WORK PLAN FOR BOILER ROOM INVESTIGATION: PHASE II

30 November 1988

Prepared for:

Amphenol Corporation
Sidney, New York

Prepared by:

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1) Q.A.P.P. - RCRA? or Cercla?
2) QA/QC send Format

SECTION 1

INTRODUCTION

1.1 Background

In the late 1960s, an underground storage tank was installed in the Boiler Room area of the Amphenol facility for the purpose of storing Number 6 fuel oil, which was used to fire the boiler in the adjacent boiler room. The tank was converted to a waste oil storage tank in 1981, was periodically emptied, and its contents transported to a disposal facility. The tank was taken out of service in 1983.

During the excavation and subsequent removal of the tank on 27 November 1984, oil was discovered in the subsurface soils surrounding the tank. Detailed inspection of the tank revealed no apparent leaks. This lead to the conclusion that small scale spillages over time were the probable source of the subsurface oil.

A Phase I Investigation was initiated in January 1985 with the installation of five shallow monitoring wells in the Boiler Room area to an approximate depth of 25 feet. The wells were located to 1) Determine the presence of free-floating oil on the shallow ground water table, 2) characterize ground water quality, and 3) define the potential for, and extent of migration of any associated dissolved organic compounds. Monitoring well locations for the Phase I investigation are included in Figure 1-1.

The following conclusions were drawn based on the Phase I Investigation:

1. Ground water in the Boiler Room area occurs under unconfined conditions within the unconsolidated glacio-alluvial soils.

2. Variable amounts of seasonal recharge, the interlayering of permeable and impermeable sediments, and low ground water flow gradients, appear to contribute to changes in direction of ground water flow within the shallow water table aquifer.

3. The high absorptive capacity of the sediments in the vicinity of the former underground storage tank prevented the occurrence of free-floating oil on the shallow ground water.

4. Dissolved BTX compounds, which have migrated northward in the shallow ground water flow system, are the primary ground water quality concern at the Boiler Room area.

5. The limited source of oil, low velocity of ground water flow, and dilution served to limit the horizontal extent of the dissolved plume of BTX compounds within the ground water.

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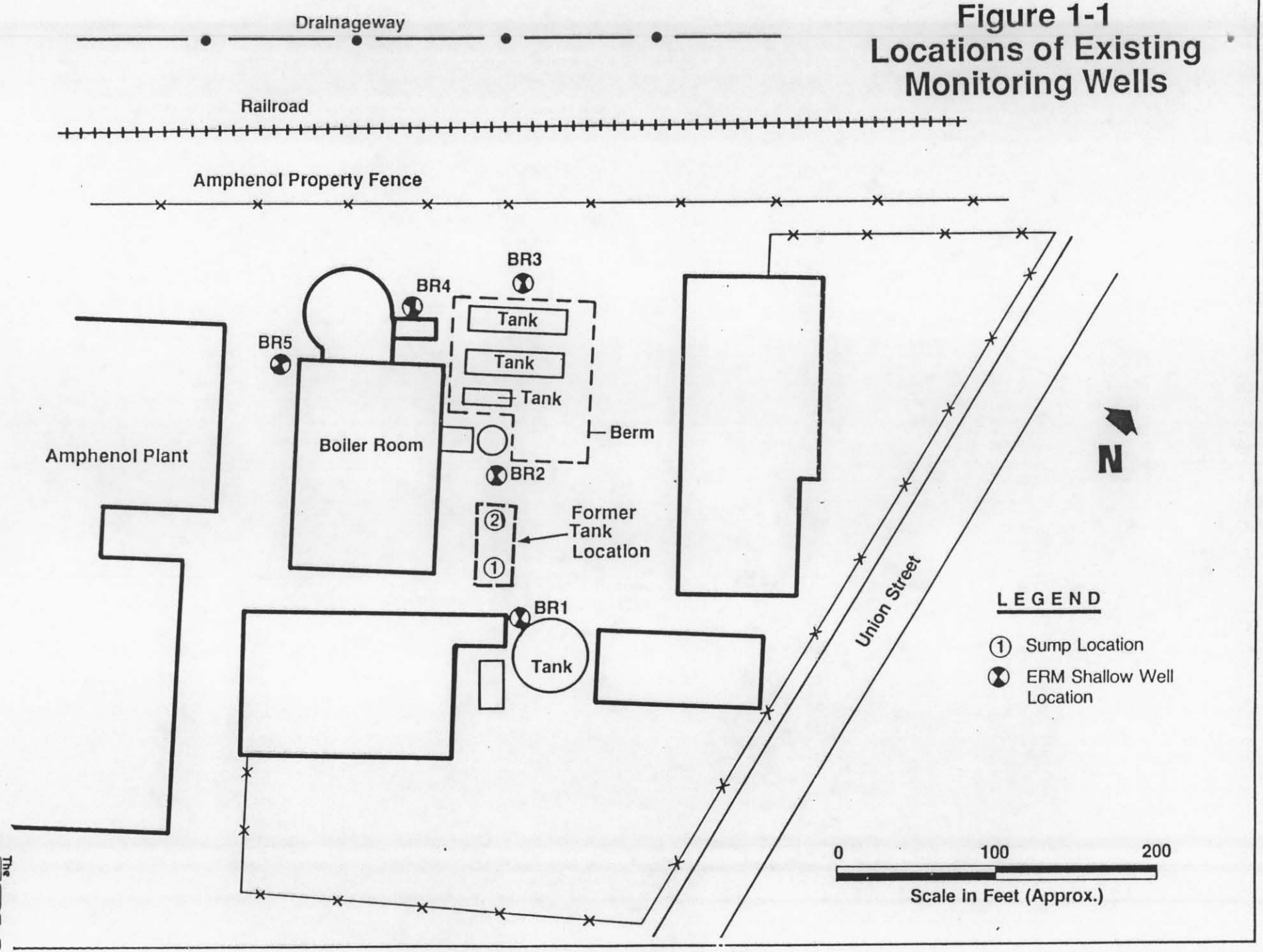
Figure 1-1
Locations of Existing Monitoring Wells



6. The vertical migration of BTX compounds into the deeper aquifer system is limited by their tendency to float or accumulate near the surface.

The Phase I Report also included recommendations that additional ground water monitoring be conducted to verify ground water flow conditions and to define the extent of BTX contamination at the site.

Ground water monitoring subsequent to the Phase I Investigation indicates the presence of non-site related compounds such as trichloroethene, trans-1,2-dichloroethene, vinyl chloride, 1,1-dichloroethene, and tetrachlorethene. This suggests the possibility of an off-site source for these compounds which have increased in concentration over time. Additionally, the direction of ground water flow across the Boiler Room area has appeared to shift from a northerly direction, in January 1985, to a westerly direction in April and September of 1988.

A soil gas survey was conducted in May 1988. In this study, a low concentration of TCE was detected at a location near the corner of the main plant building due west of the Boiler Room.

1.2 Purpose

The purpose of this Phase II Investigation is to augment the findings of the Phase I Investigation conducted in the Boiler Room area of the Amphenol facility in Sidney, New York. This Phase II Investigation has been authorized by the New York State Department of Environmental Conservation (NYSDEC) with approval pending the submittal of a Phase II Work Plan.

This Work Plan includes a Phase II well installation work plan, a health and safety plan and sampling plan as described herein. The Phase II Work Plan is designed to investigate the following questions:

1. Determine the source of the non-BTX related volatile organic compounds (VOC's) which have been detected in increasing concentrations in the Boiler Room area.

2. Evaluate the vertical and horizontal distribution of VOCs detected in the ground water beneath the Boiler Room area.

3. Assess the potential for the ground water beneath the Boiler Room area to impact the North Well and/or the Village of Sidney well #1.

These questions will be addressed by the installation of six additional monitoring wells, ground water sampling and analysis, and the determination of aquifer characteristics.

SECTION 2

SCOPE OF THE PHASE II INVESTIGATION

2.1 Monitoring Well Installation

Six additional wells will be installed to augment the existing monitoring well network within the Boiler Room area. The proposed well locations are given in Figure 2-1. In general, the well locations were selected to help identify and define ground water movement as well as to define the distribution and migration of contaminants. The rationale for each well is as follows:

- Well BR-6 - This shallow well will be located at the corner of the main plant where TCE was detected during an earlier soil gas survey.

- Well BR-7 - This shallow well will be located near the liquid propane gas tanks to the southeast of the Boiler Room and will serve as a background well at the Amphenol property line.

- Wells BR-8, BR-9 - These shallow wells will be located along the northwestern fence line marking the Amphenol property boundary. They will allow for determination of the distribution, and concentrations of VOCs potentially leaving or entering the site.

- Well BR-10 - This shallow well will be located directly east from the Boiler Room area and will monitor ground water quality at the eastern Amphenol property boundary.

- Well BR-11 - This deep well will be installed adjacent to existing well BR-4 to provide information on the vertical distribution of VOCs beneath the site, and also provide information regarding the nature and hydrogeologic characteristics of the aquifer materials.

2.2 Ground Water Sampling and Analysis

Ground water samples will be collected from the entire monitoring well (new wells and old wells) network to characterize the ground water coming into, within, and leaving the Boiler Room area. Analytical results from this effort will allow for a more extensive characterization of VOCs in the ground water.

2.3 Aquifer Characterization

After the installation of the additional monitoring wells and surveying of the top of casing, a complete round of depth-to-water measurements will be obtained and converted into elevations. A complete round of depth to water measurements will also be

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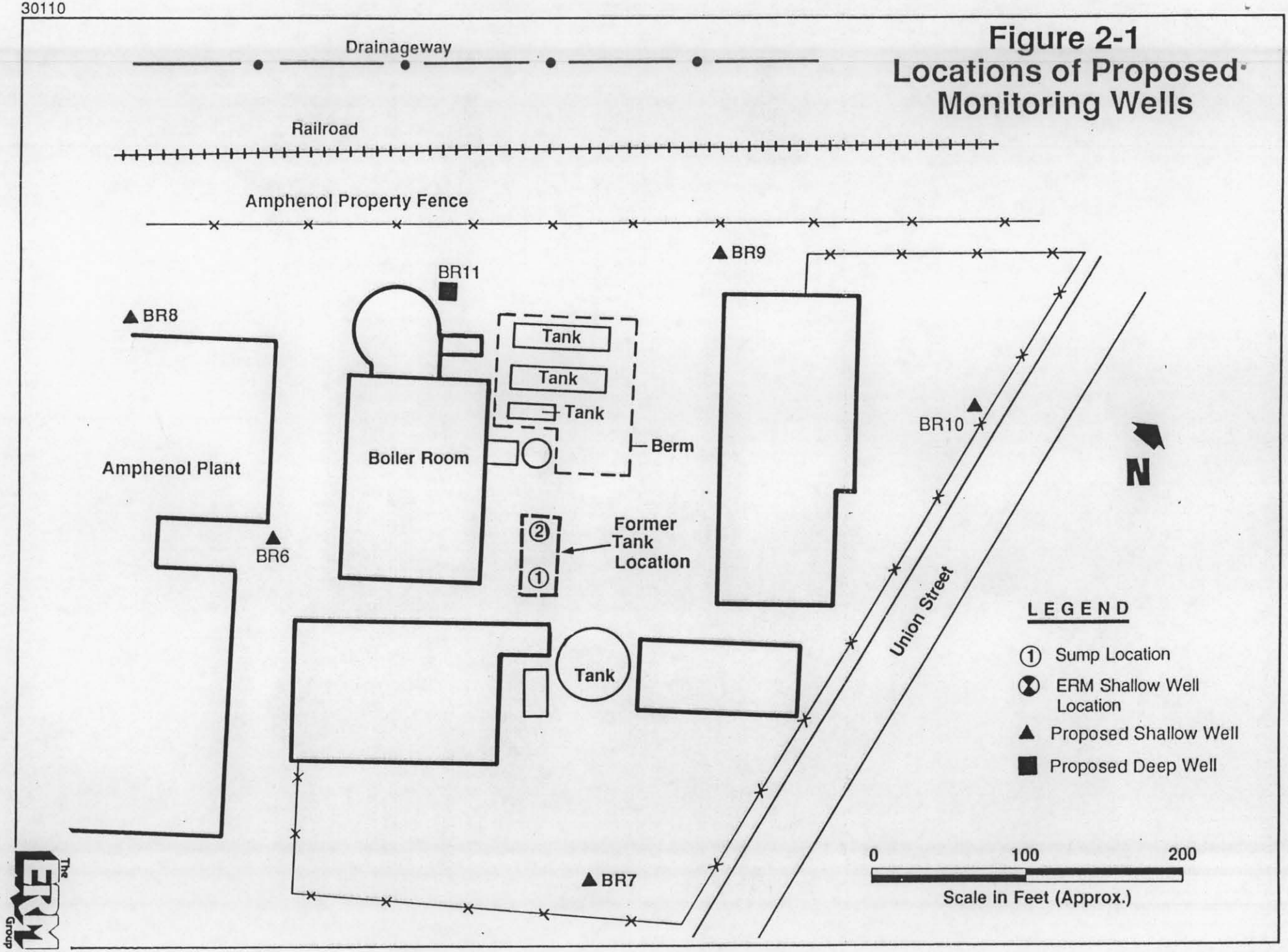
Figure 2-1
Locations of Proposed Monitoring Wells
Drainageway
Railroad
Amphenol Property Fence
BR11
BR8
BR9
BR10
BR6
BR7
Tank
Tank
Tank
Berm
Boiler Room
Amphenol Plant
Former Tank Location
Tank
Union Street
N
LEGEND
Sump Location
ERM Shallow Well Location
Proposed Shallow Well
Proposed Deep Well
0
100
200
Scale in Feet (Approx.)
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obtained prior to ground water sampling. A ground water surface configuration map of the study area will be produced for each set of measurements.

Upon completion of ground water sampling, the aquifer characteristics (transmissivity and storativity) will be determined by conducting slug tests on three of the shallow wells within the Boiler Room Area, in addition to the newly installed deep well. This information, in conjunction with ground water configuration mapping, will allow for the determination of the ground water flow velocity within the Boiler Room area.

After these tasks are completed, Hermit™ Data Loggers will be installed on four wells to record water levels for a minimum period of seven days. This information will assist in determining the impact of the on-off cycling of the north well on the Boiler Room Area.

SECTION 3

METHODS

3.1 Well Installations

Six wells are proposed to augment the existing monitoring well network within the Boiler Room area. The new shallow wells (BR6, BR7, BR8, BR9, and BR11) will be installed to an approximate depth of 25 feet. The deep well (BR10) will be installed to an approximate depth of 100 feet.

All wells will be installed within a borehole advanced by 3-1/4 inch I.D. hollow stem augers driven by a truck mounted auger rig. Subsurface materials will be characterized from split spoon samples taken at 5 foot intervals from 0 to 50 feet below land surface (BLS) and at 10-foot intervals from depths greater than 50 feet BLS.

All wells will be constructed of 2-inch I.D. schedule 40 PVC well screen and riser pipe. Shallow monitoring wells will be constructed with approximately 15 feet of #10 slot screen to extend approximately 2 to 3 feet above the water table. Each well will be sand packed such that the sand extends a minimum of 2 feet above the well screen. The sand pack will be sealed with 2 feet of bentonite pellets and the remaining annular space will be grouted with a cement/bentonite mixture to the surface. Flush mount protective well covers will be used in traffic areas, while 4-inch I.D. steel protective casing will be cemented into place and equipped with a locking cap to ensure the integrity of those wells in non-traffic areas.

The deep well will be nested with existing well BR-4. The lower 10 feet of this well will be constructed of #10 slot screen to monitor the lower portion of the aquifer. As with the shallow wells, the well screen will be sand packed such that the sand extends approximately 2 feet above the well screen. The sand pack will be sealed with 2 feet of bentonite pellets and the remaining annular space will be grouted with a cement/bentonite mixture to the surface. This well will be completed with a locking cap and a protective casing cemented into place. Upon completion, each well will be surveyed for vertical control by a New York State licensed surveyor.

3.1.2 Well Development

After monitoring well installation is completed, each well will be developed to remove sediment and turbidity. Wells will be developed with a surge block, followed by pumping until the water produced is relatively free of turbidity.

3.1.3 Decontamination

All downhole tools, including augers, split spoons, and drill rods, will be steam cleaned prior to the commencement of any drilling activities. The back of the drill rig, including tires, drilling table, controls, and all associated tools will also be steam cleaned to prevent cross contamination between boreholes.

3.2 Ground Water Sampling and Analysis

Ground water sampling will follow 2 to 3 weeks after the installation and development of monitoring wells. This will allow for the recovery of the aquifer from drilling, and ensure that ground water samples are representative of ambient ground water conditions. Samples will be collected in an upgradient to downgradient order, from areas of lower to higher historic volatile organics concentration. This will be done in order to minimize the potential for cross contamination.

3.2.1 Well Preparation

Prior to the acquisition of any ground water samples, a complete round of depth-to-water measurements will be obtained to provide a static ground water configuration and to assist in determining well volumes. A minimum of three well volumes will be removed from each well prior to sample acquisition. This will be accomplished in one of two ways: 1) Using a dedicated, pre-cleaned bailer, or 2) Pumping with a Fultz® submersible pump.

3.2.2 Sampling Method

After allowing a minimum of 90 percent recovery, samples will be obtained with a dedicated sampling bailer equipped with polypropylene string. All samples will be placed on ice immediately to maintain temperatures of 4°C after collection. After each sample is properly collected and secured, an additional sample will be collected from which pH, specific conductance, and temperature will be determined in the field. ERM chain-of-custody and Traffic Report forms will be completed for each sample. All bottles will be labeled with sampling information as to date and time of sampling, sampler's initials, Traffic Report number, analyses required and preservatives used.

3.2.3 Decontamination

Prior to ground water sampling, PVC bailers will undergo the following decontamination procedure:

1. Inside/outside scrub with a non-phosphate soap/hot tap water solution.
2. Hot tap water rinse inside/outside
3. Triple distilled water rinse inside/outside.
4. Placement into dedicated "Bailer Bags".

Each dedicated bailer will receive a final rinse with distilled water prior to its insertion into a well.

3.2.4 Sample Analysis and Quality Assurance

All ground water samples will be analyzed for VOCs + BTX via GC/MS by Lancaster Laboratories, Lancaster, PA. In compliance with the administrative consent order agreed to between Amphenol and NYSDEC, all analytical work will be conducted under Contract Laboratory Program (CLP) protocols and procedures.

The CLP Program requires the collection of a travel blank and a matrix spike/matrix spike duplicate (MS/MSD) sample. The travel blank serves as a quality control check on container cleanliness, external contamination and the analytical method. The MS/MSD sample serves as an additional quality control check on both the analytical method and the instrumentation performing the analysis. The MS/MSD sample monitors any possible matrix effects specific to samples collected from the site. The MS/MSD sample is typically collected from the location with the anticipated highest concentration of organic compounds for the identification of possible matrix effect.

The travel blank will consist of ultrapure deionized water produced by a Hydro® Model 28C2-44PE Ultrapure Water System. This system is located in ERM's warehouse in West Chester, PA. The travel blank will accompany the sample bottles to the site, and the samples to the analytical laboratory. The MS/MSD sample will be obtained by collecting the three aliquots from a single bailer full of sample.

Additionally, quality assurance will be provided by ERM Quality Assurance Chemists. Data packages will be reviewed and analytical results tabulated based on the additional Quality Assurance Review. DATA package sent to DEC. Also

3.3 Hydrogeologic Evaluation

3.3.1 Ground Water Configuration

As a means of defining the ground water configuration within the Boiler Room area, depth-to-water measurements will be obtained on at least two occasions and converted into water level elevations. From these data, ground water configuration maps will be generated, providing both the ground water flow direction and gradient. These will be produced by an experienced hydrogeologist with a knowledge of site conditions.

3.3.2 Slug Testing

The transmissivity and storativity (T and S) of the unconsolidated deposits will be assessed by slug testing 4 wells within the

Boiler Room area. Three shallow wells will be tested in addition to the deep well.

Slug testing will be conducted by causing an instantaneous displacement of the water level within the wells tested. This will be accomplished by inserting a solid slug into the well, raising the water level. Hermit™ data loggers and pressure transducers will be used to collect water level data during the recovery of the well to static conditions. After recovery, the displacement slug will be removed, lowering the water level with data collection continuing to recovery.

Standard methods of slug test data analysis will be employed to determine the transmissivity (T) and storativity (S) of the unconsolidated aquifer. These aquifer parameters, in conjunction with ground water configuration maps will assist in the determination of ground water flow velocity.

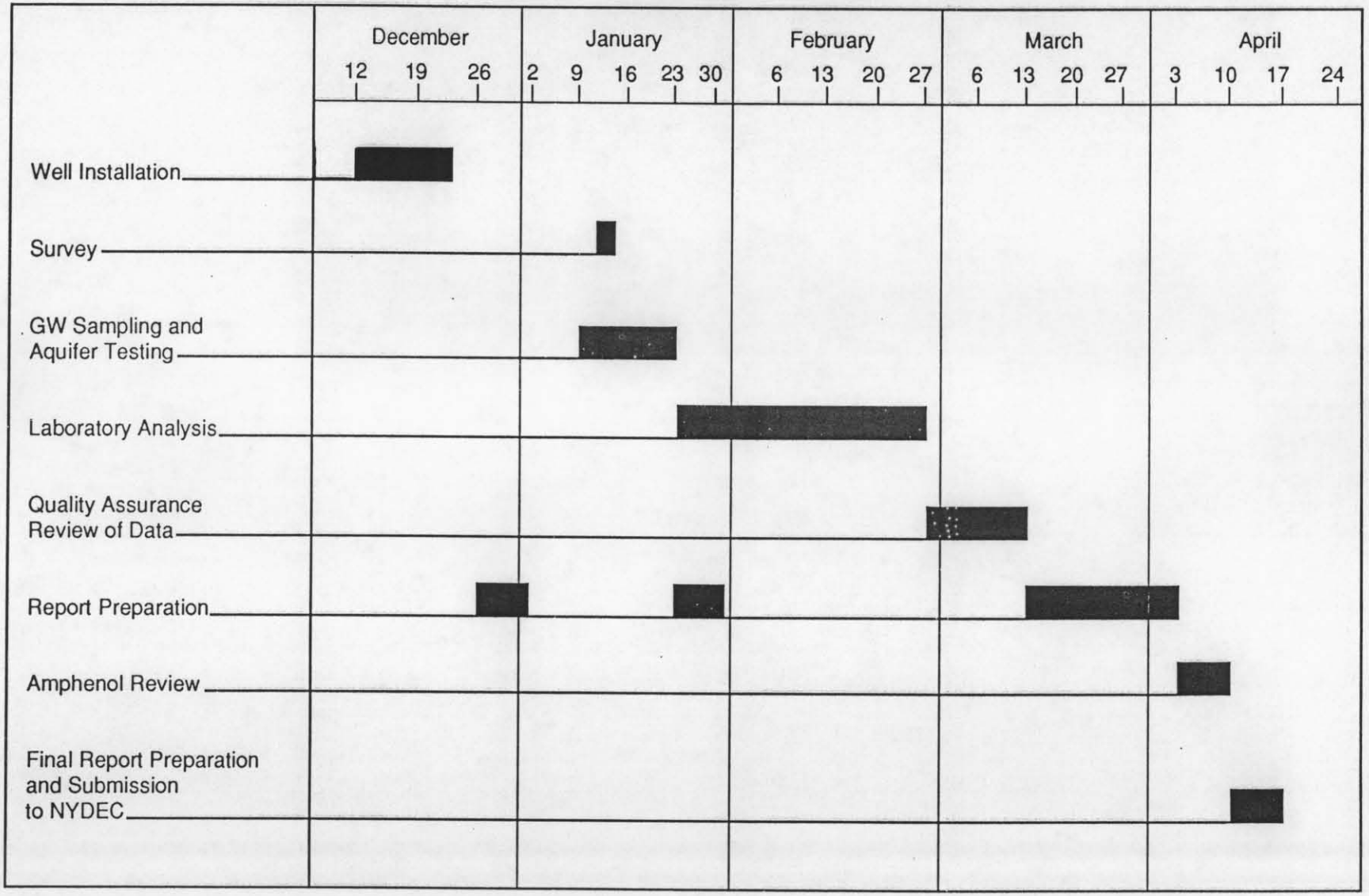
SECTION 4

SCHEDULING

Based on present knowledge of the conditions at the site, it is anticipated that a completed report will be ready for presentation to the NYSDEC by mid April 1989. Figure 4-1 shows a time line which breaks down the individual components involved in this investigation. The anticipated startup date for well installation is 12 December 1988. This task should take approximately 2 weeks (10 working days) for completion. Ground water sampling and slug testing is tentatively scheduled to begin on 9 January 1989. Based on a regular turnaround time basis for analytical data, ground water sampling results would be received by ERM at the end of February 1989. From the aforementioned data, a report will be generated and ready for presentation to the NYSDEC by mid-April 1989. In the event that weather conditions delay field activities, the presentation of the Phase II Report may likewise be delayed.

This work plan will not be initiated without prior approval by the NYSDEC. Upon approval, the NYSDEC will be kept up to date on both scheduling and the progress of the investigation.

Figure 4-1
Anticipated Schedule
Boiler Room Remedial Investigation
Phase II



W.O. # 301-27-00-01
Date 11/17/88

SITE SPECIFIC HEALTH AND SAFETY PLAN

This form must be completed a minimum of one (1) week prior to the start of work. It is the responsibility of the project manager to complete items 1 through 7 and 12 and 13. All project personnel must receive a copy of this form and familiarize themselves with its contents prior to the start of activities.

1. Site Name and Address:

   Amphenol Corporation
   Sidney New York

2. Site Personnel

   Project Manager - David Steele

   Project Geologist/Engineer - Randy Hoose

   Assistant Project Scientists - Designated Technicians

   Site Safety Officer - Designated ERM personnel

3. Site Description & Background (Attach Site Map and Area Map)

   The Amphenol Corporation is located in Sidney, New York. In 1985, an investigation was performed around the boiler room where subsurface oil was found near a former waste oil tank. The tank was taken out of service in 1983 and removed in 1984. In 1985, five 25-foot deep wells were installed to assess potential BTX and oil migration into the ground water. A sampling program was set up and from 1985 to the present the following constituents have been found: Benzene, Vinyl Chloride, Trichloroethene, 1,1-Dichloroethane and trans-1,2-Dichloroethene.

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4. List of Known Contaminants

Contaminant	*TLV/PEL	METALS TLV/PEL	Source/Quantity Characteristics	Route of Exposure	Potential Symptoms of Acute Exposure	Instrument Used to Monitor Contaminant
Benzene	1 ppm		Ground water	Inh, Abs, Ing, Con	Irr. eyes, nose, resp sys; giddy; head; nau; staggered gait; ftg, anor, lass; derm; bone marrow depres; abdom pain	Organic Vapor Analyzer
Vinyl Chloride	1 ppm		Ground water	Inh	weak; abdom pain; GI bleeding, hematomegaly, pal or cyan or extrem	Organic Vapor Analyzer
Trichlorethene	50 ppm		Ground water	Inh, Ing, Abs, con	Irrit nose, eyes; CNS depression; liver, kidney damage	Organic Vapor Analyzer
1,1-Dichloroethene	200 ppm		Ground water	Inh, Ing. Con	CNS depres; skin irrit, drow; unconscious; liver kidney damage	Organic Vapor Analyzer
trans-1,2-Dichloroethene	200 ppm		Ground water	Inh, Ing.	Irr. eyes, resp syst CNS depression	Organic Vapor Analyzer

Key

abdom - abdominal
anor - anorexia
CNS - central nervous system
cyan - cyanosis
depres - depressant/depression
derm - dermatitis
drow - drowsiness
extrem - extremities
ftg - fatigue
GI - gastrointestinal
irrit - irritation
lass - lassitude
pal - pallor
resp - respiratory

5. List of Potential Physical Hazards (complete items with asterisk to the best of your knowledge)

Include such items as: heavy traffic areas, overhead construction areas, work around excavation, work inside plant production area, etc.

Physical Hazards of Concern ( ) N/A

Hazard*	Description*	Location*	Procedures Used to Monitor/Reduce Hazard
Heavy Equipment	Drill Rig	Boiler Room Area	Keep alert and wear hard hat and work boots
Traffic	Trucks and cars travel through the Area	Boiler Room Area	Traffic cones should be placed around work area
Explosions and Electrocution	Underground Utilities are present on the site	Boiler Room Area	Check with plant personnel and locate underground utilities before any operations take place

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6. Planned Site Activities (be specific; identify personnel per task and include expected start of activities):

The project is scheduled to begin on 12 December 1988. Six monitoring wells are to be installed. After wells are installed the ground water will be purged and sampled. Finally, slug tests will be performed and possibly a pump test. Randy Hoose will be overseeing the drilling operations. Parrett-Wolfe are the subcontracted drilling company. Field technicians will do the ground water sampling.

7. Plant required Health and Safety Procedures (i.e. hard hats, long sleeve shirts, eyewear etc...)

Amphenol Corporation has no specific health and safety requirements that relate to the planned investigation, except to wear hard hats when equipment is overhead.

If any open flame (welding) or confined-space entry work is required, the Ampehnol Plant Health and Safety Officer must be contacted for permits.

8. Safety Procedures:

Procedure

Site Entry/Access - Follow on-site plant procedures. Don appropriate personnel protective equipment prior to entering any area where potential hazards exist. Do not enter any confined spaces without consulting ERM H&S coordinator and Ampheonl Plant Health and Safety Oficer (See #7) prior to entry.

Monitoring - OVA monitoring wherever needed and during all sampling and drilling.

Egress - Follow-Decon procedures outlined below prior to leaving site and areas of activities. Again follow plant procedures for signing in and out.

Decontamination- Wash hand and face thoroughly between activities and before meals.

Wash protective clothing and equipment with alconox solution and rinse with clean H_2O.

9. Special Procedures and Precautions (prepared by Safety Coordinator)

Follow on-site protocols. Also follow procedures under section 11 of this plan.

10. Action Levels (prepared by Safety Coordinator):

Activity	Location	Action Level	Level of Protection

The action levels are based on Vinyl Chloride. Because of this, any readings over 1 ppm may require (See #11 below) Level B with SCBA.

11. Contingency Procedures (prepared by Safety Coordinator):

When readings over 1 ppm occur, it is up to the discretion of the Site-Safety officer to go to Level B as stated in Section 10 of this plan, or to wait for the vapors to dissipate.

12. Emergency Contacts (name and phone number)

Police: (607) 563-3501

Fire: (607) 563-3794

Ambulance: (607) 563-3512

Hospital: (607) 563-3512

State Agency: (518) 382-0680 DEC

Federal Agency:

Plant Health and Safety Officer: Mike McDonald
(607) 563-5861

ERM Health and Safety Coordinator: Bob Deist

13. Directions to Nearest Hospital (include map indicating most direct route to medical facility)

"The Hospital" - South on Union Avenue to Pearl Street make right on Pearl Street to the hospital.

11/30/88
Project Manager / Date

11/30/88
Safety Coordinator / Date

To the Subcontractor:

This plan has been prepared solely for ERM personnel use. It is supplied to you for informational purposes only. As noted in the subcontract, you are responsible for your own health and safety program.

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