



**SUPPLEMENTAL TEST PITS AND
SOIL GAS SURVEY
DOVER PUBLIC WORKS FACILITY
RIVER STREET
DOVER, NEW HAMPSHIRE**

PREPARED FOR:
New Hampshire Office of State Planning
Concord, New Hampshire

PREPARED BY:
GZA GeoEnvironmental, Inc.
Manchester, New Hampshire

July 2002
File No. 22457

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Engineers and
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July 12, 2002
File No. 22457

Mr. Robert Minicucci II, P.E.
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Waste Management Division
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Re: Supplemental Test Pits and Soil Gas Survey
Dover Public Works Facility
Dover, New Hampshire

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Dear Bob:

On behalf of the New Hampshire Office of State Planning and City of Dover, GZA GeoEnvironmental, Inc. (GZA) is pleased to provide the attached report regarding supplemental test pits and soil gas survey at the above-referenced Site. This report was completed as part of the Coastal Piscataqua River Watershed Brownfields Assessment Demonstration Pilot Project.

GZA looks forward to continuing to work with you on this very important project.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

A handwritten signature in cursive script that reads "Nancy J. Nichols".

Nancy J. Nichols, P.E.
Project Manager

A Subsidiary of GZA
GeoEnvironmental
Technologies, Inc.

A large, stylized handwritten signature in cursive script that reads "Steven R. Lamb".

Steven R. Lamb, C.G.W.P.
Associate Principal

NJN/SRL:sjh
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Enclosure

cc: McLaughlin; OSP
Peschel; City of Dover
Jennings; EPA



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1.0 INTRODUCTION

GZA GeoEnvironmental, Inc. (GZA) has prepared this supplemental report for the New Hampshire Office of State Planning (OSP) and City of Dover (City) under the Coastal Piscataqua River Watershed Brownfields Assessment Demonstration Pilot Project. GZA previously performed investigations at the site and prepared a Remedial Action Plan (RAP) for the site, dated August 30, 2000. The work scope for the current study included additional test pits and soil gas monitoring well installations and sampling. The current work scope was based on the outcome of our meeting on June 26, 2001 with the New Hampshire OSP, New Hampshire Department of Environmental Services (NHDES), and the City; and comments from the NHDES provided by electronic mail on August 28 and September 4, 2001. GZA's work scope was approved by NHDES. In addition, GZA's Brownfields Quality Assurance Project Plan (QAPP) amendment, dated September 24, 2001, was reviewed and approved by the Environmental Protection Agency (EPA). This work was performed in accordance with our contract dated July 21, 1999, and proposed addendum dated September 19, 2001. GZA's work is subject to the Limitations in Appendix A.

The objective of the current study was to address the following outstanding issues:

1. Identification of the separation of the solid waste areas on the site and off-site municipal landfill located to the east. GZA re-assessed the limit and age of waste in the northeastern portion of the site adjacent to the former prison property and in the adjoining wet area based on supplemental test pit excavations and review of historical sources performed as part of the current study. GZA also re-assessed whether the municipal landfill encroaches on the southeastern corner of the site based on current supplemental test pits;
2. Assessment of soil gas in the vicinity of the wastewater treatment plant (WWTP) and associated storage area, where solid waste was encountered in prior explorations; and
3. Regulatory perspective regarding excavation of a portion of the solid waste as part of site development.

2.0 SITE DESCRIPTION

The site consists of approximately 35 acres located in the downtown area, including more than 2,400 feet of frontage along the Cocheco River. The site is occupied by a sewer pump station, and on-site recycling activities are on-going. During the Fall of 2001, the site was vacated by the City's Department of Public Works (DPW), which used it for vehicle storage and maintenance, materials storage (road salt, sand and gravel, Jersey Barriers, and so forth), and engineering offices. Buildings occupied by the DPW and engineering offices were razed earlier this year. The site was also formerly occupied by a WWTP. School buses were maintained and parked at the site until recently. A locus plan is provided as Figure 1. The locations of the former DPW/engineering buildings, former WWTP, and other existing and former site features are shown on the Current Exploration Location Plan, Figure 2.

3.0 SITE HISTORY

An overview of site history from the late 1800s to 2000 is provided in GZA's RAP for the site, dated August 30, 2000. Site history described in this section supplements the information contained in the RAP, and pertains mostly to the WWTP area, the adjacent WWTP storage area, and the wetland to the east of the WWTP storage area. The objective of our historical research for these areas is to assess whether there was a different landfilling history for these on-site areas than for the municipal landfill abutting the site to the east. The information presented in this section is from the following sources:



- Interviews with City personnel, as referenced;
- Dunn, "Draft Environmental Site Assessment Report," dated July 24, 1991; and
- Aerial photographs and maps made available by the City and the New Hampshire Department of Transportation and available in our in-house files. GZA reviewed five photographs, dated 1951, 1962, 1979, 1981, and 1989. GZA also reviewed a topographic map that was based on a November 30, 1967 aerial photograph, and U.S. Geologic Survey (USGS) topographic maps dated 1956 (photo-revised 1973 and 1988).

Review of the available historical sources suggests that the off-site municipal landfill abutting the site to the east operated primarily during the 1950's. City public meeting records indicate that landfilling of solid waste by trenching and covering began after cessation of burning at a former incinerator, which operated between about 1915 and 1950. The incinerator was located southeast of the site and within the limits of the off-site municipal landfill (Figure 2). Ground surface topography dating to 1944¹ indicates a ravine in the area of the off-site municipal landfill, with two access roads that dead-end at the ravine. On the same map, the ground surface is relatively low and flat in the area of the former WWTP and its storage area.

The 1951 photograph (Appendix B) shows filling operations east of the prison property to a distance of about 300 feet north and 150 feet west of the northeastern corner of the prison property. In 1951, a stream channel traversed the current wet area and extended to the face of the adjacent municipal landfill. In 1951, the ground surface in the area of the WWTP and adjacent land to the east appears rough, as if previously disturbed by excavation and/or filling; it appears thinly to moderately vegetated with brush and trees; and it is marked by several vehicular tracks and fill piles or debris.

The 1962 photograph (Appendix B) shows vegetative growth in the area of the off-site municipal landfill, indicating that landfilling had ceased by this time. The 1962 photograph also shows the new WWTP and a fence that completely surrounds the WWTP. Based on recent explorations, tannery waste underlies the northwestern and southeastern corners of the fence, of which remnants currently exist. This suggests that the tannery waste was in-place in these areas prior to 1962. Based on the disturbed appearance of the ground surface and vegetative growth in these areas in the 1951 photograph, it is likely that the tannery waste and other associated wastes (except construction demolition debris from the former WWTP) were present a number of years prior to 1951, or prior to when the municipal landfill was accepting solid waste.

¹ The ground surface topography on the 1956 USGS maps were based on planetable surveys in 1944.



DPW and WWTP personnel reported (Dunn, 1991) "that sludge from septage haul trucks is sometimes discharged into a shallow 10' x 12' pit with wooden retaining walls at the east end of the WWTF storage area in the vicinity of monitoring well MW-4...The frequency of this activity was not known." This practice reportedly ceased in 1991², which post-dates landfilling on the adjoining parcel by about 30 years. Construction debris located in the vicinity of the former WWTP likely results from the demolition of the WWTP and, therefore, likely also post-dates landfilling on the adjoining parcel.

4.0 CURRENT INVESTIGATIONS

GZA's data collection followed the procedures in the QAPP prepared by GZA dated November 1999, revised December 10, 1999, and amended March 15, 1999 and September 24, 2001. Please refer to these documents for further details not provided below. Current exploration locations shown on Figures 2 and 3 are based on line-of-site observations, and thus, are considered approximate. Logs of the explorations prepared by GZA are provided in Appendix C.

4.1 TEST PITS

On October 22, 2001, test pit excavations were performed to further assess the limit of waste in three areas as follows:

- Area 1 - TP3-1 through TP3-4: Near the access road to the off-site municipal landfill and in the vicinity of previous test pit TP-17 and existing monitoring well GZ-3 (OW). Test pits ranged in depth from 1.6 feet (TP3-1, refusal on probable bedrock) to 5 feet (TP3-2).
- Area 2 - TP3-6 through TP3-10: Near the northern corner of the former prison property. Test pits ranged in depth from 3 feet (TP3-10, refusal on probable bedrock) to 6.5 feet (TP3-8).
- Area 3 - TP3-5, and TP3-11 through TP3-20: Within the on-site wetland. Test pits ranged in depth from 1.5 feet (TP3-12) to 6.5 feet (TP3-5). In the wet area where solid waste was encountered, the depth to waste limited the depth to the bottom of test pits. A discarded 10,000-gallon tank was observed during the test pit program in the wetland, as approximately located on Figure 2.

4.2 TEST BORINGS, GAS MONITORING WELLS, AND GAS SAMPLING

On November 12, 2001, five test borings with soil gas monitoring wells were installed within the former WWTP area (SG-1, SG-2, and SG-3) and its adjacent storage area (SG-4 and SG-5). In general, test borings were advanced through fill and 2.5 to 8.5 feet below the groundwater level observed at the time of drilling. Test borings were advanced using standard hollow-stem auger drilling techniques without the use of water. Soil samples were collected at test borings

² Telephone correspondence with Mr. Dean Peschel of the City of Dover on August 4, 2000.



at approximate 5-foot intervals with a split-spoon sampler. Soil samples were screened in the field using a TEI model 580B Organic Vapor Meter (OVM) referenced to an isobutylene-in-air standard.

Gas monitoring wells were installed in each of the completed test borings to depths of 12 to 14 feet. The wells consisted of 1-inch Schedule 40 threaded PVC well screen with 0.01-inch slot size, connected to Schedule 40 threaded PVC riser. The annulus between the borehole wall and the well screen was backfilled with clean filter sand, and the well was completed with a bentonite seal. Flush-mounted aluminum-covered road boxes were installed using concrete to protect the PVC riser. Refer to Appendix C for test boring and well construction logs.

Soil cuttings from the test borings were containerized in three, steel 55-gallon drums. A composite sample from the drums (SG-1 – SG-5 C-1) was submitted to Phoenix Environmental Laboratories, Inc. for characterization testing. Based on the characterization testing results, the containerized soil was characterized as non-regulated soils, and transported by Tri-S Environmental Services, Inc. to Perma-Fix of Michigan, Inc. in Brownstone, Michigan. Documentation for the testing and transport of the containerized soil is provided in Appendix D.

Two rounds of field screening and soil gas sampling of the newly installed soil gas monitoring wells SG-1 through SG-5 were performed on November 16 and 29, 2001. Initially, approximately three to five well volumes of air were purged from each well. Pressure measurements for gas were obtained before and after purging to check that the difference in pressure was less than 1 inch of water column of vacuum. Field screening measurements were collected using direct read instrumentation, including total volatile organic compounds (VOCs)³ using a TEI Model 580B OVM/photoionization detector (PID); hydrogen sulfide using a Industrial Scientific Hydrogen Sulfide HS267; and oxygen, lower explosive limit, carbon dioxide, and methane using a CEA Instruments, Inc. LMSX Infra-Red Gas Analyzer. Each instrument was calibrated in accordance with manufacturer's instructions. Direct-read meters were connected to the sampling port, one at a time, using dedicated tubing. Stable measurements (within +/- 10 percent) were recorded.

SUMMA Canister samples were collected for VOC analysis from SG-1 on November 16, 2001, and from SG-3 on November 30, 2001 based on PID measurements, which were highest for the selected well relative to the other wells on the same sampling date. The PID measurement at SG-1 on November 16, 2001 was 1.3 parts per million (ppm), and at SG-3 on November 30, 2001 was 31 ppm. The SUMMA canisters were connected to the sampling port using dedicated tubing, allowed to fill, and submitted to ENSR Consulting and Engineering's Air Toxics Specialty Laboratory (ENSR) of Harvard, Massachusetts for VOC analysis by EPA Method TO-14. Laboratory analytical reports for the gas samples are provided in Appendix E.

4.3 RESULTS

Details for materials encountered in recent explorations are provided below. Generalized stratum descriptions were provided in GZA's Remedial Action Plan, dated August 2000. Current explorations are shown together with previous exploration on Figure 3.

³ The PID had a 10.0 eV lamp, and thus, the PID detected VOCs with ionization potentials of about 10 eV or less. The PID did not detect methane, which has a higher ionization potential.

4.3.1 Soil/Fill and Groundwater in Test Pits

AREA 1

The test pits TP3-1, TP3-3 and TP3-4 encountered granular fill over sand, blasted rock fragments, and refusal on probable bedrock. No solid waste was observed in these three test pits. Several bricks were observed in a 1-foot fill layer (depth of 3 to 4 feet) in TP3-2, which was located further to the east and closer to the municipal landfill than TP3-1, TP3-3 and TP3-4. Clay was encountered from a depth of 4 feet to the bottom of TP3-2.

Brick, which was mixed with blasted rock fragments, was also encountered in the nearby test pit TP-17, located further east and closer to the municipal landfill than TP3-2. Previous test pit TP-17 was excavated during GZA's December 1999 exploration program.

Groundwater was not encountered in any of the Area 1 test pits.

AREA 2

Test pits TP3-6 through TP3-10 encountered organic forest mat overlying sand. The sand stratum was encountered overlying silty clay in TP3-8 at a depth of 2.5 feet, and overlying probable bedrock in TP3-9 (refusal depth of 5 feet) and TP3-10 (refusal depth of 3 feet). The sand stratum is generally described as brown, fine or fine to medium sand, with little to some silt and little or no gravel. Solid waste was not encountered in any of the Area 2 test pits.

Previous test pits TP-1, TP-11 (by others) and TP-13 (by GZA), which were excavated nearby and to the north of TP3-6 through TP3-10, contained some construction/building debris. TP-1 and TP-11 also contained municipal solid waste.

Groundwater was not encountered in any of the Area 2 test pits.

AREA 3

Area 3 test pits generally encountered organic material at ground surface. The organic material was described as peat, organic forest mat, or fill with organic silt. Test pits performed near the western edge of the wet area (TP3-5, TP3-11, TP3-13, TP3-14, and TP-20) encountered natural soils and wood boards (TP3-11) or wood fragments (TP3-13). Glass fragments were also encountered in TP3-13. Previous test pits TP-8, TP-9 (by others) and TP-10 (by GZA), which were located adjacent to the western edge and above the wet area, contained asphalt. TP-10 also contained construction-type debris. TP-10 was located in the vicinity of the former sludge dewatering pit. The debris observed in TP-10 and at ground surface in this area may have been used to fill the dewatering pit after it ceased being used in 1991.

Test pits performed in the wet area and closer to the abutting municipal landfill encountered more varied man-made materials, as typify municipal waste, including bricks, leather clippings, glass bottles, wire, porcelain, cloth, paper, and a muffler. These materials were generally mixed with organic silt or clay. A newspaper clipping, dated May 1951, was



encountered in test pit TP3-17 near ground surface. Since the test pits excavated in the wet area were not advanced more than a partial bucket into solid waste, a comprehensive description of the solid waste in the wet area can not be made.

Groundwater was encountered in most of the Area 3 test pits at depths generally ranging from 0.5 to 1.5 feet. Groundwater was encountered at somewhat greater depth in TP3-5 (3.8 feet) and TP3-14 (2.5 feet). The ground surface at the latter two test pits was likely somewhat higher than at the other Area 3 test pits where groundwater was encountered.



4.3.2 Soil/Fill and Groundwater in Test Borings

Fill was encountered in SG-1 through SG-5 from ground surface to depths ranging from about 8 feet (SG-5) to more than about 13 feet (SG-1). Undisturbed soils encountered in current test borings SG-2 through SG-5 underlying fill ranged from silty clay to sand and gravel. The fill samples collected from the boreholes consisted predominantly of disturbed sand, silt and clay in varying proportions, which likely were dredged from the Cochecho River. The samples of fill collected from near ground surface (depths of 0 to 2 feet) in SG-3, SG-4 and SG-5 contained trace to some asphalt. A trace of leather scrap was found in the second sample (depth of 5 to 7 feet) collected from SG-5, and trace red brick was found in the second sample (depth of 5 to 7 feet) collected from SG-1. No other solid waste was observed in the test borings.

Due to the approximate 2-inch diameter of the split-spoon sampler, larger solid waste objects, such as leather scraps and bricks, were not observed in test boring samples. Consequently, the composition of the test boring fill samples is likely not representative of in-place fill. For descriptions of solid waste fill based on test pit excavations in the vicinity of the former WWTP and its storage area, refer to GZA's RAP. Generalized fill descriptions from the RAP are provided on Figure 3.

The field screening reading for VOCs in the headspace of test boring samples using a PID generally were modest, ranging from 0.3 to 5.2 ppm. The maximum PID reading was 9.8 ppm, which was measured for the second sample (depth of 5 to 7 feet) in SG-3. PID readings at the deepest samples collected during the current program were low, ranging from 0.3 to 1.6 ppm.

Groundwater levels were measured in the monitoring wells 4 days (November 16, 2001) and 18 days (November 30, 2001) after well completion. Stabilized water levels ranged in depth from 6 feet (SG-4) to 11 feet (SG-1). Except at SG-5, groundwater was encountered above the bottom of fill by about 2 to 7 feet. At SG-5 groundwater was encountered about 1.5 to 2.5 feet below the bottom of fill.

4.3.3 Gas Screening and Analytical Results

Direct read measurements for methane, oxygen, carbon dioxide, hydrogen sulfide, and VOCs for sampling events on November 16 and 30, 2001 are summarized in Table 1. Methane measurements were generally higher on November 30, 2001, at which time they ranged from 1 percent (SG-1) to 19.5 percent (SG-2). All of the methane concentration



measurements were low compared with typical concentrations in stabilized municipal landfill gas, which range from 30 to 53 percent⁴. The relatively low methane concentrations measured in the wells may be due to the old age, and/or low organic content of the on-site fill.⁵

Oxygen levels were measured in all wells above the detection limit of the instrument, except in SG-5 on November 30, 2001. Detected oxygen levels ranged from 0.9 (SG-5) to 15 percent (SG-1). Carbon dioxide levels ranged from 0.6 (SG-2) to 11 percent (SG-5). The oxygen measurements were generally high, with the exception of the oxygen measurements at SG-5, and the carbon dioxide measurements were low compared with typical stabilized municipal landfill oxygen concentrations of 1 to 2 percent and carbon dioxide concentrations of 34 to 51 percent.⁶ No hydrogen sulfide was detected at any of the wells during both sampling events.

Based on the relatively low methane concentrations at SG-1 compared with the methane concentrations detected at other on-site monitoring wells, it appears that less biodegradation is occurring in the immediate vicinity of SG-1 than at the other on-site monitoring wells. This may be due to less organic matter present adjacent to SG-1, which was constructed within construction debris fill. While methane gas is likely associated with the tannery waste observed in nearby test pit TP-14, the data suggests limited or no methane gas migration to SG-1 at the sampling times.

During the November 16, 2001 sampling event, the PID detected a low level of VOCs (1.3 ppm) only in SG-1. At the remaining four wells, no VOCs were detected. Based on these readings, a SUMMA canister sample was collected from SG-1 for EPA TO-14 analysis of VOCs by ENSR. Low levels of 10 VOCs were detected at concentrations ranging from 0.73 to 21 parts per billion (ppb). The detected VOCs included the petroleum compounds benzene, toluene, ethylbenzene, and xylenes (collectively, BTEX), as well as chlorinated solvents. Detected VOC concentrations are summarized in Table 1.

During the November 30, 2001 sampling event, the PID detected low levels of VOCs at SG-1 (0.2 ppm), SG-2 (0.8 ppm) and SG-3 (31 ppm). No VOCs were detected at SG-4 and SG-5 this date. Based on these readings, a SUMMA canister sample was collected from SG-3 for EPA TO-14 analysis of VOCs by ENSR. Low levels of 12 VOCs were detected at concentrations ranging from 2.7 to 490 ppb (1,2,4-trimethylbenzene), as summarized in Table 1. The VOCs detected at SG-3 were generally similar to those detected at SG-1, although 1,2,4-trimethylbenzene was not detected at SG-1. SG-3 is located near two former underground storage tanks (USTs), one of which was known to contain #2 fuel oil⁷. The content of the second former UST is unknown.

⁴ "Design, Construction, & Monitoring of Sanitary Landfill," Amalendu Bagchi, 1990.

⁵ Methane is generated during anaerobic biodegradation of organic matter. Over long periods of time, as the organic matter is biodegraded, methane concentrations tend to decrease.

⁶ "Design, Construction, & Monitoring of Sanitary Landfill," Amalendu Bagchi, 1990.

⁷ "Site Investigation Report," by CEH-Jacques Whitford Company, dated November 1997.

5.0 SUMMARY AND CONCLUSIONS

Based on the results of test pits conducted as part of this study and review of historical photographs and maps, GZA concludes the following:



- Buried municipal solid waste was not observed west of test pit TP-17 in the southern portion of the site. Municipal solid waste was not found in TP-17, GZ-3 (OW), or test pits TP3-1 through TP3-4 (Area 1). Blasted rock, brick and wood were found in one or more of these explorations, but these materials by themselves reflect historical site use and do not constitute municipal solid waste.
- Municipal solid waste is also not present in Area 2 at the northern corner of the former prison property. No waste was encountered in the five test pits conducted in this area.
- Municipal solid waste was encountered in test pits performed in the wet area (Area 3) located east of the WWTP storage area. Municipal solid waste was not detected in test pits (TP3-5, TP3-11, TP3-13, TP3-14, and TP3-20) conducted along the western edge of the wet area. These five test pits contained material, described as miscellaneous solid waste containing wood boards, wood fragments and glass fragments (TP3-13 only). The approximate limit of miscellaneous solid waste is shown on Figure 3 to include most of the WWTP area, its storage area, and the western edge of the wet area.

Based on the available subsurface information from historical and current explorations at the site, and historical information reviewed during the current study, it is GZA's opinion that the solid waste observed in the vicinity of the former WWTP and its storage area has a different filling history than the municipal solid waste landfill on the easterly adjoining property. Much of the on-site solid waste was likely in-place before the 1950s, and prior to the time when the off-site municipal landfill was in operation.

The results of gas monitoring at the new gas wells (SG-1 through SG-5) indicate the presence of methane (about 1 to 20 percent) that is elevated relative to ambient air; and concentrations of carbon dioxide (about 1 to 11 percent) and oxygen (0 to 15 percent) that are depressed relative to ambient air. These conditions are consistent with biodegradation of organic matter in the subsurface. The relatively low methane concentrations measured in the wells may be due to the old age, and/or low organic content of the on-site fill.

Based on relative gas concentrations at the five gas monitoring wells, it appears that less biodegradation is occurring in the vicinity of SG-1. This may be due to less organic matter present adjacent to SG-1, which was constructed within construction debris fill. While methane gas is likely associated with the tannery waste observed in nearby test pit TP-14, the data suggests limited or no methane gas migration to SG-1 at the sampling times.

Up to 12 VOCs were detected at low concentrations in laboratory samples of gas collected from wells SG-1 and SG-3, where the highest PID readings were observed. Maximum direct-read measurements for total VOCs using a PID for SG-1 and SG-3 were 1.3 and 31 ppm, respectively. The detected VOCs included petroleum compounds such as BTEX, as well as chlorinated solvents. The VOCs detected in the two samples were generally similar, although 1,2,4-trimethylbenzene was detected only at SG-3. The concentration detected for

1,2,4- trimethylbenzene of 490 ppb was higher than for any other detected compound. SG-3 is located near two former USTs, one of which was known to contain #2 fuel oil. The content of the second former UST is unknown.

The presence of methane gas, and thus potentially explosive conditions, is an issue that needs to be addressed during site redevelopment which includes structures (e.g., buildings, subsurface conduits, asphalt paving, etc.). The issue of subsurface gas can be addressed as follows:



1. *Construction of structure(s) at a distance away from buried organic waste, such that potentially explosive conditions are not present at the structure location(s).* To assess the buffer distance away from buried on-site and off-site organic waste, the distribution of methane gas at distance from the buried waste and gas generation rates need to be assessed with additional investigations. Assessment of gas distribution outside areas of buried waste would require multiple direct-read measurements at gas probes and/or additional gas monitoring wells. Assessment of generation rates could be performed using the existing five monitoring wells.
2. *Removal of solid waste containing organic matter.* If the organic matter is removed, then subsurface gas will no longer be an issue relative to site redevelopment. Removal of on-site solid waste containing organic matter would likely reduce on-site subsurface methane gas concentrations, but may not entirely remediate the on-site subsurface gas due to possible migration of subsurface gas from the adjoining wet area and off-site municipal landfill.

Solid waste that is removed must be properly disposed. It is anticipated that the excavated material could be disposed as unregulated soil/waste at Turnkey Landfill in Rochester, or other permitted facility. Another possible option may include re-use as dike material at the abutting municipal landfill as part of the U.S. Army Corps of Engineers Cocheco River dredging project. The latter option requires approval by the U.S. Army Corps of Engineers, assessment of possible environmental issues, and evaluation of engineering properties of the buried waste. It may be feasible and cost effective to segregate waste from soils prior to waste disposal and soil re-use.

Excavation of construction debris in the vicinity of SG-1 and other areas where the waste contains minimal organic matter may not be necessary for locating a nearby structure if it can be shown that methane levels are consistently at safe levels, and the proposed structure(s) is well ventilated.

Remedial planning that includes excavation of solid waste should include supplemental deep test pits to further assess the vertical extent and nature/distribution of solid waste, as well as to further assess groundwater conditions. It should be noted that samples collected from test borings were generally not representative of the buried solid waste due to the narrow diameter of the sampler, and prior test pits generally did not extend to the bottom of waste.

3. *Collection of soil gas via an engineered system.* An engineered system to safeguard structures and their inhabitants from the harmful effects of soil gas is technically feasible. An engineered system may consist of a gas extraction trench located between

the solid waste and structure to serve as a gas barrier. Alternatively, it may consist of sub-slab venting system and/or gas extraction at a number of wells located at a distance from a structure(s).

4. *Capping of solid waste and collection of soil gas.* Capping may consist of asphalt-paved parking, concrete slab, or other engineered gas impermeable barrier. To prevent build-up of explosive gases below the cap, the cap would need to be vented with a gas collection system.



The cost and feasibility of applying one or more of the above measures to address soil gas and prepare the site for redevelopment needs to be evaluated. Additional information regarding site re-use concept(s) would help to focus such an evaluation. Comments from the NHDES regarding regulatory issues that may be associated with the above-listed options, such as excavation of a portion of the solid waste, would also help to focus such an evaluation.

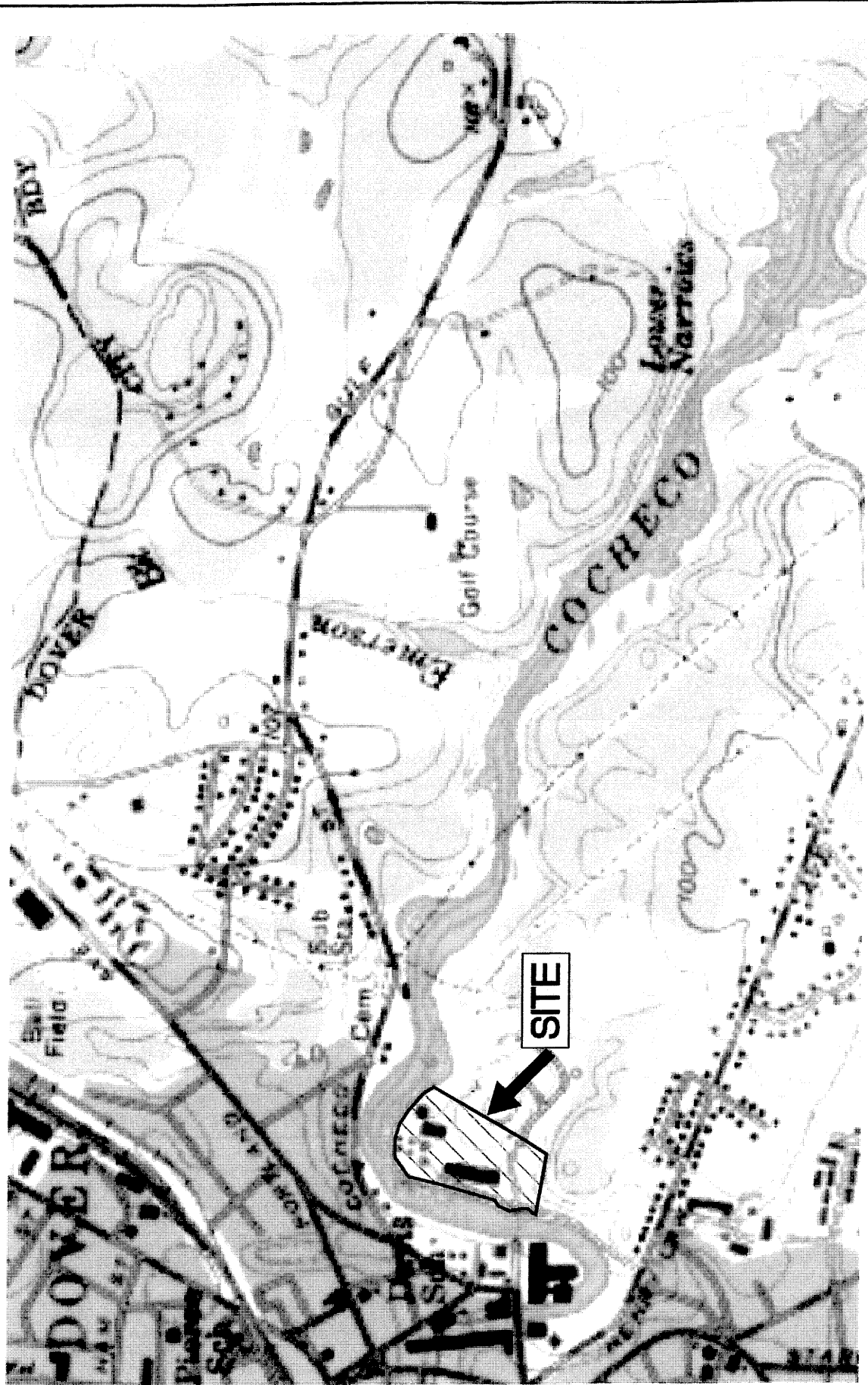
i:\jobs\22457\soil_gas\report.doc

TABLE 1
Summary of Soil Gas Analytical Data
 Former Dept. of Public Works Site
 River Street, Dover, New Hampshire

	SG-1		SG-2		SG-3		SG-4		SG-5	
	16-Nov-01	30-Nov-01	16-Nov-01	30-Nov-01	16-Nov-01	30-Nov-01	16-Nov-01	30-Nov-01	16-Nov-01	30-Nov-01
<u>Direct Read Field Measurements</u>										
Total VOCs (ppmv)	1.3	0.2	ND	0.8	ND	31.0	ND	ND	ND	ND
Carbon Dioxide (%)	2.1	5.3	0.8	0.6	1.2	1.5	4.6	11.0	11.0	10.0
Oxygen (%)	15.0	2.9	12.6	6.9	5.4	1.5	11.5	10.7	0.9	ND
Hydrogen Sulfide (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methane (%)	0.7	1.0	8.0	19.5	10.2	13.0	18.0	8.1	8.1	6.8
Lower Explosive Limit (%)	14	20	160	399	200	260	360	162	162	136
<u>SUMMA Canisters</u>										
<u>VOCs by EPA Method TO-14 (ppby)</u>										
trans-1,2 dichloroethene	0.73	NT	NT	NT		NT	NT	NT	NT	NT
cis-1,2 dichloroethene	17				4.6					
vinyl chloride	<0.50				2.7					
trichloroethene	1.3				2.9					
tetrachloroethene	6.5				<0.50					
benzene	1.5				12					
toluene	1.7				83					
ethylbenzene	4.7				9.9					
p & m-xylene	21				12					
o-xylene	11				55					
4-ethyl toluene	<0.50				9.8					
1,3,5-trimethylbenzene	2.4				48					
1,2,4-trimethylbenzene	<0.50				27					
					490					

Notes:

1. GZA GeoEnvironmental, Inc. obtained samples and direct read measurements on the dates specified.
2. Total volatile organic compound (VOC) concentrations in air were measured in parts per million on a volumetric basis (ppmv) using an Thermo Environmental Instruments, Inc. 580B organic vapor meter equipped with a 10.6 electron-volt bulb calibrated to an isobutylene-in-air standard.
3. Hydrogen sulfide concentrations in air were measured in ppmv using an Industrial Scientific HMZ 271 gas meter.
4. Oxygen, methane, carbon dioxide, and Lower Explosive Limit (LEL) were measured in percent (%) on a volumetric basis using a CEA Instruments, Inc. LMSX meter.
5. Air samples were analyzed by ENSR Consulting and Engineering Air Toxics Specialty Laboratory of Harvard, Massachusetts.
6. "<" indicates compound was not detected above its respective laboratory reporting limit.
7. ND indicates not detected. NT indicates not tested for the indicated parameter.



PROJECT No.:
22457
FIGURE No.:
1

**DOVER PUBLIC WORKS
RIVER STREET
DOVER, NEW HAMPSHIRE
LOCUS PLAN**

DES'D BY : J.L.H.
CHK'D BY : N.J.N.
APP'D BY : S.R.L.
DRAWN BY: R.L.C.
SCALE : 1"=1000'
DATE : JULY 2002



GZA
GeoEnvironmental, Inc.
Engineers and Scientists
380 HARVEY ROAD
MANCHESTER, NEW HAMPSHIRE 03103
(603) 623-3600

APPENDIX A
HYDROGEOLOGIC LIMITATIONS

APPENDIX A
HYDROGEOLOGICAL LIMITATIONS

1. The conclusions and recommendations submitted in this report are based in part upon the data obtained from a limited number of soil samples from widely spaced subsurface explorations. The nature and extent of variations between these explorations may not become evident until further investigation. If variations or other latent conditions then appear evident, it will be necessary to reevaluate the recommendations of this report.
2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.
3. Water level readings have been made in the test pits, borings and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater may occur due to variations in rainfall and other factors different from those prevailing at the time measurements were made.
4. Except as noted within the text of the report, no quantitative laboratory testing was performed as part of the site assessment. Where such analyses have been conducted by an outside laboratory, GZA GeoEnvironmental, Inc. (GZA) has relied upon the data provided, and has not conducted an independent evaluation of the reliability of these data.
5. The conclusions and recommendations contained in this report are based in part upon various types of chemical data and are contingent upon their validity. These data have been reviewed and interpretations made in the report. As indicated within the report, some of these data are preliminary "screening" level data, and should be confirmed with quantitative analyses if more specific information is necessary. Moreover, it should be noted that variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time, and other factors. Should additional chemical data become available in the future, these data should be reviewed by GZA, and the conclusions and recommendations presented therein modified accordingly.
6. Chemical analyses have been performed for specific parameters during the course of this study, as detailed in the text. It must be noted that additional constituents not searched for during the current study may be present in soil and groundwater at the site.
7. It is recommended that this firm be retained to provide further engineering services during design, implementation, and/or construction of any remedial measures, if necessary. This is to observe compliance with the concepts and recommendations contained herein and to allow design changes in the event that subsurface conditions differ from those anticipated.

\\gza\gza\jobs\22457\soil_gas\report.doc

APPENDIX B

1951 AND 1962 AERIAL PHOTOGRAPHS

APPENDIX C

TEST PIT AND TEST BORING LOGS BY GZA

GZA GeoEnvironmental, Inc. Test Pit No. TP3-1
 Engineers/Scientists Page No. 1 of 1
Dover Public Works
Dover, New Hampshire
File No. 22457.00
Checked By: NJN
 380 Harvey Road
 Manchester, New Hampshire 03103

Excavation Equipment

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. _____
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1020
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1030

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to medium SAND, some Gravel, little Silt.			D	2A	
1'	GRANULAR FILL			D	3A	
2'	Bottom of excavation at 1.6 feet below ground surface. Refusal on probable bedrock.					
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan</p> <p style="text-align: center;">10'</p> <div style="text-align: center;"> </div> <p style="text-align: center;">NORTH</p> <p>Volume = <u>1.8</u> cu. yd.</p>	<p style="text-align: center;">Boulder Class</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Letter Designation</th> <th style="text-align: left;">Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p style="text-align: center;">Excavation Effort</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>E</td> <td>Easy</td> </tr> <tr> <td>M</td> <td>Moderate</td> </tr> <tr> <td>D</td> <td>Difficult</td> </tr> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	E	Easy	M	Moderate	D	Difficult	<p style="text-align: center;">Proportions Used</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LJ.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LJ.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p style="text-align: center;">Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p style="text-align: center;">GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">Elapsed Time to Reading (Hours)</th> <th style="text-align: left;">Depth to Groundwater</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Elapsed Time to Reading (Hours)	Depth to Groundwater		
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TRACE (TR.)	0 - 10%																													
LITTLE (LJ.)	10 - 20%																													
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Elapsed Time to Reading (Hours)	Depth to Groundwater																													

GZA GeoEnvironmental, Inc.
Engineers/Scientists

Dover Public Works
Dover, New Hampshire

Test Pit No. TP3-2
Page No. 1 of 1
File No. 22457.00
Checked By: NJN

380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/01
Weather Clear, 60's Operator Brian Sellick Ground Elev. _____
Excavation Equipment: Make Yanmar Model VIO 50 Time Started 0830
Capacity 0.25 cu yd. Reach 10 ft. Time Completed 0840

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to coarse SAND, some Gravel, little Silt. GRANULAR FILL			M		
1'				M	1A	
2'				M		
3'	Dark brown, fine to coarse SAND, some Gravel, little Silt with bricks. FILL			M		
4'	Gray, Silty CLAY. CLAY			E		
5'	Bottom of excavation at 5 feet below ground surface. No refusal.					
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan</p> <p>Volume = <u>5</u> cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <p>E----Easy M----Moderate D----Difficult</p>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	<p>Proportions Used</p> <p>TRACE (TR.) 0 - 10%</p> <p>LITTLE (LI.) 10 - 20%</p> <p>SOME (SO.) 20 - 35%</p> <p>AND 35 - 50%</p>	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p>
		Letter Designation	Size Range Classification									
A	6" - 17"											
B	18" - 36"											
C	36" and Larger											
<p>Elapsed Time to Reading (Hours)</p>	<p>Depth to Ground-water</p>											

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 380 Harvey Road
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Dover Public Works
 Dover, New Hampshire

Test Pit No. TP3-3
 Page No. 1 of 1
 File No. 22457.00
 Checked By: NJN

GZA Rep.	Jay Hodkinson	Contractor	Excavation Equipment		Date	10/22/2001
		Operator	Environmental Projects, Inc.		Ground Elev.	
Weather	Clear, 60's	Make	Yanmar	Model VIO 50	Time Started	0840
		Capacity	0.25 cu yd.	Reach 10 ft.	Time Completed	0900

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to coarse SAND, some Gravel, little Silt. GRANULAR FILL			M		
1'				E		
2'	Orange-brown, fine to medium SAND, some Silt, little Gravel. SAND			E		
3'	Bottom of excavation at 3 feet below ground surface. No refusal.					
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan</p>	<p>Boulder Class</p> <table border="0"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <table border="0"> <tr> <td>E</td> <td>Easy</td> </tr> <tr> <td>M</td> <td>Moderate</td> </tr> <tr> <td>D</td> <td>Difficult</td> </tr> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	E	Easy	M	Moderate	D	Difficult	<p>Proportions Used</p> <table border="0"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LI.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LI.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table border="0"> <tr> <td>Elapsed Time to Reading (Hours)</td> <td>Depth to Groundwater</td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Elapsed Time to Reading (Hours)	Depth to Groundwater		
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SOME (SO.)	20 - 35%																													
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Elapsed Time to Reading (Hours)	Depth to Groundwater																													

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Dover Public Works
Dover, New Hampshire

Test Pit No. TP3-4
Page No. 1 of 1
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380 Harvey Road
Manchester, New Hampshire 03103

Excavation Equipment

GZA Rep. Jay Hodkinson
Weather Clear, 60's
Contractor Environmental Projects, Inc.
Operator Brian Sellick
Make Yanmar Model VIO 50
Capacity 0.25 cu yd. Reach 10 ft.

Date 10/22/2001
Ground Elev. _____
Time Started 0905
Time Completed 0915

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0	Brown, fine to coarse SAND, little Gravel, trace Silt. GRANULAR FILL			E		
1'				E		
2'				E		
3'	BLASTED ROCK FRAGMENTS			D	2A 3A	
4'	Bottom of excavation at 4 feet below ground surface. Refusal on probable bedrock.					
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan</p> <p>Volume = 5.3 cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <p>E—Easy M—Moderate D—Difficult</p>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	<p>Proportions Used</p> <table border="1"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LI.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LI.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table border="1"> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Groundwater</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Elapsed Time to Reading (Hours)	Depth to Groundwater		
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AND	35 - 50%																							
Elapsed Time to Reading (Hours)	Depth to Groundwater																							

GZA GeoEnvironmental, Inc.
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380 Harvey Road
Manchester, New Hampshire 03103

Dover Public Works
Dover, New Hampshire

Test Pit No. TP3-5
Page No. 1 of 1
File No. 22457.00
Checked By: NJN

GZA Rep. Jay Hodkinson

Weather Clear, 60's

Excavation Equipment
Contractor Environmental Projects, Inc.
Operator Brian Sellick
Make Yanmar Model VIO 50
Capacity 0.25 cu yd. Reach 10 ft.

Date 10/22/2001
Ground Elev.
Time Started 0945
Time Completed 1000

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to medium SAND, some Silt, little Gravel with organics. SAND			E		
1'						
2'	Brown, fine SAND, some Clayey Silt. SILT					1, 2
3'						
4'	Gray, Silty CLAY. CLAY					
5'						
6'						
7'	Bottom of excavation at 6.5 feet below ground surface. No refusal.					
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

- Notes:
- Groundwater encountered at a depth of 3.8 feet below ground surface.
 - Slight petroleum odor at groundwater interface.

<p>Test Pit Plan</p> <p>Volume = 7.7 cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <table border="1"> <tr> <td>E</td> <td>Easy</td> </tr> <tr> <td>M</td> <td>Moderate</td> </tr> <tr> <td>D</td> <td>Difficult</td> </tr> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	E	Easy	M	Moderate	D	Difficult	<p>Proportions Used</p> <table border="1"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LI.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LI.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>(X) Encountered () Not Encountered</p> <table border="1"> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Groundwater</th> </tr> <tr> <td>5 min</td> <td>3.8'</td> </tr> </table>		Elapsed Time to Reading (Hours)	Depth to Groundwater	5 min	3.8'
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5 min	3.8'																														

GZA GeoEnvironmental, Inc.
 Engineers/Scientists
 380 Harvey Road
 Manchester, New Hampshire 03103

Dover Public Works
 Dover, New Hampshire

Test Pit No. TP3-6
 Page No. 1 of 1
 File No. 22457.00
 Checked By: NJN

GZA Rep. Jay Hodkinson
 Weather Clear, 60's

Excavation Equipment
 Contractor Environmental Projects, Inc.
 Operator Brian Sellick
 Make Yanmar Model VIO 50
 Capacity 0.25 cu yd. Reach 10 ft.

Date 10/22/2001
 Ground Elev. 1045
 Time Started 1045
 Time Completed 1100

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to medium SAND, some Silt with root fibers. FOREST MAT			E		
1'	Brown, fine SAND, some Silt. SAND			E		
2'	Dark brown, fine to medium SAND, little Silt, little Gravel. SAND			E		
3'	Reddish brown, fine to medium SAND, some Silt, little Gravel. SAND			M	2A	
4'				M		
5'				M		
6'	Bottom of excavation at 6 feet below ground surface. No refusal.					
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan</p> <p>Volume = 4.4 cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <thead> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </tbody> </table> <p>Excavation Effort</p> <table border="1"> <tbody> <tr> <td>E</td> <td>Easy</td> </tr> <tr> <td>M</td> <td>Moderate</td> </tr> <tr> <td>D</td> <td>Difficult</td> </tr> </tbody> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	E	Easy	M	Moderate	D	Difficult	<p>Proportions Used</p> <table border="1"> <tbody> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LL)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </tbody> </table>	TRACE (TR.)	0 - 10%	LITTLE (LL)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table border="1"> <thead> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Ground-water</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </tbody> </table>		Elapsed Time to Reading (Hours)	Depth to Ground-water				
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GZA GeoEnvironmental, Inc.
Engineers/Scientists

Dover Public Works
Dover, New Hampshire

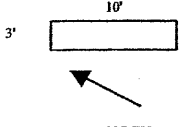
Test Pit No. TP3-7
Page No. 1 of 1
File No. 22457.00
Checked By: NJN

380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
Operator Brian Sellick Ground Elev. _____
Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1105
Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1115

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, fine to medium SAND, little Silt with root fibers. FOREST MAT			E		
1'	Reddish brown, fine to medium SAND, some Silt, little Gravel. SAND			↓		
2'						
3'					3A	
4'					1B	
5'					3A	
6'	Bottom of excavation at 6 feet below ground surface. No refusal.					
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan 10'</p>  <p>Volume = 6.7 cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <table border="1"> <tr> <td>E</td> <td>Easy</td> </tr> <tr> <td>M</td> <td>Moderate</td> </tr> <tr> <td>D</td> <td>Difficult</td> </tr> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	E	Easy	M	Moderate	D	Difficult	<p>Proportions Used</p> <table border="1"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LL)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LL)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table border="1"> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Groundwater</th> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Elapsed Time to Reading (Hours)	Depth to Groundwater		
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Elapsed Time to Reading (Hours)	Depth to Groundwater																													

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Dover Public Works
 Dover, New Hampshire

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 Checked By: NJN

380 Harvey Road
 Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/01
 Operator Brian Sellick Ground Elev. _____
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1120
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1140

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, fine to medium SAND, some Silt with root fibers. FOREST MAT			E		
1'				↓		
2'	Reddish brown, fine SAND, some Silt. SAND					
3'	Brown, Silty CLAY. CLAY					
4'						
5'	Gray, Silty CLAY. CLAY			M		
6'				M		
7'	Bottom of excavation at 6.5 feet below ground surface. No refusal.					
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

Test Pit Plan 	Boulder Class Letter Designation Size Range Classification A 6" - 17" A B 18" - 36" B C 36" and Larger C	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER () Encountered (X) Not Encountered Elapsed Time to Reading (Hours) Depth to Ground-water
	Excavation Effort E—Easy M—Moderate D—Difficult			

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Dover Public Works
Dover, New Hampshire

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Checked By: NJN

380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
Weather Clear, 60's Operator Brian Sellick Ground Elev.
Make Yanmar Model VIO 50 Time Started 1155
Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1220

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to medium SAND, some Silt with root fibers. FOREST MAT			E		
1'	Brown, fine SAND, some Silt. SAND			↓		
2'						
3'						
4'						
5'						
5'	Bottom of excavation at 5 feet below ground surface. Refusal on probable bedrock.					
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan</p> <p>10'</p> <p>3'</p> <p>NORTH</p> <p>Volume = 5.6 cu. yd.</p>	<p>Boulder Class</p> <table border="0"> <tr> <td>Letter Designation</td> <td>Size Range Classification</td> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <p>E—Easy M—Moderate D—Difficult</p>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	<p>Proportions Used</p> <table border="0"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LI.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LI.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table border="0"> <tr> <td>Elapsed Time to Reading (Hours)</td> <td>Depth to Groundwater</td> </tr> <tr> <td></td> <td></td> </tr> </table>	Elapsed Time to Reading (Hours)	Depth to Groundwater		
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SOME (SO.)	20 - 35%																							
AND	35 - 50%																							
Elapsed Time to Reading (Hours)	Depth to Groundwater																							

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Dover Public Works
Dover, New Hampshire
File No. 22457.00
Checked By: NJN
 380 Harvey Road
 Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. _____
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1300
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1315

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, fine to medium SAND, some Silt with root fibers. FOREST MAT			E		
1'	Brown, fine SAND, some Silt, little Gravel. SAND			M		
2'				M	2A	
3'	Bottom of excavation at 3 feet below ground surface. Refusal on probable bedrock.					
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

Test Pit Plan Volume = <u>2.7</u> cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E-----Easy M-----Moderate D-----Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LJ.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER () Encountered (X) Not Encountered Elapsed Time to Reading (Hours) Depth to Ground-water

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 Engineers/Scientists
 380 Harvey Road
 Manchester, New Hampshire 03103

Dover Public Works
 Dover, New Hampshire

Test Pit No. TP3-11
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 Checked By: NJN

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Weather Clear, 60's Operator Brian Sellick Ground Elev. 1335
 Excavation Equipment Make Yanmar Model VIO 50 Time Started 1335
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1340

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, ORGANICS with root fiber, wood boards.					
1'	FILL			E		1
2'	Bottom of excavation at 2 feet below ground surface. No refusal.			E		
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
 1. Groundwater encountered at a depth of 1.0 feet below ground surface.

Test Pit Plan 8' NORTH Volume = 1.8 cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E----Easy M----Moderate D----Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (L.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER	
				(X) Encountered () Not Encountered Elapsed Time to Reading (Hours) Depth to Ground-water 5 min 1.0	

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Dover, New Hampshire

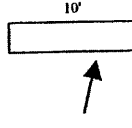
Test Pit No. TP3-12
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380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. _____
 Make Yanmar Model VIO 50 Time Started 1345
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1350
 Weather Clear, 60's

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, ORGANICS with bricks, glass. FILL			E		
1'	Bottom of excavation at 1.5 feet below ground surface. No refusal.					
2'						
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

Test Pit Plan 10'  NORTH Volume = <u>1.7</u> cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E—Easy M—Moderate D—Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER (X) Encountered () Not Encountered	
				Elapsed Time to Reading (Hours)	Depth to Groundwater

GZA GeoEnvironmental, Inc. Test Pit No. TP3-13
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Dover, New Hampshire
 380 Harvey Road File No. 22457.00
 Manchester, New Hampshire 03103 Checked By: NJN

Excavation Equipment

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. _____
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1355
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1405

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Gray-brown, SILT with organics. ORGANIC SILT					
1'	Black, ORGANCIS with wood fragments, glass. FILL					1
2'	Bottom of excavation at 2 feet below ground surface.					
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

1. Groundwater encountered at a depth of 1.0 feet below ground surface.

Test Pit Plan 9' NORTH Volume = <u>2.0</u> cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E---Easy M---Moderate D---Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER (X) Encountered () Not Encountered	
				Elapsed Time to Reading (Hours)	Depth to Ground-water 5 min 1.0

GZA GeoEnvironmental, Inc.
Engineers/Scientists

Dover Public Works
Dover, New Hampshire

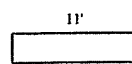
Test Pit No. TP3-14
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380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
Weather Clear, 60's Operator Brian Sellick Ground Elev. _____
Make Yanmar Model VIO 50 Time Started 1410
Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1420

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Brown, fine to medium SAND, some Silt with root fibers. FOREST MAT			E		
1'						
2'	Gray, Silty CLAY. CLAY WOOD FRAGMENTS					1
3'						
4'	Bottom of excavation at 4 feet below ground surface. No refusal.					
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
1. Groundwater encountered at a depth of 2.5 feet below ground surface.

Test Pit Plan	Boulder Class	Proportions Used	Abbreviations	GROUNDWATER																																
11'  NORTH Volume = <u>4.9</u> cu. yd.	<table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <table border="1"> <tr> <th>Excavation Effort</th> </tr> <tr> <td>E-----Easy</td> </tr> <tr> <td>M-----Moderate</td> </tr> <tr> <td>D-----Difficult</td> </tr> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	Excavation Effort	E-----Easy	M-----Moderate	D-----Difficult	<table border="1"> <tr> <th>Letter</th> <th>Proportions</th> </tr> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LL.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	Letter	Proportions	TRACE (TR.)	0 - 10%	LITTLE (LL.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	<table border="1"> <tr> <th colspan="2">GROUNDWATER</th> </tr> <tr> <td>(X) Encountered</td> <td></td> </tr> <tr> <td>() Not Encountered</td> <td></td> </tr> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Groundwater</th> </tr> <tr> <td><u>5 min</u></td> <td><u>2.5</u></td> </tr> </table>	GROUNDWATER		(X) Encountered		() Not Encountered		Elapsed Time to Reading (Hours)	Depth to Groundwater	<u>5 min</u>	<u>2.5</u>
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Excavation Effort																																				
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<u>5 min</u>	<u>2.5</u>																																			



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Dover Public Works
 Dover, New Hampshire

Test Pit No. TP3-15
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 Checked By: NJN

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. 1425
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1425
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1435

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0	Reddish brown, ORGANICS and Root Fibers. PEAT					
1'	Black, ORGANICS with wood fragments, leather clippings, bottle. FILL			E		1
2'	Bottom of excavation at 2 feet below ground surface. No refusal.					
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
 1. Groundwater encountered at a depth of 0.5 feet below ground surface.

Test Pit Plan 9' NORTH Volume = 2.0 cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E----Easy M----Moderate D----Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER (X) Encountered () Not Encountered	
				Elapsed Time to Reading (Hours)	Depth to Ground-water 5 min 0.5'

GZA GeoEnvironmental, Inc.
Engineers/Scientists

Dover Public Works
Dover, New Hampshire

Test Pit No. TP3-16
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380 Harvey Road
Manchester, New Hampshire 03103

Excavation Equipment

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. _____
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1450
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1500

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, fine to medium SAND, little Silt with root fibers. FOREST MAT			E		
1'	Gray, Silty CLAY with glass bottles, metal wire, muffler. FILL			E		1
2'				E		
3'	Bottom of excavation at 2.5 feet below ground surface. No refusal.					
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
1. Groundwater encountered at a depth of 1.5 feet below ground surface.

Test Pit Plan 7' NORTH Volume = <u>1.9</u> cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E---Easy M---Moderate D---Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER	
				(x) Encountered () Not Encountered Elapsed Time to Reading (Hours) Depth to Ground-water	5 min. 1.5

GZA GeoEnvironmental, Inc.
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 Manchester, New Hampshire 03103

Dover Public Works
 Dover, New Hampshire

Test Pit No. TP3-17
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 File No. 22457.00
 Checked By: NJN

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
 Operator Brian Sellick Ground Elev. _____
 Weather Clear, 60's Make Yanmar Model VIO 50 Time Started 1505
 Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1515

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Orange-brown, Clayey SILT with bottles, porcelain, wood, root fibers, newspapers (May 1951).	FILL		E		
1'						1
2'	Bottom of excavation at 1.5 feet below ground surface. No refusal.					
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
 1. Groundwater encountered at a depth of 1.5 feet below ground surface.

Test Pit Plan 8' NORTH Volume = 1.3 cu. yd.	Boulder Class Letter Designation Size Range Classification A 6" - 17" B 18" - 36" C 36" and Larger Excavation Effort E---Easy M---Moderate D---Difficult	Proportions Used TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% AND 35 - 50%	Abbreviations F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow	GROUNDWATER (X) Encountered () Not Encountered	
				Elapsed Time to Reading (Hours)	Depth to Ground-water 1.5

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380 Harvey Road
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GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
Weather Clear, 60's Operator Brian Sellick Ground Elev. _____
Make Yanmar Model VIO 50 Time Started 1520
Capacity 0.25 cu yd. Reach 10 ft. Time Completed 1530

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0	Dark brown to black, ORGANICS with cloth, wood fragments, glass bottles, brick. FILL			E		
1'				E		1
2'	Bottom of excavation at 2 feet below ground surface.					
3'						
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
1. Groundwater encountered at a depth of 1.5 feet below ground surface.

<p>Test Pit Plan 7'</p> <p>3'</p> <p>NORTH</p> <p>Volume = <u>1.6</u> cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <p>E---Easy M---Moderate D---Difficult</p>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	<p>Proportions Used</p> <p>TRACE (TR.) 0 - 10%</p> <p>LITTLE (LI.) 10 - 20%</p> <p>SOME (SO.) 20 - 35%</p> <p>AND 35 - 50%</p>	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>(X) Encountered () Not Encountered</p>	
		Letter Designation	Size Range Classification										
A	6" - 17"												
B	18" - 36"												
C	36" and Larger												
<p>Elapsed Time to Reading (Hours)</p> <p>10 min</p>	<p>Depth to Ground-water</p> <p>1.5'</p>												

GZA GeoEnvironmental, Inc.
Engineers/Scientists

Dover Public Works
Dover, New Hampshire

Test Pit No. TP3-19
Page No. 1 of 1
File No. 22457.00
Checked By: NJN

380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep.	Jay Hodkinson	Contractor	Excavation Equipment Environmental Projects, Inc.		Date	10/22/2001	
Weather	Clear, 60's	Operator	Brian Sellick	Ground Elev.			
		Make	Yanmar	Model	VIO 50	Time Started	1540
		Capacity	0.25 cu yd.	Reach	10 ft.	Time Completed	1550

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0	Brown, fine to medium SAND, some Silt, little Gravel. GRANULAR FILL			E		
1'				↓		1
2'	Dark brown, fine SAND and Silt, paper, bottle, wood, brick. FILL			↓		
3'	Bottom of excavation at 3 feet below ground surface.					
4'						
5'						
6'						
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:
1. Groundwater encountered at a depth of 1.5 feet below ground surface.

<p>Test Pit Plan 10'</p> <p>Volume = 3.3 cu. yd.</p>	<p>Boulder Class</p> <table border="0"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort E----Easy M----Moderate D----Difficult</p>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	<p>Proportions Used</p> <table border="0"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LL.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LL.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER (X) Encountered () Not Encountered</p> <table border="1"> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Groundwater</th> </tr> <tr> <td>5 min</td> <td>1.5</td> </tr> </table>		Elapsed Time to Reading (Hours)	Depth to Groundwater	5 min	1.5
		Letter Designation	Size Range Classification																						
A	6" - 17"																								
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AND	35 - 50%																								
Elapsed Time to Reading (Hours)	Depth to Groundwater																								
5 min	1.5																								

GZA GeoEnvironmental, Inc.
Engineers/Scientists

Dover Public Works
Dover, New Hampshire

Test Pit No. TP3-20
Page No. 1 of 1
File No. 22457.00
Checked By: NJN

380 Harvey Road
Manchester, New Hampshire 03103

GZA Rep. Jay Hodkinson Contractor Environmental Projects, Inc. Date 10/22/2001
Weather Clear, 60's Operator Brian Sellick Ground Elev. _____
Make Yanmar Model VIO 50 Time Started 1600
Capacity 0.25 cu. yd. Reach 10 ft. Time Completed 1615

Depth	Soil Description	Sample No.	PID Reading (ppm)	Excav. Effort	Boulders: Count/Class	Note No.
0'	Dark brown, fine to medium SAND, some Silt with root fibers. FOREST MAT			E		
1'						
2'	Brown, fine to medium SAND, little Silt, little Gravel. SAND					
3'						
4'						
5'	Gray, Silty CLAY. CLAY			↓		
6'	Bottom of excavation at 6 feet below ground surface. No refusal.					
7'						
8'						
9'						
10'						
11'						
12'						
13'						
14'						
15'						
16'						

Notes:

<p>Test Pit Plan 9'</p> <p>4' ←</p> <p>NORTH</p> <p>Volume = <u>8</u> cu. yd.</p>	<p>Boulder Class</p> <table border="1"> <tr> <th>Letter Designation</th> <th>Size Range Classification</th> </tr> <tr> <td>A</td> <td>6" - 17"</td> </tr> <tr> <td>B</td> <td>18" - 36"</td> </tr> <tr> <td>C</td> <td>36" and Larger</td> </tr> </table> <p>Excavation Effort</p> <table border="1"> <tr> <td>E</td> <td>Easy</td> </tr> <tr> <td>M</td> <td>Moderate</td> </tr> <tr> <td>D</td> <td>Difficult</td> </tr> </table>	Letter Designation	Size Range Classification	A	6" - 17"	B	18" - 36"	C	36" and Larger	E	Easy	M	Moderate	D	Difficult	<p>Proportions Used</p> <table border="1"> <tr> <td>TRACE (TR.)</td> <td>0 - 10%</td> </tr> <tr> <td>LITTLE (LI.)</td> <td>10 - 20%</td> </tr> <tr> <td>SOME (SO.)</td> <td>20 - 35%</td> </tr> <tr> <td>AND</td> <td>35 - 50%</td> </tr> </table>	TRACE (TR.)	0 - 10%	LITTLE (LI.)	10 - 20%	SOME (SO.)	20 - 35%	AND	35 - 50%	<p>Abbreviations</p> <p>F = Fine M = Medium C = Coarse V = Very F/M = Fine to medium F/C = Fine to coarse GR = Gray BN = Brown YEL = Yellow</p>	<p>GROUNDWATER</p> <p>() Encountered (X) Not Encountered</p> <table border="1"> <tr> <th>Elapsed Time to Reading (Hours)</th> <th>Depth to Groundwater</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	Elapsed Time to Reading (Hours)	Depth to Groundwater				
	Letter Designation	Size Range Classification																														
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SOME (SO.)	20 - 35%																															
AND	35 - 50%																															
Elapsed Time to Reading (Hours)	Depth to Groundwater																															



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Dover Public Works
 Dover, New Hampshire

Boring No.: SG-1
 Page: 1 of 1
 File No.: 22457
 Check: NJN

Contractor: New Hampshire Boring
 Foreman: Gregg Leavitt/Jason Rapsis
 Logged by: R. Haines
 Date Start/Finish: 11-12-01 / 11-12-01
 Boring Location: See Exploration Location Plan
 GS Elev.: Not Available Datum: NGVD

Auger/
 Casing Sampler
 Type: HSA SS
 I.D.: 4-1/4" 2"
 Hammer Wt.: - 140#
 Hammer Fall: - 30"
 Other: _____

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
11-12-01		9.0	well	0
11-16-01		10.9	well	4 days
11-30-01		11.0	well	18 days

Depth	Casing Blows	Sample Information					Sample Description & Classification	Stratum Desc.	Rmks.	Equipment Installed
		No.	Pen/ Rec. (In.)	Depth (Ft.)	Blows (/6")	Field Test Data (ppm)				
5'		S-1	24/19	0-2	3-10	0.3	Medium dense, brown, medium to coarse SAND and Gravel, some Silt. Dry.	FILL	1	ROADBOX CONCRETE 1' FILTER SAND BENTONITE 2.5' SEAL 1" ID SCH. 40 PVC RISER FILTER SAND 1" ID SCH. 40 PVC SCREEN (0.05" SLOT) 13'
					14-15					
10'		S-2	24/10	5-7	6-13	1.6	Medium dense, brown, medium to coarse SAND and Gravel, trace red brick. Dry.			
					12-11					
15'		S-3	24/24	10-12	1-12	1.6	Loose, fine SAND and Silt, little Clay. Wet.		2	
					1-1					
20'							Bottom of boring at 13 feet.	3		
25'										

REMARKS

- Soil samples were screened for total volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter (OVM) referenced to an isobutylene -in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Data" column. "ND" indicates no VOCs detected.
- Soil gas monitoring well with 8-inch-diameter flush-mounted locking protective casing (non-sparking) installed as shown at completion of boring.
- No refusal encountered. Bottom of boring at required depth.



GZA
GeoEnvironmental, Inc.
 Engineers and Scientists

Dover Public Works
 Dover, New Hampshire

Boring No.: SG-2
 Page: 1 of 1
 File No.: 22457
 Check: NJN

Contractor: New Hampshire Boring
 Foreman: Gregg Leavitt/Jason Rapsis
 Logged by: R. Haines
 Date Start/Finish: 11-12-01 / 11-12-01
 Boring Location: See Exploration Location Plan
 GS Elev.: Not Available Datum: NGVD

Auger/
 Casing Sampler
 Type: HSA SS
 I.D.: 4-1/4" 2"
 Hammer Wt.: - 140#
 Hammer Fall: - 30"
 Other: _____

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
11-12-01		10.0	well	0
11-16-01		7.0	well	4 days
11-30-01		6.6	well	18 days

Depth	Casing Blows	Sample Information					Sample Description & Classification	Stratum Desc.	Rmks.	Equipment Installed
		No.	Pen/ Rec. (In.)	Depth (Ft.)	Blows (/6")	Field Test Data (ppm)				
5'		S-1	24/8	0-2	12-24	0.3	Dense, brown, coarse SAND and Gravel. Dry.	FILL	1	ROADBOX CONCRETE 1' FILTER SAND 2' BENTONITE SEAL 3' 1" ID SCH. 40 PVC RISER 4' FILTER SAND
					20-18					
10'		S-2	17/13	5-7	5-13	2.0	Medium dense, dark gray, Clayey SILT, little Sand, trace organics. Wet.	FILL	2	1" ID SCH. 40 PVC SCREEN (0.05" SLOT)
					100/5"					
15'		S-3	24/12	10-12	2-1	3.6	Medium stiff, dark gray, Clayey SILT, trace fine Sand. Wet.	SILT & FINE SAND	3	BENTONITE SEAL
					5-9					
15'		S-4	24/14	15-17	22-16	1.6	Dense, gray, SILT and fine Sand, some Gravel. Wet.	SILT & FINE SAND	4	17'
					19-21					
20'							Bottom of boring at 17 feet.	17'		
25'										

**R
E
M
A
R
K
S**

- Soil samples were screened for total volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter (OVM) referenced to an isobutylene -in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Data" column. "ND" indicates no VOCs detected.
- Refusal encountered at 9 feet in three locations (suspect hidden slab). Relocated a fourth time and did not encounter refusal.
- Soil gas monitoring well with 8-inch-diameter flush-mounted locking protective casing (non-sparking) installed as shown at completion of boring.
- Bottom of boring at required depth.

Stratification lines represent approximate boundaries between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

Boring No.: SG-2



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Dover Public Works
 Dover, New Hampshire

Boring No.: SG-3
 Page: 1 of 1
 File No.: 22457
 Check: NJN

Contractor: New Hampshire Boring
 Foreman: Gregg Leavitt/Jason Rapsis
 Logged by: R. Haines
 Date Start/Finish: 11-12-01 / 11-12-01
 Boring Location: See Exploration Location Plan
 GS Elev.: Not Available Datum: NGVD

Auger/
Casing Sampler
 Type: HSA SS
 I.D.: 4-1/4" 2"
 Hammer Wt.: - 140#
 Hammer Fall: - 30"
 Other: _____

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
11-12-01		9.5	well	0
11-16-01		8.7	well	4 days
11-30-01		8.6	well	18 days

Depth	Casing Blows	Sample Information					Sample Description & Classification	Stratum Desc.	Rmks.	Equipment Installed
		No.	Pen/ Rec. (In.)	Depth (Ft.)	Blows (/6")	Field Test Data (ppm)				
5'		S-1	24/18	0-2	30-26 30-58	2.6	Very dense, brown to black, medium to coarse SAND and Gravel, some asphalt, little Silt. Dry.	FILL	1	ROADBOX CONCRETE 1' BENTONITE SEAL 1.5' 1" ID SCH. 40 PVC RISER FILTER SAND 1" ID SCH. 40 PVC SCREEN (0.05" SLOT) 13'
		S-2	24/13	5-7	3-5 6-8	9.8				
10'		S-3	24/4	10-12	8-5 4-7	5.2	Loose, gray, fine to medium SAND and Silt, some Clay. Wet.	13'	2	BENTONITE SEAL
		S-4	24/22	15-17	8-12 13-13	0.6				
15'							Bottom of boring at 17 feet.	17'	3	
20'										
25'										

R E M A R K S

- Soil samples were screened for total volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter (OVM) referenced to an isobutylene -in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Data" column. "ND" indicates no VOCs detected.
- Soil gas monitoring well with 8-inch-diameter flush-mounted locking protective casing (non-sparking) installed as shown at completion of boring.
- No refusal encountered. Bottom of boring at required depth.



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Dover Public Works
Dover, New Hampshire

Boring No.: SG-4
 Page: 1 of 1
 File No.: 22457
 Check: NJN

Contractor: New Hampshire Boring
 Foreman: Gregg Leavitt/Jason Rapsis
 Logged by: R. Haines
 Date Start/Finish: 11-12-01 / 11-12-01
 Boring Location: See Exploration Location Plan
 GS Elev.: Not Available Datum: NGVD

Auger/
 Casing Sampler
 Type: HSA SS
 I.D.: 4-1/4" 2"
 Hammer Wt.: - 140#
 Hammer Fall: - 30"
 Other: _____

GROUNDWATER READINGS				
Date	Time	Depth	Casing	Stab
11-12-01		8.5	well	0
11-16-01		6.2	well	4 days
11-30-01		6.2	well	18 days

Depth	Casing Blows	Sample Information				Field Test Data (ppm)	Sample Description & Classification	Stratum Desc.	Rmks.	Equipment Installed
		No.	Pen/Rec. (In.)	Depth (Ft.)	Blows (/6")					
5'		S-1	24/17	0-2	7-16	1.6	Very dense, brown to black, medium to coarse SAND and Gravel, little asphalt debris. Dry.	FILL	1	ROADBOX
					78-45					
5'		S-2	24/11	5-7	5-6	2.9	Medium dense, gray, SILT and fine Sand, little fine Gravel. Damp.	FILL	2	CONCRETE
					7-6					
10'		S-3	24/9	10-12	7-6	2.3	Medium dense, gray, fine to medium SAND and fine Gravel, some Silt. Wet.	FILL	3	1' FILTER SAND
					5-6					
15'		S-4	24/18	15-17	5-3	1.6	Loose, gray, medium to coarse SAND and fine Gravel, little Silt, trace Clay, trace roots. Wet.	SAND & GRAVEL	4	2.5' SEAL
					3-7					
20'							Bottom of boring at 17 feet.	17'	4	1" ID SCH. 40 PVC RISER
25'										1" ID SCH. 40 PVC SCREEN (0.05" SLOT)
										BENTONITE SEAL
										13'
										17'

REMARKS

- Soil samples were screened for total volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter (OVM) referenced to an isobutylene -in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Data" column. "ND" indicates no VOCs detected.
- Three pieces of leather scrap observed in cuttings.
- Soil gas monitoring well with 8-inch-diameter flush-mounted locking protective casing (non-sparking) installed as shown at completion of boring.
- No refusal encountered. Bottom of boring at required depth.



GZA
GeoEnvironmental, Inc.
Engineers and Scientists

Dover Public Works

Dover, New Hampshire

Boring No.: SG-5

Page: 1 of 1

File No.: 22457

Check: NJN

Contractor: New Hampshire Boring

Foreman: Gregg Leavitt/Jason Rapsis

Logged by: R. Haines

Date Start/Finish: 11-12-01 / 11-12-01

Boring Location: See Exploration Location Plan

GS Elev.: Not Available Datum: NGVD

Auger/
Casing Sampler

Type: HSA SS

I.D.: 4-1/4" 2"

Hammer Wt.: - 140#

Hammer Fall: - 30"

Other: _____

GROUNDWATER READINGS

Date	Time	Depth	Casing	Stab
11-12-01		9.5	well	0
11-16-01		dry	well	4 days
11-30-01		10.5	well	18 days

Depth	Casing Blows	Sample Information					Sample Description & Classification	Stratum Desc.	Rmks.	Equipment Installed
		No.	Pen/ Rec. (In.)	Depth (Ft.)	Blows (/6")	Field Test Data (ppm)				
5'		S-1	24/17	0-2	38-50	0.3	Very dense, brown, medium to coarse SAND and Gravel, trace asphalt. Dry.	FILL	1	
					28-29					
5'		S-2	20/8	5-7	50-50	2.9	Dense, brown to black, fine to medium SAND and Silt, trace leather scrap, little Clay. Damp.	8'	2	
					50-50/2"					
10'		S-3	24/20	10-12	3-7	0.3	Very stiff, gray, Silty CLAY, trace fine Sand. Wet.	SILTY CLAY	3	
					13-29					
15'							Bottom of boring at 12 feet.	12'	3	
20'										
25'										

REMARKS

- Soil samples were screened for total volatile organic compounds (VOCs) using a TEI Model 580B Organic Vapor Meter (OVM) referenced to an isobutylene -in-air standard. Total VOCs detected are reported in parts per million (ppm) in the "Field Test Data" column. "ND" indicates no VOCs detected.
- Soil gas monitoring well with 8-inch-diameter flush-mounted locking protective casing (non-sparking) installed as shown at completion of boring.
- No refusal encountered. Bottom of boring at required depth.

DATA VALIDATION

ENSR Consulting and Engineering Air Toxics Specialty Laboratory (ENSR) prepared the laboratory analytical report in this Appendix. GZA GeoEnvironmental, Inc. reviewed the laboratory's data package to determine whether there would be any qualifications in regards to the use of the analytical data.

ENSR noted no sample irregularities in samples or containers when the gas samples were received.

GC/MSD calibration was performed with canister standards prepared for each target compound. Five to six-point calibrations were generated for each compound using these standards.

A laboratory blank was analyzed daily prior to sample analysis in the same manner as the samples. Target analytes were not detected in blanks.

A laboratory check standard was analyzed daily with the batch of samples. All percent recoveries were noted to be within the QC acceptance limits.

The SUMMA[®] canister for the sample collected November 16, 2001 was cleaned on November 5, 2001. Analysis of one of the canisters from the batch yielded low levels (<2 ppbV) of m&p xylenes. Sample values for this compound may be biased slightly high. The SUMMA[®] canister for the sample collected November 30, 2001 was cleaned on November 2, 2001. No compounds were detected in the one canister analyzed for the November 2, 2001 cleaning batch.

\\gza\gza\jobs\22457\soil_gas\report.doc

APPENDIX E
ANALYTICAL LABORATORY REPORTS, AND
DATA VALIDATION FOR GAS SAMPLES



WASTE MANAGEMENT DIVISION
MICHIGAN DEPARTMENT OF
ENVIRONMENTAL QUALITY

ATTN: Nancy @ GZH

DO NOT WRITE IN THIS SPACE

ATT. DIS. REJ. PR.

Required under authority of Part 111 and Part 121 of Act 451, 1994, as amended.

Failure to file may subject you to criminal and/or civil penalties under Sections 324.11151 or 324.12116 MCL.

Form Approved. OMB No. 2050-0039

Please print or type.

UNIFORM HAZARDOUS WASTE MANIFEST		1. Generator's US EPA ID No. ESQG	Manifest Document No. 06286	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address City of Dover Community Services 288 Central Ave. Dover, NH 03820				A. State Manifest Document Number MI 8120453		
4. Generator's Phone (603) 516-6094				B. State Generator's ID 60 River St. Dover, NH 03231		
5. Transporter 1 Company Name Tri-S Environmental Services, Inc.		6. US EPA ID Number CTD016424210		C. State Transporter's ID V48439		
7. Transporter 2 Company Name		8. US EPA ID Number		D. Transporter's Phone (860) 875-2110		
9. Designated Facility Name and Site Address Perma-Fix of Michigan, Inc. 18550 Allen Road Brownstone, MI 48192		10. US EPA ID Number MI D096963194		E. State Transporter's ID V48439		
				F. Transporter's Phone		
				G. State Facility's ID		
				H. Facility's Phone (800) 282-9251		
11. US DOT Description (including Proper Shipping Name, Hazard Class, and ID NUMBER). HM				12. Containers	13. Total Quantity	14. Unit Wt/Vol
a. X DOT Non-regulated Material (Soil, Debris)				No.	Type	I. Waste No.
				0030	M	00165 G
b.						NA
c.						111
d.						
J. Additional Descriptions for Materials Listed Above:						K. Handling Code:
a. App: DOV06001						a.
b.						b.
c.						c.
d.						d.
15. Special Handling Instructions and Additional Information Emergency Contact Online Env. 24 Hour Tel. # 888-571-4927						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR; if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.						
Printed/Typed Name MARIO LECLERC / OZA				Signature <i>Mario Leclerc</i>		Date 12/31/01
17. Transporter 1 Acknowledgement of Receipt of Materials						
Printed/Typed Name William R Chagell				Signature <i>William R Chagell</i>		Date 1/23/02
18. Transporter 2 Acknowledgement of Receipt of Materials						
Printed/Typed Name				Signature		Date
19. Discrepancy Indication Space Corrected section I (a). Spoke to Charlie @ Online. Tk 1/3/02 Perma-Fix						
20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						
Printed/Typed Name Jason Whalen				Signature <i>J Whalen</i>		Date 01/10/02

ALL SPILLS MUST BE REPORTED TO THE MICHIGAN POLLUTION EMERGENCY ALERTING SYSTEM, IN MICHIGAN AT 1-800-252-4706 OR OUT OF STATE AT 517-373-7660 AND THE NATIONAL RESPONSE CENTER AT 1-800-424-9802 24 HOURS PER DAY.

GENERATOR
TRANSPORTER
FACILITY

G. WASTE CHARACTERIZATION:

- 1 Is this a listed EPA RCRA hazardous waste (F,K,P,U) as defined in 40 CFR 261.30
 - 2
 - a. Is this a liquid waste with a flash point <140F as defined in 40 CFR 261.31 (D001).
 - b. Is this an ignitable solid as defined in 40 CFR 261.21.(D001)
 - c. Is this an oxidizer as defined in 49 CFR 173.127. (D001)
 - d. If yes to a.b. or c. is this a High TOC waste
 - 3
 - a. Is this a liquid waste with a pH<2 or >12.5. (D002)
 - b. Is this a liquid waste that corrodes steel as defined in 40 CFR 261.22 (D002).
 - 4 Is this a reactive waste as defined in 40 CFR 261.23. (D003)
- If yes, check the subcategory: Water Reactive Air Reactive Explosive Other Reactive
- Reactive Cyanide: conc. _____ ppm Reactive Sulfide: conc. _____ ppm

YES

NO

Waste Code	Constituent	< Than	Reg Level	> Than	Waste Code	Constituent	< Than	Reg Level	> Than
D004	Arsenic	<input type="checkbox"/>	5.0	<input type="checkbox"/>	D024	m-Cresol	<input type="checkbox"/>	200	<input type="checkbox"/>
D005	Barium	<input type="checkbox"/>	100	<input type="checkbox"/>	D025	p-Cresol	<input type="checkbox"/>	200	<input type="checkbox"/>
D006	Cadmium	<input type="checkbox"/>	1.0	<input type="checkbox"/>	D026	Cresol (o, m, p)	<input type="checkbox"/>	200	<input type="checkbox"/>
D007	Chromium	<input type="checkbox"/>	5.0	<input type="checkbox"/>	D027	1,4-Dichlorobenzene	<input type="checkbox"/>	75	<input type="checkbox"/>
D008	Lead	<input type="checkbox"/>	5.0	<input type="checkbox"/>	D028	1,2-Dichloroethane	<input type="checkbox"/>	0.5	<input type="checkbox"/>
D009	Mercury	<input type="checkbox"/>	0.2	<input type="checkbox"/>	D029	1,1-Dichloroethylene	<input type="checkbox"/>	0.7	<input type="checkbox"/>
D010	Selenium	<input type="checkbox"/>	1.0	<input type="checkbox"/>	D030	2,4-Dinitrofluorobenzene	<input type="checkbox"/>	0.13	<input type="checkbox"/>
D011	Silver	<input type="checkbox"/>	5.0	<input type="checkbox"/>	D031	Heptachlor	<input type="checkbox"/>	0.008	<input type="checkbox"/>
D012	Endrin	<input type="checkbox"/>	0.02	<input type="checkbox"/>	D032	Hexachlorobenzene	<input type="checkbox"/>	0.13	<input type="checkbox"/>
D013	Lindane	<input type="checkbox"/>	0.4	<input type="checkbox"/>	D033	Hexachlorocyclopentadiene	<input type="checkbox"/>	0.5	<input type="checkbox"/>
D014	Methoxychlor	<input type="checkbox"/>	10	<input type="checkbox"/>	D034	Hexachlorocyclopentadiene	<input type="checkbox"/>	1.0	<input type="checkbox"/>
D015	Toluene	<input type="checkbox"/>	0.5	<input type="checkbox"/>	D035	Methyl Ethyl Ketone	<input type="checkbox"/>	200	<input type="checkbox"/>
D016	2,4-D	<input type="checkbox"/>	10	<input type="checkbox"/>	D036	Nitrobenzene	<input type="checkbox"/>	2.0	<input type="checkbox"/>
D017	2,4,5-TP(Silver)	<input type="checkbox"/>	1	<input type="checkbox"/>	D037	Permethrin	<input type="checkbox"/>	100	<input type="checkbox"/>
D018	Benzene	<input type="checkbox"/>	0.5	<input type="checkbox"/>	D038	Pyridine	<input type="checkbox"/>	5.0	<input type="checkbox"/>
D019	Carbon Tetrachloride	<input type="checkbox"/>	0.5	<input type="checkbox"/>	D039	Tetrachloroethylene	<input type="checkbox"/>	0.7	<input type="checkbox"/>
D020	Chlordane	<input type="checkbox"/>	0.03	<input type="checkbox"/>	D040	Trichloroethylene	<input type="checkbox"/>	0.5	<input type="checkbox"/>
D021	Chlorobenzene	<input type="checkbox"/>	100	<input type="checkbox"/>	D041	2,4,5-Trichlorophenol	<input type="checkbox"/>	40	<input type="checkbox"/>
D022	Chloroform	<input type="checkbox"/>	6.0	<input type="checkbox"/>	D042	2,4,6-Trichlorophenol	<input type="checkbox"/>	3.0	<input type="checkbox"/>
D023	o-Cresol	<input type="checkbox"/>	200	<input type="checkbox"/>	D043	Vinyl Chloride	<input type="checkbox"/>	0.2	<input type="checkbox"/>

Based on: Total Analysis TCLP Analysis Generator Knowledge

- 5 Is this a EPA Toxic Waste (D004-D043)* as defined in 40 CFR 261.34?
 - If D009: Is the total Mercury concentration above 200 ppm?
 - If this is a D001, D002, D003(selected) or D004-D043 does it contain any of the Underlying Hazardous Constituents (UHC) above Universal Treatment Standards(UTS):
 - If Yes, include a UTS/UHC form with the profile
 - 6 Is this waste a Dioxin Or Furan per 40 CFR 261.31?
 - 7 a. Is this a Non-Hazardous Waste?
- FOR WASTE DISPOSAL AT PERMA-FIX OF MICHIGAN ONLY:**
- b. Is this a hazardous Waste by state regulation only
 - c. Is this a Michigan Act 451 listed hazardous waste?

YES

NO

If you answered Yes to any question in Section G, enter the appropriate waste code(s) on the lines below.

Waste Codes: _____

Please list any Toxic Release Inventory Constituents per EPCRA Section 313 not identified above.

REV 7/6/00

II. BENZENE NESHAP 40 CFR 21, SUBPART FF (Hazardous waste with Benzene Only)

YES NO

If question 1, 2 or 3 is No, proceed to section I

- 1 Is this waste stream generated at a facility with a SIC code listed under NESHAP, or a TSDF that uses NESHAP waste? SIC Code _____ listed codes: (2800-2899, 2911, or 3312)
- 2 Does the waste contain > 10% water?
- 3 Is the total Annual Benzene quantity from the facility waste greater than 10Mg/Yr (2,200lb/yr).
(If Question 1, 2, or 3 is No, proceed to Section I)
- 4 What is the total Benzene concentration in Your Waste? _____ % of _____ ppmw.
(Do not use TCLP results. Acceptable laboratory methods include 8020, 8240, 8260, 602, and 624)
- 5 What is the TAB quantity for the generator facility? _____ Mg/Year

I. PACKAGING QUANTITY

1 Non-Bulk 1 gal 5 gal 55 gal 85 gal Other drums (5)
 Cubic Yard Boxes Bags Tons Pallets Other _____
 Quantity _____ Per: _____ Month _____ Quarter _____ Year _____
 2 Bulk Tanker Vac Truck Railroad Dump Trailer Closed Top Open Top
 Gallons _____ Pounds _____ Yards _____ Tons _____
 Quantity _____ Per: _____ Month _____ Quarter _____ Year _____

I. DOT SHIPPING INFORMATION:

Enter proper DOT shipping name from 49 CFR 172.101 table

DOT Non-REGULATED MATERIAL (SOILS)

List 2 major components:

SOIL, DEBRIS

Hazard Class NA

UN/NA code NA

PG III

K. ATTACHMENTS: (Check all that apply and include with profile)

- UTS/URC Form
- Analysis
- Additional Description
- Process Flow Diagram
- PCB source statement
- Material Safety Data Sheet
- Generator authorization
- Labpack inventory sheet
- Land Disposal Notification

L. CERTIFICATION:

I hereby certify that all the information submitted in this and all attached documents is complete and accurate. All known and suspected hazards have been disclosed. By signing below, I give Perma-Fix Environmental Services, Inc. and all of its subsidiaries, permission to make minor changes to this profile prior to its acceptance should they find an error or omission.

Printed Name: Dean Peschel Signature: Dean Peschel Date: 12/13/01

**Signatures other than the generator are required to submit an approved authorization letter from the generator to verify this profile

INTERNAL USE ONLY:

Review 1 _____ 2 _____ 3 _____

Profile I.D. No. _____ APPROVED REJECTED Form Code B _____

Waste Codes _____

DOT _____

Destination/Consolidation Code _____ Price & Initial _____

Out Bound Approval _____ Facility _____

Name _____

Chemical Conservation Corp.
FL090059728

Perma-Fix of Michigan, Inc.
MID09060194

Chemical Conservation of Georgia
GAD09330814

REV 7/6/00



Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06040
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

November 21, 2001

FOR: Attn: Ms. Nancy Nichols
GZA GeoEnvironmental
380 Harvey Rd
Airport Business Center
Manchester NH 03103

Sample Information

Matrix: SOLID
Location Code: GZA-NH
Project Code: RUSH#
P.O.#: 4-05318

Custody Information

Collected by: RH
Received by: SW
Analyzed by: see "By" below

Date

11/12/01
11/15/01

Time

0:00
10:55

Laboratory Data

Client ID: DPW BORING SG-1 - SG-5 C-1

SDG I.D.: GAD75160

Phoenix I.D.: AD75160

Parameter	Result	RL	Units	Date	Time	By	Reference
TCLP Silver	BDL	0.01	mg/L	11/16/01		EK	E1311/SW6010
TCLP Arsenic	BDL	0.01	mg/L	11/16/01		EK	E1311/SW6010
TCLP Barium	1.06	0.01	mg/L	11/16/01		EK	E1311/SW6010
TCLP Cadmium	BDL	0.005	mg/L	11/16/01		EK	E1311/SW6010
TCLP Chromium	0.01	0.01	mg/L	11/16/01		EK	E1311/SW6010
TCLP Lead	0.226	0.015	mg/L	11/16/01		EK	E1311/SW6010
TCLP Selenium	BDL	0.05	mg/L	11/16/01		EK	E1311/SW6010
TCLP Mercury	BDL	0.001	mg/L	11/19/01		RS	E1311/E245.1
Percent Solid	84		%	11/15/01		PL	E160.3
Reactivity Cyanide	BDL	1.2	mg/Kg	11/15/01		PJ	SW 846-7.3
Reactivity Sulfide	BDL	24	mg/Kg	11/15/01		PJ	SW846-7.3
Reactivity	Negative			11/15/01		PJ	SW 846-7.3
Soil Extraction for PCB	Completed			11/15/01		PL	3545/3550
TCLP Digestion Mercury	Completed			11/19/01		DD	E1311/7470
TCLP Extraction Herbicides	Completed			11/19/01		PL	EPA 1311
TCLP Extraction Metals	Completed			11/15/01		PL	EPA 1311
TCLP Extraction Pesticides.	Completed			11/17/01		B/H	EPA 1311
TCLP Extraction Semi-Vol	Completed			11/16/01		S	EPA 1311
Extraction of TPH MOD 8100 SM	Completed			11/15/01		PL	3550/5030
Field Extraction	Completed			11/12/01		JH	SW5035

Polychlorinated Biphenyls

PCB-1016	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1221	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1232	ND	400	ug/Kg	11/17/01		JH	SW 8082

Parameter	Result	RL	Units	Date	Time	By	Reference
PCB-1242	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1248	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1254	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1260	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1262	ND	400	ug/Kg	11/17/01		JH	SW 8082
PCB-1268	ND	400	ug/Kg	11/17/01		JH	SW 8082
% DCBP (Surrogate Rec)	81		%	11/17/01		JH	SW 8082
% TCMX (Surrogate Rec)	58		%	11/17/01		JH	SW 8082
<u>TCLP Herbicides</u>							
2,4,5-TP (Silvex)	ND	1.0	ug/L	11/20/01		JH	SW8151
2,4-D	ND	5.0	ug/L	11/20/01		JH	SW8151
% DCAA (Surrogate Rec)	61		%	11/20/01		JH	SW8151
<u>TCLP Pesticides</u>							
Chlordane	ND	0.5	ug/L	11/19/01		KCA	SW 8081
Endrin	ND	0.1	ug/L	11/19/01		KCA	SW 8081
Heptachlor	ND	0.05	ug/L	11/19/01		KCA	SW 8081
Heptachlor epoxide	ND	0.05	ug/L	11/19/01		KCA	SW 8081
Lindane	ND	0.05	ug/L	11/19/01		KCA	SW 8081
Methoxychlor	ND	0.5	ug/L	11/19/01		KCA	SW 8081
Toxaphene	ND	1.0	ug/L	11/19/01		KCA	SW 8081
<u>TPH by GC (Extractable Products)</u>							
Fuel Oil #4	ND	50	mg/kg	11/16/01		CN	8100Modified
Fuel Oil #6	ND	50	mg/kg	11/16/01		CN	8100Modified
Fuel Oil#2 / Diesel Fuel	ND	50	mg/kg	11/16/01		CN	8100Modified
Kerosene	ND	50	mg/kg	11/16/01		CN	8100Modified
Motor Oil	ND	50	mg/kg	11/16/01		CN	8100Modified
Other Oil (Cutting & Lubricating)	ND	50	mg/kg	11/16/01		CN	8100Modified
Unidentified	**1600	50	mg/kg	11/16/01		CN	8100Modified
<u>Volatiles</u>							
1,1,1,2-Tetrachloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,1,1-Trichloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,1,2,2-Tetrachloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,1,2-Trichloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,1-Dichloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,1-Dichloroethene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,1-Dichloropropene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2,3-Trichlorobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2,3-Trichloropropane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2,4-Trichlorobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2,4-Trimethylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2-Dibromo-3-chloropropane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2-Dibromoethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2-Dichlorobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260

Parameter	Result	RL	Units	Date	Time	By	Reference
1,2-Dichloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,2-Dichloropropane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,3,5-Trimethylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,3-Dichlorobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,3-Dichloropropane	ND	250	ug/Kg	11/19/01		KCA	SW8260
1,4-Dichlorobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
2,2-Dichloropropane	ND	250	ug/Kg	11/19/01		KCA	SW8260
2-Chlorotoluene	ND	250	ug/Kg	11/19/01		KCA	SW8260
4-Chlorotoluene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Benzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Bromobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Bromochloromethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Bromodichloromethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Bromoform	ND	250	ug/Kg	11/19/01		KCA	SW8260
Bromomethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Carbon tetrachloride	ND	250	ug/Kg	11/19/01		KCA	SW8260
Chlorobenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Chloroethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Chloroform	ND	250	ug/Kg	11/19/01		KCA	SW8260
Chloromethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
cis-1,2-Dichloroethene	ND	250	ug/Kg	11/19/01		KCA	SW8260
cis-1,3-Dichloropropene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Dibromochloromethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Dibromomethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Dichlorodifluoromethane	ND	250	ug/Kg	11/19/01		KCA	SW8260
Ethylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Hexachlorobutadiene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Isopropylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Methyl Ethyl Ketone	ND	3000	ug/Kg	11/19/01		KCA	SW8260
Methyl tert-butyl ether (MTBE)	ND	500	ug/Kg	11/19/01		KCA	SW8260
Methylene chloride	ND	500	ug/Kg	11/19/01		KCA	SW8260
n-Butylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
n-Propylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Naphthalene	ND	250	ug/Kg	11/19/01		KCA	SW8260
p-Isopropyltoluene	ND	250	ug/Kg	11/19/01		KCA	SW8260
sec-Butylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Styrene	ND	250	ug/Kg	11/19/01		KCA	SW8260
tert-Butylbenzene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Tetrachloroethene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Toluene	ND	250	ug/Kg	11/19/01		KCA	SW8260
trans-1,2-Dichloroethene	ND	250	ug/Kg	11/19/01		KCA	SW8260
trans-1,3-Dichloropropene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Trichloroethene	ND	250	ug/Kg	11/19/01		KCA	SW8260
Trichlorofluoromethane	ND	250	ug/Kg	11/19/01		KCA	SW8260

Parameter	Result	RL	Units	Date	Time	By	Reference
Vinyl chloride	ND	250	ug/Kg	11/19/01		KCA	SW8260
Xylenes, total	ND	250	ug/Kg	11/19/01		KCA	SW8260
%4-Bromofluorobenzene (Surrogate)	106		%	11/19/01		KCA	SW8260
<u>TCLP Acid/Base-Neutral</u>							
1,4-Dichlorobenzene	ND	10.0	ug/L	11/19/01		DRC	SW 8270
2,4,5-Trichlorophenol	ND	10.0	ug/L	11/19/01		DRC	SW 8270
2,4,6-Trichlorophenol	ND	10.0	ug/L	11/19/01		DRC	SW 8270
2,4-Dinitrotoluene	ND	10.0	ug/L	11/19/01		DRC	SW 8270
2-Methylphenol (o-Cresol)	ND	10.0	ug/L	11/19/01		DRC	SW 8270
3&4-Methylphenol (m&p-Cresol)	ND	10.0	ug/L	11/19/01		DRC	SW 8270
Hexachloro-1,3-butadiene	ND	10.0	ug/L	11/19/01		DRC	SW 8270
Hexachlorobenzene	ND	10.0	ug/L	11/19/01		DRC	SW 8270
Hexachloroethane	ND	10.0	ug/L	11/19/01		DRC	SW 8270
Nitrobenzene	ND	10.0	ug/L	11/19/01		DRC	SW 8270
Pentachlorophenol	ND	50.0	ug/L	11/19/01		DRC	SW 8270
Pyridine	ND	10.0	ug/L	11/19/01		DRC	SW 8270
% 2,4,6-Tribromophenol (Surrog Rec)	51		%	11/19/01		DRC	SW 8270
% 2-Fluorobiphenyl (Surrogate Rec)	75		%	11/19/01		DRC	SW 8270
% 2-Fluorophenol (Surrogate Rec)	18		%	11/19/01		DRC	SW 8270
% Nitrobenzene-d5 (Surrogate Rec)	106		%	11/19/01		DRC	SW 8270
% Phenol-d5 (Surrogate Rec)	7.2		%	11/19/01		DRC	SW 8270
% Terphenyl-d14 (Surrogate Rec)	70		%	11/19/01		DRC	SW 8270

Comments:

ND=Not detected BDL = Below Detection Limit RL=Reporting Limit

**Petroleum hydrocarbon chromatogram was not a perfect match with any of the standards, but most closely resembles motor oil.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.



Phyllis Shiller, Laboratory Director
November 21, 2001



Environmental Laboratories, Inc
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06040
Tel. (860) 645-1102 Fax (860) 645-0823

QC Report

AD75161

November 21, 2001

Sample ID AD75161

<i>Analysis:</i>	Mercury Analysis QC			<i>AD75161</i>
QC Source: ULTRA NY 3506	Blank PPM	QC Check (% Rec.)	QC Spike (% Rec.)	QC Sample Replicate (% change)
Analyte				
Hg Mercury	<0.0002	94	94	NC

Analysis: ICP Metals Analysis QC

AD75161

QC Source: ICP 1+2
 ERA 99104,99109,99111 Blank
 ICP CLP1+3
 Analyte

QC Check Sample (% Rec.)

QC Spike Sample (% Rec.)

QC Sample Replicate (% change)

Analyte	QC Check Sample (% Rec.)	QC Spike Sample (% Rec.)	QC Sample Replicate (% change)
Ag Silver	101	95	NC
Al Aluminum	102	101	NC
As Arsenic	101	101	NC
B Boron	104	108	NC
Ba Barium	101	106	NC
Be Beryllium	104	119	NC
Ca Calcium	102	--	7.5
Cd Cadmium	104	115	NC
Co Cobalt	104	110	NC
Cr Chromium	104	110	NC
Cu Copper	101	109	10.3
Fe Iron	104	110	NC
K Potassium	104	--	8.2
Mg Magnesium	103	--	6.8
Mn Manganese	104	107	NC
Mo Molybdenum	102	115	NC
Na Sodium	104	--	6.3
Ni Nickel	103	109	NC
P Phosphorus	102	--	NC
Pb Lead	102	110	NC
Sb Antimony	102	--	NC
Se Selenium	102	124	NC
Sn Tin	101	--	NC
Sr Strontium	102	119	8.1
Ti Titanium	102	--	NC
Tl Thallium	--	101	NC
V Vanadium	104	108	NC
Zn Zinc	105	113	NC

Analysis: PCB QC

AD75161

Analyte	Method Blank (ppb)	LCS (% Rec)	Matrix Spike (% Rec)	Matrix Spike Dup. (% Rec)	RPD
PCB-1016	ND				
PCB-1221	ND				
PCB-1232	ND				
PCB-1242	ND				
PCB-1248	ND				
PCB-1254	ND				
PCB-1260	ND	92.0%	121%	*1200%	nc

*PCB Matrix spike duplicate from extraction batch contained elevated levels of aroclor 1260. All samples associated with this extraction batch were non-detect.

Analysis: Reactive Cyanide QC

AD75161

QC BLANK:<1.0
 QC CHECK SAMPLE % RECOVERY:83
 QC SAMPLE REPLICATE % CHANGE:N/C

UNITS:MG/KG
 QC SOURCE: ULTRA#77343
 REPLICATED SAMPLE:Ad75209

Analysis: Reactivity Sulfide QC

AD75161

QC BLANK:<10.0
 QC SAMPLE REPLICATE % CHANGE:N/C

UNITS:mg/Kg
 REPLICATED SAMPLE:Ad75209

Analysis: Semivolatile (MS) Analysis QC

AD75161

Semivolatile Analyte	Matrix Spike (%Rec)	Spike Dup. (%Rec)	% Diff. (% D)
Phenol	86	99	14
2-Chlorophenol	63	77	19
1,4-Dichlorobenzene	68	70	3
N-Nitroso-di-n-prop.	125	126	1
1,2,4- Trichlorobenzene	85	85	0
4-Chloro-3-methylphenol	114	114	0
Acenaphthene	84	84	0
2,4-Dinitrotoluene	85	85	0
Pentachlorophenol	3	3	0
Pyrene	85	84	1

No target analytes were detected to the stated detection limits in the applicable method blanks with the following exceptions:

NONE

Analysis: TCLP Herbicides (GC) QC

AD75161

Analyte	Method Blank (ppb)	Matrix Spike (% Rec.)	Matrix Spike (% Rec.)	%RPD Duplicate
2,4-D	ND	141%	140%	0.7%
2,4,5-TP (Silvex)	ND	81.0%	79.2%	2.2%
2,4,5-T	ND	95.0%	98.0%	3.1%

Analysis: TCLP Pesticides (GC) QC

AD75161

Analyte	Method Blank (ppb)	Matrix Spike (% Rec)	Matrix Spike Dup. (% Rec.)	RPD
-				
g-BHC	ND	61%	71%	15%
Heptachlor	ND	48%	61%	23%
Aldrin	ND	40%	53%	29%
Dieldrin	ND	75%	91%	20%
Endrin	ND	73%	87%	17%
4,4'-DDT	ND	49%	68%	32%

No analytes in the method blank were above the reported detection limits.

Analysis: Volatiles (MS) Analysis QC

AD75161

Analyte	Matrix Spike (Rec)	Matrix Spike Dup (%Rec)	Relative %Diff (%D)
Benzene	94%	96%	2%
Chlorobenzene	100%	100%	0%
1,1-Dichloroethylene	94%	96%	2%
Toluene	102%	90%	12%
Trichloroethylene	86%	92%	7%

No analytes were detected in the applicable method blanks above the stated detection limits with the following exceptions:

(NONE)

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.



Phyllis Shiller
Laboratory Director

W.O. # _____
 (for lab use only)

Sample I.D.	Date/Time Sampled (Very Important)	Matrix	Sample Type	ANALYSIS REQUIRED		Total # of Cont.	Note #
				WW ONLY	DW		
59-1, 59-2, 59-3, 59-4, 59-5	11/12/01	S	G	<input type="checkbox"/> 624 <input type="checkbox"/> 625	<input type="checkbox"/> 524.2 <input type="checkbox"/> 502.1	5	1
C-1	11/12/01	SOIL	C	<input type="checkbox"/> 601 <input type="checkbox"/> 602	<input type="checkbox"/> 801 <input type="checkbox"/> 802	1	2
75160							
751610C							
* analysis	see hand						

METALS SAMPLES ("F" INDICATES THAT THE SAMPLE WAS FILTERED IN THE FIELD)

PRESERVATIVE (Cl - HCl, Me-Methanol, N - HNO3, S - H2SO4, Na - NaOH, O - Other)*

CONTAINER TYPE (P-Plastic, G-Glass, V-Vial, T-Teflon, O-Other)*

RELINQUISHED BY: (AFFILIATION) DATE/TIME RECEIVED BY: (AFFILIATION)

RELINQUISHED BY: Richard E. Williams 11/14/01 RECEIVED BY: URS

RELINQUISHED BY: (AFFILIATION) DATE/TIME RECEIVED BY: (AFFILIATION)

RELINQUISHED BY: URS 11/14/01 RECEIVED BY: Judith Kelly 11/15/01

RELINQUISHED BY: (AFFILIATION) DATE/TIME RECEIVED BY: (AFFILIATION)

RELINQUISHED BY: URS DATE/TIME RECEIVED BY: URS

PROJECT MANAGER: Nancy J. Nichols EXT: 4397

GZA GEOENVIRONMENTAL, INC.
ENGINEERS AND SCIENTISTS

Airpark Business Center
 380 Harvey Road
 MANCHESTER, NH 03103-3347
 (603) 623-3600
 FAX (603) 624-9463

PHOENIX

TURNAROUND TIME: Standard Rush Days, Approved by: _____ TEMP. OF COOLER _____ °C

GZA FILE NO: 22457 P.O. NO. 4-05318

PROJECT DPW BORING

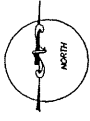
LOCATION DOVER, NH

COLLECTOR(S) RICHARD WILLIAMS SHEET 1 OF 1

NOTES: (Unless otherwise noted, all samples have been refrigerated to 4°C)
 *Specify "Other" preservatives and container types in this space.
 1. TCLP - VOC OF COMPOSITES OF 5 VIALS.
 2. TCLP - PCRAg, semi-VOCs, Pesticides, Herbicides, total PCBs, Iquidibility, Corrosivity, Reactivity, TPH.
 3. AS QUOTED TO KENT ARMSTRONG
 YOU MUST INCLUDE AN ECL PURCHASE ORDER NUMBER WHEN SHIPPING SAMPLES DIRECTLY TO ALPHA ECL P.O. # _____
 Contact ECL at 508-436-9244 Ext. 4721 - Sample Receiving for a Purchase Order Number.

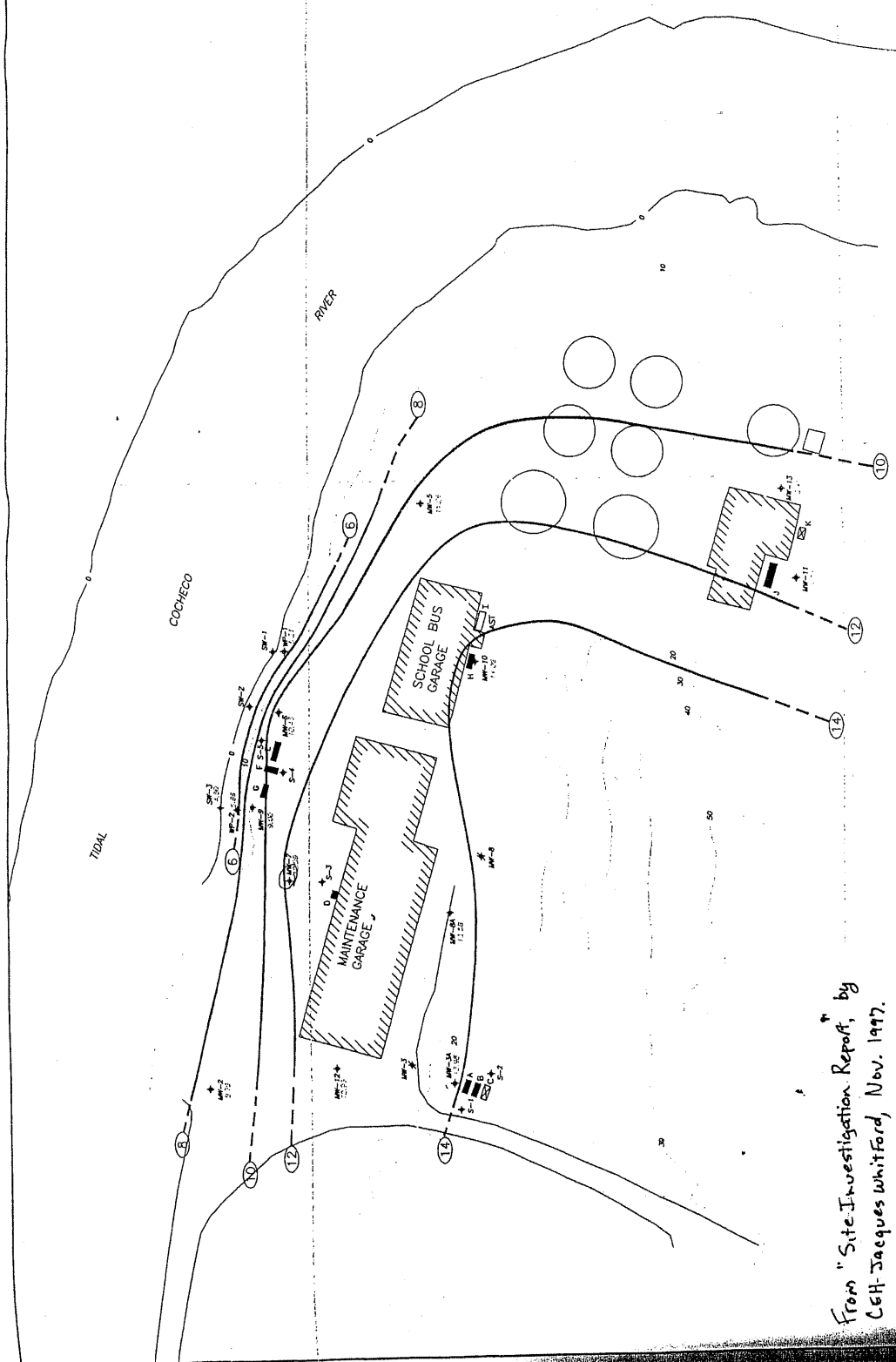
APPENDIX D

DRUM DISPOSAL DOCUMENTATION

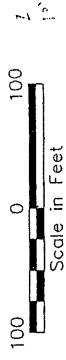


Legend

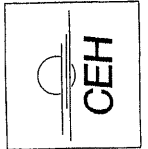
- SOIL BORING
 - 5-1
 - 5-2
 - 5-3
 - 5-4
 - 5-5
- MONITORING WELL
 - 5M-1
 - 5M-2
 - 5M-3
 - 5M-4
 - 5M-5
- WELL NOT FOUND
 - 5M-6
- SURFACE WATER MONITORING LOCATION
 - 5SW-1
- WATER TABLE ELEVATION (Feet - Assumed Datum)
 - 10.15
- POTENTIOMETRIC SURFACE CONTOUR (Dashed Where Inferred)
 - 10
- FORMER LOCATION OF UST WITH TANK IDENTIFICATION
 - ESG
- UST REMOVED PRIOR TO TMM'S 1996 WORK
 - ST
- ABOVE-GROUND STORAGE TANK WITH TANK IDENTIFICATION
 - 10
- TOPOGRAPHIC CONTOUR (Feet - Mean Sea Level)
 - 10



From "Site Investigation Report", by
CEH-Jaques Whitford, Nov. 1997.



Scale in Feet



Caswell, Eichler & Hill, Inc.

PORTSMOUTH, NEW HAMPSHIRE

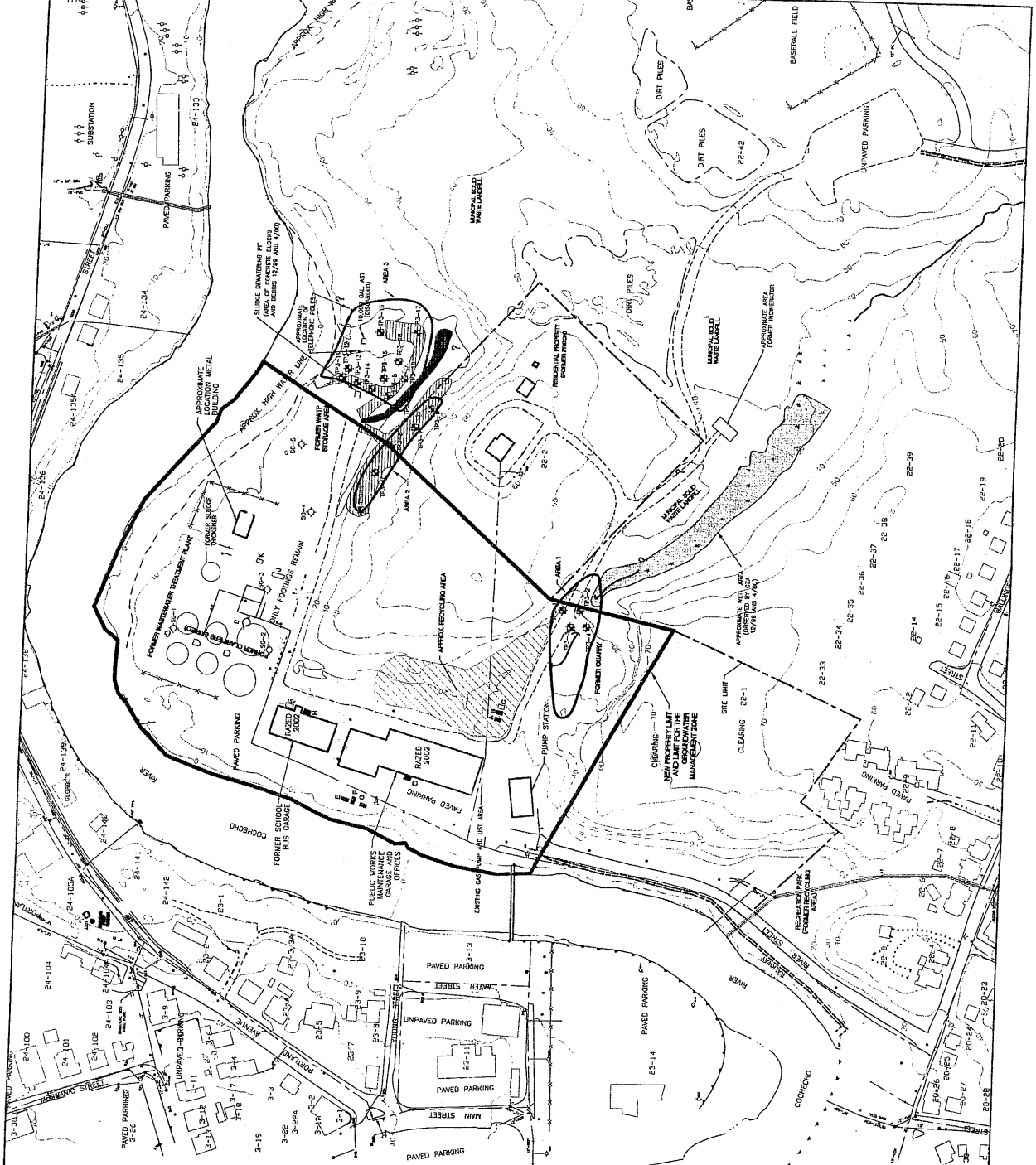
DATE PREPARED: 10-15-97
REGION: DATE: 10-15-97
FILE NAME: DOVER DPW/BWL/MAP

DESIGNED BY: CMT	CHECKED BY: CMT	PROJECT NAME/NUMBER: RIVER ST DPW - 31/PET
DRAWN BY: CMT	CREATED BY: CMT	ISSUANCE SCALE: 1"=100'
DATE: 10-15-97	REGION: 10-15-97	PROJECT: RIVER ST DPW - 31/PET
FILE NAME: DOVER DPW/BWL/MAP	PROJECT: RIVER ST DPW - 31/PET	ISSUANCE: RIVER ST DPW - 31/PET

DRAWING TITLE: WATER TABLE MAP
DATE: JUNE 4, 1997
PROJECT: RIVER ST DPW - 31/PET
ISSUANCE: RIVER ST DPW - 31/PET
SCALE: 1"=100'

NOTE: Base plan adapted from Dunn, 1991.

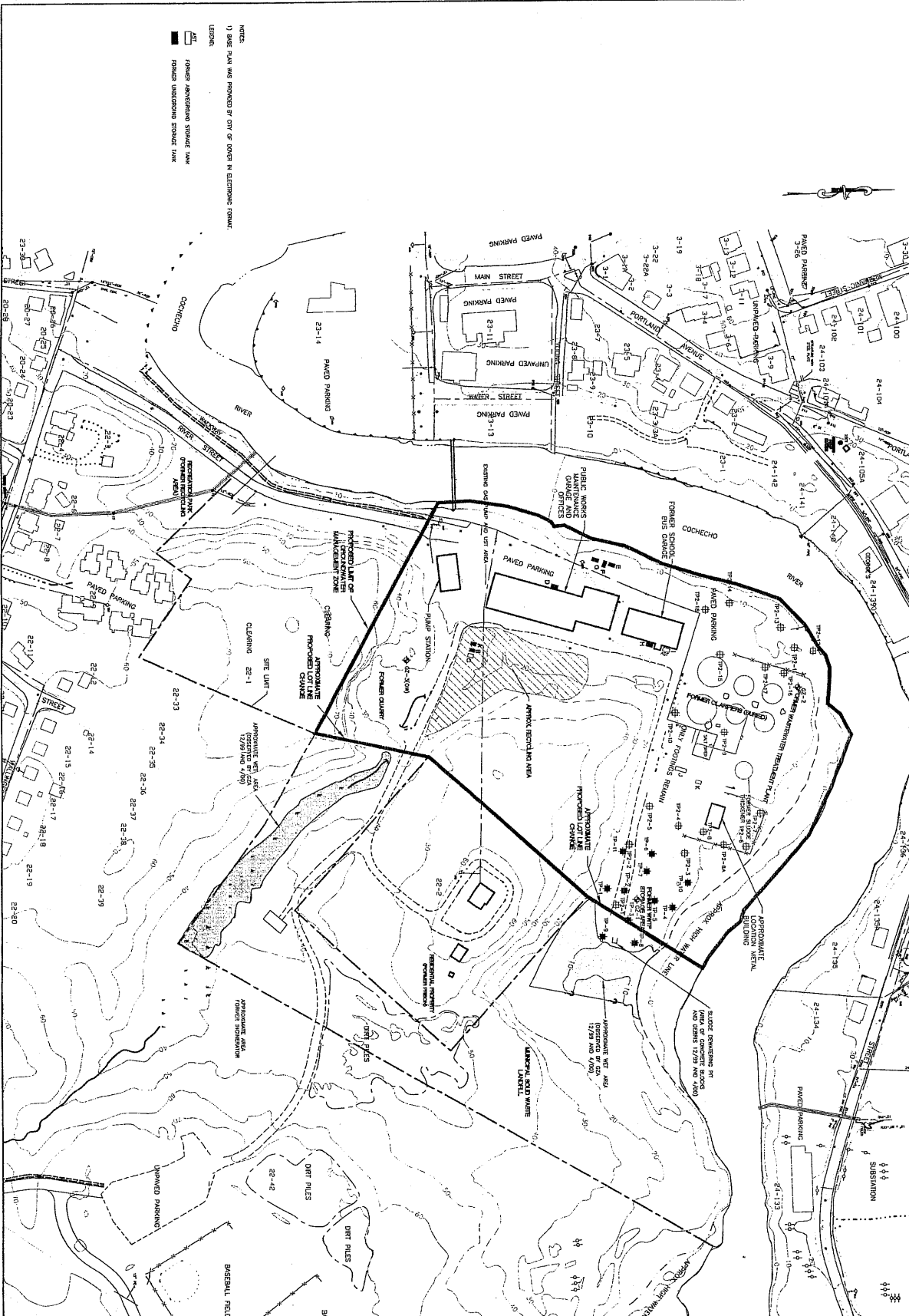
DESIGNED BY: T.L.H. CHECKED BY: J.M.N. APPROVED BY: S.R.L. DRAWN BY: R.L.C. SCALE: 1"=100' DATE: JULY 2002			GZA Geotechnical, Inc. 300 W. WASHINGTON ST. ANN ARBOR, MI 48106 (800) 823-2600	PROJECT No. 22457 SHEET No. 2
DOVER PUBLIC WORKS RIVER STREET DOVER, NEW HAMPSHIRE				CURRENT EXPLORATION LOCATION PLAN
REV#	DESCRIPTION	BY	DATE	



NOTES:

- 1) BASE MAP WAS PROVIDED BY THE CITY OF DOVER IN ELECTRONIC FORMAT.
- 2) FORMER TANK LOCATIONS ARE FROM A REPORT BY DAVID GEORGE, LLC DATED 1998.
- 3) FORMER TANK LOCATIONS ARE FROM A REPORT BY DAVID GEORGE, LLC DATED 1998.
- 4) CURRENT EXPLORATION LOCATIONS ARE BASED ON UNITS OF 2001 OBSERVATIONS AND, THEREFORE, ARE APPROXIMATE.

- LEGEND:
- FORMER ABOVEGROUND STORAGE TANK
 - FORMER UNDERGROUND STORAGE TANK
 - GSA 300 GAS MONITORING WELL
 - 30-1 GSA 300 GAS MONITORING WELL
 - 30-20 TEST PIT EXCAVATION, OCTOBER 2001 (PWS-SERIES)
 - CUT FILL
 - LOW-LYING MARSH
 - BORN



NOTES:
 1) BASE PLAN WAS PROVIDED BY CITY OF DOVER IN ELECTRONIC FORMAT.
 LEGEND:
 [Symbol] FOUNDED APPROXIMATE STORAGE TANK
 [Symbol] FOUNDED UNDERGROUND STORAGE TANK

PROJECT NO.: 22457 SHEET NO.: 2	DOVER PUBLIC WORKS RIVER STREET DOVER, NEW HAMPSHIRE	DESIGNED BY: J.L.H. CHECKED BY: N.J.N. APPROVED BY: S.R.L. DRAWN BY: M.A.N. SCALE: 1"=100' DATE: AUG 2000	GRAPHIC SCALE 0' 100' 200' 300'	GZA GeoEnvironmental, Inc. Engineers and Scientists 380 HARVEY ROAD MANCHESTER, NEW HAMPSHIRE 03103 (603) 623-3600	REVISIONS NO. DESCRIPTION BY DATE
		SITE PLAN	GZA GeoEnvironmental, Inc. Engineers and Scientists 380 HARVEY ROAD MANCHESTER, NEW HAMPSHIRE 03103 (603) 623-3600		REVISIONS NO. DESCRIPTION BY DATE

