EarthTech
A Tyco International Ltd. Company

REMEDIAL ACTION

FINAL REPORT

FOR REMOVAL OF ANOMALY AREAS AND ARSENIC CONTAMINATED SOIL FROM THE BASF SOUTH 40

BASF Corporation
36 Riverside Avenue
City of Rensselaer, Rensselaer County, New York

May 2005

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Earth Tech Project No. 76928

VOLUME 1 of 2

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EXECUTIVE SUMMARY

As requested by BASF Corporation, Earth Tech Northeast, Inc. (Earth Tech) performed remedial construction activities at the BASF Corporation, South 40, Rensselaer Site, located in the City of Rensselaer, New York. Site activities were conducted in accordance with a Remedial Action Work Plan (RAWP) (Earth Tech, July 2003) prepared in accordance with a Voluntary Cleanup Agreement between the New York State Department of Environmental Conservation (NYSDEC) and BASF dated November 27, 2001. After the RAWP was approved by NYSDEC on January 22, 2004, the site was deemed eligible for the New York State Brownfield Cleanup Program and a new agreement was entered into for the Site: Brownfield Site Cleanup Agreement among NYSDEC, BASF and Besicorp-Empire Power Company, LLC (PowerCo) dated June 24, 2004 (Index # A4-0507-0604; Site # C-241047).

The Site is located in an area that has been heavily industrialized by chemical and other manufacturing facilities since the 1870's. The Main Plant site, located directly north of the South 40 Site, has been used since the 1880's for the manufacturing of dyestuffs, including coal-tar dyestuffs. BASF acquired the Site when it purchased the entire manufacturing facility from GAF Corporation (GAF) on April 1, 1978. Following the acquisition of the facility by BASF, the NYSDEC alleged that GAF disposed of an unknown quantity of industrial wastes/solvents on the Site. It is also alleged that dredge spoil from the Hudson River was deposited at the Site, although no records have been located to confirm this allegation.

Remedial activities conducted by Earth Tech on the South 40 for the removal of anomaly areas and arsenic-contaminated soil began in July 2004 and were completed in December 2004. The initial activities consisted of mobilization to the site, clearing and grubbing of work areas, and delineation of work zones. Earth Tech subcontracted Hager-Richter Geoscience to update the magnetic survey prior to excavation in the anomaly areas. C.T. Male was hired to perform all the survey work for locating the excavation areas and laying out the elevations of pre- and post- excavation.

The excavation areas were the same as outlined in the RAWP, except for the anomaly areas. Based on the updated magnetic survey, there were twenty-four (24) locations that needed to be excavated to determine if drum carcasses were present. Dewatering was conducted within the excavation areas to remove all water and as required to assist with excavation activities. Since some of the excavations were deeper than groundwater, those excavations were dewatered during excavation and then allowed to recharge. Excavation of the arsenic-impacted soil and anomaly areas was completed to the depths as outlined in the RAWP. In cases where there was visible staining, additional soil was removed prior to sampling. In a number of instances additional excavation was needed in order to meet the cleanup objectives. The final excavation depths and boundaries are provided in this report.

During excavation activities, a Community Air Monitoring Program (CAMP) was implemented. Real-time air monitoring for volatile organic compounds and total suspended particulates was conducted at upwind and downwind monitoring stations. In addition, a Work Zone Monitoring Program was implemented and real-time air monitoring for volatile organic compounds was conducted.

Upon completing excavation activities, the excavation areas were lined with a geotextile and orange safety fence to represent the notification layer. In the outlying excavations, this notification layer was placed at the base of the excavations. In Area 1, the large excavation area encompassing the anomaly areas, the area was backfilled to 2 feet below grade and then the notification layer was placed. The remaining two feet of soil was backfilled on top of the notification layer. This was done due to the number of deep excavations in the anomaly area. The areas were backfilled with certified clean sand from a local sand quarry.

All soil excavated from the site was disposed of as RCRA non-hazardous soil. There were 7,073.9 tons of soil was generated from remediation activities, transported, and disposed of off-site. Manifesting and transportation of all non-hazardous regulated soil generated from excavation activities was conducted in accordance with applicable New York State Department of Transportation regulations. All impacted soil was transported to either the Town of Colonie or City of Albany Landfills under a standard non-hazardous waste manifest.

Upon completion of remedial actions, equipment was decontaminated and demobilized from the Site. The excavation areas were re-graded to match the original grades; this work was performed when the notification layer was being installed. The temporary access road repairs were made and the road was left in tact for future use to allow easy access around the site for inspections.

CONSTRUCTION CERTIFICATION

I herby certify, as a Professional Engineer registered in the State of New York, that the remedial action performed during the period between July and December 2004 was performed in general accordance with Earth Tech's Remedial Action Work Plan (July 2003) and in accordance with accepted standards of practice.

Respectfully submitted,
EARTH TECH NORTHEAST, INC.

Carsten H. Floess	5-16-05
Registered Professional Engineer	Date
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1.0 INTRODUCTION

1.1 GENERAL

As required by the New York State Department of Environmental Conservation (NYSDEC), Earth Tech was requested by BASF Corporation (BASF) to prepare this Remedial Action (RA) Report for the remedial construction activities that were performed at the BASF South 40 Site in accordance with the NYSDEC-approved Remedial Action Work Plan (RAWP) dated July 2003. The remedial construction activities were completed during the period between July and December 2004. The remedial action conducted at the South 40 Site consisted of the following tasks:

- Mobilization of equipment, personnel, and materials to the Site;
- Clearing and grubbing activities;
- Installation of a temporary 6' high chain link fence around the northern portion of site and new chain link fence/gate;
- Delineation of work zones (i.e. exclusion zone, contaminant reduction zone, and safety zone);
- Preparation of material stockpile management areas;
- Preparation of contaminant reduction area;
- Placement of erosion control measures and temporary access and haul road;
- Magnetic Survey;
- Survey of excavation locations and elevations;
- Excavation of approximately 7,073.9 tons of RCRA non-hazardous impacted soil;
- Air-quality monitoring;
- Sampling of excavations*;
- Stockpiling and gravity dewatering of excavated material that was below groundwater table;
- Removal of approximately 185 drum carcasses from anomaly areas;
- Transportation and offsite disposal of 7,073.9 tons of impacted material;
- Transportation and offsite disposal of 16,305 gallons of water;
- Placement of a notification layer*;
- Backfill of excavation areas with sand; and
- Decontamination and demobilization of equipment, personnel, and materials from the Site.

The asterisk (*) denotes tasks that included deviations from the RAWP. These deviations are identified and discussed in the following sections.

1.2 PROPERTY DESCRIPTION AND BACKGROUND

The Site is located in an industrial area of the City of Rensselaer, New York (Figure 1-1). The Site is located to the south of the former BASF Main Plant manufacturing facility property (Main Plant site) and the Closed Capped Landfill (Figure 1-2). According to various sources, properties along Riverside Avenue in Rensselaer have been characterized by chemical industrial activity for over 100 years. The effect of regional industrial operations on soil and groundwater quality is well documented by regulatory agencies.

The South 40 parcel consists of approximately 34 acres. The parcel was bisected into two areas by the construction of the Irwin Stewart Port Access Highway in 1992. The northern portion of the parcel is approximately 26.5 acres in size and lies to the north of the Port Access Highway. The 8.8-acre portion of the parcel located to the south of the Port Access Highway is isolated from the remainder of the parcel and has not been historically impacted by disposal activities. As such, this portion of the parcel is not subject to remediation.

A CSX Transportation (CSX) rail spur physically separates the Site from the former Main Plant and Capped Landfill properties. The Site is bounded on the west by Riverside Avenue and across the street by the Port of Rensselaer property, which includes the Rensselaer Cogeneration Facility, a metal scrap recycling facility, and the Hudson River beyond. Located east of the Site are the Irwin Stewart Port Access Highway and CSX railroad tracks, with residential and commercial properties beyond. Undeveloped land and several tank farms are located to the south. The site is serviced by the City of Rensselaer for water and Rensselaer County for sewer.

The Site is located in an area that has been heavily industrialized by chemical and other manufacturing facilities since the 1870's. The Main Plant site has been used since the 1880's for the manufacturing of dyestuffs. BASF acquired the Site when it purchased the entire manufacturing facility from GAF Corporation (GAF) on April 1, 1978. Following the acquisition of the facility by BASF, the NYSDEC alleged that GAF disposed of an unknown quantity of industrial wastes/solvents on the Site. It is also alleged that dredge spoil from the Hudson River had been deposited here, although no records have been located to confirm this allegation. The historic use of the Hudson River could result in metals and natural organic contents in the historic fills above the background levels of natural in-situ soils (Supplemental Investigation Report South 40 Parcel, Roux Associates, 2001 (Roux, 2001)).

A 1950s-era photograph of the Site shows that a staging area and Site entry road were being used at the time. No filling is known to have occurred in recent years. BASF contacted GAF for information about the alleged waste disposal at the Site; however, GAF could not confirm or deny the allegation. Based upon this lack of information, the NYSDEC requested that BASF perform a Phase II Site Investigation under Order on Consent Index Number 04-0326-85-07, which was completed in 1992 (Roux, 2001).

2.0 DESCRIPTION OF REMEDIAL ACTION

The remedial action was completed in compliance with the RAWP. The remedial construction was performed for BASF by Earth Tech.

2.1 HEALTH AND SAFETY PLAN SUBMITTAL

Upon official notice to proceed, Earth Tech prepared a Site-specific Health and Safety Plan (HASP) in conformance with 29 CFR 1910. Attached to the HASP were the required training certificates for the field personnel assigned to this project. The HASP also provided air-monitoring criteria for worker exposure and a hazard analysis for the work being performed.

2.2 MOBILIZATION/SITE PREPARATION

Prior to mobilization, the Underground Facilities Protective Organization (UFPO) marked the locations of aboveground and underground utilities. There were no active utilities in the excavation locations. There is a gas main that runs north and south near the main gate leading to the South 40. Earth Tech arranged for temporary services (including electric, water, and sanitary) through the use of generator(s), potable water storage tank and a port-a-john. The equipment and materials needed to perform the work were mobilized, and all environmental and health and safety controls were put in place prior to commencing work.

Earth Tech, as part of the site preparation, performed clearing and grubbing activities. Earth Tech removed only the trees that were necessary to provide access for remedial activities. Earth Tech stockpiled the cleared debris on-site. The bulk of debris consisted of vegetation (stumps, trunks, branches, and foliage), and limited amounts of construction and demolition debris that was present prior to remedial action activities.

Earth Tech also installed the silt fence at the locations identified in the RAWP. The silt fence was installed using a walk behind trenching machine to create the trench for the silt fence, then the silt fence was placed in the trench and backfilled.

A 6' high chain link fence with barbed wire surrounds the South 40 Site. One section of fence, which was not chain link, was replaced with chain link on the north side of the Site. A larger entrance gate was also installed to allow for the dump trailers to make the turn into and out of the Site.

Equipment that was mobilized to the site included excavator, ASV with brush hog, articulated dump truck, dozer, vibratory roller, frac tank, water tank, garbage container, dewatering equipment, miscellaneous portable equipment, air monitoring equipment, and miscellaneous hand tools. All equipment was mobilized to the site by using a temporary access road constructed by Earth Tech.

A temporary access road was constructed to provide a stabilized driving surface into the work area. Work included preparation and stabilization of road subgrade, installation of geotextile separation fabric, and placement and compaction of a crushed stone wearing surface. The roadway was constructed with 6-12" of crushed gravel placed on the geotextile separation fabric. At the intersection of the roadway that loops around the interior of the Site, Earth Tech constructed a temporary decontamination station. The decontamination station was constructed on a prepared surface. A protective geotextile was placed and then a 20-mil liner was placed and covered with another layer of fabric. Liner and fabric were then covered with stone. A collection sump was installed at the low point in the northwest corner of the decontamination station. Water was pumped from this sump, as needed, to an on-site storage tank and later disposed of off-site.

2.3 SITE SURVEYS

During mobilization activities and as the Site was cleared of trees, brush and high grass, Earth Tech was required to update the historic magnetic survey that had been performed in 1990 (URS). In addition, excavations were located and surveyed based on the historic sampling results and previous survey information from the Dunn Geoscience, Supplemental Investigation Report, 1990 and 1992 reports, the Roux, 2001 report as well as the Earth Tech, Supplemental Investigation Report, 2002 (Earth Tech, 2002).

2.3.1 *Magnetic Survey*

Earth Tech hired Hager-Richter Geosciences to perform the magnetic survey of the anomaly areas. Hager-Richter was provided an updated survey map and the historic anomaly location map. A delineation of the four corners of the main excavation area (Area 1, see Figure 2-1) was also provided to Hager-Richter.

A magnetic survey was conducted to determine the extent or the concentration of buried metal that might include steel drums. The magnetic survey was conducted using a Geometrics Model G858-G Cesium Vapor Magnetometer. The G858-G uses two sensors with a vertical separation of 2.5 feet and measures both the strength of the total magnetic field and the vertical magnetic gradient. The G858-G recorded data at a 0.3 second cycle rates and has a gamma sensitivity of 0.05. Data was acquired at about 1-foot intervals along survey lines spaced 5 feet apart in one direction across the accessible portion of the area of interest. The entire Hager-Richter report is provided in Appendix A.

2.3.2 *Pre-and Post-Excavation Survey*

Earth Tech retained C.T. Male of Latham, New York to perform all the site survey work. The site survey consisted of laying out excavation locations by identifying the outer boundaries of excavations. Each of the excavation areas outside of the main excavation area, Area-1, were located by taking the original sample location that exceeded cleanup objectives and measuring a 25' radius around the sample location. In addition, at the bottom of all non-anomaly excavations, a 10' x 10' grid was established for sampling. Once the excavation depths were achieved, C.T. Male would survey the bottom elevations at the 10' grid locations. In the Area 1 excavation, which encompassed most of the anomaly excavations, the same 10' grid pattern was established for excavation of the 2' cut across the entire area as well as the surveying of the anomaly excavation locations. Anomaly areas that contained no drum pieces or displayed no signs of contamination were not surveyed. The pre-excavation location survey and post-excavation location survey are provided as Figure 2-1 and 2-2.

2.4 SOIL EXCAVATION

As identified in the RAWP there were four (4) locations that required removal outside the main anomaly area. Areas SB-E4, S40-SB-20, S40-SB-19, and SB-B6 were excavated to the depths as outlined in the RAWP. Earth Tech excavated the locations as shown on Figure 2-1. The surveyed locations were excavated to a depth of approximately 2 to 8 feet based on historic sampling events and as depicted on Figure 2-1. These areas were excavated to remove soils from a predetermined depth and a 25-foot radius around the historical "hot" sampling locations. Figure 2-2 shows the post excavation survey depths. Additional excavation may have been required based on post-excavation sampling results. Each excavation is described below.

Earth Tech constructed one (1) stockpile management area on the west side of the Area 1 excavation location. The stockpile management area was constructed by grading the existing area, placing a layer of sand and a 20-mil liner on top of the sand. Berms were constructed around the perimeter of the stockpile area, except for the east side of the stockpile area which was contiguous with the Area 1 excavation. Excavated contaminated soil was also stockpiled on existing contaminated soil on the west side of Area 1. The stockpiles were covered with polyethylene sheeting and heavy duty tarps to control migration of dust and to prevent rainwater from coming in contact with soil. Representative photographs of soil staging areas are shown in the attached Photographic Log in Appendix B.

2.4.1 SB-E4 Soil Removal

The SB-E4 soil impacts were identified during the Earth Tech, 2002 field work. The investigation identified arsenic contamination at the 2-4' interval with a concentration of 735 ppm total arsenic. Earth Tech excavated this location to a depth of 4' at a 25' radius around the original sample location. The excavated soil was transported to the stockpile management area using an off-road articulated dump truck. Once the area was excavated, the bottom of the excavation and sidewalls were sampled in accordance with the RAWP. The sampling consisted of taking samples at a 10' x 10' grid across the bottom of the excavation and sidewall samples every 15 linear feet along the perimeter of the excavation. The summary results are provided in Table 1 of this document. Two samples exceeded the cleanup objectives for arsenic of 500 ppm. SB-E4-C4 and SB-E4-SW-03 had detectable concentrations of arsenic reported at 1,020 ppm and 542 ppm, respectively. See Figure 2-3 for SB-E4 sampling locations. The protocol for bottom sample exceedance was to excavate two additional feet of material half the distance to the next surrounding sampling points. This created an area on the bottom of the excavations that looked like a deeper square excavation that was 10' x 10'x 2'. The protocol for sidewall sample exceedances was to excavate deeper into the sidewall, again half the distance to the previous and next sample location. This created a sidewall re-excavation that was 15' long approximately 2' beyond the boundary of the original 25' radius.

Re-samples were designated with the same nomenclature as the original samples, however a RE- prefix was added to the sample identification. If a sample location required multiple re-samples, the prefix would become RE-II and if needed RE-III. No sample locations required additional analysis beyond three re-samples.

The results of the re-samples for RE-SB-E4-C4 and RE-SB-SW-03 were reported at 226 ppm and 364 ppm, respectively. These sample results met the cleanup objectives of the project. Sample results are provided in Table 1. Copies of analytical results are provided in Appendix C.

2.4.2 S40-SB-20 Soil Removal

The S40-SB-20 sample location was from a historic sampling event (ROUX, 2001) at the southeast corner of the mounded area. The historic sampling location had an arsenic concentration of 1,020 ppm at a depth of 5-7'. Earth Tech excavated the overburden soil and stockpiled the soil adjacent to the excavation. This soil was sampled for arsenic to ensure that it also met the cleanup objectives. There were four overburden samples collected OB-1 – OB-4 to insure the reuse of the overburden material would meet the cleanup objectives. The results were OB-01 at 123 ppm, OB-2 at 51.5 ppm, OB-3 at 91.1 ppm and OB-4 at 112 ppm of arsenic. From an elevation of approximately 4'-8' below grade, Earth Tech excavated and transported soil to the stockpile management area using the off-road articulated dump truck. During excavation of this area Earth Tech observed some discolored soil (purple staining). The discolored soil was removed from both sidewall locations and the bottom of the excavation prior to sampling. The sampling strategy for this excavation was the same as described in the previous section;

however, the sidewalls were sampled at two different intervals, a shallow sidewall and a deep sidewall, due to the depth of the excavation. See Figure 2-4 for S40-SB-20 sampling locations.

Arsenic levels did not exceed the cleanup objectives in any of the post-excavation sample results for S40-SB-20. Sample results are provided in Table 1. Copies of analytical results are provided in Appendix C.

2.4.3 S40-SB-19 Soil Removal

The S40-SB-19 sample location was from a historic sampling event (ROUX, 2001) at the southeast corner of the mounded area. The historic sampling location had an arsenic concentration of 836 ppm arsenic at a depth of 0-2'. Earth Tech excavated the soil from 0-2' and transported to the stockpile management area.

The post-excavation samples had two samples exceed the cleanup objectives, SB-19-B1 and SB-19-C2, at 555 ppm and 609 ppm for arsenic, respectively. These two locations were re-excavated and re-sampled. The results for RE-SB-19-B1 and RE-SB-19-C2 were 879 ppm and 675 ppm, respectively. The area was excavated again using the previously described re-excavation strategy and re-sampled. The RE-II-SB-19-B1 and RE-II-SB-19-C2 results were 323 ppm and 442 ppm arsenic, respectively, which meet the cleanup objectives. Sample results are provided in Table 1. Copies of analytical results are provided in Appendix C. See Figure 2-5 for S40-SB-19 soil sampling locations.

2.4.4 SB-B6 Soil Removal

The SB-B6 sample location was identified during the Earth Tech, 2002 field work. This area was located just to the north of the mounded area and the historical sample location originally had an arsenic concentration of 524 ppm at the 0-2' interval. The 0-2' interval was excavated and soil was transported to the stockpile management area. The post excavation samples did not exceed the site cleanup objectives for arsenic. Sample results are provided in Table 1. Copies of analytical results are provided in Appendix C. See Figure 2-6 for SB-B6 soil sampling locations.

2.4.5 Area 1 Soil Removal

The Area 1 soil excavation was approximately 170' long by 100' wide and 2 feet deep and encompassed almost all of the anomaly areas that contained drum carcasses and fragments except for one location. Earth Tech removed a 2' cut of soil from the Area 1 excavation. This soil was staged on the eastern portion of the Area 1 excavation area. No liner system was placed under this soil due to the fact that the soil was being staged on contaminated soil. The soil piles were covered at night and during periods of inactivity.

The sampling strategy for Area 1 followed the same plan as the previous areas except when some of the anomaly areas overlapped the Area 1 soil sampling locations. In these cases, the Area 1 sampling locations became part of the anomaly sampling strategy. The anomaly sampling strategy is explained in Section 2.5. The sampling grid for Area 1 consisted of a 10' x 10' grid with one axis identified by the A-J nomenclature running north to south and the other axis identified by the 1-18 nomenclature running west to east. Table 2 summarizes the sampling data for Area 1. Copies of analytical results for Area 1 are provided in Appendix D. See Figure 2-7 for Area 1 soil sampling locations.

There were 23 samples that exceeded the cleanup objectives for arsenic. Each area was re-excavated and then re-sampled until the cleanup objective was achieved, or the sample became part of an anomaly excavation area. Two locations were excavated to the groundwater table (Area 1-B-09 and Area 1-B-10). Additional sidewall (SW) samples were collected on the eastern and southern boundary of Area 1 to account for the excavation expanding in the upper 2' and on the boundary of the anomaly areas in the upper 2' excavation.

2.5 ANOMALY EXCAVATION REMOVAL

Based on the updated magnetic survey performed prior to excavation activities, there were 24 anomaly locations that needed to be explored to determine if the anomaly area contained drums, drum fragments or drum carcasses. Earth Tech assigned a numeric number to each anomaly area (Figure 2-8). Based on the change of conditions of having 24 anomaly areas instead of 4 anomaly areas, Earth Tech proposed an alternate sampling strategy to the NYSDEC (letter dated August 25, 2004, Provided in Appendix E) which was accepted and implemented.

Anomaly Locations:

Case 1) Areas with no drum pieces or carcasses – These areas were excavated to groundwater or lower and only metal from angle iron, pipes, or sheet metal were identified. These areas exhibited no olfactory or visual signs of contamination. These areas were not sampled and were backfilled with the same soil that was removed from these anomaly locations, unless the area was part of the original 2' excavation of Area 1, in which case they were sampled and the samples analyzed for arsenic. Earth Tech segregated the metal from the soil and staged the metal separately. Pictures were taken to document the excavation locations.

Case 2) Areas with drum pieces, fragments – These locations were excavated to the base of the mounded area or deeper to remove any drum fragments or pieces. These areas contained no visual or olfactory signs of contamination. These areas were sampled and the samples analyzed for arsenic at the described frequency using the 10-foot grid system and on the sidewalls. These areas were documented in field notes regarding the materials found, and photographs were taken for the photographic log. These areas were backfilled with clean soil and a notification layer was installed in conformance with the RAWP.

Case 3) Areas of olfactory and/or visual contamination – Earth Tech identified three (3) areas of olfactory and/or visual impacts. Each area was documented as to the type of odor found and the number of carcasses removed. The carcasses encountered were all decayed to some extent. Most carcasses are littered with holes and have accumulated surface water or groundwater. In areas where olfactory and/or visual contamination was evident, soil samples were collected and analyzed for TCL Volatiles +10, TCL Semi-Volatiles+20, TCL Metals.

Some anomaly areas were excavated below the groundwater table due to drum pieces, fragments, and olfactory and/or visual contamination. In these cases, only sidewall samples were collected and no bottom samples were obtained. A summary of each anomaly area is provided below:

ANOMALY ID	DESCRIPTION OF ANOMALY
Anomaly #1 (AN-01)	Case 3 - Approximately 12 drum carcasses. Encountered groundwater at approximately 2'below ground surface. The excavation contained a sweet odor. The excavation was advanced below groundwater so only sidewall samples were collected. The drum carcasses were encountered beneath the groundwater. The excavation was sampled for VOCs, SVOCs and Metals.
Anomaly #2 (AN-02)	Case 1 - Metal debris (pipe) found in excavation, not sampled. Excavation was backfilled with soil removed from excavation.

Anomaly #3 (AN-03)	Case 2 - Approximately 15 drum carcasses. No odor or visual contamination was observed, no groundwater was encountered. Excavation was sampled along the sidewalls and floors for arsenic.
Anomaly #4 (AN-04)	Case 1 - Excavated a large piece of scrap steel at approximately 6' below grade. No samples were collected and excavation was backfilled with soil removed from excavation.
Anomaly #5 (AN-05)	Case 2 – The northeast part of the anomaly contained building debris, concrete, steel pipe, angle iron and some pieces of hose. In the northeast part of anomaly approximately 6 drum carcasses were removed. No odors or staining was observed. Floors and sidewalls of the entire excavation were sampled for arsenic.
Anomaly #6 (AN-06)	Case 2 - Approximately 4 drum carcasses were removed along with pipe, concrete, angle iron and other debris. No odors or staining was observed. Floors and sidewalls sampled for arsenic.
Anomaly #7 (AN-07)	Case 3 - The northeast edge of the excavation contained building debris. The northwest edge of the excavation contained approximately 4 metal drum carcasses and 3 plastic drum carcasses. The excavation was observed to have an almond odor. The northwest portion of the excavation was sampled for VOC, SVOC and metals. The northeast portion of the excavation was sampled for arsenic. The bottom of the excavation was advanced to groundwater.
Anomaly #8 (AN-08)	Case 2 - Approximately 15 metal drum carcasses were removed from the excavation. The carcasses were encountered below groundwater. The metal was removed and the groundwater was pumped from the excavation during removal and stored in the frac tank. The sidewalls were sampled for arsenic. No odors or staining was observed in the excavation.
Anomaly #9 (AN-09)	Case 2 - Approximately 4 drum carcasses were removed. The excavation also contained a large piece of scrap metal. Excavation was dug to groundwater, therefore only sidewall samples were collected and tested for arsenic. No odors or staining was observed.
Anomaly #10 (AN-10)	Case 1 - Miscellaneous debris was removed. No drum carcasses, staining or odor was observed. The excavation was not sampled and it was backfilled with the soil that was excavated. The debris was removed and staged on the side of the excavation.
Anomaly #11 (AN-11)	Case 1 - Same as Anomaly 10. Excavation not sampled. Excavation was backfilled with soil removed during excavation.
Anomaly #12 (AN-12)	Case 1 - Same as Anomaly 10 and 11. Excavation not sampled. Excavation was backfilled with soil removed during excavation
Anomaly #13 (AN-13)	Case 2 - A piece of metal pipe was found in this anomaly location. The excavation was dug down to the groundwater table. Excavation for Anomaly 14 and Anomaly 13 became one excavation. Sampled for arsenic due to being in the two foot cut of Area 1.
Anomaly #14 (AN-14)	Case 2 - The northwest edge contained approximately 16 drum carcasses removed as part of this excavation. No odor or visual contamination was observed. The excavation was dug to just below the groundwater table. Only the sidewalls of the excavation were sampled for arsenic.
Anomaly #15 (AN-15)	Case 2 - Encountered blue soil, removed all the blue soil down to the groundwater table. The excavation was advanced to the south to remove all the blue soil. This was also the area where the blue trees had been observed. Blue trees were analyzed for VOCs and SVOCs and the results

	were non-detect for all constituents. No drums were encountered in the excavation. No visual or odor remained after excavation so only the sidewalls were sampled and analyzed for arsenic. This sampling approach was approved by the NYSDEC for this location.
Anomaly #16 (AN-16)	Case 2 – Approximately 3 drum carcasses were removed from this excavation. No odor or visual contamination was observed. The excavation was completed to below groundwater table. Only the sidewalls were sampled and analyzed for arsenic.
Anomaly #17 (AN-17)	Case 1 - Three steel reinforced concrete pieces were encountered in the anomaly area. The excavation was completed to groundwater. No odor or visual contamination was observed. Excavation was not sampled. This anomaly was part of the 2' cut required in Area 1.
Anomaly #18 (AN-18)	Case 2 - Approximately 12 drum carcasses were excavated. No odor or visual contamination was observed. Both floor and sidewall samples were collected and analyzed for arsenic.
Anomaly #19 (AN-19)	Case 3 - Largest of the anomaly areas, removed approximately 75 drum carcasses. This area appeared to be the source area of the blue dye. This area was under the trees that were cut down during clearing and grubbing and where the inside of one of the trees was blue. Anomaly 19 encompassed most of the southwest corner of Area 1 and many of the samples for Area 1 were eliminated due to the anomaly excavation being over this area. All the drum carcasses were deteriorated and did not contain anything but groundwater. Groundwater was pumped to frac tank for storage. Excavation of anomaly area was to groundwater so no bottom samples were collected. Sidewall samples were sampled for VOCs, SVOCs and Metals.
Anomaly #20 (AN-20)	Case 1 - Only metal debris found in anomaly excavation. Metal debris consisted of rebar and small metal fragments. Metal was removed and staged prior to backfilling with soil removed from excavation. No odors or visual contamination observed. No samples were collected
Anomaly #21 (AN-21)	Case 1 - Only metal debris found. Metal debris consisted of rebar and small metal fragments. Metal was removed and staged prior to backfilling with soil removed from excavation. No odors or visual contamination observed. No samples were collected.
Anomaly #22 (AN-22)	Case 1 - A 3' section of pipe was encountered near the surface. Excavation was dug to groundwater. No odor or visual contamination was observed, no samples were collected. The anomaly was backfilled with the same soil that was excavated.
Anomaly #23 (AN-23)	Case 2 - Approximately 12 drum carcasses were encountered along with miscellaneous scrap metal and construction debris. Excavation depth was to 2' below groundwater. No odors or visual contamination observed. Sidewall samples were collected for aresenic.
Anomaly #24 (AN-24)	Case 2 - Approximately 4 drum carcasses, miscellaneous scrap metal and construction debris was encountered. Excavation depth was to 4' below water table. No odors or visual contamination observed. Sidewall samples were collected for arsenic.

The results of the anomaly excavation and analysis demonstrate that low concentrations of arsenic-contaminated soil remain in Area 1 and the anomaly areas. The sampling of the anomaly areas that contained VOCs show low levels of VOCs remaining; however, many of the excavations were dug to groundwater. Earth Tech removed soil below the groundwater table to ensure that even additional saturated soils were removed that may have VOCs present. Approximately 185 drum carcasses were removed from the anomaly areas. None of the drums encountered were intact and most were deteriorated to the point that the drums fell apart as they were unearthed. Table 3 provides a summary of analytical results. Copies of analytical results for the anomaly area are provided in Appendix F.

Figure 2-9 provides an overlay of the magnetic survey and the actual anomaly excavation locations to show anomalies were excavated. A number of the smaller anomalies shown on Figure 2-9, that were addressed, are not labeled because these were just metal debris such as one length of rebar or small pieces of metal and were backfilled.

Figure 2-10 shows samples locations of the Area 1. The sample locations within the anomaly areas shown in Figure 2-10 were not sampled as part of the sampling of Area 1 because these areas were excavated below the Area 1 depths.

2.6 DEWATERING OF EXCAVATION AREAS

2.6.1 Dewatering During Remedial Work

The only dewatering that was required was during the anomaly excavations. None of the outlying areas required dewatering during the excavation of the arsenic-contaminated soil. A number of the anomaly areas were excavated below the groundwater table to remove all the drum carcasses and drum fragments. When excavations reached the groundwater level, water was pumped with a 2" submersible pump to the on-site frac tank for storage. This dewatering was required to maintain a dry working area and facilitated the removal of the drum carcasses.

2.6.2 Dewatering of Excavations Prior to Backfilling

There was significant infiltration of groundwater into the deeper excavations during idle work periods. Earth Tech spoke with the NYSDEC project management about discharging the recharged water to the ground surface on top of the mounded area. This water management plan was approved by the NYSDEC and implemented using a 3" trash pump and a 2" submersible pump. The water was pumped onto the mounded area and discharged on the surface. Once the water in the excavations was at the lowest point, the remaining water was pumped to the frac tank. The excavations were dewatered in sequence to allow for backfilling of the deeper excavation prior to their filling back up with groundwater. See Appendix G for copies of water analytical results.

2.7 BACKFILL

Upon completion of the excavation areas outside of Area 1, these areas were lined with the notification layer consisting of geotextile fabric and orange safety fence. The excavated areas were then backfilled with certified clean sand. The sand was compacted in lifts up to the final grade. The Area 1 and anomaly excavation were backfilled a little differently because of the number of holes present in the area and the difficulty in trying to place the notification layer. As the purpose of the notification layer is to distinguish the new materials from the existing materials, and the existing materials will be subject to a soil management plan, Earth Tech conservatively backfilled each anomaly area up to 2' below the original elevation. Once the –2' elevation was achieved, the notification layer was placed and the remaining two feet of clean material was placed and compacted. The deeper excavations were compacted with the excavator and a ramp was created. Once a workable slope was achieved, the area was rolled with the compactor. Earth Tech imported approximately 5,000 cubic yards of material for backfilling the excavations.

The analytical results for the certified clean backfill are provided in Appendix H.

2.8 COMMUNITY AIR MONITORING PROGRAM

2.8.1 Real-Time Air Monitoring – Volatile Organic Compounds

Real-time air quality data for volatile organic compounds (VOCs) was collected during excavation activities from one upwind and two downwind perimeter monitoring stations established by Earth Tech. Each station was located near the perimeter of the work site. The monitoring stations were positioned based on the predominant wind conditions. If wind conditions changed during the day, the monitors were relocated. Real-time monitoring began at the start of each workday when intrusive activities commenced. Real-time monitoring was accomplished using a total volatile organic analyzer equipped with a photo ionization detector (PID) and a 10.6-eV lamp, which was calibrated daily with a 100-ppm isobutylene air standard. Monitoring instruments were set up by pointing the intake tube of the PID toward the likely emission source, generally at the height of the breathing zone (4 to 5 feet). The instruments were monitored during the course of the day and data downloaded at the end of the work shift. Monitoring location, wind direction, weather conditions and site activities were also recorded.

Based on data published by OSHA (Occupational Safety and Health Administration), ACGIH (American Congress of Government Industrial Hygienists), and NIOSH (National Institute for Occupational Safety and Health), short-term air quality action levels were established for air emissions control at the site perimeter. An action level for VOCs at the site perimeter was established at 5.0 ppm above background. Background for VOCs was established prior to any remedial activities conducted on site.

No detectable concentrations of VOCs were recorded for the upwind perimeter monitoring location or the downwind perimeter monitoring location. VOC levels did not exceed the short-term air quality action level of 5.0 ppm above background at either the upwind or downwind perimeter monitoring locations. Because the short-term action level was not exceeded, no actions were taken as part of the Vapor Emissions Response Plan.

2.8.2 Real Time Monitoring – Total Suspended Particulates

In conjunction with the real-time volatile emission monitoring, real-time air quality data for total suspended particulate was collected during excavation activities from one upwind and two downwind perimeter monitoring stations established by Earth Tech. Real-time monitoring began at the start of each workday when intrusive activities commenced. The instrument used for this sampling was an MIE DataRam PDR-1000, which is a passive instrument that operates on the principle of light scattering. The DataRam PDR-1000 responds to particles in the size range of 0.1 to 10 micrometers and in the concentration range of 0.01 to 400 mg/m^3. Real-time particulate measurements were based on a 15-minute, time-weighted average. The DataRam was calibrated daily with a zero bag. Monitoring instruments were set up near the perimeter of the site toward the likely emission source, generally at the height of the breathing zone (4 to 5 feet). The instruments were monitored during the course of the day and data downloaded at the end of the work shift.

A New York State action level of 150 μg/m^3 per 15-minutes for particulate matter above background was used to determine whether modifications to given processes were required. Background for total suspended particulate was established prior to the start of each workday when intrusive activities were to occur.

On August 11, 2004, the background for total suspended particulates was established for the site. The New York State action level of 150 $\mu g/m^3$ plus the site daily 15-minute average were added together to establish the site-specific action level of 192 $\mu g/m^3$. During the course of the daily construction activities one of the monitors was located on the northwest side of the site. Excavation was occurring at the SB-B6 location using an excavator and an off-road articulated dump truck. The dump truck drove by the air monitor between 12:15 and 12:30. The dust generated from the dump truck displayed 249 ug/m^3 for that fifteen-minute interval. The monitor was relocated farther away from the active work area yet still within the boundaries of the site. There were no other exceedances observed throughout the project.

Earth Tech confirmed this by monitoring instruments through the course of the day and recording observations that coincided with real-time measurements.

2.9 WORK ZONE AIR MONITORING PROGRAM

On days when intrusive activities occurred, Earth Tech conducted work zone air monitoring for VOCs. Based on data published by OSHA (Occupational Safety and Health Administration), ACGIH (American Congress of Government Industrial Hygienists), and NIOSH (National Institute for Occupational Safety and Health), a short-term air quality action level for VOCs at the work area was established at 5.0 ppm above background. Site background for VOCs was established to be zero (discussed in the previous section), therefore, the site-specific action level for the work zone was 5.0 ppm. No concentration of VOCs recorded for work zone monitoring exceeded the site-specific action level. Because the short-term action level was not exceeded, no actions were taken as part of the site Health and Safety Plan.

2.10 DECONTAMINATION

The tires, tracks, undercarriages, and excavation buckets of all construction equipment (excavator, ASV, roller and dozer) and tools that entered the remediation area were decontaminated within the decontamination pad. Decontamination procedures include the physical/mechanical removal of soil, etc., including high-pressure washing. During bulk removal the equipment was placed on poly to capture all the heavy soils. These soils were added to the final small stockpile. All decontamination fluid was collected in the sump and pumped to the frac tank for storage. After all excavation and other equipment was decontaminated, the frac tank was pumped down to the lowest level and all solids were vacuumed out using a vacuum truck. The interior of the tank was powerwashed clean and remaining fluids were removed prior to the tank leaving the site.

Trucks transporting excavated soil off site were always on the stone road that was installed around the site. The excavator would load directly into the trucks. Any spilled material would be swept off the truck or shoveled off the road. Care was exercised when loading trucks to not spill material on the outside of the trucks and onto the ground surface. Prior to leaving the site, trucks were visually inspected (i.e. box sidewalls, box tailgate, and tires, etc.) and cleaned as required. In addition, trucks were tarped prior to leaving the site.

2.11 DEMOBILIZATION

As part of demobilization activities, Earth Tech subcontracted the cleaning and final pumping of the frac tank. All equipment was properly decontaminated and demobilized from the site. The on-site trailer, trash container and all tools were removed from the site. Also, Earth Tech added some additional stone to the access road to repair any ruts from the trucks delivering the backfill.

2.12 WASTE MANAGEMENT

Over the course of the remediation, Earth Tech characterized seven (7) samples for full TCLP parameters as required and in compliance with the disposal facilities' waste characterization procedures. Waste characterization samples were taken as a composite of a certain portion of a soil pile created from the remediation activities.

Based on the analytical results, all soils excavated from the site were disposed of as RCRA non-hazardous soil. Approximately 7,073.9 tons of soil was generated from remediation activities, transported, and disposed offsite. Earth Tech provided manifesting and transportation of all non-hazardous regulated soil generated from excavation activities in accordance with Federal Department of Transportation (DOT) regulations 49 CFR 172. The soil was transported to Town of Colonie Landfill (5,599.82 Tons) and City of Albany Landfill (1,474.08 Tons) under a standard non-hazardous manifest. See Appendix I for copies of non-hazardous waste manifests to Town of Colonie Landfill and Appendix J for copies of the manifests to City of Albany Landfill.

Earth Tech disposed of approximately 16,305 gallons of water. The water was shipped off-site under a standard non-hazardous manifest for liquid wastes because water removed during excavation activities was transported to the Mobil Oil facility in the Port of Albany for treatment. Non-Hazardous water manifests are provided in Appendix K.

3.0 CONCLUSIONS AND RECOMMENDATIONS

With the removal of 7,073.9 tons of soil and approximately 185 drum carcasses in the anomaly areas, the goals of the remedial action have been satisfied. The removal of the anomaly areas and the contaminated soil around the anomaly locations vastly improve the current site conditions. Historically, the anomaly area contained the highest concentration of arsenic in soils. The remediation, although larger than originally planned, reduced the overall mass of arsenic substantially. The original plan called for removal of approximately 4,565 tons of soil; Earth Tech removed a total of 7,073.9 tons of soil, an increase of greater than 50%. Based on all the analysis performed, it is clear that volatile organic compounds are only in isolated areas and remain at low concentrations. The fact that arsenic does not leach in the present chemical form and that the volatile organic contaminant concentrations are low, it does not appear that groundwater will be impacted in the future. The Site will continue to be protected by a Soil Management Plan that will be implemented whenever intrusive activities are performed.

If the redevelopment of the South 40 does not take place within twenty-four (24) months of completion of the remedial excavation, either the placement of a minimum of one (1) foot of clean cover with a demarcation layer, or the commencement of the construction of BEDCO's proposed power generating facility over all areas identified at the Site with arsenic concentrations in excess of NYSDEC TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs).

TABLES

TABLE 1
Summary Analysis of Hot Spot Locations

Total Arsenic Results

BASF - SOUTH 40
January 2005

BOTTOM SAMPLE LOCATIONS	A2	A3	A4	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5	E2	E3	E4
SB-19	393	321	212	**555**	364	357	143	159	438	**609**	377	345	174	314	483	123	311	389	380	297	338
RE-SB-19				**879**						**675**											
RE-II-SB-19				323						442											
SB-20	24.2	53.4	317	70.2	24.7	170	334	285	238	61.9	40.4	202	204	277	152	156	160	221	60.2	128.	454
SB-E4	8.32	5.78	126.	37.0	16.2	73.5	313.	20.7	30.2	20.0	38.6	**1020**	34.2	95.4	29.4	193	212	10.3	9.66	14.4	65.5
RE-SB-E4												226									
SB-B6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	8.30	ND	ND	ND	ND	8.76	ND	ND	ND

SIDEWALL SAMPLE LOCATIONS	SW-01	SW-02	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-17	SW-18	SW-19	SW-20	
SB-19	277	361	81.7	14.0	299	281	246	284	303	220											
SB-20	109	32.8	58.3	26.7	34.4	254	111	172	60.1	46.7	55.4	99.4	44.5	51.2	126	190	235	239	152	168	
SB-E4	154	50.2	**542**	35.8	195	431	70.0	108	99.9	260											
RE-SB-E4			364																		
SB-B6	<5.16	<4.92	<5.19	<5.04	<5.12	<5.22	30.7	<5.04	21.6	<4.94											

Notes:
All sample results are reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
Bold Type - Sample result exceeds site cleanup objective of 500 ppm.
RE= Re-sampled after additional excavation
ND = Not detected
All bottom sampling locations follow the same pattern, the original sample point is at the center of the 25' radius, all points are generated away from this point (C5).
Due to the depth of SB-20 (8.0') the sidewall samples were collected at 7.5' intervals, alternating shallow then deep sample around the perimeter of the excavation.
All other sidewall samples were collected at a 15.0' interval along the perimeter of the excavation.

Table 2

Summary Analysis of Area 1

BASF - South 40
March 2005

BOTTOM SAMPLE LOCATIONS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Area-1-A	67.7	XXXXX	XXXXX	XXXXX	333	132	XXXXX	323	418	446	159	284	285	189	59.8	**666**	XXXXX	**575**
RE 1-A																43.3		21.7
Area-1-B	XXXXX	XXXXX	XXXXX	XXXXX	342	XXXXX	232	440	**572**	**528**	280	105	143	68.5	106	322	XXXXX	287
RE-B									Ex to GW	**639**								
RE-II-B										Ex to GW								
Area-1-C	XXXXX	XXXXX	XXXXX	XXXXX	32.2	XXXXX	150	48.8	XXXXX	XXXXX	59.5	75.6	446	273	108	270	XXXXX	**746**
RE-C																		371
Area-1-D	ND	22.5	ND	XXXXX	10.5	157	10.7	18.4	XXXXX	52	147	163	308	163	296	**644**	XXXXX	ND
RE-D																**1020**		
RE-II-D									33							33		
Area-1-E	ND	ND	ND	10.3	11.9	5.79	6.38	43	10.4	313	454	50	15.5	212	160	304	XXXXX	81.4
Area-1-F	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	47.3	8.14	131	494	394	149	485	**730**	241	16.1	**598**	XXXXX	173
RE-F													38.7			409		
Area-1-G	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	401	XXXXX	XXXXX		120	43.8	273	179	XXXXX	76.1
Area-1-H	6.1	XXXXX	ND	76	XXXXX	XXXXX	XXXXX	XXXXX	367	XXXXX	XXXXX	83.6	352	144	197	52.9	XXXXX	43.1
Area-1-I	37.2	15.2	12.3	73.6	XXXXX	XXXXX	XXXXX	XXXXX	**987**	XXXXX	XXXXX		**1880**	484	229	**697**	XXXXX	359
Re-I									Ex w/AN19				47			44.8		
Area-1-J	17.5	25.6	48.4	38	XXXXX	XXXXX	XXXXX	XXXXX	447	XXXXX	XXXXX	**555**	87.7	458	**653**	26.8	XXXXX	**554**
RE-J												59.7			472			97.6
ADDITIONAL SIDEWALL SAMPLE LOCATIONS	SW-01	SW-02	SW-03	SW-04	SW-05	SW-06	SW-07	SW-08	SW-09	SW-10	SW-11	SW-12						
AREA 1	245	415	**654**	111	84.7	397	173	**1180**	**534**	**861**	29.8	**1240**						
RE			**636**					148	41.5	1270		296						
RE-II			Ex w/An-03							131								

XXXXX indicates no samples collected because sample location fell within excavated anomaly area. Sample location became part of anomaly sampling plan.
Results are shown in milligrams per kilogram (mg/kg) or parts per million (ppm).
Bold Type - Sample result exceeds site cleanup goals of 500 ppm
Re = Re-sampled after additional excavation due to site specific exceedance
ND = Not detected
GW = Groundwater
AN = Anomaly

EarthTech

TABLE 3a
Summary Analysis of Anomaly Locations

Total Arsenic Results

BASF - South 40
January 2005

BOTTOM SAMPLE LOCATIONS	01	02	03	04	SIDEWALL SAMPLE LOCATIONS	SW-01	SW-02	SW-03	SW-04	SW-05	SW-06
AN-01	Excavated to groundwater				**AN-01**	151	81.9	75.9	4.33		
AN-03	157	193	217		**AN-03 T**	15.1	430	**612**			
					RE-AN-03 T			**1740**			
					RE-II-AN-03 T			419			
					AN-03 B	250	**530**	**697**			
					RE-AN-03 B		451	308			
AN-05	10.3	5.53	ND		**AN-05 T**	**555**	**1540**	**976**	**623**		
					RE-AN-05 T	NC	191	294	NC		
					AN-05 B	212	398	491			
AN-06	4.21				**AN-06 T**	**951**	255	**1230**	374		
					RE-AN-06 T	NC		NC			
					AN-06 B	**804**	31.2	310	277		
					RE-AN-06 B	NC					
AN-07	5.55	5.55	11.9	3.57	**AN-07 T**	NC	**766**	**748**	**522**	**1500**	**1250**
					RE-AN-07 T		NC	NC	NC	**1340**	NC
					RE-II-AN-07 T					125	
					AN-07 B	166	137	46.6	158	15.7	173
AN-08	Excavated to groundwater				**AN-08 T**	216	40.3	111			
					AN-08 B	232	96.3	132			
AN-09	Excavated to groundwater				**AN-09 T**	96.8	**918**				
					RE-AN-09 T		NC				
					AN-09 B	20.2	**893**				
					RE-AN-09 B		NC				
AN-13	Excavated to groundwater				**AN-13 T**	Not sampled. Removed by 2' cut of Area-1					
					AN-13 B	14.1	6.16				
AN-14	Excavated to groundwater				**AN-14 T**	282	238	364	12.8		
					AN-14 B	49.3	11.4	7.76	27.1		
AN-15	Excavated to groundwater				**AN-15 T**	Not sampled. Removed by 2' cut of Area-1					
					AN-15 B	ND	6.7	20			
AN-16	Excavated to groundwater				**AN-16 T**	333	83.3				
					AN-16 B	**535**	398				
					RE-AN-16 B	NC					
AN-18	48.8	16.8	28.7		**AN-18 T**	156	46.4	103	70.8		
					AN-18 B	355	41.8	46.9	88.2		
AN-19	Excavated to groundwater				See Table 3b for sidewall sample results						
AN-23	Excavated to groundwater				**AN-23 T**	ND	69.5				
						5.25	195				
AN-24	Excavated to groundwater				**AN-24 T**	320	**579**				
					RE-AN-24 T		**822**				
					RE-II-AN-24 T		220				
					AN-24 B	384	226				

Notes:
All sample results reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
Bold Type = Sample result exceeds site cleanup objective of 500 ppm.
T = Top of sidewall
B = Bottom of sidewall
RE = Re-sampled due to site specific exceedence
NC = Sidewall sample not collected because either top of sidewall was removed or entire sidewall was removed up to adjacent anomaly.
ND = Not detected

TABLE 3b
Summary Analysis of Anomaly Locations

Total Arsenic Results
Volatile and Semi-Volatile Results

BASF-South 40
January 2005

	Arsenic	Benzene	Chlorobenzene	Ethylbenzene	1,2-Dichloroethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichloroethylene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene	p&m-Xylene	o-Xylene	Tetrachloroethylene	Trichloroethylene	Acenaphthene	Aniline	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	4-Chloroaniline	4-Chloro-3-methylpheno	2-Chloronaphthalene	Chrysene	Fluoranthene	Fluorene	Ideno(1,2,3-cd)pyrene	Napthalene	Phenanthrene	Pyrene
Site Specific Cleanup Objective* (mg/kg or ppm)	**500**	**0.6**	**17**	**55**	**1**	**79**	**16**	**85**	**3**	**NL**	**34**	**12**	**12**	**14**	**7**	**500**	**1**	**500**	**2.24**	**0.61**	**11**	**500**	**11**	**2.2**	**2.4**	**NL**	**4**	**500**	**500**	**32**	**130**	**500**	**500**
SIDEWALL SAMPLE LOCATION																																	
AN-19																																	
SW-01B	ND																									0.37							
SW-02 B	ND																									0.75							
SW-03 B	ND																									1.01							
SW-04 B	9.63																0.67																
SW-05 B	41.1																									5.48					0.24		
SW-06 B	82.4																**1.45**		0.27	0.25	0.31						0.26	0.69				0.67	0.55
SW-07 B	65.4																							**3.22**		0.72							
SW-08 B	165																																
SW-09 T	308																																
SW-09 B	88																																
SW-10 T	84.1																																
SW-10 B	47.9																																
SW-11 T	160																																
SW-11 B	33.9																																
SW-12 T	340																																
SW-12 B	14								0.43(CIS)						0.012																		
SW-13 T	92																																
SW-13 B	7.89								0.110(CIS)						0.011											0.77							
SW-14 B	6.78								0.006(T), 240(CIS)					0.009	0.086																		
SW-15 B	18.2				0.011				0.004(CIS)				0.008		0.007											1.31							
SW-16 B	46.1	0.019	0.024	0.007	0.008				0.110(T), 2.1(CIS)			0.015	0.007	0.010	0.450											6.03							
SW-17 B	ND								0.019(CIS)																								
SW-18 B	27.7		0.006													0.22		0.84	1.19	**1.02**	1.28	0.35	0.62			0.43	1.07	3.21	0.31	0.38		2.51	2.33
SW-19 B	5.47																																
SW-20 B	ND																																
AN-01																																	
SW-01	**																																
SW-02	**																																
SW-03	**																																
SW-04	**																																
AN-07																																	
03	**		2.84			**487**	**18**	36.3																									
04	**	**25**				**5240**	**338**	**687**			4.82																						
SW-01 B	**																																
SW-02 T	**																											0.24					0.21
SW-02 B	**	0.005	0.002			0.057	0.004	0.005																									
SW-03T	**																																
SW-03 B	**																																

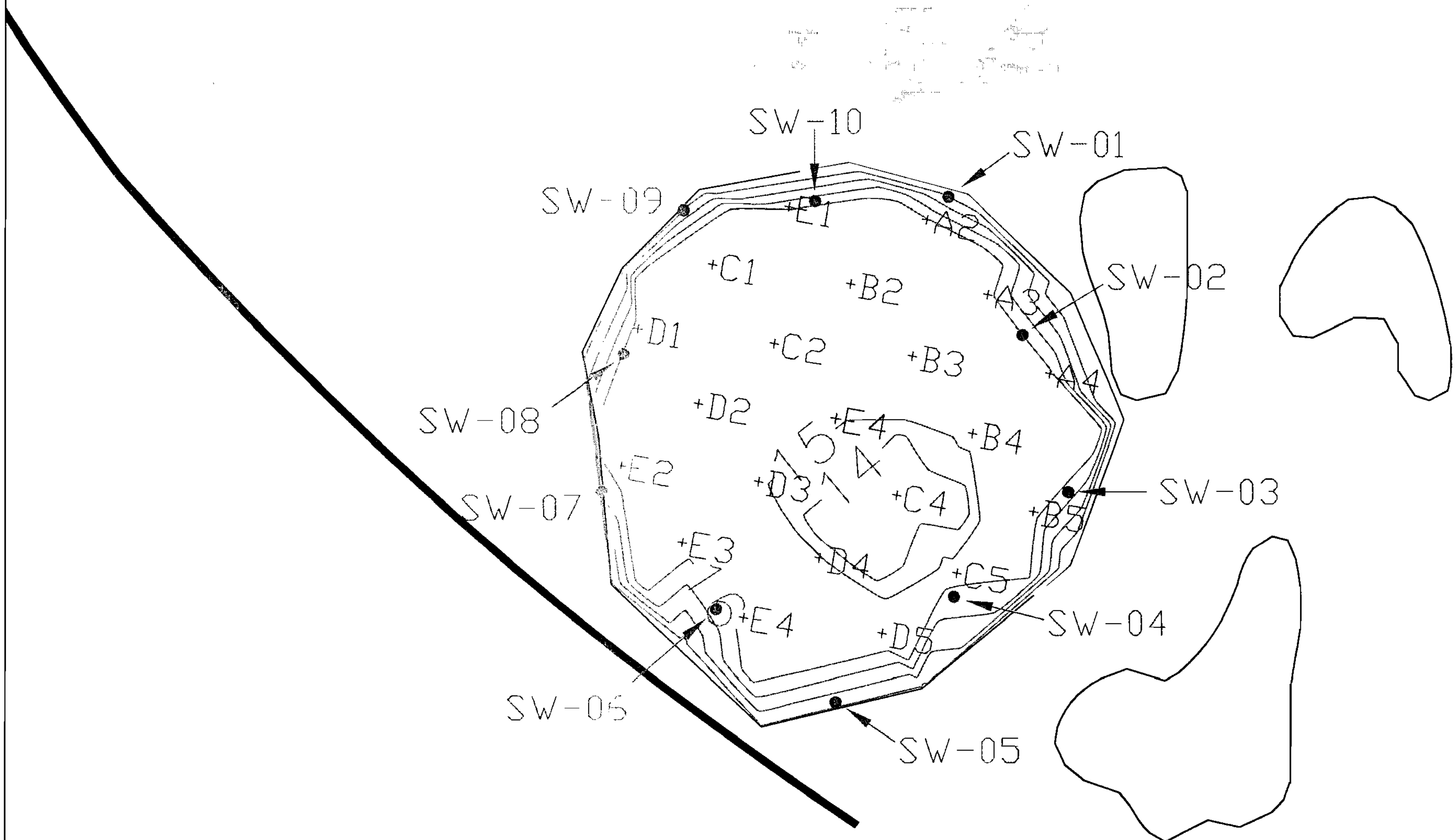
Notes:
All sample results reported in milligrams per kilogram (mg/kg) or parts per million (ppm).
Only sample results that were detected above the laboratory detection limit have been reported. All other sample results are non-detect.
Bold Type = Sample result exceeds site cleanup objective, however sample were collected below the groundwater table.
* = Site Specific Cleanup Objective are 10X greater than the NYSDEC Recommended Cleanup Objective (NYSDEC TAGM 4046, Jan. 1994) except for Arsenic - 500ppm.
** = See Table 3a *Summary Analysis of Anomaly Locations* for Total Arsenic result.
= AN-19 sidewall samples used to fullfill sidewall sampling stradegy for Area-1 Total Arsenic.
T = Top of sidewall
B = Bottom of sidewall

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY

FIGURES

NOTE: PHOTOGRAPH DATE: APRIL 14, 2000

EARTH TECH A tyco INTERNATIONAL LTD. COMPANY 40 British American Blvd. Latham, New York 12110	BASF PROPERTY AREAS SOUTH 40 SITE RENSSELAER, NEW YORK			FIGURE NUMBER 1 - 2
	DRAWN BY:	DATE:	PROJECT NUMBER:	SHEET NUMBER:
	LKE	12/30/04	60094	



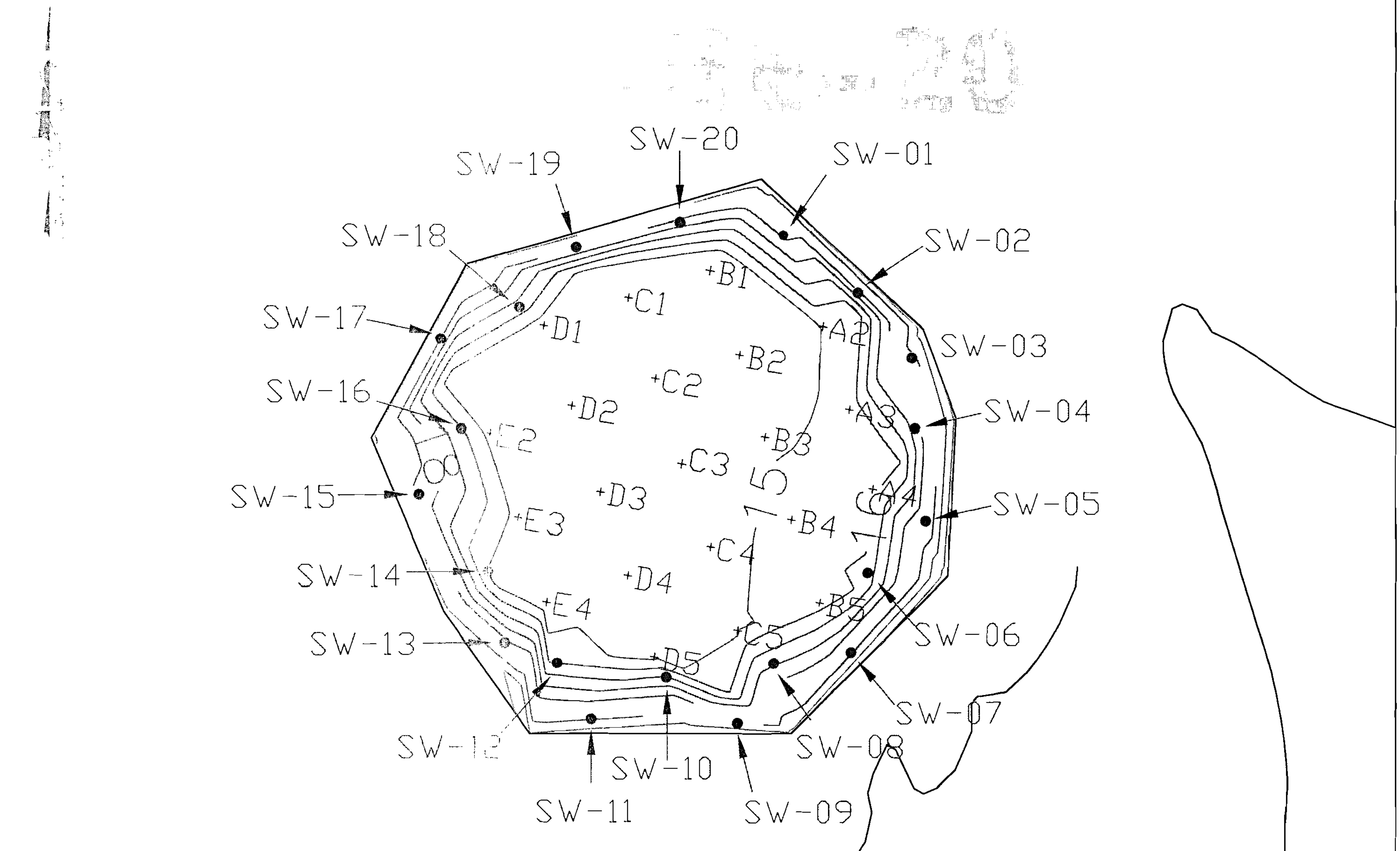
0 8' 16' 32'
SCALE IN FEET

EarthTech
A Tyco International Ltd. Company

SOIL EXCAVATION REMOVAL
SB-E4 SAMPLE LOCATIONS

BASF

SCALE	PROJECT NO: 76928	DATE: FEBUARY 2005	FIGU O 2-3

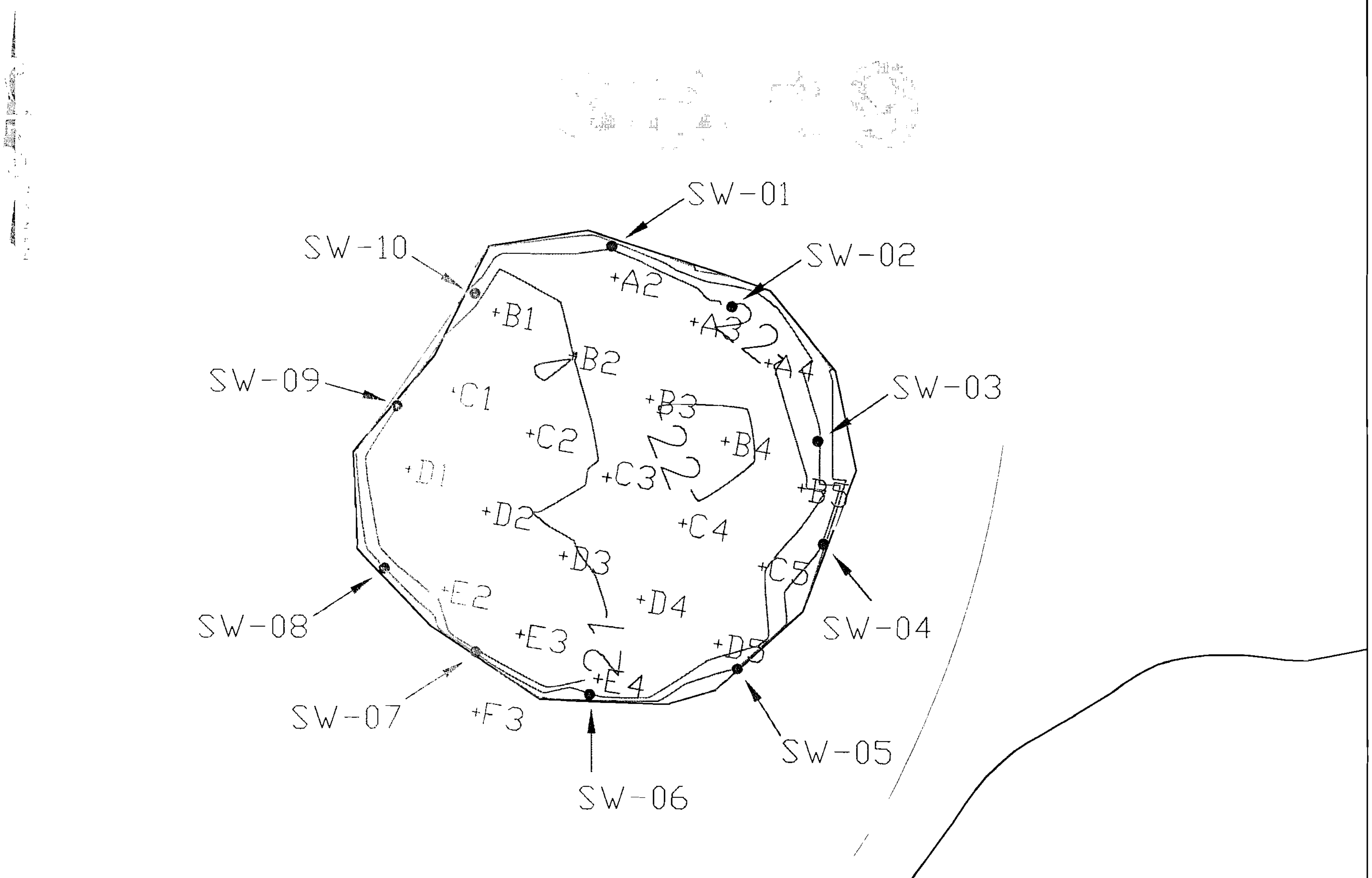


0 8' 16' 32'
SCALE IN FEET

EarthTech
A Tyco International Ltd. Company

SOIL EXCAVATION REMOVAL
S40-SB-20 SAMPLE LOCATIONS
BASF

SCALE 16'	PROJECT NO 76928	DATE · FEBUARY 2005	FIG NO 2-4

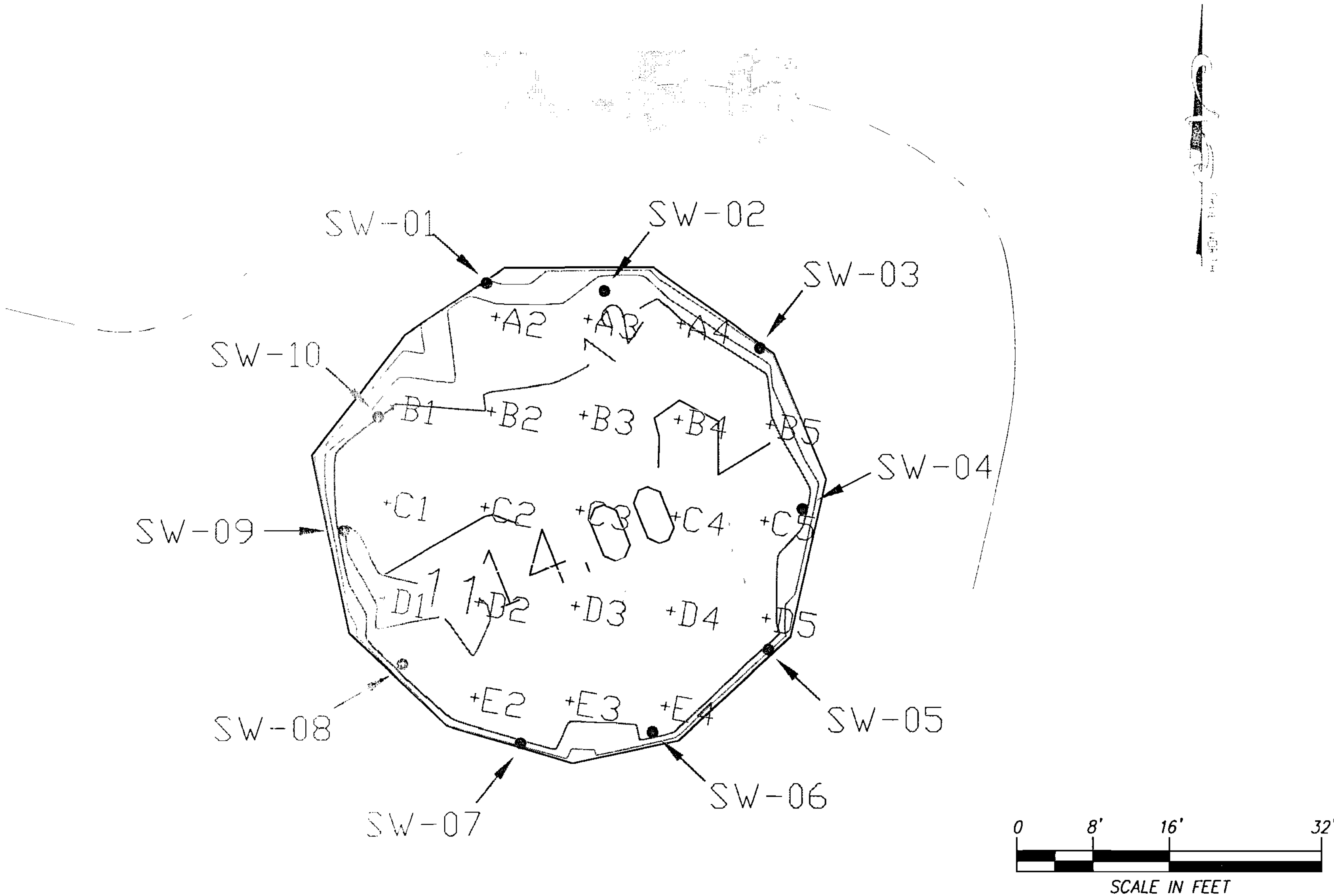


EarthTech
A Tyco International Ltd. Company

SOIL EXCAVATION REMOVAL
S40-SB-19 SAMPLE LOCATIONS

BASF

SCALE 16'	PROJECT NO : 76928	DATE FEBUARY 2005	FIGURE NO 2-5



EarthTech
A Tyco International Ltd. Company

SOIL EXCAVATION REMOVAL
SB-B-6 SAMPLE LOCATIONS

BASF

SCALE 6	PROJECT NO. 76928	DATE FEBUARY 2005	FIG NO 2-6

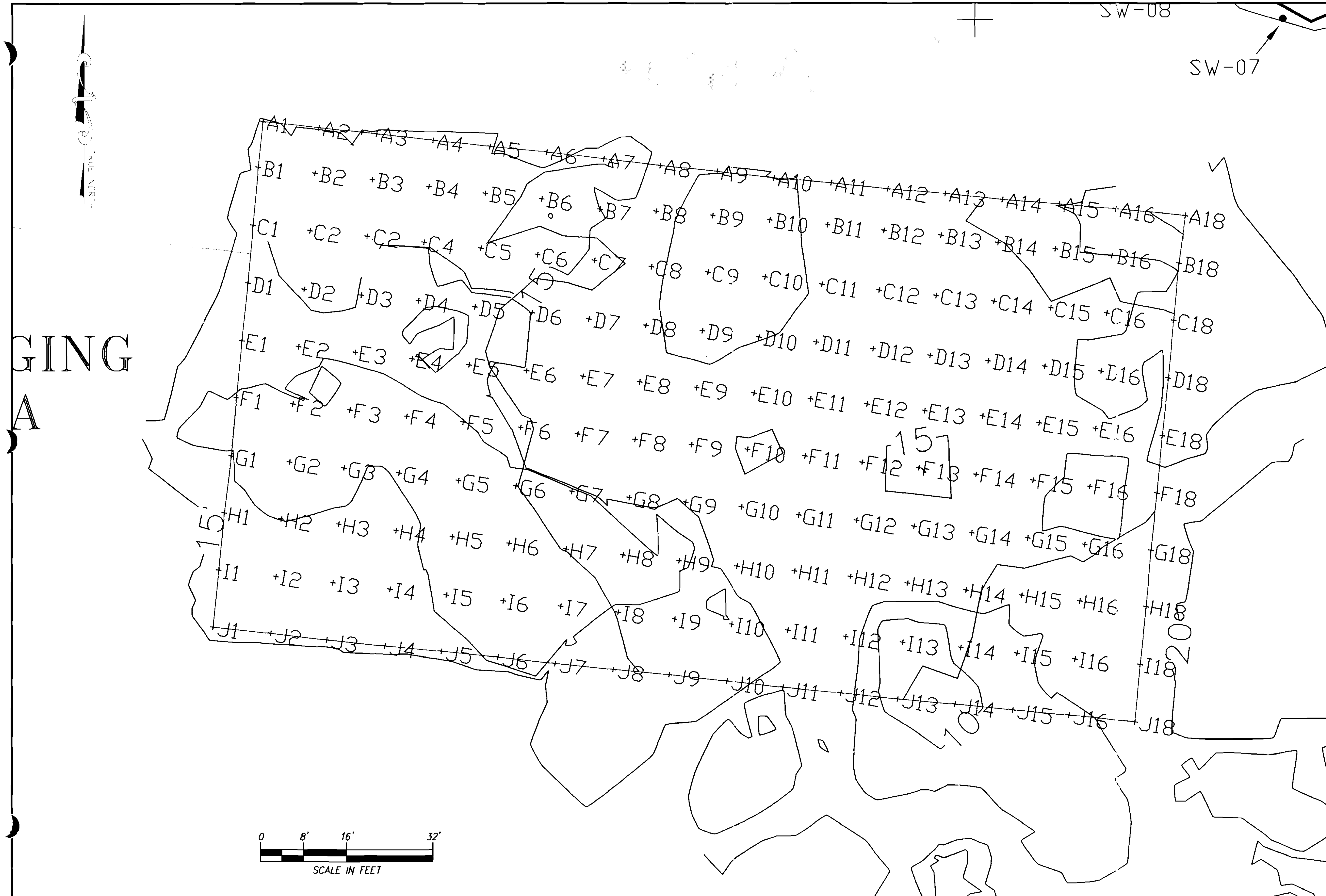


FIGURE 2-7

AREA 1 SAMPLE LOCATIONS

BASF
SOUTH 40 SITE
RENSSELAER, NY

EarthTech
A Tyco International Ltd. Company

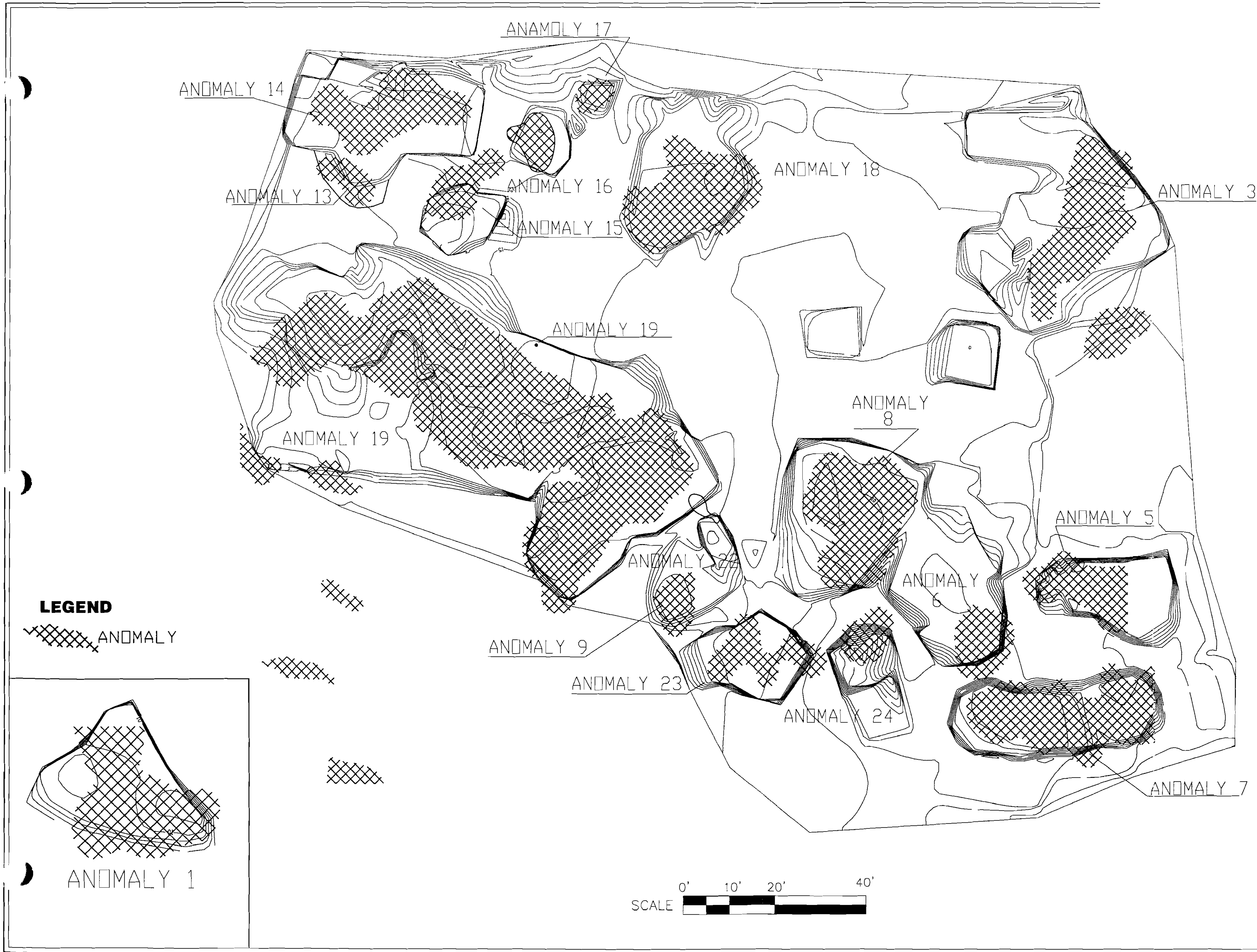


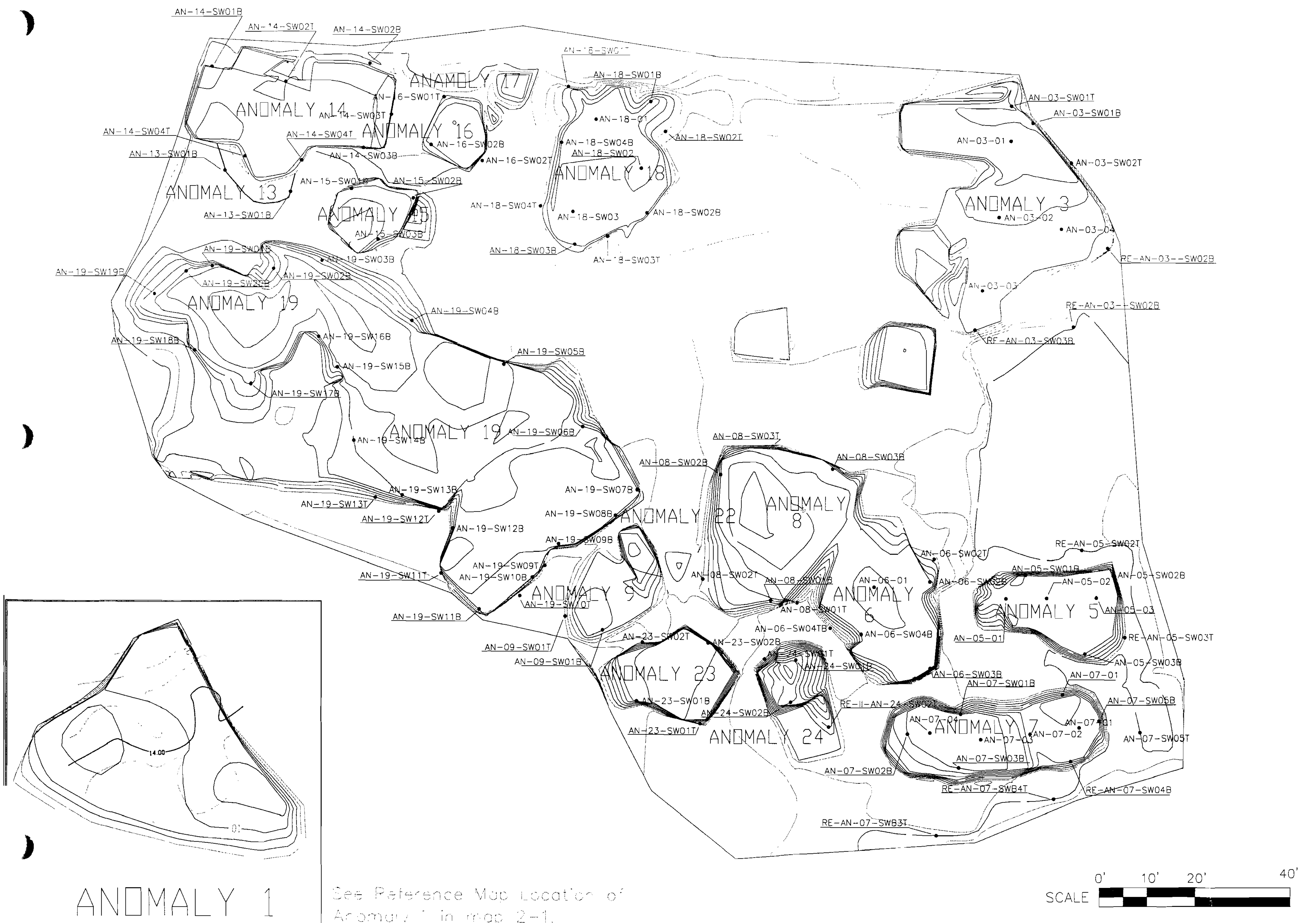
FIGURE 2-9

MAGNATOMETRY & ANOMALY OVERLAY

BASF
RENSSELAER, NY

EarthTech
A Tyco International Ltd. Company

DATE : **FEBUARY 206**
PROJECT NO : **7692**



See Reference Map Location of Anomaly 1 in map 2-1.

FIGURE 2-8

ANOMALY EXCAVATION SAMPLING LOCATION

RENSSELAER, NEW YORK

EarthTech

A Tyco International Ltd. Company

DATE FEBUARY 2005

PROJECT NO 76928

FIGURE 2-10

ANOMALY & AREA 1 OVERLAY

BASF
SOUTH 40 SITE
RENSSELAER, NY

EarthTech
A Tyco International Ltd. Company

APPENDIX A

HAGER-RICHTER GEOSCIENCES ANOMALY SURVEY

HAGER-RICHTER
GEOSCIENCE, INC.

GEOPHYSICAL SURVEY
BASF SOUTH 40 SITE
RIVERSIDE AVENUE
RENSSELAER, NEW YORK

Prepared for:

Earth Tech Inc.
40 British American Blvd.
Latham, New York 12110

Prepared by:

Hager-Richter Geoscience, Inc.
417 Berkeley Avenue
Orange, New Jersey 07050-8509

File 04MK38
August, 2004

HAGER-RICHTER
GEOSCIENCE, INC.

CONSULTANTS IN GEOLOGY & GEOPHYSICS
417 BERKELEY AVENUE
ORANGE, NEW JERSEY 07050-2106
TELEPHONE (973) 676-3001
FAX (973) 676-4599

August 12, 2004
File 04MK38

Mr. Keith Decker
Earth Tech Inc.
40 British American Blvd.
Latham, New York 12110

Tel: 518-951-2229
Fax: 518-951-2300

RE: Geophysical Survey
BASF South 40 Site
Riverside Avenue
Rensselaer, New York

Dear Mr. Decker:

In this letter, we report the results of a geophysical survey conducted on July 29, 2004 by Hager-Richter Geoscience, Inc. (H-R) at a site identified as the BASF South 40 Site located near Riverside Avenue in Rensselaer, New York for Earth Tech, Inc. (Earth Tech). The scope of the project and area of interest (AOI) were specified by Earth Tech.

INTRODUCTION

The BASF South 40 Site is vacant land located between Riverside Avenue, the port access highway, and railroad tracks. The general location of the Site is shown in Figure 1. According to information provided by Earth Tech, the site might have been used as a disposal location for steel drums. The AOI specified by Earth Tech is roughly rectangular, with dimensions of approximately 200 feet by 250 feet. The AOI is relatively flat and had been cleared of trees prior to the geophysical survey. Several grid points were surveyed by Earth Tech with GPS and were provided to H-R for locational reference points. Figure 2 shows the location of the AOI and the grid established by Earth Tech.

OBJECTIVE

The objective of the geophysical survey was to detect possible concentrations of buried metal that may include drums in the AOI specified by Earth Tech, and if detected, to locate them.

THE SURVEY

H-R personnel James Coffman, P.G., and José Carlos Cambero Calzada, conducted the field operations on July 29, 2004. Mr. Will Lindheimer of Earth Tech was present during a portion of the fieldwork and specified the area of interest for the geophysical survey.

A magnetic survey was conducted to search for concentrations of buried metal that might include steel drums. The magnetic data were acquired along survey lines spaced five feet apart in one direction across the accessible portions of the area of interest.

EQUIPMENT AND PROCEDURES

The magnetic survey was conducted using a Geometrics Model G858-G Cesium Vapor Magnetometer. The G858-G uses two sensors with a vertical separation of 2.5 feet and measures both the strength of the total magnetic field and the vertical magnetic gradient. The G858-G recorded data at 0.3 second cycle rates and has a 0.05 gamma sensitivity. Data were acquired at about 1-foot intervals along survey lines spaced 5 feet apart.

Magnetic data are most commonly presented as contour maps. The total magnetic field data are contoured using one of the sensors magnetic values. Gradiometer data are processed by subtracting the top sensor value from the bottom sensor value and dividing by the distance between the sensors. A survey line was repeated to provide values for the correction of diurnal variations.

Total magnetic field signatures caused by one or more buried metal objects commonly consist of paired positive and negative anomalies, with the positive anomaly located slightly south of the mass and the negative anomaly located slightly toward the north. The width and amplitude of an anomaly are functions of the mass of the object and its distance from the magnetometer sensor.

Vertical magnetic gradient data, also commonly called gradiometer data, can be used to interpret the relative depth of burial of metal objects. In general, an object such as a drum located at or near the ground surface produces a much greater magnetic effect at the lower sensor than at the upper sensor. The result is a relatively large vertical magnetic gradient. If a magnetic object is deeply buried, the magnetic field measured by both sensors is nearly the same, and the vertical gradient is relatively small. Therefore, steep vertical magnetic gradients indicate the presence of near-surface metallic objects.

LIMITATIONS OF THE METHOD

HAGER-RICHTER GEOSCIENCE, INC. MAKES NO GUARANTEE THAT ALL DRUMS OR OTHER POTENTIAL TARGETS OF INTEREST WERE DETECTED IN THIS SURVEY. HAGER-RICHTER GEOSCIENCE, INC. IS NOT

RESPONSIBLE FOR DETECTING POTENTIAL TARGETS THAT NORMALLY CANNOT BE DETECTED BY THE METHODS EMPLOYED OR BECAUSE OF SITE CONDITIONS.

The data recorded in magnetic surveys are affected by *all* ferrous metal objects. In particular, steel objects above ground, such as trailers, fences, and buildings, can so influence the magnetic field that the effects of buried metal objects, if any, at the same location are "masked." Thus, where magnetic anomalies can be attributed to surface objects, the presence or absence of buried metal objects cannot be determined from the magnetic data alone.

Detection and identification should be clearly differentiated. Detection is the recognition of the presence of a magnetic object, and the magnetic method is excellent for such purposes. Identification, on the other hand, is determination of the nature of the causative body (i.e., what is the body -- a cache of drums, UST, automobile, white goods, etc.?), and the magnetic method cannot identify the buried metal object.

RESULTS

The geophysical survey was conducted using the magnetic method. Survey data were acquired along lines spaced 5 feet apart across the accessible portion of the area of interest. The results of the magnetic survey are presented as color contour plots of the total magnetic field and vertical magnetic gradient in Figures 3 and 4, respectively. Figure 5 shows the interpretation of the magnetic data.

As can be seen on Figure 3, total magnetic field anomalies are present in scattered locations throughout the survey area, indicating areas containing ferrous metal objects.

In Figure 4, the higher gradient anomalies represent concentrations of iron or steel objects. The relative gradient amplitudes shown are a function of several variables including mass, condition, shape, and orientation of source objects, as well as depth of burial; however, as a general rule, higher amplitudes indicate larger and/or shallower objects.

Figure 5 shows the locations of buried ferrous objects, as interpreted from the magnetic data. Areas containing buried metal objects are indicated by a red hatched pattern. We also note a large number of small high gradient anomalies, that we attribute to scattered buried metal objects that are relatively small and/or buried at relatively shallow depths. We have marked these anomalies as unidentified shallow buried objects on Figure 5 with a black 'X' symbol.

Areas containing anomalies attributed to surface metal objects are shown by a blue hatched pattern. We note that in these areas the presence or absence of buried metal cannot be determined from the geophysical data alone.

LIMITATIONS ON THE USE OF THIS REPORT

This letter report was prepared for the exclusive use of Earth Tech, Inc, (Client). No other party shall be entitled to rely on this Report or any information, documents, records, data, interpretations, advice or opinions given to Client by Hager-Richter Geoscience, Inc. (H-R) in the performance of its work. The Report relates solely to the specific project for which H-R has been retained and shall not be used or relied upon by Client or any third party for any variation or extension of this project, any other project or any other purpose without the express written permission of H-R. Any unpermitted use by Client or any third party shall be at Client's or such third party's own risk and without any liability to H-R.

H-R has used reasonable care, skill, competence and judgment in the performance of its services for this project consistent with professional standards for those providing similar services at the same time, in the same locale, and under like circumstances. Unless otherwise stated, the work performed by H-R should be understood to be exploratory and interpretational in character and any results, findings or recommendations contained in this Report or resulting from the work proposed may include decisions which are judgmental in nature and not necessarily based solely on pure science or engineering. It should be noted that our conclusions might be modified if subsurface conditions were better delineated with additional subsurface exploration including, but not limited to, test pits, soil borings with collection of soil and water samples, and laboratory testing.

Except as expressly provided in this limitations section, H-R makes no other representation or warranty of any kind whatsoever, oral or written, expressed or implied; and all implied warranties of merchantability and fitness for a particular purpose, are hereby disclaimed.

If you have any questions or comments on this letter report, please contact us at your convenience. It has been a pleasure to work with Earth Tech on this project. We look forward to working with you again in the future.

Sincerely yours,
HAGER-RICHTER GEOSCIENCE, INC.

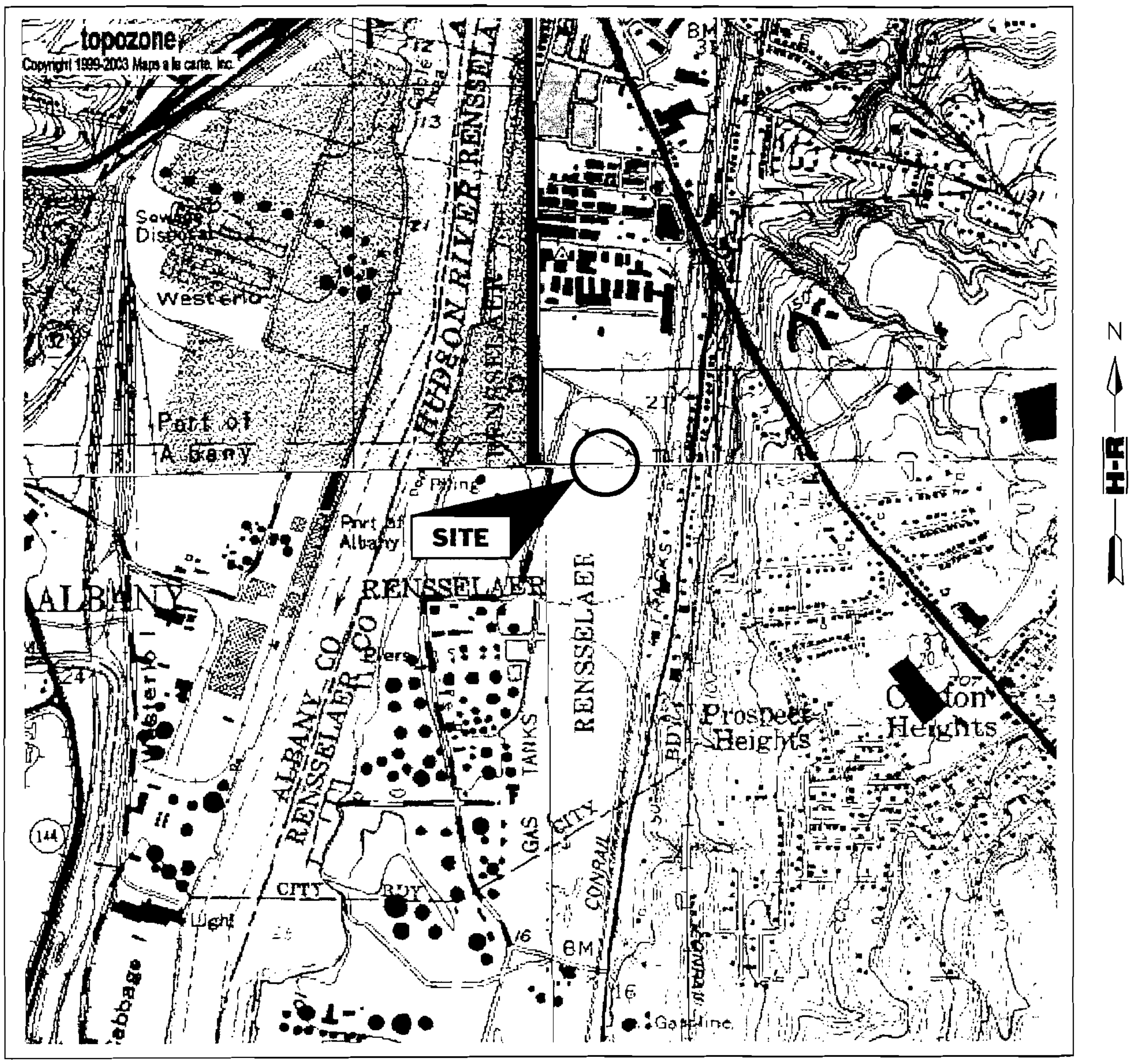
Mark Kick

Mark Kick, P.G.
Project Manager

Dorothy Richter

Dorothy Richter, P.G.
President

Attachments: Figures 1 - 5



LOCATION

SCALE (feet)

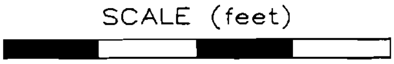
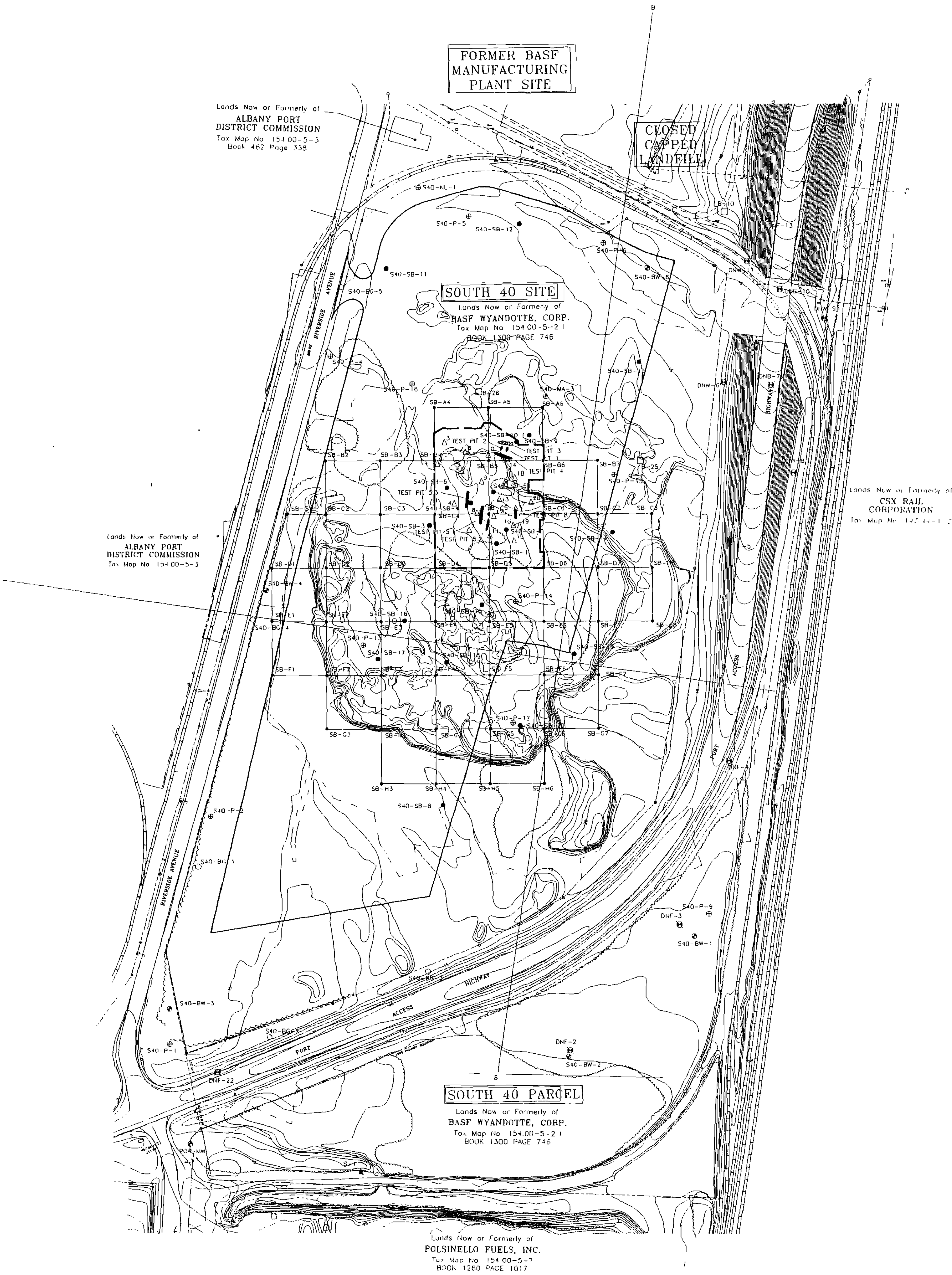


Figure 1
General Site Location
BASF South 40 Site
Riverside Avenue
Rensselaer, New York

File 04MK38	August, 2004

HAGER–RICHTER GEOSCIENCE, INC.
Orange, New Jersey



NOTE:

Modified from site plan provided by Earth Tech, Inc.

N

LEGEND

– – – – APPROXIMATE MAGNETIC SURVEY AREA

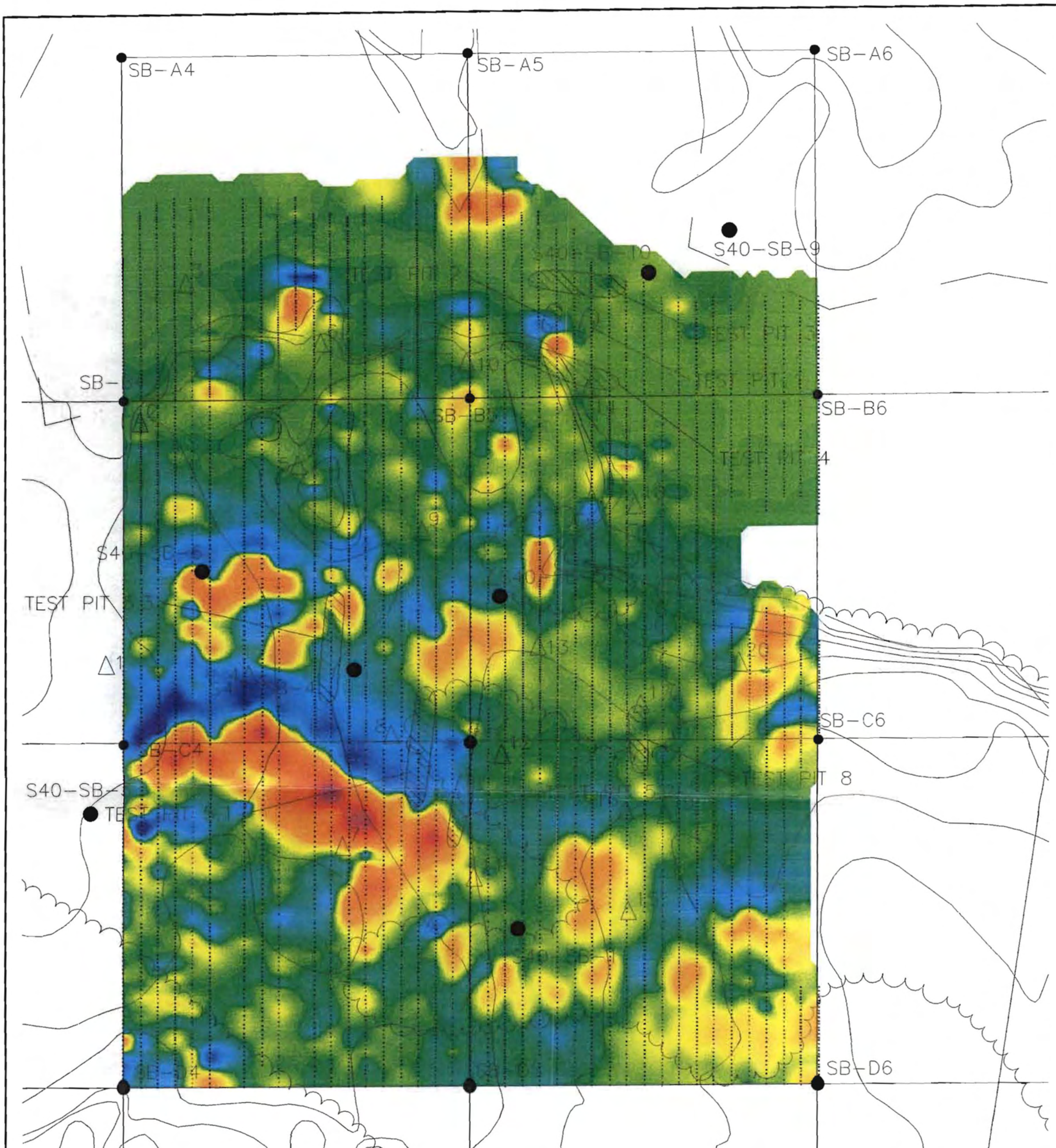
SCALE (feet)

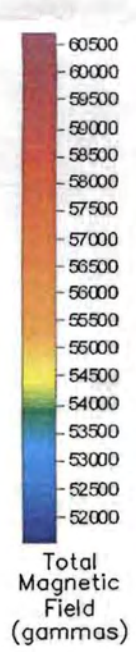
0 200 400

Figure 2
Site Plan
BASF South 40 Site
Riverside Avenue
Rensselaer, New York

File 04MK38	August, 2004

HAGER–RICHTER GEOSCIENCE, INC.
Orange, New Jersey





N

LEGEND

· DATA STATION

SCALE (feet)

0 30 60

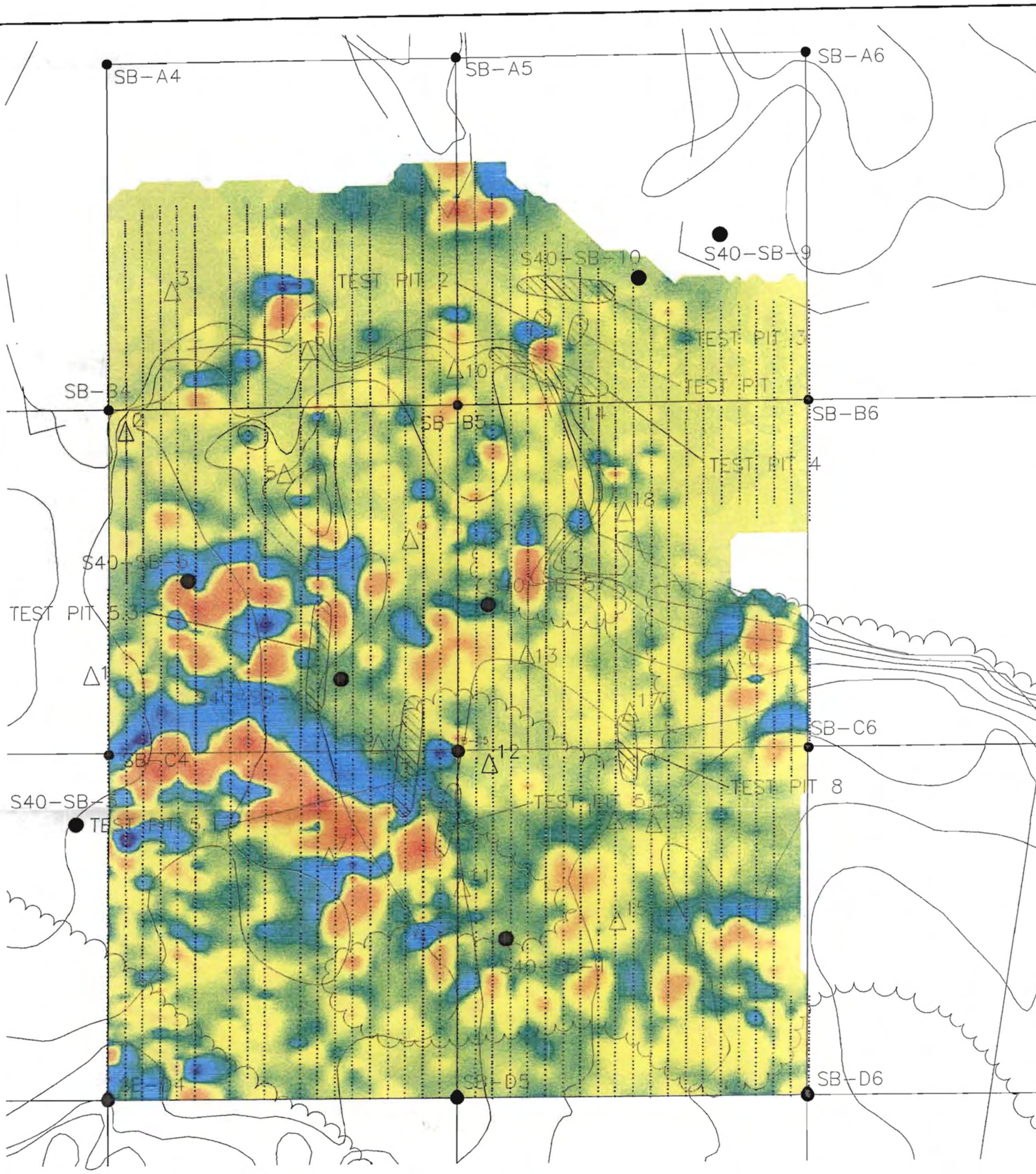
NOTES:

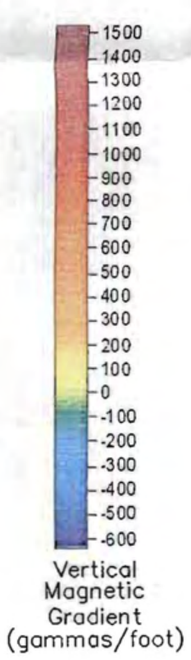
1. Modified from site plan provided by Earth Tech, Inc.
2. Data were acquired with Geometrics G858 cesium vapor magnetometer. Bottom sensor data shown.

Figure 3
Total Magnetic Field
BASF South 40 Site
Riverside Avenue
Rensselaer, New York

File 04MK38	August, 2004

HAGER–RICHTER GEOSCIENCE, INC.
Orange, New Jersey





N

H-R

LEGEND

· DATA STATION

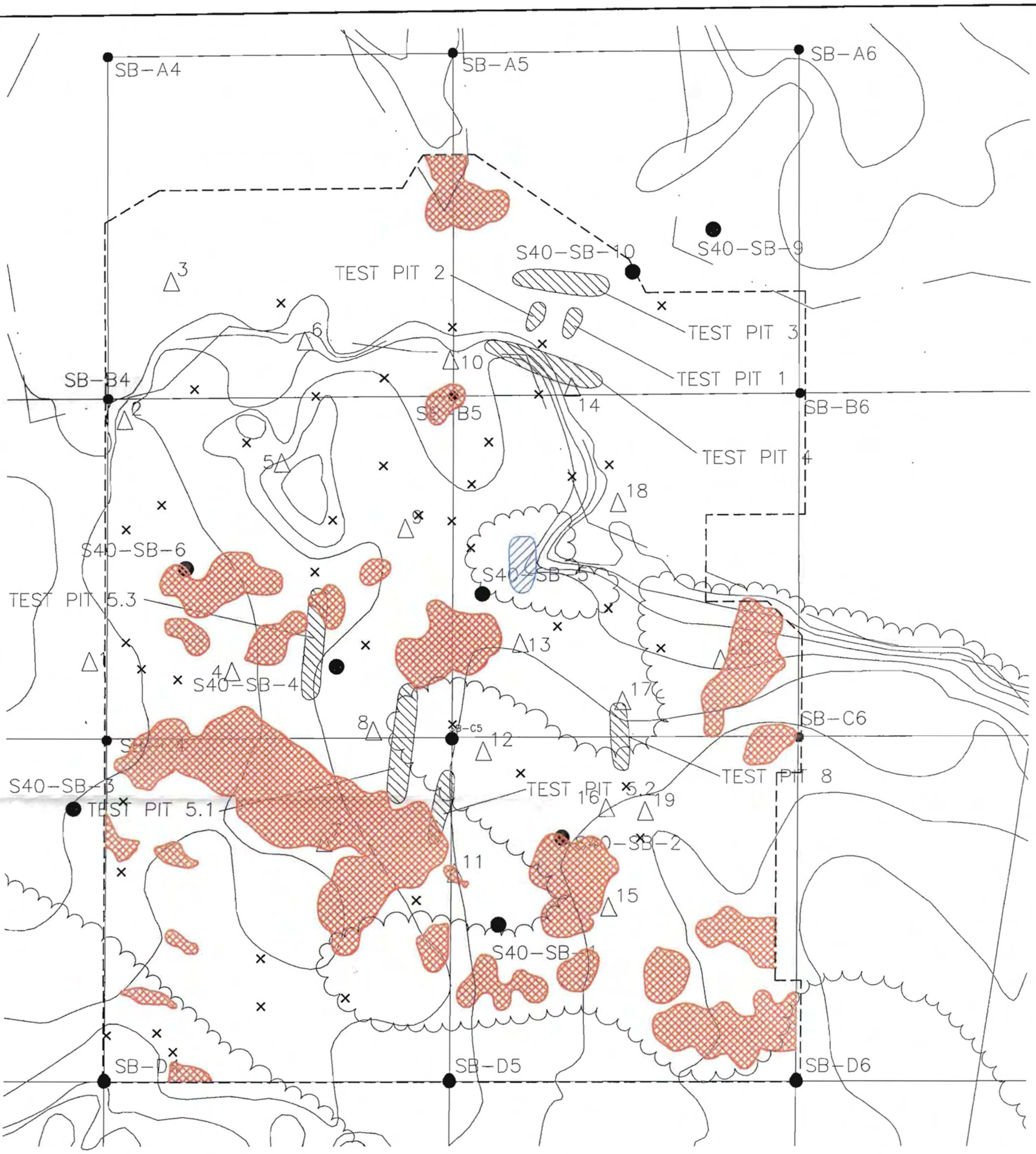
SCALE (feet)

0 30 60

NOTES:

1. Modified from site plan provided by Earth Tech, Inc.
2. Data were acquired with Geometrics G858 cesium vapor magnetometer.

Figure 4 Vertical Magnetic Gradient BASF South 40 Site Riverside Avenue Rensselaer, New York	
File 04MK38	August, 2004
HAGER-RICHTER GEOSCIENCE, INC. Orange, New Jersey	



N

SCALE (feet)

0 30 60

LEGEND

APPROXIMATE MAGNETIC SURVEY AREA

AREA OF POSSIBLE BURIED METAL

UNIDENTIFIED BURIED METAL OBJECT

MAGNETIC ANOMALY ATTRIBUTED TO EFFECTS OF SURFACE OBJECTS. THE PRESENCE OR ABSENCE OF BURIED METAL WITHIN THIS AREA CANNOT BE DETERMINED ON THE BASIS OF THE MAGNETIC DATA ALONE.

NOTE:

Modified from site plan provided by Earth Tech, Inc.

Figure 5 Interpretation BASF South 40 Site Riverside Avenue Rensselaer, New York	
File 04MK38	August, 2004
HAGER-RICHTER GEOSCIENCE, INC. Orange, New Jersey	

APPENDIX B

PHOTOGRAPHIC LOG

Dye colored tree found during clearing and grubbing, tested non-hazardous

Tree showing blue and red dye in tree and under bark

Tree with dye in upper portions of tree

Tree shows the dye throughout

Hot Spot Location SB-19 survey locations

Hot Spot Location SB-20 survey locations

Pre-mobilization site photograph

Pre-mobilization site photograph

The site during clearing and grubbing in Area 1

The site during clearing and grubbing

Hot Spot Location SB-E-4 survey locations on left

Roadway to Hot Spot Location SB-20, survey locations in background

Roadway under construction

SB-E4 survey locations in background

Southern part of roadway being constructed

Roadway near SB-E4 being constructed

SB-E4 being excavated, top 18 inches removed prior to removing to 4'

Soil from SB-E4 being transported to staging area

Soil from hot spot locations are staged in lined staging area

Bottom of SB-20 showing re-established survey locations

Sand being placed at the bottom of excavation

SB-20 sidewall showing brick and debris

SB-20 sidewall showing more brick and debris

SB-20 showing more debris

Anomaly 19 Being dewatered

Excavation of small anomalies that only contained metal debris

Area 1 showing deeper excavations performed in hot spots

Typical soil material encountered in Area 1 shown stockpiled

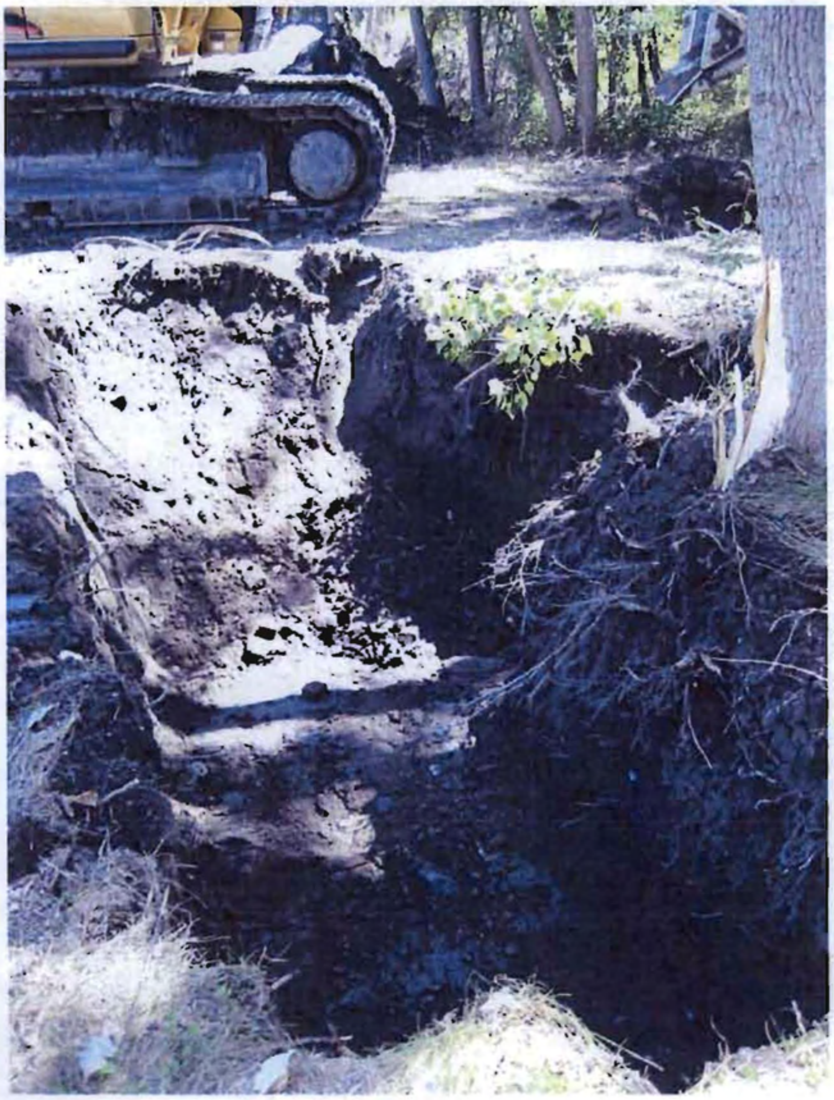
Anomaly area showing crushed carcass sitting in groundwater

Bottom of anomaly showing debris

Bottom of anomaly showing gray soil material

Anomaly area excavated to groundwater

Typical anomaly excavation where no drum carcasses found



Anomaly area south of main anomaly area where metal debris found

Area 1 after backfilling and compaction

Area 1 in background

Roadway going out to Riverside Avenue

Roadway to Hot Spot Location SB-20, SB-E4 on the left

SB-19 after restoration, orange snow fence as visual barrier

Area 1 after backfilling looking northwest

Taken from the middle of Area 1 looking west towards Cogen Plant

SB-20 area restored