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REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN

FOR RITE-OFF, INC.
BAY SHORE, NEW YORK
SUFFOLK COUNTY

NYSDEC SITE #1-52-129

ENVIRONMENTAL CONSERVATION
RECEIVED
MAR 9 1994
REGIONAL DIRECTOR
REGION 1

MARCH 1994

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MAR 16 1994
HAZARDOUS WASTE REMEDIATION
NYSDEC REGION 1

Project Requested By: **New York State Department of Environmental Conservation**

Project Manager: Richard J. Baldwin

Richard J. Baldwin, C.P.G.

Project Quality Assurance Officer: Daniel J. Smith

Daniel J. Smith

Officer-in-Charge at H2M:

Gary J. Miller, P.E., Vice President

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HOLZMACHER, McLENDON & MURRELL, P.C.
CONSULTING ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

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March 8, 1994

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HAZARDOUS WASTE REMEDIATION
NYSDEC REGION 1

Chittibabu Vasudevan, Ph.D. P.E.
Chief-Eastern Projects Section
NYSDEC
50 Wolf Road
Albany, NY 12233-7010

RE: Draft Final RI/FS Work Plan for Rite-Off, Inc.
Order on Consent Index #W1-0661-93-09
Site Code #1-52-129

Dear Dr. Vasudevan:

In accordance with the conditions set forth in the above-referenced Order on Consent, enclosed herewith please find three (3) copies (including one (1) unbound copy) of the Draft Final RI/FS Work Plan for the subject site.

In addition, the appropriate number of copies of this Draft Final Work Plan have been transmitted to the respective parties as indicated in the Order on Consent.

We await your approval of the Work Plan so that we may begin implementation as soon as possible. Should you have any questions, please feel free to contact my office (extension 611).

Very truly yours,

HOLZMACHER, McLENDON & MURRELL, P.C.

Richard J. Baldwin

Richard J. Baldwin, C.P.G.
Project Manager/Senior Hydrogeologist

RJB/rjb

Enclosure

cc: Howard Rapps (w/one enclosure)
Robert Fardella, Esq. (w/one enclosure)
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Director, Bureau of Environmental Exposure Investigation, NYSDOH (w/two enclosures)

REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN

FOR RITE-OFF, INC.
BAY SHORE, NEW YORK
SUFFOLK COUNTY

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MARCH 1994

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY WORK PLAN
RITE-OFF, INC.
1545 and 1555 FIFTH INDUSTRIAL COURT
BAY SHORE, NEW YORK

SITE NO. 1-52-129

MARCH 1994

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

WORK PLAN

FOR

NYSDEC SITE # 1-52-129

RITE-OFF, INC. SITE

1545 and 1555 FIFTH INDUSTRIAL COURT

BAY SHORE, NEW YORK

MARCH 1994

1.0 - BACKGROUND

This work plan provides a scope of work for the conductance of a remedial investigation/feasibility study (RI/FS) at the site located at 1545 and 1555 Fifth Industrial Court, Bay Shore, New York. The Rite-Off, Inc. (Rite-Off) property (hereinafter referred to as "the site") has been listed by the New York State Department of Environmental Conservation (NYSDEC) in the Registry of Inactive Hazardous Waste Disposal sites in New York State (Site Number 1-52-129). The NYSDEC has classified the site as a Classification "2" (Class 2 Site) due to volatile organic contamination at the property.

The RI/FS will provide data on current site conditions and will be used to recommend remedial measures, as appropriate. This RI/FS will be conducted under an executed order on consent. Data gathered during the RI/FS will be used for developing, evaluating, and selecting remedial actions and alternatives. Any deviation from the agreed upon protocols in this work plan will be discussed with the NYSDEC prior to implementation.

1.1 - Objectives

The overall objectives of the RI/FS are to determine the nature and extent of contaminants at the site. The information gathered during the investigation will be presented to NYSDEC and used to initiate remedial measures, if and where appropriate. The specific objectives of the RI/FS are as follows:

(1) Provide sufficient analytical data on the site so that areas that have been previously identified or suspected as potential source areas of contamination are confirmed or are determined to be either free of contamination or below regulatory levels.

(2) If source areas are present, determine the nature, type, physical extent and migratory path of contamination at and/or emanating from that location so that appropriate remedial measures can be implemented.

(3) Determine the impact of contamination quantified on human health and the environment.

(4) Document areas that are free of contamination or are already properly remediated to NYSDEC.

(5) Present and discuss the data necessary to support the development of remedial measures.

(6) Identification and screening of remedial technologies.

(7) Screening and development of remedial alternatives.

Analytical data will be collected to achieve these objectives using methods in accordance with NYSDEC protocols and analyzed by approved methods subject to NYSDEC Analytical Services Protocol (ASP) Contract Laboratory Protocol (CLP) procedures. The investigation will draw upon data acquired in previous investigations conducted at the site as well as the new data acquired during this study to the maximum extent possible.

In addition to this RI/FS Work Plan, interim remedial measures (IRMs) will be proposed by Holzmacher, McLendon, and Murrell, P. C. (H2M) upon review of preliminary data collected during the RI. An IRM work plan will be submitted to NYSDEC prior to implementation. The potential pathways of contaminant migration are air, soil and groundwater. This RI/FS will concentrate on the soil and groundwater pathways, which have been shown in previous studies to be the most significant at this site. Groundwater monitoring will be utilized to estimate if groundwater contamination exists, as well as to determine groundwater flow direction and velocity.

The subsequent RI/FS report will be formatted as outlined in the US Environmental Protection Agency (USEPA) Guidance Document, "Guidance on Remedial Investigations Under CERCLA", EPA 540/G-89/004, October 1988 and the draft "Interim Final Guidance for Conducting RI/FS under CERCLA" EPA October 1988. Development of this work plan in conjunction with the site-specific Health and Safety Plan, are the initial requirements for a RI/FS.

2.0 - SITE BACKGROUND AND HISTORY

2.1 - Site Description and Operation

The site is identified as 1545 and 1555 Fifth Industrial Court, Bay Shore, New York (see Figure 2.1.1). The main manufacturing building (1545 location) was leased by Rite-Off in 1974 (see Figure 2.1.2). This building was occupied by an electronics company, followed by a lamp company prior to occupancy by Rite-Off. Rite-Off purchased the parcel in 1984 and later expanded by building an adjacent warehouse in 1986 (designated as 1555 Fifth Industrial Court). Activities conducted at the Rite-Off site once included blending and packaging spray lubricants, spray solvents, spray insecticides and other aerosol products. The company employed approximately 35 people. In July 1987, National Designs and Development Corporation, an architectural firm, entered into a lease of 2,400 square feet of the warehouse at the 1555 building exclusively for office space. The main manufacturing building at 1545 was vacated on September 30, 1993. As of January 28. 1994, the 1545 location was occupied by Finish Line Technologies, a bicycle-maintenance products distributor. National Designs and Development Corporation recently vacated the warehouse late in December 1993. As of January 27, 1994, the 1555 location was occupied by Essco Distributors, Inc., and Essco Parts, Inc., a tree and pest-control equipment distributor.

The approximate 2.9 acre site is occupied by two single-story industrial buildings (see Figure 2.1.2). The property is bordered by a chain link fence along the southern and western property boundaries and by Fifth Industrial Court on the eastern and northern property boundaries. The site is generally level and a portion of it is paved with asphalt.

The property is situated in a highly industrialized area of Bay Shore, New York. To the north of the property is a waste transfer station, a Sears & Roebuck Company warehouse, and a chemical company; to the east is a vacant lot, an office building and a plastics manufacturer; to the southeast is a garbage hauling company; and to the west is a residential community.

The site reportedly had a number of chemical storage areas on site. A number of 55-gallon drums containing spent solvents and solvent recycling sludge (still bottom material) were stored inside the building in an area specifically allocated for this purpose until removed by Cycle Chemical Company for disposal. Historically, previous storage areas on site included a fenced area behind the manufacturing building where drums were placed on pallets, and allegedly behind the warehouse to the former trailer area. Defective spray cans were emptied of their contents and stored for thirty (30) days in trailers behind the warehouse prior to being placed in a dumpster as non-hazardous waste.

There is one (1) 5,000-gallon fuel UST adjacent to the northwest corner of the manufacturing building. Four (4) above-ground tanks were once used at the site: one (1) containing CO_2; one (1) containing Freon-12; and two (2) containing Freon-22. These tanks have been removed from the site at different times prior to and during 1993. The former tank area was located behind (immediately south of) the manufacturing building (see Figure 2.1.2).

Six (6) storm water runoff dry wells with open-grate covers provide drainage for the 1545 site and are located in the front and rear of the property in the paved areas. Six (6) storm water runoff dry wells with open-grate covers provide drainage for the 1555 location and are located in the front of the warehouse in the paved area (see Figure 2.1.2). Water is supplied by the Suffolk County Water Authority (SCWA). There are no on-site diffusion or supply wells. Non-contact cooling water from a reclamation still was discharged to the on-site septic system.

The two (2) on-site buildings utilize separate septic systems. At the 1545 location, the septic system consists of a septic tank and leaching pool. Only one (1) leaching pool has a surface access (solid manhole cover). Other overflow leaching pools have not been identified at this time. The 1555 building most likely utilizes a septic tank and two (2) leaching pools.

The processes which were conducted at the facility consisted of blending raw materials in mixing vessels, transferring blended materials into aerosol cans, and pressurizing the cans. The finished product was then "burst tested" at elevated temperature under controlled conditions. Once a can had passed the required test, they were stenciled or a gummed label was applied for identification. The cans were then transported to the 1555 Fifth Industrial Court warehouse for storage prior to shipping.

Other factory operations included the distilling and reclamation of solvents. Solvents which were contaminated with products during cleaning operations were reclaimed for future use using an electrically heated still. This still boiled the solvent, and condensed the purified vapors (non-contact water flowing through the condenser apparatus was used to condense the hot vapor). This non-contact water was then discharged to the on-site sanitary septic system. The residual still bottom sediments were then disposed of off site by a licensed industrial waste hauler.

On October 19, 1993, H2M conducted a walk through of both on-site buildings and the property. (See Figure 2.1.3 for site plan with interior detail.) The objective of the site visit was to meet with the property owner to conduct an inspection of the buildings and property in order to identify the present conditions.

The Rite-Off site was recently vacated on September 30, 1993. Both the manufacturing and warehouse buildings were constructed on a solid concrete foundation with no basements.

The main offices, which were located in the northeast portion of the manufacturing building were generally clean. The remainder of the manufacturing building was space dedicated to the production and packaging of products. Markings on the concrete floor provided evidence of the three (3) former production lines in the central portion of this building. The markings were tentatively identified as residues of oil and grease. There are no floor drains associated with these former production lines. Expansion joints in the concrete floor were noted (although no surface stains were visible at these locations).

Much of the piping, conduits (electric drops and extraneous wiring) associated with the previous processes at Rite-Off were being removed at the time of the site visit. Some equipment remains in the manufacturing building including an air compressor in the southeast corner, sprinkler manifold in the northeast corner, and furnace enclosed in the northwest corner. In the furnace room, a small floor drain (6" diameter on surface) still exists which was used as a blow-out to the furnace. This is the only floor drain in the building. The discharge point of the floor drain will be investigated during the RI.

Directly north of the southwest corner inside the building are the remains of a diked area which housed the former 1,1,1-trichloroethane (1,1,1-TCA) 5,000 gallon above-grade tank. Directly north of the diked area was the former flammable mixing room. This room housed six (6) to eight (8) standup, 550 gallon product tanks on the north wall of the room. All of these tanks have been removed. This room contained all explosion proof lighting, blow-out sections (in the roof), vents, exhausts, and an epoxy coated floor. Minor floor markings were evident in this room. Fill lines (remote fills) on the outside of the building fed into and provided a means for filling the tanks from delivery trucks outside. A diked area outside is located around the remote fills where trucks downloaded product. The diked area was constructed (specified) to contain

8,000 gallons of product. All doorways into the manufacturing building were bermed towards the interior of the building (including doorways into the offices).

The four (4) above-grade (CO_2, Freon 12, and two (2) Freon 22) tanks were removed from the concrete pad on the southern exterior side of the manufacturing building prior to October 1993. The 5,000 gallon #2 fuel oil (below grade) tank exists off the northwestern corner of the building (a vent line was observed off the northwest corner of the building). This fuel oil tank was precision tested by a licensed tank testing firm on April 1, 1992, and passed. Plans are currently being considered for the removal of this tank.

The warehouse building (1555 location) floors were generally clean with no extensive surface staining or cracks and did not contain any equipment at the time of the October 1993 site visit. No floor drains were observed in this building. The northwest portion of this building was dedicated to National Designs and Development Corporation, an architectural firm. No chemical use was reported for this segment of the building. In the central northeast side of the building were the main bathrooms. Just off the east wall of the bathrooms was a slop sink which is piped (discharges) to the septic system. Roof drains for this building run through pipes along the interior building columns. Discharging points for these drains are unknown. The design of the roof drain system may be further investigated during the RI (based upon the initial RI findings).

The front or northern portion of the property was generally free of debris and monitoring wells MW-1 and MW-2 were secure and in good condition (see Figure 2.1.3). The paved area in between the two (2) buildings was being used to store old metal shelving, benches, and wood (planks and pallets). However, this area was fairly accessible and protected by an east-west trending fence connecting the two (2) buildings.

A bare dirt area exists on the southeast side behind the warehouse building. This area marks the location of the former trailer storage where reportedly four (4) box trailers stored damaged spray cans, plastic caps, and drums awaiting disposal. This area was previously believed to be in between the two (2) on-site buildings. However, this was clarified by Mr. Rapps (present owner of the site). Therefore, the former trailer area behind the warehouse is an area of concern in addition to the paved area in between the buildings.

The area to the south of the warehouse and dirt area consisted of an open area of dirt and vegetation (brush). A large area of the parking lot in the central-southern portion of the property was covered by wooden pallets. Flooding around storm drains SD-6 and SD-7 was evident (large puddle) during the site visit which indicated a clogged or broken connection pipe between SD-6 and SD-4 (SD-4 was connected to SD-6 and SD-7) or fine-grained sediment has clogged the walls and bottoms of the storm drains. Monitoring wells MW-4 and MW-5 were secured and in good condition. However, MW-3 was in need of repair. Figure 2.1.3 depicts the pertinent site features and monitoring well locations as described above.

On January 24, 1994, H2M personnel inspected the storm drain system in front (on the north side) of the warehouse building. Six (6) storm drains with grate covers were located in front of the warehouse, one (1) of which was previously identified (SD-1 on Figure 2.1.2). The five (5) other storm drains have been labeled SD-8 through SD-12.

In addition, two (2) leaching pools were identified in front of the warehouse with solid covers exposed at grade. These two (2) leaching pools were eight foot diameter pools and were located approximately 30 feet to the north of the "house trap" located off the north wall of the warehouse. It appears that these pools are part of the septic system, although this will be verified during the RI.

H2M has identified one (1) interior roof drain within the warehouse. The discharge point of this drain is unknown at this time and may be further investigated during the RI.

Additionally, the NYSDEC was concerned about the two (2) plastic sinks (drains) which were identified at the warehouse location (near the fire suppression system) off the interior north wall. H2M identified these drains as basins for the reduced pressure zone (RPZ) valves located directly above them. These basins collect water discharged from the RPZ assembly to prevent back siphonage or back pressure into the public potable water supply system. If a large quantity of water was used nearby, a back pressure may be created on the customers water service which will cause the RPZ valve to open automatically. Water released from the RPZ would then be collected in these plastic basins and discharged through an above grade outlet on the exterior wall of the building. H2M has poured water into each basin and confirmed the two (2) above-grade discharge points.

2.2 - Previous Site Investigations and Remediation

Previous site investigations conducted at the facility were reviewed and a summary is presented below. Additional historic information was provided by the current site owner, Mr. Howard Rapps.

In September of 1983, the manufacturing building was vandalized and the trespassers opened tanks containing tetrachloroethene (PCE) and mineral spirits. Although the mineral spirits spill was contained inside the building, approximately 120 gallons of PCE was reported by Suffolk County Department of Health Services (SCDHS) to have spilled outdoors to the storm drains in the rear of the building. Rite-Off reported the incident to the Suffolk County Police Department, SCDHS, NYSDEC and USEPA. With SCDHS oversight, RGM, Inc., was hired to cleanup the

spill, which included pumping out the storm drains and excavation of soils where the PCE was diverted.

In December 1986, the NYSDEC performed sampling at the site and found elevated concentrations of solvents, including PCE, in a sample collected at the loading dock storm drain (SD-5 in Figure 2.1.3). Storm drain SD-5 is not a dry well and allegedly overflows to storm drain SD-4. A subsequent sampling event in June 1987 did not reveal as high a contaminant level, but did confirm the presence of contaminants in on-site soils and waters. Thereafter, the NYSDEC issued a Draft Order on Consent for the site. This order required the completion of a Phase II Investigation at the property.

H2M was retained to perform a Phase II Investigation at the site. The objective of the Phase II Investigation was to characterize the soil and groundwater beneath the site focusing on the previous drum storage areas, all seven (7) on-site storm water run-off dry wells, and the sanitary system leaching pool. The Phase II also included the determination of a Hazard Ranking System Score (HRS) for the site. The Phase II was conducted in conformance with a work plan dated April 1988 and approved by the NYSDEC. The results of the Phase II are presented in a report entitled, "Phase II Investigation - Rite-Off, Inc., Bay Shore, New York, Suffolk County - NYSDEC Site No. 1-52-129", dated July, 1989.

The results of the Phase II indicated the presence of volatile organic compounds (VOCs) in surface soils at the site. The primary contaminant was PCE. PCE was detected in the soils at the rear drum storage area and beneath the paved driveway at two (2) locations sampled between the two (2) on-site buildings.

In addition to surface soil locations, VOCs were detected in four (4) of the on-site storm drains located in the rear of the property (SD-4, SD-5, SD-6 and SD-7). The primary contaminants were 1,1,1-trichloroethane (1,1,1-TCA) and PCE.

At the present time, the primary areas of concern on the site are noted to be the former rear drum storage area and the sediments in the rear storm drains. The probable source of contamination of the rear storm drains has been identified as the spill of PCE that occurred in September of 1983, when the manufacturing building was vandalized.

During the implementation of this RI/FS Work Plan, H2M proposes to conduct a comprehensive historical and sampling investigation of the 1555 Fifth Industrial Court (warehouse) on the western portion of the site. The NYSDEC requested that additional data be collected in the former trailer area in back of the warehouse building to characterize the subsurface conditions in this vicinity. The objective of this investigation is to obtain data to ascertain an accurate account of past land use and to determine whether a potential source of contamination is present on this parcel. The information obtained from this investigation may be applied to delisting this portion of the site, if applicable.

3.0 - HYDROGEOLOGY

The regional and local hydrogeology of the area surrounding the site is presented in this section of the Work Plan.

3.1 - Regional Hydrogeology

The geologic formations that underlie Suffolk County are composed of a series of thick deposits of unconsolidated water-bearing sediments of late Cretaceous and Pleistocene age. These unconsolidated deposits are underlain by crystalline bedrock of Precambrian age.

There are three (3) primary water-yielding aquifers underlying Suffolk County and the site. These aquifers, from shallow to deep are: (1) upper glacial; (2) Magothy; and (3) Lloyd aquifers. The Magothy has been reported to be semi-confined (confined in areas where the Gardiners clay unit is present). The underlying Lloyd Aquifer is confined due to an overlying clay unit identified as the Raritan Clay.

The upper glacial aquifer, consisting of highly permeable sand and gravel with occasional thin clay beds, is more commonly used for drinking water in eastern Suffolk County than in the more densely populated western Suffolk County. The upper glacial aquifer is approximately 100 feet thick in the Bay Shore area. The Magothy aquifer is the principal water supply aquifer underlying Suffolk County. It consists primarily of lenticlular beds of very fine to medium sand that are interbedded with clay and sandy clay, silt and some gravel and sand. Beds of coarse sand with gravel are common in the lower 100 to 150 feet of the aquifer. The Magothy is absent in many areas along the north shore and reaches a thickness of approximately 700 to 1000 feet beneath the Bay Shore area.

Below the Magothy aquifer is the Raritan clay formation. This formation is a significant confining unit above the Lloyd aquifer that consists mainly of clay and silty clay from 0 to 200 feet in thickness. The clay has a very low hydraulic conductivity, but does not totally prevent movement of water between the Magothy and the underlying Lloyd aquifer.

The Lloyd aquifer is the oldest and deepest water-bearing unit. It unconformably rests on impermeable crystalline bedrock and consists of lenticular deposits of clay, silt, sandy clay, sand and gravel. The upper surface of the aquifer dips southeast from about 500 feet below seal level in the northern part of the county to more that 1,400 feet below sea level at the southern portion. The Lloyd aquifer ranges from 200 to 300 feet in thickness within the county.

The regional groundwater flow direction beneath the site has been mapped to be south-southeast.

3.2 - Local Hydrogeology

The local hydrogeologic units correspond to the previously discussed regional hydrogeologic units. In the vicinity of the site, the Gardiners clay is present between the Upper Glacial aquifer and the Magothy aquifer and acts as a confining layer between the two (2) aquifers. Based on the Hydrogeologic Investigations Atlas HA-709 Sheet 1 of 3 (USGS, 1989) this clay unit is present in the study area at approximately 30 feet below mean sea level and attains a maximum thickness of 20 feet. The Upper Glacial aquifer is the most permeable with an estimated horizontal hydraulic conductivity of 270 ft/day (Franke and Cohen, 1972).

Deposits in the Magothy aquifer containing less well sorted sand and gravel with interbedded clay and silt deposits have much lower hydraulic conductivities.

The predominant horizontal groundwater flow direction based on groundwater elevation maps calculated on February 16 and March 28, 1989, was to the southeast (see Figures 3.2.1 and 3.2.2) (H2M, 1989). The depth to groundwater underlying the site is approximately 20 to 25 feet below grade. Utilizing a published hydraulic conductivity value of 2,000 gpd/ft^2 (Jensen & Soren, Hydrogeologic Investigations Atlas, 1974), a porosity of 30 percent, and a calculated gradient ranging between 0.0015 and 0.0016 ft/ft, the groundwater on-site is estimated to flow at a rate of between 1.0 and 1.5 feet per day in a south-southeasterly direction.

This site is located within Hydrogeologic Zone VII defined in the "Long Island Areawide Waste Treatment Management Plan" also known as the Nassau/Suffolk 208 Plan in 1978. This zone is designated as the "South Shore Shallow Flow System" with generally shallow and horizontal groundwater flow.

3.3 - Regional Groundwater Quality

The site is located in a highly industrialized area. Within a one-half (1/2) mile radius north and hydraulically upgradient of the site is a NYSDEC Class 2 listed inactive hazardous waste disposal site identified as Serv-All Laundry (NYSDEC Site No. 1-52-077). Groundwater beneath and downgradient of the Serv-All site, has been documented with chlorinated VOCs during a RI/FS.

An earlier study conducted by the SCDHS in November 1983 identified a narrow plume of chlorinated VOCs attributed to the Serv-All Laundry facility. Sampling by the SCDHS as of January 1988 indicated that the narrow VOC plume had migrated approximately one-third of a mile during the four (4) year period between November 1983 and January 1988. This migration rate is consistent with estimates of regional groundwater flow velocity. VOC concentrations

greater than 8,500 parts per billion (ppb) (total VOCs) were, at that time, documented within approximately one (1) block of the Thomas Avenue Well Field (the Thomas Avenue Well Field is located approximately 5,000 feet to the southeast of the Rite-Off, Inc. site). This Well Field is located downgradient and slightly to the east from the site specific groundwater flow direction calculated at Rite-Off, Inc. Plume tracking, performed by the SCDHS, showed that by 1991, the VOC plume was within approximately 500 feet north of the Southern State Parkway.

Additional monitoring work is being conducted by the SCDHS to further define the downgradient limits of the plume within the upper glacial aquifer, which is approximately 80 feet thick and underlain by the Gardiners clay in the region. Monitoring below the clay awaits the completion of a joining SCDHS/USGS/SCWA program to determine the extent to which this unit protects the Magothy aquifer.

The Hubbard-Wilson Landfill is also located upgradient of the Rite-Off, Inc. site. The SCDHS conducted a groundwater investigation at this landfill in March 1983, and identified a leachate plume emanating from the landfill. However, this site has been delisted from the NYSDEC Inactive Hazardous Waste Disposal Site registry.

3.4 - Public Water Supply

Potable water is supplied to the site by SCWA. Existing SCWA well fields are located approximately one-third (1/3) of a mile to the northwest (Locust Drive well field) and approximately one (1) mile to the southeast (Thomas Avenue well field). The upgradient supply wells (the Locust Drive well field) consists of three (3) wells (S-15898, S-16175 and S-3646 with depths of 128 feet, 130 feet and 610 feet, respectively). The downgradient supply wells (the Thomas Avenue well field) consists of two (2) wells (S-46235 and S-50546) which are 712 feet and 666 feet deep, respectively.

4.0 - SCHEDULE AND PROJECT MANAGEMENT

4.1 - Schedule

A task-by-task schedule for the RI/FS activities is set forth in this work plan and is provided as a Milestone Chart (Figure 4.1.1).

4.2 - Project Management

General direction of the RI/FS will be provided by Richard J. Baldwin. Mr. Baldwin has 6 years of hydrogeological supervisory and project management experience with state and federal hazardous waste site Remedial Investigations/Feasibility Studies. Mr. Baldwin has extensive experience managing various hazardous/industrial waste investigations and has the authority within the firm to apply additional resources to the project as the need arises.

The proposed project organization is presented on Figure 4.2.1 The project manager (PM) has primary responsibility for plan development and implementation of the RI/FS, including coordination among the RI/FS leaders and support staff, development of bid packages, acquisition of engineering of specialized technical support, and all other aspects of the day-to-day activities associated with the project. The PM identifies staff requirements, directs and monitors site progress, ensures implementation of quality procedures and adherence to applicable codes and regulations, and is responsible for performance within the schedule.

The Quality Assurance Officer (QAO) for this project will be Daniel J. Smith of H2M. Mr. Smith will be responsible for overall project quality including development of

the project quality control/quality assurance (QA/QC) plans, review of specific task QA/QC procedures, review of laboratory, vendor and subcontractor plans and procedures, and auditing specific tasks at established intervals. The QAO will report directly to the officers in charge of the project and will work independent of the project manager reporting structure. Appendix A includes the QAO's resume.

Richard J. Baldwin will also be the RI/FS leader for H2M on this project. Mr. Baldwin's past project management experience includes project geologist/field team leader on several RI and site investigations (SI) for the US Army Corps of Engineers and US Navy, in addition to remedial management plan preparation for proposed CERCLA work at a facility wetlands.

The RI/FS leader is responsible for on-site management for the duration of all site operations, including the activities conducted by H2M such as sampling, and the work performed by subcontractors, such as well drilling and surveying. The RI/FS leader will provide consultation and decide on factors relating to sampling activities and changes to the field sampling program.

The RI/FS leader/PM will ensure that the analytical laboratory will perform analyses as described in the Field Sampling Program (FSP). The QAO will be responsible for assuring that proper collection, packaging, preservation and shipping of samples is performed in accordance with USEPA guidelines. Project progress meetings will be held, as needed, to evaluate project status, discuss current items of interest, and review major deliverables such as the FSP, Health and Safety Plan (HASP) and the RI/FS report.

As Figure 4.2.1 shows, a review group has been formed. The review group includes Gary J. Miller, P.E. (Vice President of H2M), Robert Fardella (counsel), and Mr. Howard Rapps (owner of the site). The review group will be responsible for providing

project oversight and checks on the project team. This will include review of technical work, scheduling, project billings and assessment of the level of effort for the project. The review person at H2M (Gary J. Miller) will provide feedback to the project manager, as necessary.

The resumes of these and other key members of the remedial investigation team are presented in Appendix A.

5.0 - TECHNICAL WORK PLAN

The following scope of work has been developed to further evaluate and characterize the site under the RI/FS in order to assess current environmental conditions and select remedial technologies and alternatives. Interim remedial measures (IRMs) may be proposed upon review and assessment of the preliminary data from the RI.

5.1 - Data Quality Objectives

The Data Quality Objectives (DQOs) for the RI/FS will be applicable for all data collection activities at the site. DQOs will be incorporated into the FSP and the QA/QC sections of the RI/FS (Sections 5.5 and 8.0, respectively).

The primary data users for this project will be H2M, NYSDEC and the New York State Department of Health (NYSDOH). No secondary users have been identified at this time. Sections 2.0 and 3.0 of this work plan present the available data for the site.

Data to be collected during the implementation of the FSP will be used to characterize the nature and extent of contamination. These results will be used for the preparation of a health-based risk assessment (by H2M), the RI report, the Treatability Study (if necessary), and the Feasibility Study (FS) report.

This project is being conducted under NYSDEC ASP CLP procedures. As part of these procedures, differing levels of work are defined. For this project, it is anticipated that Level I (screening) will be used during the soil vapor survey (at 1555 locations) and soil sampling or groundwater monitoring well installation and sampling. Level I includes screening for total VOC vapors, using a portable photoionization detector (PID) with an

11.7 ev bulb or flame ionization detector (FID). The field screening results will be utilized for determining soil sampling locations and selection of soil samples to be laboratory tested for select parameters as per Level IV DQO. Laboratory methods for inorganics will be atomic absorption (AA) or inductively coupled plasma (ICP) and methods for organics will be gas chromatograph/mass spectrometer (GC/MS) in order to achieve ppb level detection limits.

The analytical data to be obtained for this project will be analyzed by H2M Labs, Inc. and will conform to Contract Laboratory Protocol (CLP) analytical Level IV. The data will be used for risk assessment, site characterization, evaluation of alternatives, and engineering design.

5.2 - Preliminary Identification of ARARs and TBCs

5.2.1 - Potential Applicable or Relevant and Appropriate Requirements (ARARs)

The National Contingency Plan (NCP) (50 Federal Register 47912, November 20, 1985) and the Superfund Amendments and Reauthorization Acts/Comprehensive Environmental Response, Compensation, and Liability Act (SARA/CERCLA) Compliance Policy guidance define applicable requirements as the federal and state requirements for hazardous substances, which would be legally binding at the site, if site responses were to be undertaken regardless of CERCLA Section 104. Relevant and appropriate requirements which are defined as applicable apply to facilities or problems similar to those encountered at this site; therefore, their use is well suited. With respect to the selection of remedial alternatives, relevant and appropriate requirements are to be afforded the same weight and consideration as applicable requirements.

The following federal and state regulatory requirements are potential ARARs to the site:

1) Contaminant-Specific

Federal:

- Resource Conservation and Recovery Act (RCRA) Groundwater Protection Standards and Maximum Concentration Limits (40 CFR 264, Subpart F)
- Clean Water Act, Water Quality Criteria (Section 304) May 1, 1987 Gold Book)
- National Ambient Air Quality Criteria (NS) (40 CFR 50)
- Safe Drinking Water Act, Maximum Contaminant Levels (MCLs) 40 CFR 141.11-16

New York State

- New York Groundwater Quality Standards (6 NYCRR 703)
- New York State Drinking Water Act Maximum Contaminant Levels (MCLs) (10 NYCRR 5)
- New York Surface Water Quality Standards (6 NYCRR 702)
- New York State Raw Water Quality Standards (10 NYCRR 170.4)
- New York RCRA Groundwater Protection Standards (6 NYCRR 373-26e)
- New York Ambient Air Quality Standards (6 NYCRR 256 and 257)
- New York State Analytical Detectability for Toxic Pollutants (85-W-40-TOG)

2) Location - Specific

Federal

- Executive Orders on Floodplain Management and Wetlands Protection (CERCLA) Floodplain and Wetlands Assessments #11988 and 11990

- National Historic Preservation Act (16 USC 470) Section 106 et seq. (36 CFR 800)

- RCRA Location Requirements for 100-year Floodplains (40 CFR 264.18 (b))

- Wetlands Construction and Management Procedures (40 CFR 5, Appendix A)

New York State

- New York State Freshwater Wetlands Law (ECL Article 24, 71 in Title 23)

- New York State Freshwater Wetlands Permit Requirements and Classification (6 NYCRR 663 and 664)

- New York State Floodplain Management Act and Regulations (ECL Article 36 and 6 NYCRR 500)

- New York State Flood Hazard Area Construction Standard

- New York State Air Guidelines for the control of Toxic Ambient Air Contaminants (Air Guide 1)

3) Action-Specific

Federal

- RCRA Subtitle C Hazardous Waste Treatment Facility Design and

  Operating Standards for Treatment and Disposal Systems, (i.e., landfill incinerators, tanks, containers, etc.) (40 CFR 264 and 265) (Minimum Technology Requirements)

- RCRA Subtitle C Closure and Post-Closure Standards (40 CFR 264, Subpart G)

- RCRA Groundwater Monitoring and Protection Standards (40 CFR 264, Subpart F)

- RCRA Generator Requirements for Manifesting Waste for Off-site Disposal (40 CFR 263)

- RCRA Subtitle D Non-hazardous Waste Management Standards (40 CFR 257)

- RCRA Transporter Requirements for Off-site Disposal (40 CFR 270)

- Safe Drinking Water Act, Underground Injection Control Requirements (40 CFR 144 and 146)

- RCRA Land Disposal Restrictions (40 CFR 268) (On and off-site disposal of excavated soil)

- Clean Water Act - NPDES Permitting Requirements for Discharge of Treatment System Effluent (40 CFR 122-125)

- Effluent Guidelines for Organic Chemicals, Plastics and Resins (Discharge Limits) (40 CFR 414)

- Clean Water Act Discharge to Publicly Owned Treatment Works (POTW)

- National Emissions Standards for Hazardous Air Pollutants (NESHAPSs) (40 CFR 61)

- DOT Rules for Hazardous Materials Transport (49 CFR 107, 171.1-171.500)

- Occupational Safety and Health Standard for Hazardous Response and General Construction Activities (29 CFR 1904, 1910, and 1926)

<u>New York State</u>

- New York State Pollution Discharge Elimination Systems (SPDES) Requirements (Standards for Storm Water Runoff, Surface Water, and Groundwater Discharges) (6 NYCRR 750-757)

- New York State Toxicity Testing for the SPDES Permit Program (TOG 1.3.2)

- New York State RCRA Standards for the Design and Operation of Hazardous Waste Treatment Facilities (i.e., landfills, incinerators, tanks containers, etc.). Minimum Technology Requirements (6 NYCRR 370-372)

- New York State RCRA Closure and Post-Closure Standards (Clean Closure and Waste-in-Place Closures) (6 NYCRR 372)

- New York State Solid Waste Management Requirements and Siting Restrictions (6 NYCRR 360-361)

- New York State RCRA Generator and Transporter Requirements for Manifesting Waste for Off-site Disposal (6 NYCRR 364 and 372)

- New York State Air Emission Requirements (VOC Emission from Air Strippers and Process Vents, General Air Quality) (6 NYCRR 200-212)

- New York State Underground Injection Recirculation at Groundwater Remediation Sites (Technical Operating Guidance (TOG) Series 7.1.2)

The NYSDEC considers the following requirements equivalent to ARARs. These NYS requirements were taken from the NYS Standards, Criteria and Guidelines (SCG's).

Division of Solid Waste

- 6 NYCRR Part 360 -	Solid Waste Management Facilities (effective October 9, 1993) (revised in December 1993)
- 6 NYCRR Subpart 373-1 -	Hazardous Waste Treatment, Storage and Disposal Facility Permitting Requirements (revised January 31, 1992)
- 6 NYCRR Subpart 373-2 -	Final Status Standards for Owners and Operators of Hazardous Waste Treatment Storage and Disposal Facilities (revised) January 31, 1992)
- 6 NYCRR Subpart 373-3 -	Interim Status Standards for Owners and Operators of Hazardous Waste Facilities (revised January 31, 1992)
- 6 NYCRR Part 374 -	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities (revised January 31, 1992)

- 6 NYCRR Part 376 - Land Disposal Restrictions (January 31, 1992)

- 6 NTCRR Part 700-705 NYSDEC Water Quality Regulations for Surface Waters abd Groundwater

Division of Hazardous Waste Remediation

- 6 NYCRR Part 375 - Inactive Hazardous Waste Disposal Site Remedial Program (May 1992)

- Technical and Administrative Guidance Memorandum (TAGM)

HWR-92-4046 Determination of Soil Cleanup Objective and Cleanup Levels. (January 24, 1994)

- HWR-92-4030 Selection of Remedial Actions at Inactive Hazardous Waste Sites. (May 1990).

Division of Water

- 6 NYCRR Part 702.15(a), (b), (c), (d) and (e) Empowers DEC to Apply and Enforce Guidance where there is no Promulgated Standard.

- Technical and Operations Guidance Series (TOGS)

1.1.1; October, 1993 - Ambient Water Quality Standards and Guidance Values (revised in December 1993)

1.2.1; April, 1990 - Industrial SPDES Permit Drafting Strategy for Surface Waters

1.3.1; May, 1990 - Waste Assimilative Capacity Analysis and Allocation for Setting Water Quality Based Effluent Limits

1.3.1 C; August 1991 - Development of Water Quality Based Effluent Limits for Metals Amendment

1.3.2; May, 1990- Toxicity Testing in the SPDES Permit Program

1.3.4; April 1, 1987 - BPJ Methodologies

1.3.4.a; Nov. 3, 1988 - BPJ Methodologies/Amendments

1.3.7; July, 1990- Analytical Detectability and Quantitation Guidelines for Selected Environmental Parameters

2.1.2; July, 1990- Underground Injection/Recirculation (UIR) at Groundwater Remediation Sites

2.1.3; October, 1990- Primary and Principal Aquifer Determinations

Division of Air

- 6 NYCRR Part 200 (200.6) - General Provisions (Revised December, 1993)
- 6 NYCRR Part 201 - Permits and Certificates (Revised December 1993)
- 6 NYCRR Part 211 (211.1) - General Prohibitions
- 6 NYCRR Part 212 General Process Emission Sources
- 6 NYCRR Part 257 - Air Quality Standards
- Air Guide 1 - Guidelines for the Control of Toxic Ambient Air Contaminants

Division of Spills Management

- Spill Technology and Remediation Series (STARS) Memo #1, August, 1992 - Petroleum Contaminated Soil Guidance Policy

Division of Fish and Wildlife

- 6 NYCRR Part 608 - Use and Protection of Waters
- 6 NYCRR Part 662 - Freshwater Wetlands - Interim Permits

665 - Local Government Implementation of the Freshwater Wetlands Act and Statewide Minimum Land - Use Regulations for Freshwater Wetlands

- 6 NYCRR Part 182 - Endangered and Threatened Species of Fish and Wildlife
- ECL Article 24 and Article 71, Title 23 - Freshwater Wetlands Act

Division of Regulatory Affairs

- Article 27, Title II of the ECL - Industrial Siting Hazardous Waste Facilities

- 6 NYCRR Part 621 - Uniform Procedures

- 6 NYCRR Part 624 - Permit Hearing Procedures

Division of Marine Resource, Bureau of Marine Habitat Protection

- Chapter 10 of 6 NYCRR Part 661 Tidal Wetlands - Land Use Regulations

Division of Mineral Resources

- 6 NYCRR Part 420 - General

421 - Permits

422 - Mined Land - Use Plan

423 - Reclamation Bond

424 - Enforcement

425 - Civil Penalties

426 - Hearings

- Title 27 - NYS Mined Land Reclamation Law

Coastal Management

- Part 600 - Department of State, Waterfront Revitalization and Coastal Resources Act

- State Coastal Policies

- State Consistency Process

- Federal Consistency Process

- NYS Coastal Policies

- NYS Coastal Management Program

- Federal Register, June 25, 1979 - Part V - Department of Commerce - Federal Consistency Regulation

NEW YORK STATE DEPARTMENT OF HEALTH (revised 12/93)

- NYSDOH PWS 68 - Blending Policy for Use of Sources of Drinking Water
- NYSDOH PWS 69 - Organic Chemical Action Steps for Drinking Water
- NYSDOH PWS 152 - Procedure for Handling Community Water System Emergencies
- NYSDOH PWS 159 - Responding to Organic Chemical Concerns at Public Water Systems
- NYSDOH PWS 160 - Public Notification of Organic Chemical Incidents Regarding Public Water Supplies
- The 10 ppt criterion for 2, 3, 7, 8 - TCDD is fish flesh
- The Binghamton State Office Building cleanup criteria for PCDDs, PCDFS and PCBs
- Part 5 of the State Sanitary Code, Drinking Water Supplies (effective March 11, 1992)
- Part 170 of title 10 of the NYCRR, Water Supply Sources
- Appendix 5-A of Part 5 of the State Sanitary Code (Recommended Standards for Water Works)
- Appendix 5-B of Part 5 of the State Sanitary Code (Rural Water Supply)
- NYSDOH Interim Report on Point-of-Use Activated Carbon Treatment Systems
- Part 16 draft limits on the disposal of radioactive materials into sewer systems
- Criteria for the development of health advisories for sport fish consumption
- Tolerance levels for EDB in food

5.2.2 - Potential "To Be Considered" Material (TBCs)

When ARARs do not exist for a particular chemical or remedial activity or when the existing ARARs are not protective of human health or the environment, other criteria, advisories and guidance may be useful in designing and selecting a remedial alternative. The following criteria, advisories, and guidance were developed by the EPA and other federal and state agencies.

1) Federal

- Safe Drinking Water Act National Primary Drinking Water Regulations, Maximum Contaminant Level Goals (MCLGs)
- Proposed Maximum Contaminant Levels (50 Federal Register 46936-47022, November 13, 1985)
- Proposed Federal Air Emission Standards for Volatile Organic Control Equipment (52 Federal Register 3748)
- Proposed Requirements for Hybrid Structures (combined waste-in-place and clean closure) (52 Federal Register 8711)
- USEPA Drinking Water Health Advisories
- USEPA Health Effects Assessment (HEAs)
- USEPA Integrated Risk Information System (IRIS), latest revision
- TSCA Health Data
- Toxicological Profiles, Agency for Toxic Substances and Disease Registry, U.S. Public Health Service
- Policy for the Development of Water-Quality-Based Permit Limitations for Toxic Pollutants (49 Federal Register 9016)
- Cancer Assessment Group National Academy of Science Guidance Document

- Groundwater Classification Guidelines
- Groundwater Protection Strategy
- Waste Load Allocation Procedures
- Fish and Wildlife Coordination Act Advisories
- Federal Guidelines for Specification of Disposal Site for Dredged or Fill Material

5.3 - Potential Pathways of Contamination

As discussed in Sections 2.0 and 3.0, soil and groundwater sampling and analysis activities have been previously performed at the site and the surrounding area. The chemical compounds present in the soils and groundwater have been identified by the previous sampling and analysis effort. Therefore, potential pathways of contamination can be assessed.

The previous investigations performed at the site identified areas of concern as the surface soil near the former rear drum storage area, soils beneath the paved driveway between the two (2) buildings, and on-site storm drains SD-4, SD-5, SD-6 and SD-7. In general, the data indicate that VOC contamination is present in the vadose zone soils in these areas, specifically beneath the unpaved areas. The potential pathway for migration of VOCs is downward movement through the vadose zone in a dissolved-phase, due to recharge from rainwater. VOCs in solution which reach the groundwater will move, typically with the groundwater. in the direction of groundwater flow. VOC-impacted vadose zone water may eventually reach the water table. The VOC-impacted groundwater in the saturated zone then flows in the downgradient direction.

The pathway of overland runoff of VOCs dissolved in surface water after rain events has been determined to be insignificant at this time due to pavement on the site and the high soil permeability and the lack of significant topographic gradients in the site area.

Metals and semi-VOCs may enter the groundwater from the vadose zone in the same manner as VOCs. VOCs may also be present in a gaseous state and migrate within the vadose zone or off-gas into the buildings or atmosphere.

VOCs which exist in the groundwater beneath the site will typically travel with the groundwater flow which is generally in a south-southeast direction at a velocity typically consistent with the groundwater pore velocity.

A more detailed investigation of the potential pathways of contamination will be performed in the Health Risk Assessment (see Section 10.0).

5.4 - Work Plan Approach

The work plan approach is to present previous data and evaluate the existing laboratory data, as appropriate for the respective DQOs. This information will be incorporated into the tasks necessary for completion of the RI/FS. DQOs will be incorporated into the FSP and elsewhere, as necessary. Data previously collected (Phase II) will be supplemented by additional sampling and analyses in the RI/FS.

The purpose of the RI is to determine the aerial and vertical extent of soil and groundwater contamination at the site. Based upon the findings of this RI, remedial alternatives will be presented and the most feasible alternative(s) of remediation will be evaluated and documented in the FS Report.

H2M will provide details of the FSP to obtain data which satisfy the project DQOs (Level IV). The FSP will provide for the implementation of the NYSDEC approved work plan. This RI/FS work plan also outlines field investigation Procedures and Methodology; Quality Assurance/Quality Control (QA/QC); the Fish and Wildlife Impact Assessment Plan; the Health Risk Assessment (HRA) Plan; the Health and Safety Plan (HASP); and the Citizen Participation Plan (CPP).

5.5 - Field Sampling Program

Based upon the history of the site operation and VOC contamination, a RI/FS program has been developed. Areas suspected as potentially contaminated by VOCs will be focused on. In this manner, an evaluation of the nature and extent of contamination of the property will be completed and the need for remedial measures determined.

A soil vapor survey will be conducted at the former trailer area of the 1555 (warehouse) portion of the site in order to select soil boring locations. Other preliminary sampling will include the screening of the interior roof drain (and any other interior roof drains identified) in the warehouse with a PID or FID. The interior of the warehouse will be further investigated to determine whether additional roof drains exist. The PID or FID probe will be lowered into any roof drain cleanout pipe identified and screened for VOCs. If the PID or FID readings are 10 ppm or greater above background levels, the system design will be evaluated and discharge points sampled and analyzed.

Soil borings will be utilized to collect soil samples for both field screening and laboratory analysis. Soil samples will be obtained during drilling with discrete sampling intervals selected (described in the following sections). Figure 5.5.1 depicts the areas of concern that will be further investigated during the RI/FS. The NYSDEC has agreed that

H2M would propose the composite sampling of any liquid in the two (2) on-site septic systems and storm drains during the implementation of IRMs. All samples collected from the Rite-Off, Inc. site will be analyzed according to Analytical Services Protocol CLP (NYSDEC ASP CLP (12-91)). Table 5.5.1 includes a summary of the samples to be submitted for laboratory analysis.

Groundwater monitoring wells will be installed to determine on-site groundwater quality conditions as detailed in Section 6.2.

A community well survey will be performed to determine if private wells are present downgradient of the site and if they are in use. Although the area is serviced by the SCWA, if a private well in the vicinity of the site is being used for potable water, a sample will be collected and analyzed for the same parameters as detected in the on-site wells. Public supply wells within a 3 mile radius downgradient of the site have been identified. Current information will be obtained from SCWA regarding these well fields and will be used to further assess potential impacts from the site.

A detailed description of the site investigation tasks is presented below. All field work will be conducted in accordance with the HASP (see Appendix B). In addition, the NYSDEC will be notified at least five (5) working days prior to the commencement of any field activities.

5.5.1 - Task 1- Sampling of the Former Trailer Area (Warehouse)

In response to concerns of the NYSDEC with the 1555 Fifth Industrial Court Site (Warehouse), H2M will complete at least two (2) soil borings in the former trailer area (Area 1 on Figure 5.5.1). The NYSDEC expressed concerns for further sampling of this area and identified the soil gas survey points #40 and #45 (from the Phase II) for the

appropriate sampling point locations. Since this area is now accessible (trailers have been removed), H2M proposes to conduct a soil vapor survey in the former trailer area behind the warehouse building.

The soil vapor survey will utilize a 10' by 10' grid, and the two (2) soil borings will be positioned at the two (2) highest screening points measured. The objective of this sampling is to characterize the soil beneath this area to identify any potential source areas or correlations with the past site history. This sampling will provide supplemental data for the possible delisting of this portion of the property, if applicable.

Split spoon samples will be collected from the soil borings from 0'-2', 7'-9' and 14'-16' below grade and at 10 foot intervals thereafter down to a depth when no PID/FID responses are observed for two (2) consecutive samples to a minimum depth of 16 feet below grade. The PID or FID will be calibrated daily to insure accurate readings.

All sampling will be conducted under the oversight of a qualified hydrogeologist during the RI. Two (2) soil samples will be collected at each boring and submitted for laboratory analysis. Split spoon samples will be screened with a PID or FID immediately upon opening the split spoon. Samples will be immediately contained in laboratory-prepared sample bottles. The split spoon samples exhibiting the highest PID or FID responses at each boring (relative to background levels) will be retained for analysis at H2M Labs, Inc. for TCL VOCs, TCL semi-VOCs, TCL pesticides/PCBs (full TCL), Target Analyte List (TAL), malathion, diazinon, and total cyanide (CN). In addition, select samples will be analyzed for Total Organic Carbon (TOC) to aid in the health assessment phase of the RI/FS. If no sample has elevated PID or FID responses, the 0'-2' soil sample will be collected and submitted for laboratory analysis. In addition, the deepest soil sample will also be retained for laboratory analysis. This deep soil sample will

characterize the vertical extent of each boring. This rationale for the selection and submittal of soil samples collected from soil borings will be followed throughout the RI.

In addition to the soil gas survey and two (2) soil borings, the NYSDOH has required the collection of two (2) additional surface soil samples in Area 1 and one (1) outside this area (in a dirt area behind the manufacturing area). These samples will be collected with a decontaminated hand auger from 0-2" below grade. The samples will enable characterization of surface soils in this area for the DOH's health assessment.

The specific concern of the NYSDOH is for the total potential exposure to workers and trespassers. On sample will be collected from the middle of the former trailer area; one on the east side of the area; and the last sample in from the southwest corner of the unpaved area behind the manufacturing building. These three (3) surface soil samples will be analyzed for full TCL, TAL, malathion, diazinon, and CN.

In the event that contamination is detected during the sampling investigation of the warehouse property, an additional monitoring well may be proposed (to the NYSDEC) to be installed to assess the groundwater downgradient of a possible source. The proposed monitoring well may be installed between MW-4S and the warehouse itself and sampled during the second phase of the RI/FS.

Appropriate QA/QC samples will be collected as specified in Section 8.0. QA/QC samples will include a field blank, a trip blank, a site-specific matrix spike/matrix spike duplicate (MS/MSD) and a blind duplicate to provide coverage for each task and sampling equipment. Analyses of QA/QC samples will enable data evaluation for accuracy and integrity. In general, one (1) field blank, one (1) blind duplicate, and one (1) MS/MSD will be collected for every 20 samples, per matrix, per sampling equipment. Trip blanks will accompany the sampling cooler containing samples for VOC analysis on each day.

5.5.2 - Task 2 - Sampling of the Storm Drain System

Soil samples will be collected from either the bottom sediments of the storm drains or soil borings (split spoon samples) to characterize the storm drain system at the site. Storm drains SD-1 through SD-3 (Area 2 on Figure 5.5.1) were investigated during the Phase II and only limited concentrations of phenols and acetone were detected.

Although the Phase II indicated minimal contamination, storm drains SD-1 through SD-3 will be investigated by collecting one (1) sediment sample from the upper six (6) inches of the bottom sediment. Samples will be obtained by use of a decontaminated, stainless steel hand auger. The sediment samples will be screened in the field with a PID or FID, and will be retained for laboratory analyses for TCL semi-VOCs and TAL.

The NYSDEC has required the sampling of storm drains SD-8 through SD-12 (Area 3 on Figure 5.1.1) located in the paved area in the front of the warehouse. Storm drains SD-8 through SD-12 will be investigated by collecting one (1) sediment sample from the upper six (6) inches of the bottom sediment with a decontaminated stainless steel hand auger. The sediment samples will be screened in the same manner as SD-1 through SD-3, and analyzed for full TCL, TAL, malathion, diazinon, and CN. Should the results of samples reveal the presence of contamination, these storm drains may be further investigated with soil borings following the same protocol as storm drains SD-4 through SD-7 in a later phase.

Soil borings will be drilled either through the center of (if no liquids are present) or directly adjacent to storm drains SD-4, 5, 6, and 7 (Area 4). Soil samples will be collected at five (5) foot intervals starting at the bottom of each storm drain (sediment sample) or at 10 feet below grade at borings adjacent to a storm drain. Split spoon sampling will be

conducted to a minimum of 16 feet below the bottom (or projected bottom) of each storm drain. Thereafter, the split spoon sampling frequency will decrease to ten foot intervals until two (2) consecutive samples do not exhibit PID or FID responses above background. Water contained in the storm drains will be composited and sampled as part of the IRMs.

Two soil samples will be collected for laboratory analysis from each boring of storm drain SD-4 through SD-7. The rationale for the selection and submittal of soil samples collected from soil borings SD-4 through SD-7 will be identical to the soil borings performed in Area 1 (Section 5.5.1 - Task 1). Soil/sediment samples from SD-4 through SD-7 will be analyzed for full TCL, TAL, malathion, diazinon, and CN. Additionally, the flow patterns from the two (2) plastic sink outflows will be evaluated to determine which storm drain collects possible water generated by the RPZs. These possible sources will be evaluated by using the analytical data from the appropriate storm drain.

Appropriate QA/QC samples will be collected as described in Section 8.0.

5.5.3 - Task 3 - Boring and Soil Sampling in Area Between the Buildings

The Phase II performed by H2M included a PID soil gas survey at the site, concentrating on the southern portion of the property. Shallow soil samples were collected in the paved area between the two (2) on-site buildings (Area 5 on Figure 5.5.1) and indicated PCE contamination to at least a depth of 18 inches.

It is proposed that this area be remediated during an IRM. The IRM Scope of Work will be outlined in the IRM Work Plan that will be submitted upon analysis of the preliminary data from this RI/FS. The proposed remediation may include the excavation of the shallow soils, among other methods of remediation.

During the RI/FS, a minimum of two (2) soil borings will be installed at locations in the proposed excavation area, as approved by the NYSDEC for delineation of the vertical extent of contamination in the vadose zone. Split spoon samples will be collected from 0'-2', 7'-9', and 14-16' below grade and at ten foot intervals thereafter down to a depth when no PID or FID responses are obtained for two (2) consecutive samples.

Two (2) soil samples will be collected for laboratory analysis at each boring and submitted for full TCL, TAL, malathion, diazinon, and CN. The rationale for the selection and submittal of soil samples collected from these two (2) soil borings will be identical to the soil borings performed in Task 1.

During this task, one (1) background soil sample will be collected from a NYSDEC approved location on site. The sample will be collected from 0' - 2' below grade and will be analyzed for TAL parameters only. Background samples should not have natural concentrations of VOCs, semi-VOCs or pesticides/PCBs.

QA/QC sampling for this task will be collected as described in Section 8.0.

Drill cuttings generated during the drilling of the borings (not used for well construction) will be utilized as backfill following NYSDEC approved methods in accordance with the "Disposal of Cuttings and Spoil Generated On-Site During Remedial Investigations of a Class 2 Sites" presented in the NYSDEC Technical Administrative Guidance Memorandum (TAGM) dated November 21, 1989.

5.5.4 - Task 4 - Sampling of the Septic System Leaching Pools

Based upon the results of the sampling of the leaching pool located in front (on the north side) of the manufacturing building during the Phase II Investigation, the only detectable contaminant was phenols, however no source of phenols have been identified. This leaching pool has been labeled LP-1 on Figure 5.5.1 (in Area 6). To supplement this information, a surface sediment sample will be collected from the bottom of the leaching pool by use of a decontaminated, stainless steel hand auger. The sediment sample will be analyzed for TCL semi-VOCs and TAL. Appropriate QA/QC samples will be collected for this task as described in Section 8.0.

The NYSDEC has requested the sampling of the septic system located off the north side of the warehouse. Surface sediment samples will be collected from each leaching pool. H2M has identified two (2) possible leaching pools; one (1) approximately 30 feet to the north (LP-2), and 30 feet to the northwest (LP-3) of the "house trap" located on the north side of the warehouse (Area 7 on Figure 5.5.1). H2M with verify the nature of these pools and collect a bottom sediment sample from each pool with a decontaminated stainless steel hand auger. These samples will be analyzed for full TCL, TAL, and CN. H2M will sample the liquids (if present) in the septic system prior to any required IRMs, not as part of the RI.

5.5.5 - Task 5 - Sampling of the Former Rear Drum Storage Area

Two (2) soil gas sampling and surface soil samples (18" below surface) were collected in the former rear drum storage area during the Phase II. Both soil gas survey points (#23 and #24) recorded the highest detections of VOCs. The results of the surface

soil samples collected adjacent to soil gas sample point #24 indicated the highest PCE concentration (3,800 ppb).

Based on these Phase II results, a minimum of two (2) soil borings will be installed at locations in the concrete pad covering this area (Area 8 on Figure 5.5.1) as approved by the NYSDEC for delineation of the vertical extent of contamination in the vadose zone. Split spoon samples will be collected from 0'-2', 7'-9', and 14'-16' below grade and at ten (10) foot intervals thereafter down to a depth when no PID or FID responses are obtained for two (2) consecutive samples.

Two (2) soil samples will be collected for laboratory analysis at each boring and submitted for analytical testing using CLP protocol. The rationale for the selection and submittal of soil samples collected from these two (2) soil borings will be identical to the soil borings performed in Task 1. The soil samples obtained from each boring will be tested for full TCL, TAL, malathion, diazinon, and CN. Additionally, the NYSDOH and NYSDEC has requested that these samples be analyzed for Freon-12 and Freon-22 since this area once contained two (2) Freon-22 and one (1) Freon-12 above-ground storage tanks.

Appropriate QA/QC samples will be collected for Task 5 as described in Section 8.0.

5.5.6 - Task 6 - Groundwater Investigation

As depicted in Figures 3.2.1 and 3.2.2, elevation data from the five (5) existing groundwater monitoring wells indicates a south-southeast local groundwater flow direction. The installation of five (5) additional on-site monitoring wells are proposed to

monitor groundwater quality, upgradient and downgradient of the alleged source areas identified during the Phase II investigation.

Based upon a groundwater flow direction to the south-southeast direction, two (2) additional shallow wells are proposed at the site (one (1) upgradient and one (1) downgradient) as shown in Figure 5.5.6.1. The upgradient well (MW-6S) will be placed at a location in order to better define the background water quality. The shallow downgradient well (MW-7) will be installed in order to delineate the western extent of shallow groundwater contamination from the site. The construction details of the proposed shallow monitoring wells are described in Section 6.2.

To further investigate the vertical extent of groundwater contamination at the site, three (3) deep groundwater monitoring wells (piezometers) are proposed to be installed (one (1) upgradient and two (2) downgradient). The newly installed upgradient deep well (MW-6D) will be placed adjacent to MW-6S (which will be screened from 21 to 31 feet below grade) approximately 5 feet away and will be screened at approximately 70 to 80 feet below grade (see figure 5.5.6.1). The mid-point of the screen zones will allow for a 50 foot vertical separation between the shallow and deep well. Both downgradient deep wells (MW-3D and MW-4D) will be screened between approximately 75 to 85 feet below grade.

Following installation and development of the new monitoring wells, identified as MW-3D, MW-4D, MW-6S, MW-6D, and MW-7, groundwater samples will be collected from the new wells and the existing wells and analyzed for full TCL, TAL, malathion, diazinon, and CN in order to accomplish project DQOs. The NYSDOH and NYSDEC has requested that all groundwater samples be analyzed for Freon-12 and Freon-22.

QA/QC sampling for this task will include appropriate field and trip blanks, duplicates, and MS/MSD samples as specified in Section 8.0.

All of the existing and proposed monitoring wells will be resurveyed and groundwater measurements will be taken on four (4) separate dates to generate appropriate groundwater contour maps. The steel manholes of existing monitoring wells MW-3 and MW-4 were reset in concrete slightly above grade and lockable caps with locks were installed on the PVC well casings. To evaluate whether the casing of MW-3 was damaged, the top of casing will be resurveyed. If the well has moved vertically more than six (6)-hundredths of a foot, additional tests and inspections will be performed to access the integrity of the well.

Aquifer tests will be conducted for the purpose of estimating the site-specific hydraulic transmissivity. This will be done by performing single-point aquifer testing (as discussed in Section 6.4.4).

Based on the groundwater data and aquifer characterization, estimates of contaminant migration may be projected in order to determine the placement of downgradient wells, as necessary. Off-site wells may be placed at appropriate locations downgradient of the site during a second phase of the RI/FS to define the extent of the groundwater VOC plume, as necessary. The exact locations of the off-site wells may be determined by H2M and NYSDEC after initial aquifer testing. Limitations to the downgradient well placement should apply as this area of Bay Shore is highly industrial and the potential for other sources of VOC contamination in the groundwater increases with distance away from the Rite-Off site. It should be noted that a right-of-way (ROW) permit and/or road opening permit may be obtained for the off-site wells. If the wells are located on a busy street, a construction zone traffic control plan may be prepared.

Additionally, based on the results of the RI, an additional well may be installed downgradient of the warehouse as described in Section 5.5.1.

In the event that off-site wells are installed, a second round of groundwater samples will be collected and analyzed for parameters detected in the downgradient wells on the site. All groundwater samples will be collected and analyzed following strict protocol outlined in Sections 6.0, 7.0 and 8.0 of this work plan (see Table 5.5.1).

6.0 - INVESTIGATION PROCEDURES AND METHODOLOGY

This section of the work plan will outline soil/sediment sampling, well drilling and construction, groundwater sampling; and aquifer characterization procedures and methodologies.

6.1 - Soil/Sediment Sampling

Soil borings will be performed utilizing a hollow stem auger drill rig. All drilling equipment will be decontaminated prior to use at each drilling location as described in Section 8.3. During the soil boring installation program, soil/sediment samples will be collected by use of a split spoon sampler.

A stainless steel hand auger will be utilized to collect surface sediment samples from storm drains SD-1 through SD-3, SD-8 through SD-12, and the leaching pools from both septic systems. The hand auger will be decontaminated prior to each use as per Section 8.3.

6.1.1 - Split Spoon Sampling

Split spoon sampling will be conducted as described in the previous section. Split spoon samples are used to obtain representative soil samples for identification purposes and laboratory tests. Split spoon samples will also be measured for the resistance of the soil to penetration of the sampler by counting blow counts. ASTM procedures D1586-67 will be used for the collection of split spoon samples at locations described in the FSP. Samples will be contained in laboratory prepared sample jars and labeled. Samples will be tested for full TCL, TAL, malathion, diazinon, CN, and TOC as required. Pending field screening results with the PID or FID, select samples

will be submitted to H2M Labs, Inc. for analysis. Care will be taken to not exceed sample holding times.

A summary of the ASTM 1586-67 procedures is listed below.

1. Clear out hole to sampling elevation using equipment that will ensure that the material is not disturbed by the operation.

2. With the cleaned split spoon sampler resting on the bottom, drive the sampler with blows from a 180 pound hammer falling 30-inches until either 18-inches has been penetrated or 100 blows have been applied.

3. This operation will be repeated at select intervals during boring or well installation.

4. Record the number of blows required to effect each 6-inches of penetration or fractions thereof.

5. Bring the sampler to the surface and open. Scan with a PID or FID field instrument. Describe the PID or FID responses, collect typical samples of soils recovered with respect to composition, structure, consistency, color and soil condition; fill the appropriate sample jars and seal to prevent evaporation of soil moisture. Affix labels to the jars bearing job number, date, time, initials of sampler, boring number, sample number, depth of penetration and length of recovery.

6. Select samples will be chosen by the hydrogeologist and analyzed for particle size distribution. The particle size analysis of the soils will be in accordance with ASTM D422-63.

7. All samples collected will be retained and preserved for future analysis (if necessary).

6.1.2 - Hand Auger Sampling

A decontaminated stainless steel hand auger with appropriate length extensions will be utilized to collect bottom sediment samples at the base of storm drains SD-1 through SD-

3, SD-8 through SD-12, and the septic system leaching pools at both sites. Sediment samples collected with the hand auger will be carefully removed from the hand auger by first removing the top and bottom sediment. The sediment in the central portion of the auger will be containerized and retained for laboratory analysis.

6.1.3 - Field Reporting

Data obtained from borings and split spoon sampling will be recorded in the field log and include the following:

- Name, location and job number
- Date of boring (start, finish)
- Boring number and driller
- Sample number and depth
- Method of advancing sampler, penetration, recovery and blow count
- Type and size of sampler
- PID or FID reading during field screening
- Description of soil
- Thickness of observed layer
- Depth to water surface

- Type and make of equipment (drill rig, etc.) use

6.2 - Well Drilling and Construction

The contractor for drilling and related well installation activities will be a licensed monitoring well driller. The driller will be made aware of the nature of the drilling activities and will be experienced in soil/groundwater investigations of this nature.

The monitoring wells will be installed by use of a hollow stem drill rig under the direction of a qualified hydrogeologist. The NYSDEC will be notified at least five (5) working days prior to any field activities.

Prior to commencement of drilling, site-specific underground structures, overhead structures and other surface features which may impede drilling will be identified. Appropriate utilities will be contacted for mark outs. Drill cuttings (soils) generated during the installation of the wells will be stockpiled on site (on and covered by plastic sheeting) and field screened for VOCs. The PID/FID readings and analytical results from the groundwater samples collected from each well will be evaluated and, with NYSDEC approval, a disposal option implemented.

All drilling equipment will be steam cleaned prior to work and in between boring locations. An on-site potable water supply will be available for steam cleaning and other purposes as necessary. All decontamination water will be discharged to the ground surface. The well screen and casing will be decontaminated by steam cleaning unless the well materials have been cleaned and sealed at the factory.

The proposed shallow groundwater monitoring wells will be constructed with 4-inch I.D. PVC flush-joint risers with a 10 foot section of 0.010 inch (#10) slot-size PVC well screen, 3 feet above the water table and 7 feet below. A hollow stem auger rig will be utilized to drill these wells in accordance with NYSDEC specifications for wells in unconsolidated formations. Split spoon samples will be collected at 5-foot and 10-foot intervals according to the procedures described in Section 5.5.

All of the threaded joints in each monitoring well will be sealed using Teflon tape. The annular space around the well screens will be filled with a sand filter pack extending from 6-inches below the bottom of the screen to a height of 2 feet above the top of screen. A 2 foot seal of bentonite pellets will be placed above the filter pack. The bentonite pellets will be continuously hydrated for sixty minutes prior to installation of the cement/bentonite grout. The depth to the bottom and top of each seal will be measured in the borehole to the nearest 0.1 foot using a weighted tape. The remaining annular space will be grouted with a bentonite/cement slurry using the tremie method. The tremie pipe will be fitted with an elbow to deflect the grout towards the sidewall. A cement/bentonite surface seal will be constructed by filling the annular space of the borehole and will extend from approximately three (3) feet below-grade to grade where a flush mounted well manhole will be installed. A water tight locking cap will be attached to the top of the PVC casing. A 6-inch diameter protective steel casing in a cement collar will be installed over each well. A flush to grade steel cover assembly will be set around the well casing. This steel cover will be set into a sloped concrete pad, after the grout has been allowed to set (see Figure 6.2.1).

The proposed deep groundwater monitoring wells will be constructed with 4 inch I.D. PVC flush-joint risers with a 10 foot section of 0.010 inch (#10) slot-size PVC well screen. The

NYSDEC has requested that the deep monitoring wells be completed just above the Gardiners clay (approximately 110 feet beneath ground surface). The construction details of these deep wells are similar to the shallow wells described above (see Figure 6.2.2 for construction details of the deep wells). These wells will also be drilled utilizing a hollow stem auger in accordance with NYSDEC specifications for wells in unconsolidated formations.

Wells will be developed by pumping or bailing. The development water will be contained in 55 gallon drums pending analytical results. Specific conductivity and pH measurements will be taken of the discharge until both parameters stabilize to confirm adequate development. Stabilization will be established when two consecutive well volume readings are within 10% of one another. Turbidity will also be monitored and the well will be developed until a measurement of less than 50 nephelometric turbidity units (NTU) is achieved or until turbidity stabilizes. Depth to groundwater measurements will be made before and after well development. Field data will be recorded on pre-printed field forms.

6.3 - Groundwater Sampling

Following well construction, development, and an equilibrium period of one week, groundwater samples will be collected from all on site wells (MW-1 through MW-7). Samples will be submitted to H2M Labs, Inc. to be analyzed for full TCL (includes Freon-12 and Freon-22), TAL, malathion, diazinon, and CN.

Pending the first round of groundwater sampling results, additional wells may be installed off-site. Resampling of the on-site wells may also be required for confirmation of first round results. However, the analysis may be limited to TCL VOCs only.

Prior to sampling the wells, a 4' x 4' plastic sheet will be placed at the foot of the well. This will be the designated work zone for the sampling event. All sampling equipment will be placed on this sheet to minimize the possibility of cross contaminating sampling equipment from the surrounding soils. Upon opening the monitoring wells, a PID/FID will be used to screen for total VOCs in the ambient atmosphere and in the headspace of the well. PID/FID values will be recorded and compared to ambient background readings. The following procedure will be followed for groundwater sampling:

1. Prior to the purging of the wells for sample collection, a synoptic static water level measurement to the nearest hundredth (0.01) foot will be recorded in each monitoring well.

2. To ensure a representative sample from the monitoring well, purging of the well is required. In general, the groundwater standing in the well casing prior to the sample collection will be similar in quality to that in the surrounding aquifer or local groundwater, but it may not be representative.

3. A volume of water equal to three (3) or more times that standing in the casing will be purged from the well before taking the sample. If the monitoring well has a low yield, standing water will be fully evacuated and a sample collected upon recovery to 80% of static water level. Wells with high yield can be sampled immediately after evacuation of three (3) well volumes. A decontaminated stainless steel submersible pump or dedicated polyethylene bailer shall be used to remove the required well volumes. Prior to the sampling event, sampling equipment shall be decontaminated as outlined in Section 8.3. All water removed during the

evacuation process shall be contained in 55-gallon drums pending analytical results.

4. Finally, a dedicated, laboratory cleaned, polyethylene, disposable bailer will be attached to dedicated polypropylene rope or nylon line. Three (3) bailer volumes of groundwater will be removed, the fourth bailer volume shall be placed in a precleaned, glass jar dedicated to each sampling point, and used to collect analytical field parameters (temperature, pH, turbidity, and specific conductivity). the appropriate sample bottles will then be filled. The measurements will be recorded in the field book and pre-printed field form. All field instruments shall be calibrated daily prior to the sampling events, and cleaned between each sampling point.

The well cap shall be secured and the above process shall be repeated at the next monitoring well.

The pH probe will first be field calibrated with a No. 7 buffer solution and then with either a No. 10 or No. 4 buffer solution, depending on the anticipated pH of the groundwater sample. The specific conductivity probe will be calibrated with an ionic solution that is closest in conductivity to that anticipated in the groundwater sample. A mercury thermometer will be used to measure temperature and will be tested in the laboratory for accuracy prior to sampling.

In each of the monitoring wells, the TCL VOC sample will be collected first, followed by the remaining analyses. Samples for TAL analysis will be unfiltered. If groundwater turbidity exceeds 50 NTUs at the time of sample acquisition, a field decision regarding the filtering of samples will be made in consultation with NYSDEC's representative.

The field filtering apparatus consists of a hand vacuum pump which forces the sediment-bearing water through flexible tygon tubing onto a plate-type filter. The sediment is retained by the filter, while the filtrate passes through the tygon tubing to a sampler container. The filters will have a standard mean pore diameter size of 0.45 microns (um). Most filters are known to leach contaminants in small quantities and some exhibit ion exchange properties for some of the substances in water. Therefore, care must be taken to thoroughly equilibrate the filter with sample water when the filtrate is to be analyzed. Generally, 100 to 250 milliliters (ml) of sample passed through the filter is sufficient for equilibration. This rinse water should then be discarded and an additional quantity of sample filtered to provide the filtrate for chemical analysis. The following procedure will be used for filtering samples:

1. Using a bailer, a clean glass or plastic container will be filled with water.

2. The sample will be filtered and the initial 100 to 250 ml of filtrate will be discarded.

3. The sample bottle will be plastic for metals, will be filled through the discharge end of the filter, and the preservative (nitric acid) will be added to reduce pH to <2.

4. The filtering apparatus will then be disassembled and the filter discarded. The apparatus will be rinsed with distilled water and reassembled without the filter so that 100 to 200 ml of distilled water can be pumped through equilibrate to clean the internal parts. A new filter will then be installed and the above procedure will be followed for the next sample.

Appropriate QA/QC methodology and sampling protocol for these water quality analyses is reported in Section 8.0 (QA/QC). After all sample bottles are filled, they will be appropriately labeled and put in ice-filled coolers for delivery to the laboratory for analysis. These coolers will be chain-of-custody sealed after closing according to CLP procedures. Completed chain-of-custody forms will accompany all samples.

Site-specific MS/MSD samples will be collected in accordance with CLP procedures. One (1) trip blank will accompany the groundwater samples per sampling day (if samples for VOC analysis are collected). The trip blank vials will be filled in the laboratory using analyte free distilled/deionized water and will accompany the glassware from the laboratory to the field and back to the laboratory. Trip blank samples will be analyzed for TCL VOCs only. One field blank will be collected per disposable polyethylene bailer lot. The field blank vial(s) will be filled during sampling by adding distilled/deionized water to one of the bailers and then filling the field blank vials from the bailer. The field blank sample will be analyzed for the same parameters as the groundwater. In lieu of separate environmental duplicate samples, MS/MSD duplicate samples will be site-specific and will be used and analyzed for the same parameters as the groundwater at a frequency of one for every twenty (20) samples collected in each matrix.

6.4 - Aquifer Characterization

6.4.1 - Well Elevation Survey

Following installation of the groundwater monitoring wells, a well survey will be performed. It will include all wells to be utilized as part of the RI/FS. The horizontal distance between each well will be surveyed. Also, the elevation of the top of the riser pipe of the wells will be measured to the nearest 0.01 foot as well as the ground elevation to the nearest 0.1 foot.

The survey points will be tied into the closest U.S. Coast and Geodetic survey datum point in relation to the site.

6.4.2 - Groundwater Elevation Measurements

Depth to water measurements will be taken at each of the well locations (existing and new) four (4) times during the RI/FS. These measurements will be taken using a Fischer M-Scope water sensitive probe (or equivalent). The depth to water will be measured to the nearest 0.01 foot and referenced to the top of the well pipe. After use in each well, the measuring device will be decontaminated to prevent cross contamination between wells. The probe will be cleaned with a phosphate-free detergent and rinsed with distilled water in between each measurement point.

6.4.3 - Groundwater Level Contour Mapping

Groundwater elevation data collected during measurements will be used to generate groundwater contour maps. Contour maps will depict both the water table elevations and the potentiometric surface of the deeper portion of the Glacial aquifer during the four (4) episodes and used to study flow direction and gradient variation.

Based on the water table and potentiometric surface contour maps, three (3) dimensional flow will be interpreted beneath the site.

6.4.4 - Aquifer Testing

Pump Tests

Prior to conducting aquifer testing, H2M will sample and analyze the groundwater from the five (5) newly installed monitoring wells. The proposed single-point aquifer pumping tests will be conducted on a minimum of one (1) well. The well selected will be one that contained no contaminants based on the first round of sampling, allowing the purge water to be discharged directly to the ground surface. Single-point aquifer tests will b performd on a maximum of four (4) of the wells (only if the analyses come up clean and the purged water may be discharged to the ground surface). The aquifer characteristics of any newly installed wells in which contamination is detected will be evaluated by slug testing (a process in which no purge water is generated).

Single point pumping aquifer testing will be performed to evaluate the coefficients of transmissivity and storage of the aquifer material beneath site. Knowledge of these aquifer characteristics are necessary to adequately evaluate the hydrogeology of the site and to design and implement most remedial alternatives.

The well being tested will be instrumented with a 30 psi pressure transducer (set at the bottom of the well below the pump which is attached to a multi-channel data logger (such as a Hermit 2000). The initial fluid level in the well will be defined as the 0.0-foot reference datum at the beginning of the test. The pump and the data logger will simultaneously started. The pump rate will be set near the maximum sustainable pumping rate for the well (as evaluated during well development) and the data logger will be set to record data on a log time scale. The data logger will be recording time and drawdown. It is very important that a constant pumping rate be maintained.

Pumping will continue for an estimated maximum of 100 to 200 minutes at an estimated 30 gallons per minute (resulting in an estimated maximum of 6000 gallons of purged groundwater for each test). The water will be discharged to a nearby on-site storm drain (with NYSDEC approval). The data will be plotted in the field on semi-log paper to ensure that the linear drawdown plot intersects at least one log cycle on the semi-log paper. This is necessary for calculating the transmissivity by the Cooper Jacob Method (as described later). Once this condition has been satisfied, the data logger will be shut down but not reinitialized to the 0.0-foot reference. The pump will be shut down and the data logger started simultaneously (with the data logger set to record time on a log scale). The data logger will be recording time-recovery. Once the water level has recovered to 90 percent of the original datum, the test will be considered complete and the information stored in the data logger will be downloaded to a personal computer. The pump and transducer will be removed from the well and appropriately decontaminated.

The data from the time-drawdown test will be analyzed by the Cooper Jacob Method which is presented in the following reference:

Cooper, H. and Jacob, C., 1946. A Generalized Graphical Method for Evaluating Formation Constants and Summarizing Well Field History, Transactions, American Geophysical Union, Vol. 27, No. 4.

The hydrogeologic parameters obtained from this method are transmissivity and storage. Additionally, the time-drawdown diagram can be used for predicting future drawdowns.

The data from the time-recovery test will be analyzed by the Theis' nonequilibrium method and/or Jacob's modification of the nonequilibrium equation. These methods are presented in the following reference:

Theis, C., 1935. The Relation Between the Lowering of the Piezometric Surface and the Rate and Duration of Discharge of a Well Using Ground Water Storage. Transactions, American Geophysical Union, Washington D.C., pp 518-524

Jacob, C., 1946. Drawdown Test to Determine Effective Radius of Artesian Well. Transactions, American Society of American Engineers., Vol. 112, pp 1047-1070

The time-recovery data are more accurate than the time-drawdown data because the recovery rates are not affected by pump vibrations and slight changes in pumping rates. The hydrogeologic parameters obtained from this method are transmissivity and storage.

Slug Tests

A Slug test (rising head) will be performed on the newly installed monitoring well MW-7 (not being pump tested). The slug test will provide data for determining hydraulic conductivity (K) estimates for the screened interval of MW-7 for the aquifer.

The slug test will be performed by inserting a 3-foot section of PVC (sand-filled and capped at both ends) in the well. The slug test will be initiated after the well has recovered to not less than 90 percent of the original static water level (since groundwater will be displaced with the injection of the slug). Since falling head slug tests allow forced fluid from the wellbore storage readily into the formation above the natural groundwater table elevation, and this instantaneous

pressure head loss is unaccountable, only a rising head test will be performed (after removal of the slug).

The object of the slug test is to simultaneously cause a measurable lowering of the water level inside the monitoring well and then measure and record the time-rate of recovery of the water level as it returns to its original level. Instantaneous lowering of the water level is accomplished by removing the bailer as quickly and smoothly as possible.

A data logger and pressure transducer (In-Situ, Inc. Hermit Model 2000 and Model PXD-260, respectively) will be used to measure and record the recovery rates of the formation at proposed monitoring well MW-7. The Hermit 2000 data logger is a versatile, self-contained field instrument designed for monitoring and recording various aquifer testing data. This data logger utilizes a submersible pressure transducer which measures pressure head changes in the standing water volume of the well which will be translated to depth to water level measurements. These measurements will be performed at one (1) second intervals and this data is instantaneously stored on its hard drive. During the slug test, the transducer measurements will be reported on the data loggers visual LED display to ensure the progress of the test by the field personnel. This data is subsequently downloaded into various computer software programs and incorporated into table or graphical representation.

The rates of recovery are reported by the Hermit to the nearest 0.001 ft. of water level depth and 0.001 seconds of elapsed time. Elapsed time of zero (t=0) marks the instant the last amount of water was removed from the well. Since the test is not expected to run for a long duration, measurements will be taken on a log scale. Since the well will recover more rapidly at first, this high density data collection will enable the construction of very smooth graphical

representations of the data. In some cases, monitoring wells recover so quickly that measuring the recovery rate may be relatively instantaneous.

In performing the test, one (1) crew member shall set up the data logger and ensure its operation, and a second crew member ensure the optimal placement of the pressure transducer and slug in the well. This site is most likely not influenced by tidal effects which may impact the static water level measurements prior to slug testing. Slug testing will be performed as follows:

1. Set up the Hermit data logger, and prepare it for a practice test run.

2. Prepare the dewatering apparatus (slug). Decontaminate the slug and water level indicator probe and tape by steam cleaning or detergent washing, rinsing and drying, using tap water.

3. Measure and record static (undisturbed) depth to water in the well. Calculate the depth or the placement of the pressure transducer in the well.

4. At the same time, the first crew member performs #3, second crew member hooks up the transducer to the data logger, inputs the necessary data into the Hermit, and lowers the transducer to the appropriate depth into the well.

5. Perform a test run with the data logger.

6. Lower the dewatering apparatus into the well. Wait until the water level returns to within 95 percent of original level.

7. Prepare the data logger for test #1 startup.

8. Rapidly remove the slug from the well, crew member #2 simultaneously starting the data logger run.

9. Periodically review Hermit display readout to observe results of test #1.

The hydraulic conductivity shall be calculated using the method of Bower and Rice, which is presented in the following reference:

Bower, H. and R.C. Rice, 19076. A slug test for determining hydraulic conductivity of unconfined aquifers with complete or partially penetrating wells. Water Resources Research. V. 12, pp. 423-428.

Bower, H., 1989. The Bower and Rice slug test - an update. Ground water. V. 27, No. 3, pp. 304-30.

The test will require the following:

Slug or dewatering device and line.

Hermit data logger and transducer.

One (1) water level indicator marked in 0.01 foot increments.

Alconox, deionized wash water rinse decontamination.

Bucket rinse for decontamination procedures.

Depth to water in all of the wells (along with date and time) will be measured using a decontaminated water level indicator (accurate to 0.01 ft) during the aquifer testing.

In addition, select soil samples from the aquifer will be collected and sieved for grain size distribution and uniformity coefficient estimates. These estimates will be used for comparison to the aquifer pumping test data and the slug test data and used for remedial design criteria, if necessary. The information obtained from the aquifer characterization and water quality data will enable H2M and NYSDEC to determine the need (and placement) for off-site wells.

7.0 - ANALYTICAL PROCEDURES AND LABORATORY TESTING

7.1 - Analytical Laboratory

The samples will be analyzed at H2M Labs, Inc. in Melville, New York. H2M Labs, Inc. is a NYSDOH-ELAP-CLP certified laboratory, proficient in all aspects of the 1991 Analytical Services Protocol including the ability to perform continuous liquid-liquid extraction.

The Laboratory Director, John J. Molloy, P.E., has overall responsibility for all operational activities. The Laboratory QA Manager, Joann M. Slavin, will review all data and be responsible for laboratory report and quality control.

Analysis is separated into two sections utilizing two Senior Analysts. Ursula Middel will directly supervise the organic laboratory and technicians, and review all analytical and QC data. Sal Badalamenti will supervise the analyses of all inorganics. He will review all raw data, calculations and QC analyses.

A copy of this RI/FS work plan will be supplied to the laboratory prior to analyses.

7.2 - Parameters and Frequency of Analysis

7.2.1. - Soil Matrix

During the soil borings, the split-spoon soil samples with the highest PID reading from each borehole will be retained. In the absence of elevated PID readings, the shallowest sample will be retained. Also, the deepest soil sample collected from each borehole will be tested. These select samples will be analyzed for full TCL, TAL,

malathion, diazinon, and CN. Table 7.2.1.1 illustrates the appropriate laboratory methods used for soil sample analysis.

7.2.2 - Water Matrix

The wells to be sampled for the RI/FS will be analyzed according to CLP procedures. At a minimum, one (1) round of sampling will occur. The first sampling event will begin one (1) week after all the wells have been installed and developed, and if necessary, Event 2 may occur 30 days after Event 1. See Table 7.2.2.1 for the appropriate laboratory methods used for groundwater sample analysis.

All groundwater samples collected during the first round will be analyzed for full TCL (includes Freon-12 and Freon-22), TAL, malathion, diazinon, and CN. During each round of sampling, strict QA/QC protocols will be followed. A trip blank will be carried along with the VOC samples every day which will determine if outside contamination has been introduced. Trip blanks will be analyzed for TCL VOCs only. A field equipment blank will be collected for each method of sampling and analysis. A site-specific MS/MSD sample will also be collected at a minimum of one per every twenty (20) samples collected and analyzed for all respective parameters. Field tests will include temperature, pH, turbidity, and specific conductivity and will be taken immediately upon collection.

7.3 - Laboratory Procedures

7.3.1 - Calibration Practices

Instruments and equipment used in H2M Labs, Inc. are controlled by a formal calibration program. The program verifies that equipment is of the proper type, range, accuracy, and precision to provide data compatible with specified requirements. All instruments and equipment which measure a quantity (with performance expected at a

stated level) are subject to calibration. Calibration may be performed by H2M personnel using reference standards or externally by calibration agencies or equipment manufacturers.

Implementation of the laboratory calibration program is the responsibility of the Laboratory Manager and Analysts. The Laboratory QA Manager shall review the implementation of the program.

There are two (2) types of calibration pertinent to these laboratory procedures - operational and periodic.

1) Operational Calibration which is routinely performed as part of instrument usage, such as the development of a standard curve for use with an Atomic Absorption Spectrophotometer. Operational calibration is generally performed for instrument systems.

2) Periodic Calibration which is performed at prescribed intervals for equipment, such as balances and ovens. In general, equipment which can be calibrated periodically is a distinct single purpose unit and is relatively stable in performance.

Whenever possible, recognized procedures, such as those published by American Society for Testing and Materials (ASTM) or USEPA, or procedures provided by manufacturers shall be utilized.

7.3.2 - Equipment Identification

Equipment that is subject to calibration shall be uniquely identified so that calibration records can be designated with a specific instrument.

7.3.3 - Calibration Frequency

Instruments and equipment shall be calibrated at prescribed intervals and/or as part of the operational use of the equipment. Frequency shall be based on the type of equipment, inherent stability, manufacturer's recommendations, values provided in recognized standards, intended use, effect of error upon the measurement process, and prior experience.

7.3.4 - Calibration Reference Standards

Two (2) types of reference standards are used within the H2M laboratory for calibration - physical and chemical:

1. Physical Standards, such as weights for calibrating balances and certified thermometers for calibrating working thermometers and ovens, which are generally used for periodic calibration.

2. Chemical Standards primarily used for operational calibration.

Whenever possible, physical and chemical reference standards shall be known relationships to nationally recognized standards (e.g., National Bureau of Standards) or accepted values of natural physical constants. If national standards do not exist, the basis for the reference standard shall be documented.

7.3.5 - Calibration Failure

Equipment that fails calibration or becomes inoperable during use shall be removed from service and segregated to prevent inadvertent use, or shall be tagged to indicate it is

out of calibration. Such equipment shall be repaired and satisfactorily recalibrated before reuse.

7.3.6 - Calibration Records

Records shall be prepared and maintained for each piece of equipment subject to calibration. Records demonstrating accuracy of reference standards shall also be maintained.

For instruments and equipment that are calibrated on an operational basis, calibration generally consists of determining instrumental response against compounds of known composition and concentration or the preparation of a standard response curve of the same compound at different concentrations. Records of these calibration can be maintained in several ways:

1. The calibration data can be kept with analytical sample data.

2. A log book can be prepared for each instrument which contains all calibration data.

Method 1 provides response factor information, etc., directly with analytical data so that the data can be readily processed and verified. Also, the raw data package is completed as a unit.

Method 2 provides an on-going record of calibration undertaken for a specific instrument; however, to process and verify the analytical data, the log must be used in conjunction with the raw data.

For operational calibration of instrumentation used for this project, calibration data will be included with the raw analytical data and maintained in project files.

7.4 - Analytical Methods

The analytical procedures for the parameters associated with this project will be from the "New York State Department of Environmental Conservation Analytical Services Protocol, September 1989 12/91 Revisions".

1) "Statement of Work for Organics Analysis, Multi-Media, Multi-Concentration", IFB WA 85-J680, USEPA CLP, July 1987 Revision.

2) "Statement of Work for Inorganic Analysis, Multi-Media, Multi-Concentration", SOW No. 785 USEPA CLP, July 1987.

3) "Statement of Work for Semi-volatile Analysis, Multi-Media, Multi-Concentration", SOW USEPA CLP, 1987.

7.5 - Laboratory Data Processing and Reporting

7.5.1 - Review of Data Processing

The following is a discussion of the method to be used for reviewing (checking) data processing. At least 20% of all data shall be checked in this manner. If, during the checking process, errors are determined, checking shall be completely (100%) performed for the data set.

The analyst performing the data processing shall give an independent analyst, the data package. The package shall include; as appropriate, raw data, data sheets, strip

charts, computer input/output, calculations, sources for input parameters such as response factors, etc.

The independent analyst (checker) shall review the data for:

1. Appropriateness of equations used.

2. Correctness of numerical input.

3. Numerical correctness of all calculations. This will be conducted by reperforming numerical computations.

The checking process must be thorough enough to validate that the results are correct. If the checker disagrees with any part of the computations, the checker shall mark through the number with a single line and place the revised number above it.

Any changes made by the checker shall be back-checked by the originator. If the originator agrees with the change, no action is necessary. If the originator disagrees, the originator and checker must resolve the difference so they agree with the result presented.

7.5.2 - Data Reduction

Laboratory data reduction and analysis for organic analyses involves relating a "peak area" to the mass of a constituent. This is accomplished by digital computers. The computer hardware and software is designed to allow the analyst to create libraries or files of calibration standards, and then compare raw sample data against these libraries to produce a report which contains the identification and qualification of constituents present in the sample. The computer-reduced data are manually checked by the analysts.

Inorganic analyses are performed with instruments of varying electronic sophistication, but in all instances, data reduction and analysis involves essentially the generation of a standard calibration curve, and then comparing the instrument readout against the calibration curve to obtain a "Quantity" of constituent. The concentration is then manually calculated. The calculated results are manually entered into the computer system.

For laboratory reporting, the results of the inorganic analyses are entered in a computer and the report is printed. The organic analyses are typed. All reports list the date the sample was received, date collected and the date reported.

7.5.3 - Data Reporting

The following are applicable to data presentation:

1. The final presentation shall be checked in accordance with data verification requirements and approved by the Laboratory QA Manager.

2. Data presentation will include:

   a) Sample identification number used by H2M Labs, Inc. and/or the sample identification provided to the laboratory (if different).

   b) Chemical parameters analyzed, reported values, and units of measurements.

   c) Detection limit of the analytical procedure, if the reported value is less than the detection limit (see Appendix C for CLP detection limits).

   d) Data for a chemical parameter are reported with consistent significant figures for all samples.

e) Results of QC sample analysis, if appropriate.

f) Footnotes referenced to specific data, if required to explain reported values.

The format for reporting will follow that the NYSDEC CLP and procedures.

The laboratory QA officer will provide the Project Manager and the Quality Assurance Officer with a QA summary sheet including a narrative of data rejection or acceptance.

7.5.4 - Review of Data Reporting

Review of data reports is required to verify that information reported by H2M Labs, Inc. corresponds with processed analytical results. Review is only required of the data as it is presented for issuance. Intermediate steps performed after the processed data are checked to prepare the data report (such as data summarizes) do not require validation.

After the draft data report is prepared (generally in tabular form), the reported results should be checked against the reviewed processed data so that transcription errors do not occur. The checking process follows:

1. Using the draft report, all data entries are checked. The checker is not required to be independent of the work because only the transcription from the reviewed data to the data report is being checked.

2. The draft data report should be checked so that the items cited for data presentation are complete and correct. Corrected entries are marked through with a single line and the correct entry provided. The reviewer will indicate that corrections have been made in the report by placing a

second check mark by the correction after comparing the change with the revised copy. The checker shall sign and date every page of the data report in ink.

3. Use of the draft data report results in a check-print which should be maintained as a record to demonstrate the review.

4. If computer output is used directly as the data report without further transcription, only the input requires review.

After checking of the data report is complete, it is given to the Laboratory QA Manager or designated representative for final review. This step is not intended for verifying the reported data. This review is intended to determine that the report meets project requirements. The data report is approved for issue by the Laboratory QA Manager.

7.5.5 - Documentation, Data Reduction and Reporting Field Data

All information pertinent to any field activities will be recorded in bound, waterproof field books. Duplicates of all notes will be prepared each night and kept in a secure place away from the site. Proper documentation will consist of all field personnel maintaining detailed records of all work accomplished including:

(1) data and time of work events

(2) purpose of work

(3) names and addresses of people relevant to the project

(4) description of all methods

(5) description of all samples

(6) number and size of samples collected

(7) description of sampling point

(8) date and time of collection of sample

(9) sample collector's name

(10) reference to site map and/or photograph

(11) field observations

(12) any field measurements with portable instruments.

Each sample collected in the field will be labeled using waterproof ink. Each bottle will be labeled with a number of location, parameter to be analyzed, sampling time and date. The field hydrogeologist will be responsible for ensuring that hydrogeological data are properly recorded.

The data reporting scheme and key individuals who will handle the data are as follows:

(1) data collection by the field hydrogeologist

(2) data reduction, also by the field hydrogeologist

(3) data review by the Project Manager

(4) data validation by independent qualified validator

(5) data usability by the QA officer

(6) Final data interpretation by project manager

8.0 - QUALITY ASSURANCE/QUALITY CONTROL PLAN

The overall QA/QC plan objective is to produce data at the highest quality level to provide direct support for the feasibility study. All sampling activities used directly to support the RI/FS will use Level IV Data Quality Objectives. These activities include groundwater sampling and soil/sediment sampling. QA/QC samples will be collected and will represent all sampling locations to assure quality control for the soil and groundwater characterization of this site. Analyses of QA/QC samples will enable data evaluation for accuracy and integrity. QA/QC sample sets include a field blank, a trip blank, a site specific matrix spike/matrix spike duplicate, and a blind duplicate. One (1) field blank will be collected per sampling method (equipment), one (1) MS/MSD and blind duplicate per different matrix, and one (1) trip blank per sampling day or laboratory delivery (of more than one (1) cooler). Table 8.1 summarizes QA/QC sampling.

Specifically, all data will be gathered or developed using procedures appropriate for the intended use. Standard procedures are used so that known and acceptable levels of accuracy, precision, representatives, completeness, and comparability are maintained for each data set. Descriptions of these criteria are presented in the following subsections.

8.1 - Field QA/QC

In order to ensure that data collected in the field is consistent and accurate, forms will be utilized for repetitive data collection, such as depth to water in wells, well locations, etc. These field forms include Well Logging, Field Sampling and Water Level Data Records.

The accuracy of the data collected will be checked by using an additional degree of definition than the minimum wherever possible. For example, if two distances are needed to

locate a well, three (3) will be used so that if one distance is inaccurate, the well can still be located and the field measurements can be re-taken. For measurements where this is not possible (i.e., depth to water), measurements will be taken and recorded three times.

Blanks and duplicate samples will be used to verify the quality of the field sampling results. A brief description of these samples follows.

8.1.1 - Blank Samples

A field (equipment) blank will be used to determine the effectiveness of the decontamination of the sampling devices (i.e., bailers and/or split-spoon samplers). Analyte free water will be poured into the decontaminated sampling device and then transferred to sample containers before use in sampling. If dedicated bailers are used, a blank sample will be collected prior to use to ensure proper bailer decontamination from the supplier.

A trip blank will contain analyte-free water and will be transported to the site and returned without opening. This will serve as a check for contamination originating from sample transport, shipping, and from site conditions.

The analyte free water used as blanks (for both field and trip blanks) will depend upon the type of analysis. Distilled and deionized water will be used as blanks for the inorganic analysis. For organic analysis, the blanks will be high performance liquid chromatography (HPLC) grade water.

8.1.2 - Duplicate Samples

One blind duplicate sample will be prepared during soil sampling and groundwater sampling. Site-specific MS and MSDs samples will be collected and submitted to the laboratory

as separate samples. One MS/MSD will be collected for every 20 samples, per matrix, per sampling equipment.

8.1.3 - Field Records

All information pertinent to any field activities will be recorded in bound, waterproof field books. Duplicates of all notes will be prepared and kept in a secure place away from the site. Proper documentation will consist of all field personnel maintaining records of all work accomplished including the items listed below:

- date and time of work events
- purpose of work
- description of methods
- description of samples
- number and size of samples
- description of sampling point
- date and time of collection of sample
- sample collector's name
- field observations
- any field measurements with portable instruments

Each sample collected in the field will be labeled using waterproof ink. Each bottle will be labeled with a number, location, parameter to be analyzed, sampling time and date. Packaging,

shipping and chain-of-custody requirements for the samples shall be in accordance with National Enforcement Investigation Center (NEIC) procedures.

8.2 - Preparation and Preservation of Sample Containers

The scope of this project necessitates that several types of sampling containers will be used (see Appendix C). Sample containers will be provided by H2M Labs, Inc. Each sample container will be provided with a label for sample identification purposes. The amount of information on the label will include a sample identification number, time, date and initials of the sample collector. All sample containers will be accompanied by a full chain-of-custody.

All sample containers will be thoroughly pre-cleaned at the laboratory prior to sampling. Appropriate sample preservatives will be pre-added in the bottles. Procedures vary according to the type of analysis to be performed. Individual procedures are outlined below. It is lab practice to pre-preserve sample containers in order to minimize potential contaminants in the field and to reduce unnecessary sample handling in the field (see Table 7.2.1.1 and 7.2.2.1 for description of sample analysis methods, holding time and preservation procedures).

8.3 - Decontamination

8.3.1 - Decontamination Zone

The decontamination zone will be located at the southern end of the property. The driller will prepare a decontamination station whose perimeter is diked to prevent ground contamination from wash waters running out of the area. All drilling equipment shall be decontaminated in this area.

Wash waters from equipment (i.e., split-spoons, pumps, etc.) requiring decontamination will be contained and stored in 55 gallon drums pending laboratory analyses.

8.3.2 - Decontamination Procedures

All field equipment, with the exception of drilling equipment, split-spoons, dedicated polyethylene bailers, hoses, pumps, well casings, well screenings and personnel protective equipment, shall be decontaminated for field use according to the following procedures:

- Non-phosphate detergent and tap water wash.
- Tap water rinse.
- Distilled/deionized water rinse.
- 10% nitric acid rinse.**
- Methanol rinse.
- Total air dry or nitrogen blowout.
- Distilled/deionized water rinse.

** Only if sample is to be analyzed for metals.

Field Decontamination for Drilling Equipment and Split Spoon Samplers:

Field decontamination will consist of steam cleaning and/or a manual scrubbing to remove foreign material and steam cleaning inside and out. These items will then be stored in such a manner as to preserve their decontaminated condition.

Field Decontamination for the Pumps and Hoses:

The procedures for the field decontamination of the pumps and hoses shall consist of a manual scrubbing to remove foreign materials followed by an Alconox scrub and tap water rinse. All wash fluid will be collected and disposed of properly.

Personnel Protective Equipment Decontamination Procedures:

The personnel protective equipment decontamination procedure shall consist of the minimum decontamination stations outlined in the Site Health and Safety Plan (Appendix B).

8.4 - Sample Custody

To maintain and document sample possession, chain-of-custody procedures will be followed. A chain-of-custody form contains the signatures of individuals who have possession of the samples after collection and identification in the field.

A sample is under custody if:

1) it is in one's actual possession; or

2) it is in one's view, after being in your physical possession; or

3) it was in one's physical possession and then was locked up or sealed to prevent tampering; or

4) it is in a designated secure place restricted to authorized personnel.

H2M personnel will preserve and retain the unused portions of all samples in their original containers. These samples will be stored until project closeout, at which time they shall be properly packaged and, at the direction of the H2M representative, transported to an off-site location for disposal.

Each person involved with the samples will know chain-of-custody procedures. A detailed discussion of the stages of possession; (1) field collection, (2) transfer, and (3) laboratory custody is presented below in the following sections:

8.4.1 - Field Chain-of-Custody

Chain-of-Custody procedures for (1) field notebook and boring logs, (2) well key chain, (3) split-spoon sediment samples from well drilling, and (4) environmental samples are included as part of field collection.

Field Notebook and Boring Log Notebook Chain-of-Custody

Dedicated field and log books will be used for the duration of the project. These will be numbered and assigned to the field personnel. A log of the notebook number, the personnel assigned to the notebooks and their affiliation, and the date and time signed out and signed in will be kept. Maintenance of the notebook log will be the responsibility of the field hydrogeologist.

Sufficient numbers of notebooks will be provided to allow for reviews of the field data by the project hydrogeologist during the field operations.

All water level data and field notes will be recorded in bound field notebooks. Drilling data will be recorded in boring logs which will be kept in binders. Soil sample chain-of-custody forms will also be kept in binders.

Well Key Chain-of-Custody

The field hydrogeologist will be responsible for placing the locks on the protective casings and maintaining chain-of-custody of the keys. The project hydrogeologist will initiate a log tracking each set of keys from the wells. The log will contain the well number, the date and time the lock was installed on the well, the person who received the key, and the date, time and person to whom the key was given for the duration of the project. Each of the people to whom a key is assigned during the project will maintain a separate chain-of-custody log for the key(s) that they are assigned.

Split-Spoon Soil Samples

All split-spoon soil samples taken during drilling will be recorded on both the boring log forms and a chain-of-custody form. The field hydrogeologist will be responsible for the custody of the soil samples. The chain-of-custody form will report the sample I.D., date and time taken, person who received the sample, and date, time and person to whom the sample was released. The sample chain-of-custody forms will be kept in binders.

Environmental Samples Chain-of-Custody

When collecting samples for analysis or evidence, only a number which provides a fair representation of the media being sampled will be collected.

The field sampler initiates the chain-of-custody procedure in the field and is the first to sign the form upon collection of samples.

The field sampler is personally responsible for the care and custody of the samples until they are transferred and properly dispatched. Sample tags shall be completed for each sample, using waterproof ink, subjected to proper preservation, and packaged to preclude breakage during shipment. Every sample shall be assigned a unique identification number that is entered on the chain-of-custody form. Samples can be grouped for shipment using a single form.

The record shall be completed in the field as to indicate: project number, unique sample number, sample location (borehole, depth, grid coordinates), sampling date and time, person obtaining the sample, and method of sample preservation. The paperwork will be performed and checked at an on-site location.

8.5 - Transfer of Custody and Shipments

All samples will be accompanied by a chain-of-custody record. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date and note the time of transfer. This record documents transfer of custody of samples from the sampler to another person, to a mobile laboratory or to the permanent laboratory.

Samples will be properly packed for shipment and dispatched to the appropriate laboratory for analysis, with a separate signed custody record enclosed in each sample box or cooler. If samples are shipped directly to the laboratory, the chain-of-custody forms will be kept in possession of the person delivering the samples. All chemical analytical samples will be delivered to the laboratory within 24 to 48 hours of collection.

For samples shipped by commercial carrier, the chain-of-custody form will be sealed in a watertight envelope, placed in the shipping container, and the shipping container sealed prior to being given to the carrier. The waybill will serve as an extension of the chain-of-custody record between the final field person and receipt in the laboratory. The waybill number will be included on the chain-of-custody record.

Whenever samples are split with a facility or government agency, a separate chain-of-custody record will be prepared for those samples and marked to indicate with whom the samples were split.

8.6 - Laboratory Sample Custody

H2M Labs, Inc. has standard operating procedures for documenting receipt, tracking and compilation of sample data. Sample custody related to sampling procedures and sample transfer are described below.

1) Shipping or Pickup of Cooler By Client

(a) Cooler packed at H2M after contact with client.

(b) Cooler wrapped with evidence tape.

(c) Chain-of-Custody form filled out by H2M personnel and client.

(d) Client supplied with evidence tape to seal cooler prior to shipment back to the laboratory.

2) Delivery of Cooler to H2M

(a) Samplers check for any external damage (such as leaking).

(b) The outside of the cooler is checked with a Geiger counter.

(c) Samplers sign for cooler to H2M (to shipper).

(d) H2M receives cooler and complete chain of custody.

3) Final Steps

(a) Raw data stored on file.

The samples will be stored at the proper temperature and not longer than the required holding time before analysis. It is the responsibility of the laboratory to properly dispose of samples beyond the holding period.

8.7 - Data Validation

Data validation will be performed by Ms. Judy Harry of Laboratory Validation Services. Data review starts with an analyst, independent of the data acquisition and processing, reviewing and confirming that data processing has been correctly performed. It continues through verifying

that the reported analytical results correspond to the data required and processed. The data validation report will present the critical points with respect to compliance with data holding times, detection limits, and quantification values. All validation procedures and reports will conform to NYSDEC approved methods.

8.8 - Quality Assurance Officer and Data Usability

The QAO for the project is Mr. Daniel J. Smith (see Appendix A for Mr. Smith's resume). Mr. Smith will be responsible for:

A) Informing the NYSDEC Division of Hazardous Waste Remediation (DHWR) Investigation Support Section (ISS) of the frequency in which he will be present on site during implementation of the FSP.

B) Submitting his field check list prior to sampling.

C) Submitting a field audit report for each field check to NYSDEC (DHWR, ISS).

D) Reviewing laboratory results for the soil/sediment and groundwater samples pertaining to the site from a data usability standpoint. EPA's "Laboratory Data Validation, Functional Guidelines for Evaluating Organics Analyses" and EPA's "SOP No. HW-2. Evaluation of Metals Data for the Contract Laboratory Program (CLP)," will be used to determine data usability. Based upon the evaluation, the QAO will determine whether all data are usable. The QAO will submit a Data Usability Report to NYSDEC after each round of data and prior to the development of the final RI/FS report.

E. Filling out and signing of the QAO signature page (see Appendix D).

F. Notifying the NYSDEC - QAO prior to the deviation from any accepted protocols contained in the final RI/FS Work Plan (this document).

9.0 FISH AND WILDLIFE IMPACT ASSESSMENT PLAN

9.1 - Objective

This Fish and Wildlife Impact Assessment Plan is intended to evaluate fish and wildlife concerns associated with the selected and alternative remediation methods of the Rite-Off, Inc. site. The work plan is presented in a phased approach in order to lead to an efficient ecological evaluation of the site (and the surroundings) and to evaluate the potential impacts on fish and wildlife resources.

Analysis of the impact of the potential contaminant pathway and site remediation in the ecology begins with an inventory and report of identifiable fish and wildlife resources that may be affected by site-related contaminants. If a discernible pathway of contaminant migration and exposure to significant fish and wildlife resources can be identified, detailed analysis would follow. If no significant resources or potential pathways are identifiable, impact on resources may be minimal. Demonstration of minimal impact may eliminate the need for further analysis and the remainder of the phased scope under this plan.

Coordination and consultation with regulatory and non-regulatory fish and wildlife authorities, including the staff of the Inactive Hazardous Waste Evaluation Unit and the NYSDEC Division of Fish and Wildlife are provided for under this proposed work plan.

9.2 - General Ecology

The landscape of the area surrounding and including the Rite-Off, Inc. site property has changed significantly over the past 50 years. Extensive housing

developments, shopping centers, industrial complexes and office parks now dominate areas where once deciduous oak forests and then vast acreage of potato and other crop farms once existed. Rapid urbanization has created isolated fragments of the natural forest. The largest forest tracts have been replaced with typical track housing developments. The proximity of the fragmented wooded open space to extensive residential areas and high speed roadways limits the occurrence of significant wildlife populations. Associated with the remnant stands of oak, birch, cherry and maple are songbirds, which are the most common wildlife throughout the area. Backyards that have trees, shrubs, and evergreens are generally attractive to a variety of birds. English sparrows, grackles, red-wing black birds, mocking birds, cardinals, house finches, starlings, morning doves, and pigeons are the dominant species.

Typical wildlife which may be attracted to any remaining open areas include bobwhite quail, meadow vole, meadowlark, field sparrow, cottontail rabbit, raccoon, opossum, red fox, as well as those mentioned earlier above.

9.3 - Scope of Work

9.3.1 - Phase I - Baseline Information

Task 1 - Site Maps

A topographic map will be prepared for the site and a two (2) mile radius around the project site, demonstrating all NYSDEC juridical designations including but not limited to Critical Environmental Areas, Freshwater Wetlands, and Significant Habitats. In addition, a cover type map will be prepared demonstrating dominant vegetative cover on site and in a 0.5 mile radius from the boundary of the project site. Habitats will be

preliminary designated by analyzing aerial photography and subsequently field verified for accuracy and refinement.

Task 2 - The Description of Fish and Wildlife Resource, Field Investigations and Reports

Habitats and vegetative fragments identified as significant resources will be inventoried by walking line transects across the habitat. A compass heading perpendicular to a base line will be established and sample circular plots with a radius of approximately 40 feet would be sampled at intervals along the transect. Inventories will be conducted until no new plant species are observed. Dominant plant species will be noted for each vegetative unit and each unit would be categorized in accordance with the food, nesting and cover resources provided by the dominant vegetation.

Fauna will be identified by visual observations including direct siting or by observation of browse markings, scat, nests, tracks, or dens. In addition, fauna as well as flora identified in the field will be supplemented by literature file searches and communication with NYSDEC, USF&W Service and local wildlife experts. Special Concern, Threatened or Endangered animal and plant species will be specifically targeted in the inventory and listed if appropriate.

Habitats will be qualitatively assessed for ecological value to wildlife in terms of food, nesting, den, and cover resources, and to humans in terms of hunting, recreation, scientific study and wildlife observation.

Observations of stress potentially related to site contaminants will be noted and described as to its effect on the biota.

Potential fish and wildlife regulatory criteria applicable to remediation (if warranted) will be identified in the RI/FS including permit and buffer requirements.

9.3.2 - Phase II - Contaminant-Specific Impact Analysis

H2M will conduct a pathway analysis to determine the potential and feasibility of routes of contaminants migration into the biota. Contaminants of concern, contaminant source, potential pathway, likelihood of exposure and exposure frequency will be analyzed as it relates to likely receptors in the biota.

9.3.3 - Phase III - Criteria-Specific Analysis

If it is concluded that a pathway for fish and wildlife impacts exists, criteria-specific analysis and analysis of toxicological effects will be determined pursuant to "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites" (NYSDEC DF&W 1991).

9.3.4 - Phase IV - Ecological Effects of Remedial Alternatives,

Implementation and Monitoring

Analysis of the proposed remedial action as well as alternatives, will be performed as to its effect on indicator species identified as significant in Phases I, II and III. Effects related to contaminants and non-contaminant impacts of remediation will be determined including clearing, grading, excavating, construction or laydown for construction. Natural resource, regulatory setbacks and/or constraints will be discussed as they effect remediation alternatives. All alternatives including the proposed remediation will be compared to baseline conditions established at the beginning of the RI/FS.

10.0 - BASELINE HUMAN HEALTH EVALUATION PLAN

A baseline Human Health Evaluation (HHE) will be conducted in accordance with "Risk Assessment Guidance for Superfund Volume 1, Human Health Evaluation Manual (EPA 540/1-89/002, 1989) The baseline HHE consists of five (5) major steps. These are: (1) Data Collection; (2) Data Evaluation; (3) Exposure Assessment; (4) Toxicity Assessment; and (5) Risk Characterization.

Step 1 includes the collection of soil, groundwater, and air data as outlined in the previous sections of this RI/FS Work Plan, as well as the collection of potential human exposure data. The focus of data collection as it relates to the baseline HHE is the development of a site-specific characterization that will allow the risk assessor to identify potential contaminant migration pathways and possible routes of exposure. Information obtained under this step includes chemical concentration data, population data, background levels of contaminants, and meteorological data. As part of the exposure point assessment, a community well survey will be performed for the area downgradient of the site in order to identify potential receptors of groundwater. The survey will be performed for an area up to 1/2 mile downgradient of the site. Should any private wells be identified, H2M will collect samples and test them for the same parameters as detected at Rite-Off site if permission to sample the wells can be obtained.

In Step 2, the data obtained in Step 1 undergoes a thorough quality control/quality assurance review to determine data usability. The data usability screening includes evaluation of analytical methods, quantitation limits, tentatively identified compounds, review of background data, and reduction in the number of compounds to be evaluated in the risk assessment (i.e., selection of indicator chemicals).

Step 3 is the exposure assessment. The major elements of the exposure assessment include characterization of the exposure setting, identification of exposure pathways, determination of exposure point concentrations, and estimation of chemical intakes. When possible, exposure-point concentrations will be based on the results of the RI sampling. Each of these elements includes both a qualitative and quantitative evaluation. In many cases; soil, air, and groundwater modeling is required to estimate concentrations of contaminants at exposure points.

Step 4 is the toxicity assessment. The toxicity assessment includes the review of toxicity data sources (i.e., HEAST, IRIS), evaluation of carcinogenic and non-carcinogenic effects, and in some cases, development of toxicity values. This phase of the project often involves a team of biologists and toxicologists.

Step 5 is the risk characterization step. This step utilizes the data obtained from the exposure and toxicity assessments to quantify potential risks at exposure points. Sub-chronic and chronic risks are evaluated for carcinogenic and non-carcinogenic effects via the estimation of non-cancer hazard indices and cancer risk factors. In addition, a qualitative discussion will be included for chemicals which have limited, or uncertain, toxicity data available.

Figure 10.1 is a flow chart which outlines the steps to be undertaken for the baseline HRA.

11.0 - REMEDIAL ALTERNATIVES

The RI/FS report will follow the latest EPA formats as described in EPA guidance documents such as the 1985 "Guidance on RI under CERCLA", the 1988 draft "Interim Final Guidance for Conducting RI/FS under CERCLA" EPA October, 1988, and NYSDEC TAGM HWR-90-4030, "Selection of Remedial Actions at Inactive Hazardous Waste Sites". The report will include discussion of the data from the previous sampling programs as well as the data and analyses performed as part of this RI/FS.

11.1 - Remedial Alternatives Screening

Based on the established remedial response objectives and the results of the RI, the initial screening of remedial alternatives will be performed according to the procedures recommended in "Guidance on FS under CERCLA", "Interim Guidance on Superfund Selection of Remedy", "Interim Final Guidance for Conducting RI/FS under CERCLA", and "Selection of Remedial Actions at Inactive Hazardous Waste Sites".

H2M will make a presentation to the NYSDEC during which preliminary remedial action objectives shall be identified and the development of remedial alternatives will be summarized. The development of alternatives will be performed concurrent with the RI/FS. The following discussion includes identification of alternatives (although the process of identifying and screening potential alternatives will be ongoing throughout the RI/FS, as new technological and/or site-specific data emerge) including:

1. Development of remedial response actions.

2. Identification and screening of remedial technologies and process options.

3. Development and screening of remedial alternatives.

11.1.1 - Development of Remedial Action Objectives and General Response Actions

Based on the data collected in the RI/FS along with other existing data, the remedial action objectives will be developed. Prior to the development of these objectives, any significant site problems and contaminant pathways will be identified. Considering these problems and pathways, the remedial response objectives that would eliminate or minimize substantial risks to public health or the environment will be developed further. ARARs will be refined by considering site-specific conditions. Based on the response objectives, general response actions will be delineated to address each of the site problem areas. These response actions will form the foundation for the screening of remedial technologies. General response actions considered will include the No Action alternative as a baseline against which all other alternatives will be compared.

11.1.2 - Identification of Applicable Technologies and Development of Alternatives

Based on the remedial action objectives and each identified general response action, potential treatment technologies and their associated containment or treatment and disposal requirements will be identified. A prescreening of these potential treatment technologies for suitability, as part of a remedial alternative, will be conducted. Where several process options exist for a particular technology (e.g., rotary kiln, infrared or circulating bed combustion), the process option for which most data exists and whose capacities/constraints most closely match site conditions will be selected for further detailed evaluation. The final selection of a process option will occur following the completion of the RI/FS.

Technologies that could prove extremely difficult to implement, might not achieve the remedial objective in a reasonable time, or might not be applicable or feasible based on the site-specific conditions will be eliminated from further consideration.

Treatment alternatives may be developed in each of the following categories:

1. Destruction: This type of remedy will irreversibly destroy or detoxify all or most of the hazardous waste, and will result in a permanent remedy.

2. Separation/Treatment: This type of remedy will separate or concentrate hazardous waste from the waste stream. The concentrated waste stream can then be further treated or destroyed off site.

3. Control and Isolation: This type of remedy will reduce the mobility of the hazardous waste, but may not significantly reduce the toxicity or volume of the waste. This remedy utilizes site controls to meet cleanup requirements.

4. Off-site Disposal

5. No Action Alternative

11.1.3 - Screening of Remedial Alternatives

The list of potential remedial alternatives developed above will be screened. The objective of this effort is to reduce the number of technologies and alternatives for further analysis while preserving a range of options. This screening will be accomplished by evaluating alternatives on

the basis of effectiveness and implementability. These screening criteria are briefly described below.

Effectiveness Evaluation

The effectiveness evaluation will consider the capability of each remedial alternative to protect human health and the environment. Each alternative will be evaluated as to the protection it would provide, and the reductions in toxicity, mobility or volume of contaminants it would achieve.

Implementability Evaluation

The implementability evaluation will be used to measure both the technical and administrative feasibility of constructing, operating and maintaining a remedial action alternative. In addition, the availability of the technologies involved in a remedial alternative will be considered.

Innovative technologies will be considered throughout the screening process if there is a reasonable belief that they offer potential for better treatment performance or implementability, few or lesser adverse impacts than other available approaches, or lower costs than demonstrated technologies.

Cost Evaluation

Cost evaluation will include estimates of capital costs, annual operation and maintenance (O&M) cost, and present worth analysis. These conceptual cost estimates are order-of-magnitude estimates, and will be prepared based on:

1. Preliminary conceptual engineering for major construction components

2. Unit costs of capital investment and general annual operation and maintenance costs available from EPA documents.

11.2 - Evaluation Of Remedial Alternatives

The remedial alternatives that pass the initial screening will be further evaluated. During this phase, administrative difficulties and costs will be considered for the remaining alternatives. The evaluation will conform to the requirements of the NCP, in particular Section 300.68 (h) and Subpart F. It will consist of a technical, environmental and cost evaluation, as well as an analysis of other factors, as appropriate (including administrative difficulties of implementation. The detailed evaluation will follow the process specified in the "Guidance on FS under CERCLA" as updated in the December, 1986, the July, 1987 Memoranda and "Interim Guidance for Conducting RI/FS under CERCLA", and the May 1990 "Selection of Remedial Actions at Inactive Hazardous Waste Sites".

11.3 - Feasibility Study Report

A Feasibility Study (FS) report will be prepared to summarize the activities performed in the RI and to present the results and associated conclusions. The report will include a summary of laboratory treatability findings (if performed), a description of the initial screening study process and the detailed evaluations of the remedial action alternatives studied. The FS report will be prepared and presented in the format specified in "Interim Final Guidance for Conducting RI/FS under CERCLA".

The FS report will include an executive summary describing a brief overview of the FS and the analysis underlying the remedial actions that were evaluated.

The introduction of the FS report will provide background information regarding site location and facility history and operation. The nature of the problem, as identified through the various studies, will be presented. A summary of regional and local hydrogeology conditions, remedial action objectives, nature and extent of contamination, and risk assessment addressed in the RI/FS report will also be provided.

The feasible technologies and process options for site remediation will be identified for each general response action, and the results of the remedial technologies screening will be described.

Remedial alternatives will be developed by combining the technologies identified in the previous screening process. The results of the initial screening of remedial alternatives, with respect to effectiveness, implementability and cost, will be described.

A detailed description of the cost and noncost features of each remedial action alternative passing the initial screening will be presented. A detailed evaluation of each remedial alternative with respect to each of the evaluation criteria will be presented. A comparison of these alternatives will also be presented.

12.0 - PROPOSED GENERIC OUTLINE OF RI/FS REPORT

EXECUTIVE SUMMARY

1. INTRODUCTION
    - 1.1 Purpose of Report
    - 1.2 Site Background
        - 1.2.1 Site Description
        - 1.2.2 Site History
        - 1.2.3 Previous Investigations
    - 1.3 Report Organization
2. STUDY AREA INVESTIGATION
    - 2.1 Surface Features (topographic mapping, etc.) (natural and manmade features)
    - 2.2 Contaminant Source Investigations
    - 2.3 Hydrogeological Investigations
    - 2.4 Soil Investigations
    - 2.5 Groundwater Investigations
    - 2.6 Human Population Surveys
    - 2.7 Water Supply Surveys
    - 2.8 Ecological Investigations
3. PHYSICAL CHARACTERISTICS OF THE STUDY AREA
    - 3.1 Surface Features
    - 3.2 Surface Water Hydrology
    - 3.3 Geology
    - 3.4 Soils
    - 3.5 Hydrogeology
    - 3.6 Demography and Land Use

3.7 Ecology

4. NATURE AND EXTENT OF CONTAMINATION

4.1 Sources

4.2 Soils

4.3 Groundwater

4.4 Biota

5. QA/QC, DATA VALIDATION, AND DATA USABILITY

5.1 QA/QC

5.2 Data Validation

5.3 Data Usability

6. CONTAMINANT FATE AND TRANSPORT

6.1 Potential Routes of Migration (i.e., air, groundwater, etc.)

6.2 Contaminant Persistence

6.3 Contaminant Migration

7. BASELINE HEALTH RISK ASSESSMENT

7.1 Public Health Evaluation

7.1.1 Exposure Assessment

7.1.2 Toxicity Assessment

7.1.3 Risk Characterization

7.2 Environmental Assessment

8.0 SUMMARY AND CONCLUSIONS

8.1 Summary

8.1.1 Nature and Extent of Contamination

8.1.2 Fate and Transport

8.1.3 Risk Assessment

8.2 Conclusions

8.2.1 Data Limitations and Recommendations for future work

8.2.2 Recommended Remedial Action Objectives

9.0 FEASIBILITY STUDY REPORT

9.1 Site History and Operation

9.1.1 Summary of Previous Site Investigations

9.2 Regional Hydrogeology

9.3 Local Hydrogeology

9.4 Nature and Extent of Contamination

9.5 Remedial Action Objectives

9.5.1 Remedial Alternatives Screening

9.5.2 Evaluation of Remedial Alternatives (Technologies)

9.5.3 Summary of Feasible Remedial Technologies

9.5.4 Comparison of Remedial Technologies Selected

9.6 Development of Remedial Alternatives

9.6.1 Effectiveness of Remedial Alternatives

9.6.2 Implementability of Remedial Technologies

APPENDICES

A. Boring Logs

B. Hydrogeological Data

C. Analytical Data QA/QC Evaluation Results

D. Risk Assessment Models

E. Toxicity Profiles

13.0 - HEALTH AND SAFETY PLAN (HASP)

The primary health and safety concerns at the Rite-Off, Inc. site are inhalation or dermal-contact exposure to hazardous materials and physical hazards.

1. Inhalation: Ambient air will be monitored using an PID or FID during any intrusive activities. All work will be performed in EPA Level D Personal Protective Equipment (PPE). EPA Level C PPE (air-purifying respirators) will be considered if ambient air concentrations of VOCs exceed appropriate guidelines.

2. Dermal Contact: Synthetic gloves with low permeability to liquids and regular Tyvek suits will be used by all field staff in contact with on-site soil or water.

3. Physical Hazards: Hard hats, hearing protection and steel-toed safety boots will be mandatory during excavation or drilling activities. Safety glasses will be used during equipment decontamination. Air monitoring using an PID or FID will be used during drilling activities.

Personnel will adhere to corporate health and safety guidelines during field activities.

A HASP has been developed for the implementation of the work plan by H2M personnel (see Appendix B for HASP). This HASP establishes a protocol for protecting field personnel and the public from incidents that may arise while performing field activities at the Rite-Off, Inc. site. This plan establishes personnel protection standards,

mandatory operation procedures, and provides for contingencies that may arise while field work is being conducted at the site. H2M field crews and all subcontractors will be provided a copy of the HASP. In addition, all subcontractors must provide their own HASP or provide written acceptance of the H2M HASP. Any visitors will be required to abide by the procedures outlined in the HASP.

Should contractors wish to follow their own HASP, it must include safety guidelines, contingency plans, a hospital route map and emergency telephone numbers. The HASP must adhere to Federal OSHA and New York State Department of Labor hazardous materials requirements for hazard communication and health and safety, and address measures to protect nearby residents.

14.0 - CITIZEN PARTICIPATION PLAN

14.1 - Introduction

The following Citizen Participation Plan (CPP), affecting the investigation and remediation of the Rite-Off, Inc. (Rite-Off) site, an inactive hazardous waste disposal site (NYSDEC identification number 1-52-129), has been prepared in order to provide a clear set of opportunities and procedures for citizens to receive information about and provide input to the RI/FS and activities which will take place at this site. The plan seeks to assure an open process for the interested and possibly affected public. This includes public officials at all levels, citizen interest groups, commercial interests, individuals in the area of the site and the media. These parties need to be a part of the decision-making process for this site, and to be informed about on-site activities.

The site is located in a highly industrial area. The plan presented here briefly describes the site history and condition as it is now known, as well as currently proposed RI/FS activities. It also identifies community officials, groups and individuals who may be affected by or have interest in these investigations, and identifies locations where these parties can obtain additional information about the remedial program for this site. Specific opportunities for public and community input into the decision-making process are indicated. The CPP is a working document. It can be enhanced to accommodate major changes either in public attitude or in the nature and scope of technical activities at the site.

14.2 - Site Background and History

14.2.1 - Site Description and Operation

The Rite-Off, Inc. site is located at 1545 and 1555 Fifth Industrial Court, Bay Shore, New York. The original building on the property is the 1545 location. This building was occupied by an electronics company, followed by a lamp company prior to occupancy by Rite-Off, Inc. in 1974. Rite-Off, Inc. purchased the parcel in 1984 and later expanded by building the warehouse currently designated as 1555 Fifth Industrial Court. The main manufacturing building at 1545 was vacated on September 30, 1993. A portion of the warehouse building (front office space) was leased by National Designs and Development Corporation, an architectural firm, from July 1987 to December 1993.

The approximate 2.9 acre site is occupied by two (2) single-story industrial buildings. The property is bordered by a chain link fence along the southern and western property boundaries and by Fifth Industrial Court on the eastern and northern property boundaries. The site is generally level and a portion of it is paved with asphalt.

The property is situated in a highly industrialized area of Bay Shore. To the north of the property is a waste transfer station, a Sears & Roebuck Company warehouse, and a chemical company; to the east is a vacant lot, an office building and a plastics manufacturer; to the southeast is a garbage hauling company; and to the west is a residential community.

During operations Rite-Off, Inc. blended and packaged spray lubricants, spray solvents, spray insecticides and other aerosol products. The company employed about 35 people. The processes at the facility consisted of blending raw materials in mixing vessels,

transferring of these blended materials into aerosol cans and pressurizing the cans. The finished product was then "burst tested" at elevated temperature under controlled conditions. Once a can had passed the required test, it was stenciled or a gummed label was applied for identification. The cans were then transported to the 1555 Fifth Industrial Court warehouse for storage prior to shipping.

Other factory operations included the distilling/reclamation of solvents. Solvents which had become contaminated with products during flushing of equipment between products. The still boiled the solvents, then condensed the purified vapors. Non-contact water flowing through a condenser apparatus was used to condense the hot vapors. This water was then discharged to the on-site sanitary septic system. The residual still bottoms were then disposed of by a licensed industrial hauler.

There is one (1) 5,000 gallon underground fuel oil storage tank adjacent to the northwest corner of the manufacturing building. Four (4) above-ground tanks (one containing CO_2, one containing Freon-12 and two (2) containing Freon-22) have been removed from the property. The four (4) tanks were located immediately behind (immediately south of) the manufacturing building on concrete.

Six (6) storm water runoff dry wells provide drainage for the 1545 site and are located in the front and rear of the property in the paved areas. Six (6) storm water runoff dry wells provide drainage for the 1555 location and are located in the front of the warehouse in the paved area (see Figure 2.1.2). Water is supplied by the Suffolk County Water Authority (SCWA). There are no on-site diffusion or supply wells. Non-contact cooling water from a reclamation still was discharged to the on-site sanitary system.

The two (2) on-site buildings utilize separate septic systems. At the 1545 location, the septic system consists of a septic tank and leaching pool. Only one (1) leaching pool

has a surface access (solid manhole cover). Other overflow leaching pools have not been identified at this time (if at all present). The 1555 building utilizes a septic tank and two (2) leaching pools (see Figure 2.1.2).

14.2.2 - Regional Groundwater Quality

The site is located in a highly industrialized area. Within a one-half (1/2) mile radius north and hydraulically upgradient of the site is a NYSDEC Class 2 listed inactive hazardous waste disposal site identified as Serv-All Laundry (NYSDEC Site No. 1-52-077). Groundwater beneath and downgradient of the Serv-All site, has been documented with chlorinated VOCs during a RI/FS.

An earlier study conducted by the SCDHS in November 1983 identified a narrow plume of chlorinated VOCs attributed to the Serv-All Laundry facility. Sampling by the SCDHS as of January 1988 indicated that the VOC plume had migrated approximately one-third (1/3) of a mile during the four (4) year period between November 1983 and January 1988. This migration rate is consistent with estimates of regional groundwater flow velocity. VOC concentrations greater than 8,500 ppb (total VOCs) were, at that time, documented within approximately one (1) block of the Thomas Avenue well field (the Thomas Avenue well field is located approximately 5,000 feet to the southeast of the Rite-Off site). This well field is located downgradient and slightly to the east from the site specific groundwater flow direction calculated at Rite-Off. Plume tracking, performed by the SCDHS, showed that by 1991, the VOC plume was within approximately 500 feet north of the Southern State Parkway.

Additional monitoring work is being conducted by the SCDHS to further define the downgradient limits of the plume within the Upper Glacial aquifer, which is approximately 80 feet thick and underlain by the Gardiners clay in the region. Monitoring

below the clay awaits the completion of a joining SCDHS/USGS/SCWA program to determine the extent to which this unit protects the Magothy aquifer.

The Hubbard-Wilson Landfill is also located upgradient of the Rite-Off site. The SCDHS conducted a groundwater investigation at this landfill in March 1983, and identified a leachate plume emanating from the landfill. However, this site has been delisted from the NYSDEC Inactive Hazardous Waste Disposal Site registry.

14.2.3 - Previous Site Investigations and Remediation

In September of 1983, the manufacturing building was vandalized and the trespassers opened tanks containing tetrachloroethene (PCE) and mineral spirits. Although the mineral spirits spill was contained inside the building, approximately 120 gallons (as reported by the Suffolk County Department of Health Services (SCDHS)) of PCE drained outdoors to the storm drains in the rear of the building. Rite-Off site reported the incident to the Suffolk County Police Department, SCDHS and the USEPA. With SCDHS oversight, a contractor, RGM, Inc., was hired to cleanup the spill, which included pumping out the storm drain and excavation of soils where the PCE was diverted.

In December 1986, the NYSDEC performed sampling at the Rite-Off site and found elevated concentrations of solvents, including PCE, in a sample collected at the loading dock storm drain. A subsequent sampling event in June 1987 did not reveal as high a contaminant level, but did confirm the presence of contaminants in on-site soils and waters. Thereafter, the NYSDEC issued a Draft Order on Consent to the Rite-Off site. This order required the completion of a Phase II Investigation at the property.

Holzmacher, McLendon & Murrell, P.C. (H2M) was commissioned to perform a Phase II Investigation at the Rite Off site in Bay Shore, New York. The investigation was conducted in conformance with a Work Plan dated April 1988 and approved by the NYSDEC. The results of the Phase II Investigation are presented in a report entitled, "Phase II Investigation - Rite-Off, Inc. Site, Bay Shore, New York, Suffolk County - NYSDEC Site No. 1-52-129", dated July, 1989.

The results of the Phase II indicated the presence of volatile organic compounds (VOCs) in surface soils at the site. The primary contaminant was PCE. PCE was detected in the soils at the rear drum storage area and beneath the paved driveway at two (2) locations sampled between the two (2) on-site buildings.

In addition to surface soil locations, VOCs were detected in four (4) of the on-site storm drains located in the rear of the property (SD-4, SD-5, SD-6 and SD-7). The primary contaminants were 1,1,1-trichloroethane (1,1,1-TCA) and PCE.

H2M identified the probable source area for the on-site groundwater contamination as the contaminated soils in the rear drum storage area and the contaminated sediments in the rear storm drains. The probable source of contamination of the rear storm drains is the spill of PCE that occurred in September of 1983, when the manufacturing building was vandalized.

Based on the results of the Phase II Investigation, a Hazard Ranking System (HRS) score of 4 was computed. The Thomas Street public water supply well field, located approximately 4,500 feet downgradient (and slightly to the east) of the site, is considered a possible receptor of the on-site contamination. Groundwater contamination

in the vicinity of the Thomas Street Well Field has been previously documented, with several industries identified as sources of contamination at the well field.

14.3 - Project Description

14.3.1 - Objectives of the RI/FS

Rite-Off, Inc. has entered into a Order on Consent with the NYSDEC in order to further characterize site conditions and determine if the site posses a significant threat to public health or the environment for which further action is required. H2M has been retained to conduct a remedial investigation/feasibility study (RI/FS) with the following specific objectives:

1) To collect sufficient data on the site so that areas either previously identified or suspected as potential source areas of contamination are either confirmed or are determined to be below regulatory levels of concern.

2) To determine, if source areas are found to be present, the nature, type, physical extent and migratory path of contamination, in order to develop and implement appropriate remedial measures.

3) To document areas found to be free of contamination, or which have been previously remediated.

4) Present and discuss the data necessary to support the development of remedial measures.

5) Identification, screening, and development of remedial technologies and alternatives.

14.3.2 - Description of Proposed RI/FS Activities

The RI/FS will focus primarily on three (3) areas of suspected sources of VOCs which are the storm drains, the former rear drum storage area, and the former trailer area. Borings will be used to field screen and collect soil samples for analysis. The area in between the two (2) on-site buildings and the septic system leaching pools are also areas of concern and will be further investigated.

During the implementation of this RI/FS Work Plan, H2M proposes to conduct a comprehensive historical and sampling investigation of the 1555 Fifth Industrial Court (warehouse) on the western portion of the site. The NYSDEC requested that additional data be collected in the former trailer area in back of the warehouse building to characterize the subsurface conditions in this vicinity. The objective of this investigation is to obtain data to ascertain an accurate account of past land use and to determine whether a potential source of contamination is present on this parcel. The information obtained from this investigation may be applied to delisting this portion of the site, if applicable.

Groundwater monitoring wells will be installed to determine groundwater quality conditions. One (1) shallow monitoring well will be installed upgradient of the suspected source area and one (1) groundwater monitoring well will be located downgradient, however, to the west of the suspected source areas. Three (3) deep groundwater monitoring wells are proposed to be installed (one (1) upgradient and two (2) downgradient to further investigate the vertical extent of groundwater contamination at the site. If contamination is detected during the RI, H2M may propose an additional monitoring to the NYSDEC to be installed in between the warehouse and existing monitoring well MW-4S to assess downgradient groundwater quality. Additional

downgradient wells may be located off site as determined necessary following the on-site RI/FS investigation.

Groundwater samples will be collected following installation of the wells and will be analyzed for TCL VOCs, TCL semi-VOCs, TCL pesticides/PCBs, (full TCL), TAL, malathion, diazinon, and total cyanide (CN).

As part of the field investigations, a health and safety program for air monitoring will be conducted to test for airborne organic vapors. Since contamination has been detected in the soil and groundwater, the program will apply the use of a PID or FID. Details regarding the health and safety program for field investigations are presented in Appendix B.

14.4 - Preliminary Contact List of Potentially Affected/Interested Public

1) New York State Department of Environmental Conservation and Department of Health Contacts

Ray Cowen, Regional Director (NYSDEC Region I)
Bruce Bently, Citizen Participation (NYSDEC Albany)
Nina Knapp, Health Liaison Program (NYSDOH)
Sy Robbins (SCDHS)

2) Federal Elected Officials

Senator Daniel P. Moynihan (State office)
(212) 661-5150
Senator Alfonse M. D'Amato (State office)
(212) 947-7393
Congressman David A. Levy (District office)
(516) 872-9550
Congressman Richard Lazio (Babylon)
(516) 893-9010

3) State Elected Officials

Governor Mario Cuomo (Albany)
(518) 474-8418
State Senator Ralph Marino (Albany)
(518) 455-2392
Assemblyman Frederick E. Parola, Jr. (Levittown)
(516) 731-3434
State Senator Owen Johnson (Babylon)
(516) 669-9200
State Senator Caesar Trunzo (Hauppauge)
(516) 360-3236
State Assemblyman Paul Harenberg (Oakdale)
(516) 632-7180

4) County and Town Officials

County Executive Robert J. Gaffney (Hauppauge)
Town Supervisor Peter McGowan (Islip)
County Legislator Thomas Finlay (Brentwood)

5) Media

Suffolk Life Newspaper
Newsday
Islip News
Islip Bulletin
Long Island Advance

6) Public Interest and Community Organizations

Long Island Citizens Advisory Committee on Hazardous Waste
c/o NYSDEC, Dr. Joshua Epstein
Brentwood Family Center
Linkage
Concerned Neighbors, Neighborhood Watch
Brentwood Civic Association
Brentwood Community Council Contacts
Mr. Kennedy McGowan
Mr. Joseph Dugan
Rev. Patrick Callan

7) Area Residents and Businesses (list in development)

Properties contiguous to the site and located on 5th Industrial Court (north and east of the property) or Spur Drive North (south of the property);
properties on Fifth Avenue between Farrington and Spur Drive North;
properties on Farrington between Fifth Avenue and Stein;
properties on Bailey between Fifth Avenue and Stein;
properties on Spur Drive North between East Third and Hecksher;
properties on Hecksher between Spur Drive North and Hemlock.

8) Other

Mr. Crescent Bellamore, Superintendent of Schools
Bay Shore Union Free School District
Postmaster (Bay Shore Post Office)
Mr. Bunge Chief (Bay Shore Fire Department)
Brentwood Union Free School District
Hubbard Wilson Sand and Gravel
Servall Laundry
Suffolk County Water Authority
Chief Stephen B. Feron (Hauppauge Fire Department)

9) Other New York State Department of Environmental Conservation and Department of Health Contacts

Joshua Epstein
Citizen Participation Specialist
Region I, NYSDEC
Building 40, SUNY Campus
Stony Brook, NY 11790-2356
(516) 444-0249

John A. Helmeset, Environmental Engineer
NYSDEC
50 Wolf Road
Albany, NY 12233
(518) 457-1708

Dr. Chittibabu Vasudevan
NYSDEC
50 Wolf Road
Albany, NY 12233
(518) 457-1708

Louis P. Oliva, Esq., Sen. Attorney
Division of Environmental Enforcement
200 White Plains Road
5th Floor
Tarrytown, NY 19591-5805
(914) 332-1835 (extension 321)

John M. Olm, Senior Sanitarian
New York State Department of Health
Bureau of Environmental Exposure Investigation
2 University Place
Albany, NY 12203-3313
(518) 458-6305

SUGGESTED DOCUMENT REPOSITORY

1) Bay Shore Public Library
One South Country Road
Brightwaters, NY 11718

2) Region I - NYSDEC
Hazardous Waste Remediation Unit
SUNY Campus, Building 40
Stony Brook, NY 11790-2356
(516) 751-4078
Hours of Operation 8:30 a.m. - 4:45 p.m.

14.5 - Description of Citizen Participation Activities for the RI/FS Phase of the Remedial Program

Table 14.5.1.1 illustrates the activities to be carried out as part of the Citizen Participation Plan for the Rite-Off site. Rite-Off, will be responsible for implementing the plan under the oversight of NYSDEC.

A copy of the draft final and final RI/FS Work Plan will be placed in the document repositories. A notice to the identified media and a public notice detailing the availability of the plan and summarizing the contents will be mailed to the preliminary contact list.

Included on the public notice will be a question on the existence of a well on the box holder's property and a separate request to sample it. This mailing will include information about the document repositories, the name and address of the citizen participation coordinator at H2M, as well as the NYSDEC Citizen Participation Specialist, Project Manager and NYS Department of Health contact, and will request information and comments from the public. A fact sheet on the site and information on the regulations and procedures which govern the investigation and remedial process will be included in this mailing. Individuals or groups who respond to this mailing expressing interest in the site, will be added to the contact list.

After approval of this work plan, a public meeting will be held to discuss the project objectives and scope of work. A second meeting will be conducted after the preliminary RI/FS results are completed in order to present the RI/FS findings and proposed interim remedial measures (IRMs) as appropriate. Following the presentation, a draft RI/FS report will be prepared and submitted to the NYSDEC for review.

Prior to any final remedial program selection, the following Citizen Participation activities will take place: A fact-sheet, explaining the remedial alternatives considered and the reasons for one being preferred, will be distributed to the public contact list. A legal notice, doing the same, will be placed in a paper of general circulation (i.e., Newsday), while a fact-sheet or press notice will be distributed to the local weeklies.

Through these means, the public will also be noticed at least 15 days in advance of a public meeting, to present any proposed remedial action plan (or it's equivalent in this case). It will also be notified of a public comment period consisting of 30 days, and of the relevant documents being placed into the information repositories. A transcript of any such meeting will be prepared, and will be placed into the information repositories. A

responsiveness summary will be prepared and will be placed into the repositories. The responsiveness summary will be distributed to those who attend the PRAP meeting and who sent in written comments during the comment period. The presentation of any completed IRMs will also be included.

14.6 - Glossary of Key Terms and Major Program Elements

14.6.1 Key Terms

AQUIFER: A geologic formation that is sufficiently permeable to conduct groundwater and to yield significant quantities of water to wells and springs.

CITIZEN PARTICIPATION: A process to inform and involve the interested/affected public in the decision-making process during the investigation and remediation of sites. The process helps to assure that the best decisions are made from an environmental, human health, economic, social and political perspective.

CITIZEN PARTICIPATION PLAN: A document that describes the site-specific citizen participation activities that will occur in order to complement remedial activities. It also provides site background and the rationale for the selected citizen participation program for the site.

CITIZEN PARTICIPATION SPECIALIST: An NYSDEC staff member within the Division of Hazardous Waste who provides guidance, evaluation and assistance to the project manager in carrying out the site-specific Citizen Participation Plan.

CONTACT LIST: Names, addresses, and telephone numbers of individuals, groups, organizations and media interested and/or affected by a particular site in the remedial program. It is used to inform and involve the interested/affected public.

DOCUMENT REPOSITORY: Typically a regional NYSDEC office and/or public building, such as a library, at which documents related to site remedial and citizen participation activities are available for public review.

FACT SHEET: A written discussion of a site's remedial process, or some part of it, prepared for the public and written in easily understandable language. A sheet may be prepared for the general public or a particular sector. Its uses may include discussion of an element of the remedial program, opportunities for public involvement, availability of a report or other information, or announcement of a public meeting. It may be mailed to all or part of the interested public, distributed at meetings or during sampling efforts, or sent when requested.

NYSDEC PROJECT MANAGER: A NYSDEC staff member, usually an engineer, geologist, or hydrogeologist within the Division of Hazardous Waste Remediation who is responsible for the day to day administration and ultimate disposition of one or more hazardous waste sites. The project manager works with the Office of Public Affairs as well as fiscal and legal staff to accomplish site-related goals and objectives.

PUBLIC MEETING: A scheduled gathering of the NYSDEC staff and the public to give and receive information, ask questions and discuss concerns. A public meeting may take many forms and could be a large group meeting or a workshop.

PUBLIC NOTICE: A written informational technique used to inform the public of an important upcoming activity or phase in a site's remedial program. Some public notices are formal and meet legal requirements, such as those published in a local newspaper of general circulation. Others are informal notices, which may be made through telephone calls to key citizen leaders or through targeted mailings.

RESPONSIVENESS SUMMARY: A formal or informal written or verbal summary and response to public questions and comments. It is usually prepared during or after important elements in site's remedial program. The responsiveness summary may list and respond to each question or summarize and respond to questions in categories.

14.6.2 Major Program Elements

The following eight definitions represent major elements of the remedial process. They are presented in the order in which they occur, rather than in alphabetical order, to provide a context to aid in their definition.

SITE PLACED ON REGISTRY OF INACTIVE HAZARDOUS WASTE SITES: Each inactive site known or suspected of containing hazardous wastes must be included in the Registry. Therefore all sites which state or county environmental or public health agencies identify as known or suspected to have received hazardous waste should be listed in the Registry as they are identified. Whenever possible, the NYSDEC carries out an initial evaluation of the site before listing.

PHASE I SITE INVESTIGATION: An investigation that includes preliminary characterizations of hazardous substances present at a site, identifies pathways by which contaminants may be migrating away from the original area of disposal, identifies

resources or populations that may be affected by site contamination, and researches waste disposal practices and potentially responsible parties. The investigation therefore involves research of records from all agencies known to be involved with a site and interviews with site owners, employees, and local residents to gather pertinent information about a site. Information gathered is summarized in a Phase I Report.

After a Phase I Investigation, the NYSDEC may choose to initiate an emergency response, to nominate the site for the National Priorities List (NPL) or, where additional information is needed to determine site significance, to conduct a Phase II Site Investigation.

PHASE II SITE INVESTIGATION: An order by the NYSDEC when the results from a Phase I investigation are insufficient for properly classifying a site. Information gathered is summarized in a Phase II report and is used to arrive at a final hazard ranking score to classify the site. A Phase II investigation is not sufficiently detailed, however, to determine the full extent of the contamination, evaluate remedial alternatives, or prepare a conceptual design for construction.

REMEDIAL INVESTIGATION (RI): A process to determine the existence, nature and extent of contamination through data collection and analysis. The process may include sampling, monitoring, and other information-gathering techniques which are used to determine the necessity for, and proposed extent of, a remedial program for the site.

FEASIBILITY STUDY (FS): A process for developing, evaluating and selecting remedial actions and alternatives. Data gathered during the RI are used to: define the objectives of the site remedial program and broadly develop remedial action alternatives; perform an initial screening of alternatives; and perform a detailed analysis of a limited number of alternatives which remain after the initial screening stage.

REMEDIAL DESIGN: Once a remedial action has been selected, technical drawings and specification for remedial construction at a site are developed in accordance with the final RI/FS report. Design documents are used to bid and construct the chosen remedial actions. Remedial design is prepared by consulting engineers with experience in inactive hazardous waste site remediation.

CONSTRUCTION: The selection and supervision of contractors who work to carry out the designed remedial alternative. Construction may be as straightforward as excavation of contaminated soil with disposal at a permitted hazardous waste facility. One the other hand, it may involve drum sampling and identification, complete encapsulation, leachate collection, storage and treatment, groundwater management, or other technologies.

MONITORING/MAINTENANCE: Denotes post-closure activities to ensure continued effectiveness of remedial actions. Typical monitoring/maintenance activities include quarterly inspection by an engineering technician, collection of groundwater or surface water samples, water quality analysis, and other indices of possible site contamination.

CONSENT ORDER: A legal, enforceable, negotiated agreement between NYSDEC and responsible parties where the latter agrees to undertake or pay for the costs of an investigation and/or cleanup of a site. The order includes a description of the remedial actions to be undertaken at the site and the schedule for implementation.

DELISTING: Removal of a site from the state Registry based on study which shows the site does not contain hazardous waste or levels of hazardous wastes that pose a significant threat to public health or the environment.

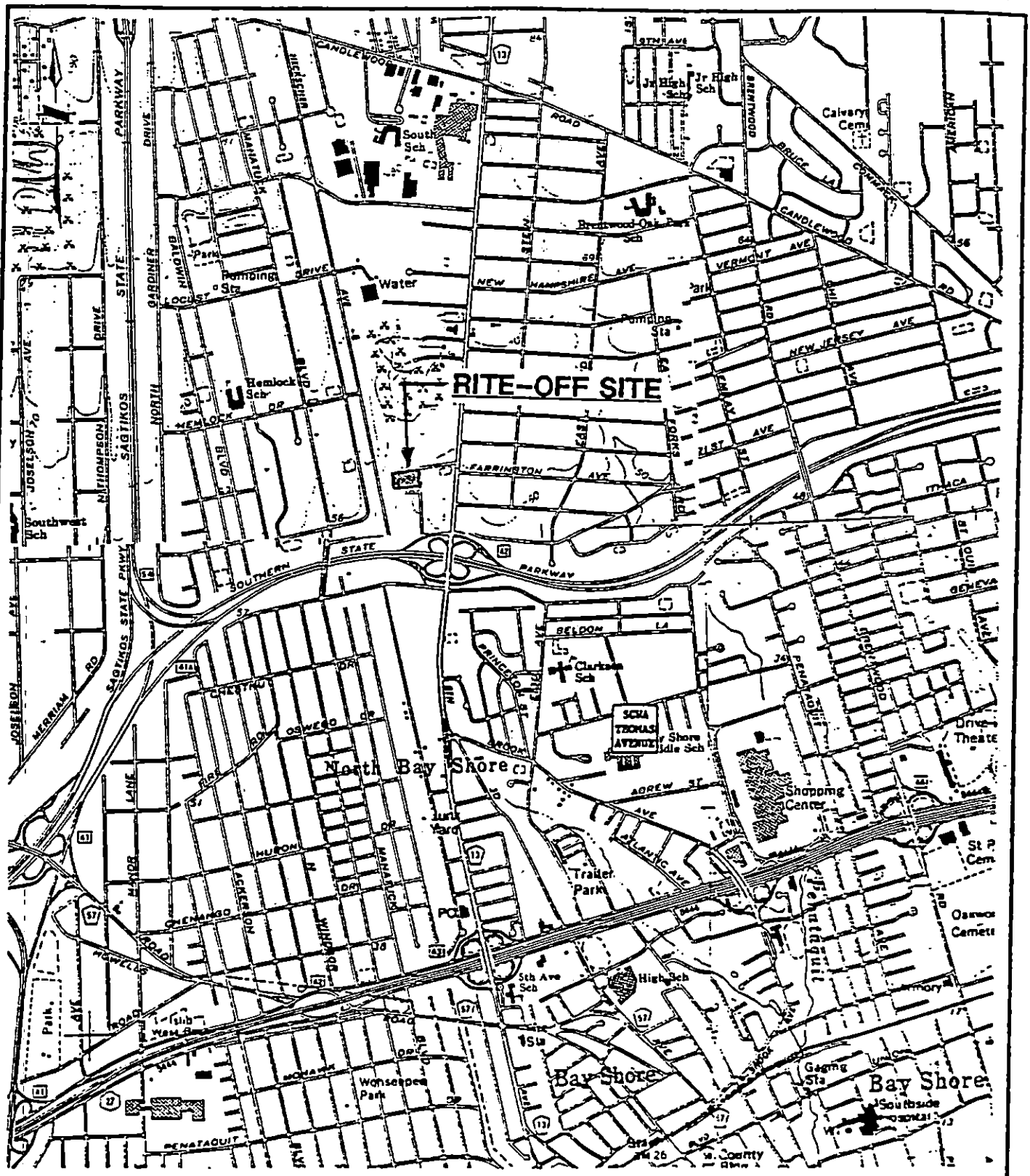
POTENTIALLY RESPONSIBLE PARTY-LEAD SITE: A site at which those legally liable have accepted responsibility for the investigation and/or the development and implementation of its remedial program. Potentially Responsible Parties (PRPs) may be current owners, past and present site operators, or those who generated waste placed at the site. Remedial programs developed and implemented by PRPs generally result from an enforcement action taken by the state. PRPs usually incur the costs associated with the remedial program.

RANKING SYSTEM: The United States Environmental Protection Agency uses a Hazard Ranking System (HRS) to assign numerical scores to each inactive hazardous waste site. The scores express the relative risk or danger from the site.

RESPONSIBLE PARTIES: Those individuals or groups responsible for, or contributing to, the contamination of a hazardous waste site.

STATE LEAD SITE: An inactive hazardous waste site at which the NYSDEC has responsibility for investigating problems at the site and for developing and implementing the site's remedial program.

FIGURES


RITE-OFF SITE
North Bay Shore
Bay Shore
Bay Shore
Southside
Water
Pumping Sta
Pumping Sta
Brentwood-Oak Park
South Sch
Jr High Sch
Jr High Sch
Calvary Cem
Hemlock Sch
Southwest Sch
Clarkson Sch
Trailer Park
Shopping Center
Drive-In Theatre
Wonsetpee Park
Gaging Sta
High Sch
Municipal Lot
Municipal Lot
Municipal Lot

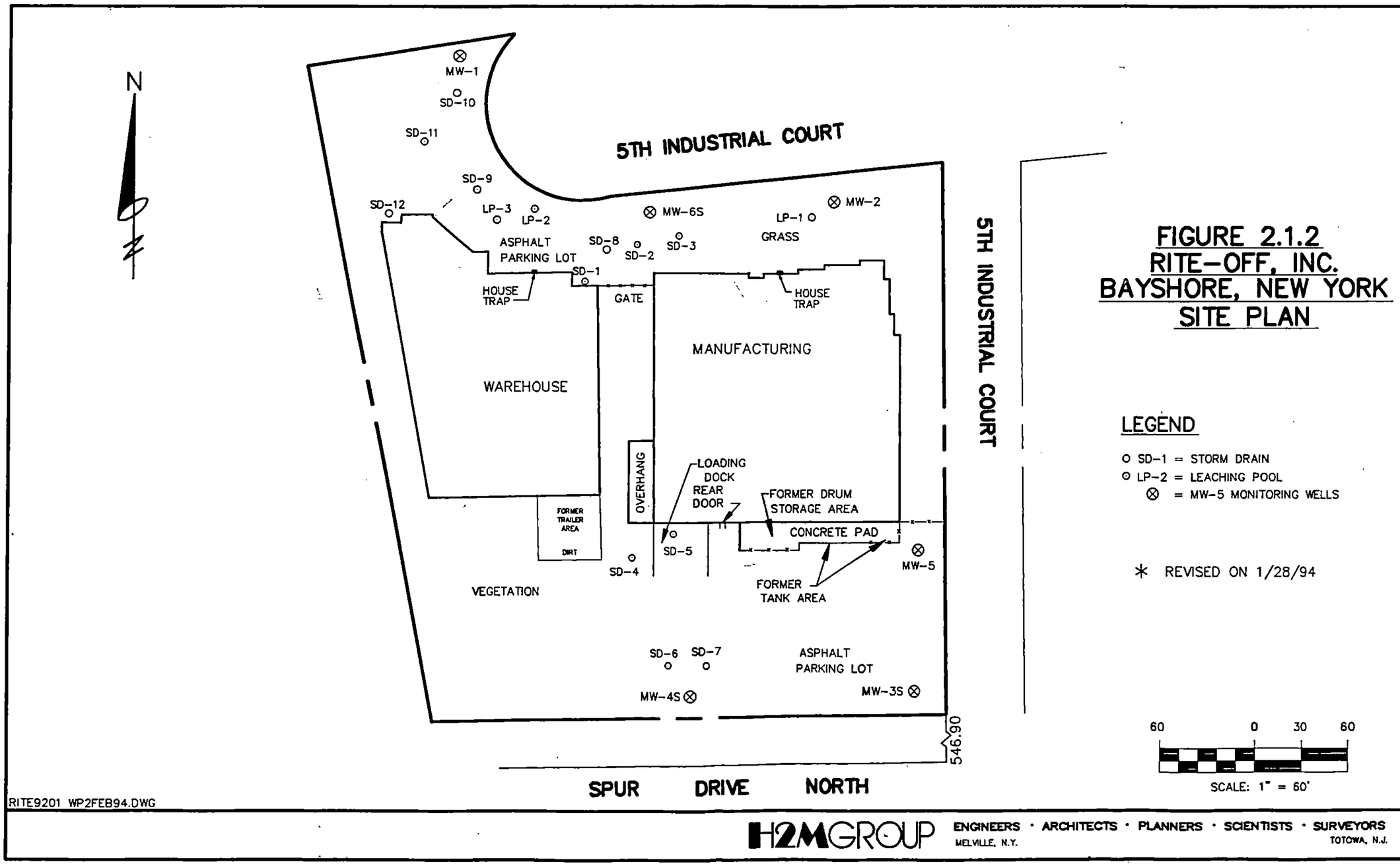


FIGURE 2.1.2
RITE-OFF, INC.
BAYSHORE, NEW YORK
SITE PLAN

LEGEND

- SD-1 = STORM DRAIN
- LP-2 = LEACHING POOL
- ⊗ = MW-5 MONITORING WELLS

* REVISED ON 1/28/94

60 0 30 60

SCALE: 1" = 60'

RITE9201 WP2FEB94.DWG

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

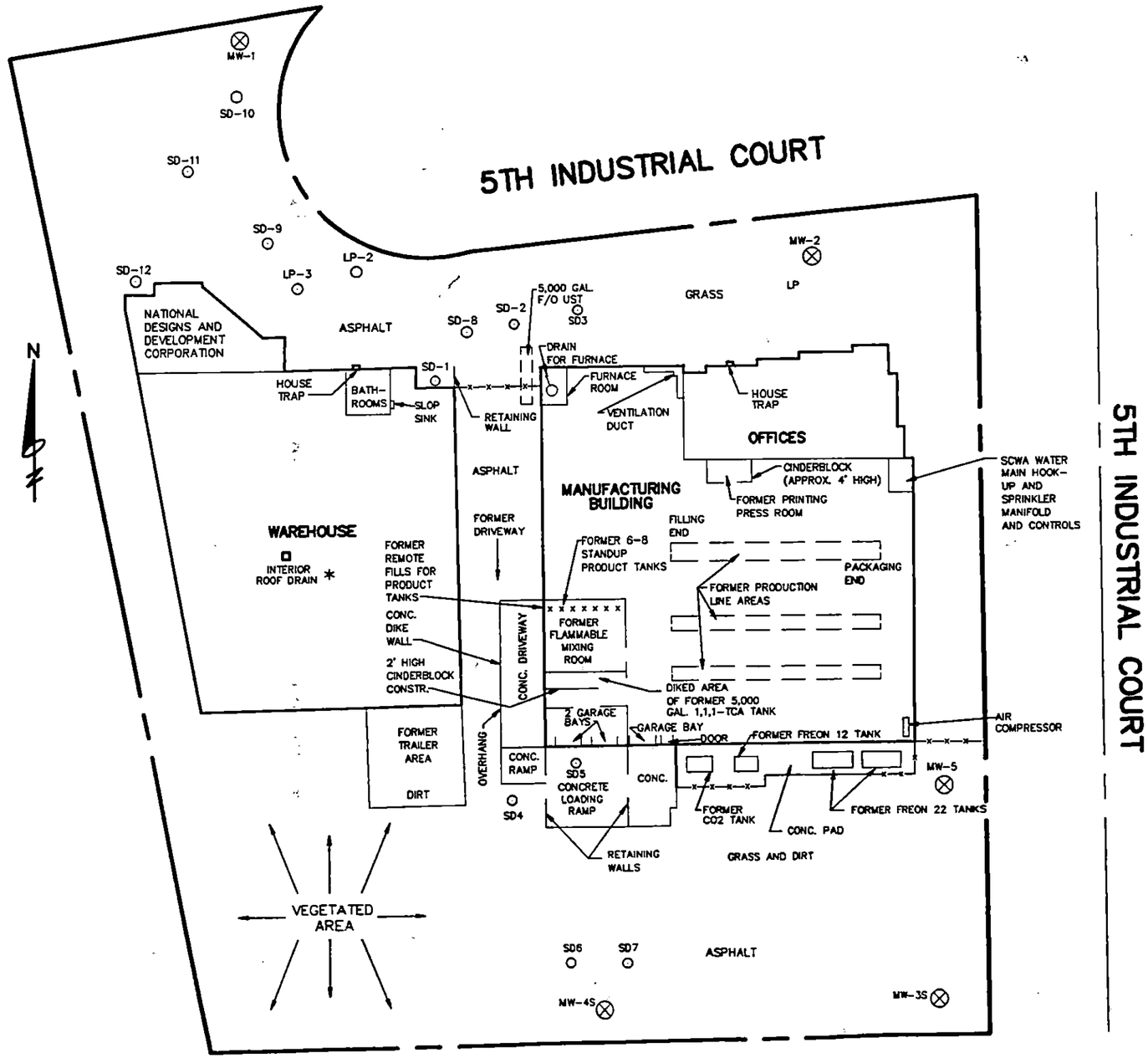


FIGURE 2.1.3
RITE-OFF, INC.
BAYSHORE, NEW YORK
SITE PLAN WITH INTERIOR DETAIL

LEGEND

- ⊙ SD-5 = STORM DRAIN
- ⊙ LP-1 = LEACHING POOL
- ⊗ = MW-5 MONITORING WELL
- ⊗ MW-3S = FORMER ⊗ MW-3
- ⊗ MW-4S = FORMER ⊗ MW-4

NOTES:

INTERIOR BLDG DESIGN NOT TO SCALE
ABOVE AND BELOW GRADE TANKS NOT TO SCALE

* LOCATION OF INTERIOR ROOF DRAIN IS APPROXIMATE

REVISED ON 1/31/94

0 50 100

SCALE: 1" = 50'

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MELVILLE, N.Y. TOTOWA, N.J.

RITE9201 BLDGINTR.DWG

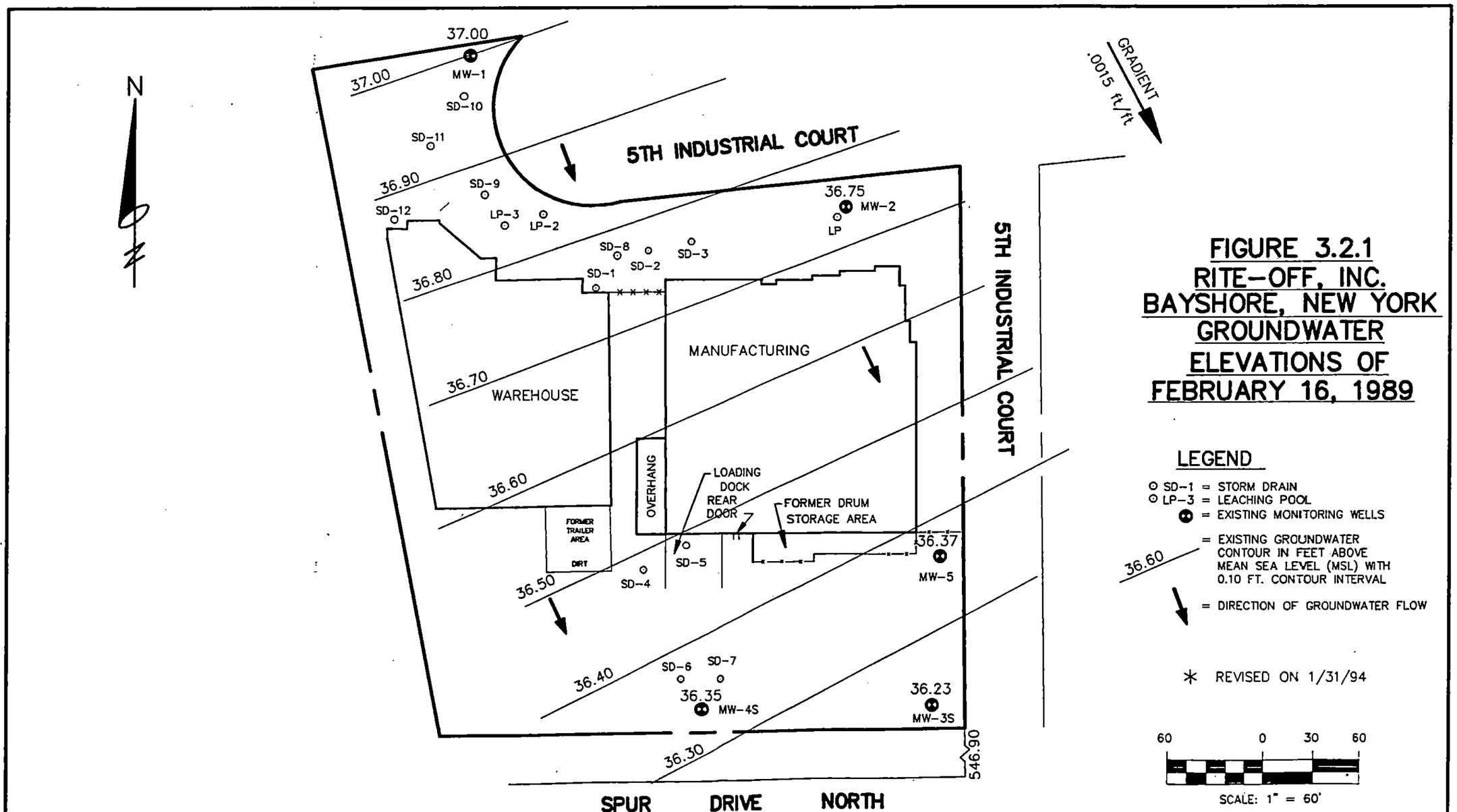


FIGURE 3.2.1
RITE-OFF, INC.
BAYSHORE, NEW YORK
GROUNDWATER ELEVATIONS OF FEBRUARY 16, 1989

LEGEND

- SD-1 = STORM DRAIN
- LP-3 = LEACHING POOL
- = EXISTING MONITORING WELLS
- = EXISTING GROUNDWATER CONTOUR IN FEET ABOVE MEAN SEA LEVEL (MSL) WITH 0.10 FT. CONTOUR INTERVAL
- = DIRECTION OF GROUNDWATER FLOW

* REVISED ON 1/31/94

60 0 30 60

SCALE: 1" = 60'

RITE9201 WP2FEB94.DWG

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

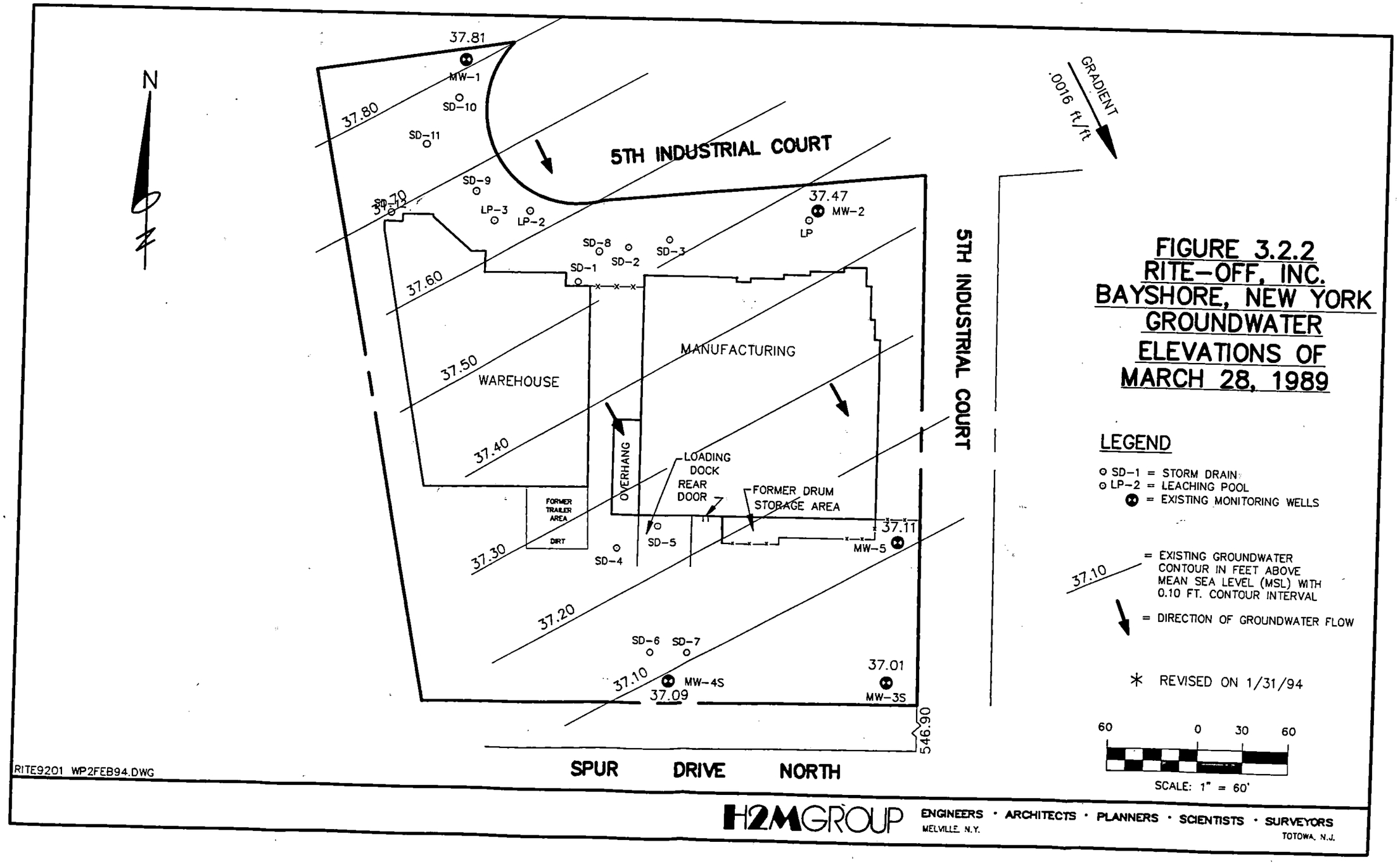


FIGURE 3.2.2
RITE-OFF, INC.
BAYSHORE, NEW YORK
GROUNDWATER ELEVATIONS OF MARCH 28, 1989

LEGEND

- SD-1 = STORM DRAIN
- LP-2 = LEACHING POOL
- = EXISTING MONITORING WELLS

37.10 = EXISTING GROUNDWATER CONTOUR IN FEET ABOVE MEAN SEA LEVEL (MSL) WITH 0.10 FT. CONTOUR INTERVAL

= DIRECTION OF GROUNDWATER FLOW

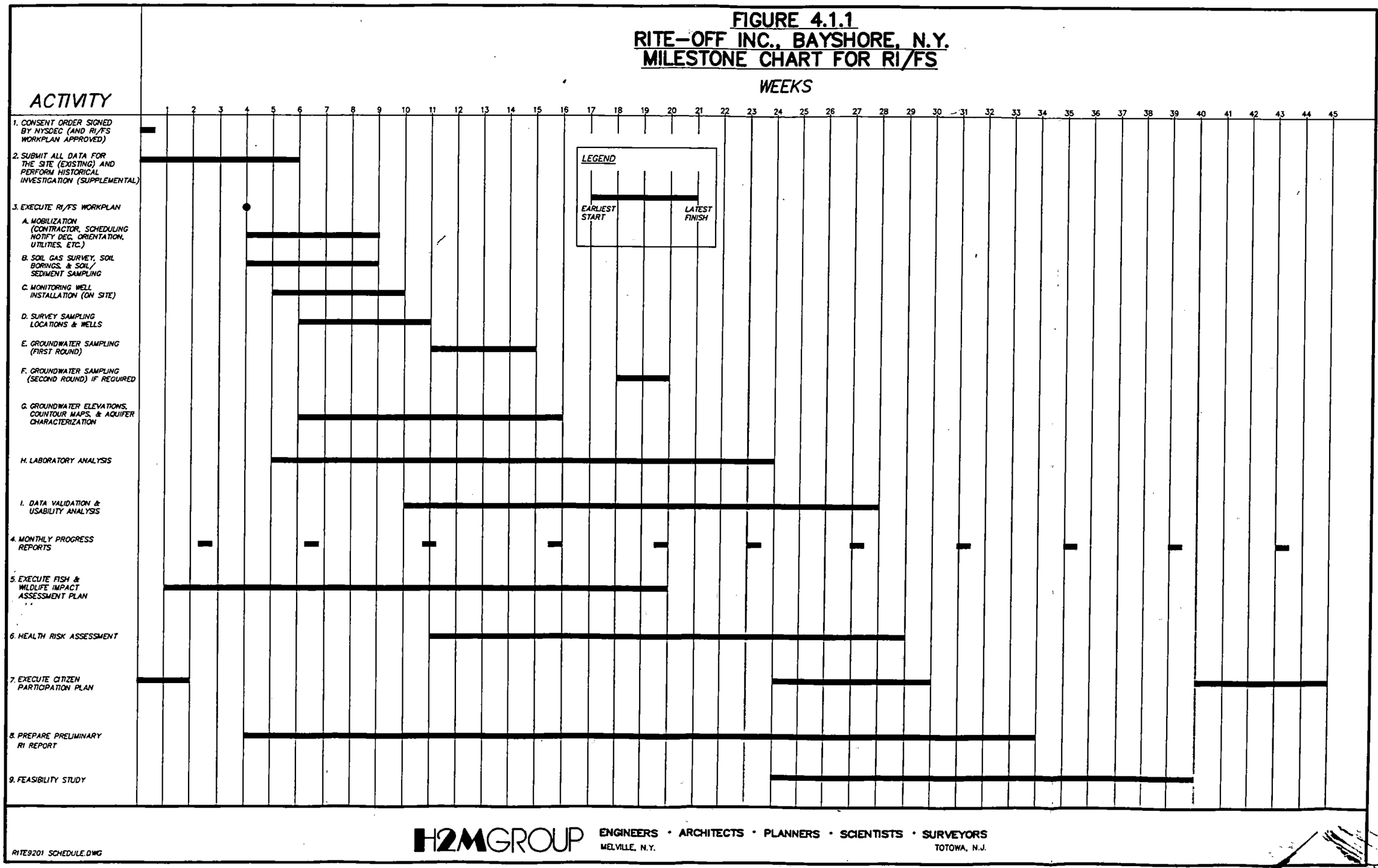
* REVISED ON 1/31/94

60 0 30 60

SCALE: 1" = 60'

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

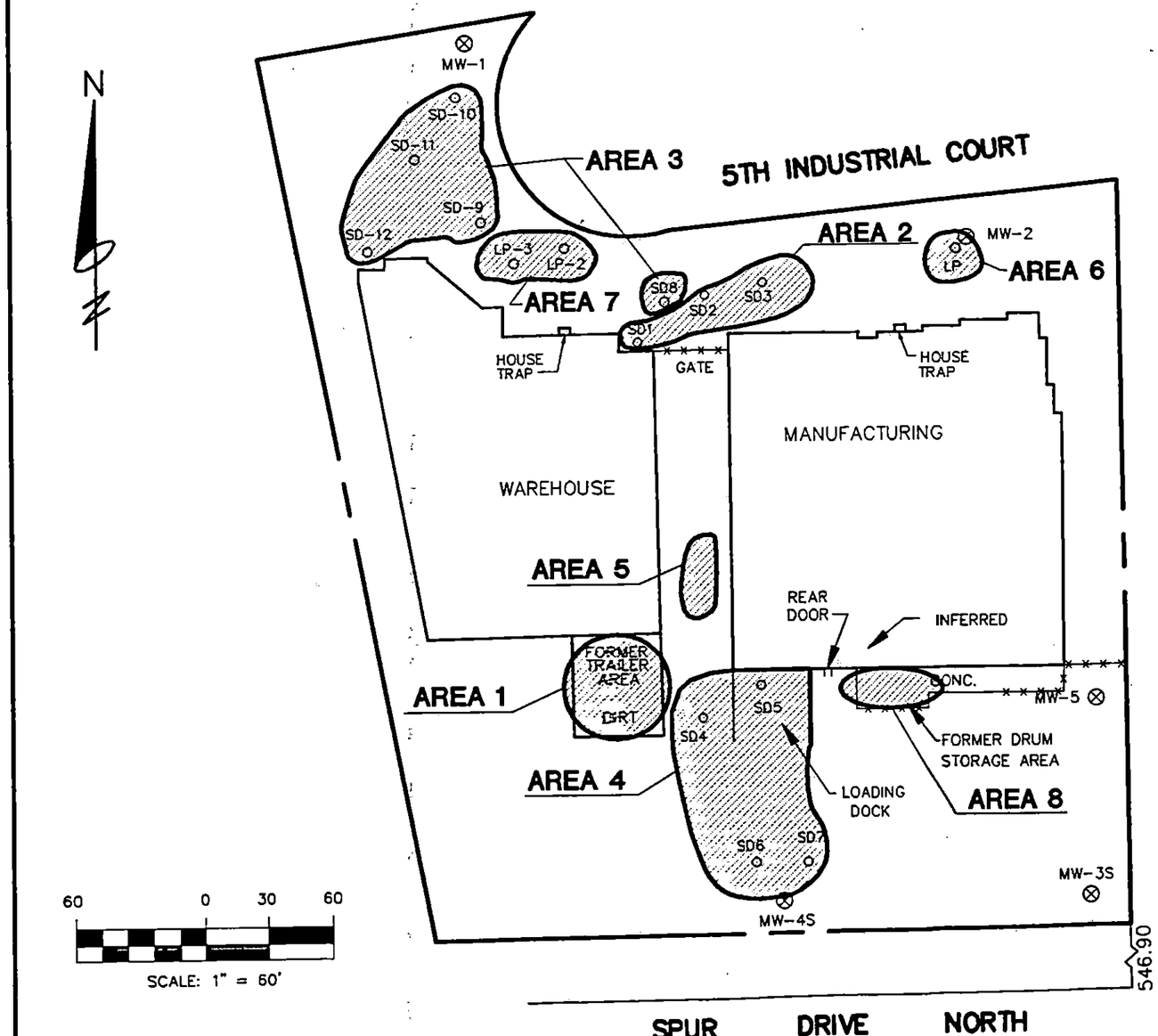
FIGURE 4.1.1
RITE-OFF INC., BAYSHORE, N.Y.
MILESTONE CHART FOR RI/FS



H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

RITE9201 SCHEDULE.DWG

FIGURE 5.5.1
RITE-OFF, INC.
BAYSHORE, NEW YORK
AREAS OF CONCERN & PROPOSED SAMPLING LOCATIONS



LEGEND

SD = STORM DRAIN
LP = LEACHING POOL

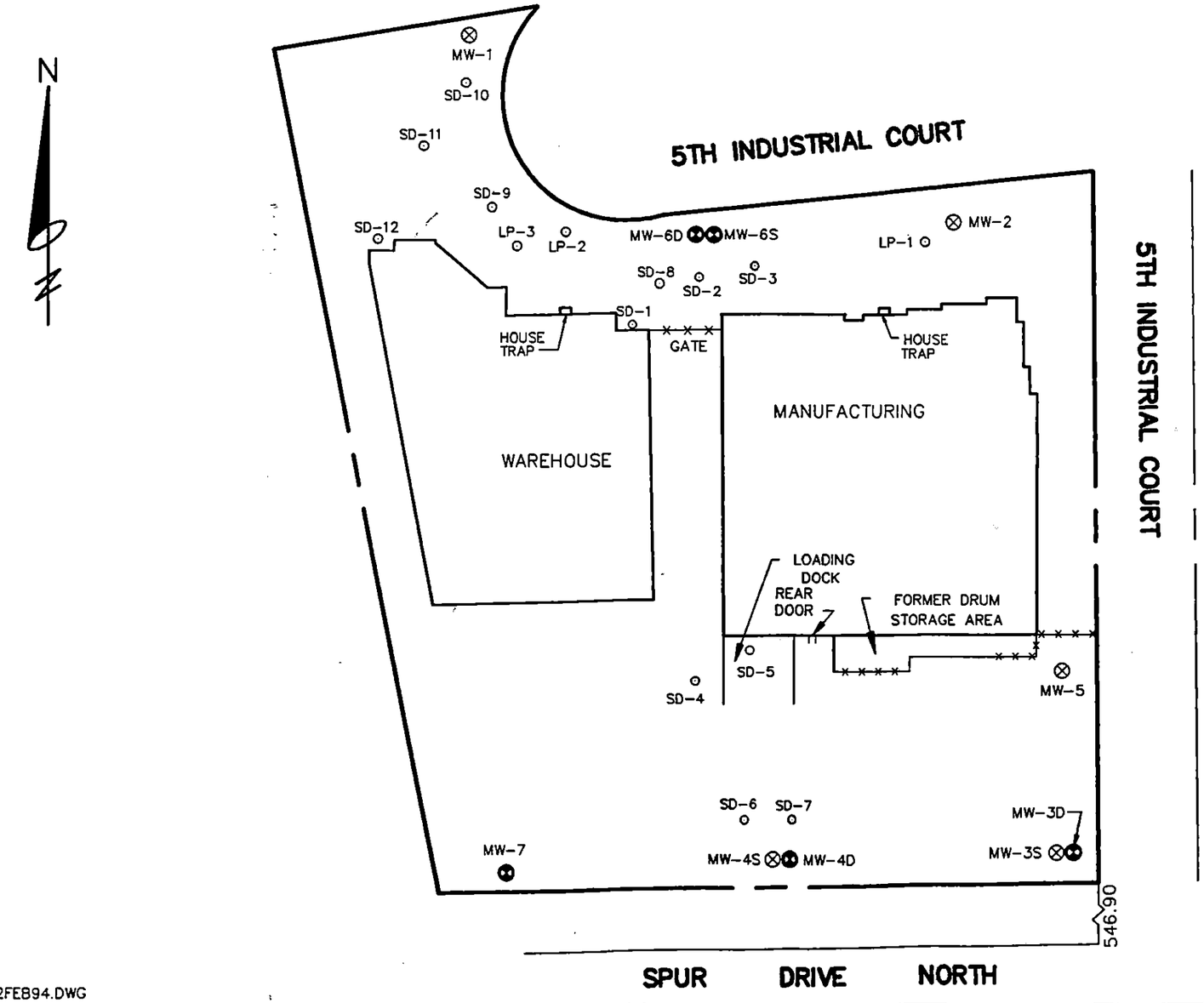
MW-5 ⊗ = MONITORING WELLS INSTALLED DURING PHASE II INVESTIGATION

1. **AREA 1**
   FORMER TRAILER AREA WILL BE INVESTIGATED BY CONDUCTING A SOIL VAPOR SURVEY AND TWO (2) SOIL BORINGS DURING RI. TWO (2) ADDITIONAL SURFACE SOIL SAMPLES WILL BE COLLECTED, INCLUDING ONE SAMPLE OUTSIDE THIS AREA TO THE SOUTHWEST.
2. **AREA 2**
   STORM DRAINS SD-1, SD-2 AND SD-3 WILL BE FURTHER INVESTIGATED BY COLLECTING BOTTOM SAMPLES DURING THE RI.
3. **AREA 3**
   STORM DRAINS SD-8 THROUGH SD-12 WILL BE INVESTIGATED BY COLLECTING BOTTOM SAMPLES DURING THE RI.
4. **AREA 4**
   STORM DRAINS SD-4, SD-5, SD-6 AND SD-7 WILL BE FURTHER INVESTIGATED DURING RI UTILIZING SOIL BORINGS.
5. **AREA 5**
   SURFACE SOIL - WILL BE FURTHER INVESTIGATED DURING RI UTILIZING TWO (2) SOIL BORINGS.
6. **AREA 6**
   LEACHING POOL - CONFIRMATORY BOTTOM SAMPLE WILL BE COLLECTED DURING RI.
7. **AREA 7**
   TWO (2) LEACHING POOLS - CONFIRMATORY BOTTOM SAMPLES WILL BE COLLECTED DURING RI.
8. **AREA 8**
   FORMER DRUM STORAGE AREA WILL BE FURTHER INVESTIGATED DURING RI UTILIZING TWO (2) SOIL BORINGS.

RITE9201 WP2FEB94.DWG

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FIGURE 5.5.6.1
RITE-OFF, INC.
BAYSHORE, NEW YORK
PROPOSED MONITORING WELL LOCATIONS



LEGEND

- SD-5 = STORM DRAIN
- LP-1 = LEACHING POOL
- = PROPOSED MONITORING WELLS
- = EXISTING MONITORING WELLS

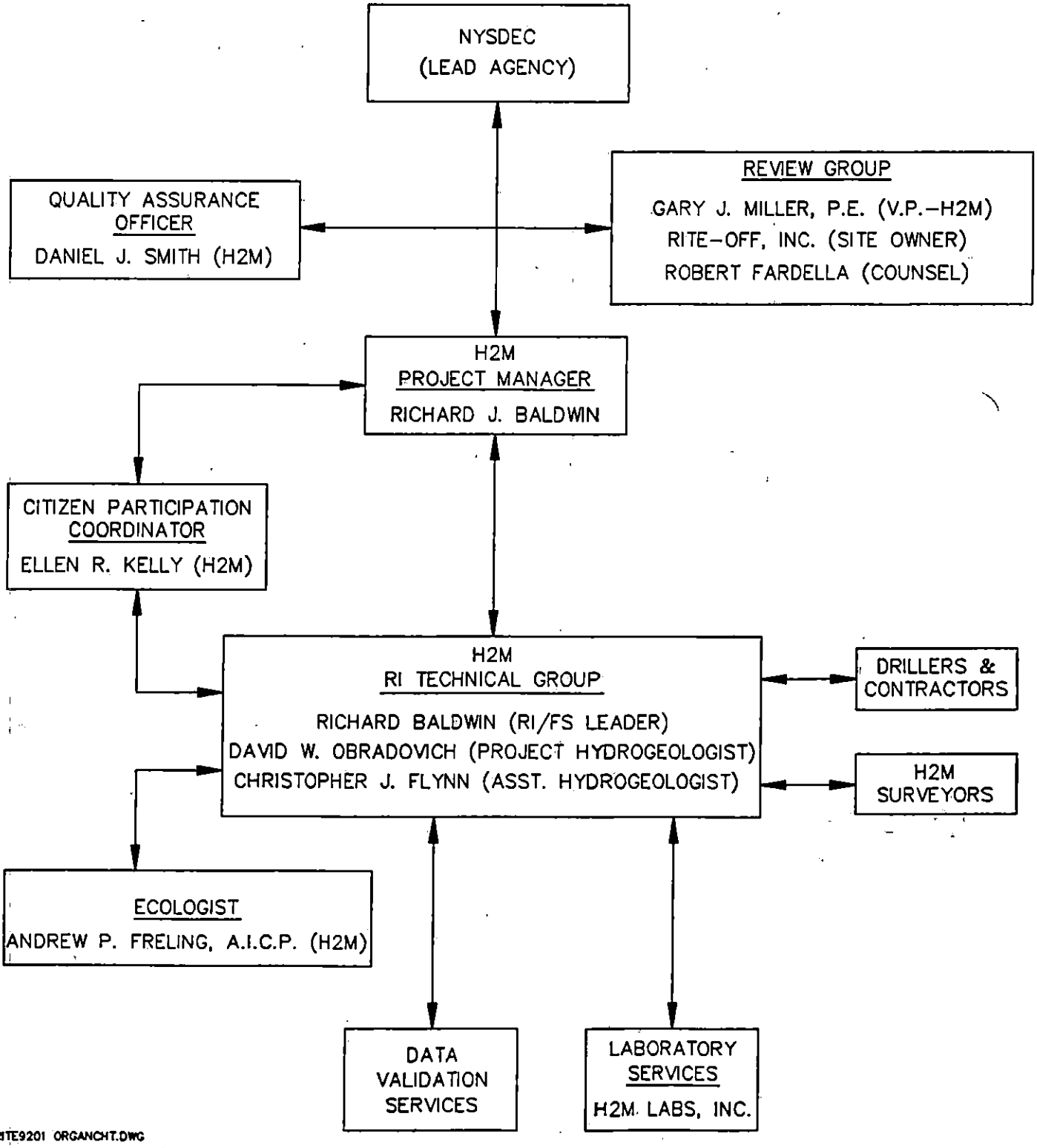
60 0 30 60

SCALE: 1" = 60'

RITE9201 WP2FEB94.DWG

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

FIGURE 4.2.1
RITE-OFF, INC.
BAY SHORE, NEW YORK
PROJECT MANAGEMENT CHART FOR RI/FS



RITE9201 ORGANCHT.DWG

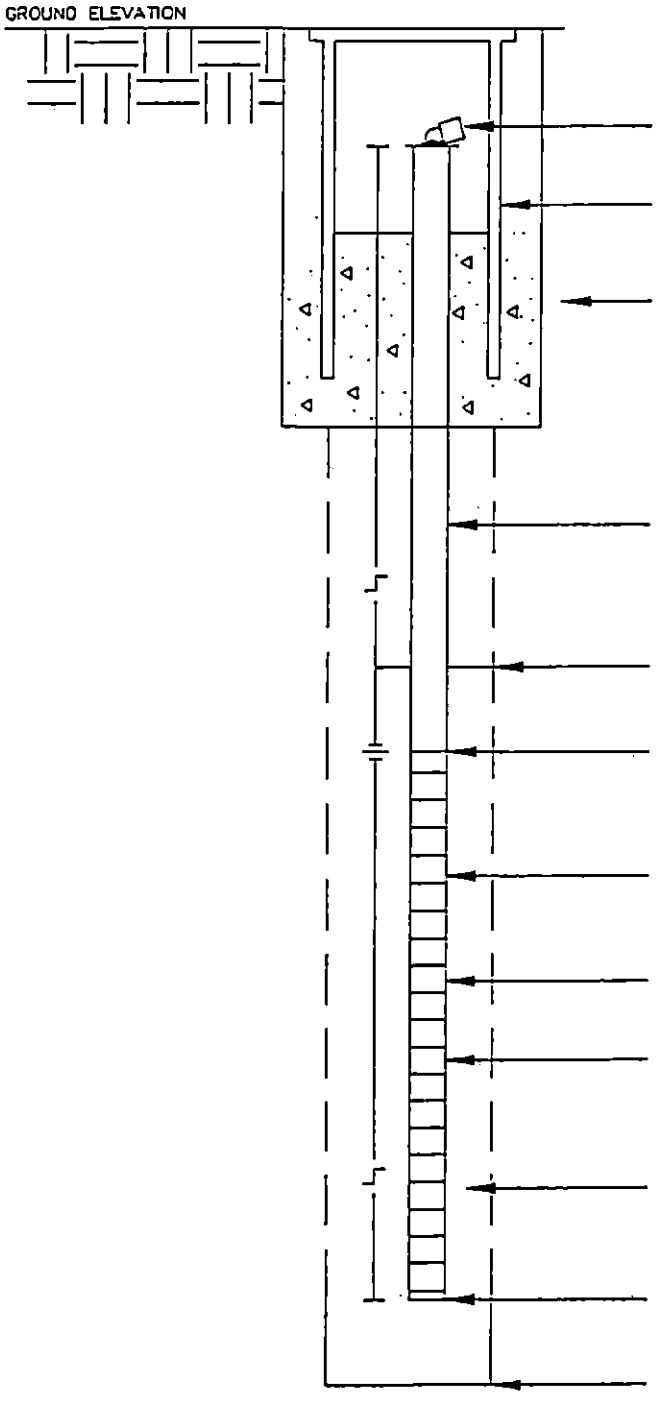
SHALLOW MONITORING WELL DESIGN

FIGURE 6.2.1

SITE: _____ INSTALLATION DATE: _____ PROJECT NO.: _____

WELL NO.: _____ LOCATION: _____

DRILLER: _____ HYDROGEOLOGIST: _____



DRILLING METHOD — HSA

PADLOCK ID NUMBER — _____

PROTECTIVE CASING — _____ DIAMETER (I.D.) _____ LENGTH

THICKNESS OF SURFACE SEAL/CONCRETE — 3.0'

[INDICATE ALL SCALE SHOWING DEPTH THICKNESS AND TYPE]

MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE — PVC 4" (SCH.40) MATERIAL DIAMETER (I.D.)

TYPE OF BACKFILL — CEMENT-BENTONITE GROUT

DEPTH OF BOTTOM OF RISER — APPROX. 20'

TYPE OF POINT OR SCREEN (PIPE SIZE TELESCOPING) AND MANUFACTURE — SCHEDULE 40 PVC

SCREEN CAGE OR SIZE OF OPENINGS — 0.010" SLOT

MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT/SCREEN — PVC 4"

TYPE OF BACKFILL — FILTER PACK

DEPTH OF BOTTOM OF SCREEN — APPROX. 30'

DEPTH OF BOTTOM OF BOREHOLE — APPROX. 32'

RITE'S.DWG

(L1) LENGTH OF RISER _____ (L2) LENGTH OF SCREEN _____ CASING ELEVATION _____ STANDPIPE ELEV.: _____

ACTUAL ELEVATIONS - WHERE AVAILABLE

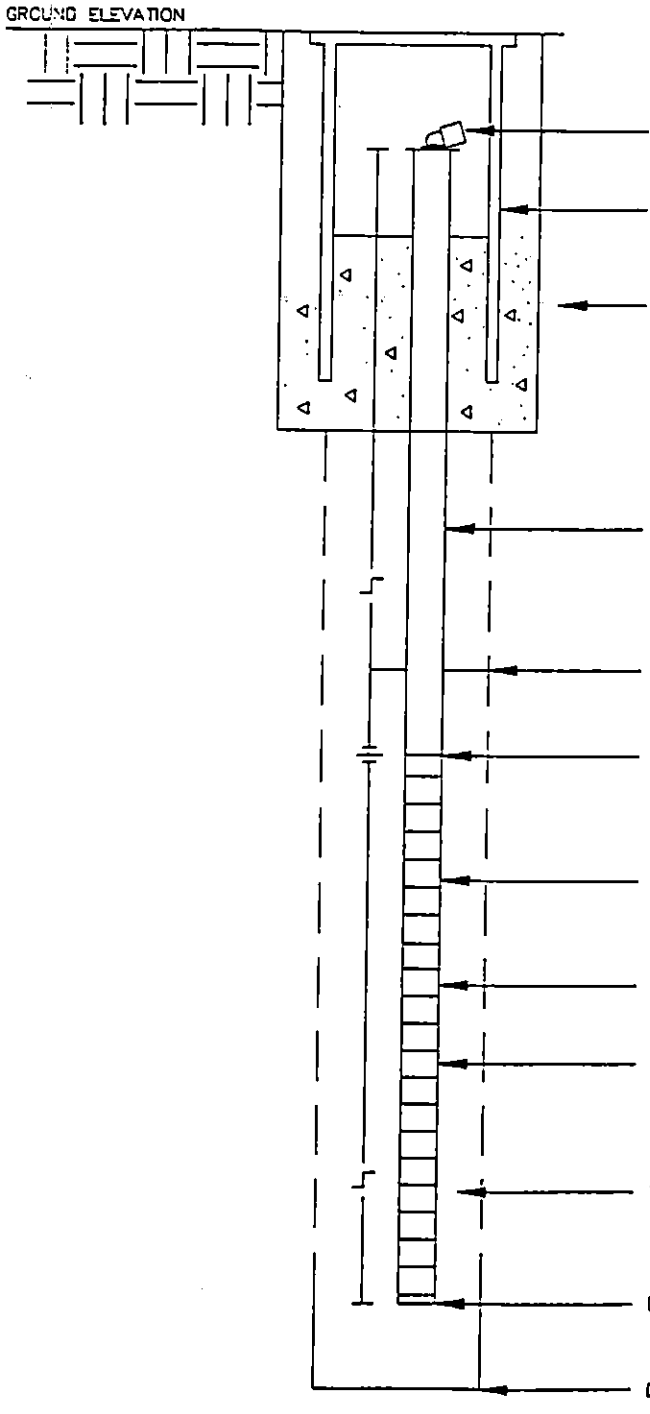
SHALLOW MONITORING WELL DESIGN

FIGURE 6.2.2

SITE: _____ INSTALLATION DATE: _____ PROJECT NO.: _____

WELL NO.: _____ LOCATION: _____

DRILLER: _____ HYDROGEOLOGIST: _____



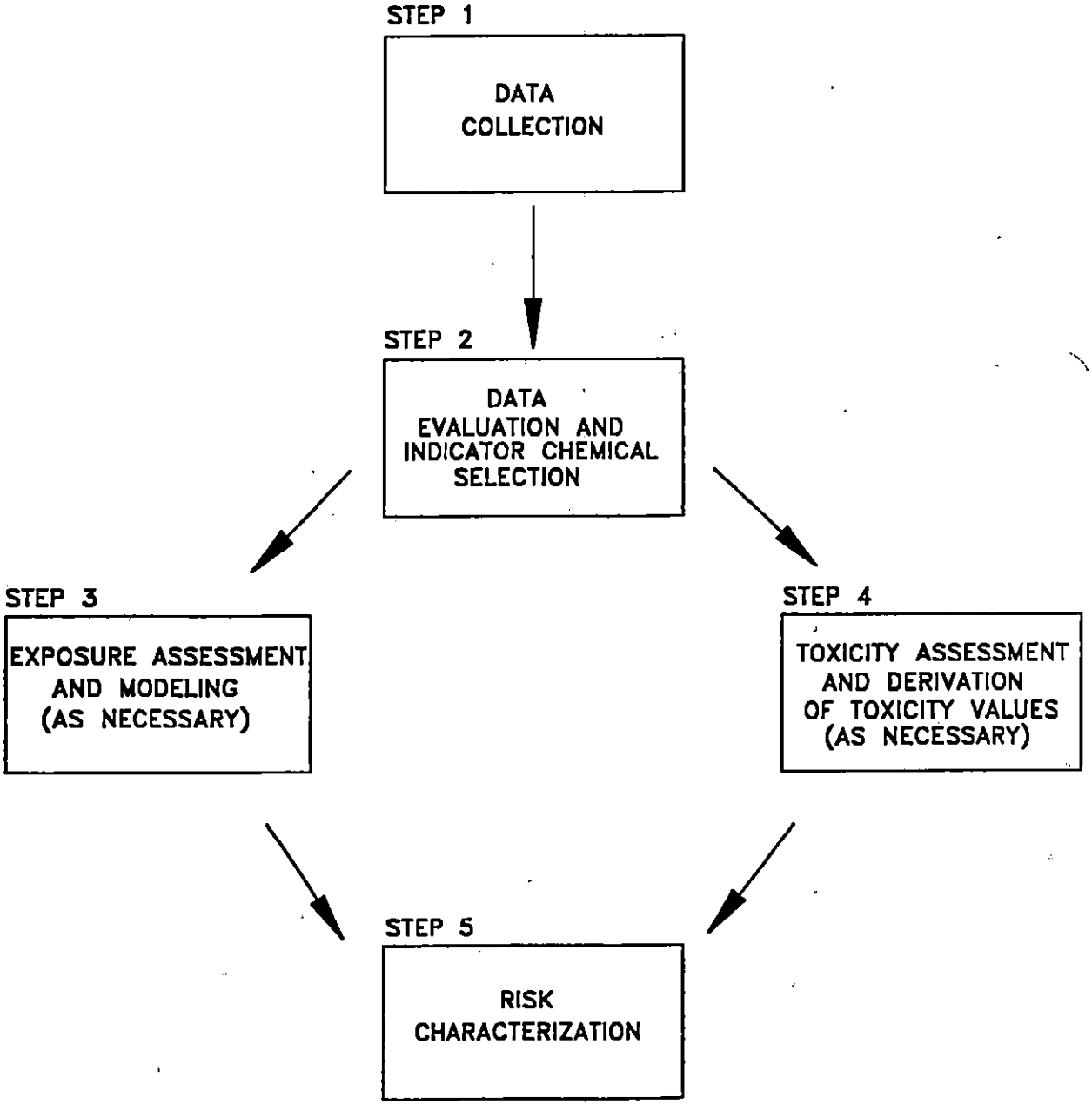
DRILLING METHOD	HSA
PADLOCK ID NUMBER	_____
PROTECTIVE CASING	_____ DIAMETER (I.D.) _____ LENGTH
THICKNESS OF SURFACE SEAL/CONCRETE	3.0'
[INDICATE ALL SCALE SHOWING DEPTH THICKNESS AND TYPE]	
MATERIAL OF MANUFACTURE AND INSIDE DIAMETER OF RISER PIPE	PVC 4" (SCH.40) MATERIAL DIAMETER (I.D.)
TYPE OF BACKFILL	CEMENT-BENTONITE GROUT
DEPTH OF BOTTOM OF RISER	APPROX. 70'
TYPE OF POINT OR SCREEN (PIPE SIZE TELESCOPING) AND MANUFACTURE	SCHEDULE 40 PVC
SCREEN CAGE OR SIZE OF OPENINGS	0.010" SLOT
MATERIAL OF MANUFACTURE AND DIAMETER OF WELLPOINT/SCREEN	PVC 4"
TYPE OF BACKFILL	FILTER PACK
DEPTH OF BOTTOM OF SCREEN	APPROX. 80'
DEPTH OF BOTTOM OF BOREHOLE	APPROX. 82'

WTEGS.DWG

(L1) LENGTH OF RISER _____ (L2) LENGTH OF SCREEN _____ CASING ELEVATION _____ STANDPIPE ELEV.: _____

ACTUAL ELEVATIONS - WHERE AVAILABLE

FIGURE 10.1
RITE-OFF, INC.
BAYSHORE, NEW YORK
FLOWCHART OF THE HUMAN HEALTH EVALUATION PROCESS



TABLES

TABLE 5.5.1

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SUMMARY OF SAMPLING

SAMPLE ID#	*NUMBER OF SAMPLES*	*TYPES OF SAMPLES (MATRIX)*	*DEPTH (FEET)*	*ANALYTICAL PARAMETERS*	*FID/PID ANALYSIS*
TASK 1- Sampling of the Former Trailer Area (Warehouse Area 1) (Soil Borings and Surface Soil Samples)					
SBT-1	2	Soil	0-2, 7-9, 14-16,*(26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
SBT-2	2	Soil	0-2, 7-9, 14-16,*(26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
SS-1**	1	Soil/Sediment	0-0.167	Full TCL, TAL, malathion, diazinon, and CN	Yes
SS-2**	1	Soil/Sedimant	0-0.167	Full TCL, TAL, malathion, diazinon, CN, and TOC***	Yes
SS-3**	1	Soil/Sediment	0-0.167	Full TCL, TAL, malathion, diazinon, and CN	Yes
TASK 2- Sampling of Storm Drain System in Area 2 (Sediment and Samples taken from Storm Drains)					
SD-1	1	Soil/Sediment	0-0.5	TCL semi-VOCs, TAL, and TOC****	Yes
SD-2	1	Soil/Sediment	0-0.5	TCL semi-VOCs, and TAL	Yes
SD-3	1	Soil/Sediment	0-0.5	TCL semi-VOCs, and TAL	Yes
Sampling of Storm Drain System in Area 4 (Soil Boring Sampling)					
SD-4	2	Soil	0-2, 7-9, 14-16,*(26-28, 38-40)	Full TCL, TAL, malathion, diazinon, CN, and TOC****	Yes
SD-5	2	Soil	0-2, 7-9, 14-16,*(26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
SD-6	2	Soil	0-2, 7-9, 14-16,*(26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
SD-7	2	Soil	0-2, 7-9, 14-16,*(26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
Sampling of Storm Drain System in Area 3 (Sediment Samples from Storm Drains)					
SD-8	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, CN, and TOC****	Yes
SD-9	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, and CN	Yes
SD-10	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, and CN	Yes
SD-11	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, and CN	Yes
SD-12	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, and CN	Yes

TABLE 5.5.1 (cont)

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SUMMARY OF SAMPLING

SAMPLE ID#	*NUMBER OF SAMPLES*	*TYPES OF SAMPLES (MATRIX)*	*DEPTH (FEET)*	*ANALYTICAL PARAMETERS*	*FID/PID ANALYSIS*
TASK 3-Soil Boring and Soil Sampling in Area Between the Two (2) On-Site Buildings (Area 5)					
SBB-1	2	Soil	0-2, 7-9, 14-16, * (26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
SBB-2	2	Soil	0-2, 7-9, 14-16 * (26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
Background	1	Soil	0-2	TAL	Yes
TASK 4-Sediment Sampling of the Septic System Leaching Pool of the Manufacturing Building (Area 6)					
LP-1	1	Soil/Sediment	0-0.5	TCL semi-VOCs, TAL	Yes
Sediment Sampling of the Septic System Leaching Pool of the Warehouse Building (Area 7)					
LP-2	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, and CN	Yes
LP-3	1	Soil/Sediment	0-0.5	Full TCL, TAL, malathion, diazinon, and CN	Yes
TASK 5-Soil Boring and Sediment Sampling at the Former Drum Storage Area (Area 8)					
SBD-1	2	Soil	0-2, 7-9, 14-16,* (26-28, 38-40)	Full TCL, TAL, malathion, diazinon, CN, and TOC****	Yes
SBD-2	2	Soil	0-2, 7-9, 14-16,* (26-28, 38-40)	Full TCL, TAL, malathion, diazinon, and CN	Yes
TASK 6- Groundwater Investigation					
MW-1	1-2	Groundwater	32	Full TCL, TAL, malathion, diazinon, and CN	Yes
MW-2	1-2	Groundwater	31	Full TCL, TAL, malathion, diazinon, and CN	Yes
MW-3S	1-2	Groundwater	31	Full TCL, TAL, malathion, diazinon, and CN	Yes
***MW-3D	1-2	Groundwater	81	Full TCL, TAL, malathion, diazinon, and CN	Yes
MW-4S	1-2	Groundwater	31	Full TCL, TAL, malathion, diazinon, and CN	Yes
***MW-4D	1-2	Groundwater	81	Full TCL, TAL, malathion, diazinon, and CN	Yes

TABLE 5.5.1 (cont)

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SUMMARY OF SAMPLING

SAMPLE ID#	*NUMBER OF SAMPLES*	*TYPES OF SAMPLES (MATRIX)*	*DEPTH (FEET)*	*ANALYTICAL PARAMETERS*	*FID/PID ANALYSIS*
MW-5	1-2	Groundwater	31	Full TCL, TAL, malathion, diazinon, and CN	Yes
***MW-6S	1-2	Groundwater	30-35	Full TCL, TAL, malathion, diazinon, and CN	Yes
***MW-6D	1-2	Groundwater	80-85	Full TCL, TAL, malathion, diazinon, and CN	Yes
***MW-7	1-2	Groundwater	30-35	Full TCL, TAL, malathion, diazinon, and CN	Yes

NOTES:
The depth of the samples is presented as feet below the dry well bottom surface or equivalent. Split spoon soil samples will be screened with a PID or FID and the sample from each boring recording the highest reading will tested by the laboratory for TCL VOCs, TCL semi-VOCs, TCL pesticides/PCBs (Full TCL), TAL, malathion diazinon, and total cyanide (CN). If no PID readings are recorded, the shallowest soil sample will be tested by the laboratory. The depth of the deepest soil sample will be determined in the field after 2 consecutive samples exhibit no PID/FID response. In the event that no PID responses are recorded for any samples within the boring, drilling will continue to a depth of 16 feet below the bottom of the pool. The deepest soil sample from each boring will also be tested for the same suite of analysis as the shallow soil sample.

The number of groundwater samples is pending the first round laboratory results. Should a second round of samples be collected, the analytical parameters may be reduced to include TCL VOCs only.

*Split spoon samples will only be collected in the event of elevated PID response in the shallower samples.

**Surface Soil Samples

***Monitoring wells proposed for installation during the RI/FS. Monitoring wells formally labeled MW-3 and MW-4 will be labeled MW-3S and MW-4S, respectively, since deep wells are proposed to be installed adjacent to them (and will be labeled MW-3D and MW-4D, respectively).

****One (1) TOC sample from each area of concern to be collected. The actual sample location to be determined in the field.

TABLE 7.2.1.1

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SOIL SAMPLES*

ANALYSIS METHODS, HOLDING TIMES, PRESERVATION AND CONTAINER PROCEDURES

PARAMETER	*METHOD*	*HOLDING TIME*	*PRESERVATION*	*CONTAINERIZATION*
TCL Pesticides/PCBs	NYSDEC ASP 12/91 CLP Method 91-3	5 days after VTSR until extraction; 40 days for analysis	Cool to 4° C	8 oz. amber glass
Malathion Diazinon	NYSDEC ASP 12/91 NYSDEC ASP SW846 Method 8140	5 days after VTSR until extraction; 40 days for analysis	Cool to 4° C	8 oz. amber glass
TCL Semi-Volatiles	NYSDEC ASP 12/91 Method 91-2	5 days after VTSR until extraction; 40 days for analysis	Cool to 4° C	8 oz. amber glass
TCL Volatiles	NYSDEC Method 91-1	7 days	Cool to 4° C	8 oz. amber glass
TOC	SW 846-9060	26 days	Cool to 4° C	8 oz. amber glass
TAL Metals Total Cyanide Phenols	NYSDEC ASP 12/91 CLP TAL Metals/Cyanide NYSDEC ASP SW 846 Method 9065	6 months Mercury 26 days 12 days 26 days		8 oz. amber glass

* See Appendix B for CLP bottle chart and contract required quantification limits.

TABLE 7.2.2.1

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

GROUNDWATER SAMPLES*

ANALYSIS METHODS, HOLDING TIMES, PRESERVATION AND CONTAINER PROCEDURES

PARAMETER	*METHOD*	*HOLDING TIME*	*PRESERVATION*	*CONTAINERIZATION*
TCL Pesticides/PCBs	NYSDEC Method 91-3	5 days after VTSR until extraction; 40 days for analysis	Cool to 4° C	(2) 1-qt. amber glass
Malathion Diazinon	NYSDEC ASP SW846 Method 8140	5 days after VTSR until extraction; 40 days for analysis	Cool to 4° C	(2) 1-qt. amber glass
TCL Semi-Volatiles	NYSDEC Method 91.2	5 days after VTSR until extraction; 40 days for analysis	Cool to 4° C	(2) 1-qt. amber glass bottle
TCL Volatiles	NYSDEC Method 91.1	7 days	Cool to 4° C	(2) 40 ml vial with teflon lined cap
CLP TAL metals/cyanide	NYSDEC ASP 12/91	6 months 12 days	HNO3 to pH less than 2 NAOH to pH >12	(1) qt. plastic (1) qt. plastic

* See Appendix C for CLP bottle chart and contract required quantification limits

TABLE 8.1

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SUMMARY OF QA/QC FOR SAMPLING

TASK	*MATRIX*	*NUMBER OF SAMPLES*	*PARAMETERS*
1. Sampling of the Former Trailer Area (Warehouse Area 1)	Soil	7	Full TCL, TAL, malathion, diazinon, and CN
QA/QC			
MS/MSD	Soil	0-2	Full TCL, TAL, malathion, diazinon, and CN
Field blank	Aqueous	0-1	Full TCL, TAL, malathion, diazinon, and CN
Trip blank	Aqueous	0-1	TCL VOCs only
2. Sampling of storm drains SD-1 to SD-3 (Area 2)	Soil	3	TCL semi-VOCs and TAL
Sampling of storm drains SD-4 to SD-7 (Area 4)	Soil	8	Full TCL, TAL, malathion, diazinon, and CN
Sampling of storm drains SD-8 to SD-12 (Area 3)	Soil	5	Full TCL, TAL, malathion, diazinon, and CN
SD-1 to SD-3			
QA/QC			
MS/MSD	Soil	0-2	TCL semi-VOCs and TAL
Field blank	Aqueous	0-1	TCL semi-VOCs and TAL
Trip blank	Aqueous	0-1	TCL VOCs only
SD-4-7			
QA/QC			
MS/MSD	Soil	0-2	Full TCL, TAL, malathion, diazinon, TOC, and CN
Field blank	Aqueous	0-1	Full TCL, TAL, malathion, diazinon, TOC, and CN
Duplicate	Soil	1	Full TCL, TAL, malathion, diazinon, TOC, and CN
Trip blank	Aqueous	0-1	TCL VOCs only
SD-8 to SD-12			
MS/MSD	Soil	0-2	Full TCL, TAL, malathion, diazinon, and CN
Field Blank	Aqueous	0-1	Full TCL, TAL, malathion, diazinon, and CN
Duplicate	Soil	0-1	Full TCL, TAL, malathion, diazinon, and CN
Trip Blank	Aqueous	0-1	TCL VOCs only

TABLE 8.1 (cont)

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SUMMARY OF QA/QC FOR SAMPLING

TASK	*MATRIX*	*NUMBER OF SAMPLES*	*PARAMETERS*
3. Boring and Soil Sampling in Area Between the Two (2) Buildings (Area 5)	Soil	4	Full TCL, TAL, malathion, diazinon, and CN
Background Soil Sampling	Soil	1	TAL metals only (Background)
QA/QC			
MS/MSD	Soil	0-2	Full TCL, TAL, malathion, diazinon, and CN
Field blank	Aqueous	0-1	Full TCL, TAL, malathion, diazinon, and CN
Trip blank	Aqueous	0-1	TCL VOCs only
4. Sampling of the Septic System Leaching Pool in Area 6	Soil	1	TCL semi-VOCs, and TAL
QA/QC			
MS/MSD	Soil	0-2	TCL semi-VOCs, and TAL
Field blank	Aqueous	1	TCL semi-VOCs, and TAL
Sampling of the Septic System Leaching Pools in Area 7	Soil	2	Full TCL, TAL, malathion, diazinon, and CN
QA/QC			
MS/MSD	Soil	0-1	Full TCL, TAL, malathion, diazinon, and CN
Field Blank	Aquious	0-1	Full TCL, TAL, malathion, diazinon, and CN
5. Sampling of the Former Rear Drum Storage Area	Soil	4	Full TCL, TAL, malathion, diazinon, and CN
QA/QC			
MS/MSD	Soil	0-2	Full TCL, TAL, malathion, diazinon, and CN
Field blank	Aqueous	0-1	Full TCL, TAL, malathion, diazinon, and CN
Trip blank	Aqueous	0-1	TCL VOCs

TABLE 8.1 (cont)

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

SUMMARY OF QA/QC FOR SAMPLING

TASK	*MATRIX*	*NUMBER OF SAMPLES*	*PARAMETERS*
6. Groundwater Investigation	Aqueous	10-20*	Full TCL, TAL, malathion, diazinon, and CN
QA/QC			
MS/MSD	Aqueous	2	Full TCL, TAL, malathion, diazinon, and CN
Field blank	Aqueous	1	Full TCL, TAL, malathion, diazinon, and CN
Duplicate	Aqueous	1	Full TCL, TAL, malathion, diazinon, and CN
Trip blank	Aqueous	1	TCL VOCs only

NOTE
* Should a second round of samples be collected, the analytical parameters may be reduced to include TCL VOCs only.

TABLE 14.5.1.1

RITE-OFF, INC. SITE
BAY SHORE, NEW YORK

CITIZEN PARTICIPATION PLAN

SPECIFIC CITIZEN PARTICIPATION ACTIVITIES			
	FINAL DRAFT RI/FS WORK PLAN	*FINAL RI/FS WORK PLAN*	*FINAL DRAFT RI/FS REPORT*
Copy placed in document repositories	X	X	X
Public notice mailing to contact list	X	X	X
Fact Sheet distribution		X	X
Mailing of activities summary		X	X
Public Meeting	X	X	X
Public comment period (30 days)		X	X
Transcript Responsiveness Summary		X	X

APPENDIX A

RESUMES OF KEY H2M PERSONNEL

GARY J. MILLER, P.E.

Vice President
Department Manager: Environmental Engineering

EXPERIENCE: **H2M/Holzmacher, McLendon & Murrell, P.C.**
(1980 - Present)

Mr. Miller has over 15 years experience in the field of environmental engineering covering a broad range of projects including solid and hazardous waste management, water and wastewater treatment, air pollution control, hazardous material storage, groundwater investigations and site remediation. As head of H2M's Environmental Engineering Division, Mr. Miller oversees and provides technical direction on major environmental projects.

Mr. Miller's experience at H2M includes all aspects of project engineering and management including engineering studies, economic analyses, treatability studies, design, construction and startup. He has been responsible for projects ranging from landfill leachate collection and methane venting systems for municipal clients to wastewater treatment, air pollution control and hazardous waste management for private industrial clients. He also has extensive experience inspecting and auditing industry for environmental compliance. He has worked closely with a spectrum of industries including petrochemical, pharmaceutical, food processing, printing, metal finishing and plating, printing circuit board and electronics, semiconductor, communications and commercial waste treatment. He is a specialist in assisting industrial clients with RCRA and other regulatory compliance programs including the storage and handling of hazardous materials.

Mr. Miller has directed numerous site investigations utilizing a variety of techniques including soil gas surveys, geophysical surveys, soil boring, monitoring wells and groundwater modeling to assess environmental impacts and implement effective remediation programs. Site investigation projects have ranged from Phase I and II environmental assessments as part of property transactions to remedial investigations/feasibility studies at state and federal Superfund sites.

Selected experience as a project manager includes:

- Preparation of engineering reports, design plans and specifications for upgrade of a 60,000 gpd industrial wastewater treatment system at a Long Island metal finishing facility.

- Study of wastewater collection, treatment and disposal facilities for the New York City Transit Authority. The project involved inspections and sampling of fueling, washing, maintenance, repair and painting facilities at 20 bus depots of varying sizes and age located throughout the five boroughs of New York City.

- Preparation and design plans and specifications for bulk chemical storage facilities at Pall Corporation's East Hills manufacturing facility. Design elements included indoor and outdoor bulk storage tanks, containerized storage, gas cylinder storage, spill containment systems and chemical distribution and inventory control systems.

- Preparation of RCRA permit application, including personnel training program, waste analysis plan, contingency plan and closure plan for a waste solvent reclamation facility. The application was approved and a permit issued by the United States Environmental Protection Agency.

- Hazardous waste lagoon closure at a northern New Jersey manufacturing facility. The project involved developing a New Jersey Department of Environmental Protection and Energy approved closure plan, technical specifications and bid documents, and directing the closure of five lagoons containing over 250,000 gallons of hazardous wastes.

- Phase II site investigation at a Suffolk County, New York metal plating facility. Conducted under an order-on-consent, the investigation included an evaluation of suspected source areas, a groundwater monitoring program and preparation of the site's HRS score.

- Remedial investigation at an automobile parts manufacturing facility in Queens County, New York. The project involves development of work plans, including HASP, field sampling and quality assurance/quality control, and the installation of soil boring and monitoring wells to assess the nature and extent of site contamination.

- Remedial design studies at a major NPL Superfund site in Massachusetts. As part of a multi-consultant remedial design team, H2M developed and implemented a field testing program to measure gaseous emissions from a specific source area. H2M also developed and implemented a groundwater treatability study assessing oxidation and air stripping as the primary unit treatment operation.

- Preparation of design plans, technical specifications and bid documents for a soil vapor extraction system designed as the final phase of an ongoing remediation program at the site of a former manufacturing facility.

Prior to joining H2M, Mr. Miller was an operations manager involved in the mechanical and electrical checkout and startup of multiple hearth furnaces, waste heat boilers, wet scrubbers and sludge handling equipment. He was also responsible for operations training, performance, emissions and acceptance tests and served as construction superintendent responsible for coordination and supervision of all subcontractors and vendors in the construction of Nichols Herreshoff multiple hearth carbon regeneration, lime reclacining and sludge incinerators.

EDUCATION:
B.S., Engineering Technology/Civil-Environmental
Virginia Polytechnic Institute and State University
A.S., Mechanical Technology
City University of New York, Queensborough Community College

REGISTRATIONS/ CERTIFICATIONS:
Licensed Professional Engineer-New York
Certified USEPA Asbestos Abatement Management Planner
Certified USEPA Asbestos Abatement Inspector
Certified Hazardous Materials Manager - Master Level
Certified Health and Safety Operations at Hazardous Waste Sites (OSHA)

MEMBERSHIPS:
Air and Waste Management Association
Hazardous Waste Action Coalition
Institute of Hazardous Materials Management
Water Pollution Control Federation

PROFESSIONAL PAPERS:

Miller, Gary J. *Closure of Industrial Facilities Containing Hazardous Wastes.* New York Water Pollution Control Association, Winter Meeting, January 1989.

Miller, Gary J. *Design of Hazardous Materials Storage Facilities.* Spill Control and Hazardous Materials Conference, New Haven, Connecticut, September 1983.

DANIEL J. SMITH

Project Manager: Industrial Services and Hazardous Waste Management

EXPERIENCE: H2M/Holzmacher, McLendon & Murrell, P.C.
(1988 - Present)

Mr. Smith is responsible for remedial investigations/feasibility studies (RI/FS), remedial design, air emissions, wastewater discharges, hazardous waste management, and environmental site assessments on both commercial and industrial properties. He is experienced in field sampling, waste treatment performance evaluation, field oversite of remedial activities, performance of risk assessments and is certified for health and safety operations at hazardous waste sites.

Mr. Smith's recently completed projects include:

- Design of hazardous materials storage and containment facilities.
- Design and management of a closure program for an electronics manufacturer including closure of a metal finishing treatment system.
- Performance of a remedial investigation, health based risk assessment, and preliminary feasibility study for a large scale automotive parts manufacturer. The remedial investigation focused on VOC and petroleum hydrocarbon contamination in soil and groundwater.
- Remediation of soils and subsurface disposal system sediments contaminated with metals and volatile organic compounds.
- Evaluation of a 3.5 mgd groundwater dewatering system for construction of a sewer system.
- Evaluation and optimization of a 70,000 gallons per day industrial wastewater treatment system.
- Environmental assessments/audits of industrial and commercial properties.

Prior to joining H2M, Mr. Smith worked for a major aerospace corporation where he was responsible for the thermal analysis and design of heat transfer systems, computer modeling of environmental control systems, infrared thermal imaging, and the review of technical specifications for thermal systems. In addition, Mr. Smith has been responsible for quality control at a wet chemistry laboratory and the production of Quality Assurance/Quality Control reports.

EDUCATION: B.S., Chemical Engineering
Polytechnic Institute of New York

TECHNICAL SEMINARS: Risk Assessment for Soil & Groundwater Contamination, University of Wisconsin
Site Remediation, Source Control Short Course, University of Connecticut
Soil Vapor Extraction Short Course, University of Connecticut
Bioremediation; State of the Practice in Hazardous Waste Remediation Options, Air and Waste Management Associates

CERTIFICATIONS: Engineer in Training-New York
Certified Health and Safety Operations at Hazardous Waste Sites (OSHA)

MEMBERSHIPS: Suffolk County Local Emergency Planning Committee (LEPC)

RICHARD J. BALDWIN

Project Geologist: Groundwater Resources/Hydrogeology

EXPERIENCE: **H2M/Holzmacher, McLendon & Murrell, P.C.**
(1993 - Present)

Mr. Baldwin has eight years experience in the field of geology/hydrogeology. At H2M, his responsibilities include management of Remedial Investigations/Feasibility Studies, including the remedial investigation of an inactive hazardous waste site; groundwater quality studies, including comprehensive hydrogeologic investigations; soil and groundwater remediation; and underground storage tank removal programs.

Prior to joining H2M, Mr. Baldwin prepared site investigation reports on eleven sites for a large naval weapons facility and was project geologist/field team leader on a 65-site remedial investigation at a U.S. Army facility. He has conducted subsurface investigations for the U.S. Army Corps of Engineers, U.S. Navy and industrial clients.

Mr. Baldwin has supervised site investigation activities at Naval Weapons Station Concord. These activities included trenching, soil sampling, groundwater monitoring, well installation and sampling, geophysical investigations, explosive ordnance characterization, packer testing, data reduction and evaluation, and report generation. He also participates in technical review committee meetings with the U.S. Navy, United States Environmental Protection Agency, California Environmental Protection Agency, NOAA, U.S. Fish and Wildlife Service, and Regional Water Quality Control Board and has participated in remedial management plan preparation for proposed CERCLA work at a facility wetlands.

His experience encompasses interim remedial actions at several large military bases and Superfund sites, and he has supervised numerous drilling and deep groundwater monitoring and extraction well installations. Additionally, Mr. Baldwin participated in a remote investigate of the Martian landscape and a geophysical study of Jupiter's satellite, Io.

EDUCATION:
Course work towards M.S. in Geology
San Jose State University
B.A., Geology
San Francisco State University

SPECIALIZED COURSES:
Princeton Groundwater Hydrogeology and Pollution Course
Environmental Law and Regulations, U.C. Berkeley Extension

CERTIFICATIONS:
Certified Health and Safety Operations at Hazardous Waste Sites (OSHA)
Radiation Safety Training

MEMBERSHIPS:
Geological Society of America
National Ground Water Association
Northern California Geological Society

H2M

DAVID W. OBRADOVICH

Project Hydrogeologist: Groundwater Resources/Hydrogeology

EXPERIENCE: **H2M/Holzmacher, McLendon & Murrell, P.C.**
(1992 - Present)

Mr. Obradovich has three years experience in the field of hydrogeology, groundwater quality analysis, management of sites impacted by petroleum hydrocarbons with ongoing soil and groundwater treatment technologies, and environmental site and risk assessments including Phase I and II. His experience includes permit expediting and liaison with state and local agencies for remedial projects and site investigations, performing site surveys and computer map generation, including graphical representation of data and computer groundwater contouring.

As Project Hydrogeologist, Mr. Obradovich performs soil and groundwater investigations for private clients, as well as federal, state and local agencies. He also serves to generate or aid in the development of Remedial Investigation/Feasibility Studies and environmental site assessments.

Since joining H2M, Mr. Obradovich has been involved in projects addressing Phase II, Remedial Investigations, Interim Remedial Measures, and reporting for private clients, New York City agencies and a New York State-lead inactive hazardous waste site. He is also responsible for generating a Hazard Ranking System (HRS) score for a New York City Department of Environmental Protection site under Capital Project. Other responsibilities include subsurface investigations and groundwater quality studies.

Prior to joining H2M, Mr. Obradovich's project management experience includes:

- Mobil Oil Corporation - Responsible for management of Region I and II NYSDEC regulated or hydrocarbon impacted service station (gasoline dispensing) sites which were either under active remediation with product recovery, air stripping or soil venting hydrocarbon treatment technologies, remediation systems under construction, or were being considered for remediation; coordinated all activities at sites including quarterly reporting with computer aided generated dissolved hydrocarbon and hydrocarbon thickness plume maps from monitoring and sampling data including groundwater contour maps and graphic representations of monitoring data.

- Star Enterprise - Project management of extensive monitoring well network, development of Remedial Action Plan, design and implementation of groundwater remediation pump and treatment system, and groundwater monitoring and sampling program.

- North Babylon School District - Management of NYSDEC-concerned bus garage spill site with ongoing pump and treatment system. Designed and implemented soil venting system to accelerate cleanup at site. Maintained SPDES and Discharge Monitoring Reports (DMR) with the NYSDEC Albany and Region I Spills Division.

- NYSDEC Region II Oil Spills Division - Managed five sites impacted with petroleum hydrocarbons. Responsible for quarterly reporting at all sites and providing recommendations for remedial action and site closure. Investigated sources of spills or releases.

For the private sector, Mr. Obradovich conducted subsurface investigations including installing monitoring wells; groundwater sampling; soil vapor surveys; Phase I and II investigations and assessment; and remediation system design.

EDUCATION: Course work towards M.S. in Hydrogeology
State University of New York at Stony Brook
B.S., Geology
State University of New York at Cortland

CERTIFICATIONS: Certified Health and Safety Operations at Hazardous Waste Sites (OSHA)

H2M

CHRISTOPHER J. FLYNN

Project Hydrogeologist: Groundwater Resources/Hydrogeology

EXPERIENCE: **H2M/Holzmacher, McLendon & Murrell, P.C.**
(1984 - Present)

As a hydrogeologist, Mr. Flynn specializes in field investigations and pollution control projects. He is responsible for landfill gas investigations, air projects, wastewater studies, soil gas surveys, environmental assessments, groundwater and potable water studies, and remediation projects. Mr. Flynn is experienced in field sampling and oversight, and is certified for Health and Safety Operations at Hazardous Waste Sites.

Mr. Flynn's recently completed projects include: potable water study for a large school district; soil gas investigation at a 500-acre site for a private client; subsurface sanitary system evaluation of an industrial facility; groundwater monitoring project for a large shipping operation; soil gas survey for a gasoline storage facility; and a sanitary system remediation project for an industrial property.

Prior to joining H2M, Mr. Flynn was a fishery technician for U.S. Army Corps of Engineers involved in the radio tracking of upstream progress of salmon spawning runs.

EDUCATION:
B.S., Wildlife/Fisheries, minor in Biology
Frostburg State College
A.A.S., Natural Resources Conservation
Community College of the Finger Lakes

CERTIFICATIONS: Certified Health and Safety Operations at Hazardous Waste Sites

H2M

APPENDIX B

HEALTH AND SAFETY PLAN (HASP)

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

FOR NYSDEC SITE #1-52-129

RITE-OFF, INC. SITE

1545 and 1555 FIFTH INDUSTRIAL COURT

BAY SHORE, NEW YORK

February 1994

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

FOR

NYSDEC SITE # 1-52-129

RITE-OFF, INC. SITE

1545 and 1555 FIFTH INDUSTRIAL COURT

BAY SHORE, NEW YORK

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

FOR

NYSDEC SITE # 1-52-129

RITE-OFF, INC. SITE

1545 and 1555 FIFTH INDUSTRIAL COURT

BAY SHORE, NEW YORK

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

FOR

NYSDEC SITE # 1-52-129

RITE-OFF, INC. SITE

1545 and 1555 FIFTH INDUSTRIAL COURT

BAY SHORE, NEW YORK

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

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BAY SHORE, NEW YORK

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REMEDIAL INVESTIGATION/FEASIBILITY STUDY

HEALTH AND SAFETY PLAN

FOR NYSDEC SITE #1-52-129

RITE-OFF, INC. SITE

1545 AND 1555 FIFTH INDUSTRIAL COURT

BAY SHORE, NEW YORK

FEBRUARY 1994

1.0 - PURPOSE

The purpose of this Health and Safety Plan (HASP) is to establish a protocol for protecting H2M field personnel from incidents that may arise while performing field activities during the remedial investigation/feasibility study (RI/FS) or other activities (i.e., IRM) to be conducted at the Rite-Off, Inc site, located at 1545 and 1555 Fifth Industrial Court in Bayshore, New York. This plan has been prepared in accordance with the United States Environmental Protection Agency (USEPA) document, "Emergency and Remedial Response Division's "Standard Operating Safety Guides", November 1984. This plan establishes personnel protection standards, mandatory operations procedures, and provides contingencies

for situations that may arise while field work is being conducted at the site. All H2M field personnel will be required to abide by these procedures. Personnel responding to environmental episodes involving chemical substances may encounter conditions that are unsafe or potentially unsafe. In addition to the potential risks associated with the physical, chemical, biological and toxicological properties of the material(s) which may be encountered, other types of hazards (e.g., electricity, water, temperature, heavy equipment, falling objects, loss of balance, tripping, etc.) can have an adverse effect on the health and safety of personnel. It is important that personnel protective equipment and safety requirements be appropriate to protect against potential and/or known hazards. Protective equipment will be selected based on the type(s), concentration(s), and routes of personnel exposure from substances at a site. In situations where the type of materials and possibilities of contact are unknown or the potential hazards are not clearly identifiable, a more subjective determination will be made of the personnel protective equipment required for initial safety.

Adherence to this HASP will minimize the possibility that personnel at the site or the surrounding community will be injured or exposed to site-related contaminants during RI/FS activities.

2.0 SITE CONDITIONS

A RI/FS will be conducted at the property to determine the need for remediation. The property has been classified as a Class 2 Inactive Hazardous Waste Site by the New York State Department of Environmental Conservation (NYSDEC) due to evidence of volatile organic compounds at the property. The property is a 2.9 acre site occupied by two (2) single-story industrial buildings. The site is generally level and paved with asphalt. The property is located in a highly industrialized area of Bayshore and had numerous chemical storage areas on-site. One (1) 5,000 gallon underground fuel oil storage tank exists and four

(4) above-ground tanks containing CO_2 and Freon were removed prior to and during 1993. Rite-Off, Inc. site activities included blending and packaging of spray lubricants, spray solvents, spray insecticides, and other aerosol products.

The field work portion of the RI/FS will consist of the drilling of soil borings through or in the vicinity of the storm drains, sampling of the leaching pool and other storm drains, installation of monitoring wells, developing and sampling of the monitoring wells, and aquifer testing. Drilling and sampling procedures can cause field personnel to come into contact with the identified contaminants. The routes of potential exposure include inhalation, ingestion, and adsorption. At the work site, the most probable route of exposure, if any, is via the inhalation of volatile organic contaminants from contaminated soils or groundwater.

3.0 PERSONNEL SAFETY

Personnel involved in field operations must often make complex decisions regarding safety. To make these decisions correctly requires more than elementary knowledge. For example, selecting the most effective personnel protective equipment requires not only expertise in the technical areas of respirators, protective clothing, air monitoring, physical stress, etc., but also experience and professional judgment. Only competent, qualified personnel will perform field operations and have the technical judgment to evaluate a particular incident and determine the appropriate safety requirements. These individuals, through a combination of professional education, on-the-job experience, specialized training and continual study, have the expertise to make sound decisions. All subcontractors will be required to provide a HASP for this project. Subcontractors may wish to adopt H2M's HASP and may do so upon completion of the site worker health and safety statement form (Appendix A).

3.1 Education and Training

All personnel involved in field work will be trained to carry out their designated field operations. Training will be provided in the use of all equipment, including respiratory protective apparatus and protective clothing; safety practices and procedures; general safety requirements; first aid; and hazardous recognition and evaluation. Each individual involved with the field work must provide documentation of training, as per 29 CFR 1910.120(E)(2).

3.2 - Health and Safety Manager

The Health and Safety Manager shall be responsible for overall implementation and coordination of the Health and Safety Program for H2M field personnel at the site. Responsibilities include providing adequate manpower, materials, equipment, and time needed to safely accomplish the tasks under the RI/FS. The Health and Safety Manager is also responsible for taking appropriate corrective actions when unsafe acts or practices arise.

3.3 - Site Safety Officer

A designated individual will perform the function of the H2M Site Safety Officer. As a minimum, this individual will be responsible for:

1. Conducting an initial site safety meeting for H2M field personnel.

2. Assuring that all personnel protective equipment is available and properly utilized by all H2M field personnel at the site.

3. Assuring that all H2M personnel are familiar with standard operating safety procedures and additional instructions contained in the Health and Safety Plan.

4. Assuring that all H2M personnel are aware of the hazards associated with the field operations.

5. Inspecting the site for hazards before field operations.

6. Determining personal protection levels including clothing and equipment for H2M personnel and periodic inspection of protective clothing and equipment.

7. Monitoring of site conditions prior to initiation of field activities, and at various intervals during on-going operations as deemed necessary for any changes in site hazard conditions. (Monitoring parameters include, but are not limited to, volatile organic contaminant levels in the atmosphere, chemical hazard information and weather conditions).

8. Executing decontamination procedures.

9. Monitoring the work parties for signs of stress such as cold exposure, heat stress or fatigue.

10. Prepare reports pertaining to incidents resulting in physical injuries or exposure to hazardous materials.

4.0 - LEVELS OF PROTECTION

Anyone entering a hazardous waste site must be protected against potential hazards. The purpose of the personal protection clothing and equipment is to minimize exposure to hazards while working on site. Careful selection and use of adequate personal protective equipment (PPE) should protect the respiratory system, skin, eyes, face, hands, feet, head, body and hearing.

The appropriate level of protection is determined prior to the initial entry on site based on available information and preliminary monitoring of the site. Subsequent information may warrant changes in the original level selected. Appropriate equipment to protect personnel against exposure to known or anticipated chemical hazards has been divided into four categories according to the degree of protection afforded.

4.1 - Level A Protection

The highest degree of protection is used in a Level A situation. It should be worn when the highest available level of respiratory, skin and eye protection is needed. This level of protection is placed in effect when there is no historic information about the site and it is assumed that the worst possible conditions exist. A confined space, and/or oxygen deficient atmosphere (less than 19.5% oxygen) also classifies as a Level A situation.

4.1.1 - Personal Protective Equipment

a. Pressure demand, self-contained breathing apparatus, approved by the Occupational Safety and Health Administration (OSHA) and National Institute of Occupational Safety and Health (NIOSH).

b. Fully encapsulating chemical-resistant suit.

c. Coveralls*.

d. Long cotton underwear*.

e. Gloves (outer), chemical-resistant.

f. Gloves (inner), chemical-resistant.

g. Boots, chemical-resistant, steel toe and shank. (Depending on suit construction, worn over or under suit boot.)

h. Hard hat* (under suit).

i. Disposable protective suit, gloves and boots* (worn over fully-encapsulating suit).

j. Two-way radio communications (intrinsically safe).

*Optional

4.1.2 - Criteria for Selection

Meeting any of the criteria listed below warrants use of Level A protection:

a. The chemical substance(s) has been identified and requires the highest level of protection for skin, eyes and the respiratory system based on:

(1) Measured (or potential for) high concentrations-of atmospheric vapors, gases, or particulates; or

(2) Site operations and work functions involving high potential for splash, immersion, or exposure to unexpected vapors, gases, or particulates.

b. Extremely hazardous substances are known or suspected to be present and skin contact is possible.

c. The potential exists for contact with substances that destroy skin.

d. Operations must be conducted in confined, poorly ventilated areas until the absence of hazards requiring Level A protection is demonstrated.

e. An oxygen deficient atmosphere where the oxygen level is less than 19.5 percent (%) by volume as measured with an oxygen meter.

f. Total atmospheric readings on photoionization detector indicate readings above 500 parts per million (ppm) of calibration gas equivalents (cge) of unidentified substances.

4.1.3 - Limiting Criteria

a. Fully encapsulating suit material must be compatible with the substances involved.

4.1.4 - Minimum Decontamination Procedure

Station 1: Segregated equipment drop.

Station 2: Outer garment, boots and gloves wash and rinse.

Station 3: Outer boot and glove removal.

Station 4: Tank change.

Station 5: Boots, gloves and outer garment removal.

Station 6: SCBA removal.

Station 7: Field wash.

4.2 - Level B Protection

4.2.1 - Personal Protective Equipment

a. Pressure-demand, self-contained breathing apparatus-(OSHA/NIOSH approved).

b. Chemical-resistant clothing (coveralls and long-sleeved jacket; coveralls, hooded, one or two-piece chemical-splash suit; disposable chemical-resistant coveralls).

c. Coveralls.*

d. Gloves (outer), chemical-resistant.

e. Gloves (inner), chemical-resistant.

f. Boots (outer), chemical-resistant, steel toe and shank.

g. Boots (outer), chemical resistant (disposable*).

h. Hard hat (face shield*).

i. Two-way radio communications (intrinsically safe).

*Optional

4.2.2 - Criteria for Selection

Meeting any one of these criteria warrants use of Level B protection:

a. The type(s) and atmospheric concentration(s) of toxic substances have been identified and require the highest level of respiratory protection, but a lower level of skin and eye protection than is required with Level A. These would be atmospheres:

(1) With concentrations immediately danger to life and health (IDLH); or

(2) Exceeding limits of protection afforded by a full-face, air-purifying mask; or

(3) Containing substances for which air-purifying canisters do not exist or have low removal efficiency; and/or

(4) Containing substances requiring air-supplied equipment, but substances and/ or concentrations do not represent a serious skin hazard.

b. The atmosphere contains less than 19.5 percent oxygen.

c. Site operations make it highly unlikely that the small, unprotected area of the head or neck will be contacted by splashes of extremely hazardous substances.

d. Total atmospheric concentrations in the breathing zone of unidentified vapors or gases range from 50 ppm to 500 ppm (calibration gas equivalence units) on monitoring instruments, and vapors are not suspected of containing high levels of chemicals toxic to skin.

4.2.3 - Limiting Criteria

a. Use only when the vapor or gases present are not suspected of containing high concentrations of chemicals that are harmful to skin or capable of being absorbed through skin contact.

b. Use only when it is highly unlikely that the work being done will generate high concentrations of vapors, gases, or particulates or splashes of material that will affect exposed skin.

4.2.4 - Minimum Decontamination Procedures

Station 1: Equipment drop.

Station 2: Outer garment, boots and gloves wash and rinse.

Station 3: Outer boot and glove removal.

Station 4: Tank change.

Station 5: Boot, gloves and outer glove removal.

Station 6: SCBA removal.

Station 7: Field wash.

4.3 - Level C Protection

4.3.1 - Personal Protective Equipment

a. Full-face, air purifying, canister-equipped respirator (Mine Safety and Health Administration (MSHA) and National Institute of Occupational Safety and Health (NIOSH) approved).

b. Chemical-resistant clothing (coveralls; hooded, two-piece chemical splash suits; chemical-resistant hood and apron; disposable chemical-resistant coveralls).

c. Coveralls.*

d. Gloves (outer), chemical-resistant.

e. Gloves (inner), chemical-resistant.

f. Boots (outer), chemical-resistant, steel toe and shank.*

g. Boots (outer), chemical-resistant (disposable*).

h. Hard hat (face shield*).

i. Escape mask*.

j. Two-way radio communications (intrinsically safe).

*Optional

4.3.2 - Criteria for Selection

Meeting all of these criteria permits use of Level C Protection:

a. Measured air concentrations of identified substances will be reduced by the respirator to, at or below the substance's exposure limit, and the concentration is within the service limit of the canister.

b. Atmospheric contaminant concentrations do not exceed IDLH levels.

c. Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect the small area of skin left unprotected by chemical-resistant clothing.

d. Job functions have been determined not to require self-contained breathing apparatus.

e. Total vapor readings register between 5 ppm (cge) and 50 ppm (cge) above background on instruments.

f. Air will be monitored periodically.

g. Cartridges are available and are approved by NIOSH and MSHA for the specific chemical(s) encountered.

4.3.3 - Limiting Criteria

a. Atmospheric concentration of chemicals must not exceed IDLH levels.

b. The atmosphere must contain at least 19.5 percent oxygen.

c. Must have sufficient information available regarding specific compounds, and their concentrations, likely to be encountered.

4.3.4 - Minimum Decontamination Procedures

Station 1: Equipment drop.

Station 2: Outer boot and glove removal.

Station 3: Canister or mask change.

Station 4: Boots, gloves and outer garment removal.

Station 5: Face piece removal.

Station 6: Field wash.

4.4 - Level D Protection

Level D protection has been selected for H2M personnel for this project. Should conditions change, re-evaluation of personnel protection will be conducted.

4.4.1 - Personal Protective Equipment

a. Coveralls.

b. Gloves*.

c. Boots/shoes, leather or chemical-resistant, steel toe and shank.

d. Boots (outer), chemical/resistant (disposable)*.

e. Safety glasses or chemical splash goggles*.

f. Hard hat (face shield*).

g. Escape mask*.

*Optional

4.4.2 - Criteria for Selection

Meeting any of these criteria allows use of Level D protection:

a. No hazardous air pollutants have been measured.

b. Work functions preclude splashes, immersion, or potential for unexpected inhalation of any chemicals.

c. Extensive information on suspected hazards/risks are known.

4.4.3 Limiting Criteria

a. The atmosphere must contain at least 20.9 percent oxygen.

4.4.4 Minimum Decontamination Procedure

Station 1: Equipment drop.

Station 2: Hand and face wash.

4.5 - Duration of Work Period

The anticipated duration of the work period will be established prior to daily activities. Work will only be performed during daylight hours. Other factors that limit work period length include:

a. Air supply consumption (SCBA assisted work);

b. Suit/ensemble, air purifying chemical cart-ridge, permeation and penetration by chemical contaminants; and

c. Ambient temperature and weather conditions.

5.0 DETERMINATION OF THE SITE-SPECIAL LEVEL OF HAZARD

Based upon information obtained from past groundwater and soil sampling results, and the examination of the hazardous substance data sheets (Appendix B) for the contaminants alleged or reported at the Rite-Off, Inc. site property, it has been determined that the appropriate level of protection for the site is Level D, the minimal level of protection.

Categories of personnel protection required depend on the degree of hazard and probability of exposure by a route of entry into the body. For this site, the most probable potential route entry is via inhalation of gases and of airborne particulates released from soils and/or standing liquids. Other potential routes of exposure include ingestion of contaminated particulates resulting from handling of contaminated soils, however, given the site conditions, these routes of exposure pose less of a concern. The site-specific chemical contaminants of

concern are volatile organic compounds, specifically 1,1,1-trichloroethane and tetrachloroethene.

The determination of Level D protection is based on the fact that field work will be performed in open, well-ventilated areas and that the potential for accidents and injuries due to obstructions caused by and/or magnified by the use of level A, B, or C protection (i.e., slip/trip hazards) is greater than the potential for problems associated with exposure from contaminants using level D protection. Level C protection, with the appropriate organic vapor cartridges, can be implemented if air quality monitoring indicates that airborne organic compounds may pose a health threat.

A PID or FID will be used to monitor air quality throughout the RI/FS during the course of field work. If necessary based upon field PID readings, the work zone will be evacuated and consideration will be given of upgrading the level of protection. An upgrade to the appropriate level of protection for field personnel will be required before re-entering the work zone if hazardous conditions persist.

In addition to potential chemical hazards, there also exists potentially greater physical hazards associated with the field operations. Due to the nature of the field operations, heavy equipment including drill rigs will be used. Therefore, all personnel should always be aware of truck movements and drilling operations. All work must be performed in strict accordance with pertaining OSHA regulations . In addition, hard hats must be worn at all times.

6.0 DESIGNATED WORK ZONES

Work zones will be determined prior to the commencement of a specific work activity. An area large enough to encompass the activity will be delineated as the work zone. Only

qualified field personnel involved in the field activity with the proper personal protective equipment will be allowed into the designated work zones. Within the work zone ambient air quality will be periodically monitored using an PID or FID to determine any changes from background air quality. If subsequent measurements suggest a significant change in air quality, the work area will be immediately evacuated. An upgrade to the appropriate level of protection for field personnel will be required before re-entering the work zone. All off-site zones will be clearly marked and roped or fenced off to ensure that the public is kept at a safe distance from the drilling activities that cause physical injury or that potentially could release contaminants into the air.

7.0 DECONTAMINATION STATIONS

The decontamination station will be a fixed location to be used for the cleaning of all heavy equipment, vehicles, tools and supplies used in the field activities as well as for personnel decontamination for the duration of the on-site field operations.

All drilling equipment (rigs, augers, etc.) will be steam cleaned between each soil boring and well installation. Decontamination of the drilling equipment will be conducted at the location of the installed boring/well, prior to moving to the next drilling location.

8.0 SITE ACCESS CONTROL

Vehicular access to the site location is readily attainable with prior notice. The drill rig and all field equipment will be secured on-site.

9.0 - PERSONAL HYGIENE

The following personal hygiene rules must be followed while performing work at the site:

1. Eating, drinking, chewing gum or tobacco, smoking, or any other practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited in the work area.

2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking, or any other activities.

3. Whenever decontamination procedures for outer garments are in effect, the entire body should be thoroughly washed as soon as possible after the protective garment is removed.

4. No excessive facial hair (i.e., beards), which interferes with a satisfactory fit of the mask-to-face seal, is allowed on personnel required to wear respiratory protective equipment.

5. Contact with contaminated or suspected contaminated surfaces will be avoided. Whenever possible, walking through puddles, mud and other discolored surfaces; kneeling on ground; leaning, sitting, or placing equipment on drums, containers, vehicles, or the ground will be avoided.

6. Medicine and alcohol can increase the effects from exposure to toxic chemicals. Prescribed drugs will not be taken by personnel on site where the potential for absorption, inhalation, or ingestion of toxic substances exists unless specifically approved by a qualified physician. Alcoholic beverage intake will be prohibited during all on-site field operations.

10.0 CONTINGENCY PLAN

This sub-section shall serve as the RI/FS contingency plan. It has been developed to identify precautionary measures, possible emergency conditions, and emergency procedures. The plan shall be implemented by the Site Safety Officer.

10.1 - Emergency Medical Care and Treatment

This section addresses emergency medical care and treatment of field personnel, resulting from possible exposures to toxic substances and injuries due to accidents. The following items will be included in emergency care provisions:

a. Name, address and telephone number of the nearest medical treatment facility will be conspicuously posted. Directions for locating the facility, plus the travel time, will be readily available (see Appendix D).

b. Names and telephone numbers of ambulance service, police and fire departments, and procedures for obtaining these services will be conspicuously posted (Appendix D).

c. Procedure for prompt notification of the H2M Site Safety Manager.

d. Emergency eyewash fountains and first aid equipment will be readily available on site and located in an area known to all personnel.

e. Specific procedure for handling personnel with excessive exposure to chemicals or contaminated soil.

f. Readily available fire extinguisher (ABC) dry chemical.

10.2 - Off-Site Emergency Medical Care

The Site Safety Officer shall pre-arrange for access to emergency medical care services at a convenient and readily accessible medical facility and establish emergency routes. The Site Safety Officer shall establish emergency communications with emergency response services.

10.3 - Personnel Accidents

Bodily injuries which occur as a result of an accident during the operation at the site will be handled in the following manner:

a. First aid equipment will be available on site for minor injuries. If the injuries are not considered minor, proceed to the next step.

b. The local first aid squad rescue unit, a paramedic unit, the local hospital and the Site Safety Officer shall be notified of the nature of the emergency.

c. The injured employee shall be transported by the local emergency vehicle to the local hospital.

d. A written report shall be prepared by the Site Safety Officer detailing the events and actions taken during the emergency within 24 hours of the accident.

10.4 - Personnel Exposure

In the event that any personnel is splashed or otherwise excessively contaminated by chemicals, the following procedure will be undertaken:

a. Disposable clothing contaminated with observable amounts of chemical residue is to be removed and replaced immediately.

b. In the event of direct skin contact in Level D, the affected area is to be washed immediately with soap and water.

c. The Site Safety Officer or other individuals who hold a current first aid certificate will determine the immediate course of action to be undertaken. This may involve using the first aid kit and/or eyewash. One or more of the following will help reduce heat stress:

10.4.1 - Weather

Adverse weather conditions is an important consideration in planning and conducting site operations. Hot or cold weather can cause physical discomfort, loss of efficiency, and personal injury. Of particular importance is heat stress resulting when protective clothing decreases natural body ventilation. One or more of the following will help reduce heat stress:

a. Provide plenty of liquids. To replace body fluids (water and electrolytes) lost because of sweating, use a 0.1 percent salt water solution, more heavily salted foods or commercial mixes. The commercial mixes may be preferable for those employees on a low sodium diet.

b. Provide cooling devices to aid natural body ventilation. These devices, however, add weight, and their use should be balanced against worker efficiency. Long cotton underwear help absorb moisture and protect the skin from direct contact with heat absorbing protective clothing. It should be the minimum undergarment worn.

c. Install mobile showers and/or hose down facilities to reduce body temperature and cool protective clothing.

d. In extremely hot weather, conduct non-emergency response operations in the early morning or evening.

e. Ensure that adequate shelter is available to protect personnel against heat, cold, rain, snow, etc.

f. In hot weather, rotate shifts of workers wearing impervious clothing.

10.4.2 - Heat Stress

If field operations are conducted in the warm summer months, heat related fatigue will be closely monitored. Monitoring of personnel wearing impervious clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. Frequency of monitoring should increase as the ambient temperature increases or as slow recovery rates are indicated. When temperatures exceeds 85 degrees Fahrenheit, workers should be monitored for heat stress after every work period. The following screening mechanism will be used to monitor for heat stress:

> Heart rate will be periodically measured by the radial pulse for 30 second during a resting period. The heart rate should not exceed 110 beats per minute. If the heart rate is higher, the next work period should be shortened by 33 percent. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be shortened by 33 percent.

Heat-related illnesses range from heat fatigue to heat stroke, the most serious. Heat stroke requires prompt treatment to prevent irreversible damage or death. Protective clothing may have to be cut off. Less serious forms of heat stress require prompt attention or they may lead to a heat stroke. Unless the victim is obviously contaminated, decontamination should be omitted or minimized and treatment begun immediately.

Heat-related problems can be categorized into:

Heat Rash: Caused by continuous exposure to hot and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.

Heat Cramps Caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.

Heat Exhaustion Caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.

Heat Stroke: The most severe form of heat stress. The body must be cooled immediately to prevent severe injury and/or death. Signs and symptoms are: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Some of the symptoms of heat stress are: hot dry skin, fever, nausea, cramps, red or spotted skin, confusion, lightheadedness, delirium, rapid pulse, convulsions and unconsciousness.

For workers suffering from heat stroke, the following actions should be taken:

1. Remove the victim to a cool area

2. Loosen clothing

3. Thoroughly soak the victim in cool water or apply cold compresses

4. Make sure someone has called for medical assistance.

10.4.3 - Cold Stress

If field operations are conducted in the cold winter months, cold stress will be monitored. Two (2) factors influence the development of a cold injury: ambient temperature and the velocity of the wind. Wind chill is used to describe the chilling effect of moving air in combination with low temperature. For instance, 10 degrees Fahrenheit with a wind of 15 miles per hour (mph) is equivalent in chilling effect to still air at -18 degrees Fahrenheit.

As a general rule, the greatest incremental increase in wind chill occurs when a wind of 5 mph increases to 10 mph. Additionally, water conducts heat 240 times faster than air. Thus, the body cools suddenly when chemical-protective equipment is removed if the clothing underneath is perspiration soaked.

Local injury resulting from cold is included in the generic term frostbite. There are several degrees of damage. Frostbite of the extremities can be categorized into:

Frost Nip or Incipient Frostbite. Characterized by suddenly blanching or whitening of skin.

Superficial Frostbite. Skin has a waxy or white appearance and is firm to the touch, but tissue beneath is resilient.

Deep Frostbite. Tissues are cold, pale and solid; extremely serious injury

Hypothermia. Systemic hypothermia is caused by exposure to freezing or rapidly dropping temperatures. Its symptoms are usually exhibited in five stages: (1) shivering; (2) apathy, listlessness, sleepiness, and (sometimes) rapid cooling of the body to less than 95 degrees Fahrenheit; (3) unconsciousness, glassy stare, slow pulse and slow respiratory rate; (4) freezing of the extremities; and finally, (5) death.

10.5 - Fire

The telephone number to the local fire department will be posted along with other emergency numbers conspicuously on-site at all times.

In the event of a fire occurring at the site, the following actions will be undertaken by the Site Safety Officer and the designated fire control personnel:

a. Evacuate all unnecessary personnel from the area of the fire and site, if necessary.

b. Contact the local fire and police departments informing them of the fire and any injuries if they have occurred.

c. Contact the local hospital of the possibility of fire victims.

d. Contact the Site Safety Officer and the H2M Site Manager.

11.0 - SUMMARY

The Health and Safety Plan establishes practices and procedures to be followed so that the welfare and safety of workers is protected. Adherence to this HASP will minimize the possibility that personnel at the site or the surrounding community will be injured or exposed to site-related contaminants during remedial investigation activities.

It is important that personal equipment and safety requirements be appropriate to protect against the potential or known hazards at a site. Protective equipment will be based upon the type(s), concentration(s), and routes of personal exposure from substances at the site, as well as the potential for hazards due to heavy equipment use, vision impairment, weather, etc.. All site operation planning incorporates an analysis of the hazards involved and procedures for preventing or minimizing the risk to personnel. The following summarizes the rules which must be obeyed:

a. The Health and Safety Plan will be made available to all H2M personnel doing field work on site. All personnel must sign this plan, indicating they have read and understood its terms.

b. All H2M personnel will be familiar with standard operating safety procedures and additional instructions contained in the Health and Safety Plan.

c. All H2M personnel going on site will be adequately trained and thoroughly briefed on anticipated hazards, equipment to be worn,

safety practices to be followed, emergency procedures and communications.

d. Any required respiratory protective devices and clothing will be worn by all personnel going into work areas.

e. Prior to commencement of work activities, notification to local police, fire and potential rescue personnel will be made.

APPENDIX A

HEALTH AND SAFETY STATEMENT FORM

SITE WORKER

HEALTH AND SAFETY STATEMENT FORM

I have read the health and Safety Plan (HASP) for the Remedial Investigation/Feasibility Study at the Rite-Off, Inc. site and I have reviewed and understand the potential hazards and the precautions/contingencies of each potential hazard.

I agree to abide by the stipulations of this HASP and further agree to hold H2M Group harmless from, and indemnify against, any accidents which may occur as a result of activities in the Site regardless of whether or not they were covered in the HASP.

Name:_____ Representing:_____

Print:_____Date:_____

Sign:_____

Name:_____Representing:_____

Print:_____Date:_____

Sign:_____

APPENDIX B

HAZARDOUS SUBSTANCE DATA SHEETS

H2MGROUP

HAZARDOUS SUBSTANCE DATA SHEET

Name of Substance: Tetrachloroethene

List the references used:

a. EPA-1985 c. Niosh

b. _____ d. Allied Fisher

Physical/Chemical Property - Source:

State a. _____

b. _____

c. colorless liquid with chloroform odor

d. colorless liquid with chloroform like oder

	A	B	C	D
SG/Dens	1.63			1.6
BP	121°C		250°F	250°F (121° C)
MP	-22.7°C		- 8°F	- 9°F (-23°C)
VP	14mm Hg 32°C		14mm	15mm Hg @ 20°C
V. Dens				5.8
FP			Not Combustible	Nonflammable
LEL				
UEL				
Autoig				
Odor Thr.				
Solub.	150-200mg/l	H_2O @ 20° C	0.015%	0.04% in water Soluble in alcohol & Benzer
Other			MW = 166 IP: 9.32	Odor threshold 50 ppm

H2MGROUP 1,1,1 - trichloroethane

HAZARDOUS SUBSTANCE DATA SHEET

Name of Substance: 1,1,1 - trichloroethane

List the references used:

a. Sax c. _____

b. Niosh d. _____

Physical/Chemical Property - Source:

State a. colorless liquid

b. colorless liquid with a mild, chloroform-like odor

c. _____

d. _____

	A	B	C	D
SG/Dens	1.3376			
BP	74.1			
MP		-36° F		
VP	100 mm			
V. Dens				
FP	none			
LEL		7%		
UEL		16%		
Autoig				
Odor Thr.				
Solub.	soluble in acetone, ~~benzene, carbon tetrachloride~~			
Other	methanol, ether			

II. Personnel Protection

Respirator Selection:

Toxicity: Exposure Limits:

OSHA 100 ppm 8 hr. TWA
OSHA 200 ppm ceiling
OSHA 300 ppm 5 min/3 hr peak
NIOSH lowest feasible limit
ACGIH 50 ppm

Warning Properties:

Incompatible with strong oxidizers and chemically active metals such as barium, lithium, beryllium

Cartridge Efficiencies:

Other Recommendations:

Colorless liquid with an odor like ether or chloroform.

H2MGROUP

II. Personnel Protection

Respirator Selection: NIOSH: 100ppm - supplied air/self contained breathing apparatus

Toxicity:

OSHA - 350 ppm
NIOSH 350 ppm (15 min. ceil)
ACGIH 350 ppm
STEL 450 ppm

Warning Properties:

Inhalation - headaches, lassitude
CNS - depression
Skin or eye contact - dermatitis, cardiac arrhytimias

Cartridge Efficiencies:

Other Recommendations:

Incompatibilities - strong caustics, strong oxidizers, chemically active metals such as aluminum, magnesium powders, sodium potassium

H2MGROUP

HAZARDOUS SUBSTANCE DATA SHEET

Name of Substance: Phenol

List the references used:

a. Niosh

b. Sax

c.

d.

Physical/Chemical Property - Source:

State

a. colorless to pink solid or thick liquid with sweet odor

b. white crystalline mass which turns red or pink if not pure

c.

d.

	A	B	C	D
SG/Dens		1.072		
BP	359°F			
MP	106°F			
VP	0.36 mm			
V. Dens		3.24		
FP	174°F			
LEL	1.7%			
UEL	8.6%			
Autoig		1319°F		
Odor Thr.				
Solub.	8.4%			
Other		misc. in alc, ether		

H2MGROUP

II. Personnel Protection

Respirator Selection: OSHA 50 ppm: chemical cartridge respirator with organic vapor cartridge(s) in combination with a dust and mist filter/supplied air/self contained breathing apparatus
125 ppm: supplied air-continuous flow

Toxicity: OSHA - 5 ppm 8 hour TWA
NIOSH 5.2 ppm 10 hour TWA
15.6 ppm 15 minute ceiling

Warning Properties: Inhalation - irritated eyes, nose, throat, skin or eye contact - skin burn, dermatitis, tremor, convulsions, twitch

Cartridge Efficiencies:

Other Recommendations: Incompatabilities - strong oxidizers, calcium hypochlorite

APPENDIX C

HEALTH AND SAFETY STATEMENT FORM

I acknowledge that I have read and understand the provisions of this Health and Safety Plan, and that I will, to the best of my ability, abide by the terms of this plan:

Name	Date	Name	Date

APPENDIX D

EMERGENCY RESPONSE INFORMATION

EMERGENCY TELEPHONE NUMBERS

HOSPITAL
Good Samaritan Hospital
(516) 661-3000
957-4015

POLICE DEPARTMENT
911

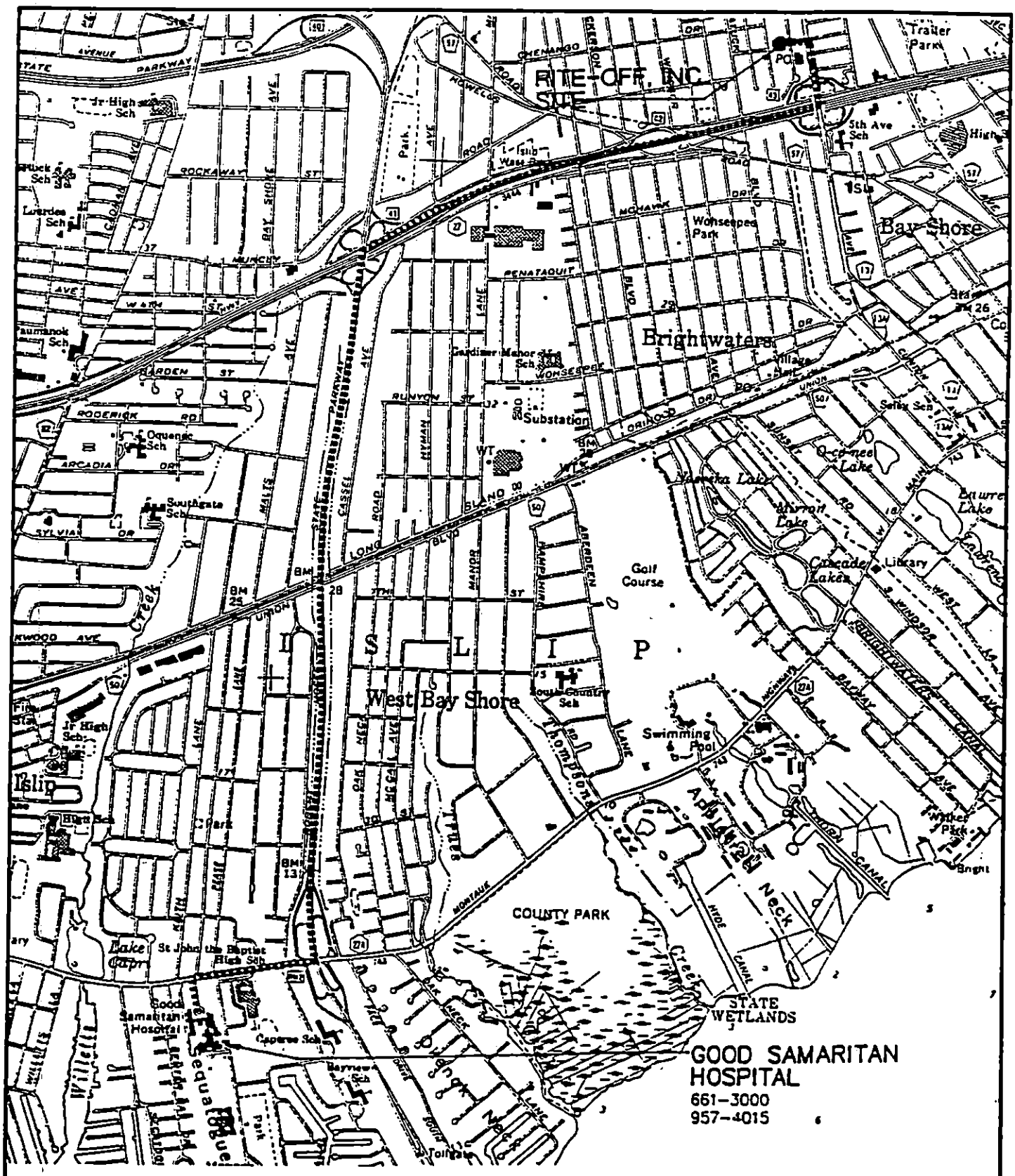
FIRE DEPARTMENT
581-5882 or 911

POISON CONTROL CENTER
542-2323

AMBULANCE
Call Local Police or Operator

H2M Group
(516) 756-8000

PROJECT MANAGER	Richard Baldwin (Ext. 611)
HEALTH & SAFETY OFFICER	Richard Baldwin (Ext. 611)



EMERGENCY ROUTE TO HOSPITAL

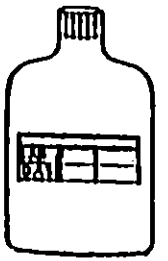
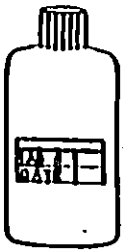
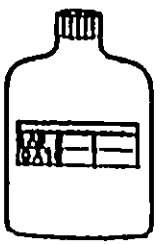
SCALE: 1" = 2000'

H2MGROUP ENGINEERS · ARCHITECTS · PLANNERS · SCIENTISTS · SURVEYORS
MELVILLE, N.Y. TOTOWA, N.J.

APPENDIX C

LABORATORY CLP BOTTLE CHART AND DETECTION LIMITS

CLP BOTTLE CHART

Soil Analysis	TCL Metals	BN/AE/Pesticide/PCB	Wet Chemistry Inorganic
			
H 8 oz. amber glass jar	EP 1000 ml. round plastic with 1:1 HNO_3	C 1 Quart amber glass bottle Unpreserved	E Unpreserved 1 Quart round plastic
Cyanide	**Volatile Organics**	**Hydrocarbons**	
			
ECN NaOH Pellets 1 Quart round plastic	D Unpreserved 40 ml. vial with Septa Cap	CP 1 Quart Amber Glass Bottle with H_2SO_4	

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

	Volatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
1.	Chloromethane	74-87-3	10	10	1200	(50)
2.	Bromomethane	74-83-9	10	10	1200	(50)
3.	Vinyl chloride	75-01-4	10	10	1200	(50)
4.	Chloroethane	75-00-3	10	10	1200	(50)
5.	Methylene chloride	75-09-2	10	10	1200	(50)
6.	Acetone	67-64-1	10	10	1200	(50)
7.	Carbon Disulfide	75-15-0	10	10	1200	(50)
8.	1,1-Dichloroethylene	75-35-4	10	10	1200	(50)
9.	1,1-Dichloroethane	75-35-3	10	10	1200	(50)
10.	1,2-Dichloroethylene(total)	540-59-0	10	10	1200	(50)
11.	Chloroform	67-66-3	10	10	1200	(50)
12.	1,2-Dichloroethane	107-06-2	10	10	1200	(50)
13.	2-Butanone	78-93-3	10	10	1200	(50)
14.	1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
15.	Carbon tetrachloride	56-23-5	10	10	1200	(50)
16.	Bromodichloromethane	75-27-4	10	10	1200	(50)
17.	1,2-Dichloropropane	78-87-5	10	10	1200	(50)
18.	cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
19.	Trichloroethene	79-01-6	10	10	1200	(50)
20.	Dibromochloromethane	124-48-1	10	10	1200	(50)
21.	1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
22.	Benzene	71-43-2	10	10	1200	(50)
23.	trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
24.	Bromoform	75-25-2	10	10	1200	(50)
25.	4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
26.	2-Hexanone	591-78-6	10	10	1200	(50)
27.	Tetrachloroethene	127-18-4	10	10	1200	(50)
28.	Toluene	108-88-3	10	10	1200	(50)
29.	1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
30.	Chlorobenzene	108-90-7	10	10	1200	(50)
31.	Ethyl Benzene	100-41-4	10	10	1200	(50)
32.	Styrene	100-42-5	10	10	1200	(50)
33.	Total Xylenes	1330-20-7	10	10	1200	(50)

* Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the laboratory for soil/sediment, calculated on dry weight basis, as required by the protocol, will be higher.

Note that the CRQL values listed on the preceding page may not be those specified in previous Analytical Services Protocols. These values are set at concentrations in the sample equivalent to the concentration of the lowest calibration standard specified in Exhibit D, Part II. Lower quantitation limits may be achievable for water samples by employing the methods in Exhibit D, Part X for Low Concentration Water for Organic Analyses.

VOLATILES

Water Samples

A 5 mL volume of water is purged with an inert gas at ambient temperature. The volatiles are trapped on solid sorbents, and desorbed directly onto the GC/MS. For a sample with compound X at the CRQL of 10 µg/L:

(10 µg/L) (5 mL) (10^{-3} L/mL) = 50 x 10^{-3} ug = 50 ng on the GC column

Low Level Soil/Sediment Samples

A 5 g aliquot of the soil/sediment sample is added to a volume of water in a purge tube, heated, and purged with an inert gas. The volatiles are trapped, and later desorbed directly onto the GC/MS. For a sample with compound X at the CRQL of 10 µg/Kg:

(10 µg/Kg) (5 g) (10^{-3} Kg/g) = 50 x 10^{-3} µg = 50 ng on the GC column

Medium Level Soil/Sediment Samples

A 4 g aliquot of soil/sediment is extracted with 10 mL of methanol, and filtered through glass wool. Only 1 mL of the methanol extract is taken for screening and analysis. Based on the results of a GC/FID screen, an aliquot of the methanol extract is added to 5 mL of reagent water and purged at ambient temperature. The largest aliquot of extract considered in Exhibit D, Part III is 100 uL. For a sample with compound X at the CRQL of 1200 µg/Kg:

(1200 µg/Kg) (4 g) (10^{-3} Kg/g) = 4800 x 10^{-3} µg = 4800 ng

This material is contained in the 10 mL methanol extract:

(4800 ng) / 10 mL = 480 ng/mL

Of which, 100 µL are purged from the reagent water.

(480 ng/mL) (100 µL) (10^{-3} mL/µL) = 480 x 10^{-1} ng = 50 ng on the GC column

Note that for both low and medium soil/sediment samples, while it may affect the purging efficiency, the volume of reagent water used in the purging process does not affect the calculations.

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)*

	Semivolatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
34.	Phenol	108-95-2	10	330	10,000	(20)
35.	bis(2-Chloroethyl) ether	111-44-4	10	330	10,000	(20)
36.	2-Chlorophenol	95-57-8	10	330	10,000	(20)
37.	1,3-Dichlorobenzene	541-73-1	10	330	10,000	(20)
38.	1,4-Dichlorobenzene	106-46-7	10	330	10,000	(20)
39.	1,2-Dichlorobenzene	95-50-1	10	330	10,000	(20)
40.	2-Methylphenol	95-48-7	10	330	10,000	(20)
41.	2,2'-oxybis(1-Chloro-propane) #	108-60-1	10	330	10,000	(20)
42.	4-Methylphenol	106-44-5	10	330	10,000	(20)
43.	N-Nitroso-di-n-propylamine*	621-64-7	10	330	10,000	(20)
44.	Hexachloroethane	67-72-1	10	330	10,000	(20)
45.	Nitrobenzene	98-95-3	10	330	10,000	(20)
46.	Isophorone	78-59-1	10	330	10,000	(20)
47.	2-Nitrophenol	88-75-5	10	330	10,000	(20)
48.	2,4-Dimethylphenol	105-67-9	10	330	10,000	(20)
49.	bis(2-Chloroethoxy) methane	111-91-1	10	330	10,000	(20)
50.	2,4-Dichlorophenol	120-83-2	10	330	10,000	(20)
51.	1,2,4-Trichlorobenzene	120-82-1	10	330	10,000	(20)
52.	Naphthalene	91-20-3	10	330	10,000	(20)
53.	4-Chloroaniline	106-47-8	10	330	10,000	(20)
54.	Hexachlorobutadiene	87-68-3	10	330	10,000	(20)
55.	4-Chloro-3-methylphenol	59-50-7	10	330	10,000	(20)
56.	2-Methylnaphthalene	91-57-6	10	330	10,000	(20)
57.	Hexachlorocyclopentadiene	77-47-4	10	330	10,000	(20)
58.	2,4,6-Trichlorophenol	88-06-2	10	330	10,000	(20)
59.	2,4,5-Trichlorophenol	95-95-4	25	800	25,000	(50)
60.	2-Chloronaphthalene	91-58-7	10	330	10,000	(20)
61.	2-Nitroaniline	88-74-4	25	800	25,000	(50)
62.	Dimethyl phthalate	131-11-3	10	330	10,000	(20)
63.	Acenaphthylene	208-96-8	10	330	10,000	(20)
64.	2,6-Dinitrotoluene	606-20-2	10	330	10,000	(20)
65.	3-Nitroaniline	99-09-2	25	800	25,000	(50)
66.	Acenaphthene	83-32-9	10	330	10,000	(20)

\# Previously known by the name bis(2-Chloroisopropyl) ether

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

	Semivolatiles	CAS Number	Quantitation Limits* Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
67.	2,4-Dinitrophenol	51-28-5	25	800	25,000	(50)
68.	4-Nitrophenol	100-02-7	25	800	25,000	(50)
69.	Dibenzofuran	132-64-9	10	330	10,000	(20)
70.	2,4-Dinitrotoluene	121-14-2	10	330	10,000	(20)
71.	Diethylphthalate	84-66-2	10	330	10,000	(20)
72.	4-Chlorophenyl phenyl ether	7005-72-3	10	330	10,000	(20)
73.	Fluorene	86-73-7	10	330	10,000	(20)
74.	4-Nitroaniline	100-01-6	25	800	25,000	(50)
75.	4,6-Dinitro-2-methylphenol	534-52-1	25	800	25,000	(50)
76.	N-nitrosodiphenylamine	86-30-6	10	330	10,000	(20)
77.	4-Bromophenyl phenyl ether	101-55-3	10	330	10,000	(20)
78.	Hexachlorobenzene	118-74-1	10	330	10,000	(20)
79.	Pentachlorophenol	87-86-5	25	800	25,000	(50)
80.	Phenanthrene	85-01-8	10	330	10,000	(20)
81.	Anthracene	120-12-7	10	330	10,000	(20)
82.	Carbazole	86-74-8	10	330	10,000	(20)
83.	Di-n-butyl phthalate	84-74-2	10	330	10,000	(20)
84.	Fluoranthene	206-44-0	10	330	10,000	(20)
85.	Pyrene	129-00-0	10	330	10,000	(20)
86.	Butyl benzyl phthalate	85-68-7	10	330	10,000	(20)
87.	3,3'-Dichlorobenzidine	91-94-1	10	330	10,000	(20)
88.	Benz(a)anthracene	56-55-3	10	330	10,000	(20)
89.	Chrysene	218-01-9	10	330	10,000	(20)
90.	bis(2-Ethylhexyl)phthalate	117-81-7	10	330	10,000	(20)
91.	Di-n-octyl phthalate	117-84-0	10	330	10,000	(20)
92.	Benzo(b)fluoranthene	205-99-2	10	330	10,000	(20)
93.	Benzo(k)fluoranthene	207-08-9	10	330	10,000	(20)
94.	Benzo(a)pyrene	50-32-8	10	330	10,000	(20)
95.	Indeno(1,2,3-cd)pyrene	193-39-5	10	330	10,000	(20)
96.	Dibenz(a,h)anthracene	53-70-3	10	330	10,000	(20)
97.	Benzo(g,h,i)perylene	191-24-2	10	330	10,000	(20)

* Quantitation limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the Laboratory for soil/sediment, calculated on dry weight basis as required by the Protocol, will be higher.

SEMIVOLATILES

Water Samples

A 1 L volume of water is extracted in a continuous liquid-liquid extractor with methylene chloride at a pH of approximately 2. This extract is reduced in volume to 1.0 mL, and a 2 µL volume is injected onto the GC/MS for analysis. For a sample with compound X at the CRQL of 10 µg/L:

(10 µg/L) (1 L) = 10 µg in the original extract

When the extract is concentrated, this material is contained in the 1 mL concentrated extract, of which 2 µL are injected into the instrument:

(10 µg/mL) (2 µL) (10^{-3} mL/µL) = 20 x 10^{-3} µg = 20 ng on the GC column

Low Soil Samples

A 30 g soil sample is extracted three times with methylene chloride/acetone at ambient pH, by sonication or Soxhlet. The extract is reduced in volume to 1.0 mL, and a 2 µL volume is injected onto the GC/MS for analysis. For a sample with compound X at the CRQL of 330 µg/Kg:

(330 µg/Kg) (30 g) (10^{-3} Kg/g) = 9900 x 10^{-3} µg = 9.9 µg

When the sample extract is to be subjected to Gel Permeation Chromatography (required) to remove high molecular weight interferences, the volume of the extract is initially reduced to 10 mL. This 10 mL is put through the GPC column, and only 5 mL are collected off the GPC. That 5 mL volume is reduced to 0.5 mL prior to analysis. Therefore:

(9.9 µg/10 mL) (5 mL) = 4.95 µg

This material is contained in the 0.5 mL extract, of which 2 µL are injected into the instrument:

(4.95 µg/0.5 mL) (2 µL) (10^{-3} mL/µL) = (1.98 x 10^{-3} µg) 20 ng on the GC column

Medium Soil Samples

A 1 g soil sample is extracted once with 10 mL of methylene chloride/acetone, which is filtered through glass wool to remove particles of soil. The filtered extract is then subjected to GPC clean up, and only 5 mL of extract are collected after GPC. This extract is reduced in volume to 0.5 mL, of which 2 µL are injected onto the GC/MS. For a sample with compound X at the CRQL of 10,000 µg/Kg:

(10,000 µg/Kg) (1 g) (10^{-3} Kg/g) = 10 µg

(continued)

Semivolatiles, Medium Soil, continued -

This material is contained in the 10 mL extract, of which only 5 mL are collected after GPC:

(10 µg) (5 mL/10 mL) = 5 ug

The volume of this extract is reduced to 0.5 mL, of which 2 µL are injected into the instrument:

(5 µg/0.5 mL) (2 µL) (10^{-3} mL/µL) = 20 x 10^{-3} ug = 20 ng on the GC column

Eight semivolatile compounds are calibrated using only a four point initial calibration, with the lowest standard at 50 ng. Therefore, the CRQL values for these eight compounds are 2.5 times higher for all matrices and levels.

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)*

	Pesticides/Arodors	CAS Number	Quantitation Limits* Water µg/L	Soil µg/Kg	On Column (ng)
98.	alpha-BHC	319-84-6	0.05	1.7	5
99.	beta-BHC	319-85-7	0.05	1.7	5
100.	delta-BHC	319-86-8	0.05	1.7	5
101.	gamma-BHC (Lindane)	58-89-9	0.05	1.7	5
102.	Heptachlor	76-44-8	0.05	1.7	5
103.	Aldrin	309-00-2	0.05	1.7	5
104.	Heptachlor epoxide	1024-57-3	0.05	1.7	5
105.	Endosulfan I	959-98-8	0.05	1.7	5
106.	Dieldrin	60-57-1	0.10	3.3	10
107.	4,4'-DDE	72-55-9	0.10	3.3	10
108.	Endrin	72-20-8	0.10	3.3	10
109.	Endosulfan II	33213-65-9	0.10	3.3	10
110.	4,4'-DDD	72-54-8	0.10	3.3	10
111.	Endosulfan sulfate	1031-07-8	0.10	3.3	10
112.	4,4'-DDT	50-29-3	0.10	3.3	10
113.	Methoxychlor	72-43-5	0.50	17.0	50
114.	Endrin ketone	53494-70-5	0.10	3.3	10
115.	Endrin aldehyde	7421-36-3	0.10	3.3	10
116.	alpha-Chlordane	5103-71-9	0.05	1.7	5
117.	gamma-Chlordane	5103-74-2	0.05	1.7	5
118.	Toxaphene	8001-35-2	5.0	170.0	500
119.	AROCLOR-1016	12674-11-2	1.0	33.0	100
120.	AROCLOR-1221	11104-28-2	1.0	67.0	200
121.	AROCLOR-1232	11141-16-5	1.0	33.0	100
122.	AROCLOR-1242	53469-21-9	1.0	33.0	100
123.	AROCLOR-1248	12672-29-6	1.0	33.0	100
124.	AROCLOR-1254	11097-69-1	1.0	33.0	100
125.	AROCLOR-1260	11096-82-5	1.0	33.0	100

* Quantitation Limits listed for soil/sediment are based on wet weight. The quantitation limits calculated by the Laboratory for soil/sediment, calculate on dry weight basis, as required by the Protocol, will be higher.

Water Samples

A 1 L volume of water is extracted three times with methylene chloride or by a continuous liquid-liquid extractor. This extract is reduced in volume to approximately 3 - 5 mL, and diluted up to 10.0 mL with clean solvent. When Gel Permeation Chromatography is performed, only 5 of the 10 mL of extract are collected after GPC.

Regardless of whether GPC is performed, either 1.0 or 2.0 mL of the 10.0 mL of the original extracts are taken through the remaining clean up steps (Florisil and sulfur removal). The volume taken through Florisil cleanup and the final volume of the extract after the clean up steps depends on the requirements of the autosampler. If the autosampler can handle 1.0 mL final extract volumes, this is the volume taken through Florisil and the final volume. If the autosampler cannot reliably handle 1.0 mL volumes, the volume is 2.0 mL. When using an autosampler, the injection volume may be 1.0 or 2.0 µL. Manual injections must use a 2.0 µL injection volume.

For a sample with compound X at the CRQL of 0.05 µg/L and an autosampler requiring a 1.0 mL volume:

(0.05 µg/L) (1 L) = 0.05 µg in the original extract

This material is contained in the 10.0 mL of extract:

(0.05 µg)/ (10.0 mL) = 0.005 µg/mL

Of which, only 1.0 mL is carried through the remaining clean up steps. For a final extract volume of 1.0 mL and a 1 µL injection volume:

(0.005 µg/L) (1 µL) (10^{-3} mL/µL) = 5×10^{-6} µg = 5 pg on the GC column

Soil Samples

There is no differentiation between the preparation of low and medium soil samples in this method for the analysis of pesticides/Aroclors. A 30 g soil sample is extracted three times with methylene chloride/acetone by sonication or Soxhlet extraction. The extract is reduced in volume to 10.0 mL and subjected to Gel Permeation Chromatography. After GPC, only 5.0 mL of extract are collected. However, as with the water sample described above, either 1.0 or 2.0 mL of that extract are subjected to the other clean up steps, so no loss of sensitivity results from the use of GPC. From this point on, the soil sample extract is handled in the same fashion as the extract of a water sample. For a sample with compound X at the CRQL of 1.7 µg/Kg:

(1.7 µg/Kg) (30 g) (10^{-3} Kg/g) = 51×10^{-3} µg = 51 ng in the original extract

This material is contained in the 10.0 mL of extract:

(51 ng)/10 mL = 5.1 ng/mL

(continued)

of which, only 1.0 or 2.0 mL are carried through the remaining cleanup steps For a final extract volume of 1.0 mL and a 1 µL injection volume:

$(5.1\ ng/mL)(1\ \mu L)(10^{-3}\ mL/\mu L) = 5.1 \times 10^{-3}\ ng = 5\ pg$ on the GC column.

For either water or soil samples, if the autosampler used requires a 2.0 mL final volume, the concentration in the 10.0 mL of extract above remains the same.

Using a 2 µL injection volume, twice the total number of picograms are injected onto the GC column. However, because the injection volume must be the same for samples and standards, twice as much material is injected onto the column during calibration, and thus the amount of compound X injected from the sample extract is equivalent to the amount of compound X injected from the calibration standard, regardless of injection volume.

If a single injection is used for two GC columns attached to a single injection part, it may be necessary to use an injection volume greater than 2 µL.

SECTION II

SUPERFUND-CLP INORGANICS

Superfund Target Compound List (TCL) and Contract Required Quantitation Limit

Parameter		Contract Required Quantitation Level (µg/L)
1.	Aluminum	200
2.	Antimony	60
3.	Arsenic	10
4.	Barium	200
5.	Beryllium	5
6.	Cadmium	5
7.	Calcium	5000
8.	Chromium	10
9.	Cobalt	50
10.	Copper	25
11.	Iron	100
12.	Lead	3
13.	Magnesium	5000
14.	Manganese	15
15.	Mercury	0.2
16.	Nickel	40
17.	Potassium	5000
18.	Selenium	5
19.	Silver	10
20.	Sodium	5000
21.	Thallium	10
22.	Vanadium	50
23.	Zinc	20
24.	Cyanide	10

1: Any analytical method specified in Exhibit D, CLP-Inorganics may be utilized as long as the documented instrument or method detection limits meet the Contract Required Quantitation Level (CRQL) requirements. Higher quantitation levels may only be used in the following circumstance:

If the sample concentration exceeds five times the quantitation limit of the instrument or method in use, the value may be reported even though the instrument or method detection limit may not equal the Contract Required Quantitation Limit. This is illustrated in the example below:

For lead:
Method in use = ICP
Instrument Detection Limit (IDL) = 40
Sample concentration = 220
Contract Required Quantitation Level (CRQL) = 3

The value of 220 may be reported even though instrument detection limit is greater than Contract Required Quantitation Limit. The instrument or method detection limit must be documented as described in Exhibit E.

2: These CRQLs are the instrument detection limits obtained in pure water that must be met using the procedure in Exhibit E. The quantitation limits for samples may be considerably higher depending on the sample matrix.

APPENDIX D

QUALITY ASSURANCE OFFICER (QAO)
SIGNATURE PAGE

QUALITY ASSURANCE OFFICER (QAO)
SIGNATURE PAGE

I, DANIEL J. SMITH hereby certify that I am an employee of Holzmacher, McLendon, Murrell, P.C. and that I have acted in conjunction with the project manager to develop this site specific Quality assurance/Quality control (QA/QC) plan. As an employee of Holzmacher, McLendon & Murrell, P.C. (H2M) and independent of H2M Labs, Inc.

I understand that I shall derive my responsibility and authority from a source other than the project manager and have the authority to override the project manager's decision in areas where QA/QC elements may be compromised.

I certify that my education and experience fulfill the minimum requirements of the New York State Department of Environmental Conservation as indicated on my resume (see Appendix D).

I have audited H2M Labs, Inc. and have determined that it is a NYSDOH-ELAP-CLP certified laboratory qualified to provide the analytical services as outlined in this RI/FS Work Plan.

I agree to assist the project manager in the development of the field sampling program (FSP) and analytical portion of the QA/QC Plan, interface with the data validator and develop a project specific data usability report.

Signature of QAO

DANIEL J. SMITH
Print Name

February 1, 1994
Date