVERY AFTER PUMPING



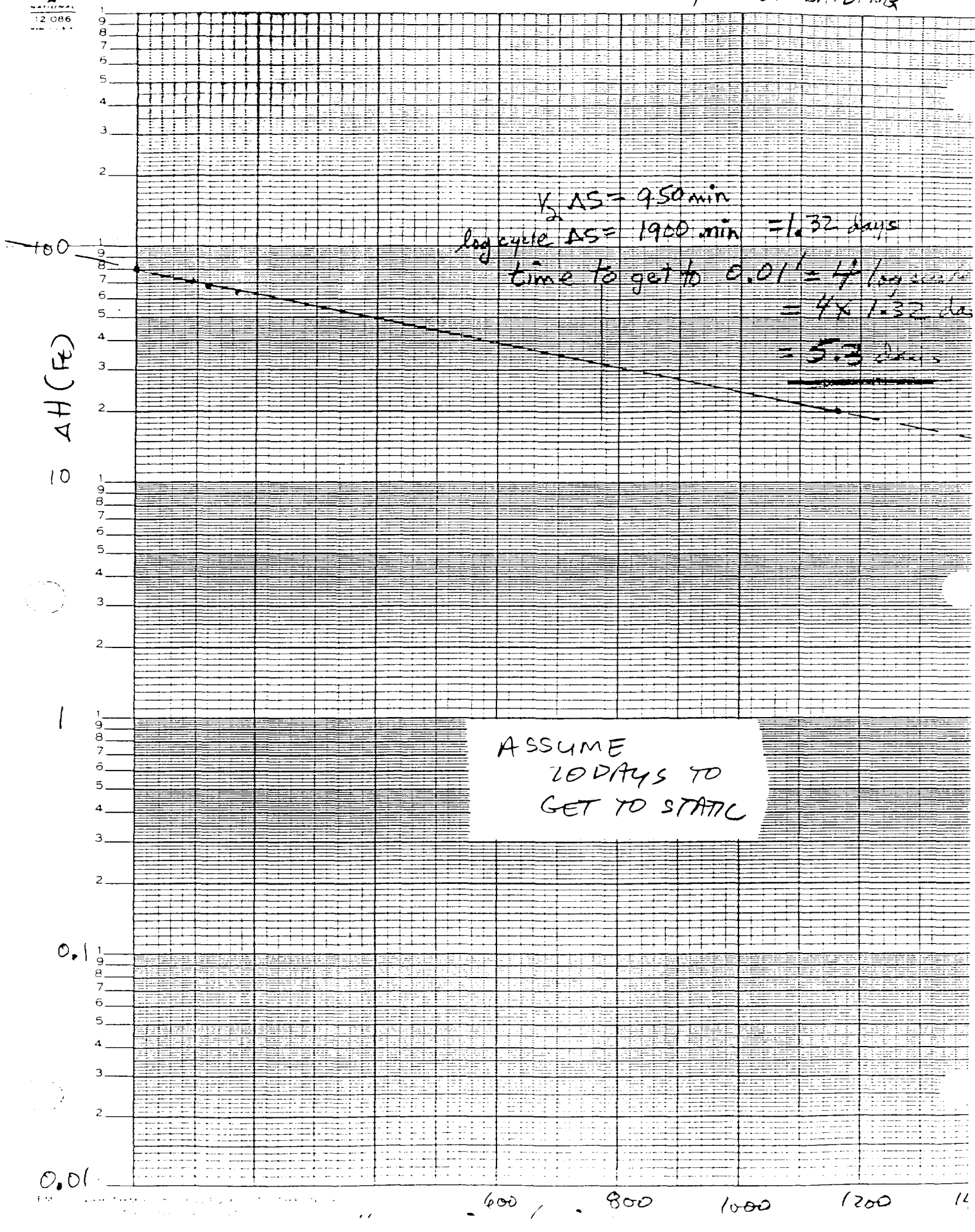
SLUGCOMP.WK1 BBL, 3/88
Modified 12/21/89, 6/10/92, 5/14/93

Project:	SRSNE SITE
Project No.:	083.31
Well No.:	MW-704R
Test Date:	NOVEMBER 14 - 15, 1996
Formation Tested:	NEW HAVEN ARKOSE
Rising (R) or Falling Head (F):	R

		(cm)		Computation	Time Lag	Variable Head
Reference Stickup (ft)	1.5	45.72		2.54 Rc (eff)		1.60E-06 K
Static water depth from stickup (ft)	3.40	103.63	57.91 SW	60.00 L/Rw		0.033837 K
Depth to bottom of screen from ground level (ft)	89.0	2712.72	2654.81 H	0.44 H/D	42182.39 T	
			2407.92 Ts	3.30 A	300.00 AH	
Boring Diameter (in)	4.0	10.16	5.08 Rw	0.50 B	1.36 HR	
Riser Diameter (in)	2.0	5.08	2.54 Rc	2.90 C	6.40 BH	
Screen Diameter (in)	2.0	5.08	5.08 DS	6.50 Pp'	1.6E-06 K	
Screen Length (ft)	10.00	304.80	304.80 L	6.00 Pp	0.03 K	
Depth to Boundary	200	6096.00	6038.09 D	3.56 RR'ab		
Delta H at Time 0 (ft)	80.30	2447.54	2447.54 H0	4.46 RR'c		
Delta H at Time t (ft)	20.60	627.89	627.89 Ht	3.56 RR		
Time t (seconds)	57720		57720.00 T	8.9E-07 KK		
Assumed Kh/Kv Ratio	100		10.00 M	0.0 K		
Porosity of Filter Pack	0.3		0.30 P			

	gpd/ft2	cm/sec
K, (Bouwer-Rice)	0.019	9E-07
K, (Hvorslev Time Lag)	0.0	1.6E-06
K, (Hvorslev Variable Head)	0.0	1.6E-06

MW-204 RECOVERY AFTER BAILING



Horizontal Anisotropy Analysis for Deep Overburden

HORIZONTAL ANISOTROPY ANALYSIS FOR OUTWASH (DEEP OVERBURDEN)

BASED ON DRAWDOWN RESPONSES DURING MW-704D SPECIFIC CAPACITY TEST NOVEMBER 13, 1996 [HANTUSH-THOMAS METHOD]

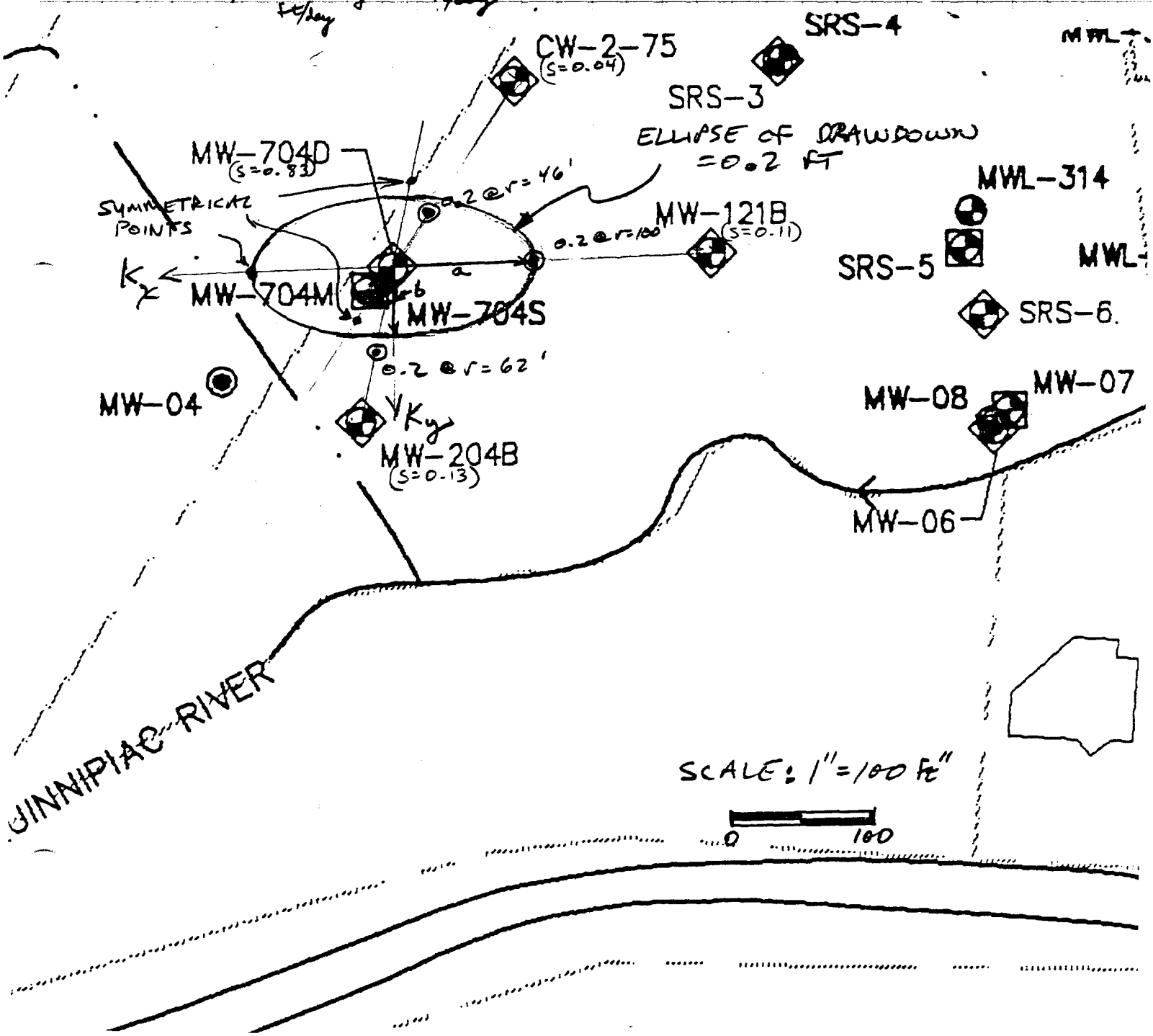
	OBS WELL	r(ft)	s (ft)	$r_{s=0.2\,ft}$ (ft)*	
DEEP OVB WELLS	CW-2-75	160	0.04	46	* BASED ON LOGARITHIC INTERPOLATION (SEE ATTACHED GRAPH)
	MW-121B	230	0.11	100	
	MW-204B	115	0.13	62	

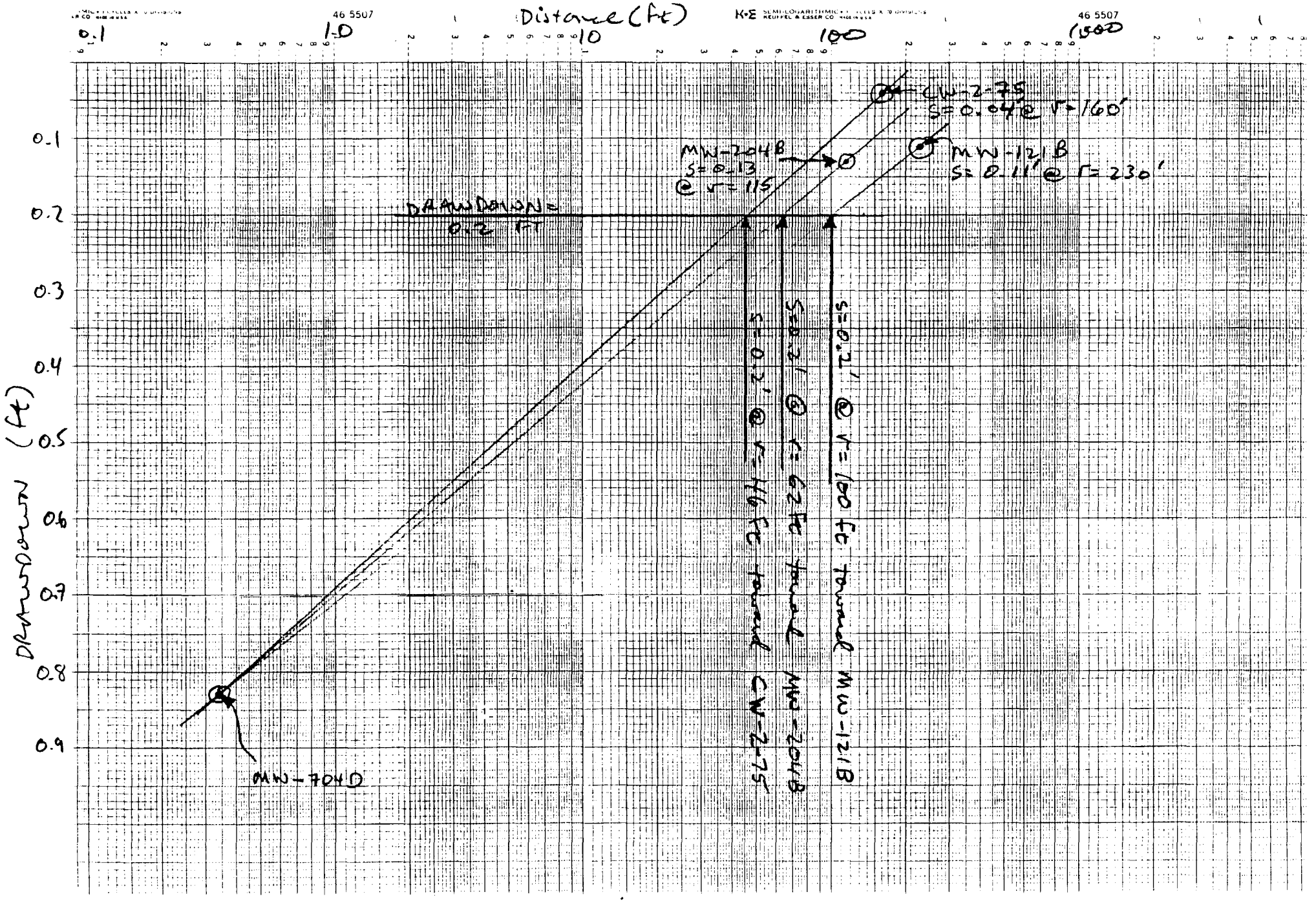
a = MAJOR AXIS OF DRAWDOWN ELLIPSE b = MINOR AXIS OF DRAWDOWN ELLIPSE

$K_x/K_y = (a/b)^2$ [KRUSEMAN & DERIDDER, 1990] a = 100 ft b = 50 ft

$K_x/K_y = (100/50)^2 = 4$ $K_e = 52$ ft/day $= \sqrt{K_x K_y} = \sqrt{4K_y^2}$ $K_y = 26$ ft/day

$K_x = 104$ ft/day $K_y = 26$ ft/day





Distance (ft)
0.1
1.0
10
100
1000
46 5507
K+E SEMI-LOGARITHMIC 5 CYCLES X 70 DIVISIONS
KEUFFEL & ESSER CO.
Drawdown (ft)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
CW-2-75
S=0.04' @ r=160'
MW-204B
S=0.13
@ r=115
MW-121B
S=0.11' @ r=230'
DRAWDOWN=
0.2 FT
S=0.2' @ r=46 ft toward CW-2-75
S=0.2' @ r=62 ft toward MW-204B
S=0.2' @ r=100 ft toward MW-121B
MW-704D

Vertical Anisotropy Analysis for Overburden

KV.WK3 by M.J. Gefell, June 5, 1997

Vertical hydraulic conductivity estimation based on pumping test data reduction technique of Neuman and Witherspoon (1972), as described by Kruseman, G.P. and de Ridder, N.A., 1990, Analysis and Evaluation of Pumping Test Data, Second Edition, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, 377 p.

VERTICAL HYDRAULIC CONDUCTIVITY (K') FROM PUMPING TEST DATA

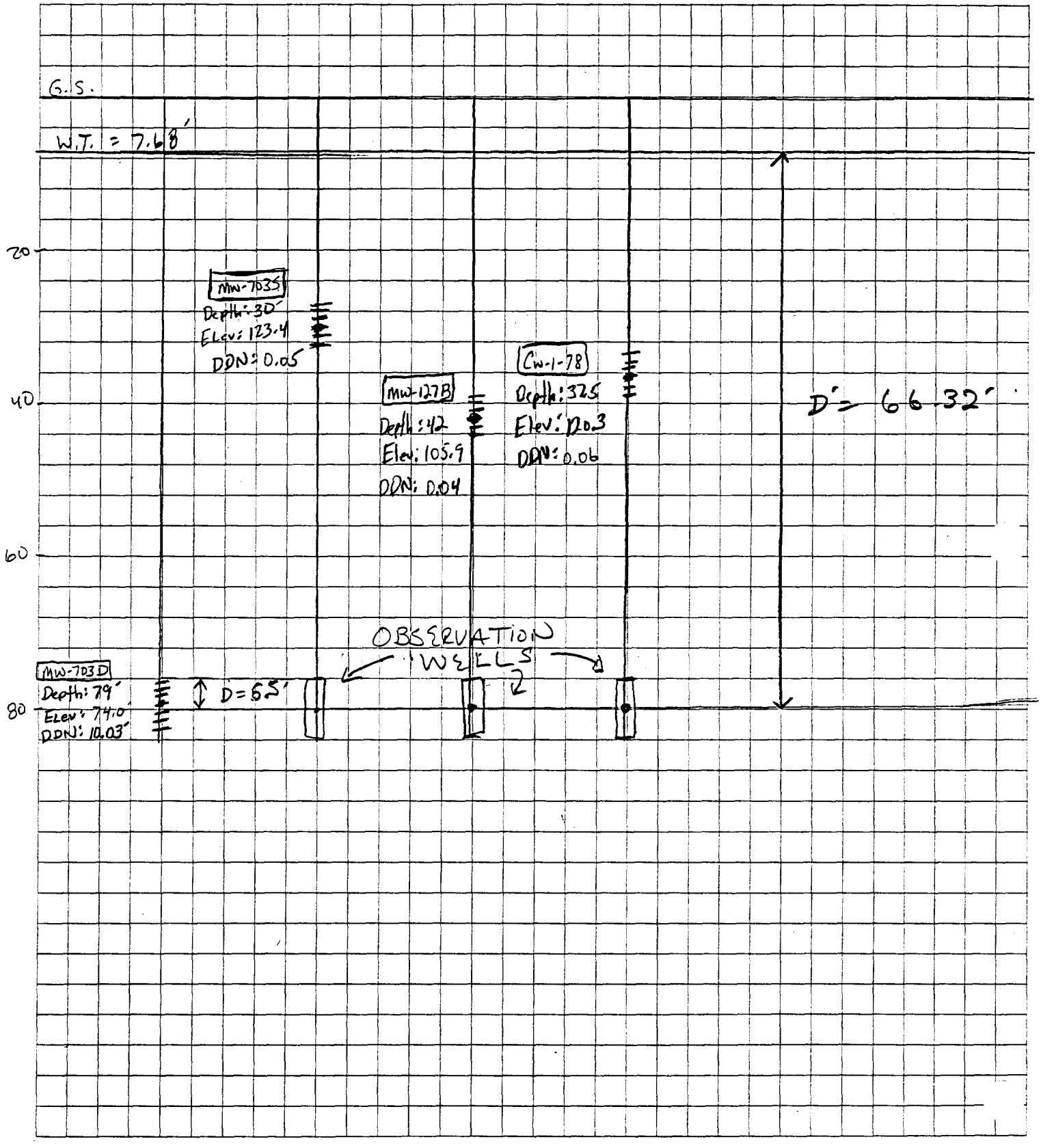
Pumped Well:	MW-703D
Site:	SRSNE -- Southington, CT
Test Date:	11/13/96

K (cm/s):	1.4E-03				
D (ft):	6.5			D' (ft):	66.32
S (est):	0.002			S' (est)	0.002
Analysis:	A	B	C		
Time (min):	241	241	241		
Obsv. Well:	Calc.	Calc.	Calc.		
s (ft):	5.4	1.7	2.4		
Piezometer:	MW-703S	MW-127B	CW-1-78		
z (ft):	49.4	31.9	46.3		
r (ft):	10	144	90		
s' (ft):	0.05	0.04	0.06		
u:	1.2E-02	2.4E+00	9.4E-01		
s'/s:	9.3E-03	2.4E-02	2.5E-02		
1/u(c):	0.4	1.3	1.1		
u(c):	2.5	0.769231	0.909091		
K' (cm/s)	0.0000155	0.000021	0.000037		
K/K':	90	67	37		

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

SUBJECT Vertical K estimate for Overburden From MW-703D Pumping	PROJ. NO. 083-31.012	BY SAP	DATE 6/9/97	SHEET 3 of 3

CALCS. BY SAP ; DATE _____ CHECKED BY _____ ; DATE _____



KV.WK3 by M.J. Gefell, June 5, 1997

11 of

Vertical hydraulic conductivity estimation based on pumping test data reduction technique of Neuman and Witherspoon (1972), as described by Kruseman, G.P. and de Ridder, N.A., 1990, Analysis and Evaluation of Pumping Test Data, Second Edition, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, 377 p.

VERTICAL HYDRAULIC CONDUCTIVITY (K') FROM PUMPING TEST DATA

Pumped Well:	MW-704D
Site:	SRSNE -- Southington, CT
Test Date:	11/05/96

K (cm/s):	2.0E-02			
D (ft):	6.5		D' (ft):	56
S (est):	0.002		S' (est)	0.002
Analysis:	A	B		
Time (min):	254	254		
Obsv. Well:	Calc.	Calc.		
s (ft):	0.3	0.32		
Piezometer:	MW-704S	MW-704M		
z (ft):	46.5	16		
r (ft):	29	24		
s' (ft):	0.05	0.29		
u:	6.5E-03	4.4E-03		
s'/s:	1.7E-01	9.1E-01		
1/u(c):	1	3000		
u(c):	1	0.000333		
K' (cm/s)	0.0000386	0.013714		
K/K':	518	1		

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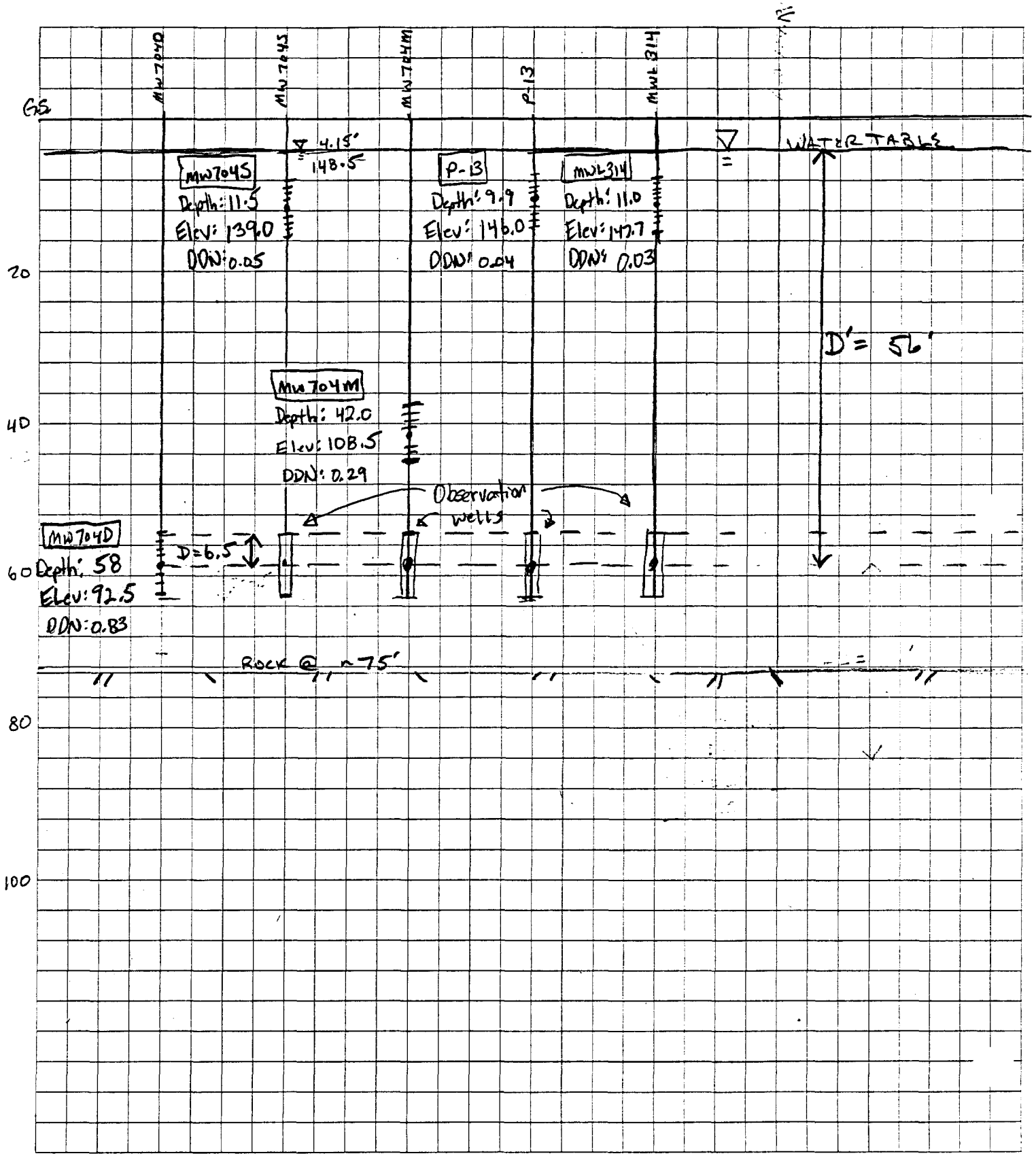
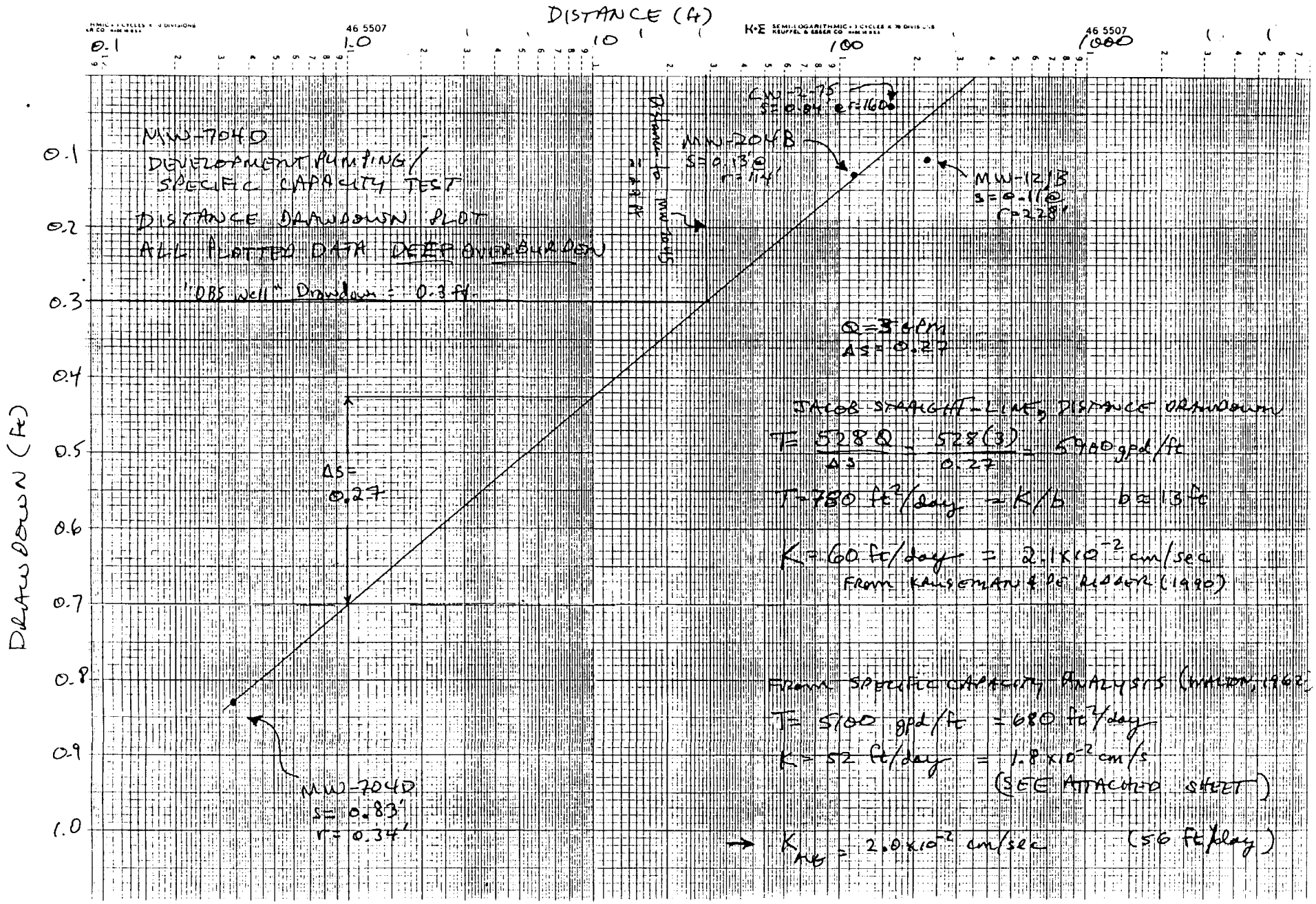
engineers & scientists

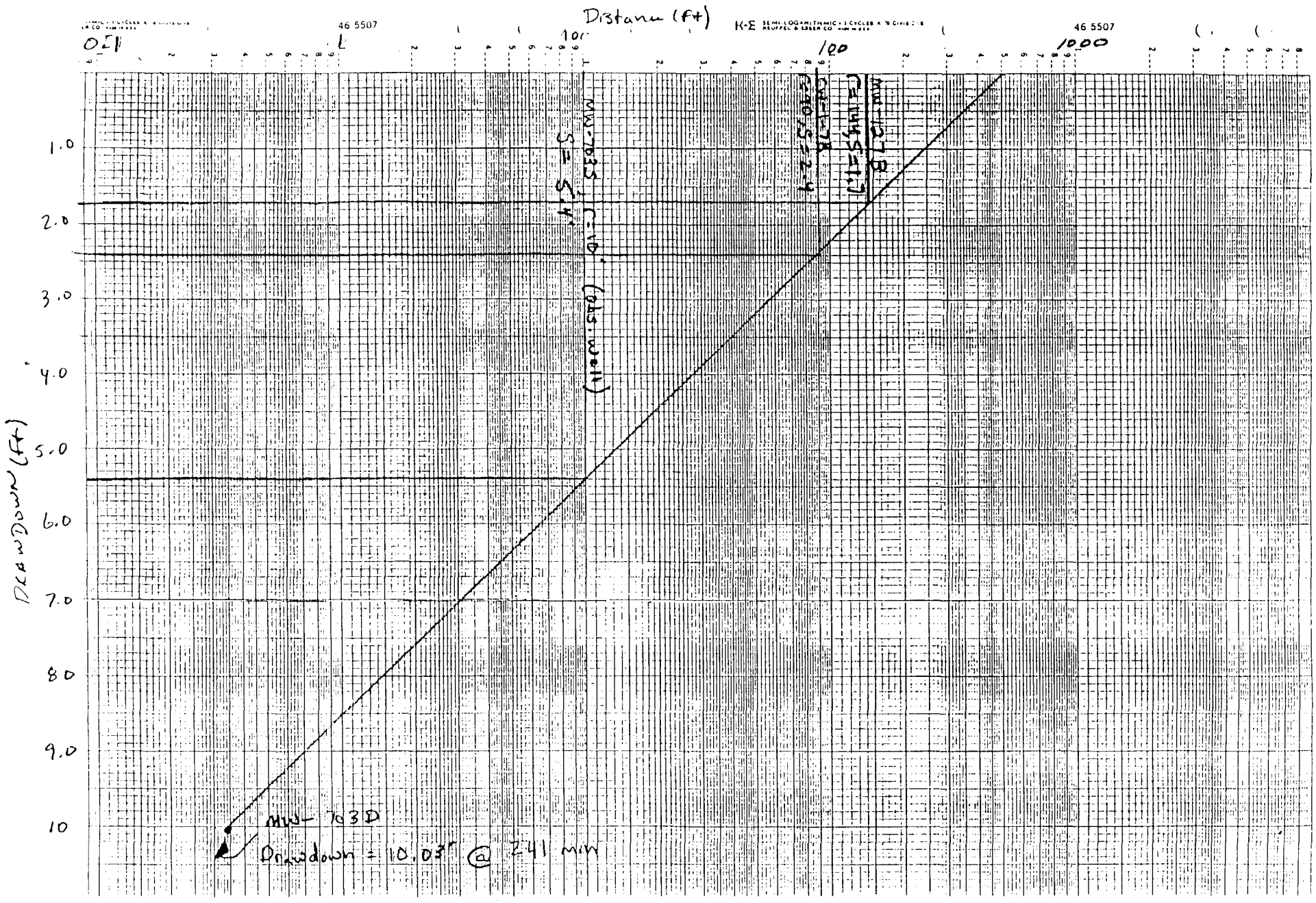
SUBJECT	PROJ. NO.	BY	DATE	SHEET
VERTICAL K ESTIMATE for Overburden From MW-704D Development Pumping	D83.31-012	JAP	6/6/97	2

CALCS. BY _____; DATE _____ CHECKED BY _____; DATE _____




DISTANCE (ft)
0.1
1.0
10
100
1000
DRAWDOWN (ft)
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
MW-704D
DEVELOPMENT PUMPING/
SPECIFIC CAPACITY TEST
DISTANCE DRAWDOWN PLOT
ALL PLOTTED DATA DEEP OVERBURDEN
"OBS well" Drawdown = 0.3 ft.
CW-2-75
s=0.84 @ r=160
MW-204B
s=0.13 @
r=114'
MW-12/B
s=0.11 @
r=228'
Distance to MW-704D
Q=3 GPM
Δs=0.27
Δs=
0.27
MW-704D
s=0.83'
r=0.34'
JACOB STRAIGHT-LINE, DISTANCE DRAWDOWN
T= 528Q/Δs = 528(3)/0.27 = 5900 gpd/ft
T=780 ft²/day = K/b b≈13 ft
K=60 ft/day = 2.1x10⁻² cm/sec
FROM KRUSEMAN & DE RIDDER (1990)
FROM SPECIFIC CAPACITY ANALYSIS (WALTON, 1962)
T= 5100 gpd/ft = 680 ft²/day
K= 52 ft/day = 1.8x10⁻² cm/s
(SEE ATTACHED SHEET)
→ K_AVG = 2.0x10⁻² cm/sec (56 ft/day)

3


Distance (Ft)
46 5507
K-E SEMI-LOGARITHMIC 3 CYCLES X 70 DIVISIONS KEUFFEL & ESSER CO.
0.1
1
10
100
1000
Drawdown (Ft)
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10
MW-103D
Drawdown = 10.05' @ 241 min

Vertical Anisotropy Analysis for Overburden - Bedrock Interface

KV.WK3 by M.J. Gefell, June 5, 1997

Vertical hydraulic conductivity estimation based on pumping test data reduction technique of Neuman and Witherspoon (1972), as described by Kruseman, G.P. and de Ridder, N.A., 1990, Analysis and Evaluation of Pumping Test Data, Second Edition, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, 377 p.

VERTICAL HYDRAULIC CONDUCTIVITY (K') FROM PUMPING TEST DATA

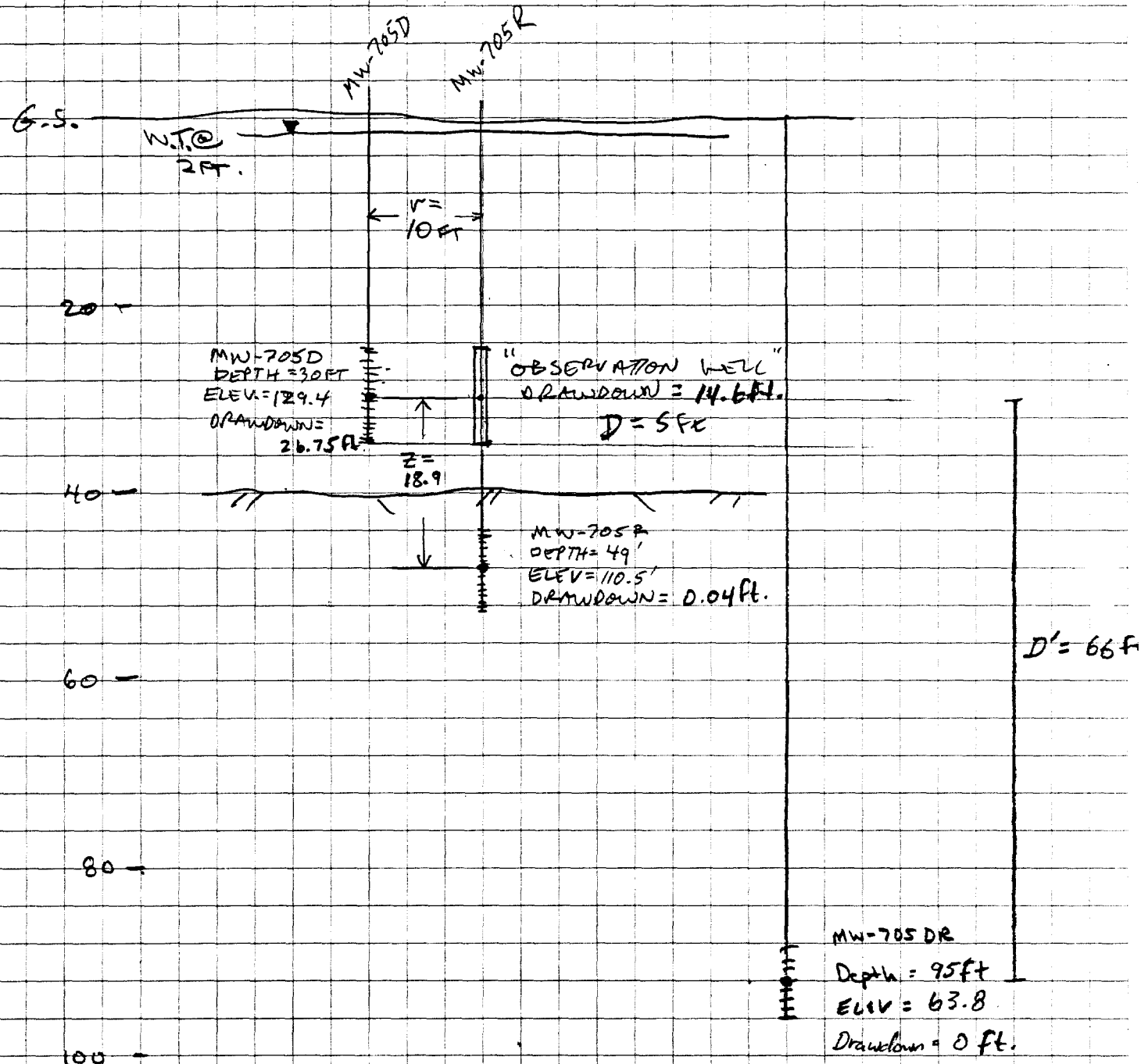
Pumped Well:	MW-705D
Site:	SRSNE -- Southington, CT
Test Date:	11/05/96

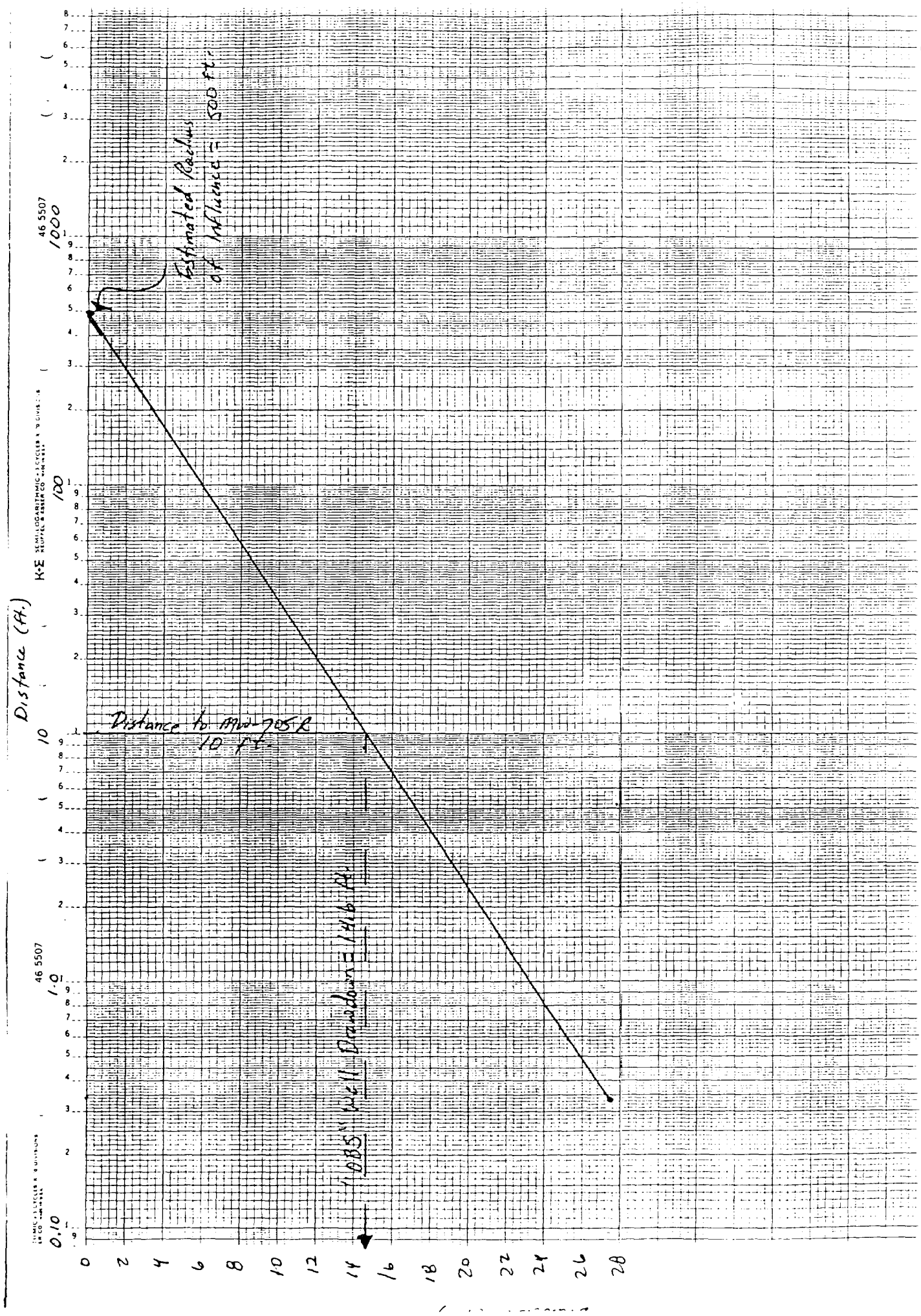
K (cm/s):	2.2E-05		
D (ft):	5	D' (ft):	66
S (est):	0.001	S' (est)	0.001
Analysis:	A		
Time (min):	194		
Obsv. Well:	Calc.		
s (ft):	14.6		
Piezometer:	MW-705DR		
z (ft):	18.9		
r (ft):	10		
s' (ft):	0.04		
u:	6.0E-02		
s'/s:	2.7E-03		
1/u(c):	0.27		
u(c):	3.7037037		
K' (cm/s)	9.57E-08		
K/K':	230		

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

SUBJECT	PROJ. NO.	BY	DATE	SHEET
VERTICAL K ESTIMATE FOR OVERBURDEN BEDROCK INTERFACE FROM MW-705D DEVELOPMENT	083.31.012	MJG	6/6/97	2 OF 3

NEUMAN - WITHERSPOON METHOD





Estimated Radius of Influence = 500 ft.
Distance to MW-705R 10 ft.
"OBS" Well Drawdown = 14.6 ft.
Distance (ft.)
46 5507
K+E SEMI-LOGARITHMIC 3 CYCLES X 10 DIVISIONS
KEUFFEL & ESSER CO. MADE IN U.S.A.
0.10
1.0
10
100
1000
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28

3
of 3

Vertical Anisotropy Analysis for Bedrock

KV.WK3 by M.J. Gefell, June 5, 1997

Vertical hydraulic conductivity estimation based on pumping test data reduction technique of Neuman and Witherspoon (1972), as described by Kruseman, G.P. and de Ridder, N.A., 1990, Analysis and Evaluation of Pumping Test Data, Second Edition, International Institute for Land Reclamation and Improvement, Wageningen, The Netherlands, 377 p.

VERTICAL HYDRAULIC CONDUCTIVITY (K') FROM PUMPING TEST DATA

Pumped Well:	MW-702DR
Site:	SRSNE -- Southington, CT
Test Date:	11/11/96

K (cm/s):	1.7E-04		
D (ft):	5	D' (ft):	66
S (est):	0.0001	S' (est)	0.0001
Analysis:	A		
Time (min):	71		
Obsv. Well:	Calc.		
s (ft):	14		
Piezometer:	P-8A		
z (ft):	34.6		
r (ft):	12		
s' (ft):	0.03		
u:	3.0E-02		
s'/s:	2.1E-03		
1/u(c):	0.25		
u(c):	4		
K' (cm/s)	8.1E-07		
K/K':	210		

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ENGINEERS & SCIENTISTS

SUBJECT	PROJ. NO.	BY	DATE	SHEET
VERTICAL K ESTIMATE FOR BEDROCK FROM MW-702DR DEVELOPMENT	083.31.012	MJG	8/7/97	2 OF 4

BASED ON NEUMAN-WITHERSPOON METHOD, AS DESCRIBED BY KRUSEMAN & DE RIDDER, 1990

MW-702DR PUMPED @ ~0.8 GPM FOR 71 MINUTES

MW-702 DRAWDOWN = 30.51 FT @ r = 0.16 FT, SCREEN LENGTH 10 FT

S_c = P-8A DRAWDOWN = 0.03 FT @ r = 12 FT

P-8B DRAWDOWN IN OVERBURDEN = 0.00 FT

SEE SKETCH

S = DRAWDOWN AT 12 FT IN PUMPED INTERVAL ESTIMATED AS 14 FT ASSUMING RADIUS OF INFLUENCE = 500 FT (SEE ATTACHED GRAPH)

ASSUMING S CONSTANT FOR ROCK @ ~0.0001, $K_H = 1.7 \times 10^{-4}$ cm/sec BASED ON SPECIFIC CAPACITY TEST DATA REDUCTION TECHNIQUE OF WALTON (1962)

GIVEN:

$K = 1.7 \times 10^{-4}$ cm/s

$S \approx 0.0001$

$t = 71$ min $= 4260$ sec

$r = 12$ FT $= 370$ cm

$D = 5$ FT $= 150$ cm

$D' = 66$ FT $= 2300$ cm

$z = 35$ FT $= 1100$ cm

$$u = \frac{r^2 S}{4KDt} = \frac{(370)^2(0.0001)}{4(1.7\times10^{-4})(150)(4260)} = 0.032$$

$$s_c/s = 0.03/14 = 0.0021$$

FROM GRAPH IN KRUSEMAN & DE RIDDER (1990, p.95), FOR $u = 0.032$ AND $s_c/s = W(u, u_c)/W_u = 0.0021$:

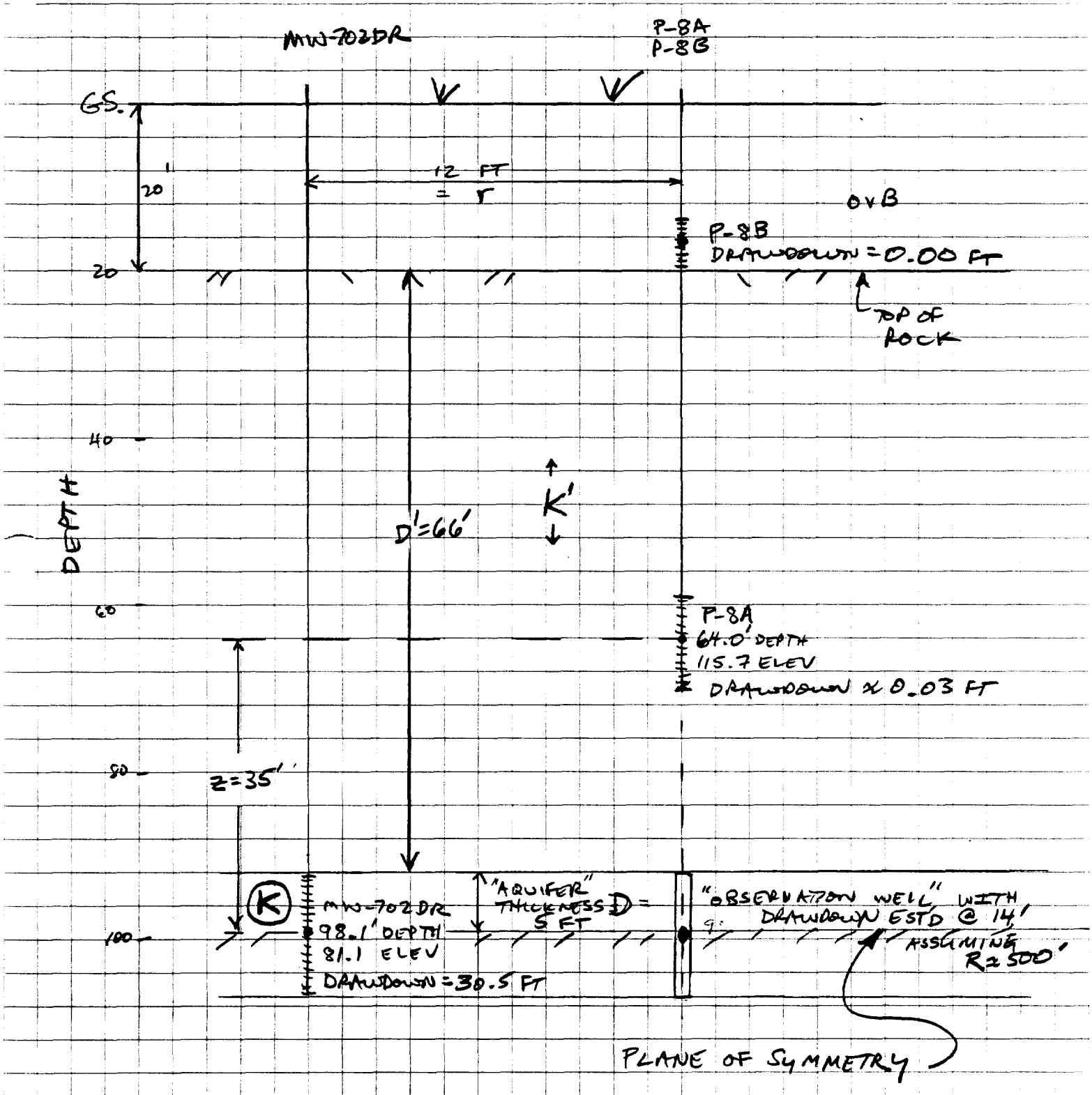
$$1/u_c = 0.25 \rightarrow u_c = 4$$

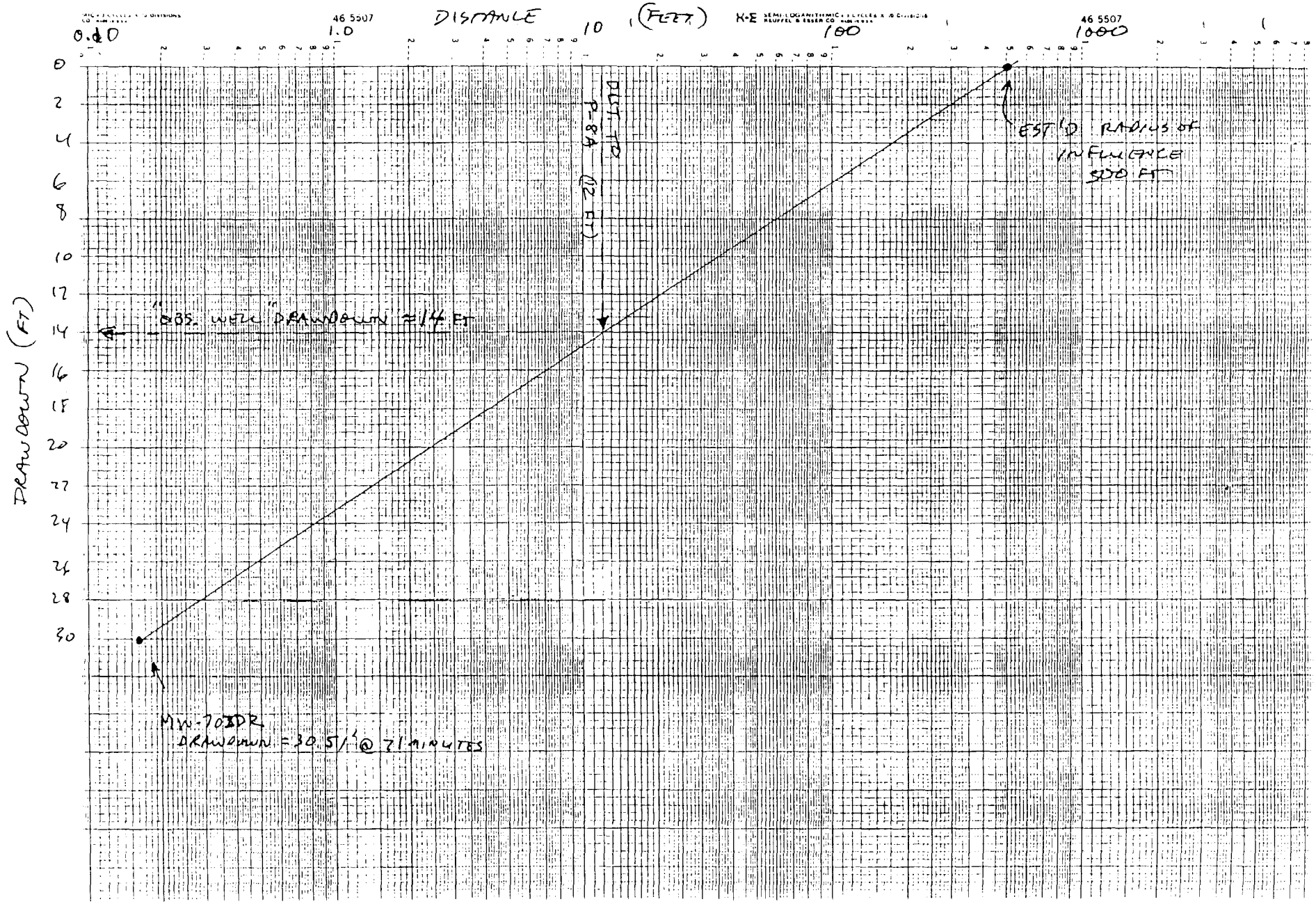
$$K' \text{ (VERTICAL K)} = \frac{z^2 S}{4 u_c D' t} = \frac{(1070)^2(0.0001)}{4(4)(2300)(4260)} = \underline{8.1 \times 10^{-7} \text{ cm/sec}}$$

$$K/K' \left(\text{ANISOTROPY RATIO}\right) = \frac{1.7\times10^{-4} \text{ cm/s}}{8.1\times10^{-7} \text{ cm/s}} \approx 210$$

BLASLAND, BOUCK & LEE, INC.
ENGINEERS & SCIENTISTS

SUBJECT	PROJ. NO.	BY	DATE	SHEET
VERTICAL K ESTIMATE FOR BEDROCK FROM MW-702DR DEVELOPMENT... 11/11/96	083.31.012	MJG	6/5/97	3 of 4




46 5507
DISTANCE (FEET)
0.10
1.0
10
100
1000
DRAWDOWN (FT)
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
DIST TO P-84 (12 FT)
"OBS. WELL" DRAWDOWN ≈ 14 FT
EST'D RADIUS OF INFLUENCE 500 FT
MW-70DR
DRAWDOWN = 30.5' @ 71 MINUTES

Page 4

Appendix I

Hydraulic Conductivity Estimates Based on Purging at Wells and Piezometers

HYDRAULIC CONDUCTIVITY ESTIMATES
BASED ON PURGING DATA AT WELLS AND PIEZOMETERS

SRSNE SITE – SOUTHINGTON, CONNECTICUT

Well ID	Depth to Water (ft BTIC)	Pumping Duration (min)	Volume Purged (gal)	Pumping Rate (gpm)	Total Drawdown (ft)	Hydraulic Conductivity (ft/day)
CPZ-1	4.47	8	9	1.13	0.78	15
CPZ-10	2.77	6	9	1.50	2.02	9.9
CPZ-1R	0	17	33	1.94	24.32	0.49
CPZ-2	2.79	10	15	1.50	6.55	2.7
CPZ-2A	2.46	7	12	1.71	1.46	10
CPZ-2R	0	15	30	2.00	43.26	0.22
CPZ-3	8.64	8	9	1.13	0.69	17
CPZ-4	5.83	6	9	1.50	3.72	3.2
CPZ-4R	3.77	7	11	1.57	64.46	0.0023
CPZ-5	19.71	3	4.5	1.50	0.50	63
CPZ-5R	10.01	6	10.5	1.75	53.80	0.02
CPZ-6	2.75	10	6.6	0.66	9.88	0.34
CPZ-6A	5.92	6	8	1.33	13.69	0.45
CPZ-7	4.63	3	4	1.33	20.49	0.024
CPZ-8	5.04	6	7.7	1.28	1.71	10
CPZ-9	3.96	7	9	1.29	1.26	15
CW-1-78	10.78	8	11	1.38	3.12	11
CW-10-78	4.94	11	21	1.91	3.41	16
CW-2-78	13.2	7	1.75	0.25	0.05	170
CW-3-75	6.22	6	9	1.50	1.90	21
CW-3-78	5.11	18	32	1.78	0.31	220
CW-4-75	3.03	8	15	1.88	0.44	150
CW-4-78	1.73	14	23.3	1.66	0.16	410
CW-5-75	6.1	8	10	1.25	0.73	53
CW-5-78	2.67	15	30	2.00	0.89	77
CW-6-75	5.59	7	9	1.29	12.26	1.7
CW-6-78	1.55	11	22	2.00	0.97	63
CW-7-78	6.8	10	12	1.20	0.02	3000
CW-8-78	5.93	18	27.5	1.53	2.07	23
CW-9-78	6.18	9	15	1.67	0.30	200
CW-B-77	2.3	5	4	0.80	20.06	0.07
DN-3	3.53	6	9.9	1.65	1.33	2.6
MW-121C	3.35	7	14	2.00	60.97	0.084
MW-123C	3.47	3	3	1.00	12.53	0.33
MW-125C	4.62	12	24	2.00	31.95	0.63
MW-126B	2.23	5	7	1.40	0.27	170
MW-126C	0.53	9	15	1.67	1.12	27
MW-127B	2.33	12	21	1.75	0.29	116
MW-201B	6.53	13	7.5	0.58	0.11	97
MW-202B	5.33	24	45	1.88	2.61	12
MW-203B	36.71	48	33	0.69	2.86	3.7
MW-204A	1.14	27	54	2.00	1.08	15
MW-205B	5.3	10	15	1.50	0.17	170
MW-206B	5.98	10	15.8	1.58	0.09	350
MW-3	6.11	20	13.5	0.68	0.12	37
MW-4	2.47	19	13.5	0.71	0.53	7.5
MW-408	9.1	21	21	1.00	17.01	0.36
MW-409	3.69	5	7.5	1.50	1.87	11
MW-413	4.08	7	9	1.29	4.87	5.9
MW-415	4.36	6	12	2.00	1.06	57
MW-5	0.7	16	15	0.94	4.65	3
MW-501C	20.5	14	5	0.36	0.22	27
MW-6	0.67	11	6	0.55	5.61	0.23
MW-7	0.72	12	9	0.75	1.59	2.2
MW-705D	3.38	9	18	2.00	22.90	0.72
MW-705DR	2.27	48	48	1.00	50.34	0.22
MW-707S	7.11	9	12	1.33	0.52	42
MW-707M	7.21	21	30	1.43	1.02	24

HYDRAULIC CONDUCTIVITY ESTIMATES
BASED ON PURGING DATA AT WELLS AND PIEZOMETERS

SRSNE SITE -- SOUTHINGTON, CONNECTICUT

Well ID	Depth to Water (ft BTIC)	Pumping Duration (min)	Volume Purged (gal)	Pumping Rate (gpm)	Total Drawdown (ft)	Hydraulic Conductivity (ft/day)
MWD-601	4.26	15	12	0.80	5.39	3.4
MWL-301	3.13	6	6	1.00	6.45	1.4
MWL-302	6.06	1.5	1.5	1.00	6.73	0.29
MWL-304	3.25	7	3.2	0.46	3.07	1.4
MWL-305	4.21	11	4	0.36	2.60	1.6
MWL-306	5.34	4	2	0.50	6.69	0.33
MWL-307	2.41	4	5	1.25	1.84	8.2
MWL-308	3	7	4.8	0.69	1.12	8.1
MWL-309	2.29	3	2	0.67	7.72	0.22
MWL-312	6.26	2	3	1.50	6.25	1.9
MWL-313	3.85	6	4	0.67	1.37	6.7
MWL-314	5.3	6	4	0.67	1.02	9.8
P-10	3.98	4	7	1.75	0.82	63
P-101C	2.38	9	6	0.67	6.94	0.83
P-102B	0.73	21	20	0.95	19.59	0.45
P-102C	2.49	3	3	1.00	12.51	0.16
P-11A	3.28	16	12	0.75	58.10	0.02
P-11B	4.95	6	8	1.33	5.80	4.7
P-12	5.78	6	9	1.50	2.54	15
P-13	9.35	1	1.5	1.50	7.65	0.64
P-14	3.36	7	18	2.57	86.65	0.05
P-16	6.92	3	3	1.00	1.42	7.7
P-1B	6.83	5	4	0.80	3.50	4.4
P-2B	4.8	4	7.5	1.88	1.51	33
P-7	2.04	8	7.5	0.94	4.26	4.9
PZR-7	0	12	21	1.75	2.34	7.4
SRS-1	4.21	10	9	0.90	4.03	5.2
SRS-4	3.37	22	6	0.27	1.54	2.3
SRS-5	4.65	9	15	1.67	1.29	6.6
TW-08A	3.01	6	7.5	1.25	0.98	18
TW-1	5.56	7	10	1.43	0.79	28
TW-12	18.73	25	12	0.48	7.00	0.75
TW-2	4.97	5	7	1.40	0.25	91
TW-3	3.35	7	6.9	0.99	0.86	17
TW-4	4.11	2	5	2.50	0.34	110
TW-5	6.32	8	6	0.75	0.09	100
TW-7A	4.62	5	11	2.20	3.61	7.6
WE-1	2.09	11	13	1.18	3.03	4
WE-2	0.68	20	20	1.00	8.88	1.2

Notes

BTIC Below top of inner casing.
Hydraulic conductivity values based on specific capacity test data reduction technique described in Walton, W.C. 1962. Selected Analytical Methods for Well and Aquifer Evaluation, Illinois State Water Survey, Bulletin 19.

Appendix J

NTCRA 2 Interim Technical Memorandum

MEMORANDUM

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

To: Sheila Eckman, USEPA Region I

Date: September 25, 1997

From: Michael J. Gefell MJG

cc: M. Beskind (CT DEP), L. Chu (HNUS), SRSNE Technical Committee, B.R. Thompson, B.H. Kueper, G.R.Cameron, D.F.Sauda

Re: NTCRA 2 Pumping Well and Piezometers, SRSNE Site, Southington, Connecticut

NTCRA 2
INTERIM TECHNICAL MEMORANDUM

This Interim Technical Memorandum was prepared by Blasland, Bouck & Lee, Inc. (BBL), to present preliminary numerical ground-water flow (MODFLOW) modeling results and describe the proposed design for a bedrock pumping well and piezometer network downgradient of the Solvents Recovery Service of New England (SRSNE) Site, located in Southington, Connecticut (Figure 1). These activities are consistent with the Non-Time Critical Removal Action No. 2 (NTCRA 2) design and study process, which will provide bedrock ground-water containment in the area downgradient of the SRSNE Site Operations Area (Figure 2). The NTCRA 2 design and study process was described in the Design and Study Work Plan (DSWP) (BBL, August 1996), which was submitted to the United States Environmental Protection Agency (USEPA) on August 30, 1996. USEPA conditionally approved the DSWP, with comments, in a letter to the SRSNE Potentially Responsible Party (PRP) Group dated October 23, 1996. To address USEPA's comments, BBL prepared a DSWP Addendum No. 1, which was submitted to USEPA on November 13, 1996.

Background

The fundamental purpose for NTCRA 2 is to minimize, to the extent reasonably practicable, the flow of ground water within the fractured bedrock from the Operations Area of the Site. However, due to the presence of non-aqueous phase liquids (NAPLs) in the bedrock immediately east (immediately downgradient) of the Operations Area (BBL, November 1995), bedrock ground water containment will be targeted in the area further downgradient (southeast) of the Operations Area to avoid remobilizing NAPL. The flow of bedrock ground water from the Operations Area can be safely contained by intercepting the ground water within the bedrock VOC plumes downgradient of the potential bedrock NAPL zone. The appropriate ground-water extraction location, therefore, will be downgradient of the potential bedrock NAPL zone, and within the off-site plumes of volatile organic compounds (VOCs) detected above regulatory criteria in shallow bedrock (Figure 3) or deep bedrock (Figure 4) ground water.

A regional MODFLOW ground-water flow model was developed as described in the DSWP (BBL, August 1996) to represent overburden and bedrock ground-water flow on a regional and site-specific scale, with model grid refinement in the vicinity of the SRSNE Site (Figure 2). The model provides the basis to complete the design for the bedrock pumping well and the network of bedrock piezometers that will be used in NTCRA 2. This Interim Deliverable describes the general setup and the preliminary results from the MODFLOW model, including the estimated pumping rate required to hydraulically control bedrock ground-water migrating downgradient of the Operations Area of the site. In addition, simulated hydraulic gradient changes were characterized to assess the potential for NAPL mobilization and to estimate the influence on NTCRA 1 Demonstration of Compliance.

As specified in the USEPA-approved DSWP, the model was used to identify the number, location, depth, diameter, and intake length of the NTCRA 2 bedrock ground-water extraction well(s), and the appropriate locations for bedrock piezometers. These construction specifications will provide the basis for the installing a bedrock pumping well and a network of bedrock piezometers during the NTCRA 2 Design Investigation. The extraction well and piezometer network will be used in a bedrock pumping test to evaluate bedrock ground-water hydraulics in the area downgradient of the site, and empirically assess the bedrock ground-water containment effectiveness of the pumping well.

Based on the pumping test results, the MODFLOW model will be refined and used for additional simulations to identify the final design for the NTCRA 2 ground-water extraction system. A detailed discussion of the NTCRA 2 MODFLOW Model design and calibration will be presented in the NTCRA 2 Technical Memorandum. The NTCRA 2 Technical Memorandum will also summarize the findings of the Design Investigation.

The remainder of this Interim Technical Memorandum presents:

- An overview of the MODFLOW ground-water flow model;
- Preliminary model results;
- A preliminary assessment of the potential for NAPL mobilization due to bedrock ground-water extraction;
- An evaluation of the potential influence of the NTCRA 2 bedrock pumping well on the NTCRA 1 Demonstration on Compliance requirements for overburden ground-water containment; and
- The proposed pumping well design and piezometer locations.

Overview of MODFLOW Ground-Water Flow Model

Ground-water flow modeling was performed using the pre/post-processor Groundwater Vistas (Rumbaugh, 1996) to facilitate the use of the United State Geological Survey (USGS) MODFLOW model (McDonald and Harbaugh, 1988). MODFLOW is a modular, three-dimensional, block-centered, finite-difference steady-state or transient flow model. A detailed discussion of the MODFLOW model, including setup, calibration, and simulation results, will be presented in the NTCRA 2 Technical Memorandum, which will be prepared after the Design Investigation. The sections below provide a brief overview of the model setup and simulation results that affect the forthcoming Design Investigation.

Model Domain

The NTCRA 2 MODFLOW model domain encompasses a section of the regional Quinnipiac River drainage basin, covering a total area of 5 square miles. The model grid dimensions are 10,800 feet (ft) (2 miles) in the east-west direction and 13,300 ft, (2.5 miles) in the north-south direction (Figure 5). The model domain is approximately centered about the SRSNE Site, and extends outward to the locations of regional surface-water features (ponds, streams, and canals) where the shallow overburden hydraulic head is known. The regional scale of the MODFLOW model allows simulation of ground-water extraction by the existing NTCRA 1 overburden ground-water extraction wells, potential NTCRA 2 bedrock ground-water extraction alternatives, or Town of Southington's Production Wells No. 4 and/or 6 with little or no impact of the pumping stresses on model boundaries.

Model Grid and Layer Structure

The model grid is rectilinear in plan view, such that the columns are oriented north to south and the rows are oriented east to west (Attachment 1). The model domain was discretized by a rectilinear, three-dimensional, block-centered finite difference model grid, consisting of 158 non-uniformly spaced rows, and 116 non-uniformly spaced columns (18,328 cells per layer). The grid in the vicinity of the SRSNE site was discretized down to cells dimensions of approximately 20 ft by 20 ft in plan view. At the periphery of the model, at a distance from the site, the grid coarsens to cells up to approximately 500 ft by 500 ft.

The model layer configuration is summarized on a schematic cross section in Attachment 1. The model grid is vertically discretized into seven layers with non-uniform interface elevations, which were defined based on geology or depth below the top of bedrock. Layers 1 and 2 represent the overburden and Layers 5 through 7 represent the bedrock. The total saturated thickness of the model ranges from approximately 600 to 720 feet and, therefore, extends to a substantial depth below the currently monitored geologic section, which extends to a maximum depth of approximately 270 feet below grade. The substantial vertical extent of the model allows the simulation of pumping wells within the overburden or the monitored portion of the bedrock with upward ground-water flow from below the simulated pumping system(s).

Portions of the hills west and northeast of the site where the water table is believed to be within the bedrock (Mazzaferro et al., 1979) were assigned as inactive cells in Layers 1 and 2.

Recharge

The recharge to ground water due to infiltration was defined for the uppermost active model layer throughout the model domain based on data reported in the literature. While reported recharge rates range from 6 to 26 inches across Connecticut (USGS, 1995), more recharge is anticipated in valley areas underlain by saturated stratified drift than in hilly areas underlain by till or bedrock (Mazzaferro, et al., 1979). Consistent with the available published information, the recharge rates identified through model calibration are generally 22 inches per year for the valleys and 6 to 9 inches per year for the hills. Other recharge rates were used to reflect anthropogenic influences on recharge, including paved areas where recharge was set to zero, areas with private septic systems where recharge was increased based on estimated domestic water use, and outflow points of storm-water culverts with well-defined catchment areas.

Regional Boundary Conditions

The regional boundary conditions for the MODFLOW model were located using USGS topographic map data for the New Britain, Meriden, and Southington quadrangles (USGS, 1992) and the Bristol quadrangle (USGS, 1984). Constant head conditions were specified in Layer 1 and Layer 2 at the periphery of the model domain approximately 5600 ft north, 5900 south, 5100 east, and 4500 west of the site. River cells were used in Layer 1 for the Quinnipiac River, associated tributaries, and other surface water features. Surface-water elevations were estimated based on USGS topographic maps. A general head boundary was used at the eastern edge of the model domain in the bottom layer of the model (Layer 7) to represent the potential regional influence of the Connecticut River on deep bedrock ground-water flow.

Private domestic wells on the hill west of the site and along Lazy Lane were simulated as a pumping rate of 450 gallons per day per well from Layer 5 (Mazzaferro et al., 1979). A hydraulic drain condition was used

to simulate a submerged sanitary sewer pipe south of the site along Queen Street (Town of Southington, June 1979).

Near-Site Hydraulic Stresses

The NTCRA 1 overburden ground-water extraction system was modeled using MODFLOW drain cells and the associated sheet pile wall modeled using MODFLOW's horizontal flow barrier (HFB) package. The 30-inch underground culvert that crosses east-west beneath the former Cianci Property was simulated using MODFLOW drain cells. A zone of high hydraulic conductivity (estimated as 100 ft/day) was used to simulate the influence of the gravel-filled, force-main trench associated with the an Off-Site Interceptor System in the north portion of the Town Well Field (Loureiro, 1984). Also, the gravel-filled ditches along the railroad tracks, which commonly contain standing water and extend to the location of two ponds north of Lazy Lane, were simulated as river cells.

Hydraulic Parameters

The horizontal hydraulic conductivity values for Layers 1 and 2 within the RI study area were defined based on the existing hydrogeologic database for the site. Individual hydraulic conductivity values measured at overburden wells and piezometers were contoured to create a smooth distribution within Layers 1 and 2. The resulting grids of hydraulic conductivity data were digitally imported to define the hydraulic conductivity at each model cell in Layers 1 and 2 within the study area, with hydraulic conductivity values ranging from < 1 to >1000 ft/day. The regional hydraulic conductivity of Layers 1 and 2 beyond the study area the were estimated based on well yields reported in the literature, and were refined through calibration to final values ranging from 6 to 400 ft/day. The horizontal hydraulic conductivity of the bedrock in Layers 3 through 7, 0.35 ft./day, is the geometric mean value from packer-tests, slug-tests, and specific capacity tests at bedrock wells in the study area. This conductivity estimate is consistent with a reported value of 0.31 ft./day based on specific capacity testing of 401 wells installed in sedimentary rock units in Connecticut (USGS, 1995).

Vertical anisotropy factors (horizontal to vertical hydraulic conductivity ratios) were estimated as 100:1 for the overburden and 200:1 for the bedrock based on Neuman-Witherspoon (1972) analysis of specific capacity tests performed in either formation. In addition, a horizontal anisotropy factor (ratio of north-south to east-west hydraulic conductivity) of 4:1 was estimated for the overburden layers based on a drawdown ellipse observed during a specific capacity test (Kruseman and de Ridder, 1990). Horizontal anisotropy for the bedrock was simulated as 20:1 due to the regional, approximately 20°, eastward dip of the bedrock strata and associated bedding plane fractures (Anderson and Woessner, 1992). Horizontal anisotropy was found to be necessary to match simulated ground-water flow directions with the known shapes of the regulatory plumes in the shallow and deep bedrock, as determined during model calibration.

Model Calibration

The NTCRA 2 MODFLOW model calibration process and results will be discussed in detail in the NTCRA 2 Technical Memorandum. Attachment 2 to this Interim Technical Memorandum, however, presents a summary plot for the calibrated versus target head values. The target heads included measured or reported head values from 195 wells and piezometers in the study area and surrounding region, and ranged from approximately 140 to 265 feet elevation. During the calibration process, the residuals (difference between model heads and target heads) were reduced to <5 ft for 88% of the targets and <2 ft for 66% of the targets.

The simulated total combined flow rate of 21 gpm from the NTCRA 1 overburden ground-water extraction wells compares favorably to the historical average of 20 gpm. Also, the simulated ground-water discharge rate into the Quinnipiac River without the NTCRA 1 system operating was 33 gpm, which is reasonably consistent with the September 1992 measurement of 48 gpm (HNUS, May 1994).

The main parameters varied during model calibration to target head values were recharge, vertical hydraulic conductivity, and hydraulic stresses associated with sewers, trenches and domestic wells/leach fields. However, even after achieving a reasonable match to target heads, ground-water flow directions downgradient of the site did adequately not match the known extent and shapes of the off-site VOC plumes. Therefore, near the end of the model calibration process, directional differences in horizontal hydraulic conductivity (anisotropic conditions) were also evaluated. The effective horizontal hydraulic conductivity (geometric mean of major and minor horizontal conductivities) remained fixed throughout the anisotropy evaluation. Without anisotropy (horizontal conductivity the same in all directions), and without the NTCRA 1 system operating, simulated ground-water flow originating from the Operations Area (and the overburden and bedrock NAPL zones) discharges into the Quinnipiac River north of the Connecticut Power and Light (CL&P) easement (Figure 2). Thus, in the absence of horizontal anisotropy, the southern portions of the regulatory plumes believed to be related to the SRSNE Site can not be explained in terms of ground-water flow from the site. Particle tracking was used to compare ground-water flow paths to the observed regulatory plumes in the overburden and in the shallow and deep bedrock and evaluate the effect of horizontal anisotropy.

Through the particle tracking process, BBL interpreted that horizontal anisotropy values of approximately 4:1 in the overburden and 20:1 in the bedrock were necessary to match the observed southward extent of the plumes in the overburden and bedrock. These factors were calculated based on measured hydraulic responses in the overburden (Kruseman and de Ridder, 1990) and published methods of estimating horizontal anisotropy of dipping bedrock strata (Anderson and Woessner, 1992). Using the anisotropy factors of 4:1 in the overburden and 20:1 in the bedrock, ground-water particle path lines tracked in reverse from key bedrock wells with regulatory exceedences in shallow and deep bedrock match the interpreted regulatory plumes, as shown on Figures 6 and 7. These results indicate that the simulated bedrock ground-water flow directions in the calibrated model are consistent with the shapes of the regulatory plumes.

The potential influence of horizontal anisotropy will be clarified based on the results of the bedrock pumping test that will be performed during the Design Investigation. For the purposes of bedrock ground-water pumping simulations, however, we included the above anisotropy estimates in the model.

Preliminary Model Results

Following calibration, predictive simulations were run to simulate bedrock ground-water flow conditions during ground-water extraction. Several containment scenarios were run to identify optimal locations and pumping rates for a NTCRA 2 bedrock ground-water extraction well to contain the regulatory VOC plume in the bedrock. To assess the simulated capture zone affected by pumping, simulated head distributions were contoured and forward particle tracking was performed in the bedrock zone(s) requiring hydraulic control.

The results of these simulations indicated that a single extraction well pumping at a rate of approximately 18 gpm in Layers 3, 4, and 5 (shallow, middle, and deep bedrock) should contain the shallow and deep bedrock ground-water within the regulatory plume downgradient of the Operations Area of the site. Figure

8 shows the resulting, simulated containment of ground-water particle paths tracked forward from key wells with ground-water regulatory exceedences in shallow and deep bedrock. Attachment 3 presents the pumping-induced head distribution in Layers 3 through 5, respectively.

It should be noted that the simulated capture zones and drawdown distributions are considered preliminary estimates of the actual pumping response that will be observed at the site. Fractured bedrock ground-water hydraulic conditions can be extremely complicated and are dominated by the spacing and connectedness of groups of fractures. The effectiveness of a ground-water extraction system in fractured media is strongly controlled, therefore, by the number of fractures intercepted by a pumping system, e.g., a well or group of wells. At the SRSNE Site, the bedrock fractures are primarily parallel to the gently eastward-dipping bedding, and therefore several water-bearing fractures should be intercepted by the proposed vertical pumping well. Nevertheless, the bedrock fracture characteristics vary from location to location. In practice, the hydraulic effectiveness of the proposed pumping well will need to be evaluated in the field during the Design Investigation. In the event that the NTCRA 2 pumping well is not found to provide sufficient bedrock ground-water containment during the design investigation, the NTCRA 2 design will be enhanced prior to NTCRA 2 implementation to improve the connection to the fractured bedrock. Potential design enhancements may include hydrofracting the pumping well borehole, installing additional bedrock extraction wells, and/or installing a fractured bedrock trench.

Assessment of NAPL Remobilization Potential and Influence on NTCRA 1 Compliance

The simulated vertical and horizontal hydraulic gradients near the downgradient border of the estimated potential NAPL zones in overburden and bedrock were evaluated to estimate the relative NAPL remobilization potential due to the proposed NTCRA 2 bedrock pumping well. Critical hydraulic gradients required to mobilize NAPL were estimated by Dr. Bernie Kueper using the measured physical characteristics of NAPL samples obtained at the site (BBL, November 1995) and the till and bedrock physical characteristics, which were quantified during the RI. These data were used to calculate: 1) the downward gradient required for a hypothetical NAPL pool to exceed the displacement pressure for the till layer overlying the bedrock, and 2) the horizontal gradient required for a hypothetical NAPL pool currently in the bedrock fractures to exceed the displacement pressure for the fracture and migrate laterally along the fracture.

Table 1 presents the pre-pumping horizontal and vertical hydraulic gradients and the estimated pumping hydraulic gradients based on the results of the MODFLOW model. To estimate the gradients that would result during bedrock ground-water pumping, the simulated head changes caused by pumping were superimposed on observed, pre-pumping head values measured at specific pairs of wells/piezometers. Thus, the MODFLOW model was used to estimate the change in heads (drawdown values) during pumping. The pre-pumping heads were selected to represent the strongest horizontal or downward hydraulic gradient, or the weakest historical upward gradient. As shown in Table 1, the estimated pumping gradients are similar to the observed pre-pumping gradients. None of the existing upward gradients are expected to reverse to a downward component due to the proposed bedrock pumping well (20 gpm near the MW-704 cluster). Based on the simulated gradient changes, we do not anticipate horizontal or vertical NAPL mobilization during pumping at the proposed pumping well (Kueper, pers. com. with M.J. Gefell, September 1997). Dr. Kueper's NAPL mobilization assessment will be presented as part of the NTCRA 2 Technical Memorandum.

In addition, BBL evaluated he simulated drawdown in the overburden adjacent to the south side of the

NTCRA 1 sheet-pile wall to assess the potential influence on NTCRA 1 Demonstration of Compliance. The NTCRA 1 compliance requirements require an inward head differential of at least 0.3 feet as measured at pairs of overburden compliance piezometers situated on either side of the sheet-pile wall. Assuming a bedrock ground-water extraction rate of 18 gpm at the location shown on Figure 8, the simulated drawdown in the overburden outside the sheet-pile wall are estimated as approximately 0.18 feet at piezometer CPZ-2 and 0.47 feet at piezometer CPZ-4. Simulated drawdowns inside the sheetpile wall were 0.05 feet at piezometer CPZ-1 and 0.03 feet at piezometer CPZ-3. While these results indicate a decrease in the inward head differential of approximately 0.13 feet at the CPZ-1/2 pair and 0.44 feet at the CPZ-3/4 pair, the typical head differences observed at these piezometer pairs are greater >0.8 feet and >2.5 feet, respectively. These modeling results suggest that the drawdown due to bedrock pumping should not affect the ability to demonstrate compliance with the NTCRA 1 reversal of gradient requirements.

Proposed NTCRA 2 Pumping Well Design and Piezometer Network

Pumping Well Design

The bedrock ground-water pumping well will be installed to extract bedrock ground water at the approximate location shown on Figure 8. Given the recognition of VOCs in the deep bedrock during the completion of the Remedial Investigation, BBL proposes to modify the pumping well design from the preliminary design considered in the Design and Study Work Plan (BBL, August 1996). In particular, the pumping well will need to extend approximately 90 feet into the bedrock (rather than the initially assumed depth of approximately 30 feet into rock) to contain deep bedrock ground-water. Given the increased depth and cost of installing the bedrock pumping well, a 12-inch, rather than 14-inch diameter pumping well borehole will be installed. A permanent, 12-inch diameter black steel casing will be grouted approximately 3 feet into the top of competent bedrock to seal off the overburden formation, and the 12-inch diameter extraction well borehole will be advanced to a depth of approximately 95 feet below the top of bedrock (approximately 170 feet total depth). This depth and diameter are consistent with the pumping well design simulated in the NTCRA 2 ground-water flow model. The depth to the top of bedrock will be verified during drilling based on the characteristics of the air-rotary drill cuttings. Drilling mud will not be used during the drilling of the pumping well borehole(s). The extraction well will be constructed as an open bedrock well, with an intake section extending from the bottom of the permanent 12-inch casing to the bottom of the bedrock borehole.

The proposed open bedrock design is consistent with the design of private bedrock wells in the region, and is considered appropriate for the NTCRA 2 pumping well. (The former Cianci Water Supply well, which was used to obtain bedrock fracture and ground-water quality data during the RI, had an open-bedrock intake section that extended from the top of bedrock to a depth of approximately 100 feet below the top of bedrock.) The open-bedrock pumping well design is fundamentally the same as the design presented in the Design and Study Work Plan (BBL, August 1996) except that, due to the substantial increase in depth, no well screen or riser will be installed in the pumping well borehole during the Design Investigation.

Bedrock Piezometer Network

The basic design of the NTCRA 2 piezometers was presented in the USEPA-approved DSWP. Five shallow bedrock and two deep bedrock piezometers will be installed at the approximate locations shown on Figure 9 to provide hydraulic response data during the pumping test activities and NTCRA 2 implementation. These locations were selected to fill data gaps in the bedrock monitoring array,

particularly in the area downgradient of the proposed pumping well location, where the extent of the capture zone will be evaluated. In combination with the existing bedrock monitoring wells in the area, the proposed piezometer locations will provide an appropriate network to characterize the hydraulic response to bedrock pumping and the shape of the resulting capture zone. Shallow and deep bedrock piezometers will be installed to a depth of approximately 25 feet and 90 feet below the top of bedrock, respectively. Each new bedrock piezometer will be constructed with a 20-feet long, 2-inch diameter, 0.010-inch slot, Schedule 40 PVC screen and riser pipe. A Morie No. 0 or equivalent filter pack will be placed in the well/borehole annulus from the bottom of the piezometer screen to approximately two feet above the top of the screen, and the remainder of the annulus will be filled with bentonite to ground surface. The new bedrock pumping well and piezometers will be located by survey with respect to the existing site coordinate system established during the initial phases of the RI completed on behalf of USEPA (HNUS, May 1994). Vertical survey control will also be established for the ground surface and the top of riser at each new bedrock pumping well and piezometer.

The proposed locations for several piezometers are within the CL&P easement that crosses the Town Well Field Property (Figure 9). Access to these locations for drilling purposes will be subject to OSHA requirements regarding safe clearance from overhead, high-tension power lines. In addition, wet, soft ground conditions along the intermittent stream that crossed the Well Field will pose access limitations associated with rig mobility. Therefore, the proposed locations should be considered approximate only, and will need be verified in the field based on actual field conditions.

Summary

This Technical Memorandum provides the basis for the NTCRA 2 Design Investigation described in the USEPA-approved DSWP. Preliminary modeling results indicate that a bedrock ground-water extraction well with a 90-foot long open-bedrock interval pumping at approximately 18 gpm may be sufficient to intercept the plumes of dissolved VOCs downgradient of the Operations Area of the site, with minimal potential for NAPL remobilization and minimal influence on NTCRA 1 Demonstration of Compliance. The modeling results provide an understanding of the bedrock ground-water capture zone and the basis for the proposed bedrock piezometer network, which will be installed in the area around the proposed pumping well during the forthcoming Design Investigation. The results of the Design Investigation and a detailed discussion of the NTCRA 2 MODFLOW model design and calibration will be presented in the NTCRA 2 Technical Memorandum.

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(Open File Report 92-43). In cooperation with the Connecticut DEP and the USEPA, Waste Management Division, Region I.

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USGS. 1992. *Southington, Connecticut Quadrangle.*

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TABLES

TABLE 1

SRSNE SITE
NTCRA 2

NAPL MOBILITY ASSESSMENT DUE TO SIMULATED PUMPING STRESSES

Well I.D.	Date	Observed Prepumping Head (ft AMSL)	A – B Distance (ft AMSL)	Observed Prepumping Gradient**	Simulated Prepumping Head (ft AMSL)	Simulated Pumping Head (ft AMSL)	Simulated Drawdown (ft)	Estimated* Pumping Heads (ft AMSL)	Estimated Pumping Gradient**
Bedrock Horizontal Gradient Assessment									
P-6	3/20/95	152.09	111.2	0.017	149.38	148.95	0.430	151.66	0.016
P-11A	3/20/95	150.19			148.61	148.25	0.360	149.83	
CPZ-3R	7/7/97	152.30	81.4	0.018	147.13	146.96	0.172	152.13	0.021
CPZ-4R	7/7/97	150.85			148.97	148.55	0.420	150.43	
Overburden/Bedrock Interface Vertical Gradient Assessment									
P-11B (OVB)	3/20/95	149.56	51.9	0.012	148.41	148.11	0.300	149.26	0.007
P-11A (Shall. Rock)	3/20/95	150.19			148.55	148.01	0.542	149.65	
MW-413 (OVB)	1/21/97	155.10	22.4	-0.151	148.42	148.39	0.028	155.07	-0.158
MW-414 (Shall. Rock)	1/21/97	151.72			148.70	148.52	0.183	151.54	
CPZ-4 (OVB)	1/21/97	151.20	40.0	0.055	150.54	150.07	0.470	150.73	0.042
CPZ-4R (Shall. Rock)	1/21/97	153.39			149.12	148.65	0.468	152.92	

Kv range for K1: 0.03 to 0.20 ft/day (Kv for deep overburden from model, KH/100).
Kv range for K2: 0.0018 to 0.0034 ft/day (from till sample vertical permeability results).
Kv for K3: 0.0018 ft/day (Kv for bedrock from model, KH/200).

Notes

This table reflects head conditions before and after pumping at a rate of approximately 20 gpm in Layers 3, 4, and 5 adjacent to bedrock wells MW-704R and MW-704DR.

* Estimated pumping heads determined by subtracting the simulated drawdown change from the observed prepumping heads.

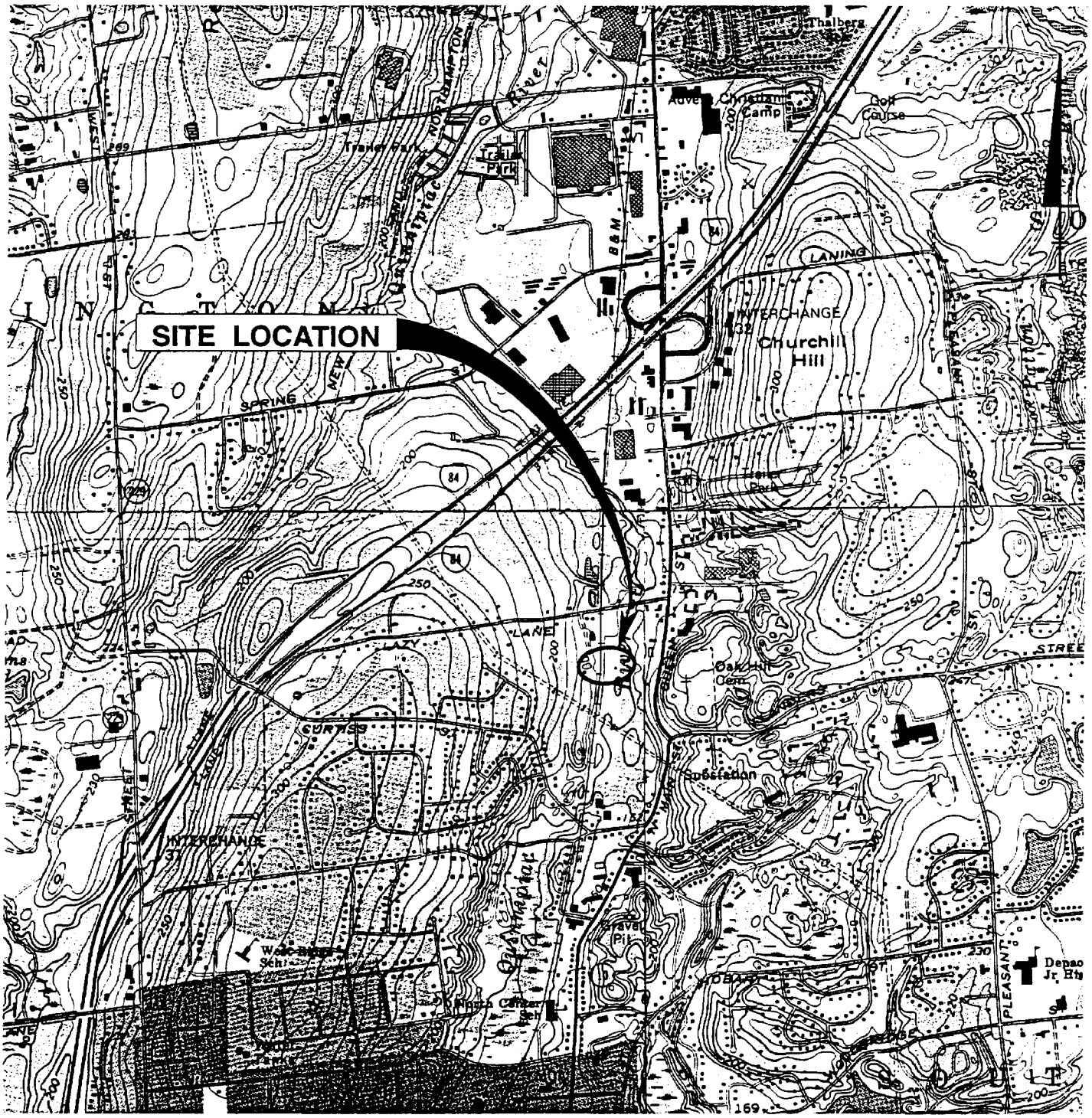
** "-" Indicates downward vertical gradient; vertical positive gradients are upward in this analysis.

Simulated drawdown during bedrock pumping estimated at key NTCRA 1 compliance piezometers include:

CPZ-1: 0.05 feet;
CPZ-2: 0.18 feet;
CPZ-3: 0.03 feet;
CPZ-4: 0.47 feet.

Therefore, the resulting changes in head differentials are estimated as -0.13 feet at the CPZ-1/CPZ-2 compliance pair, and -0.44 feet at the CPZ-3/CPZ-4 compliance pair. These minor changes should not impact NTCRA 1 *Demonstration of Compliance*.

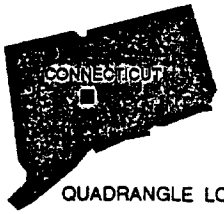
FIGURES



REFERENCE:
SOUTHINGTON, CONN. USGS QUAD. 1968 PR 1992, MERIIDAN, CONN. USGS QUAD. 1966 PR 1984,
NEW BRITIAN, CONN. USGS QUAD. 1966 PR 1984, & BRISTOL, CONN. USGS QUAD 1967 PR 1984

2000' 0 2000'

APPROX. SCALE: 1" = 2000'



QUADRANGLE LOCATION

8/96 SYR D54-JVM PMC
08331098/08331N02.cdr

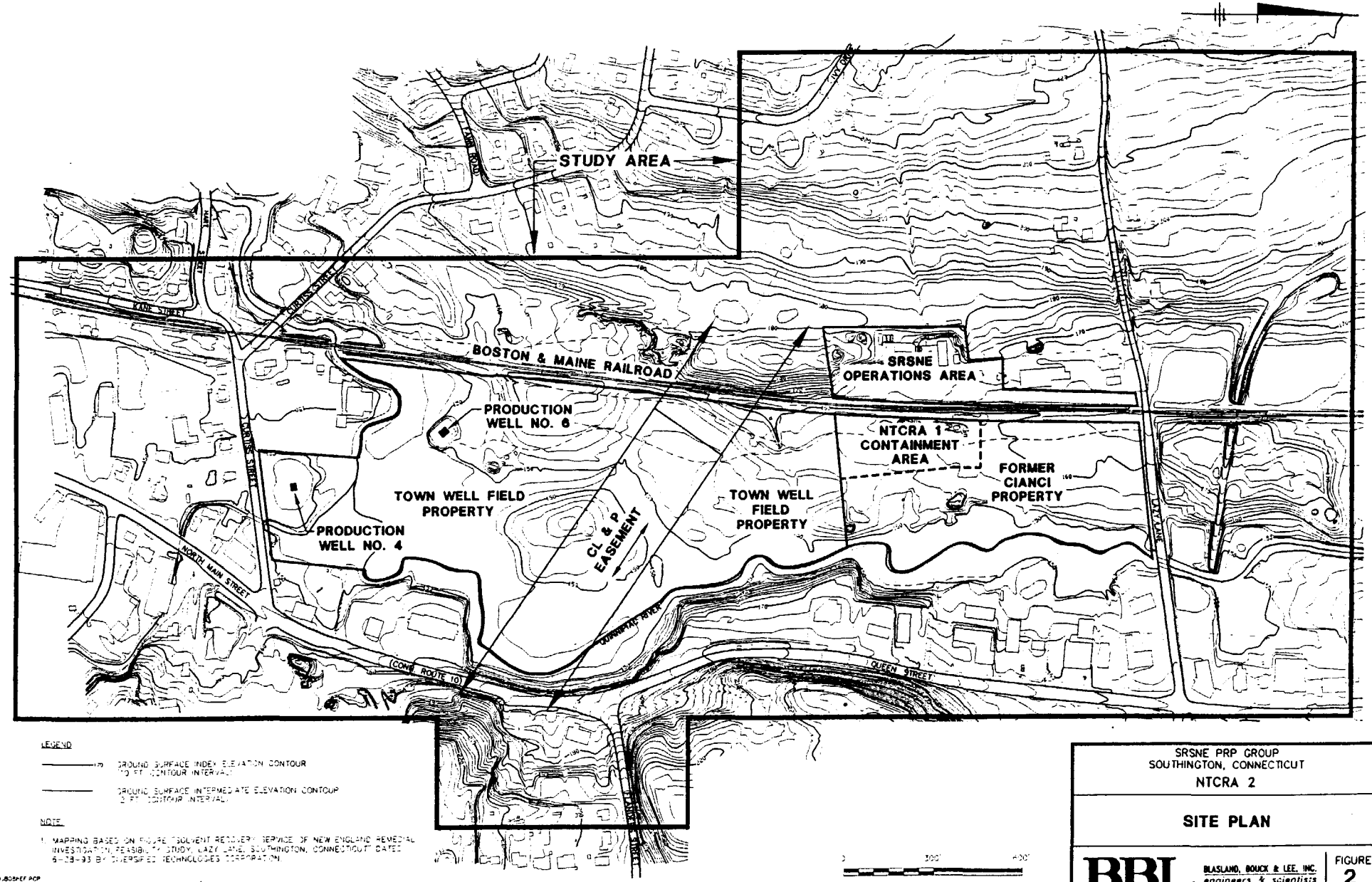
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

NTCRA 2

SITE LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
1



LEGEND

——— 170 GROUND SURFACE INDEX ELEVATION CONTOUR (10 FT. CONTOUR INTERVAL)

——— GROUND SURFACE INTERMEDIATE ELEVATION CONTOUR (2 FT. CONTOUR INTERVAL)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION, FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

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NTCRA 2

SITE PLAN

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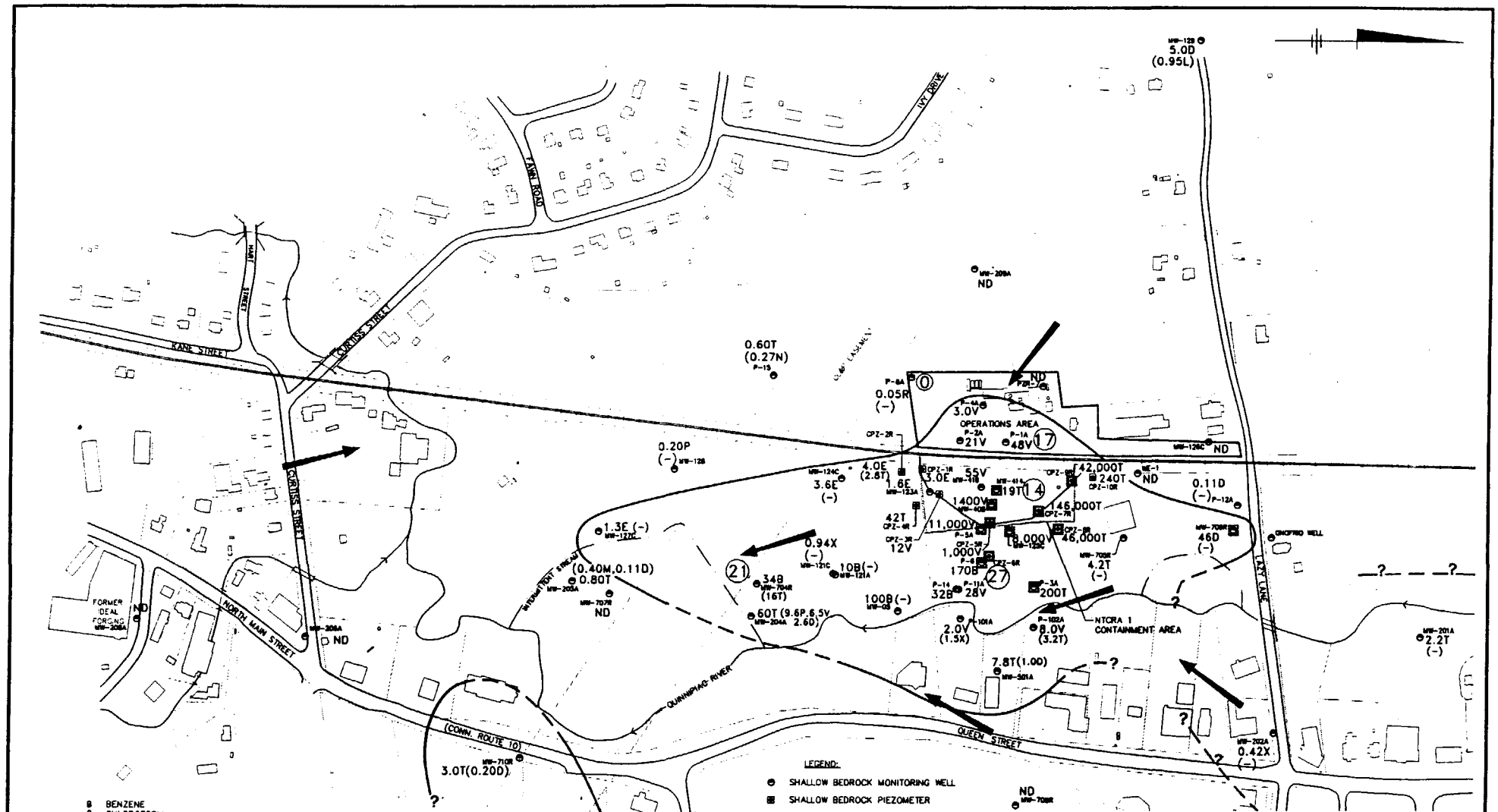
FIGURE 2



B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
M METHYLENE CHLORIDE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT

MW-707R 4.8T — WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 4.8 INDICATES 4.8 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., T = TRICHLOROETHENE) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.

LEGEND:

- SHALLOW BEDROCK MONITORING WELL
- SHALLOW BEDROCK PIEZOMETER
- ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
- USAF NATURAL ATTENUATION RANK
- LOCATION WITH ALCOHOLS DETECTION
- GENERALIZED GROUND-WATER FLOW DIRECTION

0 300' 600'

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

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NTCRA 2

SHALLOW BEDROCK GROUND-WATER REGULATORY VOC PLUME MAP

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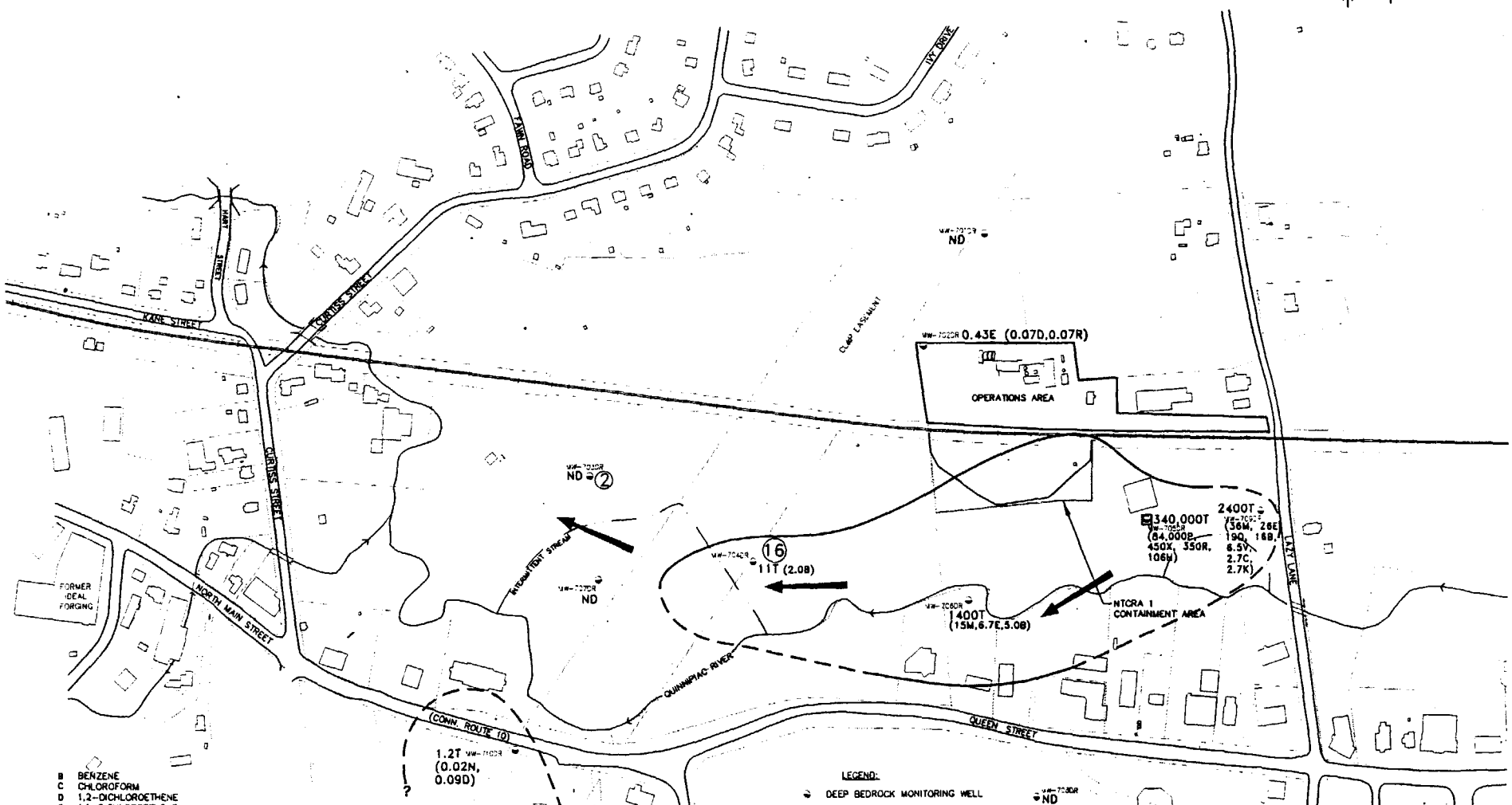
FIGURE 3

P: STD-DL.PCP @ E-SIZE OR DJB.PCP
XREF: 08325X00,08325X01; L: ON:+, OFF: REF,(XREF X01: PIPES,TRAIL)
7/22/97 SYR-54-PGL
08331900/08331819.DWG



B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
H ETHYLBENZENE
K 4-METHYL-2-PENTANONE (MIBK)
L TOLUENE
M METHYLENE CHLORIDE
N ACETONE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
S 1,1,2-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT

MW-7040R 11T — WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 11 INDICATES 11 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., T = TRICHLOROETHENE) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.

LEGEND:

- DEEP BEDROCK MONITORING WELL
- ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
- USAF NATURAL ATTENUATION RANK
- LOCATION WITH ALCOHOLS DETECTION
- GENERALIZED GROUND-WATER FLOW DIRECTION

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

300' 600'

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NTCRA 2

DEEP BEDROCK GROUND-WATER REGULATORY VOC PLUME MAP

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FIGURE 4

7/22/97 SYR-54-RLP.PCL K:08325X00.08325X01.DWG
08331900/08331821.DWG P: STD-DL.PCP & E-SIZE OR DJB.PCP

LEGEND

- STREET
- RIVER OR STREAM
- POND
- WETLAND
- REGIONAL WELL/BORING
- PRODUCTION WELL
- NTCRA 1 RECOVERY WELL
- 152 WATER TABLE ELEVATION AT REGIONAL WELL (FT, AMSL)
- 170 WATER TABLE ELEVATION CONTOUR LINE (FT, AMSL), 10-FOOT CONTOUR INTERVAL. DASHED WHERE INFERRED

GRAPHIC SCALE

EXTENT OF NTCRA 2 MODFLOW MODEL DOMAIN

NOTES:

1. BACKGROUND MAPPING COPYRIGHT 1995 AMERICAN DIGITAL CARTOGRAPHY, INC. BASED ON 1:100000 SCALE DIGITAL DATA AVAILABLE FROM THE US GEOLOGICAL SURVEY AND MEETS MAP ACCURACY STANDARDS FOR 1:100000 SCALE MAPS.
2. ALL WELL LOCATIONS ARE APPROXIMATE.
3. RI DATA MEASURED JANUARY 21, 1997 WERE USED TO INTERPRET THE WATER TABLE ELEVATION IN THE RI STUDY AREA.
4. REGIONAL WATER LEVEL DATA OBTAINED FROM MAZZAFERRO (1973) AND HAENI & ANDERSON (1980).

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NTCRA 2

MODEL DOMAIN AND MEASURED/ ESTIMATED REGIONAL WATER TABLE

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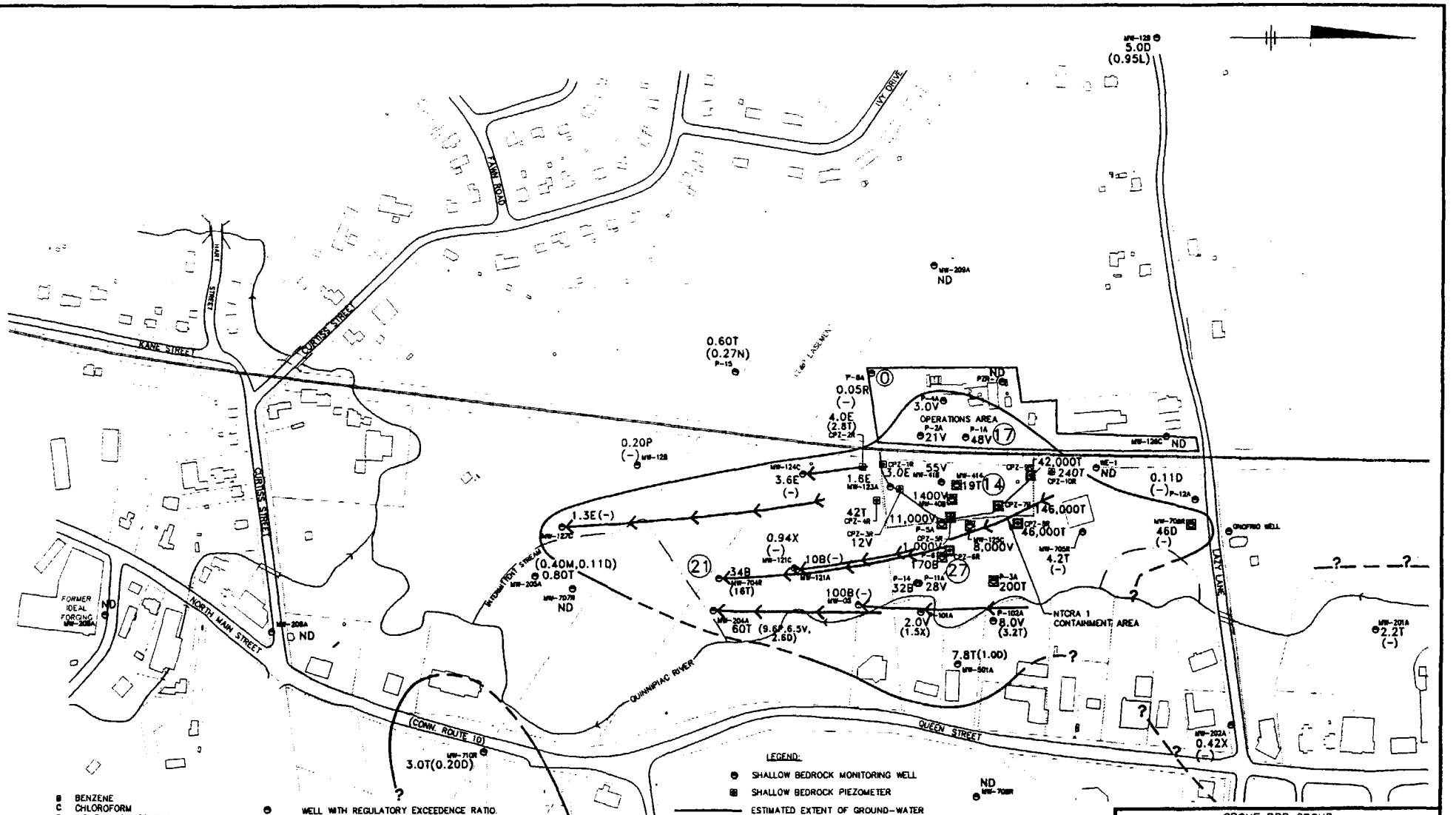
FIGURE 5



B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
M METHYLENE CHLORIDE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT

MW-707R 4.8T — WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 4.8 INDICATES 4.8 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., T = TRICHLOROETHENE) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.

LEGEND:

- SHALLOW BEDROCK MONITORING WELL
- SHALLOW BEDROCK PIEZOMETER
- ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
- USAF NATURAL ATTENUATION RANK
- LOCATION WITH ALCOHOLS DETECTION
- REVERSE-TRACKED PARTICLE PATHS

0 300' 600'

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. NO NTCRA 1 GROUND-WATER CONTAINMENT SYSTEM.

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SOUTHINGTON, CONNECTICUT

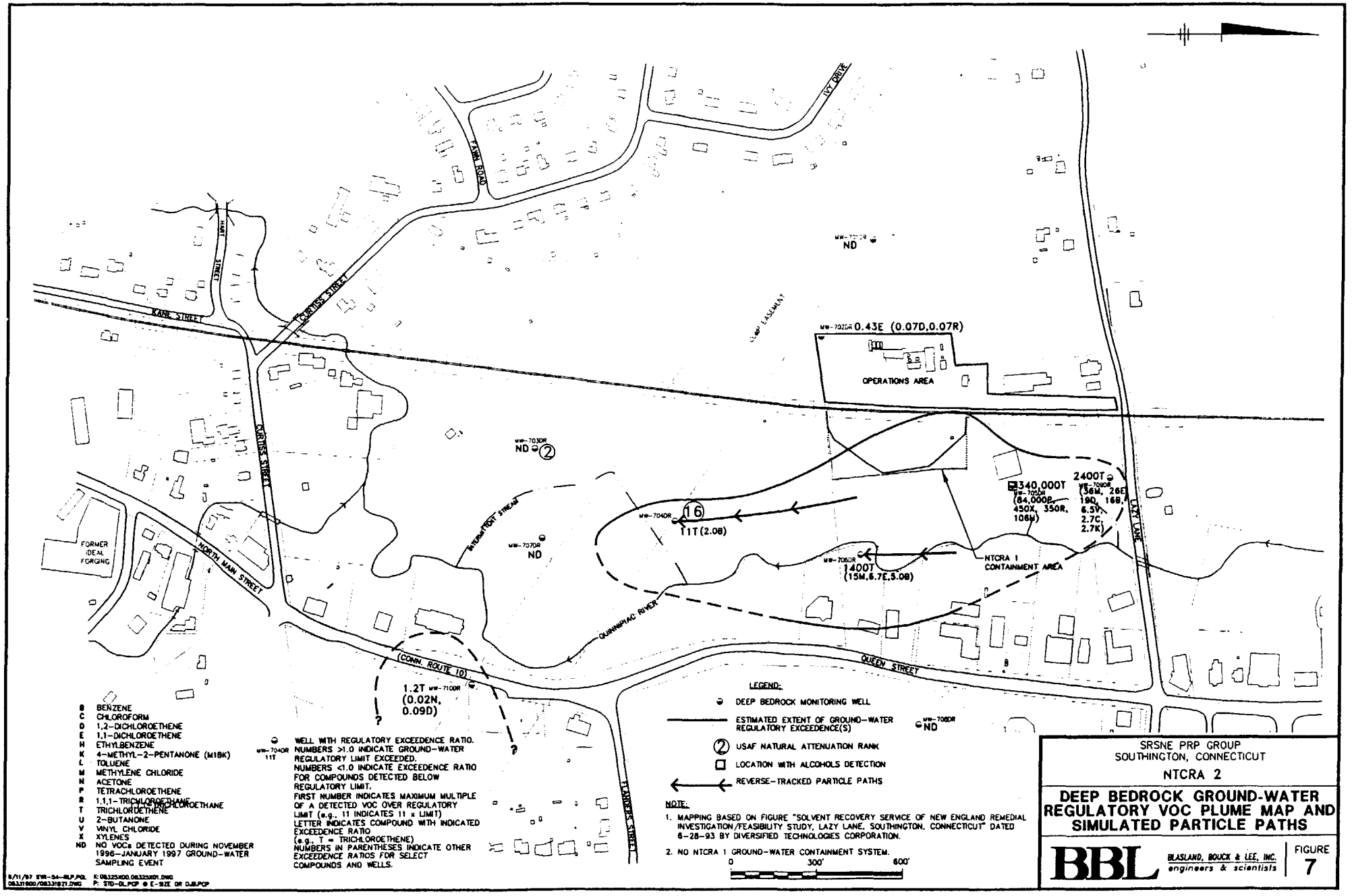
NTCRA 2

SHALLOW BEDROCK GROUND-WATER REGULATORY VOC PLUME MAP AND SIMULATED PARTICLE PATHS

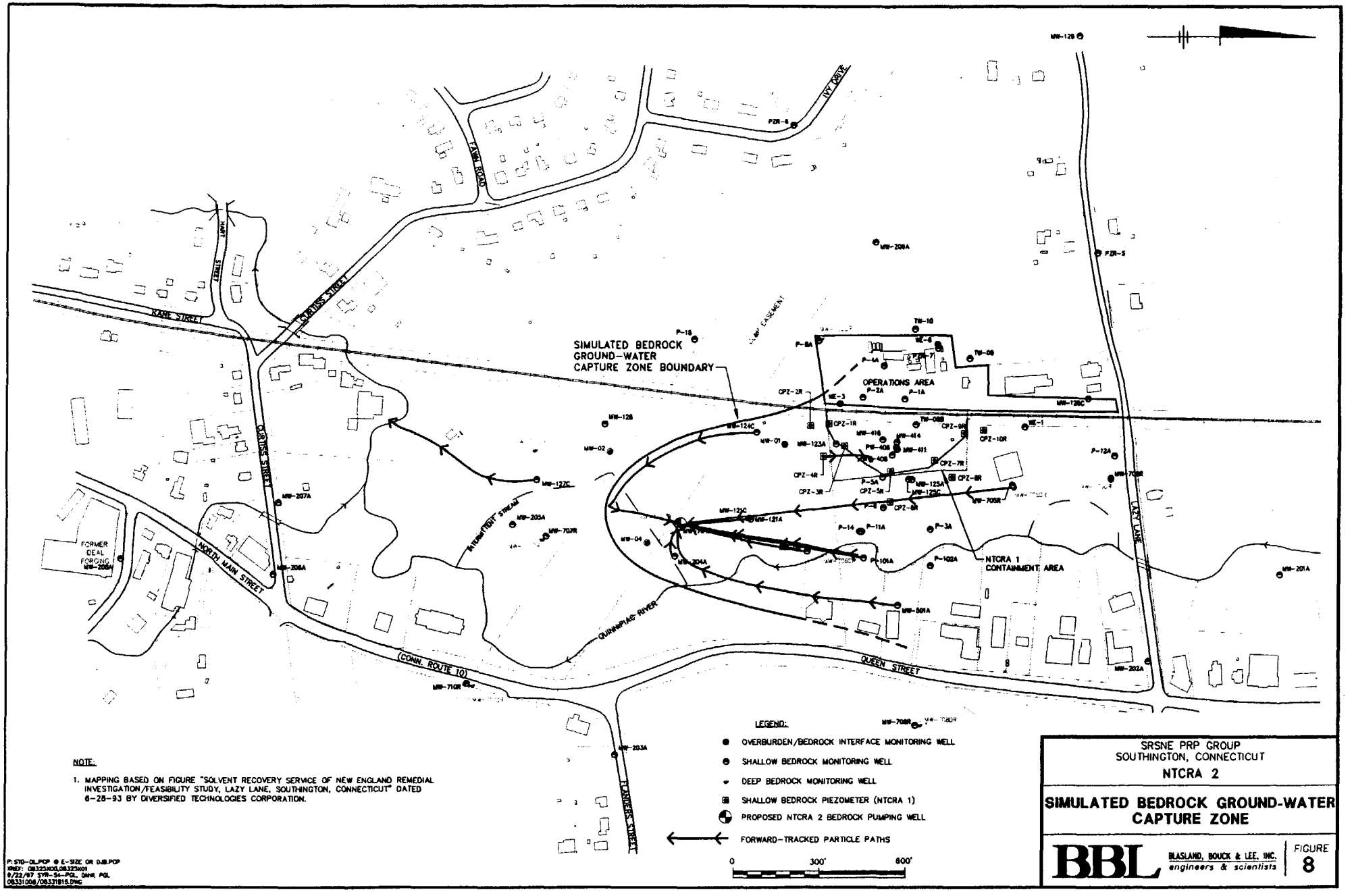
BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 6

P: STD-DL.PCP @ E-SIZE OR DJB.PCP
XREF: 08325X00,08325X01; L: ON:*, OFF: REF,(XREF XOI: PIPES,TRAIL)
8/11/97 SYR-54-PGL
08331900/08331819.DWG



KANE STREET
CURTISS STREET
HART STREET
FANN ROAD
IVY DRIVE
LAZY LANE
NORTH MAIN STREET
QUEEN STREET
FLANDERS STREET
(CONN. ROUTE 10)
QUINNIPIAC RIVER
INTERMITTENT STREAM
FORMER IDEAL FORGING
OPERATIONS AREA
NTCRA 1 CONTAINMENT AREA
MW-702DR 0.43E (0.07D,0.07R)
MW-703DR ND 2
MW-704DR 16 11T (2.0B)
MW-705DR 340,000T (84,000P, 450X, 350R, 106M)
MW-706DR 1400T (15M,6.7E,5.0B)
MW-707DR ND
MW-708DR ND
MW-709DR 2400T (36M, 26E, 19D, 16B, 6.5V, 2.7C, 2.7K)
MW-710DR 1.2T (0.02N, 0.09D)
LEGEND:
DEEP BEDROCK MONITORING WELL
ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
USAF NATURAL ATTENUATION RANK
LOCATION WITH ALCOHOLS DETECTION
REVERSE-TRACKED PARTICLE PATHS
B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
H ETHYLBENZENE
K 4-METHYL-2-PENTANONE (M1BK)
L TOLUENE
M METHYLENE CHLORIDE
N ACETONE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT
MW-704DR 11T WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 11 INDICATES 11 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., T = TRICHLOROETHENE) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.
NOTE:
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. NO NTCRA 1 GROUND-WATER CONTAINMENT SYSTEM.
0 300' 600'
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2
DEEP BEDROCK GROUND-WATER REGULATORY VOC PLUME MAP AND SIMULATED PARTICLE PATHS
BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists
FIGURE 7



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

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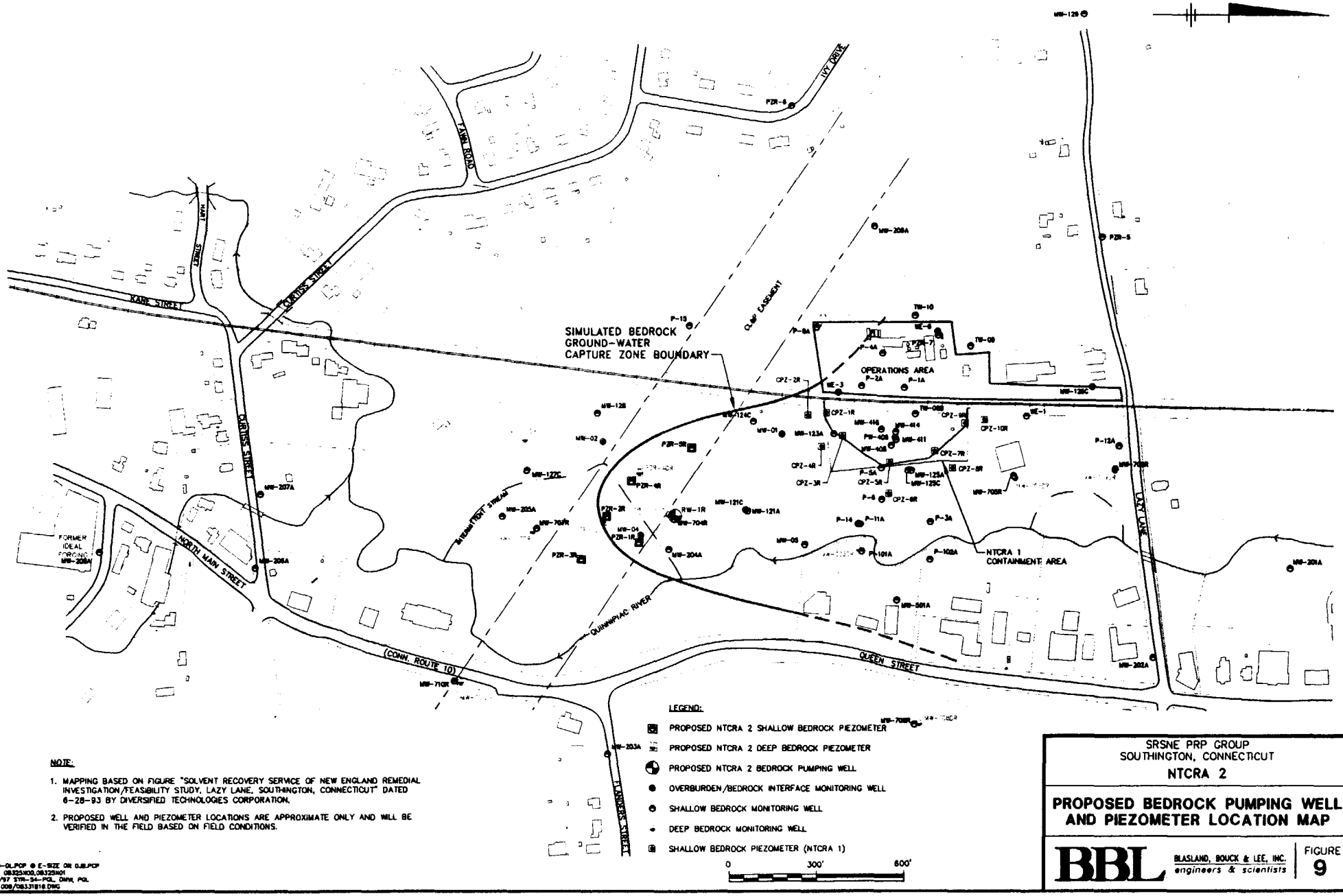
SOUTHINGTON, CONNECTICUT
NTCRA 2

SIMULATED BEDROCK GROUND-WATER CAPTURE ZONE

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 8

P:STD-OL.PCP @ E-SIZE OR DJB.PCP
XREF: 08325X00,08325X01
9/22/97 SYR-54-PGL, DMW, PGL
08331006/08331B15.DWG



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
2. PROPOSED WELL AND PIEZOMETER LOCATIONS ARE APPROXIMATE ONLY AND WILL BE VERIFIED IN THE FIELD BASED ON FIELD CONDITIONS.

P:STD-DL.PCP @ E-SIZE ON DJB.PCP
XREF: 08325X00,08325X01
9/23/97 STR-54-PGL DAW, PGL
08331008/08331818.DWG

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
NTCRA 2

PROPOSED BEDROCK PUMPING WELL AND PIEZOMETER LOCATION MAP

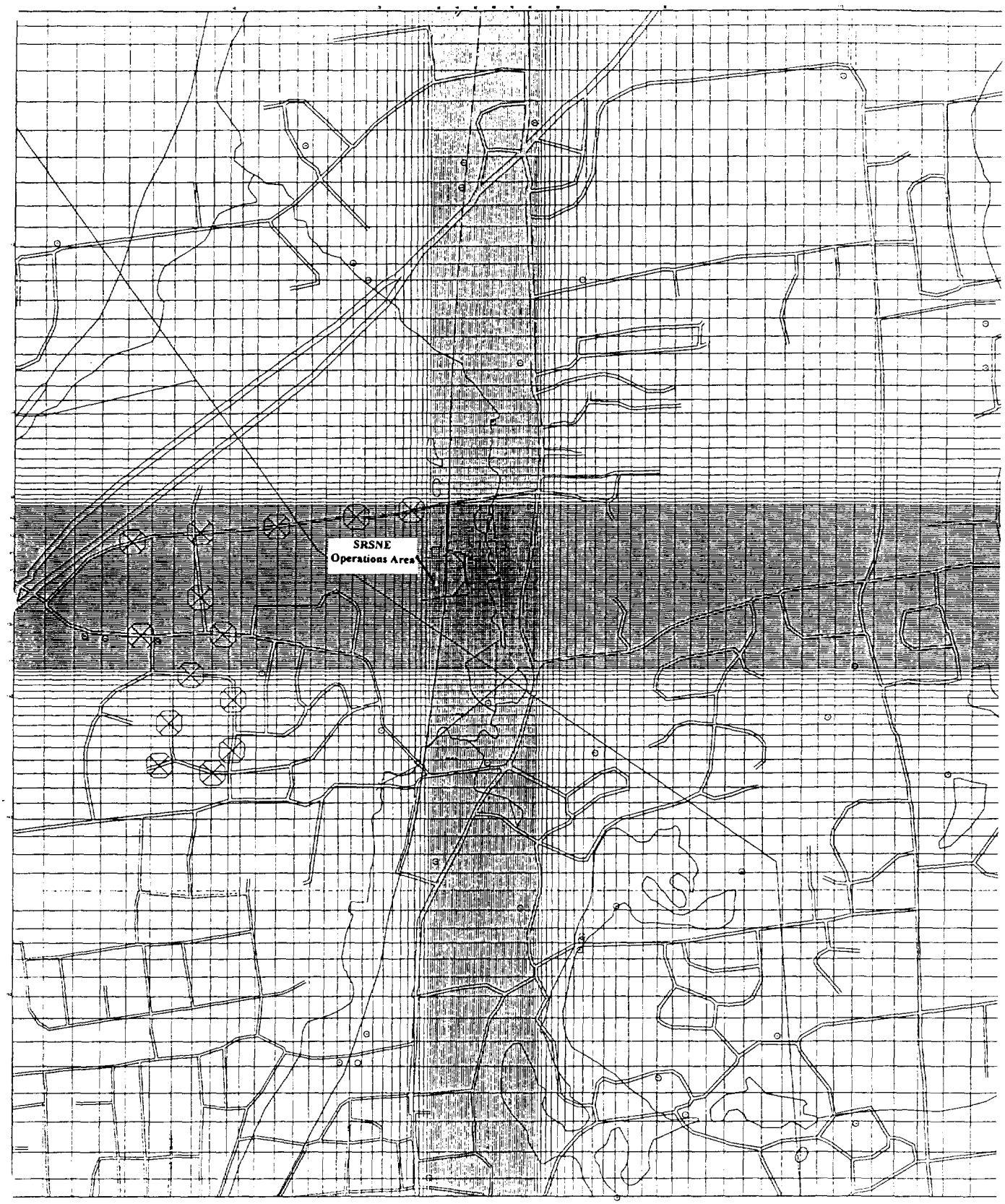
BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 9

ATTACHMENT 1

PLAN VIEW AND SCHEMATIC CROSS-SECTION OF MODEL GRID

Plan View of the Model Grid



SRSNE SITE
SOUTHINGTON, CONNECTICUT
NTCRA2 MODFLOW MODEL
MODEL LAYER STRUCTURE

Layer 1 (Outwash)
- unconfined
- estimated saturated thickness: 0 to 120 ft.
- designated inactive where saturated thickness equals 0 ft.
- heterogeneous hydraulic conductivity
- horizontally and vertically anisotropic

Layer 2 (Till and Coarse Drift)
- confined/unconfined (convertible)
- estimated saturated thickness: 0 to 50 ft.
- designated inactive where saturated thickness equals 0 ft.
- heterogeneous hydraulic conductivity
- horizontally and vertically anisotropic

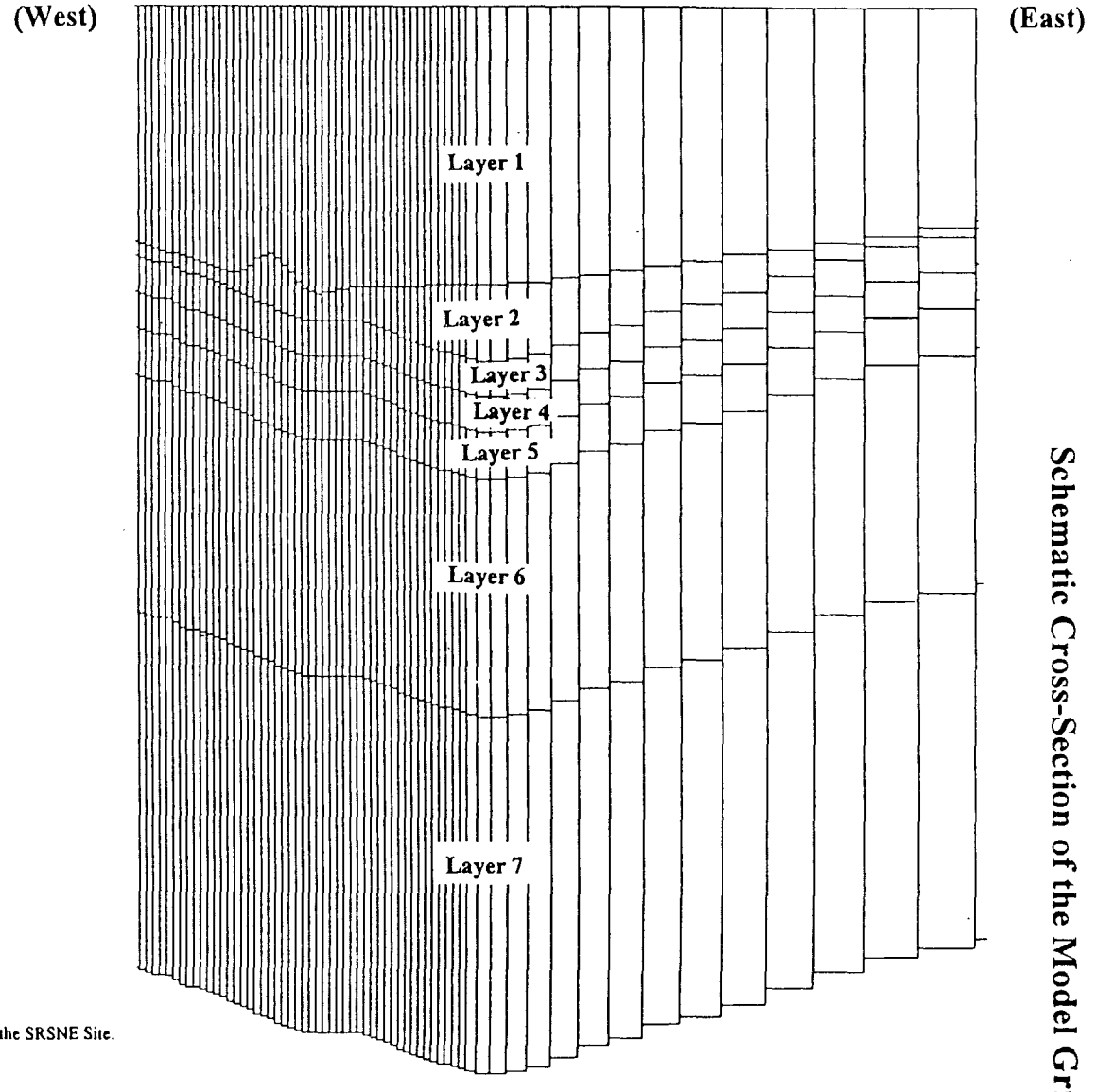
Layer 3 (Shallow Bedrock)
- confined/unconfined (convertible)
- uniform thickness: 30 ft.
- homogeneous hydraulic conductivity
- horizontally and vertically anisotropic

Layer 4 (Middle Bedrock)
- confined/unconfined (convertible)
- uniform thickness: 30 ft.
- homogeneous hydraulic conductivity
- horizontally and vertically anisotropic

Layer 5 (Deep Bedrock)
- confined/unconfined (convertible)
- uniform thickness: 40 ft.
- homogeneous hydraulic conductivity
- horizontally and vertically anisotropic

Layer 6 (Deeper Bedrock)
- confined/unconfined (convertible)
- uniform thickness: 200 ft.
- homogeneous hydraulic conductivity
- horizontally and vertically anisotropic

Layer 7 (Deeper Bedrock)
- confined/unconfined (convertible)
- uniform thickness: 300 ft.
- homogeneous hydraulic conductivity
- horizontally and vertically anisotropic



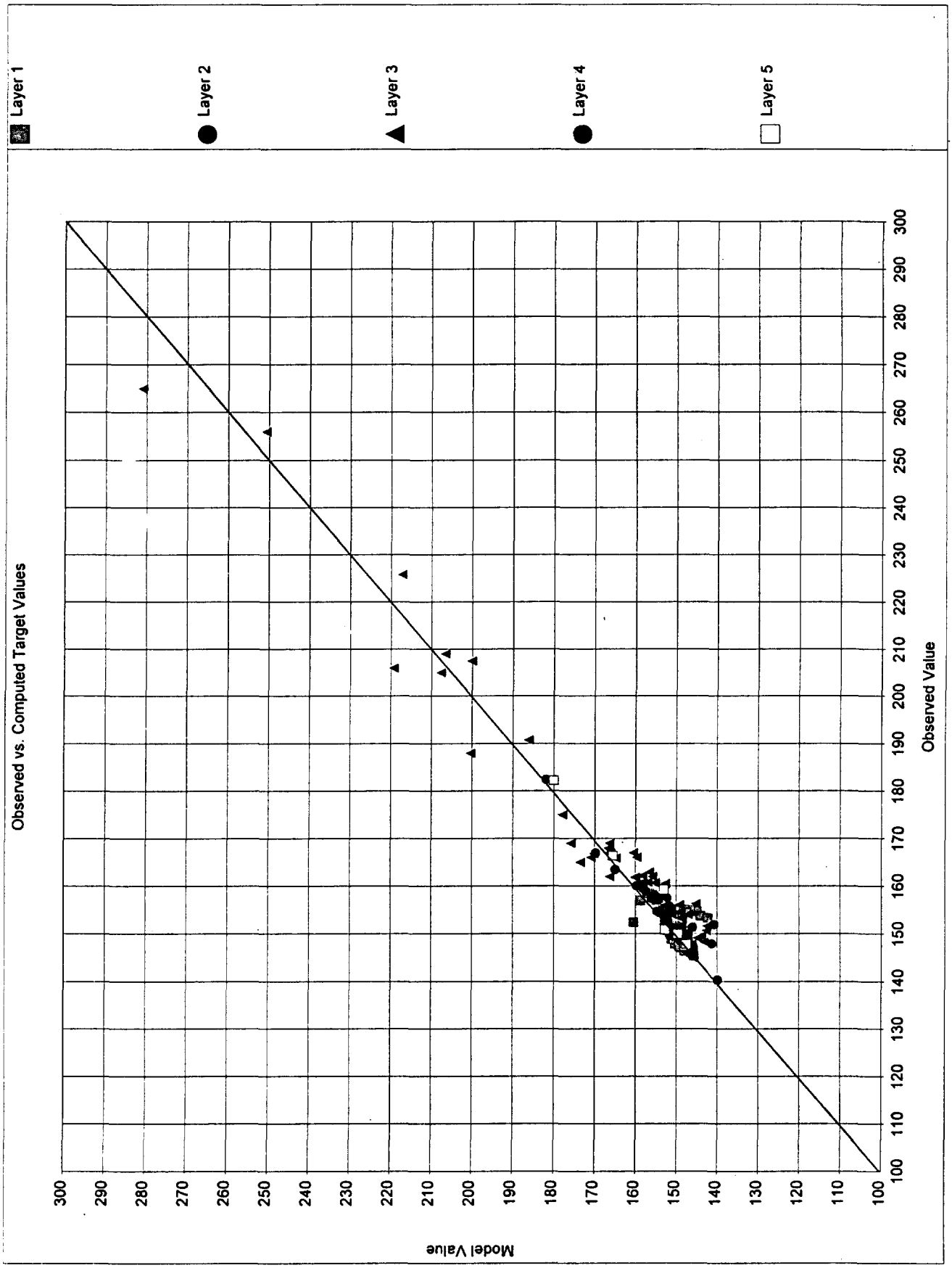
Note: *Figure represents the central position of the model grid in east-west cross-section through the SRSNE Site.*

Schematic Cross-Section of the Model Grid

ATTACHMENT 2

CALIBRATION SUMMARY PLOT

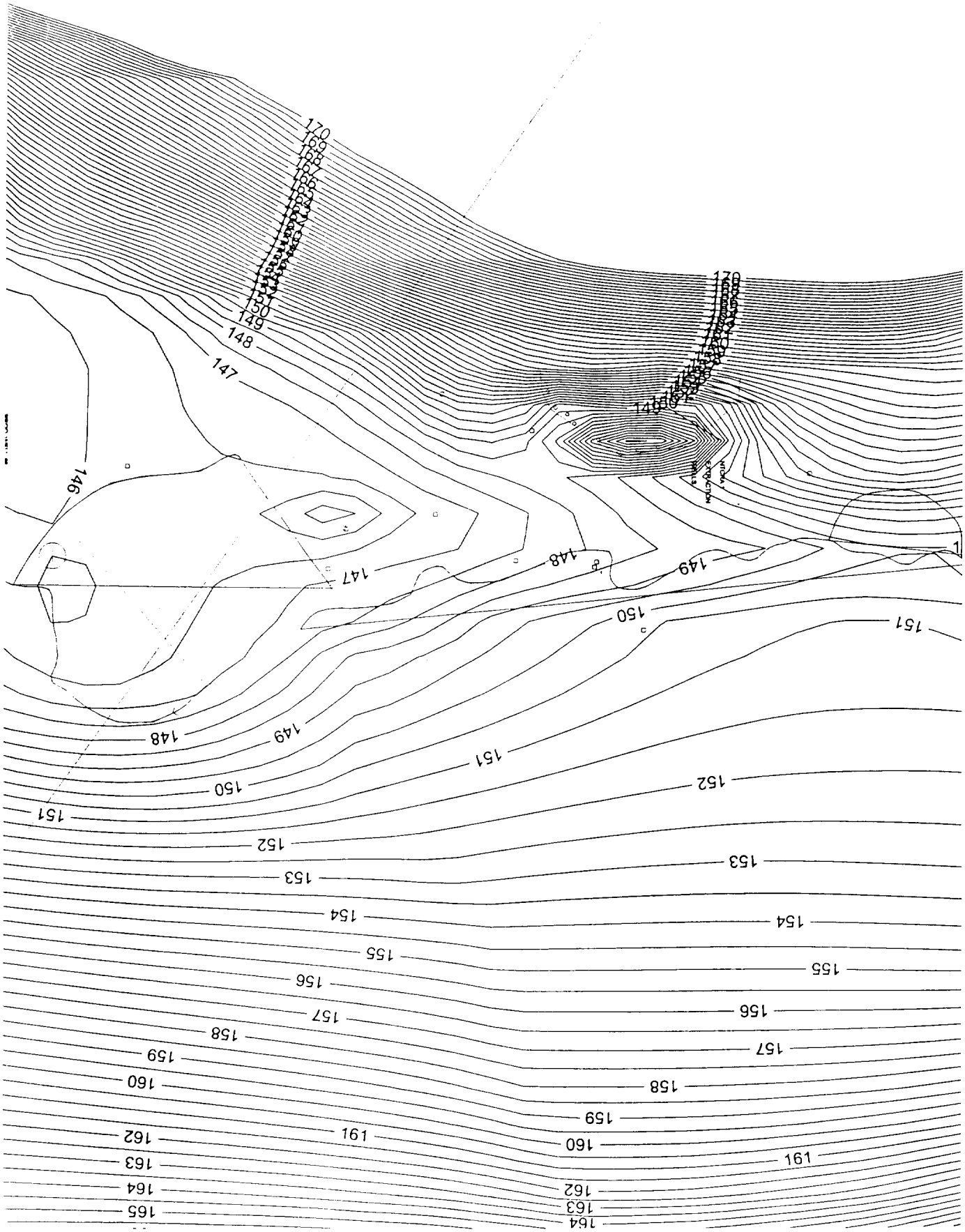
Calibration Summary Plot



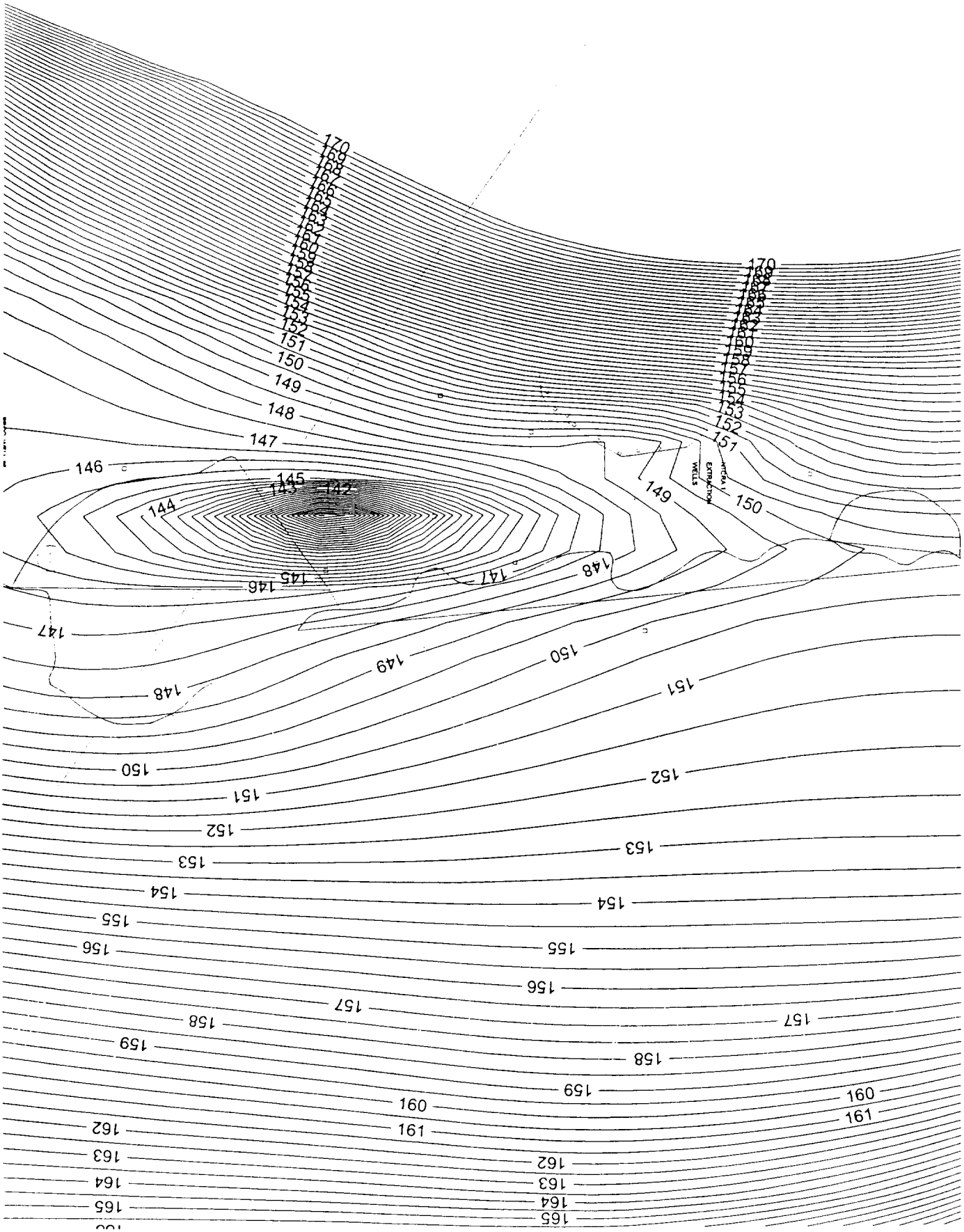
ATTACHMENT 3

SIMULATED HEADS IN LAYER 3 THROUGH 5

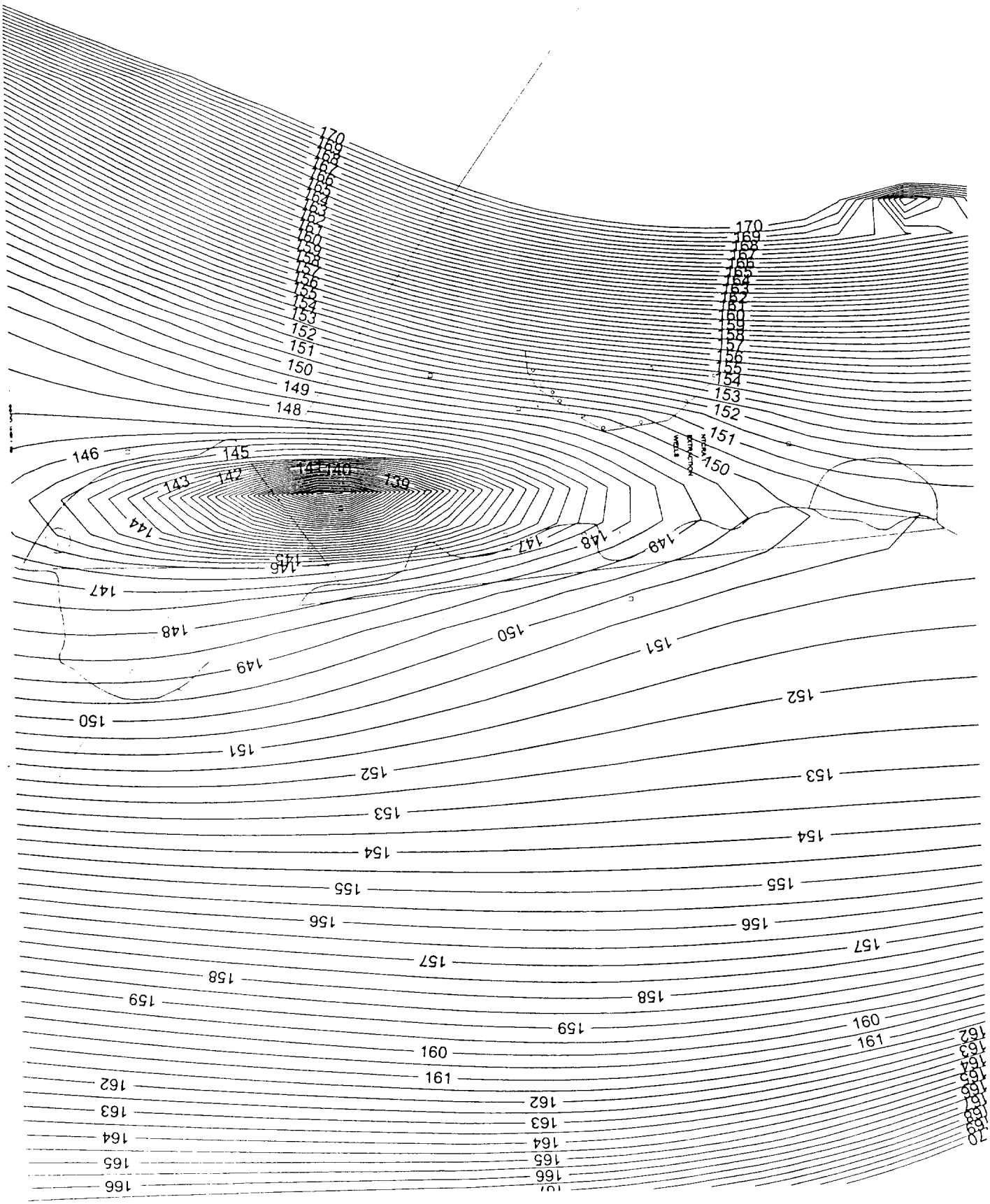
Simulated Layer 3 Heads



Simulated Layer 4 Heads

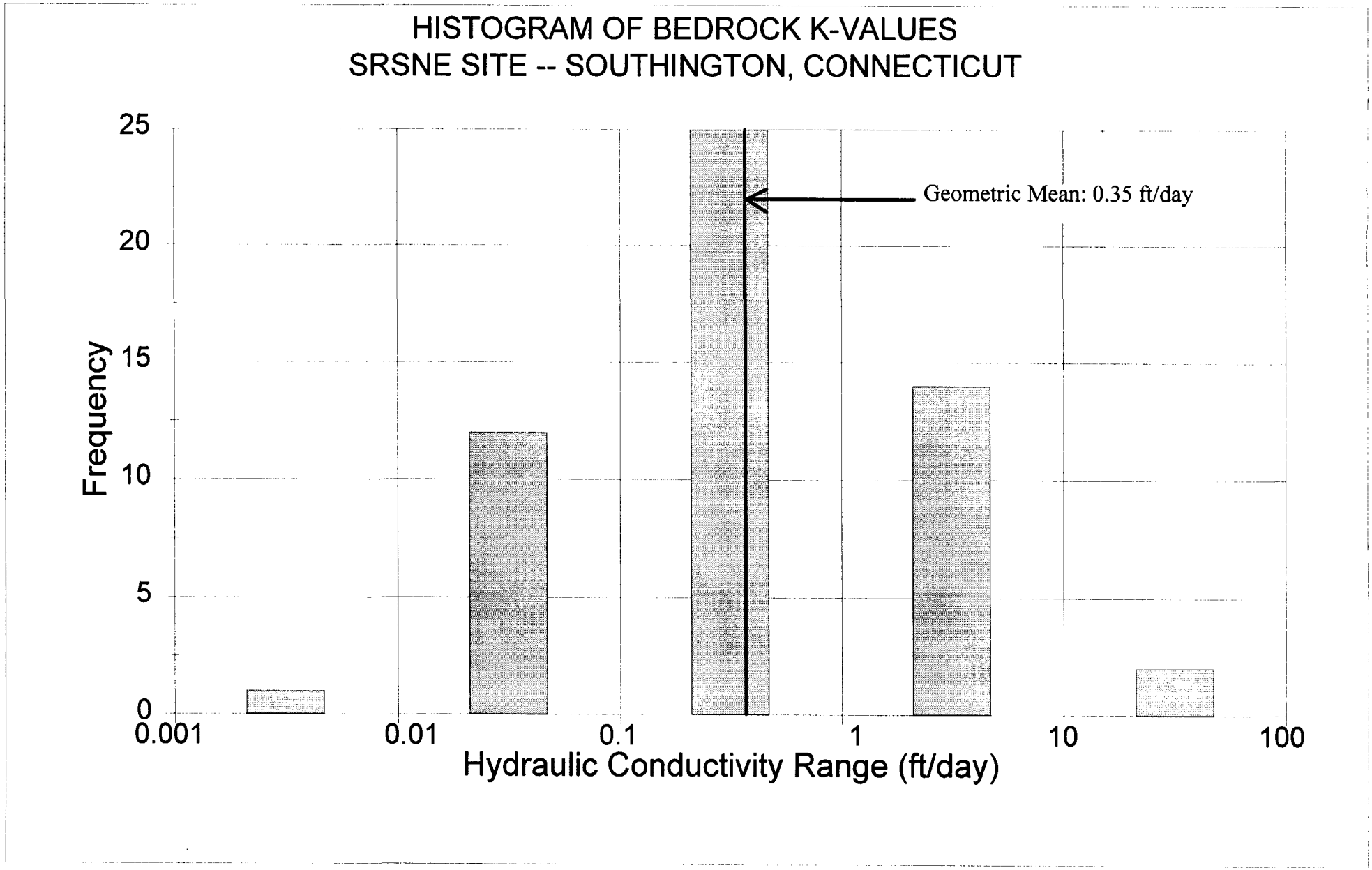


Simulated Layer 5 Heads

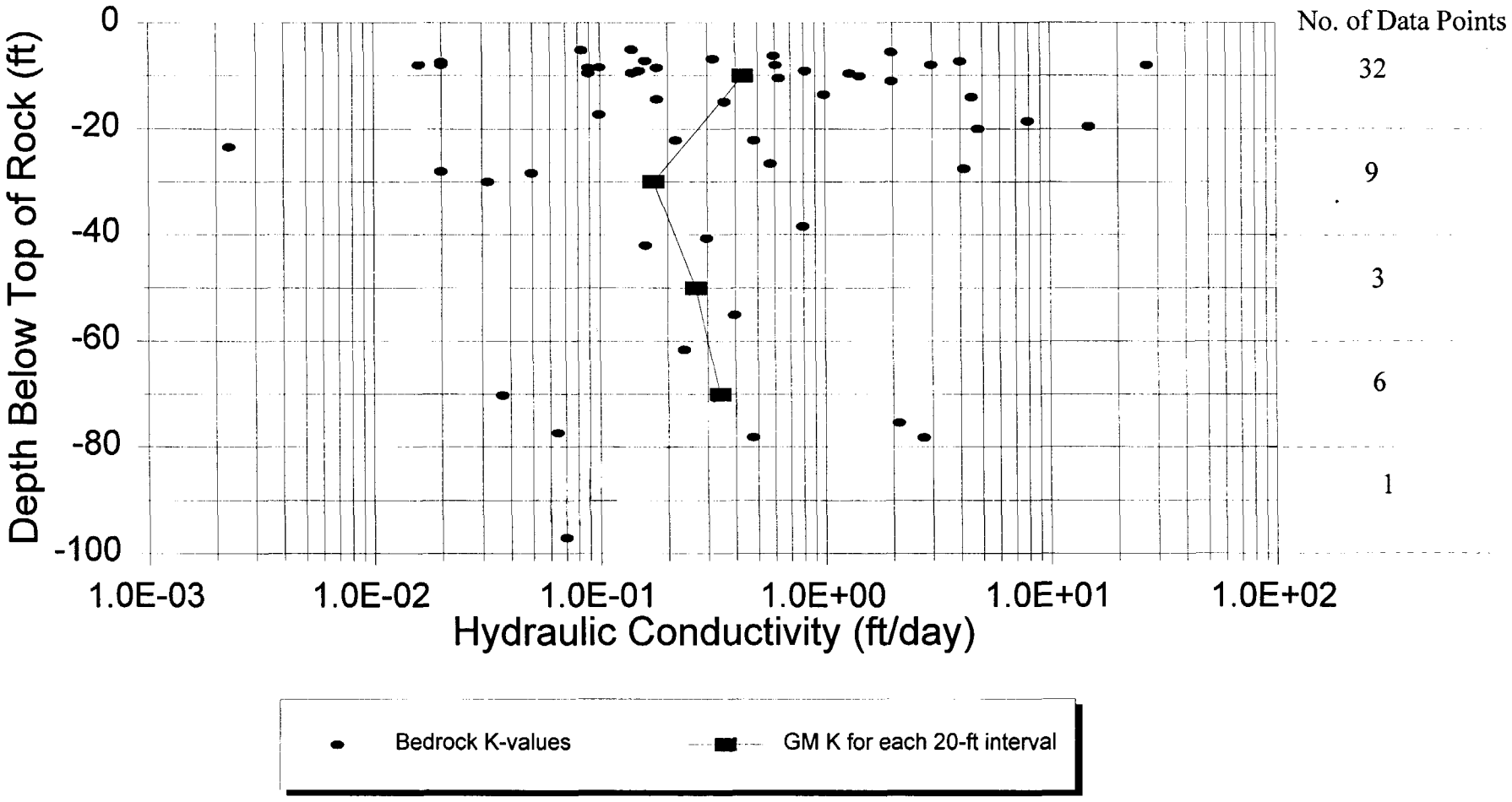


Appendix K

Bedrock Hydraulic Conductivity Histogram and Vertical Distribution


HISTOGRAM OF BEDROCK K-VALUES
SRSNE SITE -- SOUTHINGTON, CONNECTICUT
Geometric Mean: 0.35 ft/day
Frequency
25
20
15
10
5
0
0.001
0.01
0.1
1
10
100
Hydraulic Conductivity Range (ft/day)

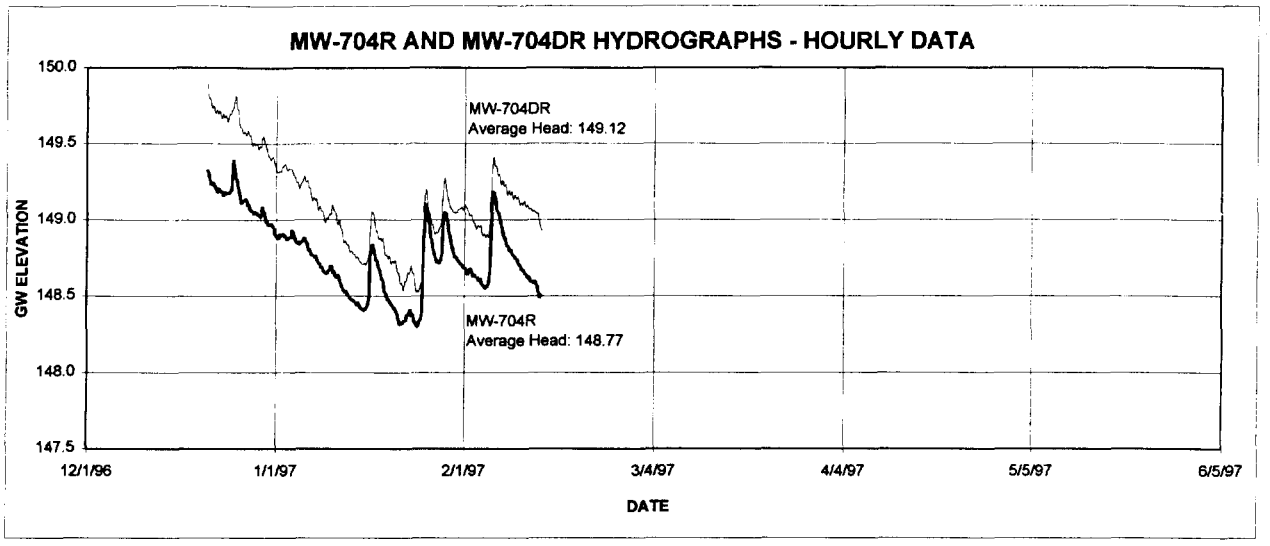
BEDROCK K-VALUES vs. DEPTH BELOW TOR
SRSNE SITE -- SOUTHINGTON, CT

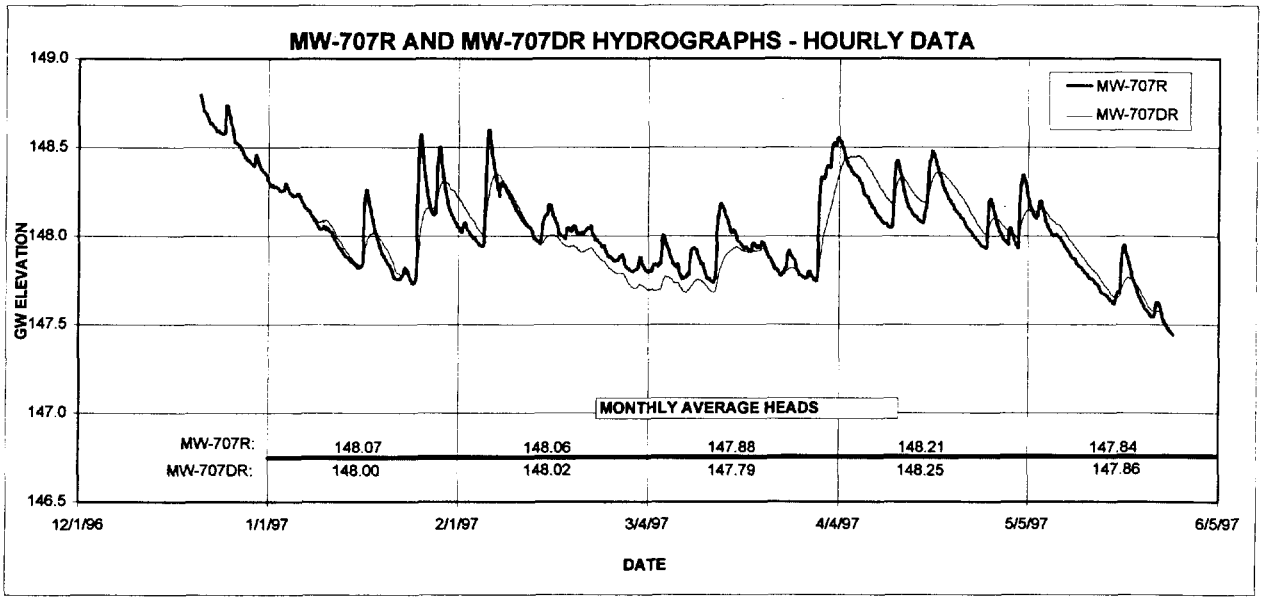


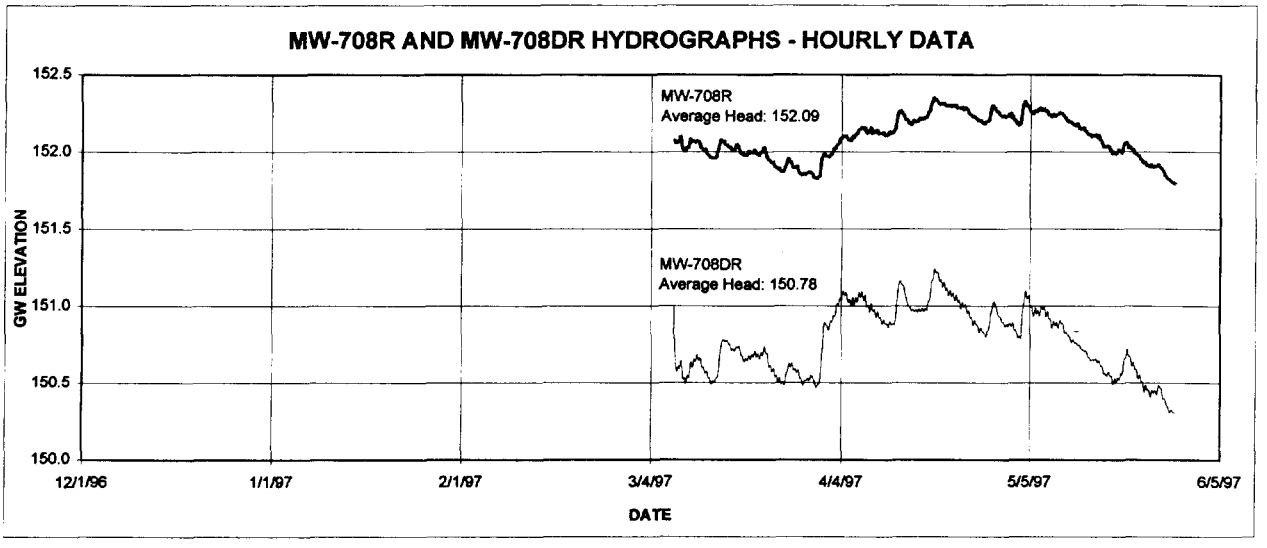
Note: GM is geometric mean, TOR is top of rock

Appendix L

Shallow and Deep Bedrock Hydrographs


MW-704R AND MW-704DR HYDROGRAPHS - HOURLY DATA
MW-704DR
Average Head: 149.12
MW-704R
Average Head: 148.77
GW ELEVATION
150.0
149.5
149.0
148.5
148.0
147.5
12/1/96
1/1/97
2/1/97
3/4/97
4/4/97
5/5/97
6/5/97
DATE


MW-707R AND MW-707DR HYDROGRAPHS - HOURLY DATA
MW-707R
MW-707DR
GW ELEVATION
149.0
148.5
148.0
147.5
147.0
146.5
MONTHLY AVERAGE HEADS
MW-707R: 148.07 148.06 147.88 148.21 147.84
MW-707DR: 148.00 148.02 147.79 148.25 147.86
12/1/96
1/1/97
2/1/97
3/4/97
4/4/97
5/5/97
6/5/97
DATE


MW-708R AND MW-708DR HYDROGRAPHS - HOURLY DATA
MW-708R
Average Head: 152.09
MW-708DR
Average Head: 150.78
GW ELEVATION
152.5
152.0
151.5
151.0
150.5
150.0
12/1/96
1/1/97
2/1/97
3/4/97
4/4/97
5/5/97
6/5/97
DATE

Appendix M

Database Output Tables and Figures Used in NAPL Delineation, VOC Mass Estimates, and CT DEP RSR Screening

Database Output Tables Used in NAPL Delineation

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
NAPL DELINEATION - VADOSE SOILS - MATHEMATICAL

X	Y	Z	LOCID	DEPTH	DETECTS	%ES	NAPL
565121.48	286149.67	162.43	B-15	4.0 - 6.0'	7	8.41	N
565115.95	286478.89	165.22	B-477	0.5 - 1.0'	7	78.84	N
565127.06	286322.15	163.47	B-479	2.0 - 3.0'	2	49.19	N
565089.86	286324.77	162.65	B-480	3.5 - 4.0'	7	1.64	N
565116.26	286250.88	162.47	B-484	3.5 - 4.0'	10	0.74	N
565103	286209.1	164.69	B-8	1.0 - 3.0'	7	1.19	N
565095.57	286365.62	161.01	MW-488	5.0 - 6.0'	10	7.57	N
565103.9101	286130.0856	168.0058	SC-1	1.0 - 3.0'	5	0.01	N
565126.9443	286467.4409	163.9324	SC-10	1.0 - 3.0'	6	18.36	N
565102.314	286345.9229	164.4956	SC-11	1.0 - 3.0'	5	4.58	N
565098.9205	286402.0614	165.0126	SC-12	1.0 - 3.0'	7	36.58	N
565090.4124	286577.8861	164.0709	SC-13	1.0 - 3.0'	6	0.01	N
565087.12	286246.1645	165.0048	SC-14	1.0 - 3.0'	7	0.16	N
565060.8426	286435.5367	165.327	SC-15	1.0 - 3.0'	4	12.42	N
565062.063	286236.028	165.961	SC-16	1.0 - 3.0'	7	0.06	N
565005.0655	286269.295	171.1502	SC-17	1.0 - 3.0'	4	0.00	N
565029.0014	286312.2255	167.2807	SC-18	1.0 - 3.0'	6	2.46	N
565044.6807	286405.5965	165.839	SC-19	1.0 - 3.0'	9	50.18	N
565124.1653	286190.4061	164.6052	SC-2	1.0 - 3.0'	8	0.00	N
565018.7874	286406.0243	166.0117	SC-20	1.0 - 3.0'	6	9.46	N
564961.8461	286377.8847	168.3373	SC-21	1.0 - 3.0'	3	0.00	N
564956.205	286428.5349	167.9701	SC-22	1.0 - 3.0'	5	0.01	N
565120.0754	286248.2745	164.0237	SC-3	1.0 - 3.0'	12	0.05	N
565115.7943	286298.6034	164.194	SC-4	1.0 - 3.0'	10	4.89	N
565138.2797	286348.1474	162.4688	SC-5	1.0 - 3.0'	7	0.03	N
565137.0462	286384.8904	162.6496	SC-6	1.0 - 3.0'	7	68.71	N
565125.6829	286402.9141	164.7282	SC-7-	1.0 - 3.0'	9	0.49	N
565131.564	286428.5763	163.0628	SC-8	1.0 - 3.0'	7	19.32	N
565114.8803	286447.0164	160.9055	SC-9	5.0 - 6.0'	10	0.64	N
565114.8803	286447.0164	164.4055	SC-9	1.0 - 3.0'	11	14.90	N
565174.0171	286688.5743	161.75	SD1-03	0.0 - 0.5'	0	0.00	N
565164.8797	286529.6109	159.8217	SD1-04	0.0 - 0.5'	13	1.39	N
565154.2033	286295.1263	160.4589	SD3-24	2.0 - 3.0'	6	0.01	N
565154.2033	286295.1263	161.4589	SD3-24	1.0 - 2.0'	6	0.00	N
565154.2033	286295.1263	162.4589	SD3-24	0.0 - 1.0'	7	0.00	N
565168.8446	286499.8981	159.3575	SD3-25	1.0 - 2.0'	8	10.74	N
565168.8446	286499.8981	159.3975	SD3-25	1.25 - 1.67'	11	3.86	N
565168.8446	286499.8981	160.3575	SD3-25	0.0 - 1.0'	12	0.40	N
565212.8145	286604.4892	159.0175	SD3-39	1.0 - 2.0'	0	0.00	N
565212.8145	286604.4892	160.0175	SD3-39	0.0 - 1.0'	0	0.00	N
565106.66	286376.49	165.62	SP-485	0.0 - 1.0'	8	23.74	N
565259.8578	286929.6815	161.1354	SS3-A1	0.0 - 0.5'	0	0.00	N
565162.7391	284922.8142	151.5186	SS3-A11	0.0 - 0.5'	0	0.00	N
565261.115	286741.1361	160.4245	SS3-A2	0.0 - 0.5'	0	0.00	N
565239	286520	160.75	SS3-A3	0.0 - 0.5'	0	0.00	N
565247.0474	286340.2091	159.7417	SS3-A4	0.0 - 0.5'	0	0.00	N
565243.5768	286157.7652	157.0076	SS3-A5	0.0 - 0.5'	0	0.00	N

SRSNE SITE
SOUTHINGTON, CONNECTICUT
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NAPL DELINEATION - VADOSE SOILS - MATHEMATICAL

X	Y	Z	LOCID	DEPTH	DETECTS	%ES	NAPL
565167.8993	285759.3688	160.5182	SS3-A7	0.0 - 0.5'	0	0.00	N
565167.7387	285342.1237	156.1859	SS3-A9	0.0 - 0.5'	0	0.00	N
565364.8845	284922.7938	154.0507	SS3-B11	0.0 - 0.5'	0	0.00	N
565547.1117	286338.4927	168.6816	SS3-B4	0.0 - 0.5'	0	0.00	N
565553.7573	286124.7213	159.2415	SS3-B5	0.0 - 0.5'	0	0.00	N
565365.9823	285764.8398	151.75	SS3-B7	0.0 - 0.5'	0	0.00	N

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
NAPL DELINEATION - VADOSE SOILS - EMPIRICAL

LOCID	X	Y	Z	DEPTH	DETECTS	100%	NAPL100%
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	7	1	N
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	7	2	N
B-479	565127.06	286322.15	163.47	2.0 - 3.0'	2	1	N
B-480	565089.86	286324.77	162.65	3.5 - 4.0'	7	0	N
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	9	0	N
B-8	565103	286209.1	164.69	1.0 - 3.0'	7	0	N
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	9	2	N
SC-1	565103.9101	286130.0856	168.0058	1.0 - 3.0'	5	0	N
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	6	1	N
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	5	1	N
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	7	2	N
SC-13	565090.4124	286577.8861	164.0709	1.0 - 3.0'	6	0	N
SC-14	565087.12	286246.1645	165.0048	1.0 - 3.0'	7	0	N
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	4	1	N
SC-16	565062.063	286236.028	165.961	1.0 - 3.0'	6	0	N
SC-17	565005.0655	286269.295	171.1502	1.0 - 3.0'	3	0	N
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	5	0	N
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	8	4	Y
SC-2	565124.1653	286190.4061	164.6052	1.0 - 3.0'	7	0	N
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	6	1	N
SC-21	564961.8461	286377.8847	168.3373	1.0 - 3.0'	3	0	N
SC-22	564956.205	286428.5349	167.9701	1.0 - 3.0'	5	0	N
SC-3	565120.0754	286248.2745	164.0237	1.0 - 3.0'	9	0	N
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	9	1	N
SC-5	565138.2797	286348.1474	162.4688	1.0 - 3.0'	6	0	N
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	7	2	N
SC-7	565125.6829	286402.9141	164.7282	1.0 - 3.0'	8	0	N
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	7	2	N
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	9	0	N
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	10	2	N
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	0	0	N
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	11	0	N
SD3-24	565154.2033	286295.1263	160.4589	2.0 - 3.0'	6	0	N
SD3-24	565154.2033	286295.1263	161.4589	1.0 - 2.0'	6	0	N
SD3-24	565154.2033	286295.1263	162.4589	0.0 - 1.0'	7	0	N
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	7	1	N
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	9	0	N
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	9	0	N
SD3-39	565212.8145	286604.4892	159.0175	1.0 - 2.0'	0	0	N
SD3-39	565212.8145	286604.4892	160.0175	0.0 - 1.0'	0	0	N
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	8	2	N
SS3-A1	565259.8578	286929.6815	161.1354	0.0 - 0.5'	0	0	N
SS3-A11	565162.7391	284922.8142	151.5186	0.0 - 0.5'	0	0	N
SS3-A2	565261.115	286741.1361	160.4245	0.0 - 0.5'	0	0	N
SS3-A3	565239	286520	160.75	0.0 - 0.5'	0	0	N
SS3-A4	565247.0474	286340.2091	159.7417	0.0 - 0.5'	0	0	N
SS3-A5	565243.5768	286157.7652	157.0076	0.0 - 0.5'	0	0	N

SRSNE SITE
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NAPL DELINEATION - VADOSE SOILS - EMPIRICAL

LOCID	X	Y	Z	DEPTH	DETECTS	100%	NAPL100%
SS3-A7	565167.8993	285759.3688	160.5182	0.0 - 0.5'	0	0	N
SS3-A9	565167.7387	285342.1237	156.1859	0.0 - 0.5'	0	0	N
SS3-B11	565364.8845	284922.7938	154.0507	0.0 - 0.5'	0	0	N
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	0	0	N
SS3-B5	565553.7573	286124.7213	159.2415	0.0 - 0.5'	0	0	N
SS3-B7	565365.9823	285764.8398	151.75	0.0 - 0.5'	0	0	N

SRSNE SITE
SOUTHINGTON, CONNECTICUT
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NAPL DELINEATION - SATURATED SOILS - MATHEMATICAL

X	Y	Z	LOCID	DEPTH	DETECTS	%ES	NAPL
565030.6	286418.8	156.92	B-1	9.0 - 11'	15	35.85	Y
565356.84	286802.15	158.77	B-10	0.0 - 2.0'	0	0.00	N
565095.4	286283.3	158.56	B-14	7.0 - 9.0'	5	0.12	N
565089.5	286347.1	154.51	B-16	11 - 13'	13	5.82	Y
565050.77	286435.68	156.72	B-2	9.0 - 11'	17	61.79	Y
565435.9	286110.3	139.35	B-3	10 - 12'	5	0.09	N
565035.7	286606.7	151.58	B-4	15 - 16'	0	0.00	N
565117.86	286411.71	156.97	B-478	9.0 - 9.5'	8	98.92	Y
565127.06	286322.15	157.47	B-479	8.0 - 9.0'	8	23.12	Y
565053.89	286435.99	157.86	B-481	8.0 - 9.5'	8	77.21	Y
565058.57	286395.82	158.17	B-482	8.0 - 9.0'	8	108.96	Y
565046.56	286273.27	158.36	B-483	8.0 - 9.0'	10	1.14	Y
565014.7	286370.3	162.95	B-5	3 - 5'	9	20.93	Y
565032.4	286385.5	158.89	B-7	7.0 - 9.0'	10	30.58	Y
565119.98	286469.36	158.95	G-442	6.0 - 8.0'	11	20.03	Y
565120.56	286370.63	159.06	G-444	6.0 - 8.0'	10	12.42	Y
565112.1	286269.74	154.23	G-446	11 - 13'	6	3.00	Y
565112.1	286269.74	159.23	G-446	6.0 - 8.0'	10	516.10	Y
565067.87	286414.8	154.5	G-452	11 - 13'	8	292.57	Y
565016.68	286361.28	159.76	G-461	6.0 - 8.0'	7	62.76	Y
565535	285826	106.12	MW-121C	44 - 46'	0	0.00	N
565274	286126	153.72	MW-123C	2.0 - 4.0'	2	0.00	N
565238	285852	144.98	MW-124C	10 - 12'	0	0.00	N
565402	286382	134.97	MW-125C	20 - 22'	3	0.01	N
565122.7	287011.1	151.78	MW-126C	10 - 12'	1	0.00	N
565404	285081	93.08	MW-127C	54 - 55'	0	0.00	N
565211	285319	104.43	MW-128	50 - 52'	0	0.00	N
565095.57	286365.62	157.01	MW-488	9.0 - 10.0'	8	32.71	Y
565315.813	286803.147	149.84	P-10	10 - 12'	1	0.00	N
565321.3	287115.3	156.27	P-12	4.0 - 6.0'	0	0.00	N
565129.2	286518.3	150.35	P-16	14 - 16'	5	0.00	N
565124.3	286367.5	154.2	P-1A	11 - 13'	8	238.61	Y
565118.5	286221.4	156.41	P-2A	9.0 - 11'	11	0.12	N
565008.3	286294	158.94	P-4A	8.0 - 10.0'	6	4.30	Y
565394	286291	150.33	P-5A	4.0 - 6.0'	6	0.10	N
565499.8	286293.5	135.74	P-6	16 - 18'	5	0.01	N
565439.1	286805.3	131.06	P-7	26 - 28'	0	0.00	N
564918.006	286063.514	164.72	P-8B	14 - 16'	0	0.00	N
565412	286584.1	124.66	P-9	32 - 34'	0	0.00	N
565264.6	286218.7	153.84	SB-701	2.0 - 4.0'	5	0.01	N
565288	286345.8	154.5	SB-702	2.0 - 4.0'	9	0.12	N
565260.7	286511.9	155.44	SB-703	2.0 - 4.0'	6	0.00	N
565087.12	286246.1645	161.5048	SC-14	5.0 - 6.0'	7	35.07	Y
565062.063	286236.028	162.461	SC-16	5.0 - 6.0'	6	38.56	Y
565029.0014	286312.2255	164.0307	SC-18	5.0 - 5.5'	2	0.00	N
565120.0754	286248.2745	160.5237	SC-3	5.0 - 6.0'	9	0.11	N
565115.7943	286298.6034	160.694	SC-4	5.0 - 6.0'	9	0.16	N

SRSNE SITE
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NAPL DELINEATION - SATURATED SOILS - MATHEMATICAL

X	Y	Z	LOCID	DEPTH	DETECTS	%ES	NAPL
565231.1429	286143.6775	155.9065	SD1-16	0.0 - 0.5'	0	0.00	N
565158.9668	286828.2456	159.1442	SD3-23	1.0 - 2.0'	0	0.00	N
565158.9668	286828.2456	160.1442	SD3-23	0.0 - 1.0'	0	0.00	N
565209.6459	286115.8933	157.3439	SD3-41	0.0 - 0.5'	2	0.00	N
565106.66	286376.49	157.62	SP-485	8.0 - 9.0'	8	67.15	Y
565511.4603	286962.0326	154.95	SS3-B1	0.0 - 0.5'	0	0.00	N
565529.8269	286760.8417	150.75	SS3-B2	0.0 - 0.5'	1	0.00	N
565542	286536	148.75	SS3-B3	0.0 - 0.5'	0	0.00	N

SRSNE SITE
SOUTHINGTON, CONNECTICUT
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NAPL DELINEATION - SATURATED SOIL - EMPIRICAL

X	Y	LOCID	DEPTH	DETECTS	1%	NAPL1%	10%	NAPL10%	100%	NAPL100%
565030.6	286418.8	B-1	9.0 - 11'	14	13	Y	8	Y	4	N
565356.84	286802.15	B-10	0.0 - 2.0'	0	0	N	0	N	0	N
565095.4	286283.3	B-14	7.0 - 9.0'	5	3	N	0	N	0	N
565089.5	286347.1	B-16	11 - 13'	13	10	Y	4	N	2	N
565050.77	286435.68	B-2	9.0 - 11'	14	13	Y	8	Y	3	N
565435.9	286110.3	B-3	10 - 12'	5	3	N	1	N	0	N
565035.7	286606.7	B-4	15 - 16'	0	0	N	0	N	0	N
565117.86	286411.71	B-478	9.0 - 9.5'	8	8	Y	8	Y	6	Y
565127.06	286322.15	B-479	8.0 - 9.0'	7	7	N	7	N	3	N
565053.89	286435.99	B-481	8.0 - 9.5'	8	8	Y	7	Y	5	Y
565058.57	286395.82	B-482	8.0 - 9.0'	8	8	Y	7	Y	6	Y
565046.56	286273.27	B-483	8.0 - 9.0'	10	8	Y	4	N	0	N
565014.7	286370.3	B-5	3 - 5'	8	8	Y	5	Y	2	N
565032.4	286385.5	B-7	7.0 - 9.0'	10	10	Y	6	Y	4	N
565119.98	286469.36	G-442	6.0 - 8.0'	10	10	Y	8	Y	2	N
565120.56	286370.63	G-444	6.0 - 8.0'	10	10	Y	8	Y	1	N
565112.1	286269.74	G-446	11 - 13'	6	6	N	4	N	0	N
565112.1	286269.74	G-446	6.0 - 8.0'	9	9	Y	9	Y	7	Y
565067.87	286414.8	G-452	11 - 13'	8	8	Y	8	Y	8	Y
565016.68	286361.28	G-461	6.0 - 8.0'	7	7	N	6	N	3	N
565535	285826	MW-121C	44 - 46'	0	0	N	0	N	0	N
565274	286126	MW-123C	2.0 - 4.0'	2	0	N	0	N	0	N
565238	285852	MW-124C	10 - 12'	0	0	N	0	N	0	N
565402	286382	MW-125C	20 - 22'	3	1	N	0	N	0	N
565122.7	287011.1	MW-126C	10 - 12'	1	0	N	0	N	0	N
565404	285081	MW-127C	54 - 55'	0	0	N	0	N	0	N
565211	285319	MW-128	50 - 52'	0	0	N	0	N	0	N
565095.57	286365.62	MW-488	9.0 - 10.0'	8	7	Y	6	Y	3	N
565315.813	286803.147	P-10	10 - 12'	1	0	N	0	N	0	N
565321.3	287115.3	P-12	4.0 - 6.0'	0	0	N	0	N	0	N
565129.2	286518.3	P-16	14 - 16'	5	0	N	0	N	0	N
565124.3	286367.5	P-1A	11 - 13'	8	8	Y	7	Y	5	Y
565118.5	286221.4	P-2A	9.0 - 11'	10	2	N	0	N	0	N
565008.3	286294	P-4A	8.0 - 10.0'	6	5	N	5	N	0	N
565394	286291	P-5A	4.0 - 6.0'	6	5	N	1	N	0	N
565499.8	286293.5	P-6	16 - 18'	5	1	N	1	N	0	N
565439.1	286805.3	P-7	26 - 28'	0	0	N	0	N	0	N
564918.006	286063.514	P-8B	14 - 16'	0	0	N	0	N	0	N
565412	286584.1	P-9	32 - 34'	0	0	N	0	N	0	N
565264.6	286218.7	SB-701	2.0 - 4.0'	4	0	N	0	N	0	N
565288	286345.8	SB-702	2.0 - 4.0'	7	1	N	0	N	0	N
565260.7	286511.9	SB-703	2.0 - 4.0'	4	0	N	0	N	0	N
565087.12	286246.1645	SC-14	5.0 - 6.0'	7	7	N	5	N	2	N
565062.063	286236.028	SC-16	5.0 - 6.0'	6	5	N	3	N	2	N
565029.0014	286312.2255	SC-18	5.0 - 5.5'	1	0	N	0	N	0	N
565120.0754	286248.2745	SC-3	5.0 - 6.0'	8	1	N	0	N	0	N
565115.7943	286298.6034	SC-4	5.0 - 6.0'	9	2	N	1	N	0	N
565231.1429	286143.6775	SD1-16	0.0 - 0.5'	0	0	N	0	N	0	N
565158.9668	286828.2456	SD3-23	1.0 - 2.0'	0	0	N	0	N	0	N
565158.9668	286828.2456	SD3-23	0.0 - 1.0'	0	0	N	0	N	0	N
565209.6459	286115.8933	SD3-41	0.0 - 0.5'	2	0	N	0	N	0	N
565106.66	286376.49	SP-485	8.0 - 9.0'	8	8	Y	7	Y	4	Y
565511.4603	286962.0326	SS3-B1	0.0 - 0.5'	0	0	N	0	N	0	N
565529.8269	286760.8417	SS3-B2	0.0 - 0.5'	1	0	N	0	N	0	N
565542	286536	SS3-B3	0.0 - 0.5'	0	0	N	0	N	0	N

SRSNE SITE
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REMEDIAL INVESTIGATION REPORT
NAPL DELINEATION - OVERBURDEN GROUND WATER - MATHEMATICAL

X	Y	Z	LOCID	DETECTS	%ES	NAPL
565212.4	286106.6	145.38	CPZ-1	3	0.00	N
565237.1	286643	144.4	CPZ-10	6	0.01	N
565215.8	286045.4	141.81	CPZ-2	9	0.02	N
565219	286090.4	141.58	CPZ-2A	6	0.01	N
565289.5	286162.5	140.06	CPZ-3	8	3.55	Y
565321.6	286091.6	139.01	CPZ-4	4	0.10	N
565300	286146.6	140.36	CPZ-4A	5	2.54	Y
565375.9	286312	139.37	CPZ-5	4	6.10	Y
565479.7	286325.3	134.61	CPZ-6	8	4.72	Y
565395.7	286321.2	138.74	CPZ-6A	4	4.44	Y
565343	286467.5	142.92	CPZ-7	4	0.46	N
565397.3	286528.7	141.75	CPZ-8	12	0.31	N
565229.5	286575.2	143.66	CPZ-9	13	0.88	N
565213.25	285074.5	120.3	CW-1-78	2	0.00	N
565407	285677	111.6	CW-2-75	3	0.10	N
565678	285115	122	CW-3-75	0	0.00	N
565162	284652	128.4	CW-3-78	2	0.00	N
565312	285355	118.1	CW-4-75	1	0.00	N
565155	284650	88.2	CW-4-78	2	0.00	N
565285.75	285029.5	118.1	CW-5-75	0	0.00	N
565251	284543	77	CW-5-78	2	0.00	N
565222	284832	107.6	CW-6-75	2	0.00	N
565396	284625	65.5	CW-6-78	2	0.00	N
565316	284843	93.8	CW-7-75	0	0.00	N
565366	284159	123.6	CW-7-78	0	0.00	N
565309.638	285710.854	130.02	CW-B-77	7	0.02	N
565227	286248		DN-1	8	2.02	Y
565211	286093	143.58	DN-2	9	0.03	N
565128	286040		DN-3	1	0.00	N
565619.9	286145.7	145.86	DP-1	1	0.00	N
565596.8	286323	143.83	DP-2	5	0.00	N
565577.7	286481	144.45	DP-3	3	0.00	N
565524	286654.5	145.37	DP-4	6	0.01	N
565602	287099.7	144.21	DP-5	1	0.00	N
565598.7	286885.5	144.54	DP-6	0	0.00	N
565281	285950	119	MW-01	10	0.03	N
565307	285338	96.3	MW-02	4	0.00	N
565509	285065	82.3	MW-03	7	0.00	N
565622	285470	87.8	MW-04	6	0.00	N
565660	286017	104.2	MW-06	6	0.07	N
565646	286028	117.8	MW-07	7	0.19	N
565654	286015	132.2	MW-08	3	0.00	N
565532	285817	103.96	MW-121B	9	0.87	N
565274	286126	144.22	MW-123C	3	0.01	N
565123.965	287008.085	152.79	MW-126B	1	0.00	N
565403	285087	105.86	MW-127B	3	0.00	N
565651.928	285568.675	75.74	MW-204B	3	0.00	N

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X	Y	Z	LOCID	DETECTS	%ES	NAPL
565551.381	284991.647	105.96	MW-205B	3	0.00	N
565319.649	286331.584	145.64	MW-409	7	22.59	Y
565278.298	286350.385	140.7	MW-413	9	22.93	Y
565275.191	286345.916	148.85	MW-415	18	5.87	Y
565837	286343	109.35	MW-501B	3	0.00	N
565838	286350	144.17	MW-501C	1	0.00	N
565495	286270	128.07	MW-502	5	5.04	Y
565300.136	285097.47	74.02	MW-703D	0	0.00	N
565299.1	285086.9	123.4	MW-703S	1	0.00	N
565540.246	285591.04	92.49	MW-704D	8	0.05	N
565557.088	285574.27	108.58	MW-704M	9	0.02	N
565557.2	285583.4	139.03	MW-704S	0	0.00	N
565421.487	286754.417	129.39	MW-705D	1	0.00	N
565599.017	285102.488	63.88	MW-707D	0	0.00	N
565605.095	285109.125	90.41	MW-707M	3	0.00	N
565607.5	285116.3	128.16	MW-707S	2	0.00	N
565228.187	286572.493	134.45	MWD-601	4	27.71	Y
565260.7	286598.2	152.82	MWL-301	11	0.02	N
565358.7	286602.7	153.15	MWL-302	3	0.00	N
565456.6	286604.3	150.96	MWL-303	4	0.00	N
565264.9	286466.1	151.96	MWL-304	4	2.60	Y
565353.7	286450	151.55	MWL-305	9	0.05	N
565501.6	286450.4	147.8	MWL-306	1	0.00	N
565259.4	286297.3	151.71	MWL-307	9	30.19	Y
565353.7	286304.5	149.88	MWL-308	2	1.05	Y
565504.9	286302.1	146.78	MWL-309	7	0.00	N
565350.6	286148.5	149.46	MWL-311	5	0.05	N
565509.1	286154	147.75	MWL-312	0	0.00	N
565351.8	285992	148.52	MWL-313	0	0.00	N
565502.2	286000.5	147.68	MWL-314	3	0.00	N
565315.813	286803.147	149.39	P-10	0	0.00	N
565674.879	286232.022	109.19	P-101B	4	7.83	Y
565676.3	286237.7	140.34	P-101C	5	0.00	N
565702.256	286465.014	114.74	P-102B	11	0.13	N
565702	286471.6	140.71	P-102C	0	0.00	N
565582.9	286219.6	140.72	P-11B	8	0.04	N
565321.3	287115.3	149.77	P-12	0	0.00	N
565242	285851	145.98	P-13	2	0.00	N
565129.2	286518.3	155.35	P-16	8	8.99	Y
565124.779	286371.502	152.9	P-1B	11	321.01	Y
565115.956	286223.494	152.91	P-2B	2	0.00	N
565569.9	286456.5	133.13	P-3B	5	1.30	Y
565010.51	286294.467	155.3	P-4B	6	66.17	Y
565391	286283	148.74	P-5B	8	0.05	N
565439.1	286805.3	144.06	P-7	0	0.00	N
564918.006	286063.514	162.32	P-8B	0	0.00	N
565412	286584.1	147.16	P-9	1	0.00	N

SRSNE SITE
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X	Y	Z	LOCID	DETECTS	%ES	NAPL
564950.989	286482.761	162.13	PZO-7	9	0.17	N
565194	285871	140.39	SRS-1	9	0.15	N
565200	285871	151.64	SRS-2	0	0.00	N
565394	285864	115.38	SRS-3	6	0.00	N
565392	285868	141.51	SRS-4	0	0.00	N
565529.69	285996.839	130.57	SRS-5	8	0.94	N
565577.595	286010.193	102.845	SRS-6	6	1.37	Y
565393	286384	135.4	TW-07A	8	3.01	Y
565387	286385	114.3	TW-07B	4	10.32	Y
565213	286406	148.9	TW-08A	8	8.13	Y
565282	285956	145.1	TW-11	4	0.01	N
565269	287366	140.5	TW-12	0	0.00	N
565220	286808	153.85	WE-2	2	0.00	N
565139	286144	158.6	WE-5	2	0.08	N

SRSNE SITE
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NAPL DELINEATION - OVERBURDEN
GROUNDWATER - EMPIRICAL

X	Y	Z	LOCID	DETECTS	1%	NAPL1%	10%	NAPL10%	100%	NAPL100%
565212.4	286106.6	145.38	CPZ-1	2	1	N	0	N	0	N
565237.1	286643	144.4	CPZ-10	6	0	N	0	N	0	N
565215.8	286045.4	141.81	CPZ-2	7	1	N	0	N	0	N
565219	286090.4	141.58	CPZ-2A	4	1	N	1	N	0	N
565289.5	286162.5	140.06	CPZ-3	5	5	N	5	N	1	N
565321.6	286091.6	139.01	CPZ-4	2	1	N	0	N	0	N
565300	286146.6	140.36	CPZ-4A	3	3	N	2	N	0	N
565375.9	286312	139.37	CPZ-5	3	3	N	3	N	1	N
565479.7	286325.3	134.61	CPZ-6	6	5	N	5	N	1	N
565395.7	286321.2	138.74	CPZ-6A	3	3	N	3	N	3	N
565343	286467.5	142.92	CPZ-7	3	3	N	2	N	0	N
565397.3	286528.7	141.75	CPZ-8	9	4	N	0	N	0	N
565229.5	286575.2	143.66	CPZ-9	9	7	Y	2	N	0	N
565213.25	285074.5	120.3	CW-1-78	2	0	N	0	N	0	N
565317	284256	102.4	CW-10-78	2	0	N	0	N	0	N
565407	285677	111.6	CW-2-75	3	3	N	1	N	0	N
565073	285036	136.5	CW-2-78	1	0	N	0	N	0	N
565678	285115	122	CW-3-75	0	0	N	0	N	0	N
565162	284652	128.4	CW-3-78	2	1	N	0	N	0	N
565312	285355	118.1	CW-4-75	1	0	N	0	N	0	N
565155	284650	88.2	CW-4-78	2	0	N	0	N	0	N
565285.75	285029.5	118.1	CW-5-75	0	0	N	0	N	0	N
565251	284543	77	CW-5-78	2	0	N	0	N	0	N
565222	284832	107.6	CW-6-75	2	0	N	0	N	0	N
565396	284625	65.5	CW-6-78	2	0	N	0	N	0	N
565316	284843	93.8	CW-7-75	0	0	N	0	N	0	N
565366	284159	123.6	CW-7-78	0	0	N	0	N	0	N
565457	284171	103.65	CW-8-78	0	0	N	0	N	0	N
565527	284271	122.5	CW-9-78	0	0	N	0	N	0	N
565309.638	285710.854	130.02	CW-B-77	7	1	N	0	N	0	N
565227	286248		DN-1	6	6	N	4	N	1	N
565211	286093	143.58	DN-2	7	2	N	1	N	0	N
565128	286040		DN-3	1	0	N	0	N	0	N
565619.9	286145.7	145.86	DP-1	1	0	N	0	N	0	N
565596.8	286323	143.83	DP-2	3	0	N	0	N	0	N
565577.7	286481	144.45	DP-3	2	1	N	0	N	0	N
565524	286654.5	145.37	DP-4	3	0	N	0	N	0	N
565602	287099.7	144.21	DP-5	1	0	N	0	N	0	N
565598.7	286885.5	144.54	DP-6	0	0	N	0	N	0	N
565281	285950	119	MW-01	6	3	N	1	N	0	N
565307	285338	96.3	MW-02	4	0	N	0	N	0	N
565509	285065	82.3	MW-03	4	0	N	0	N	0	N
565622	285470	87.8	MW-04	5	0	N	0	N	0	N
565660	286017	104.2	MW-06	3	2	N	1	N	0	N
565646	286028	117.8	MW-07	4	3	N	1	N	0	N
565654	286015	132.2	MW-08	1	0	N	0	N	0	N
565532	285817	103.96	MW-121B	7	6	N	3	N	0	N
565274	286126	144.22	MW-123C	2	0	N	0	N	0	N
565123.965	287008.085	152.79	MW-126B	1	0	N	0	N	0	N
565403	285087	105.86	MW-127B	2	1	N	0	N	0	N
565737.3	287694.4	139.48	MW-201B	1	0	N	0	N	0	N
566037.087	287224.854	68.78	MW-202B	0	0	N	0	N	0	N
566350.748	285358.657	88.47	MW-203B	0	0	N	0	N	0	N

SRSNE SITE
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NAPL DELINEATION - OVERBURDEN
GROUNDWATER - EMPIRICAL

X	Y	Z	LOCID	DETECTS	1%	NAPL1%	10%	NAPL10%	100%	NAPL100%
565651.928	285568.675	75.74	MW-204B	3	0	N	0	N	0	N
565551.381	284991.647	105.96	MW-205B	3	0	N	0	N	0	N
565726.344	284158.685	69.2	MW-206B	0	0	N	0	N	0	N
564582.176	286257.725	182.31	MW-209B	1	0	N	0	N	0	N
565319.649	286331.584	145.64	MW-409	6	6	N	6	N	5	N
565278.298	286350.385	140.7	MW-413	8	8	Y	8	Y	6	Y
565275.191	286345.916	148.85	MW-415	12	10	Y	9	Y	2	N
565837	286343	109.35	MW-501B	3	0	N	0	N	0	N
565838	286350	144.17	MW-501C	1	0	N	0	N	0	N
565495	286270	128.07	MW-502	4	4	N	4	N	2	N
565300.136	285097.47	74.02	MW-703D	0	0	N	0	N	0	N
565299.1	285086.9	123.4	MW-703S	1	0	N	0	N	0	N
565540.246	285591.04	92.49	MW-704D	5	2	N	0	N	0	N
565557.088	285574.27	108.58	MW-704M	7	1	N	0	N	0	N
565557.2	285583.4	139.03	MW-704S	0	0	N	0	N	0	N
565421.487	286754.417	129.39	MW-705D	1	0	N	0	N	0	N
565599.017	285102.488	63.88	MW-707D	0	0	N	0	N	0	N
565605.095	285109.125	90.41	MW-707M	2	0	N	0	N	0	N
565607.5	285116.3	128.16	MW-707S	2	0	N	0	N	0	N
566244.5	286405.1	101.4	MW-708M	0	0	N	0	N	0	N
566241.5	286418.1	133.2	MW-708S	0	0	N	0	N	0	N
566111.9	284847	127.8	MW-710S	1	0	N	0	N	0	N
565228.187	286572.493	134.45	MWD-601	4	4	N	4	N	1	N
565260.7	286598.2	152.82	MWL-301	8	1	N	0	N	0	N
565358.7	286602.7	153.15	MWL-302	3	0	N	0	N	0	N
565456.6	286604.3	150.96	MWL-303	4	0	N	0	N	0	N
565264.9	286466.1	151.96	MWL-304	3	3	N	2	N	0	N
565353.7	286450	151.55	MWL-305	6	2	N	1	N	0	N
565501.6	286450.4	147.8	MWL-306	0	0	N	0	N	0	N
565259.4	286297.3	151.71	MWL-307	7	7	N	7	N	7	N
565353.7	286304.5	149.88	MWL-308	1	1	N	1	N	1	N
565504.9	286302.1	146.78	MWL-309	3	0	N	0	N	0	N
565350.6	286148.5	149.46	MWL-311	4	1	N	0	N	0	N
565509.1	286154	147.75	MWL-312	0	0	N	0	N	0	N
565351.8	285992	148.52	MWL-313	0	0	N	0	N	0	N
565502.2	286000.5	147.68	MWL-314	2	0	N	0	N	0	N
565315.813	286803.147	149.39	P-10	0	0	N	0	N	0	N
565674.879	286232.022	109.19	P-101B	3	3	N	3	N	2	N
565676.3	286237.7	140.34	P-101C	1	1	N	0	N	0	N
565702.256	286465.014	114.74	P-102B	7	3	N	2	N	0	N
565702	286471.6	140.71	P-102C	0	0	N	0	N	0	N
565582.9	286219.6	140.72	P-11B	5	2	N	0	N	0	N
565321.3	287115.3	149.77	P-12	0	0	N	0	N	0	N
565242	285851	145.98	P-13	2	1	N	0	N	0	N
565129.2	286518.3	155.35	P-16	6	6	N	6	N	4	N
565124.779	286371.502	152.9	P-1B	8	7	Y	7	Y	7	Y
565115.956	286223.494	152.91	P-2B	2	0	N	0	N	0	N
565569.9	286456.5	133.13	P-3B	3	3	N	2	N	0	N
565010.51	286294.467	155.3	P-4B	6	6	N	6	N	5	N
565391	286283	148.74	P-5B	6	0	N	0	N	0	N
565439.1	286805.3	144.06	P-7	0	0	N	0	N	0	N
564918.006	286063.514	162.32	P-8B	0	0	N	0	N	0	N
565412	286584.1	147.16	P-9	1	0	N	0	N	0	N

SRSNE SITE
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NAPL DELINEATION - OVERBURDEN
GROUNDWATER - EMPIRICAL

X	Y	Z	LOCID	DETECTS	1%	NAPL1%	10%	NAPL10%	100%	NAPL100%
564950.989	286482.761	162.13	PZO-7	8	3	N	0	N	0	N
565264.529	286132.539	136.39	RW-1	4	4	N	2	N	1	N
565369.705	286333.156	135.42	RW-10	1	1	N	1	N	1	N
565353.658	286445.705	140.57	RW-11	8	8	Y	4	Y	1	N
565280.92	286161.46	137.36	RW-12	4	4	N	3	N	1	N
565376.635	286288.407	130.96	RW-2	1	1	N	1	N	1	N
565364.742	286383.951	133.79	RW-3	1	1	N	1	N	1	N
565314.029	286498.097	141.86	RW-4	0	0	N	0	N	0	N
565249.611	286569.781	143.3	RW-5	0	0	N	0	N	0	N
565225.015	286412.74	143.75	RW-6	1	1	N	1	N	1	N
565222.591	286112.959	143.46	RW-7	6	2	N	1	N	0	N
565303.742	286179.061	137.84	RW-8	1	1	N	1	N	1	N
565344.153	286237.798	135.83	RW-9	3	3	N	3	N	3	N
565194	285871	140.39	SRS-1	7	3	N	1	N	0	N
565200	285871	151.64	SRS-2	0	0	N	0	N	0	N
565394	285864	115.38	SRS-3	3	1	N	1	N	0	N
565392	285868	141.51	SRS-4	0	0	N	0	N	0	N
565529.69	285996.839	130.57	SRS-5	4	3	N	2	N	0	N
565577.595	286010.193	102.845	SRS-6	4	4	N	3	N	0	N
565344	284065	135.5	TW-01	3	0	N	0	N	0	N
565355	283770	139.3	TW-02	2	0	N	0	N	0	N
565268.6	284027.4	137.1	TW-03	4	0	N	0	N	0	N
565245	283814	138.9	TW-04	4	0	N	0	N	0	N
565149	284350	136.1	TW-05	6	1	N	0	N	0	N
565224	284480	139.5	TW-06	1	0	N	0	N	0	N
565393	286384	135.4	TW-07A	5	5	N	4	N	0	N
565387	286385	114.3	TW-07B	3	3	N	3	N	2	N
565213	286406	148.9	TW-08A	7	7	N	7	N	2	N
565282	285956	145.1	TW-11	4	1	N	0	N	0	N
565269	287366	140.5	TW-12	0	0	N	0	N	0	N
565220	286808	153.85	WE-2	2	0	N	0	N	0	N
565139	286144	158.6	WE-5	2	2	N	1	N	1	N

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
NAPL DELINEATION - BEDROCK GROUNDWATER - MATHEMATICAL

X	Y	Z	LOCID	DETECTS	%ES	NAPL
565232.7	286642	108.4	CPZ-10R	8	0.28	N
565208.8	286103.4	106.35	CPZ-1R	5	0.02	N
565216.8	286038.9	106.66	CPZ-2R	5	0.02	N
565286.4	286157.7	103.43	CPZ-3R	9	0.06	N
565322.1	286084.9	99.03	CPZ-4R	9	0.20	N
565374.5	286318.9	103.72	CPZ-5R	8	1.98	Y
565479.9	286317.5	92.34	CPZ-6R	2	0.01	N
565337.8	286471.9	105.79	CPZ-7R	9	147.37	Y
565394.9	286533	105.83	CPZ-8R	17	50.92	Y
565244.3	286575.2	114.17	CPZ-9R	5	75.12	Y
565281	285950	119	MW-01	10	0.03	N
565307	285338	96.3	MW-02	4	0.00	N
565622	285470	87.8	MW-04	6	0.00	N
565651	286030	75.9	MW-05	5	0.16	N
565539	285834	66.01	MW-121A	3	0.01	N
565535	285826	87.42	MW-121C	3	0.63	N
565279.6	286128.2	86.33	MW-123A	4	0.01	N
565238	285852	115.08	MW-124C	5	0.01	N
565403.4	286393.3	93.33	MW-125A	7	0.00	N
565402	286382	110.47	MW-125C	14	11.13	Y
565122.7	287011.1	133.78	MW-126C	0	0.00	N
565404	285081	51.08	MW-127C	6	0.01	N
565211	285319	95.43	MW-128	2	0.00	N
563866	286975	208.69	MW-129	2	0.19	N
565668.9	285566.5	47.33	MW-204A	13	0.11	N
565559.1	284996.7	21.79	MW-205A	5	0.00	N
565484.3	284175	42.7	MW-207A	0	0.00	N
565318.2	286324.4	115.58	MW-408	23	4.57	Y
565272.8	286339.5	118.29	MW-414	14	0.07	N
565264.4	286290.5	118.02	MW-416	16	0.44	N
565838	286346	80.76	MW-501A	5	0.01	N
564579	286253.5	97.45	MW-701DR	0	0.00	N
564912.5	286074.7	81.08	MW-702DR	3	0.00	N
565299.5	285072.8	-6.26	MW-703DR	0	0.00	N
565552.1	285564.5	33.55	MW-704DR	11	0.05	N
565568.3	285582.7	66.52	MW-704R	5	0.14	N
565429.3	286749.6	63.79	MW-705DR	14	118.61	Y
565422.3	286744.1	110.54	MW-705R	3	0.00	N
565667.6	286215.7	26.32	MW-706DR	12	0.78	N
565567.3	285123.7	-22.28	MW-707DR	0	0.00	N
565598.8	285115	33.91	MW-707R	0	0.00	N
565403	287091.8	34.6	MW-709DR	11	1.46	Y
565403	287091.8	101.6	MW-709R	1	0.07	N
565674.4	286226.2	67.05	P-101A	7	0.88	N
565701.7	286458.5	62.77	P-102A	5	0.01	N
565582.9	286219.6	88.8	P-11A	7	0.40	N
565321.2	287105.1	121.21	P-12A	1	0.00	N

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NAPL DELINEATION - BEDROCK GROUNDWATER - MATHEMATICAL

X	Y	Z	LOCID	DETECTS	%ES	NAPL
565582.4	286212.1	67.96	P-14	8	0.08	N
565124.3	286367.5	135.2	P-1A	14	0.20	N
565118.5	286221.4	139.41	P-2A	9	0.08	N
565575.6	286458.5	88.7	P-3A	10	9.27	Y
565008.3	286294	142.94	P-4A	7	0.02	N
565394	286291	107.83	P-5A	5	20.43	Y
565499.8	286293.5	100.24	P-6	14	9.16	Y
564921.2	286067.2	115.66	P-8A	1	0.00	N
564947.7	286482.8	133.2	PZR-7	0	0.00	N
565387	286385	114.3	TW-07B	4	10.32	Y
564984	286593	147	TW-09	2	0.00	N
564882	286403	150.1	TW-10	1	0.13	N
565220	286787	128.75	WE-1	0	0.00	N
565140	286142	134.7	WE-3	5	0.02	N

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X	Y	Z	LOCID	DETECTS	1%	NAPL1%	10%	NAPL10%	100%	NAPL100%
565232.7	286642	108.4	CPZ-10R	8	2	N	0	N	0	N
565208.8	286103.4	106.35	CPZ-1R	5	2	N	0	N	0	N
565216.8	286038.9	106.66	CPZ-2R	5	2	N	0	N	0	N
565286.4	286157.7	103.43	CPZ-3R	5	1	N	1	N	1	N
565322.1	286084.9	99.03	CPZ-4R	7	3	N	0	N	0	N
565374.5	286318.9	103.72	CPZ-5R	6	6	N	4	N	0	N
565479.9	286317.5	92.34	CPZ-6R	1	1	N	0	N	0	N
565337.8	286471.9	105.79	CPZ-7R	9	9	Y	9	Y	8	Y
565394.9	286533	105.83	CPZ-8R	13	13	Y	11	Y	6	N
565244.3	286575.2	114.17	CPZ-9R	5	5	N	5	N	4	N
565281	285950	119	MW-01	6	3	N	1	N	0	N
565307	285338	96.3	MW-02	4	0	N	0	N	0	N
565622	285470	87.8	MW-04	5	0	N	0	N	0	N
565651	286030	75.9	MW-05	2	2	N	1	N	0	N
565539	285834	66.01	MW-121A	2	1	N	0	N	0	N
565535	285826	87.42	MW-121C	2	2	N	2	N	0	N
565279.6	286128.2	86.33	MW-123A	4	0	N	0	N	0	N
565238	285852	115.08	MW-124C	5	1	N	0	N	0	N
565403.4	286393.3	93.33	MW-125A	6	0	N	0	N	0	N
565402	286382	110.47	MW-125C	12	11	Y	9	Y	6	Y
565122.7	287011.1	133.78	MW-126C	0	0	N	0	N	0	N
565404	285081	51.08	MW-127C	4	1	N	0	N	0	N
565211	285319	95.43	MW-128	1	0	N	0	N	0	N
563866	286975	208.69	MW-129	2	2	N	0	N	0	N
565732	287690	95.29	MW-201A	4	0	N	0	N	0	N
566031.4	287225	32.25	MW-202A	1	1	N	0	N	0	N
566355.3	285359.8	33.78	MW-203A	1	0	N	0	N	0	N
565668.9	285566.5	47.33	MW-204A	10	3	N	0	N	0	N
565559.1	284996.7	21.79	MW-205A	3	0	N	0	N	0	N
565731.5	284158.2	32.63	MW-206A	0	0	N	0	N	0	N
565484.3	284175	42.7	MW-207A	0	0	N	0	N	0	N
565678.1	283622	40.82	MW-208A	0	0	N	0	N	0	N
564581.9	286263.1	168.13	MW-209A	0	0	N	0	N	0	N
565318.2	286324.4	115.58	MW-408	14	11	Y	6	N	2	N
565272.8	286339.5	118.29	MW-414	11	2	N	0	N	0	N
565264.4	286290.5	118.02	MW-416	12	8	Y	2	N	1	N
565838	286346	80.76	MW-501A	5	1	N	0	N	0	N
564579	286253.5	97.45	MW-701DR	0	0	N	0	N	0	N
564912.5	286074.7	81.08	MW-702DR	3	0	N	0	N	0	N
565299.5	285072.8	-6.26	MW-703DR	0	0	N	0	N	0	N
565552.1	285564.5	33.55	MW-704DR	9	2	N	0	N	0	N
565568.3	285582.7	66.52	MW-704R	4	3	N	0	N	0	N
565429.3	286749.6	63.79	MW-705DR	14	14	Y	14	Y	14	Y
565422.3	286744.1	110.54	MW-705R	3	0	N	0	N	0	N
565667.6	286215.7	26.32	MW-706DR	9	3	N	0	N	0	N
565567.3	285123.7	-22.28	MW-707DR	0	0	N	0	N	0	N
565598.8	285115	33.91	MW-707R	0	0	N	0	N	0	N
566250.8	286423.6	-30.1	MW-708DR	0	0	N	0	N	0	N
566253.6	286408.2	37.9	MW-708R	0	0	N	0	N	0	N
565403	287091.8	34.6	MW-709DR	9	9	Y	3	N	0	N
565403	287091.8	101.6	MW-709R	1	1	N	1	N	0	N
566112.9	284856.6	-31.5	MW-710DR	3	0	N	0	N	0	N
566109.6	284835.7	26.5	MW-710R	4	0	N	0	N	0	N
565674.4	286226.2	67.05	P-101A	2	2	N	2	N	0	N
565701.7	286458.5	62.77	P-102A	4	0	N	0	N	0	N

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X	Y	Z	LOCID	DETECTS	1%	NAPL1%	10%	NAPL10%	100%	NAPL100%
565582.9	286219.6	88.8	P-11A	4	3	N	1	N	0	N
565321.2	287105.1	121.21	P-12A	1	0	N	0	N	0	N
565582.4	286212.1	67.96	P-14	5	3	N	0	N	0	N
564917	285631.5	150.18	P-15	1	0	N	0	N	0	N
565124.3	286367.5	135.2	P-1A	10	7	Y	1	N	0	N
565118.5	286221.4	139.41	P-2A	7	3	N	1	N	0	N
565575.6	286458.5	88.7	P-3A	8	7	Y	6	Y	3	N
565008.3	286294	142.94	P-4A	5	1	N	0	N	0	N
565394	286291	107.83	P-5A	4	4	N	4	N	3	N
565499.8	286293.5	100.24	P-6	8	7	Y	7	Y	3	N
564921.2	286067.2	115.66	P-8A	1	0	N	0	N	0	N
564947.7	286482.8	133.2	PZR-7	0	0	N	0	N	0	N
565387	286385	114.3	TW-07B	3	3	N	3	N	2	N
564984	286593	147	TW-09	2	0	N	0	N	0	N
564882	286403	150.1	TW-10	1	1	N	0	N	0	N
565220	286787	128.75	WE-1	0	0	N	0	N	0	N
565140	286142	134.7	WE-3	5	2	N	1	N	0	N

Tables and Figures Used in VOC Mass Estimates

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SUMMARY OF ESTIMATED VOC MASS DISTRIBUTION IN THE VADOSE ZONE AND SATURATED OVERBURDEN AND BEDROCK

							Low-End of Range			High-End of Range			Mean of High and Low		
Range in Conc. (ppm)	Surface Area of Conc. Range (ft2)	Est'd. Zone Thickness (ft)	Zone Volume (L)	Aqueous Volume (L)	Dry-Weight Solid Mass (Kg)	Mean Zone Conc. (ppm)	Zone VOC Mass (Kg)	Equiv. NAPL Vol. (gal)	% of Total Subsurface VOC Mass	Zone VOC Mass (Kg)	Equiv. NAPL Vol. (gal)	% of Total Subsurface VOC Mass	Zone VOC Mass (Kg)	Equiv. NAPL Vol. (gal)	% of Total Subsurface VOC Mass
													Based on Mean of the Low and High VOC Mass and Equiv. NAPL Volume		
VOC Mass Dissolved, Sorbed, and NAPL in the Vadose Zone															
0.01 - 0.1	24,142	8	5,469,612	-	10,611,046	0.032	0.3	0.1		0.3	0.1				
0.1 - 1	20,546	8	4,654,902	-	9,030,509	0.32	2.9	0.7		2.9	0.7				
1 - 10	20,345	8	4,609,363	-	8,942,165	3.2	28.3	6.8		28.3	6.8				
10 - 100	20,272	8	4,592,824	-	8,910,079	32	281.8	67.7		281.8	67.7				
100 - 1000	17,609	8	3,989,495	-	7,739,620	316	2447.5	587.8		2447.5	587.8				
> 1000	1,245	8	282,067	-	547,210	1285	703.3	168.9		703.3	168.9				
Estimated NAPL VOC Mass in the Vadose Zone							776	186	0.20	1,731	416	0.04	1,254	301	0.056
Total VOC Mass in Vadose Zone							3464	832	0.90	3,464	832	0.08	3,464	832	0.16
Dissolved VOC Mass in the Shallow Overburden															
0.01 - 0.1	317,280	10	89,853,696	24,709,768	-	0.032	1			1					
0.1 - 1	173,801	10	49,220,443	13,535,622	-	0.32	4			4					
1 - 10	69,966	10	19,814,371	5,448,952	-	3.2	17			17					
10 - 100	67,677	10	19,166,126	5,270,685	-	32	167			167					
> 100	1,866	10	528,451	145,324	-	132	19			19					
Subtotal							208	50	0.05	208	50	0.005	208	50	0.009
Sorbed VOC Mass in the Shallow Overburden										0					
0.01 - 0.1	168,428	10	47,698,810	-	92,535,691	0.032	3			3					
0.1 - 1	98,073	10	27,774,274	-	53,882,091	0.32	17			17					
1 - 10	49,576	10	14,039,923	-	27,237,451	3.2	86			86					
10 - 100	38,155	10	10,805,496	-	20,962,662	32	663			663					
> 100	955	10	270,456	-	524,685	121	64			64					
Subtotal							833	200	0.22	833	200	0.02	833	200	0.04
Dissolved VOC Mass in the Middle Overburden															
0.01 - 0.1	388,834	10	110,117,789	30,282,392	-	0.032	1			1					
0.1 - 1	262,437	10	74,322,158	20,438,594	-	0.32	6			6					
1 - 10	204,147	10	57,814,430	15,898,968	-	3.2	50			50					
10 - 100	129,688	10	36,727,642	10,100,101	-	32	319			319					
100 - 1000	27,490	10	7,785,168	2,140,921	-	316	677			677					
> 1000	300	10	84,960	23,364	-	1159	27			27					
Subtotal							1,081	260	0.28	1,081	260	0.03	1,081	200	0.05
Sorbed VOC Mass in the Middle Overburden															
0.01 - 0.1	260,227	10	73,696,286	-	142,970,796	0.032	5			5					
0.1 - 1	215,299	10	60,972,677	-	118,286,993	0.32	37			37					
1 - 10	155,817	10	44,127,374	-	85,607,106	3.2	271			271					
10 - 100	126,486	10	35,820,835	-	69,492,420	32	2,198			2,198					
100 - 1000	19,621	10	5,556,667	-	10,779,934	316	3,409			3,409					
> 1000	280	10	79,296	-	153,834	1197	184			184					
Subtotal							6,103	1,466	1.59	6,103	1466	0.19	6,103	1,466	0.27
Dissolved VOC Mass in the Deep Overburden															
0.01 - 0.1	411,767	10	116,612,414	32,066,414	-	0.032	1			1					
0.1 - 1	279,865	10	79,257,766	21,795,886	-	0.32	7			7					
1 - 10	182,477	10	51,677,486	14,211,309	-	3.2	45			45					
10 - 100	82,032	10	23,231,462	6,388,652	-	32	202			202					
> 100	15,812	10	4,477,958	1,231,439	-	301	370			370					
Subtotal							625	150	0.16	625	150	0.02	625	150	0.03
Sorbed VOC Mass in the Deep Overburden															
0.01 - 0.1	234,159	10	66,313,829	-	128,648,828	0.032	4			4					
0.1 - 1	202,700	10	57,404,640	-	111,365,002	0.32	35			35					
1 - 10	145,301	10	41,149,243	-	79,829,532	3.2	252			252					
10 - 100	85,294	10	24,155,261	-	46,861,206	32	1,482			1,482					
> 100	9,298	10	2,633,194	-	5,108,396	115	587			587					
Subtotal							2,361	567	0.62	2,361	567	0.06	2,361	567	0.10
Estimated Range of Total NAPL Mass in Saturated Portion of the Probable Overburden NAPL Zone								R = 0.0025			R = 0.03				
OVB NAPL	214,000	20	121,209,600	Liters of Water - Saturated Soil			333,326	80,059	86.9	3,999,917	960,710	97.0	2,166,622	520,385	96.1
Estimated Total Combined VOC Mass in the Saturated Overburden							344,538	82,752	89.9	4,011,128	963,403	97.3	2,177,833	523,077	96.6

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							Low-End of Range			High-End of Range			Mean of High and Low		
Range in Conc. (ppm)	Surface Area of Conc. Range (ft2)	Est'd. Zone Thickness (ft)	Zone Volume (L)	Aqueous Volume (L)	Dry-Weight Solid Mass (Kg)	Mean Zone Conc. (ppm)	Zone VOC Mass (Kg)	Equiv. NAPL Vol. (gal)	% of Total Subsurface VOC Mass	Zone VOC Mass (Kg)	Equiv. NAPL Vol. (gal)	% of Total Subsurface VOC Mass	Zone VOC Mass (Kg)	Equiv. NAPL Vol. (gal)	% of Total Subsurface VOC Mass
													Based on Mean of the Low and High		
VOC Mass Estimates for Bedrock							Based on Matrix VOC Samples			Maximum Matrix Storage Capacity					
Dissolved VOC Mass in Shallow Bedrock (Computations Below for High-End Estimate)															
0.01 - 0.1	413,668	40	468,603,110	36,082,440	-	0.032				1					
0.1 - 1	616,313	40	698,159,366	53,758,271	-	0.32				17					
1 - 10	212,957	40	241,237,690	18,575,302	-	3.2	Minimum Mass Dissolved and Sorbed in Bedrock Matrix Assumed Equal to Mean Total VOC Concentration in Bedrock Matrix Samples with VOCs Detected (0.655 mg/kg) x Total Volume of Plume with Dissolved Total VOC Conc Above 1 mg/L (approx 1.33E09 L) x Bedrock Bulk Density (2.52 g/cm^3) / Conversion Factor (1E6).			59					
10 - 100	98,799	40	111,919,507	8,617,802	-	32				273					
> 100	34,809	40	39,431,635	3,036,236	-	323				981					
Subtotal										1,331	320	0.0			
Sorbed VOC Mass in Shallow Bedrock (Computations for High-End Estimate)															
0.01 - 0.1	456,087	40	516,655,354	-	1,301,971,491	0.032				41					
0.1 - 1	569,148	40	644,730,854	-	1,624,721,753	0.32				514					
1 - 10	140,944	40	159,661,363	-	402,346,635	3.2				1,272					
10 - 100	96,279	40	109,064,851	-	274,843,425	32				8,691					
> 100	29,145	40	33,015,456	-	83,198,949	296				24,648					
Subtotal										35,167	8,446	0.9			
Dissolved VOC Mass in Deep Bedrock (Computations for High-End Estimate)															
0.01 - 0.1	364,053	60	618,598,858	47,632,112	-	0.032				2					
0.1 - 1	381,149	60	647,648,381	49,868,925	-	0.32				16					
1 - 10	304,142	60	516,798,086	39,793,453	-	3.2				126					
10 - 100	139,752	60	237,466,598	18,284,928	-	32				578					
100 - 1000	29,102	60	49,450,118	3,807,659	-	316				1,204					
> 1000	45	60	76,464	5,888	-	1049				6					
Subtotal										1,932	464	0.0			
Sorbed VOC Mass in Deep Bedrock (Computations for High-End Estimate)															
0.01 - 0.1	338,489	60	575,160,509	-	1,449,404,482	0.032				46					
0.1 - 1	394,602	60	670,507,718	-	1,689,679,450	0.32				534					
1 - 10	309,083	60	525,193,634	-	1,323,488,461	3.2				4,185					
10 - 100	79,196	60	134,569,843	-	339,116,005	32				10,724					
> 100	19,517	60	33,163,286	-	83,571,482	268				22,405					
Subtotal										37,894	9,102	0.92			
Total Sorbed and Dissolved VOC Mass in Bedrock							2,195	527	0.57	76,323	18,331	1.85	39,259	9,429	1.7
Total NAPL in Probable Bedrock NAPL Zone															
BDRK NAPL	260,000	100	736,320,000 Liters of Water-Saturated Rock				33,208	7,976	8.66	33,208	7,976	0.81	33,208	7,976	1.5
Estimated Total Combined VOC Mass in the Bedrock							35,403	8,503	9.23	109,531	26,307	2.66	72,467	17,405	3.2
ESTIMATED TOTAL VOC MASS IN THE SUBSURFACE							383,405	92,087	100.0	4,124,123	990,542	100.0	2,253,764	541,315	100.0

Notes:

NAPL density estimated as 1.1 g/mL for conversion from NAPL volume to VOC mass based on three site-specific DNAPL density measurements, which ranged from 1.10 to 1.23 g/mL. LNAPL has also been observed, but its density has not been measured.

Porosity for the overburden and bedrock assumed to be equal to 0.275 and 0.077, respectively, based on data collected during the completion of the RI.

Bulk density for the overburden and bedrock assumed to be equal to 1.94 and 2.52 g/cc, respectively, based on data collected during the completion of the RI.

Bulk retentr lues used for the overburden assumed to be range from 0.25% to 3%; and for the bedrock, 0.0041% (Kueper, pers. com. with M.J. Gefell, September 1997).

SRSNE SITE
SOUTHINGTONE, CONNECTICUT
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TOTAL VOLATILE ORGANICS - TOTAL
VADOSE SOILS

X	Y	Z	LOCID	DEPTH	UNITS	TVO
565121.48	286149.67	162.43	B-15	4.0 - 6.0'	mg/kg	193
565115.95	286478.89	165.22	B-477	0.5 - 1.0'	mg/kg	1904
565127.06	286322.15	163.47	B-479	2.0 - 3.0'	mg/kg	1212
565089.86	286324.77	162.65	B-480	3.5 - 4.0'	mg/kg	34.17
565116.26	286250.88	162.47	B-484	3.5 - 4.0'	mg/kg	17.37
565103	286209.1	164.69	B-8	1.0 - 3.0'	mg/kg	54.07
565095.57	286365.62	161.01	MW-488	5.0 - 6.0'	mg/kg	247.4
565103.9101	286130.0856	168.0058	SC-1	1.0 - 3.0'	mg/kg	0.293
565126.9443	286467.4409	163.9324	SC-10	1.0 - 3.0'	mg/kg	810
565102.314	286345.9229	164.4956	SC-11	1.0 - 3.0'	mg/kg	155.1
565098.9205	286402.0614	165.0126	SC-12	1.0 - 3.0'	mg/kg	960.1
565090.4124	286577.8861	164.0709	SC-13	1.0 - 3.0'	mg/kg	0.396
565087.12	286246.1645	165.0048	SC-14	1.0 - 3.0'	mg/kg	4.684
565060.8426	286435.5367	165.327	SC-15	1.0 - 3.0'	mg/kg	267.7
565062.063	286236.028	165.961	SC-16	1.0 - 3.0'	mg/kg	1.488
565005.0655	286269.295	171.1502	SC-17	1.0 - 3.0'	mg/kg	0.108
565029.0014	286312.2255	167.2807	SC-18	1.0 - 3.0'	mg/kg	82.3
565044.6807	286405.5965	165.839	SC-19	1.0 - 3.0'	mg/kg	1739
565124.1653	286190.4061	164.6052	SC-2	1.0 - 3.0'	mg/kg	0.272
565018.7874	286406.0243	166.0117	SC-20	1.0 - 3.0'	mg/kg	299
564961.8461	286377.8847	168.3373	SC-21	1.0 - 3.0'	mg/kg	0.035
564956.205	286428.5349	167.9701	SC-22	1.0 - 3.0'	mg/kg	0.65
565120.0754	286248.2745	164.0237	SC-3	1.0 - 3.0'	mg/kg	3.102
565115.7943	286298.6034	164.194	SC-4	1.0 - 3.0'	mg/kg	114.264
565138.2797	286348.1474	162.4688	SC-5	1.0 - 3.0'	mg/kg	0.929
565137.0462	286384.8904	162.6496	SC-6	1.0 - 3.0'	mg/kg	1753.7
565125.6829	286402.9141	164.7282	SC-7	1.0 - 3.0'	mg/kg	19.002
565131.564	286428.5763	163.0628	SC-8	1.0 - 3.0'	mg/kg	776.8
565114.8803	286447.0164	160.9055	SC-9	5.0 - 6.0'	mg/kg	27.71
565114.8803	286447.0164	164.4055	SC-9	1.0 - 3.0'	mg/kg	865.5
565174.0171	286688.5743	161.75	SD1-03	0.0 - 0.5'	mg/kg	0
565164.8797	286529.6109	159.8217	SD1-04	0.0 - 0.5'	mg/kg	48.123
565154.2033	286295.1263	160.4589	SD3-24	2.0 - 3.0'	mg/kg	0.168
565154.2033	286295.1263	161.4589	SD3-24	1.0 - 2.0'	mg/kg	0.088
565154.2033	286295.1263	162.4589	SD3-24	0.0 - 1.0'	mg/kg	0.047
565168.8446	286499.8981	159.3575	SD3-25	1.0 - 2.0'	mg/kg	432.3
565168.8446	286499.8981	159.3975	SD3-25	1.25 - 1.67'	mg/kg	176.66
565168.8446	286499.8981	160.3575	SD3-25	0.0 - 1.0'	mg/kg	16.023
565212.8145	286604.4892	159.0175	SD3-39	1.0 - 2.0'	mg/kg	0
565212.8145	286604.4892	160.0175	SD3-39	0.0 - 1.0'	mg/kg	0
565106.66	286376.49	165.62	SP-485	0.0 - 1.0'	mg/kg	679.6
565259.8578	286929.6815	161.1354	SS3-A1	0.0 - 0.5'	mg/kg	0
565162.7391	284922.8142	151.5186	SS3-A11	0.0 - 0.5'	mg/kg	0
565261.115	286741.1361	160.4245	SS3-A2	0.0 - 0.5'	mg/kg	0
565239	286520	160.75	SS3-A3	0.0 - 0.5'	mg/kg	0
565247.0474	286340.2091	159.7417	SS3-A4	0.0 - 0.5'	mg/kg	0
565243.5768	286157.7652	157.0076	SS3-A5	0.0 - 0.5'	mg/kg	0

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X	Y	Z	LOCID	DEPTH	UNITS	TVO
565167.8993	285759.3688	160.5182	SS3-A7	0.0 - 0.5'	mg/kg	0
565167.7387	285342.1237	156.1859	SS3-A9	0.0 - 0.5'	mg/kg	0
565364.8845	284922.7938	154.0507	SS3-B11	0.0 - 0.5'	mg/kg	0
565547.1117	286338.4927	168.6816	SS3-B4	0.0 - 0.5'	mg/kg	0
565553.7573	286124.7213	159.2415	SS3-B5	0.0 - 0.5'	mg/kg	0
565365.9823	285764.8398	151.75	SS3-B7	0.0 - 0.5'	mg/kg	0

SRSNE SITE
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TOTAL VOLATILE ORGANICS - DISSOLVED
SHALLOW OVERBURDEN

X	Y	Z	LOCID	TVO	UNITS_NEW
565678	285115	122	CW-3-75	0.008	mg/L
565162	284652	128.4	CW-3-78	0.0057	mg/L
565366	284159	123.6	CW-7-78	0	mg/L
565619.9	286145.7	145.86	DP-1	0.001	mg/L
565596.8	286323	143.83	DP-2	0.124	mg/L
565577.7	286481	144.45	DP-3	0.086	mg/L
565524	286654.5	145.37	DP-4	0.122	mg/L
565602	287099.7	144.21	DP-5	0.012	mg/L
565598.7	286885.5	144.54	DP-6	0.007	mg/L
565654	286015	132.2	MW-08	0.027	mg/L
565838	286350	144.17	MW-501C	0.001	mg/L
565299.1	285086.9	123.4	MW-703S	0.001	mg/L
565557.2	285583.4	139.03	MW-704S	0	mg/L
565607.5	285116.3	128.16	MW-707S	0.004	mg/L
565260.7	286598.2	152.82	MWL-301	0.164	mg/L
565358.7	286602.7	153.15	MWL-302	0.0049	mg/L
565456.6	286604.3	150.96	MWL-303	0.0038	mg/L
565264.9	286466.1	151.96	MWL-304	7.82	mg/L
565353.7	286450	151.55	MWL-305	0.512	mg/L
565501.6	286450.4	147.8	MWL-306	0.13	mg/L
565259.4	286297.3	151.71	MWL-307	174.91	mg/L
565353.7	286304.5	149.88	MWL-308	18	mg/L
565504.9	286302.1	146.78	MWL-309	1.825	mg/L
565350.6	286148.5	149.46	MWL-311	0.1369	mg/L
565509.1	286154	147.75	MWL-312	0	mg/L
565351.8	285992	148.52	MWL-313	0	mg/L
565502.2	286000.5	147.68	MWL-314	0.004	mg/L
565676.3	286237.7	140.34	P-101C	0.236	mg/L
565702	286471.6	140.71	P-102C	0	mg/L
565582.9	286219.6	140.72	P-11B	1.42	mg/L
565321.3	287115.3	149.77	P-12	0	mg/L
565242	285851	145.98	P-13	0.025	mg/L
565129.2	286518.3	155.35	P-16	39.8	mg/L
565569.9	286456.5	133.13	P-3B	2.94	mg/L
565391	286283	148.74	P-5B	0.232	mg/L
565439.1	286805.3	144.06	P-7	0	mg/L
565412	286584.1	147.16	P-9	0.0008	mg/L
565200	285871	151.64	SRS-2	0	mg/L
565392	285868	141.51	SRS-4	0	mg/L
565282	285956	145.1	TW-11	0.129	mg/L
565220	286808	153.85	WE-2	0.037	mg/L
565139	286144	158.6	WE-5	1.95	mg/L

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MIDDLE OVERBURDEN

X	Y	Z	LOCID	TVO	UNITS_NEW
565212.4	286106.6	145.38	CPZ-1	1.064	mg/L
565237.1	286643	144.4	CPZ-10	0.042	mg/L
565215.8	286045.4	141.81	CPZ-2	0.092	mg/L
565219	286090.4	141.58	CPZ-2A	0.106	mg/L
565289.5	286162.5	140.06	CPZ-3	16.96	mg/L
565321.6	286091.6	139.01	CPZ-4	0.392	mg/L
565300	286146.6	140.36	CPZ-4A	8.758	mg/L
565479.7	286325.3	134.61	CPZ-6	15.552	mg/L
565343	286467.5	142.92	CPZ-7	1.306	mg/L
565397.3	286528.7	141.75	CPZ-8	0.901	mg/L
565229.5	286575.2	143.66	CPZ-9	5.799	mg/L
565213.25	285074.5	120.3	CW-1-78	0.004	mg/L
565285.75	285029.5	118.1	CW-5-75	0	mg/L
565222	284832	107.6	CW-6-75	0.017	mg/L
565309.638	285710.854	130.02	CW-B-77	0.075	mg/L
565509	285065	82.3	MW-03	0.047	mg/L
565646	286028	117.8	MW-07	3.115	mg/L
565274	286126	144.22	MW-123C	0.052	mg/L
565123.965	287008.085	152.79	MW-126B	0.005	mg/L
565403	285087	105.86	MW-127B	0.018	mg/L
565551.381	284991.647	105.96	MW-205B	0.017	mg/L
565319.649	286331.584	145.64	MW-409	168.9	mg/L
565275.191	286345.916	148.85	MW-415	42.707	mg/L
565837	286343	109.35	MW-501B	0.051	mg/L
565557.088	285574.27	108.58	MW-704M	0.173	mg/L
565605.095	285109.125	90.41	MW-707M	0.004	mg/L
565315.813	286803.147	149.39	P-10	0	mg/L
565674.879	286232.022	109.19	P-101B	21.58	mg/L
565702.256	286465.014	114.74	P-102B	2.974	mg/L
565124.779	286371.502	152.9	P-1B	1343	mg/L
565115.956	286223.494	152.91	P-2B	0.02	mg/L
565010.51	286294.467	155.3	P-4B	358.4	mg/L
564918.006	286063.514	162.32	P-8B	0	mg/L
565529.69	285996.839	130.57	SRS-5	4.398	mg/L
565393	286384	135.4	TW-07A	9.771	mg/L
565213	286406	148.9	TW-08A	144.22	mg/L
565269	287366	140.5	TW-12	0	mg/L

SRSNE SITE
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REMEDIAL INVESTIGATION REPORT
TOTAL VOLATILE ORGANICS - DISSOLVED
DEEP OVERBURDEN

X	Y	Z	LOCID	TVO	UNITS_NEW
565375.9	286312	139.37	CPZ-5	18.3	mg/L
565395.7	286321.2	138.74	CPZ-6A	905	mg/L
565407	285677	111.6	CW-2-75	0.591	mg/L
565312	285355	118.1	CW-4-75	0.002	mg/L
565155	284650	88.2	CW-4-78	0.005	mg/L
565251	284543	77	CW-5-78	0.009	mg/L
565396	284625	65.5	CW-6-78	0.004	mg/L
565316	284843	93.8	CW-7-75	0	mg/L
565227	286248		DN-1	10.88	mg/L
565211	286093	143.58	DN-2	0.364	mg/L
565128	286040		DN-3	0.12	mg/L
565281	285950	119	MW-01	0.434	mg/L
565307	285338	96.3	MW-02	0.029	mg/L
565622	285470	87.8	MW-04	0.051	mg/L
565660	286017	104.2	MW-06	2.77	mg/L
565532	285817	103.96	MW-121B	11.52	mg/L
565651.928	285568.675	75.74	MW-204B	0.009	mg/L
565278.298	286350.385	140.7	MW-413	263.36	mg/L
565495	286270	128.07	MW-502	29.3	mg/L
565300.136	285097.47	74.02	MW-703D	0	mg/L
565540.246	285591.04	92.49	MW-704D	0.665	mg/L
565421.487	286754.417	129.39	MW-705D	0.002	mg/L
565599.017	285102.488	63.88	MW-707D	0	mg/L
565228.187	286572.493	134.45	MWD-601	131.6	mg/L
564950.989	286482.761	162.13	PZO-7	0.376	mg/L
565194	285871	140.39	SRS-1	0.761	mg/L
565394	285864	115.38	SRS-3	0.127	mg/L
565577.595	286010.193	102.845	SRS-6	6.056	mg/L
565387	286385	114.3	TW-07B	25.88	mg/L

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TOTAL VOLATILE ORGANICS - DISSOLVED
SHALLOW BEDROCK

X	Y	Z	LOCID	TVO	UNITS_NEW
565232.7	286642	108.4	CPZ-10R	2.18	mg/L
565208.8	286103.4	106.35	CPZ-1R	0.164	mg/L
565216.8	286038.9	106.66	CPZ-2R	0.196	mg/L
565286.4	286157.7	103.43	CPZ-3R	7.13	mg/L
565322.1	286084.9	99.03	CPZ-4R	0.617	mg/L
565374.5	286318.9	103.72	CPZ-5R	17.69	mg/L
565479.9	286317.5	92.34	CPZ-6R	2.5	mg/L
565337.8	286471.9	105.79	CPZ-7R	1044.9	mg/L
565394.9	286533	105.83	CPZ-8R	393.81	mg/L
565244.3	286575.2	114.17	CPZ-9R	306.3	mg/L
565281	285950	119	MW-01	0.434	mg/L
565307	285338	96.3	MW-02	0.029	mg/L
565622	285470	87.8	MW-04	0.051	mg/L
565651	286030	75.9	MW-05	11.57	mg/L
565539	285834	66.01	MW-121A	0.116	mg/L
565535	285826	87.42	MW-121C	1.46	mg/L
565279.6	286128.2	86.33	MW-123A	0.077	mg/L
565238	285852	115.08	MW-124C	0.0439	mg/L
565403.4	286393.3	93.33	MW-125A	0.144	mg/L
565402	286382	110.47	MW-125C	285.49	mg/L
565122.7	287011.1	133.78	MW-126C	0	mg/L
565404	285081	51.08	MW-127C	0.147	mg/L
565211	285319	95.43	MW-128	0.013	mg/L
563866	286975	208.69	MW-129	1.3	mg/L
565668.9	285566.5	47.33	MW-204A	0.682	mg/L
565559.1	284996.7	21.79	MW-205A	0.029	mg/L
565484.3	284175	42.7	MW-207A	0	mg/L
565318.2	286324.4	115.58	MW-408	25.688	mg/L
565272.8	286339.5	118.29	MW-414	0.527	mg/L
565264.4	286290.5	118.02	MW-416	3.955	mg/L
565838	286346	80.76	MW-501A	0.118	mg/L
565568.3	285582.7	66.52	MW-704R	0.733	mg/L
565422.3	286744.1	110.54	MW-705R	0.031	mg/L
565598.8	285115	33.91	MW-707R	0	mg/L
565403	287091.8	101.6	MW-709R	3.3	mg/L
565674.4	286226.2	67.05	P-101A	3.184	mg/L
565701.7	286458.5	62.77	P-102A	0.049	mg/L
565582.9	286219.6	88.8	P-11A	1.372	mg/L
565321.2	287105.1	121.21	P-12A	0.008	mg/L
565582.4	286212.1	67.96	P-14	0.765	mg/L
565124.3	286367.5	135.2	P-1A	1.416	mg/L
565118.5	286221.4	139.41	P-2A	0.867	mg/L
565575.6	286458.5	88.7	P-3A	86.96	mg/L
565008.3	286294	142.94	P-4A	0.214	mg/L
565394	286291	107.83	P-5A	130.2	mg/L
565499.8	286293.5	100.24	P-6	58.947	mg/L
564947.7	286482.8	133.2	PZR-7	0	mg/L

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SHALLOW BEDROCK

X	Y	Z	LOCID	TVO	UNITS_NEW
565387	286385	114.3	TW-07B	25.88	mg/L
564984	286593	147	TW-09	0.016	mg/L
564882	286403	150.1	TW-10	0.192	mg/L
565220	286787	128.75	WE-1	0	mg/L
565140	286142	134.7	WE-3	0.159	mg/L

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DEEP BEDROCK

X	Y	Z	LOCID	TVO	UNITS_NEW
564579	286253.5	97.45	MW-701DR	0	mg/L
564912.5	286074.7	81.08	MW-702DR	0.022	mg/L
565299.5	285072.8	-6.26	MW-703DR	0	mg/L
565552.1	285564.5	33.55	MW-704DR	0.455	mg/L
565429.3	286749.6	63.79	MW-705DR	1100	mg/L
565667.6	286215.7	26.32	MW-706DR	7.454	mg/L
565567.3	285123.7	-22.28	MW-707DR	0	mg/L
565403	287091.8	34.6	MW-709DR	15.398	mg/L
564921.2	286067.2	115.66	P-8A	0.009	mg/L

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TOTAL VOLATILE ORGANICS - SORBED
SHALLOW OVERBURDEN

X	Y	Z	LOCID	TVO	UNITS
565678	285115	122	CW-3-75	0.00	mg/kg
565162	284652	128.4	CW-3-78	0.00	mg/kg
565366	284159	123.6	CW-7-78	0.00	mg/kg
565619.9	286145.7	145.86	DP-1	0.00	mg/kg
565596.8	286323	143.83	DP-2	0.01	mg/kg
565577.7	286481	144.45	DP-3	0.01	mg/kg
565524	286654.5	145.37	DP-4	0.03	mg/kg
565602	287099.7	144.21	DP-5	0.00	mg/kg
565598.7	286885.5	144.54	DP-6	0.00	mg/kg
565654	286015	132.2	MW-08	0.00	mg/kg
565838	286350	144.17	MW-501C	0.00	mg/kg
565299.1	285086.9	123.4	MW-703S	0.00	mg/kg
565557.2	285583.4	139.03	MW-704S	0.00	mg/kg
565607.5	285116.3	128.16	MW-707S	0.00	mg/kg
565260.7	286598.2	152.82	MWL-301	0.08	mg/kg
565358.7	286602.7	153.15	MWL-302	0.01	mg/kg
565456.6	286604.3	150.96	MWL-303	0.01	mg/kg
565264.9	286466.1	151.96	MWL-304	11.52	mg/kg
565353.7	286450	151.55	MWL-305	0.24	mg/kg
565501.6	286450.4	147.8	MWL-306	0.00	mg/kg
565259.4	286297.3	151.71	MWL-307	146.86	mg/kg
565353.7	286304.5	149.88	MWL-308	1.29	mg/kg
565504.9	286302.1	146.78	MWL-309	0.02	mg/kg
565350.6	286148.5	149.46	MWL-311	0.26	mg/kg
565509.1	286154	147.75	MWL-312	0.00	mg/kg
565351.8	285992	148.52	MWL-313	0.00	mg/kg
565502.2	286000.5	147.68	MWL-314	0.00	mg/kg
565676.3	286237.7	140.34	P-101C	0.02	mg/kg
565702	286471.6	140.71	P-102C	0.00	mg/kg
565582.9	286219.6	140.72	P-11B	0.22	mg/kg
565321.3	287115.3	149.77	P-12	0.00	mg/kg
565242	285851	145.98	P-13	0.00	mg/kg
565129.2	286518.3	155.35	P-16	44.45	mg/kg
565569.9	286456.5	133.13	P-3B	5.69	mg/kg
565391	286283	148.74	P-5B	0.24	mg/kg
565439.1	286805.3	144.06	P-7	0.00	mg/kg
565412	286584.1	147.16	P-9	0.00	mg/kg
565200	285871	151.64	SRS-2	0.00	mg/kg
565392	285868	141.51	SRS-4	0.00	mg/kg
565282	285956	145.1	TW-11	0.04	mg/kg
565220	286808	153.85	WE-2	0.01	mg/kg
565139	286144	158.6	WE-5	0.50	mg/kg

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
TOTAL VOLATILE ORGANICS - SORBED
MIDDLE OVERBURDEN

X	Y	Z	LOCID	TVO	UNITS
565212.4	286106.6	145.38	CPZ-1	0.03	mg/kg
565237.1	286643	144.4	CPZ-10	0.04	mg/kg
565215.8	286045.4	141.81	CPZ-2	0.07	mg/kg
565219	286090.4	141.58	CPZ-2A	0.06	mg/kg
565289.5	286162.5	140.06	CPZ-3	16.26	mg/kg
565321.6	286091.6	139.01	CPZ-4	0.42	mg/kg
565300	286146.6	140.36	CPZ-4A	11.67	mg/kg
565479.7	286325.3	134.61	CPZ-6	22.11	mg/kg
565343	286467.5	142.92	CPZ-7	2.21	mg/kg
565397.3	286528.7	141.75	CPZ-8	1.33	mg/kg
565229.5	286575.2	143.66	CPZ-9	3.82	mg/kg
565213.25	285074.5	120.3	CW-1-78	0.00	mg/kg
565285.75	285029.5	118.1	CW-5-75	0.00	mg/kg
565222	284832	107.6	CW-6-75	0.02	mg/kg
565309.638	285710.854	130.02	CW-B-77	0.09	mg/kg
565509	285065	82.3	MW-03	0.01	mg/kg
565646	286028	117.8	MW-07	0.91	mg/kg
565274	286126	144.22	MW-123C	0.05	mg/kg
565123.965	287008.085	152.79	MW-126B	0.00	mg/kg
565403	285087	105.86	MW-127B	0.00	mg/kg
565551.381	284991.647	105.96	MW-205B	0.00	mg/kg
565319.649	286331.584	145.64	MW-409	115.49	mg/kg
565275.191	286345.916	148.85	MW-415	29.58	mg/kg
565837	286343	109.35	MW-501B	0.02	mg/kg
565557.088	285574.27	108.58	MW-704M	0.08	mg/kg
565605.095	285109.125	90.41	MW-707M	0.00	mg/kg
565315.813	286803.147	149.39	P-10	0.00	mg/kg
565674.879	286232.022	109.19	P-101B	37.06	mg/kg
565702.256	286465.014	114.74	P-102B	0.48	mg/kg
565124.779	286371.502	152.9	P-1B	1432.11	mg/kg
565115.956	286223.494	152.91	P-2B	0.01	mg/kg
565010.51	286294.467	155.3	P-4B	339.36	mg/kg
564918.006	286063.514	162.32	P-8B	0.00	mg/kg
565529.69	285996.839	130.57	SRS-5	4.33	mg/kg
565393	286384	135.4	TW-07A	14.11	mg/kg
565213	286406	148.9	TW-08A	49.32	mg/kg
565269	287366	140.5	TW-12	0.00	mg/kg

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
TOTAL VOLATILE ORGANICS - SORBED
DEEP OVERBURDEN

X	Y	Z	LOCID	TVO	UNITS
565375.9	286312	139.37	CPZ-5	29.13	mg/kg
565395.7	286321.2	138.74	CPZ-6A	30.46	mg/kg
565407	285677	111.6	CW-2-75	0.53	mg/kg
565312	285355	118.1	CW-4-75	0.00	mg/kg
565155	284650	88.2	CW-4-78	0.00	mg/kg
565251	284543	77	CW-5-78	0.00	mg/kg
565396	284625	65.5	CW-6-78	0.00	mg/kg
565316	284843	93.8	CW-7-75	0.00	mg/kg
565227	286248		DN-1	9.89	mg/kg
565211	286093	143.58	DN-2	0.12	mg/kg
565128	286040		DN-3	0.00	mg/kg
565281	285950	119	MW-01	0.15	mg/kg
565307	285338	96.3	MW-02	0.01	mg/kg
565622	285470	87.8	MW-04	0.02	mg/kg
565660	286017	104.2	MW-06	0.37	mg/kg
565532	285817	103.96	MW-121B	4.43	mg/kg
565651.928	285568.675	75.74	MW-204B	0.00	mg/kg
565278.298	286350.385	140.7	MW-413	130.21	mg/kg
565495	286270	128.07	MW-502	23.73	mg/kg
565300.136	285097.47	74.02	MW-703D	0.00	mg/kg
565540.246	285591.04	92.49	MW-704D	0.25	mg/kg
565421.487	286754.417	129.39	MW-705D	0.01	mg/kg
565599.017	285102.488	63.88	MW-707D	0.00	mg/kg
565228.187	286572.493	134.45	MWD-601	132.06	mg/kg
564950.989	286482.761	162.13	PZO-7	0.82	mg/kg
565194	285871	140.39	SRS-1	0.71	mg/kg
565394	285864	115.38	SRS-3	0.01	mg/kg
565577.595	286010.193	102.845	SRS-6	6.23	mg/kg
565387	286385	114.3	TW-07B	48.42	mg/kg

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
TOTAL VOLATILE ORGANICS - SORBED
SHALLOW BEDROCK

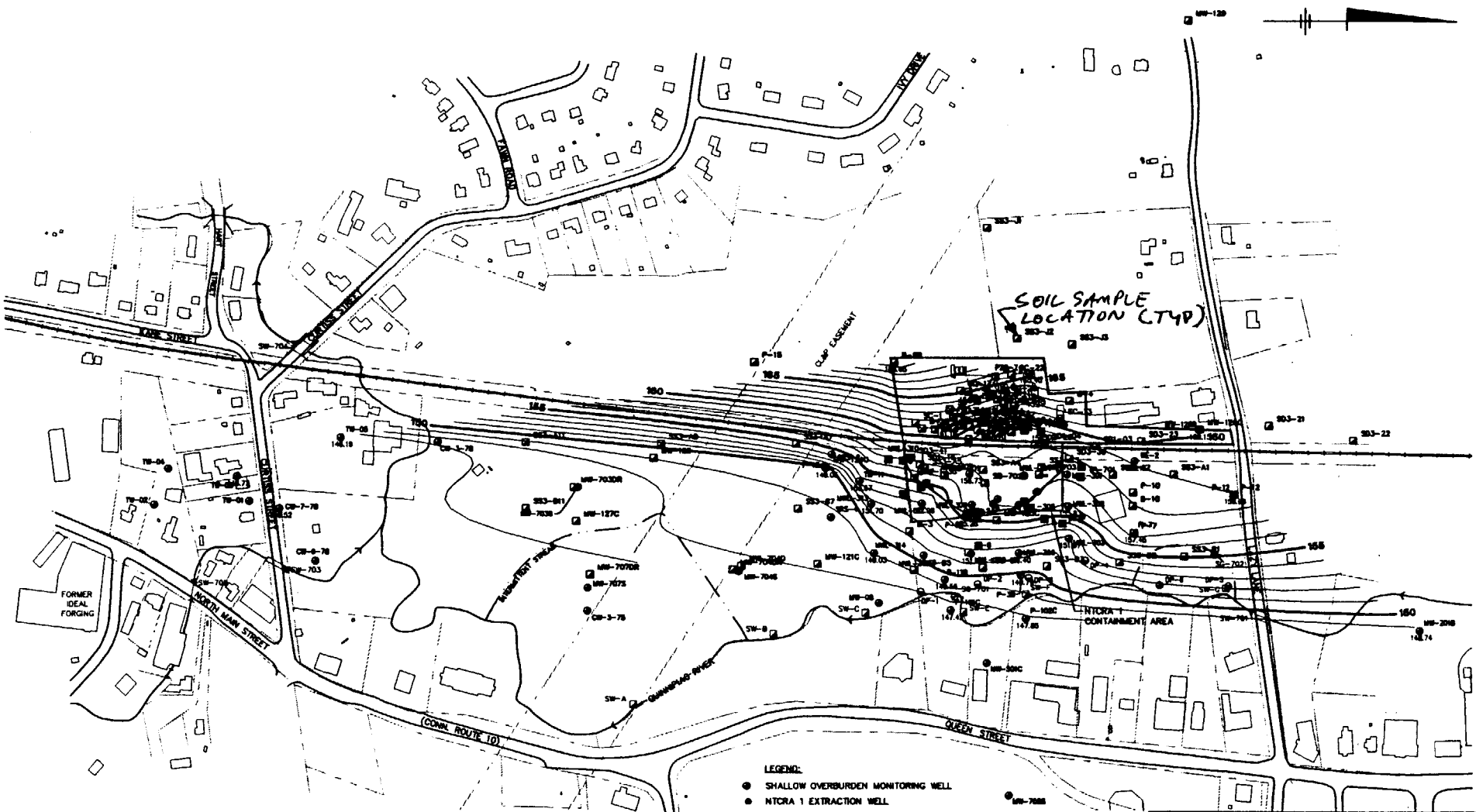
X	Y	Z	LOCID	TVO	UNITS
565232.7	286642	108.4	CPZ-10R	1.68	mg/kg
565208.8	286103.4	106.35	CPZ-1R	0.08	mg/kg
565216.8	286038.9	106.66	CPZ-2R	0.09	mg/kg
565286.4	286157.7	103.43	CPZ-3R	0.41	mg/kg
565322.1	286084.9	99.03	CPZ-4R	1.12	mg/kg
565374.5	286318.9	103.72	CPZ-5R	11.09	mg/kg
565479.9	286317.5	92.34	CPZ-6R	0.13	mg/kg
565337.8	286471.9	105.79	CPZ-7R	877.66	mg/kg
565394.9	286533	105.83	CPZ-8R	308.97	mg/kg
565244.3	286575.2	114.17	CPZ-9R	421.13	mg/kg
565281	285950	119	MW-01	0.19	mg/kg
565307	285338	96.3	MW-02	0.02	mg/kg
565622	285470	87.8	MW-04	0.02	mg/kg
565651	286030	75.9	MW-05	1.07	mg/kg
565539	285834	66.01	MW-121A	0.05	mg/kg
565535	285826	87.42	MW-121C	3.57	mg/kg
565279.6	286128.2	86.33	MW-123A	0.04	mg/kg
565238	285852	115.08	MW-124C	0.02	mg/kg
565403.4	286393.3	93.33	MW-125A	0.02	mg/kg
565402	286382	110.47	MW-125C	67.65	mg/kg
565122.7	287011.1	133.78	MW-126C	0.00	mg/kg
565404	285081	51.08	MW-127C	0.07	mg/kg
565211	285319	95.43	MW-128	0.00	mg/kg
563866	286975	208.69	MW-129	1.28	mg/kg
565668.9	285566.5	47.33	MW-204A	0.63	mg/kg
565559.1	284996.7	21.79	MW-205A	0.01	mg/kg
565484.3	284175	42.7	MW-207A	0.00	mg/kg
565318.2	286324.4	115.58	MW-408	26.01	mg/kg
565272.8	286339.5	118.29	MW-414	0.41	mg/kg
565264.4	286290.5	118.02	MW-416	2.62	mg/kg
565838	286346	80.76	MW-501A	0.05	mg/kg
565568.3	285582.7	66.52	MW-704R	0.81	mg/kg
565422.3	286744.1	110.54	MW-705R	0.02	mg/kg
565598.8	285115	33.91	MW-707R	0.00	mg/kg
565403	287091.8	101.6	MW-709R	0.68	mg/kg
565674.4	286226.2	67.05	P-101A	5.05	mg/kg
565701.7	286458.5	62.77	P-102A	0.02	mg/kg
565582.9	286219.6	88.8	P-11A	2.21	mg/kg
565321.2	287105.1	121.21	P-12A	0.00	mg/kg
565582.4	286212.1	67.96	P-14	0.44	mg/kg
565124.3	286367.5	135.2	P-1A	1.22	mg/kg
565118.5	286221.4	139.41	P-2A	0.49	mg/kg
565575.6	286458.5	88.7	P-3A	56.81	mg/kg
565008.3	286294	142.94	P-4A	0.11	mg/kg
565394	286291	107.83	P-5A	118.67	mg/kg
565499.8	286293.5	100.24	P-6	54.53	mg/kg
564947.7	286482.8	133.2	PZR-7	0.00	mg/kg

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
TOTAL VOLATILE ORGANICS - SORBED
SHALLOW BEDROCK

X	Y	Z	LOCID	TVO	UNITS
565387	286385	114.3	TW-07B	59.68	mg/kg
564984	286593	147	TW-09	0.01	mg/kg
564882	286403	150.1	TW-10	0.64	mg/kg
565220	286787	128.75	WE-1	0.00	mg/kg
565140	286142	134.7	WE-3	0.09	mg/kg

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
TOTAL VOLATILE ORGANICS - SORBED
DEEP BEDROCK

X	Y	Z	LOCID	TVO	UNITS
564579	286253.5	97.45	MW-701DR	0.00	mg/kg
564912.5	286074.7	81.08	MW-702DR	0.01	mg/kg
565299.5	285072.8	-6.26	MW-703DR	0.00	mg/kg
565552.1	285564.5	33.55	MW-704DR	0.31	mg/kg
565429.3	286749.6	63.79	MW-705DR	718.74	mg/kg
565667.6	286215.7	26.32	MW-706DR	4.83	mg/kg
565567.3	285123.7	-22.28	MW-707DR	0.00	mg/kg
565403	287091.8	34.6	MW-709DR	9.10	mg/kg
564921.2	286067.2	115.66	P-8A	0.01	mg/kg



LEGEND:

- SHALLOW OVERBURDEN MONITORING WELL
- NTCRA 1 EXTRACTION WELL
- NTCRA 1 COMPLIANCE PIEZOMETER
- NTCRA 1 WETLAND DRIVEPOINT
- SURFACE WATER MEASUREMENT POINTS
- SURFACE WATER SAMPLING LOCATION
- STREAM GAUGE
- 157.5 GROUND-WATER ELEVATION (FEET)
- 160 GROUND-WATER ELEVATION CONTOUR (FEET), DASHED WHERE INFERRED, CONTOUR INTERVAL VARIES

0 300' 600'

NOTES:

1. WELL MW-708 CLUSTER NOT COMPLETED ON 1/21/97. GROUND-WATER ELEVATION AT WELL MW-708S MEASURED ON 2/11/97 AND ADJUSTED TO ESTIMATED LEVEL ON 1/21/97 BASED ON AVERAGE CHANGE BETWEEN 1/21/97 AND 2/11/97 AT WELLS MW-201B, MW-501C, P-101C, AND P-102C.
2. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

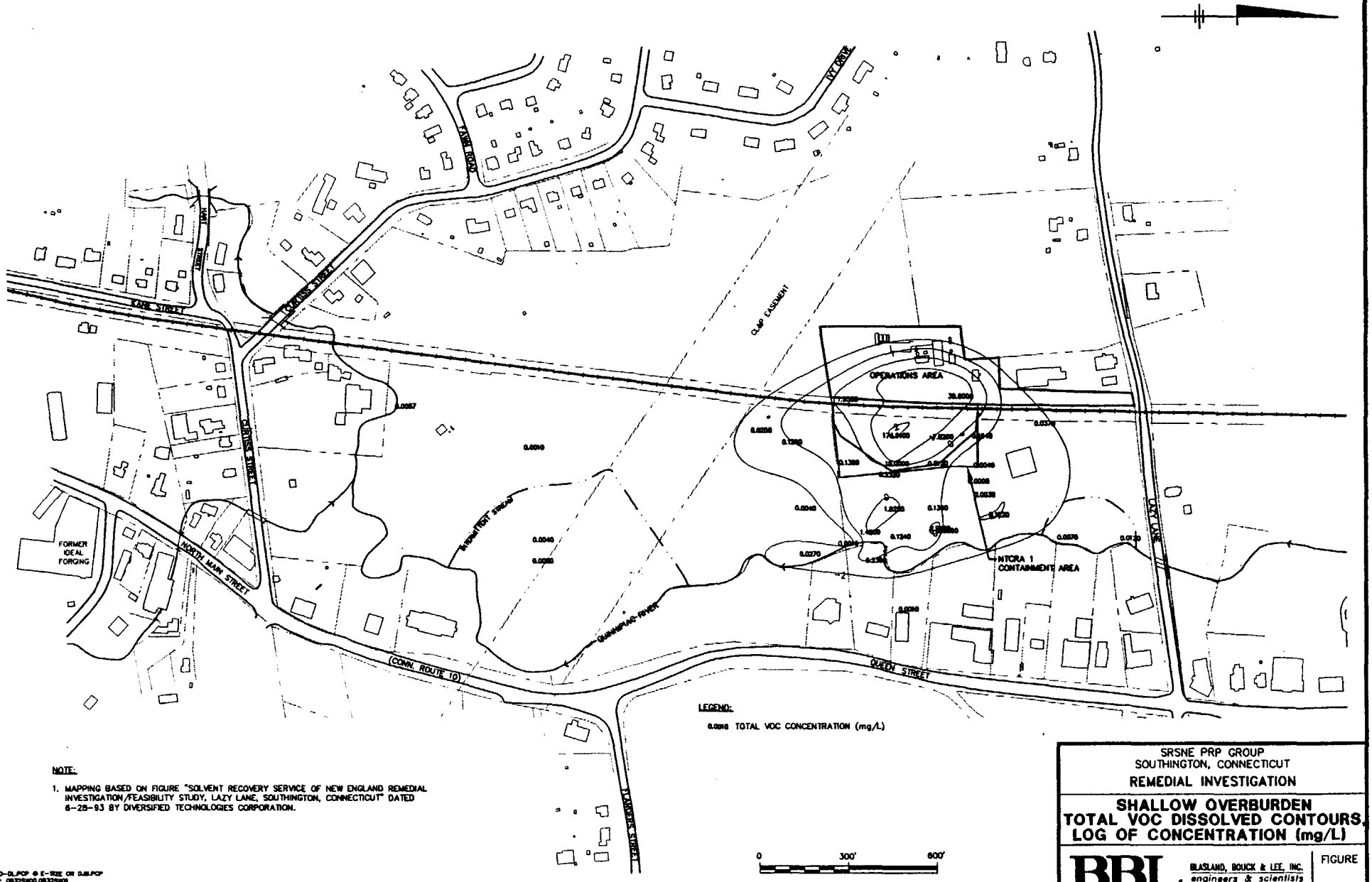
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

SHALLOW OVERBURDEN GROUND-WATER ELEVATION CONTOURS, 3/20/95

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

X: 08325X00,08325X01.DWG
P: STD-DL.PCP @ E-SIZE OR D.B.PCP
9/26/97 SYR-54-DMW
08331900/SAT/08331B01.DWG



LEGEND:

0.0010 TOTAL VOC CONCENTRATION (mg/L)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

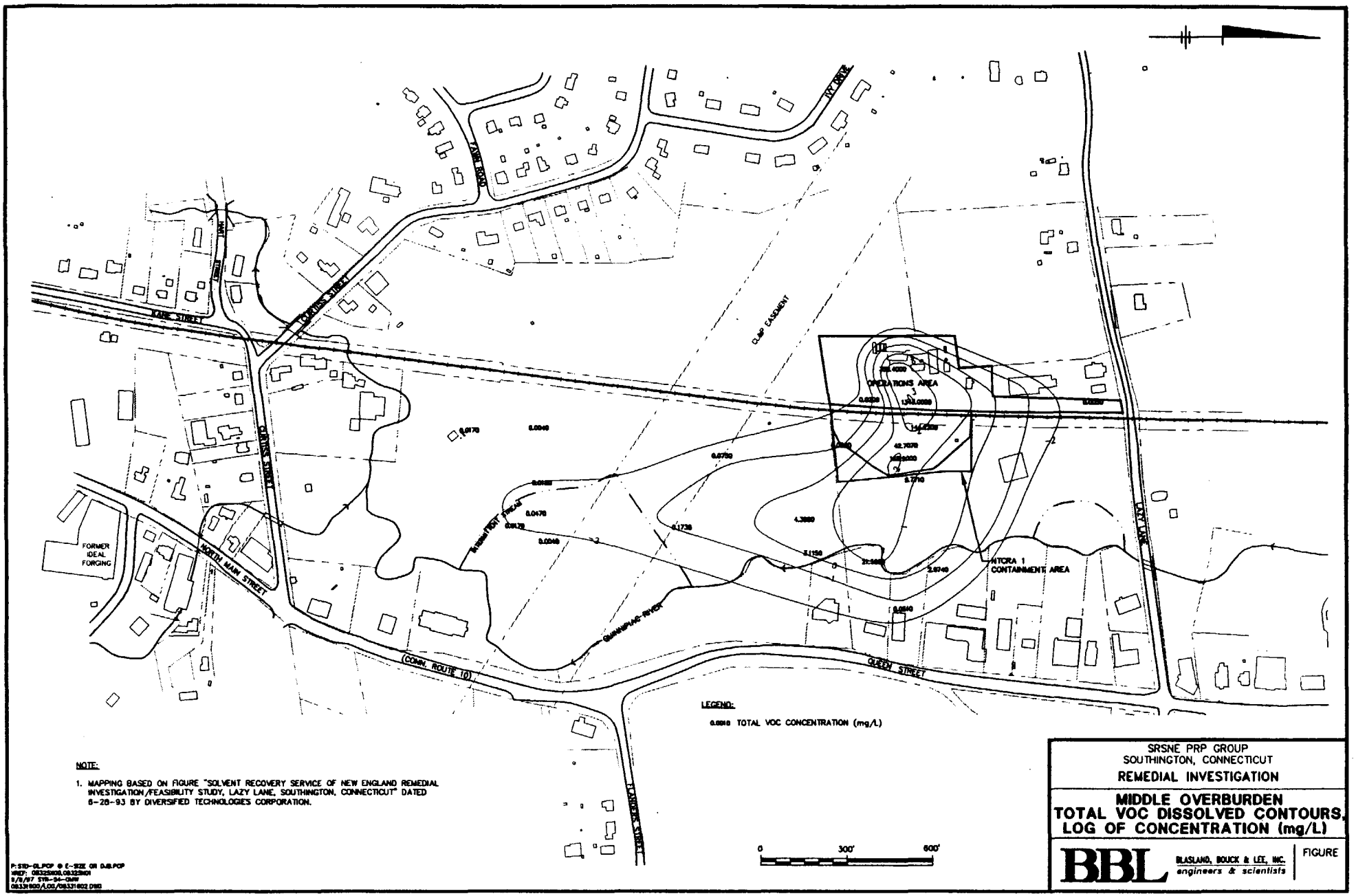
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

SHALLOW OVERBURDEN TOTAL VOC DISSOLVED CONTOURS, LOG OF CONCENTRATION (mg/L)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

P:STD-DL.PCP @ E-SIZE OR D.BLPCP
XREF: 08325X00,08325X01
9/8/97 SYR-04-DMW
08331900/LOG/08331901.DWG



LEGEND:

0.0010 TOTAL VOC CONCENTRATION (mg/L)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

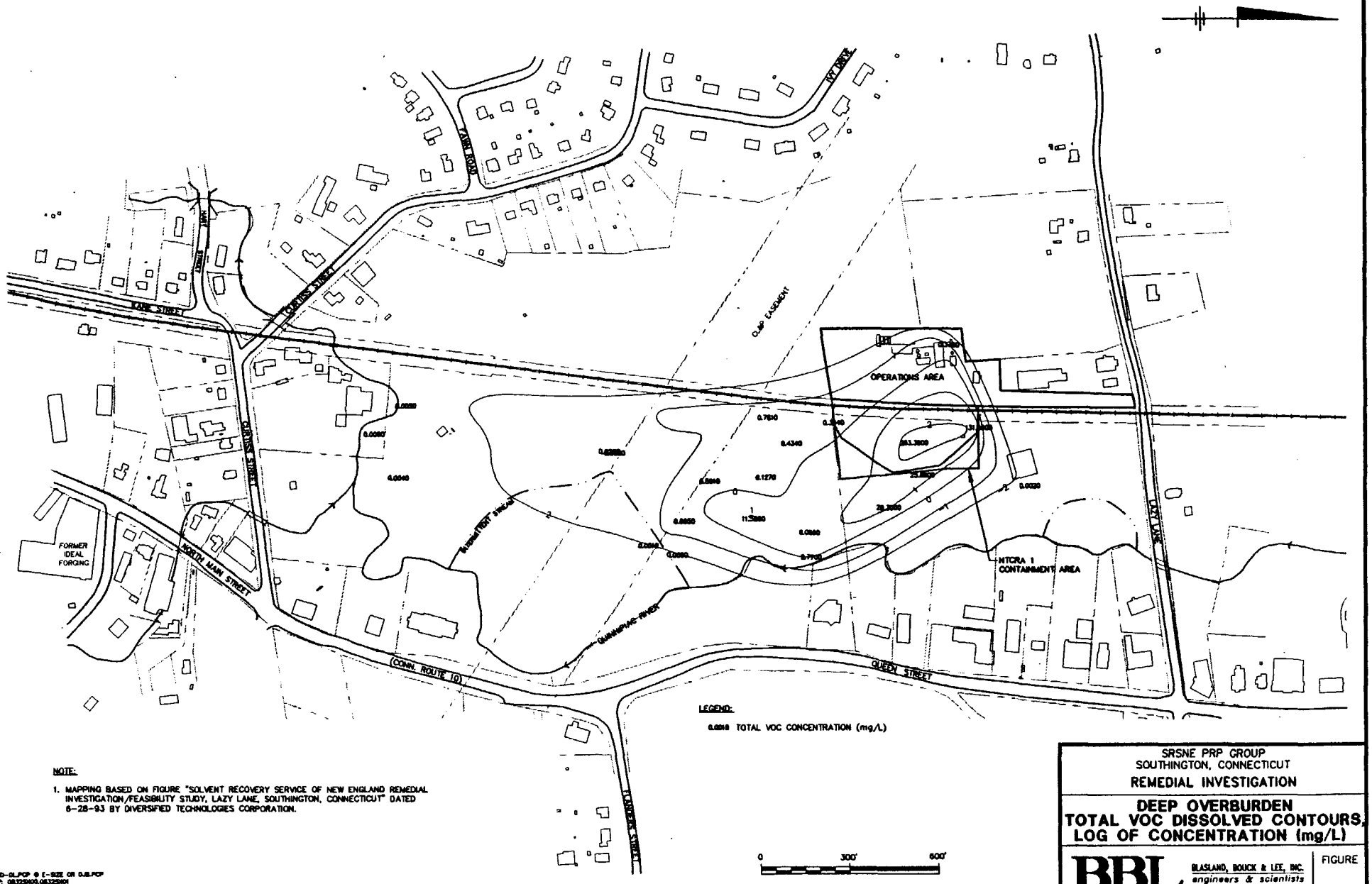
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

MIDDLE OVERBURDEN TOTAL VOC DISSOLVED CONTOURS, LOG OF CONCENTRATION (mg/L)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

P:STD-OL.PCP @ E-SIZE OR D.B.PCP
XREF: 08325X00,08325X01
8/8/97 STR-54-DMW
08331800/LOG/08331802.DWG



LEGEND:

0.0018 TOTAL VOC CONCENTRATION (mg/L)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

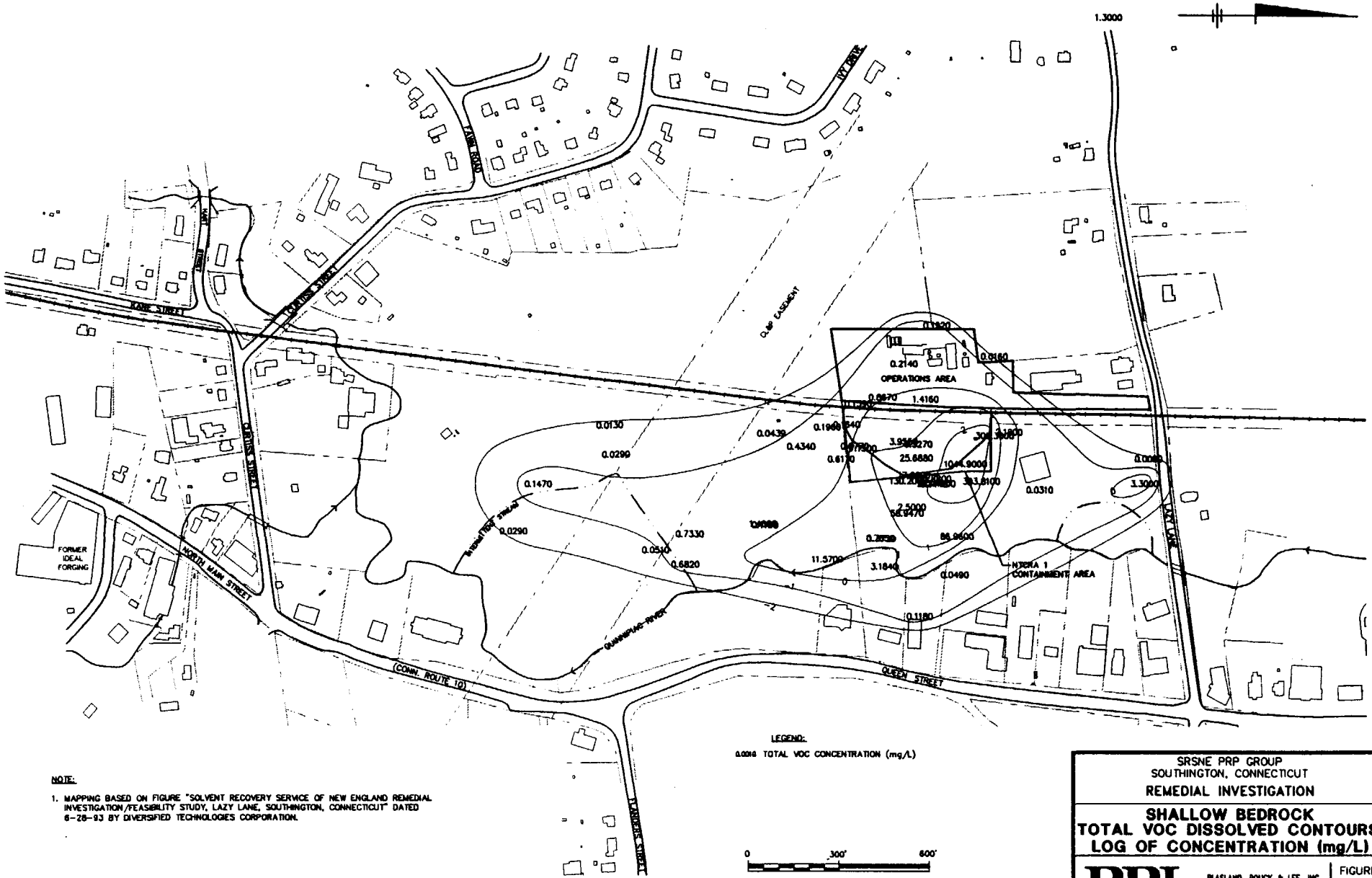
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DEEP OVERBURDEN TOTAL VOC DISSOLVED CONTOURS, LOG OF CONCENTRATION (mg/L)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

P:STD-DL.PCP @ E-SIZE OR DJB.PCP
XREF: 08325N00,08325N01
9/9/97 STR-54-DMW
08331800/LOG/08331003.DWG



NOTE:

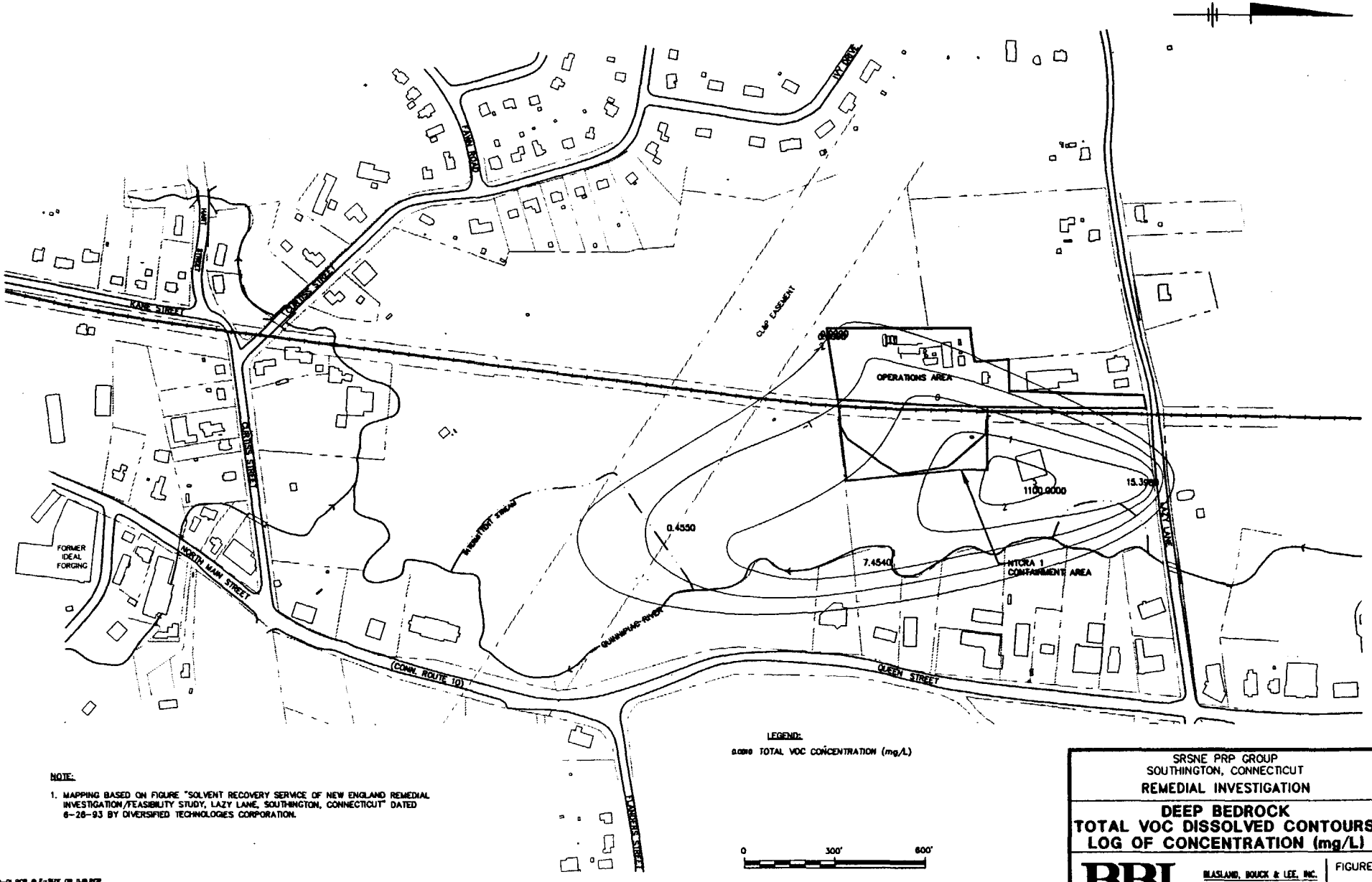
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

SHALLOW BEDROCK TOTAL VOC DISSOLVED CONTOURS, LOG OF CONCENTRATION (mg/L)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



LEGEND:

0.0010 TOTAL VOC CONCENTRATION (mg/L)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

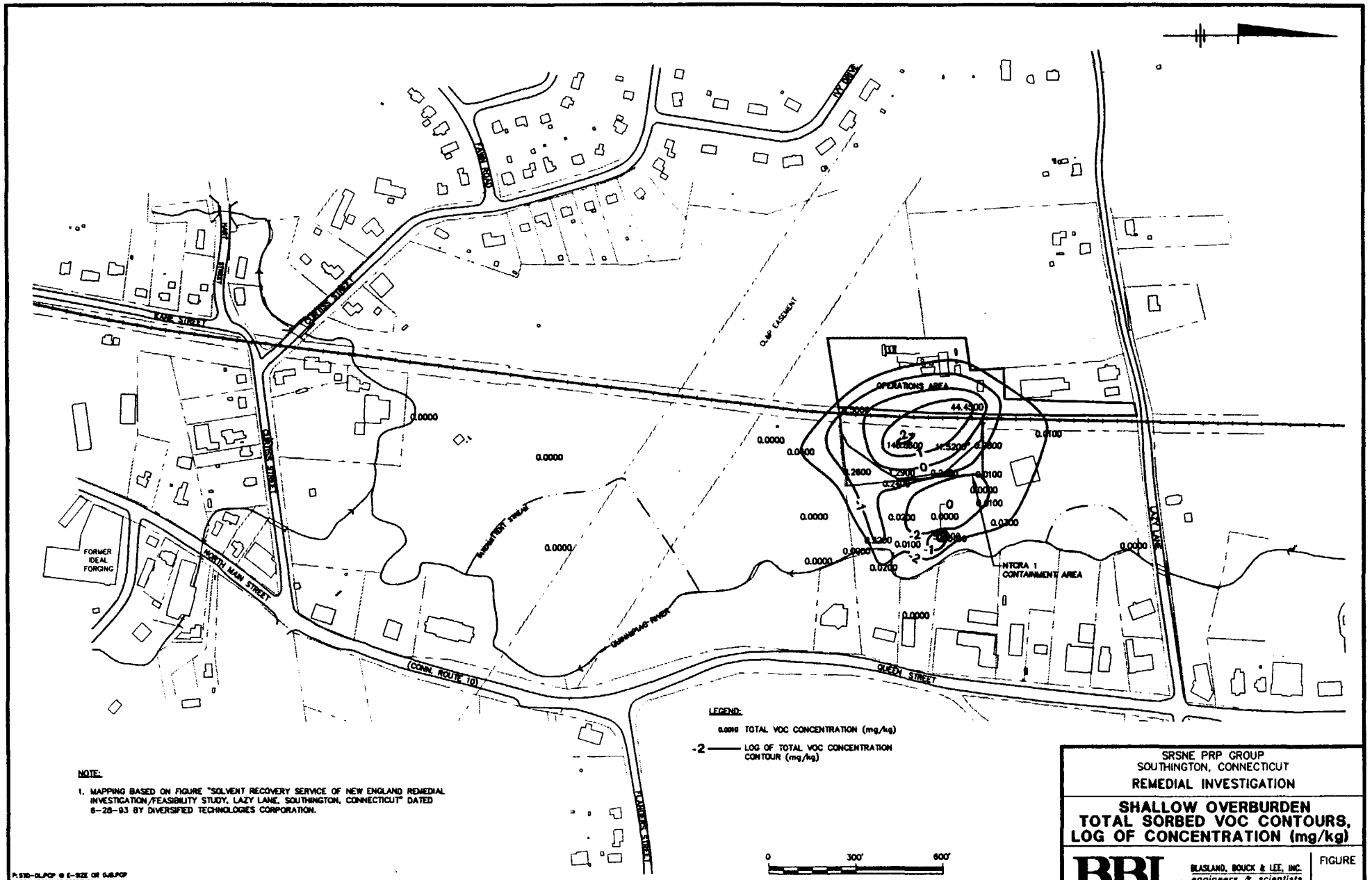
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DEEP BEDROCK
TOTAL VOC DISSOLVED CONTOURS,
LOG OF CONCENTRATION (mg/L)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

P:STD-DL.PCP @ E-SIZE OR D.BLPCP
XREF: 08325X00,08325X01
9/9/97 SYR-54-DMW
08331900/LOG/08331008.DWG



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

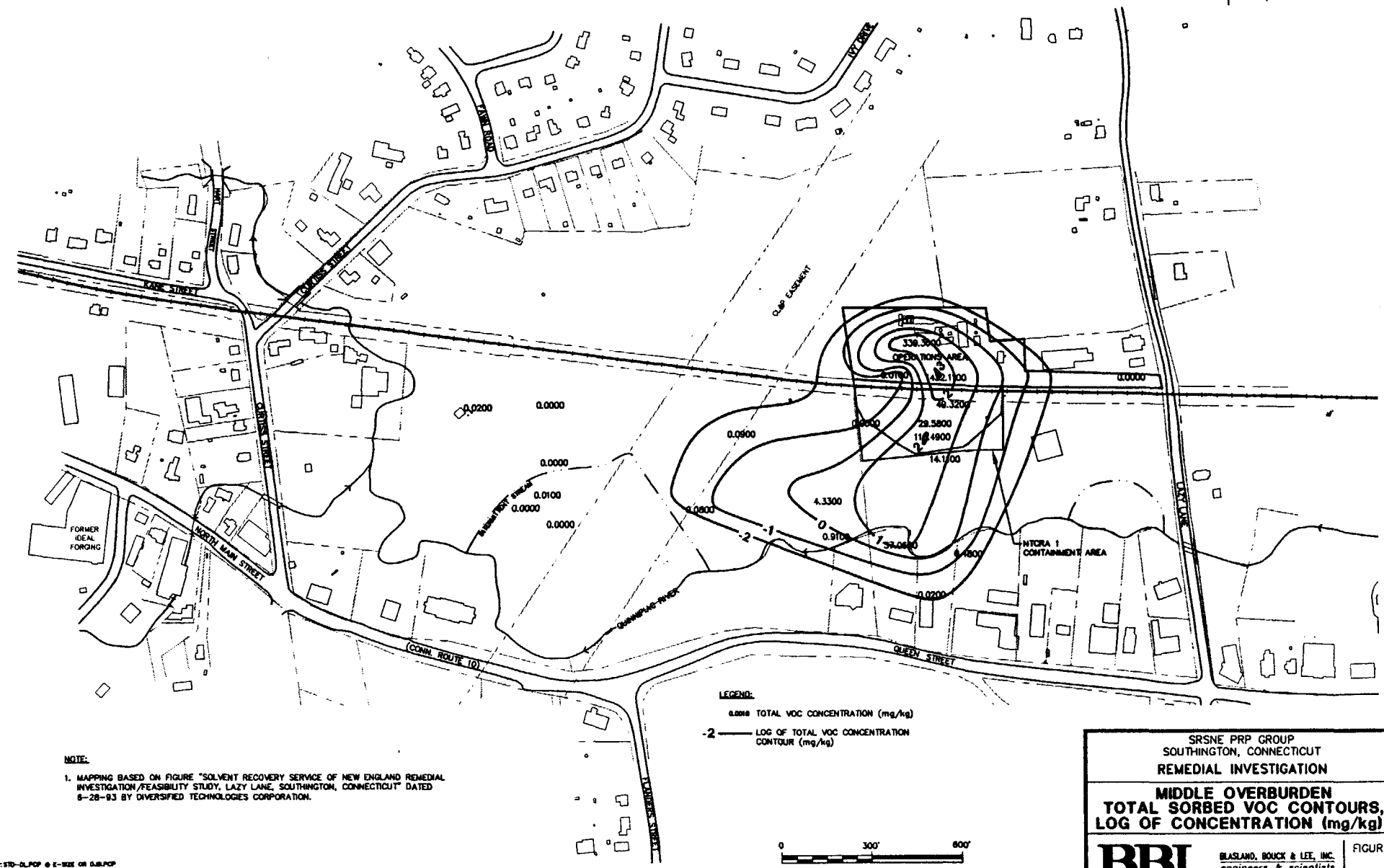
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

REMEDIAL INVESTIGATION

SHALLOW OVERBURDEN TOTAL SORBED VOC CONTOURS, LOG OF CONCENTRATION (mg/kg)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



LEGEND:

0.0018 TOTAL VOC CONCENTRATION (mg/kg)

-2 —— LOG OF TOTAL VOC CONCENTRATION CONTOUR (mg/kg)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

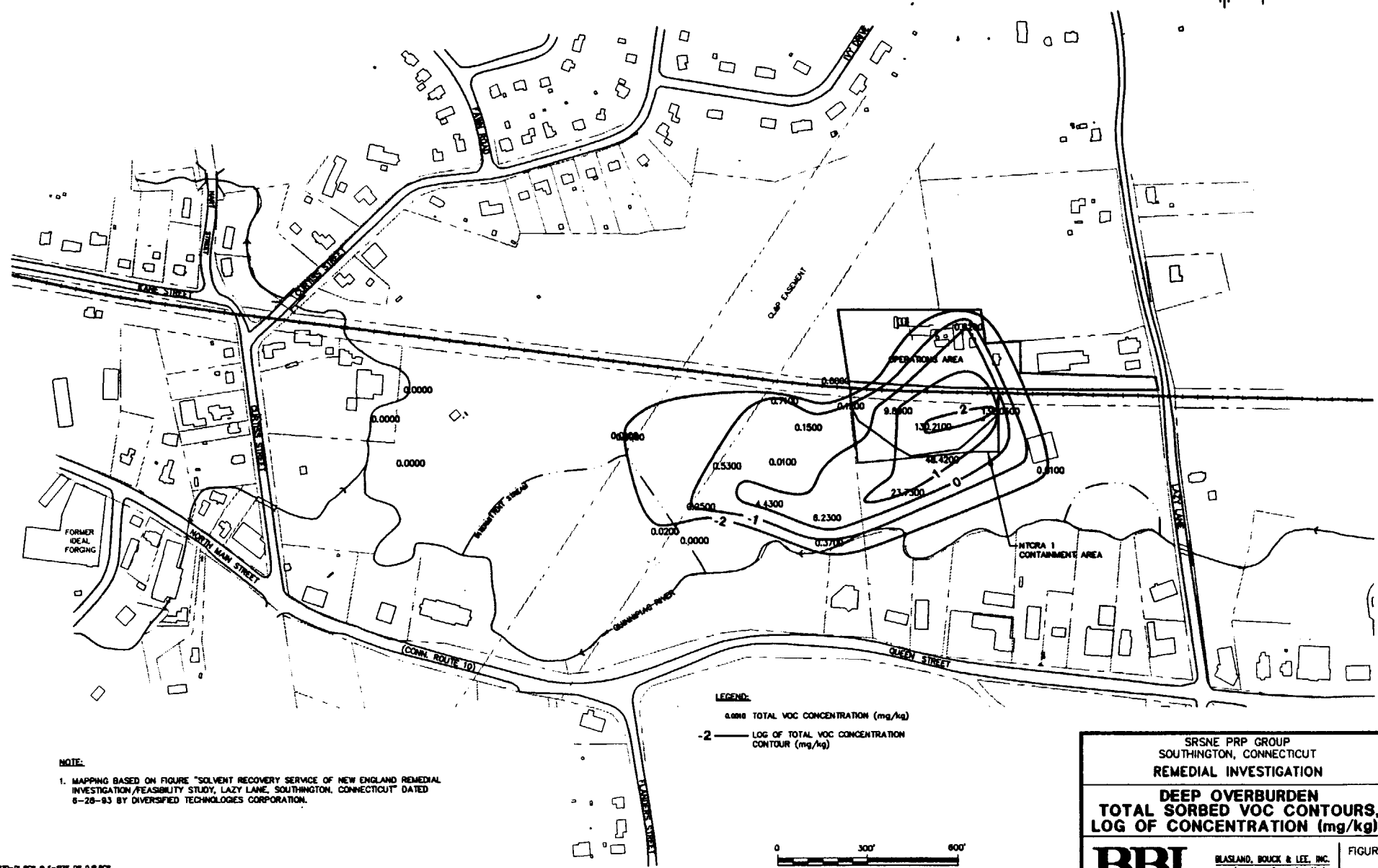
REMEDIAL INVESTIGATION

MIDDLE OVERBURDEN TOTAL SORBED VOC CONTOURS, LOG OF CONCENTRATION (mg/kg)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

P:STD-DL.PCP @ E-SIZE OR DJB.PCP
XREF: 08325K00,08325K01
8/23/97 SYR-54-DMW
08331900/LOG/08331905.DWG



NOTE:

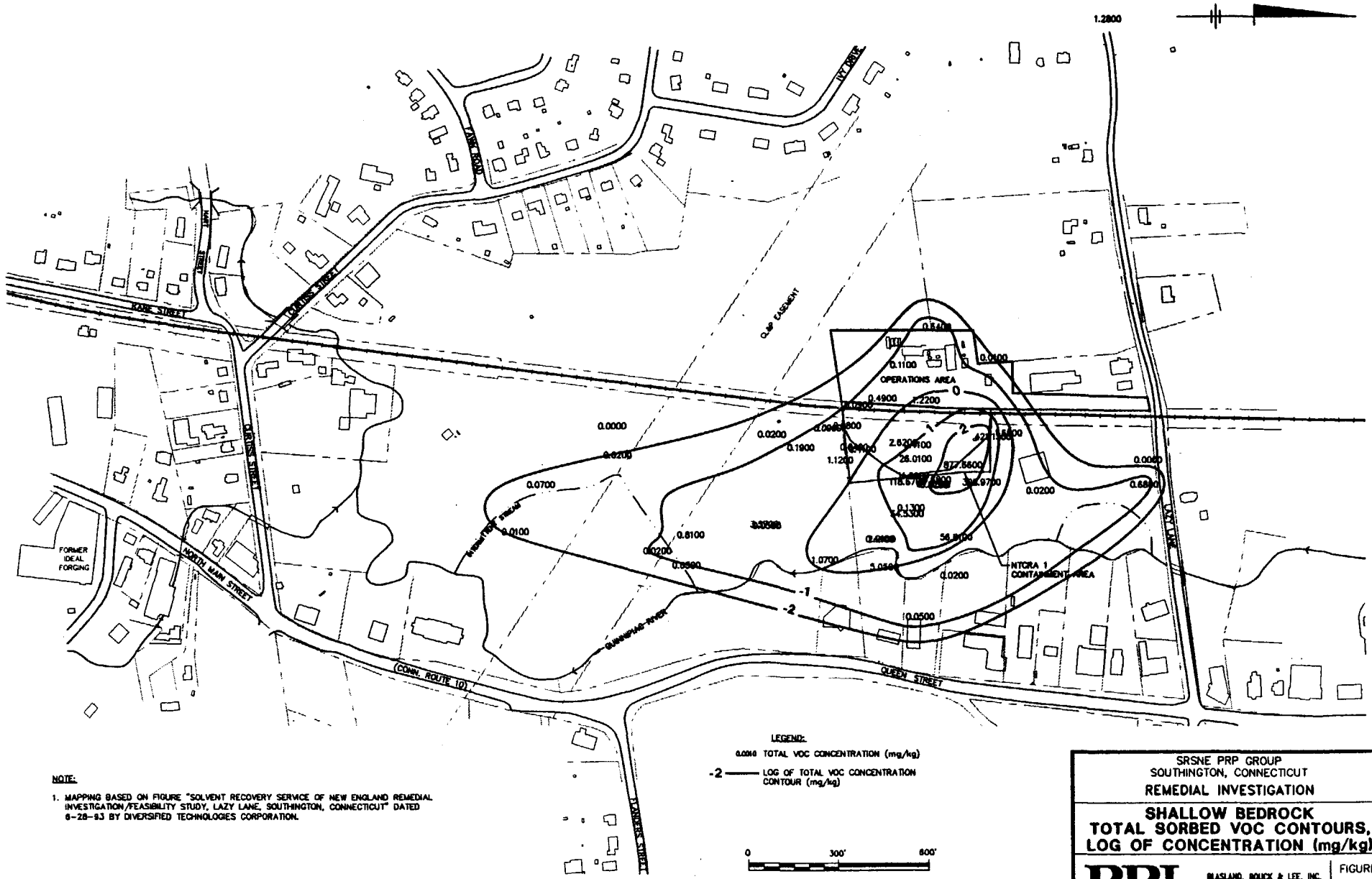
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

DEEP OVERBURDEN TOTAL SORBED VOC CONTOURS, LOG OF CONCENTRATION (mg/kg)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



NOTE:

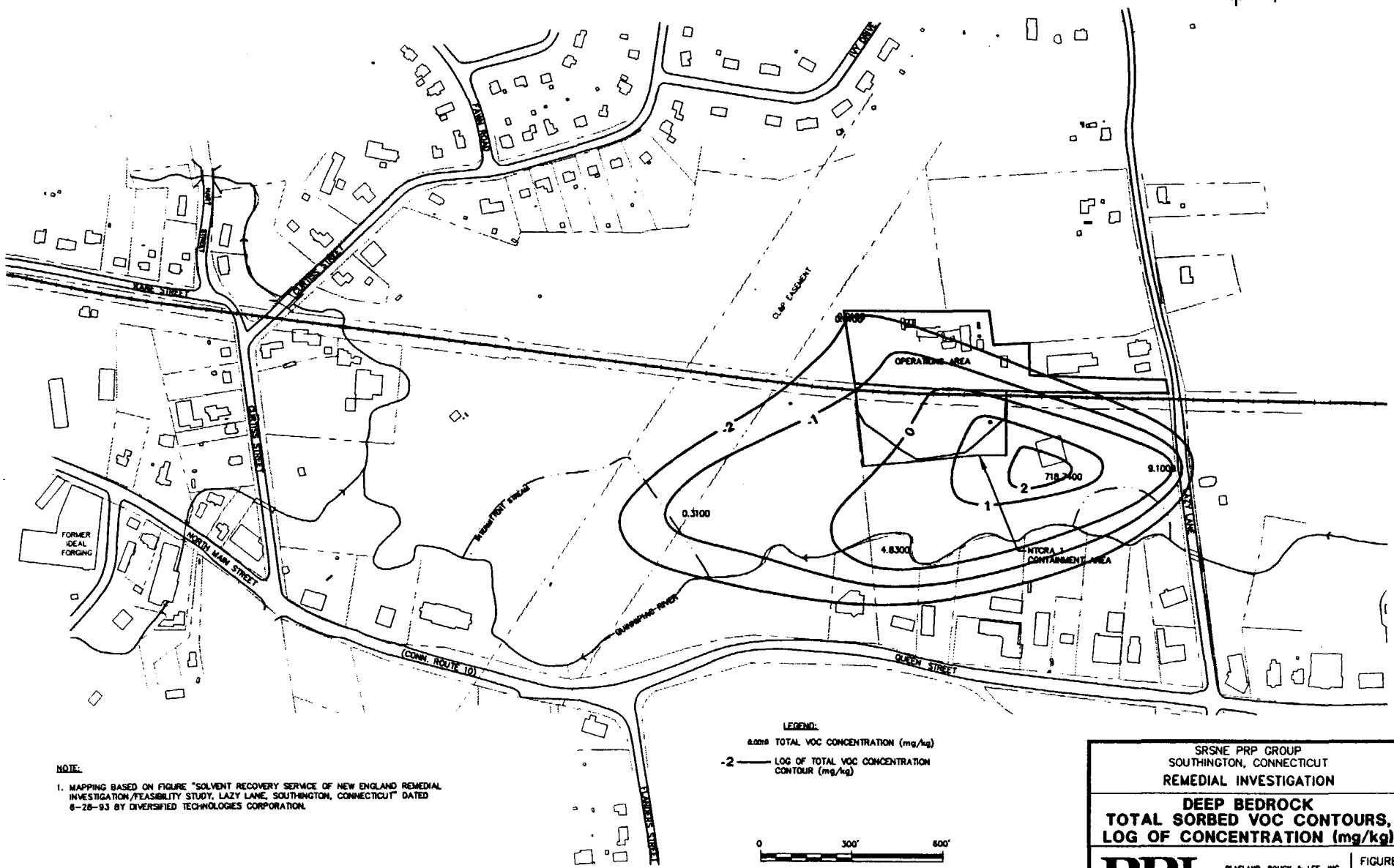
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

SHALLOW BEDROCK TOTAL SORBED VOC CONTOURS, LOG OF CONCENTRATION (mg/kg)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

REMEDIAL INVESTIGATION

DEEP BEDROCK
TOTAL SORBED VOC CONTOURS, LOG OF CONCENTRATION (mg/kg)

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

Database Output Tables and Figures Used in CT DEP RSR Screening

CT DEP POLLUTANT MOBILITY CRITERIA FOR VADOSE ZONE SOILS

The soil quality database was queried to identify VOCs and Semi-Volatile Organic Compounds (SVOCs) which were detected in soil samples collected from the vadose zone. Criteria for PCBs and Inorganic compounds require TCLP or SPLP analytical results. These results were not available, therefore no comparison was performed. Where a primary and duplicate sample were collected, the higher of the two values was used.

Compounds for which criteria were available are listed below. Compounds for which GA/GAA criteria were exceeded at at least one location are in bold italics; compounds for which GB criteria were exceeded at at least one location are underlined.

Volatile Organic Compounds

1,1,1,2-Tetrachloroethane	1,4-Dichlorobenzene	***Ethylbenzene***
1,1,1-Trichloroethane	***2-Butanone***	Methyl tert-butyl ether
1,1,2,2-Tetrachloroethane	4-Methyl-2-pentanone	***Methylene chloride***
1,1,2-Trichloroethane	Acetone	Styrene
1,1-Dichloroethane	Acrylonitrile	***Tetrachloroethene***
1,1-Dichloroethene	***Benzene***	***Toluene***
1,2-Dibromoethane	Bromoform	trans-1,2-Dichloroethene**
1,2-Dichlorobenzene	***Carbon tetrachloride***	***Trichloroethene***
1,2-Dichloroethane	Chlorobenzene	***Vinyl chloride***
1,2-Dichloropropane	***Chlorodibromomethane***	***Xylenes, Total***
1,3-Dichlorobenzene	***Chloroform***	
1,3-Dichloropropene*	***cis-1,2-Dichloroethene****	

* Concentrations for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene were totaled prior to comparison to the criteria for 1,3-Dichloropropene
**Concentrations for Total 1,2-Dichloroethene were compared to the criteria for cis-1,2-Dichloroethene

Semi-Volatile Organic Compounds

2,4-Dichlorophenol	bis(2-Chloroethyl)ether	Hexachlorobenzene
2-Chlorophenol	bis(2-Chloroisopropyl) ether	Hexachloroethane
Acenaphthylene	***bis(2-Ethylhexyl)phthalate***	Naphthalene
Anthracene	***Butyl benzyl phthalate***	Pentachlorophenol
Benzo(a)anthracene	***Di-n-butyl phthalate***	***Phenanthrene***
Benzo(a)pyrene	***Di-n-octyl phthalate***	Phenol
Benzo(b)fluoranthene	***Fluoranthene***	***Pyrene***
Benzo(k)fluoranthene	Fluorene	

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REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP GA/GAA POLLUTANT MOBILITY CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OV	Benzene	0.19	0.02	mg/kg
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OV	Ethylbenzene	23	10.1	mg/kg
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OV	Tetrachloroethene	0.2	0.1	mg/kg
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OV	Xylenes, Total	150	19.5	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	1,1,1-Trichloroethane	46	4	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	1,2-Dichloroethene, Total	10	1.4	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Ethylbenzene	300	10.1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Tetrachloroethene	60	0.1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Toluene	230	20	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Trichloroethene	58	0.1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Xylenes, Total	1200	19.5	mg/kg
B-479	565127.06	286322.15	163.47	2.0 - 3.0'	OV	1,2-Dichloroethene, Total	12	1.4	mg/kg
B-479	565127.06	286322.15	163.47	2.0 - 3.0'	OV	Tetrachloroethene	1200	0.1	mg/kg
B-480	565089.86	286324.77	162.65	3.5 - 4.0'	OV	Ethylbenzene	26	10.1	mg/kg
B-480	565089.86	286324.77	162.65	3.5 - 4.0'	OV	Tetrachloroethene	0.84	0.1	mg/kg
B-480	565089.86	286324.77	162.65	3.5 - 4.0'	OV	Trichloroethene	0.28	0.1	mg/kg
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	OV	Ethylbenzene	11	10.1	mg/kg
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	OV	Trichloroethene	0.22	0.1	mg/kg
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	OV	Vinyl chloride	0.4	0.04	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OV	Tetrachloroethene	2.3	0.1	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OV	Toluene	46	20	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OV	Trichloroethene	0.38	0.1	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OSV	bis(2-Ethylhexyl)phthalate	13	1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	1,1-Dichloroethane	1.9	1.4	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	1,2-Dichloroethene, Total	20	1.4	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Chloroform	2.1	0.12	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Ethylbenzene	34	10.1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Tetrachloroethene	12	0.1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Toluene	88	20	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Trichloroethene	12	0.1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Xylenes, Total	73	19.5	mg/kg

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP GA/GAA POLLUTANT MOBILITY CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	1,1,1-Trichloroethane	35	4	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	2-Butanone	35	8	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Ethylbenzene	50	10.1	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Tetrachloroethene	160	0.1	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Toluene	360	20	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Trichloroethene	170	0.1	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	1,1,1-Trichloroethane	8.1	4	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	2-Butanone	38	8	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	Ethylbenzene	58	10.1	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	Tetrachloroethene	15	0.1	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	Toluene	36	20	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	1,1,1-Trichloroethane	21	4	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	2-Butanone	44	8	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Benzene	2.1	0.02	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Ethylbenzene	200	10.1	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Tetrachloroethene	570	0.1	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Toluene	88	20	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Trichloroethene	35	0.1	mg/kg
SC-13	565090.4124	286577.8861	164.0709	1.0 - 3.0'	OV	Tetrachloroethene	0.106	0.1	mg/kg
SC-14	565087.12	286246.1645	165.0048	1.0 - 3.0'	OV	Tetrachloroethene	3.57	0.1	mg/kg
SC-14	565087.12	286246.1645	165.0048	1.0 - 3.0'	OV	Trichloroethene	0.53	0.1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Ethylbenzene	150	10.1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Methylene chloride	3.7	0.1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Tetrachloroethene	94	0.1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Toluene	20	20	mg/kg
SC-16	565062.063	286236.028	165.961	1.0 - 3.0'	OV	Tetrachloroethene	0.806	0.1	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	1,1,1-Trichloroethane	5.8	4	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	2-Butanone	11	8	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Chloroform	3.5	0.12	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Ethylbenzene	20	10.1	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Tetrachloroethene	22	0.1	mg/kg

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LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Toluene	20	20	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	1,1,1-Trichloroethane	260	4	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	1,1-Dichloroethene	4.2	0.14	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	2-Butanone	37	8	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Benzene	2.9	0.02	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Chloroform	5.9	0.12	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Ethylbenzene	57	10.1	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Tetrachloroethene	820	0.1	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Toluene	500	20	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Trichloroethene	52	0.1	mg/kg
SC-2	565124.1653	286190.4061	164.6052	1.0 - 3.0'	OV	Methylene chloride	0.105	0.1	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	1,1,1-Trichloroethane	24	4	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	2-Butanone	13	8	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Ethylbenzene	74	10.1	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Tetrachloroethene	77	0.1	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Toluene	92	20	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Trichloroethene	19	0.1	mg/kg
SC-22	564956.205	286428.5349	167.9701	1.0 - 3.0'	OV	Methylene chloride	0.24	0.1	mg/kg
SC-22	564956.205	286428.5349	167.9701	1.0 - 3.0'	OV	Tetrachloroethene	0.29	0.1	mg/kg
SC-3	565120.0754	286248.2745	164.0237	1.0 - 3.0'	OV	1,1,2,2-Tetrachloroethane	0.022	0.01	mg/kg
SC-3	565120.0754	286248.2745	164.0237	1.0 - 3.0'	OV	Chlorodibromomethane	0.027	0.01	mg/kg
SC-3	565120.0754	286248.2745	164.0237	1.0 - 3.0'	OV	Methylene chloride	0.553	0.1	mg/kg
SC-3	565120.0754	286248.2745	164.0237	1.0 - 3.0'	OV	Tetrachloroethene	0.334	0.1	mg/kg
SC-3	565120.0754	286248.2745	164.0237	1.0 - 3.0'	OV	Trichloroethene	0.295	0.1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	1,2-Dichloroethene, Total	1.56	1.4	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Benzene	0.031	0.02	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Ethylbenzene	67.5	10.1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Methylene chloride	0.49	0.1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Tetrachloroethene	23.6	0.1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Trichloroethene	10.4	0.1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	1,1,1-Trichloroethane	36	4	mg/kg

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LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	2-Butanone	29	8	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Ethylbenzene	720	10.1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Methylene chloride	2.7	0.1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Tetrachloroethene	510	0.1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Toluene	380	20	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Trichloroethene	76	0.1	mg/kg
SC-7	565125.6829	286402.9141	164.7282	1.0 - 3.0'	OV	Tetrachloroethene	8.81	0.1	mg/kg
SC-7	565125.6829	286402.9141	164.7282	1.0 - 3.0'	OV	Trichloroethene	7.03	0.1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	1,1,1-Trichloroethane	16	4	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	2-Butanone	8.3	8	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Ethylbenzene	40	10.1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Methylene chloride	3.5	0.1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Tetrachloroethene	170	0.1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Toluene	490	20	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Trichloroethene	49	0.1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	1,1,1-Trichloroethane	170	4	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	1,1-Dichloroethene	2.1	0.14	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	1,2-Dichloroethene, Total	2.3	1.4	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	2-Butanone	25	8	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Benzene	2.6	0.02	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Chloroform	2.1	0.12	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Ethylbenzene	45	10.1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Methylene chloride	7.4	0.1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Tetrachloroethene	120	0.1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Toluene	59	20	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Trichloroethene	430	0.1	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Benzene	0.03	0.02	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Methylene chloride	1.68	0.1	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Tetrachloroethene	5.1	0.1	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Trichloroethene	6.41	0.1	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)anthracene	1.6	1	mg/kg

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LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)pyrene	1.5	1	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	bis(2-Ethylhexyl)phthalate	5.8	1	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OV	1,2-Dichloroethene, Total	6.2	1.4	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OV	Vinyl chloride	0.22	0.04	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OV	Xylenes, Total	23	19.5	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	bis(2-Ethylhexyl)phthalate	900	1	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Butyl benzyl phthalate	120	20	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Di-n-butyl phthalate	89	14	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Di-n-octyl phthalate	61	2	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Fluoranthene	6.3	5.6	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Phenanthrene	8.7	4	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Pyrene	5.2	4	mg/kg
SD3-24	565154.2033	286295.1263	162.4589	0.0 - 1.0'	OSV	bis(2-Ethylhexyl)phthalate	11	1	mg/kg
SD3-24	565154.2033	286295.1263	161.4589	1.0 - 2.0'	OSV	bis(2-Ethylhexyl)phthalate	19	1	mg/kg
SD3-24	565154.2033	286295.1263	160.4589	2.0 - 3.0'	OSV	bis(2-Ethylhexyl)phthalate	9.5	1	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OV	1,2-Dichloroethene, Total	6.8	1.4	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OV	Tetrachloroethene	5.2	0.1	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OV	Vinyl chloride	0.069	0.04	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OSV	bis(2-Ethylhexyl)phthalate	160	1	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OSV	Di-n-octyl phthalate	9.7	2	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	1,1,1-Trichloroethane	45	4	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	1,2-Dichloroethene, Total	12	1.4	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Carbon tetrachloride	0.76	0.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Chloroform	1.2	0.12	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Methylene chloride	31	0.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Tetrachloroethene	66	0.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Trichloroethene	11	0.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OSV	bis(2-Ethylhexyl)phthalate	500	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OSV	Di-n-octyl phthalate	8.2	2	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	1,1,1-Trichloroethane	140	4	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	1,1-Dichloroethane	2.7	1.4	mg/kg

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EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP GA/GAA POLLUTANT MOBILITY CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	1,2-Dichloroethene, Total	58	1.4	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Chloroform	2.7	0.12	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Ethylbenzene	29	10.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Tetrachloroethene	170	0.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Trichloroethene	27	0.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OSV	Di-n-octyl phthalate	4.8	2	mg/kg
SD3-39	565212.8145	286604.4892	160.0175	0.0 - 1.0'	OSV	bis(2-Ethylhexyl)phthalate	1.2	1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	1,1,1-Trichloroethane	26	4	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	1,1-Dichloroethane	2.8	1.4	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	1,2-Dichloroethene, Total	35	1.4	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Ethylbenzene	84	10.1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Tetrachloroethene	8.1	0.1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Toluene	200	20	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Trichloroethene	3.7	0.1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Xylenes, Total	320	19.5	mg/kg
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	OSV	Benzo(b)fluoranthene	1.8	1	mg/kg
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	OSV	Benzo(k)fluoranthene	1.8	1	mg/kg

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EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP GB POLLUTANT MOBILITY CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OV	Ethylbenzene	23	10.1	mg/kg
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OV	Xylenes, Total	150	19.5	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	1,1,1-Trichloroethane	46	40	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Ethylbenzene	300	10.1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Tetrachloroethene	60	1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Toluene	230	67	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Trichloroethene	58	1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Xylenes, Total	1200	19.5	mg/kg
B-479	565127.06	286322.15	163.47	2.0 - 3.0'	OV	Tetrachloroethene	1200	1	mg/kg
B-480	565089.86	286324.77	162.65	3.5 - 4.0'	OV	Ethylbenzene	26	10.1	mg/kg
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	OV	Ethylbenzene	11	10.1	mg/kg
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	OV	Vinyl chloride	0.4	0.4	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OV	Tetrachloroethene	2.3	1	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OSV	bis(2-Ethylhexyl)phthalate	13	11	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	1,2-Dichloroethene, Total	20	14	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Chloroform	2.1	1.2	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Ethylbenzene	34	10.1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Tetrachloroethene	12	1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Toluene	88	67	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Trichloroethene	12	1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Xylenes, Total	73	19.5	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Ethylbenzene	50	10.1	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Tetrachloroethene	160	1	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Toluene	360	67	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Trichloroethene	170	1	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	Ethylbenzene	58	10.1	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	Tetrachloroethene	15	1	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Benzene	2.1	0.2	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Ethylbenzene	200	10.1	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Tetrachloroethene	570	1	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Toluene	88	67	mg/kg

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LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Trichloroethene	35	1	mg/kg
SC-14	565087.12	286246.1645	165.0048	1.0 - 3.0'	OV	Tetrachloroethene	3.57	1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Ethylbenzene	150	10.1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Methylene chloride	3.7	1	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Tetrachloroethene	94	1	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Chloroform	3.5	1.2	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Ethylbenzene	20	10.1	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Tetrachloroethene	22	1	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	1,1,1-Trichloroethane	260	40	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	1,1-Dichloroethene	4.2	1.4	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Benzene	2.9	0.2	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Chloroform	5.9	1.2	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Ethylbenzene	57	10.1	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Tetrachloroethene	820	1	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Toluene	500	67	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Trichloroethene	52	1	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Ethylbenzene	74	10.1	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Tetrachloroethene	77	1	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Toluene	92	67	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Trichloroethene	19	1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Ethylbenzene	67.5	10.1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Tetrachloroethene	23.6	1	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Trichloroethene	10.4	1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Ethylbenzene	720	10.1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Methylene chloride	2.7	1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Tetrachloroethene	510	1	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Toluene	380	67	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Trichloroethene	76	1	mg/kg
SC-7	565125.6829	286402.9141	164.7282	1.0 - 3.0'	OV	Tetrachloroethene	8.81	1	mg/kg
SC-7	565125.6829	286402.9141	164.7282	1.0 - 3.0'	OV	Trichloroethene	7.03	1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Ethylbenzene	40	10.1	mg/kg

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EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP GB POLLUTANT MOBILITY CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Methylene chloride	3.5	1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Tetrachloroethene	170	1	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Toluene	490	67	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Trichloroethene	49	1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	1,1,1-Trichloroethane	170	40	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	1,1-Dichloroethene	2.1	1.4	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Benzene	2.6	0.2	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Chloroform	2.1	1.2	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Ethylbenzene	45	10.1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Methylene chloride	7.4	1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Tetrachloroethene	120	1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Trichloroethene	430	1	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Methylene chloride	1.68	1	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Tetrachloroethene	5.1	1	mg/kg
SC-9	565114.8803	286447.0164	160.9055	5.0 - 6.0'	OV	Trichloroethene	6.41	1	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)anthracene	1.6	1	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)pyrene	1.5	1	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OV	Xylenes, Total	23	19.5	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	bis(2-Ethylhexyl)phthalate	900	11	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	Di-n-octyl phthalate	61	20	mg/kg
SD3-24	565154.2033	286295.1263	162.4589	0.0 - 1.0'	OSV	bis(2-Ethylhexyl)phthalate	11	11	mg/kg
SD3-24	565154.2033	286295.1263	161.4589	1.0 - 2.0'	OSV	bis(2-Ethylhexyl)phthalate	19	11	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OV	Tetrachloroethene	5.2	1	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OSV	bis(2-Ethylhexyl)phthalate	160	11	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	1,1,1-Trichloroethane	45	40	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Chloroform	1.2	1.2	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Methylene chloride	31	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Tetrachloroethene	66	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Trichloroethene	11	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OSV	bis(2-Ethylhexyl)phthalate	500	11	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	1,1,1-Trichloroethane	140	40	mg/kg

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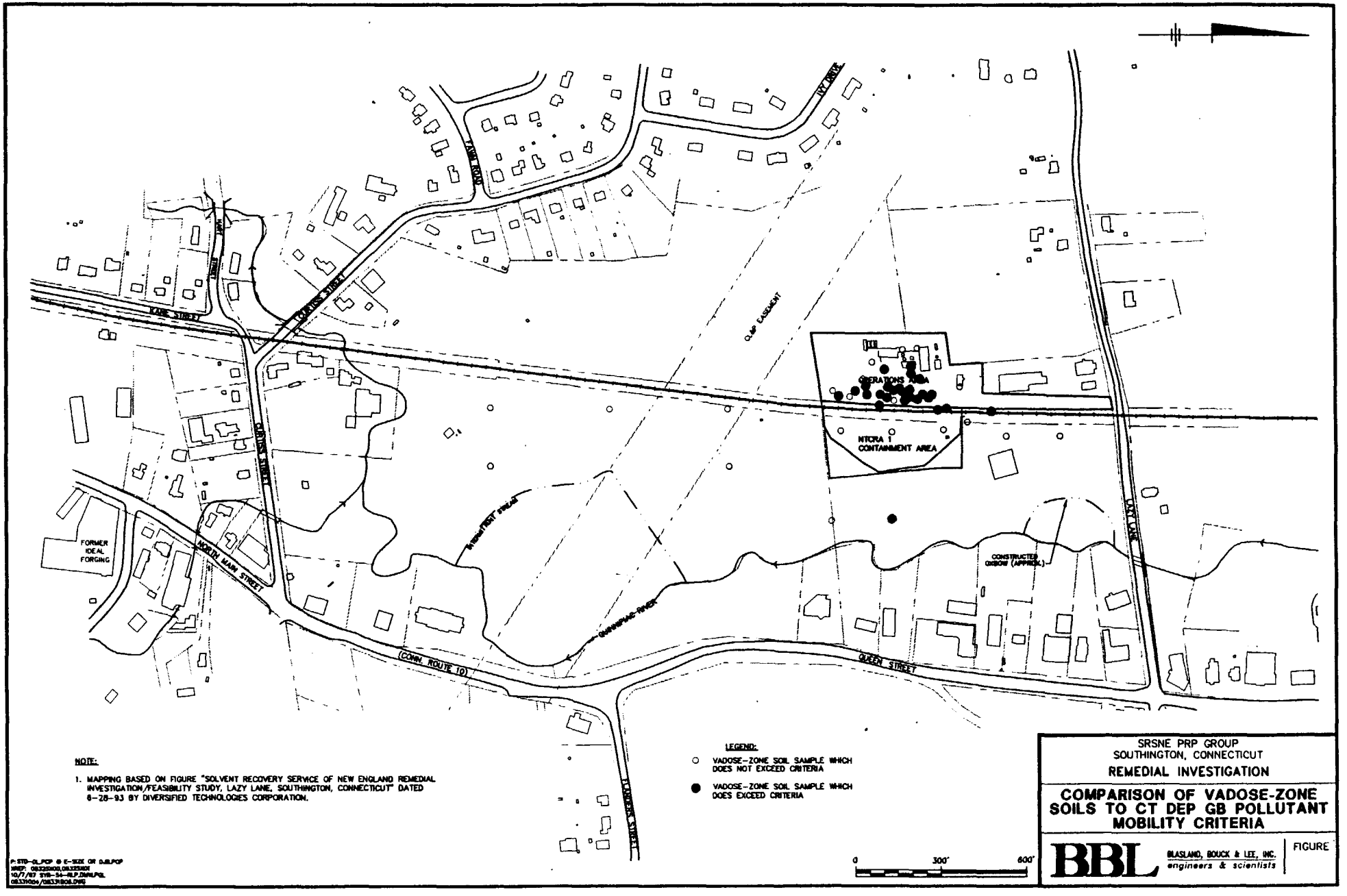
EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP GB POLLUTANT MOBILITY CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	1,2-Dichloroethene, Total	58	14	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Chloroform	2.7	1.2	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Ethylbenzene	29	10.1	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Tetrachloroethene	170	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Trichloroethene	27	1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	1,2-Dichloroethene, Total	35	14	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Ethylbenzene	84	10.1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Tetrachloroethene	8.1	1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Toluene	200	67	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Trichloroethene	3.7	1	mg/kg
SP-485	565106.66	286376.49	165.62	0.0 - 1.0'	OV	Xylenes, Total	320	19.5	mg/kg
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	OSV	Benzo(b)fluoranthene	1.8	1	mg/kg
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	OSV	Benzo(k)fluoranthene	1.8	1	mg/kg



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

LEGEND:

○ VADOSE-ZONE SOIL SAMPLE WHICH DOES NOT EXCEED CRITERIA

● VADOSE-ZONE SOIL SAMPLE WHICH DOES EXCEED CRITERIA

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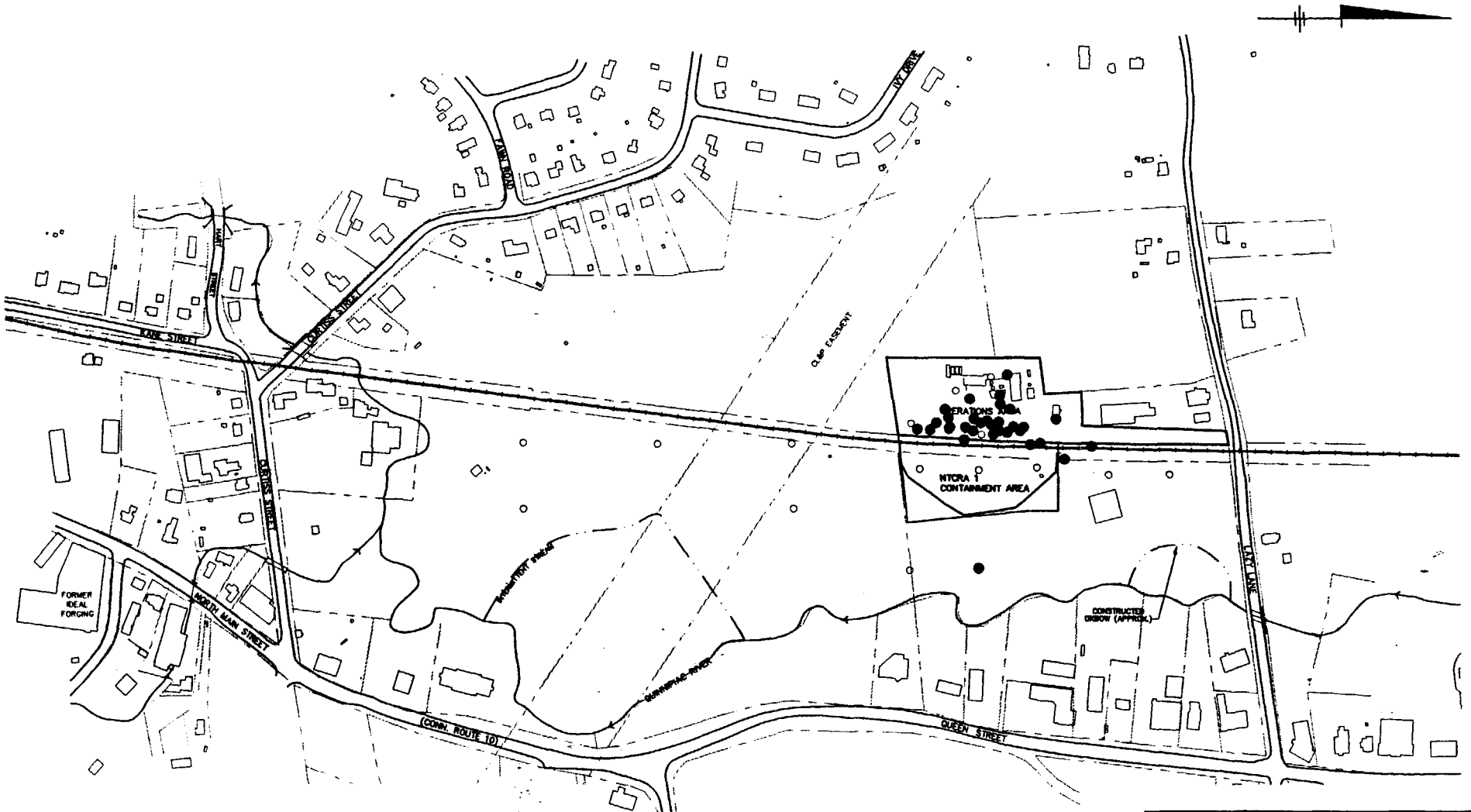
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

COMPARISON OF VADOSE-ZONE SOILS TO CT DEP GB POLLUTANT MOBILITY CRITERIA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

LEGEND:

○ VADOSE-ZONE SOIL SAMPLE WHICH DOES NOT EXCEED CRITERIA

● VADOSE-ZONE SOIL SAMPLE WHICH DOES EXCEED CRITERIA

0 300' 600'

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SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

COMPARISON OF VADOSE-ZONE SOILS TO CT DEP GA, GAA POLLUTANT MOBILITY CRITERIA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

CT DEP DIRECT EXPOSURE CRITERIA FOR VADOSE SOILS

The soil quality database was queried to identify compounds which were detected in soil samples collected from the vadose zone. Where a primary and duplicate sample were collected, the higher of the two values was used.

Compounds for which criteria were available are listed below. Compounds for which residential criteria were exceeded at at least one location are in bold italics; compounds for which industrial/commercial criteria were exceeded at at least one location are underlined.

Volatile Organic Compounds

1,1,1,2-Tetrachloroethane	1,4-Dichlorobenzene	***Ethylbenzene***
1,1,1-Trichloroethane	2-Butanone	Methyl tert-butyl ether
1,1,2,2-Tetrachloroethane	4-Methyl-2-pentanone	Methylene chloride
1,1,2-Trichloroethane	Acetone	Styrene
1,1-Dichloroethane	Acrylonitrile	***Tetrachloroethene***
1,1-Dichloroethene	Benzene	***Toluene***
1,2-Dibromoethane	Bromoform	trans-1,2-Dichloroethene**
1,2-Dichlorobenzene	Carbon tetrachloride	***Trichloroethene***
1,2-Dichloroethane	Chlorobenzene	***Vinyl chloride***
1,2-Dichloropropane	Chlorodibromomethane	***Xylenes, Total***
1,3-Dichlorobenzene	Chloroform	
1,3-Dichloropropene*	cis-1,2-Dichloroethene**	

* Concentrations for cis-1,3-Dichloropropene and trans-1,3-Dichloropropene were totaled prior to comparison to the criteria for 1,3-Dichloropropene

**Concentrations for Total 1,2-Dichloroethene were compared to the criteria for cis-1,2-Dichloroethene and trans-1,2-Dichloroethene

Semi-Volatile Organic Compounds

2,4-Dichlorophenol	bis(2-Chloroethyl)ether	Hexachlorobenzene
2-Chlorophenol	bis(2-Chloroisopropyl) ether	Hexachloroethane
Acenaphthylene	***bis(2-Ethylhexyl)phthalate***	Naphthalene
Anthracene	Butyl benzyl phthalate	Pentachlorophenol
Benzo(a)anthracene	Di-n-butyl phthalate	Phenanthrene
Benzo(a)pyrene	Di-n-octyl phthalate	Phenol
Benzo(b)fluoranthene	Fluoranthene	Pyrene
Benzo(k)fluoranthene	Fluorene	

Polychlorinated Biphenyls

Total PCBs

Inorganics (no exceedences)

Antimony	Copper	Selenium
Arsenic	Cyanide, Total	Silver
Barium	Lead	Thallium
Beryllium	Mercury	Vanadium
Cadmium	Nickel	Zinc

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REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP RESIDENTIAL DIRECT EXPOSURE CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OPCB	PCBs, Total	17.2	1	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Tetrachloroethene	60	12	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Trichloroethene	58	56	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Xylenes, Total	1200	500	mg/kg
B-479	565127.06	286322.15	163.47	2.0 - 3.0'	OV	Tetrachloroethene	1200	12	mg/kg
B-484	565116.26	286250.88	162.47	3.5 - 4.0'	OV	Vinyl chloride	0.4	0.32	mg/kg
B-8	565103	286209.1	164.69	1.0 - 3.0'	OPCB	PCBs, Total	4.42	1	mg/kg
MW-488	565095.57	286365.62	161.01	5.0 - 6.0'	OV	Tetrachloroethene	12	12	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Tetrachloroethene	160	12	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Trichloroethene	170	56	mg/kg
SC-11	565102.314	286345.9229	164.4956	1.0 - 3.0'	OV	Tetrachloroethene	15	12	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Tetrachloroethene	570	12	mg/kg
SC-15	565060.8426	286435.5367	165.327	1.0 - 3.0'	OV	Tetrachloroethene	94	12	mg/kg
SC-18	565029.0014	286312.2255	167.2807	1.0 - 3.0'	OV	Tetrachloroethene	22	12	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	1,1-Dichloroethene	4.2	1	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Tetrachloroethene	820	12	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Toluene	500	500	mg/kg
SC-20	565018.7874	286406.0243	166.0117	1.0 - 3.0'	OV	Tetrachloroethene	77	12	mg/kg
SC-4	565115.7943	286298.6034	164.194	1.0 - 3.0'	OV	Tetrachloroethene	23.6	12	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Ethylbenzene	720	500	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Tetrachloroethene	510	12	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Trichloroethene	76	56	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Tetrachloroethene	170	12	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	1,1-Dichloroethene	2.1	1	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Tetrachloroethene	120	12	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Trichloroethene	430	56	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)anthracene	1.6	1	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)pyrene	1.5	1	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	bis(2-Ethylhexyl)phthalate	900	44	mg/kg
SD3-24	565154.2033	286295.1263	162.4589	0.0 - 1.0'	OPCB	PCBs, Total	2	1	mg/kg
SD3-24	565154.2033	286295.1263	161.4589	1.0 - 2.0'	OPCB	PCBs, Total	2.65	1	mg/kg

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REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP RESIDENTIAL DIRECT EXPOSURE CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
SD3-24	565154.2033	286295.1263	160.4589	2.0 - 3.0'	OPCB	PCBs, Total	2.12	1	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OSV	bis(2-Ethylhexyl)phthalate	160	44	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OPCB	PCBs, Total	19.9	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OV	Tetrachloroethene	66	12	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OSV	bis(2-Ethylhexyl)phthalate	500	44	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OPCB	PCBs, Total	10.3	1	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Tetrachloroethene	170	12	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OPCB	PCBs, Total	23.5	1	mg/kg
SD3-39	565212.8145	286604.4892	160.0175	0.0 - 1.0'	OPCB	PCBs, Total	1.26	1	mg/kg
SD3-39	565212.8145	286604.4892	159.0175	1.0 - 2.0'	OPCB	PCBs, Total	1.76	1	mg/kg
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	OSV	Benzo(b)fluoranthene	1.8	1	mg/kg
SS3-B4	565547.1117	286338.4927	168.6816	0.0 - 0.5'	OPCB	PCBs, Total	1.23	1	mg/kg

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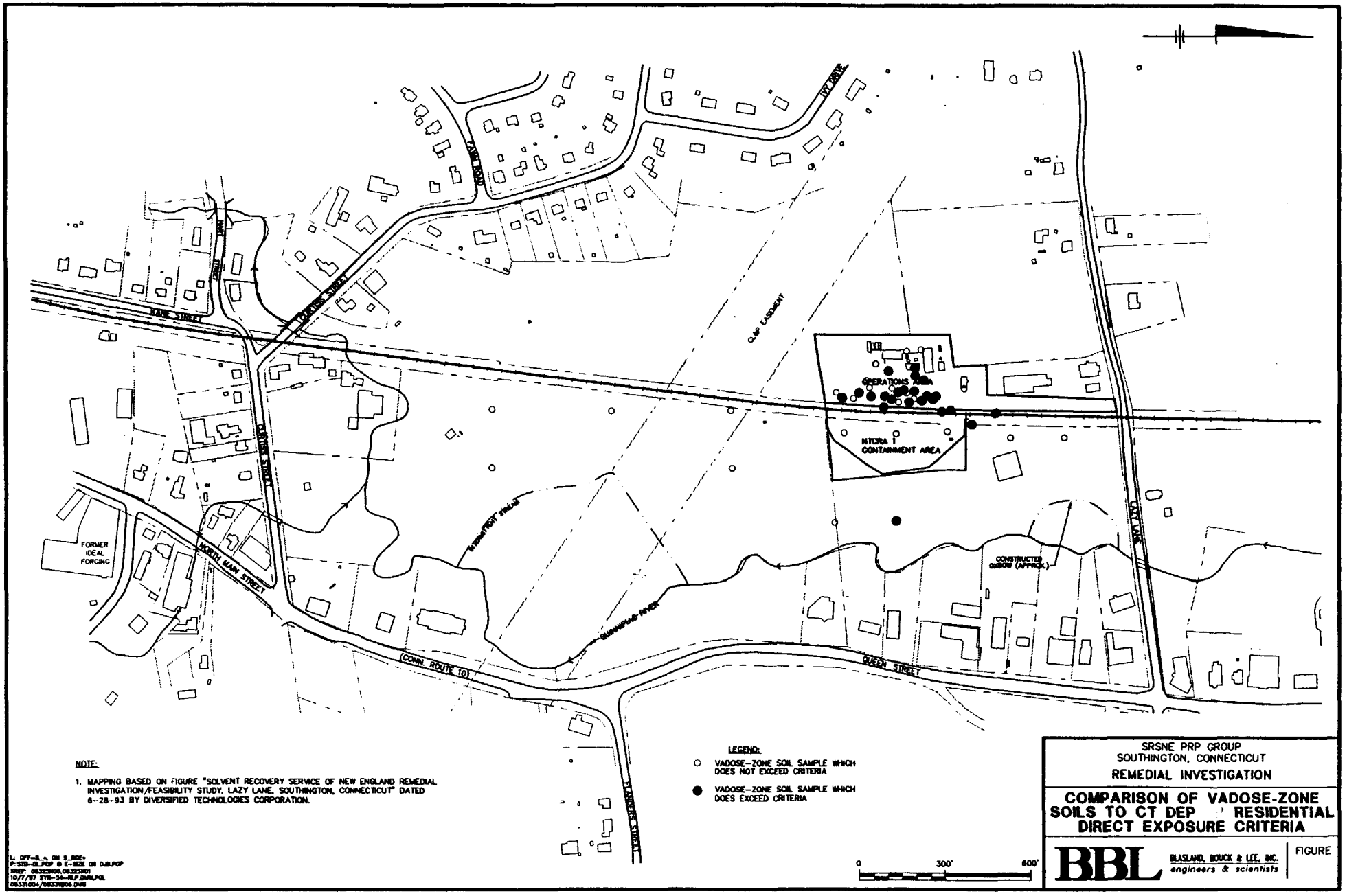
REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN VADOSE ZONE SOILS OF
CT DEP INDUSTRIAL/COMMERCIAL DIRECT EXPOSURE CRITERIA

LOCID	X	Y	Z	DEPTH	CLASS	CHEMICAL	RESULT	CRITERIA	UNITS
B-15	565121.48	286149.67	162.43	4.0 - 6.0'	OPCB	PCBs, Total	17.2	10	mg/kg
B-477	565115.95	286478.89	165.22	0.5 - 1.0'	OV	Xylenes, Total	1200	1000	mg/kg
B-479	565127.06	286322.15	163.47	2.0 - 3.0'	OV	Tetrachloroethene	1200	110	mg/kg
SC-10	565126.9443	286467.4409	163.9324	1.0 - 3.0'	OV	Tetrachloroethene	160	110	mg/kg
SC-12	565098.9205	286402.0614	165.0126	1.0 - 3.0'	OV	Tetrachloroethene	570	110	mg/kg
SC-19	565044.6807	286405.5965	165.839	1.0 - 3.0'	OV	Tetrachloroethene	820	110	mg/kg
SC-6	565137.0462	286384.8904	162.6496	1.0 - 3.0'	OV	Tetrachloroethene	510	110	mg/kg
SC-8	565131.564	286428.5763	163.0628	1.0 - 3.0'	OV	Tetrachloroethene	170	110	mg/kg
SC-9	565114.8803	286447.0164	164.4055	1.0 - 3.0'	OV	Tetrachloroethene	120	110	mg/kg
SD1-03	565174.0171	286688.5743	161.75	0.0 - 0.5'	OSV	Benzo(a)pyrene	1.5	1	mg/kg
SD1-04	565164.8797	286529.6109	159.8217	0.0 - 0.5'	OSV	bis(2-Ethylhexyl)phthalate	900	410	mg/kg
SD3-25	565168.8446	286499.8981	160.3575	0.0 - 1.0'	OPCB	PCBs, Total	19.9	10	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OSV	bis(2-Ethylhexyl)phthalate	500	410	mg/kg
SD3-25	565168.8446	286499.8981	159.3975	1.25 - 1.67'	OPCB	PCBs, Total	10.3	10	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OV	Tetrachloroethene	170	110	mg/kg
SD3-25	565168.8446	286499.8981	159.3575	1.0 - 2.0'	OPCB	PCBs, Total	23.5	10	mg/kg



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

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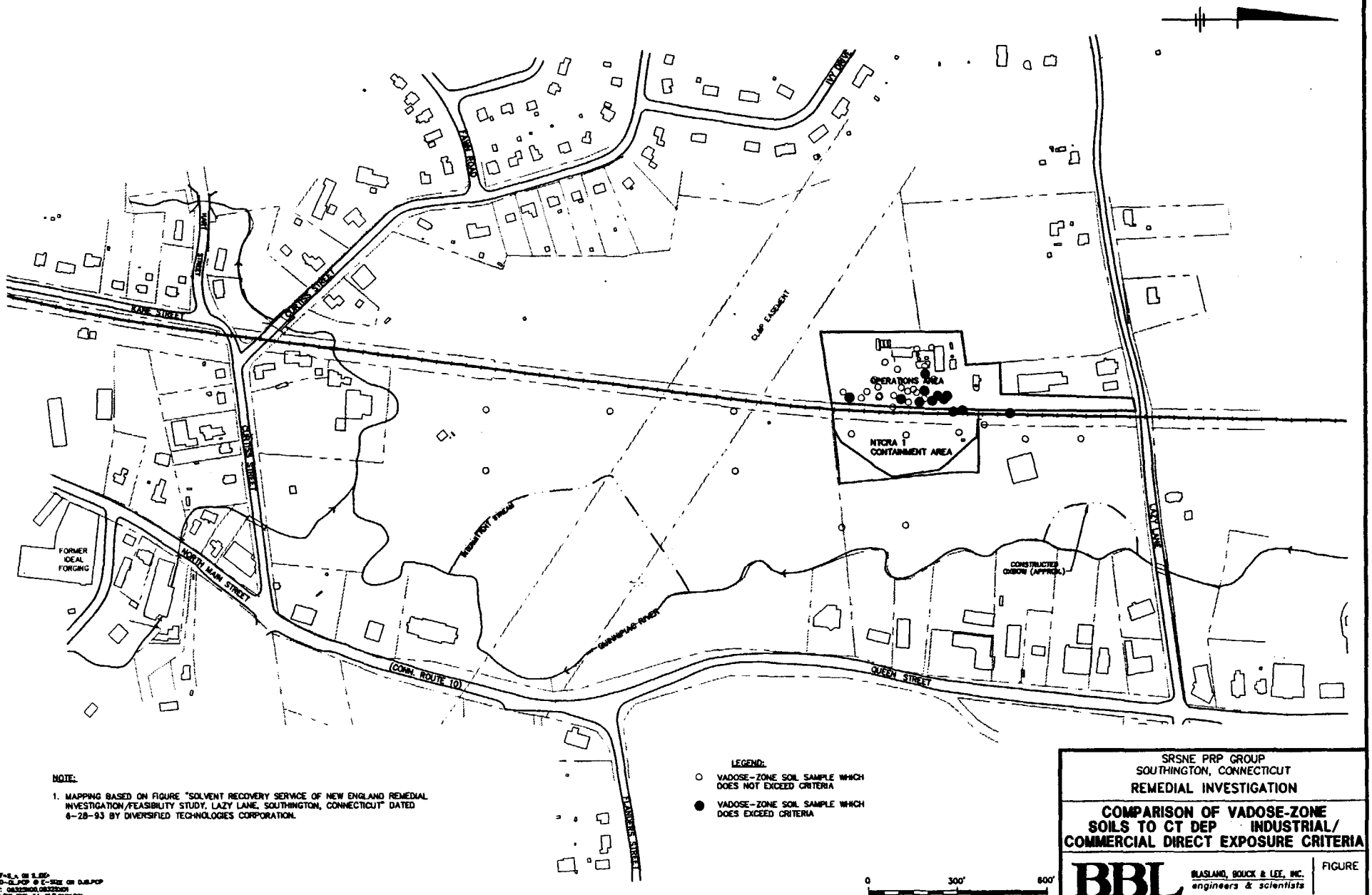
REMEDIAL INVESTIGATION

COMPARISON OF VADOSE-ZONE SOILS TO CT DEP RESIDENTIAL DIRECT EXPOSURE CRITERIA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



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LEGEND:

○ VADOSE-ZONE SOIL SAMPLE WHICH DOES NOT EXCEED CRITERIA

● VADOSE-ZONE SOIL SAMPLE WHICH DOES EXCEED CRITERIA

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REMEDIAL INVESTIGATION

COMPARISON OF VADOSE-ZONE SOILS TO CT DEP INDUSTRIAL/ COMMERCIAL DIRECT EXPOSURE CRITERIA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

CT DEP VOLATILIZATION CRITERIA FOR SHALLOW OVERBURDEN GROUND WATER

The ground-water quality database was queried to identify Volatile Organic Compounds (VOCs) which were detected in ground-water samples from shallow overburden sampling locations. The most recent set of results from each shallow overburden sampling location was used. Where a primary and duplicate sample were collected, the higher of the two values was used. These results were compared to CT DEP Residential and Industrial/Commercial Volatilization Criteria. Compounds for which criteria were available are listed below. Compounds for which residential criteria were exceeded at at least one location are in bold italics; compounds for which industrial/commercial criteria were exceeded at at least one location are underlined.

Volatile Organic Compounds

1,3-Dichloropropene	1,2-Dichloropropane	Chloroform
1,1,1,2-Tetrachloroethane	1,3-Dichlorobenzene	Ethylbenzene
1,1,1-Trichloroethane	1,4-Dichlorobenzene	Methyl tert-butyl ether
1,1,2,2-Tetrachloroethane	2-Butanone	Methylene chloride
1,1,2-Trichloroethane	4-Methyl-2-pentanone	Styrene
1,1-Dichloroethane	Acetone	Tetrachloroethene
1,1-Dichloroethene	Benzene	***Toluene***
1,2-Dibromoethane	Bromoform	Trichloroethene
1,2-Dichlorobenzene	Carbon tetrachloride	***Vinyl chloride***
1,2-Dichloroethane	Chlorobenzene	Xylenes, Total

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REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN SHALLOW OVERBURDEN GROUNDWATER OF
CT DEP RESIDENTIAL VOLATILIZATION CRITERIA

LOCID	DATE	X	Y	Z	CHEMICAL	RESULT	CRITERIA	UNITS
DP-3	12/19/96	565577.7	286481	144.45	Vinyl chloride	35	2	ug/l
MWL-301	11/22/96	565260.7	286598.2	152.82	Vinyl chloride	9	2	ug/l
MWL-304	12/12/96	565264.9	286466.1	151.96	Vinyl chloride	2700	2	ug/l
MWL-305	12/6/96	565353.7	286450	151.55	Vinyl chloride	90	2	ug/l
MWL-307	12/16/96	565259.4	286297.3	151.71	1,1,1-Trichloroethane	40000	20400	ug/l
MWL-307	12/16/96	565259.4	286297.3	151.71	1,1-Dichloroethene	1200	1	ug/l
MWL-307	12/16/96	565259.4	286297.3	151.71	Toluene	47000	23500	ug/l
MWL-307	12/16/96	565259.4	286297.3	151.71	Vinyl chloride	2000	2	ug/l
MWL-308	12/12/96	565353.7	286304.5	149.88	Vinyl chloride	10000	2	ug/l
MWL-309	12/6/96	565504.9	286302.1	146.78	Vinyl chloride	2	2	ug/l
P-16	12/12/96	565129.2	286518.3	155.35	Vinyl chloride	1400	2	ug/l
P-5B	12/13/96	565391	286283	148.74	Vinyl chloride	10	2	ug/l
TW-05	12/9/96	565149	284350	136.1	1,1-Dichloroethene	2	1	ug/l
TW-05	12/9/96	565149	284350	136.1	Vinyl chloride	30	2	ug/l

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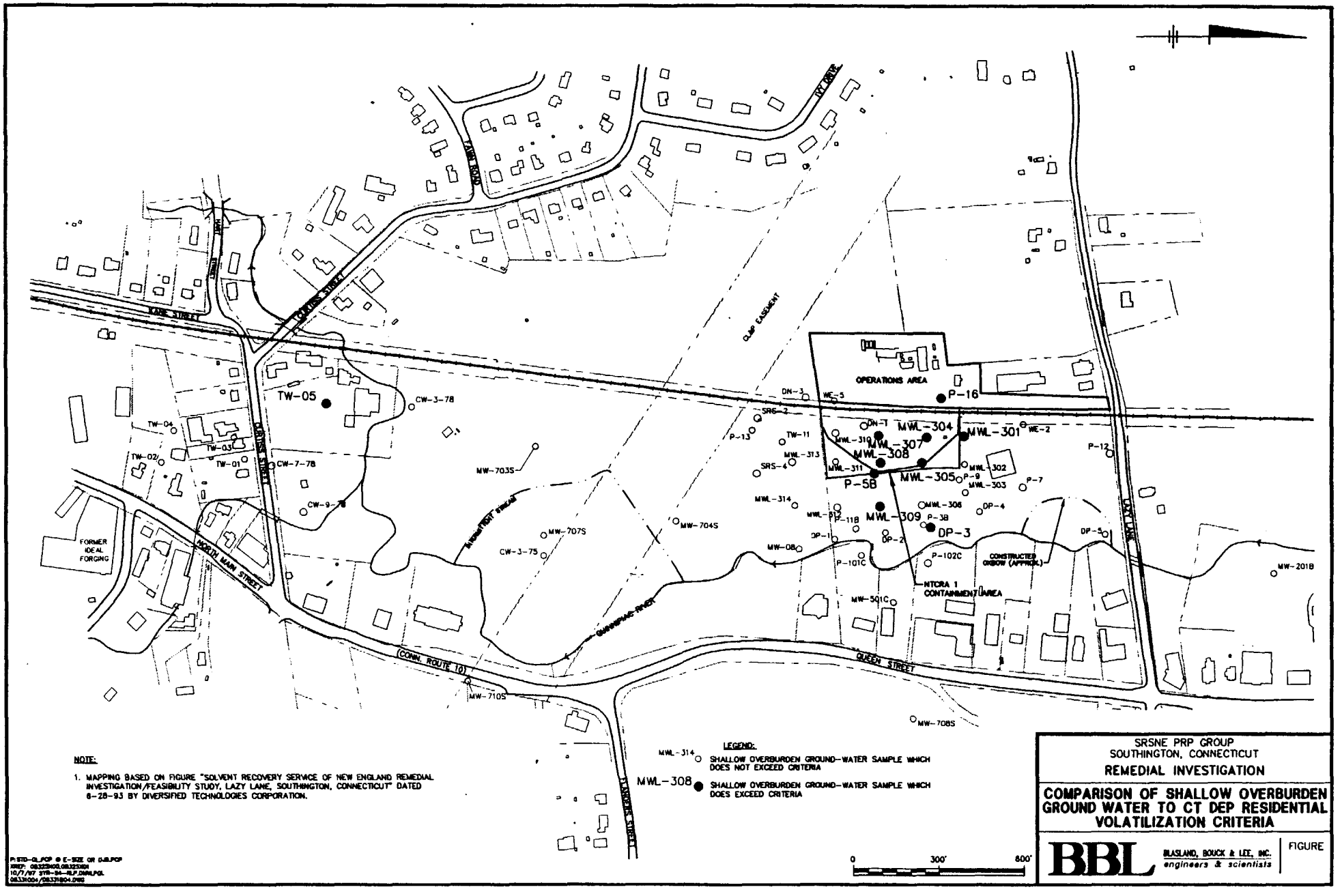
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT

EXCEEDENCES IN SHALLOW OVERBURDEN GROUNDWATER OF
CT DEP INDUSTRIAL/COMMERCIAL VOLATILIZATION CRITERIA

LOCID	DATE	X	Y	Z	CHEMICAL	RESULT	CRITERIA	UNITS
DP-3	12/19/96	565577.7	286481	144.45	Vinyl chloride	35	2	ug/l
MWL-301	11/22/96	565260.7	286598.2	152.82	Vinyl chloride	9	2	ug/l
MWL-304	12/12/96	565264.9	286466.1	151.96	Vinyl chloride	2700	2	ug/l
MWL-305	12/6/96	565353.7	286450	151.55	Vinyl chloride	90	2	ug/l
MWL-307	IN	565259.4	286297.3	151.71	1,1-Dichloroethene	1200	6	ug/l
MWL-307	12/16/96	565259.4	286297.3	151.71	Vinyl chloride	2000	2	ug/l
MWL-308	12/12/96	565353.7	286304.5	149.88	Vinyl chloride	10000	2	ug/l
MWL-309	12/6/96	565504.9	286302.1	146.78	Vinyl chloride	2	2	ug/l
P-16	12/12/96	565129.2	286518.3	155.35	Vinyl chloride	1400	2	ug/l
P-5B	12/13/96	565391	286283	148.74	Vinyl chloride	10	2	ug/l
TW-05	12/9/96	565149	284350	136.1	Vinyl chloride	30	2	ug/l



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LEGEND:

MWL-314 ○ SHALLOW OVERBURDEN GROUND-WATER SAMPLE WHICH DOES NOT EXCEED CRITERIA

MWL-308 ● SHALLOW OVERBURDEN GROUND-WATER SAMPLE WHICH DOES EXCEED CRITERIA

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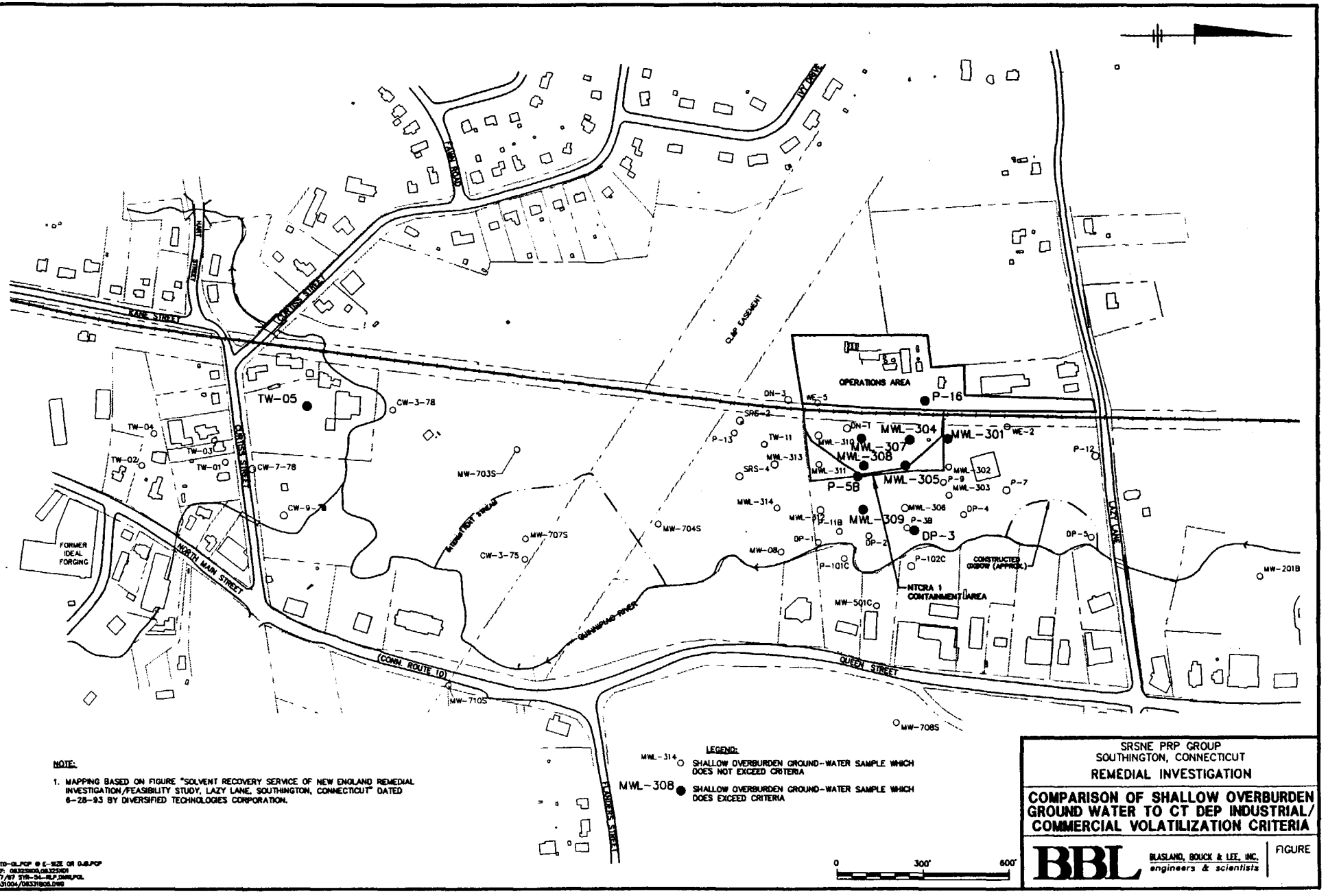
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

COMPARISON OF SHALLOW OVERBURDEN GROUND WATER TO CT DEP RESIDENTIAL VOLATILIZATION CRITERIA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE



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LEGEND:

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COMPARISON OF SHALLOW OVERBURDEN GROUND WATER TO CT DEP INDUSTRIAL/ COMMERCIAL VOLATILIZATION CRITERIA

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE

Appendix N

VLEACH Model Output File and Summary Table

COMPARISON OF VADOSE ZONE MASS FLUX CONTRIBUTION TO
OVERALL HORIZONTAL MASS FLUX IN GROUND WATER
BENEATH THE OPERATIONS AREA

SRSNE PRP GROUP
SOUTHINGTON, CT

Volatile Organic Compound:	Ethylbenzene	Trichloroethylene	Units
Dataset:	SRS14A	SRS15A	
Number of Polygons:	1	1	(-)
Timestep:	2.5	2.5	(years)
Simulation Time:	100	100	(years)
Output Time Interval:	2.5	2.5	(years)
Profile Time Interval:	25	25	(years)
Organic Carbon Distribution Coefficient, Koc (1):	676	126	(mL/g)
Henry's Law Constant (1):	0.321	0.363	(-)
Water Solubility (1):	152	1000	(mg/L)
Free Air Diffusion Coefficient (4,8):	0.611	0.701	(m^2/d)
Area:	40000	40000	(ft^2)
Vertical cell dimension:	0.5	0.5	(ft)
Recharge rate:	0.083	0.083	(ft/yr)
Dry Bulk Density:	1.94	1.94	(g/cm^3)
Effective Porosity:	0.27	0.27	(-)
Volumetric Water Content (7):	0.23	0.23	% of Vtot
Soil Organic Carbon Content:	0.00404	0.00404	(-)
Concentration of Recharge Water:	0	0	(mg/L)
Atmospheric Concentration:	0	0	(mg/L)
Water Table Concentration (2,9):	102	5.4	(mg/L)
Cell Number:	16	16	(-)
Plot Variable:	y	y	(y/n)
Plot Time:	0	0	(years)
Upper Cell (lesser integer):	1	1	(-)
Lower Cell (greater integer):	16	16	(-)
Initial Soil Contaminant Concentration in Cells (2):	73000	34000	(ug/kg)
1. Vadose Zone VOCs Mass Flux			
Total Vadose Zone Mass at t=0yr (6):	3.21E+01	1.49E+01	(g/ft^2)
	1.28E+03	5.98E+02	(Kg)
Total Vadose Zone Mass at t=100yr (6):	2.83E+01	2.46E+00	(g/ft^2)
	1.13E+03	9.84E+01	(Kg)
Ratio of 100 to 0yr Masses:	8.80E-01	1.65E-01	(-)
Advective Flux of Leachate into Ground Water	1.50E-01	3.15E-01	(g/ft^2/2.5 yr)
(LIGW: 6):	2.40E+03	5.03E+03	(g/yr)
Diffusion into Atmosphere (6):	1.85E-01	8.93E-02	(g/ft^2/2.5 yr)
	2.96E+03	1.43E+03	(g/yr)
Diffusion from Ground Water (DFGW: 6):	2.50E-01	-5.98E-02	(g/ft^2/2.5 yr)
	4.00E+03	-9.57E+02	(g/yr)
Ratio of LIGW to DFGW:	6.00E-01	-5.26E+00	(-)
Net Flux Downward from Vadose into GW (NFD):	-1.60E+03	5.99E+03	(g/yr)
2. Horizontal Ground-Water VOC Flux (9)			
Horizontal Hydraulic Conductivity (3):	5.4	5.4	(ft/d)
Block Width:	500	500	(ft)
Saturated Thickness (2):	12	12	(ft)
Horizontal Hydraulic Gradient (5):	0.045	0.045	(ft/ft)
Volumetric Water Flux:	1458	1458	(ft^3/d)
	15	15	(ML/yr)
Horizontal Ground Water VOC Flux (HFIGW):	1.5	0.081	(Mg/yr)
3. Vadose versus Ground-Water VOC Flux Comparison			
Ratio of HFIGW to LIGW:	640.02	16.18	(-)
Ratio of NFD to HFIGW:	**-0.0010**	**0.074**	**(-)**

Notes:

(-) = unitless

(1) Ravi, V., and J. A. Johnson. 1994. VLEACH: A one-dimensional finite difference vadose zone leaching model. Version 2.1. Developed for USEPA. April 6, 1994. Version 2.2a updated by Rashid Islam. June 1996.

(2) Arithmetic mean of site data in Operations Area.

(3) Geometric mean of site data in Operations Area (measured at wells P-1B, P-2B, P-4B, and P-16).

(4) LaGrega, M. D., P. L. Buckingham, and J. C. Evans. 1994. Hazardous Waste Management. New York: McGraw-Hill, Inc. Appendix A

(5) Arithmetic mean of hydraulic gradients along the eastern edge of the Operations Area, as determined based on Middle Overburden Ground-Water Elevation Contours, 01/21/97.

(6) VLEACH simulation results from initial time step (t=2.5 yrs) unless specified otherwise.

(7) ENSR, June 1994 Volume III.

(8) Cohen, R. M., J. W. Mercer, John Matthews. DNAPL Site Evaluation. CRC Press: Boca Raton, FL, 1993 (Table A-1.)

(9) These numbers based on arithmetic mean TCE and ethylbenzene concentrations detected at wells P-1B, P-2B, P-4B, and P-16 in Dec. 1996. Note that the TCE concentration assumed at well P-4B (20,500 ug/L) is one-half of the detection limit. While TCE was not detected at well P-4B in Dec. 1996, it was detected at 27,000 ug/L during the previous sampling event in March 1995 (ENSR, June 1995).

SRS14A2.PRM

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
SRSNE VADOSE ZONE LEACHING

  1 polygons.
Timestep =   2.50 years.  Simulation length =  100.00 years.
Printout every   2.50 years.  Vertical profile stored every  25.00 years.
Koc =      676.00    ml/g,      0.23873E-01cu.ft./g
Kh =     0.32100     (dimensionless).
Aqueous solubility =     152.00     mg/l,      4.3042     g/cu.ft
Free air diffusion coefficient = .61100     sq. m/day,  2400.6     sq.ft./yr


Polygon   1
OPS AREA

Polygon area =      40000.    sq. ft.
 16 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.9400    g/ml,       54935.    g/cu.ft.
 Porosity = 0.2700 Volumetric water content = 0.2300
 Organic carbon content = 0.00404000
Recharge Rate = 0.08300000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of      102.00    mg/l,       2.8883
g/cu.ft.
   with respect to gas diffusion.
```

SRS14A2.OUT

```
|-------------------------------------------------------------|
|                 VLEACH (Version 2.2a, 1996)                 |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
```

```
|        Center for Subsurface Modeling Support                    |
|        Robert S. Kerr Environmental Research Laboratory          |
|        U.S. Environmental Protection Agency                      |
|        P.O. Box 1198                                             |
|        Ada, OK 74820                                             |
|                                                                  |
|        Based on the original VLEACH (version 1.0)                |
|        developed by CH2M Hill, Redding, California               |
|        for USEPA Region IX                                       |
|------------------------------------------------------------------|
```

SRSNE VADOSE ZONE LEACHING

```
Polygon   1
At time =       0.00, total mass in vadose zone =     32.081    g/sq.ft.
Mass in gas phase     =      0.74340E-01g/sq.ft.
Mass in liquid phase  =       1.3316    g/sq.ft.
Mass sorbed           =       30.675    g/sq.ft.


Polygon   1
At time =       2.50, total mass in vadose zone =     31.996    g/sq.ft.
Mass in gas phase     =      0.74142E-01g/sq.ft.
Mass in liquid phase  =       1.3281    g/sq.ft.
Mass sorbed           =       30.594    g/sq.ft.

Since last printout at time =       0.00
               Change in Total Mass =    -0.85188E-01g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =    -0.15017    g/sq.ft.
                    Diffusion in from atmosphere =     -0.18521    g/sq.ft.
                    Diffusion in from water table =     0.25019    g/sq.ft.
               Total inflow at boundaries =    -0.85187E-01g/sq.ft.
               Mass discrepancy =    -0.75996E-06g/sq.ft.

Since beginning of run at time = 0.0
               Change in Total Mass =    -0.85188E-01g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =    -0.15017    g/sq.ft.
                    Diffusion in from atmosphere =     -0.18521    g/sq.ft.
                    Diffusion in from water table =     0.25019    g/sq.ft.
               Total inflow at boundaries =    -0.85187E-01g/sq.ft.
               Mass discrepancy =    -0.75996E-06g/sq.ft.

Polygon   1
At time =     100.00, total mass in vadose zone =     28.254    g/sq.ft.
Mass in gas phase     =      0.65471E-01g/sq.ft.
Mass in liquid phase  =       1.1728    g/sq.ft.
Mass sorbed           =       27.015    g/sq.ft.

Since last printout at time =      97.50
               Change in Total Mass =    -0.10386    g/sq.ft.
```

```
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =    -0.17674    g/sq.ft.
                    Diffusion in from atmosphere =     -0.17590    g/sq.ft.
                    Diffusion in from water table =     0.24878    g/sq.ft.
               Total inflow at boundaries =    -0.10385    g/sq.ft.
               Mass discrepancy =    -0.43660E-05g/sq.ft.

Since beginning of run at time = 0.0
               Change in Total Mass =     -3.8273    g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =     -6.5823    g/sq.ft.
                    Diffusion in from atmosphere =      -7.2127    g/sq.ft.
                    Diffusion in from water table =      9.9677    g/sq.ft.
               Total inflow at boundaries =     -3.8273    g/sq.ft.
               Mass discrepancy =    -0.14305E-04g/sq.ft.

****************************************************
TOTAL GROUNDWATER IMPACT
```

Time (yr)	Mass (g/yr)	Cumulative Mass (g)
2.50	-1600.3	-4000.9
5.00	-1585.4	-7964.4
7.50	-1570.6	-11891.
10.00	-1556.1	-15781.
12.50	-1541.7	-19635.
15.00	-1527.5	-23454.
17.50	-1513.5	-27238.
20.00	-1499.7	-30987.
22.50	-1486.0	-34702.
25.00	-1472.6	-38384.
27.50	-1459.3	-42032.
30.00	-1446.2	-45647.
32.50	-1433.3	-49230.
35.00	-1420.5	-52782.
37.50	-1408.0	-56302.
40.00	-1395.6	-59791.
42.50	-1383.4	-63249.
45.00	-1371.4	-66677.
47.50	-1359.6	-70076.
50.00	-1347.9	-73446.
52.50	-1336.4	-76787.
55.00	-1325.1	-80100.
57.50	-1314.0	-83385.
60.00	-1303.1	-86643.
62.50	-1292.3	-89874.
65.00	-1281.8	-93078.
67.50	-1271.4	-96257.
70.00	-1261.2	-99409.
72.50	-1251.1	-0.10254E+06
75.00	-1241.3	-0.10564E+06
77.50	-1231.6	-0.10872E+06
80.00	-1222.1	-0.11177E+06
82.50	-1212.8	-0.11481E+06
85.00	-1203.7	-0.11782E+06

87.50	-1194.7	-0.12080E+06
90.00	-1186.0	-0.12377E+06
92.50	-1177.4	-0.12671E+06
95.00	-1169.0	-0.12963E+06
97.50	-1160.8	-0.13254E+06
100.00	-1152.7	-0.13542E+06

SRS15A2.PRM

```
|-------------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                  |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

```
SRSNE VADOSE ZONE LEACHING

  1 polygons.
Timestep =   2.50 years.  Simulation length =  100.00 years.
Printout every   2.50 years.  Vertical profile stored every  25.00 years.
Koc =      126.00    ml/g,      0.44496E-02cu.ft./g
Kh =     0.36300     (dimensionless).
Aqueous solubility =     1000.0     mg/l,      28.317     g/cu.ft
Free air diffusion coefficient = .70100     sq. m/day,  2754.2     sq.ft./yr


Polygon   1
OPS AREA

Polygon area =      40000.    sq. ft.
 16 cells, each cell  0.500 ft. thick.
Soil Properties:
 Bulk density =     1.9400    g/ml,       54935.    g/cu.ft.
 Porosity = 0.2700 Volumetric water content = 0.2300
 Organic carbon content = 0.00404000
Recharge Rate = 0.08300000 ft/yr
Conc. in recharge water =     0.00000    mg/l,      0.00000    g/cu.ft
Atmospheric concentration =     0.00000    mg/l,      0.00000    g/cu.ft
Water table has a fixed concentration of      5.4000    mg/l,      0.15291
g/cu.ft.
   with respect to gas diffusion.
```

SRS15A2.OUT

```
|-------------------------------------------------------------|
|                VLEACH (Version 2.2a, 1996)                  |
|                                                             |
|                            By:                              |
|        Varadhan Ravi and Jeffrey A. Johnson                 |
|                  (USEPA Contractors)                        |
|        Center for Subsurface Modeling Support               |
|        Robert S. Kerr Environmental Research Laboratory     |
|        U.S. Environmental Protection Agency                 |
|        P.O. Box 1198                                        |
|        Ada, OK 74820                                        |
|                                                             |
|        Based on the original VLEACH (version 1.0)           |
|        developed by CH2M Hill, Redding, California          |
|        for USEPA Region IX                                  |
|-------------------------------------------------------------|
```

SRSNE VADOSE ZONE LEACHING

```
Polygon   1
At time =       0.00, total mass in vadose zone =     14.942    g/sq.ft.
Mass in gas phase     =      0.17609    g/sq.ft.
Mass in liquid phase  =       2.7893    g/sq.ft.
Mass sorbed           =       11.976    g/sq.ft.


Polygon   1
At time =       2.50, total mass in vadose zone =     14.478    g/sq.ft.
Mass in gas phase     =      0.17063    g/sq.ft.
Mass in liquid phase  =       2.7028    g/sq.ft.
Mass sorbed           =       11.605    g/sq.ft.

Since last printout at time =       0.00
               Change in Total Mass =    -0.46368    g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =    -0.31456    g/sq.ft.
                    Diffusion in from atmosphere =     -0.89331E-01g/sq.ft.
                    Diffusion in from water table =    -0.59788E-01g/sq.ft.
               Total inflow at boundaries =    -0.46368    g/sq.ft.
               Mass discrepancy =    -0.21160E-05g/sq.ft.

Since beginning of run at time = 0.0
               Change in Total Mass =    -0.46368    g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =    -0.31456    g/sq.ft.
                    Diffusion in from atmosphere =     -0.89331E-01g/sq.ft.
                    Diffusion in from water table =    -0.59788E-01g/sq.ft.
               Total inflow at boundaries =    -0.46368    g/sq.ft.
               Mass discrepancy =    -0.21160E-05g/sq.ft.
```

```
Polygon   1
At time =     100.00, total mass in vadose zone =     2.4589    g/sq.ft.
Mass in gas phase     =      0.28978E-01g/sq.ft.
Mass in liquid phase  =      0.45902    g/sq.ft.
Mass sorbed           =       1.9709    g/sq.ft.

Since last printout at time =      97.50
               Change in Total Mass =    -0.15559    g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =    -0.13578    g/sq.ft.
                    Diffusion in from atmosphere =     -0.17489E-01g/sq.ft.
                    Diffusion in from water table =    -0.23189E-02g/sq.ft.
               Total inflow at boundaries =    -0.15559    g/sq.ft.
               Mass discrepancy =    -0.13411E-06g/sq.ft.

Since beginning of run at time = 0.0
               Change in Total Mass =     -12.483    g/sq.ft.
                    Advection in from atmosphere =      0.00000    g/sq.ft.
                    Advection in from water table =     -9.5287    g/sq.ft.
                    Diffusion in from atmosphere =      -1.6983    g/sq.ft.
                    Diffusion in from water table =     -1.2559    g/sq.ft.
               Total inflow at boundaries =     -12.483    g/sq.ft.
               Mass discrepancy =    -0.95367E-06g/sq.ft.

*****************************************************
TOTAL GROUNDWATER IMPACT
```

Time (yr)	Mass (g/yr)	Cumulative Mass (g)
2.50	5989.5	14974.
5.00	5920.9	29776.
7.50	5852.3	44407.
10.00	5783.6	58866.
12.50	5714.6	73152.
15.00	5645.2	87265.
17.50	5575.1	0.10120E+06
20.00	5504.2	0.11496E+06
22.50	5432.3	0.12854E+06
25.00	5359.2	0.14194E+06
27.50	5284.5	0.15515E+06
30.00	5208.1	0.16817E+06
32.50	5129.8	0.18100E+06
35.00	5049.3	0.19362E+06
37.50	4966.4	0.20604E+06
40.00	4881.0	0.21824E+06
42.50	4793.0	0.23022E+06
45.00	4702.1	0.24198E+06
47.50	4608.4	0.25350E+06
50.00	4511.8	0.26478E+06
52.50	4412.3	0.27581E+06
55.00	4310.0	0.28658E+06
57.50	4204.8	0.29710E+06
60.00	4097.0	0.30734E+06
62.50	3986.7	0.31731E+06
65.00	3874.1	0.32699E+06

67.50	3759.4	0.33639E+06
70.00	3642.8	0.34550E+06
72.50	3524.7	0.35431E+06
75.00	3405.2	0.36282E+06
77.50	3284.8	0.37103E+06
80.00	3163.7	0.37894E+06
82.50	3042.3	0.38655E+06
85.00	2920.8	0.39385E+06
87.50	2799.7	0.40085E+06
90.00	2679.2	0.40755E+06
92.50	2559.6	0.41395E+06
95.00	2441.3	0.42005E+06
97.50	2324.5	0.42586E+06
100.00	2209.6	0.43139E+06

Appendix O

Technical Evaluations Prepared by Bernard H. Kueper, Ph.D., P.Eng.

DRAFT

Memorandum

TO: Mr. B.R. Thompson
demaximis, inc.

CC: Mr. M.J. Gefell
BB&L

FROM: Dr. B.H. Kueper
B. Kueper & Associates, Ltd.

DATE: July 20, 1997

SUBJECT: SRS Effective Solubility Calculations

Bruce:

Presented below are effective solubility calculations (using Raoult's Law) for the MW-705DR water and DNAPL sample results (well sampled June 19, 1997). Table 1 summarizes the sample results, as well as the effective solubility calculations. Note that the DNAPL mass fractions sum to 89.9%. Given the DNAPL sample detection limits for the compounds that are known to be present in the groundwater, but not detected in the DNAPL, it is good to see that this sum is less than 100%.

Table 1 - Effective Solubility Calculations

Compound	Aqueous Phase (mg/l)	Molec. Weight (g/mol)	Textbook Solubility (mg/l)	DNAPL Phase (ug/g)	Mole Fraction	Effective Solubility (mg/l)
Methylene Chloride	18	84.9	22,549			
1,1-DCE	2.6	97	3,176			
cis 1,2-DCE	12	97	7,314			
MEK	32	72.1	353,000			
1,1,1-TCA	33	133.4	1,352	29000	0.026	36.34
TCE	780	131.5	1,566	550000	0.517	809.86
MIBK	50	100.2	19,000			
2-Hexanone	50	100.2	35,000			
PCE	31	165.8	240	160000	0.119	28.63
Toluene	42	92.1	470	81000	0.109	51.11
Ethylbenzene	2.8	106.17	140	21000	0.024	3.42
m,p-xylene	5.1	106.16	198	46000	0.054	10.60
o-Xylene	1.6	106.17	175	12000	0.014	2.44
Other		91.9		101000	0.136	

I have assigned a molecular weight of 91.9 g/mol to the 10.1% unknown DNAPL mass fraction in order to carry out the effective solubility calculations. A molecular weight of 91.9 g/mol corresponds to the average molecular weight of the 6 compounds which were detected in groundwater, but not detected in the DNAPL. It is reasonable to assume that these compounds are indeed present in the DNAPL, but at levels below the method detection limits.

Figure 1 presents a plot of observed concentration versus calculated effective solubility for the 7 compounds which were detected in the DNAPL, along with a least squares fit to the data. The least squares fit was performed by forcing the straight line through (0,0) as predicted by Raoult's Law. It is clear that an excellent correlation exists between the observed and calculated concentrations. Figure 2 presents the same data as Figure 1, but on a log-log scale to facilitate better examination of low concentrations. Again, note that the correlation between observed and calculated results is excellent. It is clear that Raoult's Law is a reasonable and appropriate means of calculating effective solubilities at the SRS site.

Figure 1 - Calculated Concentration versus Observed Concentration

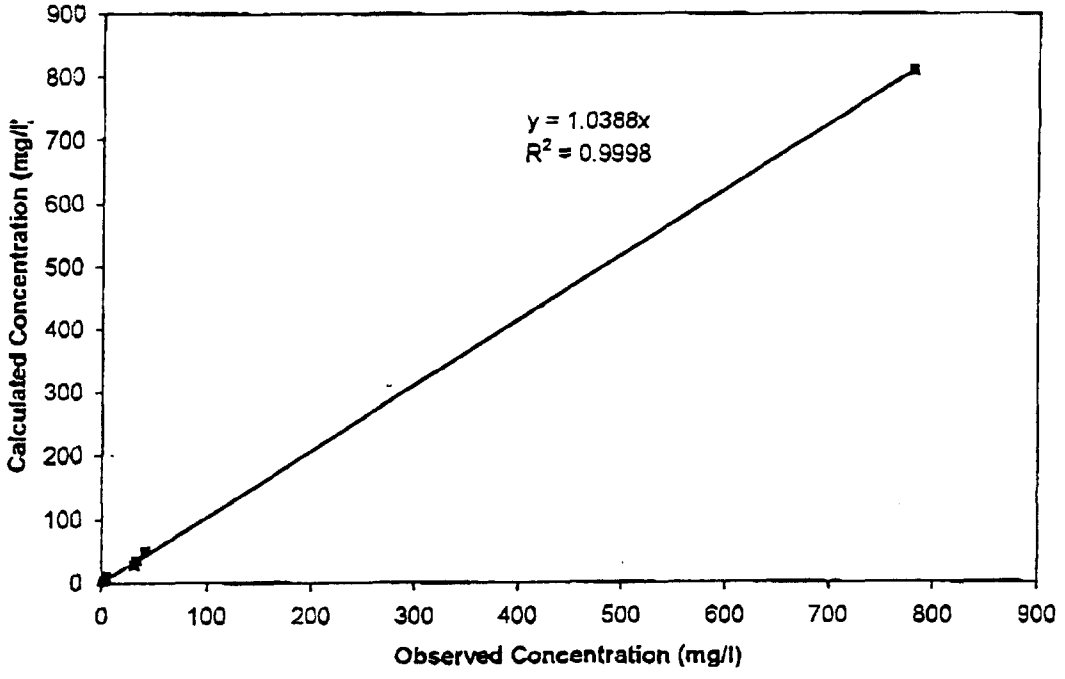
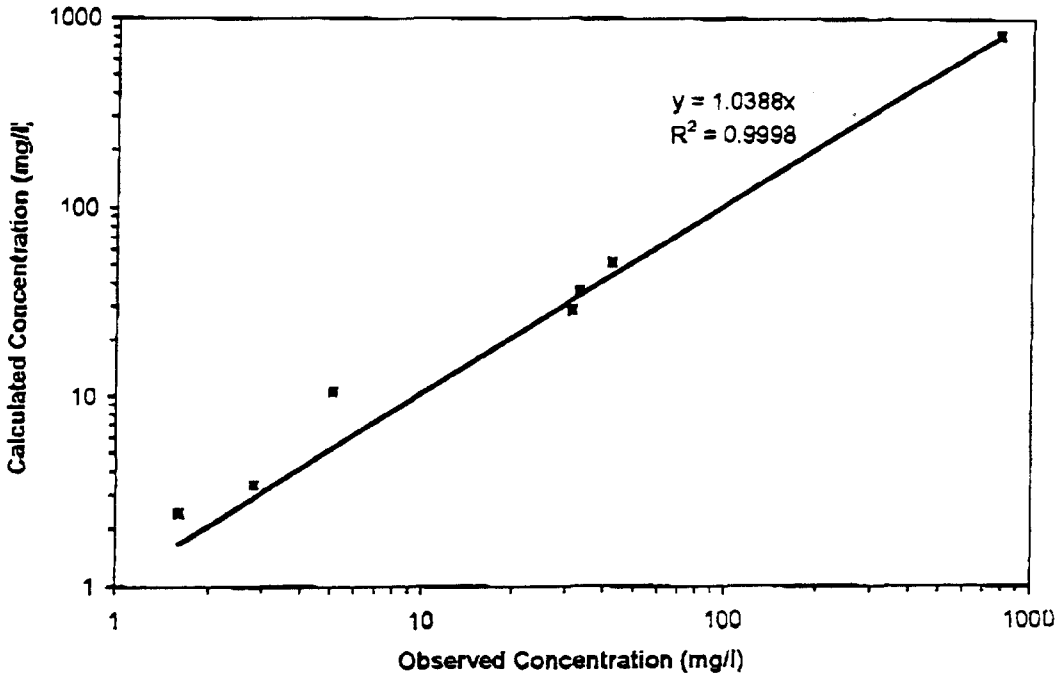


Figure 2 - Calculated Concentration versus Observed Concentration



Probable and Potential NAPL Zones
B. Kueper, October 1, 1997

Rational

The need to define both a *probable* and a *potential* NAPL zone at the SRSNE site stems from the fact that subsurface investigations generally yield only point data in space, not continuous distributions of the parameters of interest. In other words, information such as contaminant concentrations in soil and groundwater are only known at specific locations, not at every point in the subsurface. Delineation of that region of the subsurface which contains non-aqueous phase liquids (NAPLs) is therefore subject to uncertainty because the delineation procedure relies upon the magnitude and spatial distribution of soil and groundwater contaminant concentrations. The use of both a *probable* and a *potential* NAPL zone reflects this uncertainty, and corresponds to a 'factor of safety' as used in other engineering design and analysis problems.

Definitions

The *probable NAPL zone* is defined as that region of the subsurface where NAPL is either confirmed to be present, or very likely to be present. The *potential NAPL zone* is defined as that region of the subsurface where NAPL may be present, but current site data do not yield conclusive evidence that it is present.

Implications

Decisions regarding certain site investigation and remediation activities should be made differently in the two NAPL zones. The *probable NAPL zone* is that region of the subsurface where drilling should be minimized to avoid vertical DNAPL mobilization, where the influence of groundwater pumping on NAPL pool mobilization should be considered, and where estimates of NAPL mass can be carried out. The *potential NAPL zone* encompasses the *probable NAPL zone*, and is that region of the subsurface where clean-up to typical concentration-based regulatory standards is generally not feasible. The technical impracticability zone at a site will encompass the *potential NAPL zone*. It should not be surprising for future site investigation activities to locate NAPL within the *potential NAPL zone*.

Delineation - Probable NAPL Zone

The *probable NAPL zone* can be delineated using site data by identifying the following:

1) Regions within and downstream of known or suspected source release locations where groundwater concentrations exceed 10% of a component's effective solubility. At the SRSNE site, the effective solubility will be calculated using both an empirical approach and a mathematical approach. Locations where sampled

groundwater concentrations exceed 10% of a component's solubility using either of these two approaches will be included in the *probable NAPL zone*.

2) Locations where NAPL is known or suspected to have entered the subsurface. Examples of such locations include former drum storage areas, lagoons, oil spreading areas, and drainage ditches hydraulically connected to lagoons.

3) Regions where alcohols are detected in groundwater. Certain alcohols partition preferentially into the NAPL phase, and degrade rapidly when present at low concentrations in groundwater. The occurrence of alcohols in groundwater is therefore associated with the nearby presence of NAPL.

4) Regions where soil concentrations are above the calculated threshold for NAPL presence. Expressed as an equivalent pore-water concentration, this corresponds to regions where equivalent pore-water concentrations exceed 100% effective solubility.

5) Visual observation of NAPL in boreholes, monitoring wells, piezometers, pumping wells, trenches, and soil samples.

6) Regions where organic contaminants occur in groundwater in hydraulically anomalous locations and the only explanation for such occurrences is the nearby presence of NAPL. Examples include the presence of organic contamination at depth under conditions of upward groundwater flow (implies that NAPL is present beneath the monitoring location), organic contamination hydraulically upgradient of known or suspected source release locations, and organic contamination hydraulically cross-gradient of known source release locations where transverse dispersion and/or fluctuations in groundwater flow directions cannot account for occurrence of the contamination.

Delineation - Potential NAPL Zone

The potential NAPL zone can be delineated using site data by identifying the following:

1) Regions of the subsurface where groundwater concentrations exceed 1% of a component's effective solubility using either the empirical approach, or the mathematical approach.

2) Locations where soil concentrations exceed 10% of the calculated threshold value. This corresponds to locations where equivalent soil pore-water concentrations exceed 10% of a component's effective solubility using either the empirical, or the mathematical approach.

3) Regions of the subsurface where organic contamination is present in hydraulically anomalous locations and the presence of the contamination could be

explained by the presence of NAPL. An example of this is the presence of contamination on the other side of a perceived groundwater flow divide, where the exact location of that flow divide is not known.

4) Regions where an abrupt change in contaminant chemistry is observed, and the concentrations of interest exceed 1% a component's effective solubility.

SRSNE Site, Southington CT
Contaminant Mass Storage Calculation Procedure
Dr. B.H. Kueper
August 28, 1997

1) Mass of chemical component dissolved in ground water

The mass of a given chemical component dissolved in ground water can be estimated using:

$$M_{A_i} = \int C_i \phi_{w_i} dV_i \qquad i = 1, n$$

where M_{Ai} is the mass of the component dissolved in ground water within sub-area i, n is the total number of sub areas, C_i is the volume-averaged concentration of the component in ground water within sub-area i, ϕ_{wi} is the water-filled porosity of the medium within sub-area i, and V_i is the volume of the sub-area. This expression is valid for both porous and fractured media, under either saturated or unsaturated conditions.

2) Mass of chemical component sorbed to aquifer solids

The mass of a given chemical component sorbed to the soil or rock matrix can be estimated using:

$$M_{S_i} = \int C_i K_{d_i} \rho_{b_i} dV_i \qquad i = 1, n$$

where M_{Si} is the mass of sorbed chemical component within sub-area i, n is the number of sub areas, C_i is the volume-averaged concentration of the component in ground water within sub-area i, K_d is the soil-water distribution coefficient within sub-area i, ρ_{bi} is the dry bulk density of the medium within sub-area i, and V_i is the volume of the sub-area. This expression assumes equilibrium partitioning between the aqueous and solid phases. The distribution coefficient, K_d, is often estimated using $K_d = K_{oc} f_{oc}$ where K_{oc} is the organic carbon partition coefficient, and f_{oc} is the fraction organic carbon present in the porous medium (Pankow and Cherry, 1996).

3) Mass of chemical components present as vapors in the unsaturated zone

The mass of a given chemical component present as vapors in the unsaturated zone can be estimated using:

$$M_{V_i} = \int C_i H \phi_{a_i} dV_i \qquad i = 1, n$$

where M_{Vi} is the mass of vapor-phase chemical component within sub-area i, n is the number of sub areas, C_i is the volume-averaged aqueous concentration of contaminant within sub-area i, H is the dimensionless Henry's constant for the component, ϕ_{ai} is is the air-filled porosity, and V_i is the volume of sub-area i. The above expression assumes equilibrium partitioning between the aqueous and air phases.

4) NAPL Mass

The mass of NAPL in the subsurface can be estimated using:

$$M_{N_i} = R_i V_i \rho_n$$

where M_{Ni} is the mass of NAPL present within sub-area i, R_i is the bulk retention capacity of the medium within sub-area I, V_i is the total volume of medium containing NAPL, ρ_n is the chemical component mass density of the NAPL, within sub-area i. It is important to recognize that V_i includes lenses, laminations, and fractures void of NAPL as well as those containing NAPL within the overall volume of subsurface impacted by NAPL within the sub-area. For NAPL in overburden deposits, R_i typically ranges between 0.25 percent and 3 percent (Poulsen and Kueper 1992, WCGR 1996). For NAPL in fractured media, R_i depends on the fracture aperature and spacing characteristics, which have been quantified at the SRSNE Site during the completion of the RI. The estimated value of R_i in the New Haven Arkose is estimated as 4.1×10^{-3} percent (Kueper, pers. com. with M.J. Gefell, September 1997).

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Impact of Matrix Diffusion on Contaminant Fate and Transport in Fractured Bedrock at the SRSNE Superfund Site

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1.0 Introduction

The purpose of this document is to examine the impacts of matrix diffusion on dissolved-phase solute transport in bedrock at the SRSNE Superfund site located in Southington, CT. The bedrock at this site consists of the New Haven Arcose, a fractured sandstone interspersed with conglomerates and siltstone. The bedrock has an average matrix porosity of approximately 7.7% (BBL, 1997), suggesting that matrix diffusion will influence the fate and transport of solutes dissolved in groundwater. This report is not an attempt to define the region of bedrock at the SRS site which may qualify for a Technical Impracticability (T.I.) waiver, but rather a preliminary exercise illustrating the influence of matrix diffusion on contaminant fate and transport at the SRS site.

The term 'matrix' refers here to the blocks of rock separating fractures. Matrix diffusion refers to the process whereby solutes dissolved in groundwater diffuse either from open fractures into the rock matrix, or from the rock matrix into open fractures. The direction of diffusion will depend on the direction of the concentration gradient. When contaminants are initially introduced into fractures, for example, a strong concentration gradient exists from the open fractures to the uncontaminated rock matrix, bringing about diffusion of contaminants into the matrix. This process will continue until either the contaminant storage capacity of the matrix is met, or the source of contamination in the fractures is exhausted. Once the source of contamination is removed from the fractures, the concentration gradient will be from the matrix to the fractures, bringing about diffusion of contaminants back out of the matrix and into the fractures. The matrix diffusion process was first examined in a contaminant hydrogeology context by Foster (1975), and has since been examined by a number of authors including Goodall and Quigley (1977), McKay et al. (1993), Germain and Frind (1989), and Pankow and Cherry (1996).

One implication of matrix diffusion is that the majority of dissolved and sorbed phase contamination in bedrock may be located in the rock matrix, not in the open fractures. Because the open fractures typically have a higher permeability than the rock matrix, it follows that the primary groundwater flow pathways are through the fractures, not through that portion of the bedrock where the majority of contaminants may be stored. While the open fractures can be thought of as the primary pathways for groundwater flow, the rock matrix can be thought of as the primary reservoir for contaminant storage.

A second implication of matrix diffusion is that the rate of dissolved plume migration in fractured bedrock may be significantly less than the rate of groundwater flow. Matrix diffusion acts as a contaminant sink, continuously removing solutes from groundwater flowing through fractures. This can be thought of as an attenuation process which manifests itself in a manner similar to that of sorption to grain surfaces. In other words, matrix diffusion results in the contaminant velocity being less than the groundwater velocity. This is one reason why contaminant plumes in fractured bedrock at certain sites

have not traveled as far in the hydraulically downgradient direction as would be predicted from consideration of groundwater velocities alone.

A third implication of matrix diffusion is that the time required to clean-up fractured bedrock will be governed by the rate at which contaminants can diffuse back out of the rock matrix. Even if clean groundwater is flushed through open fractures, this groundwater will become contaminated by solutes diffusing back out of the rock matrix and into the fractures. This diffusion out of the rock matrix will continue until all contamination in the matrix has been depleted.

A fourth implication of matrix diffusion is that residual and pooled DNAPL present in rock fractures will dissolve directly (by diffusion) into the rock matrix, as well as into groundwater flowing through the fractures. In certain bedrock environments, the life-span of residual and pooled DNAPL is governed by the rate at which the DNAPL dissolves directly into the rock matrix, not the rate at which it dissolves into flowing groundwater. In deposits such as clay, the lifespan of DNAPL in fractures can be relatively short because of the high contaminant storage capacity of the clay matrix. At the SRS site, however, it is known on the basis of visual observation that DNAPL still exists in rock fractures. Despite the fact that DNAPL may have entered rock fractures as early as 1955, this persistence is not surprising given the average matrix porosity of approximately 7.7%, the potentially large volumes of DNAPL that may have entered bedrock, and the low aqueous solubility of many of the components comprising the DNAPL.

This report will address the second and third implications described above. The first implication, that the majority of dissolved and sorbed phase contaminant mass in bedrock is present in the rock matrix and not the open fractures, is addressed in BBL (1997). The fourth implication, which addresses the time required for residual and pooled DNAPL to diffuse directly into the rock matrix, is considered a low priority at this time because of the fact that pooled DNAPL has been observed in rock fractures at the SRS site as recent as 1997. This does not suggest, however, that there are not specific locations within bedrock at the SRS site where complete diffusive dissolution of DNAPL into the rock matrix has occurred.

2.0 Theory

The mathematical model employed in this study is based on the work of Sudicky and Frind (1982) and addresses contaminant transport through a set of parallel, equally spaced fractures. The model accounts for advective-dispersive solute transport in the fractures subject to diffusion into the matrix, sorption to the fracture walls, sorption within the matrix, and first-order decay of the solute. Unidirectional, steady-state groundwater flow is assumed to be occurring through the set of parallel fractures, with no advective component of flow in the rock matrix.

The governing equation for contaminant transport in the fractures is given by:

$$\frac{\partial c}{\partial t} + \frac{v}{R}\frac{\partial c}{\partial z} - \frac{D}{R}\frac{\partial^2 c}{\partial z^2} + \lambda c - \frac{\phi D'}{bR}\frac{\partial c'}{\partial x}\bigg|_{x=b} = 0 \tag{1}$$

where c is the concentration of contaminant in the fractures, t is time, v is the average linear groundwater velocity in the fractures, D is the coefficient of hydrodynamic dispersion in the fractures, z is the distance of travel along the fractures, λ is the contaminant decay constant, ϕ is the matrix porosity, b is equal to $e/2$ where e is the fracture aperture, D' is the effective diffusion coefficient for the matrix, c' is the concentration of contaminant in the matrix, and x is the distance into the matrix. The fracture retardation factor, R, which accounts for sorption to the fracture walls, is represented by:

$$R = 1 + \frac{K_f}{b} \tag{2}$$

where K_f is the mass of solute per unit fracture wall area divided by the concentration of solute in solution assuming a linear sorption isotherm.

Contaminant transport in the matrix is represented by:

$$\frac{\partial c'}{\partial t} - \frac{D'}{R'}\frac{\partial^2 c'}{\partial x^2} + \lambda c' = 0 \tag{3}$$

where R' is the retardation factor representing sorption of solute to grain surfaces within the matrix, calculated as:

$$R' = 1 + \frac{\rho_b}{\phi} K_m \tag{4}$$

where ρ_b is the dry bulk density of the matrix, and K_m is the distribution coefficient for the matrix calculated as $K_{oc}f_{oc}$ where K_{oc} is the organic carbon partition coefficient for the solute of concern, and f_{oc} is the fraction organic carbon of the matrix.

Equations (1) and (3) are coupled through the diffusive flux crossing the fracture/matrix interface, and the through the fact that $c = c'$ at $x = b$. The closed-form analytical solution representing the solution to the above set of governing partial differential equations is described further by Sudicky and Frind (1982). The model assumes that a constant concentration source is maintained at the inflow end to the set of parallel fractures (i.e., at z = 0). The model solves for the concentration distribution in both the

open fractures and the rock matrix for any time and spatial location of interest. The configuration of the solution domain and an illustration of relevant processes are presented in Figures 1 and 2, respectively.

3.0 Model Simulations

3.1 Diffusion from matrix to fractures

Input Parameters

The first set of numerical simulations illustrates the time scales that can be associated with trichloroethylene (TCE) diffusion from a contaminated matrix back out to fractures being flushed with clean water. Table 1 summarizes the input parameters for the various simulations performed. All simulations incorporated a fracture dispersivity of 0.3 m, a matrix tortuosity of 0.2, a free-solution TCE diffusion coefficient of 10.0E-10 m^2/s (Pankow and Cherry, 1996), a hydraulic gradient of 0.005, no sorption onto fracture walls, and no solute degradation. The matrix effective diffusion coefficient is calculated in the model as the product of the free-solution diffusion coefficient and the matrix tortuosity.

A dispersivity of 0.3 m is considered reasonable for individual, rough-walled fractures (Pankow and Cherry, 1996). The fracture dispersivity influences the degree of dispersion occurring in the open fractures, but does not exert a great influence on the rates of contaminant diffusion both into and out of the rock matrix. As a result, this value will be held constant for all simulations presented here. A matrix tortuosity of 0.2 is reasonable for a sandstone exhibiting a moderate to high matrix porosity (Pankow and Cherry, 1996). A low value of tortuosity results in slower rates of diffusion in the matrix, while a high value of tortuosity implies that diffusion paths are relatively unimpeded by the presence of the solids comprising the rock matrix, leading to faster rates of diffusion. Tortuosity values range from 0 to 1, with 0 corresponding to a medium in which diffusion cannot take place, and 1 corresponding to an open solution containing no porous medium. The value of 0.2 is considered reasonable for the SRS site, and will not be varied here. Sorption onto fracture walls will not be included in this analysis since it represents a minor component of the overall attenuation of solute transport in the sandstone. In other words, the main process leading to plume attenuation in bedrock at the SRSNE site is diffusion of solutes into the porous rock matrix, not sorption along fracture walls. For the contaminant of interest in this document (TCE), sorption to fracture walls would be small.

The hydraulic gradient of 0.005 is considered representative of hydraulic conditions within bedrock at the SRS site (BBL, 1997). This hydraulic gradient was used in conjunction with the listed fracture apertures to obtain a groundwater velocity in the fractures as follows:

$$v = -\frac{e^2 \rho g}{12\mu} \nabla h \tag{5}$$

where v is the groundwater velocity of interest, e is the fracture aperture, ρ is the density of groundwater, g is the acceleration due to gravity, μ is the viscosity of groundwater, and ∇h is the hydraulic gradient in the fracture.

The initial TCE concentration in the matrix is set to 3.13 mg/l (0.00313 kg/m^3), and was obtained from the results of matrix VOC testing in sample R005 from borehole MW705DR. BBL (1997) report a total TCE concentration of 370 ug/kg for the rock matrix. The aqueous phase concentration of TCE in equilibrium with this total matrix concentration can be calculated as:

$$S = \frac{C_T \rho_b}{(K_d \rho_b + \phi)} \tag{6}$$

where S is the aqueous phase TCE concentration of interest, C_T is the total matrix concentration of TCE, ρ_b is the dry bulk density of the matrix, K_m is the matrix distribution coefficient calculated as $K_{oc} f_{oc}$, and ϕ is the matrix porosity. Values of ρ_b = 2.49 g/cc, f_{oc} = 0.00064, and ϕ = 0.0094 are reported for sample R005 from borehole MW705DR (BBL, 1997). Using these values in conjunction with a K_{oc} value of 126 ml/g (Pankow and Cherry, 1996) yields an aqueous phase TCE concentration of 3.13 mg/l. The concentration of TCE in the matrix block of interest is assumed to be 3.13 mg/l throughout the block. Although the TCE concentration may vary spatially within the block (being both higher and lower than 3.13 mg/l), this distribution is not known. Utilizing a constant value is useful for illustrating the process of matrix diffusion.

Run 1 listed in Table 1 represents a base-case for this set of simulations. The fracture aperture of 96 microns and fracture spacing of 1.42 m represent the average values reported by BBL (1997). The matrix porosity of 0.094 is specific to rock sample R005. The matrix retardation factor of 3.14 was calculated using the reported f_{oc} value of 0.00064 for rock sample R005, and a K_{oc} value for TCE of 126 ml/g (Pankow and Cherry, 1996). Table 1 shows that runs 2 and 3 provide a sensitivity to groundwater velocity in the fractures, while runs 4 and 5 provide a sensitivity to fracture spacing.

Results

Figure 3 presents the results of Run 1 illustrating the relationship between TCE concentration in the fractures and time for a variety of distances downstream of the point at which clean water is being injected into the fractures. The figure shows that the TCE concentration in the fractures declines with time for all distances along the fractures in response to a depletion of contaminants in the matrix. The figure shows that higher concentrations arise in the fractures for greater distances downstream of where clean water is being injected. This follows from the fact that the steepest concentration

gradient driving contaminants out of the matrix occurs at the point where clean water is being injected. The process of TCE diffusion back out of the matrix is fastest at this point. As the water in the fractures becomes contaminated and migrates downgradient, the concentration gradient between the matrix and the fractures becomes less, thereby slowing the rate of TCE diffusion back out of the matrix. The figure shows that clean water flushing would need to continue for on the order of 300 years to 600 years to bring TCE concentrations in the fractures down to 5 ppb for the three presented locations of interest.

Figure 4 presents the results of runs 1, 2 and 3 illustrating the relationship between TCE concentration in the fractures and time for three values of fracture groundwater velocity. The figure corresponds to a location in the fractures a distance of 1 m downgradient from where clean water is being injected. The figure shows that increasing the groundwater velocity results in an increased rate of TCE diffusion back out of the matrix and into the open fractures, manifesting itself as lower TCE concentrations in the fractures at a given time. The figure shows that increasing the velocity in the fractures by a factor of two from the base case (i.e., $v = 7.6 \times 10^{-5}$ m/s versus 3.8×10^{-5} m/s) results in a concentration of 5 ppb being met in the fractures after 205 years, rather than 295 years. Note that a factor of two increase in the groundwater velocity did not lead to a factor of two reduction in the time required to meet the assumed clean-up goal of 5 ppb. It should also be noted that the presented figure applies to a location 1 m downgradient of where clean groundwater is being injected. Locations further downstream will exhibit a family of response curves shifted later in time.

Figure 5 presents the results of runs 1, 4, and 5 showing the relationship between TCE concentration in the fractures and time for three values of fracture spacing. The figure applies to a location in the fractures a distance of 1 m downgradient of where clean water is being injected. It is clear that an increase in the fracture spacing results in longer times required to meet a specified clean-up goal. This stems from the fact that a larger fracture spacing corresponds to larger matrix blocks, and therefore greater amounts of total mass available in the matrix for diffusion back into the open fractures.

It should be noted that the values of matrix fraction organic carbon adopted in the above simulations (0.00064) is lower than the average fraction organic carbon value presented by BBL (1997) for all samples tested. This implies that the rates of diffusion back out of the matrix at the MW705DR location will be higher than at many other locations in bedrock at the site. The time scales of 300 to 600 years presented in Figure 3, for example, should be considered as optimistic. There will be other locations at the site where the time for diffusion back out of the matrix may be significantly longer.

3.2 Diffusion from fractures to matrix

Input parameters

The second set of numerical simulations illustrates the rate at which TCE can diffuse from open fractures into an initially uncontaminated matrix. Table 2 summarizes the input parameters. All simulations incorporated a fracture dispersivity of 0.3 m, a matrix tortuosity of 0.2, a free-solution TCE diffusion coefficient of 10.0E-10 m^2/s, a hydraulic gradient of 0.005, no sorption onto fracture walls, and no solute degradation. These parameters are identical to those presented in Table 1, and have been discussed previously. The source concentration is maintained at 1 mg/l (0.001 kg/m^3) for all time, with an initially clean fracture and matrix system. A source concentration of 1 mg/l is consistent with groundwater concentrations observed at the SRSNE site. An initially clean fracture and matrix system is assumed to have been present prior to operations at the site. All results from this set of simulations correspond to a location in the fracture system immediately downstream of the source zone. This location was chosen so that the simulation results would be influenced only by diffusion into the matrix, not by solute transport in the system of equally spaced fractures.

Table 2 shows that all simulations employ a fracture aperture of 96 microns, consistent with the average fracture aperture reported by BBL (1997). A hydraulic gradient of 0.005 in conjunction with this fracture aperture yields a fracture groundwater velocity of 3.8 x 10^{-5} m/s. All simulations employ a matrix porosity of 0.077, consistent with the average matrix porosity reported by BBL (1997). Run 6 represents the base case for this set of simulations, incorporating a fracture spacing of 1.42 m, consistent with the average fracture spacing reported by BBL (1997). Run 7 incorporates a smaller fracture spacing, while runs 8, 9, and 10 provide a sensitivity to matrix sorption.

The matrix retardation factor characterizing sorption in the matrix was calculated using equation (4). The TCE partitioning coefficient, K_m, was calculated as $K_m = K_{oc} f_{oc}$ using a K_{oc} value of 126 ml/g (Pankow and Cherry). An f_{oc} value of 0.0036 was used to calculate the retardation factor of 16 utilized in the base case. This is slightly less than the average f_{oc} value of 0.0049 reported by BBL (1997). Figure 6 presents the individual f_{oc} values reported in BBL (1997). As can be seen, the value for rock sample R001 is uncharacteristically high when compared to the other measurements, and therefore significantly influences the mean. The value of 0.0036 represents the average of samples 2 through 19 on Figure 6, and results in a matrix retardation factor of 16.

Results

Figure 7 presents a plot of TCE concentration versus distance into the matrix for Run 6 at a variety of times. The positions '0 m' and '1.42 m' represent the edges of the matrix block. The figure shows that TCE diffuses into the matrix block from both directions, with further penetration into the matrix at later times. Figure 8 presents TCE concentration profiles in the matrix for Run 8 which adopts a fracture spacing of 0.5 m. Compared to Figure 7, it can be seen that a reduced fracture spacing leads to a meeting of concentration profiles at the center of the matrix block after approximately 10 years of diffusion.

Figure 9 presents a plot of TCE concentration versus distance into the matrix for runs 8, 9, 6, and 10 after 30 years. This set of runs provides a sensitivity to matrix sorption. As can be seen, a lower matrix retardation factor leads to deeper penetration into the matrix for a given TCE concentration level. It should be noted that the plotted concentrations represent aqueous phase TCE concentrations. Although the aqueous phase TCE concentration is less at a given position in the matrix for higher R values, the total TCE concentration (aqueous + sorbed) is higher for equal values of aqueous phase TCE concentration.

3.3 Plume Attenuation

Input parameters

The third set of numerical simulations illustrates the influence of matrix diffusion on plume attenuation in fractured bedrock. Table 3 summarizes the input parameters. All simulations incorporated a fracture dispersivity of 0.3 m, a matrix tortuosity of 0.2, a free-solution TCE diffusion coefficient of 10.0E-10 m^2/s, a hydraulic gradient of 0.005, no sorption onto fracture walls, and no solute degradation. The source concentration is maintained at 1 mg/l (0.001 kg/m^3) for all time, with an initially clean fracture and matrix system. These parameters are identical to those presented in Tables 1 and 2, and have been discussed previously.

Run 11 represents the base case for this set of simulations. The fracture aperture is set to 96 microns, yielding a groundwater velocity in the fractures of 3.8×10^{-5} m/s. The fracture spacing is set to 1.42 m, consistent with the average fracture spacing reported by BBL (1997). The matrix porosity is set to 0.077, consistent with the average matrix porosity reported by BBL (1997). The matrix retardation factor of 16 was calculated as described for the previous set of simulations.

Runs 12 and 13 provide a sensitivity to matrix porosity. Runs 14, 15, and 16 provide a sensitivity to matrix sorption by varying the matrix retardation factor (R) from 1 through to 24. Although a value of R=1 is unrealistic for the SRSNE site (R=1 implies no sorption in the matrix), it provides a useful endpoint for illustration purposes. A value of R=24 corresponds to values of matrix fraction organic carbon above the average value of 0.0036. Runs 17 and 18 provide a sensitivity to fracture aperture by varying the aperture from 20 microns to 200 microns. This range of fracture apertures is expected to be representative of conditions at the SRSNE site, and is consistent with the values reported in BBL (1997). With a fixed applied hydraulic gradient of 0.005, this results in a range of groundwater velocities from 1.63×10^{-6} m/s to 1.63×10^{-4} m/s.

Results

Figure 10 presents a plot of TCE concentration in the fractures versus distance from the source for the base case simulation (Run 11) for t = 10 years, 20 years, and 30 years. As can be seen, matrix diffusion promotes a highly dispersed concentration distribution along the fractures. Figure 11 presents a plot of TCE concentration in the fractures versus

distance from the source for three values of matrix porosity (runs 12, 11, and 13) at t = 30 years. The figure shows that an increase in matrix porosity leads to greater attenuation in the rate of plume migration. This stems from the fact that a higher matrix porosity results in a higher storage capacity of the matrix, and an increased rate of diffusive contaminant flux into the matrix. Note that the distance to which the plume has advanced in the fractures is very sensitive to matrix porosity. For a matrix porosity of zero (no matrix diffusion), groundwater flow would have advanced the plume a distance of approximately 36,000 m along the fractures after 30 years. Compared to a plume advancement of 40 m, consistent with the two lower curves in Figure 11, this yields a retardation factor of 900. This degree of retardation is similar to that adopted in the R.I. report (BBL, 1997).

Figure 12 presents a plot of TCE concentration in the fractures versus distance from the source at t = 30 years for runs 14, 15, 11, and 16. The figure shows that a higher matrix retardation factor (higher sorption in the matrix) leads to greater attenuation of the rate of contaminant transport in the fractures. This stems from the fact that a higher matrix retardation factor corresponds to an increase in the mass storage potential of the matrix, and an increase in the amount of mass that can diffuse from the fractures to the matrix.

Figure 13 presents a plot of TCE concentration in the fractures versus distance from the source at t = 30 years for fracture apertures ranging from 20 microns to 200 microns (runs 17, 11, and 18). Because a fixed hydraulic gradient of 0.005 is applied to the system, this range of apertures corresponds to a range in groundwater velocity from 1.63×10^{-6} m/s to 1.63×10^{-4} m/s. The figure shows that larger fracture apertures (which result in higher groundwater velocities) lead to an increased travel distance downstream. Note that the distance along the fractures to which a given concentration level has migrated is very sensitive to fracture aperture, stemming from the fact that groundwater velocity in a fracture is proportional to the square of the aperture.

4.0 Conclusions

The simulations presented in this report demonstrate that matrix diffusion is having a significant effect on the fate and transport of contaminants in bedrock at the SRSNE site located in Southington, CT. Simulations incorporating site-specific geotechnical parameters and contaminant concentrations obtained from borehole MW705DR suggest that it may require on the order of 300 years to 600 years of clean water flushing through fractures for trichloroethylene (TCE) to diffuse back out of the matrix in the vicinity of this location. This demonstrates that the time-scale for groundwater remediation in bedrock at the SRS site will be governed by the rate of contaminant diffusion from the matrix to open fractures.

Additional simulations presented in this report demonstrate that the rate of contaminant transport through fractures is influenced by the matrix diffusion process. Matrix diffusion serves to attenuate the rate of plume migration through fractured bedrock, with

higher degrees of attenuation for higher values of matrix porosity and higher amounts of contaminant sorption in the matrix. This attenuation process is consistent with the fact that the bedrock plume at the SRS site has migrated only a small fraction of the distance that would be predicted on the basis of groundwater hydraulics alone.

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Table 1 - Summary of input parameters illustrating diffusion from matrix to fractures

Parameter	Units	RUN1	RUN2	RUN3	RUN4	RUN5
Input concentration to fractures	kg/m^3	0	0	0	0	0
Initial concentration in matrix	kg/m^3	0.00313	0.00313	0.00313	0.00313	0.00313
Velocity in fractures	m/s	3.8E-05	1.9E-05	7.6E-05	3.8E-05	3.8E-05
Fracture aperture	m	96.0E-06	96.0E-06	96.0E-06	96.0E-06	96.0E-06
Fracture spacing	m	1.42	1.42	1.42	0.5	5.0
Matrix porosity	-	0.094	0.094	0.094	0.094	0.094
R (matrix)	-	3.14	3.14	3.14	3.14	3.14

Table 2 - Summary of input parameters illustrating diffusion from fractures to matrix

Parameter	Units	RUN6	RUN7	RUN8	RUN9	RUN10
Input concentration to fractures	kg/m^3	0.001	0.001	0.001	0.001	0.001
Initial concentration in matrix	kg/m^3	0	0	0	0	0
Velocity in fractures	m/s	3.8E-05	3.8E-05	3.8E-05	3.8E-05	3.8E-05
Fracture aperture	m	96.0E-06	96.0E-06	96.0E-06	96.0E-06	96.0E-06
Fracture spacing	m	1.42	0.50	1.42	1.42	1.42
Matrix porosity	-	0.077	0.077	0.077		0.077
R (matrix)	-	16	16	1	8	24

Table 3 - Summary of input parameters illustrating plume attenuation in fractures

Parameter	Units	RUN11	RUN12	RUN13	RUN14	RUN15	RUN16	RUN17	RUN18
Input concentration to fractures	kg/m^3	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Initial concentration in matrix	kg/m^3	0	0	0	0	0	0	0	0
Velocity in fractures	m/s	3.8E-05	3.8E-05	3.8E-05	3.8E-05	3.8E-05	3.8E-05	1.63E-06	1.63E-04
Fracture aperture	m	96.0E-06	96.0E-06	96.0E-06	96.0E-06	96.0E-06	96.0E-06	20.0E-06	200.E-06
Fracture spacing	m	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.42
Matrix porosity	-	0.077	0.011	0.129	0.077	0.077	0.077	0.077	0.077
R (matrix)	-	16	16	16	1	8	24	16	16

Figure 1 - Configuration of Solution Domain

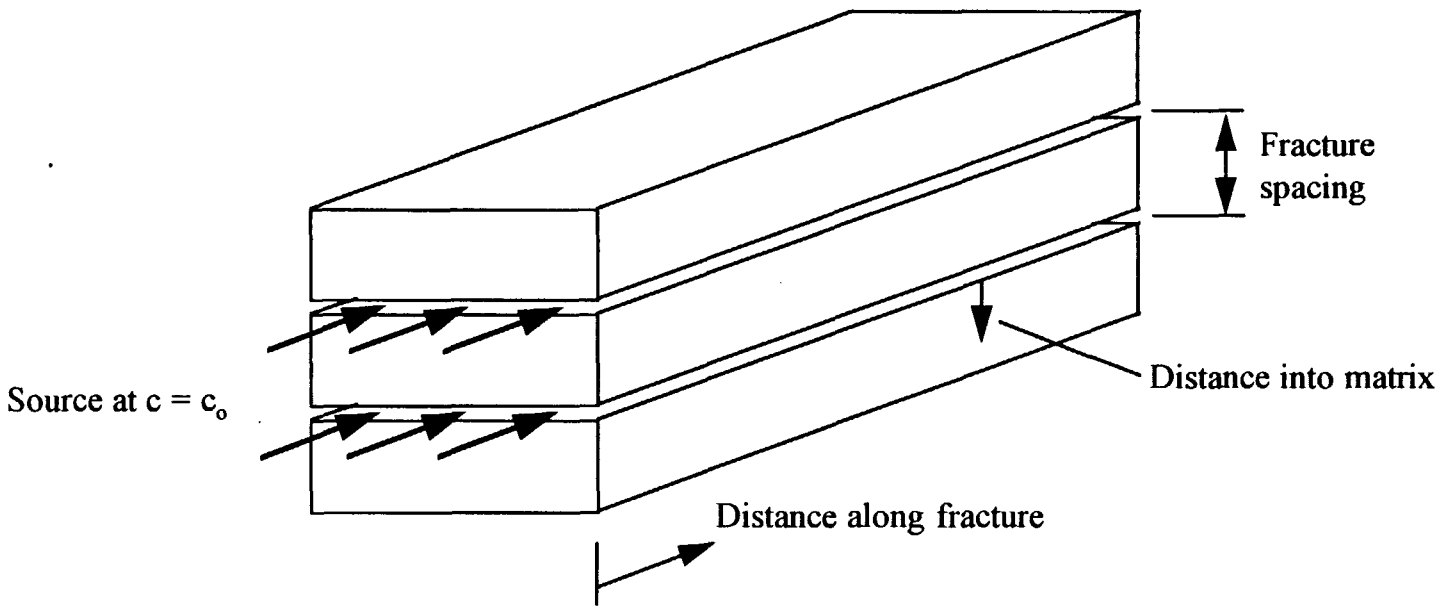


Figure 2 - Illustration of Relevant Processes

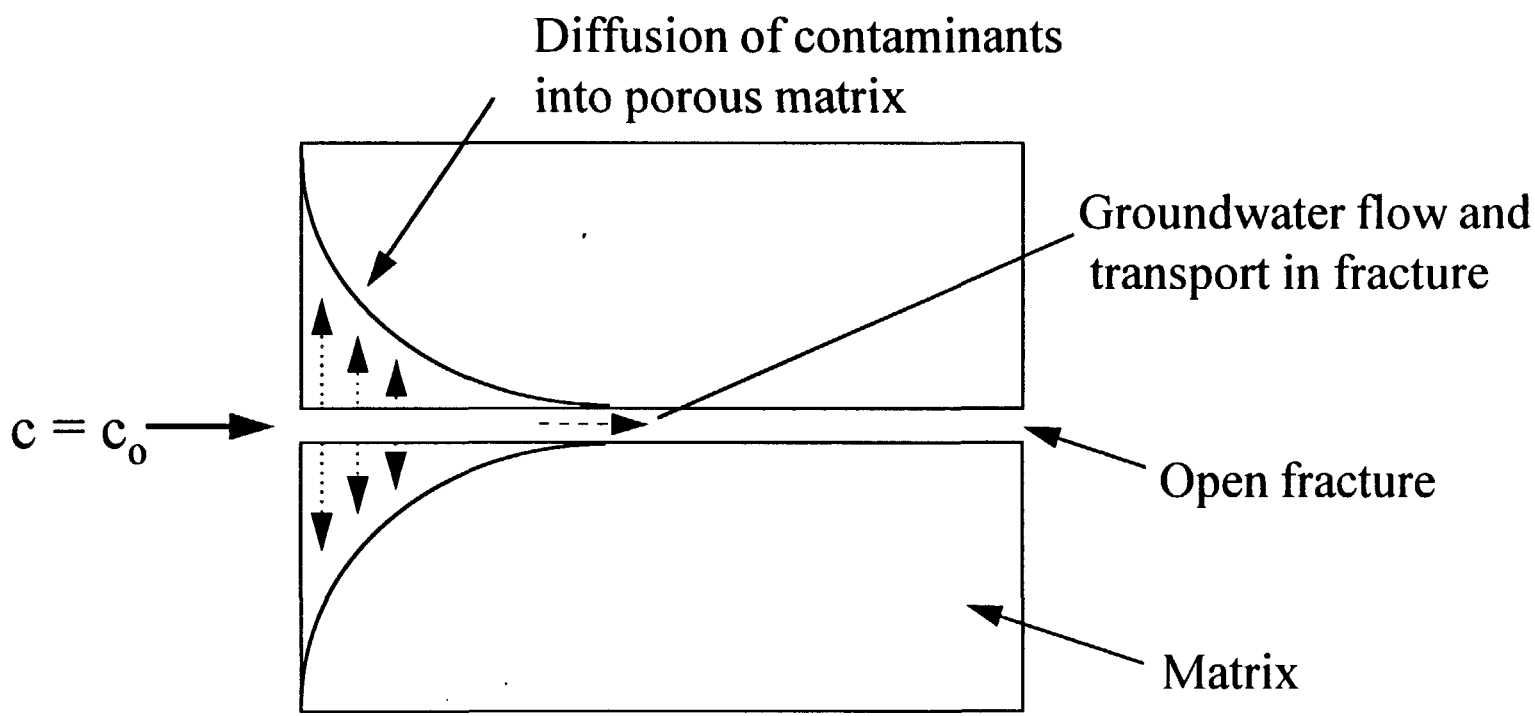


Figure 3
Flushing of Fractures With Clean Water - Run 1
(TCE concentration in fractures vs time)

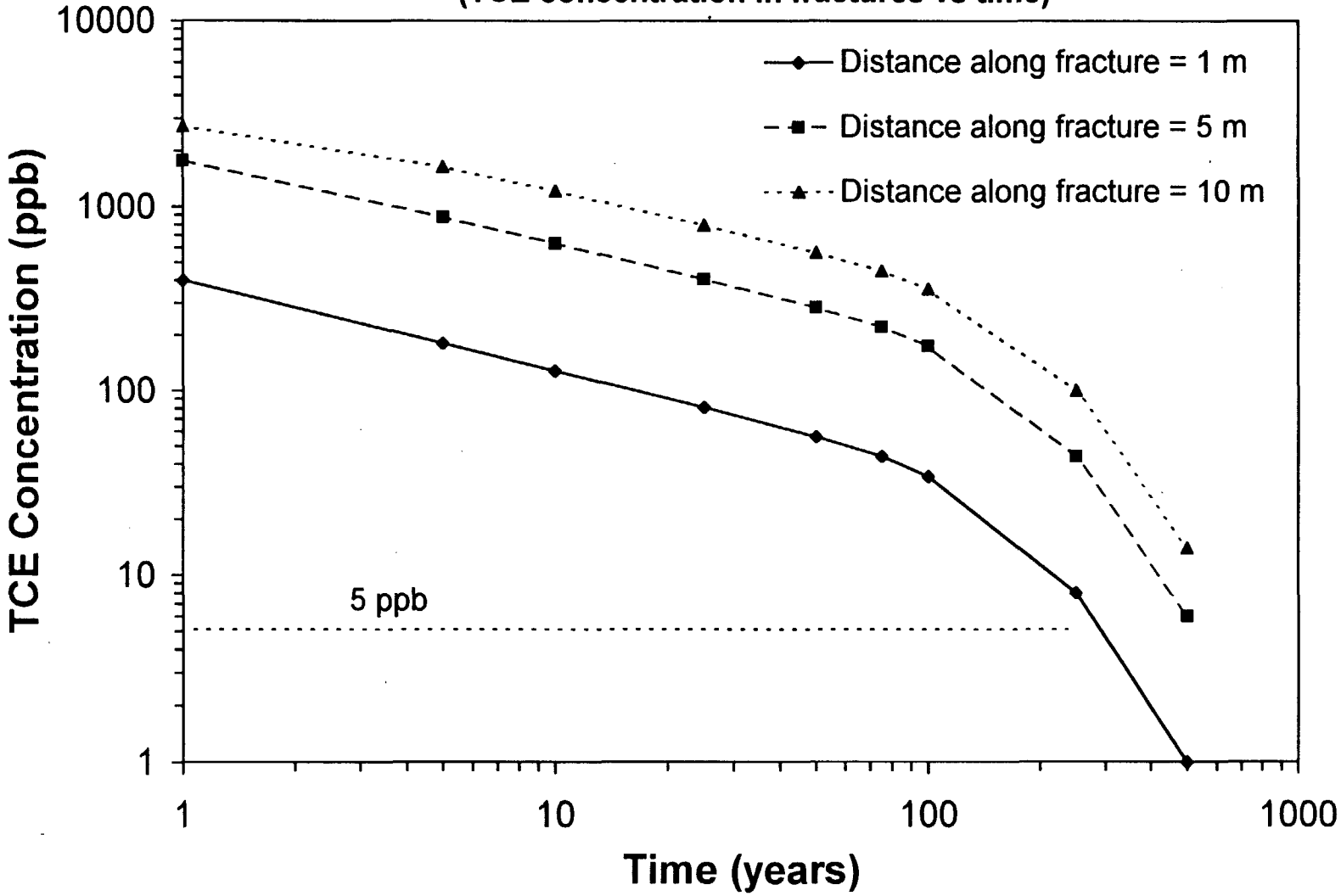


Figure 4
Flushing of Fractures With Clean Water - Runs 1, 2, and 3
(TCE concentration in fractures vs time, distance = 1 m along fracture)

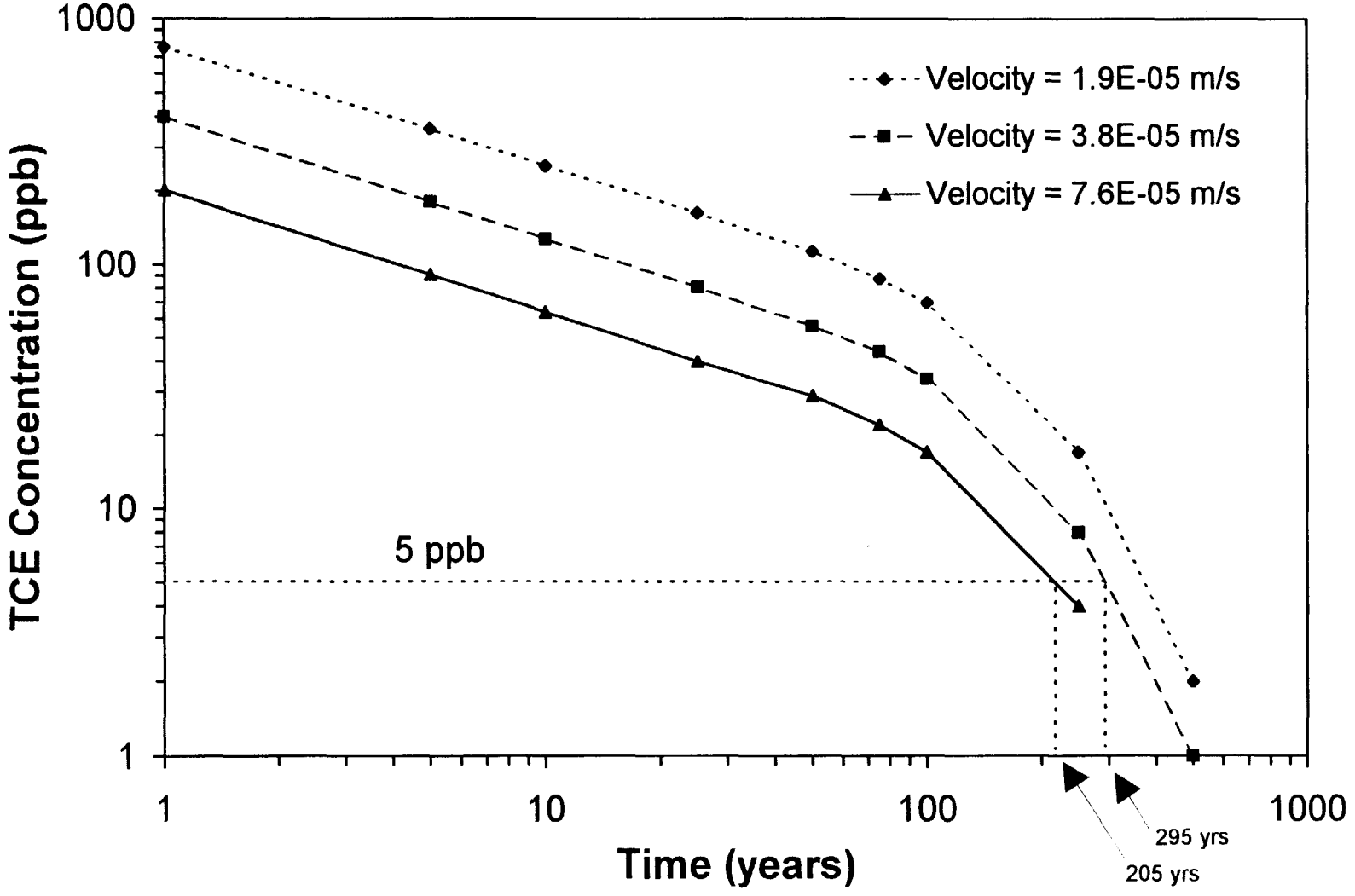


Figure 5
Flushing of Fractures With Clean Water - Runs 1, 4, and 5
(TCE concentration in fractures vs time; distance = 1 m along fracture)

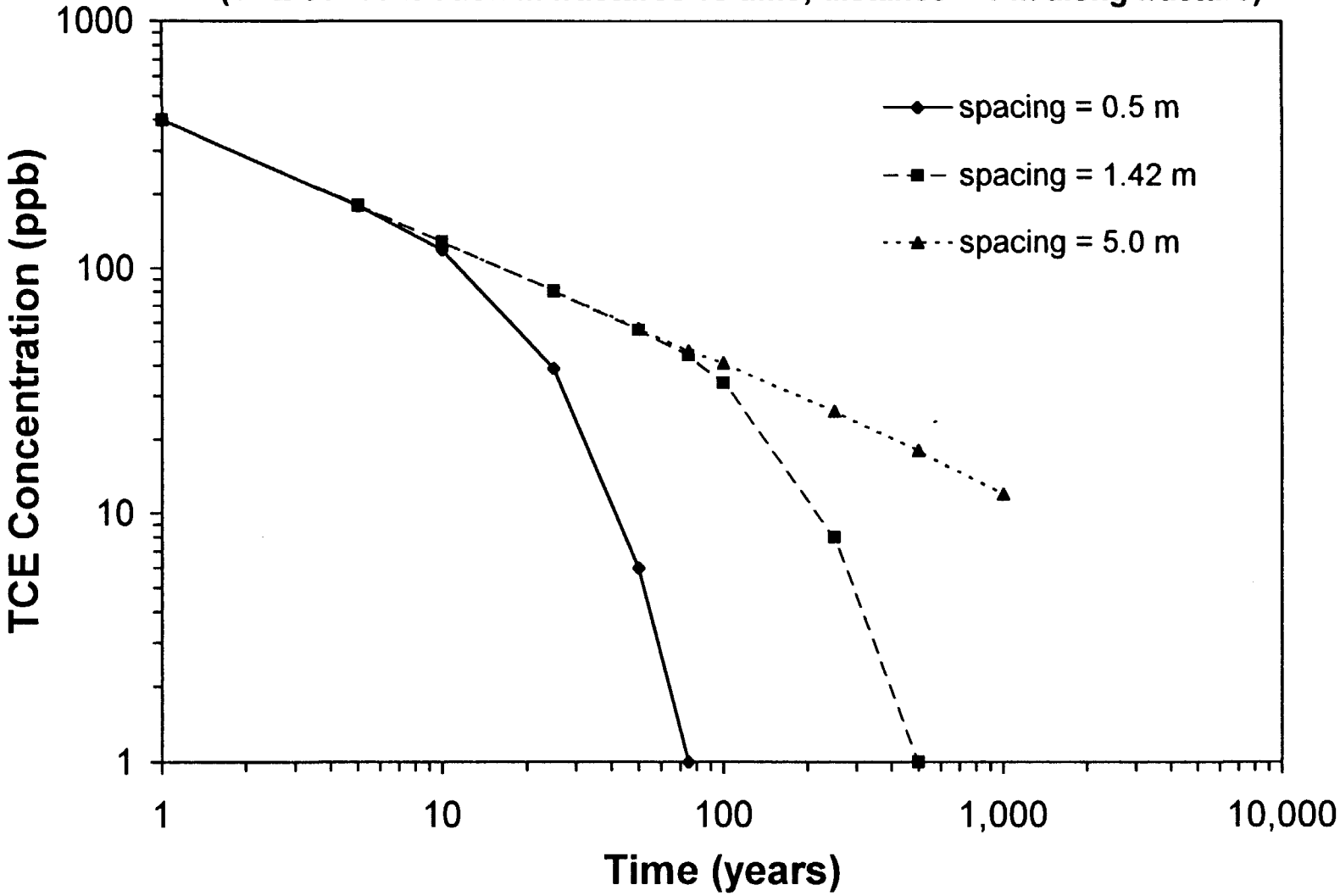


Figure 6 - Bedrock Fraction Organic Carbon Measurements

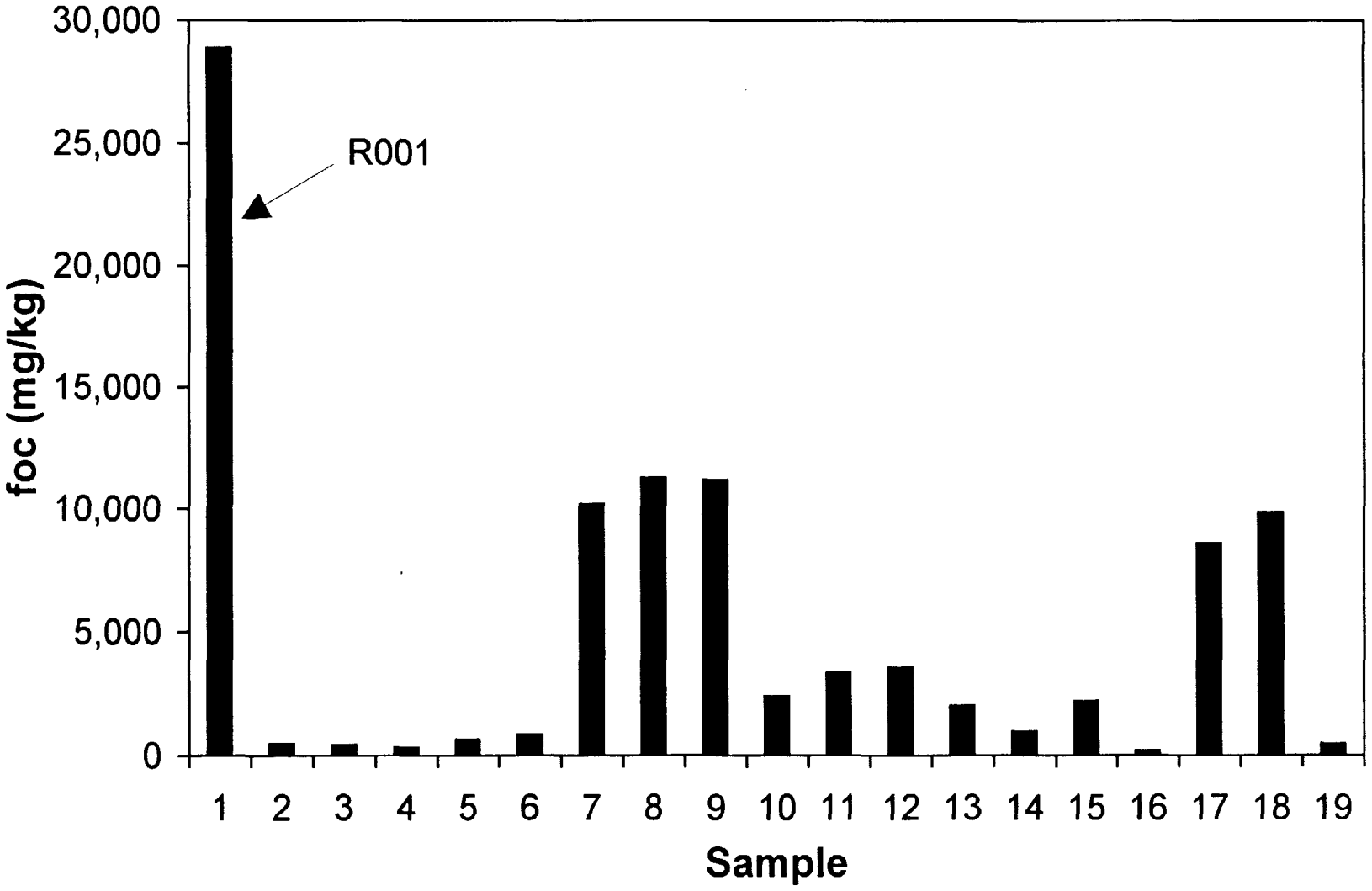


Figure 7
TCE Concentration vs Position in Matrix - Run 6

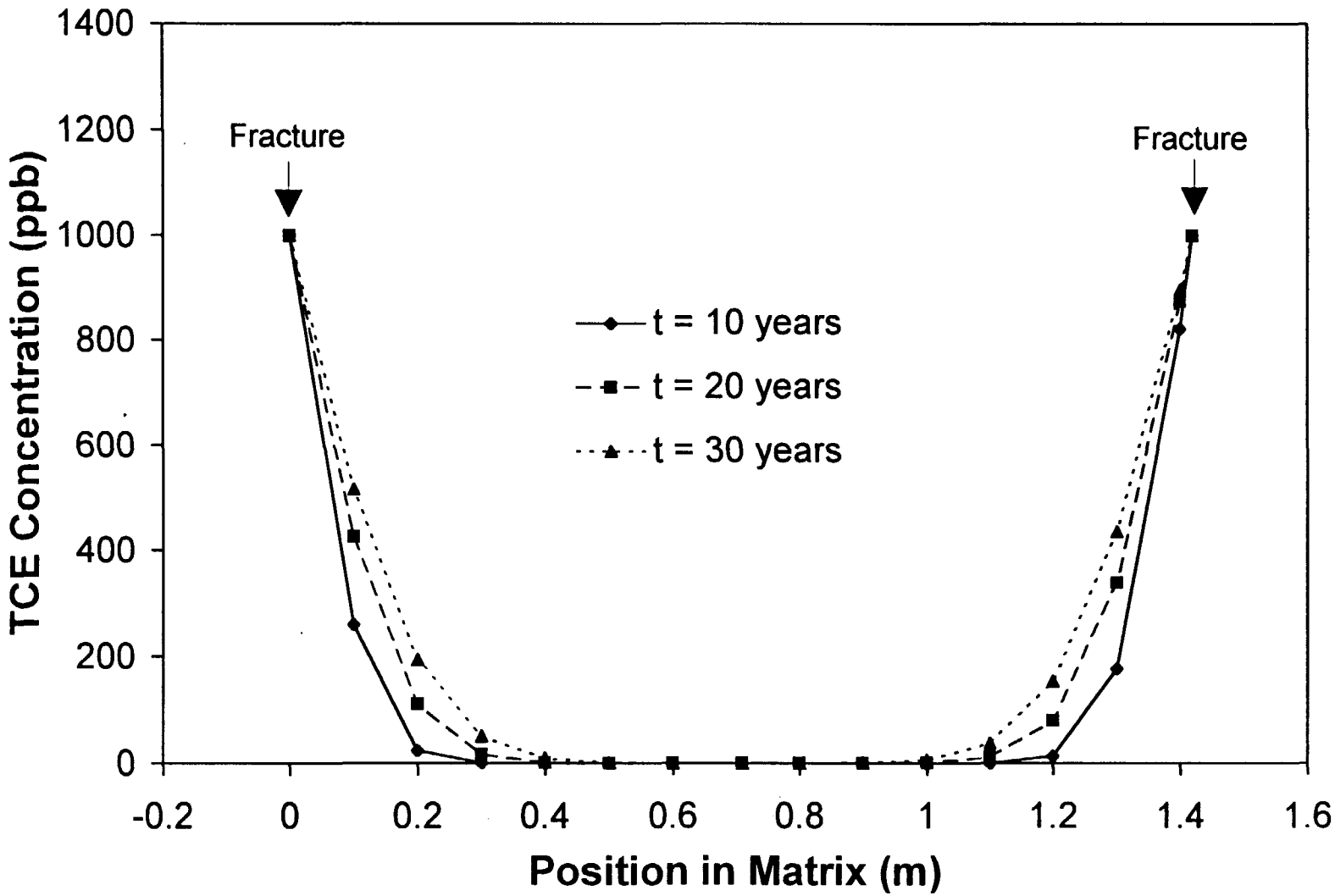


Figure 8
TCE Concentration vs Position in Matrix - Run 7

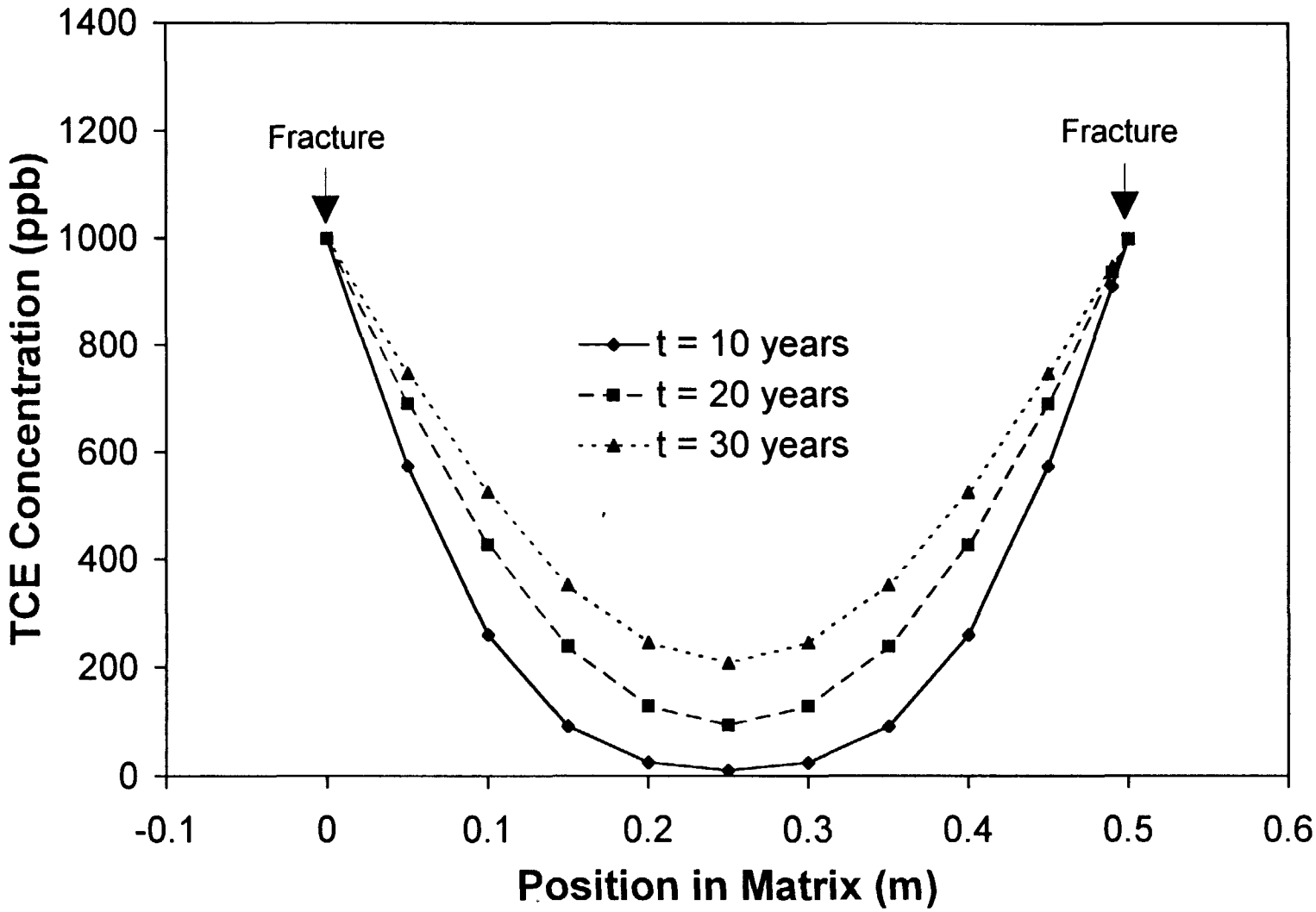


Figure 9
TCE Concentration vs Position in Matrix - Runs 8, 9, 6, and 10

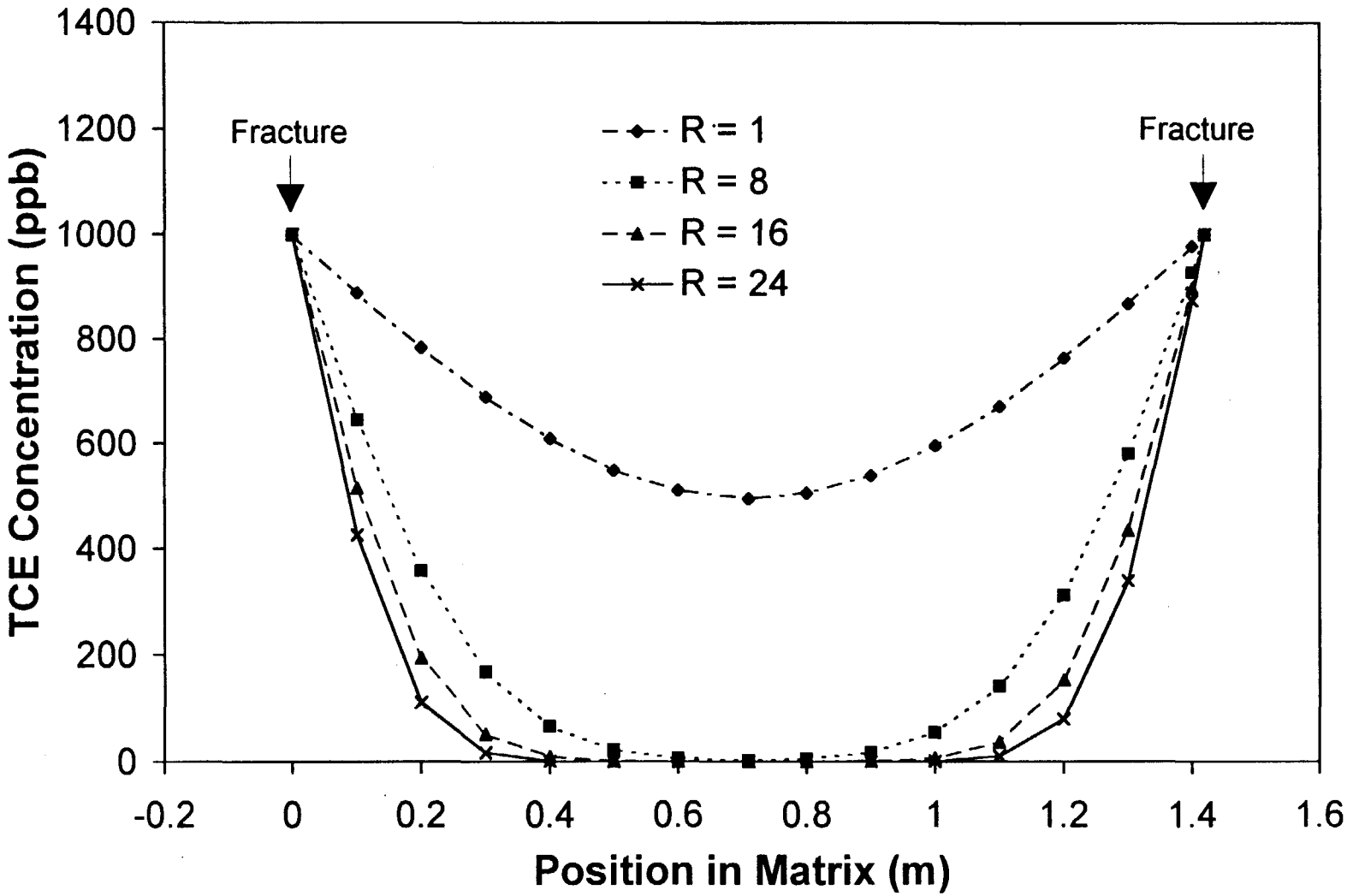


Figure 10
TCE Concentration in Fractures vs Distance From Source - Run 11

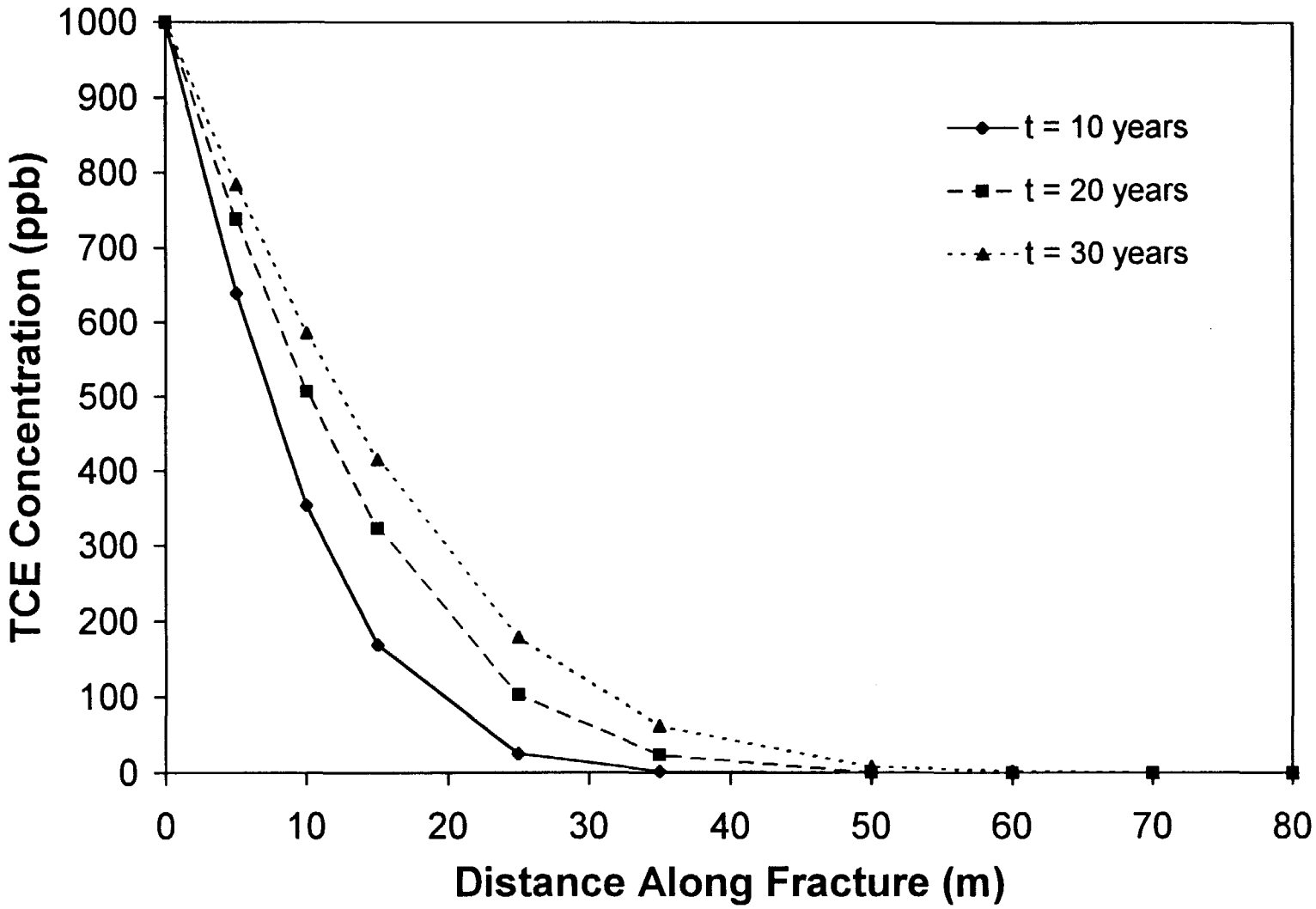


Figure 11
TCE Concentration in Fractures vs Distance From Source
Runs 12, 11, and 13

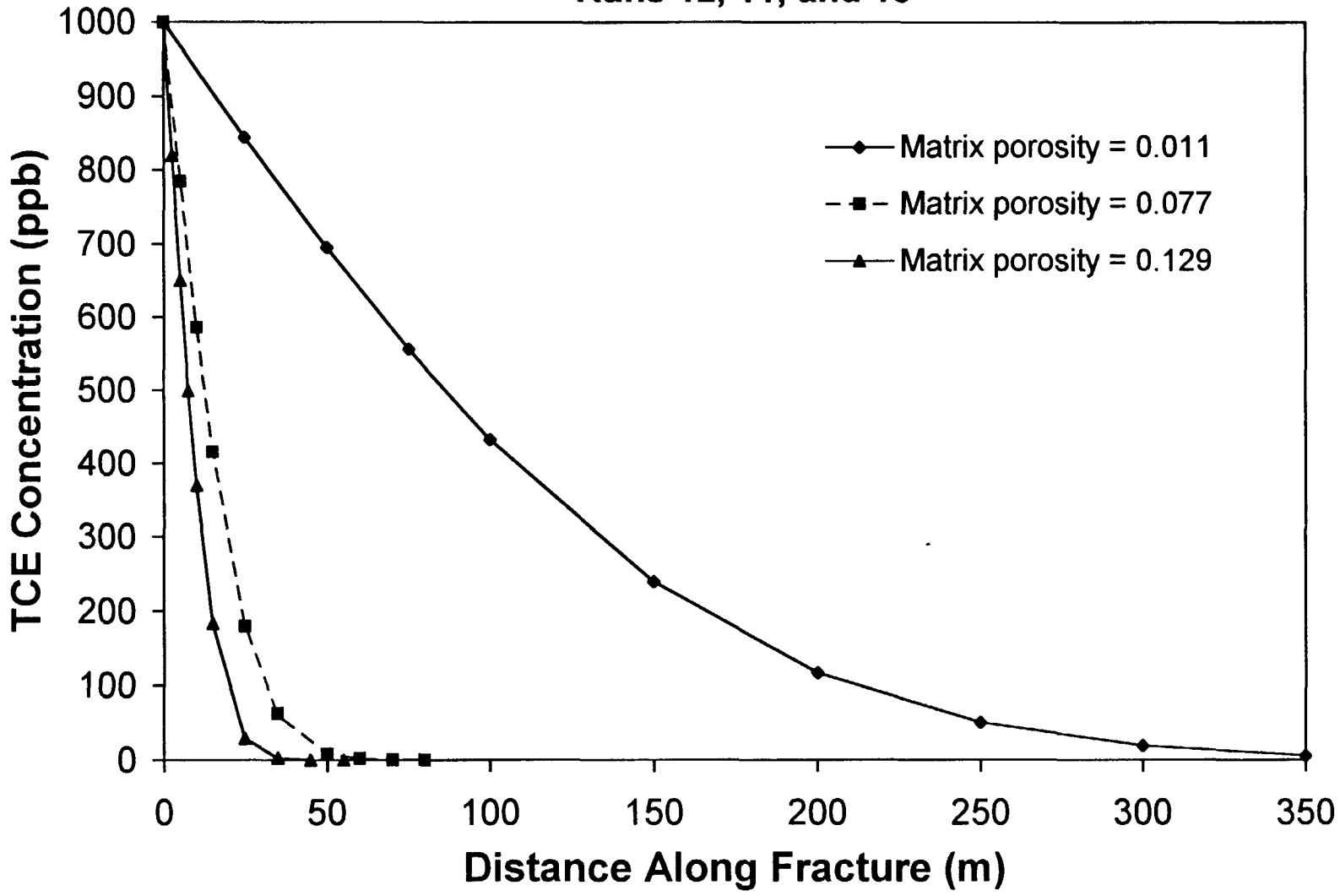


Figure 12
TCE Concentration in Fractures vs Distance From Source
Runs 14, 15, 11, and 16

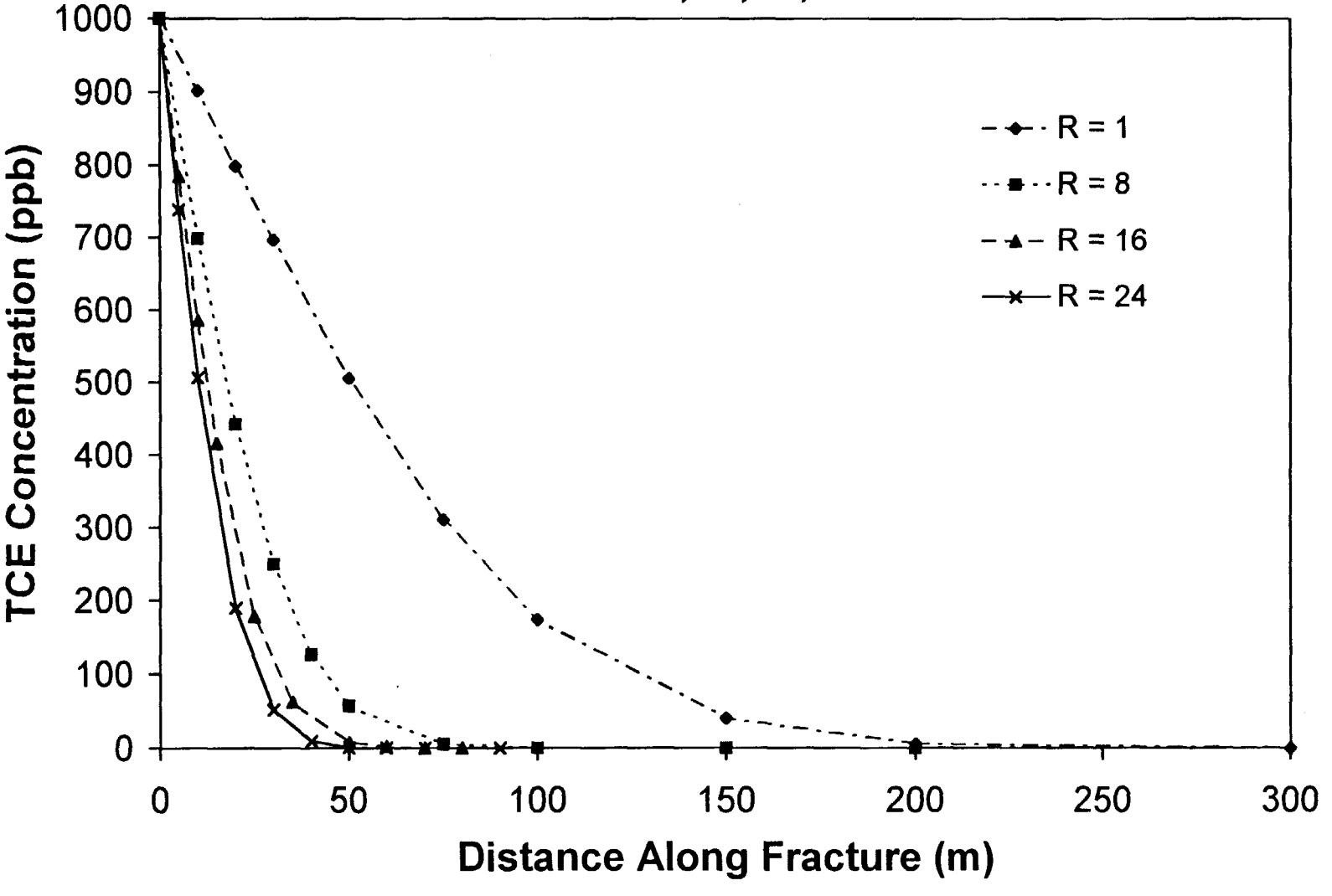
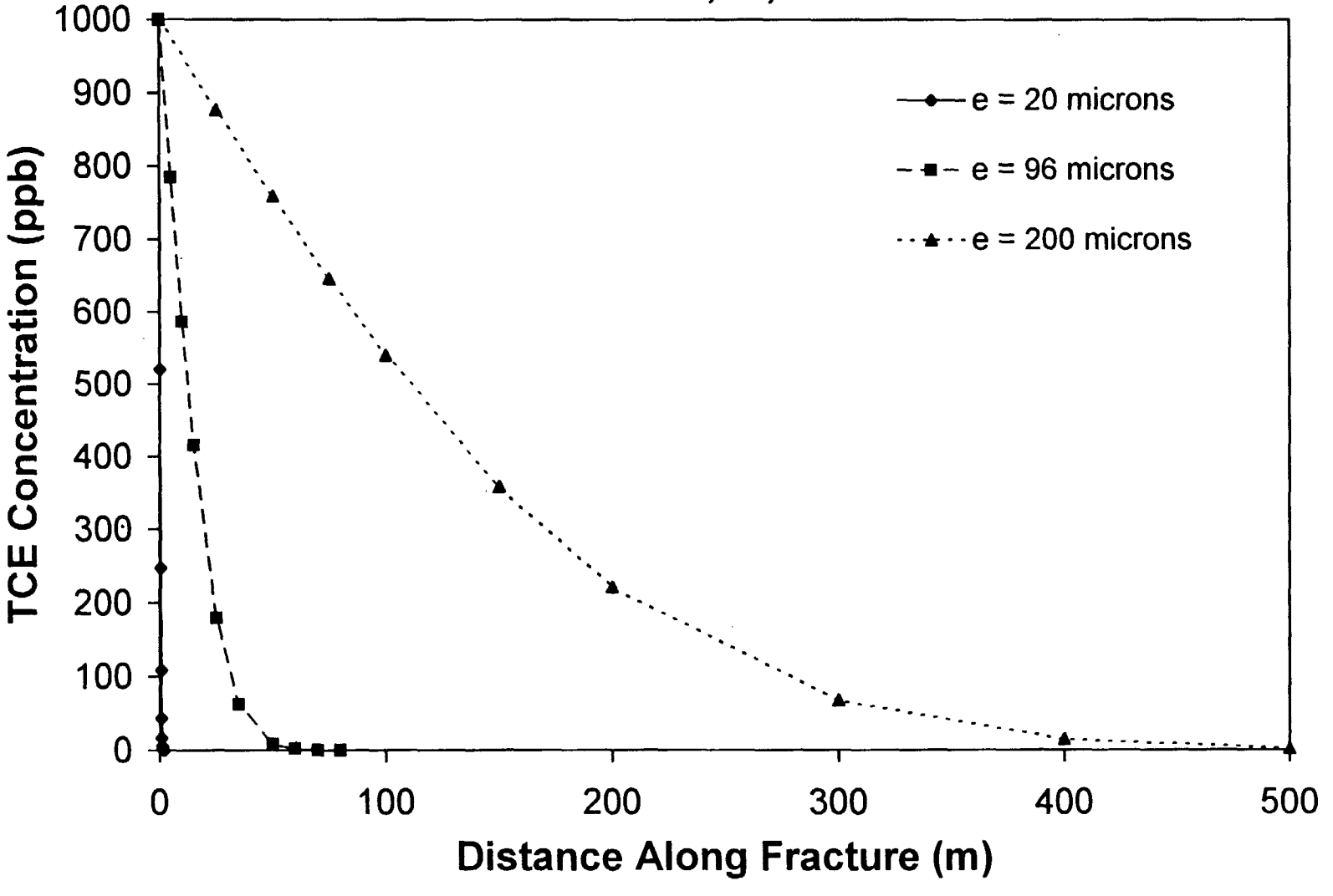


Figure 13
TCE Concentration in Fractures vs Distance From Source
Runs 17, 11, and 18



Identification and Preliminary Evaluation of Remedial Technologies Within the Potential NAPL Zone

Prepared by Dr. B.H. Kueper

November 11, 1997

1.0 Introduction

The purpose of this document is to identify and evaluate technologies with the potential to restore groundwater within the potential NAPL zone at the SRSNE site located in Southington, CT. Restoration of groundwater is defined here as reducing aqueous phase contaminant concentrations to applicable concentration-based regulatory standards. The particular standards which apply at the SRSNE site are outlined in the main body of the R.I. report (BBL, 1997). A preliminary evaluation of remedial technologies is carried out to select technologies which will be evaluated further as part of a formal application for technical impracticability.

The primary obstacle to restoring groundwater within the potential NAPL zone is the presence of DNAPL. This report will show that no currently existing a technologies are capable of removing sufficient contaminant mass from the potential NAPL zone to achieve the goal of groundwater restoration. This report therefore also addresses methods of containing the potential NAPL zone such that downstream mass flux is eliminated. Elimination of contaminant mass flux from the potential NAPL zone will allow downstream aqueous phase concentrations to decline to below regulatory standards. Since the lifespan of DNAPL in the subsurface at the SRSNE site is on the order of several decades to hundreds of years, restoration of groundwater outside of the potential NAPL zone cannot be achieved in reasonable time-frames without elimination of this mass flux.

The degree of mass removal required to achieve various remedial goals (or desired end-points) can be examined conceptually using Figure 1. The first goal shown is partial removal of DNAPL. This can be achieved by simply pumping fluids from any monitoring wells which have accumulated DNAPL. Partial removal of DNAPL has been accomplished at the SRSNE site, but has not significantly lowered aqueous phase concentrations, and has not served to significantly reduce the aqueous phase mass flux leaving the potential NAPL zone. Stabilization of pooled DNAPL refers to removing sufficient quantities of DNAPL such that saturations in pools are reduced towards residual levels. This renders the pools with a relative permeability approaching zero, and serves to stabilize the pools such that they cannot be mobilized by future pumping activities or changes in flow conditions. Stabilization of pooled DNAPL can be a remedial goal at sites where large, obvious pools of DNAPL exist. This is not the case at the SRSNE site, however, where DNAPL is believed to be distributed at a much smaller scale, occurring as residual and pools in many locations at several elevations.

This distribution of DNAPL is supported by the fact that permeability varies at the scale of centimeters in overburden at the site (BBL, 1997), and by the fact that only small to moderate volumes of DNAPL have been recovered from monitoring wells.

Figure 1 shows that a substantial degree of mass removal is required to reduce the downstream aqueous phase mass flux of contaminants. At present, very little research has been conducted to demonstrate the relationship between partial DNAPL removal and the degree of reduction of downstream mass flux. This is partly due to the fact that regulations are typically concentration based, not mass flux based. It will be assumed for the purposes of this report that partial DNAPL removal cannot reduce downstream aqueous phase mass flux to the degree required to meet concentration-based regulatory standards downstream of the potential NAPL zone. Figure 1 also shows that complete DNAPL removal corresponds to removal of the vast majority of contaminant mass in the subsurface. The figure has been prepared for unconsolidated deposits such as sands, gravels, and silts. In fractured sandstone, complete DNAPL removal would correspond to the removal of a smaller portion of the total mass, consistent with the fact that the porous matrix has the potential to store more mass in dissolved and sorbed form than the open fractures can as DNAPL pools and residual.

Figure 1 shows that achieving typical regulatory-based cleanup standards requires removal of virtually all contaminant mass from the subsurface. Because this is not achievable at the SRSNE site, a more appropriate remedial goal for the SRSNE site potential NAPL zone is expected to be elimination of downstream mass flux using a containment technology. This will not reduce aqueous phase concentrations to below regulatory limits within the potential NAPL zone, but will allow concentrations outside of the potential NAPL zone to be reduced to regulated cleanup levels. This will eliminate the most mobile form of contamination at the site, which is the aqueous phase plume migrating downstream.

2.0 Identification and Preliminary Evaluation of DNAPL Removal and Containment Technologies

A variety of technologies have the potential to extract DNAPL and/or contain contaminants within the potential NAPL zone. These can be generally grouped as follows:

1) **Hydraulic and physical containment.** This includes the use of vertical pumping wells, horizontal pumping wells, pumping trenches, constructed wetlands, sealable-joint sheet piling, slurry walls, injection grouting, capping, and permeable treatment walls such as reactive iron.

2) **In-situ flushing.** This includes the use of biodegradation, alcohol flooding, cosolvent flushing, surfactant flushing, air sparging, pump-and-treat, waterflooding, and steam flooding.

Hydraulic Containment

Hydraulic containment involves the placement of either vertical pumping wells, horizontal pumping wells, or pumping trenches on the downstream boundary of the potential NAPL zone. The objective of hydraulic containment is to intercept contaminated groundwater and prevent its migration to adjacent areas where groundwater restoration is being achieved. Hydraulic containment is generally a reliable means of intercepting contaminated groundwater. The performance of such systems can be monitored in a relatively simple fashion by measuring hydraulic heads and groundwater concentrations. Depending on geology and hydrogeology, such systems can be augmented with the use of physical barriers.

Hydraulic containment will be evaluated further as part of the formal technical impracticability evaluation for both overburden and bedrock at the SRSNE site. It should be noted, however, that hydraulic containment will be considered a plume interception technology, not a DNAPL removal technology. It is clear from the discussion of DNAPL dissolution which was presented in the R.I. workplan (BBL, 1995) that even aggressive pumping of groundwater in DNAPL zones will not significantly shorten the lifespan of residual and pooled DNAPL present below the watertable.

Pumping of groundwater in the vicinity of DNAPL may result in pool mobilization towards 'till windows' which are known to be present on-site. This may result in further contamination of bedrock, and a worsening of the spatial extent of contamination. Careful consideration will need to be given to the placement of hydraulic containment systems to ensure that the risk of pool mobilization is kept to a minimum. This risk has been evaluated by comparing the threshold gradients required to initiate pool mobilization to the gradients that will be created by groundwater pumping (Kueper, 1997a).

The placement of a constructed wetland downstream of the potential NAPL zone can be viewed as a means of hydraulic containment. The wetland has the potential to act as a large-scale pumping well, serving to capture the downstream aqueous phase plume exiting the potential NAPL zone. Biotic degradation processes can be enhanced in the wetland through proper selection of bottom sediments and aquatic vegetation. In order to adequately serve as a large-scale groundwater discharge zone capturing all portions of the contaminant plume, the waterlevel in the wetland will need to be controlled and monitored. One option is to pump water from the wetland to maintain waterlevels at the required levels. A second option is to key the wetland to the Quinipiac river. The use of a constructed wetland can be evaluated further for application at the SRSNE site.

Special attention should be given to seasonal effects, particularly the influence of freezing in the winter, and elevated river levels in the spring.

Physical Containment

Physical containment refers to the placement of either sealable joint sheet piling, slurry walls, or injection grout walls around the potential NAPL zone. The objective of such barriers is to eliminate contaminant transport further downstream. Physical barrier systems typically require small amounts of groundwater pumping from within the enclosure to offset infiltration and to ensure that no outward leakage occurs. Physical barriers can also be constructed without a barrier at the upstream end. In such cases a larger amount of groundwater pumping will be required to offset both infiltration and upstream groundwater flow. The use of physical barriers to contain the potential NAPL zone in overburden can be evaluated further at the SRSNE site.

The use of slurry walls and sealable joint sheet piling are not feasible technologies for physical containment in bedrock. Injection grouting can be considered, however, to construct a physical barrier in fractured rock. As in overburden, a small amount of groundwater pumping from within the enclosure is usually required to offset infiltration and to ensure that outward leakage is not occurring. The use of injection grouting to contain groundwater within the potential NAPL zone in bedrock can be evaluated further at the SRSNE site.

Physical capping can be considered as a method of reducing ground surface exposure to contaminants, and to reducing infiltration. Physical caps can be constructed of pavement, soil, or a variety of geosynthetics. The effectiveness of a soil cap in preventing upward diffusion of contaminants can be enhanced by keeping the cap water-saturated at all times. Physical capping by itself, however, will not prevent off-site transport of contaminants in groundwater. It should also be pointed out that placement of a physical cap may not significantly improve groundwater quality beneath the cap. This will be case at sites such as SRSNE where significant quantities of DNAPL are present below the watertable. Physical capping should not be evaluated further as a means of restoring groundwater within the potential NAPL zone, or as a means of eliminating aqueous phase mass flux leaving the potential NAPL zone.

Permeable Treatment Walls

In-situ permeable treatment walls have been proposed as a means of passively treating contaminated groundwater (Pankow and Cherry, 1996). These walls involve the construction of a trench into which a reactive material is placed. Contaminants are degraded while flowing through the trench. The use of a permeable treatment wall does not shorten the lifespan of residual and pooled DNAPL. The rate at which contaminants are delivered to the trench is determined by solubility and mass transfer

constraints governing DNAPL dissolution. Permeable treatment walls are therefore a means of plume interception. To date, iron has been identified as a material suitable for the degradation of certain chlorinated organics such as trichloroethylene and tetrachloroethylene. The patent for using iron treatment walls to remediate groundwater is held by Envirometal Inc., located in Guelph, Ontario. Because the use of a permeable reaction wall may offer a cost-effective means of containing groundwater within the potential NAPL zone, this technology can be evaluated further for application at the SRSNE site. The difficulty in constructing trenches in bedrock, however, restricts the use of this technology to the overburden deposits at SRSNE. It should also be noted that it is not clear whether or not this technology can degrade all of the contaminants (e.g., ketones, aromatics, furans) present in the multicomponent contaminant plume that exists at the site.

It should be pointed out that reactive iron walls are currently an emerging technology in the research and development stage. Although numerous laboratory evaluations have been carried out and several field trials are underway, there has been no comprehensive evaluation of the field application of this technology. This is due in part to the fact that this is a relatively new technology, and in part to the fact that many years of monitoring are required to asses the effectiveness of a passive technology. Current concerns regarding its long-term effectiveness include the formation of precipitates, and the associated reduction in porosity.

Biodegradation

In-situ biodegradation has the potential to degrade certain organic compounds under both aerobic and anaerobic conditions (Pankow and Cherry, 1996). This technology is generally suited to low concentrations of organics in groundwater and therefore is not suitable as a means of removing residual and pooled DNAPL. This does not imply, however, that substantial amounts of degradation are not occurring within the potential NAPL zone, as discussed in BBL (1997). There is very little evidence that sufficient biodegradation can occur to significantly reduce the lifespan of DNAPL in the subsurface. Biodegradation should not be evaluated further as a means of restoring groundwater within the potential NAPL zone in either overburden or bedrock. The ability of biodegradation to contribute towards natural attenuation of groundwater contaminants downstream of the potential NAPL zone, however, can be evaluated further.

Alcohol Flooding and CoSolvent Flushing

Alcohol flooding has been proposed as a DNAPL remediation technology because of the fact that many alcohols are mutually miscible in both water and DNAPL. If enough alcohol is added to a DNAPL-water system, one fluid phase will result as the interfacial tension is reduced to zero. Because alcohol has the ability to reduce interfacial tension

to zero, it is theoretically possible to remove large volumes of DNAPL using slugs of alcohol that are less than one pore volume in size. Table 1 lists several alcohols which have been identified as suitable for the removal of various DNAPLs.

Various researchers have demonstrated that alcohol flooding can bring about significant amounts of DNAPL removal in one-dimensional laboratory experiments (e.g., Brandes 1992, WCGR 1995). There do not exist, however, any three-dimensional studies of alcohol flooding as a DNAPL removal technology. As illustrated in Table 1, the alcohols suitable for DNAPL removal are less dense than water. It will therefore be difficult to allow alcohol to contact any residual or pooled DNAPL present in the lower portions of the overburden or bedrock at SRSNE. Buoyancy will result in rapid upward movement of alcohol unless very small well spacings and high injection pressures are employed. In addition, most alcohols are more viscous than water, implying that hydrodynamic instabilities will govern sweep efficiencies. While the phase behavior of alcohol systems is extremely favorable for DNAPL removal, the density and viscosity of alcohol results in poor deliverability. Improving the deliverability of alcohol is currently an active area of research (Lunn and Kueper, 1997). Major advances will need to be made to overcome the complicating effect of heterogeneity before consideration can be given to application at actual sites.

It appears that alcohol flooding may be suited to the removal of DNAPL from small, localized areas where the injection-withdrawal process can be controlled. Alcohol flooding is currently in the developmental stage, and is not ready for off-the-shelf implementation. It should also be pointed out that the success of an alcohol flood will depend in part on proper alcohol selection. The majority of laboratory studies conducted to date have focused on single-component DNAPLs such as tetrachloroethylene and trichloroethylene. No data exist examining the ability of alcohol to remove complex, multicomponent DNAPL such as that present at SRSNE. Also, the high degree of heterogeneity present in overburden and bedrock at the site will hinder the ability of injected fluids to contact all regions of the subsurface containing DNAPL. It is also not clear whether or not regulatory approval can be obtained for injecting large volumes of alcohol into the subsurface. Alcohol flooding should not be considered further at this time as a means of removing DNAPL from the potential NAPL zone in either overburden or bedrock.

Several authors (e.g., Pankow and Cherry, 1996) have coined the term 'cosolvent' flooding in reference to the use of alcohols. Cosolvent flooding generally refers to the injection of low concentrations (e.g., 1% - 5% by volume) of alcohol such that the system of interest remains as a two phase (DNAPL-water) system. The low concentrations of alcohol, however, serve to increase the solubility of DNAPL in aqueous solution (hence a cosolvent effect). The degree of solubility enhancement will be compound specific. In a cosolvent flood, many pore volumes of cosolvent need to be flushed through the DNAPL zone to accelerate dissolution. Unlike with the injection of high concentrations of alcohol (70% - 90%), no DNAPL mobilization takes place. Co-solvent flooding will exhibit tailing, typically well above clean-up levels,

due to pore-scale and field-scale limitations to mass transfer. To date, no experiments have been performed to demonstrate that cosolvent flooding can bring about aquifer restoration at a DNAPL site. Cosolvent flooding should not be evaluated further at this time as a means of restoring groundwater within the potential NAPL zone in either overburden or bedrock.

TABLE 1 - Physical properties of selected alcohols (data from Verschueren 1983, Weast 1986)

Alcohol	Density (g/cc)	Viscosity (cP)	Aqueous Solubility (wt % @ 25C)
Methanol	0.791	0.597	infinite
Ethanol	0.789	1.2	infinite
1-Propanol	0.804	2.25	infinite
2-Propanol (IPA)	0.785	2.5	infinite
1-Butanol	0.810	2.95	20.5
2-Butanol	0.808	3.18	44.1
Isobutanol (IBA)	0.798	3.91	16.9
Tert-Butanol	0.788	4.52	

Surfactant Flushing

Chemical surfactants (surface active agents) are typically long-chain molecules composed of a strongly hydrophilic end group and a strongly hydrophobic carbon tail. Surfactants are generally grouped into three primary classes depending on the nature of the particular hydrophile-hydrophobe combination: anionic, cationic, and nonionic. Once surfactants are added to aqueous solution, they will tend to be attracted to any liquid-liquid interfaces that are present. In a DNAPL-water system, the hydrophobic portion of a surfactant molecule will be attracted to the DNAPL phase, while the hydrophilic group will remain attracted to the aqueous phase. This results in an alteration of a number of properties, including a lowering of DNAPL-water interfacial tension.

If a sufficient quantity of surfactant is added to aqueous solution, aggregates of monomers called micelles will form. The concentration at which micelles begin to form is referred to as the critical micelle concentration (CMC). Micelles are configured with the hydrophobic tails of individual monomers pointed inwards, giving rise to a strongly hydrophobic interior into which organic contaminants can be entrained. The presence of micelles in the vicinity of DNAPL will give rise to an enhanced aqueous solubility of the DNAPL. This process of micellar solubilization is therefore capable of accelerating the rate of DNAPL dissolution into flowing groundwater. With proper matching of surfactant to DNAPL, the aqueous solubility of typical DNAPL compounds such as

trichloroethylene (TCE) and tetrachloroethylene (PCE) can be increased by two to three orders of magnitude. Surfactant chemistry is discussed further by West and Harwell (1992).

While surfactants have the ability to increase the aqueous solubility of many sparingly soluble organics, the process of DNAPL dissolution into surfactant solution is typically rate limited, showing a dependence on a number of factors including groundwater flow rate. The implication of this is that contaminant concentrations in recovered groundwater during a surfactant flood will exhibit a slow, gradual decline towards clean-up levels. This slow decline is typical of many flushing technologies (c.f., soil vacuum extraction), and is referred to as 'tailing'. During a field-scale application of surfactant flooding, tailing will occur in response to velocity-dependent mass transfer at the pore scale, as well as in response to the presence of low permeability layers (i.e., heterogeneity) which will be difficult to access with injected chemical agents. Figure 2, for example, presents effluent PCE concentrations for a surfactant field trial carried out by Fountain et al. (1996) at Canadian Forces Base Borden in a relatively homogeneous aquifer. Note the significant tailing of concentrations after even 14 pore volumes of surfactant flushing. Note also that effluent concentrations at this point are still significantly higher than the aqueous solubility (non-chemically enhanced) of PCE.

In addition to the number of pore volumes required to reduce contaminant concentrations to acceptable levels during a surfactant flood, the threat of vertical pool mobilization must be considered. The exposure of residual and pooled DNAPL to aqueous surfactants will result in a lowering of interfacial tension in response to a reduction in free energy of the DNAPL-water interface. Aqueous surfactants will typically reduce DNAPL-water interfacial tension to between 0.1 and 1.0 dynes/cm (WCGR, 1995). The fact that surfactant flooding may lead to vertical pool mobilization can be illustrated best by considering the maximum stable pool height, H, that can form in a porous medium (Kueper et al., 1993):

$$H = \frac{P_C'' - P_C'}{\Delta\rho g} \qquad (1)$$

where P_C'' is the capillary pressure at the base of the pool, P_C' is the capillary pressure at the top of the pool, $\Delta\rho$ is the density difference between DNAPL and water, and g is the acceleration due to gravity. Equation (1) is independent of depth below the watertable and demonstrates that pools can even form in homogeneous media. The maximum possible pool height is calculated by setting P_C'' equal to the displacement pressure of the medium upon which pooling is taking place. It follows that fine grained sand, silt, and clay lenses provide optimal capillary barriers upon which pooling can take place.

It is clear that a reduction of P_C'' will lead to shorter equilibrium pool heights. Since the displacement pressure is proportional to interfacial tension, exposure of pooled DNAPL

to surfactants will lead to a risk of vertical pool mobilization. If a pool exists at its maximum stable pool height, any reduction in interfacial tension will lead to vertical pool mobilization. Such mobilization is particularly undesirable at the SRSNE site where fractured bedrock underlies the overburden deposits. Because the fracture porosity of bedrock is substantially less than the porosity of unconsolidated sands and silts, a fixed volume of DNAPL will occupy a significantly greater bulk volume in bedrock than in overburden. Assuming that the porosity of the overburden at SRSNE is 0.30 and that the fracture porosity of bedrock is 0.001, an overburden pool mobilized into bedrock will occupy at least 300 times its original volume. In practice, this volume may be much larger if the pool distributes itself as residual in the bedrock.

It has been reported in previous investigations (e.g., ENSR, 1995) that the low permeability horizon at the base of the overburden is not continuous across the SRSNE site. Locations where this layer is absent have been described as 'till windows'. In such locations it can be assumed that mobilized DNAPL will come into direct contact with fractured rock. The maximum DNAPL pool height which can be supported by fractured bedrock is given by (Kueper and McWhorter, 1991):

$$H = \frac{2\sigma\cos\theta}{(\rho_{NW} - \rho_W)ge} \qquad (2)$$

where H is the maximum stable pool height, σ is the DNAPL-water interfacial tension, θ is the contact angle, ρ_{NW} is the non-wetting phase (DNAPL) density, ρ_W is the wetting phase (groundwater) density, g is the acceleration due to gravity, and e is the largest fracture aperture. It is clear that a reduction in interfacial tension may lead to vertical pool mobilization.

Figure 3 presents the relationship between maximum stable pool height and fracture aperture invaded for the SRSNE DNAPL properties measured from samples obtained from MWD-601 and RW-5 (see R.I. Workplan for density and interfacial tension measurements). Figure 3 also presents the same relationship for a reduction in interfacial tension to 1.0 dyne/cm, which is typical of exposure to solubilizing surfactants. It is clear that a reduction in interfacial tension leads to smaller equilibrium pool heights required for entry into fractures. For the reduced interfacial tension conditions shown, pool heights as small as 20 cm (7.9 inches) will enter fractures as small as 10 microns. Apertures on the order of 10 microns are in general considered very small, and are below the average fracture aperture of 96 microns for the SRSNE site reported by BBL (1997).

Because of the long time periods required for surfactant flushing to bring about a reduction in groundwater concentrations to clean-up standards and the risks of vertical pool mobilization into bedrock, surfactant flushing should not be evaluated further for the overburden deposits at the SRSNE site. It should be pointed out that surfactant flushing is also not suitable for application in bedrock at SRSNE because of the

unacceptable risk of mobilizing pools deeper into the subsurface. In addition, increasing contaminant concentrations upon exposure to surfactants will increase the concentration gradient into the matrix, accelerating the transfer of mass from open fractures to the rock matrix. This same concern applies to alcohol flooding. Application of surfactant flushing and alcohol flooding may therefore increase the amount of time required to remediate bedrock, since clean-up time scales will be governed by the rate at which contaminants can diffuse back out of the porous matrix.

Recent Chemical Flooding Field Trials

A recent study completed by AATDF (1996) involved the review of 26 field demonstrations of surfactant/alcohol flooding. Figure 4 plots the cumulative number of completed field trials versus year up until 1997. The trend of this line, in conjunction with the fact that no full-scale implementations of surfactant/alcohol flooding have yet taken place in North America, support the fact that this is an emerging and innovative technology which is currently in its research and development stage.

Table 2 reports the target compounds and geological settings for the 12 field trials which were directed at sites known to contain DNAPL. The remaining 14 field trials either contained LNAPL, or did not show conclusive evidence for the presence of DNAPL. The table shows that the primary geological setting of interest was sand and/or gravel aquifers, consistent with the fact that surfactant/alcohol flooding is generally not an attractive mass removal technology in low permeability environments where the time to cycle fluids is high. The target source zone in the reported field trials generally had an area of less than 10 m x 10 m, and was generally restricted to depths of less than 15 m below ground surface.

Unfortunately, very little data has been collected from the 26 completed field trials to accurately determine factors such as achieved end-point groundwater concentrations downstream of the target NAPL zone, end-point groundwater concentrations within the target NAPL zone, and aqueous phase mass flux leaving the source zone following completion of the chemical flood. Some estimates of the degree of NAPL mass removal are available, however, and are summarized in Figure 5. As can be seen, the reported mass removals range from 0% to 99%. The 99% mass removal was reported for a surfactant/cosolvent flood implemented at Hill Air Force Base located in the state of Utah. The mass removal for this field trial is based on the evaluation of partitioning tracer tests completed both before and after the implemented chemical flood. Soil cores have not yet been taken to confirm these results. The high range of mass removals reported in Figure 5 are consistent with the fact that surfactant/alcohol flooding is an emerging technology currently in the research and development stage.

The cost of a surfactant/alcohol flood is an important factor in determining the applicability of the technology at a particular site. Incurred costs include expenditures for site characterization, laboratory testing, numerical simulations, field

Table 2 - Summary of target compounds and geological settings for 12 field trials where DNAPLs were known to be present in the subsurface.

Target Compound	Site Location	Geological Setting
Creosote based wood treating oil	Laramie, Wyoming, USA	Gravel grading upward to sand
Creosote based wood treating oil	Fredricksburg, Virginia, USA	Silty clay alluvium
Multicomponent chlorinated solvent DNAPL	Hill Air Force Base Operable Unit 2	Alluvial gravels and sands
Multicomponent DNAPL	Ville Mercier, Quebec, Canada	Sand and gravel till
Multicomponent DNAPL	Thouin, Quebec, Canada	Silty sands
Multicomponent chlorinated solvent DNAPL	Commercial Site, New Jersey, USA	Sandy silt/Silty clay
Trichloroethylene (TCE)	Picatinny Arsenal, New Jersey, USA	Sand and gravel
Trichloroethylene (TCE)	Paducah, Kentucky, USA	Sand and gravel
Multicomponent TCE-rich DNAPL	Piketon, Ohio, USA	Sand and gravel
Trichloroethylene (TCE)	Fort Worth, Texas, USA	Sand and gravel
Carbon tetrachloride	Corpus Christi, Texas, USA	Well-sorted fine sand with clay interbeds
Tetrachloroethylene (PCE)	Canadian Forces Base Borden	Fine to medium grained sand, relatively homogeneous

demonstrations, employee training, full-scale design, construction, operations and maintenance, and monitoring. Construction costs include the cost for the actual physical facility components, as well as mechanical and electrical installations, permitting and legal fees, services during construction, preparation of operations and maintenance (O&M) manuals, safety protocols, demolition and site restoration, and various contingencies. The operations and maintenance costs include expenditures for labor, materials, chemicals, utilities, laboratory analysis, and disposal of waste fluids and residues.

AATDF (1997) present a cost analysis for full-scale implementation of a surfactant/alcohol flood at a number of hypothetical sites. These cost estimates are summarized in Figure 6. Some of the presented costs are based on literature cost estimates provided by others. The figure indicates that the cost for a full-scale chemical flood ranges from a low of approximately $0.57 million (U.S.) an acre, to a high of approximately $7.50 million (U.S.) an acre. The presented cost estimates are applicable to sites where contamination is restricted to depths of less than approximately 6.2 m. At the SRSNE site, costs would be significantly higher because of the fact that a thicker overburden deposit exists, and because of the fact that DNAPL is present in bedrock. The costs presented in Figure 6 vary widely from case to case because of differing assumptions regarding chemical selection, initial NAPL volume, and site conditions. Because no full-scale implementations of surfactant/alcohol flooding have yet been carried out for DNAPL sites, the presented cost information should be regarded as uncertain. It is clear, however, that the unit cost per acre is higher for small sites where economies of scale cannot be realized.

It is important to note that the cost of implementing a surfactant/alcohol flood can be reported as a cost per area of treated land, cost per volume of impacted soil, and cost per volume of NAPL recovered. Table 3 presents the range of cost estimates presented in AATDF (1997) for each of these three reporting methods. It can be concluded again that the cost of implementing a surfactant/alcohol flood can vary widely depending on contaminant type and site conditions, and that the cost of implementation may have a high degree of uncertainty associated with it, even following good site characterization efforts.

Air Sparging

Air sparging involves the injection of air into overburden deposits to promote the transfer of volatile contaminants from groundwater into the flowing air phase. The contaminant laden air is then collected in the unsaturated zone using vacuum extraction wells. The success of air sparging is dependent upon the ability to uniformly distribute air through the subsurface. In homogeneous deposits, the majority of air flow will occur in the immediate vicinity of the sparging well. This follows from the fact that air is significantly less dense than water, resulting in a strong upward driving force. Air sparging in homogeneous deposits will therefore require very small well spacings.

Table 3 - Cost estimates for full-scale implementation of surfactant/alcohol flooding in shallow overburden deposits (from AATDF, 1997)

	Cost per acre (US Dollars)	Cost per cubic yard of impacted soil (US Dollars)	Cost per gallon of NAPL removed (US Dollars)
Minimum	570,000	65	21
Average	3,400,000	270	86
Maximum	7,500,000	750	239

In heterogeneous deposits, it has been demonstrated (WCGR, 1995) that air flow is not uniform through the subsurface. Air is non-wetting with respect to water and has a surface tension of approximately 0.072 N/m. As a result, rising air will be impeded by the presence of finer grained lenses and laminations. Air will pool below these lenses and flow laterally underneath them, resulting in large regions above the lenses which are not contacted by the rising air. Mass transfer from these stagnant regions to the rising air will be diffusion limited. It follows that while air sparging will certainly remove mass from the subsurface, long periods of tailing are to be expected in response to diffusion limited mass transfer from zones not contacted by injected air.

Except for exceptionally homogeneous sites, it can be concluded that injected air will largely by-pass zones of residual and pooled DNAPL. Recall that such zones will form above lower permeability horizons, the bottom of which will be impermeable to the rising air. Mass transfer from DNAPL to air will be primarily through groundwater, a process that will be constrained by the rate of aqueous phase diffusion. Air sparging can therefore not be regarded as a DNAPL removal technology. Air sparging should not be evaluated further as a means of removing NAPL from the potential NAPL zone in either overburden or bedrock.

It has been suggested by Pankow et al. (1993) that high permeability sparge trenches can be used as a means of intercepting aqueous phase plumes. The trenches are constructed of a highly permeable porous medium such as pea gravel. This allows for unimpeded flow of groundwater through the trench, and uniform coverage of rising air supplied from a horizontal injection well placed at the base of the trench. A sparge trench can therefore be regarded as a plume containment technology in overburden. The use of sparge trenches can be evaluated further as a means of hydraulically containing the potential NAPL zone.

Pump-and-Treat

Pump-and-treat refers to the extraction of contaminated groundwater followed by ex-situ treatment. It is now well recognized that pump-and-treat is ineffective at restoring groundwater in the presence of DNAPL because of the long time periods required to dissolve residual and pooled DNAPL. This conclusion holds regardless of the rate of groundwater pumping. It can therefore be concluded that pump-and-treat is not a viable technology for restoring groundwater within the potential NAPL zone in overburden where DNAPL is confirmed to be present. Pump-and-treat should not be evaluated further for application in overburden within the potential NAPL zone.

With respect to bedrock, it is also well-recognized that pump-and-treat is ineffective at restoring groundwater in the presence of DNAPL. The high concentrations of chlorinated organics in bedrock at SRSNE, the fact that numerous short-circuiting pathways (e.g., interceptor wells) have existed in the past, and visual observation confirm that DNAPL entered bedrock at some point in time. As discussed in Kueper (1997b), the process of matrix diffusion will be the limiting influence in restoring groundwater both within and outside the potential NAPL zone.

Water Flooding

Waterflooding refers to the physical displacement of DNAPL in response to groundwater pumping. Imposing a hydraulic gradient across residual and pooled DNAPL will increase the capillary pressure at the leading edge of the DNAPL distribution (downstream end) relative to the trailing edge (upstream end), thereby imparting a hydraulic driving force. Waterflooding has been implemented as a secondary oil recovery technology for several decades in the petroleum industry (Lake, 1989).

The ability of a waterflood to displace residual NAPL in porous media can be characterized using the capillary number:

$$N_c = \frac{k\rho_w g J}{\sigma} \qquad (3)$$

where N_C is the dimensionless capillary number, k is the intrinsic permeability of the medium, ρ_W is the wetting phase (water) density, g is the acceleration due to gravity, J is the imposed hydraulic gradient, and σ is the DNAPL-water interfacial tension. As can be seen from equation (3), the capillary number represents the ratio of viscous to capillary forces. If viscous forces are high enough, the capillary resistance of a porous medium can be overcome and residual blobs will be mobilized. Equation (3) illustrates that residual DNAPL is easier to displace for higher groundwater gradients, more permeable media, and a lower DNAPL-water interfacial tension.

An analysis of waterflooding to remove residual DNAPL using equation (3) was presented in the R.I. Workplan (BBL, 1995) and made it clear that residual DNAPL cannot be removed from the SRSNE site using waterflooding technology. This conclusion was relatively insensitive to the value of intrinsic permeability assigned. Water flooding should not be evaluated further as a means of restoring groundwater in the potential NAPL zone.

Steam Flooding

The use of steam flooding to displace DNAPL in saturated porous media has been suggested as a potential remediation technology in recognition of the fact that many components of DNAPL may have boiling points less than approximately 100 C. If steam is brought into contact with DNAPL composed of chemicals with boiling points less than 100 C, rapid vaporization will occur. The vaporized DNAPL components will travel towards the steam front in the vapor phase where they will condense to form a mobile 'DNAPL bank'. This bank will increase in size as the steam front progresses through the DNAPL zone, leading to a build-up of capillary pressure at the base. It is clear that a geological horizon impermeable to DNAPL must exist beneath the zone to be steam-flooded in order to prevent vertical mobilization of the DNAPL bank. At the SRSNE site, the presence of the 'till windows' prevents the application of steam flooding without a high risk of mobilizing DNAPL into bedrock.

In addition to the problem of vertical DNAPL mobilization in response to increasing capillary pressures in the DNAPL bank, it must be noted that it may be difficult to ensure that injected steam will be brought into contact with all residual and pooled DNAPL. In an unconfined overburden deposit such as at SRSNE, the injected steam will quickly travel upwards into the unsaturated zone. Steam floods are best suited to confined aquifers where a capillary barrier to the buoyant steam exists above the contaminated zone. Even if the steam can be manipulated to remain in the saturated zone, gravity over-ride and the complicating effect of heterogeneity will result in poor contact between steam and pooled DNAPL located at the base of the zone to be steam flooded. The same issue applies to bedrock.

Steam flooding is best suited to sites where the individual DNAPL components have boiling points less than approximately 100 C. Table 4 lists the components which comprise SRSNE DNAPL along with their reported boiling points. It is clear that while many of the components will be vaporized quickly upon contact with steam, some will not be completely vaporized. In such cases steam flooding must be operated as a flushing technology, with a certain number of pore volumes required to bring about complete mass removal. Steam flooding will therefore exhibit a slow 'tailing' towards clean-up levels, as is to be expected with any flushing technology which relies on dissolution. It should also be pointed out that the four most concentrated compounds detected in DNAPL recovered from MWD-601 were p/m xylenes, tetrachloroethylene,

toluene, and trichloroethylene. Of these four compounds, only trichloroethylene has a boiling point less than 100 C.

It can be concluded on the basis of the above discussion that steam flooding is not an appropriate technology for DNAPL removal at the SRSNE site. The primary reason for this is the fact that the majority of DNAPL exists in an unconfined overburden aquifer where it will be difficult to prevent vertical short-circuiting of steam up to the unsaturated zone. In addition, till windows exist through which DNAPL may be mobilized downwards into bedrock. It is also apparent from a consideration of boiling points that steam flooding would need to be operated as a flushing technology, subject to long tailing towards clean-up levels.

TABLE 4 - Boiling Points of Compounds Detected in DNAPL Obtained from MWD-601 and RW-5 (chemical data from Mackay et al. 1993, Pankow and Cherry 1995)

Compound	Boiling Point (C)
PCB-1260	> 300
1,1-Dichloroethylene	31.9
1,1-Dichloroethane	57.3
cis-1,2-Dichloroethylene	60.0
Chloroform	62.0
1,1,1-Trichloroethane	74.1
Benzene	80.1
1,2-Dichloroethane	83.5
Trichloroethylene	86.7
Toluene	110.6
1,1,2-Trichloroethane	113.7
Tetrachloroethylene	121.4
Ethylbenzene	136.2
p/m Xylenes	138.0 (p), 139.3 (m)
o Xylene	144.0
Styrene	145.1

3.0 Conclusions

It is clear that many DNAPL remediation technologies can bring about rapid rates of mass removal in laboratory columns where contact between the injected solutions (e.g., alcohol, surfactants, steam, oxidants) and the target DNAPL is ensured. In field applications, however, the presence of heterogeneity leads to incomplete contact with the target DNAPL and a corresponding incomplete degree of mass removal. In fractured sedimentary bedrock, remediation efforts are constrained by the rate at which contaminants will diffuse back out of the porous matrix. Partial mass removal is inconsistent with achieving typical concentration-based cleanup goals. Ongoing research is focused on improving deliverability (i.e., improving sweep efficiency) in both overburden and bedrock field settings. To date, however, there does not exist one site which has been restored to typical concentration-based cleanup goals where moderate to large amounts of DNAPL are present below the watertable in either overburden or bedrock deposits. It is also clear that application of an inappropriate remediation technology may actually worsen the extent of contamination at a site.

It can be concluded on the basis of this report that there does not currently exist a technology to restore groundwater to regulated cleanup levels within the potential NAPL zone in both overburden and bedrock at the SRSNE site. Application of an inappropriate technology can worsen the extent of contamination. The primary impediments to restoring groundwater within the potential NAPL zone are aquifer heterogeneity in overburden, and the presence of a porous matrix in bedrock. Technologies do exist, however, to either physically or hydraulically contain the potential NAPL zone such that downstream aqueous phase mass flux is eliminated. This will allow groundwater concentrations outside of the potential NAPL zone to be reduced to regulated cleanup levels.

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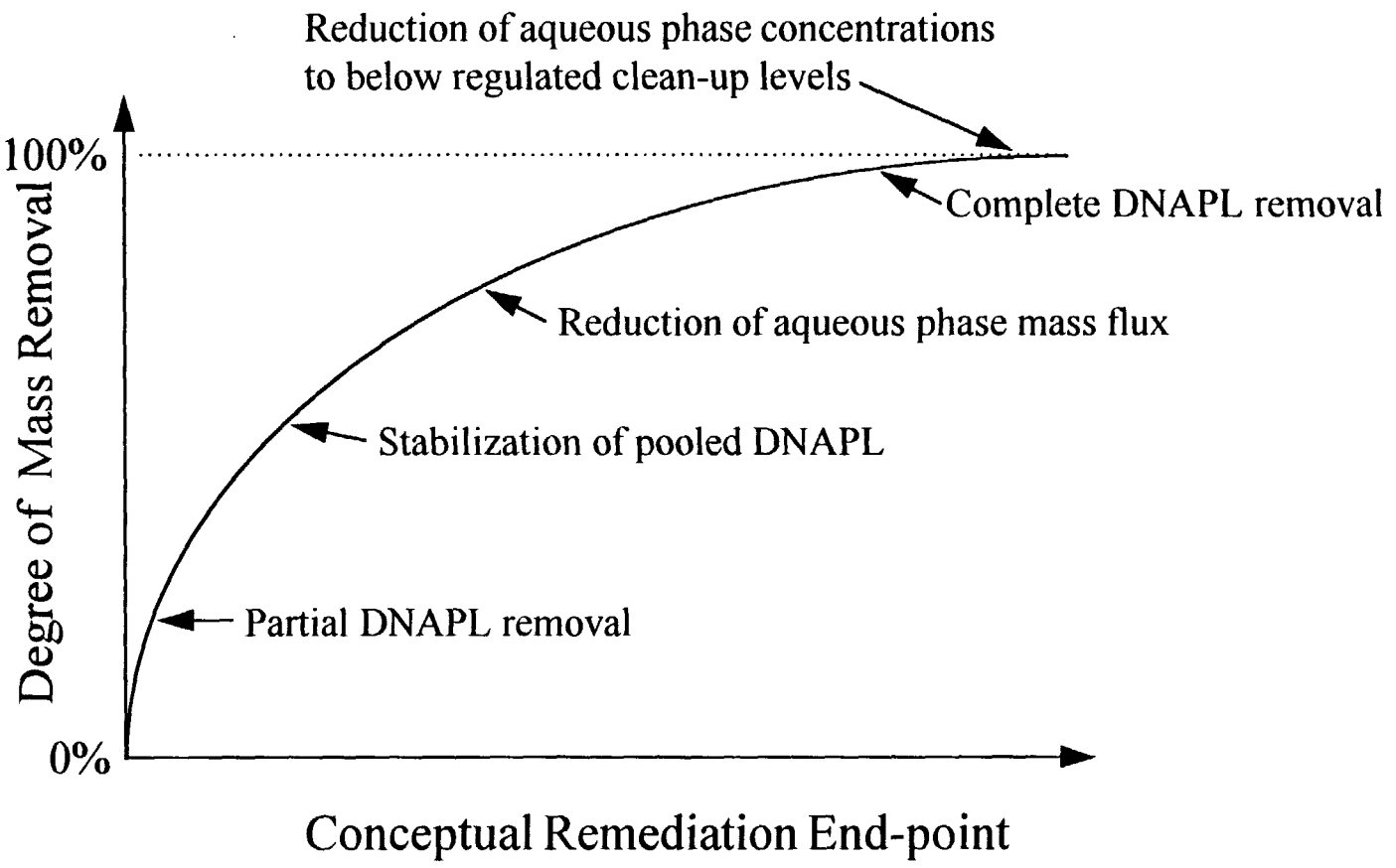
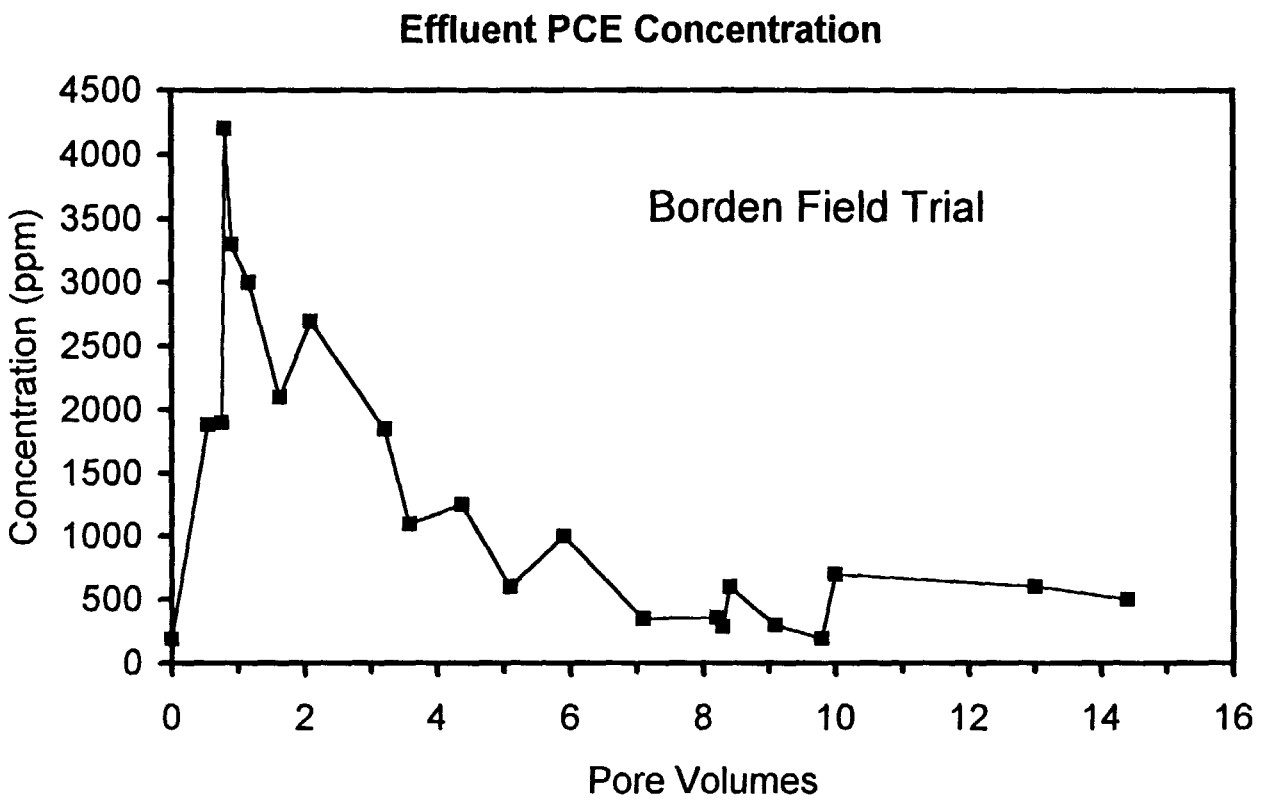

Reduction of aqueous phase concentrations
to below regulated clean-up levels
100%
Degree of Mass Removal
Complete DNAPL removal
Reduction of aqueous phase mass flux
Stabilization of pooled DNAPL
Partial DNAPL removal
0%
Conceptual Remediation End-point

FIG. 1


Effluent PCE Concentration
Borden Field Trial
Concentration (ppm)
4500
4000
3500
3000
2500
2000
1500
1000
500
0
0
2
4
6
8
10
12
14
16
Pore Volumes

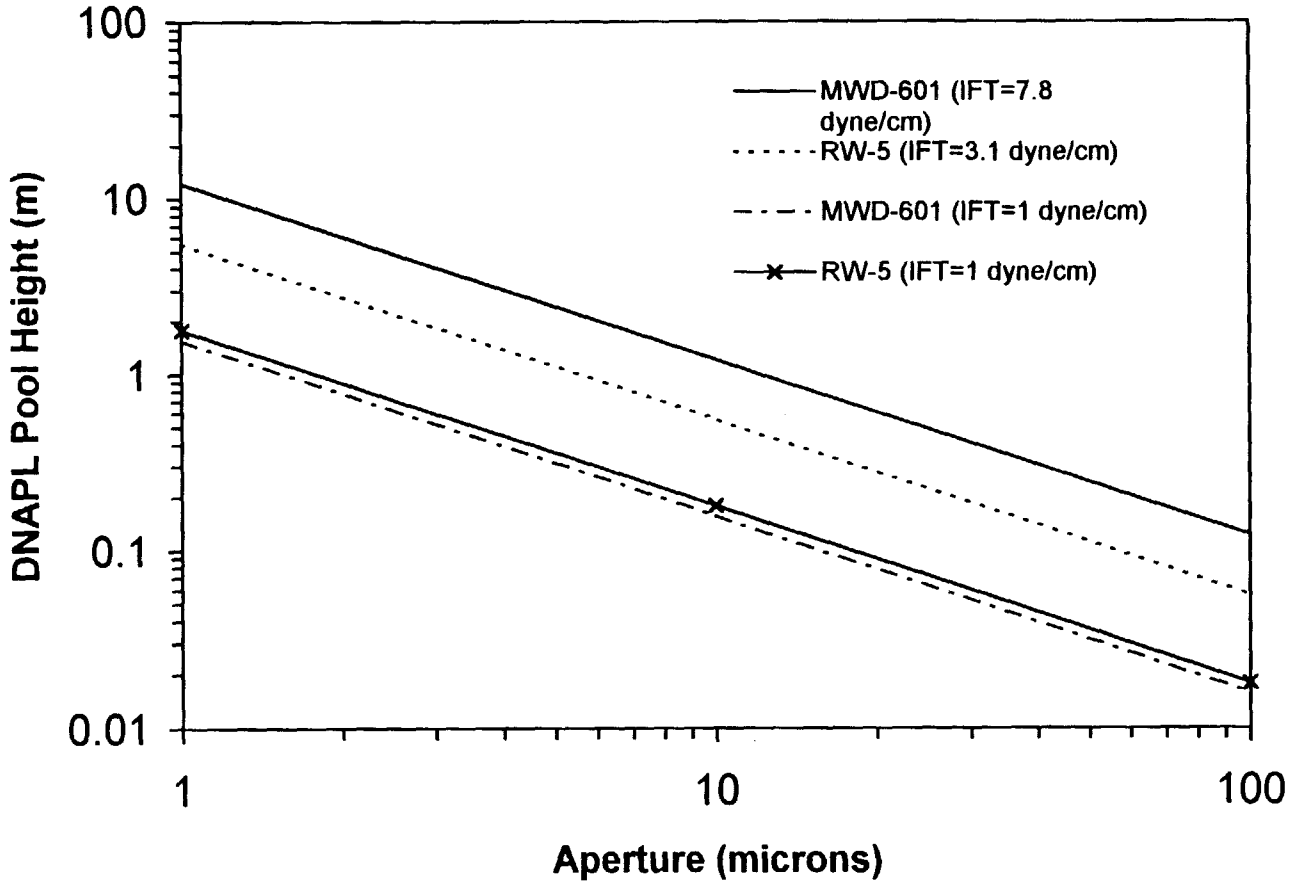

100
10
1
0.1
0.01
DNAPL Pool Height (m)
1
10
100
Aperture (microns)
MWD-601 (IFT=7.8 dyne/cm)
RW-5 (IFT=3.1 dyne/cm)
MWD-601 (IFT=1 dyne/cm)
RW-5 (IFT=1 dyne/cm)

FIG 4

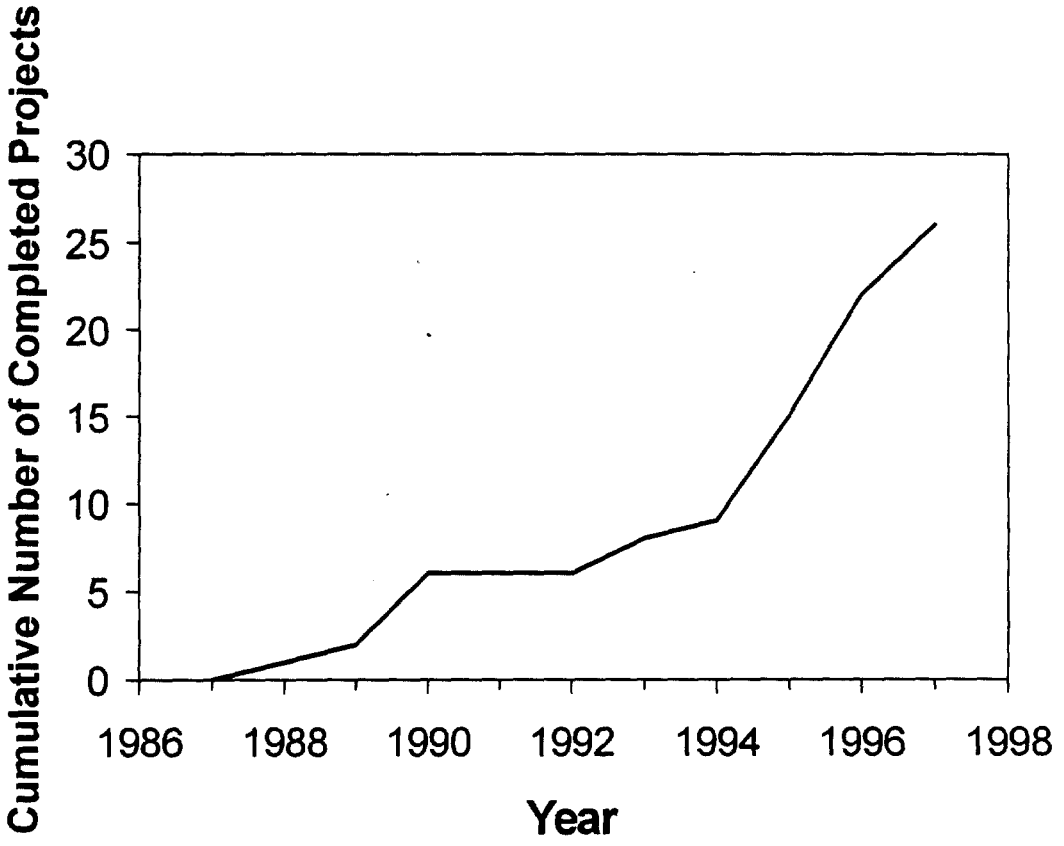
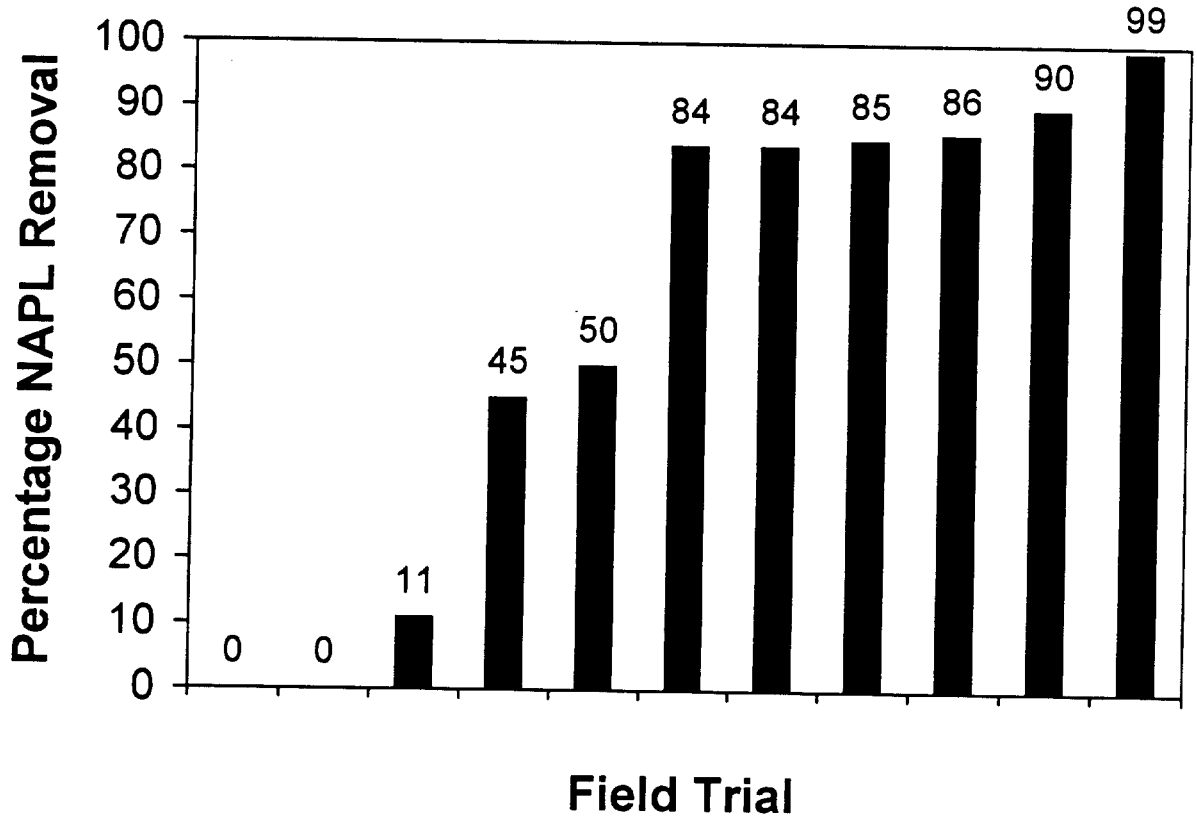
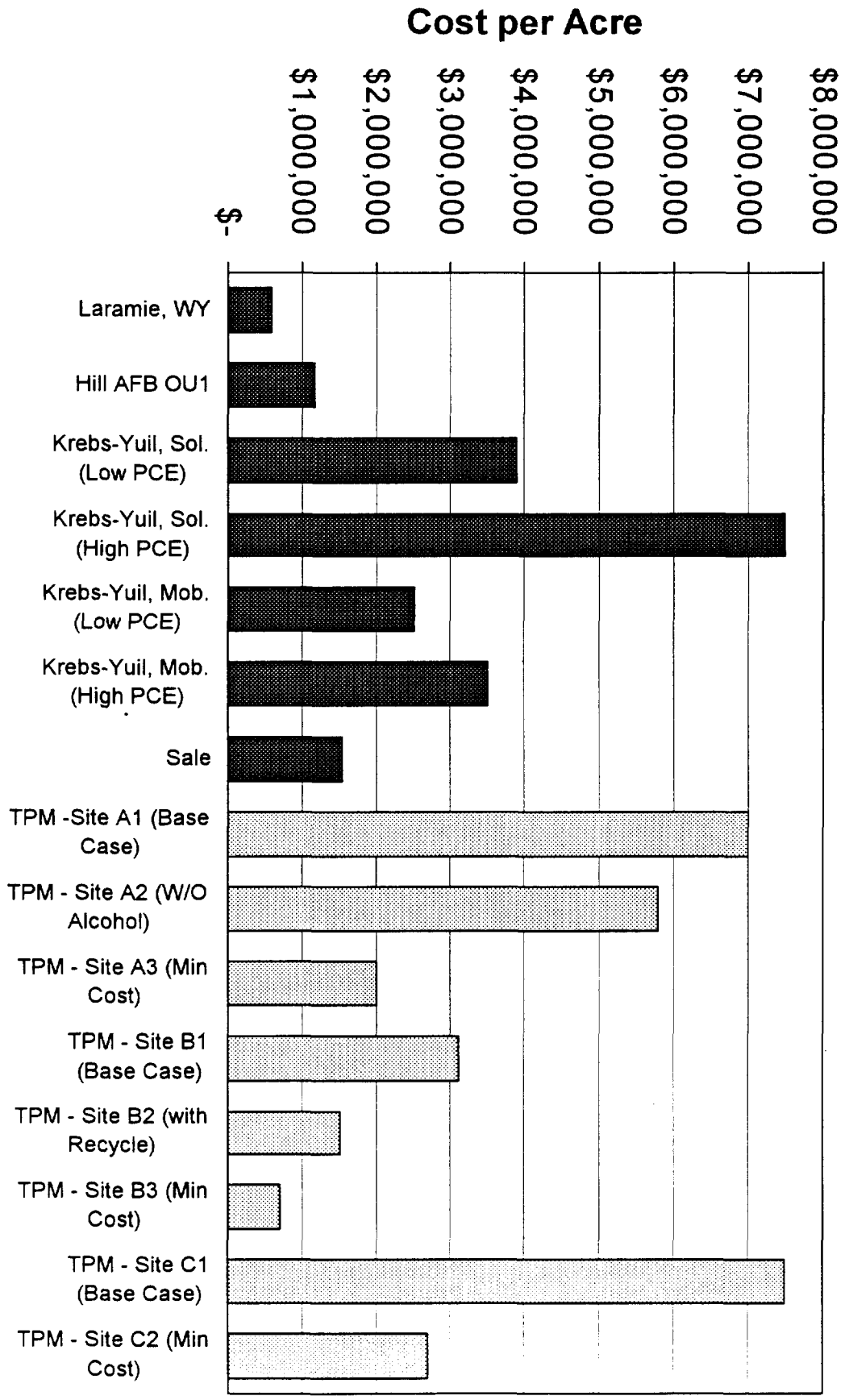

Cumulative Number of Completed Projects
30
25
20
15
10
5
0
1986
1988
1990
1992
1994
1996
1998
Year

FIG 5


Percentage NAPL Removal
100
90
80
70
60
50
40
30
20
10
0
0
0
11
45
50
84
84
85
86
90
99
Field Trial


Cost per Acre
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
Laramie, WY
Hill AFB OU1
Krebs-Yuil, Sol. (Low PCE)
Krebs-Yuil, Sol. (High PCE)
Krebs-Yuil, Mob. (Low PCE)
Krebs-Yuil, Mob. (High PCE)
Sale
TPM -Site A1 (Base Case)
TPM - Site A2 (W/O Alcohol)
TPM - Site A3 (Min Cost)
TPM - Site B1 (Base Case)
TPM - Site B2 (with Recycle)
TPM - Site B3 (Min Cost)
TPM - Site C1 (Base Case)
TPM - Site C2 (Min Cost)

Appendix P

Ground-Water and Surface-Water VOCs and Alcohols Analytical Data Summary

Ground-Water, Surface-Water, and NAPL Sample Log

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G001	C-G-MW705DR-01-S	C	G	MW705DR	01	S	NA	9/6/96	1605	VOA 601/602
G002	C-G-CIANCI-01-S-34	C	G	CIANCI	01	S	34	10/9/96	1545	VOA 601/602 from TOP(LNAPL) of Cianci well
G003	C-G-CIANCI-02-S-82	C	G	CIANCI	02	S	82.5	10/9/96	1600	VOA 601/602 from middle of Cianci well
G004	C-G-CIANCI-03-S-131	C	G	CIANCI	03	S	131	10/9/96	1615	VOA 8010/8020 from bottom of Cianci well
G005	C-G-DRILLWATER-01-P-0	C	G	DRILL WATER	01	P	0	11/19/96	0845	VOC CLP-RAS & Alcohols for drill water from treatment building
G006	P-G-CW878-01-S-47.3	P	G	CW878	01	S	47.3	11/19/96	1036	VOC CLP-RAS & Alcohols
G007	P-G-CW778-01-S-	P	G	CW778	01	S		11/19/96	1040	VOC CLP-RAS & Alcohols
G008	P-G-TW1-01-S-13	P	G	TW1	01	S	13	11/19/96	1125	VOC CLP-RAS & Alcohols
G009	P-G-TW2-01-S-10	P	G	TW2	01	S	10	11/19/96	1240	VOC CLP-RAS & Alcohols
G010	P-G-TW4-01-S-13	P	G	TW4	01	S	13	11/19/96	1305	VOC CLP-RAS & Alcohols
G011	P-G-TW4-01-T-13	P	G	TW4	01	T	13	11/19/96	1400	VOC CLP-RAS & Alcohols Trip Blank
G012	P-G-MW206B-01-S-84	P	G	MW206B	01	S	84	11/19/96	1517	VOC CLP-RAS & Alcohols
G013	P-G-CW978-01-S-27.5	P	G	CW978	01	S	27.5	11/19/96	1600	VOC CLP-RAS & Alcohols
G014	P-G-CW978-01-R-0	P	G	CW978	01	R	0	11/20/96	0730	VOC CLP-RAS & Alcohols, Rinse Blank
G015	P-G-MW206A-01-S-110.5	P	G	MW206A	01	S	110.5	11/20/96	1550	VOC CLP-RAS & Alcohols
G016	W-G-CW178-01-S-37.5	W	G	CW178	01	S	37.5	11/20/96	0915	VOC CLP-RAS & Alcohols
G017	W-G-CW575-01-S-34.5	W	G	CW575	01	S	34.5	11/20/96	0945	VOC CLP-RAS & Alcohols
G018	W-G-CW675-01-S-42.5	W	G	CW675	01	S	42.5	11/20/96	1020	VOC CLP-RAS & Alcohols
G019	W-G-CW478-01-S-57.5	W	G	CW478	01	S	57.5	11/20/96	1145	VOC CLP-RAS & Alcohols
G020	W-G-CW378-01-S-17.5	W	G	CW378	01	S	17.5	11/20/96	1210	VOC CLP-RAS & Alcohols
G021	W-G-P13-01-S-9.9	W	G	P13	01	S	9.9	11/20/96	1407	VOC CLP-RAS & Alcohols
G021MS	W-G-P13-01-MS-9.9	W	G	P13	01	MS	9.9	11/20/96	1409	VOC CLP-RAS & Alcohols
G021MSD	W-G-P13-01-MSD-9.9	W	G	P13	01	MSD	9.9	11/20/96	1410	VOC CLP-RAS & Alcohols
G022	W-G-MW124C-01-S-40.9	W	G	MW124C	01	S	40.9	11/20/96	1510	VOC CLP-RAS & Alcohols
G023	W-G-MW124C-01-D-40.9	W	G	MW124C	01	D	40.9	11/20/96	1520	VOC CLP-RAS & Alcohols
G024	W-G-MW124C-01-T-40.9	W	G	MW124C	01	T	40.9	11/20/96	1615	VOC CLP-RAS & Alcohols Trip Blank
G025	W-G-MW205A-01-S-128.5	W	G	MW205A	01	S	128.5	11/21/96	1200	VOC CLP-RAS & Alcohols
G026	W-G-MW205B-01-S-44.5	W	G	MW205B	01	S	44.5	11/21/96	0845	VOC CLP-RAS & Alcohols
G027	W-G-CW375-01-S-30.5	W	G	CW375	01	S	30.5	11/21/96	1045	VOC CLP-RAS & Alcohols
G028	W-G-CW578-01-S-69.5	W	G	CW578	01	S	69.5	11/21/96	1135	VOC CLP-RAS & Alcohols
G029	W-G-CW678-01-S-80.5	W	G	CW678	01	S	80.5	11/21/96	1210	VOC CLP-RAS & Alcohols
G030	W-G-MW127B-01-S-42	W	G	MW127B	01	S	42.0	11/21/96	1400	VOC CLP-RAS & Alcohols
G031	W-G-MW127C-01-S-96.5	W	G	MW127C	01	S	96.5	11/21/96	1600	VOC CLP-RAS & Alcohols
G032	W-G-CW475-01-S-32.5	W	G	CW475	01	S	32.5	11/21/96	1525	VOC CLP-RAS & Alcohols
G033	W-G-MW128-01-S-60	W	G	MW128	01	S	60	11/21/96	1630	VOC CLP-RAS & Alcohols
G034	W-G-MW128-01-T-60	W	G	MW128	01	T	60	11/21/96	1645	VOC CLP-RAS & Alcohols Trip Blank
G035	C-G-MWL301-01-S-6	C	G	MWL301	01	S	6	11/22/96	0755	VOC CLP-RAS & Alcohols
G036	C-G-MWL302-01-S-6	C	G	MWL302	01	S	6	11/22/96	0825	VOC CLP-RAS & Alcohols
G037	C-G-MWL303-01-S-6	C	G	MWL303	01	S	6	11/22/96	0855	VOC CLP-RAS & Alcohols
G038	C-G-MWL306-01-S-6	C	G	MWL306	01	S	6	11/22/96	0955	VOC CLP-RAS & Alcohols
G039	C-G-MWL312-01-S-6	C	G	MWL312	01	S	6	11/22/96	1055	VOC CLP-RAS & Alcohols
G040	C-G-P10-01-S-11.5	C	G	P10	01	S	11.5	11/22/96	1125	VOC CLP-RAS & Alcohols
G041	C-G-P12-01-S-11.5	C	G	P12	01	S	11.5	11/22/96	1240	VOC CLP-RAS & Alcohols
G042	C-G-P12A-01-S-40	C	G	P12A	01	S	40	11/22/96	1218	VOC CLP-RAS & Alcohols

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designtation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G042MS	C-G-P12A-01-MS-40	C	G	P12A	01	MS	40	11/22/96	1218	VOC CLP-RAS & Alcohols MS
G042MSD	C-G-P12A-01-MSD-40	C	G	P12A	01	MSD	40	11/22/96	1218	VOC CLP-RAS & Alcohols MSD
G043	P-G-MW126C-01-S-29	P	G	MW126C	01	S	29	11/22/96	1420	VOC CLP-RAS & Alcohols
G044	P-G-MW126C-01-D-29	P	G	MW126C	01	D	29	11/22/96	1429	VOC CLP-RAS & Alcohols Blind Duplicate of MW-126C
G045	P-G-MW126C-01-T-29	P	G	MW126C	01	T	29	11/22/96	1423	VOC CLP-RAS & Alcohols Trip Blank
G046	P-G-MW126B-01-S-10	P	G	MW126B	01	S	10	11/22/96	1425	VOC CLP-RAS & Alcohols
G047	P-G-MW126B-01-R-10	P	G	MW126B	01	R	10	11/22/96	1510	VOC CLP-RAS & Alcohols Rinse blank from pump
G048	P-G-WE1-01-S-34.3	P	G	WE1	01	S	34.3	12/2/96	1330	VOC CLP-RAS & Alcohols
G049	P-G-WE2-01-S-8.3	P	G	WE2	01	S	8.3	12/2/96	1405	VOC CLP-RAS & Alcohols
G051	O-G-P4A-1-S-25	O	G	P4A	01	S	25	12/2/96	1550	VOC CLP-RAS & Alcohols
G052	O-G-P4A-1-D-25	O	G	P4A	01	D	25	12/2/96	1600	VOC CLP-RAS & Alcohols, duplicate of P-4A
G053	O-G-P4A-1-T-0	O	G	P4A	01	T	0	12/2/96	1610	VOC CLP-RAS & Alcohols, trip blank
G054	P-G-TW12-01-S-34.5	P	G	TW12	01	S	34.5	12/3/96	0730	VOC CLP-RAS & Alcohols
G055	O-G-P4A-01-L-25	O	G	P4A	01	L	25	12/3/96	0800	VOC CLP-RAS & Alcohols, low flow
G056	O-G-MW702DR-01-S-100	O	G	MW702DR	01	S	100	12/3/96	1200	VOC CLP-RAS & Alcohols
G057	P-G-MW201B-01-S-15	P	G	MW201B	01	S	15	12/3/96	1030	VOC CLP-RAS & Alcohols
G058	P-G-MW201A-01-S-59	P	G	MW201A	01	S	59	12/3/96	1230	VOC CLP-RAS & Alcohols
G059	P-G-MW208A-01-S-59	P	G	MW208A	01	S	116	12/3/96	1210	VOC CLP-RAS & Alcohols
G060	C-G-P07-01-S-14	C	G	P7	01	S	14	12/3/96	1220	VOC CLP-RAS & Alcohols
G061	P-G-MW501C-01-S-25	P	G	MW501C	01	S	25	12/3/96	1310	VOC CLP-RAS & Alcohols
G061MS	P-G-MW501C-01-MS-25	P	G	MW501C	01	MS	25	12/3/96	1310	VOC CLP-RAS & Alcohols
G061MSD	P-G-MW501C-01-MSD-25	P	G	MW501C	01	MSD	25	12/3/96	1310	VOC CLP-RAS & Alcohols
G062	P-G-MW501A-01-S-88.5	P	G	MW501A	01	S	88.5	12/3/96	1445	VOC CLP-RAS & Alcohols
G063	C-G-DP05-01-S-3	C	G	DP5	01	S	3	12/3/96	1515	VOC CLP-RAS & Alcohols
G064	C-G-DP06-01-S-3	C	G	DP6	01	S	3	12/3/96	1540	VOC CLP-RAS & Alcohols
G065	C-G-DP06-01-T-3	C	G	DP6	01	T	3	12/3/96	1600	VOC CLP-RAS & Alcohols, trip blank
G066	P-G-MW501A-01-R-88.5	P	G	MW501A	01	R	88.5	12/3/96	1615	VOC CLP-RAS & Alcohols, rinse blank
G067	P-G-MW701DR-01-S-702	P	G	MW701DR	01	S	102	12/4/96	0859	VOC CLP-RAS & Alcohols
G068	P-G-MW209A-01-S-28	P	G	MW209A	01	S	28	12/4/96	0915	VOC CLP-RAS & Alcohols
G069	P-G-MW209B-01-S-13.5	P	G	MW209B	01	S	13.5	12/4/96	0928	VOC CLP-RAS & Alcohols
G070	P-G-P15-01-S-29	P	G	P15	01	S	29	12/4/96	1015	VOC CLP-RAS & Alcohols
G071	P-G-P102C-01-S-8	P	G	P102C	01	S	8	12/4/96	1155	VOC CLP-RAS & Alcohols
G072	P-G-P102A-01-S-86	P	G	P102A	01	S	86	12/4/96	1255	VOC CLP-RAS & Alcohols
G073	P-G-P11B-01-S-8	C	G	P11B	01	S	8	12/4/96	1531	VOC CLP-RAS & Alcohols
G074	C-G-P11B-01-D-8	C	G	P11B	01	D	8	12/4/96	1549	VOC CLP-RAS & Alcohols by 8015
G075	C-G-P11B-01-T-8	C	G	P11B	01	T	8	12/4/96	1600	VOC CLP-RAS & Alcohols by 8015, trip blank
G076	W-6-MW04-01-S-61	W	G	MW04	01	S	61	12/5/96	0923	VOC CLP-RAS & Alcohols by 8015
G077	W-6-MW04-01-T-61	W	G	MW04	01	T	61	12/5/96	0930	VOC CLP-RAS & Alcohols by 8015, trip blank
G078	W-G-MW03-01-S-67.5	W	G	MW03	01	S	67.5	12/5/96	1040	VOC CLP-RAS & Alcohols by 8015
G078MS	W-G-MW03-01-MS-67.5	W	G	MW03	01	MS	67.5	12/5/96	1040	VOC CLP-RAS & Alcohols by 8015 MS
G078MSD	W-G-MW03-01-MSD-67.5	W	G	MW03	01	MSD	67.5	12/5/96	1040	VOC CLP-RAS & Alcohols by 8015 MSD
G079	C-G-MW408-01-S-42	C	G	MW408	01	S	42	12/5/96	1210	VOC CLP-RAS & Alcohols by 8015
G080	P-G-TW3-01-S-11	P	G	TW03	01	S	42	12/5/96	1210	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (i)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G081	W-G-MW204B-01-S-68	W	G	MW204B	01	S	68	12/5/96	1240	VOC CLP-RAS & Alcohols by 8015
G082	W-G-MW02-01-S-	W	G	MW02	01	S		12/5/96	1440	VOC CLP-RAS & Alcohols by 8015
G083	W-G-MW707S-01-S-25	W	G	MW707S	01	S	25	12/5/96	1405	VOC CLP-RAS & Alcohols by 8015
G084	W-G-MW707M-01-S-63	W	G	MW707M	01	S	63	12/5/96	1436	VOC CLP-RAS & Alcohols by 8015
G085	P-G-MW203A-01-S-155	P	G	MW203A	01	S	155	12/5/96	1457	VOC CLP-RAS & Alcohols by 8015
G086	P-G-MW203B-01-S-100	P	G	MW203B	01	S	100	12/5/96	1545	VOC CLP-RAS & Alcohols by 8015
G087	P-G-MW203B-01-R-100	P	G	MW203B	01	R	100	12/5/96	1620	VOC CLP-RAS & Alcohols by 8015, rinse blank from 203B tubing
G088	C-G-MW123A-01-S	C	G	MW123A	01	S	NA	12/6/96	0830	VOC CLP-RAS & Alcohols by 8015
G089	C-G-MW125A-01-S	C	G	MW125A	01	S	NA	12/6/96	0900	VOC CLP-RAS & Alcohols by 8015
G090	C-G-MWL305-01-S	C	G	MWL305	01	S	NA	12/6/96	1130	VOC CLP-RAS & Alcohols by 8015
G091	C-G-MWL309-01-S	C	G	MWL309	01	S	NA	12/6/96	1230	VOC CLP-RAS & Alcohols by 8015
G092	C-G-MWL314-01-S	C	G	MWL314	01	S	NA	12/6/96	1300	VOC CLP-RAS & Alcohols by 8015
G093	C-G-MWL313-01-S	C	G	MWL313	01	S	NA	12/6/96	1400	VOC CLP-RAS & Alcohols by 8015
G094	P-G-P102B-01-S	P	G	P102B	01	S	NA	12/6/96	1320	VOC CLP-RAS & Alcohols by 8015
G095	W-G-MW707D-01-S	W	G	MW707D	01	S	NA	12/6/96	1440	VOC CLP-RAS & Alcohols by 8015
G096	P-G-MW501B-01-S	P	G	MW501B	01	S	NA	12/6/96	1515	VOC CLP-RAS & Alcohols by 8015
G097	W-G-MW501B-01-T	P	G	MW501B	01	T	NA	12/6/96	1520	VOC CLP-RAS & Alcohols by 8015, trip blank
G098	W-G-MW703S-01-S	W	G	MW703S	01	S	NA	12/9/96	1300	VOC CLP-RAS & Alcohols by 8015 & bio
G099	W-G-MW703D-01-S	W	G	MW703D	01	S	NA	12/9/96	1400	VOC CLP-RAS & Alcohols by 8015 & bio
G100	W-G-MW703DR-01-S	W	G	MW703DR	01	S	NA	12/9/96	1500	VOC CLP-RAS & Alcohols by 8015 & bio
G101	P-G-TW5-01-S	P	G	TW5	01	S	NA	12/9/96	1230	VOC CLP-RAS & Alcohols by 8015
G102	P-G-CW1078-01-S	P	G	CW-10-78	01	S	NA	12/9/96	1308	VOC CLP-RAS & Alcohols by 8015
G103	P-G-CW1078-01-D	P	G	CW-10-78	01	D	NA	12/9/96	1355	VOC CLP-RAS & Alcohols by 8015, blind duplicate of CW-10-78 (G102)
G104	C-G-MW705D-01-S	C	G	MW705D	01	S	NA	12/9/96	1511	VOC CLP-RAS & Alcohols by 8015
G105	C-G-MW705R-01-S	C	G	MW705R	01	S	NA	12/9/96	1545	VOC CLP-RAS & Alcohols by 8015
G106	C-G-MW705R-01-T	C	G	MW705R	01	T	NA	12/9/96	1600	VOC CLP-RAS & Alcohols by 8015, trip blank
G107	C-G-P11A-01-S	C	G	P11A	01	S	NA	12/10/96	1010	VOC CLP-RAS & Alcohols by 8015
G108	P-G-P101C-01-S	P	G	P101C	01	S	NA	12/10/96	1103	VOC CLP-RAS & Alcohols by 8015
G108MS	P-G-P101C-01-MS	P	G	P101C	01	MS	NA	12/10/96	1103	VOC CLP-RAS & Alcohols by 8015 MS
G108MSD	P-G-P101C-01-MSD	P	G	P101C	01	MSD	NA	12/10/96	1103	VOC CLP-RAS & Alcohols by 8015 MSD
G109	P-G-P101A-01-S	P	G	P101A	01	S	NA	12/10/96	1145	VOC CLP-RAS & Alcohols by 8015
G110	P-G-MW706DR-01-S	P	G	MW706DR	01	S	NA	12/10/96	1150	VOC CLP-RAS & Alcohols by 8015
G111	C-G-MW415-01-S	C	G	MW415	01	S	NA	12/10/96	1230	VOC CLP-RAS & Alcohols by 8015 & bio
G112	C-G-MW415-01-D	C	G	MW415	01	D	NA	12/10/96	1200	Blind duplicate for bio only
G113	C-G-MW414-01-S	C	G	MW414	01	S	NA	12/10/96	1130	VOC CLP-RAS & Alcohols by 8015 &bio
G114	O-G-P8A-01-S	O	G	P8A	01	S	NA	12/10/96	1000	VOC CLP-RAS & Alcohols by 8015 &bio
G115	O-G-P8B-01-S	O	G	P8B	01	S	NA	12/10/96	0900	VOC CLP-RAS & Alcohols by 8015 &bio
G116	C-G-P6-01-S	C	G	P6	01	S	NA	12/10/96	1500	VOC CLP-RAS & Alcohols by 8015 & bio
G117	W-G-SRS4-01-S	W	G	SRS4	01	S	NA	12/10/96	0920	VOC CLP-RAS & Alcohols by 8015
G118	C-G-TW7A-01-S	C	G	TW7A	01	S	NA	12/10/96	1410	VOC CLP-RAS & Alcohols by 8015
G119	C-G-MW416-01-S	C	G	MW416	01	S	NA	12/10/96	1520	VOC CLP-RAS & Alcohols by 8015
G120	C-G-MW416-01-T	C	G	MW416	01	T	NA	12/10/96	1530	VOC CLP-RAS & Alcohols by 8015, trip blank
G121	C-G-MW416-01-R	C	G	MW416	01	R	NA	12/10/96	1545	VOC CLP-RAS & Alcohols by 8015, rinse blank from hose
G122	W-G-MW6-01-S	W	G	MW6	01	S	NA	12/11/96	0920	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designtation (a)			Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
		Site Name (b)	Matrix Type (c)	Specific Location (d)						
G123	W-G-SRS3-01-S	W	G	SRS3	01	S	NA	12/11/96	0920	VOC CLP-RAS & Alcohols by 8015
G124	W-G-MW7-01-S	W	G	MW7	01	S	NA	12/11/96	1043	VOC CLP-RAS & Alcohols by 8015
G125	W-G-MW7-01-D	W	G	MW7	01	D	NA	12/11/96	1058	VOC CLP-RAS & Alcohols by 8015, blind duplicate of G124
G126	W-G-SRS5-01-S	W	G	SRS5	01	S	NA	12/11/96	1115	VOC CLP-RAS & Alcohols by 8015
G126MS	W-G-SRS5-01-MS	W	G	SRS5	01	MS	NA	12/11/96	1115	VOC CLP-RAS & Alcohols by 8015
G126MSD	W-G-SRS5-01-MSD	W	G	SRS5	01	MSD	NA	12/11/96	1115	VOC CLP-RAS & Alcohols by 8015
G127	W-G-SRS6-01-S	W	G	SRS6	01	S	NA	12/11/96	1145	VOC CLP-RAS & Alcohols by 8015
G128	W-G-MW5-01-S	W	G	MW5	01	S	NA	12/11/96	1210	VOC CLP-RAS & Alcohols by 8015
G129	W-G-DN3-01-S	W	G	DN3	01	S	NA	12/11/96	1315	VOC CLP-RAS & Alcohols by 8015
G130	W-G-SRS1-01-S	W	G	SRS1	01	S	NA	12/11/96	1418	VOC CLP-RAS & Alcohols by 8015
G131	O-G-P2B-01-S	O	G	P2B	01	S	NA	12/11/96	1450	VOC CLP-RAS & Alcohols by 8015
G132	W-G-CWB77-01-S	W	G	CWB77	01	S	NA	12/11/96	1505	VOC CLP-RAS & Alcohols by 8015
G133	W-G-CWB7701-T	W	G	CWB77	01	T	NA	12/11/96	1530	VOC CLP-RAS & Alcohols by 8015, trip blank
G134	C-G-MW709R-01-S	C	G	MW709R	01	S	NA	12/12/96	0839	VOC CLP-RAS & Alcohols by 8015
G135	C-G-MW709DR-01-S	C	G	MW709DR	01	S	NA	12/12/96	0915	VOC CLP-RAS & Alcohols by 8015
G136	C-G-MW709DR-01-T	C	G	MW709DR	01	T	NA	12/12/96	0800	VOC CLP-RAS & Alcohols by 8015, trip blank
G137	O-G-P2A-01-S	O	G	P2A	01	S	NA	12/12/96	0815	VOC CLP-RAS & Alcohols by 8015
G138	O-G-P16-01-S	O	G	P16	01	S	NA	12/12/96	0845	VOC CLP-RAS & Alcohols by 8015
G139	O-G-PZO7-01-S	O	G	PZO7	01	S	NA	12/12/96	0945	VOC CLP-RAS & Alcohols by 8015
G140	O-G-PZR7-01-S	O	G	PZR7	01	S	NA	12/12/96	1030	VOC CLP-RAS & Alcohols by 8015
G141	P-G-MW202A-01-S	P	G	MW202A	01	S	NA	12/12/96	1410	VOC CLP-RAS & Alcohols by 8015
G142	P-G-MW202B-01-S	P	G	MW202B	01	S	NA	12/12/96	1145	VOC CLP-RAS & Alcohols by 8015
G143	P-G-MW202B-01-R	D	G	MW202B	01	R	NA	12/12/96	1200	VOC CLP-RAS & Alcohols by 8015, rinse blank of MW202B tubing
G144	C-G-MWL304-01-S	C	G	MWL304	01	S	NA	12/12/96	1058	VOC CLP-RAS & Alcohols by 8015
G145	C-G-MWL308-01-S	C	G	MWL308	01	S	NA	12/12/96	1209	VOC CLP-RAS & Alcohols by 8015
G146	W-G-MW121C-01-S	W	G	MW121C	01	S	NA	12/12/96	1430	VOC CLP-RAS & Alcohols by 8015
G147	W-G-MW121A-01-S	W	G	MW121A	01	S	NA	12/12/96	1520	VOC CLP-RAS & Alcohols by 8015
G148	O-G-P4B-01-L	O	G	P4B	01	L	NA	12/12/96	1450	VOC CLP-RAS & Alcohols by 8015 (low-flow)
G149	O-G-P4B-01-S	O	G	P4B	01	S	NA	12/12/96	1500	VOC CLP-RAS & Alcohols by 8015 (traditional)
G150	W-G-MW121B-01-S	W	G	MW121B	01	S	NA	12/13/96	1218	VOC CLP-RAS & Alcohols by 8015
G151	C-G-P5A-01-L	C	G	P5A	01	L	NA	12/13/96	1040	VOC CLP-RAS & Alcohols by 8015 (low-flow)
G152	C-G-P5A-01-S	C	G	P5A	01	S	NA	12/13/96	1100	VOC CLP-RAS & Alcohols by 8015 (traditional)
G153	C-G-P5B-01-L	C	G	P5B	01	L	NA	12/13/96	1220	VOC CLP-RAS & Alcohols by 8015 (low-flow)
G154	C-G-P5B-01-S	C	G	P5B	01	S	NA	12/13/96	1300	VOC CLP-RAS & Alcohols by 8015 (traditional)
G155	W-G-MW707R-01-S	W	G	MW707R	01	S	NA	12/13/96	1330	VOC CLP-RAS & Alcohols by 8015
G156	C-G-MWL311-01-S	C	G	MWL311	01	S	NA	12/13/96	1328	VOC CLP-RAS & Alcohols by 8015
G157	C-G-MWL311-01-T	C	G	MWL311	01	T	NA	12/13/96	1400	VOC CLP-RAS & Alcohols by 8015, trip blank
G158	C-G-MW123C-01-S	C	G	MW123C	01	S	NA	12/16/96	1200	VOC CLP-RAS & Alcohols by 8015
G159	C-G-MWL307-01-S	C	G	MWL307	01	S	NA	12/16/96	1245	VOC CLP-RAS & Alcohols by 8015
G160	C-G-MWL307-01-D	C	G	MWL307	01	D	NA	12/16/96	1300	VOC CLP-RAS & Alcohols by 8015, duplicate of MWL307
G161	C-G-MW409-01-S	C	G	MW409	01	S	NA	12/16/96	1320	VOC CLP-RAS & Alcohols by 8015
G162	C-G-P3B-01-S	C	G	P3B	01	S	NA	12/16/96	1410	VOC CLP-RAS & Alcohols by 8015
G163	C-G-MW413-01-S	C	G	MW413	01	S	NA	12/16/96	1445	VOC CLP-RAS & Alcohols by 8015
G164	C-G-TW08A-01-S	C	G	TW08A	01	S	NA	12/16/96	1515	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G165	C-G-TW08A-01-T	C	G	TW08A	01	T	NA	12/16/96	1530	VOC CLP-RAS & Alcohols by 8015, trip blank
G167	W-G-MW704M-01-S	W	G	MW704M	01	S	NA	12/17/96	0920	VOC CLP-RAS & Alcohols by 8015 & bio sampling
G168	W-G-MW704M-01-R	W	G	MW704M	01	R	NA	12/17/96	0940	VOC CLP-RAS & Alcohols by 8015 & bio sampling, rinse blank
G169	W-G-MW704DR-01-S	W	G	MW704DR	01	S	NA	12/17/96	1300	VOC CLP-RAS & Alcohols by 8015 & bio sampling
G169MS	W-G-MW704DR-01-MS	W	G	MW704DR	01	MS	NA	12/17/96	1300	VOC CLP-RAS & Alcohols by 8015, just VOCs and alcohol
G169MSD	W-G-MW704DR-01-MSD	W	G	MW704DR	01	MSD	NA	12/17/96	1300	VOC CLP-RAS & Alcohols by 8015, just VOCs & alcohol
G170	W-G-MW704S-01-L	W	G	MW704S	01	L	NA	12/17/96	1205	VOC CLP-RAS & Alcohols by 8015 & bio low-flow
G171	W-G-MW704S-01-S	W	G	MW704S	01	S	NA	12/17/96	1305	VOC CLP-RAS & Alcohols by 8015 (traditional)
G172	W-G-MW704R-01-L	W	G	MW704R	01	L	NA	12/17/96	1410	VOC CLP-RAS & Alcohols by 8015 & bio (low-flow)
G173	W-G-MW704R-01-S	W	G	MW704R	01	S	NA	12/17/96	1530	VOC CLP-RAS & Alcohols by 8015 (traditional)
G174	W-G-MW704R-01-T	W	G	MW704R	01	T	NA	12/17/96	1600	VOC CLP-RAS & Alcohols by 8015, trip blank
G175	W-G-MW704D-01-S	W	G	MW704D	01	S	NA	12/18/96	0850	VOC CLP-RAS & Alcohols by 8015 & bio (traditional)
G176	O-G-P1A-01-S	O	G	P1A	01	S	NA	12/18/96	1055	VOC & Alcohol & bio
G176MS	O-G-P1A-01-MS	O	G	P1A	01	MS	NA	12/18/96	1055	VOC & Alcohol & bio MS
G176MSD	O-G-P1A-01-MSD	O	G	P1A	01	MSD	NA	12/18/96	1055	VOC, Alcohols MSD
G177	O-G-P1B-01-S	O	G	P1B	01	S	NA	12/18/96	1145	VOC & Alcohols & bio
G178	O-G-P1B-01-D	O	G	P1B	01	D	NA	12/18/96	1200	VOC, Alcohols & bio, duplicate of P1B for VOCs and Alcohols
G179	C-G-MW502-01-S	C	G	MW502	01	S	NA	12/18/96	1210	VOC & Alcohols, and Bio
G180	C-G-P14-01-S	C	G	P14	01	S	NA	12/18/96	1355	VOC & Alcohols
G181	C-G-CPZ10R-01-S	C	G	CPZ10R	01	S	NA	12/18/96	1454	VOC & Alcohols
G182	C-G-CPZ1R-01-S	C	G	CPZ1R	01	S	NA	12/18/96	1520	VOC & Alcohols
G183	C-G-CPZ2R-01-S	C	G	CPZ2R	01	S	NA	12/18/96	1550	VOC & Alcohols
G184	C-G-CPZ2R-01-T	C	G	CPZ2R	01	T	NA	12/18/96	1615	VOC & Alcohols, trip blank
G185	P-G-DP1-01-S	P	G	DP1	01	S	NA	12/19/96	0905	VOC CLP-RAS & Alcohols by 8015
G186	P-G-P101B-01-S	P	G	P101B	01	S	NA	12/19/96	1215	VOC CLP-RAS & Alcohols by 8015
G187	P-G-MW129-01-S	P	G	MW129	01	S	NA	12/19/96	1115	VOC CLP-RAS & Alcohols by 8015
G188	C-G-CPZ1-01-S	C	G	CPZ1	01	S	NA	12/19/96	1140	VOC CLP-RAS & Alcohols by 8015
G189	C-G-CPZ-2A-01-S	C	G	CPZ2A	01	S	NA	12/19/96	1210	VOC CLP-RAS & Alcohols by 8015
G190	C-G-CPZ3R-01-S	C	G	CPZ3R	01	S	NA	12/19/96	1235	VOC CLP-RAS & Alcohols by 8015
G191	C-G-CPZ3-01-S	C	G	CPZ3	01	S	NA	12/19/96	1315	VOC CLP-RAS & Alcohols by 8015
G192	C-G-CPZ3-01-R	C	G	CPZ3	01	R	NA	12/19/96	1320	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Hose
G193	C-G-DP4-01-S	C	G	DP4	01	S	NA	12/19/96	1230	VOC CLP-RAS & Alcohols by 8015
G194	C-G-DP3-01-S	C	G	DP3	01	S	NA	12/19/96	1500	VOC CLP-RAS & Alcohols by 8015
G195	C-G-DP2-01-S	C	G	DP2	01	S	NA	12/19/96	1440	VOC CLP-RAS & Alcohols by 8015
G196	C-G-CPZ4A-01-S	C	G	CPZ4A	01	S	NA	12/19/96	1345	VOC CLP-RAS & Alcohols by 8015
G197	C-G-CPZ7-01-S	C	G	CPZ7	01	S	NA	12/19/96	1420	VOC CLP-RAS & Alcohols by 8015
G198	C-G-CPZ7R-01-5	C	G	CPZ7R	01	S	NA	12/19/96	1515	VOC CLP-RAS & Alcohols by 8015
G199	C-G-CPZ74-01-T	C	G	CPZ7R	01	T	NA	12/19/96	1600	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G200	W-G-MW204A-01-S	W	G	MW204A	01	S	NA	12/20/96	0742	VOC CLP-RAS & Alcohols by 8015
G201	C-G-MW125C-01-S	C	G	MW125C	01	S	NA	12/20/96	0930	VOC CLP-RAS & Alcohols by 8015
G202	C-G-MW125C-01-D	C	G	MW125C	01	D	NA	12/20/96	0945	VOC CLP-RAS & Alcohols by 8015 Blind Dups
G203	C-G-P3A-01-S	C	G	P3A	01	S	NA	12/20/96	1030	VOC CLP-RAS & Alcohols by 8015
G203MS	C-G-P3A-01-MS	C	G	P3A	01	MS	NA	12/20/96	1030	VOC CLP-RAS & Alcohols by 8015 MS

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designtation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G203MSD	C-G-P3A-01-MSD	C	G	P3A	01	MSD	NA	12/20/96	1030	VOC CLP-RAS & Alcohols by 8015 MSD
G204	C-G-MW1-01-S	C	G	MW1	01	S	NA	12/20/96	1200	VOC CLP-RAS & Alcohols by 8015
G205	C-G-CPZ10-01-S	C	G	CPZ10	01	S	NA	12/20/96	1150	VOC CLP-RAS & Alcohols by 8015
G206	C-G-CPZ9R-01-S	C	G	CPZ9R	01	S	NA	12/20/96	1220	VOC CLP-RAS & Alcohols by 8015
G207	C-G-CPZ9-01	C	G	CPZ9	01	S	NA	12/20/96	1245	VOC CLP-RAS & Alcohols by 8015
G208	C-G-CPZ8-01-S	C	G	CPZ8	01	S	NA	12/20/96	1315	VOC CLP-RAS & Alcohols by 8015
G209	C-G-CPZ8-01-R	C	G	CPZ8	01	R	NA	12/20/96	1320	VOC CLP-RAS & Alcohols by 8015 Rinse Blank
G210	C-G-CPZ8R-01-S	C	G	CPZ8R	01	S	NA	12/20/96	1340	VOC CLP-RAS & Alcohols by 8015
G211	C-G-CPZ6R-01-S	C	G	CPZ6R	01	S	NA	12/20/96	1430	VOC CLP-RAS & Alcohols by 8015
G212	W-G-CW278-01-S	W	G	CW278	01	S	NA	12/20/96	1352	VOC CLP-RAS & Alcohols by 8015
G213	C-G-CPZ6-01-S	C	G	CPZ6	01	S	NA	12/20/96	1505	VOC CLP-RAS & Alcohols by 8015
G214	C-G-CPZ6-01-T	C	G	CPZ6	01	T	NA	12/20/96	1530	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G215	W-G-CPZ2-01-S	W	G	CPZ2	01	S	NA	12/26/96	0845	VOC CLP-RAS & Alcohols by 8015
G216	W-G-CPZ4-01-S	W	G	CPZ4	01	S	NA	12/26/96	0918	VOC CLP-RAS & Alcohols by 8015
G217	W-G-CPZ4R-01-S	W	G	CPZ4R	01	S	NA	12/26/96	0955	VOC CLP-RAS & Alcohols by 8015
G218	C-G-CPZ5-01-S	C	G	CPZ5	01	S	NA	12/26/96	1050	VOC CLP-RAS & Alcohols by 8015
G219	C-G-CPZ5R-01-S	C	G	CPZ5R	01	S	NA	12/26/96	1130	VOC CLP-RAS & Alcohols by 8015
G220	C-G-CPZ6A-01-S	C	G	CPZ6A	01	S	NA	12/26/96	1148	VOC CLP-RAS & Alcohols by 8015
G221	C-G-MWD601-01-S	C	G	MWD601	01	S	NA	12/26/96	1241	VOC CLP-RAS & Alcohols by 8015
G222	C-G-MW705DR-02-S	C	G	MW705DR	02	S	NA	12/26/96	1353	VOC CLP-RAS & Alcohols by 8015
G223	C-G-RW7-01-S	C	G	RW7	01	S	NA	12/26/96	1407	VOC CLP-RAS & Alcohols by 8015
G224	C-G-RW7-01-D	C	G	RW7	01	D	NA	12/26/96	1425	VOC CLP-RAS & Alcohols by 8015 Blind Dup
G225	C-G-RW1-01-S	C	G	RW1	01	S	NA	12/26/96	1500	VOC CLP-RAS & Alcohols by 8015
G225MS	C-G-RW1-01-MS	C	G	RW1	01	MS	NA	12/26/96	1500	VOC CLP-RAS & Alcohols by 8015 MS
G225MSD	C-G-RW1-01-MSD	C	G	RW1	01	MSD	NA	12/26/96	1500	VOC CLP-RAS & Alcohols by 8015 MSD
G226	C-G-RW1-01-R	C	G	RW1	01	R	NA	12/26/96	1509	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Bailer
G227	C-G-RW1-01-T	C	G	RW1	01	T	NA	12/26/96	1512	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G228	C-G-RW12-01-S	C	G	RW12	01	S	NA	12/26/96	1545	VOC CLP-RAS & Alcohols by 8015
G229	C-G-RW8-01-S	C	G	RW8	01	S	NA	12/27/96	0823	VOC CLP-RAS & Alcohols by 8015
G230	C-G-RW9-01-S	C	G	RW9	01	S	NA	12/27/96	0850	VOC CLP-RAS & Alcohols by 8015

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (!)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G231	C-G-RW2-01-S	C	G	RW2	01	S	NA	12/27/96	0945	VOC CLP-RAS & Alcohols by 8015
G232	C-G-RW10-01-S	C	G	RW10	01	S	NA	12/27/96	1022	VOC CLP-RAS & Alcohols by 8015
G233	C-G-RW3-01-S	C	G	RW3	01	S	NA	12/27/96	1115	VOC CLP-RAS & Alcohols by 8015
G234	C-G-RW11-01-S	C	G	RW11	01	S	NA	12/27/96	1128	VOC CLP-RAS & Alcohols by 8015
G235	C-G-RW4-01-S	C	G	RW4	01	S	NA	12/27/96	1148	VOC CLP-RAS & Alcohols by 8015
G236	C-G-RW4-01-D	C	G	RW4	01	D	NA	12/27/96	1200	VOC CLP-RAS & Alcohols by 8015 Blind Dup of RW-4
G237	C-G-RW6-01-S	C	G	RW6	01	S	NA	12/27/96	1215	VOC CLP-RAS & Alcohols by 8015
G237MS	C-G-RW6-01-MS	C	G	RW6	01	MS	NA	12/27/96	1215	VOC CLP-RAS & Alcohols by 8015 MS
G237MSD	C-G-RW6-01-MSD	C	G	RW6	01	MSD	NA	12/27/96	1215	VOC CLP-RAS & Alcohols by 8015 MSD
G238	C-G-RW5-01-S	C	G	RW5	01	S	NA	12/27/96	1245	VOC CLP-RAS & Alcohols by 8015
G239	C-G-RW5-01-R	C	G	RW5	01	R	NA	12/27/96	1300	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Bailer used @ RW5
G240	C-G-RW5-01-T	C	G	RW5	01	T	NA	12/27/96	1315	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G241	C-G-MW705DR-03-S	C	G	MW705DR	03	S	NA	12/27/96	1530	VOC CLP-RAS & Alcohols by 8015 of Pure DNAPL & Physical Properties
G242	W-G-MW707DR-01-S	W	G	MW707DR	01	S	NA	12/30/96	1358	VOC CLP-RAS & Alcohols by 8015
G243	W-G-SWA-01-S	W	G	SWA	01	S	NA	12/30/96	0750	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G244	W-G-SWB-01-S	W	G	SWB	01	S	NA	12/30/96	0830	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G245	W-G-SWC-01-S	W	G	SWC	01	S	NA	12/30/96	0845	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G246	C-G-SWD-01-S	C	G	SWD	01	S	NA	12/30/96	0900	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G247	C-G-SWE-01-S	C	G	SWE	01	S	NA	12/30/96	0915	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G248	C-G-SWE-01-D	C	G	SWE	01	D	NA	12/30/96	1200	VOC CLP-RAS & Alcohols by 8015 Blind Dup
G249	C-G-SWF-01-S	C	G	SWF	01	S	NA	12/30/96	0945	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G249MS	C-G-SWF-01-MS	C	G	SWF	01	MS	NA	12/30/96	0945	VOC CLP-RAS & Alcohols by 8015 MS
G249MSD	C-G-SWF-01-MSD	C	G	SWF	01	MSD	NA	12/30/96	0945	VOC CLP-RAS & Alcohols by 8015 MSD
G250	C-G-SWG-01-S	C	G	SWG	01	S	NA	12/30/96	1020	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G251	C-G-INFLUENT-01-S	C	G	INFLUENT	01	S	NA	12/30/96	1130	VOC CLP-RAS & Alcohols by 8015, Influent to 30-inch culvert under former Cianci Property
G252	C-G-EFFLUENT-01-S	C	G	EFFLUENT	01	S	NA	12/30/96	1140	VOC CLP-RAS & Alcohols by 8015, Effluent from 30-inch culvert under former Cianci Property
G253	C-G-EFFLUENT-01-R	C	G	EFFLUENT	01	R	NA	12/30/96	1215	VOC CLP-RAS & Alcohols by 8015 Rinse Blank from Jar
G254	C-G-EFFLUENT-01-T	C	G	EFFLUENT	01	T	NA	12/30/96	1500	VOC CLP-RAS & Alcohols by 8015 Trip Blank
G255	C-G-MW705DR-04-S	C	G	MW705DR	04	S	NA	01/29/97	1400	DNAPL Physical Properties
G256	P-G-MW708DR-01-S	P	G	MW708DR	01	S	NA	02/07/97	1105	VOC CLP-RAS & Alcohols by 8015
G257	P-G-MW708S-01-S	P	G	MW708S	01	S	NA	02/07/97	1030	VOC CLP-RAS & Alcohols by 8015
G257MS	P-G-MW708S-01-MS	P	G	MW708S	01	MS	NA	02/07/97	1030	VOC CLP-RAS & Alcohols by 8015 MS
G257MSD	P-G-MW708S-01-MSD	P	G	MW708S	01	MSD	NA	02/07/97	1030	VOC CLP-RAS & Alcohols by 8015 MSD
G258	P-G-MW708R-01-S	P	G	MW708R	01	S	NA	02/07/97	1207	VOC CLP-RAS & Alcohols by 8015
G259	P-G-MW708R-01-D	P	G	MW708R	01	D	NA	02/07/97	1238	VOC CLP-RAS & Alcohols by 8015, Blind Duplicate
G260	P-G-MW708M-01-S	P	G	MW708M	01	S	NA	02/07/97	1235	VOC CLP-RAS & Alcohols by 8015
G261	P-G-MW209A-02-S	P	G	MW209A	02	S	NA	02/07/97	1400	VOC CLP-RAS & Alcohols by 8015
G262	W-G-MW707R-02-S	W	G	MW707R	02	S	NA	02/07/97	1500	VOC CLP-RAS & Alcohols by 8015
G263	W-G-MW707R-02-R	W	G	MW707R	02	R	NA	02/07/97	1530	VOC CLP-RAS & Alcohols by 8015, Rinse Blank of Waterra tubing
G264	W-G-MW707R-02-T	W	G	MW707R	02	T	NA	02/07/97	1535	VOC CLP-RAS & Alcohols by 8015, Trip Blank

SAMPLE LOG - GROUND-WATER AND DNAPL SAMPLES FROM WELLS AND PIEZOMETERS, AND SURFACE-WATER SAMPLES
REMEDIAL INVESTIGATION
SRSNE SITE - SOUTHINGTON, CONNECTICUT

Lab (Container) Name (l)	Sample Designation	Elements of Sample Designation (a) Site Name (b)	Matrix Type (c)	Specific Location (d)	Sampling Event (e)	Sample Identifier (f)	Depth (g)	Date	Time	Notes
G265	P-G-MW710DR-01-S	P	G	MW710DR	01	S	NA	06/13/97	1330	VOC CLP-RAS & Alcohols by 8015
G266	P-G-MW710R-01-S	P	G	MW710R	01	S	NA	06/13/97	1240	VOC CLP-RAS & Alcohols by 8015
G267	P-G-MW710R-01-D	P	G	MW710R	01	D	NA	06/13/97	1200	VOC CLP-RAS & Alcohols by 8015, Blind Duplicate
G268	P-G-MW710S-01-S	P	G	MW710S	01	S	NA	06/13/97	1136	VOC CLP-RAS & Alcohols by 8015
G268MS	P-G-MW710S-01-MS	P	G	MW710S	01	MS	NA	06/13/97	1136	VOC CLP-RAS & Alcohols by 8015 MS
G268MSD	P-G-MW710S-01-MSD	P	G	MW710S	01	MSD	NA	06/13/97	1136	VOC CLP-RAS & Alcohols by 8015 MSD
G269	P-G-MW710S-01-R	P	G	MW710S	01	R	NA	06/13/97	1000	VOC CLP-RAS & Alcohols by 8015, Rinse Blank from Whale pump
G270	P-G-MW710S-01-T	P	G	MW710S	01	T	NA	06/13/97	1005	VOC CLP-RAS & Alcohols by 8015, Trip Blank
G271	C-G-MW705DR-05-S	C	G	MW705DR	05	S	90-93'	06/19/97	1155	Ground-water grab sample for VOC by Modified 8260
G272	C-G-MW705DR-06-S	C	G	MW705DR	06	S	99-100'	06/19/97	1200	DNAPL grab sample for VOC by Modified 8260
G273	W-G-SWA-02-R	W	G	SWA	02	R	NA	07/08/97	915	VOC CLP-RAS & Alcohols by 8015, Rinse Blank from new sample collection jar (dip sampler)
G274	W-G-SWA-02-S	W	G	SWA	02	S	NA	07/08/97	955	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G275	W-G-SWB-02-S	W	G	SWB	02	S	NA	07/08/97	1019	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G276	W-G-SWC-02-S	W	G	SWC	02	S	NA	07/08/97	1045	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G276MS	W-G-SWC-02-MS	W	G	SWC	02	MS	NA	07/08/97	1045	VOC CLP-RAS & Alcohols by 8015 MS
G276MSD	W-G-SWC-02-MSD	W	G	SWC	02	MSD	NA	07/08/97	1045	VOC CLP-RAS & Alcohols by 8015 MSD
G277	C-G-SWD-02-S	C	G	SWD	02	S	NA	07/08/97	1110	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G278	C-G-SWE-02-S	C	G	SWE	02	S	NA	07/08/97	1140	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G279	C-G-SWF-02-D	C	G	SWF	02	D	NA	07/08/97	1215	VOC CLP-RAS & Alcohols by 8015, Blind Duplicate of G280
G280	C-G-SWF-02-S	C	G	SWF	02	S	NA	07/08/97	1200	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G281	C-G-SWG-02-S	C	G	SWG	02	S	NA	07/08/97	1220	VOC CLP-RAS & Alcohols by 8015 for Surface Water
G282	C-G-INFLUENT-02-S	C	G	INFLUENT	02	S	NA	07/08/97	1240	VOC CLP-RAS & Alcohols by 8015, Influent to 30-inch culvert under former Cianci Property
G283	C-G-EFFLUENT-02-S	C	G	EFFLUENT	02	S	NA	07/08/97	1315	VOC CLP-RAS & Alcohols by 8015, Effluent from 30-inch culvert under former Cianci Property
G284	C-G-EFFLUENT-02-T	C	G	EFFLUENT	02	T	NA	07/08/97	1320	VOC CLP-RAS & Alcohols by 8015, Trip Blank
G285	C-G-INFLUENT-03-S	C	G	INFLUENT	03	S	NA	07/08/97	1545	VOC CLP-RAS, Ground-Water component of Influent to 30-inch culvert under former Cianci Property
G286	C-G-INFLUENT-04-S	C	G	INFLUENT	04	S	NA	07/08/97	1546	VOC CLP-RAS, 4-inch, perf. PVC Pipe component of Influent to 30-inch culvert under Cianci Property
G287	C-G-DS1-01-S	C	G	DS1	01	S	NA	07/08/97	1550	VOC CLP-RAS, Surface Water from Drainage Ditch along west side of RR Tracks, 85 ft south of Lazy Ln
G288	C-G-LLC-01-S	C	G	LLC	01	S	NA	07/08/97	1555	VOC CLP-RAS, Surface Water from Lazy Lane Culvert along west side of RR Tracks, 15 ft so. of Lazy Ln

Notes:

(l) Lab (Container) Name is the designation that is written on the sample containers sent to the laboratory, consisting of the matrix type designation and the sequential number of the sample within the running total of that type of sample obtained during the investigation.

(a) See Section 4.0 of Field Sampling Plan for Sample Designation details, which are summarized below.

(b) O = SRSNE Operations Area, C = former Cianci Property, W = Town of Southington Wellfield, P = other areas on perimeter of RI Study Area.

(c) G = well or piezometer ground-water sample, H = in-situ (Hydropunch) groundwater sample, S = soil, R = bedrock.

(d) Non-hyphenated name for sampling location, routine name for the well, boring, test pit, etc, e.g., MW501, TP702, RW12, CPZ10R, MW704M, MWD601, P101C, CW578.

(e) Two-digit number of the sample within the sequence of sampling events, rounds, or depth intervals at a specific location. Start with "01," and continue upward in increments of 1 (e.g., "02," "03," "04," ....."83," "84," ...)

(f) S = primary field sample, R = rinse blank, T = trip blank, D = duplicate, MS = matrix spike, MSD = matrix spike duplicate, L = supplemental ground-water sample obtained using USEPA Region 1 Low-Flow Purging and Sampling Procedure, P = potable drilling water sample.

(g) Optional number for depth (interval) or sample below grade, e.g. "(10-12) for a sample obtained in the 10 to 12 foot depth interval.

Blank-Corrected or Validated Ground-Water, Surface-Water and NAPL Analytical Results

GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		CPZ-1	CPZ-1R	CPZ-2	CPZ-2A	CPZ-2R	CPZ-3	CPZ-3R	CPZ-4	CPZ-4A
CLIENT ID			G188	G182	G215	G189	G183	G191	G190	G216	G196
SAMPLE DATE			12/19/96	12/18/96	12/26/96	12/19/96	12/18/96	12/19/96	12/19/96	12/26/96	12/19/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	M	R	M	M	R	M	R	M	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	20 U	75 D	26 D	5 U	83 D	500 U	10 U	10 U	100 U
1,1,2,2-Tetrachloroethane	0.5	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,1,2-Trichloroethane	5	5	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,1-Dichloroethane	70	NA	20 U	24	27	63	23	2,700	1,100 D	10 U	100 U
1,1-Dichloroethene	7	7	20 U	21	2	5 U	28	500 U	10 U	10 U	100 U
1,2-Dibromo-3-chloropropane	NL	0.2	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,2-Dibromoethane	0.05	0.05	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,2-Dichlorobenzene	600	600	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,2-Dichloroethane	1	5	20 U	2 U	1 U	5 U	2 U	500 U	43	10 U	100 U
1,2-Dichloroethene, Total	NL	NA	30 J	42	13 U	10 U	53	1,800	46	20 U	200 U
1,2-Dichloropropane	5	5	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,3-Dichlorobenzene	600	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
1,4-Dichlorobenzene	75	75	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
2-Butanone	400	NA	1,000	12 U	5 U	25 U	12 U	2,500 U	50 U	50 U	500 U
2-Hexanone	NL	NA	100 U	12 U	5 U	25 U	12 U	2,500 U	50 U	50 U	500 U
4-Methyl-2-pentanone	350	NA	100 U	12 U	5 U	25 U	12 U	2,500 U	50 U	50 U	500 U
Acetone	700	NA	220 U	31 U	5 U	25 U	12 U	2,500 U	100 U	50 U	500 U
Benzene	1	5	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Bromochloromethane	NL	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Bromodichloromethane	NL	80	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Bromoform	4	80	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Bromomethane	NL	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Carbon disulfide	NL	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Carbon tetrachloride	5	5	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Chlorobenzene	100	100	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Chlorodibromomethane	0.5	80	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Chloroethane	NL	NA	20 U	2 U	2	10	2 U	1,500	46	160	2,300
Chloroform	6	80	39	4 U	1 U	9	4 U	1,100	10 U	10 U	98 J
Chloromethane	NL	NA	20 U	3 U	1 U	5 U	4 U	500 U	10 U	10 U	100 U
cis-1,2-Dichloroethene	70	70	25	38	12 U	5 U	48	1,700	45	10 U	100 U
cis-1,3-Dichloropropene	NL	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Ethylbenzene	700	700	20 U	2 U	10	7	2 U	2,700	20	130	2,200 D
M,P-Xylene	NL	NL	40 U	5 U	3	5 J	5 U	460 J	12 J	20	520
Methylene chloride	5	5	40 U	5 U	2 U	10 U	4 U	1000 U	20 U	33 U	200 U
O-Xylene	NL	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	140
Styrene	100	100	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Tetrachloroethene	5	5	20 U	2 U	3	5 U	2 U	500 U	10 U	10 U	100 U
Tetrahydrofuran	NL	NA	200 U	25 U	10 U	50 U	25 U	5,000 U	5,800 D	82 J	1,000 U
Toluene	1000	1000	20 U	2 U	8 U	12	2 U	5,300	40	16 U	3,500 D
trans-1,2-Dichloroethene	100	100	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
trans-1,3-Dichloropropene	0.5	NA	20 U	2 U	1 U	5 U	2 U	500 U	10 U	10 U	100 U
Trichloroethene	5	5	20 U	6	11	5 U	14	500 U	10 U	10 U	220 U
Vinyl chloride	2	2	20 U	2 U	8	5 U	2 U	1,500	24	10 U	100 U
Xylenes, Total	530	10000	40 U	5 U	4	8 J	5 U	920 J	18 J	22	710
Total Volatile Organics			1,064	164	92	106	196	16,960	7,130	392	8,758
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		CPZ-4R	CPZ-5	CPZ-5R	CPZ-6	CPZ-6A	CPZ-6R	CPZ-7	CPZ-7R	CPZ-8
CLIENT ID			G217	G218	G219	G213	G220	G211	G197	G198	G208
SAMPLE DATE	Connecticut	US EPA	12/26/96	12/26/96	12/26/96	12/20/96	12/26/96	12/20/96	12/19/96	12/19/96	12/20/96
SCREEN	GA/GAA	MCLs	R	D	R	M	D	R	M	R	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	21	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	13
1,1,2,2-Tetrachloroethane	0.5	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,1,2-Trichloroethane	5	5	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	10
1,1-Dichloroethane	70	NA	19	1,000 U	100 U	50 U	5,000 U	500 U	76	2,500 U	10
1,1-Dichloroethene	7	7	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	5,100	2 U
1,2-Dibromo-3-chloropropane	NL	0.2	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,2-Dibromoethane	0.05	0.05	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,2-Dichlorobenzene	600	600	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,2-Dichloroethane	1	5	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,2-Dichloroethene, Total	NL	NA	28 U	2,000 U	2,100	100 U	10,000 U	1,000 U	100 U	120,000 D	44
1,2-Dichloropropane	5	5	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,3-Dichlorobenzene	600	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
1,4-Dichlorobenzene	75	75	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
2-Butanone	400	NA	25 U	5,000 U	2,300	250 U	470,000	3,600 U	250 U	12,000 U	12 U
2-Hexanone	NL	NA	25 U	5,000 U	500 U	250 U	25,000 U	1,600 J	250 U	12,000 U	12 U
4-Methyl-2-pentanone	350	NA	25 U	5,000 U	570	480	57,000	2,500 U	250 U	14,000	12 U
Acetone	700	NA	25 U	5,000 U	6,100	250 U	320,000	3,400 U	250 U	12,000 U	12 U
Benzene	1	5	5 U	1,000 U	100 U	82	5,000 U	500 U	50 U	2,500 U	4
Bromochloromethane	NL	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Bromodichloromethane	NL	80	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Bromoform	4	80	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Bromomethane	NL	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Carbon disulfide	NL	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Carbon tetrachloride	5	5	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Chlorobenzene	100	100	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Chlorodibromomethane	0.5	80	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Chloroethane	NL	NA	5 U	1,400	100 U	440	5,000 U	500 U	580	2,500 U	22
Chloroform	6	80	7	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Chloromethane	NL	NA	5 U	1,000 U	100 U	50 U	5,000 U	610 U	50 U	2,500 U	2 U
cis-1,2-Dichloroethene	70	70	26 U	1,000 U	2,000	50 U	5,000 U	500 U	50 U	110,000 D	40
cis-1,3-Dichloropropene	NL	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Ethylbenzene	700	700	60	3,900	940	3,600 EJ	6,000	500 U	240	8,200	55
M,P-Xylene	NL	NL	48	2,000	880	1,800	10,000 U	1,000 U	410	17,000	110
Methylene chloride	5	5	16 U	2,600 U	240 U	100 U	8,300 U	2,300 U	100 U	11,000	5 U
O-Xylene	NL	NA	19	1,000 U	330	490	5,000 U	500 U	50 U	6,600	20
Styrene	100	100	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Tetrachloroethene	5	5	120	1,000 U	100 U	50 U	5,000 U	500 U	50 U	51,000 D	250 D
Tetrahydrofuran	NL	NA	23 J	10,000 U	570 J	2,200	52,000	900 J	500 U	25,000 U	25 U
Toluene	1000	1000	90	11,000	2,000	6,100 EJ	14,000 U	700 U	50 U	92,000 D	61 D
trans-1,2-Dichloroethene	100	100	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
trans-1,3-Dichloropropene	0.5	NA	5 U	1,000 U	100 U	50 U	5,000 U	500 U	50 U	2,500 U	2 U
Trichloroethene	5	5	210 D	1,000 U	100 U	360	5,000 U	500 U	50 U	730,000 D	250 D
Vinyl chloride	2	2	5 U	1,000 U	2,000	50 U	5,000 U	500 U	50 U	2,500 U	56
Xylenes, Total	530	10000	78	2,600	1,400	2,100	10,000 U	1,000 U	550	25,000	110
Total Volatile Organics			617	18,300	17,690	15,552	905,000	2,500	1,306	1,044,900	901
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,600	1,000 U	160,000	12,000	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,500	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,900	1,000 U	200,000	5,000	1,000 U	17,000	1,000 U
Total Alcohols	NL	NA	ND	ND	5,000	ND	360,000	17,000	ND	17,000	ND

See Notes ge 27.

S. . : SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		CPZ-8R	CPZ-9	CPZ-9R	CPZ-10	CPZ-10R	CW-1-78	CW-2-78	CW-3-75	CW-3-78
CLIENT ID			G210	G207	G206	G205	G181	G016	G212	G027	G020
SAMPLE DATE			12/20/96	12/20/96	12/20/96	12/20/96	12/18/96	11/20/96	12/20/96	11/21/96	11/20/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	M	R	M	R	M	D	S	S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	12,000	260 D	20,000	3	60	1 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,1,2-Trichloroethane	5	5	160	16	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,1-Dichloroethane	70	NA	250	280 EJ	10,000 U	1 U	10 U	2	10 U	1 U	5
1,1-Dichloroethene	7	7	1,400 EJ	37	10,000 U	1 U	9 J	1 U	10 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,2-Dichlorobenzene	600	600	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,2-Dichloroethane	1	5	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	73,000 EJ	2,300 D	70,000 U	21	660 D	2	32 U	2 U	0.7 J
1,2-Dichloropropane	5	5	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
1,4-Dichlorobenzene	75	75	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
2-Butanone	400	NA	2,900	25 U	50,000 U	5 U	50 U	21 U	50 U	20 U	5 U
2-Hexanone	NL	NA	250 U	25 U	50,000 U	5 U	50 U	5 U	50 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	6,000	25 U	50,000 U	5 U	50 U	5 U	50 U	5 U	5 U
Acetone	700	NA	1,200	25 U	50,000 U	5 U	70 U	6 U	50 U	8	5 U
Benzene	1	5	640	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Bromochloromethane	NL	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Bromodichloromethane	NL	80	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Bromoform	4	80	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Bromomethane	NL	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Carbon disulfide	NL	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Carbon tetrachloride	5	5	3,000	90	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Chlorobenzene	100	100	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Chlorodibromomethane	0.5	80	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Chloroethane	NL	NA	50 U	37	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Chloroform	6	80	260	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Chloromethane	NL	NA	50 U	8 U	18,000 U	1 U	10 U	1 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	67,000 EJ	2,200 D	63,000 U	19	630 D	2	25 U	1 U	0.7 J
cis-1,3-Dichloropropene	NL	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Ethylbenzene	700	700	3,200 E	99	9,300 J	5	18	1 U	10 U	1 U	1 U
M,P-Xylene	NL	NL	6,900 E	220	18,000 J	4	24	2 U	20 U	2 U	2 U
Methylene chloride	5	5	1,000	10 U	20,000 U	2 U	28 U	2 U	20 U	2 U	2 U
O-Xylene	NL	NA	2,000 E	90	10,000 U	1 U	11	1 U	10 U	1 U	1 U
Styrene	100	100	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Tetrachloroethene	5	5	17,000 EJ	640 D	49,000	2	130	1 U	10 U	1 U	1 U
Tetrahydrofuran	NL	NA	500 U	50 U	100,000 U	10 U	100 U	10 U	100 U	10 U	10 U
Toluene	1000	1000	33,000 EJ	250 D	42,000 U	5 U	98	1 U	10 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	50 U	5 U	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Trichloroethene	5	5	230,000 D	580 D	210,000	9	1,200 D	2 U	130	2 U	3 U
Vinyl chloride	2	2	5,900 EJ	1,100 D	10,000 U	1 U	10 U	1 U	10 U	1 U	1 U
Xylenes, Total	530	10000	7,500 E	280	25,000	3	42	2 U	20 U	2 U	2 U
Total Volatile Organics			393,810	5,799	306,300	42	2,180	4	130	8	5.7
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,700	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	14,000	1,000 U	12,000	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	15,700	ND	12,000	ND	ND	ND	ND	ND	ND

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SRSNE SITE
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LOCATION	CRITERIA		CW-4-75	CW-4-78	CW-5-75	CW-5-78	CW-6-75	CW-6-78	CW-7-78	CW-8-78	CW-9-78
CLIENT ID			G032	G019	G017	G028	G018	G029	G007	G006	G013
SAMPLE DATE			11/21/96	11/20/96	11/20/96	11/21/96	11/20/96	11/21/96	11/19/96	11/19/96	11/19/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	D	D	M	D	M	D	S	M	S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	2	1 U	1 U	1 U	1 U	2	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	4	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	2 U	1 J	2 U	2	5	2	2 U	2 U	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	5 U	5 U	7 U	5 U	24 U	5 U	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	700	NA	5 U	5 U	5 U	6	6	7 U	5 U	5 U	5 U
Benzene	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	6	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	1 U	1	1 U	1	5	2	1 U	1 U	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene chloride	5	5	2 U	1 U	2 U	2	2 U	2 U	2 U	2 U	2 U
O-Xylene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	1 U	1 U	1 U	6	1 U	1 U	1 U	1 U
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1000	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	2 U	2 U	2 U	2 U	2 U	6 U	2 U	2 U	2 U
Vinyl chloride	2	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	530	10000	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Total Volatile Organics			2	5	ND	9	17	4	ND	ND	ND
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

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LOCATION	CRITERIA		CW-10-78	CW-10-78 (D)	CW-8-77	DN-3	DP-1	DP-2	DP-3	DP-4	DP-5
CLIENT ID			G102	G103	G132	G129	G185	G195	G194	G193	G063
SAMPLE DATE	Connecticut	US EPA	12/9/96	12/9/96	12/11/96	12/11/96	12/19/96	12/19/96	12/19/96	12/19/96	12/3/96
SCREEN	GA/GAA	MCLs	M	M	M		S	S	S		S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	24	1 U	1 U	1 U	10 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	1 U	13	1 U	1 U	1 U	22	2	1 U
1,1-Dichloroethene	7	7	1 U	1 U	4	1 U	1 U	1 U	10 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	1 J	1 J	11 U	2 U	2 U	3	29	2 U	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
2-Butanone	400	NA	5 U	5 U	9	120	5 U	5 U	50 U	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	5 U	5 U	5 U	50 U	5 U	5 U
Acetone	700	NA	5 U	5 U	5 U	20 U	6 U	5 U	50 U	5 U	5 U
Benzene	1	5	1 U	1 U	1 U	1 U	1 U	2	10 U	7	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1	1 U	1 U	1 U	10 U	3	11
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	10 U	3	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	1 U	1 U	7	10 U	22	1 U
Chloroform	6	80	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	1	1	11 U	1 U	1 U	2	29	1 U	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	11	1 U	1 U	1 U	10 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	2 U	9	2 U	2 U	3	20 U	8	2 U
Methylene chloride	5	5	2 U	2 U	2 U	2 U	2 U	2 U	20 U	2 U	2 U
O-Xylene	NL	NA	1 U	1 U	2	1 U	1 U	1 U	10 U	1	1 U
Styrene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Tetrachloroethene	5	5	8	9	2	1 U	1 U	1 U	10 U	1 U	1 U
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	12 U	10 U	110	100 U	76	10 U
Toluene	1000	1000	1 U	1 U	2 U	1 U	1	1 U	10 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	10 U	1 U	1 U
Trichloroethene	5	5	1 U	1 U	1 U	1 U	5 U	1 U	14 U	1 U	1
Vinyl chloride	2	2	1 U	1 U	1 U	1 U	1 U	1 U	35	1 U	1 U
Xylenes, Total	530	10000	2 U	2 U	12	2 U	2 U	4	20 U	10	2 U
Total Volatile Organics			9	10	75	120	1	124	86	122	12
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

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LOCATION	CRITERIA		DP-6	EFFLUENT	EFFLUENT	INFLUENT	INFLUENT	MW-01	MW-02	MW-03	MW-04
CLIENT ID			G064	G252	G283	G251	G282	G204	G082	G078	G076
SAMPLE DATE			12/3/96	12/30/96	7/8/97	12/30/96	7/8/97	12/20/96	12/5/96	12/5/96	12/5/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	S					D	D	M	D
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	9	1 U	18	1 U	170 D	17	1 U	1
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	1 U	1 U	1	1 U	150 D	4	2	4
1,1-Dichloroethene	7	7	1 U	1 U	1 U	1 U	1 U	13	2	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	1 U	1 U	2	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	2 U	15	2 U	21	2	76 D	6	4	39
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	700	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	6	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	1 U	1 U	6	1 U	28 E	1
Chloroform	6	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	1 U	13	1 U	19	2	66 D	6	4	32 D
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene chloride	5	5	2 U	2 U	1 U	2 U	2 U	2 U	2 U	2 U	2 U
O-Xylene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	4	1 U	6 U	1 U	4	1 U	1 U	1
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	10 U	10 U	12	10 U	10 U	10 U
Toluene	1000	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	1 U	2	1	3	2 U	7	1 U	1	12
Vinyl chloride	2	2	1 U	1 U	1 U	1 U	1 U	4	1 U	3	1 U
Xylenes, Total	530	10000	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Total Volatile Organics			7	28	1	41	2	434	29	47	51
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

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LOCATION	CRITERIA		MW-05	MW-06	MW-07	MW-07 (D)	MW-121A	MW-121B	MW-121C	MW-123A	MW-123C
CLIENT ID			G128	G122	G124	G125	G147	G150	G146	G088	G158
SAMPLE DATE			12/11/96	12/11/96	12/11/96	12/11/96	12/12/96	12/13/96	12/12/96	12/6/96	12/16/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	D	M	M	R	D	R	R	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	10 U	10 U	10 U	10 U	10 U	370	100 U	38 D	2 U
1,1,2,2-Tetrachloroethane	0.5	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,1,2-Trichloroethane	5	5	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,1-Dichloroethane	70	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	2	2 U
1,1-Dichloroethene	7	7	10 U	10 U	10 U	10 U	10 U	100 U	100 U	11	2 U
1,2-Dibromo-3-chloropropane	NL	0.2	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,2-Dibromoethane	0.05	0.05	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,2-Dichlorobenzene	600	600	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,2-Dichloroethane	1	5	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,2-Dichloroethene, Total	NL	NA	20 U	20 U	20 U	20 U	20 U	190 UJ	200 U	31	5 U
1,2-Dichloropropane	5	5	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,3-Dichlorobenzene	600	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
1,4-Dichlorobenzene	75	75	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
2-Butanone	400	NA	50 U	170	50 U	150	50 U	3,400	500 U	5 U	42 U
2-Hexanone	NL	NA	50 U	50 U	50 U	50 U	50 U	500 U	500 U	5 U	12 U
4-Methyl-2-pentanone	350	NA	50 U	50 U	50 U	50 U	50 U	500 U	500 U	5 U	12 U
Acetone	700	NA	50 U	50 U	50 U	50 U	50 U	1,200 U	500 U	5 U	22 U
Benzene	1	5	100	80	75	97	10	110	100 U	1 U	2 U
Bromochloromethane	NL	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Bromodichloromethane	NL	80	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Bromoform	4	80	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Bromomethane	NL	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Carbon disulfide	NL	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Carbon tetrachloride	5	5	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Chlorobenzene	100	100	57	30	28	38	10 U	100 U	100 U	1 U	2 U
Chlorodibromomethane	0.5	80	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Chloroethane	NL	NA	160	190	130	240	95	310	470	1 U	45
Chloroform	6	80	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Chloromethane	NL	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
cis-1,2-Dichloroethene	70	70	10 U	10 U	10 U	10 U	10 U	160 U	100 U	26 D	2 U
cis-1,3-Dichloropropene	NL	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Ethylbenzene	700	700	130 U	10 U	110 U	120	11	120	550	1 U	7
M,P-Xylene	NL	NL	240	100	170	170	20 U	770	440	2 U	5 U
Methylene chloride	5	5	20 U	20 U	20 U	20 U	60 U	230 U	460 U	2 U	3 U
O-Xylene	NL	NA	13	10 U	11	10 U	10 U	100 U	100 U	1 U	2 U
Styrene	100	100	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Tetrachloroethene	5	5	10 U	10 U	10 U	10 U	10 U	140	100 U	1 U	2 U
Tetrahydrofuran	NL	NA	11,000 DEJ	2,200 D	2,500 D	2,300 D	100 U	5,100	1,000 U	10 U	25 U
Toluene	1000	1000	10 U	10 U	13 U	10 U	10 U	1,200	100 U	1 U	2 U
trans-1,2-Dichloroethene	100	100	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
trans-1,3-Dichloropropene	0.5	NA	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Trichloroethene	5	5	10 U	10 U	10 U	10 U	70 U	350 U	100 U	5 U	2 U
Vinyl chloride	2	2	10 U	10 U	10 U	10 U	10 U	100 U	100 U	1 U	2 U
Xylenes, Total	530	10000	260	110	180	160	20 U	770	500	2 U	9
Total Volatile Organics			11,570	2,770	2,914	3,115	116	11,520	1,460	77	52
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

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LOCATION	CRITERIA		MW-124C	MW-124C (D)	MW-125A	MW-125C	MW-125C (D)	MW-126B	MW-126C	MW-126C (D)	MW-127B
CLIENT ID			G022	G023	G089	G201	G202	G046	G043	G044	G030
SAMPLE DATE			11/20/96	11/20/96	12/6/96	12/20/96	12/20/96	11/22/96	11/22/96	11/22/96	11/21/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	R	R	R	R	M	R	R	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	3	50 U	2,000 U	1 U	1 U	1 U	4
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	1 U	4	550	2,000 U	1 U	1 U	1 U	8
1,1-Dichloroethene	7	7	25	7	1 U	410	2,000 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	130	2,000 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	18	15	7	33,000 EJ	57,000	5	2 U	2 U	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	5 U	86	140,000 EJ	10,000 U	5 U	5 U	5 U	19 U
2-Hexanone	NL	NA	5 U	5 U	5 U	250 U	10,000 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	14,000 EJ	9,600 J	5 U	5 U	5 U	5 U
Acetone	700	NA	5 U	5 U	10	61,000 EJ	89,000	5 U	5 U	5 U	8 U
Benzene	1	5	1 U	1 U	1	130	2,000 U	1 U	1 U	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	6
Chloroform	6	80	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	14	15	6	32,000 EJ	51,000	5	1 U	1 U	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	2 U	3,700 EJ	2,500	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	2 U	2 U	4,400 EJ	4,500	2 U	2 U	2 U	2 U
Methylene chloride	5	5	2 U	4	2 U	220	4,000 U	2 U	1 U	1 U	3 U
O-Xylene	NL	NA	1 U	1 U	1 U	1,800 EJ	2,000 U	1 U	1 U	1 U	1 U
Styrene	100	100	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	0.9 J	1 U	1 U	180	2,000 U	1 U	1 U	1 U	1 U
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	500 U	20,000 U	10 U	10 U	10 U	10 U
Toluene	1000	1000	1 U	1 U	1 U	12,000 EJ	8,100	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	50 U	2,000 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	4	5	24	970	2,000 U	7 U	2 U	2 U	2 U
Vinyl chloride	2	2	1 U	1 U	10	14,000 EJ	16,000	1 U	1 U	1 U	1 U
Xylenes, Total	530	10000	2 U	2 U	2 U	6,200 EJ	4,100	2 U	2 U	2 U	2 U
Total Volatile Organics			44	31	144	285,490	180,700	5	ND	ND	18
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	3,200	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	4,800	4,200	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	29,000	30,000	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	37,000	34,200	ND	ND	ND	ND

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LOCATION	CRITERIA		MW-127C	MW-128	MW-129	MW-201A	MW-201B	MW-202A	MW-202B	MW-203A	MW-203B
CLIENT ID			G031	G033	G187	G058	G057	G141	G142	G085	G086
SAMPLE DATE			11/21/96	11/21/96	12/19/96	12/3/96	12/3/96	12/12/96	12/12/96	12/5/96	12/5/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	R	R	R	S	R	D	R	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	78 DJ	1 U	330 UJ	2	1 U	10 U	10 U	1 UJ	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,1-Dichloroethane	70	NA	36 D	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,1-Dichloroethene	7	7	9	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	R	1 U	1 UJ	10 U	10 U	R	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	330 U	1 U	1 UJ	10 U	10 U	1 UJ	1 U
1,2-Dichloroethane	1	5	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,2-Dichloroethene, Total	NL	NA	10	2 U	R	13	R	79 U	160 U	R	2 U
1,2-Dichloropropane	5	5	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	330 U	1 U	1 UJ	10 U	10 U	1 UJ	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	330 U	1 U	1 UJ	10 U	10 U	1 UJ	1 U
2-Butanone	400	NA	5 U	33 U	1,700 U	5 U	5 UJ	50 U	50 U	5 UJ	5 U
2-Hexanone	NL	NA	5 U	5 U	1,700 U	5 U	5 UJ	50 U	50 U	5 UJ	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	1,700 U	5 U	5 U	50 U	50 U	5 UJ	5 U
Acetone	700	NA	5 U	5 U	1,700 UJ	15 U	5 UJ	50 U	50 U	5 UJ	5 U
Benzene	1	5	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Bromochloromethane	NL	NA	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Bromodichloromethane	NL	80	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Bromoform	4	80	1 U	1 U	330 U	1 U	1 UJ	10 U	10 U	1 UJ	1 U
Bromomethane	NL	NA	1 U	1 U	330 UJ	1 U	1 UJ	10 U	10 U	1 UJ	1 U
Carbon disulfide	NL	NA	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Carbon tetrachloride	5	5	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Chlorobenzene	100	100	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Chloroethane	NL	NA	7	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Chloroform	6	80	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Chloromethane	NL	NA	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
cis-1,2-Dichloroethene	70	70	9	1 U	350	12	1 U	72 U	150 U	1 UJ	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Ethylbenzene	700	700	1 U	1 U	330 U	1 U	1 U	130 U	15 U	1 UJ	1 U
M,P-Xylene	NL	NL	2 U	2 U	R	2 U	R	180	20 U	R	2 U
Methylene chloride	5	5	2 U	3 U	670 UJ	2 U	2 UJ	20 U	20 U	2 UJ	2 U
O-Xylene	NL	NA	1 U	1 U	R	1 U	R	49	10 U	R	1 U
Styrene	100	100	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Tetrachloroethene	5	5	1 U	1	330 U	1	1	10 U	10 U	1 UJ	1 U
Tetrahydrofuran	NL	NA	8 J	12	3,300 U	10 U	10 UJ	100 U	100 U	10 UJ	10 U
Toluene	1000	1000	1 U	1 U	950	1 U	1 U	84 U	17 U	1 UJ	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	330 UJ	1 U	1 U	10 U	10 U	1 UJ	1 U
Trichloroethene	5	5	2 U	6 U	330 U	11	1 U	13 U	88 U	1 UJ	1 U
Vinyl chloride	2	2	1 U	1 U	330 U	1 U	1 U	10 U	10 U	1 UJ	1 U
Xylenes, Total	530	10000	2 U	2 U	670 U	2 U	2 U	220	20 U	2 UJ	2 U
Total Volatile Organics			147	13	1,300	26	1	229	ND	0.9	ND
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

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LOCATION	CRITERIA		MW-204A	MW-204B	MW-205A	MW-205B	MW-206A	MW-206B	MW-208A	MW-209A	MW-209A
CLIENT ID			G200	G081	G025	G026	G015	G012	G059	G068	G261
SAMPLE DATE	Connecticut	US EPA	12/20/96	12/5/96	11/21/96	11/21/96	11/20/96	11/19/96	12/3/96	12/4/96	2/7/97
SCREEN	GA/GAA	MCLs	R	D	R	D	R	M	R	R	R
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,1-Dichloroethane	70	NA	18	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,1-Dichloroethene	7	7	2	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	R	1 U	1 U	1 U	25 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,2-Dichloroethene, Total	NL	NA	180 D	6	9	R	2 U	2 U	2 U	50 U	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	25 U	1 U
2-Butanone	400	NA	5 U	5 U	17 U	20 UJ	24 U	5 U	5 U	120 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	120 U	5 U
4-Methyl-2-pentanone	350	NA	8	5 U	5 U	5 U	5 U	5 U	5 U	120 U	5 U
Acetone	700	NA	24 U	5 U	7	9 UJ	6 U	5 U	6 U	120 U	5 U
Benzene	1	5	1	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 UJ	1 U	1 U	1 U	25 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	2 U	28	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Chlorobenzene	100	100	1 U	1 U	2	1 U	1 U	1 U	1 U	25 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Chloroethane	NL	NA	9	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Chloroform	6	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1
Chloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
cis-1,2-Dichloroethene	70	70	160 D	6	8	3	1 U	1 U	1 U	25 U	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Ethylbenzene	700	700	20	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
M,P-Xylene	NL	NL	30 EJ	2 U	2 U	R	2 U	2 U	2 U	50 U	2 U
Methylene chloride	5	5	2 U	2 U	2	2 UJ	1 U	2 U	2 U	50 U	2 U
O-Xylene	NL	NA	9 J	1 U	1 U	R	1 U	1 U	1 U	25 U	1 U
Styrene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Tetrachloroethene	5	5	48 D	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Tetrahydrofuran	NL	NA	26 E	10 U	6 J	10 U	10 U	10 U	10 U	250 U	10 U
Toluene	1000	1000	38 D	1	1 U	1 U	1 U	1 U	1 U	25 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Trichloroethene	5	5	300 D	2	4	4 U	2 U	2 U	1 U	25 U	1 U
Vinyl chloride	2	2	13	1 U	1 U	1 U	1 U	1 U	1 U	25 U	1 U
Xylenes, Total	530	10000	39 EJ	2 U	2 U	2 U	2 U	2 U	2 U	50 U	2 U
Total Volatile Organics			682	9	29	3	ND	ND	ND	28	1
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes r ıe 27.

LOCATION	CRITERIA		MW-209B	MW-408	MW-409	MW-413	MW-414	MW-415	MW-416	MW-501A	MW-501B
CLIENT ID			G069	G079	G161	G163	G113	G111	G119	G062	G096
SAMPLE DATE	Connecticut	US EPA	12/4/96	12/5/96	12/16/96	12/16/96	12/10/96	12/10/96	12/10/96	12/3/96	12/6/96
SCREEN	GA/GAA	MCLs	D	R	M	D	R	M	R	R	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	320 EJ	12,000	7,100	14	4,100 D	380 D	3	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	2	1,000 U	250 U	1 U	140	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	470 EJ	15,000	3,100	10	2,700 EJ	440 D	7	2
1,1-Dichloroethene	7	7	1 U	83 EJ	1,000 U	520	4	760 EJ	96 EJ	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	R	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	2	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	22	1,000 U	250 U	1 U	110	7 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	R	8,000 D	79,000 D	180,000 D	92 EJ	10,000 D	1,300 D	71 D	27
1,2-Dichloropropane	5	5	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	890 EJ	5,000 U	13,000 U	90	7,800 D	210 EJ	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5,000 U	1,200 U	5 U	50 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	890 EJ	5,000 U	3,100	20 U	5,000 U	19 U	5 U	5 U
Acetone	700	NA	5 UJ	350 EJ	58,000 U	8,900 U	46 U	4,800 U	48 U	5 U	5 U
Benzene	1	5	1 U	45 EJ	1,000 U	250 U	1	230	8	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 UJ	2	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	9	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	11	1,000 U	250 U	1 U	14	2	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1,000 EJ	1,000 U	250 U	18	540 EJ	110 EJ	1 U	1 U
Chloroform	6	80	1 U	2	1,000 U	250 U	1 U	62	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	1 U	7,500 D	74,000 D	170,000 D	98 D	9,100 D	1,300 D	67 D	25
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	3,000 D	8,200	3,300	31 D	1,500 D	170 D	1 U	1 U
M,P-Xylene	NL	NL	R	36	5,200	2,900	10	2,700 EJ	72 EJ	2 U	2 U
Methylene chloride	5	5	2 UJ	120 EJ	3,000 U	2500 U	4 U	1,700 EJB	65 EJ	2 U	2 U
O-Xylene	NL	NA	R	240 EJ	1,700	920	4	1,600 EJ	28 EJ	1 U	1 U
Styrene	100	100	1 U	17	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	18	1,000 U	250 U	5	51	26 EJ	2	1 U
Tetrahydrofuran	NL	NA	10 U	1,000 EJ	10,000 U	2500 U	31	1,200 U	76	10 U	10 U
Toluene	1000	1000	1 U	6,800 D	45,000 D	72,000 D	110 D	8,600 D	640 D	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	17	1,000 U	250 U	1 U	70	2	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1,000 U	250 U	1 U	10 U	1 U	1 U	1 U
Trichloroethene	5	5	2	140 EJ	1,000 U	250 U	94 D	190	220 D	39 D	24
Vinyl chloride	2	2	1 U	2,700 D	7,800	420	9	740 EJ	110 D	1 U	1 U
Xylenes, Total	530	10000	2 U	1,400 JD	8,700	4,000	15	4,100 EJ	100 EJ	2 U	2 U
Total Volatile Organics			2	25,688	168,900	263,360	527	42,707	3,955	118	51
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	3,500	9,400	1,000 U	2,700	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	2,800	5,400	1,000 U	2,500	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,500	25,000	69,000	1,400	23,000	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	1,500	31,300	83,800	1,400	28,200	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		MW-501C	MW-502	MW-701DR	MW-702DR	MW-703D	MW-703DR	MW-703S	MW-704D	MW-704DR
CLIENT ID			G061	G179	G067	G056	G099	G100	G098	G175	G169
SAMPLE DATE			12/3/96	12/18/96	12/4/96	12/3/96	12/9/96	12/9/96	12/9/96	12/18/96	12/17/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	S	D	DR	DR	D	DR	S	D	DR
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1,000 U	1 U	14	1 U	1 U	1 U	12	9
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,1,2-Trichloroethane	5	5	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,1-Dichloroethane	70	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	13
1,1-Dichloroethene	7	7	1 U	1,000 U	1 U	3	1 U	1 U	1 U	10 U	2 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,2-Dibromoethane	0.05	0.05	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,2-Dichlorobenzene	600	600	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,2-Dichloroethane	1	5	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,2-Dichloroethene, Total	NL	NA	2 U	2,000 U	2 U	5	2 U	2 U	1 J	20 U	10
1,2-Dichloropropane	5	5	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,3-Dichlorobenzene	600	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
1,4-Dichlorobenzene	75	75	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
2-Butanone	400	NA	5 U	5,000 U	5 U	5 U	5 U	5 U	5 U	50 U	24 U
2-Hexanone	NL	NA	5 U	5,000 U	5 U	5 U	5 U	5 U	5 U	50 U	12 U
4-Methyl-2-pentanone	350	NA	5 U	7,200	5 U	5 U	5 U	5 U	5 U	50 U	12 U
Acetone	700	NA	25 U	22,000 U	5 U	5 U	5 U	5 U	5 U	83 U	40 U
Benzene	1	5	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	46	2
Bromochloromethane	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Bromodichloromethane	NL	80	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Bromoform	4	80	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Bromomethane	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Carbon disulfide	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	23
Carbon tetrachloride	5	5	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Chlorobenzene	100	100	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	11	2 U
Chlorodibromomethane	0.5	80	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Chloroethane	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	300 D	53
Chloroform	6	80	1 U	2,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Chloromethane	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
cis-1,2-Dichloroethene	70	70	1 U	1,000 U	1 U	5	1 U	1 U	1	10 U	9
cis-1,3-Dichloropropene	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Ethylbenzene	700	700	1 U	4,400	1 U	1 U	1 U	1 U	1 U	12	35
M,P-Xylene	NL	NL	2 U	1,200 J	2 U	2 U	2 U	2 U	2 U	45	14
Methylene chloride	5	5	2 U	2,000 U	2 U	2 U	2 U	2 U	2 U	20 U	3 U
O-Xylene	NL	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	6
Styrene	100	100	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Tetrachloroethene	5	5	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	4
Tetrahydrofuran	NL	NA	10 U	9,500 J	10 U	10 U	10 U	10 U	10 U	210	190
Toluene	1000	1000	1 U	7,000	1 U	1 U	1 U	1 U	1 U	29	44
trans-1,2-Dichloroethene	100	100	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Trichloroethene	5	5	1	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	53
Vinyl chloride	2	2	1 U	1,000 U	1 U	1 U	1 U	1 U	1 U	10 U	2 U
Xylenes, Total	530	10000	2 U	1,400 J	2 U	2 U	2 U	2 U	2 U	50	21
Total Volatile Organics			1	29,300	ND	22	ND	ND	1	665	455
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	2,500	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	3,800	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	6,300	ND	ND	ND	ND	ND	ND	ND

See Notes r ıe 27.

LOCATION	CRITERIA		MW-704M	MW-704R	MW-704R (L)	MW-704S	MW-704S (L)	MW-705D	MW-705DR	MW-705DR	MW-705R
CLIENT ID			G167	G173	G172	G171	G170	G104	G222	G241	G105
SAMPLE DATE	Connecticut	US EPA	12/17/96	12/17/96	12/17/96	12/17/96	12/17/96	12/9/96	12/26/96	12/27/96	12/9/96
SCREEN	GA/GAA	MCLs	M	R	R	S	S	D	DR	DR	R
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	2 U	20 U	20 U	1 U	1 U	1 U	**70,000**	120,000,000 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,1,2-Trichloroethane	5	5	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,1-Dichloroethane	70	NA	**4**	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,1-Dichloroethene	7	7	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,2-Dibromoethane	0.05	0.05	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,2-Dichlorobenzene	600	600	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,2-Dichloroethane	1	5	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,2-Dichloroethene, Total	NL	NA	**14**	40 U	40 U	2 U	2 U	2 U	100,000 U	250,000,000 U	**7**
1,2-Dichloropropane	5	5	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,3-Dichlorobenzene	600	NA	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
1,4-Dichlorobenzene	75	75	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
2-Butanone	400	NA	12 U	850 U	100 U	5 U	5 U	5 U	250,000 U	620,000,000 U	5 U
2-Hexanone	NL	NA	12 U	100 U	100 U	5 U	5 U	5 U	250,000 U	620,000,000 U	5 U
4-Methyl-2-pentanone	350	NA	12 U	100 U	100 U	5 U	5 U	5 U	250,000 U	620,000,000 U	5 U
Acetone	700	NA	18 U	200 U	260 U	5 U	5 U	5 U	250,000 U	620,000,000 U	5 U
Benzene	1	5	**8**	**34**	**28**	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Bromochloromethane	NL	NA	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Bromodichloromethane	NL	80	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Bromoform	4	80	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Bromomethane	NL	NA	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Carbon disulfide	NL	NA	2 U	**25**	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Carbon tetrachloride	5	5	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Chlorobenzene	100	100	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Chlorodibromomethane	0.5	80	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Chloroethane	NL	NA	**76**	**400**	**350**	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Chloroform	6	80	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Chloromethane	NL	NA	2 U	20 U	20 U	1 U	1 U	1 U	72,000 U	120,000,000 U	1 U
cis-1,2-Dichloroethene	70	70	**13**	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	**7**
cis-1,3-Dichloropropene	NL	NA	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Ethylbenzene	700	700	**11**	**95**	**66**	1 U	1 U	1 U	**74,000**	120,000,000 U	1 U
M,P-Xylene	NL	NL	**5**	**100**	**70**	2 U	2 U	2 U	**180,000**	250,000,000 U	2 U
Methylene chloride	5	5	3 U	40 U	40 U	2 U	2 U	2 U	100,000 U	420,000,000 U	2 U
O-Xylene	NL	NA	2 U	20 U	20 U	1 U	1 U	1 U	**65,000**	120,000,000 U	1 U
Styrene	100	100	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Tetrachloroethene	5	5	2 U	20 U	20 U	1 U	1 U	**2**	**420,000**	290,000,000 U	**3**
Tetrahydrofuran	NL	NA	**37**	200 U	200 U	10 U	10 U	10 U	500,000 U	1,200,000,000 U	10 U
Toluene	1000	1000	**12**	20 U	20 U	1 U	1 U	1 U	270,000 U	120,000,000 U	1 U
trans-1,2-Dichloroethene	100	100	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
trans-1,3-Dichloropropene	0.5	NA	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Trichloroethene	5	5	**7**	**79**	20 U	1 U	1 U	1 U	**1,700,000 D**	960,000,000 U	**21**
Vinyl chloride	2	2	2 U	20 U	20 U	1 U	1 U	1 U	50,000 U	120,000,000 U	1 U
Xylenes, Total	530	10000	**8**	**120**	**80**	2 U	2 U	2 U	**240,000**	250,000,000 U	2 U
Total Volatile Organics			**173**	**783**	**524**	ND	ND	**2**	**2,509,000**	ND	**31**
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	**2,100**	**100,000**	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	**2,300**	**2,000,000**	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	**500,000**	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	**6,800**	**2,000,000**	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	**11,200**	**4,600,000**	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		MW-706DR	MW-707D	MW-707DR	MW-707M	MW-707R	MW-707R	MW-707S	MW-708DR	MW-708M
CLIENT ID			G110	G095	G242	G084	G155	G262	G083	G256	G260
SAMPLE DATE	Connecticut GA/GAA	US EPA MCLs	12/10/96	12/6/96	12/30/96	12/5/96	12/13/96	2/7/97	12/5/96	2/7/97	2/7/97
SCREEN			DR	D	DR	M	R	R	S	DR	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	6 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	7	47 EJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	8	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	28	2 U	2 U	2	5 U	2 U	2	2 U	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	16	5 U	5 U	5 U	12 U	5 U	5 U	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	5 U	12 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	2,500 U	5 U	5 U	5 U	12 U	5 U	5 U	5 U	5 U
Acetone	700	NA	20 U	5 U	32 U	5 U	12 U	5 U	5 U	5 U	5 U
Benzene	1	5	5	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	2	6	1 U	1 U	1 U	1 U
Chloroform	6	80	4	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1
Chloromethane	NL	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	2 U
cis-1,2-Dichloroethene	70	70	30 EJ	1 U	1 U	1	2 U	1 U	2	1 U	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	13 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	31	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U
Methylene chloride	5	5	73 EJ	2 U	2 U	3 U	5 U	2 U	2 U	2 U	2 U
O-Xylene	NL	NA	15	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Styrene	100	100	4	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	10 U	25 U	10 U	10 U	10 U	10 U
Toluene	1000	1000	220 EJ	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	7,000 D	1 U	1 U	1	24 U	1 U	2	1 U	1 U
Vinyl chloride	2	2	1	1 U	1 U	1 U	2 U	1 U	1 U	1 U	1 U
Xylenes, Total	530	10000	46	2 U	2 U	2 U	5 U	2 U	2 U	2 U	2 U
Total Volatile Organics			7,454	ND	ND	4	6	ND	4	ND	1
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes ıe 27.

S : SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		MW-708R	MW-708R (D)	MW-708S	MW-709DR	MW-709R	MW-710DR	MW-710R	MW-710R (D)	MW-710S
CLIENT ID			G258	G259	G257	G135	G134	G265	G266	G267	G268
SAMPLE DATE			2/7/97	2/7/97	2/7/97	12/12/96	12/12/96	6/13/97	6/13/97	6/13/97	6/13/97
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	R	S	DR	R	DR	R	R	S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	1 U	2 U	100 U	1 U	1	2	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	1 U	1 U	15	100 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	7	1 U	1 U	1 U	180 EJ	100 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	2 U	2 U	2 U	1,200 EJ	3,200	6	15	15	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	5 U	5 U	12 U	500 U	5 U	5 U	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	12 U	500 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	930 EJ	500 U	5 U	5 U	5 U	5 U
Acetone	700	NA	14 U	18 U	5 U	150 U	500 U	17	5 U	4 J	5 U
Benzene	1	5	1 U	1 U	1 U	16	100 U	1 U	1 U	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Chloroform	6	80	1 U	1 U	1 U	16	100 U	1	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	1 U	1 U	1 U	1,300 EJ	3,300 D	6	14	15	1 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	1 U	4 U	100 U	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	2 U	2 U	74	200 U	2 U	2 U	2 U	2 U
Methylene chloride	5	5	1 U	2 U	2 U	180 EBJ	200 U	1 JB	2 U	1 JB	1 JB
O-Xylene	NL	NA	1 U	1 U	1 U	44	100 U	1 U	1 U	1 U	1 U
Styrene	100	100	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	20 U	1,000 U	10 U	10 U	10 U	10 U
Toluene	1000	1000	6 U	6 U	1 U	630 EJ	100 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	2 U	100 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	1 U	1 U	1 U	12,000 D	780 U	6	15	15	1 U
Vinyl chloride	2	2	1 U	1 U	1 U	13	100 U	1 U	1 U	1 U	1 U
Xylenes, Total	530	10000	2 U	2 U	2 U	120	200 U	2 U	2 U	2 U	2 U
Total Volatile Organics			ND	ND	ND	15,398	3,300	31	30	37	1
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	2,100	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	2,100	ND	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		MWD-601	MWL-301	MWL-302	MWL-303	MWL-304	MWL-305	MWL-306	MWL-307	MWL-307 (D)
CLIENT ID			G221	G035	G036	G037	G144	G090	G038	G159	G160
SAMPLE DATE			12/26/96	11/22/96	11/22/96	11/22/96	12/12/96	12/6/96	11/22/96	12/16/96	12/16/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	D	S	S	S	S	S	S	S	S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	14,000	14	1 U	1 U	1,200	280 D	5 U	35,000 D	40,000 D
1,1,2,2-Tetrachloroethane	0.5	NA	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,1,2-Trichloroethane	5	5	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,1-Dichloroethane	70	NA	5,000 U	19	1 U	1 U	500 U	48 D	5 U	25,000	24,000
1,1-Dichloroethene	7	7	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,200	1,100
1,2-Dibromo-3-chloropropane	NL	0.2	5,000 U	1 U	R	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,2-Dibromoethane	0.05	0.05	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,2-Dichlorobenzene	600	600	5,000 U	1 U	1 UJ	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,2-Dichloroethane	1	5	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,2-Dichloroethene, Total	NL	NA	56,000 U	54 D	R	0.9 J	4,200 U	60 D	10 U	24,000 D	30,000 D
1,2-Dichloropropane	5	5	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,3-Dichlorobenzene	600	NA	5,000 U	1 U	1 UJ	1 U	500 U	1 U	5 U	1,000 U	1,000 U
1,4-Dichlorobenzene	75	75	5,000 U	1 U	1 UJ	1 U	500 U	1 U	5 U	1,000 U	1,000 U
2-Butanone	400	NA	25,000 U	5 U	15 UJ	22 U	2,500 U	5 U	25 U	10,000 U	5,000 U
2-Hexanone	NL	NA	25,000 U	5 U	5 U	5 U	2,500 U	5 U	25 U	5,000 U	5,000 U
4-Methyl-2-pentanone	350	NA	25,000 U	12	5 U	5 U	2,500 U	5 U	25 U	5,000 U	5,000 U
Acetone	700	NA	25,000 U	31 U	5 UJ	15 U	2,500 U	5 U	62 U	13,000 U	9,500 U
Benzene	1	5	5,000 U	1 U	1 U	1 U	500 U	2	5 U	1,000 U	1,000 U
Bromochloromethane	NL	NA	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Bromodichloromethane	NL	80	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Bromoform	4	80	5,000 U	1 U	1 UJ	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Bromomethane	NL	NA	5,000 U	1 U	1 UJ	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Carbon disulfide	NL	NA	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Carbon tetrachloride	5	5	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Chlorobenzene	100	100	5,000 U	1 U	1 U	1 U	500 U	2	5 U	1,000 U	1,000 U
Chlorodibromomethane	0.5	80	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Chloroethane	NL	NA	5,000 U	10	1 U	1 U	500 U	17	5 U	9,000	8,800
Chloroform	6	80	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Chloromethane	NL	NA	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
cis-1,2-Dichloroethene	70	70	53,000 U	58 D	0.9 J	1 U	4,400 U	56 D	5 U	25,000 D	29,000 D
cis-1,3-Dichloropropene	NL	NA	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Ethylbenzene	700	700	5,000 U	8	1 U	0.9 J	1,300	10 U	5 U	19,000	19,000
M,P-Xylene	NL	NL	8,600 J	5	R	0.9 J	1,900	2 U	10 U	3,000	3,200
Methylene chloride	5	5	10,000 U	2 U	2 UJ	2 U	1,000 U	2 U	6 U	3,000 U	2,500 U
O-Xylene	NL	NA	5,000 U	3	R	1 U	720	2	5 U	1,000	910 J
Styrene	100	100	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Tetrachloroethene	5	5	14,000	1	2	1 U	500 U	15	5 U	1,000 U	1,000 U
Tetrahydrofuran	NL	NA	50,000 U	12	10 U	10 U	5,000 U	10 U	130	10,000 U	10,000 U
Toluene	1000	1000	17,000 U	13 D	2	2	3,100 U	1 U	5 U	40,000 D	47,000 D
trans-1,2-Dichloroethene	100	100	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
trans-1,3-Dichloropropene	0.5	NA	5,000 U	1 U	1 U	1 U	500 U	1 U	5 U	1,000 U	1,000 U
Trichloroethene	5	5	95,000	9 U	13 U	2 U	510 U	8 U	5 U	1,000 U	1,000 U
Vinyl chloride	2	2	5,000 U	9	1 U	1 U	2,700	90 D	5 U	2,000	1,900
Xylenes, Total	530	10000	14,000	8	2 U	2	2,600	4	10 U	4,700	5,000
Total Volatile Organics			131,600	164	4.9	3.8	7,820	512	130	160,200	174,910
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	3,400	3,000
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,400	1,300
Sec-Butanol	NL	NA	17,000	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	6,800	9,300
Total Alcohols	NL	NA	17,000	ND	ND	ND	ND	ND	ND	11,600	13,600

See Notes r e 27.

LOCATION	CRITERIA		MWL-308	MWL-309	MWL-311	MWL-312	MWL-313	MWL-314	P-1A	P-1B	P-1B (D)
CLIENT ID			G145	G091	G156	G039	G093	G092	G176	G177	G178
SAMPLE DATE	Connecticut	US EPA	12/12/96	12/6/96	12/13/96	11/22/96	12/6/96	12/6/96	12/18/96	12/18/96	12/18/96
SCREEN	GA/GAA	MCLs	S	S	S	S	S	S	R	M	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	5,000 U	1 U	1 U	1 U	1 U	1 U	190 D	120,000 D	120,000
1,1,2,2-Tetrachloroethane	0.5	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,1,2-Trichloroethane	5	5	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,1-Dichloroethane	70	NA	8,000	4	1 U	1 U	1 U	2	240 D	10,000	93000 J
1,1-Dichloroethene	7	7	5,000 U	1 U	1 U	1 U	1 U	1 U	32	4,800	10,000 U
1,2-Dibromo-3-chloropropane	NL	0.2	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,2-Dibromoethane	0.05	0.05	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,2-Dichlorobenzene	600	600	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,2-Dichloroethane	1	5	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,2-Dichloroethene, Total	NL	NA	10,000 U	2	2 U	2 U	2 U	2	140	60,000 D	660,000
1,2-Dichloropropane	5	5	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,3-Dichlorobenzene	600	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
1,4-Dichlorobenzene	75	75	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
2-Butanone	400	NA	25,000 U	5 U	5 U	5 U	5 U	5 U	72	11,000 U	700,000 U
2-Hexanone	NL	NA	25,000 U	5 U	5 U	5 U	5 U	5 U	50 U	5,000 U	50,000 U
4-Methyl-2-pentanone	350	NA	25,000 U	5 U	5 U	5 U	5 U	5 U	50 U	5,000 U	50,000 U
Acetone	700	NA	25,000 U	5 U	5 U	5 U	5 U	5 U	63 U	16,000 U	50,000 U
Benzene	1	5	5,000 U	6	0.9 J	1 U	1 U	1 U	11	1,000 U	10,000 U
Bromochloromethane	NL	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Bromodichloromethane	NL	80	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Bromoform	4	80	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Bromomethane	NL	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Carbon disulfide	NL	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Carbon tetrachloride	5	5	5,000 U	1 U	1 U	1 U	1 U	1 U	57	1,000 U	10,000 U
Chlorobenzene	100	100	5,000 U	6	2	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Chlorodibromomethane	0.5	80	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Chloroethane	NL	NA	5,000 U	5	1 U	1 U	1 U	1 U	16	2,200	10,000 U
Chloroform	6	80	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	210,000 U
Chloromethane	NL	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	160,000 U
cis-1,2-Dichloroethene	70	70	42,000 U	2	1 U	1 U	1 U	1	130	55,000 D	610,000
cis-1,3-Dichloropropene	NL	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Ethylbenzene	700	700	5,000 U	1 U	16	1 U	1 U	1 U	82	40,000 D	400,000
M,P-Xylene	NL	NL	10,000 U	2 U	110 D	2 U	2 U	2 U	63	6,300	20,000 U
Methylene chloride	5	5	10,000 U	2 U	2 U	2 U	2 U	2 U	13 U	3,400 U	20,000 U
O-Xylene	NL	NA	5,000 U	1 U	3	1 U	1 U	1 U	27	2,100	10,000 U
Styrene	100	100	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Tetrachloroethene	5	5	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Tetrahydrofuran	NL	NA	50,000 U	1,800 D	10 U	10 U	10 U	10 U	180	3,100 J	10,000 U
Toluene	1000	1000	17,000 U	1 U	5	1 U	1 U	1 U	200	120,000 D	120,000
trans-1,2-Dichloroethene	100	100	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
trans-1,3-Dichloropropene	0.5	NA	5,000 U	1 U	1 U	1 U	1 U	1 U	10 U	1,000 U	10,000 U
Trichloroethene	5	5	5,000 U	1 U	1 U	2 U	1 U	1 U	20	1,200	10,000 U
Vinyl chloride	2	2	10,000	2	1 U	1 U	1 U	1	96	2,400	10,000 U
Xylenes, Total	530	10000	10,000 U	2 U	75	2 U	2 U	2 U	95	9,800	20,000 U
Total Volatile Organics			18,000	1,825	137	ND	ND	4	1,416	367,100	1,343,000
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,300	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	2,900	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	13,000	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	9,000
Total Alcohols	NL	NA	17,200	ND	ND	ND	ND	ND	ND	ND	9,000

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		P-2A	P-2B	P-3A	P-3B	P-4A	P-4A (D)	P-4A (L)	P-4B	P-4B (L)
CLIENT ID			G137	G131	G203	G162	G051	G052	G055	G149	G148
SAMPLE DATE			12/12/96	12/11/96	12/20/96	12/16/96	12/2/96	12/2/96	12/3/96	12/12/96	12/12/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	M	R	S	R	R	R	M	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	320 D	16	100 U	190	110 D	97 D	76 D	170,000 D	200,000 D
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,1,2-Trichloroethane	5	5	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,1-Dichloroethane	70	NA	260 D	1 U	100 U	120 U	43 D	25	25 D	2,500 U	2,500 U
1,1-Dichloroethene	7	7	1 U	2	100 U	120 U	11	8	6	4,600	3,800
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,2-Dichlorobenzene	600	600	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,2-Dichloroethane	1	5	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,2-Dichloroethene, Total	NL	NA	200 D	7 U	200 U	130 U	34 D	22	22 D	27,000 U	27,000 U
1,2-Dichloropropane	5	5	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
1,4-Dichlorobenzene	75	75	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
2-Butanone	400	NA	5 U	5 U	12,000 D	620 U	5 U	35 U	5 U	12,000 U	12,000 U
2-Hexanone	NL	NA	5 U	5 U	500 U	620 U	5 U	5 U	5 U	12,000 U	12,000 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	9,200 D	620 U	5 U	5 U	5 U	12,000 U	12,000 U
Acetone	700	NA	5 U	5 U	34,000 D	1,300 U	5 U	8 U	5 U	12,000 U	12,000 U
Benzene	1	5	1 U	1 U	190	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Bromochloromethane	NL	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Bromodichloromethane	NL	80	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Bromoform	4	80	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Bromomethane	NL	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Carbon disulfide	NL	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Carbon tetrachloride	5	5	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Chlorobenzene	100	100	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Chlorodibromomethane	0.5	80	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Chloroethane	NL	NA	5	1 U	660	300	3	2	1 U	2,500 U	2,500 U
Chloroform	6	80	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Chloromethane	NL	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
cis-1,2-Dichloroethene	70	70	180 D	7 U	100 U	130 U	36 D	22	21 D	29,000 U	28,000 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Ethylbenzene	700	700	23	8 U	4,300 D	1,500	1 U	1 U	1 U	4,200	4,000
M,P-Xylene	NL	NL	12	7 U	4,800	270	2 U	2 U	2 U	7,600	6,400
Methylene chloride	5	5	2 U	2 U	390 U	270 U	2 U	2 U	2 U	11,000 U	12,000 U
O-Xylene	NL	NA	4	2	2,000	180	1 U	1 U	1 U	2,500 U	2,500 U
Styrene	100	100	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Tetrachloroethene	5	5	3	1 U	210	120 U	1 U	1 U	1 U	12,000	14,000
Tetrahydrofuran	NL	NA	10 U	10 U	5,600 JD	500 J	10 U	10 U	10 U	25,000 U	25,000 U
Toluene	1000	1000	18	1 U	13,000 D	1,000 U	5	4	1 U	160,000 D	240,000 D
trans-1,2-Dichloroethene	100	100	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	100 U	120 U	1 U	1 U	1 U	2,500 U	2,500 U
Trichloroethene	5	5	12 U	1 U	1,000	120 U	1 U	1 U	1 U	41,000 U	40,000 U
Vinyl chloride	2	2	42 EJ	1 U	100 U	120 U	6	4	1 U	2,500 U	2,500 U
Xylenes, Total	530	10000	16	9 U	6,800	540	2 U	2 U	2 U	10,000	8,900
Total Volatile Organics			867	20	86,960	2,940	214	162	150	358,400	470,700
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	28,000	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	12,000	1,000 U	1,000 U	1,000 U	1,000 U	9,700	7,800
Total Alcohols	NL	NA	ND	ND	40,000	ND	ND	ND	ND	9,700	7,800

See Notes c ıe 27.

LOCATION	CRITERIA		P-5A	P-5A (L)	P-5B	P-5B (L)	P-6	P-7	P-8A	P-8B	P-10
CLIENT ID			G152	G151	G154	G153	G116	G060	G114	G115	G040
SAMPLE DATE			12/13/96	12/13/96	12/13/96	12/13/96	12/10/96	12/3/96	12/10/96	12/10/96	11/22/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	R	S	S	R	S	DR		M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1,000 U	8,800	55 D	100 D	19	1 U	9 J	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
1,1,2-Trichloroethane	5	5	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
1,1-Dichloroethane	70	NA	1,000 U	1,000 U	1 U	1 U	26 U	1 U	1 UJ	1 U	1 U
1,1-Dichloroethene	7	7	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1,000 U	1,000 U	1 U	1 U	5 U	1 U	R	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
1,2-Dichlorobenzene	600	600	1,000 U	1,000 U	1 U	1 U	5	1 U	1 UJ	1 U	1 U
1,2-Dichloroethane	1	5	1,000 U	1,000 U	1 U	1 U	8	1 U	1 UJ	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	70,000 D	37,000 D	33 D	7 U	10 U	2 U	R	2 U	2 U
1,2-Dichloropropane	5	5	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
1,3-Dichlorobenzene	600	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
1,4-Dichlorobenzene	75	75	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
2-Butanone	400	NA	5,000 U	5,000 U	5 U	5 U	7,300 D	5 U	5 UJ	5 U	16 U
2-Hexanone	NL	NA	5,000 U	5,000 U	5 U	5 U	25 U	5 U	5 UJ	5 U	5 U
4-Methyl-2-pentanone	350	NA	5,000 U	5,000 U	5 U	5 U	9,200 D	5 U	5 UJ	5 U	5 U
Acetone	700	NA	12,000 U	8,400 U	9 U	8 U	12,000 D	5 U	5 UJ	5 U	6 U
Benzene	1	5	1,000 U	1,000 U	1 U	1 U	170 EJ	1 U	1 UJ	1 U	1 U
Bromochloromethane	NL	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Bromodichloromethane	NL	80	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Bromoform	4	80	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Bromomethane	NL	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Carbon disulfide	NL	NA	1,000 U	1,000 U	1	1 U	5 U	1 U	1 UJ	1 U	1 U
Carbon tetrachloride	5	5	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Chlorobenzene	100	100	1,000 U	1,000 U	1 U	1 U	44	1 U	1 UJ	1 U	1 U
Chlorodibromomethane	0.5	80	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Chloroethane	NL	NA	1,000 U	1,000 U	2	1 U	830 JD	1 U	1 UJ	1 U	1 U
Chloroform	6	80	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Chloromethane	NL	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
cis-1,2-Dichloroethene	70	70	64,000 D	36,000 D	29 D	8 U	11 U	1 U	2 UJ	1 U	1 U
cis-1,3-Dichloropropene	NL	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Ethylbenzene	700	700	7,800	3,400	15	4	6,300 D	1 U	1 UJ	1 U	1 U
M,P-Xylene	NL	NL	9,900	4,500	23	8	2,900 D	2 U	R	2 U	2 U
Methylene chloride	5	5	2,000 U	2,000 U	4 U	4 U	34 U	2 U	2 UJ	2 U	2 U
O-Xylene	NL	NA	3,500	1,000 U	6	2	1,300 EJ	1 U	R	1 U	1 U
Styrene	100	100	1,000 U	1,000 U	1 U	1 U	49	1 U	1 UJ	1 U	1 U
Tetrachloroethene	5	5	1,000 U	1,000 U	7	6	5 U	1 U	1 UJ	1 U	1 U
Tetrahydrofuran	NL	NA	10,000 U	10,000 U	10 U	10 U	5,800 JD	10 U	10 UJ	10 U	10 U
Toluene	1000	1000	23,000	25,000	84 D	110 D	13,000 D	1 U	1 UJ	1 U	1 U
trans-1,2-Dichloroethene	100	100	1,000 U	1,000 U	1 U	1 U	10	1 U	1 UJ	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1,000 U	1,000 U	1 U	1 U	5 U	1 U	1 UJ	1 U	1 U
Trichloroethene	5	5	1,000 U	2,700 U	14 U	14 U	7 U	1 U	1 UJ	1 U	2 U
Vinyl chloride	2	2	22,000	10,000	10	1	12	1 U	1 UJ	1 U	1 U
Xylenes, Total	530	10000	14,000	6,600	20 D	10	4,500 D	2 U	2 UJ	2 U	2 U
Total Volatile Organics			130,200	90,800	232	231	58,947	ND	9	ND	ND
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	3,600	1,600	1,000 U	1,000 U	9,400	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	9,500	3,400	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	19,000	9,500	1,000 U	1,000 U	2,600	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	32,100	14,500	ND	ND	12,000	ND	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		P-11A	P-11B	P-11B (D)	P-12	P-12A	P-13	P-14	P-15	P-16
CLIENT ID			G107	G073	G074	G041	G042	G021	G180	G070	G138
SAMPLE DATE			12/10/96	12/4/96	12/4/96	11/22/96	11/22/96	11/20/96	12/18/96	12/4/96	12/12/96
SCREEN	Connecticut GA/GAA	US EPA MCLs	R	S	S	S	R	S	R	R	S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	1,900
1,1,2,2-Tetrachloroethane	0.5	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,1,2-Trichloroethane	5	5	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,1-Dichloroethane	70	NA	5 U	2 U	1 U	1 U	1 U	14	7 U	1 UJ	3,000 D
1,1-Dichloroethene	7	7	5 U	2 U	1 U	1 U	1 U	2 U	7 U	1 UJ	100 U
1,2-Dibromo-3-chloropropane	NL	0.2	5 U	2 U	1 U	1 U	1 U	1 U	7 U	R	100 U
1,2-Dibromoethane	0.05	0.05	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,2-Dichlorobenzene	600	600	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,2-Dichloroethane	1	5	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,2-Dichloroethene, Total	NL	NA	27 EJ	4 U	2	2 U	9	10	13 U	R	14,000 D
1,2-Dichloropropane	5	5	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,3-Dichlorobenzene	600	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
1,4-Dichlorobenzene	75	75	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
2-Butanone	400	NA	25 U	10 U	5 U	20 U	5 U	5 U	33 U	5 UJ	500 U
2-Hexanone	NL	NA	25 U	10 U	5 U	5 U	5 U	5 U	33 U	5 UJ	500 U
4-Methyl-2-pentanone	350	NA	25 U	10 U	5 U	5 U	5 U	5 U	33 U	5 UJ	500 U
Acetone	700	NA	25 U	10 U	5 U	7 U	5 U	5 U	60 U	190 DJ	500 U
Benzene	1	5	20	40	58 D	1 U	1 U	1 U	32	1 UJ	100 U
Bromochloromethane	NL	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Bromodichloromethane	NL	80	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Bromoform	4	80	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Bromomethane	NL	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Carbon disulfide	NL	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Carbon tetrachloride	5	5	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Chlorobenzene	100	100	5 U	14	23	1 U	1 U	1 U	10	1 UJ	100 U
Chlorodibromomethane	0.5	80	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Chloroethane	NL	NA	17	94 D	98 D	1 U	1 U	1 U	41	1 UJ	1,100
Chloroform	6	80	5 U	2 U	1 U	1 U	1 U	1 U	13 U	1 UJ	100 U
Chloromethane	NL	NA	5 U	2 U	6	1 U	1 U	1 U	7 U	1 UJ	100 U
cis-1,2-Dichloroethene	70	70	27	2 U	1 U	1 U	8	11	7 U	1 UJ	13,000 D
cis-1,3-Dichloropropene	NL	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Ethylbenzene	700	700	390 D	2 U	1 U	1 U	1 U	1 U	55	1 UJ	4,200 D
M,P-Xylene	NL	NL	180 D	66	60 D	2 U	2 U	2 U	40	R	5,600 D
Methylene chloride	5	5	10 U	6	4	1 U	2 U	7 U	13 U	2 UJ	410 U
O-Xylene	NL	NA	52 D	2 U	1 U	1 U	1 U	1 U	11	R	1,800
Styrene	100	100	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Tetrachloroethene	5	5	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Tetrahydrofuran	NL	NA	630 D	1,200 D	1,100 D	10 U	10 U	10 U	530	10 UJ	1,000 U
Toluene	1000	1000	9 U	2 U	1 U	1 U	1 U	1 U	35	1 UJ	7,800 DB
trans-1,2-Dichloroethene	100	100	5 U	2 U	1	1 U	1 U	1 U	7 U	1 UJ	100 U
trans-1,3-Dichloropropene	0.5	NA	5 U	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	100 U
Trichloroethene	5	5	5 U	2 U	1	2 U	2 U	4 U	11	3 J	100 U
Vinyl chloride	2	2	56 D	2 U	1 U	1 U	1 U	1 U	7 U	1 UJ	1,400
Xylenes, Total	530	10000	260 D	65	60 D	2 U	2 U	2 U	52	2 UJ	7,600 D
Total Volatile Organics			1,372	1,420	1,351	ND	8	25	765	193	39,800
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	5,500
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	5,500

See Notes o· ·e 27.

LOCATION CLIENT ID SAMPLE DATE SCREEN	CRITERIA Connecticut GA/GAA	CRITERIA US EPA MCLs	P-101A G109 12/10/96 R	P-101B G186 12/19/96 M	P-101C G108 12/10/96 S	P-102A G072 12/4/96 R	P-102B G094 12/6/96 M	P-102C G071 12/4/96 S	PZO-7 G139 12/12/96 D	PZR-7 G140 12/12/96 R	RW-1 G225 12/26/96 M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	250 U	1 U	1 U	39 EJ	1 U	35	1 U	50 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,1,2-Trichloroethane	5	5	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,1-Dichloroethane	70	NA	5 U	250 U	1 U	1 U	90 EJ	1 U	14	1 U	580
1,1-Dichloroethene	7	7	1 U	250 U	1 U	1 U	14	1 U	1 U	1 U	50 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,2-Dibromoethane	0.05	0.05	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,2-Dichlorobenzene	600	600	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,2-Dichloroethane	1	5	3	250 U	1 U	1 U	6	1 U	1 U	1 U	50 U
1,2-Dichloroethene, Total	NL	NA	3 U	500 U	3 U	14	1,300 D	2 U	15	2 U	330 U
1,2-Dichloropropane	5	5	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,3-Dichlorobenzene	600	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
1,4-Dichlorobenzene	75	75	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
2-Butanone	400	NA	5 U	1,200 U	5 U	5 U	5 U	5 U	5 U	5 U	250 U
2-Hexanone	NL	NA	5 U	1,200 U	5 U	5 U	5 U	5 U	5 U	5 U	250 U
4-Methyl-2-pentanone	350	NA	19 U	1,200 U	5 U	5 U	5 U	5 U	5 U	5 U	250 U
Acetone	700	NA	5 U	1,200 U	5 U	5 U	5 U	5 U	5 U	5 U	250 U
Benzene	1	5	33 U	250 U	20 D	1 U	5	1 U	1 U	1 U	50 U
Bromochloromethane	NL	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Bromodichloromethane	NL	80	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Bromoform	4	80	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Bromomethane	NL	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Carbon disulfide	NL	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Carbon tetrachloride	5	5	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chlorobenzene	100	100	17	250 U	9	1 U	1 U	1 U	1 U	1 U	50 U
Chlorodibromomethane	0.5	80	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chloroethane	NL	NA	330 D	1,300	95 D	1 U	20	1 U	1 U	1 U	2,500 D
Chloroform	6	80	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Chloromethane	NL	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
cis-1,2-Dichloroethene	70	70	2 U	250 U	1 U	14	1,300 D	1 U	16	1 U	320 U
cis-1,3-Dichloropropene	NL	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Ethylbenzene	700	700	670 D	5,400	5 U	2	1 U	1 U	83 D	1 U	820
M,P-Xylene	NL	NL	640 D	3,000	5 U	2 U	2 U	2 U	140 D	2 U	210
Methylene chloride	5	5	4 U	500 U	2 U	2 U	2 U	2 U	2 U	2 U	120 U
O-Xylene	NL	NA	120 D	880	1 U	1 U	1	1 U	36 D	1 U	72
Styrene	100	100	1 U	250 U	1 U	1 U	1 U	1 U	2	1 U	50 U
Tetrachloroethene	5	5	1 U	250 U	1 U	1	15	1 U	6	1 U	50 U
Tetrahydrofuran	NL	NA	1,400 D	2,500 U	110 D	10 U	540 EJ	10 U	10 U	10 U	500 U
Toluene	1000	1000	33 U	11,000 D	1 U	1 U	1 U	1 U	43 D	1 U	870
trans-1,2-Dichloroethene	100	100	1 U	250 U	1	1 U	4	1 U	1 U	1 U	50 U
trans-1,3-Dichloropropene	0.5	NA	1 U	250 U	1 U	1 U	1 U	1 U	1 U	1 U	50 U
Trichloroethene	5	5	1 U	250 U	1 U	16 D	300 D	1 U	3 U	1 U	50 U
Vinyl chloride	2	2	4	250 U	1	16	640 D	1 U	1	1 U	460
Xylenes, Total	530	10000	810 D	4,000	6 U	2 U	2 U	2 U	180 D	2 U	320
Total Volatile Organics			3,184	21,580	236	49	2,974	ND	376	ND	5,512
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		RW-2	RW-3	RW-4	RW-4 (D)	RW-5	RW-6	RW-7	RW-7 (D)	RW-8
CLIENT ID			G231	G233	G235	G236	G238	G237	G223	G224	G229
SAMPLE DATE	Connecticut GA/GAA	US EPA MCLs	12/27/96	12/27/96	12/27/96	12/27/96	12/27/96	12/27/96	12/26/96	12/26/96	12/27/96
SCREEN				D	M	M	M	M	M	M	M
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	3,600 U	4,900 U	5,000 U	5,000 U	2,500 U	18,000 U	20 U	35	1,400 U
1,1,2,2-Tetrachloroethane	0.5	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,1,2-Trichloroethane	5	5	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,1-Dichloroethane	70	NA	2,500	950 J	5,000 U	5,000 U	2,500 U	6,300	42 U	120 D	2,600
1,1-Dichloroethene	7	7	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,2-Dibromo-3-chloropropane	NL	0.2	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,2-Dibromoethane	0.05	0.05	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,2-Dichlorobenzene	600	600	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,2-Dichloroethane	1	5	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,2-Dichloroethene, Total	NL	NA	18,000 U	13,000 U	82,000 U	80,000 U	8,900 U	86,000 U	31 U	30 U	1,000 U
1,2-Dichloropropane	5	5	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,3-Dichlorobenzene	600	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
1,4-Dichlorobenzene	75	75	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
2-Butanone	400	NA	5,000 U	5,000 U	25,000 U	25,000 U	12,000 U	25,000 U	100 U	25 U	2,500 U
2-Hexanone	NL	NA	5,000 U	5,000 U	25,000 U	25,000 U	12,000 U	25,000 U	100 U	25 U	2,500 U
4-Methyl-2-pentanone	350	NA	5,000 U	5,000 U	25,000 U	25,000 U	12,000 U	25,000 U	100 U	25 U	2,500 U
Acetone	700	NA	5,000 U	5,000 U	25,000 U	25,000 U	12,000 U	25,000 U	100 U	25 U	2,500 U
Benzene	1	5	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Bromochloromethane	NL	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Bromodichloromethane	NL	80	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Bromoform	4	80	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Bromomethane	NL	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Carbon disulfide	NL	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Carbon tetrachloride	5	5	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Chlorobenzene	100	100	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Chlorodibromomethane	0.5	80	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Chloroethane	NL	NA	4,400	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	100	460 DEJ	1,100
Chloroform	6	80	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Chloromethane	NL	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	20 U	500 U
cis-1,2-Dichloroethene	70	70	16,000 U	12,000 U	88,000 U	84,000 U	9,600 U	92,000 U	20 U	25 U	3900 U
cis-1,3-Dichloropropene	NL	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Ethylbenzene	700	700	4,900 U	1,500 U	5,000 U	5,700 U	2,600 U	5,500 U	20 U	53	2300 U
M,P-Xylene	NL	NL	2,700 U	2,200 U	10,000 U	10,000 U	5,700 U	10,000 U	40 U	10	1000 U
Methylene chloride	5	5	2,000 U	2,000 U	13,000 U	12,000 U	5,400 U	18,000 U	40 U	7 U	1000 U
O-Xylene	NL	NA	920 J	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Styrene	100	100	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Tetrachloroethene	5	5	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	8	500 U
Tetrahydrofuran	NL	NA	10,000 U	10,000 U	50,000 U	50,000 U	25,000 U	50,000 U	200 U	50 U	5000 U
Toluene	1000	1000	19,000 U	8,400 U	13,000 U	18,000 U	6,600 U	29,000 U	20 U	5 U	6200 U
trans-1,2-Dichloroethene	100	100	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
trans-1,3-Dichloropropene	0.5	NA	1,000 U	1,000 U	5,000 U	5,000 U	2,500 U	5,000 U	20 U	5 U	500 U
Trichloroethene	5	5	1,000 U	1,000 U	5,000 U	5,000 U	15,000 U	5,000 U	20 U	19	500 U
Vinyl chloride	2	2	2,900 U	1,300 U	11,000 U	8,900 U	2,500 U	5,000 U	20 U	28	1300 U
Xylenes, Total	530	10000	3,900 U	2,800 U	10,000 U	10,000 U	5,600 U	10,000 U	40 U	19	500 U
Total Volatile Organics			7,820	950	ND	ND	ND	6,300	100	723	3,700
ALCOHOLS											
Ethanol	NL	NA	1,800	1,000 U	1,000 U	1,000 U	1,000 U	1,200	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	2,400	1,000 U	1,000 U	1,000 U	1,000 U	7,400	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,600	1,000 U	3,000	3,100	1,000 U	4,200	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	7,000	3,900	12,000	13,000	3,300	33,000	1,000 U	1,000 U	1,400
Total Alcohols	NL	NA	12,800	3,900	15,000	16,100	3,300	45,800	ND	ND	1,400

See Notes ıe 27.

S. .E SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		RW-9	RW-10	RW-11	RW-12	SRS-1	SRS-3	SRS-4	SRS-5	SRS-6
CLIENT ID			G230	G232	G234	G228	G130	G123	G117	G126	G127
SAMPLE DATE	Connecticut GA/GAA	US EPA MCLs	12/27/96	12/27/96	12/27/96	12/26/96	12/11/96	12/11/96	12/10/96	12/11/96	12/11/96
SCREEN			M	M	M	M	D	D	S	M	D
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	12,000 U	5,000 U	510 EJ	200 U	1 U	7 U	1 U	1 U	50 U
1,1,2,2-Tetrachloroethane	0.5	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,1,2-Trichloroethane	5	5	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,1-Dichloroethane	70	NA	13,000	8,800	510 EJ	730	110	60 D	1 U	1 U	50 U
1,1-Dichloroethene	7	7	2,500 U	5,000 U	21	200 U	1 U	1 U	1 U	1 U	50 U
1,2-Dibromo-3-chloropropane	NL	0.2	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,2-Dibromoethane	0.05	0.05	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,2-Dichlorobenzene	600	600	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,2-Dichloroethane	1	5	2,500 U	5,000 U	21	200 U	1 U	1	1 U	1 U	50 U
1,2-Dichloroethene, Total	NL	NA	43,000 U	70,000 U	4,200 D	730 U	16	7	2 U	2 U	100 U
1,2-Dichloropropane	5	5	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,3-Dichlorobenzene	600	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
1,4-Dichlorobenzene	75	75	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
2-Butanone	400	NA	12,000 U	25,000 U	50 U	1,000 U	50	5 U	5 U	5 U	1,100
2-Hexanone	NL	NA	12,000 U	25,000 U	50 U	1,000 U	5 U	5 U	5 U	5 U	250 U
4-Methyl-2-pentanone	350	NA	12,000 U	25,000 U	50 U	1,000 U	5 U	5 U	5 U	130 U	250 U
Acetone	700	NA	12,000 U	25,000 U	50 U	1,000 U	12 U	5 U	8 U	18 U	250 U
Benzene	1	5	2,500 U	5,000 U	27	200 U	2	2	1 U	68 D	76
Bromochloromethane	NL	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Bromodichloromethane	NL	80	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Bromoform	4	80	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Bromomethane	NL	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Carbon disulfide	NL	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	2	50 U
Carbon tetrachloride	5	5	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Chlorobenzene	100	100	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	17	50 U
Chlorodibromomethane	0.5	80	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Chloroethane	NL	NA	2,800	5,000 U	320 EJ	1,800	140	56 D	1 U	310 D	560
Chloroform	6	80	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Chloromethane	NL	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
cis-1,2-Dichloroethene	70	70	40,000 U	64,000 U	3,800 D	350 U	17	6	1 U	1 U	50 U
cis-1,3-Dichloropropene	NL	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Ethylbenzene	700	700	8,400	5,000 U	810 EJ	570	74	4 U	1 U	750 D	1,300 D
M,P-Xylene	NL	NL	3,600 J	10,000 U	1,100 D	400 U	57	2 U	2 U	490 D	750
Methylene chloride	5	5	5,000 U	10,000 U	20 U	400 U	2 U	2 U	2 U	5 U	100 U
O-Xylene	NL	NA	2,500 U	5,000 U	250 EJ	200 U	20	1 U	1 U	190 D	170
Styrene	100	100	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Tetrachloroethene	5	5	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Tetrahydrofuran	NL	NA	25,000 U	50,000 U	200	2000 U	10 U	69 U	10 U	2,300 D	2,100
Toluene	1000	1000	30,000 U	31,000 U	2,700 D	2,300	260 EJ	6 U	1 U	270 D	79 U
trans-1,2-Dichloroethene	100	100	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
trans-1,3-Dichloropropene	0.5	NA	2,500 U	5,000 U	10 U	200 U	1 U	1 U	1 U	1 U	50 U
Trichloroethene	5	5	2,500 U	8,100 U	18 U	200 U	1 U	1 U	1 U	1 U	50 U
Vinyl chloride	2	2	5,800 U	13,000 U	3,100 D	510 U	31	2	1 U	1	50 U
Xylenes, Total	530	10000	6,200	10,000 U	1,300 D	550	78	4 U	2 U	710 D	950
Total Volatile Organics			27,800	8,800	13,369	5,400	761	127	ND	4,398	6,056
ALCOHOLS											
Ethanol	NL	NA	1,600	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	3,300	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	2,400	4,100	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	14,000	20,000	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	18,000	27,400	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		SW-A	SW-A	SW-B	SW-B	SW-C	SW-C	SW-D	SW-D	SW-E
CLIENT ID			G243	G274	G244	G275	G245	G276	G246	G277	G247
SAMPLE DATE	Connecticut GA/GAA	US EPA MCLs	12/30/96	7/8/97	12/30/96	7/8/97	12/30/96	7/8/97	12/30/96	7/8/97	12/30/96
SCREEN			SW	SW	SW	SW	SW	SW	SW	SW	SW
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	NL	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	700	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	6	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	3 U
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene chloride	5	5	2 U	2 U	2 U	1 U	2 U	2 U	2 U	2 U	2 U
O-Xylene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1000	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	1 U	2U	1 U	2 U	1 U	1 U	1 U	2 U	1 U
Vinyl chloride	2	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	530	10000	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Total Volatile Organics			ND	ND	ND	ND	ND	ND	ND	ND	ND
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes ' 'e 27.

LOCATION	CRITERIA		SW-E (D)	SW-E	SW-F	SW-F	SW-F (D)	SW-G	SW-G	TW-01	TW-02
CLIENT ID			G248	G278	G249	G280	G279	G250	G281	G008	G009
SAMPLE DATE	Connecticut	US EPA	12/30/96	7/8/97	12/30/96	7/8/97	7/8/97	12/30/96	7/8/97	11/19/96	11/19/96
SCREEN	GA/GAA	MCLs	SW	SW	SW	SW	SW	SW	SW	S	S
VOLATILE ORGANIC COMPOUNDS											
1,1,1-Trichloroethane	200	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	NA	1 U	2	1 U	6	5	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethene, Total	NL	NA	2 U	2	4 U	5	5	2 U	2 U	9	22
1,2-Dichloropropane	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone	400	NA	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Hexanone	NL	NA	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	350	NA	5 U	1 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	700	NA	5 U	6	5 U	5 U	5 U	5 U	7	5 U	5 U
Benzene	1	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromochloromethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NL	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	4	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon disulfide	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon tetrachloride	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform	6	80	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane	NL	NA	1 U	1 U	1 U	3	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	70	2 U	2	4 U	5	5	1 U	1 U	8	21
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Ethylbenzene	700	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
M,P-Xylene	NL	NL	2 U	1 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Methylene chloride	5	5	2 U	1 U	1 U	2 U	2 U	1 U	1 U	2 U	2 U
O-Xylene	NL	NA	1 U	1 U	1 U	1 U	1 U	2 U	1 U	1 U	1 U
Styrene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Tetrachloroethene	5	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	13	30 D
Tetrahydrofuran	NL	NA	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Toluene	1000	1000	1 U	1 U	2 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	5	1 U	2 U	0.9 J	2 U	1 U	1 U	2 U	2	8 U
Vinyl chloride	2	2	1 U	1 U	1	1 U	1 U	1 U	1 U	1 U	1 U
Xylenes, Total	530	10000	2 U	1 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Total Volatile Organics			ND	10	1.9	14	10	ND	7	23	51
ALCOHOLS											
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 27.

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION REPORT
GROUNDWATER VOCS AND ALCOHOLS ANALYTICAL RESULTS

LOCATION	CRITERIA		TW-03	TW-04	TW-05	TW-07A	TW-08A	TW-12	WE-1	WE-2
CLIENT ID			G080	G010	G101	G118	G164	G054	G048	G049
SAMPLE DATE	Connecticut	US EPA	12/5/96	11/19/96	12/9/96	12/10/96	12/16/96	12/3/96	12/2/96	12/2/96
SCREEN	GA/GAA	MCLs	S	S	S	M	M	M	R	S
VOLATILE ORGANIC COMPOUNDS										
1,1,1-Trichloroethane	200	200	4	1 U	1 U	50 U	7,100 EJ	1 U	1 U	2 J
1,1,2,2-Tetrachloroethane	0.5	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,1,2-Trichloroethane	5	5	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,1-Dichloroethane	70	NA	1 U	1	3	50 U	1,600	1 U	1 U	1 UJ
1,1-Dichloroethene	7	7	1 U	1 U	2	50 U	340	1 U	1 U	1 UJ
1,2-Dibromo-3-chloropropane	NL	0.2	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,2-Dibromoethane	0.05	0.05	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,2-Dichlorobenzene	600	600	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,2-Dichloroethane	1	5	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,2-Dichloroethene, Total	NL	NA	14	19	220 D	100 U	120,000 D	2 U	2 U	R
1,2-Dichloropropane	5	5	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,3-Dichlorobenzene	600	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
1,4-Dichlorobenzene	75	75	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
2-Butanone	400	NA	5 U	5 U	5 U	250 U	5,300 U	5 U	28 U	5 UJ
2-Hexanone	NL	NA	5 U	5 U	5 U	250 U	1,200 U	5 U	5 U	5 UJ
4-Methyl-2-pentanone	350	NA	5 U	5 U	5 U	250 U	1,200 U	5 U	5 U	5 UJ
Acetone	700	NA	5 U	5 U	5 U	250 U	5,200 U	5 U	10 U	7 UJ
Benzene	1	5	1 U	1 U	1	140	250 U	1 U	1 U	1 UJ
Bromochloromethane	NL	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Bromodichloromethane	NL	80	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Bromoform	4	80	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Bromomethane	NL	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Carbon disulfide	NL	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Carbon tetrachloride	5	5	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Chlorobenzene	100	100	1 U	1 U	1 U	52	250 U	1 U	1 U	1 UJ
Chlorodibromomethane	0.5	80	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Chloroethane	NL	NA	1 U	1 U	1 U	690	250 U	1 U	1 U	1 UJ
Chloroform	6	80	1 U	1 U	2	50 U	250 U	1 U	1 U	1 UJ
Chloromethane	NL	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
cis-1,2-Dichloroethene	70	70	14	20	220 D	50 U	120,000 D	1 U	1 U	38 DJ
cis-1,3-Dichloropropene	NL	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Ethylbenzene	700	700	1 U	1 U	1 U	2,300 D	1,600	1 U	1 U	1 UJ
M,P-Xylene	NL	NL	2 U	2 U	2 U	1,900 D	2,500	2 U	2 U	R
Methylene chloride	5	5	2 U	2 U	2 U	50 U	1,800 U	2 U	2 U	2 UJ
O-Xylene	NL	NA	1 U	1 U	1 U	600 D	780	1 U	1 U	R
Styrene	100	100	1 U	1 U	1 U	49 J	250 U	1 U	1 U	1 UJ
Tetrachloroethene	5	5	24	23 D	150 D	50 U	250 U	1 U	1 U	1 UJ
Tetrahydrofuran	NL	NA	10 U	10 U	10 U	3,400	2,500 U	10 U	10 U	10 UJ
Toluene	1000	1000	1 U	1 U	1 U	640	10,000 B	1 U	1 U	1 UJ
trans-1,2-Dichloroethene	100	100	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
trans-1,3-Dichloropropene	0.5	NA	1 U	1 U	1 U	50 U	250 U	1 U	1 U	1 UJ
Trichloroethene	5	5	4	4	37 D	50 U	250 U	1 U	1 U	8 UJ
Vinyl chloride	2	2	1 U	1 U	30 D	50 U	300	1 U	1 U	1 UJ
Xylenes, Total	530	10000	2 U	2 U	2 U	2,500 D	3,400	2 U	2 U	2 UJ
Total Volatile Organics			46	48	445	9,771	144,220	ND	ND	38
ALCOHOLS										
Ethanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U
Isopropanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	2,600	1,000 U	1,000 U	1,000 U
Methanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	3,100	1,000 U	1,000 U	1,000 U
Sec-Butanol	NL	NA	1,000 U	1,000 U	1,000 U	1,000 U	37,000	1,000 U	1,000 U	1,000 U
Total Alcohols	NL	NA	ND	ND	ND	ND	42,700	ND	ND	ND

Se· s on Page 27.

Notes:
All concentrations in micrograms/liter (ug/L); equivalent to parts per billion (ppb).
Samples MW-129, MW-201B, MW-203A, MW-205B, MW-209B, MWL-302, P-8A, P-15, and WE-2 have been validated. All other samples have been blank corrected.
(D) = Duplicate Sample.
(L) = Low-flow sample procedures.
Screen Interval:
- S = Shallow overburden
- M = Middle overburden
- D = Deep overburden
- R = Shallow rock
- DR = Deep rock

Organic Data Qualifiers:
B = The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
D = Concentration is based on a diluted sample analysis.
E = The compound was quantitated above the calibration range.
J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
U = The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
UJ = The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

Criteria:
NA = Not available.
NL = Not listed.

Laboratory Data
Blank Correction Reports

LABORATORY DATA QUALITY REVIEW
SRSNE SITE -- SOUTHINGTON, CONNECTICUT

COMPREHENSIVE GROUND-WATER AND SURFACE-WATER SAMPLING EVENT
NOVEMBER 1996 - FEBRUARY 1997

Upon inspection of the ground-water and surface-water analytical data received from Galson Laboratories, Inc., for the SRSNE Site Remedial Investigation, a number of GC/MS volatile target compounds were observed in the rinse blanks and trip blanks associated with the 264 samples collected between November 20, 1996 and February 7, 1997. In response to the observed blank contamination, a general review of the data quality was conducted to assess the impact of the blank contamination on the data usability and to determine if any additional data quality issues exist which might indicate the need for full data validation. In addition to rinse and trip blanks, method blanks, surrogate recoveries, matrix spike and matrix spike duplicate (MS/MSD) recoveries and matrix spike blank (MSB) recoveries were examined for deviations which might indicate systemic problems.

An expected number of deviations were observed in the surrogates, MS/MSDs and MSBs, with no indications of a systemic problem. Inspection of the method blanks revealed a pattern of contamination similar to that observed in the rinse and trip blanks. Based upon the results of this inspection, it was determined that a complete data validation was not required, but that the data should be corrected for blank contamination.

The blank correction procedure was consistent with the USEPA Contract Laboratory Program - National Functional Guidelines for Organic Data Review (2/94). This procedure calls for the identification of the contamination in the method, trip and rinse blanks, and the qualification of these constituents in the associated samples when their concentrations are comparable. For common laboratory solvents, such as methylene chloride, acetone, and 2-butanone, any concentration in an associated sample that is within 10 times the blank concentration will be considered contamination and the data qualified as undetected (U). For other target compounds, any concentration in an associated sample that is within five times the blank concentration is deemed contamination and the data qualified as undetected (U). Sample data in exceedence of these rules have been deemed site related. Additionally, if a target compound has been observed to be routinely present in many of the method blanks, but not specifically in the method blank associated with a

specific sample, its data has still been qualified as undetected (U) when of a comparable concentration.

Acetone, methylene chloride, and 2-butanone were the primary contaminants observed in many of the samples and blanks. Additionally, compounds such as chloromethane, trichloroethene, and toluene, among others, were detected in many samples and blanks at comparable concentrations. The common laboratory solvents, like methylene chloride and acetone, are most likely airborne contaminants, while the less common solvents and chlorinated hydrocarbons were probably the result of cross contamination, either in the laboratory during sample preparation, or as a result of storage adjacent to a sample containing very high levels of these compounds.

The corrected analytical results are tabulated and the hand-corrected laboratory reporting forms (Form I) are included in this appendix to the RI Report. For samples requiring dilution, the original reporting forms are presented with the results and "E" qualifier crossed out, and the corresponding results from the dilution are circled in ink. If the sample was over-diluted and no analytes were detected in the dilution, the original data is used, but qualified as estimated (J).

MEMORANDUM

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

To: Mike Gefell **Date:** 07/30/97

From: Anthony Zoccolillo **cc:**

Re: SRS - July 97 sampling

Attached are the corrected Form Is for the GC/MS volatiles analyses of the July 1997 surface-water sampling of the SRS site (SDG# L37879). Due to the presence of low level contaminants in the method blanks, trip blank and equipment blank, the results have been blank corrected based on the procedure specified in the USEPA Contract Laboratory Program National Functional Guidelines For Organic Data Review (2/94).

Methylene chloride was detected in the method blanks (VBLK1 and VBLK2) and in most of the other samples at concentrations near the detection limit. All methylene chloride detections were qualified as undetected at the concentration reported on the Form I.

Toluene was originally detected in the trip blank (G284) but was not detected in the reanalysis of the trip blank (G284RE). This suggests that either: 1) one of the trip blank's sample vials was contaminated and the second vial was not; or 2) the laboratory's sampling sparger was contaminated on the initial analysis. Since the trip blank sample vials were certified pre-cleaned by the manufacturer and filled by the laboratory, it is unlikely one vial was contaminated and not the second. The most likely source of contamination is from the instrument sample sparge glassware. As a result, the toluene data for all samples except the equipment blank (G273) have been qualified as undetected. The equipment blank contained toluene at a concentration more than ten times greater than the trip blank. Only toluene data within that range is assumed to be contamination. If the toluene present in the trip blank and samples is a result of instrument contamination, then the toluene present in the equipment blank is also suspect, though not qualified as undetected based on the validation rules.

Trichloroethene was detected in the equipment blank and in many of the samples at a comparable concentration. All trichloroethene data have been qualified as undetected in all the samples except sample G283. This sample was not collected using the same sampling equipment that the equipment blank was taken from. Rather, sample G283 was collected directly into the sample vials by immersing the sample vials in surface water. Thus, there is no basis for qualifying the trichloroethene data for this sample.

AJZ/ajz

Tier III
Data Validation Report

DATA REVIEW FOR

SRSNE SITE

VOLATILE ANALYSES

Analyses performed by:

Galson Laboratories
East Syracuse, New York

Review performed by:

BBL
BLASLAND, BOUCK & LEE, INC
engineers & scientists

Blasland, Bouck & Lee, Inc.
Syracuse, New York

Summary

The following is an assessment of the data for select samples from the November-December 1997 sampling at the SRSNE Site. Included with this assessment are the data review check sheets used in the review of the data and the corrected sample results. The following select samples were reviewed:

Sample ID	Lab ID	Matrix	Sample Date	Analysis			
				VOA	BNA	PCB	TAL
G026	L33882-2	water	11/21/97	x			
G034	L33883-5	water	--	x			
G036	L33916-2	water	11/22/97	x			
G045	L33916-13	water	--	x			
G047	L33916-15	water	11/22/97	x			
G049	L34050-2	water	12/2/97	x			
G053	L34050-5	water	--	x			
G057	L34079-4	water	12/3/97	x			
G065	L34079-14	water	--	x			
G066	L34079-15	water	12/3/97	x			
G069	L34098-3	water	12/4/97	x			
G070	L34098-4	water	12/4/97	x			
G075	L34110-4	water	--	x			
G077	L34135-2	water	--	x			
G085	L34135-12	water	12/5/97	x			
G087	L34135-14	water	12/5/97	x			
G114	L34283-1	water	12/10/97	x			
G121	L34283-4	water	12/10/97	x			
G187	L34497-3	water	12/19/97	x			
G192	L34497-8	water	12/19/97	x			

VOLATILE ANALYSES

Introduction

Analyses were performed according to USEPA SOW 10/92, "Superfund Analytical Methods for Low Concentration Water for Organic Analysis".

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with National Functional Guidelines:

- U The compound was analyzed for but not detected. The associated value is the compound quantitation limit.
- J The compound was positively identified; however, the associated numerical value is an estimated concentration only.
- B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
- JN The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification. The associated numerical value is an estimated concentration only.
- E The compound was quantitated above the calibration range.
- D Concentration is based on a diluted sample analysis.
- UJ The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.
- R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant QC problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

Data Assessment

1. Holding Time

The method specified holding time for volatile analyses under SOW 10/92 is 10 days from sample receipt. The technical holding time for preserved waters is 14 days from sample collection.

All samples were analyzed within the specified holding times.

2. Blank Contamination

Quality assurance blanks (i.e., method, trip, field, and rinse blanks) are prepared to identify any contamination which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure contamination of samples during shipment. Field and rinse blanks measure contamination of samples during field operations.

Methylene chloride was detected in two of the 14 associated method blanks. Acetone was also detected in three of the method blanks and 2-butanone was detected in one of the method blanks. Acetone, methylene chloride and trichloroethene were each detected in two of the eight trip blanks while carbon disulfide, 1,1-dichloroethane, cis-1,2-dichloroethene, 2-butanone and toluene were each detected in one of the trip blanks. Methylene chloride and trichloroethene were each detected in two of the five rinse blanks while chloroethane, 2-butanone, 4-methyl-2-pentanone, toluene, ethylbenzene and tetrahydrofuran were each detected in one of the rinse blanks.

Based on the blank content, data for acetone, methylene chloride, 2-butanone and trichloroethene in sample G026; data for methylene chloride, 2-butanone and trichloroethene in sample G036; data for acetone and trichloroethene in sample G049; and data for methylene chloride cis-1,2-dichloroethene and trichloroethene in sample G114 have been qualified as undetected.

3. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable.

4. Calibration

Satisfactory instrument calibration is established to insure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

4.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) limits and minimum response factors (RF) for select compounds only and allows two outliers. A technical review of the data applies limits to all compounds with no exceptions.

The %RSD for all compounds were less than 30% and all RF values were above the minimum allowable value of 0.05, with the following exceptions:

Instrument MSC 11/29/96

Bromomethane	45.3%	
Methylene chloride	74.2%	
Acetone	108.%	
2-Butanone	158.%	
1,4-Dichlorobenzene	30.8%	
1,2-Dibromo-3-chloropropane	33.5%	rf=0.041
Tetrahydrofuran		rf=0.028

Data for 1,2-dibromo-3-chloropopane have been rejected and data for bromomethane, methylene chloride, acetone, 2-butanone and 1,4-dichlorobenzene have been qualified as estimated in the associated samples G026, G034 and G036 based on the %RSD/RF. Although the RF for tetrahydrofuran was below the technical minimum (0.05), based on its higher reporting limit, no additional data qualification was necessary.

Instrument MSC 12/6/96

Bromomethane	62.1%
Acetone	40.4%
2-Butanone	36.6%
2-Hexanone	42.8%
Tetrahydrofuran	30.6%
1,2-Dibromo-3-chloropropane	43.8%

Data for the listed compounds have been qualified as estimated in the associated samples G045, G047, G049, G049DL, G057, G065, G066, G057RE and G053 based on the %RSD.

Instrument MSC 12/16/96

Bromomethane	34.4%	
Methylene chloride	37.6%	
Acetone	46.6%	
Tetrahydrofuran		rf=0.029
1,2-Dibromo-3-chloropropane		rf=0.039

Data for 1,2-dibromo-3-chloropopane have been rejected and data for bromomethane, methylene chloride and acetone have been qualified as estimated in the associated samples G069, G070, G070DL, G075, G075RE, G085, G087, G085RE, G087RE, G077, G114, G121, G187 and G192 based on the %RSD/RF. Although the RF for tetrahydrofuran was below the technical minimum (0.05), based on its higher reporting limit, no additional data qualification was necessary.

4.2 Continuing Calibration

Continuing calibration standards were within 30% difference (%D) of the initial calibration and had acceptable RF values, with the following exceptions:

Instrument MSC 12/3/96 12:28

Methylene chloride	-61.2%	
2-Butanone	-66.1%	
1,1,2,2-Tetrachloroethane	31.7%	
Tetrahydrofuran		rf=0.034

Data for methylene chloride and 2-butanone have been qualified as estimated in the associated sample G026. Since no 1,1,2,2-tetrachloroethane was detected in the sample and since the compound response was increasing, no additional data have been qualified based on the %D.

Instrument MSC 12/4/96 10:57

Bromomethane	-31.1%	
Methylene chloride	-61.7%	
Carbon disulfide	52.3%	
2-Butanone	-64.3%	
4-Methyl-2-pentanone	34.6%	
2-Hexanone	37.1%	
Tetrahydrofuran	32.1%	rf=0.037
1,2-Dibromo-3-chloropropane	68.3%	

Data for bromomethane, methylene chloride and 2-butanone have been qualified as estimated in the associated samples G034 and G036. Since no carbon disulfide, 4-methyl-2-pentanone, 2-hexanone or tetrahydrofuran were detected in the samples and since the compound responses were increasing, no additional data have been qualified based on the %D. Data for 1,2-dibromo-3-chloropropane have been previously rejected based on the initial calibration RF.

Instrument MSC 12/6/96 17:08

Chloromethane	-36.0%	
Methylene chloride	-40.0%	
Acetone	-37.2%	
4-Methyl-2-pentanone	-32.0%	
2-Hexanone	-39.9%	
Tetrahydrofuran	-36.8%	rf=0.036

Data for the listed compounds have been qualified as estimated in the associated samples G045 and G047 based on the %D.

Instrument MSC 12/10/96 09:51

Bromomethane	-41.6	
Carbon disulfide	42.9%	
2-Butanone	31.7%	
Tetrahydrofuran		rf=0.046

Data for bromomethane have been qualified as estimated in the associated samples G049 and G049DL. Since no carbon disulfide or 2-butanone were detected in the samples and since the compound responses were increasing, no additional data have been qualified based on the %D.

Instrument MSC 12/11/96 09:13

Methylene chloride	-30.8%	
2-Butanone		rf=0.043
Tetrahydrofuran	-43.9%	rf=0.032

Data for methylene chloride and tetrahydrofuran have been qualified as estimated in the associated samples G057, G065, G066 and G057RE based on the %D. Although the RF for 2-butanone was below the technical minimum (0.05), based on its higher reporting limit, no additional data qualification was necessary.

Instrument MSC 12/12/96 17:59

Bromomethane	-40.8%	
Methylene chloride	-33.2%	
Acetone	-38.5%	
2-Butanone	-50.0%	rf=0.030
4-Methyl-2-pentanone	-36.4%	
2-Hexanone	-45.4%	
Tetrahydrofuran	-40.4$	rf=0.034
1,2-Dibromo-3-chloropropane	-56.0%	rf=0.037

Data for 1,2-dibromo-2-chloropropane has been rejected and data for the remaining listed compounds have been qualified as estimated in the associated sample G053 based on the %D/RF. Although the RFs for 2-butanone and tetrahydrofuran were below the technical minimum (0.05), based on their higher reporting limit, no additional data qualification was necessary.

Instrument MSC 12/17/96 10:48

trans-1,3-Dichloropropane	-34.4%	
2-Hexanone	-34.8%	
Tetrahydrofuran		rf=0.030
1,2-Dibromo-3-chloropropane	-46.2%	rf=0.021

Data for 1,2-dibromo-3-chloropropane have been rejected and data for trans-1,3-dichloropropane and 2-hexanone have been qualified as estimated in the associated samples G070, G070DL and G075 base don the %D/RF.

Instrument MSC 12/18/96 09:44

Chloroethane	60.9%	
Tetrahydrofuran		rf=0.028
1,2-Dibromo-3-chloropropane	-66.7%	rf=0.013

Data for 1,2-dibromo-3-chloropropane have been rejected in the associated samples G075RE, G085, G087, G085RE and G087RE based on the RF. Since no chloroethane was detected in the samples and since the compound response was increasing, no data have been qualified based on the %D.

Instrument MSC 12/19/96 12:06

Acetone	38.0%	
trans-1,3-Dichloropropane	-30.8%	
Tetrahydrofuran	-37.9%	rf=0.029
1,2-Dibromo-3-chloropropane	-56.4%	rf=0.017

Data for 1,2-dibromo-3-chloropropane has been rejected and data for trans-1,3-dichloropropane and tetrahydrofuran have been qualified as estimated in the associated sample G077 based on the %D/RF. Since no acetone was detected in the sample and since the compound response was increasing, no additional data have been qualified based on the %D.

Instrument MSC 12/21/96 10:42

Tetrahydrofuran		rf=0.028
1,2-Dibromo-3-chloropropane	64.1%	

Data for 1,2-dibromo-3-chloropropane have been previously rejected based on the initial calibration RF. Although the RF for tetrahydrofuran was below the technical minimum (0.05), based on its higher reporting limit, no data qualification was necessary.

Instrument MSC 12/31/96 11:13

Bromomethane	-31.3%	
1,1,1-Trichloroethane	-42.4%	
trans-1,3-Dichloropropane	-34.1%	
Tetrahydrofuran	55.2%	rf=0.045
1,2-Dibromo-3-chloropropane		rf=0.032

Data for 1,2-dibromo-3-chloropropane have been rejected and data for bromomethane, 1,1,1-trichloroethane and trans-1,3-dichloropropane have been qualified as estimated in the associated samples G187 and G192 based on the %D/RF. Since no tetrahydrofuran was detected in the samples and since the compound response was increasing, no additional data have been qualified based on the %D.

5. Surrogates / System Monitoring Compounds

All samples to be analyzed for organic compounds are spiked with surrogate compounds prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique.

Surrogate recovery was below control limits in samples G049, G049DL, G070, G075, G075RE, G085, G085RE, G087, G087RE and G114. All data for these samples have been qualified as estimated based on the recoveries. All other surrogate recoveries were within control limits.

6. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every experimental run.

Responses for one or more internal standards were below established limits in samples G034, G036, G045, G047, G049, G049DL, G057, G057RE and G085. Data for all compounds quantitated under the non-compliant standards have been qualified as estimated based on the deviations. All other internal standard responses and retention times were within established limits.

7. Compound Identification

Compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and ion spectra.

All identified compounds met the specified criteria.

8. Matrix Spike/Matrix Spike Duplicate/Matrix Spike Blank

Matrix spike and matrix spike duplicate data are used to assess the precision and accuracy of the analytical method.

Data for six sets of matrix spike/matrix spike duplicates were included in the reviewed data packages. Recoveries for trichloroethene were above control limits in three matrix spikes and two matrix spike duplicates. Recovery for toluene was below control limits in one matrix spike duplicate. All other matrix spike and matrix spike duplicate recoveries were within control limits. The relative percent differences between recoveries were, however, outside control limits for 1,1-dichloroethene in one set, toluene in another set and trichloroethene in two sets. No data have been qualified based on matrix spike performance alone.

Recovery for trichloroethene was above control limits in one of the five reviewed matrix spike blanks. All other matrix spike blank recoveries were within control limits.

9. Field Duplicates

No field duplicates were included among the reviewed samples.

10. General Comments

The reported target compound list was in error. The data have been corrected to reflect the proper reporting list.

The recommended data usage for sample dilutions and reanalyses is as follows:

G049 and G049 DL
Data from the original analysis should be used for all compounds except cis-1,2-dichloroethene. Data from the dilution should be used for cis-1,2-dichloroethene only.

G057 and G057RE
The response for one internal standard was below established limits in both the original analysis and the reanalysis. Since neither analysis was more compliant, data from the original analysis should be used for all compounds.

G070 and G070DL
Data from the original analysis should be used for all compounds except acetone. Data from the dilution should be used for acetone only.

G075 and G075RE
Surrogate recoveries were below control limits in both the original analysis and the reanalysis. Since neither analysis was more compliant, data from the original analysis should be used for all compounds.

G085 and G085RE
Surrogate recoveries were below control limits in both the original analysis and the reanalysis. Response for one internal standard was also below established limits in the original analysis. Since the reanalysis was more compliant, data from the reanalysis should be used for all compounds.

G087 and G087RE
Surrogate recoveries were below control limits in both the original analysis and the reanalysis. Since neither analysis was more compliant, data from the original analysis should be used for all compounds.

The chromatograms for some initial and continuing calibration standards were missing from the data packages. No verification of the reported response factors for the missing standards could be performed.

The relatively large number of detected compounds in the rinse and trip blanks indicates a potentially significant contamination problem. The presence of these compounds in the rinse blanks would initially seem to indicate a field decontamination problem; however, the presence of many of these same compounds in the trip blanks indicates that the contamination problem is more likely to be laboratory-related.

11. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines listed in the analytical method.

Data Validation Checksheets

Volatile Organics Data Validation Checklist

	YES	NO	NA
Data Completeness and Deliverables			
Have any missing deliverables been received and added to the data package?		X	
Is there a narrative or cover letter present?	X		
Are the sample numbers included in the narrative?		X	
Are the sample chain-of-custodies present?	X		
Do the chain-of-custodies indicate any problems with sample receipt or sample condition?		X	
Holding Times			
Have any holding times been exceeded?		X	
Surrogate Recovery			
Are surrogate recovery forms present?	X		
Are all the samples listed on the appropriate surrogate recovery form?	X		
Was the surrogate recovery outside of specified limits for any sample or blank?	X		
If yes, were the samples reanalyzed?		X	
Are there any transcription/calculation errors between the raw data and the summary form?		X	
Matrix Spikes			
Is there a matrix spike recovery form present?	X		
Were matrix spikes analyzed at the required frequency?	X		
How many spike recoveries were outside of QC limits?			
6 out of 60			
How many RPDs for matrix spike and matrix spike duplicate were outside of QC limits?			
5 out of 30			
Blanks			
Is a method blank summary form present?	X		
Has a method blank been analyzed for each set of samples or for each 20 samples, whichever is more frequent?	X		

Volatile Organics Data Validation Checklist - Page 2

	YES	NO	NA
Has a blank been analyzed at least once every twelve hours for each system used?	X		
Is the chromatographic performance acceptable for each instrument?	X		
Do any method/reagent/instrument blanks have positive results?	X		
Do any trip/field/rinse blanks have positive results?	X		
Are there field/rinse/equipment blanks associated with every sample?	X		
Tuning and Mass Calibration			
Are the GC/MS tuning forms present for BFB?	X		
Are the bar graph spectrum and mass/charge listing provided for each BFB?	X		
Has a BFB been analyzed for each twelve hours of analysis per instrument?	X		
Have the ion abundance criteria been met for each instrument used?	X		
Are there any transcription/calculation errors between the mass lists and the summary form?		X	
Are the spectra and mass calibration acceptable?	X		
Target Analytes			
Is an organics analysis data sheet present for each of the following:			
Samples	X		
Matrix spikes	X		
Blanks	X		
Are the reconstructed ion chromatograms present for each of the following:			
Samples	X		
Matrix spikes	X		
Blanks	X		
Is the chromatographic performance acceptable with respect to:			
Baseline stability	X		
Resolution	X		

	YES	NO	NA
Peak shape	X		
Attenuation	X		
Are the mass spectra of the identified compounds present?	X		
Is the RRT of each reported compound within 0.06 RRT units of the continuing calibration standard?	X		
Are all ions present in the standard mass spectrum at a relative intensity of 10% or greater also present in the sample spectrum?	X		
Do the samples and standard relative ion intensities agree within 20%?	X		
Tentatively Identified Compounds			
Are all the TIC summary forms present?			X
Are the mass spectra for the tentatively identified compounds and their associated "best match" spectra present?			X
Are any target compounds listed as TICs?			X
Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?			X
Do the TIC and "best match" spectrum agree within 20%?			X
Quantitation and Detection Limits			
Are there any transcription/calculation errors in the Form 1 results?		X	
Are the reporting limits adjusted to reflect sample dilutions and, for soils, sample moisture?	X		
Standard Data			
Are the quantitation reports and reconstructed ion chromatograms present for all initial and continuing calibration standards?		X	
Initial Calibration			
Are the initial calibration forms present for each instrument used?	X		
Are the response factor RSDs within acceptable limits?		X	

	YES	NO	NA
Are the average RRFs equal to or greater than minimum requirements?		X	
Are there any transcription/calculation errors in reporting the RRFs or RSDs?		X	
Continuing Calibration			
Are the continuing calibration forms present for each day and each instrument?	X		
Has a continuing calibration standard been analyzed for each twelve hours of analysis per instrument?	X		
All %D within acceptable limits?		X	
Are all RF equal to or greater than minimum requirements?		X	
Are there any transcription/calculation errors in reporting of RF or %D?		X	
Internal Standards			
Are internal standard areas of every sample and blank within the upper and lower limits for each continuing calibration?		X	
Are the retention times of the internal standards within 20 seconds of the associated calibration standard?	X		
Field Duplicates			
Were field duplicates submitted with the samples?	X		

Volatile Qualifier Summary
Holding Time, Surrogates, Internal Standards

Sample ID	Holding Time[1]	Surrogate[1]	Internal Standards[1]		
		BFB	DFB	CBZ	DCB
G026					
G034					
G036					
G045					
G047					
G049		↓			
G049 DL					
G053					
G057					
G057 RE					
G066					
G069					
G070		↓			
G070 DL					
G075		↓			
G075 RE		↓			
G077					
G085		↓			↓
G085 RE		↓			
G087		↓			
G087 RE		↓			
G114		↓			
G121					
G187					
G192					

Surrogate:
BFB Bromofluorobenzene

Internal Standards:
DCB 1.,4-Dichlorobenzene-d4
DFB 1,4-Difluorobenzene
CBZ Chlorobenzene-d5

Qualifiers:
↑ Recovery high
↓ Recovery low
↓↓ Recovery less than 25%

[1] Unless otherwise specified, all parameters are within acceptable limits.

Volatile Calibration Outliers

Instrument: MSC
Matrix: water
Level: low

Date/Time	11/29/96		12/3/96 1228		12/4/96 1057			
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chloromethane								
Bromomethane		45.3				-31.1		
Vinyl chloride								
Chloroethane								
Methylene chloride		74.2		-61.2		-61.7		
Acetone		108						
Carbon disulfide						52.3		
1,1-Dichloroethene								
1,1-Dichloroethane								
cis-1,2-Dichloroethene								
trans-1,2-Dichloroethene								
Chloroform								
1,2-Dichloroethane								
2-Butanone		158		-66.1		-64.3		
Bromochloromethane								
1,1,1-Trichloroethane								
Carbon tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
trans-1,3-Dichloropropene								
Bromoform								
4-Methyl-2-pentanone						34.6		
2-Hexanone						37.1		
Tetrachloroethene								
1,1,2,2-Tetrachloroethane				31.7				
Toluene								
1,2-Dibromoethane								

Volatile Calibration Outliers - Page 2

Date/Time	11/29/96		12/3/96 1228		12/4/96 1057			
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chlorobenzene								
Ethylbenzene								
Styrene								
Xylenes (total)								
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene		30.8						
Tetrahydrofuran	.028		.034		.037	32.1		
1,2-Dibromo-3-chloropropane	.041	33.5				68.3		

Affected Samples:			
	G026	G026	G034
	G034		G036
	G036		

vlj694

Volatile Calibration Outliers - Page 3

Instrument: MSC
Matrix: water
Level: low

Date/Time	12/6/96		12/6/96 1708		12/10/96 0951		12/11/96 0913	
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chloromethane				-36.0				
Bromomethane		62.1				-41.6		
Vinyl chloride								
Chloroethane								
Methylene chloride				-40.0				-30.8
Acetone		40.4		-37.2				
Carbon disulfide						42.9		
1,1-Dichloroethene								
1,1-Dichloroethane								
cis-1,2-Dichloroethene								
trans-1,2-Dichloroethene								
Chloroform								
1,2-Dichloroethane								
2-Butanone		36.6				31.7	.043	
Bromochloromethane								
1,1,1-Trichloroethane								
Carbon tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
trans-1,3-Dichloropropene								
Bromoform								
4-Methyl-2-pentanone				-32.0				
2-Hexanone		42.8		-39.9				
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								
Toluene								
1,2-Dibromoethane								

Volatile Calibration Outliers - Page 4

Date/Time	12/6/96		12/6/96 1708		12/10/96 0951		12/11/96 0913	
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chlorobenzene								
Ethylbenzene								
Styrene								
Xylenes (total)								
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								
Tetrahydrofuran		30.6	.036	-36.8	.046		.032	-43.9
1,2-Dibromo-3-chloropropane		43.8						

Affected Samples:				
	G045	G045	G049	G057
	G047	G047	G049DL	G065
	G049			G066
	G049DL			G057RE
	G057			
	G065			
	G066			
	G057RE			
	G053			

Volatile Calibration Outliers - Page 5

Instrument: MSC
Matrix: water
Level: low

Date/Time			12/12/96 1759					
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chloromethane								
Bromomethane				-40.8				
Vinyl chloride								
Chloroethane								
Methylene chloride				-33.2				
Acetone				-38.5				
Carbon disulfide								
1,1-Dichloroethene								
1,1-Dichloroethane								
cis-1,2-Dichloroethene								
trans-1,2-Dichloroethene								
Chloroform								
1,2-Dichloroethane								
2-Butanone			.030	-50.0				
Bromochloromethane								
1,1,1-Trichloroethane								
Carbon tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
trans-1,3-Dichloropropene								
Bromoform								
4-Methyl-2-pentanone				-36.4				
2-Hexanone				-45.4				
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								
Toluene								
1,2-Dibromoethane								

Volatile Calibration Outliers - Page 6

Date/Time			12/12/96 1759					
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chlorobenzene								
Ethylbenzene								
Styrene								
Xylenes (total)								
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								
Tetrahydrofuran			.034	-40.4				
1,2-Dibromo-3-chloropropane			.037					

Affected Samples:				
		G053		

Volatile Calibration Outliers - Page 7

Instrument: MSC
Matrix: water
Level: low

Date/Time	12/16/96		12/17/96 1048		12/18/96 0944		12/19/96 1206	
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chloromethane								
Bromomethane		34.4						
Vinyl chloride								
Chloroethane						60.9		
Methylene chloride		37.6						
Acetone		46.6						38.0
Carbon disulfide								
1,1-Dichloroethene								
1,1-Dichloroethane								
cis-1,2-Dichloroethene								
trans-1,2-Dichloroethene				-35.4				-30.8
Chloroform								
1,2-Dichloroethane								
2-Butanone								
Bromochloromethane								
1,1,1-Trichloroethane								
Carbon tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
trans-1,3-Dichloropropene								
Bromoform								
4-Methyl-2-pentanone								
2-Hexanone				-34.8				
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								
Toluene								
1,2-Dibromoethane								

Volatile Calibration Outliers - Page 8

Date/Time	12/16/96		12/17/96 1048		12/18/96 0944		12/19/96 1206	
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chlorobenzene								
Ethylbenzene								
Styrene								
Xylenes (total)								
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								
Tetrahydrofuran	.029	64.9	.030		.028		.029	-37.9
1,2-Dibromo-3-chloropropane	.039		.021	-46.2	.013	-66.7	.017	-56.4

Affected Samples:				
	G069	G070	G075RE	G077
	G070	G070DL	G085	
	G070DL	G075	G087	
	G075		G085RE	
	G075RE		G087RE	
	G085			
	G087			
	G085RE			
	G087RE			
	G077			
	G114			
	G121			
	G187			
	G192			

Volatile Calibration Outliers - Page 9

Instrument: MSC
Matrix: water
Level: low

Date/Time			12/21/96 1042		12/31/96 1113			
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chloromethane								
Bromomethane						-31.3		
Vinyl chloride								
Chloroethane								
Methylene chloride								
Acetone								
Carbon disulfide								
1,1-Dichloroethene								
1,1-Dichloroethane								
cis-1,2-Dichloroethene								
trans-1,2-Dichloroethene								
Chloroform								
1,2-Dichloroethane								
2-Butanone								
Bromochloromethane								
1,1,1-Trichloroethane						42.4		
Carbon tetrachloride								
Bromodichloromethane								
1,2-Dichloropropane								
cis-1,3-Dichloropropene								
Trichloroethene								
Dibromochloromethane								
1,1,2-Trichloroethane								
Benzene								
trans-1,3-Dichloropropene						-34.1		
Bromoform								
4-Methyl-2-pentanone								
2-Hexanone								
Tetrachloroethene								
1,1,2,2-Tetrachloroethane								
Toluene								
1,2-Dibromoethane								

Volatile Calibration Outliers - Page 10

Date/Time			12/21/96 1042		12/31/96 1113			
	Initial Cal.		Cont. Cal.		Cont. Cal.		Cont. Cal.	
	RF	%RSD	RF	%D	RF	%D	RF	%D
Chlorobenzene								
Ethylbenzene								
Styrene								
Xylenes (total)								
1,3-Dichlorobenzene								
1,2-Dichlorobenzene								
1,4-Dichlorobenzene								
Tetranydrofuran			.028		.045	55.2		
1,2-Dibromo-3-chloropropane				64.1	.032			

Affected Samples:				
		G114	G187	
		G121	G192	

Corrected Sample Analysis Data Sheets

MW-705 E

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G026

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDGA-A

Matrix: (soil/water) Water Lab Sample ID: L33882-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS344

Level: (low/med) LOW Date Received: 11/22/96

%Moisture: not dec. Date Analyzed: 12/03/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	**2**	
67-64-1	**Acetone**	**9**	
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~**540-59-0**~~	~~**1,2-Dichloroethene (Total)**~~	~~**3**~~	
156-59-2	**cis-1,2-Dichloroethene**	**2** 3	
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	**2-Butanone**	**20**	
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**4**	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G026

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDGA-A

Matrix: (soil/water) Water Lab Sample ID: L33882-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS344

Level: (low/med) LOW Date Received: 11/22/96

%Moisture: not dec. Date Analyzed: 12/03/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	~~U~~ UJ
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~ R

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G034

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33883-5

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS362

Level: (low/med) LOW Date Received: 11/22/96

%Moisture: not dec. Date Analyzed: 12/04/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~
67-64-1	**Acetone**	**9**	
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	~~U~~
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	2	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G034

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33883-5

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS362

Level: (low/med) LOW Date Received: 11/22/96

%Moisture: not dec. Date Analyzed: 12/04/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G036

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33916-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS364

Level: (low/med) LOW Date Received: 11/23/96

%Moisture: not dec. Date Analyzed: 12/04/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	2 ~~1~~	~~J~~
67-64-1	Acetone	5	~~U~~
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~**540-59-0**~~	~~**1,2-Dichloroethene (Total)**~~	~~1~~	~~J~~
156-59-2	**cis-1,2-Dichloroethene**	**0.9**	**J**
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	**2-Butanone**	**15**	
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**13**	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	**Tetrachloroethene**	**2**	
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	**Toluene**	**2**	
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G036

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33916-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS364

Level: (low/med) LOW Date Received: 11/23/96

%Moisture: not dec. Date Analyzed: 12/04/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	~~U~~
541-73-1	1,3-Dichlorobenzene	1	~~U~~
106-46-7	1,4-Dichlorobenzene	1	~~U~~
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G045

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33916-13

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS430

Level: (low/med) LOW Date Received: 11/23/96

%Moisture: not dec. Date Analyzed: 12/06/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	~~U~~
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	~~U~~
75-00-3	Chloroethane	1	~~U~~
75-09-2	**Methylene Chloride**	**2**	**B**
67-64-1	Acetone	5	~~U~~
75-15-0	Carbon Disulfide	1	~~U~~
75-35-4	1,1-Dichloroethene	1	~~U~~
75-34-3	1,1-Dichloroethane	1	~~U~~
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	~~U~~
156-60-5	trans-1,2-Dichloroethene	1	~~U~~
67-66-3	Chloroform	1	~~U~~
107-06-2	1,2-Dichloroethane	1	~~U~~
78-93-3	2-Butanone	5	~~U~~
74-97-5	Bromochloromethane	1	~~U~~
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	2	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	~~U~~
591-78-6	2-Hexanone	5	~~U~~
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G045

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33916-13

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS430

Level: (low/med) LOW Date Received: 11/23/96

%Moisture: not dec. Date Analyzed: 12/06/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	~~U~~ UJ
106-46-7	1,4-Dichlorobenzene	1	~~U~~ UJ
96-12-8	1,2-Dibromo-3-chloropropane	1	~~U~~ UJ

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G047

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33916-15

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS432

Level: (low/med) LOW Date Received: 11/23/96

%Moisture: not dec. Date Analyzed: 12/06/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	~~U~~
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	**2**	B
67-64-1	Acetone	5	~~U~~
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	**2-Butanone**	**22**	
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**10**	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	~~U~~
591-78-6	2-Hexanone	5	~~U~~
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G047

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: SDG-B

Matrix: (soil/water) Water Lab Sample ID: L33916-15

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS432

Level: (low/med) LOW Date Received: 11/23/96

%Moisture: not dec. Date Analyzed: 12/06/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~
95-50-1	1,2-Dichlorobenzene	1	~~U~~
541-73-1	1,3-Dichlorobenzene	1	~~U~~
106-46-7	1,4-Dichlorobenzene	1	~~U~~
96-12-8	1,2-Dibromo-3-chloropropane	1	~~U~~

12/18/96

NE-2

SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

G049

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34050-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS486

Level: (low/med) LOW Date Received: 12/03/96

%Moisture: not dec. Date Analyzed: 12/10/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	**Acetone**	**7**	**B**
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~**540-59-0**~~	~~**1,2-Dichloroethene (Total)**~~	~~**35**~~	
156-59-2	**cis-1,2-Dichloroethene**	38 ~~**35**~~	
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	**1,1,1-Trichloroethane**	**2**	J
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**8**	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G049

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34050-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS486

Level: (low/med) LOW Date Received: 12/03/96

%Moisture: not dec. Date Analyzed: 12/10/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	~~U~~
100-42-5	Styrene	1	~~U~~
1330-20-7	Xylene (Total)	2	~~U~~
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~
95-50-1	1,2-Dichlorobenzene	1	~~U~~
541-73-1	1,3-Dichlorobenzene	1	~~U~~
106-46-7	1,4-Dichlorobenzene	1	~~U~~
96-12-8	1,2-Dibromo-3-chloropropane	1	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G049DL

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34050-2DL

Sample wt/vol: 2.5 (g/mL) mL Lab File ID: CS495

Level: (low/med) LOW Date Received: 12/03/96

%Moisture: not dec. Date Analyzed: 12/10/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2	U
74-83-9	Bromomethane	2	U
75-01-4	Vinyl Chloride	2	U
75-00-3	Chloroethane	2	U
75-09-2	**Methylene Chloride**	**3**	**JD**
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	2	U
75-35-4	1,1-Dichloroethene	2	U
75-34-3	1,1-Dichloroethane	2	U
~~**540-59-0**~~	~~**1,2-Dichloroethene (Total)**~~	~~**37**~~	~~**D**~~
156-59-2	**cis-1,2-Dichloroethene**	**38**	**D**
156-60-5	trans-1,2-Dichloroethene	2	U
67-66-3	Chloroform	2	U
107-06-2	1,2-Dichloroethane	2	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	2	U
71-55-6	**1,1,1-Trichloroethane**	**6**	**D**
56-23-5	Carbon Tetrachloride	2	U
75-27-4	Bromodichloromethane	2	U
78-87-5	1,2-Dichloropropane	2	U
10061-01-5	cis-1,3-Dichloropropene	2	U
79-01-6	**Trichloroethene**	**7**	**D**
124-48-1	Dibromochloromethane	2	U
79-00-5	1,1,2-Trichloroethane	2	U
71-43-2	Benzene	2	U
10061-02-6	trans-1,3-Dichloropropene	2	U
75-25-2	Bromoform	2	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	2	U
79-34-5	1,1,2,2-Tetrachloroethane	2	U
108-88-3	Toluene	2	U
106-93-4	1,2-Dibromoethane	2	U
108-90-7	Chlorobenzene	2	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G049DL

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34050-2DL

Sample wt/vol: 2.5 (g/mL) mL Lab File ID: CS495

Level: (low/med) LOW Date Received: 12/03/96

%Moisture: not dec. Date Analyzed: 12/10/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	2	~~U~~
100-42-5	Styrene	2	~~U~~
1330-20-7	Xylene (Total)	4	~~U~~
~~000-00-0~~	~~m,p-Xylene~~	~~4~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~2~~	~~U~~
109-99-9	Tetrahydrofuran	20	~~U~~
95-50-1	1,2-Dichlorobenzene	2	~~U~~
541-73-1	1,3-Dichlorobenzene	2	~~U~~
106-46-7	1,4-Dichlorobenzene	2	~~U~~
96-12-8	1,2-Dibromo-3-chloropropane	2	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G053

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34050-5

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS550

Level: (low/med) LOW Date Received: 12/03/96

%Moisture: not dec. Date Analyzed: 12/12/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~ UJ
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~ UJ
67-64-1	Acetone	5	~~U~~ UJ
75-15-0	**Carbon Disulfide**	**5**	
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	~~U~~ UJ
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**3**	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	~~U~~ UJ
591-78-6	2-Hexanone	5	~~U~~ UJ
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G053

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34050-5

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS550

Level: (low/med) LOW Date Received: 12/03/96

%Moisture: not dec. Date Analyzed: 12/12/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~ R

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G057

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS518

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~
67-64-1	Acetone	5	~~U~~
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	~~U~~
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	~~U~~
127-18-4	**Tetrachloroethene**	**1**	
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G057

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS518

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G057RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-4RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS527

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~
67-64-1	Acetone	5	~~U~~
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	~~U~~
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	~~U~~
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	~~U~~
127-18-4	**Tetrachloroethene**	**1**	
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G057RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-4RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS527

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	1	~~U~~ UJ
541-73-1	1,3-Dichlorobenzene	1	~~U~~ UJ
106-46-7	1,4-Dichlorobenzene	1	~~U~~ UJ
96-12-8	1,2-Dibromo-3-chloropropane	1	~~U~~ UJ

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G065

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-14

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS525

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~ 5
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~ 12
67-64-1	**Acetone**	**7**	4
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	**2-Butanone**	**34**	4
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	~~U~~ 12
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G065

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-14

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS525

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U UJ

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G066

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-15

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS526

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~
67-64-1	Acetone	5	~~U~~
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	~~U~~
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	~~U~~
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G066

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34079-15

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS526

Level: (low/med) LOW Date Received: 12/04/96

%Moisture: not dec. Date Analyzed: 12/11/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
96-12-8	1,2-Dibromo-3-chloropropane	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G069

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34098-3

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS616

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/16/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~ 5
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~ 5
67-64-1	Acetone	5	~~U~~ 5
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**2**	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G069

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34098-3

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS616

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/16/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~ K

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G070

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34098-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS644

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/17/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	**Acetone**	~~210~~ 190	~~E~~ DJ
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	3	
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G070

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34098-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS644

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/17/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	~~U~~
100-42-5	Styrene	1	~~U~~
1330-20-7	Xylene (Total)	2	~~U~~
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~
95-50-1	1,2-Dichlorobenzene	1	~~U~~
541-73-1	1,3-Dichlorobenzene	1	~~U~~
106-46-7	1,4-Dichlorobenzene	1	~~U~~
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~ K

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G070DL

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34098-4DL

Sample wt/vol: 2.5 (g/mL) mL Lab File ID: CS646

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/17/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	2	U
74-83-9	Bromomethane	2	~~U~~ UJ
75-01-4	Vinyl Chloride	2	U
75-00-3	Chloroethane	2	U
75-09-2	Methylene Chloride	4	~~U~~ UJ
67-64-1	**Acetone**	**190**	**DJ**
75-15-0	Carbon Disulfide	2	U
75-35-4	1,1-Dichloroethene	2	U
75-34-3	1,1-Dichloroethane	2	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~4~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	2	U
156-60-5	trans-1,2-Dichloroethene	2	~~U~~ UJ
67-66-3	Chloroform	2	U
107-06-2	1,2-Dichloroethane	2	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	2	U
71-55-6	1,1,1-Trichloroethane	2	U
56-23-5	Carbon Tetrachloride	2	U
75-27-4	Bromodichloromethane	2	U
78-87-5	1,2-Dichloropropane	2	U
10061-01-5	cis-1,3-Dichloropropene	2	U
79-01-6	Trichloroethene	2	U
124-48-1	Dibromochloromethane	2	U
79-00-5	1,1,2-Trichloroethane	2	U
71-43-2	Benzene	2	U
10061-02-6	trans-1,3-Dichloropropene	2	~~U~~ UJ
75-25-2	Bromoform	2	U
108-10-1	4-Methyl-2-Pentanone	10	U
591-78-6	2-Hexanone	10	~~U~~ UJ
127-18-4	Tetrachloroethene	2	U
79-34-5	1,1,2,2-Tetrachloroethane	2	U
108-88-3	Toluene	2	U
106-93-4	1,2-Dibromoethane	2	U
108-90-7	Chlorobenzene	2	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G070DL

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34050

Matrix: (soil/water) Water Lab Sample ID: L34098-4DL

Sample wt/vol: 2.5 (g/mL) mL Lab File ID: CS646

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/17/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 2

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	2	U
100-42-5	Styrene	2	U
1330-20-7	Xylene (Total)	4	U
~~000-00-0~~	~~m,p-Xylene~~	~~4~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~2~~	~~U~~
109-99-9	Tetrahydrofuran	20	U
95-50-1	1,2-Dichlorobenzene	2	U
541-73-1	1,3-Dichlorobenzene	2	U
106-46-7	1,4-Dichlorobenzene	2	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~2~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G075

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34110-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS641

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/17/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G075

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34110-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS641

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/17/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G075RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34110-4RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS666

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G075RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34110-4RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS666

Level: (low/med) LOW Date Received: 12/05/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	~~U~~ UJ
100-42-5	Styrene	1	~~U~~ UJ
1330-20-7	Xylene (Total)	2	~~U~~ UJ
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	1	~~U~~ UJ
541-73-1	1,3-Dichlorobenzene	1	~~U~~ UJ
106-46-7	1,4-Dichlorobenzene	1	~~U~~ UJ
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G077

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS699

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/19/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	**1**	**J**
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G077

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-2

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS699

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/19/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~ UJ
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G085

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-12

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS672

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**0.9**	**J**
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G085

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-12

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS672

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
96-~~12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G085RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-12RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS678

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G085RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-12RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS678

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	~~U~~
100-42-5	Styrene	1	~~U~~
1330-20-7	Xylene (Total)	2	~~U~~
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~
95-50-1	1,2-Dichlorobenzene	1	~~U~~
541-73-1	1,3-Dichlorobenzene	1	~~U~~
106-46-7	1,4-Dichlorobenzene	1	~~U~~
96-~~12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G087

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-14

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS674

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	J
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	U
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G087

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-14

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS674

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	~~U~~
100-42-5	Styrene	1	~~U~~
1330-20-7	Xylene (Total)	2	~~U~~
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	~~U~~
95-50-1	1,2-Dichlorobenzene	1	~~U~~
541-73-1	1,3-Dichlorobenzene	1	~~U~~
106-46-7	1,4-Dichlorobenzene	1	~~U~~
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G087RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-14RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS680

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	**3**	
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G087RE

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34135-14RE

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS680

Level: (low/med) LOW Date Received: 12/06/96

%Moisture: not dec. Date Analyzed: 12/18/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G114

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34283-1

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS764

Level: (low/med) LOW Date Received: 12/11/96

%Moisture: not dec. Date Analyzed: 12/21/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	**2**	**B**
67-64-1	Acetone	5	U
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	
156-59-2	**cis-1,2-Dichloroethene**	**2**	
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	**1,1,1-Trichloroethane**	**9**	
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	~~0.9~~ 1	~~J~~
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G114

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34283-1

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS764

Level: (low/med) LOW Date Received: 12/11/96

%Moisture: not dec. Date Analyzed: 12/21/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

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VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G121

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34283-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS767

Level: (low/med) LOW Date Received: 12/11/96

%Moisture: not dec. Date Analyzed: 12/21/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	U
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	**Methylene Chloride**	**2**	B
67-64-1	**Acetone**	**50**	
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	U
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	U
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	**Trichloroethene**	**0.9**	**J**
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	U
75-25-2	Bromoform	1	U
108-10-1	**4-Methyl-2-Pentanone**	**60**	
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	**Toluene**	**5**	
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G121

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34110

Matrix: (soil/water) Water Lab Sample ID: L34283-4

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS767

Level: (low/med) LOW Date Received: 12/11/96

%Moisture: not dec. Date Analyzed: 12/21/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	3	
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	36	
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G187

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34384

Matrix: (soil/water) Water Lab Sample ID: L34497-3

Sample wt/vol: .015 (g/mL) mL Lab File ID: CS926

Level: (low/med) LOW Date Received: 12/20/96

%Moisture: not dec. Date Analyzed: 12/31/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 333.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	330	U
74-83-9	Bromomethane	330	U
75-01-4	Vinyl Chloride	330	U
75-00-3	Chloroethane	330	U
75-09-2	Methylene Chloride	670	U
67-64-1	Acetone	1700	U
75-15-0	Carbon Disulfide	330	U
75-35-4	1,1-Dichloroethene	330	U
75-34-3	1,1-Dichloroethane	330	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~370~~	J
156-59-2	**cis-1,2-Dichloroethene**	**350**	
156-60-5	trans-1,2-Dichloroethene	330	U
67-66-3	Chloroform	330	U
107-06-2	1,2-Dichloroethane	330	U
78-93-3	2-Butanone	1700	U
74-97-5	Bromochloromethane	330	U
71-55-6	1,1,1-Trichloroethane	330	U
56-23-5	Carbon Tetrachloride	330	U
75-27-4	Bromodichloromethane	330	U
78-87-5	1,2-Dichloropropane	330	U
10061-01-5	cis-1,3-Dichloropropene	330	U
79-01-6	Trichloroethene	330	U
124-48-1	Dibromochloromethane	330	U
79-00-5	1,1,2-Trichloroethane	330	U
71-43-2	Benzene	330	U
10061-02-6	trans-1,3-Dichloropropene	330	U
75-25-2	Bromoform	330	U
108-10-1	4-Methyl-2-Pentanone	1700	U
591-78-6	2-Hexanone	1700	U
127-18-4	Tetrachloroethene	330	U
79-34-5	1,1,2,2-Tetrachloroethane	330	U
108-88-3	**Toluene**	**950**	
106-93-4	1,2-Dibromoethane	330	U
108-90-7	Chlorobenzene	330	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G187

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34384

Matrix: (soil/water) Water Lab Sample ID: L34497-3

Sample wt/vol: .015 (g/mL) mL Lab File ID: CS926

Level: (low/med) LOW Date Received: 12/20/96

%Moisture: not dec. Date Analyzed: 12/31/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 333.3

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	330	U
100-42-5	Styrene	330	U
1330-20-7	Xylene (Total)	670	U
~~000-00-0~~	~~m,p-Xylene~~	~~670~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~330~~	~~U~~
109-99-9	Tetrahydrofuran	3300	U
95-50-1	1,2-Dichlorobenzene	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~330~~	~~U~~

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G192

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34384

Matrix: (soil/water) Water Lab Sample ID: L34497-8

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS931

Level: (low/med) LOW Date Received: 12/20/96

%Moisture: not dec. Date Analyzed: 12/31/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	1	U
74-83-9	Bromomethane	1	~~U~~ UJ
75-01-4	Vinyl Chloride	1	U
75-00-3	Chloroethane	1	U
75-09-2	Methylene Chloride	2	~~U~~ UJ
67-64-1	Acetone	5	~~U~~ UJ
75-15-0	Carbon Disulfide	1	U
75-35-4	1,1-Dichloroethene	1	U
75-34-3	1,1-Dichloroethane	1	U
~~540-59-0~~	~~1,2-Dichloroethene (Total)~~	~~2~~	~~U~~
156-59-2	cis-1,2-Dichloroethene	1	U
156-60-5	trans-1,2-Dichloroethene	1	~~U~~ UJ
67-66-3	Chloroform	1	U
107-06-2	1,2-Dichloroethane	1	U
78-93-3	2-Butanone	5	U
74-97-5	Bromochloromethane	1	U
71-55-6	1,1,1-Trichloroethane	1	~~U~~ UJ
56-23-5	Carbon Tetrachloride	1	U
75-27-4	Bromodichloromethane	1	U
78-87-5	1,2-Dichloropropane	1	U
10061-01-5	cis-1,3-Dichloropropene	1	U
79-01-6	Trichloroethene	1	U
124-48-1	Dibromochloromethane	1	U
79-00-5	1,1,2-Trichloroethane	1	U
71-43-2	Benzene	1	U
10061-02-6	trans-1,3-Dichloropropene	1	~~U~~ UJ
75-25-2	Bromoform	1	~~U~~ UJ
108-10-1	4-Methyl-2-Pentanone	5	U
591-78-6	2-Hexanone	5	U
127-18-4	Tetrachloroethene	1	U
79-34-5	1,1,2,2-Tetrachloroethane	1	U
108-88-3	Toluene	1	U
106-93-4	1,2-Dibromoethane	1	U
108-90-7	Chlorobenzene	1	U

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

G192

Lab Name: GALSON LABORATORIES Contract: Blasland, B

Lab Code: Case No.: 1 SAS No.: SDG No.: L34384

Matrix: (soil/water) Water Lab Sample ID: L34497-8

Sample wt/vol: 5 (g/mL) mL Lab File ID: CS931

Level: (low/med) LOW Date Received: 12/20/96

%Moisture: not dec. Date Analyzed: 12/31/96

GC Column: HP-624 ID: .2 (mm) Dilution Factor: 1

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
100-41-4	Ethylbenzene	1	U
100-42-5	Styrene	1	U
1330-20-7	Xylene (Total)	2	U
~~000-00-0~~	~~m,p-Xylene~~	~~2~~	~~U~~
~~95-47-6~~	~~o-Xylene~~	~~1~~	~~U~~
109-99-9	Tetrahydrofuran	10	U
95-50-1	1,2-Dichlorobenzene	1	U
541-73-1	1,3-Dichlorobenzene	1	U
106-46-7	1,4-Dichlorobenzene	1	U
~~96-12-8~~	~~1,2-Dibromo-3-chloropropane~~	~~1~~	~~U~~

Chain of Custody

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE / 08331.003

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	Grab	Aqueous	Soil	Other	Laboratory	ID Number	VOC CLP-RAS	ALCOHOLS (8015)	TEMPERATURE CHECK
G005	11/19/96	8:45		X	X			Blasland, Bouck & Lee	L33833-1	2	2	
G006	11/19/96	10:36		X	X			Blasland, Bouck & Lee	L33833-2	2	2	
G007	11/19/96	10:40		X	X			Blasland, Bouck & Lee	L33833-3	2	2	
G008	11/19/96	11:25		X	X			Blasland, Bouck & Lee	L33833-4	2	2	
G009	11/19/96	12:46		X	X			Blasland, Bouck & Lee	L33833-5	2	2	
G010	11/19/96	13:05		X	X			Blasland, Bouck & Lee	L33833-6	2	2	
G011	11/19/96	14:00		X	X			Blasland, Bouck & Lee	L33833-7	1	1	
G012	11/19/96	15:17		X	X			Blasland, Bouck & Lee	L33833-8	2	2	
G013	11/19/96	16:00		X	X			Blasland, Bouck & Lee	L33833-9	2	2	
TEMP BLANK	11/19/96	16:20		X	X			11/20/96 Water G013		1		1

Total Containers - 33

REMARKS: G011 requires VOC CLP-RAS + VOC Alcohols (8015). Sample volume is 2 40ml VOA vials per MJG request. All samples collected in 40ml VOA vials w/ No headspace, preserved w/ HCl and chilled to ≤ 4°C. SDGA-A G011 - is Temp Blank per [illegible] 11/20/96
*Need validatable data package

SAMPLER'S NAME: A.D. SVITANA SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana	DATE: 11/19/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 16:30	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME	DATE:	Received For Laboratory (Signature)	DATE: 11/20/96
SIGNATURE:	TIME:		TIME: 830

VOC Pres U P AU NA
Custody Seal Intact? X Yes No NA
Shipment Complete? Yes No
Temp 2 °C IS IB IM
Airbill # 257 672 5456

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6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNG / 08331.003

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P.O. # 08331.003

PARAMETERS FOR ANALYSIS

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	VOC by CLP-RAS	Alcohols by 8015
G014	11/20/96	0730		X	X			[illegible]	[illegible]	2	2
G015	11/20/96	1550		X	X			[illegible]	[illegible]	2	2
G016	11/20/96	9:15		X	X			[illegible]	[illegible]	2	2
G017	11/20/96	9:45		X	X			[illegible]	[illegible]	2	2
* G018	11/20/96	10:20		X	X			[illegible]	[illegible]	2	2
G019	11/20/96	1145		X	X			[illegible]	[illegible]	2	2
G020	11/20/96	1210		X	X			[illegible]	[illegible]	2	2
G021	11/20/96	1407		X	X			[illegible]	[illegible]	2	2
G021MS	11/20/96	1409		X	X			Blasland, Bouck & Lee	L33865-9	2	2
G021 MSD	11/20/96	1410		X	X			Blasland, Bouck & Lee	L33865-10	2	2
G022	11/20/96	1510		X	X			Blasland, Bouck & Lee	L33865-11	2	2
G023	11/20/96	1520		X	X			Blasland, Bouck & Lee	L33865-[illegible]	2	2

11/21/96 Water G023

Total Containers - 48

REMARKS: All samples collected in 40ml VOA vials w/ no headspace w/ HCl preservative and chilled to ≤4°C. G024 2 40ml vials both for VOC, CLP-RAS + Alcohols per MJG request
*Need validatable data package. SDGA-A per [illegible] 11/21/96 KAP
* 750 ppb for TOT. VOC - per Aaron S. 11/21/96 KAP

SAMPLER'S NAME: A.D. SVITANA

SIGNATURE: [signature]

VOC Pres U (P) AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] N.A
Shipment Complete? [ ] Yes [ ] No

Temp <4 °C TS (TB) TM

Airbill # 260 102 8953

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana SIGNATURE: [signature]	DATE: 11/20/96 TIME: 16:30	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 11/21/96 TIME: 930

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
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Company Name: BBL

Project Name / Number: SRSNE/ 08331.003

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Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory	ID	Number	VOCs by CLP-RAS	Alcohols by 8015	Temperature Check
G024	11/20/96	1615		X	X			Blasland, Bouck & Lee 11/21/96 Water	G024	L33865-13	1	1	
Temperature Blank	11/20/96	1600		X	X								1

REMARKS: See page 1 of 2

Total Containers - ~~2~~ 3 (SAT) 11/2?/96

G024 - Trip Blank per Claron - needed for CLP RAS only
Alcohols only one time per week (KAB) 11/21/96

SAMPLER'S NAME: A.D. SVITANA SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana	DATE: 11/20/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 16:30	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME	DATE:	Received For Laboratory (Signature) [signature]	DATE: 11/21/96
SIGNATURE:	TIME:		TIME: 930

VOC Pres U (P) AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] NA
Shipment Complete? [ ] Yes [ ] No

Temp 24 °C TS (TB) TM

Airbill # 260 102 8953

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E. Syracuse, NY 13057
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Company Name: BBL

Project Name / Number: SRSNE/08331.003

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Page 1 of [illegible]

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Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	VOCs by CLP - RAS	Alcohols by 8015
G025	11/21/96	1200		X	X			Blasland, Bouck & Lee	L33882-1	2	2
G026	11/21/96	0245		X	X			Blasland, Bouck & Lee	L33882-2	2	2
G027	11/21/96	10:45		X	X			Blasland, Bouck & Lee	L33882-3	2	2
G028	11/21/96	11:35		X	X			Blasland, Bouck & Lee	L33882-4	2	2
L33883- G029	11/21/96	12:10		X	X			Water		2	2

PARAMETERS FOR ANALYSIS

Total Containers - 20

REMARKS: All samples collected in 4 40ml VOA vials w/no headspace, preserved w/HCl and chilled to ≤4°C. G028 has the potential of containing >50ppb total VOC's. G029 is the last of sample delivery group A (SDG-A). - Per Mike Gefell remove G029 from this log-in and [illegible] on log in L33883

* Need validatable data package

SAMPLER'S NAME: A.D. Svitana

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana	DATE: 11/21/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 17:00	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE: 11/22/96
SIGNATURE:	TIME:		TIME: 22

VOC Pres U P AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] N/A

Shipment Complete? [X] Yes [ ] No

Temp -1 °C TS TB TM

Airbill # 260 102 9056

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE/08331.003

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[ ] - * Rush Service
Date requested by:
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Send Report to: M.J. GEFELL

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	VOC CLP-RAS	Alcohols 8015	Temperature Check
G030	11/21/96	1400		X	X			Blasland, Bouck & Lee	L33883-1	2	2	
G031	11/21/96	1600		X	X			Blasland, Bouck & Lee	L33883-2	2	2	
G032	11/21/96	15:25		X	X			Blasland, Bouck & Lee	L33883-3	2	2	
G033	11/21/96	16:30		X	X			Blasland, Bouck & Lee	L33883-4	2	2	
G034	11/21/96	16:45		X	X			Blasland, Bouck & Lee	L33883-5	1	1	
TEMP BLANK	11/21/96	16:47		X	X			11/22/96 Water G034				1

PARAMETERS FOR ANALYSIS

Total Containers - 19

REMARKS: All samples collected in 4 40ml VOA bottles w/no headspace, preserved w/HCl and chilled to ≤4°C. Sample G030 is the first sample of Sample Delivery Group B (SDG-B). G034 is Temp Blank. only [illegible]

* Need validatable data package.

SAMPLER'S NAME: A.D. SVITANA

SIGNATURE: [signature]

VOC Pres U (P) AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] NA
Shipment Complete? [X] Yes [ ] No

Temp [illegible] °C TS (TB) TM [illegible]

Airbill # 260 102 9056.

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. SVITANA SIGNATURE: [signature]	DATE: 11/21/96 TIME: 17:00	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 11/22/96 TIME: 930

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE/08331.003

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	[illegible]	[illegible]
G035	11/22/96	9:55		X	X			Blasland, Bouck & Lee	L33916-1	2	2
G036	11/22/96	3:25		X	X			Blasland, Bouck & Lee	L33916-2	2	2
G037	11/22/96	9:55		X	X			Blasland, Bouck & Lee	L33916-3	2	2
G038	11/22/96	9:55		X	X			Blasland, Bouck & Lee	L33916-4	2	2
G039	11/22/96	10:55		X	X			Blasland, Bouck & Lee	L33916-5	2	2
G040	11/22/96	11:25		X	X			Blasland, Bouck & Lee	L33916-6	2	2
G041	11/22/96	12:40		X	X			Blasland, Bouck & Lee	L33916-7	2	2
G042	11/22/96	1218		X	X			Blasland, Bouck & Lee	L33916-8	2	2
G042MS	11/22/96	1218		X	X			Blasland, Bouck & Lee	L33916-9	2	2
G042MSD	11/22/96	1218		X	X			Blasland, Bouck & Lee	L33916-10	2	2
G043	11/22/96	1420		X	X			Blasland, Bouck & Lee	L33916-11	2	2
G044	11/22/96	14:29		X	X			Blasland, Bouck & Lee	L33916-12	2	2

11/23/96 Water G044

PARAMETERS FOR ANALYSIS

Total Containers - 48

REMARKS: G038 has the potential of having total VOC > 50ppb. All samples are collected in [illegible] VOA vials w/ no headspace, preserved w/HCl and chilled ≤4°C. Sample delivery group B (SDG-B)

* Need Validatable data package

SAMPLER'S NAME: A.D. SVITANA

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana SIGNATURE: [signature]	DATE: 11/23/96 TIME: 16:00	NAME: [illegible] SIGNATURE:	DATE: 11/[illegible] TIME: 1100
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 11/[illegible] TIME: 830

VOC Pres U (P) AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] NA

Shipment Complete? [X] Yes [ ] No

Temp -1 °C TS (TB) TM [illegible]

Airbill # 260 102 9152

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800-950-0506

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Date requested by: _____
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Fax # (315) -449 - 2353

Send Report to: M.J. Geffell

Send Invoice to: M.J. Geffell

P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory	ID	Number	VOC by CLP-RAS	Alcohols by 8015	Temperature Check							
6045	11/22/96	14:23		X	X			Blasland, Bouck & Lee		L3391[illegible]	2	2								
6046	11/22/96	14:25		X	X			Blasland, Bouck & Lee		L3391[illegible]	2	2								
6047	11/22/96	15:10		X	X			Blasland, Bouck & Lee		L3391[illegible]	2	2								
TEMP BLANK	11/22/96	15:30		X	X			[illegible]		[illegible]			1							

REMARKS: See page 1.

Total Containers - 13

SAMPLER'S NAME: A.D. Svitana

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana SIGNATURE: [signature]	DATE: 11/22/96 TIME: 16:00	NAME: [illegible] SIGNATURE:	DATE: 11/23/96 TIME: [illegible]
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:
NA SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 11/23/96 TIME: 8:30

VOC Pres U (P) AU NA
Custody Seal Intact? [X] Yes [ ] No [ ] N/A
Shipment Complete? [X] Yes [ ] No
Temp [illegible] °C IS (IB) IM
Airbill #

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E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE/08331.003

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Page 1 of 1

Send Report to: M. J. Gefell

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	VOCs by CLP-RAS	Alcohols by 8015	Temperature Check
G048	12/2/96	1330		X	X			Blasland, Bouck & Lee	L34050-1	2	2	
G049	12/2/96	1405		X	X			Blasland, Bouck & Lee	L34050-2	2	2	
~~G050~~	12/2/96	1510		X	X			12/03/96 Water G049		2	2	
G051	12/2/96	1550		X	X			Blasland, Bouck & Lee	L34050-3	2	2	
G052	12/2/96	1600		X	X			Blasland, Bouck & Lee	L34050-4	2	2	
G053	12/2/96	1610		X	X			Blasland, Bouck & Lee	L34050-5	1	1	
Temp Blank								12/03/96 Water G053				1

REMARKS: Beginning of Sample Delivery Group C; All samples collected in 4-40mL Vials with no headspace, preserved with HCl and cooled to ≤ 4°C by wet ice; G053 is a trip blank, please analyze as per BBL QAPP.

Cancel Per Scott Powlin to Pam Weaver 12/3/96 (KAB)

Total Containers - 23

SAMPLER'S NAME: Scott A. Powlin SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Scott A. Powlin	DATE: 12/2/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 1635	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) Chris Smallman	DATE: 12/3/96
SIGNATURE:	TIME:		TIME: 9:30
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:

VOC Pres U P AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] NA
Shipment Complete? [X] Yes [ ] No

Temp 2.6 °C TS TB TM TCC

Airbill # 2601033050

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE/08331.003

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[OK] Standard Service
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Date requested by: _____
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Fax # (315) 443-2353

Page 1 of 2

Send Report to: M. J. GeFell

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	Grab	Aqueous	Soil	Other	Laboratory	ID	Number	Volatile Organics	Aldehydes by HPLC
G054	12/3/96	0930		X	X			Blasland, Bouck & Lee		L34079-1	2	2
G055	12/3/96	0900		X	X			Blasland, Bouck & Lee		L34079-2	2	2
G056	12/3/96	1200		X	X			Blasland, Bouck & Lee		L34079-3	2	2
G057	12/3/96	1030		X	X			Blasland, Bouck & Lee		L34079-4	2	2
G058	12/3/96	1230		X	X			Blasland, Bouck & Lee		L34079-5	2	2
G059	12/3/96	1210		X	X			Blasland, Bouck & Lee		L34079-6	2	2
G060	12/3/96	1220		X	X			Blasland, Bouck & Lee		L34079-7	2	2
G061MS	12/3/96	1310		X	X			Blasland, Bouck & Lee		L34079-8	2	2
G061MSD	12/3/96	1310		X	X			Blasland, Bouck & Lee		L34079-9	2	2
G061	12/3/96	1310		X	X			Blasland, Bouck & Lee		L34079-10	2	2
G062	12/3/96	1445		X	X			Blasland, Bouck & Lee		L34079-11	2	2
G063	12/3/96	1515		X	X			Blasland, Bouck & Lee		L34079-12	2	2

12/04/96 Water G054
12/04/96 Water G058
12/04/96 Water G060
12/04/96 Water G061
12/04/96 Water G063

Total Containers - 48

REMARKS: Samples from Sample delivery Group C; All samples collected in 4-40 ml vials with no headspace, preserved with HCl, and cooled to ≤ 4°C with wet ice; G065 is a trip blank, G066 is rinse blank; please analyze as per BBL QAPP

SAMPLER'S NAME: Scott A. Powlin

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Scott A. Powlin	DATE: 12/3/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 1635	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) Chris Smallman	DATE: 12/4/96 TIME: 10:30
SIGNATURE:	TIME:		
NAME:	DATE:	Received For Laboratory: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:

VOC Pres U P AU NA

Custody Seal Intact? [ ] Yes [ ] No [ ] NA

Shipment Complete? [✓] Yes [ ] No

Temp 4.1 °C IS IB (IM) TCC

Airbill #

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	VOC by CLP-RAS	Alcohols by E015	Temperature Check							
G064	12/3/96	1540		X	X			Blasland, Bouck & Lee 12/04/96 Water G064	L34079-13	2	2								
G065	12/3/96	1600		X	X			Blasland, Bouck & Lee	L34079-14	1	(1)				0				
G066	12/3/96	1615		X	X			Blasland, Bouck & Lee 12/04/96 Water G066	L34079-15	2	2								
Temp Blank	12/3/96	1630		X	X							1							

PARAMETERS FOR ANALYSIS

REMARKS: See page 1 of 2

Total Containers - 11

SAMPLER'S NAME: Scott A. Powlin

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Scott A. Powlin	DATE: 12/3/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 1635	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) Chris Mallmann	DATE: 12/4/96 TIME: 10:30
SIGNATURE:	TIME:		
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE: TIME:
SIGNATURE:	TIME:		

VOC Pres U P AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] N.A.
Shipment Complete? [X] Yes [ ] No

Temp 2.1 °C TS TB (M) ECC

Airbill #

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6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSINE 06331.003

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Page 1 of

Send Report to: M.J. GEFELL

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P.O. # 06331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory	ID Number	VOC by EPA 8260	ALL VOLS by 8015							
G067	12/4/96	8:09		X	X			Blasland, Bouck & Lee	L34098-1	2	2							
G068	12/4/96	9:15		X	X			Blasland, Bouck & Lee	L34098-2	2	2							
G069	12/4/96	9:28		X	X			Blasland, Bouck & Lee	L34098-3	2	2							
G070	12/4/96	10:15		X	X			Blasland, Bouck & Lee	L34098-4	2	2							
G071	12/4/96	11:55		X	X			Blasland, Bouck & Lee	L34098-5	2	2							
~~G072~~	12/4/96	12:11		X	X			12/05/96 Water	G071									

remove from this log & add to SDG-D per Mike Gefell (to Fran J.) 12/5/96.

REMARKS: All samples collected in 4 40ml VOA vials with headspace w/HCl preservative and chilled to ≤4°C. Samples G067 → G072 are partial Sample ID [illegible]

~~Need untitratable data packages: NO~~

Total Containers -

SAMPLER'S NAME: A. D. Svitana

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: [illegible]	DATE: 12/4/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 11:30	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) [signature]	DATE: 12/5/96
SIGNATURE:	TIME:		TIME: 10:00

VOC Pres U P AU NA

Custody Seal Intact? [ ] Yes [ ] No [ ] N/A

Shipment Complete? [ ] Yes [ ] No

Temp 1 °C TS TB TM

Airbill #

GALSON LABORATORIES
6601 Kirkville Road East
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315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SCSNE 0[illegible]

Turn-Around Time
[X] - Standard Service
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Date requested by:
Ph # (315) [illegible]
Fax # (315) [illegible]

Page 2 of 2

Send Report to: M.J. Gefell

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P.O. # [illegible]

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory	ID	Number	[illegible]	[illegible]	[illegible]
~~G024~~	~~11/24/96~~	~~1605~~		~~X~~	~~X~~								
G073	12/4/96	15:37		X	X			Blasland, Bouck & Lee		L3411[illegible]	2	[illegible]	
G074	12/4/96	15:44		X	X			Blasland, Bouck & Lee		L3411[illegible]	2	2	
G075 TB	12/4/96	16:00		X	X			Blasland, Bouck & Lee		L3411[illegible]	1	1	
TEMP BLANK	12/4/96	11:40		X	X			12/05/96 Water	G075				1
G072	12/4/96	12:55		X	X			Blasland, Bouck & Lee 12/05/96 Water	G072	L3411[illegible]	2	2	

Add to SDG-D per Mike Gefell 12/5/96 PAW

REMARKS: See page one. G072 - G075 are part of SAMPLE DELIVERY GROUP D (SDG-D)

Total Containers -

SAMPLER'S NAME: Ann Sultana

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: [signature]	DATE: 12/4/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 16:30	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) [signature]	DATE: 12/5/96
SIGNATURE:	TIME:		TIME: 10:00

VOC Pres U P AU NA

Custody Seal Intact? [ ] Yes [ ] No [ ] N.A.

Shipment Complete? [ ] Yes [ ] No

Temp [illegible] °C TS TB TM

Airbill #

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Project Name / Number: SRSWE 08331.003

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Send Report to: M.J. GEFELL

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	Grab	Aqueous	Soil	Other	Laboratory	ID	Number	VOC by CLP-RPS	Alcohols 8015	TEMP CHECK
TEMP BLANK	12/5/96	16:30		X	X								1
6076		7:25						Blasland, Bouck & Lee	L34135-1		2	2	
6077 TB		930						Blasland, Bouck & Lee	L34135-2		1	1	
6078		1040						Blasland, Bouck & Lee	L34135-3		2	2	
6078 MS		1040						Blasland, Bouck & Lee	L34135-4		2	2	
6078 MSD		1040						Blasland, Bouck & Lee	L34135-5		2	2	
6079		1210						Blasland, Bouck & Lee	L34135-6		2	2	
6080		1210						Blasland, Bouck & Lee	L34135-7		2	2	
6081		1240						Blasland, Bouck & Lee	L34135-8		2	2	
6082		1440						Blasland, Bouck & Lee	L34135-9		2	2	
6083		1405						Blasland, Bouck & Lee	L34135-10		2	2	
6084		1456						Blasland, Bouck & Lee	L34135-11		2	2	

12/06/96 Water 6084

Total Containers 42

REMARKS: All samples collected in 40ml vial with preservative and chilled to ≤4°C. Trip Blank = 6077 Sample Delivery group D (SDG D)

SAMPLER'S NAME: A.D. Svitana SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana	DATE: 12/5/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 17:00	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) Chris Smallman	DATE: 12/6/96 TIME: 14:30
SIGNATURE:	TIME:		
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE: TIME:
SIGNATURE:	TIME:		

VOC Pres U P AU NA
Custody Seal Intact? ☒ Yes ☐ No ☐ N.A.
Shipment Complete? ☒ Yes ☐ No
Temp -11 °C TS TB TM Ice
Airbill # 2601029255

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
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800-950-0506

Company Name: BBL

Project Name / Number: SRSNE 08331.003

Turn-Around Time
[X] - Standard Service
[ ] - * Rush Service
Date requested by:
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Page 2 of 1

Send Report to: M.J. GEFELL

Send Invoice to: M.J. GEFELL

P.O. # 08331.003

PARAMETERS FOR ANALYSIS

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID Number	VOC by CLP-RAS	Alcohol 8015
G085	12/6/96	14:57		X	X			Blasland, Bouck & Lee L34135-12	2	2
G086	↓	1545		X	X			Blasland, Bouck & Lee L34135-13	2	2
G087	↓	1620		X	X			Blasland, Bouck & Lee L34135-14	2	2
								12/06/96 Water G087		

REMARKS: See Page #1

Total Containers - 12

SAMPLER'S NAME: A.D. Svitana

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana SIGNATURE: [signature]	DATE: 12/5/96 TIME: 17:00	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) Chris Smallman	DATE: 12/6/96 TIME: 14:30
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:

VOC Pres U P AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] N.A.
Shipment Complete? [X] Yes [ ] No

Temp [illegible] °C TS TB AM [illegible]

Airbill # 2601029255

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SPGNE / 08331.003

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Date requested by: _____
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Fax # (315) -449 - 2358

Page 1 of 1

Send Report to: M.J. GEFELL

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID Number	PARAMETERS FOR ANALYSIS: VOC by 8260	PARAMETERS FOR ANALYSIS: Al, Ca, Fe, Mg, Na, K by 6010	PARAMETERS FOR ANALYSIS: Temperature Preservation
TEMP BLANK	12/6/96	15:40		X	X						1
G096	12/6/96	~~14:40~~ 15:15	MS	X	X			Blasland, Bouck & Lee	2	2	
G095	12/6/96	14:40		X	X			Blasland, Bouck & Lee	2	2	

Total Containers - 9

REMARKS: All samples collected in 4 40ml VOA vials w/no headspace & preserved w/HCL and chilled to ≤ 4°C. G095 & G096 part of SDG-D.

SAMPLER'S NAME: A.D. Svitana SIGNATURE: A.D. Svitana

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana SIGNATURE: A.D. Svitana	DATE: 12/6/96 TIME: 16:30	NAME: SIGNATURE: VTSR	DATE: 12/7/96 TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) Chris Smallman	DATE: 12/7/96 TIME: 9:00
NA SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:

VOC Pres U P AU NA
Custody Seal Intact? ☒ Yes ☐ No ☐ NA
Shipment Complete? ☒ Yes ☐ No
Temp 1°C IS IB
Airbill # 2601079351

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE/08331.003

Turn-Around Time
[X] - Standard Service
[ ] - * Rush Service
Date requested by:
Ph # (315) -446 - 9120
Fax # (315) -449 - 2353

Page 2 of 2

Send Report to: M. J. Gefell

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P.O. # 08331-003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory ID	Number	VOC by CLP-RAS	Alcohols by 8015
G098	12/9/96	1300		X	X			Blasland, Bouck & Lee	[illegible]	2	2
G099	12/9/96	1400		X	X			Blasland, Bouck & Lee	[illegible]	2	2
G100	12/9/96	1500		X	X			Blasland, Bouck & Lee 12/10/96 Water G100	[illegible]	2	2
G100 MS	added per Mike										
G100 MSD	Gefell 12/19/96.										

PARAMETERS FOR ANALYSIS

REMARKS: See page 1 of 2, Samples G098 - G100 are part of sample delivery group D [SDG-D]

Total Containers - 12

SAMPLER'S NAME: A.D. Svitana

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana SIGNATURE: [signature]	DATE: 12/9/96 TIME: 12:30	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 12/10/96 TIME: 10:00
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:

VOC Pres U P AU NA

Custody Seal Intact? [X] Yes [ ] No [ ] N.A

Shipment Complete? [X] Yes [ ] No

Temp 4 °C TS TB TM / C

Airbill # 260 102 9653

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE / 08331.003

Turn-Around Time
☐ - Standard Service
☐ - * Rush Service
Date requested by: _____
Ph # ( ) - -
Fax # ( ) - -

Send Report to: M.J. GEFELL

Send Invoice to: M.J. GEFELL

P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other		PARAMETERS FOR ANALYSIS: VOC by CLP-RAS	PARAMETERS FOR ANALYSIS: Alcohols by 8015
G114	12/10/96	10:00		X	X			Blasland, Bouck & Lee 12/11/96 Water G114	2	2
G115	12/10/96	9:00		X	X			Blasland, Bouck & Lee 12/11/96 Water G115	2	2

REMARKS: SEE PAGE #1 The samples on this page are the last of Sample Delivery Group D (SDG-D)

Total Containers - 8

SAMPLER'S NAME: A.D. Svitana SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana	DATE: 12/10/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 16:10	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) [signature]	DATE: 12/11/96
SIGNATURE:	TIME:		TIME: 10:00

VOC Pres U P AU NA

Custody Seal Intact? ☐ Yes ☐ No ☐ N.A

Shipment Complete? ☐ Yes ☐ No

Temp 1 °C IS IB IM

Airbill #

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE 08331.003

Turn-Around Time
[X] - Standard Service
[ ] - * Rush Service
Date requested by:
Ph # (3) - -
Fax # ( ) - -

Page 2 of 3

Send Report to: M.J. GEFELL

Send Invoice to: M.J. GEFELL

P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	Grab	Aqueous	Soil	er	VOC by CLP-RAS	Alcohols by 8015	Temperature Check
G116	12/10/96	15:00		X	X			2	2	
G121	12/10/96	15:45		X	X			2	2	
TEMP BLANK	12/10/96	16:00		X	X					1

Blasland, Bouck & Lee L34[illegible]
12/11/96 Water G116

Blasland, Bouck & Lee L34[illegible]
12/11/96 Water G121

PARAMETERS FOR ANALYSIS

REMARKS: SEE PAGE 1 (Samples this page part of SDG-~~E~~ D) KAB

Total Containers - 9

SAMPLER'S NAME: A.D. SVITANA

SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. SVITANA SIGNATURE: [signature]	DATE: 12/10/96 TIME: 16:10	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 12/11/96 TIME: 10:00

VOC Pres U P AU NA

Custody Seal Intact? [ ] Yes [ ] No [ ] N A

Shipment Complete? [ ] Yes [ ] No

Temp 1 °C TS TB TM

Airbill #

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSN2/08331-003

Turn-Around Time
☑ - Standard Service
☐ - * Rush Service
Date requested by:
Ph # (315) - 446 - 9120
Fax # (315) - 446 - 2353

Send Report to: M. J. Gefell

Send Invoice to: M. J. Gefell

P.O. # 08331-003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	Grab	Aqueous	Oil	Other	PARAMETERS FOR ANALYSIS: VOC by CLP-RAS	Alcohols by 8015	Total Metals (Fe, Mn) by 6010	Dissolved Metals (Fe, Mn) by 6010
G170	12/16/96	1205		X	X			2	2	1	1
G171		1305						2	2	1	1
G172		1410						2	2	1	1
G173		1530						2	2	1	1
G174 TB		1600						1	1		

Blasland, Bouck & Lee L34384-1 G170
Bouck & Lee L34384-2 G171
Lee L34384-3 G172
Lee L34384-4 G173
Lee L34384-5 G174

Total Containers - 26

REMARKS: G170 → G174 marks the 1st four (GR) samples of [SDG-H]. G174 is trip blank. All primary samples (five) may have VOC concentrations > 50 ppb.

SAMPLER'S NAME: Scott A. Pawlin SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Scott A. Pawlin	DATE: 12/17/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 1630	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME	DATE:	Received For Laboratory By: (Signature) [signature]	DATE: 12/18/96
SIGNATURE:	TIME:		TIME: 10:00

VOC Pres U P AU NA
Custody Seal Intact? ☐ Yes ☐ No ☐ N.A.
Shipment Complete? ☐ Yes ☐ No
Temp ____ °C IS IB IM
Airbill #

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSNE/08331.003

Turn-Around Time
[X] - Standard Service
[ ] - * Rush Service
Date requested by:
Ph # (315) - 446-9120
Fax # (315) - 449-2353

Page 1 of 2

Send Report to: M.J. Gefell

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P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous	Soil	Other	Laboratory	VOC's by CLP-RAS	Alcohols by 8015	Total Metals (Fe,Mn) by 6010	Dissolved Metals (Fe,Mn) by 6010	Temperature Check (JAB)
G175	12/18/96	0850		X	X			Blasland, Bouck & Lee 12/19/96 Water G175 L34418-1	2	2	1	1	
G176		1055						Blasland, Bouck & Lee 12/19/96 Water G176 L34418-2	2	2	1	1	
G176MS		1055						Blasland, Bouck & Lee 12/19/96 Water G176MS L34418-3	2	2	1	1	
G176 MSD		1055						Blasland, Bouck & Lee 12/19/96 Water G176MSD L34418-4	2	2			
G177		1145						Blasland, Bouck & Lee 12/19/96 Water G177 L34418-5	2	2	1	1	
G178 Dup		1200						Blasland, Bouck & Lee 12/19/96 Water G178 L34418-6	2	2			
G179		1210						Blasland, Bouck & Lee 12/19/96 Water G179 L34418-7	2	2	1	1	
G180		1355						Blasland, Bouck & Lee 12/19/96 Water G180 L34418-8	2	2			
G181		1454						Blasland, Bouck & Lee 12/19/96 Water G181 L34418-9	2	2			
G182		1520						Blasland, Bouck & Lee 12/19/96 Water G182 L34418-10	2	2			
G183		1550						Blasland, Bouck & Lee 12/19/96 Water G183 L34418-11	2	2			
G184 TB		1615						Blasland, Bouck & Lee 12/19/96 Water G184 L34418-12	1	1			

REMARKS: All samples for VOC's and Alcohols analysis collected in 4-40mL VOA vials with no headspace; Metals bottles collected in 1-liter plastics and preserved with HNO_3; Dissolved metals have been field filtered, G184 is trip blank; All samples belong in sample delivery group H; All samples are likely to have VOC concentrations > 50 ppb.

Total Containers - 56

SAMPLER'S NAME: Scott A. Powlin SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: Scott A. Powlin SIGNATURE: [signature]	DATE: 12/18/96 TIME: 1630	NAME: SIGNATURE:	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature)	DATE: TIME:
NAME: SIGNATURE:	DATE: TIME:	Received For Laboratory By: (Signature) [signature]	DATE: 12/19/96 TIME: 10:01

VOC Pres U P AU NA

Custody Seal Intact? [ ] Yes [ ] No [ ] N.A.
Shipment Complete? [ ] Yes [ ] No

Temp ____ °C TS TB TM

Airbill #

GALSON LABORATORIES
6601 Kirkville Road East
E. Syracuse, NY 13057
315-432-0506
800-950-0506

Company Name: BBL

Project Name / Number: SRSWE/08331.003

Turn-Around Time
[X] - Standard Service
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Date requested by:
Ph #: (315) - 446-9120
Fax # (315) - 449-2353

Page 1 of 2

Send Report to: M.J. GEFELL

Send Invoice to: M.J. GEFELL

P.O. # 08331.003

Chain of Custody Record

SAMPLE ID	Date	Time	TYPE Comp.	TYPE Grab	Aqueous			VOC by CLP-RAS	Alcohols by 8015
G185	12/19/96	9:05		X	X	Blasland, Bouck & Lee 12/20/96 Water G185	L34497-1	2	2
G186		12:15		X	X	Blasland, Bouck & Lee	L34497-2	2	2
G187		11:15		X	X	Blasland, Bouck & Lee	L34497-3	2	2
G188		11:40		X	X	Blasland, Bouck & Lee	L34497-4	2	2
G189		12:10		X	X	Blasland, Bouck & Lee	L34497-5	2	2
G190		1235		X	X	Blasland, Bouck & Lee	L34497-6	2	2
G191		1315		X	X	Blasland, Bouck & Lee	L34497-7	2	2
G192		13:20		X	X	Blasland, Bouck & Lee 12/20/96 Water G192	L34497-8	2	2

PARAMETERS FOR ANALYSIS

Total Containers - 32

REMARKS: All samples collected in 40ml vials w/no headspace; preserved w/HCl and chilled to ≤4°C. All samples on this chain are part of SDG-H and all have suspected total VOC concentrations >50ppb except for G187 which is likely <50ppb.

SAMPLER'S NAME: A.D. SVITANA SIGNATURE: [signature]

SAMPLES RELINQUISHED BY:		SAMPLES RECEIVED BY:	
NAME: A.D. Svitana	DATE: 12/19/96	NAME:	DATE:
SIGNATURE: [signature]	TIME: 16:30	SIGNATURE:	TIME:
NAME:	DATE:	Received For Laboratory By: (Signature)	DATE:
SIGNATURE:	TIME:		TIME:
NAME:	DATE:	Received For Laboratory By: (Signature) [signature]	DATE: 12/20/96
SIGNATURE:	TIME:		TIME: 10:30

VOC Pres U P AU NA
Custody Seal Intact? [X] Yes [ ] No [ ] N.A.
Shipment Complete? [X] Yes [ ] No
Temp <4 °C TS TB (TM) 1 CC
Airbill # 260 102 7755

Appendix Q

Summary of Temporal VOC Detection History at Selected Wells

LOCATION	DATE	1,1,1-Trichloroethane	1,1-Dichloroethane	Benzene	Tetrachloroethene	Trichloroethene	Vinyl chloride
CW-1-78	6/16/81	ND	9	ND	ND	ND	
CW-1-78	9/1/82	14	48	ND	ND	32	
CW-1-78	3/22/95	5 U	6	5 U	5 U	5 U	10 U
CW-1-78	11/20/96	1 U	2	1 U	1 U	2 U	1 U
CW-3-78	6/16/81	ND	4	ND	ND	ND	
CW-3-78	9/1/82	ND	ND	ND	ND	ND	
CW-3-78	3/22/95	5 U	5 U	5 U	5 U	5 U	10 U
CW-3-78 (DUP)	3/22/95	4 J	5 U	5 U	5 U	5 U	10 U
CW-3-78	11/20/96	1 U	5	1 U	1 U	3 U	1 U
CW-4-78	3/1/80	32	12		1	1.8	
CW-4-78	6/16/81	ND	ND	180	ND	ND	
CW-4-78	9/1/82	30	12	ND	ND	2	
CW-4-78	11/20/96	1 U	4	1 U	1 U	2 U	1 U
MW-01	9/1/82	870	1400	ND	ND	20 <	
MW-01	8/1/83	243	636	ND	ND	ND	
MW-01	7/1/84	320	649	ND	ND	ND	
MW-01	4/1/85	180	660	ND	ND	ND	
MW-01	9/1/85	360	530	ND	ND	ND	
MW-01	2/1/86	200	400	ND	ND	ND	
MW-01	6/26/90	82	200	5 U	5 U	5	4 J
MW-01	12/13/90	81	180	2 U	2.2	6	10 U
MW-01	11/30/94	140	120	5 U	5 U	5 U	9 J
MW-01	3/28/95	150	100	5 U	5 U	5 U	6 J
MW-01	12/20/96	170 D	150 D	1 U	4	7	4
MW-02	6/27/90	24	16	5 U	5 U	5 U	10 U
MW-02	11/29/94	62	25	5 U	5 U	5 U	10 U
MW-02	3/28/95	20	11	5 U	5 U	5 U	10 U
MW-02	12/5/96	17	4	1 U	1 U	1 U	1 U
MW-05	9/1/82	ND	ND	17	ND	ND	
MW-05	8/1/83	ND	ND	ND	ND	ND	
MW-05	9/1/85	ND	ND	ND	ND	ND	
MW-05	2/1/86	ND	ND	25	ND	ND	
MW-05	6/28/90	5 U	5 U	37	5 U	5 U	10 U
MW-05	12/13/90	2 U	2 U	26	2 U	2 U	10 U
MW-05	8/28/91	5000 UJ	5000 UJ	5000 UJ	5000 UJ	5000 UJ	5000 UJ
MW-05	11/30/94	630 U	630 U	630 U	630 U	630 U	1300 U
MW-05	3/28/95	280 U	280 U	280 U	280 U	280 U	560 U
MW-05	12/11/96	10 U	10 U	100	10 U	10 U	10 U
MW-06	9/1/82	ND	ND	14	ND	5	
MW-06	5/1/83	11	13	17	ND	ND	
MW-06	8/1/83	ND	ND	20	ND	ND	
MW-06	9/1/85	ND	ND	ND	ND	ND	
MW-06	2/1/86	ND	ND	34	ND	ND	
MW-06	12/13/90	2 U	2 U	26	2 U	2 U	10 U
MW-06	12/11/96	10 U	10 U	80	10 U	10 U	10 U
MW-07	9/1/82	ND	ND	26	ND	ND	
MW-07	5/1/83	ND	ND	17	ND	ND	
MW-07	8/1/83	ND	ND	22	ND	ND	

LOCATION	DATE	1,1,1-Trichloroethane	1,1-Dichloroethane	Benzene	Tetrachloroethene	Trichloroethene	Vinyl chloride
MW-07	7/1/84	ND	ND	30	ND	ND	
MW-07	4/1/85	ND	ND	23	ND	ND	
MW-07	9/1/85	ND	ND	ND	ND	ND	
MW-07	2/1/86	ND	ND	26	ND	ND	
MW-07	6/28/90	5 U	5 U	14	5 U	5 U	10 U
MW-07	12/13/90	2 U	2 U	9.1	2 U	2 U	10 U
MW-07	8/28/91	5 UJ	5 UJ	28 J	5 UJ	5 UJ	5 UJ
MW-07	11/30/94	130 U	130 U	130 U	130 U	130 U	250 U
MW-07	3/28/95	50 U	50 U	42 J	50 U	50 U	100 U
MW-07	12/11/96	10 U	10 U	75	10 U	10 U	10 U
MW-07 (DUP)	12/11/96	10 U	10 U	97	10 U	10 U	10 U
MW-121A	8/29/91	1 UJ	6 J	7.1 J	1 UJ	1 UJ	13 J
MW-121A	12/10/92	10 U	7 J	6 J	10 U	10 U	7 J
MW-121A	11/30/94	5 U	5 U	6	5 U	5 U	4.3 J
MW-121A	3/28/95	5 U	5 U	7	5 U	5 U	10 U
MW-121A	12/12/96	10 U	10 U	10	10 U	70 U	10 U
MW-121B	12/8/92	100 U	100 U	91 J	100 U	100 U	100 U
MW-121B	11/30/94	170 U	170 U	170 U	170 U	170 U	330 U
MW-121B	3/28/95	250 U	250 U	250 U	250 U	250 U	500 U
MW-121B	12/13/96	370	100 U	110	140	350 U	100 U
MW-121C	8/13/91	56 J	220 J	110 J	1 UJ	0.5 J	1900 J
MW-121C	12/8/92	200 U	200 U	96 J	200 U	200 U	200 U
MW-121C	11/30/94	130 U	130 U	130 U	130 U	130 U	250 U
MW-121C	3/28/95	140 U	140 U	140 U	140 U	140 U	290 U
MW-121C	12/12/96	100 U	100 U	100 U	100 U	100 U	100 U
MW-127C	8/13/91	12 UJ	37 J	3 J	1 UJ	0.8 J	3 J
MW-127C	12/4/92	10	21	2 J	10 U	10 U	10 U
MW-127C (DUP)	12/4/92	10	21	2 J	10 U	10 U	10 U
MW-127C	11/29/94	24	35	5 U	5 U	5 U	10 U
MW-127C	3/23/95	31	30	5 U	5 U	5 U	10 U
MW-127C (DUP)	3/23/95	31	30	5 U	5 U	5 U	10 U
MW-127C	11/21/96	78 DJ	36 D	1 U	1 U	2 U	1 U
MW-204A	12/3/92	6 J	22	7 J	10 U	30	170
MW-204A	12/1/94	8 U	16	8 U	8 U	34	55
MW-204A	3/28/95	3.2 J	10	5 U	5 U	16	10 U
MW-204A	12/20/96	1 U	18	1	48 D	300 D	13
MW-204B	12/3/92	10 U	10 U	10 U	10 U	10 U	10 U
MW-204B	12/1/94	5 U	5 U	5 U	5 U	5 U	10 U
MW-204B	3/28/95	5 U	5 U	5 U	5 U	5 U	10 U
MW-204B	12/5/96	1 U	1 U	1 U	1 U	2	1 U
SRS-3	5/1/83	31	655	ND	ND	ND	
SRS-3	9/1/85	ND	24	ND	ND	ND	
SRS-3	2/1/86	19	110	ND	ND	ND	
SRS-3	12/13/90	43	130	2 U	2 U	6.1	10 U
SRS-3	12/11/96	7 U	60 D	2	1 U	1 U	2
SRS-5	12/13/90	40 U	40 U	74	40 U	40 U	200 U
SRS-5	12/11/96	1 U	1 U	68 D	1 U	1 U	1
SRS-6	12/13/90	40 U	40 U	78	40 U	40 U	200 U

LOCATION	DATE	1,1,1-Trichloroethane	1,1-Dichloroethane	Benzene	Tetrachloroethene	Trichloroethene	Vinyl chloride
SRS-6	12/11/96	50 U	50 U	76	50 U	50 U	50 U
TW-02	3/1/80	2000	69		230	23	
TW-02	6/16/81	ND	9	ND	ND	ND	
TW-02	6/27/90	5 U	5 U	5 U	3 J	5 U	10 U
TW-02	12/1/94	5 U	5 U	5 U	5 U	5 U	10 U
TW-02 (DUP)	12/1/94	5 U	5 U	5 U	5 U	5 U	10 U
TW-02	11/19/96	1 U	1 U	1 U	30 D	8 U	1 U
TW-05	3/1/80	90	7		2.8	1	
TW-05	6/16/81	1	ND	109	ND	ND	
TW-05	6/27/90	92	25 U	25 U	390	39	50 U
TW-05	12/1/94	5 U	5 U	5 U	45	51	19
TW-05	3/21/95	5 U	5 U	5 U	29	57	21
TW-05	12/9/96	1 U	3	1	150 D	37 D	30 D
TW-07A	3/1/80	440	2700		18	4	
TW-07A	9/1/82	ND	4300	570	470	330	
TW-07A	8/1/83	132	6400	414	491	296	
TW-07A	2/1/86	ND	6100	ND	ND	ND	
TW-07A	6/25/90	5000 U	5000 U	5000 U	5000 U	5000 U	4900 J
TW-07A	12/13/90	500 U	500 U	500 U	500 U	500 U	2500 U
TW-07A	8/26/91	R	R	R	R	R	R
TW-07A	12/3/92	1000 U	1000 U	1000 U	1000 U	1000 U	1000 U
TW-07A	12/9/92	500 U	500 U	500 U	500 U	500 U	500 U
TW-07A	11/30/94	330 U	330 U	330 U	330 U	330 U	670 U
TW-07A	3/23/95	170 U	170 U	170 U	170 U	170 U	330 U
TW-07A	12/10/96	50 U	50 U	140	50 U	50 U	50 U
TW-07B	3/1/80	300	650		120	800	
TW-07B	9/1/82	370	720	240	ND	ND	
TW-07B	8/1/83	64	527	123	42	35	
TW-07B	7/1/84	533	643	347	ND	ND	
TW-07B	9/1/85	ND	ND	ND	ND	ND	
TW-07B	2/1/86	ND	ND	ND	ND	ND	
TW-07B	6/25/90	5000 U	1700 J	5000 U	5000 U	5000 U	14000 J
TW-07B	12/13/90	500 U	700	500 U	500 U	500 U	5800
TW-07B	11/30/94	830 U	830 U	830 U	830 U	830 U	1700 U
TW-07B	3/23/95	450 U	450 U	450 U	450 U	450 U	910 U
TW-08A	3/1/80	11000	1000		5000	25000 >	
TW-08A	9/1/82	9600	1100	390	2900	40000	
TW-08A	9/1/85	10000	ND	ND	ND	3500	
TW-08A	6/28/90	2600	3400 U	2500 U	2500 U	2500 U	6800
TW-08A	8/26/91	500 UJ	210 J	62 J	500 UJ	500 UJ	2700 J
TW-08A	12/3/92	500 U	500 U	500 U	500 U	500 U	500 U
TW-08A	11/30/94	9600	7200	2500 U	2500 U	2500 U	8900
TW-08A (DUP)	11/30/94	10000	6900	1700 U	1700 U	1700 U	9900
TW-08A	3/21/95	12000	4300 J	6300 U	6300 U	6300 U	13000 U
TW-08A	12/16/96	7100 EJ	1600	250 U	250 U	250 U	300
TW-11	3/1/80	550	275		4.1	26	
TW-11	9/1/82	19	120	ND	ND	5	
TW-11	5/1/83	12					

LOCATION	DATE	1,1,1-Trichloroethane	1,1-Dichloroethane	Benzene	Tetrachloroethene	Trichloroethene	Vinyl chloride
TW-11	8/1/83	ND	59	ND	ND	ND	
TW-11	7/1/84	14	28	ND	ND	ND	
TW-11	4/1/85	ND	27	ND	ND	ND	
TW-11	9/1/85	ND	150	ND	ND	ND	
TW-11	2/1/86	100	87	ND	ND	ND	
TW-11	6/26/90	9	4 J	5 U	5 U	5 U	10 U
TW-11	12/13/90	35	17	2 U	2 U	2 U	10 U
TW-11	11/30/94	54	36	5 U	5 U	3.4 J	10 U

Appendix R

USAF Natural Attenuation Ranking System Summary Tables

EPA/540/R-96/509
September 1996

Symposium on Natural Attenuation of Chlorinated Organics in Ground Water

Hyatt Regency Dallas
Dallas, TX
September 11-13, 1996

Overview of the Technical Protocol for Natural Attenuation of Chlorinated Aliphatic Hydrocarbons in Ground Water Under Development for the U.S. Air Force Center for Environmental Excellence

Todd H. Wiedemeier, Matthew A. Swanson, and David E. Moutoux
Parsons Engineering Science, Inc., Denver, Colorado

John T. Wilson and Donald H. Kampbell
U.S. Environmental Protection Agency, National Risk Management Research Laboratory, Ada, Oklahoma

Jerry E. Hansen and Patrick Haas
U.S. Air Force Center for Environmental Excellence, Technology Transfer Division, Brooks Air Force Base, Texas

Office of Research and Development
U.S. Environmental Protection Agency
Washington, DC

Table 2. Analytical Parameters and Weighting for Preliminary Screening

Analyte	Concentration in Most Contaminated Zone	Interpretation	Points Awarded
Oxygen[a]	< 0.5 mg/L	Tolerated; suppresses reductive dechlorination at higher concentrations	3
Oxygen[a]	> 1 mg/L	Vinyl chloride may be oxidized aerobically, but reductive dechlorination will not occur	-3
Nitrate[a]	< 1 mg/L	May compete with reductive pathway at higher concentrations	2
Iron (II)[a]	> 1 mg/L	Reductive pathway possible	3
Sulfate[a]	< 20 mg/L	May compete with reductive pathway at higher concentrations	2
Sulfide[a]	> 1 mg/L	Reductive pathway possible	3
Methane[a]	> 0.1 mg/L	Ultimate reductive daughter product	2
	> 1	Vinyl chloride accumulates	3
	< 1	Vinyl chloride oxidizes	
Oxidation reduction potential[a]	< 50 mV against Ag/AgCl	Reductive pathway possible	< 50 mV = 1 < -100 mV = 2
pH[a]	5 < pH < 9	Tolerated range for reductive pathway	
DOC	> 20 mg/L	Carbon and energy source; drives dechlorination; can be natural or anthropogenic	2
Temperature[a]	> 20°C	At T > 20ÉC, biochemical process is accelerated	1
Carbon dioxide	> 2x background	Ultimate oxidative daughter product	1
Alkalinity	> 2x background	Results from interaction of carbon dioxide with aquifer minerals	1
Chloride[a]	> 2x background	Daughter product of organic chlorine; compare chloride in plume to background conditions	2
Hydrogen	> 1 nM	Reductive pathway possible; vinyl chloride may accumulate	3
Hydrogen	< 1 nM	Vinyl chloride oxidized	
Volatile fatty acids	> 0.1 mg/L	Intermediates resulting from biodegradation of aromatic compounds; carbon and energy source	2
BTEX[a]	> 0.1 mg/L	Carbon and energy source; drives dechlorination	2
Perchloroethene[a]		Material released	
Trichloroethene[a]		Material released or daughter product of perchloroethene	2[b]
Dichloroethene[a]		Material released or daughter product of trichloroethene; if amount of *cis*-1,2-dichloroethene is greater than 80% of total dichloroethene, it is likely a daughter product of trichloroethene	2[b]
Vinyl chloride[a]		Material released or daughter product of dichloroethenes	2[b]
Ethene/Ethane	< 0.1 mg/L	Daughter product of vinyl chloride/ethene	> 0.01 mg/L= 2 > 0.1 = 3
Chloroethane[a]		Daughter product of vinyl chloride under reducing conditions	2
1,1,1-Trichloroethane[a]		Material released	
1,1-dichloroethene[a]		Daughter product of trichloroethene or chemical reaction of 1,1,1-trichloroethane	

[a] Required analysis.
[b] Points awarded only if it can be shown that the compound is a daughter product (i.e., not a constituent of the source NAPL).

Table 3. Interpretation of Points Awarded During Screening Step 1

Score	Interpretation
0 to 5	Inadequate evidence for biodegradation of chlorinated organics
6 to 14	Limited evidence for biodegradation of chlorinated organics
15 to 20	Adequate evidence for biodegradation of chlorinated organics
> 20	Strong evidence for biodegradation of chlorinated organics

Example 1. Strong Evidence for Biodegradation of Chlorinated Organics

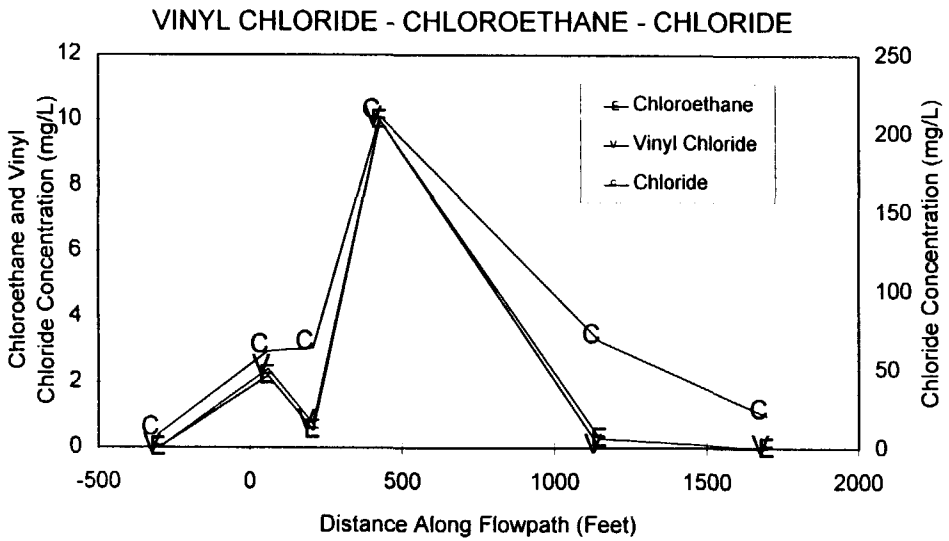
Analyte	Concentration in Most Contaminated Zone	Points Awarded
DO	0.1 mg/L	3
Nitrate	0.3 mg/L	2
Iron(II)	10 mg/L	3
Sulfate	2 mg/L	2
Methane	5 mg/L	3
Oxidation-reduction potential	-190 mV	2
Chloride	3x background	2
Perchloroethene (released)	1,000 µg/L	0
Trichloroethene (none released)	1,200 µg/L	2
cis-1,2-Dichloroethene (none released)	500 µg/L	2
Vinyl chloride (none released)	50 µg/L	2
	Total points awarded	23

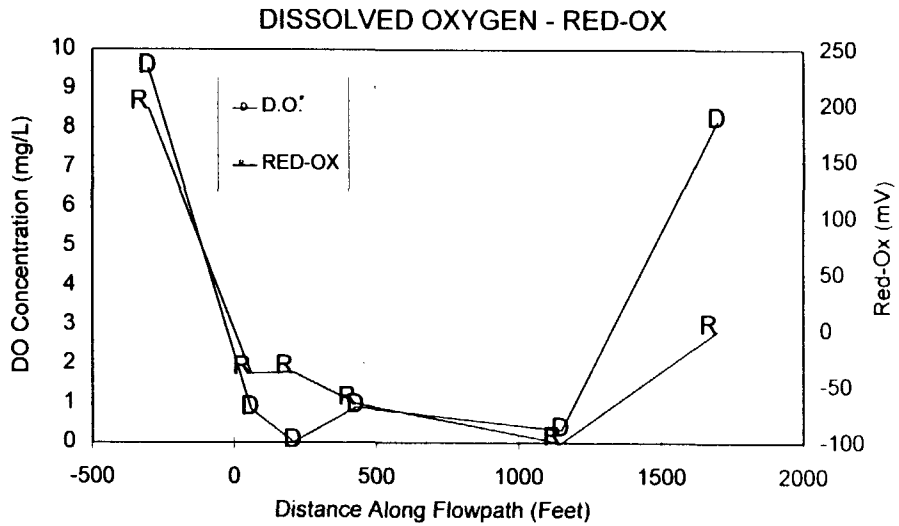
Appendix S

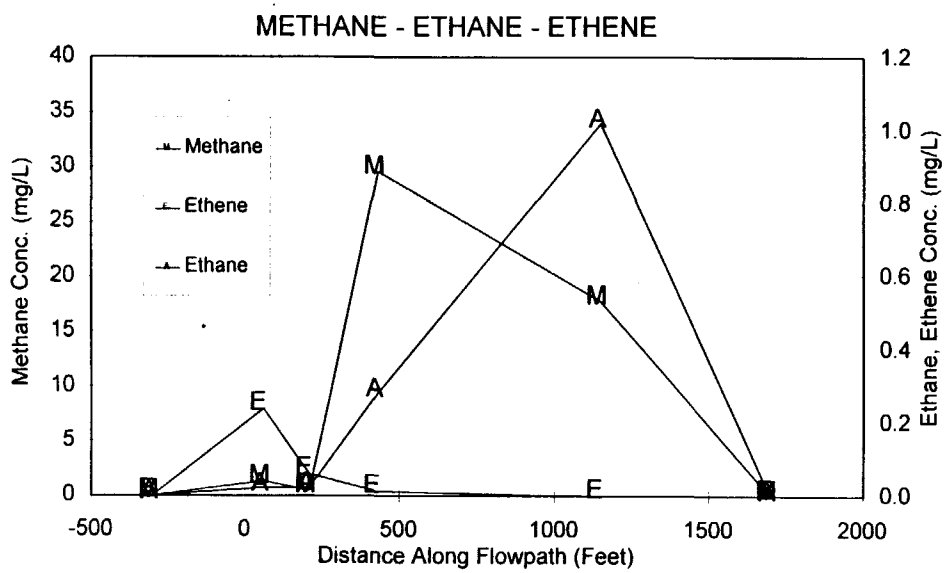
Graphs of Geochemical/Biologic Parameters, and Degradation Sequences in Overburden and Bedrock Ground Water

OVERBURDEN GEOCHEMICAL/BIOLOGIC PARAMETERS

SRSNE SITE - SOUTHINGTON, CONNECTICUT







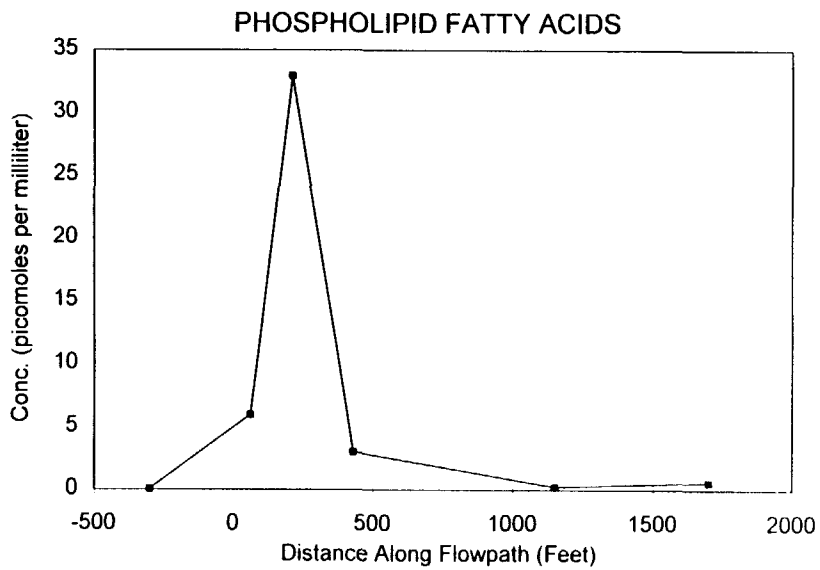
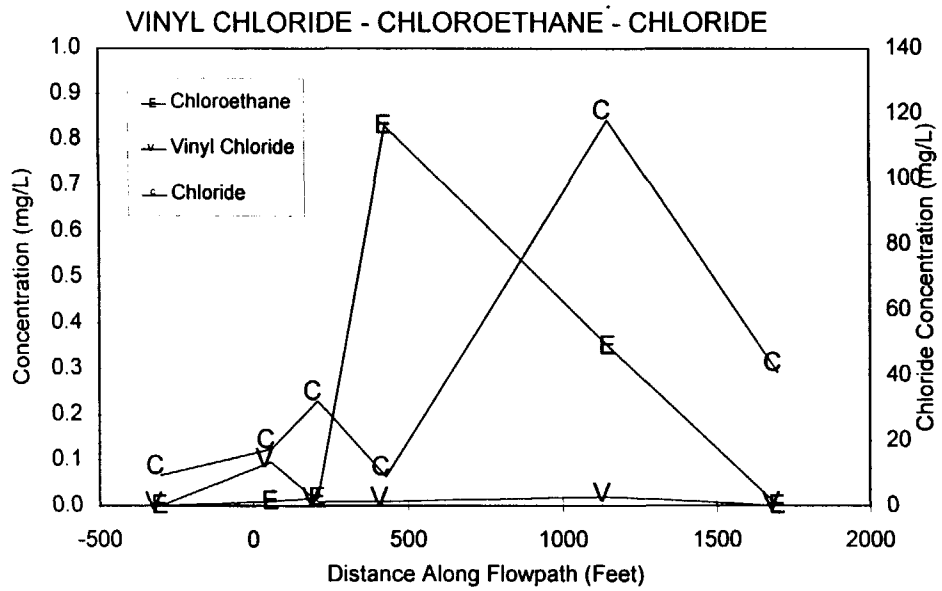
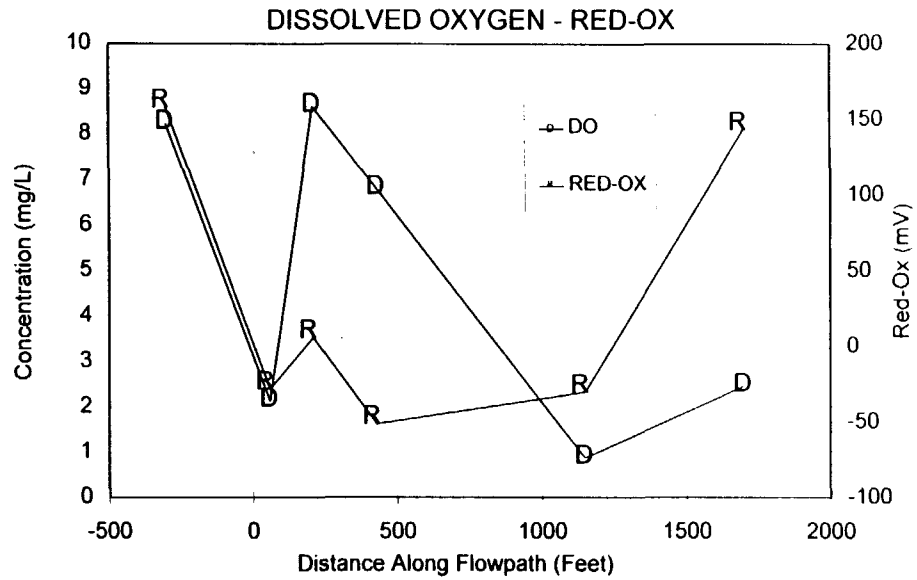


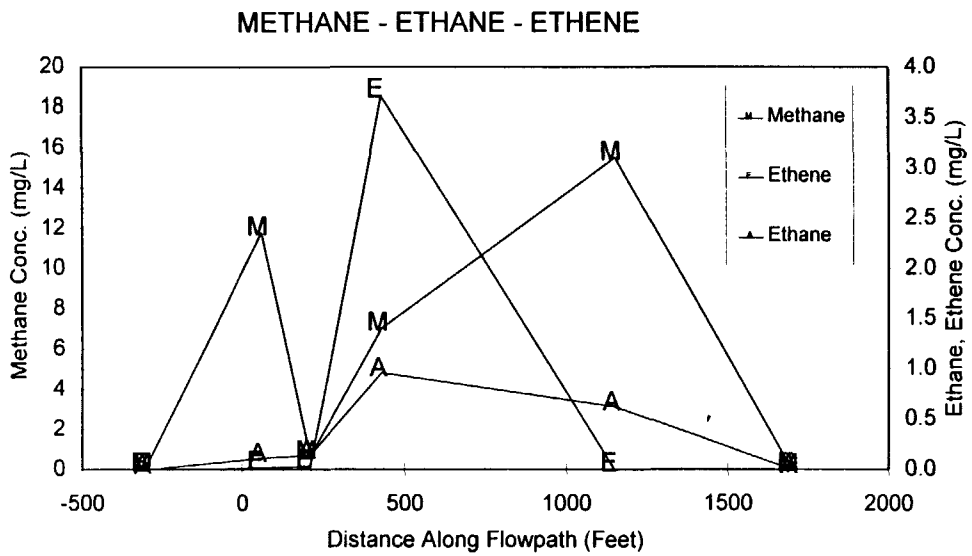
FIGURE S-1

BEDROCK GEOCHEMICAL/BIOLOGIC PARAMETERS

SRSNE SITE - SOUTHINGTON, CONNECTICUT







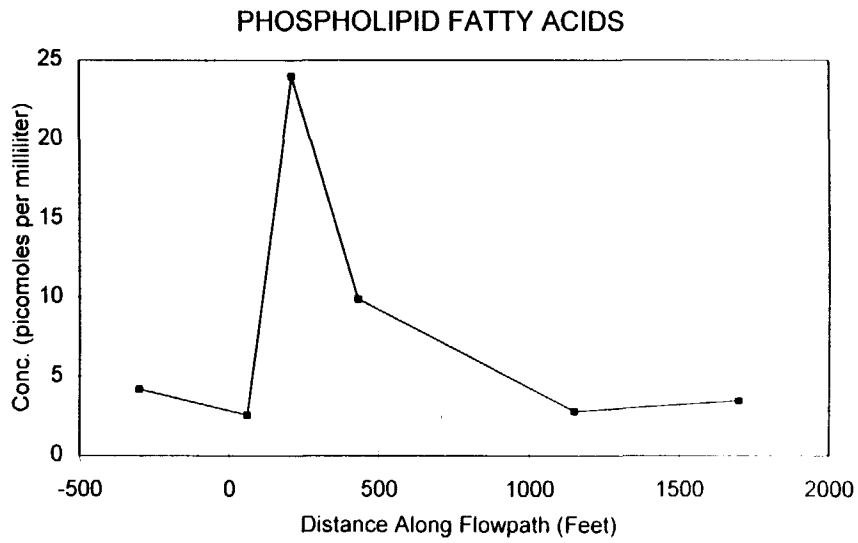


FIGURE S-2

SRSNE Site

Overburden Wells - Dissolved/Total Mn

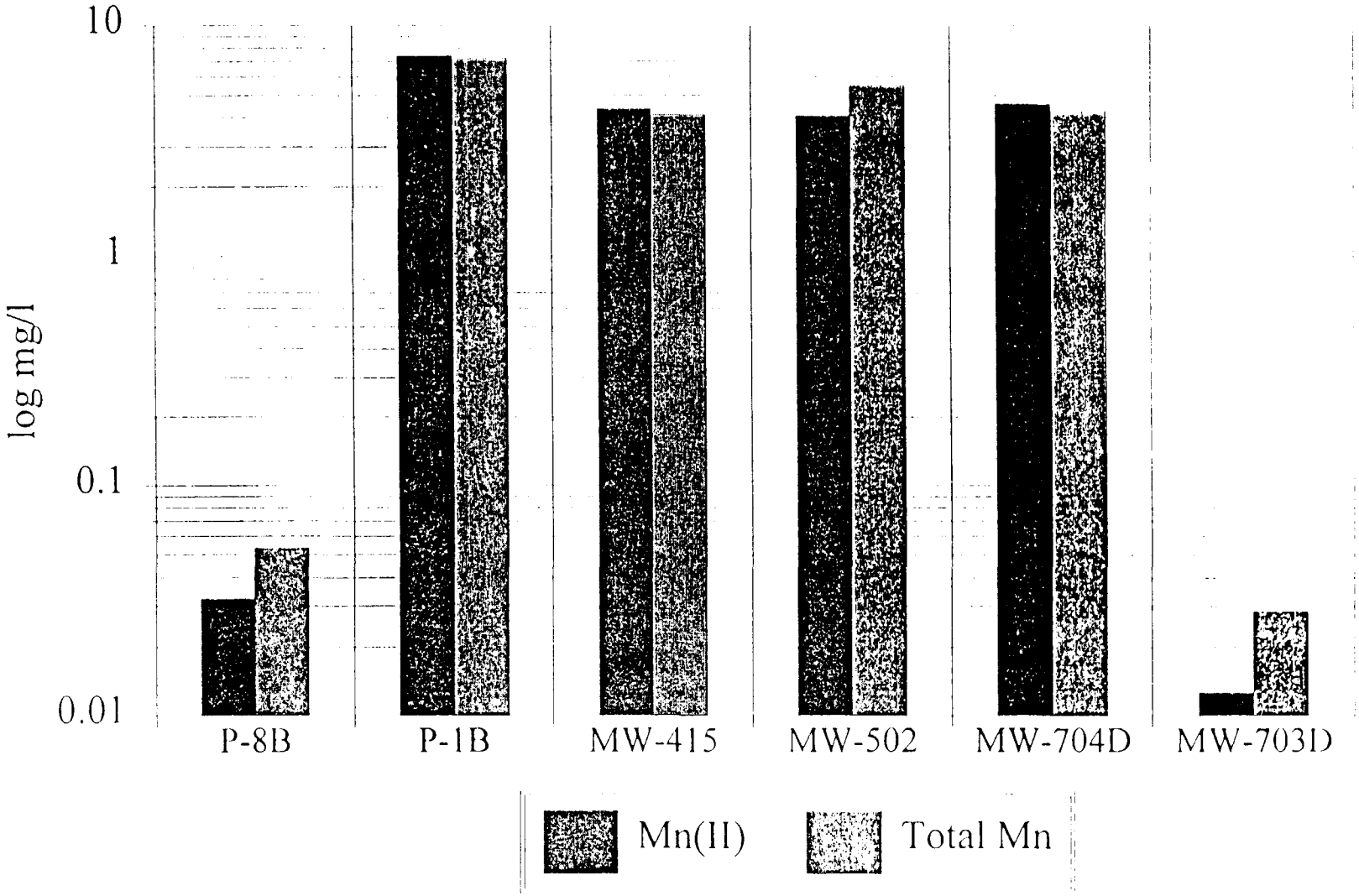


FIGURE S-3

SRSNE Site

Bedrock Wells - Dissolved/Total Mn

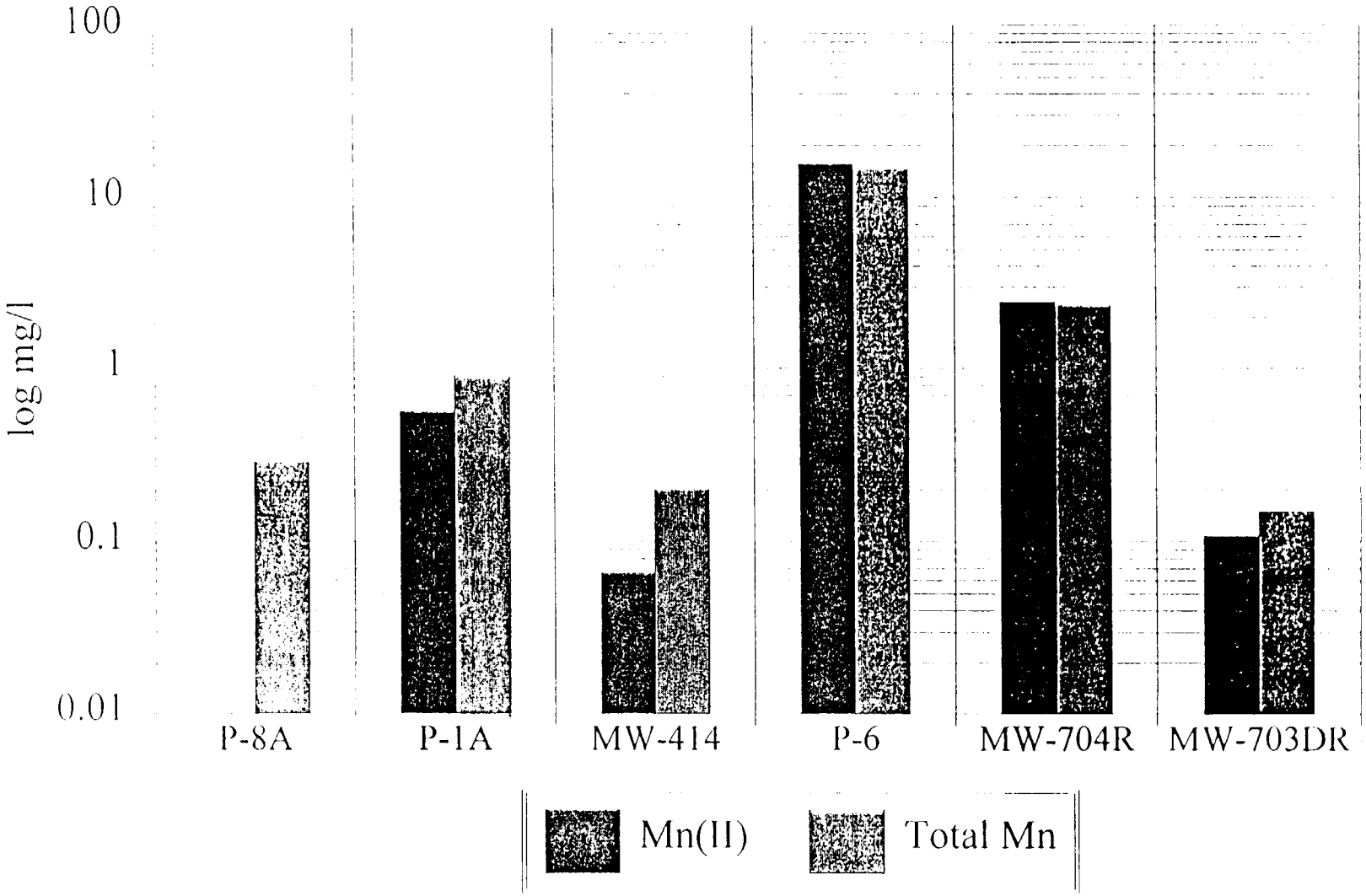


FIGURE S-4

SRSNE Site

Overburden Wells - Dissolved/Total Fe

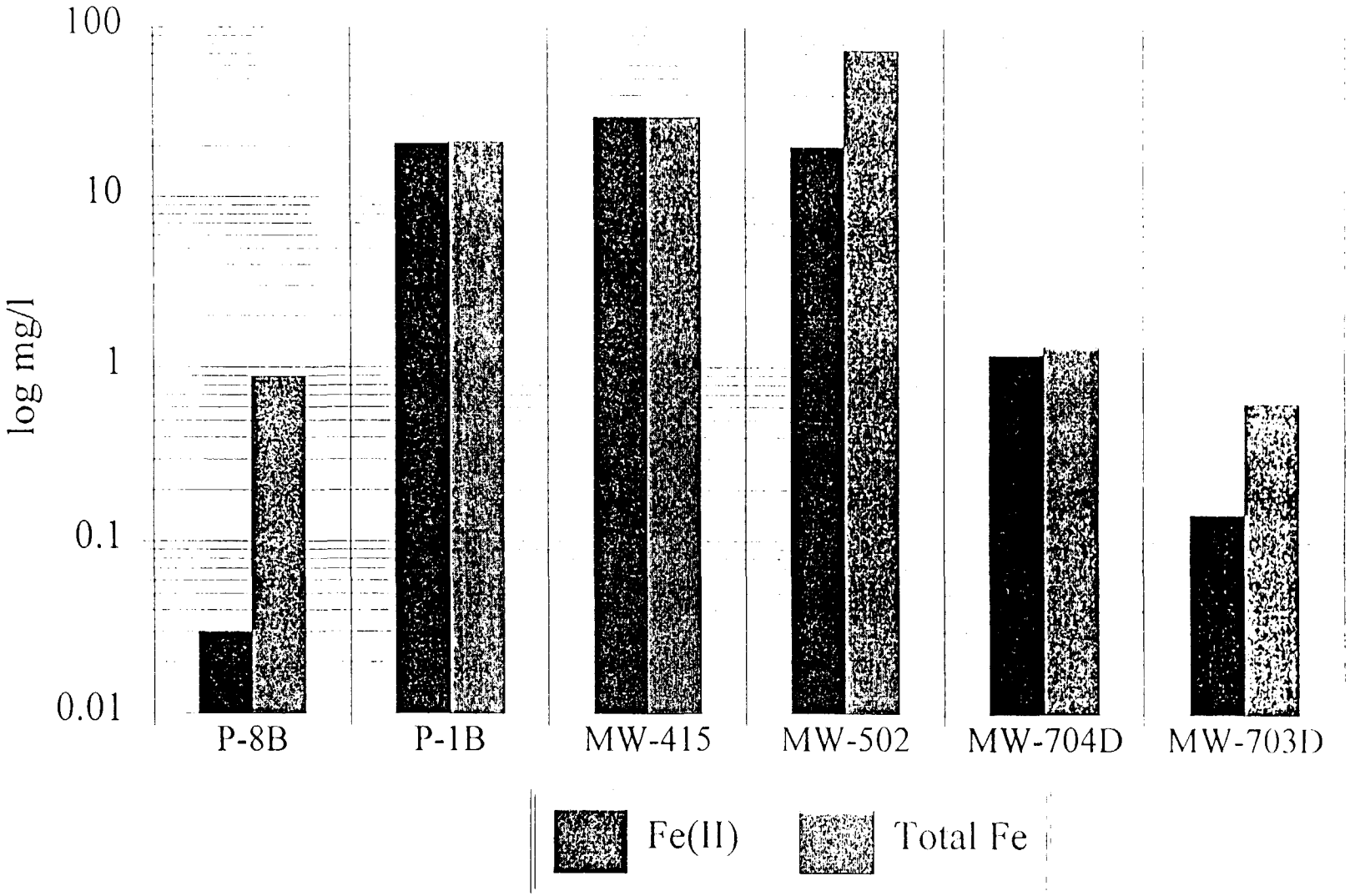


FIGURE S-5

SRSNE Site

Bedrock Wells - Dissolved/Total Fe

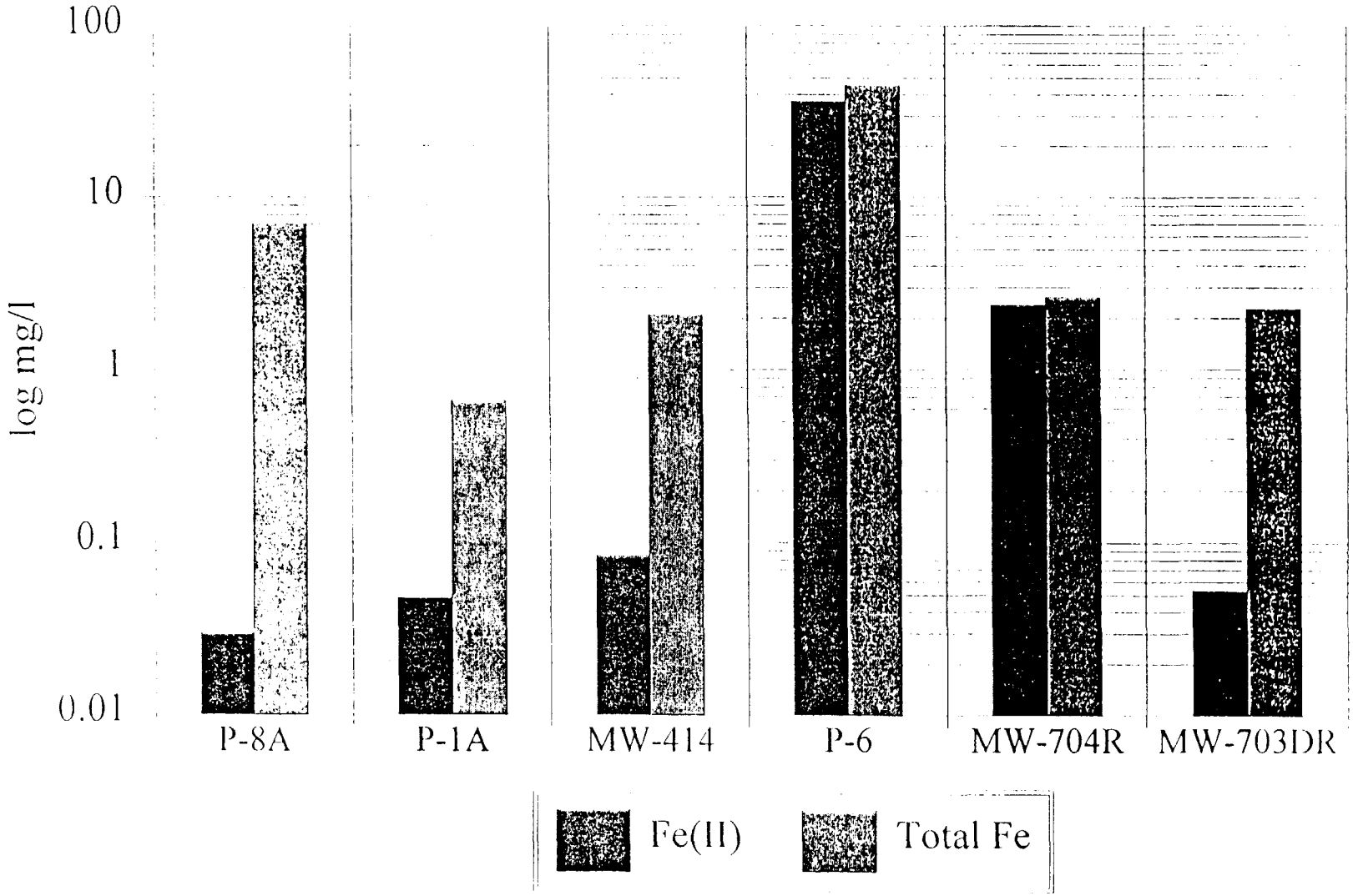


FIGURE S-6

SRSNE Site

Overburden Wells – Sulfate/Sulfide

FIGURE S-7

SRSNE Site

Bedrock Wells – Sulfate/Sulfide

FIGURE S-8

FIGURE S-9

NATURAL ATTENUATION PARAMETERS IN GROUNDWATER, MW-704 CLUSTER

SRSNE SITE
SOUTHINGTON, CONNECTICUT
REMEDIAL INVESTIGATION

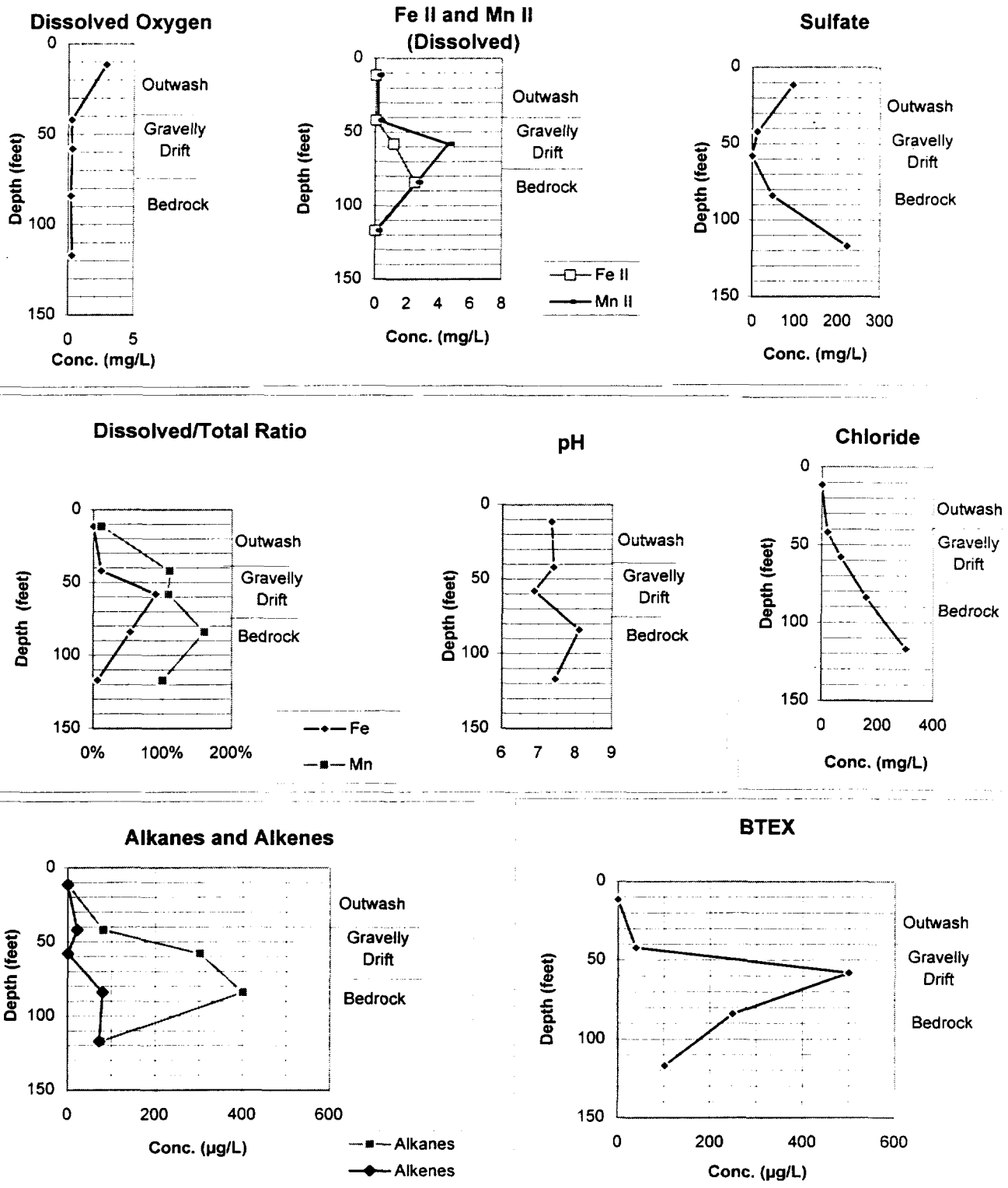
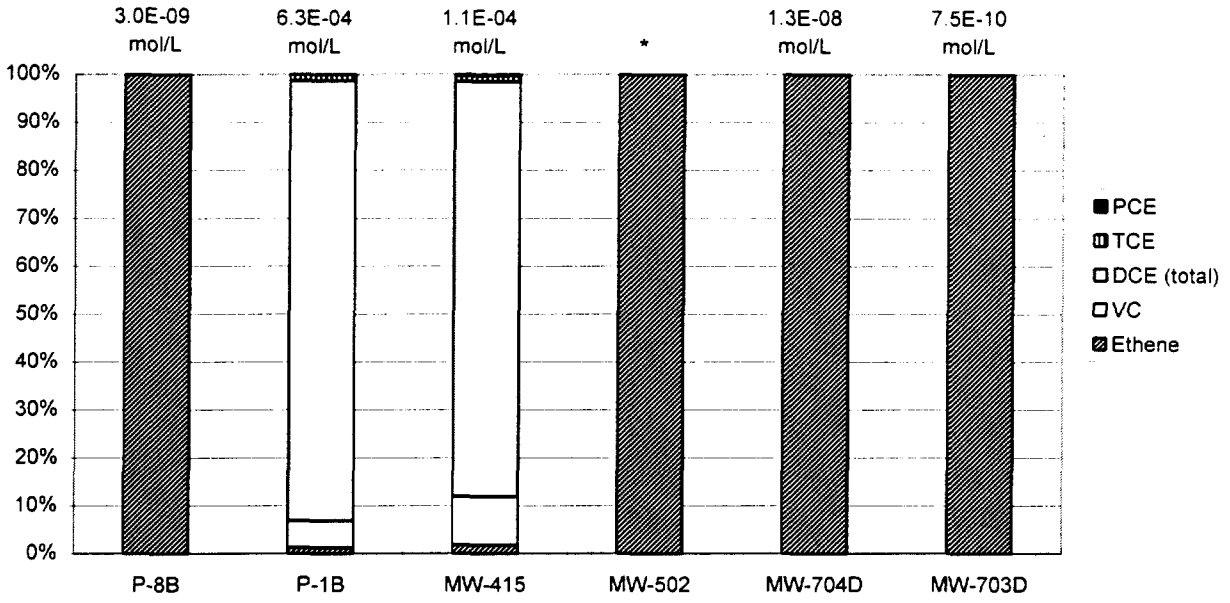


FIGURE S-10

SRSNE Site

Overburden Flow Path Ethenes



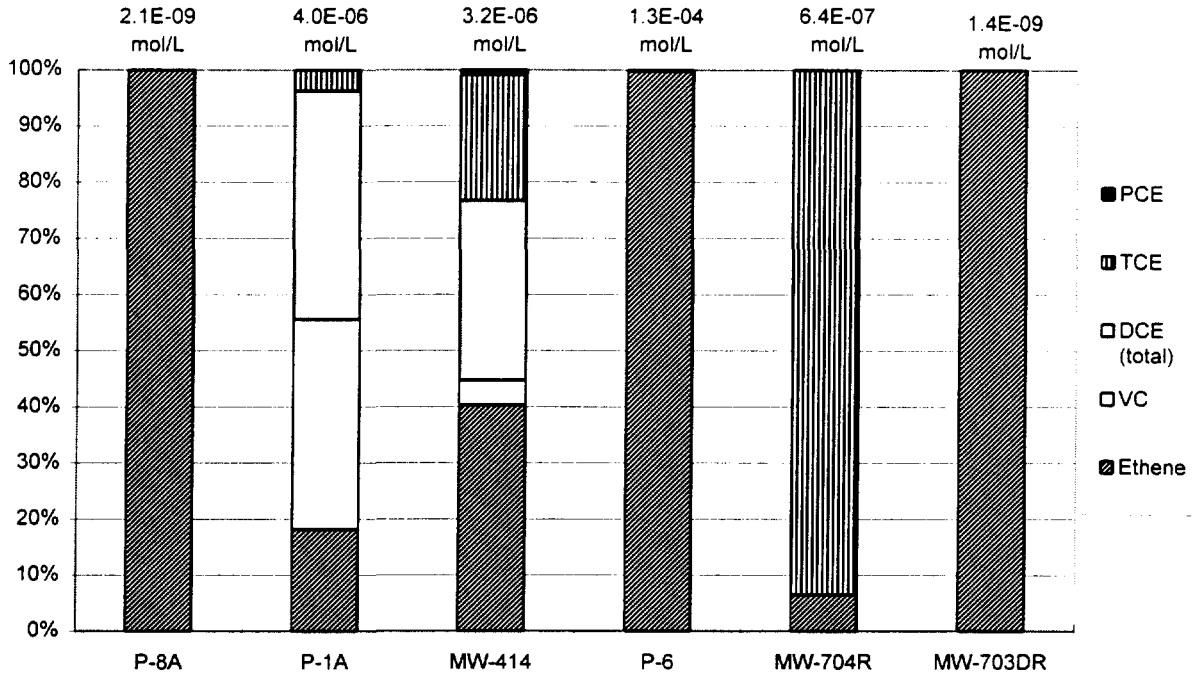
Notes:

1. Sum of total ethenes concentrations posted at top of each bar.
2. mol/L = moles per liter.
3. * = data from MW-502 not summed; VOCs were not detected due to elevated VOC detection levels.
4. DCE (total) = sum of DCE isomer concentrations (1,1-DCE, cis-1,2-DCE, and trans-1,2-DCE).

FIGURE S-11

SRSNE Site

Bedrock Flow Path Ethenes



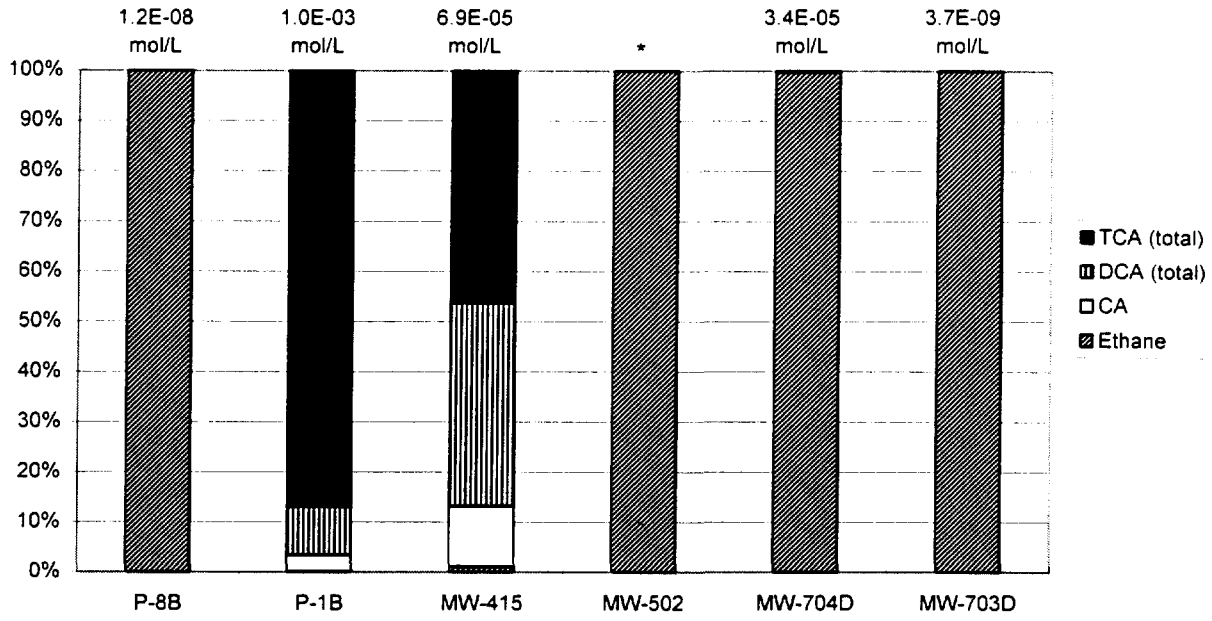
Notes:

1. Sum of total ethenes concentrations posted at top of each bar.
2. mol/L = moles per liter.
3. DCE (total) = sum of DCE isomer concentrations (1,1-DCE, cis-1,2-DCE, and trans--1,2-DCE).
4. Detection of TCE at monitoring well MW-704R interpreted as VOCs discharging from deep bedrock to shallow bedrock.

FIGURE S-12

SRSNE Site

Overburden Flow Path Ethanes



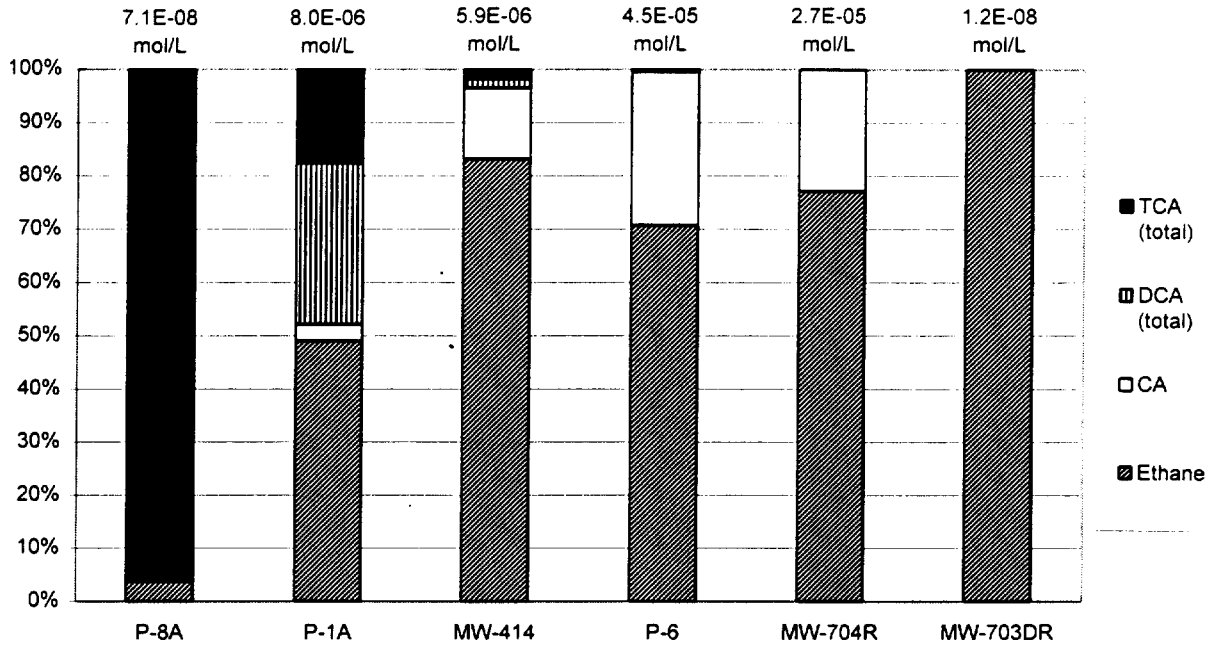
Notes:

1. Sum of total ethanes concentrations posted at top of each bar.
2. mol/L = moles per liter.
3. * = data from MW-502 not summed; VOCs were not detected due to elevated VOC detection levels.
4. TCA (total) = sum of TCA isomer concentrations (1,1,1-TCA and 1,1,2-TCA).
5. DCA (total) = sum of DCA isomer concentrations (1,1-DCA and 1,2-DCA).

FIGURE S-13

SRSNE Site

Bedrock Flow Path Ethanes



Notes:

1. Sum of total ethanes concentrations posted at top of each bar.
2. mol/L = moles per liter.
3. TCA (total) = sum of TCA isomer concentrations (1,1,1-TCA and 1,1,2-TCA).
4. DCA (total) = sum of DCA isomer concentrations (1,1-DCA and 1,2-DCA).

Appendix T

Phospholipid Fatty Acids (PLFA) Data Report

Blasland, Bouck & Lee: PLFA Analysis
January 20, 1997

Summary:

Twenty water samples from the SRSNE Superfund Site were sent for PLFA analysis. These samples contained relatively diverse microbial communities, primarily composed of Gram negative bacteria. Except for the G100, G113, G169, G172, G173 and G175 samples, the Gram negative communities with detectable biomarkers for growth phase were in the stationary phase of growth. The G100, G113, G169, G172, G173 and G175 samples were in the log phase of growth. Except for the G169, G171, G172 and G175 samples, the Gram negative communities with detectable biomarkers for environmental stress were suffering from environmental stress from either toxicity or starvation.

Evidence indicative of Gram positive bacteria, sulfate reducing bacteria and microeukaryotes was also detected.

Biomass:

The biomass measurement is the quantity of phospholipid fatty acids (PLFA) detected in a sample. Phospholipids are part of the intact cell membranes, thus the biomass is a measure of viable or potentially viable cells. As the cell ruptures, phospholipids are attacked by enzymes resulting in a diglyceride fatty acid (DG) molecule representative of recently dead or lysed microorganisms.

The cell equivalent value is calculated from experiments with typical bacteria isolated from soil and water. This is based on 2.0×10^{12} cells per gram dry weight of cells and 10^8 picomoles of phospholipid/gram dry weight of cells. This gives between 1.4×10^4 and 4.0×10^4 cells per picomole (10^{-12}) of PLFA. The number of cells/gram of dry weight may vary and is dependent on the environmental conditions from which the microorganisms were recovered.

The biomass of these samples with detectable levels ranged from 0.04 picomoles/mL with a cell equivalent value of 8.20×10^2 cells/mL of water filtered in the G115 sample to 32.95 picomoles/mL with a cell equivalent value of 6.59×10^5 cells/mL of water filtered in the sample. No biomass detected in the G167 sample.

Community Structure:

All of the samples contained diverse microbial communities primarily composed of monoenoic PLFA. The highest relative proportion of monoenoic PLFA was detected in

the G114 sample (83.7%). Monoenoic PLFA are mostly found in Gram negative bacteria. Generally, Gram negative bacteria are fast growing bacteria which utilize many carbon sources, and adapt quickly to a variety of environments. Except for G177 sample, the monoenoic biomarker for the sulfate-reducing bacteria *Desulfobulbus* (17:1ω6c) was detected in all the samples.

Except for the G098, G115 and G168 samples, terminally branched saturated PLFA representative of Gram positive bacteria but also found in the cell membranes of many sulfate reducing bacteria were detected in all the samples. The highest relative proportion of terminally branched PLFA was detected in the G179 sample (28.4%). Generally, Gram positive bacteria are slower growing than Gram negative bacteria, more resilient, and are capable of degrading more complex compounds.

Except for the G098, G115 and G168 samples, branched monoenoic PLFA were detected in all the samples, with the highest relative proportion in the G112 sample (6.5%). Branched monoenoic PLFA are usually found in the cell membranes of obligate anaerobes such as sulfate or iron reducing bacteria. Except for G099, G100 G114, G167, G169, G171, G175, the branched monoenoic biomarker indicative of the anaerobic sulfate or iron reducing bacteria *Desulfovibrio* (i17:1ω7c) was detected in the sample.

Except for the G098 and G168 samples, mid-chain branched saturated PLFA were detected in all the samples. Mid-chain branched saturated PLFA are common in *Actinomycete* spp., sulfate reducing bacteria and certain Gram positive bacteria. Except for G100, G114, G115, G167 and G169, the biomarker 10me16:0, found in the anaerobic sulfate or iron reducing bacteria's *Desulfobacter,* was detected in all the samples. Except for G099, G114, G115, G167, G169, G172, G173 and G175, the biomarker 10me18:0, found in *Actinomycete* spp., was detected in all the samples.

Eukaryote PLFA, which are found in organisms such as fungi, protozoa, algae, higher plants and animals, were detected in all the samples. The highest relative proportion of eukaryotic PLFA was detected in the G098 sample (37.7%). There are several biomarkers for different microeukaryotic organisms. Except for G168, the biomarker 18:2ω6, which is prominent in fungi but is also found in algae, protozoa, higher plants and animals, was detected in all the samples. Except for G098, G114, G115, G167, G168, G169, G172, G175, G176 and G177, both the biomarkers found in protozoa (20:3ω6 and 20:4ω6) were detected in all the samples. In samples G098, G114, G175 and G176, the 20:4ω6 biomarker was detected. The biomarker 20:5ω3, found in diatoms and higher plants, was detected in the G099, G100, G113, G115, G116, G169, G170, G171, G172, G175 and G176 samples. The eukaryote profiles for these samples contained a relatively large proportion of the fatty acid 18:1ω9c, which is a precursor for certain eukaryote PLFA and due to the presence of biomarkers indicative of microeukaryotes, is included in the PLFA profile. However, this fatty acid is also detected in the Gram

negative bacteria and its inclusion in the eukaryote profile may lead to a slight overestimation of the level of microeukaryotes and an underestimation of the relative proportion of Gram negative bacteria in these samples.

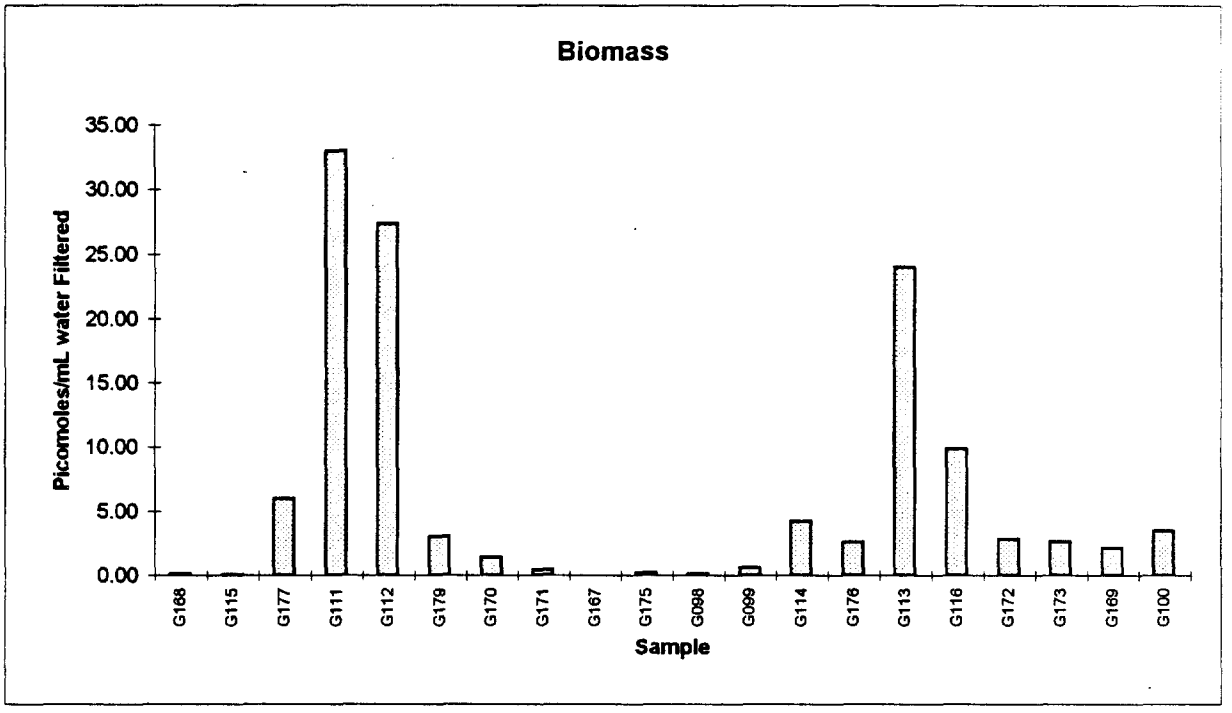
Metabolic Status:

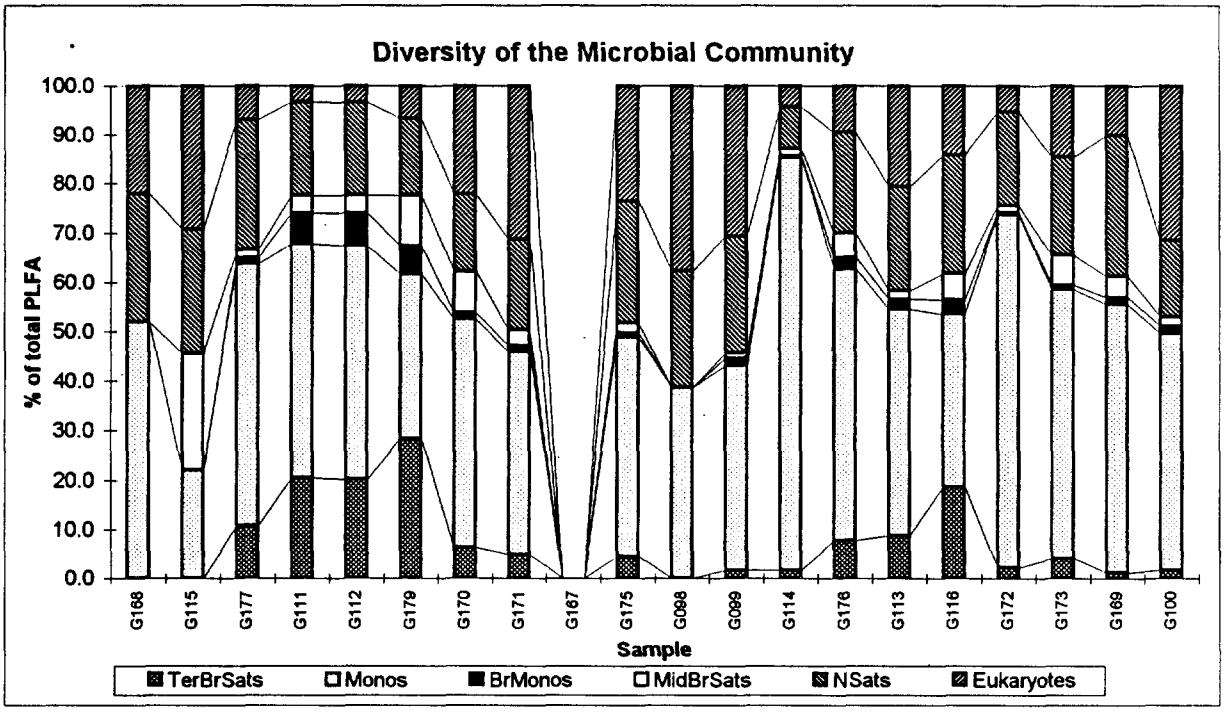
In Gram negative bacteria, the monoenoics (16:1ω7c & 18:1ω7c) are converted to cyclopropyl fatty acids (cy17:0 & cy19:0) as microbes move from a log to a stationary phase of growth (i.e. slowing of growth). This change is expressed in the two ratios cy17:0/16:1ω7c and cy19:0/18:1ω7c. The ratios vary from organism to organism or environment to environment but usually will fall within the range of 0.05 (log phase) to 2.5 (stationary phase). When the ratios are summed the range is from 0.1 to 5.0. An increase in cyclopropyl formation has also been associated with anaerobic metabolism. The ratio is inversely proportional to the turnover rate, ie., a lower ratio infers a higher turnover rate.

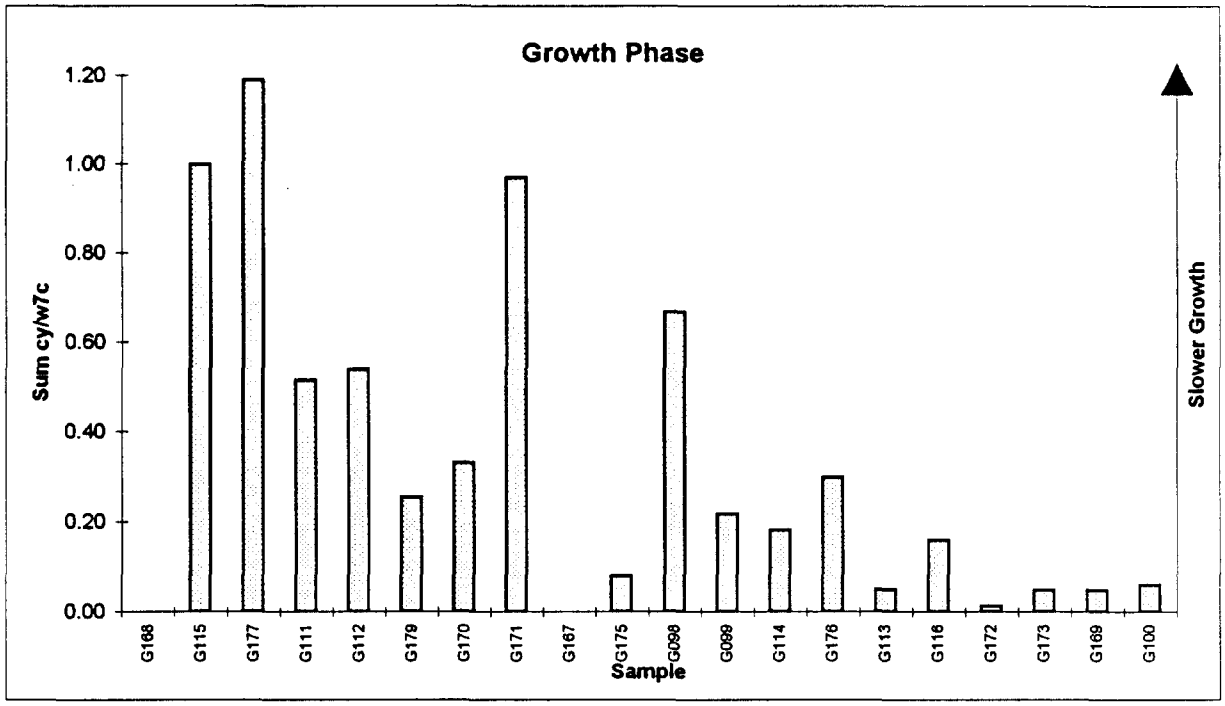
Except for the G100, G113, G169, G172, G173 and G175 samples, the Gram negative communities with detectable biomarkers for growth phase were in the stationary phase of growth. The G100, G113, G169, G172, G173 and G175 samples were in the log phase of growth. The G172 sample had the fastest turnover rate.

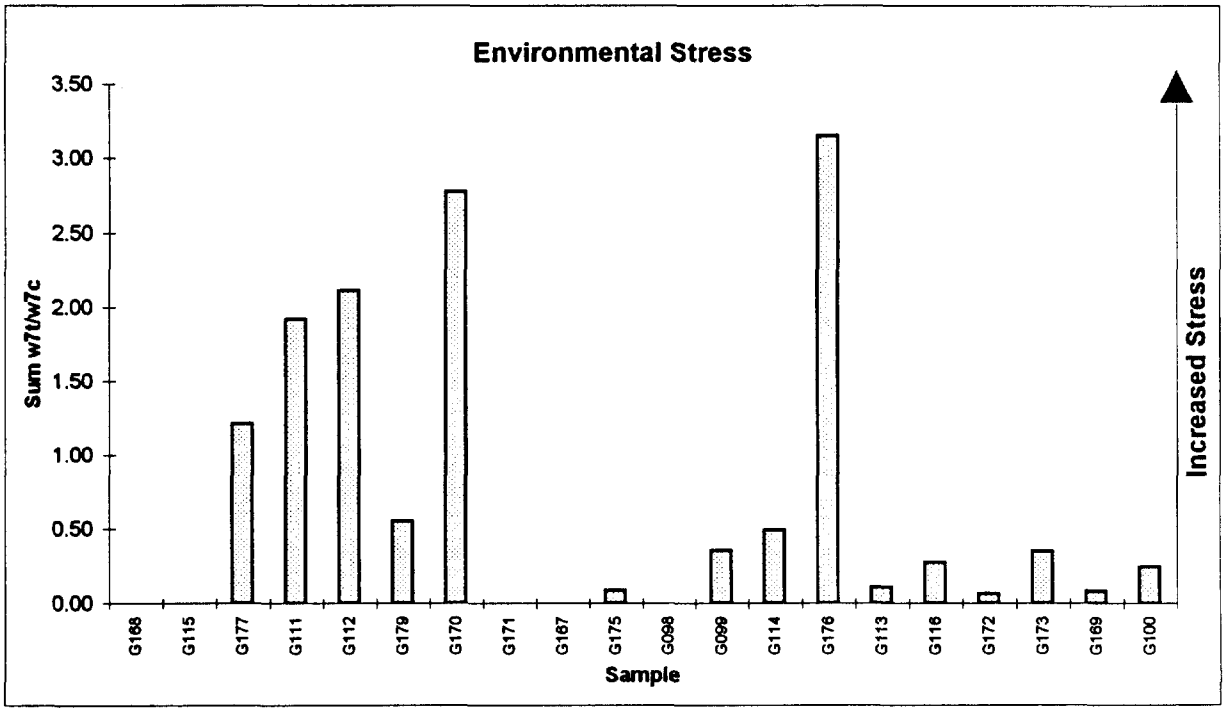
Gram negative bacteria also make *trans* fatty acids to modify their cell membranes as protection against changes in the environment such as toxicity or starvation. For example, the bacteria make w7t fatty acids in the presence of toxic pollutants like phenol. Ratios (16:1ω7t/16:1ω7c and 18:1ω7t/18:1ω7c) greater than 0.1 have been shown to indicate the effects of starvation on bacterial isolates. The range is generally between 0.05 (healthy) to 0.3 (starved), or 0.1 (healthy) to 0.6 (starved) when the two are summed.

Except for the G169, G171, G172 and G175 samples, the Gram negative communities with detectable biomarkers for environmental stress were suffering from environmental stress from either toxicity or starvation.


Biomass
Picomoles/mL water Filtered
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
G168
G115
G177
G111
G112
G179
G170
G171
G167
G175
G098
G099
G114
G176
G113
G116
G172
G173
G169
G100
Sample


Diversity of the Microbial Community
% of total PLFA
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
G168
G115
G177
G111
G112
G179
G170
G171
G167
G175
G098
G099
G114
G176
G113
G116
G172
G173
G169
G100
Sample
TerBrSats
Monos
BrMonos
MidBrSats
NSats
Eukaryotes


Growth Phase
Sum cy/w7c
1.20
1.00
0.80
0.60
0.40
0.20
0.00
G168
G115
G177
G111
G112
G179
G170
G171
G167
G175
G098
G099
G114
G176
G113
G116
G172
G173
G169
G100
Sample
Slower Growth


Environmental Stress
Sum w7t/w7c
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
G168
G115
G177
G111
G112
G179
G170
G171
G167
G175
G098
G099
G114
G176
G113
G116
G172
G173
G169
G100
Sample
Increased Stress

Microbial Insights. Inc.

Project Name SRSNE
Dates Received 12/10/96-12/20/96

Sample Name	12/17/96	12/10/96	12/18/96	12/10/96	12/10/96
Sample Date	G168	G115	G177	G111	G112
Amount of Water Filtered ml	1,138	1,146	1,162	1,176	1,246
MI Identifier	11bbl11	11bbl8	11bbl19	11bbl4	11bbl5
Total Picomoles of PLFA	89	47	6,923	38,751	34,099

Data Summary Sheet

Biomass:					
picomoles total PLFA/ml filtered	0.08	0.04	5.96	32.95	27.37
Cells/ml filtered	1.56E+03	8.20E+02	1.19E+05	6.59E+05	5.47E+05
picomoles prokaryote PLFA	0.061	0.029	5.552	31.897	26.450
picomoles eukaryote PLFA	0.017	0.012	0.405	1.054	0.917
ratio prokaryote/eukaryote	4	2	14	30	29
Metabolic Status: (Ratio)					
cy17:0/16:1w7c	NC	NC	0.96	0.29	0.30
cy19:0/18:1w7c	NC	1.00	0.23	0.23	0.24
Total	0.00	1.00	1.19	0.52	0.54
16:1w7t/16:1w7c	NC	NC	0.30	0.19	0.19
18:1w7t/18:1w7c	NC	NC	0.91	1.73	1.93
Total	0.00	0.00	1.21	1.92	2.12
Community Structure: (% of Total PLFA)					
TerBrSats	0.0	0.0	10.8	20.4	20.2
Monos	51.9	22.1	53.1	47.3	47.2
BrMonos	0.0	0.0	1.2	6.2	6.5
MidBrSats	0.0	23.5	1.5	3.7	3.7
NSats	26.1	25.1	26.6	19.2	19.1
Eukaryotes	22.0	29.3	6.8	3.2	3.4

NA: Not Analyzed
NC: Not Calculated
ND: Not Detected

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name	12/18/96	12/17/96	12/17/96	12/17/96	12/18/96
Sample Date	G179	G170	G171	G167	G175
Amount of Water Filtered ml	1,050	1,146	1,242	1,170	1,148
MI Identifier	11bbl20	11bbl13	11bbl14	11bbl10	11bbl17
Total Picomoles of PLFA	3,167	1,568	525	0	247

Data Summary Sheet

Biomass:					
picomoles total PLFA/ml filtered	3.02	1.37	0.42	0.00	0.22
Cells/ml filtered	6.03E+04	2.74E+04	8.45E+03	0.00E+00	4.30E+03
picomoles prokaryote PLFA	2.816	1.065	0.290	0.000	0.164
picomoles eukaryote PLFA	0.200	0.304	0.133	0.000	0.051
ratio prokaryote/eukaryote	14	4	2	NC	3
Metabolic Status: (Ratio)					
cy17:0/16:1w7c	0.19	0.21	0.97	NC	0.00
cy19:0/18:1w7c	0.06	0.12	0.00	NC	0.08
Total	0.25	0.33	0.97	0.00	0.08
16:1w7t/16:1w7c	0.12	0.07	0.00	NC	0.09
18:1w7t/18:1w7c	0.43	2.71	0.00	NC	NC
Total	0.55	2.78	0.00	0.00	0.09
Community Structure: (% of Total P					
TerBrSats	28.4	6.3	4.9	0.0	4.6
Monos	33.4	46.1	40.9	0.0	44.3
BrMonos	5.6	1.4	1.4	0.0	0.9
MidBrSats	10.2	8.5	3.1	0.0	1.9
NSats	15.8	15.6	18.4	0.0	24.7
Eukaryotes	6.6	22.2	31.4	0.0	23.6

NA: Not Analyzed
NC: Not Calculated
ND: Not Detected

Microbial Insights. Inc.

Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name	12/9/96	12/9/96	12/10/96	12/18/96	12/10/96
Sample Date	G098	G099	G114	G176	G113
Amount of Water Filtered ml	1,250	1,222	1,106	1,096	1,082
MI Identifier	11bbl1	11bbl2	11bbl7	11bbl18	11bbl6
Total Picomoles of PLFA	139	732	4,640	2,817	25,947

Data Summary Sheet

Biomass:					
picomoles total PLFA/ml filtered	0.11	0.60	4.20	2.57	23.98
Cells/ml filtered	2.22E+03	1.20E+04	8.39E+04	5.14E+04	4.80E+05
picomoles prokaryote PLFA	0.069	0.415	4.017	2.328	19.033
picomoles eukaryote PLFA	0.042	0.184	0.178	0.242	4.954
ratio prokaryote/eukaryote	2	2	23	10	4
Metabolic Status: (Ratio)					
cy17:0/16:1w7c	0.67	0.19	0.06	0.10	0.05
cy19:0/18:1w7c	0.00	0.02	0.12	0.20	0.00
Total	0.67	0.22	0.18	0.30	0.05
16:1w7t/16:1w7c	0.00	0.14	0.49	0.22	0.11
18:1w7t/18:1w7c	NC	0.22	NC	2.93	0.00
Total	0.00	0.36	0.49	3.15	0.11
Community Structure: (% of Total P					
TerBrSats	0.0	1.7	1.6	7.7	8.8
Monos	38.6	41.5	83.7	55.0	45.8
BrMonos	0.0	1.5	0.5	2.4	2.1
MidBrSats	0.0	1.1	1.4	4.9	1.7
NSats	23.7	23.5	8.6	20.6	21.0
Eukaryotes	37.7	30.7	4.2	9.4	20.7

NA: Not Analyzed
NC: Not Calculated
ND: Not Detected

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name	12/10/96	12/17/96	12/17/96	12/17/96	12/9/96
Sample Date	G116	G172	G173	G169	G100
Amount of Water Filtered ml	1,202	1,214	1,182	1,100	1,200
MI Identifier	11bbl9	11bbl15	11bbl16	11bbl12	11bbl3
Total Picomoles of PLFA	11,871	3,393	3,081	2,357	4,172

Data Summary Sheet

Biomass:					
picomoles total PLFA/ml filtered	9.88	2.79	2.61	2.14	3.48
Cells/ml filtered	1.98E+05	5.59E+04	5.21E+04	4.29E+04	6.95E+04
picomoles prokaryote PLFA	8.478	2.646	2.229	1.927	2.384
picomoles eukaryote PLFA	1.398	0.149	0.378	0.215	1.093
ratio prokaryote/eukaryote	6	18	6	9	2
Metabolic Status: (Ratio)					
cy17:0/16:1w7c	0.13	0.01	0.04	0.05	0.05
cy19:0/18:1w7c	0.03	0.00	0.01	0.00	0.01
Total	0.16	0.01	0.05	0.05	0.06
16:1w7t/16:1w7c	0.19	0.07	0.08	0.08	0.10
18:1w7t/18:1w7c	0.09	0.00	0.27	0.00	0.14
Total	0.27	0.07	0.35	0.08	0.24
Community Structure: (% of Total P					
TerBrSats	18.6	2.1	4.2	1.2	1.7
Monos	34.9	71.6	54.3	54.4	47.9
BrMonos	3.0	0.4	1.0	1.3	1.6
MidBrSats	5.3	1.4	6.0	4.3	1.8
NSats	24.1	19.2	20.0	28.7	15.6
Eukaryotes	14.2	5.3	14.5	10.1	31.5

NA: Not Analyzed
NC: Not Calculated
ND: Not Detected

Microbial Insights. Inc.

Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name	filter blank
Sample Date	-
Amount of Water Filtered ml	-
MI Identifier	11bbl21
Total Picomoles of PLFA	0

Data Summary Sheet

Biomass:	
picomoles total PLFA/ml filtered	NC
Cells/ml filtered	NC
picomoles prokaryote PLFA	NC
picomoles eukaryote PLFA	NC
ratio prokaryote/eukaryote	NC
Metabolic Status: (Ratio)	
cy17:0/16:1w7c	NC
cy19:0/18:1w7c	NC
Total	0.00
16:1w7t/16:1w7c	NC
18:1w7t/18:1w7c	NC
Total	0.00
Community Structure: (% of Total P	
TerBrSats	0.0
Monos	0.0
BrMonos	0.0
MidBrSats	0.0
NSats	0.0
Eukaryotes	0.0

NA: Not Analyzed
NC: Not Calculated
ND: Not Detected

Microbial Insights. Inc.

Project Name SRSNE

Dates Received 12/10/96-12/20/96

Sample Name	12/17/96	12/10/96	12/18/96	12/10/96	12/10/96
Sample Date	G168	G115	G177	G111	G112
Amount of Water Filtered ml	1,138	1,146	1,162	1,176	1,246
MI Identifier	11bbl11	11bbl8	11bbl19	11bbl4	11bbl5
Total Picomoles of PLFA	89	47	6,923	38,751	34,099

Analytical Report

PLFA Profile (% of total PLFA)

	Equivalent Chain Length					
Terminally Branched Saturates (TerBrSats)						
i14:0	13.62	0.0	0.0	0.0	0.3	0.4
i15:0	14.63	0.0	0.0	4.0	6.2	6.1
a15:0	14.71	0.0	0.0	2.8	8.0	8.1
i16:0	15.63	0.0	0.0	1.4	2.7	2.7
i17:0	16.63	0.0	0.0	0.8	1.2	1.2
a17:0/1w8c	16.71	0.0	0.0	1.3	1.9	1.9
i18:0	17.63	0.0	0.0	0.5	0.1	0.0
i19:0	18.63	0.0	0.0	0.0	0.0	0.0
a19:0	18.71	0.0	0.0	0.0	0.0	0.0
		0.0	0.0	10.8	20.4	20.2
Monoenoics (Monos)						
15:1w6c	14.78	0.0	0.0	0.0	0.1	0.2
16:1w9c	15.69	0.0	0.0	0.5	1.4	1.3
16:1w7c	15.74	0.0	0.0	13.4	16.3	15.9
16:1w7t	15.79	0.0	0.0	4.0	3.1	3.0
16:1w5c	15.83	0.0	0.0	0.6	1.6	1.4
17:1w6c	16.79	21.0	3.8	0.0	0.6	0.6
cy17:0	16.81	0.0	0.0	12.9	4.7	4.7
UNKMONO	17.33	30.9	0.0	0.0	0.2	0.0
18:1w11c	17.65	0.0	0.0	1.1	0.4	0.5
18:1w7c	17.75	0.0	9.1	13.7	13.7	14.0
18:1w7t	17.80	0.0	0.0	3.4	1.8	1.8
18:1w5c	17.85	0.0	0.0	0.0	0.2	0.2
19:1w6c	18.79	0.0	0.0	0.3	0.1	0.1
cy19:0	18.82	0.0	9.1	3.1	3.1	3.4
		51.9	22.1	53.1	47.3	47.2
Branched Monoenoics (BrMonos)						
i15:1	14.35	0.0	0.0	0.0	0.3	0.3
i15:1	14.44	0.0	0.0	0.0	0.1	0.2
i16:1a	15.34	0.0	0.0	0.0	0.0	0.0
i16:1b	15.39	0.0	0.0	0.0	1.3	1.3
br17:1	16.32	0.0	0.0	0.0	0.0	0.0
i17:1w7c	16.34	0.0	0.0	0.4	4.1	4.2

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/20/96

Sample Name		12/17/96	12/10/96	12/18/96	12/10/96	12/10/96
Sample Date		G168	G115	G177	G111	G112
Amount of Water Filtered ml		1,138	1,146	1,162	1,176	1,246
MI Identifier		11bbl11	11bbl8	11bbl19	11bbl4	11bbl5
Total Picomoles of PLFA		89	47	6,923	38,751	34,099
br19:1	18.03	0.0	0.0	0.8	0.4	0.6
		0.0	0.0	1.2	6.2	6.5
Mid-Chain Branched Saturates (MidBrSats)						
10me14:0	14.51	0.0	0.0	0.0	0.0	0.0
br15:0a	15.02	0.0	0.0	0.0	0.0	0.0
br15:0b	15.09	0.0	0.0	0.0	0.0	0.0
br15:0	15.47	0.0	0.0	0.0	0.0	0.0
br16:0	16.05	0.0	23.5	0.2	0.4	0.3
8me16:0	16.41	0.0	0.0	0.0	0.0	0.0
10me16:0	16.43	0.0	0.0	1.0	2.8	2.9
12me16:0	16.51	0.0	0.0	0.0	0.2	0.2
br17:0a	17.04	0.0	0.0	0.0	0.0	0.0
10me18:0	18.38	0.0	0.0	0.3	0.3	0.3
		0.0	23.5	1.5	3.7	3.7
Normal Saturates (NSats)						
14:0	13.99	0.0	0.0	0.6	1.1	1.1
15:0	14.99	0.0	0.0	0.5	0.9	0.8
16:0	15.99	7.6	0.0	22.3	15.4	15.2
17:0	16.98	0.0	0.0	0.5	0.7	0.7
18:0	17.98	18.5	25.1	2.7	1.1	1.3
		26.1	25.1	26.6	19.2	19.1
Eukaryotes						
18:3w6	17.40	0.0	0.0	0.0	0.1	0.2
18:2	17.46	12.4	0.0	0.0	0.0	0.0
18:2	17.52	0.0	0.0	0.0	0.0	0.0
18:2w6	17.59	0.0	9.0	2.6	0.2	0.2
18:1w9c	17.69	9.6	14.1	3.7	2.4	2.4
20:4w6	19.18	0.0	0.0	0.0	0.2	0.2
20:5w3	19.21	0.0	6.2	0.0	0.0	0.0
20:1w11c	19.66	0.0	0.0	0.0	0.0	0.0
20:1w9c	19.68	0.0	0.0	0.0	0.0	0.0
20:1w7c	19.75	0.0	0.0	0.0	0.0	0.0
20:0	19.98	0.0	0.0	0.2	0.1	0.1
22:0	21.98	0.0	0.0	0.4	0.1	0.2
24:0	23.98	0.0	0.0	0.0	0.0	0.0
		22.0	29.3	6.8	3.2	3.4

Microbial Insights. Inc.

Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		12/18/96	12/17/96	12/17/96	12/17/96	12/18/96
Sample Date		G179	G170	G171	G167	G175
Amount of Water Filtered ml		1,050	1,146	1,242	1,170	1,148
MI Identifier		11bbl20	11bbl13	11bbl14	11bbl10	11bbl17
Total Picomoles of PLFA		3,167	1,568	525	0	247

Analytical Report

PLFA Profile (% of total PLFA)

	Equivalent C					
Terminally Branched Saturates (TerB						
i14:0	13.62	0.7	0.0	0.0	0.0	0.0
i15:0	14.63	6.1	0.6	0.0	0.0	1.0
a15:0	14.71	12.4	0.3	0.0	0.0	1.1
i16:0	15.63	3.2	0.6	0.3	0.0	0.9
i17:0	16.63	1.3	0.8	0.6	0.0	0.0
a17:0/1w8c	16.71	4.3	3.1	2.8	0.0	1.5
i18:0	17.63	0.3	0.7	0.9	0.0	0.0
i19:0	18.63	0.0	0.2	0.3	0.0	0.0
a19:0	18.71	0.2	0.0	0.0	0.0	0.0
		28.4	6.3	4.9	0.0	4.6
Monoenoics (Monos)						
15:1w6c	14.78	0.3	0.0	0.0	0.0	0.0
16:1w9c	15.69	1.9	1.3	0.6	0.0	0.0
16:1w7c	15.74	7.8	13.3	3.9	0.0	19.9
16:1w7t	15.79	0.9	0.9	0.0	0.0	1.8
16:1w5c	15.83	1.9	1.2	0.4	0.0	4.9
17:1w6c	16.79	4.5	0.8	3.9	0.0	0.5
cy17:0	16.81	1.5	2.8	3.8	0.0	0.0
UNKMONO	17.33	0.2	1.0	0.0	0.0	0.0
18:1w11c	17.65	0.4	0.0	0.0	0.0	0.0
18:1w7c	17.75	10.7	20.6	24.8	0.0	16.0
18:1w7t	17.80	1.5	0.9	1.5	0.0	0.0
18:1w5c	17.85	0.9	0.5	0.0	0.0	0.0
19:1w6c	18.79	0.2	0.3	2.0	0.0	0.0
cy19:0	18.82	0.7	2.6	0.0	0.0	1.3
		33.4	46.1	40.9	0.0	44.3
Branched Monoenoics (BrMonos)						
i15:1	14.35	0.5	0.0	0.0	0.0	0.0
i15:1	14.44	0.0	0.0	0.0	0.0	0.0
i16:1a	15.34	0.4	0.0	0.0	0.0	0.0
i16:1b	15.39	0.8	0.0	0.0	0.0	0.0
br17:1	16.32	1.3	0.0	0.0	0.0	0.9
i17:1w7c	16.34	1.4	0.4	0.0	0.0	0.0

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		12/18/96	12/17/96	12/17/96	12/17/96	12/18/96
Sample Date		G179	G170	G171	G167	G175
Amount of Water Filtered ml		1,050	1,146	1,242	1,170	1,148
MI Identifier		11bbl20	11bbl13	11bbl14	11bbl10	11bbl17
Total Picomoles of PLFA		3,167	1,568	525	0	247
br19:1	18.03	1.3	0.9	1.4	0.0	0.0
		5.6	1.4	1.4	0.0	0.9
Mid-Chain Branched Saturates (MidB						
10me14:0	14.51	0.9	0.0	0.0	0.0	0.0
br15:0a	15.02	0.4	0.0	0.0	0.0	0.0
br15:0b	15.09	0.2	0.0	0.0	0.0	0.0
br15:0	15.47	1.3	0.0	0.0	0.0	0.0
br16:0	16.05	1.7	3.5	0.0	0.0	0.0
8me16:0	16.41	0.0	0.0	0.0	0.0	0.0
10me16:0	16.43	4.6	2.0	1.0	0.0	1.9
12me16:0	16.51	0.4	0.3	0.0	0.0	0.0
br17:0a	17.04	0.4	1.1	0.7	0.0	0.0
10me18:0	18.38	0.3	1.6	1.4	0.0	0.0
		10.2	8.5	3.1	0.0	1.9
Normal Saturates (NSats)						
14:0	13.99	1.1	0.0	0.0	0.0	0.0
15:0	14.99	2.0	0.2	0.0	0.0	0.0
16:0	15.99	8.0	10.3	8.0	0.0	13.0
17:0	16.98	0.8	0.7	1.2	0.0	1.4
18:0	17.98	3.9	4.4	9.1	0.0	10.4
		15.8	15.6	18.4	0.0	24.7
Eukaryotes						
18:3w6	17.40	0.3	1.2	1.3	0.0	0.0
18:2	17.46	0.0	1.7	4.0	0.0	0.0
18:2	17.52	0.0	0.0	1.1	0.0	0.0
18:2w6	17.59	0.7	2.6	3.9	0.0	5.0
18:1w9c	17.69	3.6	6.0	9.6	0.0	8.1
20:4w6	19.18	0.1	3.0	3.4	0.0	1.9
20:5w3	19.21	0.0	2.2	2.1	0.0	3.4
20:1w11c	19.66	0.4	0.0	0.0	0.0	1.6
20:1w9c	19.68	0.5	0.0	0.0	0.0	0.0
20:1w7c	19.75	0.0	0.0	0.4	0.0	0.0
20:0	19.98	0.6	1.2	1.8	0.0	2.4
22:0	21.98	0.3	1.9	1.6	0.0	1.4
24:0	23.98	0.3	2.5	2.2	0.0	0.0
		6.6	22.2	31.4	0.0	23.6

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		12/9/96	12/9/96	12/10/96	12/18/96	12/10/96
Sample Date		G098	G099	G114	G176	G113
Amount of Water Filtered ml		1,250	1,222	1,106	1,096	1,082
MI Identifier		11bbl1	11bbl2	11bbl7	11bbl18	11bbl6
Total Picomoles of PLFA		139	732	4,640	2,817	25,947

Analytical Report

PLFA Profile (% of total PLFA)

	Equivalent C					
Terminally Branched Saturates (TerB						
i14:0	13.62	0.0	0.0	0.0	0.0	0.0
i15:0	14.63	0.0	0.5	1.0	1.7	3.3
a15:0	14.71	0.0	0.0	0.7	1.6	1.8
i16:0	15.63	0.0	0.0	0.0	1.0	1.0
i17:0	16.63	0.0	0.0	0.0	1.4	0.9
a17:0/1w8c	16.71	0.0	1.2	0.0	2.1	1.6
i18:0	17.63	0.0	0.0	0.0	0.0	0.3
i19:0	18.63	0.0	0.0	0.0	0.0	0.0
a19:0	18.71	0.0	0.0	0.0	0.0	0.0
		0.0	1.7	1.6	7.7	8.8
Monoenoics (Monos)						
15:1w6c	14.78	0.0	0.0	0.0	0.0	0.2
16:1w9c	15.69	0.0	0.3	25.0	1.3	0.9
16:1w7c	15.74	5.7	10.4	20.3	18.0	20.9
16:1w7t	15.79	0.0	1.4	10.0	4.0	2.3
16:1w5c	15.83	0.0	1.0	22.8	8.8	4.2
17:1w6c	16.79	6.7	7.1	0.3	1.0	2.5
cy17:0	16.81	3.8	2.0	1.3	1.8	1.0
UNKMONO	17.33	11.8	2.0	0.5	0.0	0.3
18:1w11c	17.65	0.0	0.0	0.0	0.0	0.2
18:1w7c	17.75	10.8	15.3	3.2	14.8	12.1
18:1w7t	17.80	0.0	1.6	0.0	1.0	1.0
18:1w5c	17.85	0.0	0.0	0.0	1.3	0.3
19:1w6c	18.79	0.0	0.0	0.0	0.0	0.0
cy19:0	18.82	0.0	0.3	0.4	2.9	0.0
		38.6	41.5	83.7	55.0	45.8
Branched Monoenoics (BrMonos)						
i15:1	14.35	0.0	0.0	0.0	0.0	0.2
i15:1	14.44	0.0	0.0	0.0	0.0	0.0
i16:1a	15.34	0.0	0.0	0.0	0.0	0.0
i16:1b	15.39	0.0	0.0	0.0	0.0	0.4
br17:1	16.32	0.0	0.0	0.0	0.0	0.0
i17:1w7c	16.34	0.0	0.0	0.0	1.6	1.0

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		12/9/96	12/9/96	12/10/96	12/18/96	12/10/96
Sample Date		G098	G099	G114	G176	G113
Amount of Water Filtered ml		1,250	1,222	1,106	1,096	1,082
MI Identifier		11bbl1	11bbl2	11bbl7	11bbl18	11bbl6
Total Picomoles of PLFA		139	732	4,640	2,817	25,947
br19:1	18.03	0.0	1.5	0.5	0.8	0.5
		0.0	1.5	0.5	2.4	2.1
Mid-Chain Branched Saturates (MidB						
10me14:0	14.51	0.0	0.0	0.0	0.0	0.0
br15:0a	15.02	0.0	0.0	0.0	0.0	0.0
br15:0b	15.09	0.0	0.0	0.0	0.0	0.0
br15:0	15.47	0.0	0.0	0.0	0.0	0.0
br16:0	16.05	0.0	0.0	1.4	2.3	0.0
8me16:0	16.41	0.0	0.0	0.0	0.0	0.0
10me16:0	16.43	0.0	0.5	0.0	1.8	1.2
12me16:0	16.51	0.0	0.0	0.0	0.0	0.0
br17:0a	17.04	0.0	0.6	0.0	0.0	0.0
10me18:0	18.38	0.0	0.0	0.0	0.8	0.5
		0.0	1.1	1.4	4.9	1.7
Normal Saturates (NSats)						
14:0	13.99	0.0	0.0	0.0	0.0	1.5
15:0	14.99	0.0	0.0	0.0	0.4	1.1
16:0	15.99	8.5	9.4	7.2	14.9	13.0
17:0	16.98	2.7	1.5	0.0	0.9	0.5
18:0	17.98	12.5	12.6	1.4	4.5	5.0
		23.7	23.5	8.6	20.6	21.0
Eukaryotes						
18:3w6	17.40	0.0	0.3	0.0	0.0	0.2
18:2	17.46	8.2	3.3	0.0	0.9	0.6
18:2	17.52	0.0	0.0	0.0	0.0	0.0
18:2w6	17.59	3.6	5.9	0.8	0.8	2.7
18:1w9c	17.69	10.1	18.8	2.7	4.3	15.8
20:4w6	19.18	2.4	0.5	0.8	1.3	0.4
20:5w3	19.21	0.0	0.5	0.0	0.6	0.2
20:1w11c	19.66	0.0	0.0	0.0	0.0	0.0
20:1w9c	19.68	0.0	0.0	0.0	0.0	0.2
20:1w7c	19.75	0.0	0.0	0.0	0.0	0.0
20:0	19.98	8.8	0.9	0.0	0.7	0.2
22:0	21.98	4.6	0.3	0.0	0.6	0.3
24:0	23.98	0.0	0.3	0.0	0.0	0.0
		37.7	30.7	4.2	9.4	20.7

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		12/10/96	12/17/96	12/17/96	12/17/96	12/9/96
Sample Date		G116	G172	G173	G169	G100
Amount of Water Filtered ml		1,202	1,214	1,182	1,100	1,200
MI Identifier		11bbl9	11bbl15	11bbl16	11bbl12	11bbl3
Total Picomoles of PLFA		11,871	3,393	3,081	2,357	4,172

Analytical Report

PLFA Profile (% of total PLFA)

	Equivalent C					
Terminally Branched Saturates (TerB						
i14:0	13.62	0.0	0.0	0.0	0.0	0.0
i15:0	14.63	3.2	0.3	0.5	0.0	0.0
a15:0	14.71	3.5	0.3	0.4	0.0	0.0
i16:0	15.63	3.0	0.3	0.4	0.0	0.1
i17:0	16.63	1.5	0.3	0.3	0.0	0.1
a17:0/1w8c	16.71	5.4	1.0	1.1	0.7	0.9
i18:0	17.63	1.3	0.0	1.5	0.5	0.5
i19:0	18.63	0.2	0.0	0.0	0.0	0.0
a19:0	18.71	0.5	0.0	0.0	0.0	0.0
		18.6	2.1	4.2	1.2	1.7
Monoenoics (Monos)						
15:1w6c	14.78	0.2	0.0	0.0	0.0	0.0
16:1w9c	15.69	1.3	0.2	0.4	0.0	0.3
16:1w7c	15.74	10.5	27.4	21.2	19.3	13.8
16:1w7t	15.79	2.0	1.8	1.7	1.6	1.4
16:1w5c	15.83	0.8	1.8	4.3	2.2	0.6
17:1w6c	16.79	1.1	0.6	1.1	0.6	0.3
cy17:0	16.81	1.4	0.4	0.8	0.9	0.7
UNKMONO	17.33	0.2	0.0	0.0	1.5	1.6
18:1w11c	17.65	0.4	0.2	0.0	0.0	0.0
18:1w7c	17.75	11.6	37.7	23.0	27.4	26.5
18:1w7t	17.80	3.7	0.9	1.1	1.0	2.0
18:1w5c	17.85	1.0	0.6	0.6	0.0	0.5
19:1w6c	18.79	0.7	0.0	0.0	0.0	0.0
cy19:0	18.82	0.3	0.0	0.3	0.0	0.3
		34.9	71.6	54.3	54.4	47.9
Branched Monoenoics (BrMonos)						
i15:1	14.35	0.0	0.0	0.0	0.0	0.0
i15:1	14.44	0.0	0.0	0.0	0.0	0.0
i16:1a	15.34	0.2	0.0	0.0	0.0	0.0
i16:1b	15.39	0.4	0.0	0.0	0.0	0.0
br17:1	16.32	0.5	0.0	0.0	0.0	0.0
i17:1w7c	16.34	0.7	0.4	0.6	0.0	0.0

Microbial Insights. Inc.
Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		12/10/96	12/17/96	12/17/96	12/17/96	12/9/96
Sample Date		G116	G172	G173	G169	G100
Amount of Water Filtered ml		1,202	1,214	1,182	1,100	1,200
MI Identifier		11bbl9	11bbl15	11bbl16	11bbl12	11bbl3
Total Picomoles of PLFA		11,871	3,393	3,081	2,357	4,172
br19:1	18.03	1.2	0.0	0.4	1.3	1.6
		3.0	0.4	1.0	1.3	1.6
Mid-Chain Branched Saturates (MidB						
10me14:0	14.51	0.1	0.0	0.0	0.0	0.0
br15:0a	15.02	0.0	0.0	0.0	0.0	0.0
br15:0b	15.09	0.0	0.0	0.0	0.0	0.0
br15:0	15.47	0.6	0.0	0.0	0.0	0.0
br16:0	16.05	0.3	0.9	5.2	4.3	1.6
8me16:0	16.41	0.3	0.0	0.0	0.0	0.0
10me16:0	16.43	2.9	0.5	0.9	0.0	0.0
12me16:0	16.51	0.0	0.0	0.0	0.0	0.0
br17:0a	17.04	0.0	0.0	0.0	0.0	0.0
10me18:0	18.38	1.0	0.0	0.0	0.0	0.2
		5.3	1.4	6.0	4.3	1.8
Normal Saturates (NSats)						
14:0	13.99	0.9	0.0	0.0	0.0	0.0
15:0	14.99	2.8	0.3	0.0	0.0	0.0
16:0	15.99	11.5	13.0	13.8	14.4	6.6
17:0	16.98	1.5	0.8	0.7	0.7	0.4
18:0	17.98	7.5	5.2	5.4	13.6	8.6
		24.1	19.2	20.0	28.7	15.6
Eukaryotes						
18:3w6	17.40	0.5	0.0	0.5	0.0	0.4
18:2	17.46	0.6	0.0	0.0	0.0	1.3
18:2	17.52	0.2	0.0	0.0	0.0	0.0
18:2w6	17.59	1.3	1.4	5.3	3.1	4.8
18:1w9c	17.69	9.1	2.7	5.9	5.7	20.8
20:4w6	19.18	0.3	0.0	0.2	0.0	1.1
20:5w3	19.21	0.5	0.2	0.0	0.5	2.2
20:1w11c	19.66	0.2	0.3	0.5	0.0	0.0
20:1w9c	19.68	0.3	0.0	0.0	0.0	0.0
20:1w7c	19.75	0.2	0.3	0.0	0.0	0.0
20:0	19.98	1.0	0.3	0.7	0.8	0.4
22:0	21.98	0.0	0.2	0.7	0.0	0.3
24:0	23.98	0.0	0.0	0.8	0.0	0.2
		14.2	5.3	14.5	10.1	31.5

Microbial Insights. Inc.

Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name	filter blank
Sample Date	-
Amount of Water Filtered ml	-
MI Identifier	11bbl21
Total Picomoles of PLFA	0

Analytical Report

PLFA Profile (% of total PLFA)

	Equivalent C	
Terminally Branched Saturates (TerB		
i14:0	13.62	0.0
i15:0	14.63	0.0
a15:0	14.71	0.0
i16:0	15.63	0.0
i17:0	16.63	0.0
a17:0/1w8c	16.71	0.0
i18:0	17.63	0.0
i19:0	18.63	0.0
a19:0	18.71	0.0
		0.0
Monoenoics (Monos)		
15:1w6c	14.78	0.0
16:1w9c	15.69	0.0
16:1w7c	15.74	0.0
16:1w7t	15.79	0.0
16:1w5c	15.83	0.0
17:1w6c	16.79	0.0
cy17:0	16.81	0.0
UNKMONO	17.33	0.0
18:1w11c	17.65	0.0
18:1w7c	17.75	0.0
18:1w7t	17.80	0.0
18:1w5c	17.85	0.0
19:1w6c	18.79	0.0
cy19:0	18.82	0.0
		0.0
Branched Monoenoics (BrMonos)		
i15:1	14.35	0.0
i15:1	14.44	0.0
i16:1a	15.34	0.0
i16:1b	15.39	0.0
br17:1	16.32	0.0
i17:1w7c	16.34	0.0

Microbial Insights. Inc.

Project Name SRSNE
Dates Received 12/10/96-12/

Sample Name		filter blank
Sample Date		-
Amount of Water Filtered ml		-
MI Identifier		11bbl21
Total Picomoles of PLFA		0
br19:1	18.03	0.0
		0.0
Mid-Chain Branched Saturates (MidB		
10me14:0	14.51	0.0
br15:0a	15.02	0.0
br15:0b	15.09	0.0
br15:0	15.47	0.0
br16:0	16.05	0.0
8me16:0	16.41	0.0
10me16:0	16.43	0.0
12me16:0	16.51	0.0
br17:0a	17.04	0.0
10me18:0	18.38	0.0
		0.0
Normal Saturates (NSats)		
14:0	13.99	0.0
15:0	14.99	0.0
16:0	15.99	0.0
17:0	16.98	0.0
18:0	17.98	0.0
		0.0
Eukaryotes		
18:3w6	17.40	0.0
18:2	17.46	0.0
18:2	17.52	0.0
18:2w6	17.59	0.0
18:1w9c	17.69	0.0
20:4w6	19.18	0.0
20:5w3	19.21	0.0
20:1w11c	19.66	0.0
20:1w9c	19.68	0.0
20:1w7c	19.75	0.0
20:0	19.98	0.0
22:0	21.98	0.0
24:0	23.98	0.0
		0.0

Microbial Insights, Inc.
Quality Assurance report

Company: Blasland, Bouck & Lee

Twenty samples were analyzed for PLFA content.

The samples were analyzed under the U.S. EPA Good Laboratory Practice Standards; Toxic Substances Control Act (40 CFR part 790).

All instruments used in the analysis were calibrated and operated within acceptable ranges. The instruments were calibrated according to Microbial Insights, Inc. Standard Operating Procedures (SOP) EQ1.

Inspection Date for Phase I of the analysis Instrument calibration occurred. 9/24/96 by: LD

Phase II consisted of the processing of sample according to sop's B&D1, SA1, and HPGC1. Inspection of Phase II occurred on 12/18/96 by: LD

The following solvents were used during the analysis and were free of contamination.

Chloroform Lot #'s	BN128
Methanol Lot #'s	BM685
Acetone Lot #'s	BN110
H_2O Buffer Lot #	PB0081

All data generated through this analysis was acceptable

All required analysis holding times were met.

Samples arrival conditions were acceptable.

No QC or analytical problems were encountered.

Microbial Insights, Inc.
Comprehensive microbial community analysis
201 Center Park Dr. Suite 1140
Knoxville, Tennessee 37922-2105

Mr. Mike Gefell
BBL, Inc.
6723 Towpath Rd. Box 66
Syracuse, NY 13214

January 29, 1997

Dear Mike Gefell:

Sample G167:

Sample G167 did not contain detectable microbial lipids. It is likely that microbial lipids were present in this sample but they were corrupted by the abundance of contamination. This contamination can easily be seen from the difference in shape and number of peaks of its chromatogram Figure 1 and the chromatogram from the field blank Figure 2. Each of these peaks are identified using a mass spectrometer and only when we can positively identify a fatty acid does is count toward the total biomass. Several of the peaks in sample G167 could contain Fatty acids but they could not be identified because their mass spectra was corrupted by the abundance of contamination. The contamination in sample G167 can be seen as a rise in the base-line and the abundance of the smaller peaks. There could be as much as 300 picomoles of microbial fatty acids that are being corrupted by the contamination. The possible fatty acids are peaks that have the correct retention time as common microbial fatty acids but do not have a clean enough spectra for positive identification.

Sample G115

Sample G115 contained a very similar profile and amount of fatty acids compared to the rinse blank. However, several fatty acids were detected in sample G115 that were not found in the rinse blank. These fatty acids include 18:1w7c, br16:0, 20:5w3. The presence of these fatty acids indicate that there was a unique microbial community in sample G115.

Sample G168 Rinse Blank:

It is common to detect small amounts of microbial lipids in rinse blanks. This rinse blank showed a very clean chromatogram (Figure 2) and only a few common fatty acids.

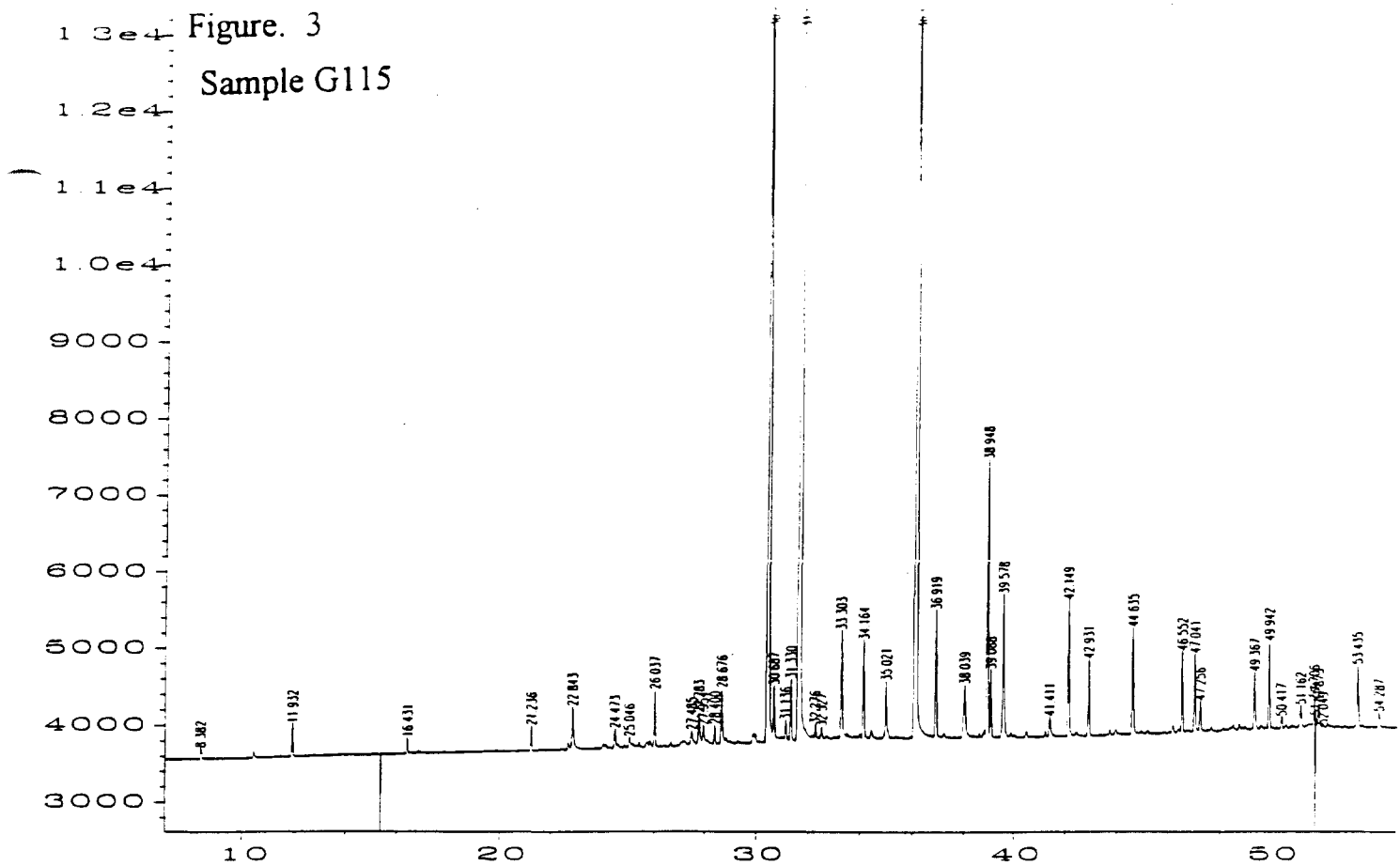
Regards,

Greg Davis

Gregory A. Davis

Figure. 3

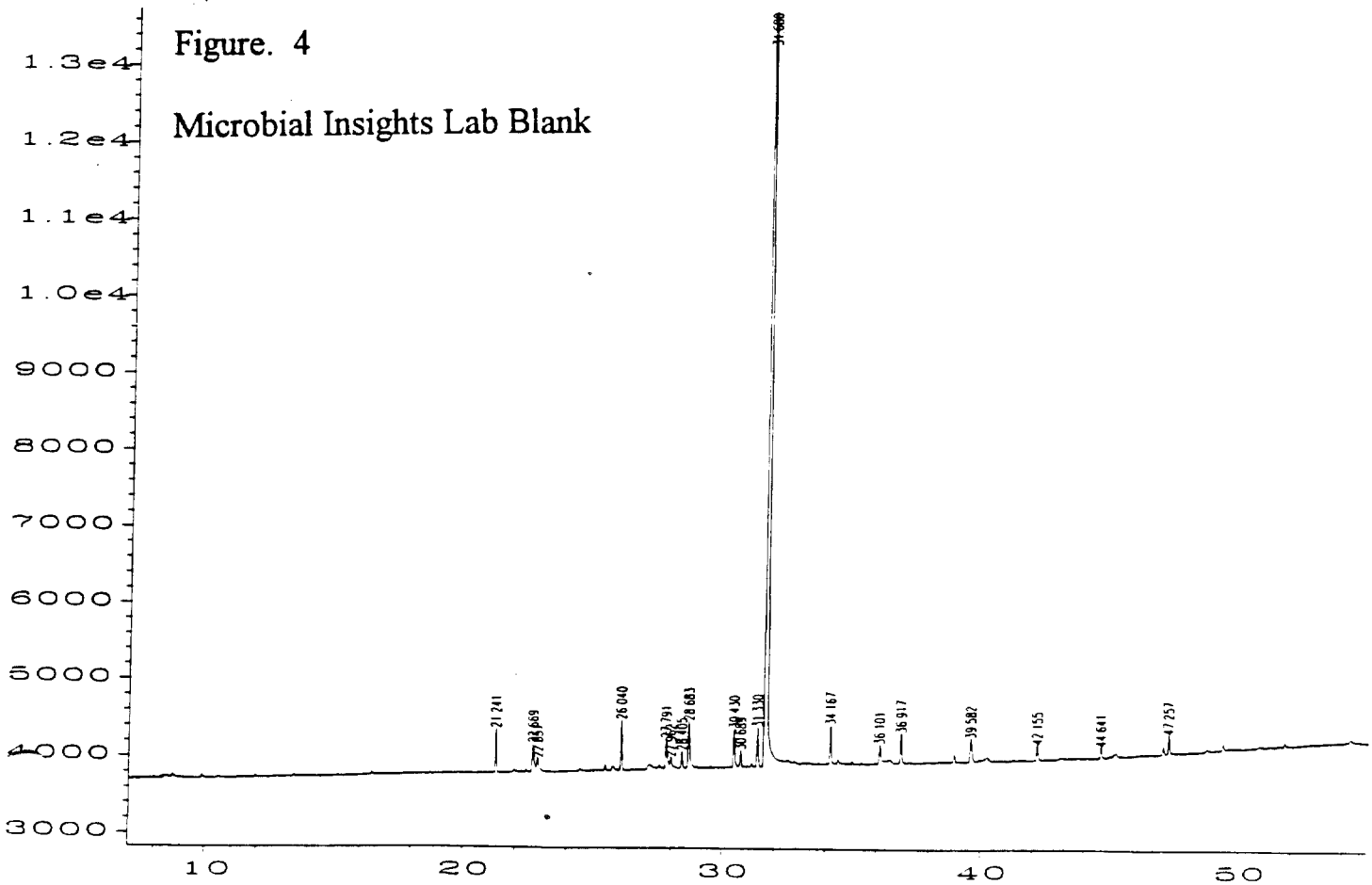
Sample G115



Sig. 2 in D:\DATAFILE\BBL\11BBL\11BBL.S\11BBL8G.D

Figure. 4

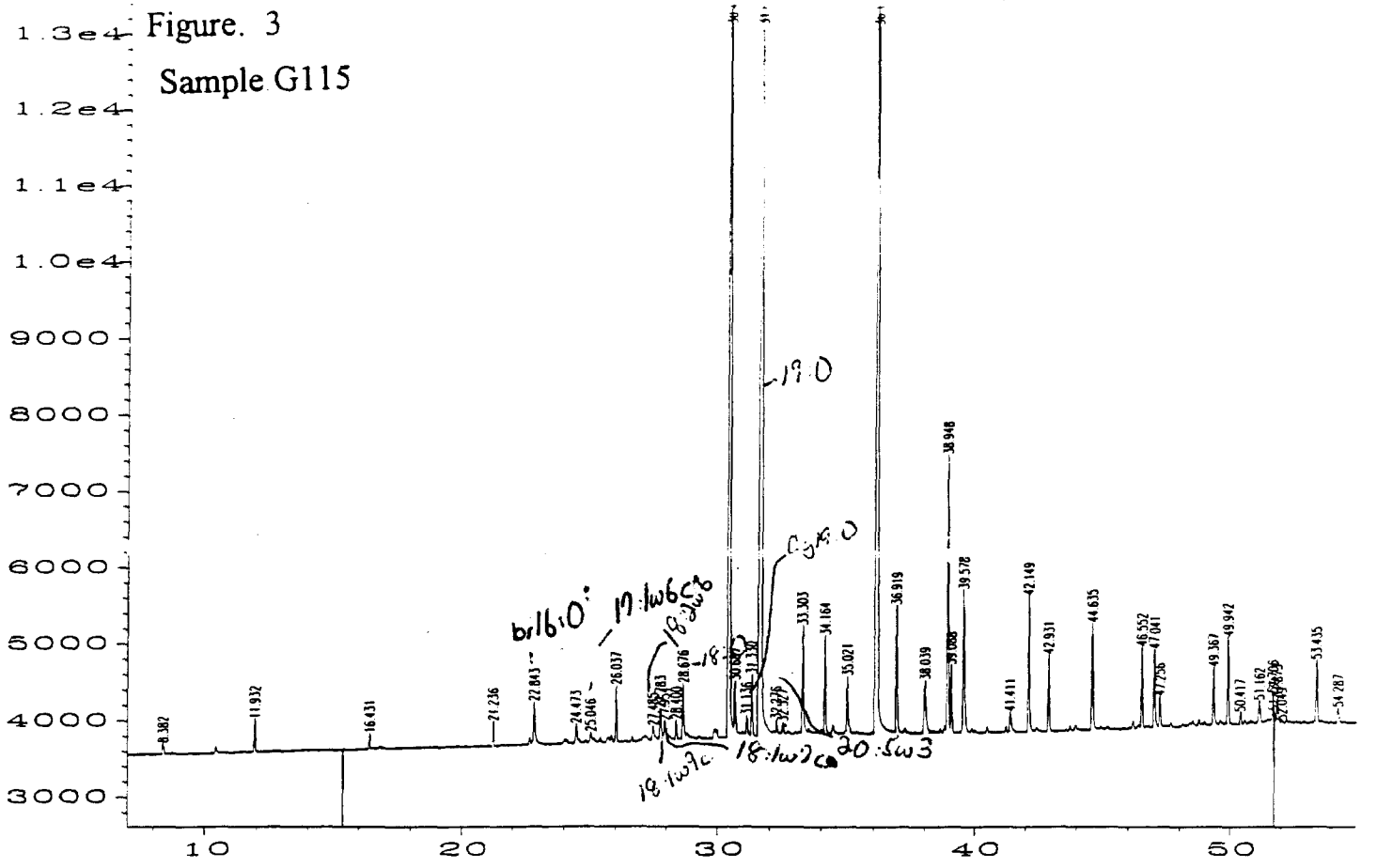
Microbial Insights Lab Blank



Sig. 2 in D: DATAFILE BBL 11BBL 11BBL.S 11BBL21G.D

Figure. 3

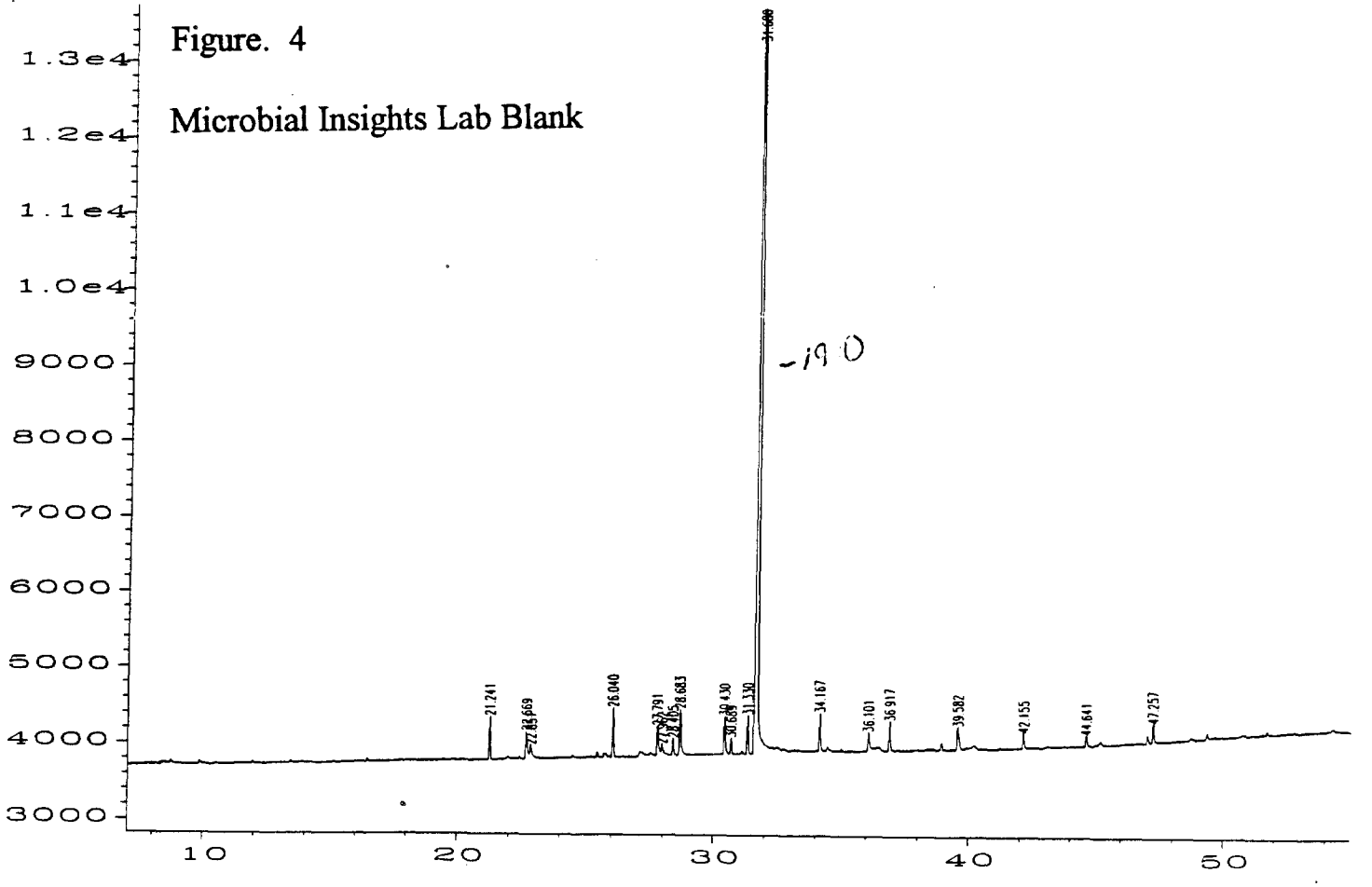
Sample G115



Sig. 2 in D:\DATAFILE\BBL\11BBL\11BBL.S\11BBL8G.D

Figure. 4

Microbial Insights Lab Blank



Sig. 2 in D:\DATAFILE\BBL\11BBL\11BBL.S\11BBL21G.D

Appendix U

Interim Monitoring and Sampling Plan

APPENDIX U

Interim Monitoring and Sampling Plan

Solvents Recovery Service of New England, Inc.
Superfund Site
Southington, Connecticut

Prepared For:
SRSNE PRP Group

June 1998

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

6723 Towpath Road, P.O. Box 66
Syracuse, New York, 13214-0066
(315) 446-9120

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5 Shallow Bedrock Ground-Water Regulatory VOC Plume Map
6 Deep Bedrock Ground-Water Regulatory VOC Plume Map
7 Summary of Surface-Water Sampling Results, 12/30/96 and 7/8/97

1. Introduction

1.1 General

This Interim Monitoring and Sampling Plan describes the proposed field investigations, data acquisition, and evaluations appropriate to support the long-term monitoring of ground-water and surface-water quality at the Solvents Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut (Figure 1). This document was prepared by Blasland, Bouck & Lee, Inc. (BBL), on behalf of the SRSNE Site Potentially Responsible Parties (PRP) Group. This Plan sets forth the approach to Interim Monitoring and Sampling pursuant to the requirements of the Remedial Investigation/Feasibility Study (RI/FS) Statement of Work (SOW). The SOW was issued by the United States Environmental Protection Agency (USEPA) as part of the Administrative Order on Consent (Order) For Removal Action and RI/FS, which became effective on July 20, 1996. The SOW is based on the USEPA Action Memorandum for the SRSNE Site that was signed by the USEPA Region I Regional Administrator on June 1, 1995, and defines the response activities and deliverables required by the SRSNE PRP Group pursuant to the Order. This Plan shall commence with USEPA's approval of this Interim Monitoring and Sampling Plan, and shall continue to the issuance of the Record of Decision (ROD).

1.2 Background and Rationale

The primary purpose for interim monitoring and sampling is to monitor the nature and extent of the plumes of dissolved volatile organic compounds (VOCs) associated with the SRSNE Site until the issuance of the ROD. The VOC plumes have been delineated in the shallow, middle, and deep overburden, and the shallow and deep bedrock during the RI (Figures 2 through 6). These delineated plumes will serve as the basis for the forthcoming FS, and will ultimately be addressed through the final site remedy, which will be identified in the ROD. The purpose for interim monitoring and sampling is to detect any temporal changes in the plume that may influence the appropriateness or location of the remedial technologies considered in the FS or selected as part of the ROD.

The Quinnipiac River is situated immediately downgradient (east and southeast) of the SRSNE Site, as shown on Figure 1 (attached). Based on the current site-specific hydrogeologic database, overburden and bedrock ground-water beneath the former SRSNE Operations Area and the former Cianci Property migrate south-southeastward toward the river. Similarly, the available data indicate that overburden and bedrock ground water on the east side of the Quinnipiac River migrate southwestward toward the river. Based on these findings and data published by the United States Geological Survey, the river is believed to be the ultimate discharge point for essentially all ground water in the vicinity of the SRSNE Site. Figure 7 summarizes the results of surface-water sampling performed during the completion of the RI.

During the completion of the RI, BBL obtained 192 ground-water samples (not including QA/QC samples) from wells and piezometers (BBL, 1996) to delineate regulatory VOC exceedences in ground water associated with the site (Figures 2 through 6). The plumes extend downgradient of the Operations Area and former Cianci Property (between the Operations Area and the river) where non-aqueous phase liquids (NAPLs) were identified in the overburden and bedrock during the RI. The Interim Monitoring and Sampling Plan will be implemented to evaluate whether the dimensions of these regulatory plumes are changing and to identify any temporal trends in VOC concentrations near the edges of the plumes.

A temporal evaluation of VOCs detected at the wells installed in the Town Well Field (south of the operations area) was presented in the RI Report. These results suggest that several wells in the central and southern portions of the Town Well Field have generally exhibited steady or decreasing trends throughout their monitoring history. These results may indicate that the southern extent of the plumes have attenuated back after extending beyond their natural steady-state limit. The interpreted, prior overextension of the plumes may have occurred during the use of

Production Wells No. 4 and 6 prior to 1980. In addition, geochemical and biologic data acquired during the RI indicate active biodegradation processes are mitigating the concentrations of dissolved VOCs within the plumes. However, the data trends in the northern portion of the Town Well Field indicate generally steady or increasing concentrations trends. These results suggest that natural attenuation processes, while well documented in the RI, may not be maintaining steady-state plume conditions in the northern portion of the Well Field.

Two rounds of surface-water samples were obtained from the Quinnipiac River by BBL during the RI (BBL, 1996) to characterize the river chemistry near and downstream of the SRSNE Site. The results obtained by BBL were consistent with previous data reported by HNUS (May, 1994), which indicated essentially no detectable VOCs in the river. The results of surface-water samples obtained during the completion of the RI indicate low concentrations of VOCs at sampling locations immediately downstream form a culvert outlet (Figure 7). Given the proximity to ground-water VOC detections and the outlet of a 30-inch culvert pipe, which extends west to east across the former Cianci Property (Figure 1), these surface-water VOC detections are partially attributed to VOCs discharging from the pipe. VOC concentrations were below detectable levels within 400 feet downstream of the culvert outlet. Additional sampling will be performed upgradient and downgradient of the pipe discharge in the Quinnipiac River to address temporal surface-water quality changes.

1.3 Purpose and Objectives

As described above, the overall objective of this Interim Monitoring and Sampling Plan is to evaluate long-term VOC concentration trends near the edges of regulatory VOC plumes in ground water, and the surface-water quality along the Quinnipiac River. The RI Report (BBL, 1996) includes detailed evaluations of changes in the nature, quantity, background levels, and migration pathways for the constituents of concern in ground water downgradient of the site. The goal of the Interim Monitoring and Sampling Plan, therefore, is to evaluate changes in the extent, seasonal variability, climatological influence, and environmental fate and transport for the constituents of concern in ground water downgradient of the site, as manifested by temporal changes in the extent of the regulatory VOC plumes in ground water. Surface-water quality sampling is also proposed to confirm the interpretation that VOCs associated with the site do not adversely impact surface-water quality within the Quinnipiac River.

2. Proposed Interim Monitoring and Sampling Locations and Schedule

The Interim Monitoring and Sampling Plan will involve periodic ground-water sampling, up until the issuance of the ROD, for VOCs at monitoring well locations near the edges of the ground-water regulatory VOC plumes (Figure 2 through 6) and surface-water locations along the Quinnipiac River (Figure 7). In the history of ground-water investigations in the SRSNE RI Study Area, the most frequent sampling interval at any monitoring well is less than one event per year. Based on this historical sampling frequency, a biannual (twice per year) sampling rate, is considered a reasonable sampling frequency to assess temporal data trends, and is proposed for the interim monitoring and sampling program. Implementation of the Interim Monitoring and Sampling Plan will commence upon USEPA approval of the plan.

Proposed locations for the biannual (twice per year) sampling include:

- Shallow overburden monitoring wells: No proposed sampling locations in the due to the limited extent of detected VOCs (Figure 2);
- Middle overburden monitoring wells: CW-B-7; MW-3; MW-127B; MW-205B; MW-501B; and MW-707M (Figure 3);
- Deep overburden monitoring wells: CW-4-75; MW-4; MW-204B; MW-704D; and MW-707D (Figure 4);
- Shallow bedrock monitoring wells: MW-127C; MW-128; MW-204A; MW-205A; MW-501A; and MW-707R (Figure 5);
- Deep bedrock monitoring wells: MW-703DR, MW-704DR, MW-707DR (Figure 6); and
- Surface water sampling locations along the Quinnipiac River: SW-C, SW-F, and SW-G (Figure 7).

A key objective of the RI was to assess whether the off-site plume impacts or could potentially impact private water-supply wells. Private residences in the areas north and west of the site rely on domestic wells, primarily drilled bedrock wells, for their water supply. While these areas appear to be upgradient from the SRSNE Site, additional ground-water elevation data obtained during the RI were used to develop a three-dimensional flow net, which confirmed their inferred upgradient position relative to the site. Residences south and east of the site have been using municipal water for approximately 100 years.

The only private wells in the vicinity of the interpreted regulatory plumes are situated at the Maeillaro (Mickey's Garage) and Onofrio Properties, which are situated immediately north and northeast of the SRSNE Site, respectively. Historically, sampling of the Onofrio Well indicated low levels of VOCs below regulatory criteria. Given the likely low average pumping rate required for domestic water use, the Onofrio Well is not considered likely to produce a reversal in the hydraulic gradient at the northern limits of the regulatory plumes in bedrock. In addition, the Onofrio residence is currently unoccupied. The Maiellaro property is currently being supplied with bottled drinking water by the CT DEP due to the previous detections of VOCs above regulatory criteria. The SRSNE PRP Group is taking actions to abandon the Maeillaro and Onofrio wells and supply municipal water to these properties. Therefore, no sampling is proposed at private wells as part of the interim monitoring and sampling activities.

3. Methods

Ground-water sampling will be performed in accordance with the RI Work Plan (BBL, November 1995) and Project Operations Plan (POP)(BBL, August 1996). Surface-water sampling will be performed as described in RI Work Plan Addendum No. 6. Samples will be analyzed for VOCs using Contract Laboratory Protocol Routine Analytical Services (CLP-RAS), USEPA Method 10-92, low concentration organics in water. For the ground-water and surface-water matrices, quality assurance/quality control samples will be obtained as described in the POP and RI Work Plan Addendum No. 6, respectively, including one field duplicate, rinse blank, matrix spike (MS), and matrix spike duplicate (MSD) per every 20 samples obtained during each sampling event. In addition, one trip blank will accompany each cooler of ground-water and/or surface-water samples shipped to the analytical laboratory. Validatable analytical data packages will be prepared by the analytical laboratory for each set of samples. The results for each sample location will be compiled within a tabular database to allow qualitative assessment of data trends, plotting of data versus time (as appropriate), and comparison to regulatory criteria.

Based on the data obtained from each interim monitoring and sampling round, the data will be qualitatively compared to previous results to evaluate whether noteworthy changes are evident with respect to the regulatory plume extent or surface-water quality. In the event that an increasing concentration trend is observed based on a new ground-water regulatory exceedence location, or increasing concentrations observed based on consecutive data collection rounds for ground water or surface water, the sampling array may be expanded. Alternatively, if locations currently near the edge of a plume are found to be below regulatory criteria during consecutive future sampling events, the area covered by the sampling array may be decreased. Any modifications to the interim monitoring and sampling array will be made with the consultation and concurrence of the USEPA and CT DEP.

4. Reporting

The results of each sampling round will be presented as an Interim Monitoring and Sampling Report, which will be submitted as a letter to the USEPA within 75 days of each sampling event. Each report will include:

- A figure summarizing the ground-water and surface-water sampling locations;
- A cumulative table of ground-water VOCs detected during each sampling event at each well or surface-water sampling location during the Interim Monitoring and Sampling Program;
- A qualitative discussion of any apparent data trends, such as changes in regulatory compliance with ground-water criteria, concentration increases, or concentration decreases; and
- Any recommendations regarding changes to the sampling array, including ground-water and surface-water sampling locations.

Also, the previous regulatory VOC plume maps will be reassessed, and if changes are noted in the interpreted regulatory plume dimensions, maps will be revised and submitted with the letter report.

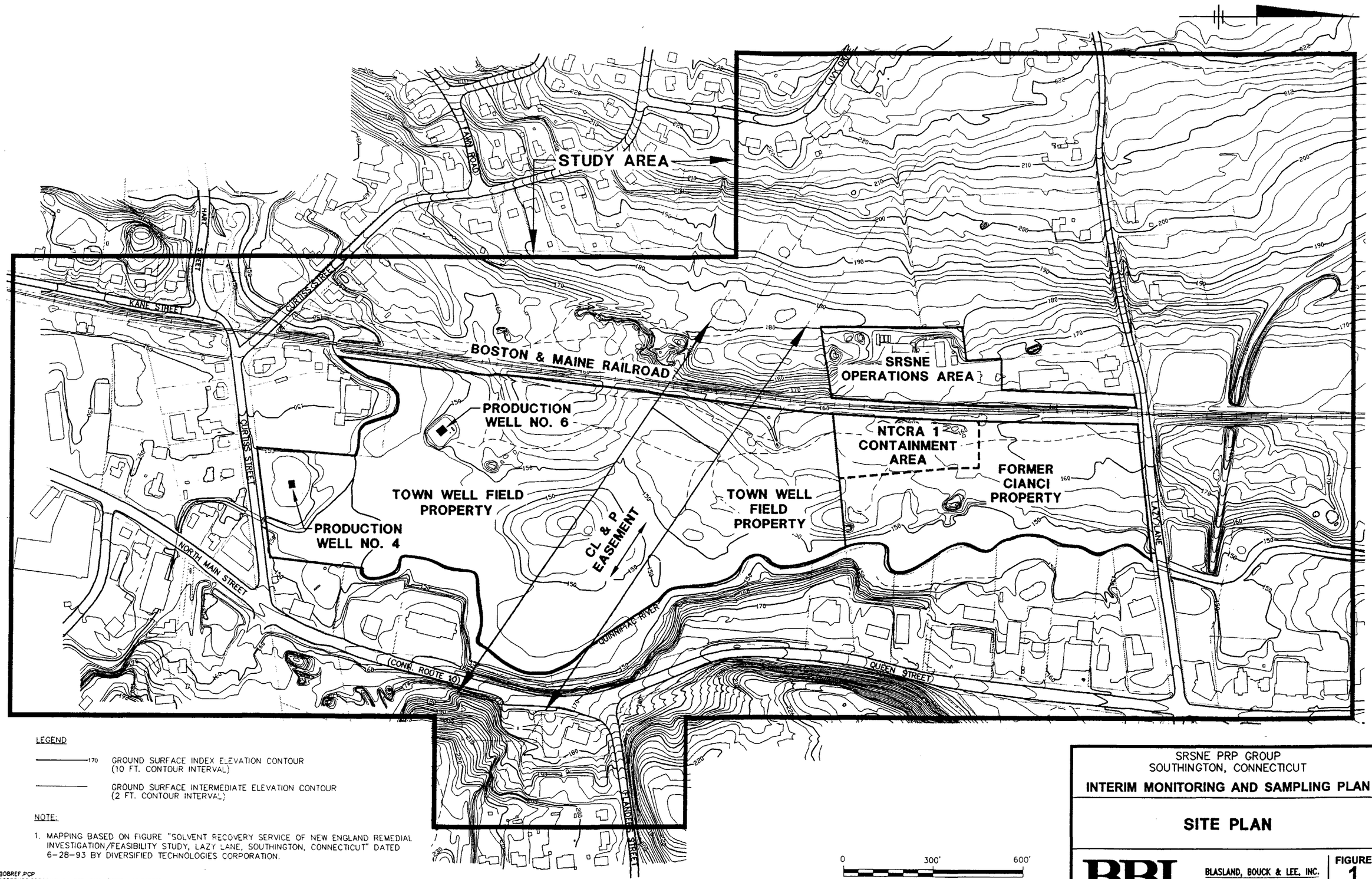
5. References

Blasland, Bouck & Lee, Inc. (BBL). Remedial Investigation Work Plan, Solvents Recovery Service of New England, Inc. Superfund Site, Southington, Connecticut, November 1995.

Blasland, Bouck & Lee, Inc. (BBL). Project Operations Plan, Solvents Recovery Service of New England, Inc. Superfund Site, Southington, Connecticut, November 1995.

Blasland, Bouck, & Lee, Inc. (BBL). Remedial Investigation Work Plan Addendum No. 6. Letter to Ms. Sheila Eckman; USEPA, December 18, 1996.

Halliburton NUS. Final Remedial Investigation Report: Remedial Investigation/Feasibility Study. May 1994.



LEGEND

170 GROUND SURFACE INDEX ELEVATION CONTOUR (10 FT. CONTOUR INTERVAL)

GROUND SURFACE INTERMEDIATE ELEVATION CONTOUR (2 FT. CONTOUR INTERVAL)

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

DJB08REF.PCP
X:08325X00,08325X01;L: OFF: REF+,(XREF X01:PIPES)
8/12/96 SYR-54-DMW
08331011/08331G01.DWG

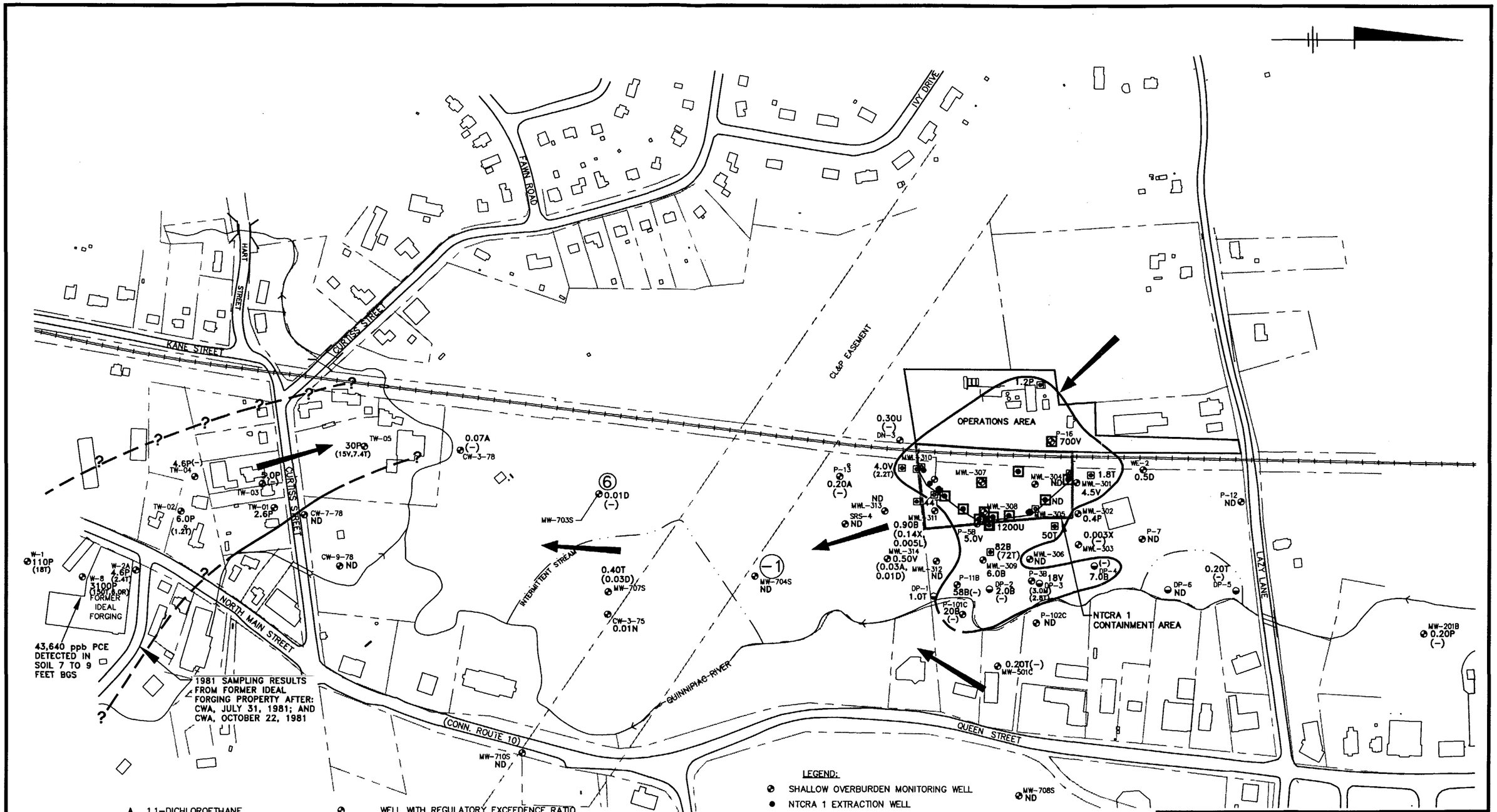
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

INTERIM MONITORING AND SAMPLING PLAN

SITE PLAN

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 1



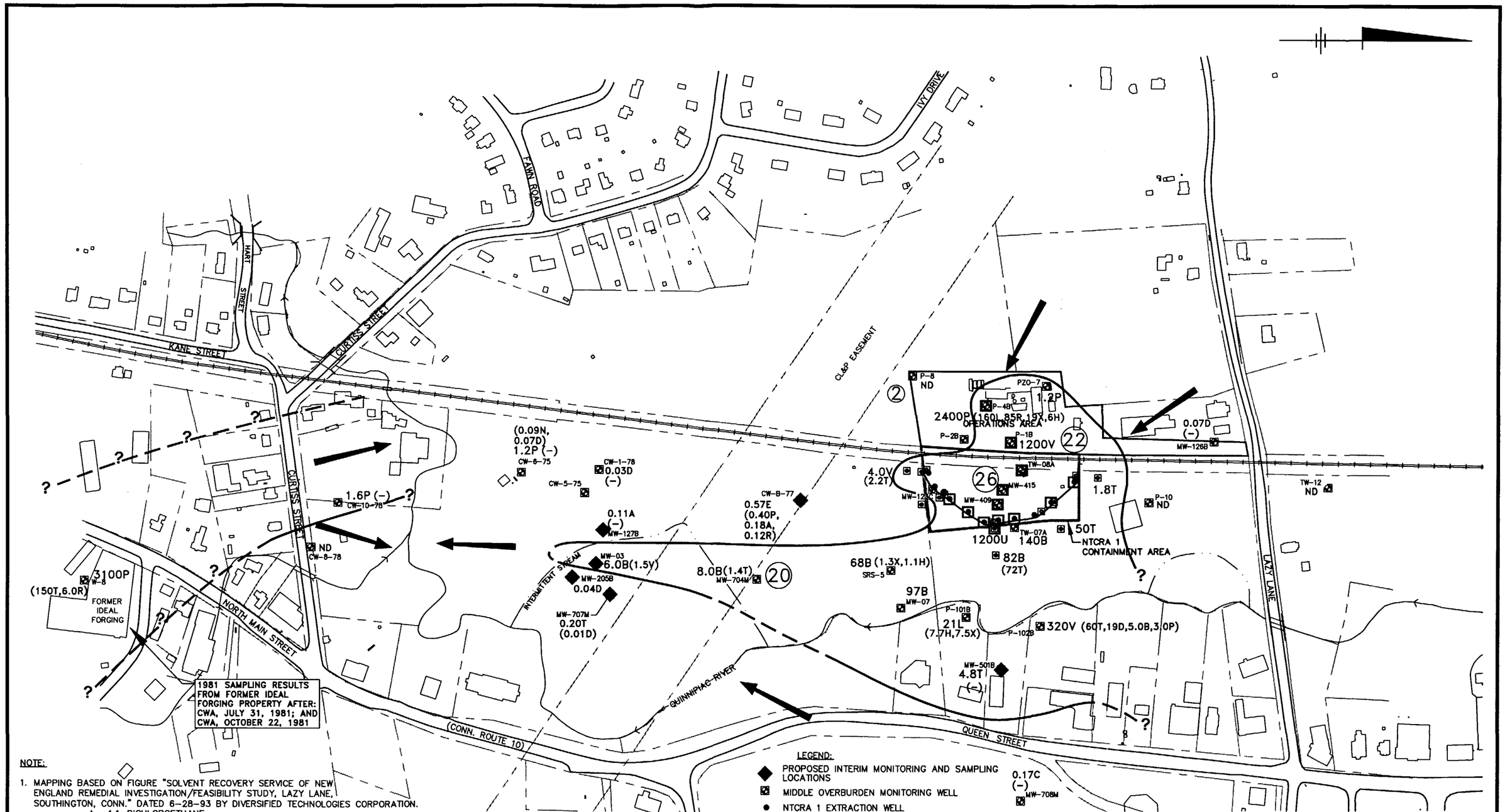
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

INTERIM MONITORING AND SAMPLING PLAN

SHALLOW OVERBURDEN GROUND-WATER REGULATORY VOC PLUME MAP

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 2



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONN." DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

1981 SAMPLING RESULTS FROM FORMER IDEAL FORGING PROPERTY AFTER: CWA, JULY 31, 1981; AND CWA, OCTOBER 22, 1981

A	1,1-DICHLOROETHANE
B	BENZENE
C	CHLOROFORM
D	1,2-DICHLOROETHENE
E	1,1-DICHLOROETHENE
H	ETHYLBENZENE
L	TOLUENE
M	METHYLENE CHLORIDE
N	ACETONE
P	TETRACHLOROETHENE
R	1,1,1-TRICHLOROETHANE
T	TRICHLOROETHENE
U	2-BUTANONE
V	VINYL CHLORIDE
X	XYLENES

MW-07 97B — WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 97 INDICATES 97 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., B = BENZENE) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.

LEGEND:

- PROPOSED INTERIM MONITORING AND SAMPLING LOCATIONS
- MIDDLE OVERBURDEN MONITORING WELL
- NTCRA 1 EXTRACTION WELL
- NTCRA 1 COMPLIANCE PIEZOMETER
- ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
- (2) USAF NATURAL ATTENUATION RANK
- LOCATION WITH ALCOHOLS DETECTION IN GROUND WATER
- GENERALIZED GROUND-WATER FLOW DIRECTION
- ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT

0 300' 600'

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

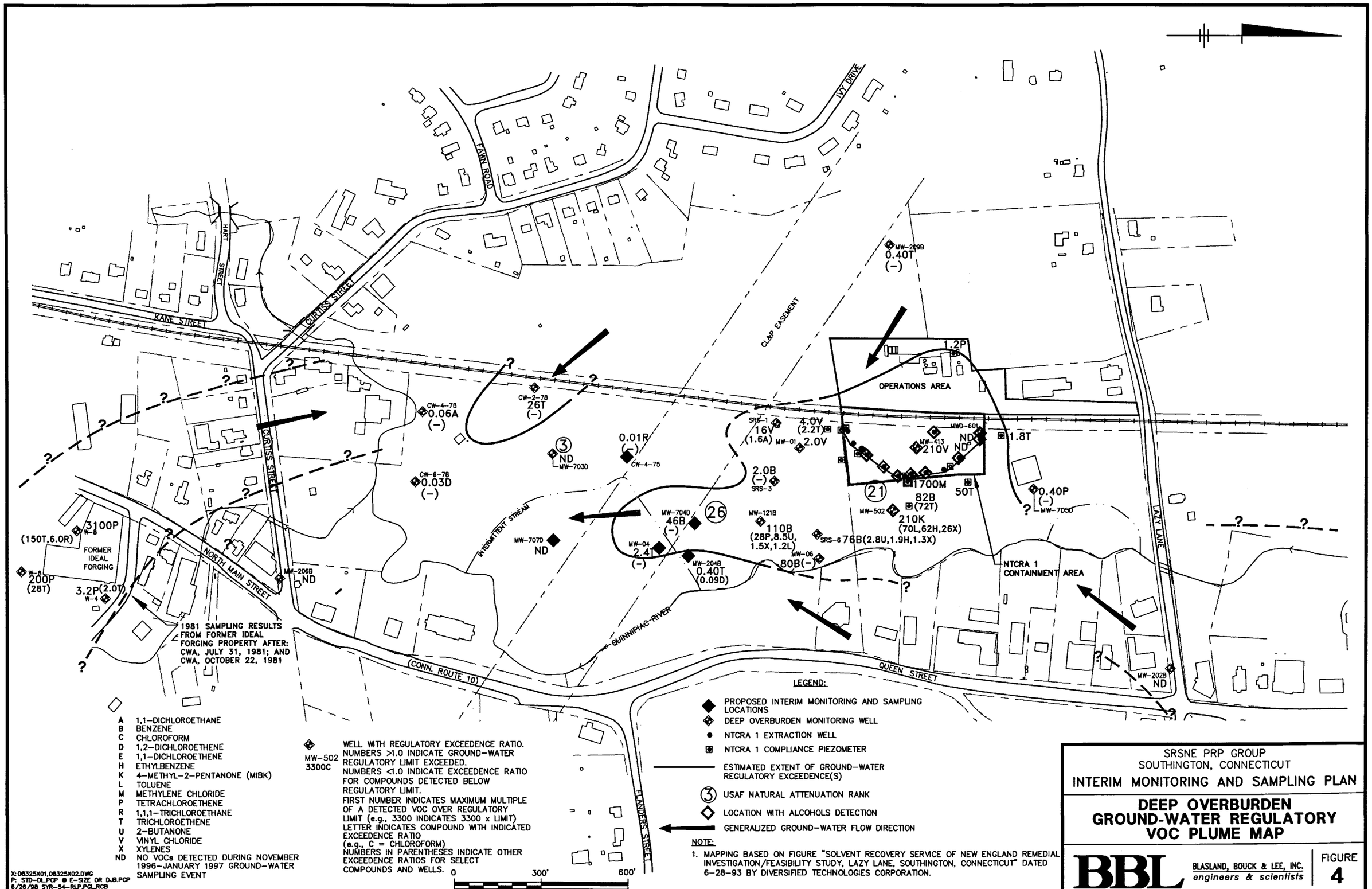
INTERIM MONITORING AND SAMPLING PLAN

MIDDLE OVERBURDEN GROUND-WATER REGULATORY VOC PLUME MAP

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 3

XREF: 08325X00,08325X01; L: ON: *, OFF:REF,(XREF X01: PIPES,TRAIL)
6/26/98 SYR-54-RLP,PGL,RCB
08331900/08331B15.DWG P: STD-DL.PCP ● E-SIZE OR DJB.PCP



A 1,1-DICHLOROETHANE
B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
H ETHYLBENZENE
K 4-METHYL-2-PENTANONE (MIBK)
L TOLUENE
M METHYLENE CHLORIDE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT

MW-502 3300C — WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 3300 INDICATES 3300 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., C = CHLOROFORM) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.

LEGEND:

- PROPOSED INTERIM MONITORING AND SAMPLING LOCATIONS
- DEEP OVERBURDEN MONITORING WELL
- NTCRA 1 EXTRACTION WELL
- NTCRA 1 COMPLIANCE PIEZOMETER
- ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
- (3) USAF NATURAL ATTENUATION RANK
- LOCATION WITH ALCOHOLS DETECTION
- GENERALIZED GROUND-WATER FLOW DIRECTION

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
INTERIM MONITORING AND SAMPLING PLAN

DEEP OVERBURDEN GROUND-WATER REGULATORY VOC PLUME MAP

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 4

X:08325X01,08325X02.DWG
P: STD-DL.PCP ● E-SIZE OR DJB.PCP
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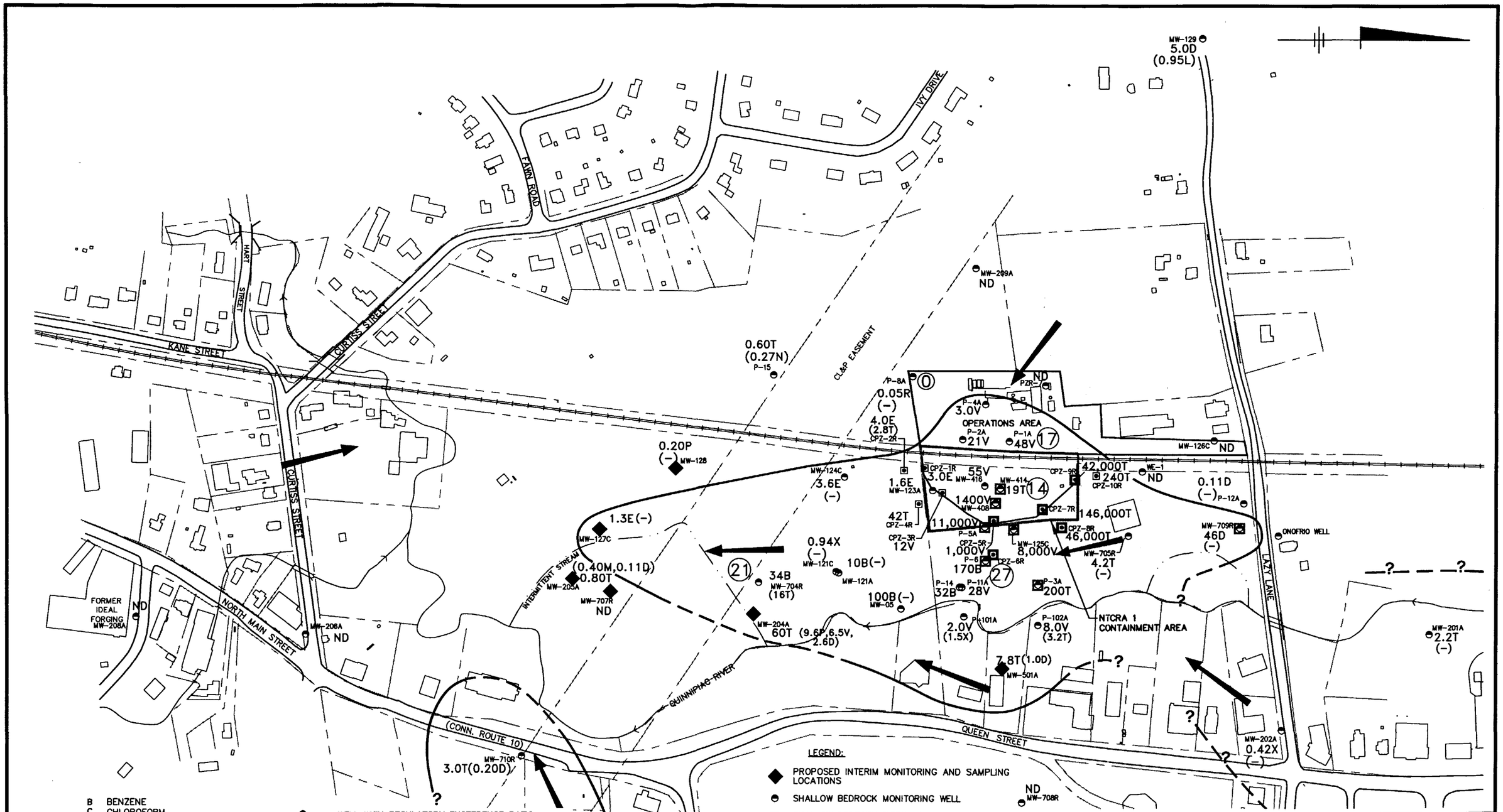

B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
M METHYLENE CHLORIDE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT

MW-707R
4.8T

WELL WITH REGULATORY EXCEEDENCE RATIO. NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED. NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT. FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 4.8 INDICATES 4.8 x LIMIT) LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO (e.g., T = TRICHLOROETHENE) NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.

0 300' 600'

LEGEND:

- PROPOSED INTERIM MONITORING AND SAMPLING LOCATIONS
- SHALLOW BEDROCK MONITORING WELL
- SHALLOW BEDROCK PIEZOMETER
- ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
- USAF NATURAL ATTENUATION RANK
- LOCATION WITH ALCOHOLS DETECTION
- GENERALIZED GROUND-WATER FLOW DIRECTION

NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

INTERIM MONITORING AND SAMPLING PLAN

SHALLOW BEDROCK GROUND-WATER REGULATORY VOC PLUME MAP

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 5

P: STD-DL_PCP ● E-SIZE OR DJB.PCP
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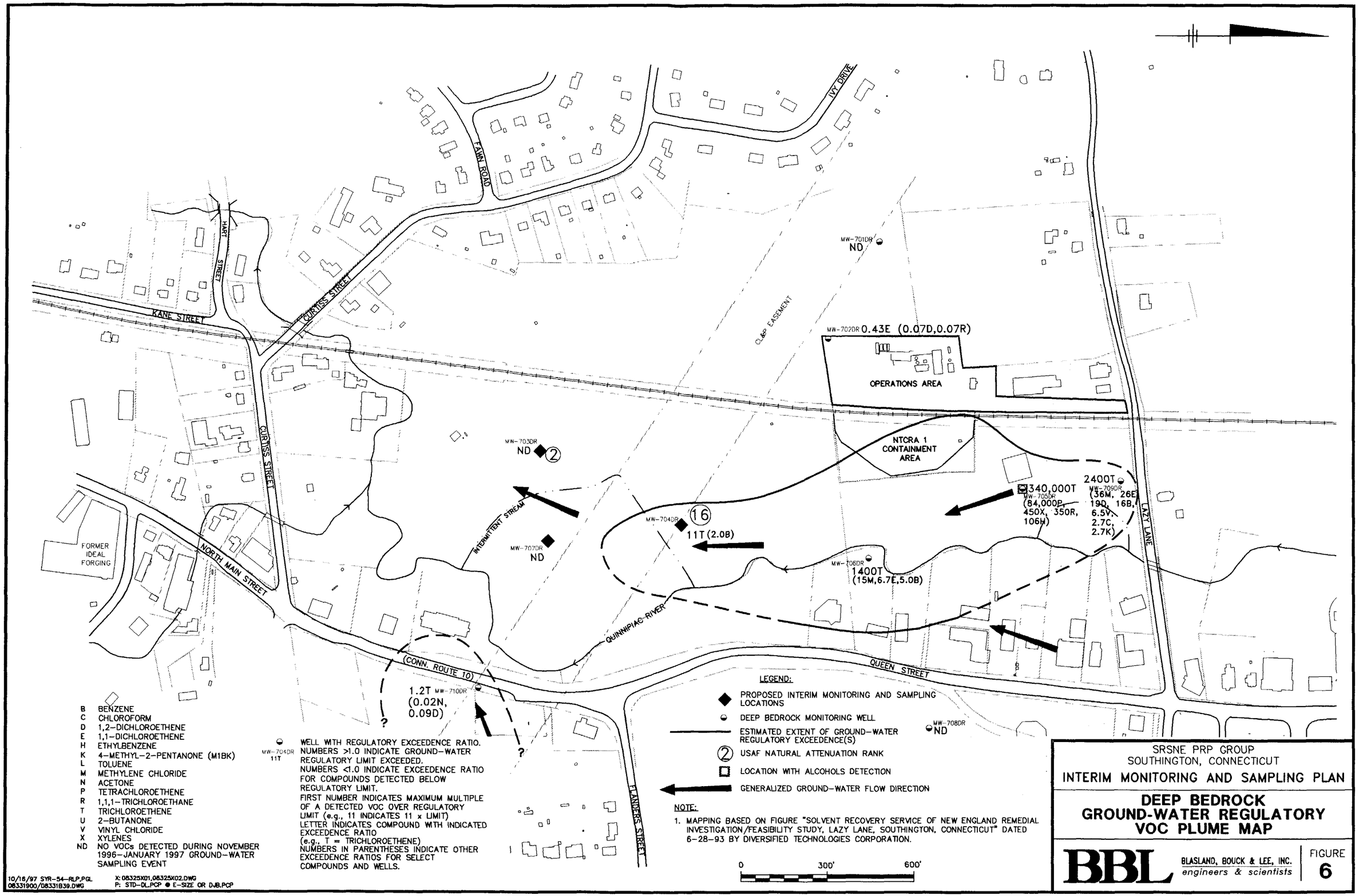
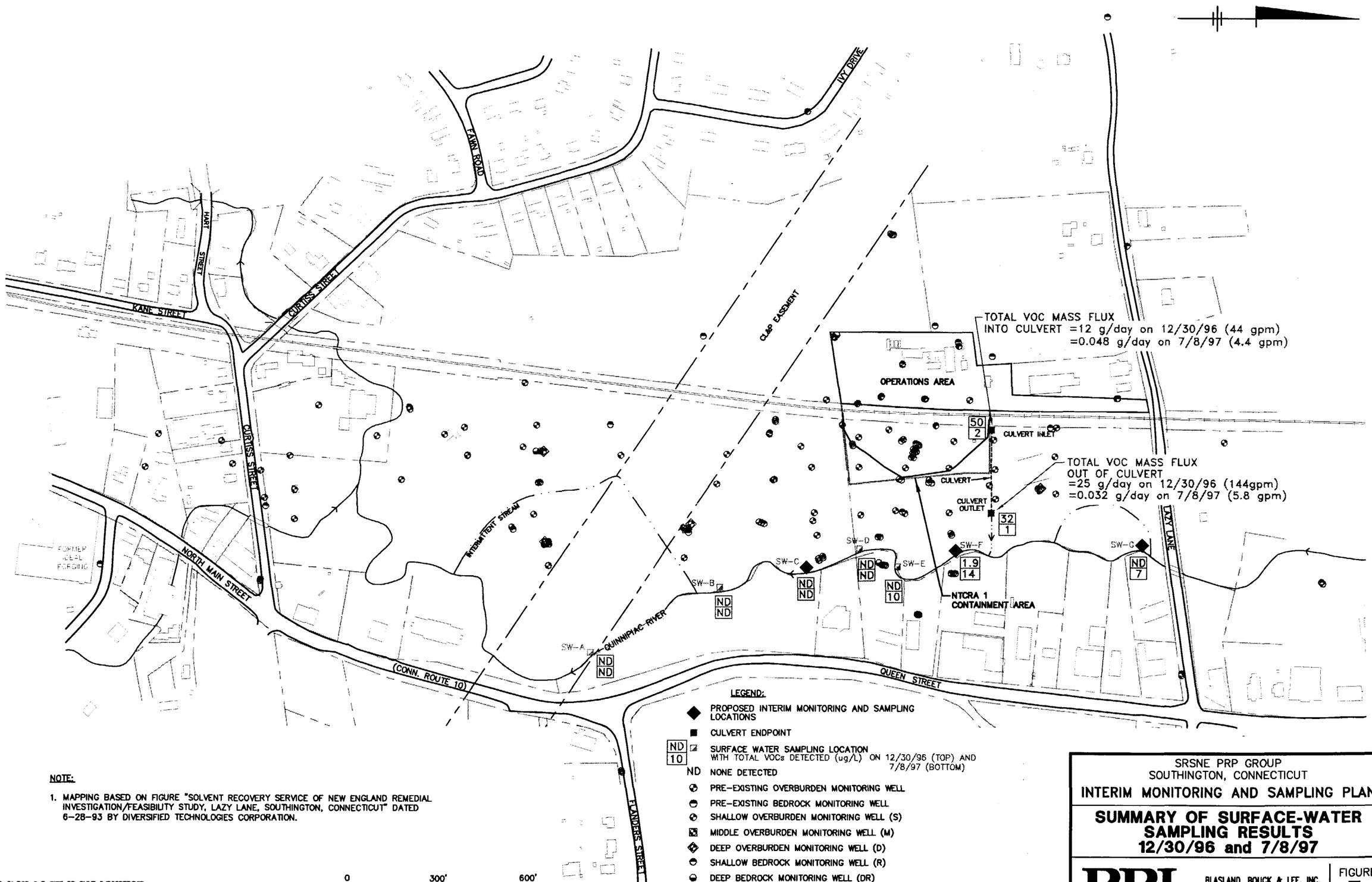

IVY DRIVE
FAWN ROAD
HART STREET
CURTISS STREET
KANE STREET
CURTISS STREET
CL&P EASEMENT
MW-701DR
ND
MW-702DR 0.43E (0.07D,0.07R)
OPERATIONS AREA
NTCRA 1
CONTAINMENT
AREA
MW-703DR
ND
2
340,000T
MW-705DR
(84,000P,
450X, 350R,
106H)
2400T
MW-709DR
(36M, 26E,
19O, 16B,
6.5V,
2.7C,
2.7K)
LAZY LANE
16
MW-704DR
11T (2.0B)
INTERMITTENT STREAM
MW-707DR
ND
MW-706DR
1400T
(15M,6.7E,5.0B)
FORMER
IDEAL
FORGING
NORTH MAIN STREET
QUINNIPIAC RIVER
(CONN. ROUTE 10)
QUEEN STREET
1.2T MW-710DR
(0.02N,
0.09D)
?
?
MW-708DR
ND
FLANDERS STREET
B BENZENE
C CHLOROFORM
D 1,2-DICHLOROETHENE
E 1,1-DICHLOROETHENE
H ETHYLBENZENE
K 4-METHYL-2-PENTANONE (M1BK)
L TOLUENE
M METHYLENE CHLORIDE
N ACETONE
P TETRACHLOROETHENE
R 1,1,1-TRICHLOROETHANE
T TRICHLOROETHENE
U 2-BUTANONE
V VINYL CHLORIDE
X XYLENES
ND NO VOCs DETECTED DURING NOVEMBER 1996-JANUARY 1997 GROUND-WATER SAMPLING EVENT
MW-704DR 11T
WELL WITH REGULATORY EXCEEDENCE RATIO.
NUMBERS >1.0 INDICATE GROUND-WATER REGULATORY LIMIT EXCEEDED.
NUMBERS <1.0 INDICATE EXCEEDENCE RATIO FOR COMPOUNDS DETECTED BELOW REGULATORY LIMIT.
FIRST NUMBER INDICATES MAXIMUM MULTIPLE OF A DETECTED VOC OVER REGULATORY LIMIT (e.g., 11 INDICATES 11 x LIMIT)
LETTER INDICATES COMPOUND WITH INDICATED EXCEEDENCE RATIO
(e.g., T = TRICHLOROETHENE)
NUMBERS IN PARENTHESES INDICATE OTHER EXCEEDENCE RATIOS FOR SELECT COMPOUNDS AND WELLS.
LEGEND:
PROPOSED INTERIM MONITORING AND SAMPLING LOCATIONS
DEEP BEDROCK MONITORING WELL
ESTIMATED EXTENT OF GROUND-WATER REGULATORY EXCEEDENCE(S)
USAF NATURAL ATTENUATION RANK
LOCATION WITH ALCOHOLS DETECTION
GENERALIZED GROUND-WATER FLOW DIRECTION
NOTE:
1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.
0
300'
600'
10/16/97 SYR-54-RLP.PGL
08331900/08331B39.DWG
X: 08325X01,08325X02.DWG
P: STD-DL.PCP ● E-SIZE OR DJB.PCP
SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT
INTERIM MONITORING AND SAMPLING PLAN
DEEP BEDROCK
GROUND-WATER REGULATORY
VOC PLUME MAP
BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists
FIGURE
6



NOTE:

1. MAPPING BASED ON FIGURE "SOLVENT RECOVERY SERVICE OF NEW ENGLAND REMEDIAL INVESTIGATION/FEASIBILITY STUDY, LAZY LANE, SOUTHINGTON, CONNECTICUT" DATED 6-28-93 BY DIVERSIFIED TECHNOLOGIES CORPORATION.

LEGEND:

- ◆ PROPOSED INTERIM MONITORING AND SAMPLING LOCATIONS
- ■ CULVERT ENDPOINT
- ND / 10 — SURFACE WATER SAMPLING LOCATION WITH TOTAL VOCs DETECTED (ug/L) ON 12/30/96 (TOP) AND 7/8/97 (BOTTOM)
- ND — NONE DETECTED
- PRE-EXISTING OVERBURDEN MONITORING WELL
- PRE-EXISTING BEDROCK MONITORING WELL
- SHALLOW OVERBURDEN MONITORING WELL (S)
- MIDDLE OVERBURDEN MONITORING WELL (M)
- DEEP OVERBURDEN MONITORING WELL (D)
- SHALLOW BEDROCK MONITORING WELL (R)
- DEEP BEDROCK MONITORING WELL (DR)

SRSNE PRP GROUP
SOUTHINGTON, CONNECTICUT

INTERIM MONITORING AND SAMPLING PLAN

SUMMARY OF SURFACE-WATER SAMPLING RESULTS 12/30/96 and 7/8/97

BBL BLASLAND, BOUCK & LEE, INC. engineers & scientists

FIGURE 7

P: STD-DL.PCP @ E-SIZE OR @MVB DJB08REF.PCP
XREF: 08325X01,08325X02
9/30/97 SYR-54-RLP,PGL,DCC
08331008/08331B14.DWG

Appendix V

Development and Initial Screening of Remedial Alternatives Report

APPENDIX V

Development and Initial Screening of Remedial Alternatives Report

Solvents Recovery Service of New England, Inc.
Superfund Site
Southington, Connecticut

Prepared For:
SRSNE PRP Group

June 1998

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

6723 Towpath Road, P.O. Box 66
Syracuse, New York, 13214-0066
(315) 446-9120

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1. Introduction

1.1 General

This Development and Initial Screening of Alternatives Report presents the results from the identification and preliminary screening of potential remedial alternatives for addressing chemical constituents identified in the vadose zone soil and dissolved phase ground water at the Solvent Recovery Service of New England, Inc. (SRSNE) Superfund Site in Southington, Connecticut. Following agency approval, the preliminary screening presented in this report will be used as the basis for the Feasibility Study (FS). The Remedial Investigation/Feasibility Study (RI/FS) is being conducted pursuant to the Scope of Work (SOW) issued by the United States Environmental Protection Agency (USEPA) as part of the second Administrative Order on Consent (AOC) between the USEPA and the SRSNE Potentially Responsible Party (PRP) Group.

As discussed in the RI Work Plan [Blasland, Bouck & Lee, Inc. (BBL), November 1995] and detailed in the RI (BBL, November 1997), the presence and extent of non-aqueous phase liquids (NAPLs) within the saturated zone at the SRSNE Site has been documented. The practicability of aquifer restoration will be detailed in a Technical Impracticability (TI) Evaluation which will be completed in accordance with USEPA guidance and will be submitted in conjunction with the FS. A TI Evaluation is appropriate for the SRSNE Site because the presence of slowly dissolving NAPLs in the saturated zone, heterogeneous nature and low permeability of the geologic media underlying the site, and the likely influence of constituent diffusion into the bedrock matrix render remediation of the aquifer in the NAPL zones technically impracticable. Based on that evaluation, it is expected that the USEPA will delineate zones of impacted ground water and NAPL which are technically impracticable to remediate. Remediation of those zones are not considered herein and will not be evaluated as part of the FS.

Although remediation of the NAPL zones may be technically impracticable, restoration of the aqueous contaminant plume outside of the NAPL zones and remediation of potential ground-water contaminant source areas, may be practicable and must be considered in the FS. Media to be considered herein and during the FS include the portion of the aqueous contaminant plume outside of the USEPA-defined *TI Zone* and vadose zone soils which may act as a source of ground-water contamination. An evaluation of potentially applicable remedial alternatives for media within the TI Zone will be performed as part of the TI Evaluation to be submitted in conjunction with the FS.

This report has been prepared based on guidance presented in the USEPA's "Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA," and "Guidance for Evaluating the Technical Impracticability of Ground Water Restoration," and the National Contingency Plan (NCP) (40 CFR Part 300).

1.2 Background Information

1.2.1 General

The SRSNE Superfund Site is located on approximately 14 acres of land along Lazy Lane in the Town of Southington, Connecticut. The SRSNE Site is located in Hartford County, approximately 15 miles southwest of the city of Hartford (see Site Location Map, Figure 1). The areas which have been identified as containing impacted area and which may be subject to remediation include (Figure 2) the following:

- The SRSNE facility Operations Area;
- The adjoining former Cianci Property, including the Containment Area where the NTCRA 1 Ground-Water Containment System was installed;
- The Town of Southington Well Field Property; and
- The adjacent areas to the north, south, east, and west.

In this document, *site* refers to the SRSNE Operations Area and the Containment Area on the former Cianci Property. *Off-site* refers to areas within the study area that are hydraulically downgradient of the Containment Area, including the Town Well Field Property.

1.2.2 Area Descriptions

The primary areas which were impacted by past operations at the site encompass the three specific properties listed above and the adjacent areas to the north, south, east, and west (Figure 2). A comprehensive description of the study area background and physical setting for the three subject areas is included in the previously conducted RI, Sections 1 and 3 (HNUS, May 1994). This section presents an overview of the study area conditions and history based upon information provided in the previously conducted RI and other investigation documents.

SRSNE Operations Area

The SRSNE Operations Area is located in the Quinnipiac River basin approximately 600 feet west of the Quinnipiac River channel (Figure 2). The Operations Area consists of approximately 2.5 acres of grounds and structures situated on a 3.7-acre lot. An access road extends to the north, connecting the Operations Area to Lazy Lane. The Operations Area is bordered on the east (downhill) by the Boston and Maine (B&M) railroad right-of-way and the former Cianci Property, to the north by Mickey's Garage automotive repair shop, to the west (uphill) by the S. Yorski property, and to the south by the Delahunty property, the Connecticut Light and Power (CL&P) electrical transmission line easement, and the Town of Southington Well Field.

Much of the Operations Area is currently paved with asphalt and/or concrete and is completely enclosed with security fencing. Site features include an office trailer, operations building, former ground-water treatment system control building, multiple above ground storage tanks, and two concrete-surfaced drum storage areas. From approximately 1955 to 1991, day-to-day operations in this area included drum and bulk storage solvent distillation and fuel blending. A number of spent solvents and chemicals, including chlorinated solvents, aromatic hydrocarbons, alcohols, and ketones, were handled, stored, and processed in the SRSNE Operations Area. The history of the Operations Area is discussed further below.

Former Cianci Property

The former Cianci Property is the 10-acre parcel situated immediately east of the Operations Area, across the B&M Railroad right-of-way. The Quinnipiac River borders the eastern edge of the former Cianci Property. Lazy Lane is located to the north, and the Town of Southington Well Field borders the property to the south.

The former Cianci Property lot was occupied by the Cianci Construction Company from approximately 1969 through 1988 and was used for the storage of construction equipment and as a truck washing station. The property was sold to SRSNE in June 1988.

Until the construction of the NTCRA 1 Ground-Water Containment and Treatment System, the former Cianci Property was undeveloped, but had been altered by past earth-moving and leveling activities. Some of the wetland areas that formerly occupied a portion of this property had been filled. The impact of the NTCRA 1 system on the remaining wetland areas along the floodplain of the Quinnipiac River was evaluated in accordance with a Conceptual Wetlands Mitigation Plan (BBL, April 1995). Subsequently, a Detailed Wetlands Mitigation Design (BBL, September 1995) was developed to mitigate impacts to small, isolated wetlands within and immediately adjacent to the Containment Area during implementation of NTCRA 1. No measurable impacts

were observed at the wetlands adjacent to the Quinnipiac River (BBL, September 1995). An unpaved access road traverses from north to south through the Cianci Property and into the Town of Southington Well Field property.

Southington Well Field

The Town of Southington Well Field property consists of approximately 28.2 acres of undeveloped land situated south of the former Cianci Property and southeast of the Operations Area. The well field is bounded to the east by the Quinnipiac River and to the south by the Quinnipiac River and Curtiss Street. The B&M Railroad right-of-way and the Delahunty property border the western perimeter of the well field. The CL&P easement runs northwest-southwest through the northern portion of the well field.

Town Production Well Nos. 4 and 6 are located approximately 2,000 and 1,400 feet south of the SRSNE property, respectively. The Quinnipiac River divides the area between Production Well Nos. 4 and 6. Production well No. 6 is accessible using dirt roads originating from Lazy Lane or Curtiss Street, while Well No. 4 is only accessible from Curtiss Street. Production Well Nos. 4 and 6 were installed in 1965 and brought on-line to provide drinking water to the town of Southington in 1966. These wells have not been used for water supply since approximately 1979 due to the detection of solvent-related VOCs in the discharge water from the wells (HNUS, May 1994).

1.2.3 SRSNE Site History

The SRSNE facility began operations in Southington in 1955 (ATSDR, 1992). From approximately 1955 to the early 1980s, spent solvents were received from customers, the materials were distilled to remove impurities, and the recovered solvents were returned to the customer or others for reuse. Based on a partial record of materials processed at the SRSNE facility (excluding pre-1967 operations files, which were destroyed in a fire), SRSNE handled in excess of 41 million gallons of waste solvents, fuels, paints, etc. Approximately 3 to 5 million gallons of liquid wastes and 100,000 pounds of solid wastes were processed annually at the SRSNE facility during this period of operations (ATSDR, 1992). The liquid wastes processed at the SRSNE facility included unrecoverable or spent solvent-based fuels, spent chlorinated solvents, and wastes generated from fuel-blending operations. The liquid wastes were brought to the facility in tank trucks and were transferred to drums to allow batch-wise processing of the materials obtained from individual generators. The facility processed approximately 170,000 gallons of state-regulated wastes annually, including spent lubricating and hydraulic oils and antifreeze. Waste liquids generated on site included still-bottom sludges and contact and non-contact steam from the distillation process, non-contact cooling water from the fuel-blending operations, overflow water generated from an on-site ground-water recovery system, boiler blow down generated from boiler steam condensate, and storm-water runoff (ATSDR, 1992). Contact and non-contact distillation stream generated during distillation were discharged into a subsurface drain pipe that discharges into a ditch along the west side of the B&M Railroad tracks. The facility also received solid hazardous wastes, including gloves, rubber, cloth, rags, plastics, asphalt, and mine wastes.

From 1957 to approximately 1967, the non-recoverable portion of distilled solvents, consisting of distillation or still-bottom sludge, was stored in two on-site unlined lagoons located in the Operations Area. The largest lagoon was approximately 90 feet long, 40 feet wide, and 10 feet deep (approximately 270,000-gallon capacity) [Connecticut Department of Environmental Protection (CT DEP), October 1978]. The exact quantity of waste material placed in the on-site lagoons can not be determined. Sludge was periodically removed from the lagoons; however, the lagoons sometimes were filled beyond their capacity with solvent sludge (CT DEP, October 1978). In 1967, sludge disposal in the lagoons was discontinued, and the lagoons were drained and covered with fill.

After the closure of the lagoons in 1967, wastes, including still-bottom sludge and flammable liquid wastes, were incinerated in an open pit on site or disposed of off site. The open pit incinerator burned approximately 1,000 gallons of solvent sludge per day between 1966 and 1974, when it was decommissioned (ATSDR, 1992). Ash from the open pit incinerator was used as fill material within the Operations Area. By about 1976, some of the spent solvents were incorporated into SRSNE's fuel blending program. The solvent burning and fuel blending operations involved handling, storage, and transfer activities that resulted in leaks and spills to bare ground within the Operations Area. In 1989 and 1990, site paving and control measures were installed in accordance with a Resource Conservation and Recovery Act (RCRA) Corrective Measures Plan.

On September 16, 1976, VOCs were detected at Town of Southington Production Well Nos. 4 and 6 (Amory, August 1978), and in approximately 1979, Town of Southington Production Well Nos. 4 and 6 ceased operation due to the presence of VOCs in the discharge from the wells (HNUS, May 1994). In 1983, USEPA and SRSNE reached a Consent Decree, which required the installation of an on-site ground-water interceptor system (OIS) along the downgradient property line of the Operations Area. The on-site interceptor system was installed in 1985 and ostensibly consisted of 25 combination overburden/bedrock ground-water extraction wells spaced every 24 feet along a generally north-south line, transversing to the east-southeastward hydraulic gradient at the site. The Consent Decree also required modifications to SRSNE's solvent handling practices and the performance of subsurface investigation activities to assess impacts associated with the site. Concurrent with the issuance of the Consent Decree, USEPA placed the site on the National Priority List (NPL), making it eligible for federal assistance with site study and cleanup expenses. Between 1983 and the facility's closure in 1991, SRSNE made some improvements as required under the Consent Decree, including spill control measures, paving of the Operations Area, fire protection measures, and installation of a ground-water treatment system discussed below.

Between 1986 and 1991, the on-site ground-water treatment system utilized a cooling tower, which was converted into an air stripper on the roof of the operations building, with discharge via a subsurface drain pipe to the ditch along the railroad tracks east of the site. In addition to ground water from the OIS, the converted air stripper also received wet steam containing high concentrations of solvent compounds from the solvent distillation process. Thus, during system operation, VOC concentrations in the tens of parts per million (ppm), potentially including NAPL, may have been discharged to the ditch along the railroad tracks.

A USEPA RCRA inspection in February 1989 documented 75 cases of solvent releases from drums, tank trucks, hoses, and other solvent containers and transfer equipment during 1988 (USEPA, February, 1989). During the February 1989 USEPA RCRA inspection, the OIS was not operating as a continuous hydraulic barrier to downgradient ground-water flow (USEPA, February 1989). Subsequently, three extraction wells were removed and replaced in 1989 in an attempt to improve the ground-water extraction rate of the OIS. The cooling tower/air stripper treatment system was replaced with an enhanced oxidation treatment system in July 1992.

In 1988, the three batch stills were removed, and spent solvents received by SRSNE were transferred to other facilities for the remainder of SRSNE's operations period. Additional USEPA and CT DEP enforcement orders were subsequently issued to compel SRSNE to perform further site cleanup work at the facility. The facility ceased operation in March 1991 and was closed down in May 1991.

1.3 Previous Investigations

USEPA has conducted a three-phased RI that characterized the geology, hydrogeology, and soil and ground-water quality at the SRSNE Site and surrounding area. These investigations are detailed in the Halliburton NUS RI Report, dated May 1994. Because significant data gaps remained, a fourth RI was completed by BBL on behalf of the SRSNE PRP Group. The purposes of this RI were to fill data gaps that remained following the previous

phases of the RI, to complete the characterization of the SRSNE Site, and to support the development of the FS including a Technical Impracticability (TI) evaluation for a portion of the site with solvent-related VOCs which are either in NAPL form or else irrevocably diffused into the geologic media in dissolved phase. The significant RI findings are summarized below and detailed in the RI Report.

- Shallow, middle, and deep overburden ground-water elevation data measured on January 21, 1997, and July 7, 1997, indicated overburden ground-water flow converging toward the Quinnipiac River from both sides of the river throughout the overburden thickness. Overburden hydraulic heads were also inward with respect to the Non-Time Critical Removal Action No. 1 (NTCRA 1) overburden ground-water containment system.

- Shallow bedrock ground-water elevation data measured on January 21, 1997, and July 7, 1997, indicated shallow bedrock ground-water flow converging toward the Quinnipiac River from both sides of the river. A potentiometric depression was observed in the shallow bedrock in the vicinity of the NTCRA 1 overburden ground-water containment system, indicating partial containment of shallow bedrock ground water due to the NTCRA 1 system.

- Deep bedrock ground-water elevation data measured on January 21, 1997, and July 7, 1997, suggested deep bedrock ground-water flow converging toward the Quinnipiac River from both sides.

- Vertical hydraulic gradients throughout the monitored section of overburden and bedrock in the study area on January 21, 1997, and July 7, 1997, were generally upward in the vicinity of the Quinnipiac River, downward within localized areas farther from the river, and neutral in the central portion of the Town of Southington Well Field Property.

- NAPL thickness measurements at wells and piezometers indicated free-phase DNAPL at four overburden and three bedrock wells and piezometers in the Operations Area and the (downgradient) former Cianci Property. Measurable LNAPL was observed at one overburden well, indicating a limited distribution of potentially recoverable LNAPL. Based on VOC effective solubility calculations and dissolved concentrations at wells and piezometers, and the relationships between the shapes of the VOC plumes and hydraulic gradients at the site, the Probable and Potential NAPL zones have been delineated in the overburden and bedrock. The potential overburden and bedrock NAPL zones cover an area of approximately 12.4 and 14.2 acres, respectively.

- Surface-water sampling results from sampling events on December 30, 1996, and July 8, 1997, indicated detectible VOCs at the inlet and outlet of the underground culvert beneath the former Cianci Property. Surface-water samples from the Quinnipiac River indicated no detectible VOCs upstream of the culvert on December 30, 1997, but low concentrations of VOCs upstream of the culvert on July 8, 1997. Immediately downstream of the culvert outlet, low concentrations of VOCs were detected in the river, with concentrations decreasing to non-detectible within approximately 500 feet downstream from the culvert during both sampling events.

- The shallow overburden ground-water regulatory VOC plume associated with the SRSNE Site is well-defined, and is constrained to the area within approximately 300 feet of the SRSNE Operations Area and the NTCRA 1 Containment Area. An unrelated source of VOCs (primarily tetrachloroethene) is evident south of Curtiss Street.

- The middle overburden ground-water regulatory VOC plume associated with the SRSNE Site is reasonably well defined, and appears to extend into the southern half of the Town Well Field. An unrelated source of VOCs (primarily tetrachloroethene) is evident south of Curtiss Street.

- The deep overburden ground-water regulatory VOC plume associated with the SRSNE Site is reasonably well defined, and appears to extend into the central portion of the Town Well Field. An unrelated source of VOCs (primarily tetrachloroethene) is evident south of Curtiss Street, and a second unrelated VOC source is interpreted near the southern portion of the Town Well Field.

- The shallow and deep bedrock ground-water regulatory VOC plumes associated with the SRSNE Site are reasonably well defined, and appear to extend into the central portion of the Town Well Field.

- Hydraulic head and ground-water quality data indicate a limited potential for impact of the VOC plume(s) associated with the SRSNE Site at private water supply wells, including two wells located immediately upgradient from the site, near at the edge of the site-related VOC plume. One of the two private wells in question has contained VOCs in excess of ground-water regulatory criteria, and the CT DEP supplies that property owner with bottled water. The other well in question has historically indicated low concentrations of VOCs below applicable ground-water regulatory criteria (HNUS, July 1994). The SRSNE PRP Group is taking action to provide municipal water supply to these two properties by November 1997 and spring 1998, respectively. All other wells in the area around the site are beyond the current extent of the VOC plume attributable to the SRSNE Site.

- The results of the United States (US) Air Force method (Wiedemeier et al., September 1996; November 1996) for assessing natural attenuation of chlorinated organics in ground water based on geochemical parameters indicates "adequate evidence" (rank between 15 and 20) to "strong evidence" (rank greater than 20) for biodegradation of chlorinated organics at the majority of the locations within the ground-water regulatory plume(s) where natural attenuation parameters were characterized.

- VOC mass distribution calculations indicate that approximately 97.7 percent of the VOC mass in the subsurface at the SRSNE Site is in the form of NAPLs, and the remainder of the mass is in dissolved, sorbed, or vapor phase. Approximately 96.6 percent of the VOC mass is in the saturated overburden, 3.2 percent is in the bedrock, and 0.15 percent is in the vadose zone.

As part of the RI, *probable* and *potential NAPL zone* boundaries in both overburden and ground water were delineated. The *probable NAPL zone* is delineated based on direct NAPL observations or accepted principles based on effective solubility limits of NAPL constituents. The *potential NAPL zone* provides a reasonable factor of safety around the probable NAPL zone, given the recognized range of error in the delineation of the *probable NAPL zone* due to geologic heterogeneity. The delineation the *probable* and *potential NAPL zones* in the overburden and bedrock are detailed in the RI and described below.

Overburden Probable and Potential NAPL Zones

Figure 45 from the RI Report summarizes the results of the NAPL screening process for the overburden. As detailed in the RI, the overburden probable NAPL zone was delineated as the zone containing all the data points where NAPL is known or highly suspected. The potential NAPL zone represents a safety factor around the probable NAPL zone, and is used to account for the inherent uncertainty of delineating NAPL in heterogenous porous media. The overburden probable NAPL zone covers and area of approximately 214,000 square feet (4.9 acres), and extends east from the Operations Area to the vicinity of the Quinnipiac River, and southeast to the northern edge of the Town Well Field. The overburden potential NAPL zone covers an area of approximately 540,000 square feet (12.4 acres). The TI Zone will be conceptually delineated during the Detailed TI Evaluation, which will be submitted with the FS, and will include, at a minimum, the entire overburden potential NAPL zone, a zone where diffusion of constituents into the soil matrix will also act as a long-term source of ground-water

contaminants (the "matrix diffusion zone"), and an area between the matrix diffusion zone and the point of aqueous plume containment (the "containment zone").

Bedrock Probable and Potential NAPL Zones

Figure 46 from the RI Report summarizes the results of the NAPL screening process for the bedrock. As detailed in the RI, the bedrock probable NAPL zone was delineated as the zone containing all the data points where NAPL is known or highly suspected. The potential NAPL zone represents a safety factor around the probable NAPL zone, and is used to account for the inherent uncertainty of delineating NAPL in fractured bedrock. The bedrock probable NAPL zone covers and area of approximately 260,000 square feet (6.0 acres), and extends from the Operations Area eastward to the vicinity of the Quinnipiac River, and north (upgradient based on non-pumping head data) to the location of the former Cianci Water Supply Well. The bedrock potential NAPL zone covers an area of approximately 618,000 square feet (14.2 acres). The TI Zone will be conceptually delineated during the TI Evaluation to be submitted with the FS, and will include, at a minimum, the entire bedrock potential NAPL zone and the matrix diffusion and containment zones.

The depth of the potential NAPL zone was not investigated directly during the RI and can not be determined safely due to the risk of mobilizing NAPL during drilling and contaminating the deeper bedrock, which may not currently contain any NAPL or VOCs. Also, the depth of the NAPL zone in the bedrock does not warrant detailed delineation given that the aqueous phase VOC plume associated with the bedrock NAPL zone is discharging upward to the overburden. The depth of the NAPL zone may be inferred indirectly, based on the three-dimensional distribution of dissolved VOCs and ground-water flow directions. Based on the interpreted depth of the VOC plume in bedrock and the vertical hydraulic gradients, it appears that the NAPL zone could potentially extend to a depth on the order of 200 feet below grade within the footprint of the bedrock probable NAPL zone.

Human Health Risk - As a result of USEPA's Phase 1 and 2 investigations, several contaminants of concern (COCs) were identified in the study area ground water, shallow soil, surface water, and sediment. Phase 3 of the RI evaluated the possible adverse health effects to human receptors posed by these contaminants to determine the total cancer risks and total non-cancer risks present. Average total cancer risks and average total hazard indices (non-carcinogenic risk factors) posed by potential ingestion of the study area ground water exceeded acceptable USEPA target levels. The highest calculated ground-water ingestion risks occurred principally within the Operations Area and the former Cianci Property. VOCs comprised the primary COCs in ground water. The ground water in the area along the east side of the Quinnipiac River directly downgradient of the Operations Area and the former Cianci Property had the second highest calculated risk levels, which also exceeded acceptable USEPA target levels. No current ground-water receptors exist in the areas where the calculated ground-water ingestion risks exceeded target levels.

The average total cancer risks and total hazard indices calculated for accidental ingestion and dermal contact within the study area shallow soils do not exceed acceptable USEPA levels. The Operations Area and former Cianci Property had the only calculated maximum risks that exceeded USEPA acceptable levels, but these results were calculated using subsurface rather than surface soil data. Furthermore, most of the Operations Area is covered with asphalt. The total cancer risks calculated for accidental ingestion and dermal contact with study area surface waters and sediment do not exceed acceptable levels.

Ecological Risk - Several COCs in the study area pose potential adverse effects to ecological receptors. The ecological risk due to soil contaminants is associated exclusively within the Operations Area and the former Cianci Property. In surface water and sediment, potential ecological risks have been identified throughout the initial RI study area.

2. Identification and Screening of Technologies

This section identifies potential Applicable or Relevant and Appropriate Requirements. Remedial Action Objectives (RAOs), and General Response Actions (GRAs) for the SRSNE Site. This section also presents a preliminary screening of remedial technologies that may be applicable to address vadose zone soils and the dissolved phase VOC ground-water plume ("the regulatory VOC plume").

2.1 Potential Applicable or Relevant and Appropriate Requirements (ARARs)

This subsection presents a discussion of potential Applicable or Relevant and Appropriate Requirements (ARARs) for consideration throughout the future identification, screening, and evaluation of remedial alternatives during the FS.

ARARs are promulgated, enforceable federal and state environmental or public health requirements, which fit into either of two categories: "applicable requirements;" and "relevant and appropriate requirements." Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site. Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that, while not legally applicable to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site or actions at the site.

The USEPA and the states have also identified certain guidance as "to be considered" criteria (TBCs). TBCs are non-promulgated advisories or guidance issued by federal or state government that are not legally binding and do not have the status of potential ARARS. Along with ARARS, TBCs may be used to develop the remedial action limits necessary to protect human health and the environment.

The USEPA categorizes ARARs and TBCs as being chemical-specific, location-specific, or action-specific. These ARAR categories are described below.

2.1.1 Potential Chemical-Specific ARARs and TBCs

Chemical-specific ARARs and TBCs are usually health- or risk-based values which may define acceptable exposure levels and, therefore, may be used in establishing remediation goals. In general, chemical-specific ARARs are set for a single chemical or a closely related group of chemicals. A preliminary listing of potential chemical-specific ARARs and TBCs is included in Table 1.

2.1.2 Potential Location-Specific ARARs and TBCs

Location-specific ARARs and TBCs are restrictions placed on the concentrations of hazardous substances or the conduct of activities solely because they are in specific areas. The general types of potential location-specific ARARs and TBCs that may be applied to the SRSNE Site are briefly described below.

Several potential federal and state ARARs regulate wetlands and floodplains. Because the study area includes wetlands and portions of the area are located in the 100-year floodplain of the Quinnipiac River, these regulations would be ARARs if the remedial alternatives to be evaluated during the FS would result in impacts to these resources. Section 404 of the Clean Water Act and State Inland Wetland and Water Courses Regulations restrict

activities that adversely affect wetlands and waterways. RCRA Location Standards outline the requirements for the construction of a RCRA facility located in a 100-year floodplain. The Floodplains Executive Order, incorporated into 40 CFR Part 6, Appendix A, requires that floodplains be protected and preserved and that adverse impacts be minimized.

Additional potential location-specific ARARs include the Fish and Wildlife Coordination Act, which requires that any federal agency proposing to modify a body of water must consult with the U.S. Fish and Wildlife Service. Again, these requirements would be ARARs for the SRSNE Site if the remedial alternatives evaluated in the FS impact the Quinnipiac River.

A preliminary listing of potential location-specific ARARs and TBCs is included in Table 2.

2.1.3 Potential Action-Specific ARARs and TBCs

Action-specific ARARs and TBCs are usually technology- or activity-based requirements or limitations on actions taken with respect to hazardous wastes. These requirements generally focus on actions taken to remediate, handle, treat, transport, or dispose of hazardous wastes. These action-specific requirements do not in themselves determine the remedial alternative; rather, they indicate how a selected alternative must be achieved. The general types of potential action-specific ARARs that may be applied to the SRSNE Site are briefly described below.

The Clean Water Act (CWA) requires that any point source discharge to waters of the U.S. meets all applicable requirements under the National Pollutant Discharge Elimination System (NPDES) program. These requirements would apply if the remedial alternatives evaluated during the FS involve point source discharges to the Quinnipiac River. The CWA Pretreatment Regulations state that all discharges to a publicly owned treatment works (POTW) must be treated so as to prevent interference with operation of the POTW, pass-through of pollutants, and violations of local limits. These regulations would be ARARs if the remedial alternatives for the SRSNE Site include discharge to a POTW. The state regulates the discharge of process wastewater and does not permit the discharge of toxic pollutants for which "Health Advisories" are unavailable and for which there is insufficient data for the establishment of a Health Advisory. This discharge restriction is potentially applicable to several contaminants detected in the study area.

Various requirements under the Clean Air Act would also be potential ARARs, if the remedial alternatives to be evaluated as part of the FS involve air emissions. The National Ambient Air Quality Standards (NAAQS) set maximum primary and secondary 24-hour concentrations for six criteria pollutants in the ambient air. The Connecticut State Implementation Plan (SIP) contains specific requirements for particular sources designed to ensure the attainment and maintenance of the NAAQS and Connecticut Ambient Air Quality Standards. Two of the six criteria pollutants, particulate matter and ozone, may be released into the air during implementation of remedial activities. State regulations also establish limits for air emissions from treatment facilities. Disposal actions may also be regulated by the state hazardous waste regulations and state waterways regulations and the ground-water injection program. These regulations may also be potential ARARs.

The RCRA facility standards address the design, facility operations, manifesting and record keeping, treatment, disposal, ground-water monitoring, and closure for certain types of waste management facilities.

Ambient Water Quality Criteria (AWQC) have been developed under the CWA as guidelines for the protection of freshwater aquatic life and human health, based on ingestion of water and fish consumption. These standards would be used to develop effluent discharge limits for those alternatives that require discharges to the Quinnipiac River.

A preliminary listing of potential action-specific ARARs and TBCs is included in Table 3.

These lists of ARARs and TBCs will be revised and refined throughout the development of the FS. The final ARARs and TBCs will be used in the detailed analysis of the effectiveness of remedial alternatives, and will be factored into the development of performance standards to be included in the Record of Decision (ROD) for the site.

2.1.4 ARAR Waivers

There are certain circumstances under which a remedial alternative may be selected which does not meet an ARAR, and for which a waiver of the necessity to comply with the ARAR may be granted. Of the six sets of circumstances described in Section 300.430(f)(1)(ii)(c) of the NCP for which waivers may be granted, one is considered applicable to the SRSNE Site:

"Compliance with the requirements is technically impracticable from an engineering perspective."

All ARARs listed above will be evaluated with regard to the applicability of the waiver mechanisms in the NCP as part of the FS. The *technical impracticability* waiver will be evaluated in consideration of the USEPA's "Guidance for Evaluating the Technical Impracticability of Ground-Water Restoration."

2.2 Remedial Action Objectives

Baseline human health and ecological risk assessment identified several COCs with respect to human health risk in the study area ground water, shallow soil, surface water, and sediment. Average total cancer risks and average total hazard indices posed by potential ingestion of the study area ground water were found to exceed USEPA target levels. The highest calculated ground-water ingestion risks related to the Operations Area/former Cianci Property and the area immediately east of the Quinnipiac River downgradient of the Operations Area. No current ground-water receptors exist in areas downgradient of the Operations Area. No current ground-water receptors exist in the areas downgradient and cross-gradient (immediately north) of the SRSNE Site, where the calculated ground-water ingestion risks exceeded target levels.

The Baseline Risk Assessment evaluated potential soil exposure risks based on the following assumed exposure pathways: 1) incidental ingestion; 2) dermal contact; and/or 3) inhalation of fugitive dusts. The only calculated Human Health Risk that exceeded USEPA acceptable levels for dermal contact with soil was related to the Operations Area and former Cianci Property surface soils. The Baseline Risk Assessment used conservative assumptions regarding exposure which probably overestimated the actual risk. Using reasonable and realistic exposure scenarios, the surface soils at the Operations Areas and the former Cianci Property do not appear to pose an unacceptable risk under any exposure scenario evaluated in the Baseline Risk Assessment. However, institutional controls, designed to limit access to surface soils, including the installation of fencing around most of the Cianci Property and the repair of the fence around the Operations Area have been completed. Also, in accordance with the NTCRA 2 Scope of Work, the SRSNE PRP Group is preparing to upgrade the existing pavement at the Operations Area to further limit exposure to surface soils.

The total cancer risks calculated as part of the Baseline Risk Assessment for accidental ingestion and dermal contact with study area surface waters and sediment do not exceed acceptable levels.

According to HNUS, several COCs in the study area may pose adverse effects to ecological receptors. The ecological risk due to soil contaminants is associated exclusively within the Operations Area and the former Cianci Property.

The complete restoration of the dissolved phase ground-water plume is considered technically impracticable due to the presence of un-recoverable DNAPL. The presence of DNAPL in the saturated overburden and bedrock zones will provide a continuing source of ground-water impacts, and, as recognized by the USEPA's TI guidance, the "inability to contain a source, or other technical constraints, may render plume restoration technically impracticable." Because the source is expected to remain in place, alternative remedial strategies designed to remediate the ground water to the extent practical, provide exposure control, and/or provide hydraulic containment, will be evaluated for the dissolved phase ground water.

The mass of VOCs in the vadose zone soils (approximately 0.15 percent of total VOC mass identified at the site), and the contribution of those VOCs to ground-water impacts, is considered trivial in comparison of the VOC mass already dissolved, sorbed, diffused, or present in the form of NAPL in the saturated zone. In a DNAPL zone, much of the constituent mass in ground water comes from dissolution of DNAPL below the water table, not from leaching through the vadose zone (Pankow and Cherry, 1995). Thus, DNAPL sites are distinct from non-NAPL sites in that remedial efforts in the vadose zone generally contribute little or no reduction of risks resulting from ground-water quality impacts (Pankow and Cherry, 1995).

At sites where the complete restoration of contaminated ground water is found to be technically impracticable, an alternative remedial strategy that is technically practicable, protective of human health and the environment, and satisfies the statutory and regulatory requirements of CERCLA may be appropriate. Alternative remedial strategies typically will address three types of problems at contaminated ground-water sites: prevention of exposure to contaminated ground water; remediation of contamination sources; and remediation of aqueous contaminant plumes. As the primary objective of any remedial strategy is overall protectiveness, exposure prevention plays a significant role in an alternative remedial strategy. Source remediation and control (including containment) should be considered when developing a remedial strategy in cases where the removal or treatment of the source is technically feasible and will result in significant risk reduction. At the SRSNE Site, remediation of the source of dissolved phase constituents in ground water (i.e., NAPL and related constituents diffused into the soil and bedrock matrices) is technically impracticable - this aspect will be addressed in the TI Evaluation to be submitted with the FS. In cases where contaminant sources can be effectively contained, the portion of the aqueous plume outside of the containment area should be restored to established cleanup levels.

RAOs have been developed for vadose zone soil and ground water in consideration of the following factors:

- The potential human health risks associated with exposure to surface soils at the Operations Area and former Cianci Property;
- The human health risks associated with exposure to ground water;
- The technical impracticability of remediating the NAPL zone (i.e., the contaminant source); and
- Alternative remedial strategies.

The RAOs for each medium are presented below.

Vadose Zone Soil: Limit potential human exposure to vadose zone soils and mitigate the migration of constituents to ground water.

Dissolved Phase Ground Water: Limit potential future human exposure through ingestion, direct contact, and inhalation and restore ground water to the extent practicable.

2.3 General Response Actions

General Response Actions (GRAs) are non-specific remedial strategies that will achieve the remedial action objectives identified for the site. The following GRAs have been identified to address vadose zone soils.

Vadose Zone Soils

No Action
Institutional Controls
Containment (capping)
In-situ Treatment
Removal/Ex-Situ Treatment
Removal/Off-Site Disposal

In developing the GRAs for dissolved phase ground water, it has been assumed that remediation (including containment) of the NAPL zone and matrix diffusion zone will be deemed Technically Impracticable, thus the source of dissolved phase contaminants will not be remediated. In accordance with USEPA's TI guidance and CT DEP's Remediation Standard Regulations, containment of the TI zone will be evaluated in the TI Evaluation. Because source zone remediation is considered technically impracticable, the GRAs have been developed in consideration an alternative remedial strategy with a focus on exposure control and aqueous plume remediation.

Dissolved Phase Ground Water

No Action
Institutional Controls
Alternate Public Water Supply
Containment
In-Situ Treatment
Ex-Situ Treatment

2.4 Areas and Volumes of Media to Which Remedial Action May Apply

Vadose Zone Soil

As discussed previously, the VOC mass present in vadose zone soils in the Operations and Containment Area is considered trivial in comparison to the VOC mass present NAPL within the saturated overburden and bedrock beneath the Cianci and northern Town Well Field properties. It is expected that vadose zone soil remediation will not measurably improve ground-water quality conditions because of the following conditions: 1) the presence of large quantities of NAPL in the saturated overburden in both areas renders the VOC mass in the vadose zone negligible in comparison, 2) widespread paving in the Operations Area substantially limits infiltration of clean water and VOC leaching from the vadose zone; and 3) in the Containment Area, the water table typically is within

0 to 4 feet of the ground surface which limits vadose zone soils available for risk contribution. However, vadose zone soil remedial alternatives for the Operations Area and former Cianci Property will be evaluated in terms of further limiting potential future human exposure and surface-water infiltration.

Based on the analysis of VOC mass distribution presented in the RI Report, the volume of vadose zone soils having concentrations in excess of 0.01 ppm is approximately 30,900 cubic yards.

Dissolved Phase Ground Water

As discussed in the SRSNE RI Work Plan and as will be documented in the TI Evaluation, the NAPL zone and the matrix diffusion zone are considered technically impracticable to remediate and will not be evaluated as part of this FS. VOC mass estimates presented it the RI indicate that approximately 96.8 percent of the VOC mass is present in the overburden and only approximately 3.2 percent is in the bedrock.

Based on the analysis of VOC mass distrubution presented in the RI Report, the areal extent of impacted ground water is approximately 32 acres. It should be noted that a large percentage of this area is expected to fall within the TI Zone.

2.5 Identification and Screening of Technologies and Process Options

The methodology used to identify potential technologies and process options for addressing vadose zone soil and dissolved phase ground water is discussed below. Each identified technology/process option is described and evaluated against preliminary screening criteria. This approach is used to determine if a particular technology is applicable for remediation of specified SRSNE media of interest. Process options will be eliminated or retained for incorporation into treatment alternatives (Section 3). Remedial alternatives that are not retained through the preliminary screening will be reviewed as part of the detailed analysis of alternatives to be developed as part of the final FS.

Remedial technologies and process options were identified based on a review of available literature, including the following USEPA documents:

- "Remedial Action at Waste Disposal Sites Handbook", USEPA, October 1985;
- "Treatment Technologies", August 1991;
- USEPA Superfund Innovative Technology Evaluation (SITE) program literature (various dates);
- "Innovative Treatment Technologies", USEPA, October 1991; and
- "Remediation Technologies Screening Matrix and Reference Guide", USEPA, July 1993.

In addition, select technology/process option vendor information was consulted to identify additional candidate technologies that are potentially applicable for addressing the potential SRSNE chemicals of concern in vadose zone soil and dissolved phase ground water.

2.5.1 Identification and Screening of Technologies and Process Options

Based on the literature and vendor information review, type of media, identified COCs present in the soil and ground water, the commercial availability of each technology, and GRAs, the list of remedial technologies included below has been developed.

Potential Technologies/Process Options for Soil

No Action

- No Action

Institutional Controls

- Fencing
- Deed Restrictions/Environmental Land Use Restriction

Containment

- Geocomposite Cap
- Multi-layer Clay Cap
- Asphalt Cap
- Vertical Barriers

In-Situ Treatment

- Bioremediation
- Soil Vapor Extraction
- Stabilization
- Thermal Treatment

Removal/Ex-Situ Treatment

- Excavation
- Thermal Treatment
- Physical Treatment
- Biological Treatment

Dissolved Phase Ground Water

No Action

- No Action

Institutional and/or Limited Control Measures

- Fencing
- Deed Restrictions/Environmental Land Use Restrictions
- Alternate Concentration Limits
- Ground Water Reclassification
- Alternate Public Water Supply
- Monitoring
- Natural Attenuation

Containment

- Hydraulic Containment
- Physical Containment

In-Situ Treatment

- Biological
- Separation
- Passive Reaction Walls

Aquifer Connection and Ground-Water Removal

- Bedrock Fracturing
- Constructed Wetlands
- Vertical Wells/Trench
- Active Removal via Pumping
- Passive Removal Using Existing Hydraulic Gradients

Ex-Situ Treatment

- Biological Treatment Using Constructed Wetlands
- Ultraviolet Oxidation
- Fenton's Reagent
- Phytoremediation
- Zero Valent Iron
- Conventional Treatment

2.5.2 Evaluation and Screening of Representative Technologies/Process Options

A brief technical description of each of the remedial technologies is presented below.

2.5.2.1 Description of Technologies/Process Options for Soil

No Action

The baseline risk assessment concluded that risk related to vadose zone soil may exist under hypothetical future exposure scenarios (i.e., trespassing and residential), however, these exposure scenarios are considered unlikely due to the presence of fencing/paving and previous land use (i.e., commercial/industrial). Under existing conditions, there are no unacceptable exposure scenarios related to vadose zone soils. Under the no action alternative, no additional actions would be taken in the Operations Area or the Cianci Property to address exposure to vadose zone soils. However, under the no action alternative, the contaminant concentrations in vadose zone soils are expected to diminish through natural attenuation processes.

The NCP requires that the no action alternative be considered during the FS process. Therefore, the no action alternative will be retained throughout the detailed evaluation of alternatives. The no-action alternative will serve as a baseline for comparing the effectiveness of other remedial alternatives to be developed for vadose zone soils.

Institutional Controls

Institutional control measures such as fencing, deed restrictions (e.g., Environmental Land Use Restrictions), and posting are measures which could be implemented to limit potential exposure to constituents present in vadose zone soils. Institutional control measures are aimed at preventing the unauthorized access to or use of the site by the public. Institutional control measures currently existing at the site including site fencing and posting. As part of this alternative, the existing access controls will be evaluated and upgraded, if needed. Also, under this alternative an Environmental Land Use Restriction would be effected to limit future usage of the site.

It is anticipated that the institutional actions to be considered under this alternative will be in place prior to the selection of a vadose zone soil remedial alternative (if needed). Thus, this alternative will not be retained for further evaluation.

Containment

Containment technologies for vadose zone soil at the SRSNE Site include capping and vertical barriers.

Capping

Capping technologies are intended to limit exposure, through direct contact, inhalation, or ingestion, to vadose zone soils and to reduce infiltration through (and thus desorption from) the vadose zone soil. The capping technology would include the demolition of existing site structures, upgrading the existing asphalt cap or the installation of a new low permeability asphalt, geocomposite, or multilayer clay cap. The cap would be designed to minimize infiltration and promote surface water runoff. The cap would be installed in a manner which minimizes disturbance of vadose zone soil.

The NTCRA 2 Action Memorandum Scope of Work requires that the existing asphalt cap in the Operations Area be repaired and/or repaved and that aphalt pavement be installed in unpaved areas. To that end, an "engineered control" consisting of an asphalt cap will be installed at the Operations Area to limit exposure and surface water infiltration to the vadose zone soil. It is expected that the engineered control will be completed prior to selection of the vadose zone soil remedy. In accordance with the State of Connecticut's Remediation Standard Regulations, the engineered control will be designed and constructed "to physically isolate the polluted soil and minimize migration of liquids through the soil, to function with minimum maintenance, to promote drainage and minimize erosion of or other damage to such control and to accommodate settling and subsidence of the underlying soil so as to maintain the control's structural integrity." As part of the engineered control, an ELUR will be effected which ensures that the property will not be used on a manner that could disturb the engineered control or the impacted soil and limits future use of the property to commercial or industrial activity. The ground-water monitoring component of the engineering control will be included with the selected ground-water remedy.

Because this alternative will reduce potential future exposure to the vadose zone soil and will reduce infiltration through the soil, this technology will be retained for further evaluation.

Vertical Barriers

Vertical barriers are subsurface structures that physically limit the horizontal migration of contaminants. Typical vertical barriers would include slurry walls, sheet piling, and grout curtains. A sheet pile vertical barrier is currently in use in the NTCRA 1 "containment area" to physically contain impacted ground water. The vadose

zone soil RAO is to limit potential exposure to the soil and vertical migration of constituents to ground water. Horizontal migration of contaminants is not a concern for the SRSNE vadose zone soils.

Because vertical barriers would not limit potential human exposure to the soil and would not limit the infiltration of surface water through the vadose zone soil this technology will not be retained for further evaluation.

In-Situ Treatment

The following in-situ treatment technologies have been identified for addressing vadose zone soils:

- Stabilization,
- Thermal Treatment,
- Bioremediation, and
- Vapor Extraction.

Stabilization

This technology would involve mixing the soils with stabilizing agents to alter the physical and/or chemical state of the constituents present in the soil matrix. The end product is a stabilized mass in which the constituents are less toxic and/or less leachable than the original matrix. Stabilization can be conducted either in-situ or ex-situ. The in-situ application would typically involve soil mixing with simultaneous addition of stabilizing agents typically including cement-, pozzolonic-, asphalt-, or organic polymer-based agents. The process is designed to result in a low-permeability monolith of stabilized soil.

This technology would be effective in reducing the mobility of the inorganic soil constituents, however, the effective stabilization of VOCs constituents is questionable. Because this technology may not be effective in reducing the leachability of the vadose zone VOCs, it will not be evaluated further.

Bioremediation

Bioremediation technologies involve the use of natural subsurface processes to reduce the chemical concentrations. These processes include biodegradation and abiotic chemical reactions with subsurface materials. These biodegradative and chemical reactions include electron with consequent molecular transformation to reduce toxicity. These two bioremediation processes being considered for the vadose zone soil include bioventing and soil mixing/nutrient addition.

The objective of bioventing is to supplement the subsurface oxygen with atmospheric air, to increase the rate of naturally occurring biodegradation; oxygen is often a limiting factor in subsurface microbial activity. The bioventing system is similar in construction to a soil vapor extraction system, in that the typical bioventing system would include air extraction or injection wells, and a blower system. However the objective of the bioventing system is to supply or induce a low flow of atmospheric or subsurface air to contaminated areas, whereas, an SVE system is designed to produce a high flow mass extraction and ex-situ treatment of VOCs. In extraction mode bioventing, the objective is to draw oxygen present in subsurface air within the surrounding clean soils to promote aerobic degradation. In injection mode, air is injected into the subsurface and allowed to diffuse from the well into the surrounding impacted soil producing an aerobic environment centered at the injection well. An advantage of air injection is the introduction of higher concentrations of oxygen, however, air injection may induce the desorption and migration of VOCs to non-contaminated areas or volatilization to the surface. If needed, bioventing

can be supplemented with nutrient addition, typically nitrogen and phosphorous, to optimize subsurface biodegradative conditions.

Biological treatment through in-situ soil blending consists of mixing soils in place to improve the mass transfer of oxygen and nutrients which, in turn, enhances the growth and activity of aerobic bacteria.

The ability of naturally occurring microbial communities to effectively degrade fuel hydrocarbons has been well documented. More recently it has been established that certain types of microorganisms will, under specific conditions, degrade or transform chlorinated ethenes and ethanes. Anerobic processes such as reductive dehalogenation and aerobic processes such as co-metabolism are effective as a bioremedial treatment train for chlorinated ethenes and ethanes when applied in sequential combination (USEPA, 1995b). Physical, physiochemical, and biological properties of soil samples from the Operations Area were measured and bench-scale bioventing tests were previously completed by ENSR (see ENSR's report entitled, "Ground Water Technical Memorandum, Soils Study Report and Additional Studies Report for the SRSNE Superfund Site"), these tests concluded that in-situ biodegradation would not be an effective remedial technology for vadose zone soils in the Operations Area. Thus, this technology will not be retained for further evaluation.

Thermal Treatment

Thermal treatment technologies potentially applicable to the vadose zone soils include *steam stripping* and *vitrification*. *Steam stripping* involves the subsurface application of a heat source (i.e., steam) to increase the desorption and volatilization of VOCs from the soil matrix. The volatilized VOCs are entrained in the steam and carried to the surface where they can be captured in for treatment. Steam stripping typically involves the use of drill augers which are modified to allow the subsurface injection of steam while drilling in the treatment area. The area being actively treated is covered with a shroud placed under negative pressure, which is designed to collect VOC-containing vapors as they rise to the surface. The collected vapors are typically condensed to remove water and treated as needed prior to discharge.

Vitrification involves inducing an electrical current (producing temperatures up to 3,600° C) across the impacted area. Field application involves the insertion of large electrodes into contaminated soils containing significant levels of silicate. Because dry soils are not electrically conductive, a layer of conductive material (e.g., graphite) is placed between the electrodes. At the induced temperatures, any soil or rock components of the waste material will melt, organic compounds will be pyrolyzed in the glass matrix and many metallic materials will either fuse or vaporize. Any gases and vapors produced can be collected for treatment at the surface with a shroud under negative pressure. After the process is terminated and the soil cooled, the fused waste material will be dispersed into a chemically inert and stable crystalline form that has a very low leachability.

Because of the heterogeneity of the soils present at the site, steam stripping is expected to promote lateral migration of contaminants along preferential pathways. Also, steam stripping is not expected to be readily implementable due to the presence of the shallow depth to water; therefore, steam stripping will not be retained for further evaluation. The presence of a shallow water table in the Operations Area is also expected to render in-situ vitrification ineffective, thus in-situ vitrification will not be retained for further evaluation.

Vapor Extraction

This technology involves extracting VOC-containing soil vapors from the unsaturated soils by inducing a high-flow vacuum. The components of a typical system include gas extraction wells, header piping, vacuum blower, air/water separator, off-gas, and water treatment systems (if needed). Spacing and construction of the gas extraction wells

and vacuum induction rates will be determined by the physical constraints of the site. To supplement vapor extraction, a dual phase system, can be implemented. In the dual phase system, ground-water extraction and treatment is used in conjunction with vapor phase extraction to lower the ground-water table and allow for treatment of a deeper unsaturated zone.

The system operates by applying a vacuum to the wells which creates a negative pressure gradient within the subsurface soils. The negative pressure gradient causes the VOCs in the soil to mobilize and diffuse through the voids in the soils to the extraction wells. The extracted VOC-containing vapors are conveyed to the surface, treated (if necessary), and discharged to the atmosphere. An ex-situ treatment system may consist of an air/water separator and vapor-phase carbon adsorption. If air/water separation is used, a separate water treatment train, also consisting of carbon adsorption (possibly with metals/solids pretreatment), may be needed. If a dual phase system is employed, the extracted water would also require on-site treatment and disposal.

Previous vapor extraction pilot tests conducted at the facility by ENSR (see ENSR report entitled "Ground-Water Technical Memorandum, Soils Study Report, and Additional Studies Report for the SRSNE Superfund Site) have concluded that due to the shallow depth to ground water and the heterogeneity of the vadose zone soil (which promotes preferential flow pathways and lateral contaminant migration), SVE would not be an effective remedial technology for the site. Thus, vapor extraction technologies will not be retained for further evaluation.

Ex-Situ Technologies

The following ex-situ technologies have been identified for addressing vadose zone soils:

- Excavation,
- Thermal Treatment,
- Physical Treatment, and
- Biological Treatment.

Each of these technologies is described in more detail below.

Excavation

This technology consists of excavating in-situ vadose zone soil to remove material impacted by chemical constituents. Vadose zone soils are present only at shallow depths and can be excavated using standard construction equipment (e.g., backhoe and excavator). If soils present beneath existing structures (e.g., tanks and buildings) are to be removed, those structures will need to be either removed or structurally reinforced. Because the existing structures are not in use and are not anticipated to be used, it is expected that all structures will be removed prior to excavating vadose zone soils. It is expected that soil excavation would be conducted during seasonal low ground-water conditions. However, because of the shallow depth to ground water and significant fluctuations in ground-water elevations, a localized ground-water controls system, such as a wellpoint system, may be needed near the excavation area in order to limit ground-water accumulation and slope failures within the excavation. Any collected ground water would presumably be treated in the NTCRA 1 treatment system. Short-term risks associated with excavation technologies would consist of the uncontrolled emission of VOCs to the atmosphere during excavation [attempts have been made at other sites to limit these risks through the use of temporary enclosures (e.g., RUBB Tents), these measures have not met with complete success and would not be applicable at the SRSNE Site due to the difficulties associated with internal air handling and the expected high concentrations of VOCs]. Excavated materials would be temporarily stored in a constructed stockpile area prior to treatment and/or disposal. The excavated area would be backfilled with clean fill material. The excavation

technology would be combined with another technology process that would address final disposition of the excavated materials.

Because implementation of any ex-situ treatment technology would require excavation of impacted soils, this technology has been retained for further evaluation. It should be noted that due to the fluctuation of impacted ground water, it is expected that the backfill material present within the fluctuation zone is expected to become re-contaminated.

Thermal Treatment

Typical ex-situ thermal treatment technologies include low temperature thermal desorption (*LTTD*) and *incineration*. *LTTD* is a process by which the excavated soil containing constituents with boiling points less than 800°F are heated using a mobile treatment unit and the compounds are desorbed from the soil matrix into an induced air flow. To implement the LTTD, the excavated soil is initially screened to remove materials larger than 1-inch in diameter; those material larger than 1-inch are crushed and returned to the screened materials. The soil is then fed through a mill or rotary drum system equipped with heat transfer surfaces. The soil is heated to temperatures typically ranging from 500°F to 800°F. Air or nitrogen gas is passed over the soil to collect volatilized organic constituents. The carrier gas is treated by either condensation and carbon filtration, or by thermal destruction in a combustion afterburner. The treated soils could be used as backfill material within the excavation.

Incineration would be implemented in a manner similar to LTTD. However instead of thermal desorption, incineration provides high temperature thermal destruction of contaminants. The treated soils could be used as backfill material within the excavation.

Because LTTD would be effective in treating vadose zone soil, it has been retained for further evaluation. Because incineration would result in a significantly more costly remedy than LTTD and would not provide any additional benefits beyond LTTD, LTTD will not be retained for further evaluation.

Physical Treatment

Physical treatment technologies to be evaluated include *stabilization* and *soil washing*. *Stabilization* involves mixing the excavated soil in a vessel (tank or container) with stabilization agents to alter the physical or chemical state of the constituents present in the soil matrix. The end product is a stabilized mass in which the constituents are less toxic and/or leachable than the original soil matrix. Prior to mixing, the excavated materials would be screened to remove large pieces of debris and homogenized to provide a uniform consistency. Following stabilization, the materials would be disposed of on-site, possibly within the excavation. Treatability studies would be required to determine which stabilization agents would be effective in reducing the leachability of the constituents in the soil matrix.

Soil washing is an aqueous-based technology that, in general, uses mechanical processes to separates fine- and coarse-grained fractions of the soil matrix. This technology is based on the principle that chemicals of concern adhere mostly to the fines present in the media and thus is primarily a volume reduction technology.

Stabilization does not effectively address soils with high concentrations of organic constituents; thus, solidification will not be retained for further evaluation. Soil washing is effective in removing organic constituents from soil and will be retained for further evaluation.

Biological Treatment

Bioremediation of sediments is accomplished by the stimulation of indigenous or cultured microorganisms which transform the chemical constituents. A variety of biological treatment techniques are available for the treatment of soils. These techniques can be performed either aerobically or anaerobically. Ex-situ bioremediation systems typically employed can be generally categorized as treatment in a *solid-phase* (soil pile treatment) or treatment in a *liquid/solid phase* (batch reactor slurry).

Solid phase bioremediation involves treating soils in an above-grade system, using conventional soil management practices to enhance the microbial degradation or organic constituents. Site soils are excavated and placed in an above-grade system that may consist of a high-density liner, leachate collection piping, and a sand layer. Nutrients and water may then be applied to the sediments to optimize the microorganism's ability to break down the select organic chemicals of concern. Once cleanup levels are met, the treated soils may be placed back into the excavated area.

Liquid/solid-phase bioremediation involves treating excavated soil in a treatment vessel or tank. The excavated material will be screened and mixed with nutrient-amended water to produce a slurry of 10 to 30 percent solids. Once biodegradation is complete, the treated slurry is settled and residual water is recycled back into the bioreator or is treated and disposed of off-site. The treated solids are placed back into the excavated area.

Unlike in-situ bioremediation, ex-situ bioremediation allows for more control over the biodegrative conditions, such as nutrient and oxygen levels, which will affect an anerobic/aerobic treatment process that is expected to reduce the constituent levels in the soil. Ex-situ bioremediation technology will be retained for further evaluation.

2.5.2.2 Description of Technologies for Ground Water

No Action

The no action alternative would not utilize any remedial technologies for the treatment of dissolved phased ground water. The site would be allowed to remain in its current condition. The no action alternative would not actively reduce the toxicity, mobility, or volume of the chemical constituents present the site, although the toxicity, mobility, and volume of constituents in the dissolved phase ground water would be reduced over time through natural attenuation and discharge to the Quinnipiac River east and south of the site. The no action alternative could be implemented at the site.

The NCP requires that the no action alternative be considered during the FS process. Therefore, the no action alternative will be retained for further evaluation during the detailed analysis of remedial alternatives. The no action alternative will serve as a baseline for comparing the effectiveness of other remedial alternatives to be developed for ground water.

Institutional and/or Limited Control Measures

Deed Restriction

Impacted ground water at the SRSNE Site is not currently used for potable consumption and is not expected to be used because residential development of this industrial/commercial property is unlikely. However, deed restrictions (e.g., State of Connecticut Environmental Land Use Restrictions) could be implemented at those

properties outside the TI zone to ensure that in the unlikely event that the site is developed, ground water would not be used for potable consumption. This technology will be retained for further evaluation.

Monitoring

Monitoring involves the collection and analysis of ground-water samples to document changes in ground-water quality over time and to evaluate the effectiveness of the selected remedial action. This technology has been retained for further evaluation during the FS process.

Ground-Water Reclassification

This technology involves requesting that the state of Connecticut reclassify ground water at and downgradient of the site from a potable to a non-potable drinking water source. Because this technology will eliminate the human health risk associated with potential future residential development and ground-water consumption, this technology will be retained for further evaluation.

Alternate Concentration Limits

In accordance with USEPA's TI guidance, to qualify for use of an alternate concentration limit (ACL), the site must meet the following three requirements:

- There must be no known points of entry of the contaminated ground water into the surface water;
- There must be no statistically significant increases of the contaminant concentrations in the surface water or contaminant accumulations in downstream sediments; and
- Enforceable measures can be put into place to prevent exposure to the contaminated ground water.

In addition, USEPA generally considers ACLs appropriate only where cleanup to ARARs is impracticable, based on an analysis of the "balancing" and "modifying" evaluation criteria in the NCP (i.e., long-term effectiveness; reduction of mobility, toxicity, or volume; short-term effectiveness; implementability; cost; and state or community acceptance). Where an ACL is established, an ARAR waiver is not necessary. Because source area control and thus attainment of ARARs for the dissolved phase ground water may not be practicable, this alternative will be retained for further evaluation.

Alternate Potable Water Supply

Because a variety of VOC sources in the Town Well Field area, including the SRSNE Site, have contributed contaminants to ground water at concentrations that exceed ARARS, ground water from Town Well Nos. 4 and 6 cannot be used as a potable water supply without treatment. This technology includes two options: 1) identify and secure an alternate potable water supply for potential future use by the town of Southington; or 2) provide treatment for the ground water extracted from the existing town wells.

The initial option would include the abandonment of existing Town Well Nos. 4 and 6 to eliminate potential human health risks associated with future ground-water consumption associated with the town wells. To replace the available potable water volume lost due to the well abandonment, an alternate water supply would be identified and secured. Alternate water supplies may consist of the installation of new ground-water wells in un-impacted areas, the identification of available surface-water supplies, or the purchase of potable water from a

nearby municipality. Because this technology will address potential human health risks associated with consumption of ground water from the existing town wells, this technology will be retained for further evaluation.

The second option involves treating ground water extracted from the town wells to meet drinking water standards. This option would be coupled with one of the treatment technologies presented below for ex-situ ground-water treatment. Because this technology, when used in conjunction with an appropriate ground-water treatment technology, will address human health risks associated with consumption of ground water from the existing town wells, this technology will be retained for further evaluation.

Natural Attenuation

Natural attenuation (also known as intrinsic degradation) relies on the ground water's natural restorative ability through physical, chemical, and biological processes. Natural attenuation is generally a moderate- to long-term process that would commence following control of the source of the constituents. Although constituent source (i.e., DNAPL) control at the SRSNE Site is considered technically impracticable, natural attenuation processes will continue to address the dissolved phase VOCs. Because the source of dissolved VOCs to ground water cannot be effectively remediated or contained, natural attenuation will need to be instituted in conjunction with other institutional actions in order to be protective of human health and the environment. Because natural attenuation is an on-going process and will effectively address ground-water constituents, this technology will be retained for further evaluation.

Containment Technologies

Hydraulic Containment

Hydraulic containment of the dissolved phase ground-water plume would consist of providing active or passive hydraulic ground-water control and collection. To minimize the potential of mobilizing NAPL, the hydraulic containment system would be located so that the hydraulic influence of the system does not affect the TI Zone. Two options for the location of the hydraulic containment system will be considered in the FS including the following: a location intended to capture the areas of highest dissolved phase VOC concentrations (i.e., the leading edge of the dissolved VOC "wave front" emanating from the current NAPL zone) in combination with natural attenuation processes to address the lower concentration "fringe," which remains as a result of previous pumping stresses on the aquifers from the past operation of Town Well 6; and a downgradient location intended to capture the entire dissolved phase VOC plume.

The extracted ground water would be treated using an appropriate ex-situ treatment technology, as discussed below. Both the active and passive containment technologies require that a hydraulic connection from the zones exhibiting dissolved phase VOC impacts to an active or passive treatment system be established. Methodologies available to the provide hydraulic connection include vertical extraction wells, collection trench, bedrock fracturing, and a constructed wetland.

Vertical extraction well(s) would consist of the installation of a vertical, slotted pipe into the impacted plume. The number, depth, and placement of the extraction well(s) would be determined through ground-water modeling. Extraction wells can be installed using typical drilling techniques and have been successfully installed at the SRSNE Site.

An overburden *collection trench* would be installed by excavating a trench through the overburden to a specified depth, installing a perforated collection pipe at the base of the trench, and backfilling the trench with permeable fill (e.g., stone) to provide a preferential subsurface discharge zone within the overburden. The overburden collection trench would be used as the primary method to hydraulically contain and collect impacted overburden ground water. As with the extraction wells, the depth and placement of an overburden collection trench would be determined through ground-water modeling.

Bedrock fracturing would involve physically fracturing shallow bedrock by drilling a linear series of blast holes to a predetermined depth within the bedrock. Explosive charges would be placed in each blast hole and detonated, thus physically fracturing the surrounding bedrock. The depth, spacing and size the blast holes would be designed to provide a transect of highly fractured bedrock. The purpose of bedrock fracturing is to form a highly permeable connection between the shallow bedrock and the extraction system and to increase the efficiency of the extraction system. The fractured bedrock would typically be used in conjunction with the extraction wells or trench.

The *constructed wetland* would involve constructing a manmade wetland area at the ground surface over the dissolved phase plume. Wetland construction would consist of excavating a large surface area and backfilling the area with a combination of highly permeable soils (e.g., sand and gravel) to promote increased ground-water discharge rates and fine grained organic soils to support wetland vegetation and promote natural water treatment processes. The constructed wetland is expected to be an enhanced discharge location for the existing, upward hydraulic flow of the dissolved phase ground-water plume. The location, size, and construction materials for a constructed wetland would be determined through modeling ground-water flow, surface-water flow and treatment characteristics of the wetland.

Phytoremediation provides both hydraulic containment and ex situ treatment. Phytoremediation of ground water requires the planting of trees with deep root systems or other species of plants to remove water directly from the capillary fringe and the top of the saturated zone. One potential application at the SRSNE site may involve the use of phreatophytic, hybrid poplar trees. The use of the poplar trees for the treatment of ground water relies, in part, on the trees' high rate of water use, which essentially serves as a low flow ground water pump. Poplar trees can be planted in dense rows to form a hydraulic barrier or supplement another hydraulic containment remedy. The number and spacing of trees would be determined based on ground water monitoring results and expected water usage per tree. Another potential application of phytoremediation would include the planting of wetland species in constructed wetlands, if included as a component of the site remedy.

Active ground-water containment would consist of extracting ground water through conventional pumping systems (e.g., submersible pumps). Active ground-water extraction would be utilized in conjunction with either vertical wells or vertical trench. Passive extraction would utilize the existing upward hydraulic gradients within the dissolved phase plume to extract ground water. Recent ground-water elevation data indicate that the shallow, middle, and deep overburden ground water and the shallow bedrock ground-water flow upward and converge toward the Quinnipiac River. Passive ground-water extraction would take advantage of existing flow gradients and provide a flow pathway and discharge location for the ground water. Passive extraction may be used in conjunction with vertical extraction wells, which would provide a flow pathway to the surface, and/or to a constructed wetland.

Because of the technical difficulty of excavating vertical trenches within the overburden to the depths required (up to 100 feet), overburden collection trenches will not be retained for further evaluation. Vertical wells, bedrock fracturing, constructed wetlands, and phytoremediation are each technologies that can be implemented

at the site, each of these technologies will be retained for further evaluation. Active and passive ground-water extraction will also be retained for further evaluation.

Physical Containment

Physical containment technologies include surficial capping used as a source control measure, and subsurface containment systems used to physically limit further migration of the dissolved phase plume.

Capping involves the construction of a low permeability cap (e.g., asphalt pavement, clay cap, geosynthetic cap) over potential source areas. The cap would reduce or eliminate infiltration of precipitation through the site soils, which would reduce the leaching of constituents to ground water (at the SRSNE Site, leaching of VOCs from the vadose zone soils has been determined to be an insignificant contributor to ground-water impacts in comparison to the mass of VOCs in the saturated zone in the form of NAPL).

In-situ containment involves the installation of a low permeability barrier (e.g., sheet piles, slurry wall, grout curtains) to contain the dissolved phase plume. Hydraulic controls may be necessary to control the inward/outward flow of ground water from the containment area.

Because the primary source of VOCs to ground water is subsurface DNAPL, surficial capping is not expected to significantly reduce constituent migration to ground water; thus capping will not be retained for further evaluation as a dissolved phase ground-water remedy (as discussed above, capping <u>will</u> be retained as a potentially applicable technology for vadose zone soils). Because dissolved phase contaminants are present within bedrock, a subsurface containment system would have to be installed through the overburden and up to 200 feet into the bedrock to be effective. The installation of an in-situ containment system into fractured bedrock would not be effective and may actually influence the further downward migration of contaminants by creating additional bedrock fractures during installation. In-situ physical containment will not be retained for further evaluation as a dissolved phase ground-water remedy.

In-Situ Treatment

Biological Treatment

Biological treatment at the site would be performed using *enhanced bioremediation*. This technology involves altering subsurface environmental conditions to enhance microbial metabolism of select organic constituents. Enhancement would typically involve the introduction of oxygen and select nutrients through a series of injection wells. The RI has determined, through an analysis of geochemical parameters, that a complete biodegradation sequence is occurring within the dissolved phase plume. Treatability studies would be needed to determine how the existing biological activity can be enhanced. Enhanced bioremediation has been retained for further evaluation.

Passive Treatment Walls

The technology involves directing ground-water flow through a passive treatment zone which uses reductive halogenation triggered by a metal catalyst (i.e., zero valent iron). This in-situ application of this technology uses a "funnel and gate" system, which includes a low permeability wall (the "funnel") which would passively direct flow toward a high permeability zone (the "gate") that contains zero valent iron. As water flows through the iron wall, contaminants are degraded, sorbed, or precipitated, depending on the oxidation-reduction reaction that occurs when the chlorinated solvents come into contact with the metallic iron in the absence of oxygen. The

result is a non-toxic chloride and simple hydrocarbons, such as methane, ethane, and ethene, that are further reduced naturally through biodegradation.

Because impacted ground water is present within the fractured bedrock, as well as the overburden, the reaction wall would require installation into the bedrock in order to successfully remediate the plume. Installation of a reaction wall into bedrock is not considered practical due to the difficulty of installation and the variability of flow pathways within fractured bedrock. Thus, this technology will not be retained for further evaluation as an in-situ treatment technology.

Ex-Situ Treatment

Presented below are potentially applicable treatment technologies that would be used in conjunction with one of the retained ground-water extraction technologies described above. Potentially applicable ex-situ treatment technologies include the following: ultraviolet oxidation (UvOx); conventional treatment; biological treatment; phytoremediation; Fenton's Reagent technology; and zero valent iron. Each of these technologies is described in more detail below.

UvOx

UvOx uses ultraviolet light in conjunction with standard oxidants such as hydrogen peroxide and ozone to achieve greatly increased treatment performance over that obtained by hydrogen peroxide or ozone alone. Ultraviolet light is used to split the hydrogen peroxide or ozone molecules and produce a highly reactive hydroxyl radical. The hydroxyl radicals then quickly react with organic contaminants in the water to break down (i.e., mineralize) the organics into carbon dioxide and water.

UvOx is currently used employed as the NTCRA 1 ground-water treatment technology. UvOx will be retained for further evaluation in the detailed analysis of alternatives.

Conventional Treatment

Conventional treatment technologies would include flow equalization, metals pretreatment, sedimentation/ filtration, oil/water separation, air stripping, and carbon adsorption. These technologies are common water treatment technologies that would be combined, as needed, to provide an effective treatment train. Because conventional treatment technologies can be combined to provide an effective treatment train, conventional treatment will be retained for further evaluation.

Biological

This technology will be combined with the constructed wetland technology to essentially provide an ex-situ, self-maintaining bioreactor. The use of wetlands for effective treatment of municipal wastewater and landfill leachate is widely recognized. A constructed wetland would typically consist of five principal components (Hammer, 1989) including the following:

1. Substrates with various rates of hydraulic conductivity;
2. Plants adapted to water-saturated anaerobic substrates;
3. A water column (water flowing in or above the surface of the substrate);
4. Invertebrates and vertebrates; and
5. An aerobic and anaerobic microbial population.

Within the wetland system, microbes including bacteria, fungi, algae and protozoa, alter chemical substrates, typically to less- and non-toxic substrates, to obtain nutrients or energy to carry out their life cycles. If needed, non-native microbes can be introduced and maintained within the system to address specific pollutants. Wetland plants provide a location for microbial populations to attach and also provide a transport mechanism of atmospheric gases to the root zone which provides a small aerobic zone within the anaerobic substrate. This aerobic zone (the rhizosphere boundary) provides an important location for a number of desirable pollutant transformations. Substrates consisting of various soils, sand, or gravel provide a physical support for plants, a considerable reactive area for complexing ions, anions, and other compounds, and attachment surfaces for microbial populations. The surface and subsurface water transports nutrients and gases to the microbial populations, carries off byproducts and provides an environment for biochemical processes of plants and microbes. Water would be discharged from the constructed wetland to the Quinnipiac River. Although freezing will limit the rate of biodegradation, biodegrative processes will continue below the frozen zone.

Constructed wetland technology will require ground- and surface water modeling, as well as treatability studies, to define appropriate plant and microbial species. Constructed wetland technology will be retained for further evaluation.

Fenton's Reagent Technology

Fenton's reagent technology is also a chemical oxidation technology, similar to UvOx, although Fenton's technology generates hydroxyl radicals through the catalysis of hydrogen peroxide by iron. As with UvOx, the hydroxyl radicals quickly react with organic contaminants in the water to mineralize the organics into carbon dioxide and water. Although currently Fenton's reagent technology is not currently widely used in commercial treatment systems, it may be an applicable technology for the SRSNE Site and will be retained for further evaluation.

Phytoremediation

Phytoremediation involves the use of plants to naturally remediate contaminated soil and ground water. Phytoremediation of ground water requires the development of deep root systems. Application at the SRSNE Site would involve the use of phreatophytic poplar trees which are able to use water directly from the saturated zone. Special planting techniques are utilized to develop deep root zones. A variety of biological mechanisms are involved in phytoremediation. Plant-root exudates, which contain nutrients, metabolites, and enzymes, contribute to the stimulation of microbial activity. As with a wetland system, in the aerobic zone of soil closely associated with the plant root (the rhizosphere) there are expanded populations of metabolically active microbes which can biodegrade organic contaminants. The use of poplar trees for the treatment of ground water relies, in part, on the tree's high rate of water use which essentially serves as a low flow ground water pump. Poplar trees can be planted in dense rows to form a hydraulic barrier. The number and spacing of trees would be determined through ground-water monitoring and expected water usage per tree.

A phytoremediation pilot study for ground-water treatment is expected to be conducted at the NTCRA 1 containment area. The results of that pilot study will determine the applicability of this technology for the dissolved phase ground water. Because phytoremediation processes will be inherently associated with the constructed wetland technology and will be instituted, on a pilot scale, at NTCRA 1, phytoremediation will be retained for further evaluation.

Zero Valent Iron

As with the in-situ passive treatment wall, this technology involves directing ground-water flow through a passive treatment zone which uses reductive halogenation triggered by a metal catalyst (i.e., zero valent iron). The ex-situ application would allow extracted ground water to percolate through an above ground zero valent iron "treatment cell." As water flows through the metallic cell, contaminants are degraded, sorbed, or precipitated, depending on the oxidation-reduction reaction that occurs when the chlorinated solvents come into contact with the metallic iron. The result is a non-toxic chloride and simple hydrocarbons, such as methane, ethane and ethene, that are further reduced naturally through biodegradation. Because zero valent iron is proven effective at dechlorinating VOCs, ex-situ zero valent iron technology will be retained for further evaluation.

2.5.3 Retained Technologies/Process Options

Based upon the results presented herein of the identification, evaluation, and screening of candidate treatment technologies to be considered for implementation at the SRSNE Site, the following technologies were retained based on their expected effectiveness and technical implementability.

2.5.3.1 Vadose Zone Soil

No Action

Institutional Controls

Fencing
Environmental Land Use Restrictions
Posting

Containment

Capping

Ex-Situ Treatment Technologies

Excavation
Low Temperature Thermal Desorption
Soil Washing
Biological Treatment
Off-Site Disposal

2.5.3.2 Dissolved Phase Ground Water

No Action

No Action

Institutional and/or Limited Control Measures

Environmental Land Use Restrictions

Monitoring
Ground-water Reclassification
Alternate Concentration Limits
Alternate Potable Water Supply
Natural Attenuation

Hydraulic Containment

Extraction Wells
Bedrock Fracturing
Constructed Wetlands
Passive Extraction
Active Extraction

In-Situ Treatment Technologies

Enhanced Bioremediation
Passive Treatment Wall Using Zero Valent Iron

Ex-Situ Treatment Technologies

UvOx
Conventional Treatment
Biological Treatment Using Constructed Wetlands
Fenton's Reagent Technology
Phytoremediation
Zero Valent Iron

2.5.4 Treatability Testing

Vadose Zone Soil

If retained following the preliminary screening of remedial alternatives, treatability testing may be warranted for several of the vadose zone soil ex-situ treatment technologies, including soil washing, low temperature thermal desorption, and biological treatment. However, it is expected that each of these technologies can be evaluated as part of the FS in the absence of treatability studies. If one of these alternatives is selected as the preferred remedy, treatability testing could be performed as part of a pre-design investigation or the remedial design. No treatability testing is recommended for the vadose zone soil technologies at this time.

Dissolved Phase Ground Water

If retained following the preliminary screening of remedial alternatives, treatability testing may be warranted for several ground-water remedial technologies, including the following: constructed wetland biological treatment; zero valent iron treatment; Fenton's Reagent technology; and enhanced in-situ bioremediation. However, it is expected that each of these technologies can be evaluated as part of the FS in the absence of treatability studies. If one of these alternatives is selected as the preferred remedy, treatability testing could be performed as part of a pre-design investigation or the remedial design. No treatability testing is recommended for dissolved phase ground water at this time.

3. Development and Screening of Remedial Alternatives

This section of the FS assembles the remedial technologies/process options that were retained during the preliminary screening (Section 2.5) into remedial alternatives which may be appropriate to attain the RAOs. The assembled remedial alternatives are screened on the basis of effectiveness, implementability, and relative cost. The preliminary screening also considers the extent or volume of contaminated material that will need to be addressed as part of the remedial alternative.

The effectiveness screening of each alternative considers its ability to protect human health and the environment through a reduction in the toxicity, mobility, or volume of COCs. The implementability screening considers both the technical and administrative feasibility of construction, operation, and maintenance of the alternative relative to site-specific conditions. Technical feasibility includes the ability to successfully construct and operate the remedial action to meet the objectives. Administrative feasibility includes the ability to successfully obtain inter-agency approval to perform the remedial action. The cost evaluation includes capital costs and annual operation and maintenance costs. This preliminary evaluation presents only relative costs; the FS will present detailed estimates of costs as part of the development and screening of remedial alternatives.

Alternatives with the most favorable composite evaluation of all screening factors are retained for further consideration during the detailed analysis of alternatives. An attempt is made to preserve the range of treatment and containment technologies and alternatives initially developed.

3.1 Development of Remedial Alternatives

Vadose Zone Soils

As described in Section 2, the VOC mass present in vadose zone soils in the Operations and Containment Area is considered trivial in comparison to the VOC mass present in the saturated zone (0.15 percent versus 99.85 percent). It is expected that vadose zone soil remediation will not measurably improve ground-water quality conditions because of the following: 1) the presence of large quantities of NAPL in the saturated overburden in both areas renders the VOC mass in the vadose zone negligible in comparison (Pankow and Cherry, 1995); and 2) widespread paving in the Operations Area substantially limits infiltration of clean water and VOC leaching from the vadose zone. However, the following vadose zone soil remedial alternatives for the Operations Area and Cianci Property will be evaluated in terms of further limiting potential future human exposure and surface water infiltration:

- No Action;
- Capping;
- Excavation, Low Temperature Thermal Desorption, and On-Site Disposal;
- Excavation, Soil Washing, and On-Site Disposal;
- Excavation, Biological Treatment, and On-Site Disposal; and
- Excavation, Off-Site Disposal.

Dissolved Phase Ground Water

In order to limit potential future human exposure through ingestion, direct contact, and inhalation, and to restore ground-water to the extent practicable the below listed alternatives have been developed.

- No Action
- Institutional Controls

- In-Situ Enhanced Bioremediation
- In-Situ Passive Treatment Wall
- Ground-Water Extraction with UvOx Treatment
- Ground-Water Extraction with Conventional Treatment
- Ground-Water Extraction with Fenton's Reagent Treatment
- Ground-Water Extraction Constructed Wetland Treatment including Phytoremediation and Zero-Valent Iron

As discussed, these alternatives will be considered at locations intended to address the highest VOC concentrations (i.d., the dissolved VOC "wave front" from the current NAPL zones) as well as the downgradient dissolved phase VOC plume "fringe."

3.2 Preliminary Screening of Vadose Zone Soil Remedial Alternatives

3.2.1 No Action

Description

Under this alternative, no active remediation would be conducted to address vadose zone soil. However, under the no action alternative, exposure to the site soils is limited by asphalt pavement and fencing and the COC concentrations would be expected to diminish through natural attenuation processes.

Effectiveness

This alternative will not actively reduce the mobility, toxicity or volume of the COCs present in the vadose zone soil, however, natural attenuation processes are expected to reduce the toxicity and volume of COCs. Exposure to the COCs is unlikely under existing conditions due to the asphalt cap and site fencing, and the desorption of contaminants to ground water is trivial in comparison to the contaminants loading associated with DNAPL.

Implementability

This alternative could be implemented without technical or administrative limitations.

Costs

There are no capital costs associated with this alternative. Operation and maintenance costs associated with monitoring vadose zone soils are considered low.

Screening Summary

Limited human health exposure pathways and migration of constituents to ground water exist under this alternative. This alternative is easily implementable. The NCP requires that the no action alternative be carried through the entire FS process as a baseline for comparison to other alternatives. Therefore, this alternative is retained for detailed evaluation.

3.2.2 Capping

Technical Description

Under this alternative the existing asphalt cap would be upgraded to further reduce potential exposure to and percolation through the vadose zone soils. As part of this alternative, non-essential site structures will be demolished and transported off-site for disposal.

As discussed above, an "engineered control" consisting of a low-permeability asphalt cap will be installed in the Operations Area, as required by the NTCRA2 SOW and in accordance with the requirements of the Connecticut Remediation Standard Regulations and applicable RCRA standards. The engineered control will be designed to physically isolate the impacted soil, to minimize migration of liquids through the soil, to function with a minimum of maintenance, to promote drainage and minimize damage to such control, and to accommodate settling and subsidence of the underlying soil so as to maintain the control's structural integrity. As part of the planned engineered control, an ELUR will be effected which ensures that the property will not be used in a manner that could disturb the engineered control or the impacted soil and limits future use of the property to commercial or industrial activity. The planned engineered control will include upgrading the existing property fencing, as needed.

Effectiveness

This alternative will effectively reduce the potential exposure to vadose zone soils and will reduce surface-water infiltration, thus reducing the COC mobility. The toxicity and volume of the COCs are expected to be reduced through natural attenuation processes.

Implementability

This alternative could be implemented without technical or administrative limitations.

Costs

The capital and operation and maintenance costs associated with this alternative are low to moderate.

Screening Summary

This alternative will further reduce the potential exposure to and surface water percolation through vadose zone soils. Therefore, this alternative is retained for detailed evaluation.

3.2.3 Excavation, Low Temperature Thermal Desorption, and On-Site Disposal

Technical Description

Under this alternative, impacted soils would be excavated, stockpiled on-site, treated on-site using LTTD, and disposed of within the excavation. Excavation of site soils would require the demolition of existing site structures and the removal of the existing asphalt cap. To avoid recontamination of soils due to the fluctuation of impacted ground water, soil will be excavated to the high ground-water elevation. However, due to the presence of shallow ground water, excavation will be conducted during seasonal low ground water and a ground-water dewatering system may be needed; any collected ground water would be treated in the NTCRA 1 treatment

system. Excavated soils would be treated in a mobile LTTD unit which thermally strips the VOCs; the volatilized VOCs would be condensed and collected for treatment and/or disposal. The treated soils would be backfilled within the excavation.

Effectiveness

Excavation and LTTD are proven technologies for addressing VOC-impacted soils. This alternative is expected to reduce the toxicity, mobility and volume of COCs in the excavated soil. Short term impacts to workers and nearby residents may be associated with the air borne release of VOCs due to soil excavation and handling.

Implementability

Excavation, LTTD, and on-site disposal are proven remedial technologies which are considered both technically and administratively feasible. Compliance with the substantive requirements of treatment and disposal permits will be required, however, this is not expected to preclude the use of these technologies. An air pathways analysis would be required in support of this alternative to determine the magnitude of off-site impacts resulting from air emissions from both the excavation and treatment processes. This alternative is not expected to be met with widespread community acceptance based on past local concerns with air emissions associated with excavation of soil having high concentrations of VOCs and the stigma of on-site thermal treatment as an incineration technology.

Cost

The capital cost of this alternative is expected to be high. The operation and maintenance costs associated with this alternative are expected to be low.

Screening Summary

This alternative is expected to be effective in reducing the COC concentrations in excavated soils. However, because of the minimal mass (relative to the saturated zone) of VOCs present in the vadose zone soil, this alternative is expected to provide minimal reduction in VOC loading to ground water. Further, in the presence of the NTCRA 2 cap, this alternative is not expected to provide additional exposure control and will actually result in additional short term exposure to workers and nearby residents. This alternative will not be retained for further evaluation.

3.2.4 Excavation, Soil Washing, and On-Site Disposal

Technical Description

Under this alternative, impacted soils would be excavated, stockpiled on-site, treated on-site using soil washing, and disposed of within the excavation. Excavation of site soils would require the demolition of existing site structures and removal of the existing asphalt cap. To avoid recontamination of soils due to the fluctuation of impacted ground water, soil will be excavated to the high ground-water elevation. Due to the presence of shallow ground water, excavation will be conducted during seasonal low ground water and a ground-water dewatering system may be needed; any collected ground water would be treated in the NTCRA 1 treatment system. Excavated soils would be treated in a soil washing system which segregates highly organic media that will contain higher VOC concentrations. The segregated, high concentration, organic media is collected for treatment and/or disposal. The segregated soils would be backfilled within the excavation.

Effectiveness

Excavation and soil washing are proven technologies for addressing VOC-impacted soils. This alternative is expected to reduce the volume of COCs in the excavated soil which would be backfilled into the excavation. Short-term impacts to workers and nearby residents may be associated with the air borne release of VOCs during soil excavation and handling.

Implementability

Excavation, soil washing, and on-site disposal are proven remedial technologies which are considered both technically and administratively feasible. Compliance with the substantive requirements of treatment and disposal permits will be required, however, this is not expected to preclude the use of these technologies.

Cost

The capital cost of this alternative is expected to be high. The operation and maintenance costs associated with this alternative are expected to be low.

Screening Summary

This alternative is expected to be effective in reducing the volume of COC-impacted soils. However, because of the minimal mass (relative to the saturated zone) of VOCs present in the vadose zone soil, this alternative is expected to provide minimal reduction in VOC loading to ground water. Further, in the presence of the NTCRA 2 cap, this alternative is not expected to provide additional exposure control and will actually result in additional short-term exposure to workers and nearby residents. This alternative will not be retained for further evaluation.

3.2.5 Excavation, Biological Treatment and On-Site Disposal

Technical Description

Under this alternative, impacted soils would be excavated, stockpiled on-site, and treated on-site using biologically treated. Excavation of site soils would require the demolition of existing site structures and removal of the existing asphalt cap. To avoid recontamination of soils due to the fluctuation of impacted ground water, soil will be excavated to the high ground-water elevation. Due to the presence of shallow ground water, excavation will be conducted during seasonal low ground water and a ground-water dewatering system may be needed; any collected ground water would be treated in the NTCRA 1 treatment system. Excavated soils would be treated biologically to destroy the COCs. The more efficient method of biological treatment (i.e., solid phase or liquid/slurry phase) would need to be determined through pilot studies. The treated soils would be backfilled within the excavation.

Effectiveness

Excavation and biological treatment are proven technologies for addressing VOC-impacted soils. This alternative is expected to reduce the toxicity, mobility, and volume of COCs in the excavated soil which would be backfilled into the excavation. Short term impacts to workers and nearby residents may be associated with the air borne release of VOCs during soil excavation and handling.

Implementability

Excavation, biological treatment, and on-site disposal are proven remedial technologies which are considered both technically and administratively feasible. Compliance with the substantive requirements of treatment and disposal permits will be required, however, this is not expected to preclude the use of these technologies.

Cost

The capital cost of this alternative is expected to be high. The operation and maintenance costs associated with this alternative are expected to be low.

Screening Summary

This alternative is expected to be effective in reducing the toxicity, mobility and volume of COC-impacted soils. However, because of the minimal mass (relative to the saturated zone) of VOCs present in the vadose zone soil, this alternative is expected to provide minimal reduction in VOC loading to ground water. Further, in the presence of the NTCRA 2 cap, this alternative is not expected to provide additional exposure control and will actually result in additional short term exposure to workers and nearby residents. This alternative will not be retained for further evaluation.

3.2.6 Excavation and Off-Site Disposal

Technical Description

Under this alternative, impacted soils would be excavated and transported off-site for disposal at a permitted landfill. The excavation would be backfilled with soils form an off-site source. To avoid recontamination of soils due to the fluctuation of impacted ground water, soil will be excavated to the high ground-water elevation. Excavation of site soils would require the demolition of existing site structures and removal of the existing asphalt cap. Due to the presence of shallow ground water, excavation will be conducted during seasonal low ground water and a ground-water dewatering system may be needed; any collected ground water would be treated in the NTCRA 1 treatment system.

Effectiveness

Excavation and off-site disposal are proven technologies for addressing VOC-impacted soils. This alternative is expected to reduce the toxicity, mobility and volume of COCs present in the on-site soils. Short term impacts to workers and nearby residents may be associated with the air borne release of VOCs during soil excavation and handling.

Implementability

Excavation and off-site disposal are proven remedial technologies which are considered both technically and administratively feasible.

Cost

The capital cost of this alternative is expected to be high. The operation and maintenance cost associated with this alternative are expected to be low.

Screening Summary

This alternative is expected to be effective in reducing the toxicity, mobility and volume of COC-impacted soils. Although this alternative is not expected to provide a long-term remedy for vadose zone soils, this alternative may be incorporated as needed to address any "hot spots" identified during the execution of the planned "engineered control" (i.e., building demolition and soil cap) planned for the Operations Area. This alternative will be retained for further evaluation.

3.3 Preliminary Screening of Ground-Water Remedial Alternatives

3.3.1 No Action

Technical Description

Under this alternative no actions will be taken to address the dissolved phase ground water. However, natural subsurface processes that reduce the concentrations of chemical constituents would continue to take place. These attenuative processes include dilution, volatilization, biodegradation, adsorption and chemical reactions with subsurface materials. Geochemical parameters measured at the site indicate adequate to strong evidence for biodegradation of chlorinated organics at the site. Long-term monitoring of the ground-water plume would be implemented, using the existing monitoring wells.

Effectiveness

Under the current exposure scenario there are no risks associated with human exposure to ground water. However, a potential risk exists with the hypothetical future potable consumption of ground water. The no action alternative will not actively reduce the risk associated with the future exposure scenario and would not actively reduce the toxicity, mobility or volume of COCs in ground water. On-going natural attenuation processes are expected to reduce the toxicity and volume of COCs in the leading edge of the ground-water plume (i.e., areas farthest from the source) and thus reduce the human exposure risks. Additionally, in the absence of future pumping from the Town Well Field, the downgradient extent of the dissolved phase VOC plume associated with the site will continue to be limited by ground-water discharge to the Quinnipiac River.

Implementability

There are no technical or administrative limitations associated with this alternative.

Costs

There are no capital costs associated with this alternative. Operation and maintenance costs associated with this alternative are expected to be low.

Screening Summary

This alternative will be retained for purposes of comparison in accordance with the requirements of the NCP.

3.3.2 Institutional Controls

Technical Description

Under this alternative a series of institutional controls would instituted to limit potential future exposure to ground water (i.e., exposure control). These institutional controls may include the following: implementing an ELUR to restrict ground-water usage at the site; reclassifying ground-water usage downgradient from the site from a potable source to a non-potable source; instituting alternate concentration limits; abandoning the existing Town Well Nos. 4 and 6; and securing a new potable drinking water supply to replace available potable water from the abandoned wells. As with the no action alternative, a ground-water monitoring program will be implemented using the existing monitoring wells.

Effectiveness

This alternative is expected to be effective in limiting potential human health risks associated with ground-water consumption, regardless of the presence or absence of a VOC source. This alternative will not actively address the toxicity, mobility or volume of COCs in ground water, however, natural attenuation processes are expected to naturally reduce COC toxicity and volume at the leading edge of the plume.

Implementability

There are no technical limitations associated with this alternative. The ELUR, Town Well abandonment and usage of an alternate water supply will require administrative approval by the Connecticut DEP Commissioner and town, respectively. These approvals are not expected to preclude the use of this alternative.

Costs

The costs associated with this alternative are expected to be low to moderate.

Screening Summary

Although this alternative will not actively address dissolved phase COCs, this alternative will provide exposure control which reduces risks associated with future hypothetical human exposure to affected ground water. This alternative has been retained for further evaluation.

3.3.3 In-Situ Enhanced Bioremediation

Technical Description

Under this alternative the natural subsurface biological processes will be enhanced by the addition of oxygen and nutrients through a series of injection wells. Treatability studies would be conducted to determine the optimum subsurface conditions for bioremediation. This alternative would include the institutional controls described above. A ground-water monitoring program would be instituted using the existing monitoring wells.

Effectiveness

The existing ground-water data indicates that natural subsurface, biological processes are reducing the toxicity and volume of COCs. Enhanced bioremediation is expected to increase the effectiveness of those processes.

Implementability

There are no technical or administrative limitations associated with this alternative.

Costs

Capital and operation and maintenance costs associated with this alternative are expected to be low.

Screening Summary

Although this alternative is expected to increase the natural bioremediation processes, this alternative is not expected to provide risk reduction beyond that provided by the institutional controls, thus, this alternative will not be retained for detailed evaluation.

3.3.4 In-Situ Passive Treatment Wall

Technical Description

In addition to the institutional controls described above, this alternative would consist of installing a subsurface reaction wall across the dissolved phase plume. The wall would be of "funnel and gate" construction, which is designed to passively "funnel" ground water through a highly permeable "gate" which contains reactive material (typically zero-valent iron). As ground water passes through the reactive gate, the COCs will be mineralized and treated ground water will continue to flow downgradient. Installation of the reaction wall would involve the installation of a trench down to and possibly within bedrock.

Effectiveness

Recent full scale installations have shown that zero-valent iron reaction walls are effective in reducing the toxicity and volume of chlorinated VOCs.

Implementability

Because dissolved phase COCs are present within fractured bedrock, the reaction wall would require installation down to or into bedrock in order to successfully remediate the impacted plume. Installation of a reaction wall to depths beyond 50 feet has not been conducted and installation into bedrock is not considered practical due to the variability in bedrock flow pathways within bedrock fractures. The successful implementation of a reaction wall is not considered technically feasible due to the presence of impacted ground water in bedrock.

Costs

The capital costs associated with this alternative are expected to be high. Operation and maintenance costs are dependent upon the need to replace the reactive material and are expected to be low to moderate.

Screening Summary

Because this alternative is not considered technically implementable, this alternative will not be retained for further evaluation.

3.3.5 Ground-Water Extraction with Conventional Treatment

Technical Description

In addition to the institutional controls described above, this alternative would involve extracting water from within the dissolved phase plume. Ground-water extraction may be conducted by using the existing upward hydraulic gradients (passive extraction) or by pumping (active extraction) and may include bedrock fracturing to increase the bedrock hydraulic connection. The ground-water extraction system would be placed relatively close to the overburden and bedrock NAPL zones, but at a safe distance from those zones so that NAPL is not mobilized by the hydraulic influence of the extraction system. The ground-water extraction system will be designed to hydraulically contain the continued migration of the dissolved phase plume. Additional ground-water modeling will be conducted as part of the FS to determine which ground-water extraction technology would provide hydraulic containment of the dissolved phase plume. Dissolved phase constituents downgradient of the hydraulic containment zone would be subject to natural attenuation processes.

To support the evaluation of ground-water extraction technologies, an additional overburden investigation will be completed at the site, and will include:

- installing an overburden pumping well and piezometers;
- developing and testing the specific capacity of the new pumping well and piezometers;
- performing step-drawdown and constant-rate pumping tests; and
- comparing the existing MODFLOW model to the hydraulic response observed during the pumping test.

The resulting information, and the existing MODFLOW model will be used during the FS to estimate:

- flow rates required to hydraulically contain the overburden VOC plume under current conditions;
- flow rates required to hydraulically contain the overburden VOC plume in the event that Town Wells 4 and/or 6 were to be reactivated; and
- potential effectiveness of the use of a constructed wetland to contain the overburden VOC plume under either current or future conditions.

Bedrock fracturing may also be conducted to increase the yield of the existing NTCRA 2 bedrock pumping well.

The FS will evaluate whether it is appropriate to supplement the natural attenuation processes to remediate the portion of the dissolved phase ground-water plume located downgradient of the hydraulic containment. If it is determined that restoration of this portion of the aquifer would be cost-effectively achieved in a significantly shorter time frame, a secondary ground-water extraction system may be warranted. The secondary system would probably be located near the center of the overburden or bedrock dissolved phase plume, downgradient of the above described hydraulic containment system. The secondary system would collect ground water from the leading edge of the plume which is not captured by the containment system. The purpose of the secondary ground-water extraction system would be to provide VOC mass reduction and, potentially, earlier restoration of the leading edge aqueous contaminant plume.

Once extracted, ground water would be pumped to a treatment building and treated using conventional treatment technologies, including (as needed): flow equalization; oil/water separation; chemical flocculation/precipitation; filtering; air stripping and carbon adsorption. Treated ground water would be discharged to the Quinnipiac River under the provisions of a NPDES permit. A ground-water monitoring program would be implemented using the existing monitoring wells.

Effectiveness

Conventional treatment technologies are effective in reducing the toxicity and volume of COCs in the extracted dissolved phase ground water. With this alternative, the aquifer downgradient of the ground-water extraction location would be restored through natural attenuation or through implementation of a secondary ground-water extraction system. Ground-water extraction is an effective hydraulic containment technology which will reduce the mobility of the dissolved phase plume.

Implementability

This alternative can be implemented using standard techniques and readily available equipment. Because there is a continual source of VOCs to ground water, a time frame for the operation and maintenance of the ground-water extraction and treatment system cannot be predicted. Discharge of treated water would require substantive compliance with the requirements of a NPDES permit. This alternative is considered technically and administratively feasible.

Costs

The estimated capital cost of this alternative including pre-design investigations, design and treatment system installation are low to moderate. Annual operation maintenance costs are considered high relative to passive alternatives (i.e., no action, institutional controls, constructed wetlands).

Screening Summary

This technology is expected to provide hydraulic containment of the TI zone and ultimately restore the aquifer in the area of the dissolved phase VOC plume through natural attenuation processes and/or through implementation of a secondary ground-water extraction system. Institutional controls to be employed under this alternative will provide exposure control. This alternative will be retained for further evaluation.

3.3.6 Ground-Water Extraction with UvOx Treatment

Technical Description

In addition to the institutional controls described above, this alternative would involve extracting water from within the dissolved phase plume. Ground-water extraction may be conducted by using the existing upward hydraulic gradients (passive extraction) or by pumping (active extraction) and may include bedrock fracturing to increase the bedrock hydraulic connection. The ground-water extraction system would be placed relatively close to the overburden and bedrock NAPL zones, but at a safe distance from those zones so that NAPL is not mobilized by the hydraulic influence of the extraction system. The ground-water extraction system will be designed to hydraulically contain the continued migration of the dissolved phase plume. Additional ground-water modeling will be conducted as part of the FS to determine which ground-water extraction technology would provide hydraulic containment of the dissolved phase plume. Dissolved phase constituents downgradient of the hydraulic containment zone would be subject to natural attenuation processes.

To support the evaluation of ground-water extraction technologies, an additional overburden investigation will be completed at the site, and will include:

- installing an overburden pumping well and piezometers;

- developing and testing the specific capacity of the new pumping well and piezometers;
- performing step-drawdown and constant-rate pumping tests; and
- comparing the existing MODFLOW model to the hydraulic response observed during the pumping test.

The resulting information, and the existing MODFLOW model will be used during the FS to estimate:

- flow rates required to hydraulically contain the overburden VOC plume under current conditions;
- flow rates required to hydraulically contain the overburden VOC plume in the event that Town Wells 4 and/or 6 were to be reactivated; and
- potential effectiveness of the use of a constructed wetland to contain the overburden VOC plume under either current or future conditions.

Bedrock fracturing may also be conducted to increase the yield of the existing NTCRA 2 bedrock pumping well.

The FS will evaluate if it is appropriate to supplement the natural attenuation processes to remediate the portion of the dissolved phase ground-water plume located downgradient of the hydraulic containment. If it is determined that restoration of this portion of the aquifer would be cost-effectively achieved in a significantly shorter time frame, a secondary ground-water extraction system may be warranted. The secondary system would probably be located near the center of the overburden or bedrock dissolved phase plume, downgradient of the above described hydraulic containment system. The secondary system would collect ground water from the leading edge of the plume which is not captured by the containment system. The purpose of the secondary ground-water extraction system would be to provide VOC mass reduction and, potentially, earlier restoration of the leading edge aqueous contaminant plume.

Once extracted, ground water would be pumped to a treatment building and treated using UvOx treatment. Because UvOx is currently employed at NTCRA1, this alternative assumes that the dissolved phase ground water will be treated using the NTCRA1 treatment system. Treated ground water would continue to be discharged to the Quinnipiac River under the provisions of a NPDES permit. A ground-water monitoring program would be implemented using the existing monitoring wells.

Effectiveness

UvOx has proven effective in reducing the toxicity and volume of COCs of the dissolved phase ground water. With this alternative, the aquifer downgradient of the ground-water extraction location would be restored through natural attenuation or through implementation of a secondary ground-water extraction system. Ground-water extraction is an effective hydraulic containment technology which will reduce the mobility of the dissolved phase plume.

Implementability

This alternative can be implemented using standard techniques and readily available equipment. Because there is a continual source of VOCs to ground water, a time frame for the operation and maintenance of the ground-water extraction and treatment system cannot be predicted. Discharge of treated water would require substantive compliance with the requirements of a NPDES permit. This alternative is considered technically and administratively feasible.

Costs

The estimated capital cost of this alternative including pre-design investigations, design and treatment system installation is low, assuming that the existing treatment system components can be used. Annual operation and maintenance costs are considered high relative to conventional treatment technologies.

Screening Summary

This technology is expected to provide hydraulic containment of the TI zone and ultimately restore the aquifer in the area of the dissolved phase VOC plume through natural attenuation processes and/or through implementation of a secondary ground-water extraction system. Because of the long-term operation and maintenance that will be required, due to incomplete source control, the cost of UvOx treatment is expected to be significantly higher than conventional treatment without additional risk reduction. Because this alternative will not provide additional risk reduction, relative to ground-water extraction with conventional treatment, this alternative will not be retained for further evaluation.

3.3.7 Ground-Water Extraction with Fenton's Reagent Treatment

Technical Description

In addition to the institutional controls described above, this alternative would involve extracting water from within the dissolved phase plume. Ground-water extraction may be conducted by using the existing upward hydraulic gradients (passive extraction) or by pumping (active extraction) and may include bedrock fracturing to increase the bedrock hydraulic connection. The ground-water extraction system would be placed relatively close to the overburden and bedrock NAPL zones, but at a safe distance from those zones so that NAPL is not mobilized by the hydraulic influence of the extraction system. The ground-water extraction system will be designed to hydraulically contain the continued migration of the dissolved phase plume. Additional ground-water modeling will be conducted as part of the FS to determine which ground-water extraction technology would provide hydraulic containment of the dissolved phase plume. Dissolved phase constituents downgradient of the hydraulic containment zone would be subject to natural attenuation processes.

To support the evaluation of ground-water extraction technologies, an additional overburden investigation will be completed at the site, and will include:

- installing an overburden pumping well and piezometers;
- developing and testing the specific capacity of the new pumping well and piezometers;
- performing step-drawdown and constant-rate pumping tests; and
- comparing the existing MODFLOW model to the hydraulic response observed during the pumping test.

The resulting information, and the existing MODFLOW model will be used during the FS to estimate:

- flow rates required to hydraulically contain the overburden VOC plume under current conditions;
- flow rates required to hydraulically contain the overburden VOC plume in the event that Town Wells 4 and/or 6 were to be reactivated; and
- potential effectiveness of the use of a constructed wetland to contain the overburden VOC plume under either current or future conditions.

Bedrock fracturing may also be conducted to increase the yield of the existing NTCRA 2 bedrock pumping well.

The FS will evaluate whether it is appropriate to supplement the natural attenuation processes to remediate the portion of the dissolved phase ground-water plume located downgradient of the hydraulic containment. If it is determined that restoration of this portion of the aquifer would be cost-effectively achieved in a significantly shorter time frame, a secondary ground-water extraction system may be warranted. The secondary system would probably be located near the center of the overburden or bedrock dissolved phase plume, downgradient of the above described hydraulic containment system. The secondary system would collect ground water from the leading edge of the plume which is not captured by the containment system. The purpose of the secondary ground-water extraction system would be to provide VOC mass reduction and, potentially, earlier restoration of the leading edge aqueous contaminant plume.

Once extracted, ground water would be pumped to a treatment building and treated using Fenton's reagent technology. Treated ground water would be discharged to the Quinnipiac River under the provisions of a NPDES permit. A ground-water monitoring program would be implemented using the existing monitoring wells.

Effectiveness

Although not widely used in commercial applications, Fenton's reagent technology is considered effective in reducing the toxicity and volume of COCs of the dissolved phase ground water. With this alternative, the aquifer downgradient of the ground-water extraction location would be restored through natural attenuation or through implementation of a secondary ground-water extraction system. Ground-water extraction is an effective hydraulic containment technology which will reduce the mobility of the dissolved phase plume.

Implementability

This alternative can be implemented using standard techniques and readily available equipment. Because there is a continual source of VOCs to ground water, a time frame for the operation and maintenance of the ground-water extraction and treatment system cannot be predicted. Discharge of treated water would require substantive compliance with the requirements of a NPDES permit. This technology is considered technically and administratively feasible.

Costs

The estimated capital cost of this alternative including pre-design investigations, design and treatment system installation is low to moderate. Annual operation and maintenance costs are considered high relative to conventional treatment technologies.

Screening Summary

This technology is expected to provide hydraulic containment of the TI zone and ultimately restore the aquifer in the area of the dissolved phase VOC plume through natural attenuation processes and/or through implementation of a secondary ground-water extraction system. Because of the long-term operation and maintenance that will be required the cost of Fenton's reagent treatment is expected to be somewhat higher than conventional treatment without additional risk reduction. However, the technology, in conjunction with conventional treatment technologies, shows promise for future use in applications such as the SRSNE Site and therefore may be retained for further evaluation at this time.

3.3.8 Ground-Water Extraction with Constructed Wetland Treatment

Technical Description

In addition to the institutional controls described above, this alternative would involve constructing a large surface area wetland within the dissolved phase plume. Ground-water extraction may be conducted by using the existing upward hydraulic gradients (passive extraction) or by pumping (active extraction) and may include bedrock fracturing to increase the overburden/bedrock hydraulic connection. The ground-water extraction system will be designed to hydraulically contain the continued migration of the dissolved phase plume. Dissolved phase constituents downgradient of the hydraulic containment zone would be subject to natural attenuation processes.

The FS will evaluate if it is appropriate to supplement the natural attenuation processes to remediate the portion of the dissolved phase ground-water plume located downgradient of the area of hydraulic influence of the constructed wetland. If it is determined that restoration of this portion of the aquifer would be cost-effectively achieved in a significantly shorter time frame, a secondary ground-water extraction system may be warranted. The secondary system would probably be located near the center of the overburden or bedrock dissolved phase plume, downgradient of the constructed wetland. The secondary system would collect ground water from the leading edge of the plume which is not captured by the containment system. The purpose of the secondary ground-water extraction system would be to provide VOC mass reduction and, potentially, earlier restoration of the leading edge aqueous contaminant plume.

Extracted ground water would discharge to a manmade wetland area consisting of various substrates, plants and microbial communities. Within the wetland system, microbes alter chemical substrates to less- or non-toxic substances. The constructed wetland would also employ phytoremediation, which uses deep root plants (e.g., poplar trees), which stimulate microbial activity. Treated water would be allowed to passively discharge to the Quinnipiac River. If system modeling indicates that the constructed wetland may not provide sufficient ground-water treatment through microbial degradation, the constructed wetland technology can be supplemented with zero-valent iron technology. Zero-valent iron may be provided as a wetland substrate, essentially providing "pre-treatment" prior to ground-water discharge to the wetland or may be installed at the wetland discharge to provide water "polishing" prior to discharge. A mature wetland system is expected to be relatively maintenance free. A ground-water monitoring program would be instituted using the existing monitoring wells.

Effectiveness

Biological treatment processes associated with wetland systems and phytoremediation are expected to reduce the toxicity and volume of VOCs. With this alternative, the aquifer downgradient of the area of hydraulic influence of the constructed wetland would be restored through natural attenuation or through implementation of a secondary ground-water extraction system. Based on data developed in the RI, enhanced natural discharge of ground-water to a constructed wetland would be an effective hydraulic containment technology which will reduce the mobility of the dissolved phase plume.

Implementability

This alternative can be implemented using standard techniques and readily available equipment. Because there is a continual source of VOCs to ground water, a time frame for the operation and maintenance of the ground-water extraction and treatment system cannot be predicted. Discharge of treated water would require substantive compliance with the requirements of a NPDES permit. This technology is considered technically and administratively feasible.

Costs

The estimated capital cost of this alternative including pre-design investigations, design and treatment system installation is moderate. Annual operation maintenance costs are considered low relative to active treatment technologies (i.e., conventional treatment, UvOx and Fenton's reagent technology).

Screening Summary

This technology is expected to provide hydraulic containment of the TI zone and ultimately restore the aquifer in the area of the dissolved phase VOC plume through natural attenuation processes and/or through implementation of a secondary ground-water extraction system. In addition, institutional controls to be employed under this alternative will provide exposure control. Because this alternative will provide a level of containment and treatment similar to other treatment technologies at a lower long-term cost, this alternative will be retained for further evaluation.

3.4 Preliminary Screening Results

A total of three remedial alternatives were identified to address vadose zone soil impacts and six alternatives were identified to address dissolved phase ground-water impacts.

Those remedial alternatives that were identified as potentially applicable to meet the RAOs underwent a preliminary screening to identify those alternatives that warrant a more detailed analysis. The alternatives were screened based on the anticipated effectiveness, implementability and cost with respect to site conditions. Based on the results of the preliminary screening process the remedial alternatives listed below have been retained for detailed evaluations.

Vadose Zone Soil

- Alternative S-1: No Action
- Alternative S-2: Capping and Access Control
- Alternative S-3: Excavation and Off-Site Disposal

Dissolved Phase Ground Water

- Alternative GW-1: No Action
- Alternative GW-2: Institutional Controls
- Alternative GW-3a: Ground-Water Extraction at TI Zone Boundary with Constructed Wetland Treatment
- Alternative GW-3b: Ground-Water Extraction at TI Zone Boundary and Downgradient with Constructed Wetland Treatment
- Alternative GW-4a: Ground-Water Extraction at TI Zone Boundary with Conventional Treatment (with and without Fenton's Reagent)
- Alternative GW-4b: Ground-Water Extraction at TI Zone Boundary and Downgradient with Conventional Treatment (with and without Fenton's Reagent)

TABLES

TABLE 1

SRSNE SITE
SOUTHINGTON, CONNECTICUT
DEVELOPMENT AND INITIAL SCREENING OF REMEDIAL ALTERNATIVES

CHEMICAL-SPECIFIC ARARs AND TBCs

Regulatory Level	Requirement	Status	Requirement Synopsis	RI Work Plan Considerations
Federal	Clean Water Act (CWA) Water Quality Criteria for Protection of Human Health and Aquatic Life	Applicable	Contaminant levels regulated by water quality criteria are provided to protect human health for exposure from drinking water and from fish consumption.	The promulgated values will be compared to the maximum contaminant levels at the SRSNE Site during the evaluation of target cleanup levels.
	RCRA Maximum Concentration Levels (MCLs)	Applicable	Provides standards for protection of ground water. This regulation also provides the basis for application of alternate concentration limits on a site-specific basis.	The promulgated values are included in the SDWA MCLs (see SDWA below). The combined standards will be compared to the maximum contaminant levels at the SRSNE Site during the evaluation of target cleanup levels.
	Safe Drinking Water Act (SDWA) MCLs	Relevant and Appropriate	Provides contaminant concentration standards for public drinking water systems.	The SDWA MCLs, along with Connecticut standards and guidance values, will be used during the evaluation of target cleanup levels.
State of Connecticut	Remediation Standard Regulations	Applicable	Provides soil, surface water, and ground-water concentration standards for remedial activities in the state of Connecticut.	This ARAR would be considered during the development of target cleanup levels for soil and ground water at the Site.

TABLE 2

SRSNE SITE
SOUTHINGTON, CONNECTICUT
DEVELOPMENT AND INITIAL SCREENING OF REMEDIAL ALTERNATIVES

LOCATION-SPECIFIC ARARs AND TBCs

Regulatory Level	Requirement	Status	Requirement Synopsis	RI Work Plan Considerations
Federal	Fish and Wildlife Coordination Act (16 U.S.C. 661)	Relevant and Appropriate	This regulation requires that any federal agency that proposes to modify a body of water must consult with the U.S. Fish and Wildlife Service.	During the identification, screening, and evaluation of remedial alternatives in the FS, the effects of potential remedial actions on streams and wetlands will be evaluated. If an alternative modifies a body of water or potentially affects fish or wildlife, the U.S. Fish and Wildlife Service will be consulted.
	RCRA Location Standards (40 CFR 264.18)	Applicable	This regulation outlines the requirements for constructing a RCRA facility on a 100-year floodplain.	A facility located on a 100-year floodplain must be designed, constructed, operated, and maintained to prevent washout of any hazardous waste by a 100-year flood, unless waste may be safely removed before floodwater can reach the facility or no adverse effects on human health and the environment would result if washout occurred.
	Floodplains Executive Order (E.O. 11990)	Relevant and Appropriate	Federal agencies are required to reduce the risk of flood loss, and to restore and preserve the natural and beneficial values of floodplains.	The potential effects of any action must be evaluated to ensure that the planning and decision-making reflect consideration of flood hazards and floodplain management, including restoration and preservation of natural, undeveloped floodplains.

TABLE 3

SRSNE SITE
SOUTHINGTON, CONNECTICUT
DEVELOPMENT AND INITIAL SCREENING OF REMEDIAL ALTERNATIVES

ACTION SPECIFIC ARARs AND TBCs

Regulatory Level	Requirement	Status	Requirement Synopsis	RI Work Plan Considerations
Federal	Clean Air Act (CAA) - National Primary and Secondary Air Quality Standards for Particulate Matter (40 CFR 50.6)	Relevant and Appropriate	The primary and secondary 24-hour ambient air quality standard for particulate matter is 150 micrograms/cubic meter ($\mu g/m^3$) (24-hour average concentration). The primary and secondary annual ambient air quality standard for particulate matter annual standard is 50 $\mu g/m^3$ (annual arithmetic mean).	This potential ARAR would apply if remedial alternatives result in air emissions during demolition, grading, and paving.
	CAA - National Primary and Secondary Air Quality Standards for Carbon Monoxide (40 CFR 50.8)	Relevant and Appropriate	The primary and secondary ambient air quality standard for carbon monoxide, not to be exceeded more than once per year, is 10 milligrams/cubic meter (mg/m^3) for an 8-hour concentration, or 35 mg/m^3 for a 1-hour concentrations.	This potential ARAR would apply if air emissions from treatment (thermal/catalytic oxidation) of organics in the off-gas from a soil treatment system would be required.
	CAA - National Primary and Secondary Air Quality Standards for Nitrogen Dioxide (40 CFR 50.11)	Relevant and Appropriate	The primary and secondary ambient air quality standards for nitrogen oxide are 100 $\mu g/m^3$, annual arithmetic mean concentration.	This potential ARAR would apply if air emissions from treatment (thermal/catalytic oxidation) of organics in the off-gas from a soil treatment system would be required.
	CAA - National Emissions Standards for Hazardous Air Pollutants (NESHAPs) - Vinyl Chloride (40 CFR 61, Subpart F)	Relevant and Appropriate	The standard applies to plants that manufacture or use vinyl chloride in the production. The average concentration of vinyl chloride must not exceed 10 ppm in the exhaust gas stream for a 3-hour period. As off-gas treatment for vinyl chloride may be necessary for a soil treatment system, this ARAR is potentially relevant and appropriate.	This potential ARAR would apply if air emissions from treatment (thermal/catalytic oxidation) of organics in the off-gas from a soil treatment system would be required.
	CAA - NESHAPs for Equipment Leaks (Fugitive Emissions) (40 CFRR 61, Subpart V)	Relevant and Appropriate	These standards address fugitive emissions of volatile hazardous air pollutants from various equipment, including pumps, compressors, pressure relief valves, sampling connection systems, valves, flanges, connectors, and certain control devices and systems.	This potential ARAR would apply if air emissions from treatment (thermal/catalytic oxidation) of organics in the off-gas from a soil treatment system would be required.

TABLE 3
(CONT'D)

SRSNE SITE
SOUTHINGTON, CONNECTICUT
DEVELOPMENT AND INITIAL SCREENING OF REMEDIAL ALTERNATIVES

ACTION-SPECIFIC ARARs AND TBCs

Regulatory Level	Requirement	Status	Requirement Synopsis	RI Work Plan Considerations
Federal (cont'd)	CAA - NESHAPs for Benzene Waste Operations (40 CFR 61, Subpart FF)	Relevant and Appropriate	This regulation specifies use of a closed-vent system to route all organic vapors vented by an oil-water separator to a control device (40 CFR 61.347); and requirements for the design, installation, operation, and maintenance of closed-vent systems and control devices.	This potential ARAR would apply if air emissions from treatment (thermal/catalytic oxidation) of organics in the off-gas from a soil treatment system would be required.
	CWA - National Pollutant Discharge Elimination System (NPDES) (40 CFR 122, 125)	Applicable	Any point-source discharge must meet NPDES requirements, which include compliance with established discharge limitation, and completion of regular discharge monitoring records.	This potential ARAR applies to potential remedial alternatives that involve ground water and process water treatment and discharge to the Quinnipiac River.
	CWA Ambient Water Quality Criteria (AWQC)	Relevant and Appropriate	AWQC are health-based criteria that have been developed for 95 carcinogenic and non-carcinogenic compounds.	AWQC are used to develop discharge limitations for treated ground water.
	RCRA - General Facility Standards (40 CFR 264.10 - 264.18)	Relevant and Appropriate	General facility requirements outline general waste analysis, security measures, inspections, and training requirements.	Remedial alternatives requiring on-site treatment of soil or ground water would comply with this potential ARAR. The treatment facility will be constructed, fenced, posted, and operated in accordance with this requirement. All workers will be properly trained. Process wastes will be evaluated for the characteristics of hazardous wastes to assess further handling requirements.
	RCRA - Preparedness and Prevention (40 CFR 264.30 - 264.37)	Relevant and Appropriate	Outlines requirements for safety equipment and spill control.	This potential ARAR would apply to all remedial alternatives requiring on-site activities.
	RCRA - Contingency Plan and Emergency Procedures (40 CFR 264.50 - 264.56)	Relevant and Appropriate	Outlines requirements for emergency procedures to be used following explosions, fires, etc.	This potential ARAR would apply to all remedial alternatives requiring on-site activities.
	RCRA - Manifesting, Recordkeeping, and Reporting (40 CFR 264.70 - 264.77)	Relevant and Appropriate	Specifies the recordkeeping and reporting requirements for RCRA facilities.	All remedial alternatives requiring handling and disposal of hazardous waste would comply with this potential ARAR.

TABLE 3
(CONT'D)

SRSNE SITE
SOUTHINGTON, CONNECTICUT
DEVELOPMENT AND INITIAL SCREENING OF REMEDIAL ALTERNATIVES

ACTION-SPECIFIC ARARs AND TBCs

Regulatory Level	Requirement	Status	Requirement Synopsis	RI Work Plan Considerations
Federal (cont'd)	RCRA - Closure and Post-Closure (40 CFR 264.110 - 264.120)	Relevant and Appropriate	Details specific requirements for closure and post-closure of hazardous waste facilities.	This potential ARAR would apply to all remedial alternatives requiring on-site activities.
	RCRA - Use and Management of Containers (40 CFR 264 Subpart I)	Relevant and Appropriate	This regulation specifies conditions for hazardous waste storage in containers.	Remedial alternatives requiring the use of containers would comply with these requirements.
	RCRA - Tank Systems (40 CFR 264 Subpart J)	Relevant and Appropriate	This regulation applies to the use of tank systems to store or treat hazardous wastes. Specifies design, installation, containment, and operating criteria.	Remedial alternatives requiring the use of tanks would comply with these requirements.
	RCRA - Air Emission Standards for Process Vents (40 CFR 264 Subpart AA)	Relevant and Appropriate	Regulates air pollutant emissions for process vents, closed-vent systems, control devices for TSDFs, air/steam stripping operations when equipment treats identified or listed RCRA hazardous wastes.	Remedial alternatives requiring the use of air pollutant control equipment would require compliance with this potential ARAR.
	RCRA - Air Emission Standards for Equipment Leaks (40 CFR 264 Subpart BB)	Relevant and Appropriate	This requirement governs equipment that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight. Specifies periodic monitoring for leaks that may cause air emissions and specifies repairs.	This potential ARAR would apply to remedial alternatives requiring on-site treatment of ground water or soil.
	RCRA - Thermal Treatment (40 CFR 265 Subpart P)	Relevant and Appropriate	This requirement regulates thermal treatment of hazardous wastes.	This potential ARAR would apply to alternatives requiring thermal and catalytic oxidation of VOC's from a soil treatment system.
State Regulatory Requirements	Control of Particulate Matter (RCSA §22a-174-18)	Applicable	This regulation governs visible emissions and fugitive dusts from stationary sources.	This potential ARAR would apply to remedial alternatives requiring on-site treatment of soil or ground water.
	Control of Organic Compound Emissions (RCSA §22a-174-20)	Relevant and Appropriate	This requirement regulates the storage of VOCs and specifies the air emission controls required if a storage tank of 250 gallons or greater is used, or the VOC has a vapor pressure of 1.5 psi or greater.	This potential ARAR would apply to remedial alternatives requiring on-site treatment of ground water.

TABLE 3
(CONT'D)

SRSNE SITE
SOUTHINGTON, CONNECTICUT
DEVELOPMENT AND INITIAL SCREENING OF REMEDIAL ALTERNATIVES

ACTION-SPECIFIC ARARs AND TBCs

Regulatory Level	Requirement	Status	Requirement Synopsis	RI Work Plan Considerations
State Regulatory Requirements (cont'd)	Control of Nitrogen Oxide Emission (RCSA §22a-174-22)	Relevant and Appropriate	This regulation specifies the emission limits of nitrogen oxide based on the type of fuel combusted.	This potential ARAR would apply to remedial alternatives requiring off gas treatment which use supplemental fuels to maintain oxidation of stripped VOCs.
	Primary Standards for Ambient Air (RCSA §22a-174-24)	Relevant and Appropriate	This regulation prohibits the operation of any source that substantially causes or contributes to a violation of the limits specified in this regulation.	This potential ARAR would apply if remedial alternatives result in air emissions.
	Hazardous Air Pollutants (RCSA §22a-174-29)	Applicable	These regulations limit emissions that interfere with maintenance of Connecticut Air Quality Standards for NAAQS. The regulations include ambient air quality standards (HLVs) and maximum allowable stack concentrations (MASCs) for hundreds of hazardous air pollutants.	Air emissions from ground-water treatment systems would be controlled and would comply with these air quality regulations.
	Connecticut Water Quality Standards (CGS 22a-426)	Relevant and Appropriate	These standards provide criteria for maintaining the quality of surface waters through limitations on point source discharges and implementation of reasonable controls or best management practices (BMP).	Ground water treated on-site and discharged to surface water would be required to comply with these standards.
	Connecticut Discharge Permit Regulations (22a-430-1 to 8)	Applicable	These requirements provide specific effluent limitations for a given discharge.	Ground water treated on-site and discharged to a surface water will need to comply with the substantive requirements of these regulations.
Criteria, Advisories, Guidance	OSWER Directive 9355.0-28, Air Stripper Control Guidance	To Be Considered	Guidance regarding use of air emission controls at CERCLA sites.	This guidance will be used to develop air emission controls if an alternative requiring air emissions is selected.