SITE INVESTIGATION AND
REMEDIAL ALTERNATIVES ANALYSIS REPORT
WORK PLAN

McKINNEY BURT STREET SITE
SITE CODE E734086
CITY OF SYRACUSE
ONONDAGA COUNTY, NEW YORK

NYS Department of Environmental Conservation
RECEIVED
Environmental Remediation
Region 7 - Syracuse

Prepared For:

SYRACUSE HOUSING AUTHORITY
AND
NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

Prepared By:

DVIRKA AND BARTILUCCI CONSULTING ENGINEERS
EAST SYRACUSE, NEW YORK

JUNE 2007

SITE INVESTIGATION AND
REMEDIAL ALTERNATIVES ANALYSIS REPORT
McKINNEY BURT STREET SITE
CITY OF SYRACUSE, NEW YORK

TABLE OF CONTENTS

SITE INVESTIGATION AND
REMEDIAL ALTERNATIVES ANALYSIS REPORT
McKINNEY BURT STREET SITE
CITY OF SYRACUSE, NEW YORK

TABLE OF CONTENTS (continued)

SITE INVESTIGATION AND
REMEDIAL ALTERNATIVES ANALYSIS REPORT
McKINNEY BURT STREET SITE
CITY OF SYRACUSE, NEW YORK

TABLE OF CONTENTS (continued)

List of Figures

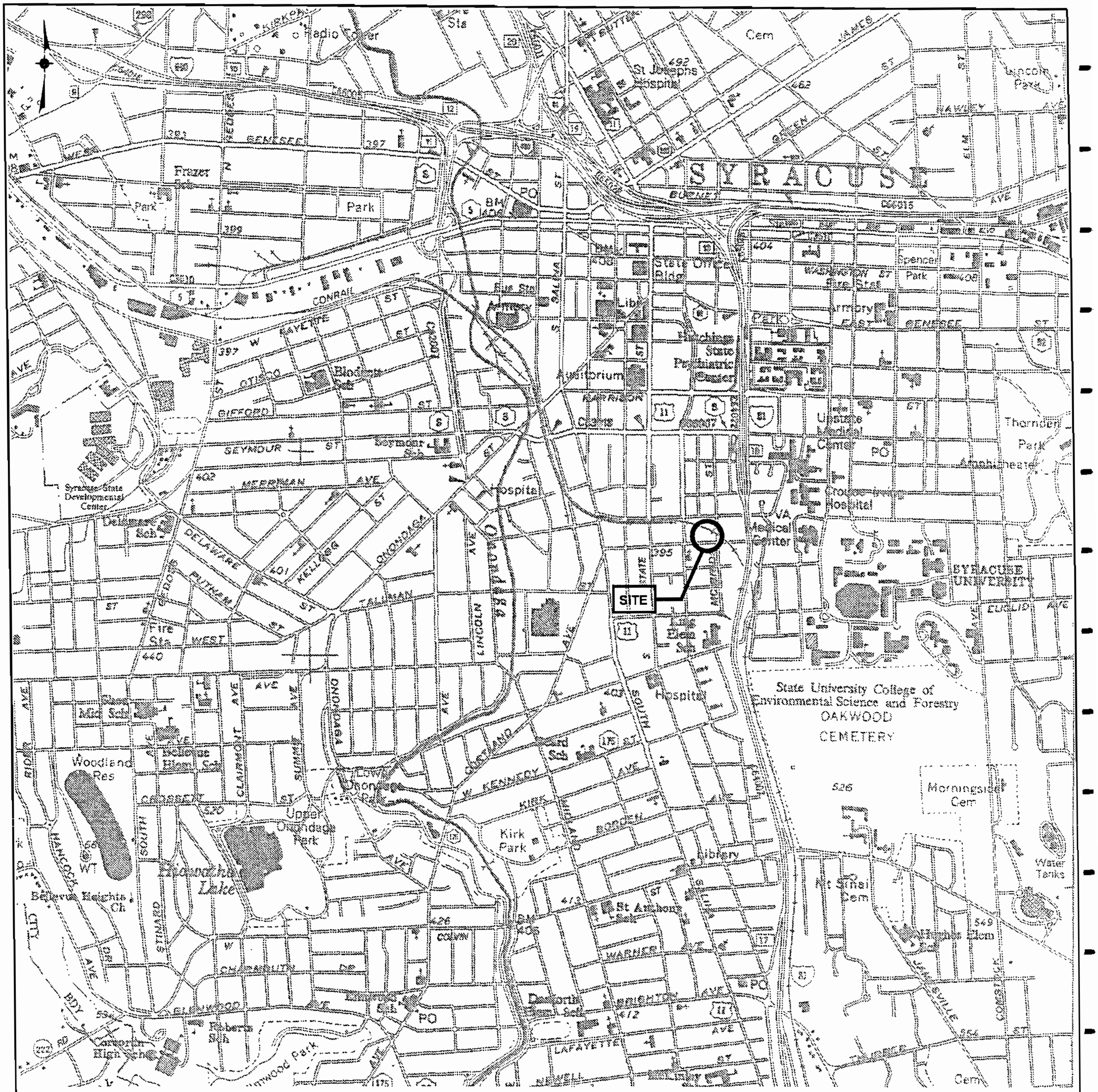
List of Tables

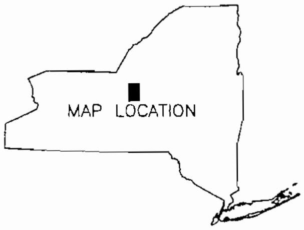
Section 1

1.0 INTRODUCTION

Dvirka and Bartilucci Consulting Engineers (D&B) has been contracted by the Syracuse Housing Authority (SHA) to conduct a Site Investigation/Remedial Alternatives Analysis Report (SI/RAAR) for the McKinney Burt Street Site located in the City of Syracuse, Onondaga County, New York (see Figure 1-1). The SI/RAAR for this Site is being performed with funding from the SHA and the New York State 1996 Clean Water/Clean Air Bond Act Environmental Restoration Program. The site code for the McKinney Burt Street Site is E734086.

The SI/RAAR Work Plan has been prepared in accordance with New York State Department of Environmental Conservation (NYSDEC) guidance, and presents components of the SI/RAAR and a description of the tasks to be performed. It describes specific methods and procedures that will be used to conduct the field investigations. In addition, this Work Plan includes administrative details regarding project staffing, proposed subcontractors, and schedule. Implementation of the Work Plan will result in site-specific data and interpretations that will define the nature and extent of contamination, the risks associated with the contamination, and identification and evaluation of alternatives for remediation of the Site.





SOURCE: USGS SYRACUSE WEST

McKINNEY BURT STREET SITE
SYRACUSE, NEW YORK

SITE LOCATION MAP

Dvirka and Bartilucci
Consulting Engineers

FIGURE 1-1

SEP 5, 2006 SEP C:\2576\2576-siteloc.dwg

Section 2

2.0 BACKGROUND INFORMATION

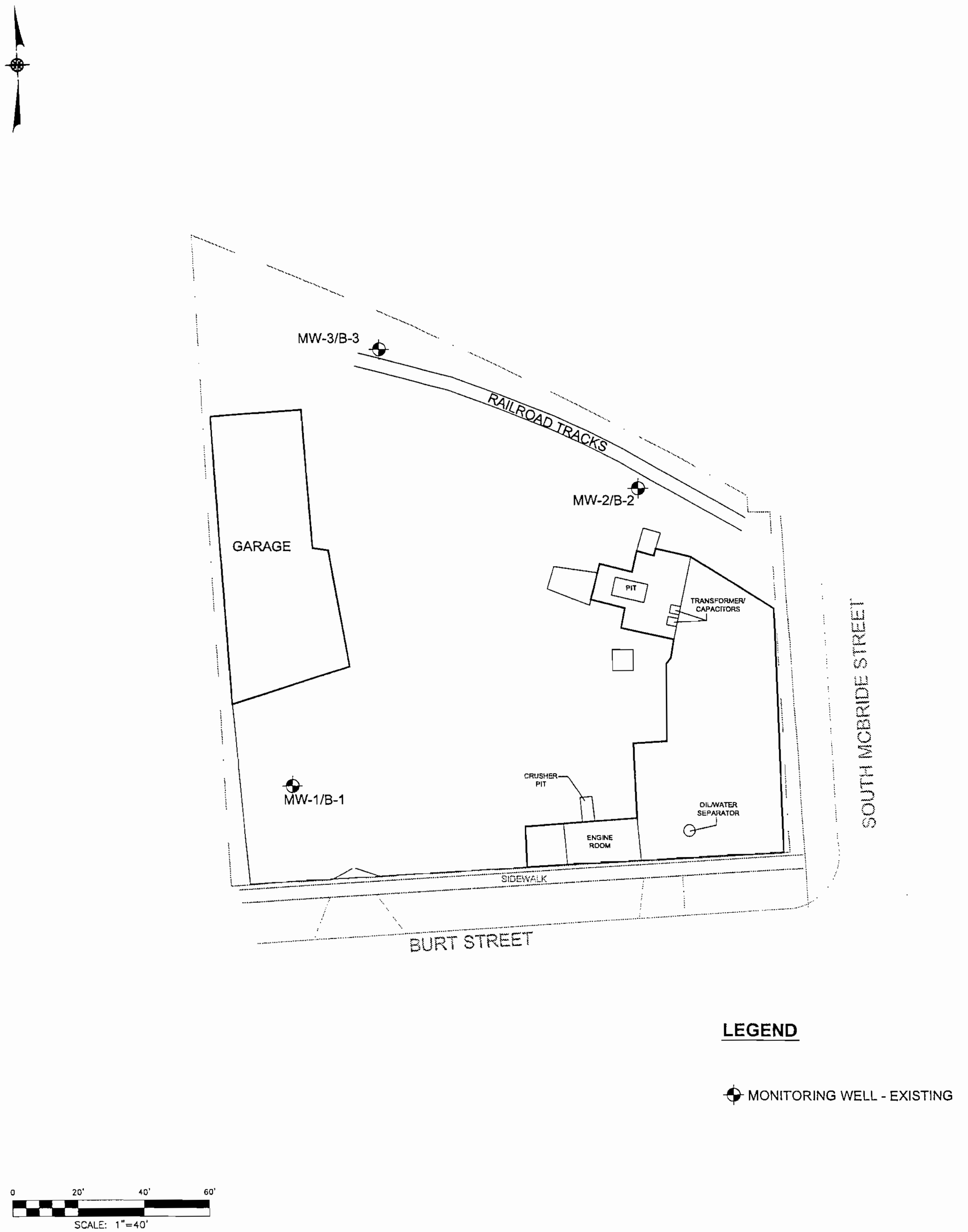
2.1 Site Description and History

The McKinney Burt Street Site is located in a mixed residential and commercial neighborhood in the City of Syracuse, Onondaga County, New York. The Site is a former scrap metal storage/processing facility and is located at 1226 South McBride Street on the northwest corner of the intersection of South McBride Street and Burt Street. The Site is approximately 0.6 acres in size and consists of one (1) tax parcel (tax map identification number 094.-09-04.0). The Site is bounded on the north by a concrete retaining wall for an elevated railroad right of way, on the south by Burt Street, on the east by South McBride Street, and on the west by a commercial property. The Site is occupied by a dilapidated one-story wood and steel garage and a one-story masonry block and steel building (main building), which was partially destroyed by a fire in May 2004. Site ground surface is relatively flat. A layout of the Site is presented in Figure 2-1.

Access to the Site is obtained from Burt Street via a stone driveway and from South McBride Street via a concrete driveway. The widows and doors of the Site buildings are either locked or covered by plywood. With the exception of the Site buildings, access to the Site is unrestricted.

The McKinney Burt Street Site was used as a scrap metal storage/processing facility. Site activities consisted of the operation of hydraulic machinery, an oil-water separator, and petroleum storage tanks. In addition, the property was used for storage of scrap automobiles, household appliances, and other metal debris. Currently, no scrap metal is stored on the property.

A crusher pit is located on the south side of the Site, adjacent to the main building. Reportedly, this pit is approximately eight (8) feet deep, filled with water and has a 6-inch thick layer of black liquid on the bottom. A motor that powered the crusher is located immediately south of the pit. An empty capacitor and reservoirs for lubricating oil are associated with the motor. A second pit, associated with a crane formerly housed in the main building, is located in



c:/2576/mckinney wp.dwg/sitelay

SITE LAYOUT
McKINNEY BURT STREET SITE
SYRACUSE, NEW YORK

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Casulich Associates, P.C.

FIGURE 2-1

the northeast portion of the Site. The pit reportedly contains a black, tar-like material. Two (2) capacitors are also associated with the crane. An oil-water separator is located in the main building.

2.2 Previous Investigations

In 1987, BLT Technical Services, Inc. collected twelve (12) surface soil samples from various locations throughout the property. All twelve (12) samples were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) organics ("F" listed wastes), Targeted Compound List (TCL) polychlorinated biphenyls (PCBs) and pesticides, and Extraction Procedure Toxicity metals. With the exception of beta-BHC, which was detected in one (1) sample, no pesticides were detected in the surface soil samples collected at the Site. However, low levels of organics, PCBs, and metals were detected in several samples collected from the Site.

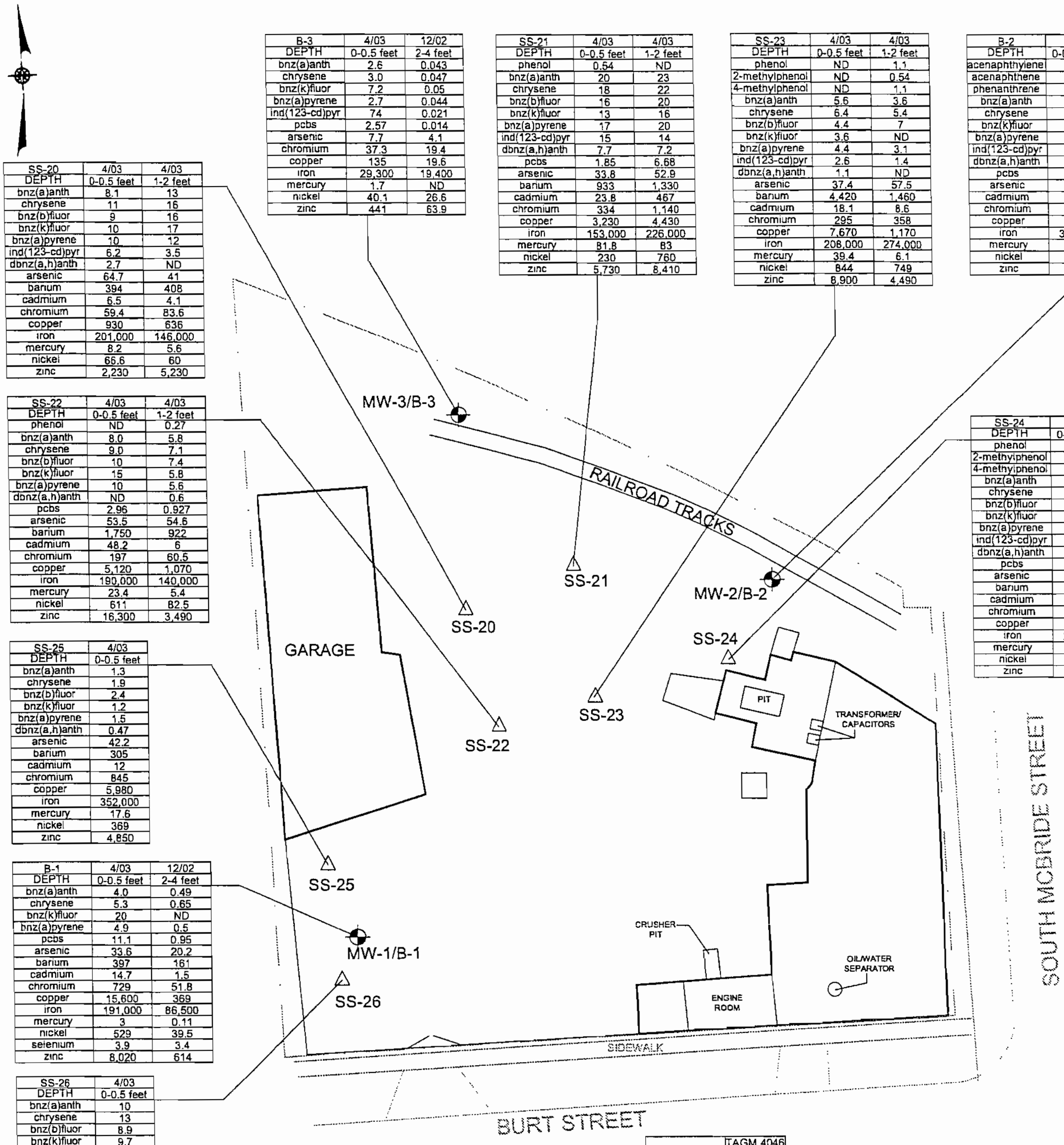
The Site's former use as a scrap metal storage/processing facility, as well as the presence of scrap automobiles, household appliances, and other refuse on the property, warranted the performance of additional investigation activities to further characterize potential environmental concerns. Subsequently, a site investigation was performed by S&W Redevelopment of North America, LLC (SWRNA) to characterize potential environmental concerns that may be present at the Site. The site investigation was conducted between December 2002 and May 2003 and included surface soil sampling, subsurface soil sampling, installation of monitoring wells, and groundwater sampling. A pre-demolition asbestos survey was also completed during the site investigation. Results of the site investigation are presented in SWRNA's report entitled *Site Investigation McKinney Parcel,* dated January 2004.

Fifteen (15) surface soil samples were collected as part of the SWRNA site investigation. The samples were analyzed for semi-volatile organic compounds (SVOCs), PCBs and metals. Three (3) subsurface soil samples were collected from three (3) soil borings installed at the Site. The samples were analyzed for volatile organic compounds (VOCs), SVOCs, PCBs and metals. Three (3) groundwater samples were collected from the Site and analyzed for VOCs, SVOCs, PCBS and metals. Three PCB wipes samples were collected from floor surfaces within the Site buildings. Figure 2-2 presents a summary of soil sample locations and soil sample data from the site investigation. Figure 2-3 presents a summary of groundwater sample locations and groundwater sample data from the site investigation.

Samples were also collected from residual materials (i.e., sediment, sludge, oil, etc.) located within various operational areas of the Site. Samples were obtained from materials contained in the crusher pit, the engine room, the crane building pit, the crane building capacitors, the basement of the main building and the oil-water separator.

Samples collected during the SWRNA site investigation confirmed the presence of SVOCs, PCBs and metals contamination in soil and groundwater at the Site. Samples collected from the engine room, crane building capacitors and oil-water separator exhibited elevated levels of total VOCs. The sample collected from the oil-water separator also contained elevated levels of total SVOCs, PCBs and metals. The sample collected from the crane building pit contained elevated levels of PCBs and metals.

The asbestos survey indicated the presence of asbestos containing material (ACM) associated with both the main building and garage. The asbestos survey estimated the presence of 3,405 square feet of ACM and 91 linear feet of ACM.



B-3	4/03	12/02
DEPTH	0-0.5 feet	2-4 feet
bnz(a)anth	2.6	0.043
chrysene	3.0	0.047
bnz(k)fluor	7.2	0.05
bnz(a)pyrene	2.7	0.044
ind(123-cd)pyr	74	0.021
pcbs	2.57	0.014
arsenic	7.7	4.1
chromium	37.3	19.4
copper	135	19.6
iron	29,300	19,400
mercury	1.7	ND
nickel	40.1	26.6
zinc	441	63.9

SS-21	4/03	4/03
DEPTH	0-0.5 feet	1-2 feet
phenol	0.54	ND
bnz(a)anth	20	23
chrysene	18	22
bnz(b)fluor	16	20
bnz(k)fluor	13	16
bnz(a)pyrene	17	20
ind(123-cd)pyr	15	14
dbnz(a,h)anth	7.7	7.2
pcbs	1.85	6.68
arsenic	33.8	52.9
barium	933	1,330
cadmium	23.8	467
chromium	334	1,140
copper	3,230	4,430
iron	153,000	226,000
mercury	81.8	83
nickel	230	760
zinc	5,730	8,410

SS-23	4/03	4/03
DEPTH	0-0.5 feet	1-2 feet
phenol	ND	1.1
2-methylphenol	ND	0.54
4-methylphenol	ND	1.1
bnz(a)anth	5.6	3.6
chrysene	6.4	5.4
bnz(b)fluor	4.4	7
bnz(k)fluor	3.6	ND
bnz(a)pyrene	4.4	3.1
ind(123-cd)pyr	2.6	1.4
dbnz(a,h)anth	1.1	ND
arsenic	37.4	57.5
barium	4,420	1,460
cadmium	18.1	8.6
chromium	295	358
copper	7,670	1,170
iron	208,000	274,000
mercury	39.4	6.1
nickel	844	749
zinc	8,900	4,490

B-2	4/03	12/02
DEPTH	0-0.5 feet	2-4 feet
acenaphthylene	72	0.42
acenaphthene	87	0.66
phenanthrene	59	4.1
bnz(a)anth	2.8	1.5
chrysene	2.8	2
bnz(k)fluor	4.8	4.6
bnz(a)pyrene	25	1.2
ind(123-cd)pyr	6.8	0.3
dbnz(a,h)anth	3.5	ND
pcbs	1.64	0.26
arsenic	40.8	18.2
cadmium	8.4	ND
chromium	2,470	1,160
copper	2,070	1,620
iron	338,000	127,000
mercury	5.2	0.23
nickel	498	195
zinc	450	173

SS-20	4/03	4/03
DEPTH	0-0.5 feet	1-2 feet
bnz(a)anth	8.1	13
chrysene	11	16
bnz(b)fluor	9	16
bnz(k)fluor	10	17
bnz(a)pyrene	10	12
ind(123-cd)pyr	6.2	3.5
dbnz(a,h)anth	2.7	ND
arsenic	64.7	41
barium	394	408
cadmium	6.5	4.1
chromium	59.4	83.6
copper	930	636
iron	201,000	146,000
mercury	8.2	5.6
nickel	66.6	60
zinc	2,230	5,230

SS-22	4/03	4/03
DEPTH	0-0.5 feet	1-2 feet
phenol	ND	0.27
bnz(a)anth	8.0	5.8
chrysene	9.0	7.1
bnz(b)fluor	10	7.4
bnz(k)fluor	15	5.8
bnz(a)pyrene	10	5.6
dbnz(a,h)anth	ND	0.6
pcbs	2.96	0.927
arsenic	53.5	54.6
barium	1,750	922
cadmium	48.2	6
chromium	197	60.5
copper	5,120	1,070
iron	190,000	140,000
mercury	23.4	5.4
nickel	611	82.5
zinc	16,300	3,490

SS-24	4/03	4/03
DEPTH	0-0.5 feet	1-2 feet
phenol	0.74	ND
2-methylphenol	0.5	ND
4-methylphenol	1.3	0.78
bnz(a)anth	7.6	41
chrysene	7.4	48
bnz(b)fluor	8.1	30
bnz(k)fluor	7.1	28
bnz(a)pyrene	8.1	26
ind(123-cd)pyr	3.2	23
dbnz(a,h)anth	1.2	11
pcbs	8.9	0.562
arsenic	53.2	71.4
barium	1,400	2,170
cadmium	39	24.2
chromium	344	109
copper	10,200	5,350
iron	274,000	233,000
mercury	79.5	25.6
nickel	312	145
zinc	12,200	11,800

SS-25	4/03
DEPTH	0-0.5 feet
bnz(a)anth	1.3
chrysene	1.9
bnz(b)fluor	2.4
bnz(k)fluor	1.2
bnz(a)pyrene	1.5
dbnz(a,h)anth	0.47
arsenic	42.2
barium	305
cadmium	12
chromium	845
copper	5,980
iron	352,000
mercury	17.6
nickel	369
zinc	4,850

B-1	4/03	12/02
DEPTH	0-0.5 feet	2-4 feet
bnz(a)anth	4.0	0.49
chrysene	5.3	0.65
bnz(k)fluor	20	ND
bnz(a)pyrene	4.9	0.5
pcbs	11.1	0.95
arsenic	33.6	20.2
barium	397	161
cadmium	14.7	1.5
chromium	729	51.8
copper	15,600	369
iron	191,000	86,500
mercury	3	0.11
nickel	529	39.5
selenium	3.9	3.4
zinc	8,020	614

SS-26	4/03
DEPTH	0-0.5 feet
bnz(a)anth	10
chrysene	13
bnz(b)fluor	8.9
bnz(k)fluor	9.7
bnz(a)pyrene	8.8
dbnz(a,h)anth	1.6
arsenic	7.7
cadmium	4.1
chromium	58.5
copper	4,970
iron	24,500
mercury	1.8
nickel	40.9
zinc	810

ANALYTE	TAGM 4046 STANDARD
phenol	0.03
2-methylphenol	0.1
4-methylphenol	0.9
acenaphthylene	41
acenaphthene	50
phenanthrene	50
bnz(a)anth	0.224
chrysene	0.4
bnz(b)fluor	1.1
bnz(k)fluor	1.1
bnz(a)pyrene	0.061
ind(123-cd)pyr	3.2
dbnz(a,h)anth	0.014
pcbs	1 / 10*
arsenic	7.5 / SB
barium	300 / SB
cadmium	1 / SB
chromium	10 / SB
copper	25 / SB
iron	2,000 / SB
mercury	0.1
nickel	13 / SB
selenium	2 / SB
zinc	20 / SB

results reported in milligrams per kilogram (mg/kg)
* PCBs - 1 mg/kg surface soil,
10 mg/kg subsurface soil
ND - not detected

LEGEND

△ SURFACE SOIL SAMPLE - PREVIOUS

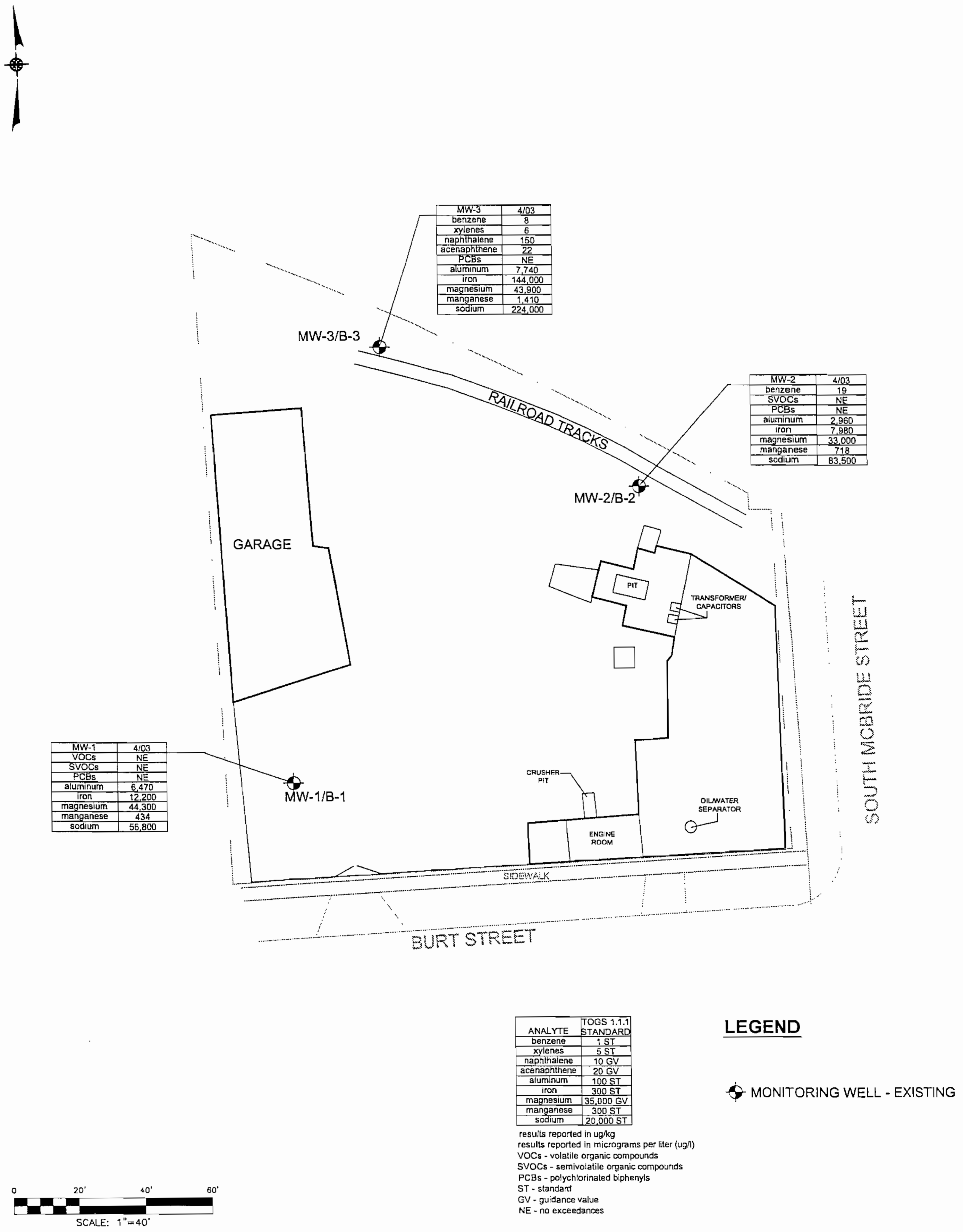
⊕ MONITORING WELL - EXISTING

c:/2576/mckinney wp.dwg/prevsoil

PREVIOUS SOIL SAMPLE EXCEEDANCES
McKINNEY BURT STREET SITE
SYRACUSE, NEW YORK

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 2-2



MW-3	4/03
benzene	8
xylenes	6
naphthalene	150
acenaphthene	22
PCBs	NE
aluminum	7,740
iron	144,000
magnesium	43,900
manganese	1,410
sodium	224,000

MW-2	4/03
benzene	19
SVOCs	NE
PCBs	NE
aluminum	2,960
iron	7,980
magnesium	33,000
manganese	718
sodium	83,500

MW-1	4/03
VOCs	NE
SVOCs	NE
PCBs	NE
aluminum	6,470
iron	12,200
magnesium	44,300
manganese	434
sodium	56,800

ANALYTE	TOGS 1.1.1 STANDARD
benzene	1 ST
xylenes	5 ST
naphthalene	10 GV
acenaphthene	20 GV
aluminum	100 ST
iron	300 ST
magnesium	35,000 GV
manganese	300 ST
sodium	20,000 ST

results reported in ug/kg
results reported in micrograms per liter (ug/l)
VOCs - volatile organic compounds
SVOCs - semivolatile organic compounds
PCBs - polychlorinated biphenyls
ST - standard
GV - guidance value
NE - no exceedances

LEGEND

⊕ MONITORING WELL - EXISTING

c:/2576/mckinney wp.dwg/prevgw

PREVIOUS GROUNDWATER SAMPLE EXCEEDANCES
McKINNEY BURT STREET SITE
SYRACUSE, NEW YORK

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 2-3

Section 3

3.0 SCOPE OF WORK

The purpose of the McKinney Burt Street SI/RAAR is to determine the nature and extent of contamination resulting form previous site activities, ascertain whether complete routes of exposure to site contaminants exists, and develop a remedial action that will be protective of human health and the environment. The scope of work will be sufficient for the SHA to plan redevelopment of the Site.

The approach to the investigation is to review existing data, fill data gaps, and interpret the old and new data on a site-wide basis. Using this information, a qualitative human health and environmental exposure assessment will be performed. Based on the findings of the investigation and exposure assessment, remedial measures will be evaluated in a remedial alternatives analysis and a remedy recommended.

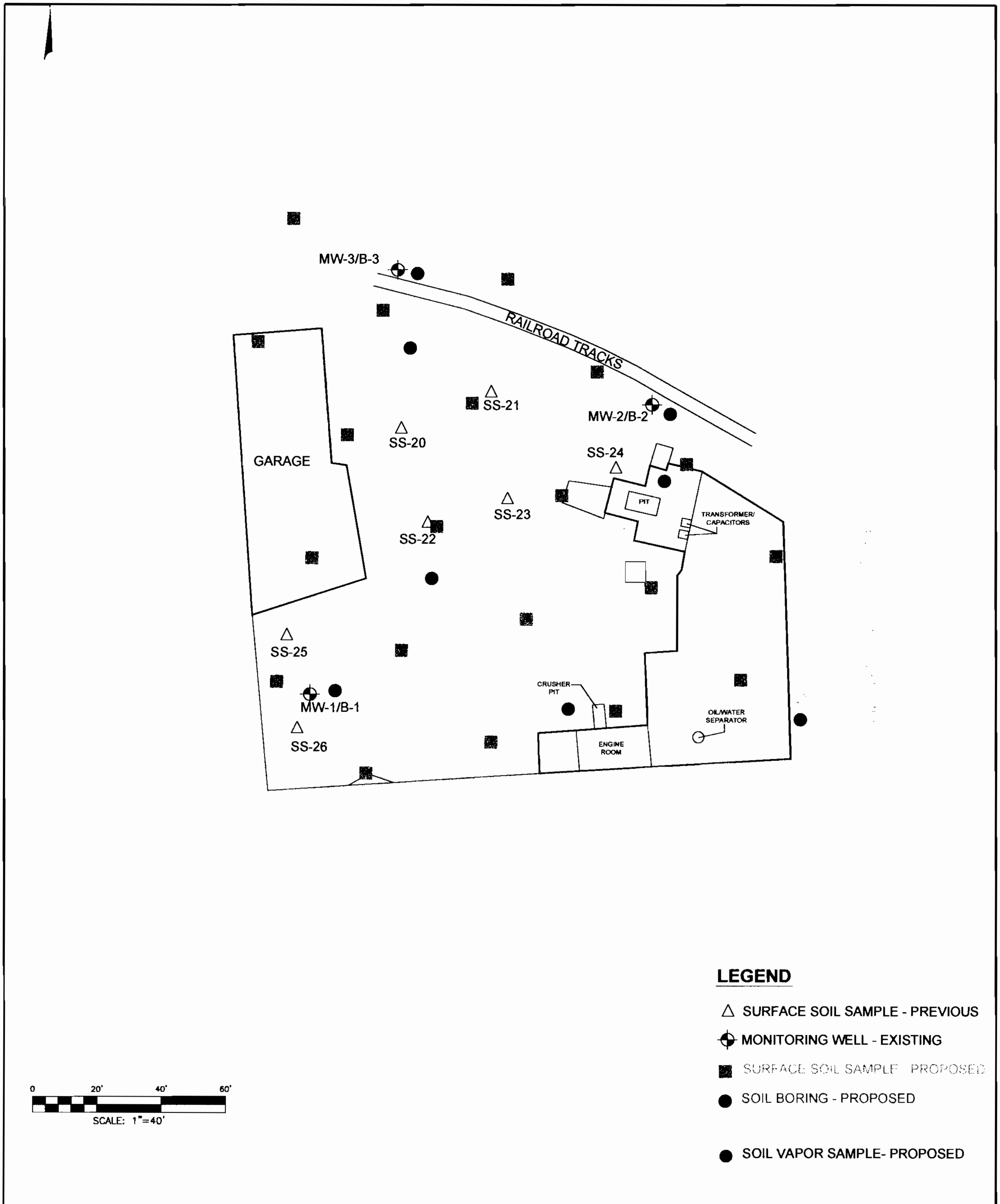
The services to be provided by D&B include preparation of a SI/RAAR Work Plan (Task 1), performance of a site investigation (Task 2), development of remedial alternatives (Task 3), and Remedial Alternatives Analysis Report (Task 4).

3.1 Task 1 - Work Plan Preparation

This task involves preparation of draft and final versions of this SI/RAAR Work Plan for SHA and NYSDEC review and comment. This task also includes participation in a preliminary scoping meeting at the Site with representatives of SHA and NYSDEC, review of site background information, and development of a scope of work for the site investigation.

3.2 Task 2 – Site Investigation

The site investigation field activities will consist of soil borings and monitoring well installations, water level monitoring, and groundwater and soil sampling and analysis. Figure 3-1 presents the study area and proposed sample locations. Table 3-1 summarizes samples to be collected and laboratory analyses. The following describes the site investigation in detail.



c:/2576/mckinney wp.dwg/proposed

PROPOSED SAMPLE LOCATIONS
McKINNEY BURT STREET SITE
SYRACUSE, NEW YORK

Dvirka and Bartilucci
Consulting Engineers
A Division of William F. Cosulich Associates, P.C.

FIGURE 3-1

Table 3-1

MCKINNEY BURT STREET SITE
SITE INVESTIGATION AND REMEDIAL ALTERNATIVES REPORT
WORK PLAN
SAMPLE MATRIX

Program Element	Medium	Sample Type/Depth	Number of Samples	Equipment	Laboratory Analyses
Soil Vapor Sampling	Soil Vapor	Grab sample from 10 feet bgs	4	Summa Canister or Mini-Canister	VOCs
Surface Soil Sampling	Soil	Grab sample from 0 to 2 inches bgs	25	Disposable polyethylene scoop	SVOCs, pesticides, PCBs, metals, and cyanide
Surface Soil Sampling	Soil	Grab sample from 0 to 2 inches bgs	1	Disposable polyethylene scoop	TCLP and RCRA Characteristics ****
Surface Soil Sampling	Soil	Grab sample from 6-12 inches bgs	20	Decontaminated bucket auger	SVOCs pesticides, PCBs, metals and cyanide
Surface Soil Sampling	Soil	Grab sample from 18 to 24 inches bgs	20	Decontaminated bucket auger	SVOCs, pesticides, PCBs, metals, and cyanide
Subsurface Soil Sampling	Soil	Grab samples from 2 to 4 feet bgs and the 2-foot interval above water table	16	Disposable polyethylene scoop and decontaminated split spoon.	VOCs, SVOCs, pesticides, PCBs, metals and cyanide
Subsurface Soil Sampling	Soil	Grab samples from 2 to 4 feet bgs or the 2-foot interval above water table	1	Disposable polyethylene scoop and decontaminated split spoon.	TCLP and RCRA Characteristics ****
Groundwater Sampling	Groundwater	At surface of water in well after purging well	7	Disposable polyethylene bailer	VOCs, SVOCs pesticides, PCBs, metals and cyanide

Table 3-1 (cont'd)

MCKINNEY BURT STREET SITE
SITE INVESTIGATION AND REMEDIAL ALTERNATIVES REPORT
WORK PLAN
SAMPLE MATRIX

Program Element	Medium	Sample Type/Depth	Number of Samples	Equipment	Laboratory Analyses
Quality Assurance/ Quality Control Samples					
Trip Blanks	Water	Trip blank	1**	Distilled water provided by laboratory	VOCs
Matrix Spike/ Matrix Spike Duplicates	Aqueous	Groundwater (split of sample).	1***	Disposable polyethylene bailer.	VOCs, SVOCs pesticides, PCBs, metals and cyanide
Matrix Spike/ Matrix Spike Duplicates	Soil	Soil (split of sample).	3***	Disposable polyethylene scoop.	VOCs, SVOCs, pesticides, PCBs, metals, and cyanide

*Samples to be archived for possible laboratory analysis pending results of shallow surface soil samples.
**One trip blank will accompany each shipment of aqueous samples requiring volatile organic compound analysis.
***One MS/MSD for each media for every 20 samples collected or one every week if fewer than 20 samples.
****RCRC Characteristics include ignitability, corrosivity, and reactivity.
Note: No field blanks will be collected as per New York State Department of Environmental Conservation guidance.

3.2.1 Base Map Development

A site map completed as part of previous investigations was provided to D&B by the SHA and will serve as the base map for the Site. Relevant features on the base map include structures, roads, previous soil sample locations and existing monitoring wells. The base map will be used to plot all soil borings, monitoring wells, sample locations and any other items of interest noted during the field activities.

Upon completion of fieldwork, a New York State-licensed surveyor will establish the locations and elevations of each of the new monitoring wells and other sampling points. Elevations of all well casings and the corresponding locations will be determined to within 0.01 feet based on the North America Vertical Datum (NAVD) 1988 and added to the base map.

3.2.2 Soil Vapor Sampling

In order to evaluate whether VOC contamination is migrating through the unsaturated zone, a soil vapor intrusion investigation will be conducted. As part of the investigation, a total of four soil vapor probes will be installed. Three of the probes (SV-1, SV-2, and SV-3) will be located adjacent to existing monitoring wells MW-1, MW-2 and MW-3, respectively. The fourth probe will be located in the southeast corner of the site adjacent to the proposed monitoring well (See Figure 3-1).

Each soil vapor probe will be installed to a depth of approximately 8 to 10 feet below ground surface (bgs) using the direct push method. Groundwater is anticipated to be less than 10 feet below ground surface. As such, the final depth of each soil vapor probe will be dependent on the actual depth to groundwater observed during drilling. The procedures employed for the collection of the soil vapor samples will follow the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006. The samples will be analyzed for VOCs using USEPA method TO-15.

3.2.3 Surface Soil Sampling

Results of previous investigations indicate that the presence of SVOCs, metals and PCBs in surface soil are a concern at the Site. Therefore, twenty on-site surface soil samples and five off-site background surface soil samples will be collected from 0 to 2 inches bgs for laboratory analysis. Twenty surface soil samples will also be collected from the on-site surface soil locations from a depth of 6 to 12 inches bgs for laboratory analysis. Additionally, twenty soil samples will be collected from 18 to 24 inches bgs and archived for possible laboratory analysis pending results of the analysis of the shallow surface soil samples.

A hexagonal grid network applicable to site characterizations, which was developed using USEPA's Field Manual for Grid Sampling of PCB Spill Sites to Verify Cleanup, will be established over the Site. The grid will consist of a serious of parallel north-south trending staked lines and a serious of east-west trending staked lines. One (1) sample will be collected from every node point of the grid network. All surface soil samples will be analyzed for TCL SVOCs, TCL pesticides/PCBs, Target Analyte List (TAL) metals and cyanide. Surface soil samples will be screened in the field for VOCs with a photoionization detector (PID).

One surface soil sample will be analyzed for TCLP parameters and RCRA Characteristics. This sample will be collected from the location of the most highly contaminated portion of surface soil as determined by field observations. Results of the analysis will be used to evaluate soil disposal options for site remediation.

3.2.4 Subsurface Soil Sampling

Sixteen (16) subsurface samples will be collected from eight (8) subsurface borings. Subsurface borings will be advanced utilizing hollow stem auger drilling techniques. Continuous split spoon samples will be collected from grade surface to 2 feet below the water table from each boring, screened with a PID and geologically logged, including indications of contamination such as odors or staining. Two (2) soil borings will be advanced adjacent to the pit located at the northern end of the main building. One (1) soil boring will be advanced adjacent to the crusher pit and one (1) soil boring will be advanced adjacent to the engine room. One (1) soil boring will be located near the intersection of Burt Street and South McBride Street, along the eastern Site boundary. Three (3) soil borings will be located in the central portion of the Site in the area of previous surface soil sample locations SS-20 through SS-23. Samples from 2 to 4 feet bgs and from the 2-foot interval immediately above the water table will be submitted for laboratory analysis of TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, TAL metals and cyanide.

One subsurface soil sample will be analyzed for TCLP and RCRA Characteristics. This sample will be collected from the depth and location of the most highly contaminated portion of the subsurface as determined by field observations. Results of the analysis will be used to evaluate soil disposal options for site remediation.

3.2.5 Monitoring Well Installation

Groundwater monitoring wells will be installed at four (4) of the subsurface soil boring locations described above to characterize groundwater flow and quality at the Site. The monitoring wells will be installed as permanent wells.

Monitoring wells will be installed by advancing soil borings using $4^1/_4$-inch inside diameter hollow stem augers to approximately 5 feet below groundwater. Groundwater is anticipated to be less than 10 feet below ground surface. During construction of each borehole, split spoon samples will be obtained continuously from the ground surface to the bottom of the borehole. Soil samples will be observed and logged for geologic characteristics, odors and staining, and screened with a PID.

Permanent monitoring wells will be constructed of 2-inch inside diameter, Schedule 40, 10 feet long slotted polyvinyl chloride (PVC) well screen and threaded, flush joint PVC casing. The well screens will be installed with approximately 5 feet of screen below the water table, based on observations during drilling, in order to maximize contact with the water table under varying seasonal groundwater elevations.

Upon completion, the monitoring wells will be developed by surging and pumping. The monitoring wells will be developed until a turbidity of 50 nephelometric turbidity units (NTUs) is achieved or until field parameters, such as pH, specific conductance, turbidity and temperature, have stabilized. Water removed from the wells during well development will be discharge to the ground surface in the area of the wells.

3.2.6 Investigation Derived Waste

Cuttings generated from the construction of the boreholes will be handled in accordance with NYSDEC Technical and Guidance Memorandum (TAGM) No. 4032 Disposal of Drill Cuttings, dated November 1989. In general, this guidance document allows for on-site disposal of cuttings as long as certain criteria as to location and cover of cuttings are met. Soil cuttings will be spread on the ground surface in the area the soil borings.

3.2.7 Groundwater Elevation Monitoring and Sampling

Water levels in the four (4) monitoring wells installed during this investigation and three (3) monitoring wells installed during previous investigations will be measured and recorded on a periodic basis and prior to groundwater sampling events. The measuring points will be surveyed for location and elevation. Water level measurements will be made relative to a fixed reference point using an electronic water level indicator to the nearest 0.01 feet. Groundwater level data will be used to determine groundwater elevations and to construct groundwater potentiometric surface maps and to determine local horizontal flow direction.

Groundwater elevations in five (5) monitoring wells, including the two (2) new and three (3) existing monitoring wells, will be measured manually on a periodic basis during site activities. In addition, a rain gauge will be installed on-site to monitor precipitation. Groundwater and precipitation measurements will be coordinated, when possible, with other field activities, such as groundwater sampling. Water table and potentiometric surface maps will be developed based on synoptic water level measurements. These maps will be used to interpret groundwater flow direction under static conditions and to determine responses, if present, due to seasonal or precipitation variations.

Groundwater samples will be collected from the four (4) newly installed monitoring wells and three (3) existing monitoring wells. Groundwater samples from each location will be analyzed for TCL VOCs, TCL SVOCs, TCL pesticides/PCBs, TAL metals and cyanide.

3.2.8 Data Usability Summary Report

D&B's Quality Assurance/Quality Control (QA/QC) Officer will perform a data usability analysis. A Data Usability Summary Report (DUSR) will be prepared, which will determine the adequacy of the data for environmental assessment and design purposes.

3.2.9 Site Investigation Report

The information and sample results obtained as part of the field program will be reviewed and evaluated to determine if sufficient data is available to characterize the property, including a determination of the nature, extent and source(s) of contamination. If necessary, data gaps will be identified and further investigation recommended.

Analytical results will be presented in a spreadsheet format for each matrix by sample number and compared to standards, criteria and guidelines (SCGs), which will be used as screening values to determine the significant of the analytical results and contamination found at the site. Samples exceeding the SCGs, either as a function of individual contaminant or as a group of contaminants, will be highlighted and identified as contaminants of concern (COCs) pending the results of the human health exposure assessment.

Screening levels for the surface and subsurface soil analytical results will be based on NYSDEC 6 NYCRR Part 375 regulations (December 2006). The screening levels for groundwater analytical results will be obtained from NYSDEC Technical and Operational Guidance Series (TOGS) 1.1.1, Ambient Water Quality Standards and Guidance Values, dated

June 1998. Analytical results for groundwater samples will be compared to Class GA groundwater standards and guidance values. Soil vapor data will be evaluated in accordance with the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006. As stated in the document, New York State does not currently have SCGs for concentrations of compounds in soil vapor. Rather, the data will be evaluated as a whole to identify trends and variations.

This information, together with the documentation of all field procedures undertaken, including sampling, testing, QA/QC, and health and safety, will be included in the draft Site Investigation Report. The report will present figures and maps illustrating the locations of all sampling points, including surface soil, subsurface soil and groundwater samples and other relevant information as required. If appropriate, cross sections will be prepared to describe the geologic and hydrogeologic characteristics of the Site, as well as pertinent analytical information.

Analytical results will be evaluated to delineate the "source" and residual areas of contamination at the property, and to identify routes of exposure, contaminant migration pathways and potential receptors. If applicable, the media and areas of the Site that require remediation will be identified. Also as part of the Site Investigation Report, preliminary identification of presumptive remedial technologies will be presented, together with a preliminary plan for remediation of the Site based on planned use of the Site for a surface parking lot.

A human health exposure assessment will be performed and included in the Site Investigation Report. The qualitative exposure assessment will address the potential exposure routes for identified contaminants and will identify potentially affected on-site and off-site receptors. The goals of the exposure assessment are to:

- Provide qualitative analysis of human health risks under current site conditions and potential future site use, including identification of contaminant migration pathways and potential receptors.

- Provide a basis for determining contamination that can remain on-site while providing adequate protection of human health.

The approach to be used to perform the risk assessment for the Site will be to identify contaminants and media of concern at the Site based on a comparison to SCGs selected for the Site. The routes of exposure to these contaminants and media will be defined, potential receptors identified and a determination will be made as to whether the pathways are complete or incomplete.

3.3 Task 3 - Development of Remedial Alternatives

Using the information contained in the Site Investigation Report, a determination will be made as to the need for a removal action and/or the need to designate operable units on the Site.

Potential remedial alternatives that are applicable for the Site will be identified. The approach to the development of alternatives for evaluation will be to select those remedial actions that will consider future land use and integrate remediation with planned site development to the greatest extent possible. The likely primary emphasis will be the remediation or removal of contaminated soil to prevent direct contact with humans and off-site migration. If groundwater remediation appears warranted at the Site, cost-effective alternatives will be developed and evaluated to provide efficient remediation that is consistent with development plans for the property and potential impacts on health and environment.

At a minimum, two (2) alternatives will be identified and include a "No Action" alternative and an alternative that eliminates all exceedances of SCGs. Each of these alternatives will be carried through initial screening and to the detailed analysis.

3.4 Task 4 - Remedial Alternatives Analysis Report

The detailed analysis of alternatives includes further refinement and/or modification of alternatives. The detailed analysis involves evaluation of seven (7) criteria in accordance with NYSDEC guidance, including 1) Overall protection of human health and the environment; 2)

Compliance with SCGs; 3) Long-term effectiveness and permanence; 4) Reduction of toxicity, mobility and volume; 5) Short-term effectiveness; 6) Implementability; and 7) Cost.

After the detailed analysis has been performed, the alternatives will be compared to examine the relationship between protectiveness and costs of remedial alternatives providing similar levels of protection. The alternatives will be ranked by effectiveness and cost.

After the detailed analysis has been performed, the top-ranking alternative will be recommended as the preferred alternative and presented in the RAAR for public comment.

Remedial alternatives will be presented and evaluated based on the results and recommendations of the Site Investigation Report. In addition, volumes associated with the source areas, which will require remediation will be calculated and mapped. The format of the RAAR will be consistent with guidance presented in NYSDEC Environmental Restoration Program Handbook (July 2004). The goal of the remediation plan is to develop practical and cost-effective measures to eliminate or minimize "sources" of contamination and threats to human health through site development.

Section 4

4.0 PROJECT MANAGEMENT

4.1 Project Organization and Staffing Plan

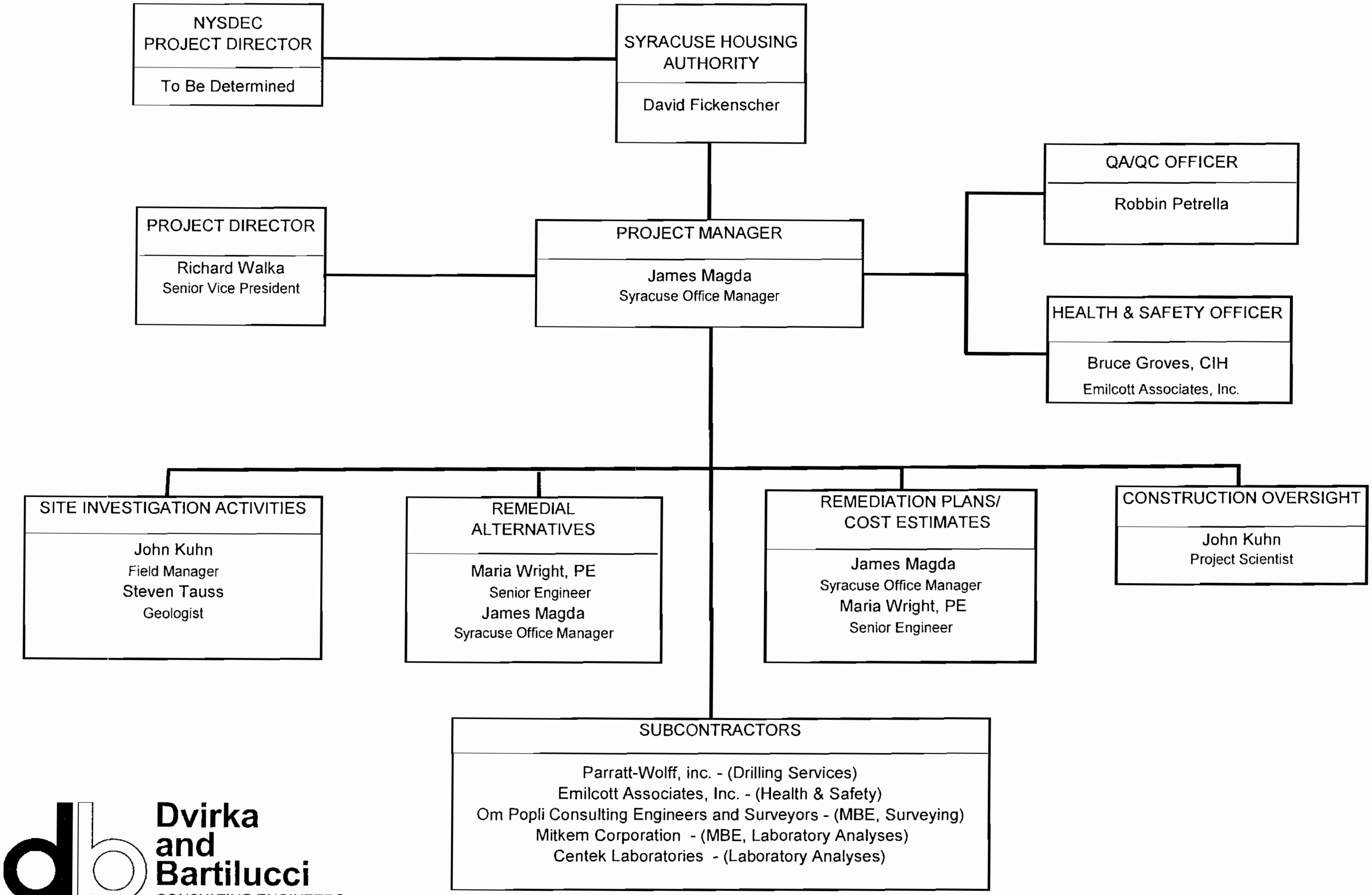
D&B will be responsible for managing and performing the SI/RAAR. D&B will be responsible for conducting the background information search, data review and site reconnaissance, preparation of the Work Plan, implementation of the Work Plan, preparation of the Site Investigation Report and RAAR, and providing support for presentations to the public.

Subcontractors that will provide services as part of the field investigation include Emilcott Associates for health and safety, Om Popli Consulting Engineers for surveying, Parratt-Wolff, Inc. for soil borings and monitoring well installations, and Mitkem Corporation and Centek Laboratories for sample analysis. Each of these subcontractors has extensive experience in hazardous waste investigations and has worked together successfully with D&B as a team on similar projects.

The project organization chart for this program is provided in Figure 4-1. Provided below are project responsibilities and the key staff members who will undertake these responsibilities. All of these personnel have substantial experience in the performance of site investigations, and remedial investigations and feasibility studies (RI/FSs), including projects at New York State Superfund and Brownfield sites. As a result of this experience, these project personnel are familiar with NYSDEC and United States Environmental Protection Agency (USEPA) investigative procedures and protocols, including preparation of work plans and reports.

The Project Director and Technical Advisor will be Richard Walka. Mr. Walka is the Principal-in-Charge of D&B's Division of Environmental Remediation and Multimedia. Environmental Compliance, which is responsible for conducting the firm's hazardous waste and Brownfield projects. Mr. Walka has over 30 years of technical and management experience in the field of environmental engineering, the last 17 of which have specialized in contaminated site investigation and remediation. He has been the Project Director or Manager for numerous hazardous waste projects conducted under CERCLA, SARA, RCRA and the New York State Superfund Program.

FIGURE 4-1
PROJECT ORGANIZATION CHART



Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Organization Chart

Mr. Walka has extensive experience working with NYSDEC, as well as with USEPA, and has directed/managed many projects at New York State Superfund and Brownfield sites.

The Project Manager will be James Magda. Mr Magda is Manager of D&B's East Syracuse Office. Mr. Magda has over seven years of experience in conducting and managing Brownfield investigations, environmental assessments, remedial investigations, feasibility studies and hydrogeologic investigations at sites throughout New York State. Mr. Magda has been responsible for managing or conducting assessments and investigations at numerous sites, including active and inactive industrial and commercial sites, petroleum storage and waste disposal facilities, and abandoned landfills. These sites include Phase I/II site assessments, municipal/New York State Brownfield sites and remedial design studies at New York State Superfund sites. Mr. Magda is experienced with many types of site investigation techniques, including various drilling techniques for groundwater and subsurface soil assessment.

The Field Manager will be John Kuhn, who is a Biologist. Mr. Kuhn has more than 21 years of professional experience in the environmental field including designing and implementing soil and groundwater sampling programs. Mr. Kuhn has served as project manager for numerous pre-design investigations at hazardous waste sites located in Central New York. Mr. Kuhn has also provided extensive construction inspection services for multi-phased soil and groundwater remediation programs at hazardous waste sites located in New York State.

The Field Geologist will be Steven Tauss, who is a Geologist. Mr Tauss has been a field geologist on a number of contaminated site investigations, including environmental site assessment (ESA) and RI/FS projects conducted at New York State Superfund sites, as well as SI/RI Studies and the Clean Water/Clean Air Bond Act. He has also been responsible for assistance with the preparation of ESA, RI/FS and SI/RA reports, in particular, the description of field activities and presentation of background information and data.

The Quality Assurance Officer will be Robbin Petrella, who is the corporate Quality Assurance Officer for D&B, and is responsible for the preparation and management of the firm's QA/QC program and procedures. She is also responsible for the preparation of site-specific Quality Assurance Project Plans and performance of field audits to ensure proper implementation of Sampling and Analysis Plans and QA/QC Plans, as well as preparation of data validation/usability reports, many of which have been prepared for New York State Superfund sites and approved by NYSDEC. Ms. Petrella has prepared numerous Quality Assurance Project Plans for Brownfield sites, including those funded by USEPA and NYSDEC.

The Health and Safety Officer will be Bruce Groves, who is a Certified Industrial Hygienist. Mr. Groves has more than 25 years of comprehensive industrial hygiene, safety, environmental, loss control consulting and training experience. Mr. Groves' project experience involves Health and Safety program development and implementation for manufacturing, utility, engineering and public sector clients. He has directed Health and Safety oversight projects for engineering firms, construction firms and government agencies.

The Design Engineer will be Maria Wright, who is a licensed Professional Engineer in the State of New York and has 16 years of experience in the field of hazardous waste investigation and remediation. Her experience comprises the positions of Project Engineer involved in field investigation activities, as well as preparation of work plans, remedial investigation reports, feasibility studies and remedial designs, and Project Manager involved in the management of hazardous waste/New York State Superfund site investigations, feasibility studies, treatability studies and development of remediation plans. Projects include the completion of 22 Phase II site assessments, and preparation of remedial investigations, feasibility studies and remedial designs for 15 New York State Superfund sites. Ms. Wright has prepared human health exposure assessments and developed remediation plans for a number of sites under the USEPA and NYSDEC Brownfield Programs.

4.2 Minority/Woman-Owned Business Utilization

D&B has undertaken many site investigation and remediation projects, as well as other projects, which have had goals for the use of Most of these projects, which have been under direct contract to New York State or through the EQBA Title 3 Program under contract to municipal clients, have had MBE and WBE goals of 15 percent and 5 percent, respectively, similar to the goals for this project under the Clean Water/Clean Air Title 5 Environmental

Restoration Projects/Brownfield Program. In many of these projects, we have attained or exceeded the combined M/WBE goal of 20 percent.

Minority and Women Business Enterprise (M/WBE) firms that will be utilized for this project include Mitkem Corporation (MBE) for laboratory services and Om Popli Surveyors, Inc. (MBE) for surveying. Both are New York State certified Minority Business Enterprises. Based on the scope of work described in Section 3.0, the MBE participation for this project will be approximately 48%.

4.3 Project Management Reporting

The level of effort for the scope of work described in Section 3.0 is presented by task in Table 4-1 and will be tracked according to the Project Schedule presented in Figure 4-2.

4.4 Office Location and Logistics

James Magda, manager of our East Syracuse Office, will manage this project. East Syracuse Office personnel will staff the site investigations. Emilcott Associates will provide site-specific Health and Safety plans. Support services, such as quality assurance/quality control, remedial engineering, drafting and word processing, will be provided, as needed, from our Woodbury, New York Corporate Office.

4.5 Project Meetings

As shown on the Project Schedule, one public meeting is scheduled. The meeting will occur after the Site Investigation Report has been finalized to present the findings to the affected and interested communities. It is assumed that one meeting will be held to present the results for the property.

TABLE 4-1
LEVEL OF EFFORT
McKINNEY BURT STREET SITE
SITE INVESTIGATION AND REMEDIAL ALTERNATIVES ANALYSIS REPORT
WORK PLAN

		Work Element I						**Work Element II**						
		Task I - Scoping		Task II - Site Characterization				Task III - Dev. Alternatives		Task IV - Detailed Analysis of Alternatives				
LABOR CLASSIFICATION	NSPE Level	Task IA Review of Background Information	Task IB Work Plan, QAPP, & HASP	Task IIA Data Collection	Task IIB Data Analysis	Task IIC Identify SCGs/SIR Preparation	Task IID Exposure Assessment	Task IIIA Recommend Immediate Action	Task IIIB Identify Remedial Alternatives	Task IVA Detailed Eval. of Remedial Alternatives	Task IVB Comparison of Remedial Alternatives	Task IVC Formulate Preferred Alternative	Task IVD Public Meeting	**TOTAL**
Project Director	IX	0	2	0	0	2	0	0	0	1	1	0	0	6
Project Manager	VI	0	8	4	0	16	2	4	0	2	2	0	2	40
QA/QC Officer	V	0	4	0	16	0	0	0	0	0	0	0	0	20
Senior Engineer	V	0	0	0	0	0	0	0	12	4	8	4	0	28
Geologist	V	4	40	52	8	40	8	8	4	16	24	8	12	224
Drafter	II	0	8	0	0	4	0	0	0	4	4	0	0	20
Scientist	II	0	0	38	8	0	0	0	0	0	0	0	0	46
Word Processor	II	0	4	0	1	2	2	0	2	2	2	0	0	15
LABOR TOTAL		4	66	94	33	64	12	12	18	29	41	12	14	399

NSPE = National Society of Professional Engineers

FIGURE 4-2
PROJECT SCHEDULE
MCKINNEY BURT STREET SITE

Item	Action	Start Date	Duration (weeks)	Completion Date
TASK 1 - SCOPING				
1	Notice to Proceed*		(time zero)	8/11/2006
2	Review of Background Information		1	8/18/2006
3	Draft Work Plan Preparation		3	9/8/2006
4	SHA and NYSDEC Review		32	4/20/2007
5	Final Work Plan Preparation		8	6/15/2007
6	Work Plan Approval*		2	6/29/2007
TASK 2 - SITE CHARACTERIZATION		6/29/2007		
7	Field Work		2	7/13/2007
8	Sample Analysis		4	8/10/2007
9	Data Review/DUSR Preparation		1	8/17/2007
10	Preliminary Data Submittal*		1	8/24/2007
11	Draft Site Investigation Report Preparation		2	8/31/2007
12	SHA and NYSDEC Review		4	9/28/2007
13	Final Site Investigation Report Preparation		1	10/5/2007
14	Final Site Investigation Report Approval*		1	10/12/2007
15	Public Meeting		1	10/19/2007
TASK 3 - DEVELOPMENT OF REMEDIAL ALTERNATIVES		10/19/2007		
16	Draft Remedial Alternatives Report Preparation		4	11/16/2007
17	SHA and NYSDEC Review		4	12/14/2007
18	Final Remedial Alternatives Report Preparation		2	12/28/2007
19	SHA and NYSDEC Review		1	1/4/2008
20	Final Remedial Alternatives Report Approval*		1	1/11/2008

* - Project Milestone

4.6 Project Schedule

The proposed schedule for this project is presented in Figure 4-2. As illustrated in the Project Schedule (Figure 4-2), key milestones and document deliverables are identified that will focus and monitor work progress. Fieldwork is anticipated to begin prior to July 2, 2007. Specific time frames and dates have been established throughout the project schedule, including review periods by SHA and NYSDEC, to ensure timely completion of the project.

Section 5

5.0 QUALITY ASSURANCE/QUALITY CONTROL PLAN

5.1 Project Identification

Project Name:	Syracuse Housing Authority – McKinney Burt Street Site
Project Requested By:	SHA and New York State Department of Environmental Conservation (NYSDEC)
Project Manager:	David Fickenscher (Syracuse Housing Authority) James Magda (D&B Consulting Engineers)
Quality Assurance Officer:	Robbin Petrella (D&B Consulting Engineers)
Field Operations Manager:	John Kuhn (D&B Consulting Engineers)

5.2 Objective and Scope

The objective of the investigation is to determine the nature and extent of possible contamination, ascertain whether complete routes of exposure to site contaminants exist and develop a remedial action that will be protective of human health and the environment. The scope of work will be sufficient for the SHA to plan redevelopment of the Site.

The purpose of this QA/QC Plan is to develop and describe the detailed sample collection and analytical procedures that will ensure high quality, valid data for use in the SI/RAAR.

5.3 Data Usage

The data generated from the field sampling program will be used to monitor for health and safety of workers at the Site and the health and safety of persons off-Site. As described above, it will also be utilized to evaluate on-Site and off-Site impacts due to potential surface soil, subsurface soil and groundwater contamination, prepare a qualitative exposure and environmental assessment and to select and prepare remedial alternatives for redevelopment of the Site.

5.4 Sampling Program Design and Rationale

The following presents a general discussion of the sampling to be conducted during the site investigation.

- Soil Vapor Sampling: Four soil vapor probes will be installed. Three of the probes (SV-1, SV-2, and SV-3) will be located adjacent to existing monitoring wells MW-1, MW-2 and MW-3, respectively. The fourth probe will be located in the southeast corner of the site adjacent to the proposed monitoring well (See Figure 3-1). Each soil vapor probe will be installed to an approximate depth of 10 feet bgs using the direct push method. Four soil vapor samples will be collected and analyzed for VOCs using USEPA method TO-15.

- Surface Soil: A hexagonal grid network will be established across the Site prior to conducting soil sampling activities. Twenty surface soil samples will be collected from a depth of 0 to 2 inches bgs for laboratory analysis. Twenty surface soil samples will also be collected from the on-site surface soil locations from a depth of 6 to 12 inches bgs for laboratory analysis. In addition, 20 surface soil samples will be collected from 18 to 24 inches bgs and archived for possible laboratory analysis pending the results of the shallow surface soil samples. Samples will be collected from pre-selected nodes on the grid network. Five (5) background surface soil samples will be collected for laboratory analysis from off-Site locations. The background surface soil samples will be collected from a depth of 0 to 2 inches bgs at locations selected by the on-Site geologist.

- Subsurface Soil: Sixteen (16) subsurface soil samples will be collected from eight (8) soil borings. Samples for laboratory analysis will be collected from a depth of 2 to 4 feet bgs and from the 2-foot interval immediately above the water table.

- Groundwater: Groundwater monitoring wells will be installed at four (4) of the subsurface soil boring locations. The wells will be constructed as permanent 2-inch diameter PVC wells. The wells will be constructed using 10-foot screens that straddle the water table. Seven (7) groundwater samples will be collected from the Site. One (1) sample will be collected from each of the four (4) new monitoring wells and each of the three (3) existing monitoring wells.

For a detailed discussion of the sampling program, and selection of sample matrices and locations, see the Section 3.0.

5.5 Analytical Parameters

Sample analysis for the surface soil, subsurface soil and groundwater samples collected will consist of all or part of the Targeted Compound List (TCL) +30 substances and Target Analyte List (TAL) parameters including cyanide identified in the NYSDEC Analytical Services Protocol (ASP) latest revision. Two (2) soil samples will also be analyzed for TCLP parameters and RCRA Characteristics.

Table 5-1 presents a summary of the parameters/sample fractions to be analyzed together with the sample location, type of sample, sample matrix, type of sample container, method of sample preservation, holding time and analytical method.

5.6 Data Quality Requirements and Assessment

Data quality requirements and assessments are provided in the NYSDEC ASP, which includes the detection limit for each parameter and sample matrix. Note that quantification limits, estimated accuracy, accuracy protocol, estimate precision and precision protocol are determined by the laboratory and will be in conformance with the requirements of the NYSDEC ASP and/or USEPA 5/99 SOW for organics and USEPA 1/00 SOW for inorganics, where applicable. Table 5-2 presents a summary of the data quality requirements.

In addition to meeting the requirements provided in the NYSDEC ASP, the data must also be useful in evaluating the nature and extent of contamination. Data obtained during the site investigation will be compared to SCGs. The SCGs to be utilized include:

Matrix	**SCG**
Soil Vapor	None
Surface and Subsurface Soil	NYSDEC 6 NYCRR Subpart 375-6.8 Remedial Soil Cleanup Objectives, dated December 2006.
Groundwater	Division of Water Technical and Operational Guidance Series (TOGs) (1.1.1) - Ambient Water Quality Standards and Guidance Values, dated June 1998.

Table 5-1

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Probe Locations	Grab	Soil Vapor	Volatile Organics	One 6-liter SUMMA Canister or one 1-liter mini-canister	None	7 days after VTSR	USEPA Method TO-15
Surface Soil	Grab	Surface Soil TCLP Extract	Volatile Organics	Glass, amber/ 2oz mL/1 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for TCLP extraction, 7 days from extraction for analysis	NYSDEC ASP, Method 1311 – extraction Method 8260B - Analysis
	Grab	Surface Soil TCLP Extract	Base Neutral and Acid Extractable Organics	Glass, amber/ 8 oz/2 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for TCLP extraction, 7 days from TCLP extraction to extraction	NYSDEC ASP, Method 1311 – extraction Method 8270 - Analysis
	Grab	Surface Soil TCLP Extract	Pesticides/PCBs	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for TCLP extraction, 7 days from TCLP extraction to extraction	NYSDEC ASP, Method 1311 – extraction Method 8080/8082 -Analysis

VTSR - Verified Time of Sample Receipt at the laboratory

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Surface Soil (cont'd)	Grab	Surface Soil TCLP Extract	Metals	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for TCLP extraction of Hg and 28 days for analysis, 6 months after VTSR for TCLP extraction and then 6 months after extraction for analysis	NYSDEC ASP, Method 1311 - extraction Method 6010 - Analysis
	Grab	Surface Soil	RCRA Characteristics	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	10 days after VTSR for analysis	NYSDEC ASP, Method 1030, 1110A, SW-846, Chapter 8
Soil Borings	Grab	Subsurface Soil	Volatile Organics	Glass, clear/ 2 oz/2 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	NYSDEC ASP, Method OLM 04.2
	Grab	Subsurface Soil	Base Neutral and Acid Extractable Organics	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	NYSDEC ASP, Method OLM 04.2

VTSR - Verified Time of Sample Receipt at the laboratory
*Holding times based on Appendix I NYSDEC ASP

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Soil Borings (cont'd)	Grab	Subsurface Soil	Pesticides/PCBs	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	NYSDEC ASP, Method OLM 04.2
	Grab	Subsurface Soil	Metals	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	26 days after VTSR for Hg analysis, 6 months after VTSR for analysis of others	NYSDEC ASP, Superfund CLP Inorganics
	Grab	Subsurface Soil	Cyanide	Glass, amber/ 2 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	12 days after VTSR for analysis	NYSDEC ASP, Method 335.2
	Grab	Subsurface Soil TCLP Extract	Volatile Organics	Glass, amber/ 2oz mL/1 ICHEM 200 series or equivalent	Cool to 4°C	7 days after VTSR for TCLP extraction, 7 days from extraction for analysis	NYSDEC ASP, Method 1311 – extraction Method 8260B - analysis
	Grab	Subsurface Soil TCLP Extract	Base Neutral and Acid Extractable Organics	Glass, amber/ 8 oz/2 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for TCLP extraction, 7 days from TCLP extraction to extraction	NYSDEC ASP, Method 1311 – extraction Method 8260C - analysis

VTSR - Verified Time of Sample Receipt at the laboratory
*Holding times based on Appendix I NYSDEC ASP

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Soil Borings (cont'd)	Grab	Subsurface Soil TCLP Extract	Pesticides/PCBs	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for TCLP extraction, 7 days from TCLP extraction to extraction	NYSDEC ASP, Method 1311 – extraction Method 8080/8082 - analysis
	Grab	Subsurface Soil	Metals	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	5 days after VTSR for TCLP extraction of Hg and 28 days for analysis, 6 months after VTSR for TCLP extraction and then 6 months after extraction for analysis	NYSDEC ASP, Method 1311 - extraction Method 6010 - analysis
	Grab	Surface Soil TCLP Extract	RCRA Characteristics	Glass, amber/ 8 oz/1 ICHEM 200 series or equivalent	Cool to 4°C	10 days after VTSR for analysis	NYSDEC ASP, Method 1030, 1110A, SW-846, Chapter 8
Monitoring Wells	Grab	Groundwater	Volatile Organics	Glass, clear/ 40 mL/3 ICHEM 300 series or equivalent	Cool to 4°C	7 days after VTSR for analysis	NYSDEC ASP, by Method OLM 04.2

VTSR - Verified Time of Sample Receipt at the laboratory
*Holding times based on Appendix I NYSDEC ASP

Table 5-1 (continued)

SUMMARY OF MONITORING PARAMETERS

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Monitoring Wells (cont'd)	Grab	Groundwater	Base Neutral and Acid Extractable Organics	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	NYSDEC ASP, Method OLM 04.2
	Grab	Groundwater	Pesticide/PCBs	Glass, amber/ 1L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days after VTSR for extraction, 40 days after extraction for analysis	NYSDEC ASP, Method OLM 04.2
	Grab	Groundwater	Metals	Plastic/1L/1 ICHEM 300 series or equivalent	HNO_3 to pH <2 Cool to 4°C	26 days for Hg analysis,6 months for analysis of others	NYSDEC ASP, Method ILM 04.0
	Grab	Groundwater	Cyanide	Plastic/1L/1 ICHEM 300 series or equivalent	NaOH to pH >2Cool to 4°C	12 days for analysis	NYSDEC ASP, Method 335.2

VTSR - Verified Time of Sample Receipt at the laboratory
*Holding times based on Appendix I NYSDEC ASP

Table 5-2

DATA QUALITY REQUIREMENTS

Parameter	Sample Matrix	CRDL*	Estimated Accuracy	Accuracy Protocol**	Estimated Precision	Precision Protocol**
Volatile Organics	Liquid	10	0.87 - 1.18 ug/l	Vol. IV, Part XIX, Method 8260B, Table 7	0.11 - 0.84 ug/l	Vol. IV, Part XIX, Method 8260B, Table 7
	Solid	10				
Base Neutrals	Liquid	10-50	0.29 - 1.23 ug/l	Vol. IV, Part XIX, Method 8270C Table 7	0.13 - 1.05 ug/l	Vol. IV, Part XIX, Method 8270C, Table 7
	Solid	330-1600				
Acid Extractables	Liquid	10-50	0.29 - 1.23 ug/l	Vol. IV, Part XIX, Method 8270C, Table 7	0.13 - 1.055 ug/l	Vol. IV, Part XIX, Method 8270C, Table 7
	Solid	330-1600				
Pesticides/PCBs	Liquid	0.5-1.0	0.66 - 0.97 ug/l	Vol. IV, Part XIX, Method 8081, Table 12	0.15 - 0.47 ug/l	Vol. IV, Part XIX, Method 8081, Table 12
	Solid	8.0-160				
Metals	Liquid	0.2-5000	--	Vol. III, Part XIV, Method 200.7*** Table 4	--	Vol. III, Part XIV, Method 200.7*** Table 4
	Solid	0.2-5000				
Cyanide	Liquid	10	85% - 102% of recovery	Vol. III, Part XV, Method 335.2, Subpart 10	±0.005 - +0.094 mg/l	Vol. III, Part XV, Method 335.2, Subpart 10
	Solid	10				

*Contract Required Detection Limits - units are ug/l for liquid samples, ug/kg for solid samples.
** Reference: NYSDEC 6/00 ASP.
***If trace ICP is not used, then SW-846 Methods for:

Metal	Method
Selenium	7740
Lead	7421
Thallium	7841
Mercury	7470
Arsenic	7060

Table 5-2 (continued)

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION, ACCURACY, AND COMPLETENESS

Matrix/Parameter	Precision (%)	Accuracy (%)
Soil/Sediment		
VOCs[(a)]	See Table 5-2a	See Table 5-2a
Extractables[(a)]	See Table 5-2b	See Table 5-2b
Pesticides/PCBs	See Table 5-2c	See Table 5-2c
Metals[(b)(c)]	± 25	75-125
Water		
VOCs[(a)]	See Table 5-2a	See Table 5-2a
Extractables[(a)]	See Table 5-2b	See Table 5-2b
Pesticides/PCBs	See Table 5-2c	See Table 5-2c
Metals[(b)(c)]	± 25%	75-125

NOTES:

(a) Accuracy will be determined as percent recovery of surrogate spike compounds and matrix spike compounds. Surrogate and matrix spike compounds for VOCs, extractables, and pesticides/PCBs are listed in Table 5-2a, 5-2b and 5-2c, respectively. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

(b) Accuracy will be determined as percent recovery of matrix spikes when appropriate or the percent recovery of a QC sample if spiking is inappropriate. Precision will be determined as relative percent difference of matrix spike duplicate samples, or duplicate samples if spiking is inappropriate.

(c) Precision will be determined as the average percent difference for replicate samples. Accuracy will be determined as the percent recovery of matrix spike samples or laboratory control samples, as appropriate.

Source: NYSDEC 6/00 ASP

Table 5-2a

DATA QUALITY REQUIREMENTS
ACCURACY REQUIREMENTS FOR VOCs

	Spike Recovery Limits (%)	
	Water	Low/Medium Soil
Surrogate Compound		
Toluene-d8	88-110	84-138
4-Bromofluorobenzene	86-115	59-113
1,2-Dichloroethane-d4	76-114	70-121
Matrix Spike Compound		
1,1-Dichloroethene	61-145	59-172
Trichloroethane	71-120	62-137
Chlorobenzene	75-130	60-133
Toluene	76-125	59-139
Benzene	76-127	66-142

Source: NYSDEC 6/00ASP

Table 5-2b

DATA QUALITY REQUIREMENTS OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

Surrogate Compounds	Matrix	Precision	Accuracy %
d5-Nitrobenzene	Water	≤ 20	35-114
	Solid	≤ 25	23-120
2-Fluorobiphenyl	Water	≤ 20	43-116
	Solid	≤ 25	30-115
d14-Terphenyl	Water	≤ 20	33-141
	Solid	≤ 25	18-137
d5-Phenol	Water	≤ 20	10-110
	Solid	≤ 25	24-113
2-Fluorophenol	Water	≤ 20	21-110
	Solid	≤ 25	25-121
2,4,6-Tribromophenol	Water	≤ 20	10-123
	Solid	≤ 25	19-122
2-Chlorophenol-d4 (Advisory)	Water	≤ 20	33-110
	Solid	≤ 25	20-130
1,2-Dichlorobenzene-d4 (Advisory)	Water	≤ 20	16-110
	Solid	≤ 25	20-130

Table 5-2b (continued)

DATA QUALITY REQUIREMENTS OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

	Matrix	Precision	Accuracy %
Matrix Spike Compounds			
1,2,4-Trichlorobenzene	Water	≤ 20	39-98
	Solid	≤ 25	38-107
Acenaphthene	Water	≤ 20	46-118
	Solid	≤ 25	31-137
2,4-Dinitrotoluene	Water	≤ 20	24-96
	Solid	≤ 25	28-89
Pyrene	Water	≤ 20	26-127
	Solid	≤ 25	35-142
N-Nitroso-Di-n-Propylamine	Water	≤ 20	41-116
	Solid	≤ 25	41-126
1,4-Dichlorobenzene	Water	≤ 20	36-97
	Solid	≤ 25	28-104
Pentachlorophenol	Water	≤ 20	9-103
	Solid	≤ 25	17-109
Phenol	Water	≤ 20	12-110
	Solid	≤ 25	26-90
2-Chlorophenol	Water	≤ 20	27-123
	Solid	≤ 25	25-102

Table 5-2b (continued)

DATA QUALITY REQUIREMENTS
OBJECTIVES FOR PRECISION AND ACCURACY OF EXTRACTABLE COMPOUNDS BASED UPON RECOVERY OF SURROGATE AND MATRIX SPIKE COMPOUNDS*

	Matrix	Precision	Accuracy %
Matrix Spike Compounds (continued)			
4-Chloro-3-methylphenol	Water	≤ 20	23-97
	Solid	≤ 25	26-103
4-Nitrophenol	Water	≤ 20	10-80
	Solid	≤ 25	11-114

* Accuracy will be determined as percent recovery of these compounds. Precision will be estimated as the relative standard deviation of the percent recoveries per matrix.

Source:NYSDEC 6/00 ASP

Table 5-2c

ADVISORY RECOVERY LIMITS
SURROGATE AND MATRIX SPIKE COMPOUNDS
FOR PESTICIDES/PCBs*

	Advisory Recovery Limits (%)	
	Water	Soil/Sediment
Surrogate Compound		
Decachlorobiphenyl	60-150	60-150
Tetrachloro-m-xylene	60-150	60-150
Matrix Spike Compound		
Lindane	56-123	46-127
Heptachlor	40-131	35-130
Aldrin	40-120	34-132
Dieldrin	52-126	31-134
Endrin	56-121	42-139
4,4'-DDT	38-127	23-134

*Samples do not have to be reanalyzed if these recovery limits are not met.

Source: NYSDEC 6/00 ASP

The methods of analysis will be in accordance with the NYSDEC ASP. Specific analytical procedures and laboratory QA/QC descriptions are not included in this QA/QC plan, but will be available upon request from the laboratory selected to perform the analyses.

The laboratory will be New York State Department of Health (NYSDOH) Environmental Laboratory Approved Program (ELAP) certified for organic and inorganic analyses, and also NYSDOH Contract Laboratory Protocol (CLP) certified.

5.6.1 Data Representativeness

Representative samples will be collected as follows:

- Soil Vapor - Samples will be obtained from soil vapor probes using six liter Summa Canisters or Mini-Canisters connected to Teflon-lined polyethylene tubing.
- Surface Soil - Samples will be collected from surface soil locations using a sterile polystyrene scoop and/or wooden tongue depressor.
- Subsurface Soil - Samples will be obtained using a decontaminated split spoon during soil boring construction and transferred into the container with a sterile polystyrene scoop and/or wooden tongue depressor.
- Groundwater - Samples will be obtained after the wells have been purged of three to five volumes or field measurements (pH, conductivity, temperature and turbidity) have stabilized, or until the well is purged dry (whichever occurs first) and allowed to recharge. Samples will be collected with new disposable polyethylene bailers.
- Equipment Calibration - Field equipment will be calibrated daily before use according to the manufacturer's procedures.
- Equipment Decontamination - Non-sterile sampling equipment will be decontaminated prior to use at each location according to the NYSDEC approved procedures described on Section 5.8 of this QA/QC Plan.

5.6.2 Data Comparability

All data will be presented in the units designated by the methods specified by a NYSDOH ELAP and CLP certified laboratory, and the NYSDEC ASP. In addition, sample locations, collection procedures and analytical methods from earlier studies will be evaluated for comparability with current procedures/methods.

5.6.3 Data Completeness

The acceptability of 100% of the data is desired as a goal for this project. The acceptability of less than 100% complete data, meeting all laboratory QA/QC protocols/standards, will be evaluated on a case-by-case basis.

5.7 Detailed Sampling Procedures

Three types of environmental samples will be collected from different locations as part of the investigation for the Site. These include soil vapor, soil, and groundwater. Sample locations will consist of surface areas, soil borings, and groundwater monitoring wells. Actual locations are described in Section 3.0. Sampling procedures and equipment are described in this section. A summary of the sampling program, including sample media, locations, depths, equipment, rationale and analytical parameters is provided in Table 3-1. Sample collection will be performed in conformance with Dvirka and Bartilucci Consulting Engineer's Quality Assurance Procedures and Field Investigations Manual for Hazardous Waste Sites, which has been prepared in accordance with USEPA and NYSDEC requirements and guidelines.

When collecting soil samples, an attempt will be made to maintain sample integrity by preserving its physical form and chemical composition to as great an extent as possible. First, the mechanism used to collect the soil must be properly decontaminated. An appropriate sampling device (i.e., disposable scoop or sterile wooden tongue depressor) will be utilized to transfer the sample into the sample container. The sample should reflect and contain a good representation of the matrix it was taken from.

The sample will be transferred into the sample container as quickly as possible, with no mixing, to ensure that the volatile fraction is not lost.

The materials involved in groundwater sampling are critical to the collection of high quality monitoring information, particularly where the analyses of volatile, pH sensitive or reduced chemical constituents are of interest. Sterile disposable polyethylene bailers will be utilized for this project.

There will be several steps taken after the transfer of the soil or water sample into the sample container that are necessary to properly complete collection activities. Once the sample is transferred into the appropriate container, the container will be capped and, if necessary, the outside of the container will be wiped with a clean paper towel to remove excess sampling material. The container will not be submerged in water in an effort to clean it. Rather, if necessary, a clean paper towel moistened with distilled/deionized water will be used.

The sample container will then be properly labeled. Information such as sample number, location, collection time and sample description will be recorded in the field log book. Associated forms (e.g., Chain of Custody forms) will then be completed and will stay with the sample. The samples will be packaged in a manner that will allow the appropriate storage temperature (4□C) to be maintained during shipment to the laboratory. Samples will be delivered to the laboratory within 48 hours of collection.

5.7.1 Sample Identification

Each sample container will have a label of durable material affixed to it, which specifies the following sample information:

- Sample location;
- Sample type;
- Sample identification number (including well designation);
- Name(s) of sampler(s);
- Date and time of sample collection;

- Container number for that sample, if more than one container is used (e.g., No. 1 of 4); and
- Laboratory analyte.

All samples collected during the site investigation at the McKinney Burt Street Site will be labeled with a sample identification code. The code will identify the sample type, sample location and QA/QC requirements. Samples will be labeled according to the following system:

Sample Type:

- Soil Vapor “SV”
- Surface Soil “SS”
- Soil Boring “SB”

Monitoring Well “MW”

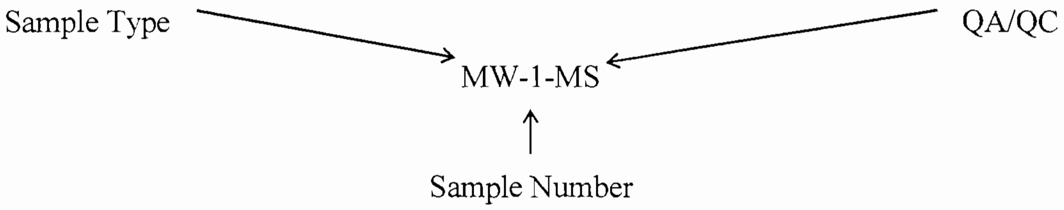
Sample Location and Number:

More than one sample of the same type will be collected from the Site, therefore, the number corresponding to the sample location will be assigned to the appropriate sample location in the field.

Quality Assurance/Quality Control (QA/QC):

- Trip Blank “TB”
- Matrix Spike “MS”
- Matrix spike duplicate “MSD”

Based upon the above sample identification procedures, an example of a sample label may be:



5.7.2 Sample Handling, Packaging and Shipping

All analytical samples will be placed in the appropriate sample containers as specified in the NYSDEC ASP and/or USEPA 5/99 and 1/00 SOWs. The holding time criteria identified in the ASP and SOWS will be followed, as specified in Table 5-1.

Prior to packaging any samples for shipment, the sample containers will be checked for proper identification and compared to the field log book for accuracy. The samples will then be wrapped with a cushioning material and placed in a cooler (or laboratory shuttle) with a sufficient amount of bagged ice or "blue ice" packs in order to keep the samples at 4□C until arrival at the laboratory.

All necessary documentation required to accompany the sample during shipment will be placed in a sealed plastic bag and taped to the underside of the cooler lid. The cooler will then be sealed with fiber (duct) tape, and custody seals will be placed in such a manner that any opening of the cooler prior to arrival at the laboratory can be detected.

All samples will be shipped to ensure laboratory receipt within 48 hours of sample collection in accordance with NYSDEC and USEPA requirements. The laboratory will be notified prior to the shipment of the samples.

5.7.3 Soil Vapor

- Be certain that the sample location is noted in the field logbook.
- Apply a ring of hydrated bentonite, approximately two feet in diameter, to the ground surface around the soil vapor probe. Place a plastic sheet over the probe and bentonite ring. Seal the edges of the plastic sheet to the ground surface using the bentonite. Penetrate the plastic sheet with the probe tubing.
- Prepare an enclosure (e.g., a five-gallon plastic bucket) by drilling two $^1/_4$-inch diameter holes in the bucket. Drill one hole in the top of the bucket and one hole in the side of the bucket.

- Place the enclosure over the probe and route the sample tubing through the top of the enclosure. Seal the enclosure to the plastic sheet using hydrated bentonite. Seal the hole around the sampling tubing with bentonite.

- Connect a helium cylinder to the port in the side of the enclosure. Fill the enclosure with helium, avoiding buildup of excess pressure. Check enclosure with a helium detector to ensure helium reading is 100%.

- Connect the tubing from the probe to an air sampling pump and extract vapor at a rate of 0.2 liters per minute or less for a purging period of five minutes. Collect extracted air in a one-liter Tedlar bag. Screen contents of the bag with a helium detector. If the helium readings are less than 20 percent, sampling may proceed. If the readings are greater than 20 percent, reseal the probe and repeat the test until a satisfactory result is obtained or a defective probe is replaced.

- Record canister serial number on the chain of custody. Assign sample identification on canister tag and record on COC. Install a vacuum gauge on canister valve fitting. Open and close canister valve. Record gauge vacuum. Gauge vacuum must read greater than 25 in. Hg.

- Connection the laboratory cleaned sampling canister and regulator to the sample tubing with swage lock or clamped fittings and open valve.

- Keep the sample canister and regulator out of direct sunlight to prevent heating of the flow controller during samples.

- The samples will be collected over a one-hour period at a flow rate of less than 0.2 liters per minute.

- After sampling, close the valve and install a vacuum gauge on canister valve fitting. Open and close canister valve. Record gauge vacuum. A slight vacuum will be left in the canister at the end of sampling and recorded so that it may be documented that the canister did not leak during transit.

5.7.4 Soil (Surface)

- Be certain that the sample location is noted on Location Sketch (see Section 5.10.1).

- Be certain that the sampling equipment is decontaminated utilizing the procedures outlined in Section 5.8.

- Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 5.10.2 and 5.10.3).

- At the desired location, clear surface debris (e.g., grass, rocks, twigs). Collect an adequate portion of soil from a depth of 0-2 inches using a decontaminated/sterile scoop and/or sterile wooden tongue depressor. Transfer the sample directly into the sample container. Collect an adequate portion of soil from a depth of 6-12 inches using a decontaminated/sterile scoop. Transfer the sample directly into the sample container. Collect an adequate portion of soil from a depth of 18-24 inches bgs using a decontaminated bucket auger or split spoon sampler. Transfer the sample directly into the sample container.
- Return the sample containers to the cooler.
- If reusable, decontaminate the sampling equipment according to the procedures described in Section 5.8.

5.7.5 Soil (Subsurface)

- Be certain that the sample location is noted on Location Sketch (see Section 5.10).
- Remove laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 5.10).
- Drive the split spoon sampler to the desired sampling depth.
- Retrieve the split spoon sampler and immediately after opening it, obtain an organic vapor measurement with a FID or PID.
- Remove a sample aliquot from the split spoon using the sterile scoop and/or tongue depressor, place into the open sample container and replace the container cover.
- Return the sample container to the cooler.
- If reusable, decontaminate the sampling equipment according to the procedures described in Section 5.8.

5.7.6 Groundwater (Monitoring Well)

- Be certain that the sample location is noted in the field logbook.
- Measure the depth of water and total depth using a decontaminated water level indicator and compute the volume of standing water in the well.

- Remove three to five times the volume of standing water from the well. Collect field measurements including pH, conductivity, temperature, dissolved oxygen and turbidity from the well. Turbidity must be less than 50 NTUs prior to collection of a sample for metals analysis. Greater than 50 NTUs may require waiting a maximum of 24 hours for the turbidity to decrease.

- Remove the laboratory precleaned sample containers from sample cooler, label container with an indelible marker, fill out Sample Information Record and Chain of Custody Form (see Section 6.10).

- Obtain a sample by using the disposable polyethylene bailer. The order in which the samples are to be collected is: VOC, SVOC, Pesticide/PCB, metals and cyanide.

- If the turbidity exceeds 50 NTUs, then the well should be sampled for all constituents except metals. The well can rest for a maximum of 24 hours until a turbidity reading is less than 50 NTUs, once less than 50 NTUs, the metals sample can be collected.

- If it is determined in consultation with the NYSDEC that filtering of the sample is necessary (i.e. through direction from NYSDEC), first collect an unfiltered sample in a sample container, replace the cover on the sample container and label the sample. Next, pour an appropriate amount of the remaining sample from the bailer into a second sample container through a filter medium (0.45 microns) to remove particulates from suspension. Replace the cover on the sample container and label the sample. The turbidity of both the filtered and unfiltered sample will be recorded at the time of collection.

- Gently pour the sample into the sample container taking care not to spill on outside of container or overfill container and replace cover on the sample container. Samples for volatile organic analyses, will have no air space in the sample vial prior to sealing. This is done by filling the vial such that there is a meniscus on top. Carefully, slide the septum, Teflon® side down, onto the top of the vial and cap the vial. Check for bubbles by turning the vial upside down and tapping it lightly. If bubbles appear, reopen the vial, remove the septum and add more sample (or resample). Replace the septum, recap and check for bubbles. Continue until vial is bubble-free.

- Return sample container to sample cooler.

5.8 Decontamination Procedures

All field sampling equipment should be sterile and dedicated to a particular sampling point. In instances where this is not possible, a field cleaning (decontamination) procedure will be used in order to reduce the chances of cross-contamination between sample locations. A decontamination station will be established for all field activities. This will be an area located away from the suspected source of contamination so as not to adversely impact the decontamination procedure, but close enough to the sampling area to keep equipment handling to a minimum.

5.8.1 Field Decontamination Procedures

All nondisposable equipment will be decontaminated at appropriate intervals (e.g., prior to initial use, prior to moving to a new sampling location and prior to leaving the Site). Different decontamination procedures are used for various types of equipment that perform the field activities as discussed below. When using field decontamination, it is advisable to start sampling in the area of the Site with the lowest contaminant probability and proceed through to the areas of highest suspected contamination.

5.8.2 Decontamination Procedure for Drilling/Test Trench/Pit Equipment

All equipment such as drill rigs, backhoes and other mobile equipment should receive an initial cleaning prior to use at the Site. The equipment will then be decontaminated prior to leaving the Site and each time it returns on-Site. Unless otherwise specified and approved, all wash/rinse solutions should be collected and contained on-Site.

After the initial washing, cleaning may be reduced to those areas that are in close proximity to materials being sampled. Drill rig items such as auger flights, drill rods, and drill bits are to be cleaned in between sample locations.

Drilling equipment will be decontaminated in the following manner:

- Scrub all surfaces thoroughly with nonresidual nonionic anionic detergent (such as alconox) and tap water using a brush to remove particulate matter or surface film. This is necessary in order to remove any solids buildup on the back of the rig, auger flights, drill rods, drilling head, etc. Any loose paint chips, paint flakes and rust must also be removed.

- Steam clean (212□F).

Also, following the general cleaning procedures described above, all downhole/drilling items, such as split spoon samplers, or any other item of equipment which will come in direct contact with a sample during drilling will be decontaminated by steam cleaning.

5.8.3 Decontamination Procedure for Sampling Equipment

Teflon, PVC, polyethylene, polystyrene and stainless steel sampling equipment decontamination procedures will be the following:

- Wash thoroughly with nonresidual nonionic anionic detergent (such as Alconox) and clean potable tap water using a brush to remove particulate matter or surface film.
- Rinse thoroughly with tap water.
- Rinse thoroughly with distilled water.
- Rinse in a well ventilated area with methanol (pesticide grade) and air dry.
- Rinse thoroughly with distilled water and air dry.
- Wrap completely in clean aluminum foil with dull side against the equipment. For small sampling items, such as scoops, decontamination will take place over a drum specifically used for this purpose.

The first step, a soap and water wash, is to remove all visible particulate matter and residual oils and grease. This is followed by a tap water rinse and a distilled/deionized water rinse to remove the detergent. Next, a high purity solvent rinse is designated for trace organics removal. Methanol has been chosen because it is not an analyte of concern in the Target Compound List (TCL). The solvent must be allowed to evaporate and then a final distilled/deionized water rinse is performed. This rinse removes any residual traces of the solvent. The aluminum wrap protects the equipment and keeps it clean until it is used at another sampling location.

5.8.4 Decontamination Procedure for Well Casing/ Screen and Development/Purging Equipment

Field cleaning of well casing and screen should consist of a manual scrubbing to remove foreign material and steam cleaning, inside and out, until all traces of oil and grease are removed. If precleaned certified well casing and screen can be obtained from the manufacturer this would also be acceptable. This material should then be stored in such a manner so as to preserve it in this condition. Special attention to threaded joints may be necessary to remove cutting oil or weld burn residues.

Materials and equipment that will be used within the monitoring well casing for the purposes of well development and purging shall also be decontaminated.

The submersible pump will be decontaminated by the following procedures:

- Place pump in a water solution of an nonionic anionic surfactant solution (Alconox) solution and wash the outside of the pump with a scrub brush.
- Pump approximately five gallons of the wash solution through the pump.
- Place pump in bucket of clean water and pump out five gallons of water.
- Wipe down the cable with deionized water and a paper towel.

5.9 Laboratory Sample Custody Procedures

A NYSDOH ELAP and CLP certified laboratory meeting the requirements for sample custody procedures, including cleaning and handling sample containers and analytical equipment will be used. The laboratory's Standard Operating Procedures will be available upon request.

5.10 Field Management Documentation

Proper management and documentation of field activities is essential to ensure that all necessary work is conducted in accordance with the sampling plan and QA/QC Plan in an efficient and high quality manner. Field management procedures include following proper chain of custody procedures to track a sample from collection through analysis, noting when and how samples are to be composited (if required), preparing a Location Sketch, completing Sample Information Record Forms, Chain of Custody Forms and Boring, Well and Test Pit Construction Logs, maintaining a daily Field Log Book, preparing Daily Field Activity Reports, completing Field Change Forms and filling out a Daily Air Monitoring Form. Copies of each of these forms, with the exception of the Air Monitoring Forms, are provided in Section 5.22. Proper completion of these forms and the field log book are necessary to support the consequent actions that may result from the sample analysis. This documentation will support that the evidence was gathered and handled properly.

5.10.1 Location Sketch

Each sampling point shall have its own location sketch (found in Section 5.22) with permanent references, to the maximum extent practicable.

5.10.2 Sample Information Record

At each sampling location, the Sample Information Record Form is filled out and maintained including, but not limited to, the following information:

- Site name
- Sample crew
- Sample location
- Field sample identification number
- Date
- Time of sample collection
- Weather conditions
- Temperature
- Sample matrix

- Method of sample collection and any factor that may affect its quality adversely
- Well information (groundwater only)
- Field test results
- Constituents sampled
- Remarks (Sample Compositing Information)

5.10.3 Chain of Custody

The Chain of Custody (COC) is initiated at the laboratory with bottle preparation and shipment to the site. The COC remains with the sample at all times and bears the name of the person assuming responsibility for the samples. This person is tasked with ensuring secure and appropriate handling of the bottles and samples. When the form is complete, it should indicate that there were no lapses in sample accountability.

A sample is considered to be in an individual's custody if any of the following conditions are met:

- It is in the individual's physical possession, or
- It is in the individual's view after being in his or her physical possession, or
- It is secured by the individual so that no one can tamper with it, or
- The individual puts it in a designated and identified secure area.

In general, Chain of Custody Forms are provided by the laboratory contracted to perform the analytical services. At a minimum, the following information shall be provided on these forms:

- Project name and address
- Project number
- Sample identification number

- Date
- Time
- Sample location
- Sample type
- Analysis requested
- Number of containers and volume taken
- Remarks
- Type of waste
- Sampler(s) name(s) and signature(s)
- Spaces for relinquished by/received by signature and date/time.

For this particular study, forms provided by the laboratory will be utilized. A copy of this form is contained in Section 5.22.

The Chain of Custody Form is filled out and signed by the person performing the sampling. The original of the form travels with the sample and is signed and dated each time the sample is relinquished to another party, until it reaches the laboratory or analysis is completed. The field sampler keeps one copy and a copy is retained for the project file. The sample container must also be labeled with an indelible marker with a minimum of the following information:

- Sample number
- Analysis to be performed
- Date of collection
- Compositing information

A copy of the completed form is returned by the laboratory with the analytical results.

5.10.4 Split Samples

Whenever samples are being split with another party, a Receipt for Samples Form must be completed and signed. A copy of this form can be found in Section 5.22. A copy of the COC Form will accompany this form. The present work plan does not provide for split samples.

5.10.5 Field Log Book

Field log books must be bound and should have consecutively numbered, water resistant pages. All pertinent information regarding the site and sampling procedures must be documented. Notations should be made in log book fashion, noting the time and date of all entries. Information recorded in this notebook should include, but not be limited to, the following:

The first page of the log contains the following information:

- Project name and address
- Name, address and phone number of field contact
- Waste generator and address, if different from above
- Type of process (if known), generating waste
- Type of waste
- Suspected waste composition, including concentrations

Daily entries are made for the following information:

- Purpose of sampling
- Location of sampling point
- Number(s) and volume(s) of sample(s) taken
- Description of sampling point and sampling methodology
- Date and time of collection, arrival and departure

- Collector's sample identification number(s)
- Sample distribution and method of storage and transportation
- References, such as sketches of the sampling site or photographs of sample collection
- Field observations, including results of field analyses (e.g., pH, temperature, specific conductance), water levels, drilling logs, and organic vapor and dust readings
- Signature of personnel responsible for completing log entries.

5.10.6 Daily Field Activity Report

At the end of each day of field work, the Field Operations Manager, or designee, completes this form noting personnel on-site and summarizing the work performed that day, equipment, materials and supplies used, results of field analyses, problems and resolutions. This form is then signed and is subject to review. A copy of the Daily Field Activity Report form is contained in Section 5.22.

5.10.7 Field Changes and Corrective Actions

Whenever there is a required or recommended investigation/sampling change or correction, a Field Change Form must be completed by the Field Operations Manager and NYSDEC on-site supervisor, and approved by the D&B Consulting Engineers and NYSDEC Project Managers.

5.11 Calibration Procedures and Preventive Maintenance

The following information regarding equipment will be maintained at the project site:

- Equipment calibration and operating procedures which will include provisions for documentation of frequency, conditions, standards and records reflecting the calibration procedures, methods of usage and repair history of the measurement system. Calibration of field equipment will be done daily at the sampling site so that any background contamination can be taken into consideration and the instrument calibrated accordingly.

- Critical spare parts, necessary tools and manuals will be on hand to facilitate equipment maintenance and repair.

Calibration procedures and preventive maintenance, in accordance with the NYSDEC ASP, for laboratory equipment is contained in the laboratory's standard operating procedures (SOP) and is available upon request.

5.12 Performance of Field Audits

During field activities, the QA/QC officer may accompany sampling personnel into the field to verify that the site sampling program is being properly implemented and to detect and define problems so that corrective action can be taken. All findings will be documented and provided to the Field Operations Manager. A copy of D&B's Field Audit form is in Section 5.26.

5.13 Control and Disposal of Contaminated Material

During construction and sampling of the monitoring wells and borings installed during the Site investigation, possibly contaminated waste, soil and water may be generated from drill cuttings, drilling fluids, decontamination water, development water and purge water. Drill cuttings will be handled in accordance with the NYSDEC Technical and Administrative Guidance Memorandum (TAGM) - No. 4032 - Disposal of Drill Cuttings. Specifically, all soil and water associated with the wells or borings will be disposed of on-Site. Decontamination water will also be disposed of on-Site.

In general, soiled personal protective equipment (PPE) and disposable sampling equipment (i.e., bailers, tongue depressors, scoops) will be considered solid waste and contained and disposed off-Site. If hazardous waste contamination of PPE or disposable equipment is suspected, due to elevated measurements of screening instruments, visual observations, odors or other means, PPE and equipment will be drummed and secured on-site until a hazardous waste determination can be made. Once a determination has been made, an approved disposal method will be employed.

5.14 Documentation, Data Reduction and Reporting

A NYSDOH ELAP and CLP certified laboratory meeting requirements for documentation, data reduction and reporting will be used. All data will be cataloged according to sampling locations and sample identification nomenclature which is described in Section 5.7.1 of the QA/QC plan.

NYSDEC "Sample Identification and Analytical Requirement Summary" and "Sample Preparation and Analysis Summary" forms (for VOA Analysis, B/N-A Analysis, Pesticides/PCB Analysis and Inorganic Analysis) will be completed and included with each data package. These forms are contained in Section 5.23. The sample tracking forms are required and supplied by the NYSDEC ASP.

5.15 Data Validation

Data validation will be performed in order to define and document analytical data quality in accordance with NYSDEC requirements that investigation data must be of known and acceptable quality. The analytical and validation processes will be conducted in conformance with the NYSDEC ASP and/or USEPA 5/99 and 1/00 SOWs.

Because the NYSDEC ASP is based on the USEPA CLP, the USEPA Functional Guidelines for Evaluating Organics Analyses for the Contract Laboratory Program (CLP) will assist in formulating standard operating procedures (SOPs) for the data validation process. The data validation process will ensure that all analytical requirements specific to the QA/QC plan are followed. Procedures will address validation of Routine Analytical Services (RAS) results based on the NYSDEC ASP Target Compound List and Target Analyte List for standard sample matrices.

The data validation process will provide an informed assessment of the laboratory's performance based upon contractual requirements and applicable analytical criteria. The report generated as a result of the data validation process will provide a base upon which the usefulness of the data can be evaluated by the end user of the analytical results. The overall level of effort and specific data validation procedure to be used will be equivalent to a "100% validation" of all data in any given data package.

"Qualified" analytical results for any one field sample will be established and presented based on the results of specific QC samples and procedures associated with its sample analysis group or batch. Precision Accuracy criteria (i.e., QC acceptance limits) will be used in determining the need for qualifying data. Where test data have been reduced by the laboratory, the method of reduction will be discussed in the report. Reduction of laboratory measurements and laboratory reporting of analytical parameters will be verified in accordance with the procedures specified in the NYSDEC and USEPA program documents for each analytical method (i.e., recreate laboratory calculations and data reporting in accordance with the method specific procedure).

The standard operating guideline manuals for any specific analytical methodology required will specify documentation needs and technical criteria and will be taken into consideration in the validation process. Copies of the complete data package and the data validation report, including laboratory result data report sheets, with any qualifiers deemed appropriate by the data reviewer, and supplementary field QC sample result summary statement, will be provided with the site investigation report.

The following is a description of the two-phased approach to data validation which will be used for this investigation. The first phase is called checklisting and the second phase is the analytical quality review, with the former being a subset of the latter.

- Checklisting - The data package will be checked for correct submission of the contract required deliverables, correct transcription from the raw data to the required deliverable summary forms and proper calculation of a number of parameters.
- Analytical Data Review – The data package will be closely examined to recreate the analytical process and verify that proper and acceptable analytical techniques have been preformed. Additionally, overall data quality and laboratory performance will be evaluated by applying the appropriate data quality criteria to the data to reflect

conformance with the specified, accepted QA/QC standards and contractual requirements.

At the completion of the data validation, a Data Usability Summary Report (DUSR) will be prepared as part of the site investigation report.

5.16 Performance and System Audits

A NYSDOH ELAP and CLP certified laboratory which has satisfactorily completed performance audits and performance evaluation samples shall be used.

5.17 Corrective Action

A NYSDOH ELAP and CLP certified laboratory shall meet the requirements for corrective action protocols, including sample "clean up" to attempt to eliminate/mitigate "matrix interference."

The NYSDEC ASP protocols include both mandatory and optional sample cleanup and extraction methods. GPC cleanup is required for soil samples by the NYSDEC ASP for semivolatile and pesticide/PCB analyses in order to meet contract required detection limits. Florisil column cleanup is required for the pesticide/PCB fraction of both soil and water samples. There are several optional cleanup and extraction methods noted in the NYSDEC ASP protocol. These include: Silica gel column cleanup, acid-base partition, steam distillation and sulfuric acid cleanup for PCB analysis.

It should be noted, that if these optional cleanup and extraction methods are requested by NYSDEC, holding time requirements should not be exceeded due to negligence of the laboratory. However, subsequent to selection of the analytical laboratory for this project, a meeting will be scheduled among representatives of the NYSDEC, D&B and the laboratory to discuss these issues and establish procedures to ensure good and timely communications among all parties.

5.18 Trip Blanks (Travel Blanks)

The primary purpose of this type of blank is to detect additional sources of contamination that might potentially influence contaminant values reported in actual samples both quantitatively and qualitatively. The following have been identified as potential sources of contamination:

- Laboratory reagent water
- Sample containers
- Cross contamination in shipment
- Ambient air or contact with analytical instrumentation during preparation and analysis at the laboratory
- Laboratory reagents used in analytical procedures

A trip blank consists of a set of 40 ml sample vials filled at the laboratory with laboratory demonstrated analyte free water. Trip blanks should be handled, transported and analyzed in the same manner as the samples acquired that day, except that the sample containers themselves are not opened in the field. Rather, they just travel with the sample cooler. Trip blanks must accompany samples at a rate of one per shipment. The temperature of the trip blanks must be maintained at 4°C while on-site and during shipment. Trip blanks must return to the laboratory with the same set of bottles they accompanied in the field.

The purpose of a trip blank is to control sample container preparation and blank water quality as well as sample handling. Thus, the trip blank travels to the site with the empty sample container, and back from the site with the collected samples, in an effort to simulate sample handling conditions. Contaminated trip blanks may indicate inadequate bottle cleaning or blank water of questionable quality. Trip blanks are implemented only when collecting water samples, and analyzed for VOCs only.

5.19 Field Blank (Field Rinsate Blank)/Equipment Blank

Field blanks are not required for this project, since disposable bailers and sterile scoops are being utilized for sample collection.

5.20 Matrix Spikes/Matrix Spike Duplicates and Spiked Blanks

Matrix spike samples and blanks are quality control procedures, consistent with 6/00 NYSDEC ASP specifications, used by the laboratory as part of its internal Quality Assurance/Quality Control program. The matrix and matrix spike duplicates are aliquots of a designated sample (water or soil) which are spiked with known quantities of specified compounds. They are used to evaluate the matrix effect of the sample upon the analytical methodology as well as to determine the precision of the analytical method used. A matrix spike blank is an aliquot of analyte-free water, prepared in the laboratory, and spiked with the same solution used to spike the MS and MSD. The MSB is subjected to the same analytical procedure as the MS/MSD and used to indicate the appropriateness of the spiking solution by calculating the spike compound recoveries. The procedure and frequency regarding the MS, MSD and MSB are defined in the NYSDEC ASP.

5.21 Method Blanks

A method blank is an aliquot of laboratory water or soil which is spiked with the same internal and surrogate compounds as the samples. Its purpose is to define and determine the level of laboratory background contamination. Frequency, procedure and maximum laboratory containment concentration limits are specified in the NYSDEC ASP as follows:

The laboratory shall prepare and analyze one laboratory reagent blank (method blank) for each group of samples of a similar matrix (for water or soil samples), extracted by a similar method (separatory funnel, continuous liquid extraction or sonication) and a similar concentration level (for volatile and semivolatile soil samples only) for the following, whichever is most frequent:

- Each case of field samples received; or

- Each 20 samples in a case, including matrix spikes and reanalyses; or
- Each 7 calendar day period during which field samples in a case were received (said period beginning with the receipt of the first sample in that sample delivery group); or
- Whenever samples are extracted.

Volatile analysis requires one method blank for each 12-hour time period when volatile target compounds are analyzed.

Semivolatile and pesticide method blanks shall be carried through the entire analytical process from extraction to final GC/MS or GC/EC analysis, including all protocol performance/ delivery requirements.

5.22 Field Management Forms

Dvirka and Bartilucci Test Pit Log

Contractor: __________
Operator: __________
Inspector: __________
Equip Type: __________

Project Name: __________
Project #: __________

Pit No. TP-______
Sheet 1 of ____
Pit Location:

Groundwater Observations

Water level		
Time		
Date		
Depth of pit		

Start: __________
Finish: __________
Weather: __________

Plot Plan

(see location map)

USCS Classification	Sample No.	Depth	Description	Comments
		1		
		2		
		3		
		4		
		5		
		6		
		7		
		8		
		9		
		10		
		11		
		12		
		13		
		14		
		15		
		16		
		17		
		18		
		19		
		20		

Stratigraphic Summary: __________

Driller: ____________________

Inspector: ____________________

Rig Type: ____________________

Drilling Method: ____________________

Dvirka and Bartilucci Boring Log

Project Name: ____________________

Project #: ____________________

Boring Depth: ________

Boring ID : ____

Sheet _____ **of** _____

Location: __________

	Groundwater Observations		
Date			
Time			
DTW			
Casing/Total Depth			

Start (Date & Time): ____________________

Finish (Date & Time): ____________________

Weather: ____________________

Elevation of Ground Surface: ________

Location Sketch:

Sample Interval	Sample No.	Blows		Field Description	Well Schematic	Comments

Soil Stratigraphy Summary ____

Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Well Construction Log

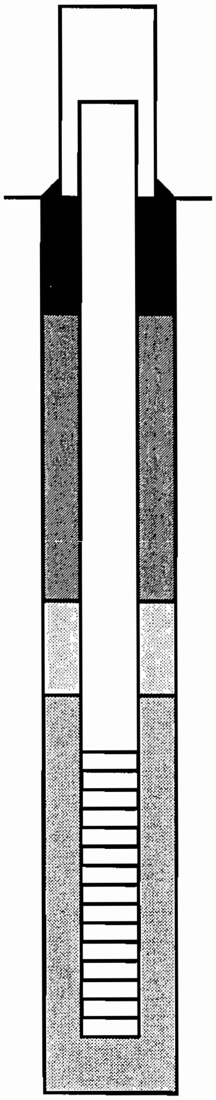
Site ______________________ Job No. ________ Well No. ________

Total Depth __________ Surface Elevation ________ Top Riser Elevation __________

Water Levels (Depth, Date, Time) ____________________ Date Installed __________

Riser Dia. ______ Material ______ Length ______
Screen Dia. ______ Material ______ Length ______ Slot Size ______
Protective Casing Dia. ______ Material ______ Length ______

SCHEMATIC



_____ Protective Casing Stickup

_____ Riser Stickup

Ground Surface

Surface Seal Type __________
____

_____ Bottom Surface Seal

Grout Type __________
____

_____ Top Seal

Seal Type __________
____

_____ Top Sand Pack

_____ Top Screen

Sand Pack Type __________
Size __________

_____ Bottom Screen

_____ Total Depth of Boring

Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Well Construction Log

Site ______________________ Job No. __________ Well No. __________

Total Depth __________ Surface Elevation __________ Top Riser Elevation __________

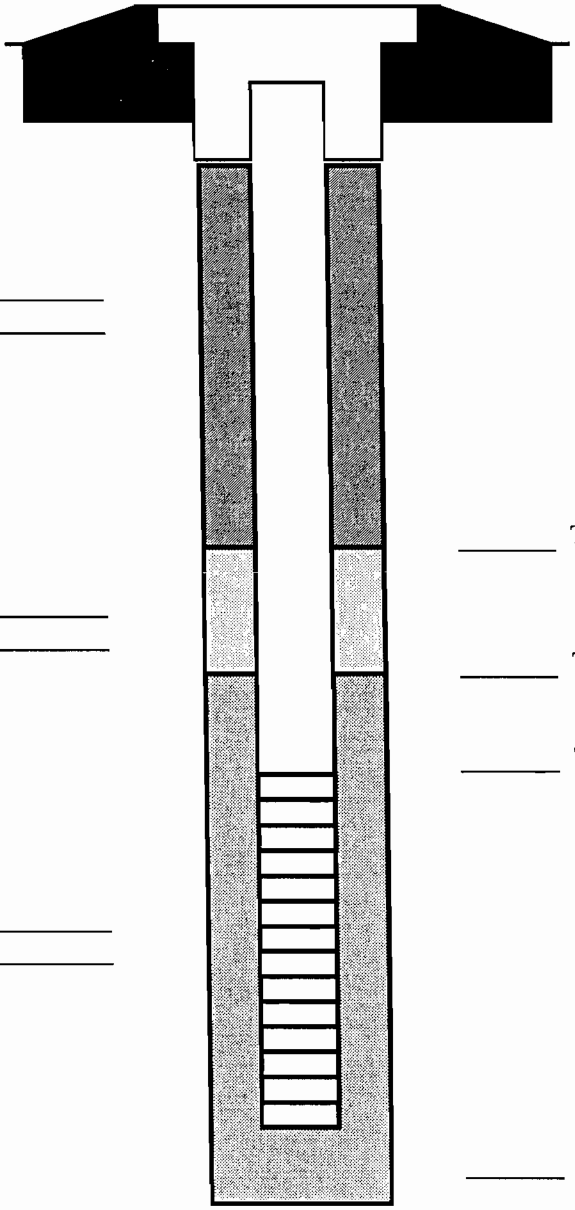
Water Levels (Depth, Date, Time) ______________________ Date Installed __________

Riser Dia. ________ Material ________ Length ________

Screen Dia. ________ Material ________ Length ________ Slot Size ________

SCHEMATIC

Surface Seal Type
____
____



Ground Surface
_______ Riser Elevation
_______ Bottom Surface Seal

Grout Type ______________
____

_______ Top Seal

Seal Type ______________
____

_______ Top Sand Pack

_______ Top Screen

Sand Pack Type ______________
Size ______________

_______ Bottom Screen

_______ Total Depth of Boring

D&B_WCLF

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Date: ____________________

LOCATION SKETCH

Project ________________________________ Sample Crew ________________________

Sample(s) Locations(s) ____

Sample(s) and/or Well Number(s) ____

Location of sample points, wells, borings, etc., with reference to three permanent reference points. Measure all distances, clearly label roads, wells and permanent features.

N

↑

Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Date: ____________________

SAMPLE INFORMATION RECORD

Site: ______________________________ **Sample Crew:** ______________________________

Sample Location/Well No. ____

Field Sample I.D. Number ______________________ **Time** ______________________________

Weather ______________________________ **Temperature** ______________________________

Sample Type:

Groundwater ______________________________ **Sediment** ______________________________

Surface Water/Stream ______________________________ **Air** ______________________________

Soil ______________________________ **Other (describe, i.e. water, septage, etc.)** ______________________________

Well Information (fill out for groundwater samples)

Depth to Water ______________________________ **Measurement Method** ______________________________

Depth of Well ______________________________ **Measurement Method** ______________________________

Volume Removed ______________________________ **Removal Method** ______________________________

Field Test Results

pH ____________ Spec Cond (mS/cm) ____________ Turbidity (NTUs) ____________

Diss. Oxygen (mg/l) ____________ Temperature °C ____________ Salinity (%) ____________

PID (ppm) ____________ Color ____________ Odor ____________

Other: ____

Laboratory Analyses Requested

____________ ____________ ____________ ____________

____________ ____________ ____________ ____________

Remarks:

____

____

____

Well Casing Volumes

GAL/FT	1¼" = 0.077	2" = 0.16	3" = 0.37	4" = 0.65
	1½ =0.10	2½ " = 0.24	3½ = 0.50	6" = 1.46

D&B_SIRa/gg

Rev. 04/06/00

DVIRKA
AND
BARTILUCCI

Receipt for Samples

Project Name: ______________________

Project Address: ______________________

Project Number: ______________________

Field Log Book Reference Number: ______________________

Sampled By: ______________________

Split With: ______________________

SAMPLE NUMBERS	DATE	TIME	COMP	GRAB	SPLIT SAMPLES	LOG BOOK PAGE NO.	TAG NUMBERS	SAMPLE LOCATION	NO. OF CONTAINERS	REMARKS

Transferred by (Signature)		**Received by (Signature)**		**Telephone**	
Date	**Time**	**Title**		**Date**	**Time**

RFS

Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Date:

DAILY FIELD ACTIVITY REPORT

Report Number: Project Number:

Field Log Book Page Number:

Project:

Address:

Weather: (AM) Rainfall: (AM) Inches

(PM) (PM) Inches

Temperature: (AM) °F Wind Speed: (AM) MPH Wind Direction: (AM)

(PM) °F (PM) MPH (PM)

Site Condition:

Personnel On Site:	Name	Affiliation	Arrival Time	Departure Time

Subcontractor Work Commencement: (AM) (PM)

Subcontractor Work Completion: (AM) (PM)

D&B_DFAR/kb Rev. 03/09/98

Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Date: ____________

DAILY FIELD ACTIVITY REPORT

Work Performed by subcontractor(s) (includes equipment and labor breakdown):

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Date: ____________________

DAILY FIELD ACTIVITY REPORT

General work performed today by D&B Engineers:

List specific inspection(s) performed and results (include problems and corrective actions):

List type and location of tests performed and results (include equipment used and monitoring results):

Verbal comments received from subcontractor (include construction and testing problems, and recommendations/resulting actions):

Prepared by: ____________________ Reviewed by: ____________________

D&B_DFAR/kb

Rev. 03/09/98

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

FIELD CHANGE FORM

Project Name:____

Project Number:____________________Field Change Number:____________

Location: ____________________________Date:____________

Field Activity Description:________________________________

Reason for Change:____________________________________

Recommended Disposition:________________________________

________________________________ ____________
Field Operations Officer (D&B Consulting Engineers) (Signature) Date

Disposition:____

________________________________ ____________
On-site Supervisor (NYSDEC) (Signature) Date

Distribution:	Project Manager (D&B)	Others as Required:____________
	Project Manager (NYSDEC)	____________
	Field Operations Officer	____________
	On-site Supervisor (NYSDEC)	____________

Dvirka
and
Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

Date: ____________________

DAILY EQUIPMENT CALIBRATION LOG

Project Name: ____________________________________

Project Number: ____________________________________ Calibrated by: ___________________________

Instrument Name and Model Number	Calibration Method	Time	Readings and Observations

5.23 NYSDEC Sample Identification, Preparation and Analysis Summary Forms

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

Customer Sample Code	Laboratory Sample Code	Analytical Requirements					
		*VOA GC/MS Method #	*BNA GC/MS Method #	*VOA GC Method #	*Pest PCBs Method #	*Metals	*Other

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
VOLATILE (VOA)
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
PESTICIDE/PCB
ANALYSES

Laboratory Sample ID	Matrix	Date Collected	Date Rec'd at Lab	Date Extracted	Date Analyzed

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY
SEMIVOLATILE (BNA)
ANALYSES

Laboratory Sample ID	Matrix	Analytical Protocol	Extraction Method	Auxiliary Cleanup	Dil/Conc Factor

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE PREPARATION AND ANALYSIS SUMMARY INORGANIC ANALYSES

Laboratory Sample ID	Matrix	Metals Requested	Date Rec'd at Lab	Date Analyzed

5.24 QA/QC Office Resume and DUSR Preparation Guidelines

APPENDIX 2B

Guidance for the Development of Data Usability Summary Reports

Background:

The Data Usability Summary Report (DUSR) provides a thorough evaluation of analytical data without the costly and time consuming process of third party data validation. The primary objective of a DUSR is to determine whether or not the data, as presented, meets the site/project specific criteria for data quality and data use.

The DUSR and the data deliverables package will be reviewed by the DER Quality Assurance Unit. If data validation is found to be necessary (e.g. pending litigation) this can be carried out at a later date on the same data package used for the development of the DUSR.

Personnel Requirements:

The Environmental Scientist preparing the DUSR must hold a Bachelors Degree in a relevant natural or physical science or field of engineering and must submit a resume to the Division's Quality Assurance Unit documenting experience in environmental sampling, analysis and data review.

Preparation of a DUSR:

The DUSR is developed by reviewing and evaluating the analytical data package. During the course of this review the following questions must be asked and answered:

1. Is the data package complete as defined under the requirements for the NYSDEC ASP Category B or USEPA CLP deliverables?

2. Have all holding times been met?

3. Do all the QC data: blanks, instrument tunings, calibration standards, calibration verifications, surrogate recoveries, spike recoveries, replicate analyses, laboratory controls and sample data fall within the protocol required limits and specifications?

4. Have all of the data been generated using established and agreed upon analytical protocols?

5. Does an evaluation of the raw data confirm the results provided in the data summary sheets and quality control verification forms?

6. Have the correct data qualifiers been used?

Evaluation of NYSDEC ASP Matrix Spike Blank (MSB) data - If the MSB recovery is less that the ASP criteria, the positive results should be qualified as J, estimated biased low. If the MSB recovery is less than the ASP criteria, but greater than 10%, the nondetects should be qualified J, biased low. If the MSB recovery is less than 10%, the nondetect data must be rejected.

Any Quality Control exceedances must be numerically specified in the DUSR and the corresponding QC summary sheet from the data package should be attached to the DUSR. All data that would be rejected by the EPA Region 2 Data Validation Guidelines must also be rejected in the DUSR.

Once the data package has been reviewed and the above questions asked and answered the DUSR proceeds to describe the samples and the analytical parameters. Data deficiencies, analytical protocol deviations and quality control problems are identified and their effect on the data is discussed. The DUSR shall also include recommendations on resampling/reanalysis. All data qualifications must be documented following the NYSDEC ASP '95 Rev. guidelines.

ROBBIN A. PETRELLA

QUALITY ASSURANCE OFFICER

EDUCATION

SUNY at Buffalo, B.S. (Chemical Engineering) - 1986

PROFESSIONAL EXPERIENCE

Ms. Petrella's professional quality assurance/quality control (QA/QC) experience spans 17 years. During this time, she served as a Sample and Data Analyst for two large environmental laboratories. Ms. Petrella was responsible, as Data Review Group Leader, for supervision of data validation and QA/QC coordination between the laboratory and its clients. Her technical experience includes both the analysis and review of environmental samples using numerous protocols, including those developed by the United States Environmental Protection Agency (USEPA), New York State Department of Environmental Conservation (NYSDEC), and New Jersey Department of Environmental Protection (NJDEP).

Since joining the firm, Ms. Petrella has been responsible for preparing Quality Assurance/Quality Control Plans and Waste Analysis Plans for a number of large private sector clients. These include Chemical Waste Disposal Corporation, the International Business Machines Corporation and Northrop Grumman Corporation. She also has prepared overall QA/QC programs for Northrop Grumman's on-site laboratories.

Ms. Petrella has prepared QA/QC Plans and data validation/usability reports for remedial investigation and feasibility studies conducted at numerous New York State Registry Sites, including those in the Towns of Cheektowaga, Schodack, and North Tonawanda, as well as the Villages of Croton-on-Hudson and Brentwood, New York. These tasks involved evaluation of the laboratory data to determine compliance with NYSDEC Analytical Services Protocols (ASP), as well as to determine the usability of the data particularly if it was not consistent with ASP requirements.

Ms. Petrella has assisted in the preparation and performance of air sampling programs for remedial investigation/feasibility studies (RI/FS) conducted at landfill/Superfund sites in Wallkill, New York and East Northport, New York. She has also performed water supply sampling for an RI/FS in Rensselaer County, New York, and a surface and subsurface water and soil sampling program as part of an RI/FS in Elmira, New York.

Ms. Petrella has acted as the QA/QC officer, and prepared and performed field audits for Superfund site investigations in Tonawanda, New York; Owego, New York; Brookhaven, New York; and Hornell, New York, and for a major railroad facility in New York City. She also has assisted in the preparation of laboratory contracts for analytical services for hazardous waste studies in Schodack, New York; Jamaica, New York; and the New York State Superfund Standby contract.

Ms. Petrella is responsible for performing laboratory audits on all laboratories having contracts with the firm as part of the New York State Superfund Program. She has been certified by the USEPA in both organic and inorganic data validation by successfully completing courses authorized by the USEPA. These certifications have also been accepted by the NYSDEC.

Ms. Petrella is responsible for the data validation of all data packages from ongoing hydrogeologic investigation and landfill closure investigations in Brookhaven and Hauppauge, New York. She also is responsible for validation of all data collected during field investigations for a large aerospace corporation, a major utility on Long Island, and manufactured gas plants across Long Island.

Ms. Petrella has acted as Project Manager for a standby project with the NYSDEC and a groundwater treatment project located in New Jersey.

Ms. Petrella has been instrumental in the design and implementation of the firm's GIS\Key Database system. In that role, she is responsible for the maintenance of the system and training of personnel in its use. She also is responsible for all updates to the GIS\Key program and communicates on a regular basis with the GIS\Key venders with regard to system improvements and network administration. Currently, there are seven ongoing projects that use GIS\Key, five of which are MGP sites. Ms. Petrella is responsible for entering and reporting of all chemistry data from GIS\Key.

Ms. Petrella also has conducted indoor and outdoor air sampling programs as part of MGP site field investigations. She has conducted interviews with homeowners as part of the air sampling program. She also is responsible for data validation of all the data from the air sampling programs.

Ms. Petrella presently is the Quality Assurance/Quality Control officer for the firm and responsible for reviewing all work relating to Quality Assurance/Quality Control for hazardous waste, hazardous substance, manufactured gas plant and solid waste projects undertaken by the firm. She also is responsible for preparation and maintenance of the Corporate Quality Assurance Manual, and for inventory and maintenance of the firm's field/sampling and monitoring equipment. As the QA/QC Officer, she reports directly to the Principal-in-Charge of the Environmental Remediation Division.

5.25 Data Quality Requirements and Assessment Summaries

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

			Quantitation Limits*			
	Volatiles	CAS Number	Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
1.	Dichlorodifluoromethane	75-71-8	10	10	1200	(50)
2.	Chloromethane	74-87-3	10	10	1200	(50)
3.	Bromomethane	74-83-9	10	10	1200	(50)
4.	Vinyl chloride	75-01-4	10	10	1200	(50)
5.	Chloroethane	75-00-3	10	10	1200	(50)
6.	Trichlorofluoromethane	75-69-4	10	10	1200	(50)
7.	1,1-Dichloroethene	75-35-4	10	10	1200	(50)
8.	1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	10	10	1200	(50)
9.	Acetone	67-64-1	10	10	1200	(50)
10.	Carbon Disulfide	75-15-0	10	10	1200	(50)
11.	Methyl Acetate	79-20-9	10	10	1200	(50)
12.	Methylene chloride	75-09-2	10	10	1200	(50)
13.	trans-1,2-Dichloroethene	156-60-5	10	10	1200	(50)
14.	Methyl tert-Butyl Ether	1634-04-4	10	10	1200	(50)
15.	1,1-Dichloroethane	75-35-3	10	10	1200	(50)
16.	cis-1,2-Dichloroethene	156-59-2	10	10	1200	(50)
17.	2-Butanone	78-93-3	10	10	1200	(50)
18.	Chloroform	67-66-3	10	10	1200	(50)
19.	1,1,1-Trichloroethane	71-55-6	10	10	1200	(50)
20.	Cyclohexane	110-82-7	10	10	1200	(50)
21.	Carbon tetrachloride	56-23-5	10	10	1200	(50)
22.	Benzene	71-43-2	10	10	1200	(50)
23.	1,2-Dichloroethane	107-06-2	10	10	1200	(50)
24.	Trichloroethene	79-01-6	10	10	1200	(50)
25.	Methylcyclohexane	108-87-2	10	10	1200	(50)
26.	1,2-Dichloropropane	78-87-5	10	10	1200	(50)
27.	Bromodichloromethane	75-27-4	10	10	1200	(50)
28.	cis-1,3-Dichloropropene	10061-01-5	10	10	1200	(50)
29.	4-Methyl-2-pentanone	108-10-1	10	10	1200	(50)
30.	Toluene	108-88-3	10	10	1200	(50)
31.	trans-1,3-Dichloropropene	10061-02-6	10	10	1200	(50)
32.	1,1,2-Trichloroethane	79-00-5	10	10	1200	(50)
33.	Tetrachloroethene	127-18-4	10	10	1200	(50)
34.	2-Hexanone	591-78-6	10	10	1200	(50)
35.	Dibromochloromethane	124-48-1	10	10	1200	(50)

Superfund Target Compound List (TCL) and Contract Required Quantitation Limits (CRQL)

			Quantitation Limits*			
	Volatiles (cont.)	CAS Number	Water µg/L	Low Soil µg/Kg	Med Soil µg/Kg	On Column (ng)
36.	1,2-Dibromoethane	106-93-4	10	10	1200	(50)
37.	Chlorobenzene	108-90-7	10	10	1200	(50)
38.	Ethyl Benzene	100-41-4	10	10	1200	(50)
39.	Total Xylenes	1330-20-7	10	10	1200	(50)
40.	Styrene	100-42-5	10	10	1200	(50)
41.	Bromoform	75-25-2	10	10	1200	(50)
42.	Isopropylbenzene	98-82-8	10	10	1200	(50)
43.	1,1,2,2-Tetrachloroethane	79-34-5	10	10	1200	(50)
44.	1,3-Dichlorobenzene	541-73-1	10	10	1200	(50)
45.	1,4-Dichlorobenzene	106-46-7	10	10	1200	(50)
46.	1,2-Dichlorobenzene	95-50-1	10	10	1200	(50)
47.	1,2-Dibromo-3-chloropropane	96-12-8	10	10	1200	(50)
48.	1,2,4-Trichlorobenzene	120-82-1	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-Chloropropane) #	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)

			Quantitation Limits*			
	Semivolatiles	CAS Number	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^{-2} 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)*

			Quantitation Limits*		
	Pesticides/Aroclors	CAS Number	Water µg/L	Soil µg/Kg	On Column (pg)
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	2.0	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.

PESTICIDES/AROCLORS

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 x 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 x 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 µL)(10^{-3} mL/µL) = 5.1 x 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.

Section III -- Regulatory Promulgated Parameters

In addition to the preceding lists, the Laboratory may be asked to analyze for any or all of the conventional water quality parameters as listed in 40CFR Part 136 or for the hazardous waste parameters listed in 40CFR Part 260 through 270.

Quantitation limits to be achieved for these analyses are specified.

5.26 Field Audit Form

FIELD AUDIT FORM

Site: ______________________ Date: ______________________

Persons On-site: ______________________ QA/QC Officer Conducting Audit:

______________________ ______________________

______________________ Project:

______________________ ______________________

1. Is safety equipment in use (hardhats, respirators, gloves etc.):		YES	NO
2. Is a decontamination station, equipment and supplies on-site and in working order:	Methanol	YES	NO
	Alconox	YES	NO
	D.I. Water	YES	NO
	Scrub Brushes	YES	NO
	Steam Cleaner	YES	NO

Comments: ______________________

____

____

3. Is the decontamination pad set up so water is contained: YES NO

Comments: ______________________

____

____

4. Is the site/investigation areas secured (fence, markers, etc.) or otherwise in accordance with project requirements: YES NO

Comments: ______________________

____

____

FIELD AUDIT FORM
(continued)

5. Is contaminated material properly stored and in a secure area or otherwise in accordance with project requirements:	YES	NO
Are the drums of waste (water, soil, ppe) labeled properly:	YES	NO

Comments: ______________________________

____

____

6. Are field forms filled out properly, legibly and timely:

Field Log Book	YES	NO
Chain of Custody	YES	NO
Equipment Calibration Log	YES	NO
Daily Field Activity Report	YES	NO
Location Sketch	YES	NO
Sample Information Record	YES	NO
Equipment Usage Form	YES	NO
Boring Logs	YES	NO

Comments: ______________________________

____

____

7. Is the proper sampling and field measurement equipment, including calibration supplies on-site:	YES	NO

Comments: ______________________________

____

____

FIELD AUDIT FORM
(continued)

8. Are there adequate sample containers, including deionized water for QA/QC:

QA/QC:	Field Blanks	YES	NO
	Trip Blanks	YES	NO

Comments: ______________________________

____

____

9. Is the equipment decontaminated in accordance with project requirements:

Sampling equipment	YES	NO
Construction equipment	YES	NO

Comments: ______________________________

____

____

10. Is field measurement equipment calibrated:

Daily	YES	NO
Properly	YES	NO

Comments: ______________________________

____

____

11. Are samples collected and labeled properly: YES NO

Comments: ______________________________

____

____

FIELD AUDIT FORM
(continued)

12. Are samples stored at 4°C: YES NO

Comments: ______________________

____

____

13. Are coolers properly sealed and packed for shipment including Chain of Custody taped to underside of lid: YES NO

Comments: ______________________

____

____

14. Is a copy of the Field Investigation Work Plan available on-site: YES NO

Comments: ______________________

____

____

15. Is a copy of each equipment manual on-site: YES NO

Comments: ______________________

____

____

16. Is a copy of the QA/QC Plan available on-site: YES NO

Comments: ______________________

____

____

FIELD AUDIT FORM
(continued)

17. Are investigation personnel familiar with the Work Plan and QA/QC Plan: YES NO

Comments: ______________________________

____

____

18. Are quality control samples taken:

Trip Blanks	YES	NO
Field Blanks	YES	NO

19. Are samples shipped in a timely and appropriate manner: YES NO

Comments: ______________________________

____

____

20. Has the laboratory been contacted regarding planned shipment of samples: YES NO

Comments: ______________________________

____

____

21. Certification - Based upon my audit at the above project, I hereby certify/do not certify compliance with QA/QC requirements for the project:

______________________ Dated

______________________ Signed

FIELD AUDIT FORM
(continued)

General Comments: ____

Section 6

6.0 SITE-SPECIFIC HEALTH AND SAFETY PLAN

The following site-specific information comprises information not included in D&B's Corporate Health and Safety Program, dated August 2001 (Corporate HASP). The following information will be utilized in conjunction with the Corporate HASP. Information with regard to contaminants of concern, personal protective equipment, exposure limits and monitoring requirements are provided in the Corporate HASP. A copy of the Corporate can be provided upon request.

Site Name:	McKinney Burt Street Site
Address:	1226 South McBride Street Syracuse, New York
Telephone:	
Dates of Field Investigations:	To Be Determined – Fall 2006
Entry Objectives:	Surface soil samples, Soil borings, and groundwater monitoring wells

Site Organization Structure:	Name	Phone
Project Director:	Richard Walka	516-364-9890
Project Manager:	James Magda	315-437-1142
Health and Safety Officer (HSO)	Bruce Groves	973-765-0991
Field Operations Manager/Alternate HSO	John Kuhn	315-437-1142
Field Team Staff:	Steven Tauss	516-364-9890

Subcontractors:	Om Popli Consulting Engineers	585-388-2060
	Parratt-Wolff, Inc.	315-437-1429
	Mitkem Corporation	401-732-4300
	Centek Laboratories	315-431-9730
	Emilcott Associates, Inc.	973-765-0991

Medical Assistance:
Physician: Dr. Ronald Miller
Address: 961 Canal Street
Syracuse, NY 13210
Telephone: 315-478-1977

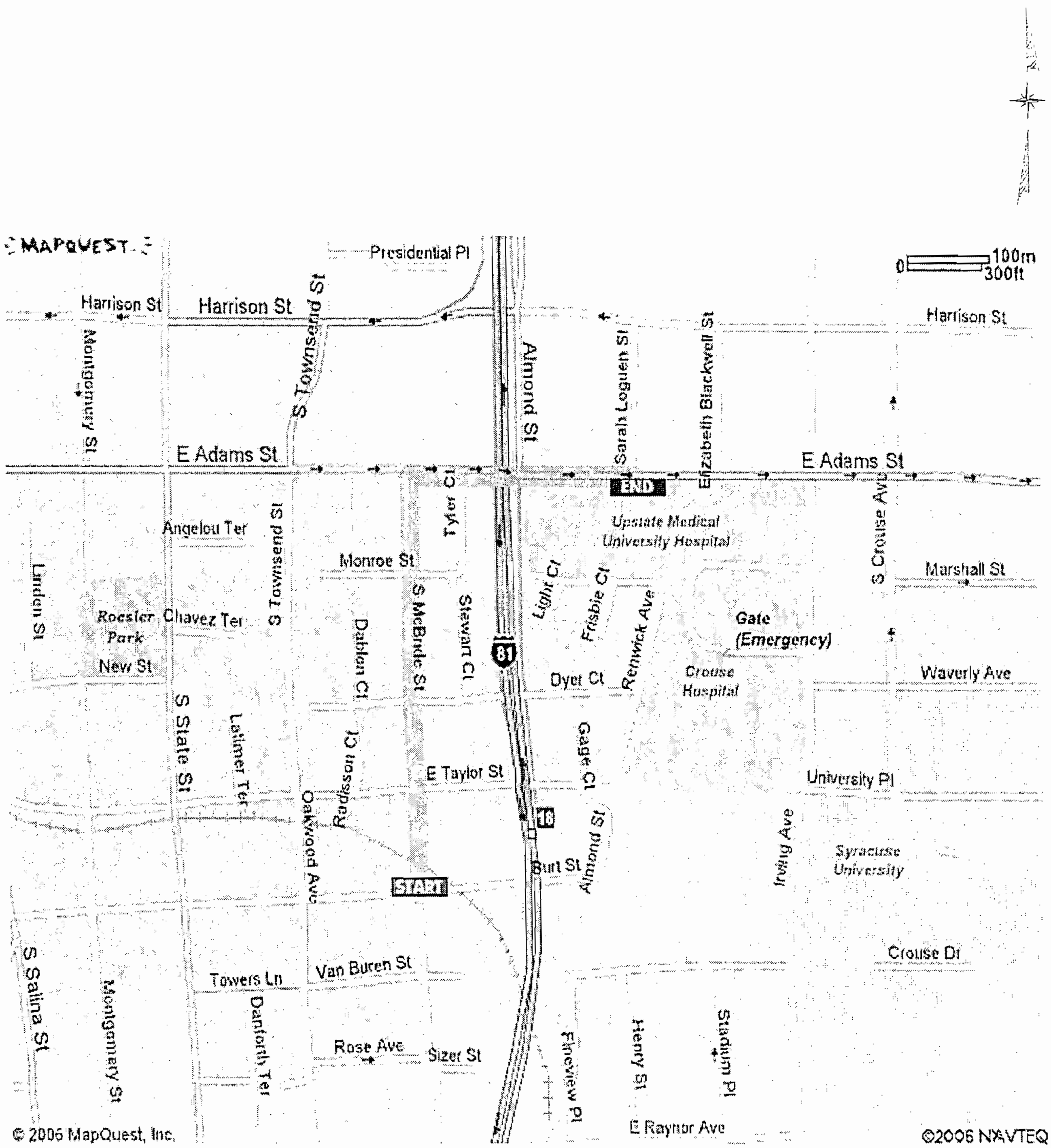
Name of Hospital: University Hospital
Telephone: 315-464-5540
Directions: From the site, turn left and proceed north on S. McBride St. for approximately 0.2 miles. Turn right onto E. Adams Street and proceed approximately 0.1 miles. University Hospital is on the right.

Emergency Telephones:

Agent/Facility	Telephone	Emergency Number
EMS - Ambulance	911	911
Police Department	315-442-5111	911
Fire Department	315-471-1161	911
Hospital	315-464-5540	--
Poison Control Center	800-222-1222	--

Additional site-related information (including, special hazards, site control, waste storage and disposal, personal protective equipment, decontamination area location, special engineering controls, etc.).

NOT APPLICABLE



Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C

McKINNEY BURT STREET SITE
SYRACUSE, NEW YORK

HOSPITAL ROUTE MAP

FIGURE 6-1

Section 7

7.0 COMMUNITY AIR MONITORING PLAN

Community air monitoring will be conducted by real-time air monitoring for VOCs and particulate levels at the perimeter of the work area. Based on existing environmental data and the work tasks to be performed in this work plan, the likelihood for the air quality of the general public being affected by site investigation activities is low.

The CAMP for this site investigation requires real-time monitoring for VOCs and particulates (i.e. dust) at the downwind perimeter of each designated work area when certain activities are in progress at the Site. This CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e. off-Site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities do not spread contamination off-site through the air.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Continual monitoring will be required for all ground intrusive activities and during the site investigation activities. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of surface soil and sediment samples or the collection of groundwater samples from new or existing monitoring wells. "Periodic" monitoring during sample collection will consist of taking a measurement upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well bailing/purging, and taking a measurement prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continual monitoring may be required during sampling activities. Examples of situations requiring air monitoring include groundwater sampling at wells in or near a public roadway, in the midst of adjacent properties, or adjacent to a school or residence.

7.1 VOC Monitoring, Response Levels, and Actions

VOCs will be monitored at the downwind perimeter of the immediate work area (i.e. the exclusion zone) on a continual basis or as otherwise specified. Upwind concentrations will be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work will be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment will be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment will be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings will be recorded and will be available for State (NYSDEC and NYSDOH) personnel to review. Instantaneous readings, if any, used for decision purposes will also be recorded.

7.2 Particulate Monitoring, Response Levels, and Actions

Particulate concentrations will be monitored continually at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring will be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

Note that, while remote, due to site history, there exists the potential for release of asbestos-containing material (ACM) during ground intrusive activities at the site. Any friable ACM that could potentially become airborne during ground intrusive activities would be entrained in on-site dust. Therefore, particulate monitoring activities at the site should provide sufficient safety measures against airborne ACM.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m3 above the upwind level and provided that no visible dust is migrating from the work area.
- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 of the upwind level and in preventing visible dust migration.

All readings will be recorded and be available for State (NYSDEC and NYSDOH) personnel to review.