OFFSITE INVESTIGATION
FOR SOIL GAS AND GROUNDWATER

Operable Unit 2
BASF Rensselaer
Rensselaer, New York

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Prepared for:

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This Operable Unit 2 (OU-2) Investigation Report for Soil Gas and Groundwater summarizes the approach and methods that were used to evaluate whether, and to what extent, constituents originating on the BASF Corporation (BASF) Main Plant located in Rensselaer, New York have been transported in soil gas and groundwater to surrounding properties. OU-2 was designated by the New York State Department of Environmental Conservation (NYSDEC) to include offsite areas not included in the Remedial Investigation of the BASF Rensselaer Main Plant (OU-1). BASF had directed Roux Associates, Inc. (Roux Associates) to perform the OU-2 investigation in accordance with the April 23, 2004 Revised Work Plan for Operable Unit 2 (OU-2 Work Plan). The OU-2 Work Plan included in its scope of work tasks for sampling of Hudson River sediment and an air emissions pathway analysis. The results of these two tasks will be provided in separate documents.

The NYSDEC has identified the offsite flow of dissolved phase constituents in groundwater--and associated soil gas due to volatilization--along subsurface utility conduits beneath Riverside Avenue as a potential concern to the residential areas located approximately 1,000 feet north of the Site. All other groundwater and soil gas migration pathways had already been investigated and ruled out.

Soil gas samples were obtained from three locations above the sewer bedding at locations 60 feet, 550 feet and 940 feet north of the BASF Main Plant along Riverside Avenue, and two locations immediately north of the Sterling Site. Groundwater samples were obtained from 18 locations, including the same locations at which the soil gas samples were obtained.

The results of the groundwater and soil gas investigations strongly support the conclusion that no constituents originating on the BASF site are being transported in groundwater or soil gas to the residential area to the north. The specific findings, presented in this report, include:

- No COCs were present in the groundwater samples collected from the two piezometers installed in the sewer bedding north of the BASF Site. These results document the absence of any BASF COCs in the groundwater transport pathway between BASF and the residential area.
- No VOCs were found in either the groundwater samples obtained from the northwest corner of the BASF Site (the location at which any groundwater from BASF would enter

the sewer bedding), or the two piezometers installed in the sewer bedding north of the BASF site. Since no VOCs are present in the groundwater originating from BASF and traveling towards the residential neighborhood, groundwater originating on the BASF Site cannot be a source of subsurface vapors (soil gas) in the residential neighborhood.

- Generally, only low concentrations of COCs were found in the soil gas. With the exception of benzene and 1,2 DCA, the highest concentrations of all COCs were lower than their respective AGC for ambient air as established by the NYSDEC Division of Air Resources.

- Benzene is not found in the soil gas samples from either the location closest to the BASF Site or the location immediately downstream from BASF, but is found in the three samples along the northern perimeter of the Sterling Site. These data strongly support a conclusion that the benzene is not associated with BASF.

- 1,2 dichloroethane is not found in the samples collected along the perimeter of the residential area.

- A wide range of other constituents, including many that are not COCs in soil or groundwater at the BASF site, are also found at low levels in the soil gas samples. The presence of these constituents and the absence of any concentration trends suggest that the sewer line itself may also be a source of vapors.

Based on the absence of any data that would support a conclusion that COCs originating at the BASF Site are present at or migrating towards the residential area to the north, BASF requests that no further action be required for this component of the OU-2 investigation.

1.0 INTRODUCTION

This Operable Unit 2 (OU-2) Investigation Report for Soil Gas and Groundwater summarizes the approach and methods that were used to evaluate whether, and to what extent, constituents originating on the BASF Corporation (BASF) Main Plant located in Rensselaer, New York (Figure 1) have been transported in soil gas and groundwater to surrounding properties. OU-2 was designated by the New York State Department of Environmental Conservation (NYSDEC) to include offsite areas not included in the Remedial Investigation of the BASF Rensselaer Main Plant (OU-1). BASF had directed Roux Associates, Inc. (Roux Associates) to perform the OU-2 investigation in accordance with the April 23, 2004 Revised Work Plan for Operable Unit 2 (OU-2) (OU-2 Work Plan). The OU-2 Work Plan also included in its scope of work tasks for sampling of Hudson River sediment, and an air emissions pathway analysis. The results of these two tasks will be provided in separate documents.

BASF was initially requested to submit a work plan for the investigation of OU-2 on October 31, 2003, with additional detail regarding the scope of the work plan provided in a November 10, 2003 letter to BASF from the NYSDEC. In that letter, the NYSDEC made recommendations as to the areas of concern to be incorporated into the scope of work for the work plan. These areas included:

- all outfall locations, including the City of Rensselaer and Town of East Greenbush storm sewers, and industrial discharge points;
- offsite migration of impacted groundwater northward beneath Riverside Avenue and northward from the Lagoon Area;
- a soil gas survey related to the offsite groundwater migration investigation; and
- an investigation of areas of possible airborne and particulate deposition, including soil sampling in residential areas to the east and northwest of the Main Plant.

BASF submitted an initial version of the requested work plan on December 10, 2003. NYSDEC provided comments on January 9, 2004. BASF met with the NYSDEC and the New York State Department of Health (NYSDOH) on February 19, 2004 to discuss BASF's approach to each of the requested components of the offsite investigation and received comments from the NYSDEC and NYSDOH on BASF's approach. A first Revised Work Plan was submitted to the NYSDEC on March 5, 2004, which incorporated the January 9, 2004 comments from NYSDEC and the

comments provided by NYSDEC and NYSDOH in the February 19, 2004 meeting, and addressed each of the four offsite areas identified by NYSDEC. The second Revised Work Plan was prepared to address comments provided by the NYSDEC to BASF in an April 9, 2004 letter.

The focus of the scope of work summarized in this report was to complete the investigation of any offsite transport of constituents of concern in soil gas and groundwater that may have originated on the BASF Main Plant and Lagoon Area. A key component of the Work Plan was to differentiate those constituents that may be present as a result of activities on either the Main Plant or Lagoon Area from those that may be present as a result of off-site activities unrelated to BASF. These offsite activities include, among others, operations conducted at the Sterling Drug Site, located to the north of BASF (Figure 2).

BASF has used the information developed in the course of the OU-1 (Onsite) Remedial Investigation (RI) as well as data obtained from the adjacent Sterling Drug Site to develop the scope of work presented in the OU-2 Work Plan. These physical and chemical data supported BASF's conclusion that there are three primary pathways by which constituents from the BASF Main Plant or Lagoon Area may have migrated off-site. Based on these data, the three primary pathways are:

- **Discharge of Constituents Present in Groundwater Flowing through Utility Bedding to Outfalls in the Hudson River**
  As per the November 10, 2003 letter, the investigation of this pathway was focused on sediment at industrial and municipal outfall locations.

- **Groundwater and Organic Vapor Migration Via Sewer and/or Utility Bedding Located Beneath Riverside Avenue**
  Other possible pathways have already been investigated during the RI, and the potential for offsite migration via these pathways has been eliminated. Therefore, the primary focus of the requested offsite groundwater and soil gas investigation to the north and northwest of the Main Plant was the sewer and utility bedding below the water table beneath Riverside Avenue.

- **Deposition of Airborne Constituents that May Have Been Emitted from the BASF Main Plant**
  BASF proposed in the OU-2 Work Plan the process by which a detailed soil sampling plan to assess the potential impact of this pathway will be developed in consultation with NYSDEC and NYSDOH. BASF is currently compiling and analyzing information regarding historical emissions from the Site and the local meteorology. The ultimate objective of this evaluation is to determine what, if any, risk is posed by impacts to soil in the neighborhood from historic airborne emissions from the BASF site.

This OU-2 Investigation Report summarizes the sampling methods and analytical results used to evaluate whether and to what extent constituents originating on the BASF Main Plant have been transported offsite to surrounding properties through groundwater and organic vapor migration via sewer and/or utility bedding (i.e., the second of the three pathways listed above). The results of investigations pertaining to the other two migration pathways will be presented in separate reports to the NYSDEC.

1.1 Facility Background

This section presents a brief description of the results of the RI of the Main Plant (OU-1) that indicated the need for further off-site investigation. A more complete description and a Site history are presented in the Remedial Investigation and Supplemental Remedial Investigation Report (Roux Associates, 2000), and the Additional Remedial Investigation Activities Report (Roux Associates 2001).

1.1.1 Facility Description

The BASF Rensselaer facility is located in an industrial area of Rensselaer, Rensselaer County, New York. The BASF property consists of an approximate 80-acre parcel of land that is separated into four areas that are commonly referred to as the Main Plant and Lagoon Area, Closed Landfill, Warehouse Building (Building 39) and South 40 (Figure 2). Three of these areas are listed in the NYSDEC Registry of Inactive Hazardous Waste Disposal Sites. The Main Plant is listed in the New York State Registry of Inactive Hazardous Waste Disposal Sites as a Class 2 Site (Inactive Hazardous Waste Disposal Ste Code 442027) and subject to an Order on Consent (Index Number A4-0345-96-07).

The Main Plant was first developed in the 1880s, and functioned primarily as a production facility for colorants and dyes. BASF acquired the property in 1978. The Main Plant is currently inactive and contains 18 buildings that were production buildings, maintenance shops, laboratories, warehouses, and offices. Areas of the Main Plant that are not covered by asphalt or buildings are covered with gravel or grass.

The Main Plant is bordered on the north by the Sterling Drug Site 1 (Sterling Drug Site [Inactive Hazardous Waste Disposal Site Code 442009]) – a chemical manufacturing plant that was

formerly Sterling Drug, NYCOMED, Organichem, and is currently owned and operated by Albany Molecular – and residential areas north of the Sterling Drug Site. Riverside Avenue borders the Main Plant to the west and south and separates the Main Plant from the Lagoon Area. The Closed Landfill (Inactive Hazardous Waste Disposal Site Code 442004) is located to the southeast of the Main Plant with the South 40 (Inactive Hazardous Waste Disposal Site Code 442022) beyond. To the east of the Main Plant are several Amtrak rail spurs, New York State Route 9J and the elevated Port of Rensselaer Highway. The Hudson River is to the west of the Lagoon Area (Figure 2).

1.1.2 Previous Investigations

The following reports summarize previous investigations that were conducted at the Main Plant and Lagoon Area:

- "Wastewater Equalization Lagoon Reconstruction Study and Preliminary Design," March 1993, Clough, Harbour & Associates (1993).
- "BASF/Sterling Organics Wastewater Lagoons Baseline Assessment Rensselaer, New York," June 1994, Malcolm Pirnie, Inc (1994).
- "Remedial Investigation (RI) and Supplemental Remedial Investigation (SRI) Report, BASF Rensselaer, Rensselaer, New York," November 2000, Roux Associates, Inc (2000).
- "Additional Remedial Investigation Activities, BASF Rensselaer, Rensselaer, New York," August 3, 2001, Roux Associates, Inc (2001).

Additional investigations have been performed in the Closed Landfill and South 40 under two separate Voluntary Cleanup Agreements with the NYSDEC. Investigations of these areas are described in the following reports:

- "Voluntary Cleanup Program Application, Closed Landfill" (Roux Associates, Inc. 2002a).
- "Site Investigation Report, Closed Landfill" (Roux Associates, Inc. 2002b).
- "Voluntary Cleanup Program Application, South 40 Parcel" (Roux Associates, Inc. 2001b).
- "Site Investigation Report, South 40 Parcel" (Roux Associates, Inc. 2001c).

1.2 Scope of Work

To accomplish the OU-2 Work Plan objectives for the soil gas and groundwater investigations, the following scope of work was performed:

- Task 1: Utility Identification;
- Task 2: Maintenance of Existing Sewer Bedding Groundwater Sampling Ports;
- Task 3: Installation of Sewer Bedding Soil Gas Sampling Ports;
- Task 4: Installation of Sewer Bedding Soil Gas Sampling Wells;
- Task 5: Installation of Sewer Bedding Groundwater Sampling Piezometers;
- Task 6: Soil Gas Sampling; and
- Task 7: Groundwater Sampling.

1.3 Report Organization

The remainder of the report is organized as follows:

- Section 2.0: Scope of Work;
- Section 3.0: Physical Characteristics of Study Area;
- Section 4.0: Nature and Extent of Constituents of Concern in Offsite Soil Gas and Groundwater;
- Section 5.0: Constituent Fate and Transport;
- Section 6.0: Summary and Conclusions; and
- Section 7.0: References.

2.0 SCOPE OF WORK

The scope of work was performed according to the methods discussed in Work Plan and described in Section 1.2.

2.1 Task 1: Utility Identification

Roux Associates reviewed Rensselaer County Sewer District records and met on March 11, 2004 with Rensselaer County Sewer District engineers. Based on maps and plans provided by the Rensselaer County Sewer District (Appendix A) and a field reconnaissance, the Rensselaer Interceptor Sewer (sanitary sewer) was identified as the only utility below the water table trending north-south beneath Riverside Avenue. Roux Associates also met with the City of Rensselaer on March 11, 2004 and identified a single sanitary sewer as the only utility below the water table trending east-west beneath Rensselaer Avenue, which borders the Sterling Drug Site to the north.

Six manholes were identified in the Rensselaer Interceptor Sewer: OS-MH-2, OS-MH-3, LG-MH-4A, LG-MH-5, LG-MH-6 and LG-MH-7. The latter three manholes had been identified and sampled during previous Main Plant RI activities, and already contained groundwater sampling ports completed through the manhole sidewalls. Manhole LG-MH-4A contained a groundwater sampling port, but had not been sampled previously.

Two brick-lined manholes were identified in the sewer beneath Rensselaer Avenue.

2.2 Task 2: Maintenance of Existing Sewer Bedding Groundwater Sampling Ports

Existing groundwater sampling ports located in Manholes LG-MH-4A, LG-MH-5, LG-MH-6, and LG-MH-7 were inspected. The original construction of each sampling port consisted of a steel pipe inserted horizontally through a hole drilled in the manhole sidewall and into the sewer bedding. A sampling tube was connected from a pipe nipple on the steel pipe to the surface where it could be accessed and sampled. Following inspection of each of the four existing sewer bedding sampling ports, the sampling tube was disconnected from the pipe nipple and a new sampling tube was attached. The new sampling tube was connected to a pipe nipple on a one-inch diameter PVC well riser that was sealed at the bottom with a threaded cap and O-ring.

The one-inch diameter PVC well riser acts as a manometer tube allowing water level measurements and groundwater samples to be obtained.

2.3 Task 3: Installation of Sewer Bedding Soil Gas Sampling Ports in Manholes

Soil gas sampling ports were installed in sewer manholes OS-MH-4A and OS-MH-3. Discharge of sanitary sewage to OS-MH-2 near the surface of the manhole prevented access to the manhole for installation of a soil gas sampling port. Each soil gas sampling port consisted of a one-inch diameter steel screen and pipe with a sealed end installed horizontally through a hole drilled in the manhole wall approximately three feet below land surface. The screen and pipe were driven up to one foot into the fill adjacent to the exterior of the manhole sidewall. The annular space between the pipe and manhole wall was then sealed with concrete. The end of the pipe extending into the manhole has a sealed end and a small pipe nipple on the top of the pipe. A ¼-inch Teflon sampling tube was connected to the pipe nipple and extended to the top of the manhole. When not in use, the sampling tube is sealed with a plug.

2.4 Task 4: Installation of Sewer Bedding Soil Gas Sampling Wells

Three temporary soil gas sampling wells (OS-MH-2, OS-SG-201, and OS-SG-202) were installed via Geoprobe® adjacent to groundwater sampling locations (discussed below in Section 2.5). Each soil gas well consisted of a Screen Point 15 Sampler threaded onto the leading end of a Geoprobe® rod and advanced with a Geoprobe® direct-push machine. The Screen Point Sampler was advanced to a depth of approximately three feet. Once at the desired depth, extension rods were sent down the center of the Sampler until the leading rod contacted the bottom of the Sampler screen. The tool string was then retracted approximately 12 inches while the screen was held in place with the extension rods. This exposed approximately 12-inches of screen from approximately two to three feet below land surface in the unsaturated zone.

2.5 Task 5: Installation of Sewer Bedding Groundwater Sampling Piezometers

Eight piezometers (LG-PZ-128, LG-PZ-129, and OS-PZ-201 through OS-PZ-206) were installed to measure groundwater levels and evaluate groundwater quality in sewer bedding material. Piezometer construction logs are provided in Appendix B.

Piezometers OS-PZ-205 and OS-PZ-206 were installed adjacent to manholes OS-MH-2 and OS-MH-3, respectively. These piezometers were needed because of sanitary sewage near the surface of manhole OS-MH-2 that prevented access to the manhole for installation of a sampling port, and the groundwater sampling port installed through the manhole sidewall at the bottom of manhole OS-MH-3 was dry. Piezometers OS-PZ-201 and OS-PZ-202 were installed adjacent to the two manholes along Rensselaer Avenue. Piezometers OS-PZ-203 and OS-PZ-204 were installed on Albany Port District Commission Property immediately south of the City of Rensselaer storm sewer.

Each piezometer consisted of a Geoprobe® pre-packed screen and Schedule 80 PVC riser pipe. Geoprobe® pre-packed screens are five-foot long sections of 1.4-inch outside diameter (0.75-inch inside diameter) Schedule 80 PVC with 0.01-inch slots encased inside a 1.5-inch diameter stainless steel wire mesh with 0.011-inch pore size. Enough lengths of pre-packed screen were used to bring the well screen to a minimum of two feet above the water table, with blank riser used to complete the piezometers to land surface. The road has been repaired with surface completion of the piezometers in flush-mount curb boxes.

Each piezometer was allowed to set for a minimum of 24 hours prior to development. Development included surging the screen zone with a surge block. Groundwater was then evacuated from each piezometer using a peristaltic pump.

2.6 Task 6: Soil Gas Sampling

Two soil gas samples, one surface (i.e., ambient air sample in the vicinity of the soil gas sampling port or well) and one subsurface, were collected from each of five sampling locations (Plate 1) (LG-MH-4A [port in manhole], OS-PZ-201 [soil gas well], OS-PZ-202 [soil gas well], OS-MH-2 [soil gas well], and OS-MH-3 [port in manhole]) on June 7, 2004. At each sampling location, one end of a Teflon sampling tube was connected to the tube rising from the soil gas sampling port (for manhole locations) or into the screened interval of a temporary soil gas well installed via Geoprobe®. Tubing installed in the soil gas well was sealed from the atmosphere with a one-hole silicon rubber stopper inserted into the top of the well. The sampling tube was connected to a three-way stopcock. One opening of the stopcock led to a vacuum pump and another end of the stopcock led to a pre-evacuated 6 Liter Summa canister supplied by the

laboratory. Initially, the stopcock on the tubing leading to the Summa canister was closed, and the stopcock on the tubing leading to the vacuum pump was open. The tubing was purged of soil gas using the vacuum pump for approximately ten minutes at a rate equal to 0.2 liters per minute. Following purging, the stopcock on the tubing leading to the vacuum pump was closed, the vacuum pump was turned off, and the stopcock on the tubing leading to the Summa canister was opened. The Summa canister was filled at a rate of 0.2 liters per minute using a regulator supplied by the laboratory. Once the Summa canister was filled, the valve on the canister was closed, and the canister was disconnected from the sampling tubing. At each soil gas sampling location, an additional Summa canister was filled with ambient air at the ground surface. These samples were collected by simply opening the Summa canister valve and filling the canister using a regulator set at approximately 0.2 liters per minute.

All Summa canisters were shipped to Accutest Laboratories of Dayton, New Jersey and analyzed for volatile organic compounds using USEPA Method TO-15. Accutest is a certified New York State Department of Health Environmental Laboratory Approval Program (ELAP) and New York State certified Analytical Services Protocols (ASP) laboratory. Analytical data are provided in Appendix C.

2.7 Task 7: Groundwater Sampling

Groundwater sampling was conducted from June 8 through June 15, 2004 from the following 18 sampling locations (Plate 2):

LG-MH-4A	LG-MH-5	LG-MH-6	LG-MH-7
LG-PZ-101	LG-PZ-103	MP-PZ-107	LG-PZ-129
LG-MW-3	MP-PP-1	MP-PP-2	MP-PZ-106
OS-PZ-201	OS-PZ-202	OS-PZ-203	OS-PZ-204
OS-PZ-205	OS-PZ-206		

Twelve groundwater locations proposed in the Work Plan were not sampled. Four wells were dry (LG-PZ-102, LG-PZ-128, MP-PZ-104 and MP-PZ-105) and access to eight wells on the Sterling Drug Site property had not been obtained at the time of the investigation. Piezometer

LG-PZ-129 was only sampled and analyzed for VOCs because only a limited volume of water could be obtained due to an extremely slow recharge rate following purging.

Each well or piezometer was purged of three to five casing volumes or until dry using a peristaltic pump. Manhole sampling ports were purged of approximately one gallon of water prior to obtaining samples. Groundwater samples for VOCs were collected using a decontaminated stainless steel bailer. All remaining analyses were collected using the peristaltic pump. All samples were analyzed for Target Compound List (TCL) VOCs, TCL SVOCs, and filtered and unfiltered Target Analyte List (TAL) metals, including cyanide. Following collection, sample containers were placed on ice in a cooler at 4°C for transport to the laboratory. Filtered samples were collected in the field with a peristaltic pump and disposable 0.45-micron filters. The groundwater samples were analyzed by Hampton-Clarke, Inc. located in Fairfield, New Jersey, a certified New York State Department of Health Environmental Laboratory Approval Program (ELAP) and New York State certified Analytical Services Protocols (ASP) laboratory. Analytical data are provided in Appendix C.

A comprehensive round of water-level measurements was not recorded during the OU-2 remedial investigation as access to wells owned by Sterling Drug had not yet been obtained by BASF.

3.0 PHYSICAL CHARACTERISTICS OF STUDY AREA

OU-2 consists of four general areas (Figure 2):

1. Subsurface utility gravel bedding beneath Riverside Avenue, Rensselaer Avenue and Belmore Place that may be serving as conduits for offsite migration of soil gas and impacted groundwater;

2. Groundwater in the saturated fill south of the Lagoon Area beneath Albany Port District Commission Property;

3. Hudson River sediment in the vicinity of current and former sewer outfalls; and

4. The residential area to the north of the Sterling Drug Site.

3.1 Surface Features

The following discussion pertains to the BASF Main Plant. The Site topography is generally flat and gently slopes down to the west. No naturally occurring surface-water bodies exist within the Site. A majority of the Site is paved with asphalt (approximately 0.5 feet thick) or covered by a building. A large gravel parking lot covers the southwest corner of the Main Plant. In addition, there are several gravel areas located throughout the Main Plant including several former building footprints and a portion of the former railroad spur along the north edge of the property. Runoff from the Main Plant is directed to storm drains that discharge to the lagoons.

3.2 Site Geology

The evaluation of geologic conditions was based upon the information developed during drilling of the soil borings and monitoring well pilot boreholes for the Remedial Investigation (RI), Supplemental Remedial Investigation (SRI), and Additional Remedial Investigation Activities (Additional RI Activities). The Main Plant and Lagoon Areas are predominately underlain by fill, consisting of sand with silt and clay. The fill is approximately five to ten-feet thick beneath the Main Plant and becomes slightly thicker adjacent to the Hudson River. In the Lagoon Area, the fill is underlain by alluvial deposits consisting of sand with gravel and some silt and clay. These alluvial deposits are approximately 18-feet thick adjacent to the Hudson River and pinch out along the eastern edge of the wastewater lagoons.

Underlying the fill (alluvial deposits in the Lagoon Area) are glacio-lacustrine deposits consisting of silt and clay ranging from less than nine feet thick beneath the eastern border of the Main Plant to approximately 55 feet thick beneath the Lagoon Area and the western portion of

the Main Plant. The glacio-lacustrine deposits are underlain by a thin sand and gravel unit approximately 6.5 feet thick along the western boundary of the Main Plant. This unit is absent and presumably pinches out beneath the eastern boundary of the Main Plant. Shale bedrock is below the sand and gravel unit at a depth of 70.5 feet along the western boundary of the Main Plant. The shale bedrock is located immediately below the silt and clay at a depth of 17 feet along the eastern boundary of the Main Plant.

3.3 Site Hydrogeology

The evaluation of hydrogeologic conditions was based upon a review of three synoptic rounds of water-level measurements collected during the RI, SRI, and Additional RI Activities. In general, the water table underlying the Main Plant, Lagoon Area, and Closed Landfill occurs within the upper fill deposits. Depth to water beneath the Main Plant ranged from approximately 0.5 feet below land surface to approximately 15 feet below land surface.

The general groundwater flow direction across the Main Plant is from east to west, towards the Hudson River, but this flow direction is not uniform and contains perturbations that are assumed to indicate the influence of subsurface conduits (e.g., sewers) and anisotropies in the fill. As discussed in the Additional RI Activities, steep groundwater gradients are present at the north, west and south perimeters of the Main Plant at locations where either BASF sanitary sewers or City of Rensselaer storm sewers are present. Groundwater flow directions in these locations are towards the sewers, and it has been hypothesized that groundwater beneath the Main Plant discharges to the gravel bedding of these utilities. Groundwater flow directions based on data obtained during the RI of the Main Plant are shown in Figure 3.

Groundwater level measurements from the adjacent Sterling Drug Site show that a groundwater divide exists across the center of the Sterling Drug Site (Figure 3). South of the groundwater divide, groundwater flows to the south, towards the BASF sanitary sewer located between Sterling and BASF, and west, towards the City of Rensselaer Interceptor Sewer located beneath Riverside Avenue. North of the groundwater divide, groundwater flows to the northwest, towards the residential area and the Hudson River. Based on these groundwater elevation data, it can be concluded that groundwater from both the BASF Main Plant and Sterling Drug Site may discharge to the bedding of the BASF sanitary sewer and ultimately to the bedding of the City of

Rensselaer Interceptor Sewer. However, groundwater cannot flow in the saturated fill from the BASF Main plant north to beneath the Sterling Drug Site due to the presence of the groundwater divide and the reversal in groundwater flow direction beneath the Sterling Drug Site (Figure 3). Since groundwater beneath the northern portion of the Sterling Drug Site is known to contain constituents similar to those found in groundwater beneath the BASF Main Plant, constituents originating on the Sterling Drug Site may also be migrating towards the residential area.

3.4 Groundwater and Soil Gas Migration Pathways

Based on the information collected during the RI and summarized above, it was concluded that the north-south trending sewer bedding beneath Riverside Avenue represented the only viable pathway by which groundwater could be transported offsite towards the residential area to the north. This pathway is show conceptually in Figure 3. Therefore, as discussed previously, this pathway was the focus of the groundwater investigation.

This pathway is also the focus of the soil gas evaluation. Vapors can originate from and be transported through the subsurface by two general mechanisms:

1. Volatilization from sources areas (i.e., areas of relatively high concentrations of COCs in soil and groundwater) and diffusive transport along decreasing concentration gradients. This transport mechanism is limited by the rate of volatilization from the source area and by the diffusion rate of the vapor in the soil matrix, resulting in a low rate of mass transfer. Therefore, this is not considered a primary transport mechanism.

2. Transport of dissolved-phase VOCs in groundwater flowing offsite, and volatilization of the VOCs from the groundwater to the surrounding soil matrix. This would be the primary potential transport mechanism if contaminated groundwater is migrating offsite, but soil vapors would be found only in the immediate vicinity of offsite impacted groundwater.

As identified during the RI, therefore, the subsurface sewers and associated sewer bedding were considered to be the potential conduits for the offsite migration of impacted groundwater and vapors volatilizing from the groundwater.

4.0 NATURE AND EXTENT OF CONSTITUENTS OF CONCERN IN OFFSITE SOIL GAS AND GROUNDWATER

The following summarizes the nature and extent of constituents of concern detected in soil gas and sewer bedding groundwater. As stated previously, the primary mechanism for soil gas transport is volatilization from groundwater transported through the sewer bedding; therefore, the results of the groundwater investigation also provide information regarding the nature and extent of vapor transport from the BASF site.

4.1 Groundwater Quality

The results of the groundwater analyses are summarized in Tables 1 through 3 and on Plate 2. Plate 2 presents a summary of detections of constituents of concern in groundwater at concentrations above NYS AWQS. A review of Plate 2 resulted in the following observations supporting a conclusion that no constituents originating on the BASF Site are being transported in groundwater to the residential area to the north:

- No COCs were found in sewer bedding groundwater at the two most northern sampling locations (OS-PZ-205 and OS-PZ-206). Therefore, there is no potential for any BASF COC to be transported to the residential area to the north. COCs were found in OS-PZ-201, but this location is located hydraulically down gradient of the Sterling Site, and these constituents are most likely associated with Sterling.

- No VOCs were present in either the samples collected at the northwest corner of the BASF Site (MP-PP-1, MP-PP-2, LG-PZ-128, LG-PZ-103, and LG-MH-4A), which identify the COCs originating from the BASF Site, or in any of the down stream samples except for OS-PZ-201, which is located hydraulically down gradient of the Sterling Site, as discussed above. These data strongly support a conclusion that no VOCs are being transported in groundwater from the BASF Site northward and, since volatilization of VOCs from groundwater is the primary transport mechanism for soil gas, there is also no migration of soil gas from the BASF Site.

- Arsenic was detected in east-west trending sewer bedding beneath the lagoon area in LG-PZ-103 at a concentration of 240 µg/L. Arsenic is a known COC in groundwater beneath the Lagoon Area, and has been the focus of recent interim remedial measures that have included removal of large quantities of arsenic-impacted soil from beneath the Lagoon Area. Additional remedial measures proposed by BASF for arsenic in groundwater beneath the Lagoon Area included pump and treat and in-situ treatment.

- Arsenic was observed in groundwater south of the lagoon area beneath Albany Port District Commission property at locations OS-PZ-203 and OS-PZ-204 at concentrations of 240 µg/L and 36 µg/l, respectively.

Detections of COCs at all other OU-2 monitoring locations indicated groundwater impacts that are associated with onsite impacts, which were observed and reported during the RI of the Main Plant. Impacted groundwater at all of these locations will be addressed during implementation of the OU-1 groundwater remedy.

4.2 Soil Gas Sampling Results

The results of the soil gas sampling and analyses are summarized in Table 4 and Plate 1. Twenty-three VOCs were detected in soil gas samples associated with sewer bedding beneath Riverside Avenue north of the Site and along Rensselaer Avenue north of the Sterling Drug Site. Only eight of the 23 VOCs found in soil gas are also constituents of concern (COCs) in soil and groundwater at the BASF Site:

Benzene	Ethylbenzene
Chlorobenzene	Toluene
o-Dichlorbenzene	1,2,4-Trichlorobenzene
1,2-Dichloroethane	Xylenes

These eight VOCs are highlighted on Plate 1. Since the other VOCs found in the soil gas samples are not BASF COCs, they cannot be related to the BASF site and, therefore, are not further discussed with respect to the potential for BASF COCs to migrate to the residential area to the north.

The distribution of the above eight VOCs in OU-2 soil gas as presented on Plate 1 must be viewed in combination with the groundwater data discussed previously. These data result in the following observations:

- Only low levels of the COCs are found in the soil gas. With the exceptions of benzene and 1,2 dichloroethane (discussed below), none of the COCs were found at levels greater than their respective Annual Guideline Concentration (AGC) for ambient air, published by the NYSDEC Division of Air Resources.

- Benzene does not originate from the BASF site. In fact, benzene was not detected in the subsurface samples from the two soil gas sampling locations closest to the BASF Main Plant along Riverside Avenue (OS-MH-3 and OS-MH-4A), although it was detected in the subsurface samples at the three furthest north soil gas locations beneath Riverside and Rensselaer Avenues to the north of the Sterling Drug Site (OS-MH-2, OS-SG-201 and

OS-SG-202). Benzene was also detected in the surface ambient air samples at all five sampling locations, indicative of ambient conditions near the roadways.

- 1,2-dichloroethane was not present in any of the soil gas samples from the locations adjacent to the residential area. 1,2-dichloroethane was only detected in soil gas samples from the two closest locations to the BASF Main Plant; OS-MH-3 and OS-MH-4A, and a concentration increase was observed between OS-MH-4A, which is closer to the BASF Main Plant, and OS-MH-3, which is adjacent to the Sterling Drug Site.

- Chlorobenzene, one of the most prevalent COCs in BASF groundwater, is not present at any of the down stream soil gas sample locations, including those north of Sterling and adjacent to the residential area. Cholorbenzene was only detected in the subsurface in the soil gas sample from the location closest to the BASF Main Plant (OS-MH-4A), and not in any other subsurface soil gas sample.

- Two COCs, o-dichlorobenzene and 1,2,4 trichlorobenzene, were only detected in the soil gas sample from OS-MH-3, which is adjacent to the Sterling Drug Site.

- Ethylbenzene, toluene and xylenes were detected in the subsurface in all five soil gas sampling locations at relatively comparable levels, suggesting an ambient level of soil vapors that may be associated with the sewer line rather than any discharge from either BASF or Sterling. Regardless of the source, however, the concentrations of these constituents range from approximately 0.5 percent to 4 percent of their respective AGC in the samples obtained adjacent to the residential area.

5.0 SUMMARY AND CONCLUSIONS

An evaluation of data obtained during the OU-1 RI indicated that the only potential route for offsite migration of dissolved COCs in groundwater was the bedding of the north-south running sewers beneath Rensselaer Avenue. Additionally, the primary mechanism by which vapors could be transported through the subsurface to the residential area (i.e., soil gas) was volatilization of these vapors from contaminated groundwater as the groundwater migrated through the sewer bedding.

Migration along the utility bedding was identified by the NYSDEC as a potential mechanism by which groundwater, and therefore soil gas, could be transported to the residential areas north of the Site. This OU-2 investigation was designed to evaluate the offsite groundwater and soil gas migration pathways to determine whether constituents originating on the BASF Site are being transported to offsite areas, with a particular emphasis on the residential area to the north.

The results of the groundwater and soil gas investigations strongly support the conclusion that no constituents originating on the BASF site are being transported in groundwater or soil gas to the residential area to the north. The specific findings, presented in Section 4 of this report, include:

- No COCs were present in the groundwater samples collected from the two piezometers installed in the sewer bedding north of the BASF Site. These results document the absence of any BASF COCs in the groundwater transport pathway between BASF and the residential area.

- No VOCs were found in either the groundwater samples obtained from the northwest corner of the BASF Site (the location at which any groundwater from BASF would enter the sewer bedding), or the two piezometers installed in the sewer bedding north of the BASF site. Since no VOCs are present in the groundwater originating from BASF and traveling towards the residential neighborhood, groundwater originating on the BASF Site cannot be a source of subsurface vapors (soil gas) in the residential neighborhood.

- Generally, only low concentrations of COCs were found in the soil gas. With the exception of benzene and 1,2 DCA, the highest concentrations of all COCs were lower than their respective AGC for ambient air as established by the NYSDEC Division of Air Resources.

- Benzene is not found in the soil gas samples from either the location closest to the BASF Site or the location immediately downstream from BASF, but is found in the three samples along the northern perimeter of the Sterling Site. These data strongly support a conclusion that the benzene is not associated with the BASF site.

- 1,2 dichloroethane is not found in the samples collected along the perimeter of the residential area.
- A wide range of other constituents, including many that are not COCs in soil or groundwater at the BASF site, are also found at low levels in the soil gas samples. The presence of these constituents and the absence of any concentration trends suggest that the sewer line itself may also be a source of vapors.

Based on the absence of any data that would support a conclusion that COCs originating at the BASF Site are present at or migrating towards the residential area to the north, BASF requests that no further action be required for this component of the OU-2 investigation.

Respectfully submitted,

ROUX ASSOCIATES, INC.

Nathan Epler, Ph.D.
Principal Hydrogeologist

7.0 REFERENCES

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Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: LG-MH-5 Sample Date: 6/8/04 Sample ID: B12-22-24 Unfiltered	Sample Location: LG-MH-5 Sample Date: 6/8/04 Sample ID: B12-23-02 Filtered	Sample Location: LG-MH-6 Sample Date: 6/8/04 Sample ID: B12-21-25 Unfiltered	Sample Location: LG-MH-6 Sample Date: 6/8/04 Sample ID: B12-22-02 Filtered	Sample Location: LG-MH-7 Sample Date: 6/8/04 Sample ID: B12-20-22 Unfiltered
Aluminum	--	100 U	100 U	100 U	100 U	100 U
Antimony	3	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Arsenic	25	12	9.5	8.7	5.5	4.8
Barium	1000	63	61	44	41	28
Beryllium	3	4 U	4 U	4 U	4 U	4 U
Cadmium	5	2 U	2 U	2 U	2 U	2 U
Calcium	--	110,000	110,000	63,000	60,000	55,000
Chromium	50	25 U	25 U	25 U	25 U	25 U
Cobalt	--	10 U	10 U	10 U	10 U	10 U
Copper	200	25 U	25 U	25 U	25 U	25 U
Cyanide	200	10 U	10 U	10 U	10 U	10 U
Iron	300	**7,500**	**7,300**	**3,200**	**3,000**	**4,400**
Lead	25	5 U	5 U	5 U	5 U	5 U
Maghesium	35000	14,000	14,000	7,000	6,600	6,000
Manganese	300	**900**	**890**	**600**	**570**	**1,300**
Mercury	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100	10 U	10 U	10 U	10 U	10 U
Potassium	--	6,200	6,000	4,700	4,300	3,300
Selenium	10	25 U	25 U	25 U	25 U	25 U
Silver	50	10 U	10 U	10 U	10 U	10 U
Sodium	20000	**450,000**	**450,000**	**320,000**	**290,000**	**310,000**
Thallium	0.5	5 U	5 U	5 U	5 U	5 U
Vanadium	--	25 U	25 U	25 U	25 U	25 U
Zinc	2000	25 U	25 U	47	43	53

Notes:

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bold -detections that exceed AWQS

µg/L - Micrograms per Liter

FD - Field duplicate

Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: LG-MH-7 Sample Date: 6/8/04 Sample ID: B12-21-02 Filtered	LG-MW-3 6/9/04 B12-28-22 Unfiltered	LG-MW-3 6/9/04 B12-29-02 Filtered	LG-PZ-103 6/9/04 B12-30-16 Unfiltered	LG-PZ-103 6/9/04 B12-30-19 Filtered
Aluminum	--	100 U	5,700	100 U	1,200	100 U
Antimony	3	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Arsenic	25	4 U	8.1	4 U	**250**	**240**
Barium	1000	28	130	82	180	190
Beryllium	3	4 U	4 U	4 U	4 U	4 U
Cadmium	5	2 U	2 U	2 U	2.1	2
Calcium	--	53,000	170,000	150,000	210,000	230,000
Chromium	50	25 U	25 U	25 U	25 U	25 U
Cobalt	--	10 U	10 U	10 U	10 U	10 U
Copper	200	25 U	39	25 U	25 U	25 U
Cyanide	200	10 U	10 U	10 U	10 U	10 U
Iron	300	**4,300**	**11,000**	150 U	**2,300**	150 U
Lead	25	5 U	7.9	5 U	5.2	5 U
Magnesium	35000	5,900	**44,000**	**41,000**	29,000	31,000
Manganese	300	**1,300**	150	25 U	72	25 U
Mercury	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100	10 U	10	10 U	75	38
Potassium	--	3,400	3,600	2,500 U	7,300	7,700
Selenium	10	25 U	25 U	25 U	25 U	25 U
Silver	50	10 U	10 U	10 U	10 U	10 U
Sodium	20000	**310,000**	**100,000**	**110,000**	**200,000**	**230,000**
Thallium	0.5	5 U	5 U	5 U	5 U	5 U
Vanadium	--	25 U	25 U	25 U	25 U	25 U
Zinc	2000	25 U	37	25 U	25 U	25 U

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Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location:	MP-PP-1	MP-PP-1	MP-PP-2	MP-PP-2	MP-PP-2 FD
		Sample Date:	6/11/04	6/11/04	6/11/04	6/11/04	6/11/04
		Sample ID:	B12-41-17	B12-41-20	B12-40-07	B12-40-10	B12-40-13
			Unfiltered	Filtered	Unfiltered	Filtered	Unfiltered
Aluminum	--		100 U	100 U	220	100 U	250
Antimony	3		7.5 U	7.5 U	**55**	**37**	**60**
Arsenic	25		**170**	**120**	**110**	**100**	**120**
Barium	1000		99	98	110	58	120
Beryllium	3		4 U	4 U	4 U	4 U	4 U
Cadmium	5		2 U	2 U	2 U	2 U	2 U
Calcium	--		140,000	140,000	88,000	110,000	100,000
Chromium	50		25 U	25 U	25 U	25 U	25 U
Cobalt	--		10 U	10 U	10 U	10 U	10 U
Copper	200		25 U	25 U	25 U	25 U	25 U
Cyanide	200		10 U	10 U	10 U	10 U	10 U
Iron	300		280	150 U	**540**	150 U	**600**
Lead	25		5 U	5 U	12	5 U	10
Magnesium	35000		18,000	19,000	11,000	13,000	13,000
Manganese	300		**480**	**440**	**2,700**	25 U	**1,700**
Mercury	0.7		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100		10 U	10 U	10 U	10 U	10 U
Potassium	--		6,000	6,100	3,200	4,200	3,700
Selenium	10		25 U	25 U	25 U	25 U	25 U
Silver	50		10 U	10 U	10 U	10 U	10 U
Sodium	20000		**320,000**	**310,000**	**47,000**	**71,000**	**54,000**
Thallium	0.5		5 U	5 U	5 U	5 U	5 U
Vanadium	--		25 U	25 U	25 U	25 U	25 U
Zinc	2000		25 U	25 U	34	25 U	28

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Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: MP-PP-2 FD Sample Date: 6/11/04 Sample ID: B12-40-16 Filtered	MP-PZ-106 6/14/04 B12-43-21 Unfiltered	MP-PZ-106 6/14/04 B12-43-25 Filtered	MP-PZ-107 6/8/04 B12-24-07 Unfiltered	MP-PZ-107 6/8/04 B12-24-10 Filtered	OS-MH-4A 6/14/04 B12-44-22 Unfiltered
Aluminum	--	100 U	190	100 U	100 U	100 U	100 U
Antimony	3	**35**	**18**	**16**	7.5 U	7.5 U	**9.1**
Arsenic	25	**93**	**1,200**	**1,200**	8.7	4 U	**56**
Barium	1000	53	25 U	25 U	120	120	170
Beryllium	3	4 U	4 U	4 U	4 U	4 U	4 U
Cadmium	5	2 U	**7.5**	**7**	2 U	2 U	2 U
Calcium	--	98,000	47,000	46,000	100,000	100,000	240,000
Chromium	50	25 U	25 U	25 U	25 U	25 U	25 U
Cobalt	--	10 U	10 U	10 U	10 U	10 U	10 U
Copper	200	25 U	25 U	25 U	25 U	25 U	25 U
Cyanide	200	10 U	10 U	10 U	10 U	10 U	10 U
Iron	300	150 U	**550**	150 U	**970**	**1,400**	150 U
Lead	25	5 U	5 U	5 U	5 U	5 U	7.2
Magnesium	35000	12,000	5,500	5,300	11,000	12,000	26,000
Manganese	300	25 U	93	90	**620**	**1,000**	25 U
Mercury	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100	10 U	10 U	10 U	10 U	10 U	10 U
Potassium	--	3,900	2,600	2,600	4,700	4,600	15,000
Selenium	10	25 U	25 U	25 U	25 U	25 U	25 U
Silver	50	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	20000	**66,000**	**320,000**	**330,000**	**330,000**	**340,000**	**150,000**
Thallium	0.5	5 U	5 U	5 U	5 U	5 U	5 U
Vanadium	--	25 U	25 U	25 U	25 U	25 U	25 U
Zinc	2000	25 U	25 U	25 U	25 U	25 U	220

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FD - Field duplicate

Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: OS-MH-4A Sample Date: 6/14/04 Sample ID: B12-44-24 Filtered	OS-PZ-201 6/10/04 B12-34-21 Unfiltered	OS-PZ-201 6/10/04 B12-34-24 Filtered	OS-PZ-202 6/10/04 B12-33-12 Unfiltered	OS-PZ-202 6/10/04 B12-33-16 Filtered	OS-PZ-203 6/9/04 B12-26-07 Unfiltered
Aluminum	--	100 U	19,000	100 U	4,400	100 U	270
Antimony	3	**7.8**	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Arsenic	25	**51**	**30**	16	12	15	**250**
Barium	1000	170	570	530	400	420	240
Beryllium	3	4 U	4 U	4 U	4 U	4 U	4 U
Cadmium	5	2 U	2 U	2 U	2 U	2 U	2 U
Calcium	--	240,000	380,000	440,000	210,000	230,000	220,000
Chromium	50	25 U	38	25 U	25 U	25 U	25 U
Cobalt	--	10 U	40	10 U	10 U	10 U	10 U
Copper	200	25 U	64	25 U	25 U	25 U	25 U
Cyanide	200	10 U	16	10 U	10 U	10 U	10 U
Iron	300	150 U	**48,000**	**11,000**	**16,000**	**11,000**	**12,000**
Lead	25	6.1	**110**	11	7.8	5 U	5 U
Magnesium	35000	25,000	**50,000**	**52,000**	24,000	26,000	**47,000**
Manganese	300	25 U	**8,800**	**7,900**	**2,000**	**2,300**	**1,000**
Mercury	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100	10 U	60	10 U	24	11	10 U
Potassium	--	16,000	12,000	10,000	6,200	6,200	4,000
Selenium	10	25 U	25 U	25 U	25 U	25 U	25 U
Silver	50	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	20000	**160,000**	**430,000**	**530,000**	**290,000**	**340,000**	16,000
Thallium	0.5	5 U	5 U	5 U	5 U	5 U	5 U
Vanadium	--	25 U	45	25 U	25 U	25 U	25 U
Zinc	2000	330	270	46	45	25 U	25 U

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Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: OS-PZ-203 Sample Date: 6/9/04 Sample ID: B12-26-10 Filtered	OS-PZ-204 6/9/04 B12-27-09 Unfiltered	OS-PZ-204 6/9/04 B12-27-12 Filtered	OS-PZ-205 6/14/04 B12-45-20 Unfiltered	OS-PZ-205 6/14/04 B12-45-23 Filtered	OS-PZ-206 6/10/04 B12-36-02 Unfiltered
Aluminum	--	100 U	630	100 U	260	100 U	3,100
Antimony	3	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U	7.5 U
Arsenic	25	**240**	**36**	**65**	4 U	4 U	5.4
Barium	1000	240	87	91	160	150	87
Beryllium	3	4 U	4 U	4 U	4 U	4 U	4 U
Cadmium	5	2 U	2 U	2 U	2 U	2 U	2 U
Calcium	--	220,000	210,000	210,000	210,000	210,000	110,000
Chromium	50	25 U	25 U	25 U	25 U	25 U	25 U
Cobalt	--	10 U	10 U	10 U	10 U	10 U	10 U
Copper	200	25 U	25 U	25 U	25 U	25 U	25 U
Cyanide	200	10 U	10 U	10 U	10 U	10 U	10 U
Iron	300	**11,000**	**2,000**	**1,100**	**780**	150 U	**8,200**
Lead	25	5 U	5 U	5 U	5 U	5 U	11
Magnesium	35000	**47,000**	**55,000**	**53,000**	**67,000**	**71,000**	29,000
Manganese	300	**1,000**	**1,200**	**1,100**	**1,200**	**1,200**	**700**
Mercury	0.7	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel	100	10 U	10 U	10 U	10 U	10 U	18
Potassium	--	3,900	6,200	6,300	7,700	7,300	4,300
Selenium	10	25 U	25 U	25 U	25 U	25 U	25 U
Silver	50	10 U	10 U	10 U	10 U	10 U	10 U
Sodium	20000	16,000	9,600	9,400	**330,000**	**300,000**	**61,000**
Thallium	0.5	5 U	5 U	5 U	5 U	5 U	5 U
Vanadium	--	25 U	25 U	25 U	25 U	25 U	25 U
Zinc	2000	25 U	25 U	25 U	25 U	25 U	130

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µg/L - Micrograms per Liter

FD - Field duplicate

Table 1. Summary of Metals in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

		Sample Location:	OS-PZ-206
		Sample Date:	6/10/04
		Sample ID:	B12-36-05
	NYSDEC AWQS		Filtered
Analyte (concentrations in ug/L)			
Aluminum	--		100 U
Antimony	3		7.5 U
Arsenic	25		4 U
Barium	1000		71
Beryllium	3		4 U
Cadmium	5		2 U
Calcium	--		120,000
Chromium	50		25 U
Cobalt	--		10 U
Copper	200		25 U
Cyanide	200		10 U
Iron	300		150 U
Lead	25		5 U
Magnesium	35000		33,000
Manganese	300		260
Mercury	0.7		0.2 U
Nickel	100		10 U
Potassium	--		4,400
Selenium	10		25 U
Silver	50		10 U
Sodium	20000		**75,000**
Thallium	0.5		5 U
Vanadium	--		25 U
Zinc	2000		25 U

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FD - Field duplicate

Table 2. Summary of Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Renssealer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: LG-MH-5 Sample Date: 6/8/04 Sample ID: B12-22-24	LG-MH-6 6/8/04 B12-21-25	LG-MH-7 6/8/04 B12-20-22	LG-MW-3 6/9/04 B12-28-22	LG-PZ-103 6/9/04 B12-30-16	LG-PZ-129 6/15/04 B12-49-05	MP-PP-1 6/11/04 B12-41-17	MP-PP-2 6/11/04 B12-40-07	MP-PP-2 6/11/04 B12-40-13
Acetone	50	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	7.3 U	7.3 U	7.3 U	7.3 U
Benzene	1	0.41 U	0.41 U	**33**	0.41 U	0.41 U	0.57 U	0.57 U	0.57 U	0.57 U
Bromodichloromethane	50	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.73 U	0.73 U	0.73 U	0.73 U
Bromoform	50	0.36 U	0.36 U	0.36 U	0.36 U	0.36 U	0.85 U	0.85 U	0.85 U	0.85 U
Bromomethane	5	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	1.4 U	1.4 U	1.4 U	1.4 U
2-Butanone	--	12 U	12 U	12 U	12 U	12 U	1.4 U	1.4 U	1.4 U	1.4 U
Carbon disulfide	--	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U	1.1 U	1.1 U	1.1 U	1.1 U
Carbon tetrachloride	5	0.52 U	0.52 U	0.52 U	0.52 U	0.52 U	0.66 U	0.66 U	0.66 U	0.66 U
Chlorobenzene	5	**97**	**9.1**	**440**	0.55 U	0.55 U	0.57 U	1.1	0.57 U	0.57 U
Chloroethane	5	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U
Chloroform	7	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	0.82 U	0.82 U	0.82 U	0.82 U
Chloromethane	--	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	1.4 U	1.4 U	1.4 U	1.4 U
Dibromochloromethane	50	0.49 U	0.49 U	0.49 U	0.49 U	0.49 U	0.66 U	0.66 U	0.66 U	0.66 U
1,2-Dichlorobenzene	3	0.55 U	0.55 U	**3.4**	0.55 U	0.55 U	0.59 U	0.59 U	0.59 U	0.59 U
1,3-Dichlorobenzene	3	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.51 U	0.51 U	0.51 U	0.51 U
1,4-Dichlorobenzene	3	0.47 U	0.47 U	1.6	0.47 U	0.47 U	0.77 U	0.77 U	0.77 U	0.77 U
1,1-Dichloroethane	5	0.89 U	0.89 U	0.89 U	0.89 U	0.89 U	0.88 U	0.88 U	0.88 U	0.88 U
1,2-Dichloroethane	0.6	**4.5**	**1.6**	**77**	**1.5**	0.69 U	**44**	0.83 U	0.83 U	0.83 U
1,1-Dichloroethene	5	0.83 U	0.83 U	0.83 U	0.83 U	0.83 U	0.94 U	0.94 U	0.94 U	0.94 U
Cis-1,2-Dichloroethene	5	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.81 U	0.81 U	0.81 U	0.81 U
Trans-1,2-Dichloroethene	5	0.88 U	0.88 U	0.88 U	0.88 U	0.88 U	0.73 U	0.73 U	0.73 U	0.73 U
1,2-Dichloropropane	1	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.99 U	0.99 U	0.99 U	0.99 U
Cis-1,3-Dichloropropene	0.4	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U	0.47 U	0.47 U	0.47 U	0.47 U
Trans-1,3-Dichloropropene	0.4	0.62 U	0.62 U	0.62 U	0.62 U	0.62 U	0.48 U	0.48 U	0.48 U	0.48 U
Ethylbenzene	5	0.87 U	0.87 U	0.87 U	0.87 U	0.87 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Hexanone	50	0.45 U	0.45 U	0.45 U	0.45 U	0.45 U	0.9 U	0.9 U	0.9 U	0.9 U
4-Methyl-2-Pentanone	--	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	1 U	1 U	1 U	1 U
Methylene chloride	5	1 U	1 U	1 U	1 U	1	0.8 U	0.8 U	0.8 U	1.4
Styrene	5	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.39 U	0.39 U	0.39 U	0.39 U
1,1,2,2-Tetrachloroethane	5	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.76 U	0.76 U	0.76 U	0.76 U
Tetrachloroethene	5	0.34 U	0.34 U	0.34 U	0.34 U	0.34 U	0.61 U	0.61 U	0.61 U	0.61 U
Toluene	5	0.63 U	0.63 U	0.63 U	0.63 U	0.63 U	0.54 U	0.54 U	0.54 U	0.54 U
1,2,4-Trichlorobenzene	5	0.61 U	0.61 U	0.61 U	0.61 U	0.61 U	0.27 U	0.27 U	0.27 U	0.27 U
1,1,1-Trichloroethane	5	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U	0.64 U
1,1,2-Trichloroethane	1	0.43 U	0.43 U	0.43 U	0.43 U	0.43 U	0.67 U	0.67 U	0.67 U	0.67 U
Trichloroethene	5	0.7 U	0.7 U	0.7 U	0.7 U	0.7 U	0.74 U	0.74 U	0.74 U	0.74 U
Vinyl chloride	2	0.47 U	0.47 U	**12**	0.47 U	0.47 U	1.3 U	1.3 U	1.3 U	1.3 U
O-Xylene	5	0.72 U	0.72 U	0.72 U	0.72 U	0.72 U	0.57 U	0.57 U	0.57 U	0.57 U
M&p-Xylenes	5	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U	0.81 U	0.81 U	0.81 U	0.81 U

Notes:
NYSDEC -New York State Department of Environmental Conservation
AWQS - NYSDEC Ambient Water Quality Standard or Guidance Value
-- -No NYSDEC Ambient Water-Quality Standard or Guidance Value Available
B - Detected in blank
J - Result is estimated value below the reporting limit
U - Not detected, method detection limit shown
bold -detections that exceed AWQS
µg/L - Micrograms per Liter

Table 2. Summary of Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Renssealer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: MP-PZ-106 Sample Date: 6/14/04 Sample ID: B12-43-21	MP-PZ-107 6/8/04 B12-24-07	OS-MH-4A 6/14/04 B12-44-22	OS-PZ-201 6/10/04 B12-34-21	OS-PZ-202 6/10/04 B12-33-12	OS-PZ-203 6/9/04 B12-26-07	OS-PZ-204 6/9/04 B12-27-09	OS-PZ-205 6/14/04 B12-45-20	OS-PZ-206 6/10/04 B12-36-02
Acetone	50	7.3 U	73 U	7.3 U	7.3 U	1.6 U	2.8 U	2.8 U	7.3 U	1.6 U
Benzene	1	**98**	**150**	0.57 U	0.57 U	0.15 U	0.41 U	0.41 U	0.57 U	0.15 U
Bromodichloromethane	50	0.73 U	7.3 U	0.73 U	0.73 U	0.38 U	0.52 U	0.52 U	0.73 U	0.38 U
Bromoform	50	0.85 U	8.5 U	0.85 U	0.85 U	0.27 U	0.36 U	0.36 U	0.85 U	0.27 U
Bromomethane	5	1.4 U	14 U	1.4 U	1.4 U	0.46 U	0.9 U	0.9 U	1.4 U	0.46 U
2-Butanone	--	1.4 U	14 U	1.4 U	1.4 U	2.4 U	12 U	12 U	1.4 U	2.4 U
Carbon disulfide	--	1.1 U	11 U	1.1 U	1.1 U	0.28 U	0.53 U	0.53 U	1.1 U	0.28 U
Carbon tetrachloride	5	0.66 U	6.6 U	0.66 U	0.66 U	0.4 U	0.52 U	0.52 U	0.66 U	0.4 U
Chlorobenzene	5	**200**	**260**	0.57 U	**17**	1.1	2.6	0.55 U	0.57 U	0.26 U
Chloroethane	5	1.2 U	12 U	1.2 U	1.2 U	0.59 U	1.3 U	1.3 U	1.2 U	0.59 U
Chloroform	7	0.82 U	8.2 U	4.8	0.82 U	0.8 U	1.2 U	1.2 U	0.82 U	0.8 U
Chloromethane	--	1.4 U	14 U	1.4 U	1.4 U	0.46 U	1.1 U	1.1 U	1.4 U	0.46 U
Dibromochloromethane	50	0.66 U	6.6 U	0.66 U	0.66 U	0.29 U	0.49 U	0.49 U	0.66 U	0.29 U
1,2-Dichlorobenzene	3	0.59 U	5.9 U	0.59 U	0.59 U	0.31 U	0.55 U	0.55 U	0.59 U	0.31 U
1,3-Dichlorobenzene	3	0.51 U	5.1 U	0.51 U	0.51 U	0.35 U	0.5 U	0.5 U	0.51 U	0.35 U
1,4-Dichlorobenzene	3	0.77 U	7.7 U	0.77 U	0.77 U	0.38 U	0.47 U	0.47 U	0.77 U	0.38 U
1,1-Dichloroethane	5	0.88 U	8.8 U	0.88 U	1.4	0.39 U	0.89 U	0.89 U	0.88 U	0.39 U
1,2-Dichloroethane	0.6	0.83 U	**1,400**	0.83 U	0.83 U	0.46 U	0.69 U	0.69 U	0.83 U	0.46 U
1,1-Dichloroethene	5	0.94 U	9.4 U	0.94 U	0.94 U	0.41 U	0.83 U	0.83 U	0.94 U	0.41 U
Cis-1,2-Dichloroethene	5	0.81 U	8.1 U	0.81 U	0.81 U	0.25 U	0.72 U	0.72 U	0.81 U	0.25 U
Trans-1,2-Dichloroethene	5	0.73 U	7.3 U	0.73 U	0.73 U	0.4 U	0.88 U	0.88 U	0.73 U	0.4 U
1,2-Dichloropropane	1	0.99 U	9.9 U	0.99 U	0.99 U	0.22 U	0.44 U	0.44 U	0.99 U	0.22 U
Cis-1,3-Dichloropropene	0.4	0.47 U	4.7 U	0.47 U	0.47 U	0.21 U	0.51 U	0.51 U	0.47 U	0.21 U
Trans-1,3-Dichloropropene	0.4	0.48 U	4.8 U	0.48 U	0.48 U	0.26 U	0.62 U	0.62 U	0.48 U	0.26 U
Ethylbenzene	5	2.9	5 U	0.5 U	0.5 U	0.54 U	0.87 U	0.87 U	0.5 U	0.54 U
2-Hexanone	50	0.9 U	9 U	0.9 U	0.9 U	0.87 U	0.45 U	0.45 U	0.9 U	0.87 U
4-Methyl-2-Pentanone	--	1 U	10 U	1 U	1 U	0.25 U	0.44 U	0.44 U	1 U	0.25 U
Methylene chloride	5	0.8 U	8 U	0.8 U	0.8 U	0.53 U	2	1 U	0.8 U	0.53 U
Styrene	5	0.39 U	3.9 U	0.39 U	0.39 U	0.14 U	0.44 U	0.44 U	0.39 U	0.14 U
1,1,2,2-Tetrachloroethane	5	0.76 U	7.6 U	0.76 U	0.76 U	0.22 U	0.63 U	0.63 U	0.76 U	0.22 U
Tetrachloroethene	5	0.61 U	6.1 U	0.61 U	0.61 U	0.5 U	0.34 U	0.34 U	0.61 U	0.5 U
Toluene	5	1.2	5.4 U	0.54 U	0.54 U	0.27 U	0.63 U	0.63 U	0.54 U	0.27 U
1,2,4-Trichlorobenzene	5	0.27 U	2.7 U	0.27 U	0.27 U	0.34 U	0.61 U	0.61 U	0.27 U	0.34 U
1,1,1-Trichloroethane	5	0.64 U	6.4 U	0.64 U	0.64 U	0.45 U	0.64 U	0.64 U	0.64 U	0.45 U
1,1,2-Trichloroethane	1	0.67 U	6.7 U	0.67 U	0.67 U	0.36 U	0.43 U	0.43 U	0.67 U	0.36 U
Trichloroethene	5	0.74 U	7.4 U	0.74 U	0.74 U	0.26 U	0.7 U	0.7 U	0.74 U	0.26 U
Vinyl chloride	2	1.3 U	13 U	1.3 U	1.3 U	0.45 U	0.47 U	0.47 U	1.3 U	0.45 U
O-Xylene	5	1.2	5.7 U	0.57 U	1.5	0.19 U	0.72 U	0.72 U	0.57 U	0.19 U
M&p-Xylenes	5	0.81 U	8.1 U	0.81 U	0.81 U	0.6 U	1.1 U	1.1 U	0.81 U	0.6 U

Notes:
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-- -No NYSDEC Ambient Water-Quality Standard or Guidance Value Available
B - Detected in blank
J - Result is estimated value below the reporting limit
U - Not detected, method detection limit shown
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µg/L - Micrograms per Liter

Table 3. Summary of Semi-Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

		Sample Location:	LG-MH-5	LG-MH-6	LG-MH-7	LG-MW-3	LG-PZ-103	MP-PP-1	MP-PP-2
		Sample Date:	6/8/04	6/8/04	6/8/04	6/9/04	6/9/04	6/11/04	6/11/04
		Sample ID:	B12-22-24	B12-21-25	B12-20-22	B12-28-22	B12-30-16	B12-41-17	B12-40-07
Analyte (concentrations in ug/L)	NYSDEC AWQS								
2,4-Dinitrotoluene	5		0.29 U	0.32 U	0.3 U	0.29 U	0.29 U	0.29 U	0.36 U
2,6-Dinitrotoluene	5		0.48 U	0.53 U	0.5 U	0.48 U	0.48 U	0.48 U	0.6 U
Fluoranthene	50		0.24 U	0.26 U	0.25 U	0.24 U	0.24 U	0.24 U	0.3 U
Fluorene	50		0.26 U	0.29 U	0.27 U	0.26 U	0.26 U	0.26 U	0.32 U
Hexachlorobenzene	0.04		0.25 U	0.28 U	0.26 U	0.25 U	0.25 U	0.25 U	0.31 U
Hexachlorobutadiene	0.5		0.24 U	0.27 U	0.25 U	0.24 U	0.24 U	0.24 U	0.3 U
Hexachlorocyclopentadiene	5		1.3 U	1.4 U	1.4 U	1.3 U	1.3 U	1.3 U	1.6 U
Hexachloroethane	5		0.38 U	0.42 U	0.39 U	0.38 U	0.38 U	0.38 U	0.47 U
Indeno[1,2,3-cd]pyrene	0.002		0.17 U	0.18 U	0.17 U	0.17 U	0.17 U	0.17 U	0.21 U
Isophorone	50		0.25 U	0.28 U	0.26 U	0.25 U	0.25 U	0.25 U	0.31 U
2-Methylnaphthalene	--		1.5 U	1.6 U	1.5 U	1.5 U	1.5 U	1.5 U	1.8 U
2-Methylphenol	--		2.5 U	2.8 U	2.6 U	2.5 U	2.5 U	2.5 U	3.2 U
3&4-Methylphenol	--		2.5 U	2.7 U	2.6 U	2.5 U	2.5 U	2.5 U	3.1 U
Naphthalene	10		0.18 U	0.2 U	0.19 U	0.18 U	0.18 U	0.18 U	0.23 U
2-Nitroaniline	5		2.1 U	2.4 U	2.2 U	2.1 U	2.1 U	2.1 U	2.6 U
3-Nitroaniline	5		2.9 U	3.2 U	3 U	2.9 U	2.9 U	2.9 U	3.6 U
4-Nitroaniline	5		1.7 U	1.9 U	1.8 U	1.7 U	1.7 U	1.7 U	2.2 U
Nitrobenzene	0.4		0.33 U	0.36 U	0.34 U	0.33 U	0.33 U	0.33 U	0.41 U
2-Nitrophenol	--		2 U	2.3 U	2.1 U	2 U	2 U	2 U	2.5 U
4-Nitrophenol	--		1.6 U	1.8 U	1.7 U	1.6 U	1.6 U	1.6 U	2 U
N-Nitrosodiphenylamine	50		0.21 U	0.23 U	0.22 U	0.21 U	0.21 U	0.21 U	0.26 U
DI-n-octylphthalate	--		0.17 U	0.19 U	0.18 U	0.17 U	0.17 U	0.17 U	0.21 U
Pentachlorophenol	1		0.61 U	0.68 U	0.64 U	0.61 U	0.61 U	0.61 U	0.77 U
Phenanthrene	50		0.17 U	0.19 U	0.18 U	0.17 U	0.17 U	0.17 U	0.21 U
Phenol	1		1.2 U	1.3 U	1.2 U	1.2 U	1.2 U	1.2 U	1.5 U
N-Nitroso-Di-N-Propylamine	--		0.29 U	0.32 U	0.3 U	0.29 U	0.29 U	0.29 U	0.36 U
Pyrene	50		0.21 U	0.23 U	0.22 U	0.21 U	0.21 U	0.21 U	0.26 U
1,2,4-Trichlorobenzene	5		0.35 U	0.38 U	0.36 U	0.35 U	0.35 U	0.35 U	0.43 U
2,4,5-Trichlorophenol	--		1.6 U	1.8 U	1.7 U	1.6 U	1.6 U	1.6 U	2 U
2,4,6-Trichlorophenol	--		1.4 U	1.5 U	1.4 U	1.4 U	1.4 U	1.4 U	1.7 U

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Table 3. Summary of Semi-Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: LG-MH-5 Sample Date: 6/8/04 Sample ID: B12-22-24	LG-MH-6 6/8/04 B12-21-25	LG-MH-7 6/8/04 B12-20-22	LG-MW-3 6/9/04 B12-28-22	LG-PZ-103 6/9/04 B12-30-16	MP-PP-1 6/11/04 B12-41-17	MP-PP-2 6/11/04 B12-40-07
Acenaphthene	20	0.3 U	0.33 U	0.31 U	0.3 U	0.3 U	0.3 U	0.37 U
Acenaphthylene	--	0.26 U	0.29 U	0.27 U	0.26 U	0.26 U	0.26 U	0.32 U
Anthracene	50	0.2 U	0.22 U	0.21 U	0.2 U	0.2 U	0.2 U	0.25 U
Benzo[a]anthracene	0.002	0.25 U	0.27 U	0.26 U	0.25 U	0.25 U	0.25 U	0.31 U
Benzo[a]pyrene	--	0.24 U	0.27 U	0.25 U	0.24 U	0.24 U	0.24 U	0.3 U
Benzo[b]fluoranthene	0.002	0.23 U	0.26 U	0.24 U	0.23 U	0.23 U	0.23 U	0.29 U
Benzo[g,h,i]perylene	5	0.22 U	0.24 U	0.23 U	0.22 U	0.22 U	0.22 U	0.27 U
Benzo[k]fluoranthene	0.002	0.25 U	0.27 U	0.26 U	0.25 U	0.25 U	0.25 U	0.31 U
Bis(2-Chloroethoxy)methane	5	0.4 U	0.45 U	0.42 U	0.4 U	0.4 U	0.4 U	0.5 U
Bis(2-Chloroethyl)Ether	1	0.39 U	0.43 U	0.41 U	0.39 U	0.39 U	0.39 U	0.49 U
Bis(2-Chloroisopropyl)ether	--	0.1 U	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.13 U
Bis(2-Ethylhexyl)phthalate	5	0.26 U	0.29 U	0.27 U	0.26 U	0.26 U	0.26 U	3.6 B
4-Bromophenyl-phenylether	--	0.48 U	0.53 U	0.5 U	0.48 U	0.48 U	0.48 U	0.6 U
Butylbenzylphthalate	--	0.22 U	0.24 U	0.23 U	0.22 U	0.22 U	0.22 U	0.27 U
Di-n-butylphthalate	--	0.17 U	0.19 U	0.18 U	0.17 U	0.17 U	0.17 U	0.22 U
Carbazole	--	0.14 U	0.16 U	3.2	0.14 U	0.14 U	0.14 U	0.18 U
4-Chloro-3-methylphenol	--	3.3 U	3.6 U	3.4 U	3.3 U	3.3 U	3.3 U	4.1 U
4-Chloroaniline	5	2.8 U	3.1 U	2.9 U	2.8 U	2.8 U	2.8 U	3.5 U
2-Chloronaphthalene	10	0.24 U	0.27 U	0.25 U	0.24 U	0.24 U	0.24 U	0.3 U
2-Chlorophenol	--	2.6 U	2.8 U	2.2 J	2.6 U	2.6 U	2.6 U	3.2 U
4-Chlorophenyl-phenylether	--	0.36 U	0.4 U	0.37 U	0.36 U	0.36 U	0.36 U	0.45 U
Chrysene	0.002	0.22 U	0.24 U	0.22 U	0.22 U	0.22 U	0.22 U	0.27 U
Dibenzo[a,h]Anthracene	--	0.31 U	0.35 U	0.33 U	0.31 U	0.31 U	0.31 U	0.39 U
Dibenzofuran	--	1.5 U	1.6 U	1.5 U	1.5 U	1.5 U	1.5 U	1.8 U
1,2-Dichlorobenzene	3	0.16 U	0.18 U	1.8	0.16 U	0.16 U	0.16 U	0.21 U
1,3-Dichlorobenzene	3	0.17 U	0.19 U	0.18 U	0.17 U	0.17 U	0.17 U	0.21 U
1,4-Dichlorobenzene	3	0.14 U	0.15 U	0.14 U	0.14 U	0.14 U	0.14 U	0.17 U
3,3'-Dichlorobenzidine	5	2.3 U	2.6 U	2.4 U	2.3 U	2.3 U	2.3 U	2.9 U
2,4-Dichlorophenol	5	2.3 U	2.6 U	2.4 U	2.3 U	2.3 U	2.3 U	2.9 U
Diethylphthalate	--	0.27 U	0.3 U	0.28 U	0.27 U	0.27 U	0.27 U	0.33 U
2,4-Dimethylphenol	50	3 U	3.4 U	3.1 U	3 U	3 U	3 U	3.8 U
Dimethylphthalate	--	0.27 U	0.3 U	0.28 U	0.27 U	0.27 U	0.27 U	0.34 U
4,6-Dinitro-2-methylphenol	--	1.7 U	1.9 U	1.8 U	1.7 U	1.7 U	1.7 U	2.2 U
2,4-Dinitrophenol	10	1.3 U	1.4 U	1.3 U	1.3 U	1.3 U	1.3 U	1.6 U

Table 3. Summary of Semi-Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: / Sample Date: / Sample ID: MP-PP-2 6/11/04 B12-40-13	MP-PZ-106 6/14/04 B12-43-21	MP-PZ-107 6/8/04 B12-24-07	OS-MH-4A 6/14/04 B12-44-22	OS-PZ-201 6/10/04 B12-34-21	OS-PZ-202 6/10/04 B12-33-12	OS-PZ-203 6/9/04 B12-26-07
Acenaphthene	20	0.3 U	0.31 U	0.3 U	0.37 U	0.3 U	0.3 U	0.31 U
Acenaphthylene	--	0.26 U	0.27 U	0.26 U	0.32 U	0.26 U	0.26 U	0.27 U
Anthracene	50	0.2 U	0.21 U	0.2 U	0.25 U	0.2 U	0.2 U	0.21 U
Benzo[a]anthracene	0.002	0.25 U	0.26 U	0.25 U	0.31 U	0.25 U	0.25 U	0.26 U
Benzo[a]pyrene	--	0.24 U	0.26 U	0.24 U	0.3 U	0.24 U	0.24 U	0.25 U
Benzo[b]fluoranthene	0.002	0.23 U	0.24 U	0.23 U	0.29 U	0.23 U	0.23 U	0.24 U
Benzo[g,h,i]perylene	5	0.22 U	0.23 U	0.22 U	0.27 U	0.22 U	0.22 U	0.23 U
Benzo[k]fluoranthene	0.002	0.25 U	0.26 U	0.25 U	0.31 U	0.25 U	0.25 U	0.26 U
Bis(2-Chloroethoxy)methane	5	0.4 U	0.42 U	0.4 U	0.5 U	0.4 U	0.4 U	0.42 U
Bis(2-Chloroethyl)Ether	1	0.39 U	0.41 U	0.39 U	0.49 U	0.39 U	0.39 U	0.41 U
Bis(2-Chloroisopropyl)ether	--	0.1 U	0.11 U	0.1 U	0.13 U	0.1 U	0.1 U	0.1 U
Bis(2-Ethylhexyl)phthalate	5	4.2 B	0.28 U	0.26 U	0.33 U	0.26 U	**13 B**	0.27 U
4-Bromophenyl-phenylether	--	0.48 U	0.5 U	0.48 U	0.6 U	0.48 U	0.48 U	0.5 U
Butylbenzylphthalate	--	0.22 U	0.23 U	0.22 U	0.27 U	0.22 U	0.22 U	0.23 U
Di-n-butylphthalate	--	0.17 U	0.18 U	0.17 U	0.22 U	0.17 U	0.17 U	0.18 U
Carbazole	--	0.14 U	0.15 U	0.14 U	0.18 U	0.14 U	0.14 U	0.15 U
4-Chloro-3-methylphenol	--	3.3 U	3.4 U	3.3 U	4.1 U	3.3 U	3.3 U	3.4 U
4-Chloroaniline	5	2.8 U	3 U	2.8 U	3.5 U	2.8 U	2.8 U	2.9 U
2-Chloronaphthalene	10	0.24 U	0.25 U	0.24 U	0.3 U	0.24 U	0.24 U	0.25 U
2-Chlorophenol	--	2.6 U	2.7 U	2.6 U	3.2 U	2.6 U	2.6 U	2.7 U
4-Chlorophenyl-phenylether	--	0.36 U	0.37 U	0.36 U	0.45 U	0.36 U	0.36 U	0.37 U
Chrysene	0.002	0.22 U	0.23 U	0.22 U	0.27 U	0.22 U	0.22 U	0.22 U
Dibenzo[a,h]Anthracene	--	0.31 U	0.33 U	0.31 U	0.39 U	0.31 U	0.31 U	0.33 U
Dibenzofuran	--	1.5 U	1.5 U	1.5 U	1.8 U	1.5 U	1.5 U	1.5 U
1,2-Dichlorobenzene	3	0.16 U	1.6	0.16 U	0.21 U	0.16 U	0.16 U	0.17 U
1,3-Dichlorobenzene	3	0.17 U	0.18 U	0.17 U	0.21 U	0.17 U	0.17 U	0.18 U
1,4-Dichlorobenzene	3	0.14 U	0.14 U	0.14 U	0.17 U	0.14 U	0.14 U	0.14 U
3,3'-Dichlorobenzidine	5	2.3 U	2.5 U	2.3 U	2.9 U	2.3 U	2.3 U	2.4 U
2,4-Dichlorophenol	5	2.3 U	2.4 U	2.3 U	2.9 U	2.3 U	2.3 U	2.4 U
Diethylphthalate	--	0.27 U	0.28 U	0.27 U	0.33 U	0.27 U	0.27 U	0.28 U
2,4-Dimethylphenol	50	3 U	3.2 U	3 U	3.8 U	3 U	3 U	3.1 U
Dimethylphthalate	--	0.27 U	0.29 U	0.27 U	0.34 U	0.27 U	0.27 U	0.28 U
4,6-Dinitro-2-methylphenol	--	1.7 U	1.8 U	1.7 U	2.2 U	1.7 U	1.7 U	1.8 U
2,4-Dinitrophenol	10	1.3 U	1.3 U	1.3 U	1.6 U	1.3 U	1.3 U	1.3 U

Table 3. Summary of Semi-Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in ug/L)	NYSDEC AWQS	Sample Location: MP-PP-2 Sample Date: 6/11/04 Sample ID: B12-40-13	MP-PZ-106 6/14/04 B12-43-21	MP-PZ-107 6/8/04 B12-24-07	OS-MH-4A 6/14/04 B12-44-22	OS-PZ-201 6/10/04 B12-34-21	OS-PZ-202 6/10/04 B12-33-12	OS-PZ-203 6/9/04 B12-26-07
2,4-Dinitrotoluene	5	0.29 U	0.31 U	0.29 U	0.36 U	0.29 U	0.29 U	0.3 U
2,6-Dinitrotoluene	5	0.48 U	0.5 U	0.48 U	0.6 U	0.48 U	0.48 U	0.5 U
Fluoranthene	50	0.24 U	0.25 U	0.24 U	0.3 U	0.24 U	0.24 U	0.25 U
Fluorene	50	0.26 U	0.27 U	0.26 U	0.32 U	0.26 U	0.26 U	0.27 U
Hexachlorobenzene	0.04	0.25 U	0.26 U	0.25 U	0.31 U	0.25 U	0.25 U	0.26 U
Hexachlorobutadiene	0.5	0.24 U	0.25 U	0.24 U	0.3 U	0.24 U	0.24 U	0.25 U
Hexachlorocyclopentadiene	5	1.3 U	1.4 U	1.3 U	1.6 U	1.3 U	1.3 U	1.4 U
Hexachloroethane	5	0.38 U	0.4 U	0.38 U	0.47 U	0.38 U	0.38 U	0.39 U
Indeno[1,2,3-cd]pyrene	0.002	0.17 U	0.18 U	0.17 U	0.21 U	0.17 U	0.17 U	0.17 U
Isophorone	50	0.25 U	0.26 U	0.25 U	0.31 U	0.25 U	0.25 U	0.26 U
2-Methylnaphthalene	--	1.5 U	1.5 U	1.5 U	1.8 U	1.5 U	1.5 U	1.5 U
2-Methylphenol	--	2.5 U	2.7 U	2.5 U	3.2 U	2.5 U	2.5 U	2.6 U
3&4-Methylphenol	--	2.5 U	2.6 U	2.5 U	3.1 U	2.5 U	2.5 U	2.6 U
Naphthalene	10	0.18 U	0.19 U	0.18 U	0.23 U	0.18 U	0.18 U	0.19 U
2-Nitroaniline	5	2.1 U	2.2 U	2.1 U	2.6 U	2.1 U	2.1 U	2.2 U
3-Nitroaniline	5	2.9 U	3.1 U	2.9 U	3.6 U	2.9 U	2.9 U	3 U
4-Nitroaniline	5	1.7 U	1.8 U	1.7 U	2.2 U	1.7 U	1.7 U	1.8 U
Nitrobenzene	0.4	0.33 U	0.34 U	0.33 U	0.41 U	0.33 U	0.33 U	0.34 U
2-Nitrophenol	--	2 U	2.1 U	2 U	2.5 U	2 U	2 U	2.1 U
4-Nitrophenol	--	1.6 U	1.7 U	1.6 U	2 U	1.6 U	1.6 U	1.7 U
N-Nitrosodiphenylamine	50	0.21 U	0.22 U	0.21 U	0.26 U	0.21 U	0.21 U	0.22 U
Di-n-octylphthalate	--	0.17 U	0.18 U	0.17 U	0.21 U	0.17 U	1.7	0.18 U
Pentachlorophenol	1	0.61 U	0.64 U	0.61 U	0.77 U	0.61 U	0.61 U	0.64 U
Phenanthrene	50	0.17 U	0.18 U	0.17 U	0.21 U	0.17 U	0.17 U	0.18 U
Phenol	1	1.2 U	**1.5**	1.2 U	1.5 U	1.2 U	1.2 U	1.2 U
N-Nitroso-Di-N-Propylamine	--	0.29 U	0.31 U	0.29 U	0.36 U	0.29 U	0.29 U	0.3 U
Pyrene	50	0.21 U	0.22 U	0.21 U	0.26 U	0.21 U	0.21 U	0.22 U
1,2,4-Trichlorobenzene	5	0.35 U	0.36 U	0.35 U	0.43 U	0.35 U	0.35 U	0.36 U
2,4,5-Trichlorophenol	--	1.6 U	1.7 U	1.6 U	2 U	1.6 U	1.6 U	1.7 U
2,4,6-Trichlorophenol	--	1.4 U	1.4 U	1.4 U	1.7 U	1.4 U	1.4 U	1.4 U

Notes:
NYSDEC -New York State Department of Environmental Conservation
AWQS - NYSDEC Ambient Water Quality Standard or Guidance Value
-- -No NYSDEC Ambient Water-Quality Standard or Guidance Value Avai
B - Detected in blank
J - Result is estimated value below the reporting limit
U - Not detected, method detection limit shown
bold -detections that exceed AWQS
µg/L - Micrograms per Liter

Table 3. Summary of Semi-Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

		Sample Location:	OS-PZ-204	OS-PZ-205	OS-PZ-206
		Sample Date:	6/9/04	6/14/04	6/10/04
		Sample ID:	B12-27-09	B12-45-20	B12-36-02
	NYSDEC AWQS				
Analyte (concentrations in ug/L)					
Acenaphthene	20		0.33 U	0.37 U	0.3 U
Acenaphthylene	--		0.29 U	0.32 U	0.26 U
Anthracene	50		0.22 U	0.25 U	0.2 U
Benzo[a]anthracene	0.002		0.27 U	0.31 U	0.25 U
Benzo[a]pyrene	--		0.27 U	0.3 U	0.24 U
Benzo[b]fluoranthene	0.002		0.26 U	0.29 U	0.23 U
Benzo[g,h,i]perylene	5		0.24 U	0.27 U	0.22 U
Benzo[k]fluoranthene	0.002		0.27 U	0.31 U	0.25 U
Bis(2-Chloroethoxy)methane	5		0.45 U	0.5 U	0.4 U
Bis(2-Chloroethyl)Ether	1		0.43 U	0.49 U	0.39 U
Bis(2-Chloroisopropyl)ether	--		0.11 U	0.13 U	0.1 U
Bis(2-Ethylhexyl)phthalate	5		0.29 U	0.33 U	0.26 U
4-Bromophenyl-phenylether	--		0.53 U	0.6 U	0.48 U
Butylbenzylphthalate	--		0.24 U	0.27 U	0.22 U
Di-n-butylphthalate	--		0.19 U	0.22 U	0.17 U
Carbazole	--		0.16 U	0.18 U	0.14 U
4-Chloro-3-methylphenol	--		3.6 U	4.1 U	3.3 U
4-Chloroaniline	5		3.1 U	3.5 U	2.8 U
2-Chloronaphthalene	10		0.27 U	0.3 U	0.24 U
2-Chlorophenol	--		2.8 U	3.2 U	2.6 U
4-Chlorophenyl-phenylether	--		0.4 U	0.45 U	0.36 U
Chrysene	0.002		0.24 U	0.27 U	0.22 U
Dibenzo[a,h]Anthracene	--		0.35 U	0.39 U	0.31 U
Dibenzofuran	--		1.6 U	1.8 U	1.5 U
1,2-Dichlorobenzene	3		0.18 U	0.21 U	0.16 U
1,3-Dichlorobenzene	3		0.19 U	0.21 U	0.17 U
1,4-Dichlorobenzene	3		0.15 U	0.17 U	0.14 U
3,3'-Dichlorobenzidine	5		2.6 U	2.9 U	2.3 U
2,4-Dichlorophenol	5		2.6 U	2.9 U	2.3 U
Diethylphthalate	--		0.3 U	0.33 U	0.27 U
2,4-Dimethylphenol	50		3.4 U	3.8 U	3 U
Dimethylphthalate	--		0.3 U	0.34 U	0.27 U
4,6-Dinitro-2-methylphenol	--		1.9 U	2.2 U	1.7 U
2,4-Dinitrophenol	10		1.4 U	1.6 U	1.3 U

Table 3. Summary of Semi-Volatile Organic Compounds in Groundwater, OU-2 Investigation, BASF Corporation, Rensselaer, New York

		Sample Location:	OS-PZ-204	OS-PZ-205	OS-PZ-206
		Sample Date:	6/9/04	6/14/04	6/10/04
		Sample ID:	B12-27-09	B12-45-20	B12-36-02
	NYSDEC AWQS				
Analyte (concentrations in ug/L)					
2,4-Dinitrotoluene	5		0.32 U	0.36 U	0.29 U
2,6-Dinitrotoluene	5		0.53 U	0.6 U	0.48 U
Fluoranthene	50		0.26 U	0.3 U	0.24 U
Fluorene	50		0.29 U	0.32 U	0.26 U
Hexachlorobenzene	0.04		0.28 U	0.31 U	0.25 U
Hexachlorobutadiene	0.5		0.27 U	0.3 U	0.24 U
Hexachlorocyclopentadiene	5		1.4 U	1.6 U	1.3 U
Hexachloroethane	5		0.42 U	0.47 U	0.38 U
Indeno[1,2,3-cd]pyrene	0.002		0.18 U	0.21 U	0.17 U
Isophorone	50		0.28 U	0.31 U	0.25 U
2-Methylnaphthalene	--		1.6 U	1.8 U	1.5 U
2-Methylphenol	--		2.8 U	3.2 U	2.5 U
3&4-Methylphenol	--		2.7 U	3.1 U	2.5 U
Naphthalene	10		0.2 U	0.23 U	0.18 U
2-Nitroaniline	5		2.4 U	2.6 U	2.1 U
3-Nitroaniline	5		3.2 U	3.6 U	2.9 U
4-Nitroaniline	5		1.9 U	2.2 U	1.7 U
Nitrobenzene	0.4		0.36 U	0.41 U	0.33 U
2-Nitrophenol	--		2.3 U	2.5 U	2 U
4-Nitrophenol	--		1.8 U	2 U	1.6 U
N-Nitrosodiphenylamine	50		0.23 U	0.26 U	0.21 U
DI-n-octylphthalate	--		0.19 U	0.21 U	0.17 U
Pentachlorophenol	1		0.68 U	0.77 U	0.61 U
Phenanthrene	50		0.19 U	0.21 U	0.17 U
Phenol	1		1.3 U	1.5 U	1.2 U
N-Nitroso-Di-N-Propylamine	--		0.32 U	0.36 U	0.29 U
Pyrene	50		0.23 U	0.26 U	0.21 U
1,2,4-Trichlorobenzene	5		0.38 U	0.43 U	0.35 U
2,4,5-Trichlorophenol	--		1.8 U	2 U	1.6 U
2,4,6-Trichlorophenol	--		1.5 U	1.7 U	1.4 U

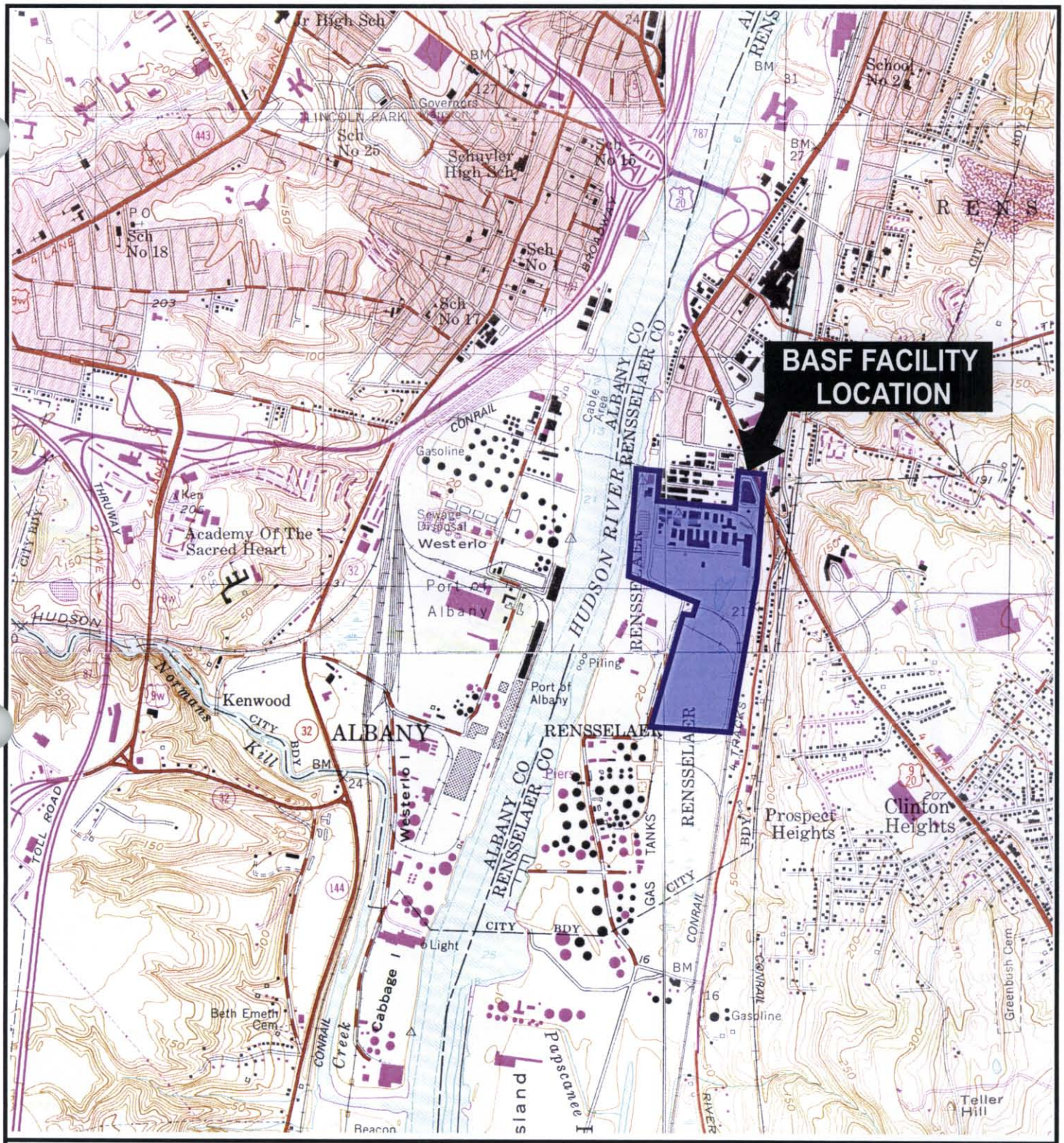
Notes:
NYSDEC -New York State Department of Environmental Conservation
AWQS - NYSDEC Ambient Water Quality Standard or Guidance Value
-- -No NYSDEC Ambient Water-Quality Standard or Guidance Value Avai
B - Detected in blank
J - Result is estimated value below the reporting limit
U - Not detected, method detection limit shown
bold -detections that exceed AWQS
µg/L - Micrograms per Liter

Table 4. Summary of Soil Gas and Ambient Air Samples, OU-2 Investigation, BASF Corporation, Rensselaer, New York

Analyte (concentrations in µg/m³)	NYSDEC AGC (µg/m³)	OS-MH-2SG	OS-MH-2SG	OS-MH-3SG	OS-MH-3SG	OS-MH-3SG	OS-MH-4SG	OS-MH-4SG	OS-SG-201	OS-SG-201	OS-SG-202	OS-SG-202	Field Blank[2]
Sample Depth (ft):		Surface[1]	3.0	Surface[1]	3.0	3.0 Duplicate	Surface[1]	3.0	Surface[1]	3.0	Surface[1]	3.0	Surface[1]
Sample Date:		6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004	6/7/2004
Sample ID:		B12-16-22	B12-16-18	B12-17-18	B12-17-14	B12-18-02	B12-18-19	B12-18-15	B12-15-12	B12-15-08	B12-14-17	B12-14-14	B12-16-15
1,1,1-Trichloroethane	--	1.1 U	**20**	1.1 U	**3.7 J**	**3.2 J**	1.1 U	**19**	1.1 U	**47**	1.1 U	**1.1**	1.1 U
1,1,2,2-Tetrachloroethane	0.017	1.4 U	1.4 U	1.4 U	5.5 U	5.5 U	1.4 U	6.9 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U
1,1,2-Trichloroethane	1.4	1.1 U	1.1 U	1.1 U	4.4 U	4.4 U	1.1 U	5.5 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
1,1-Dichloroethane	0.063	0.81 U	0.81 U	0.81 U	3.2 U	3.2 U	0.81 U	4 U	0.81 U	**1.1**	0.81 U	0.81 U	0.81 U
1,1-Dichloroethylene	70	0.79 U	0.79 U	0.79 U	3.2 U	3.2 U	0.79 U	4 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
1,2,4-Trichlorobenzene	--	1.5 U	1.5 U	1.5 U	**4.2 J**	5.9 U	1.5 U	7.4 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U
1,2-Dichloroethane	0.038	0.81 U	0.81 U	**7.3**	**97.1**	**80.5**	**0.49 J**	**34**	0.81 U	0.81 U	0.81 U	0.81 U	0.81 U
1,2-Dichloropropane	4.0	0.92 U	0.92 U	0.92 U	3.7 U	3.7 U	0.92 U	4.6 U	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
2-Hexanone	48	0.82 U	0.82 U	0.82 U	3.3 U	3.3 U	**0.74 J**	4.1 U	0.82 U	0.82 U	0.82 U	0.82 U	0.82 U
Acetone	28000	0.48 U	**29.2**	**249**	**594**	**309**	**38**	**321**	**7.4**	**82.4**	**10**	**21**	0.48 U
Benzene	0.13	**0.8**	**2.2**	**0.54 J**	2.6 U	2.6 U	**0.42 J**	3.2 U	**0.77**	**5.4**	**0.48 J**	**0.96**	0.64 U
Bromodichloromethane	0.02	1.3 U	1.3 U	1.3 U	**6.2**	**5.4**	1.3 U	**11**	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Bromoform	0.91	2.1 U	2.1 U	2.1 U	8.3 U	8.3 U	2.1 U	10 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
Bromomethane	5.0	0.78 U	0.78 U	0.78 U	3.1 U	3.1 U	0.78 U	3.9 U	0.78 U	0.78 U	0.78 U	0.78 U	0.78 U
Carbon disulfide	700	0.62 U	**30**	**13**	**18**	**13**	0.62 U	**17**	0.62 U	**14**	0.62 U	**2.9**	0.62 U
Carbon tetrachloride	0.067	1.3 U	**2**	1.3 U	5 U	5 U	1.3 U	6.3 U	1.3 U	1.3 U	**0.39 J**	1.3 U	1.3 U
Chlorobenzene	110	0.92 U	0.92 U	**0.97**	3.7 U	3.7 U	0.92 U	**2.6 J**	0.92 U	0.92 U	0.92 U	0.92 U	0.92 U
Chloroethane	1000	0.53 U	0.53 U	0.53 U	2.1 U	2.1 U	0.53 U	2.6 U	0.53 U	0.53 U	0.53 U	0.53 U	0.53 U
Chloroform	0.043	0.98 U	**222**	**4.6**	**222**	**190**	**1.7**	**354**	0.98 U	**3.9**	0.98 U	**165**	0.98 U
Chloromethane	90	**1.1**	0.41 U	**1.5**	**8.9**	**7.2**	**1.6**	**64.2**	**1.1**	0.41 U	**1.3**	**0.7**	0.41 U
cis-1,2-Dichloroethylene	1900	0.79 U	0.79 U	0.79 U	3.2 U	3.2 U	0.79 U	4 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
cis-1,3-Dichloropropene	0.25	0.91 U	0.91 U	0.91 U	3.6 U	3.6 U	0.91 U	4.5 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Dibromochloromethane	--	1.7 U	1.7 U	1.7 U	6.8 U	6.8 U	1.7 U	8.5 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U
Ethylbenzene	1000	**0.87 B**	**3.1 B**	**0.78 JB**	**3.1 JB**	3.5 U	0.87 U	**4 JB**	0.87 U	**5.2 B**	0.87 U	**1.9 B**	**0.56 J**
m-Dichlorobenzene	360	1.2 U	1.2 U	1.2 U	4.8 U	4.8 U	1.2 U	6 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Methyl ethyl ketone	5000	0.59 U	**5.3**	**1.7**	2.4 U	2.4 U	0.59 U	2.9 U	0.59 U	**18**	**0.83**	**4.7**	0.59 U
Methyl Isobutyl Ketone	3000	**0.57 J**	0.82 U	0.82 U	3.3 U	3.3 U	0.82 U	4.1 U	0.82 U	**9.4**	0.82 U	**0.7 J**	0.82 U
Methylene chloride	2.1	**2.7**	**0.76**	0.69 U	2.8 U	**2.1 J**	0.69 U	3.5 U	0.69 U	0.69 U	**0.42 J**	**0.52 J**	0.69 U
o-Dichlorobenzene	360	1.2 U	1.2 U	1.2 U	**2.8 J**	4.8 U	1.2 U	6 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
p-Dichlorobenzene	0.09	1.2 U	1.2 U	1.2 U	4.8 U	4.8 U	1.2 U	6 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
Styrene	1000	**1.9**	**3.4**	**0.47 J**	**2.9 J**	3.4 U	**0.55 J**	**2.3 J**	0.85 U	**3.5**	0.85 U	**0.64 J**	0.85 U
Tetrachloroethylene	1.0	1.4 U	**1.6**	1.4 U	**4.3 J**	5.4 U	1.4 U	**6.8**	1.4 U	**0.66 J**	1.4 U	**1.1 J**	1.4 U
Toluene	400	**4.1 B**	**9.4 B**	**26 B**	**65.6 B**	**20 B**	**5.7 B**	**183 B**	**3.7 B**	**17 B**	**3.7 B**	**5.7 B**	**1.7**
trans-1,2-Dichloroethylene	1900	0.79 U	0.79 U	0.79 U	3.2 U	3.2 U	0.79 U	4 U	0.79 U	0.79 U	0.79 U	0.79 U	0.79 U
trans-1,3-Dichloropropene	0.25	0.91 U	0.91 U	0.91 U	3.6 U	3.6 U	0.91 U	4.5 U	0.91 U	0.91 U	0.91 U	0.91 U	0.91 U
Trichloroethylene	0.5	1.1 U	**6.4**	1.1 U	4.3 U	4.3 U	1.1 U	5.4 U	1.1 U	1.1 U	1.1 U	1.1 U	1.1 U
Vinyl chloride	0.11	0.51 U	0.51 U	0.51 U	2 U	2 U	0.51 U	2.6 U	0.51 U	0.51 U	0.51 U	0.51 U	0.51 U
Xylenes (total)	100	**2.3 B**	**15 B**	**2.4 B**	**15 B**	**7.8 B**	**0.91 B**	**21 B**	**1.7 B**	**28 B**	**1.7 B**	**9.1 B**	**3**

Notes:

NYSDEC - New York State Department of Environmental Conservation
AGC - Annual Guideline Concentration
-- - No NYSDEC AGC available
Surface - indicates ambient air sample obtained in vicinity of soil gas sampling port or well
Field Blank - Summa canister filled with zero air supplied by laboratory
ug/m³ - micrograms per cubic meter
bold - indicates detection
U - Not detected; detection limit shown
J - Estimated concentration below reporting limit
B- Detected in field blank



QUADRANGLE LOCATION

SOURCE:
USGS; 1980. Albany, New York;
USGS; 1980. Troy South, New York
USGS; 1980. Delmar, New York
USGS; 1980. East Greenbush, New York
7.5 Minute Topographic Quadrangles

0 2000'

Title:

SITE LOCATION MAP

RENSSELAER, NEW YORK FACILITY

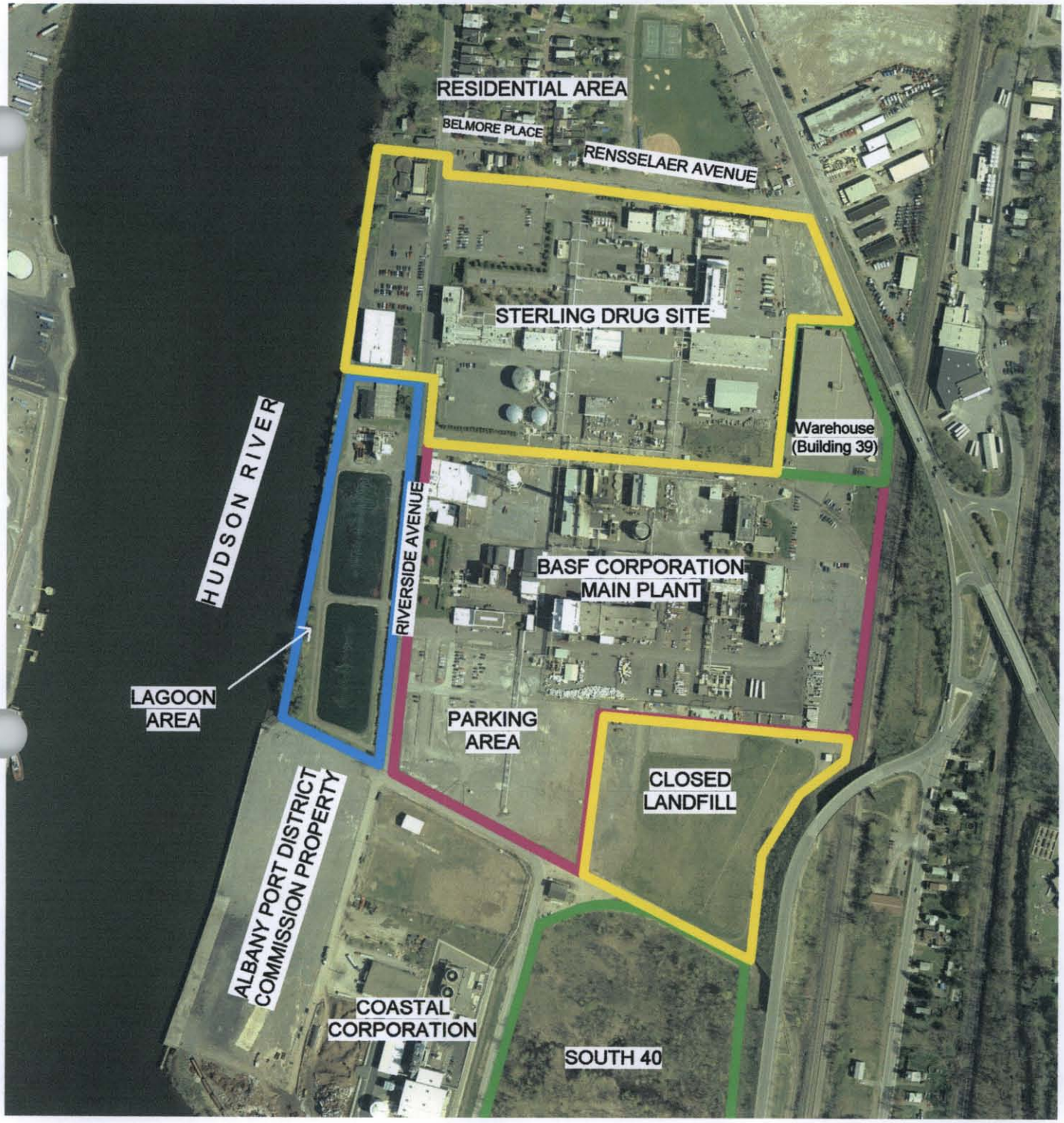
Prepared for:

BASF CORPORATION
MOUNT OLIVE, NEW JERSEY

ROUX
ROUX ASSOCIATES, INC.
Environmental Consulting & Management

Compiled by: M.R.	Date: 8/16/04	FIGURE
Prepared by: G.M.	Scale: AS SHOWN	1
Project Mgr.: N.E.	Office: NY	
File No.: BF1138803.CDR	Project No.: 25111Y24	

N:\PROJECTS\BF2511\481BF1134802.CDR



AERIAL PHOTOGRAPH DATE : SPRING 2001

N

Title:

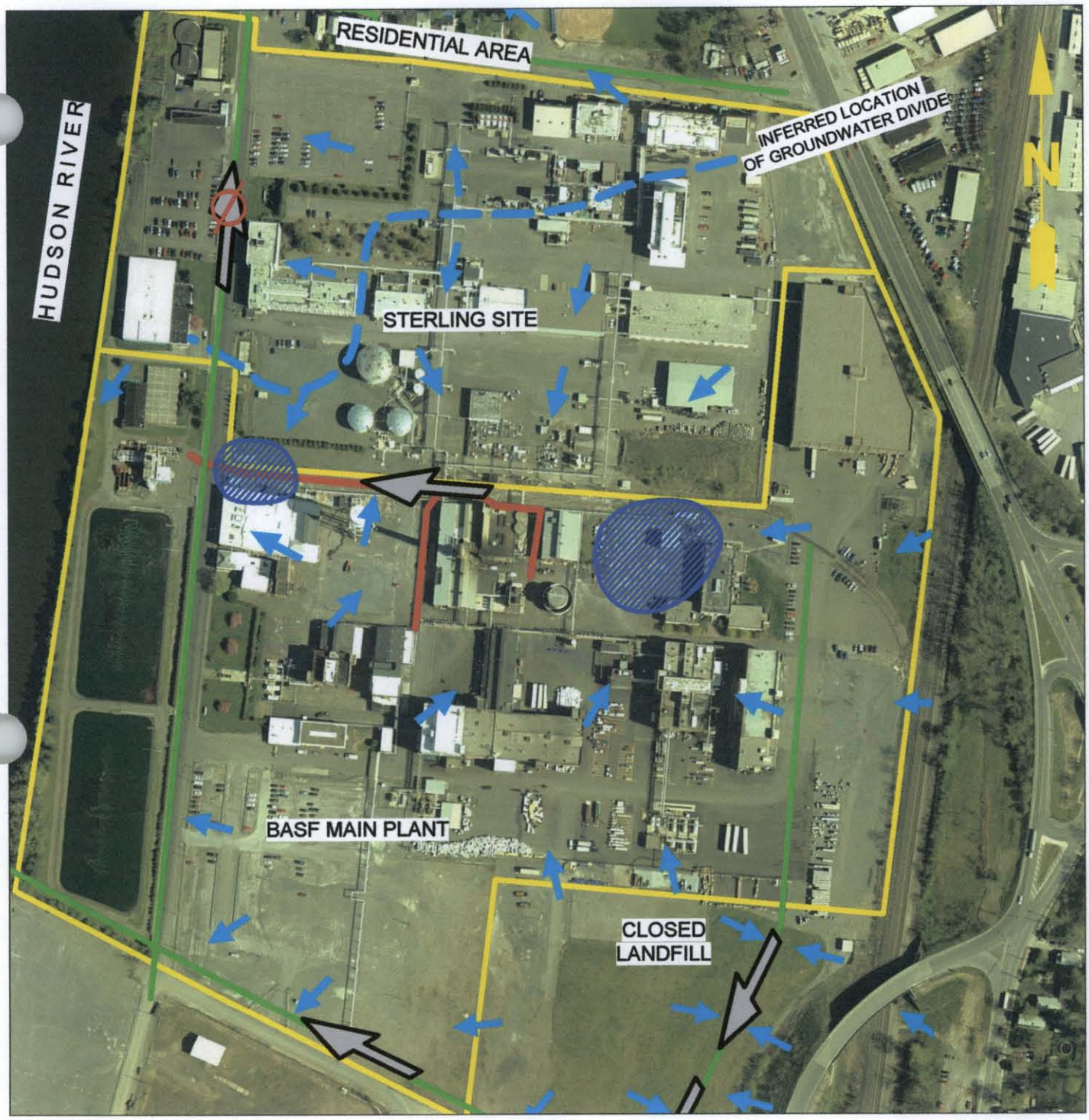
SITE AREAS

OU-2 INVESTIGATION
BASF RENSSELAER, NEW YORK FACILITY

Prepared For:
BASF CORPORATION
MOUNT OLIVE, NEW JERSEY

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: N.E.	Date: 7/27/04	FIGURE 2
Prepared by: NE	Scale: 1" = 450'	
Project Mgr: N.E.	Office: NY	
File No: BF1138804.WOR	Project: BF25111Y24	



INFERRED DIRECTION OF GROUND-WATER FLOW IN SEWER BEDDING

INFERRED DIRECTION OF GROUND-WATER FLOW IN SEWER BEDDING WAS DETERMINED NOT TO RESULT IN NORTHWARD MIGRATION

INFERRED DIRECTION OF GROUND-WATER FLOW IN FILL

PERFORATED PIPE

SEWER LOCATIONS

AREA WHERE SATURATED FILL WAS NOT PRESENT

Notes:
1- BASF groundwater levels measured during Additional RI Activities (April 2001)
2- Sterling Site groundwater levels based on November 2000 SAIC map.
3- Aerial photograph date Spring 2001

Title:

CONCEPTUAL GROUNDWATER FLOW DIRECTIONS

OU-2 INVESTIGATION
BASF RENSSEALER, NEW YORK FACILITY

Prepared For:

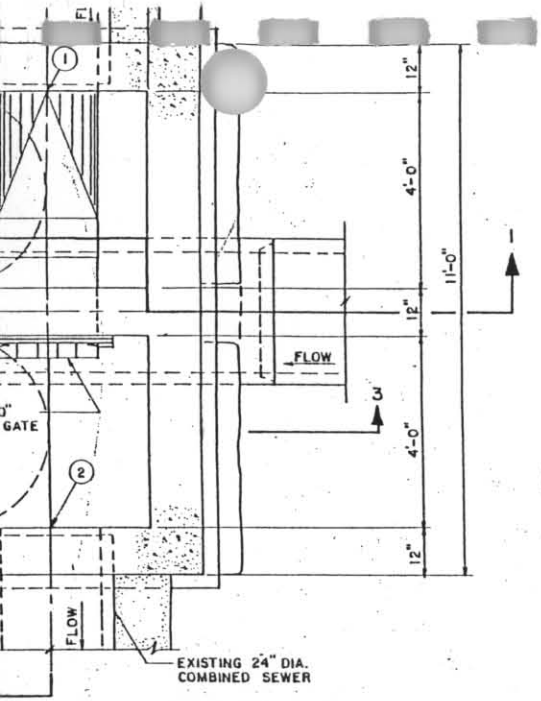
BASF CORPORATION
MOUNT OLIVE, NEW JERSEY

ROUX ASSOCIATES INC
Environmental Consulting & Management

Compiled by: N.E.	Date: 8/16/04	FIGURE 3
Prepared by: NE	Scale: 1" = 300'	
Project Mgr: N.E.	Office: NY	
File No: BF1138805.WOR	Project: BF25111Y24	

APPENDIX A

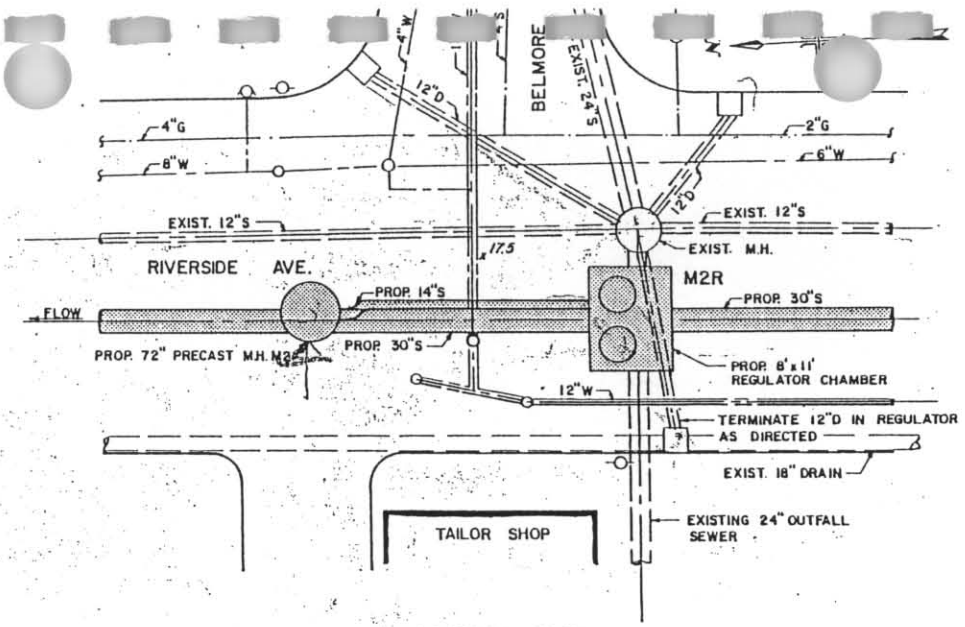
Rensselaer County Sewer District
Maps and Plans



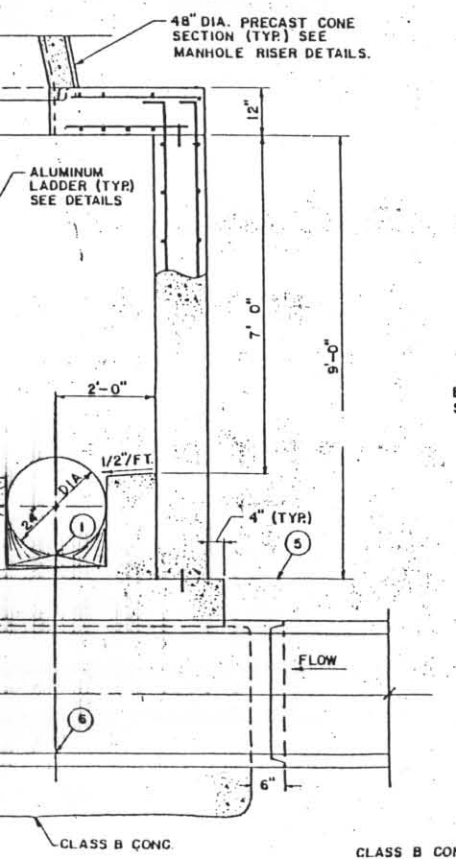
ELEVATIONS (USGS DATUM)	
1	4.3±
2	4.2±
3	4.05
4	4.88
5	3.87
6	0.19
7	3.96
8	0.16
FIN. GRADE	17.5±

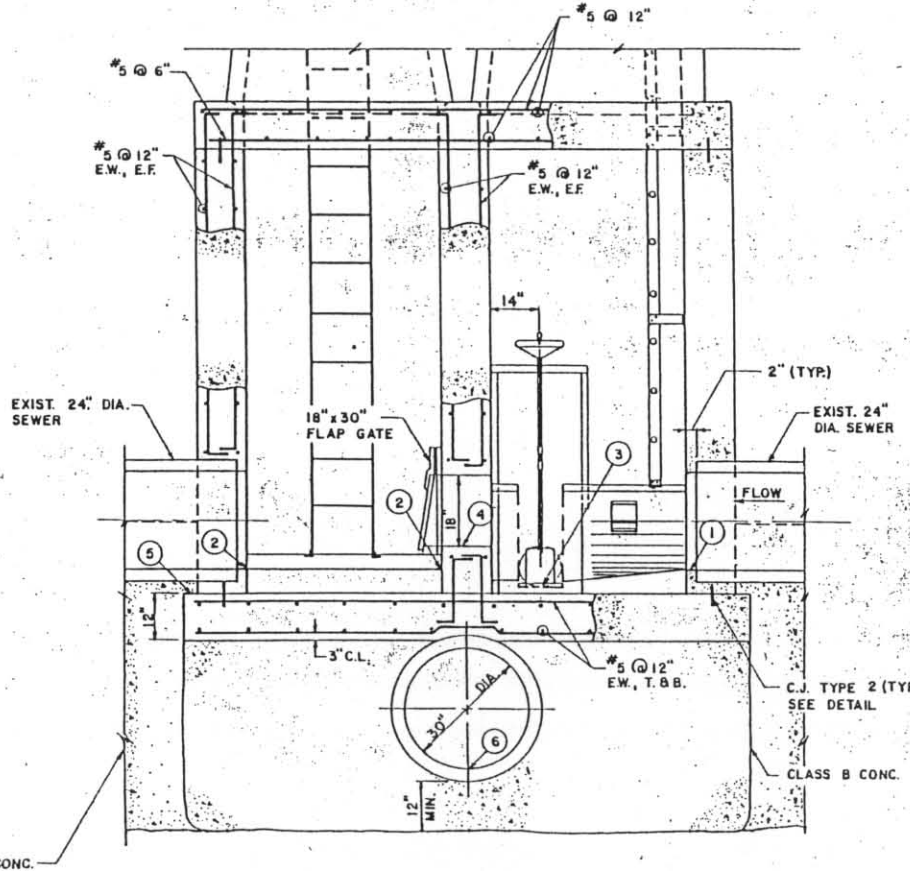
GENERAL NOTES

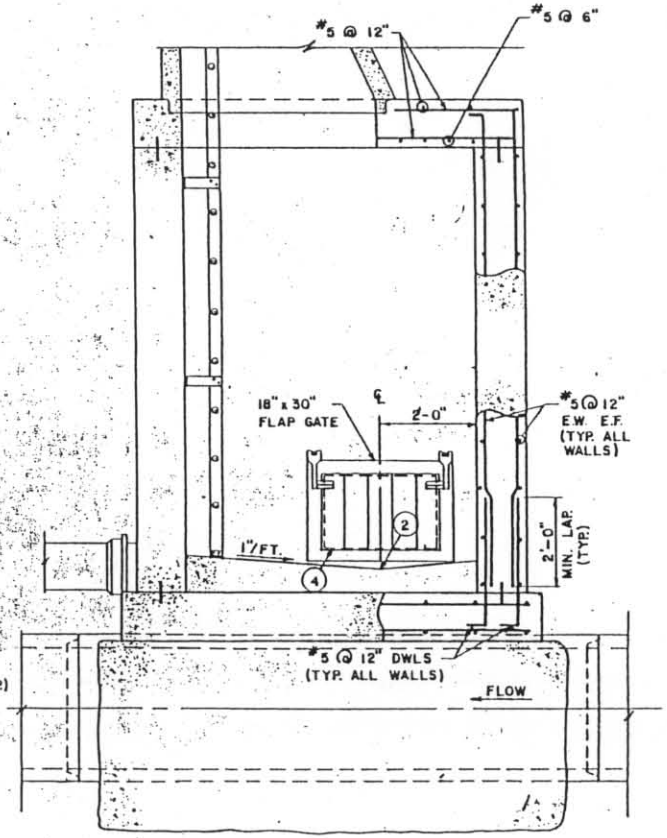
1. SEE SHEET 34 FOR STD. STRUCTURAL DETAILS.
2. MAINTAIN SLOPE OF INTERCEPTOR THRU REGULATOR.
3. CLASS A CONCRETE SHALL BE USED FOR ALL BENCHES AND CHANNELS.
4. SET C.I. TOE POCKETS 15" O.C. VERTICALLY ABOVE THE INVERT CHANNEL, AND STAGGERED 15" O.C.

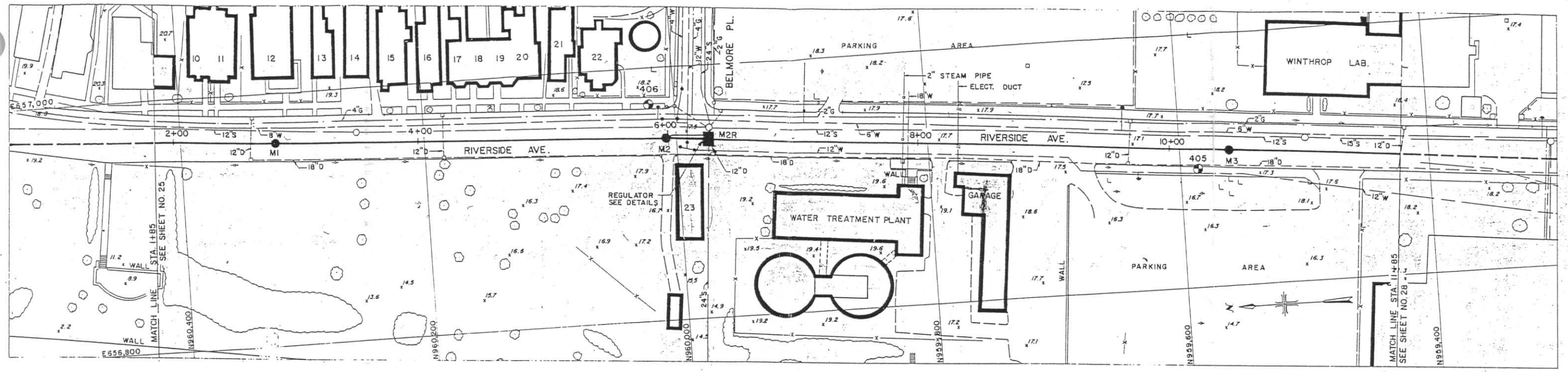


LOCATION PLAN
SCALE 1"= 10'



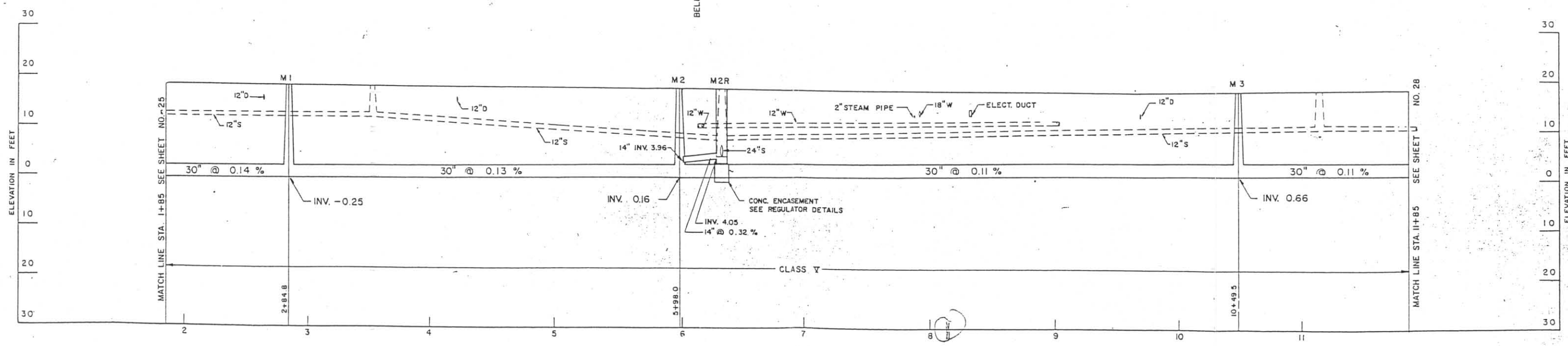






4th Force Main

THE CONTRACTOR SHALL INCLUDE IN THE PRICES BID FOR CONTRACT ITEMS THE COST OF RELOCATING ALL UTILITIES, PIPES AND MISCELLANEOUS STRUCTURES AS REQUIRED.



HALF SIZE

MALCOLM PIRNIE, INC.

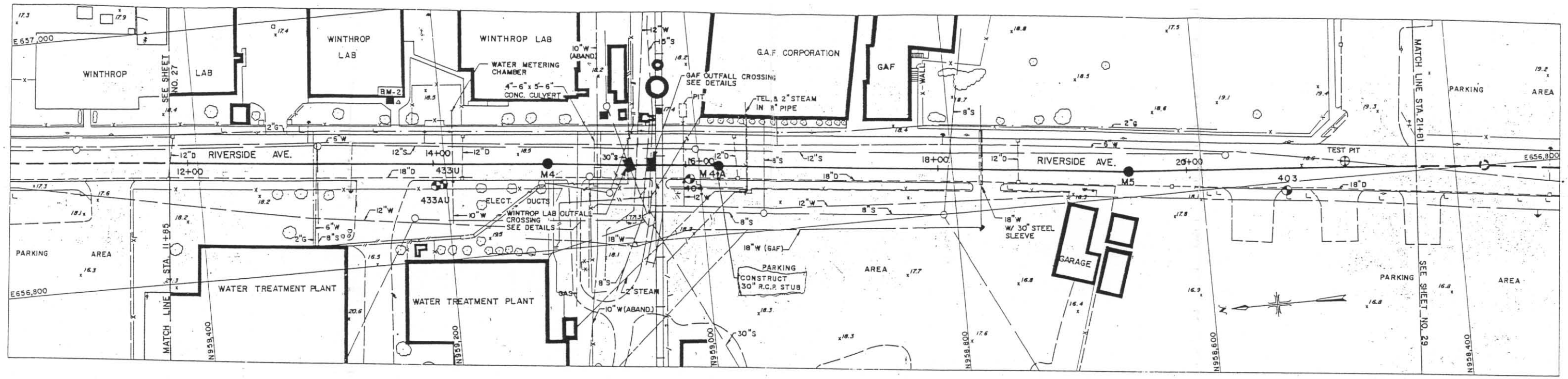
DESIGNED JSM DRAWN AGR CHECKED TCS
REVISIONS:

RENSSELAER COUNTY SEWER DISTRICT NO. 1
RENSSELAER COUNTY, NEW YORK
INTERCEPTOR AND TRUNK SEWERS
CONTRACT NO. 13

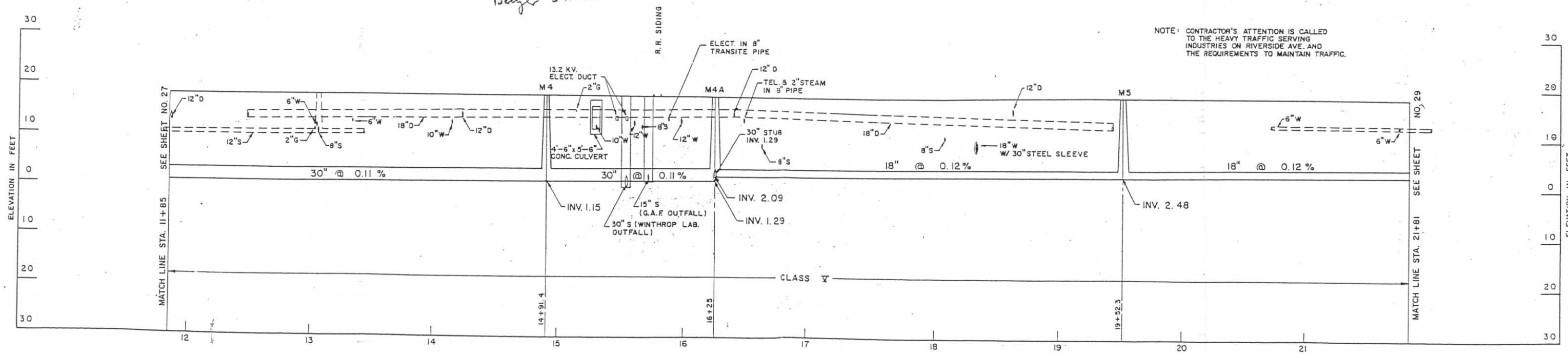
RENSSELAER INTERCEPTOR SEWER
BROADWAY AND RIVERSIDE AVE. SOUTH
STA. 1+85 TO STA. 11+85
SCALES: HORIZ. 1" = 40'
VERT. 1" = 10'

DATE MARCH 1973
SHEET 27 OF 43
DWG NO. 181 L-71.056-0

AERIAL SURVEYS BY AMERICAN AERIAL SURVEYS, INC



Winthrop Lab
USGS Bench Mark
Bayer South



NOTE: CONTRACTOR'S ATTENTION IS CALLED TO THE HEAVY TRAFFIC SERVING INDUSTRIES ON RIVERSIDE AVE. AND THE REQUIREMENTS TO MAINTAIN TRAFFIC.

THE CONTRACTOR SHALL INCLUDE IN THE PRICES BID FOR CONTRACT ITEMS THE COST OF RELOCATING ALL UTILITIES, PIPES AND MISCELLANEOUS STRUCTURES AS REQUIRED.

HALF SIZE

MALCOLM PIRNIE, INC.

LICENSED PROFESSIONAL ENGINEER ALFRED C. LEONARD 27161 STATE OF NEW YORK

DESIGNED JBN DRAWN JPC CHECKED TCA

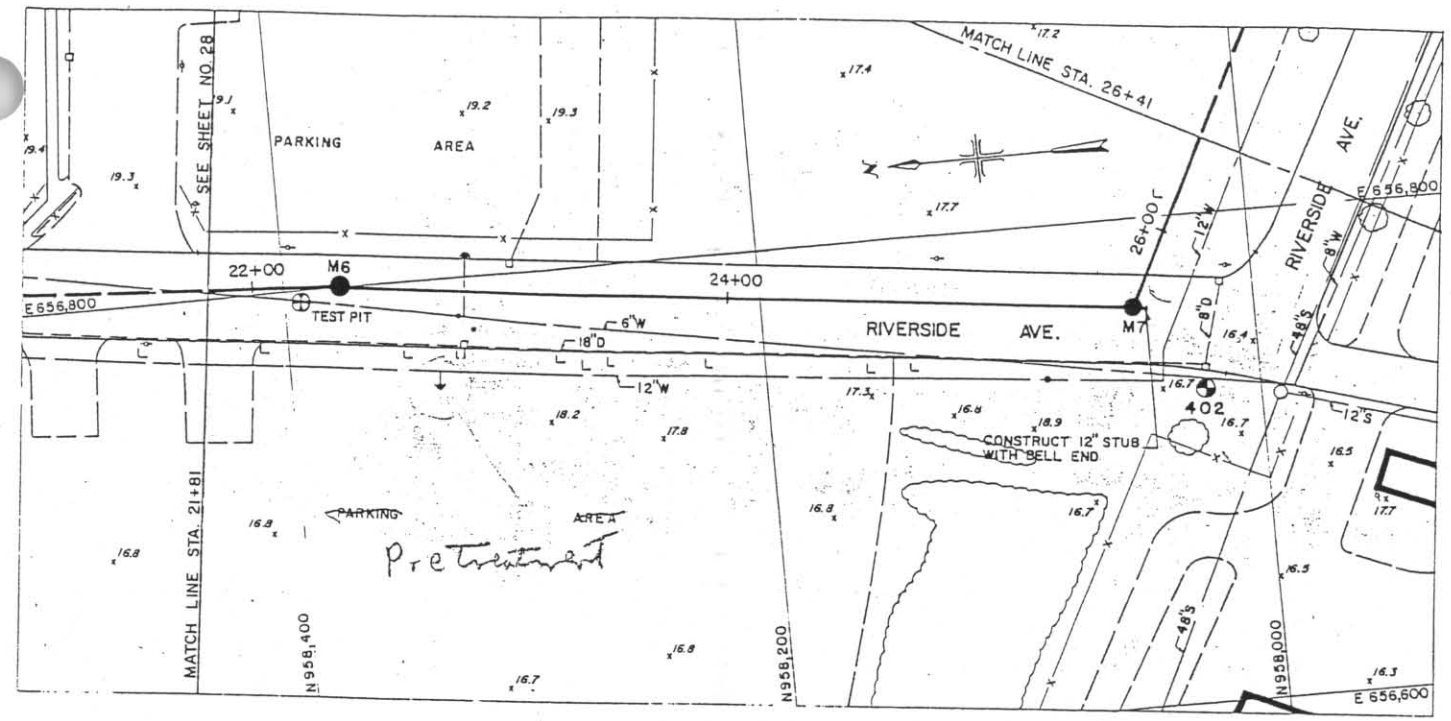
REVISIONS:
3-30-73 PIPE DIA. REDUCED TO 18" MANHOLE M4A ADDED

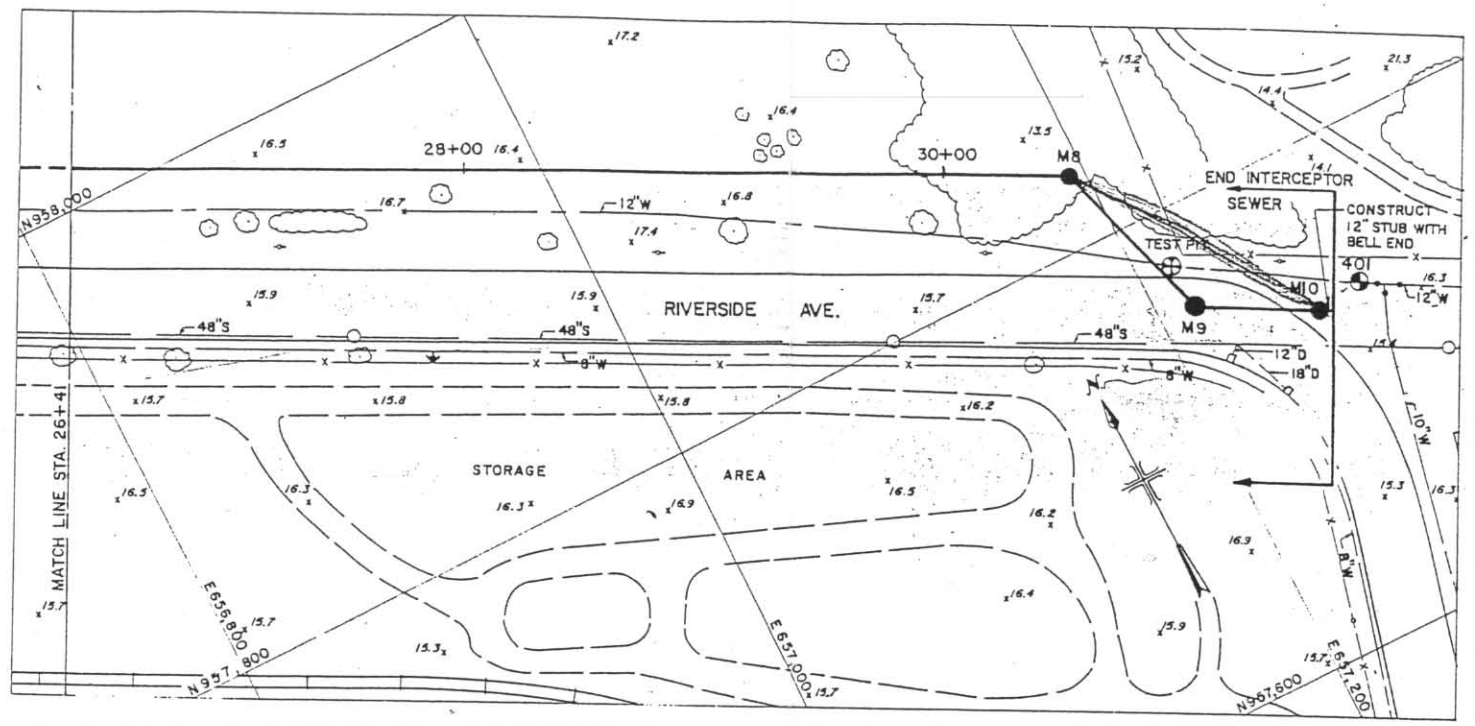
RENSSELAER COUNTY SEWER DISTRICT NO. 1
RENSSELAER COUNTY, NEW YORK
INTERCEPTOR AND TRUNK SEWERS
CONTRACT NO. 13

RENSSELAER INTERCEPTOR SEWER
BROADWAY AND RIVERSIDE AVE. SOUTH
STA. 11+85 TO STA. 21+81
SCALES: HORIZ. 1" = 40'
VERT. 1" = 10'

DATE MARCH 1973
SHEET 28 OF 43
DWG. NO. 181 L-71.057-1

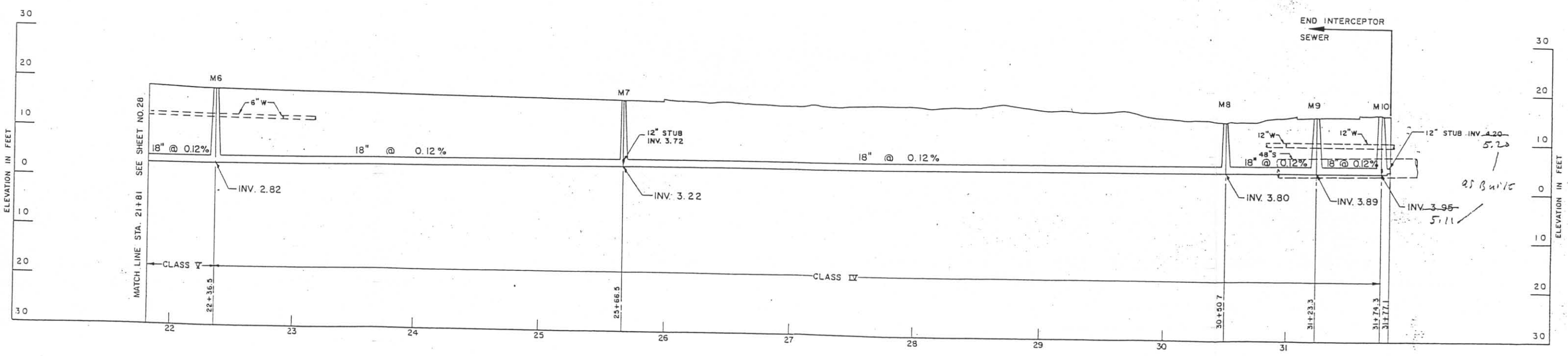
AERIAL SURVEY BY AMERICAN AIR SURVEYS, INC





THE CONTRACTOR SHALL INCLUDE IN THE PRICES BID FOR CONTRACT ITEMS THE COST OF RELOCATING ALL UTILITIES, PIPES AND MISCELLANEOUS STRUCTURES AS REQUIRED.

M9 Eliminated



HALF SIZE

MALCOLM PIRNIE, INC

DESIGNED JEO DRAWN AEB CHECKED TCH

REVISIONS:
3-30-73 PIPE DIA. REDUCED TO 18"

RENSSELAER COUNTY SEWER DISTRICT NO. 1
RENSSELAER COUNTY, NEW YORK

INTERCEPTOR AND TRUNK SEWERS

CONTRACT NO. 13

RENSSELAER INTERCEPTOR SEWER
BROADWAY AND RIVERSIDE AVE. SOUTH
STA. 21+81 TO STA. 31+77.1

SCALES: HORIZ. 1" = 40'
VERT. 1" = 10'

DATE MARCH 1973

SHEET 29 OF 43

DWG. NO. 181 L-71 058-1

APPENDIX B

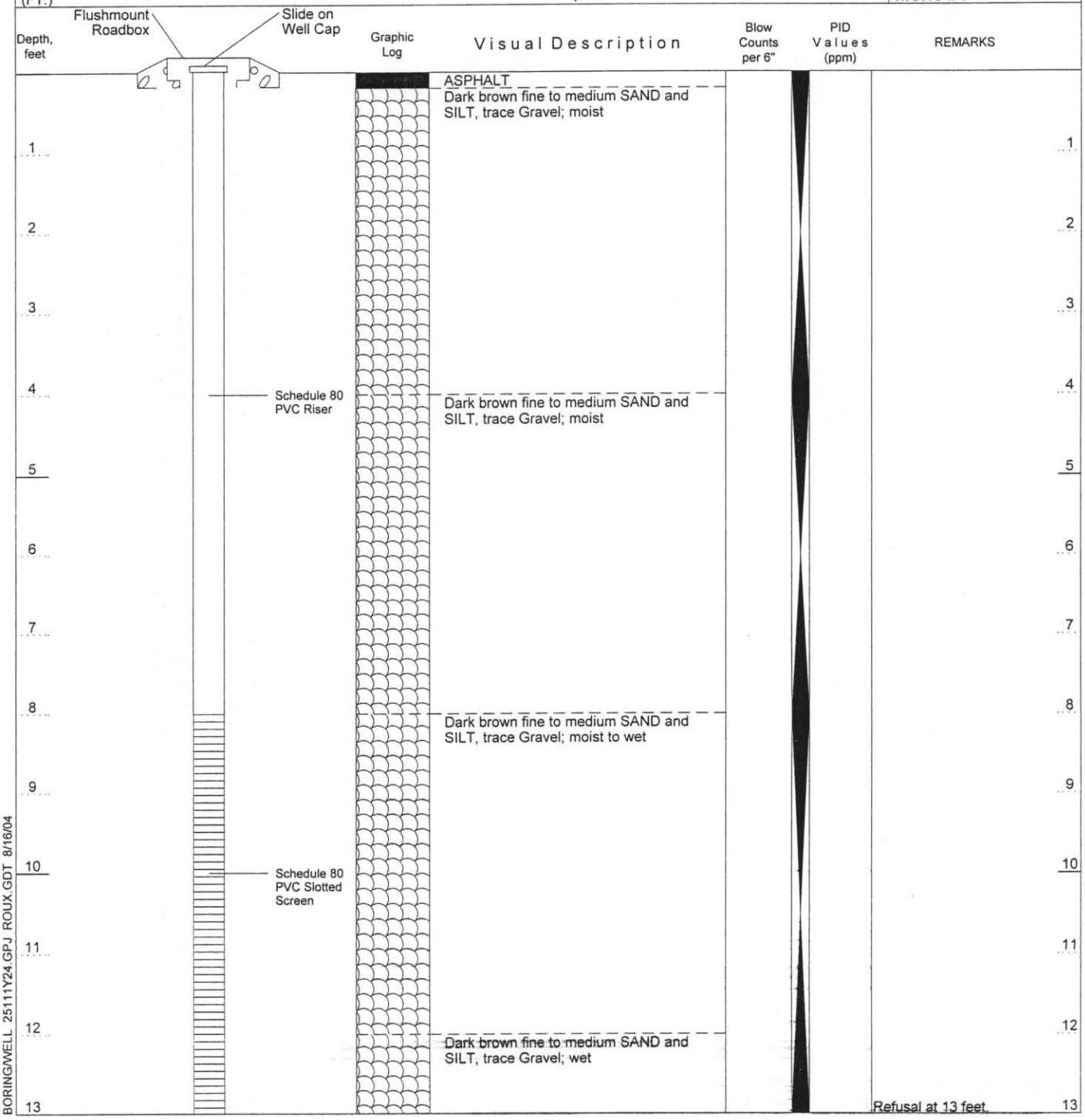
Piezometer Construction Logs

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO. **LG-PZ-128**	NORTHING **Not Measured**	EASTING **Not Measured**		
PROJECT NO./NAME **25111Y24 / Offsite**		LOCATION **BASF Corporation 36 Riverside Avenue**		
APPROVED BY	LOGGED BY **H. Dolland**	**Rensselaer, New York**		
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling and Testing / Kim Sarro**		GEOGRAPHIC AREA **Lagoon**		
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **6610 DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/1/04-4/1/04**
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Slotted**	MAT. **PVC**	TOTAL LENGTH **5.0**	DIA. **1-inch** SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE GRAVEL PACK **Morie #1**



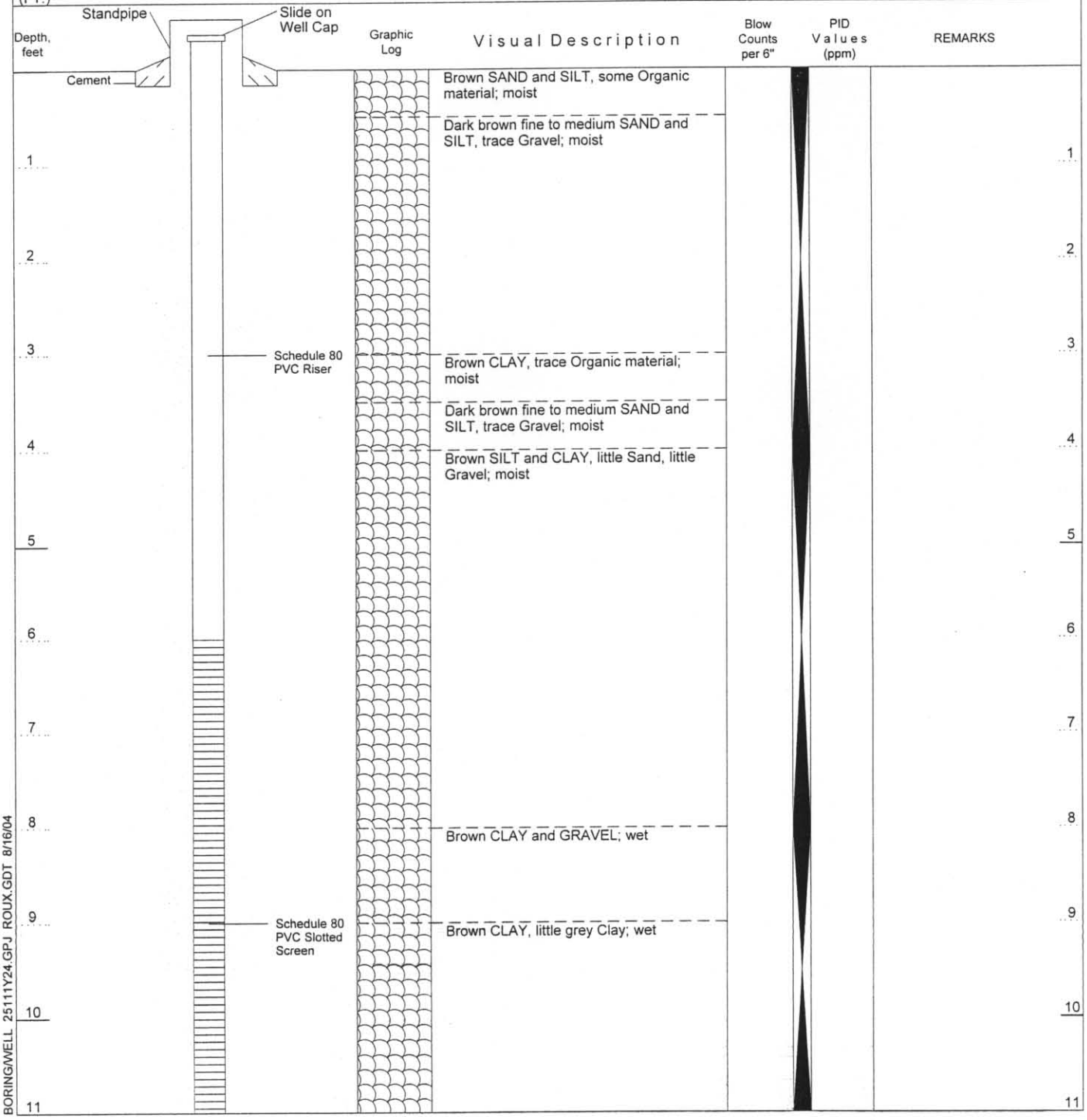
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO. **LG-PZ-129**	NORTHING **Not Measured**	EASTING **Not Measured**			
PROJECT NO./NAME **25111Y24 / Offsite**		LOCATION **BASF Corporation 36 Riverside Avenue**			
APPROVED BY	LOGGED BY **C. Battista**	**Rensselaer, New York**			
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling and Testing / Kim Sarro**		GEOGRAPHIC AREA **Lagoon**			
DRILL BIT DIAMETER/TYPE **2-in. / Drive Sampler**	BOREHOLE DIAMETER **2-inches**	DRILLING EQUIPMENT/METHOD **6610 DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **4/1/04-4/1/04**	
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Slotted**	MAT. **PVC**	TOTAL LENGTH **5.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK **Morie #1**



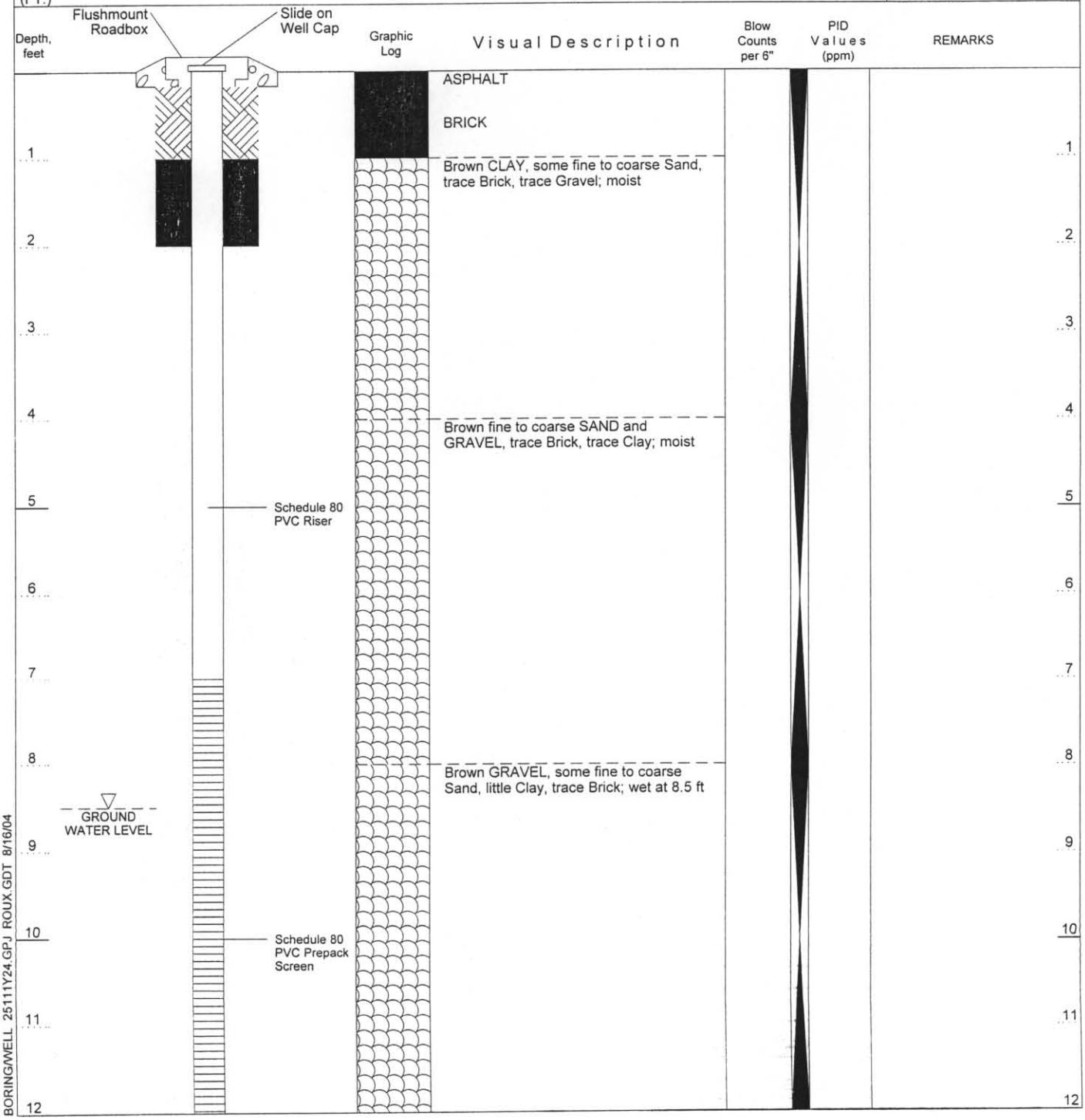
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.: **OS-PZ-201**	NORTHING: **Not Measured**	EASTING: **Not Measured**			
PROJECT NO./NAME: **25111Y24 / Offsite**		LOCATION: **BASF Corporation 36 Riverside Avenue**			
APPROVED BY:	LOGGED BY: **M. Kroll**	**Rensselaer, New York**			
DRILLING CONTRACTOR/DRILLER: **Aquifer Drilling and Testing / Harry Connel**		GEOGRAPHIC AREA: **Rensselaer Avenue**			
DRILL BIT DIAMETER/TYPE: **3-in. / Drive Sampler**	BOREHOLE DIAMETER: **3-inches**	DRILLING EQUIPMENT/METHOD: **6610 DT / Geoprobe**	SAMPLING METHOD: **2" Macro-Core**	START-FINISH DATE: **5/1/04-5/1/04**	
CASING MAT./DIA.: **PVC / 1-inch**	SCREEN: TYPE **Pre-Packed** MAT. **PVC**	TOTAL LENGTH **5.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**	
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN **/**	GW SURFACE	GRAVEL PACK: **Morie #1**



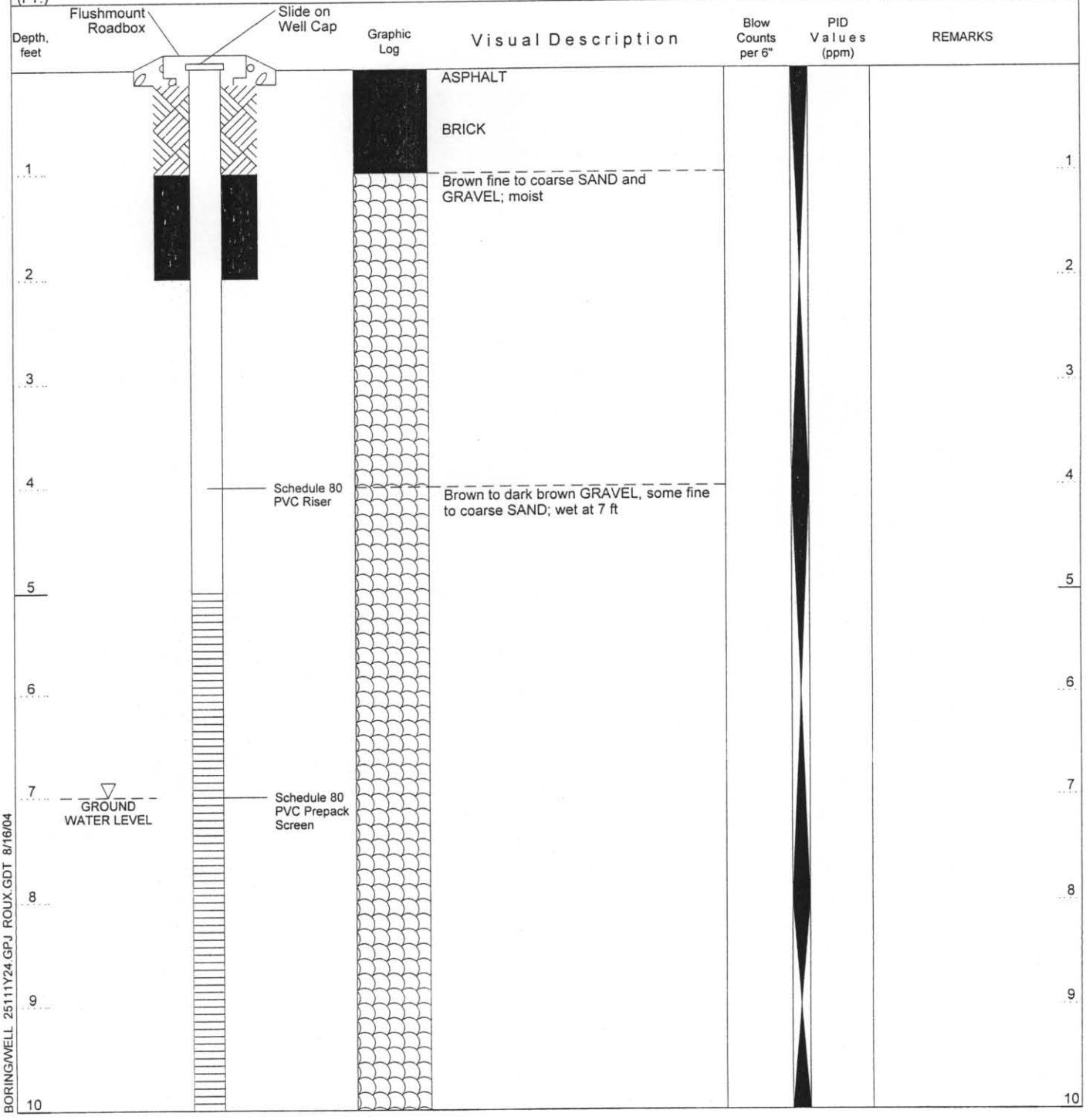
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO. **OS-PZ-202**	NORTHING **Not Measured**	EASTING **Not Measured**			
PROJECT NO./NAME **25111Y24 / Offsite**		LOCATION **BASF Corporation 36 Riverside Avenue**			
APPROVED BY	LOGGED BY **M. Kroll**	**Rensselaer, New York**			
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling and Testing / Harry Connel**		GEOGRAPHIC AREA **Rensselaer Avenue**			
DRILL BIT DIAMETER/TYPE **3-in. / Drive Sampler**	BOREHOLE DIAMETER **3-inches**	DRILLING EQUIPMENT/METHOD **6610 DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **5/1/04-5/1/04**	
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Pre-Packed**	MAT. **PVC**	TOTAL LENGTH **5.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK **Morie #1**



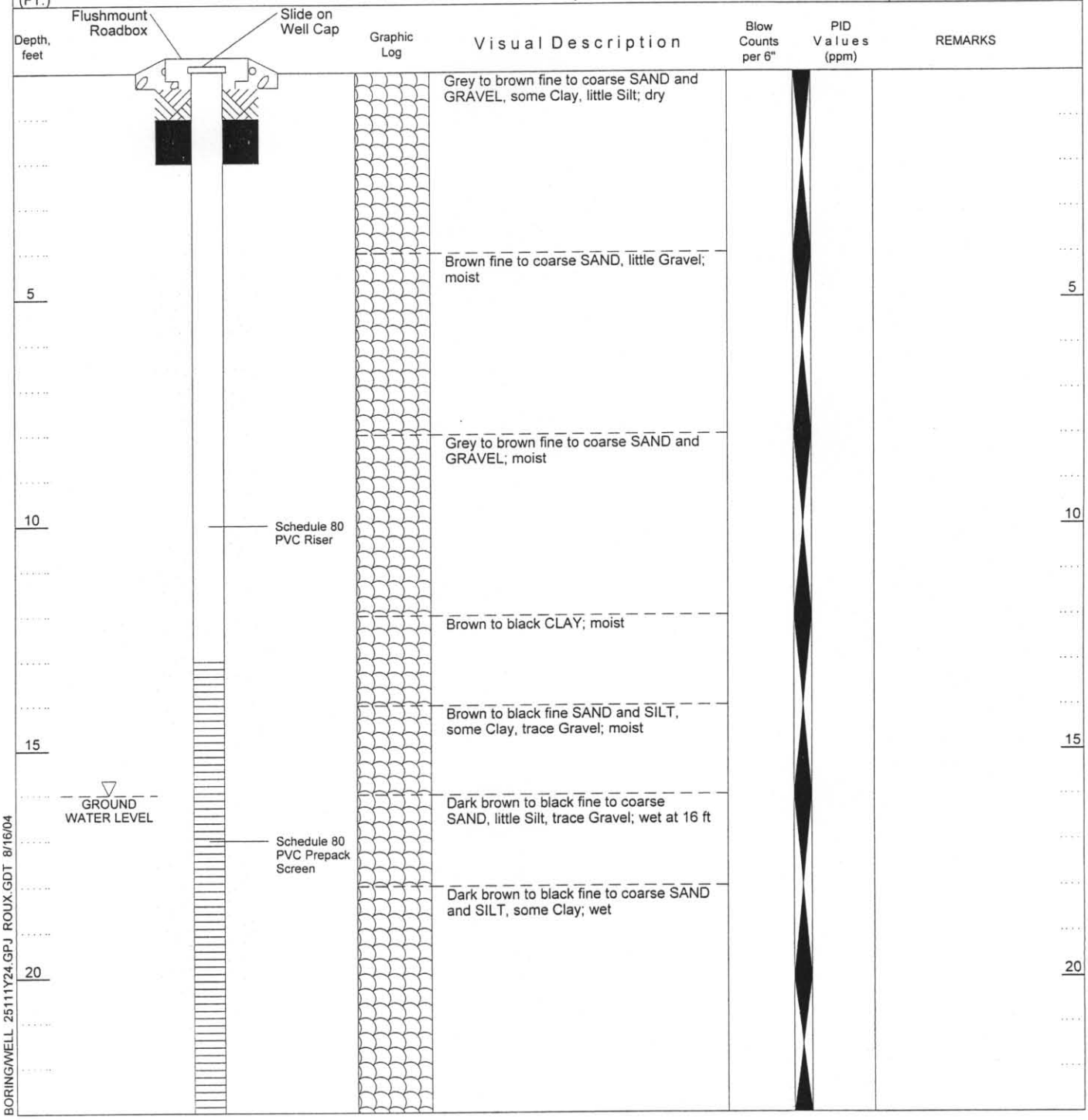
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO. **OS-PZ-203**	NORTHING **Not Measured**	EASTING **Not Measured**			
PROJECT NO./NAME **25111Y24 / Offsite**		LOCATION **BASF Corporation 36 Riverside Avenue**			
APPROVED BY	LOGGED BY **M. Kroll**	**Rensselaer, New York**			
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling and Testing / Harry Connel**		GEOGRAPHIC AREA **Port of Rensselaer Property**			
DRILL BIT DIAMETER/TYPE **3-in. / Drive Sampler**	BOREHOLE DIAMETER **3-inches**	DRILLING EQUIPMENT/METHOD **6610 DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **5/18/04-5/18/04**	
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Pre-Packed** MAT. **PVC**	TOTAL LENGTH **10.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**	
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK **Morie #1**



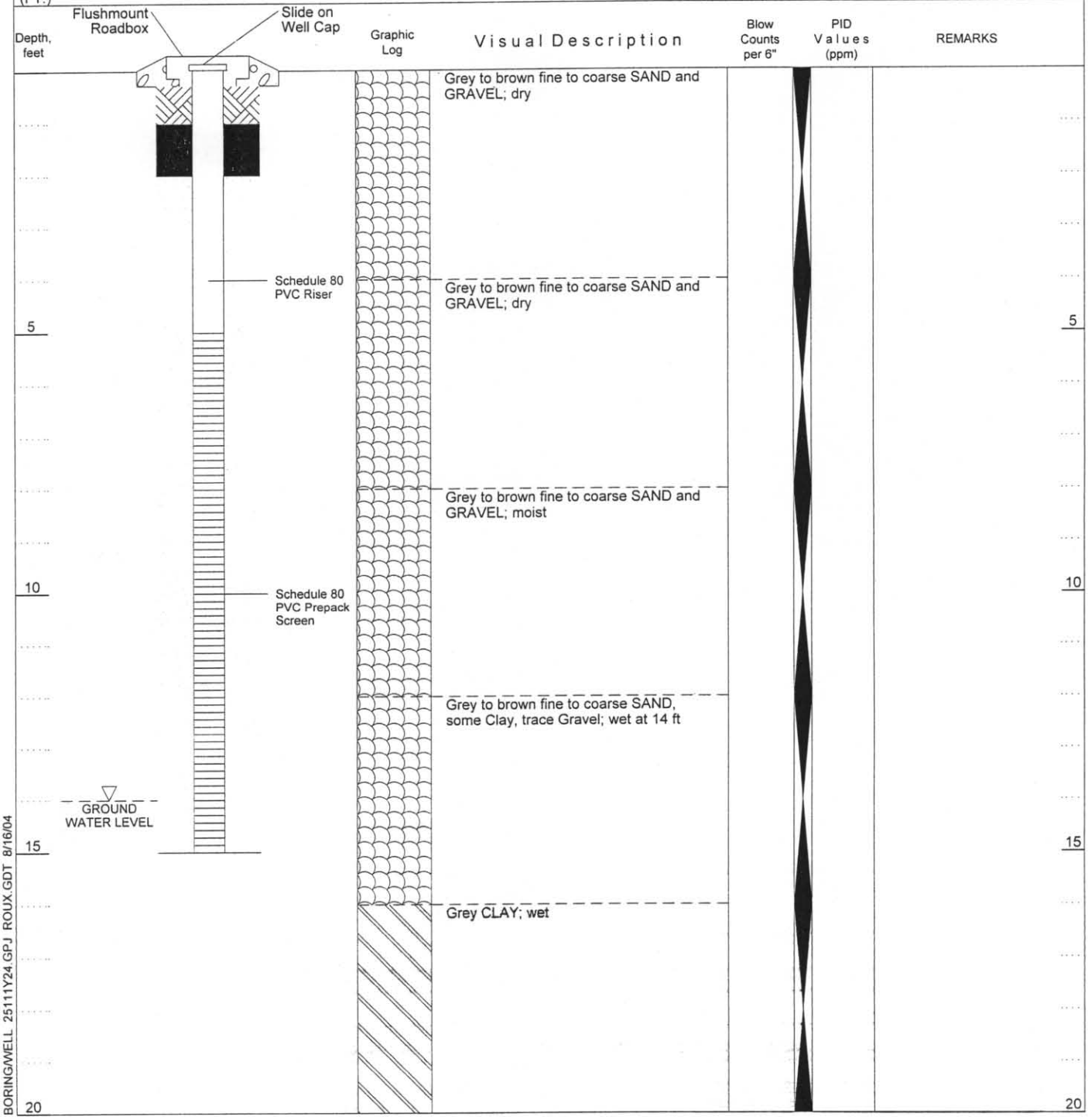
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.: **OS-PZ-204**	NORTHING: **Not Measured**	EASTING: **Not Measured**			
PROJECT NO./NAME: **25111Y24 / Offsite**		LOCATION: **BASF Corporation 36 Riverside Avenue, Rensselaer, New York**			
APPROVED BY:	LOGGED BY: **M. Kroll**				
DRILLING CONTRACTOR/DRILLER: **Aquifer Drilling and Testing / Harry Connel**		GEOGRAPHIC AREA: **Port of Rensselaer Property**			
DRILL BIT DIAMETER/TYPE: **3-in. / Drive Sampler**	BOREHOLE DIAMETER: **3-inches**	DRILLING EQUIPMENT/METHOD: **6610 DT / Geoprobe**	SAMPLING METHOD: **2" Macro-Core**	START-FINISH DATE: **5/18/04-5/18/04**	
CASING MAT./DIA.: **PVC / 1-inch**	SCREEN: TYPE **Pre-Packed** MAT. **PVC**	TOTAL LENGTH **5.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**	
ELEVATION OF: (FT.) GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN **/**	GW SURFACE	GRAVEL PACK: **Morie #1**	



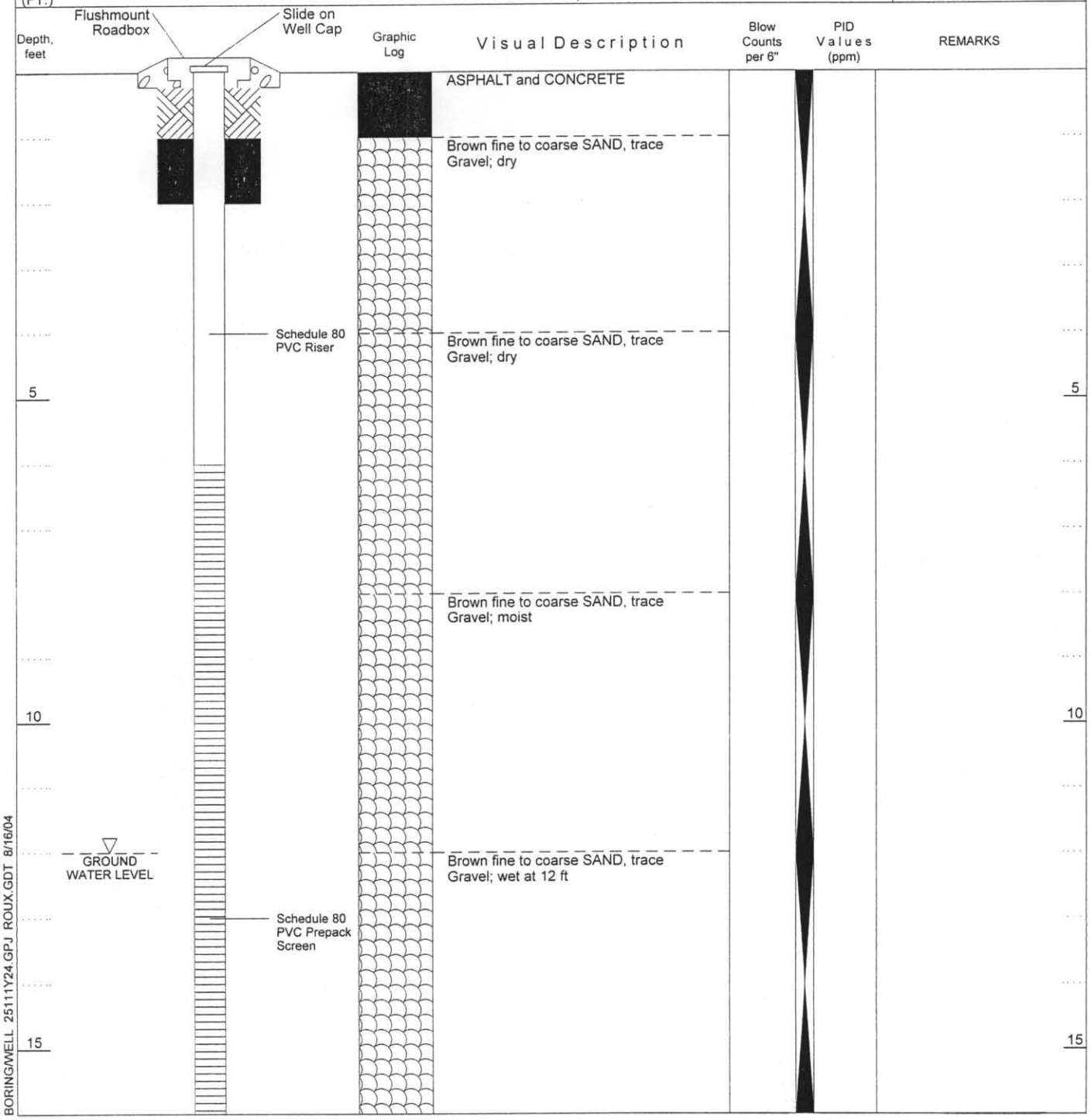
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO.: **OS-PZ-205**	NORTHING: **Not Measured**	EASTING: **Not Measured**		
PROJECT NO./NAME: **25111Y24 / Offsite**		LOCATION: **BASF Corporation 36 Riverside Avenue**		
APPROVED BY:	LOGGED BY: **M. Kroll**	**Rensselaer, New York**		
DRILLING CONTRACTOR/DRILLER: **Aquifer Drilling and Testing / Harry Connel**		GEOGRAPHIC AREA: **Riverside Avenue**		
DRILL BIT DIAMETER/TYPE: **3-in. / Drive Sampler**	BOREHOLE DIAMETER: **3-inches**	DRILLING EQUIPMENT/METHOD: **6610 DT / Geoprobe**	SAMPLING METHOD: **2" Macro-Core**	START-FINISH DATE: **5/27/04-5/27/04**
CASING MAT./DIA.: **PVC / 1-inch**	SCREEN: TYPE **Pre-Packed** MAT. **PVC**	TOTAL LENGTH **10.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE / GRAVEL PACK **Morie #1**



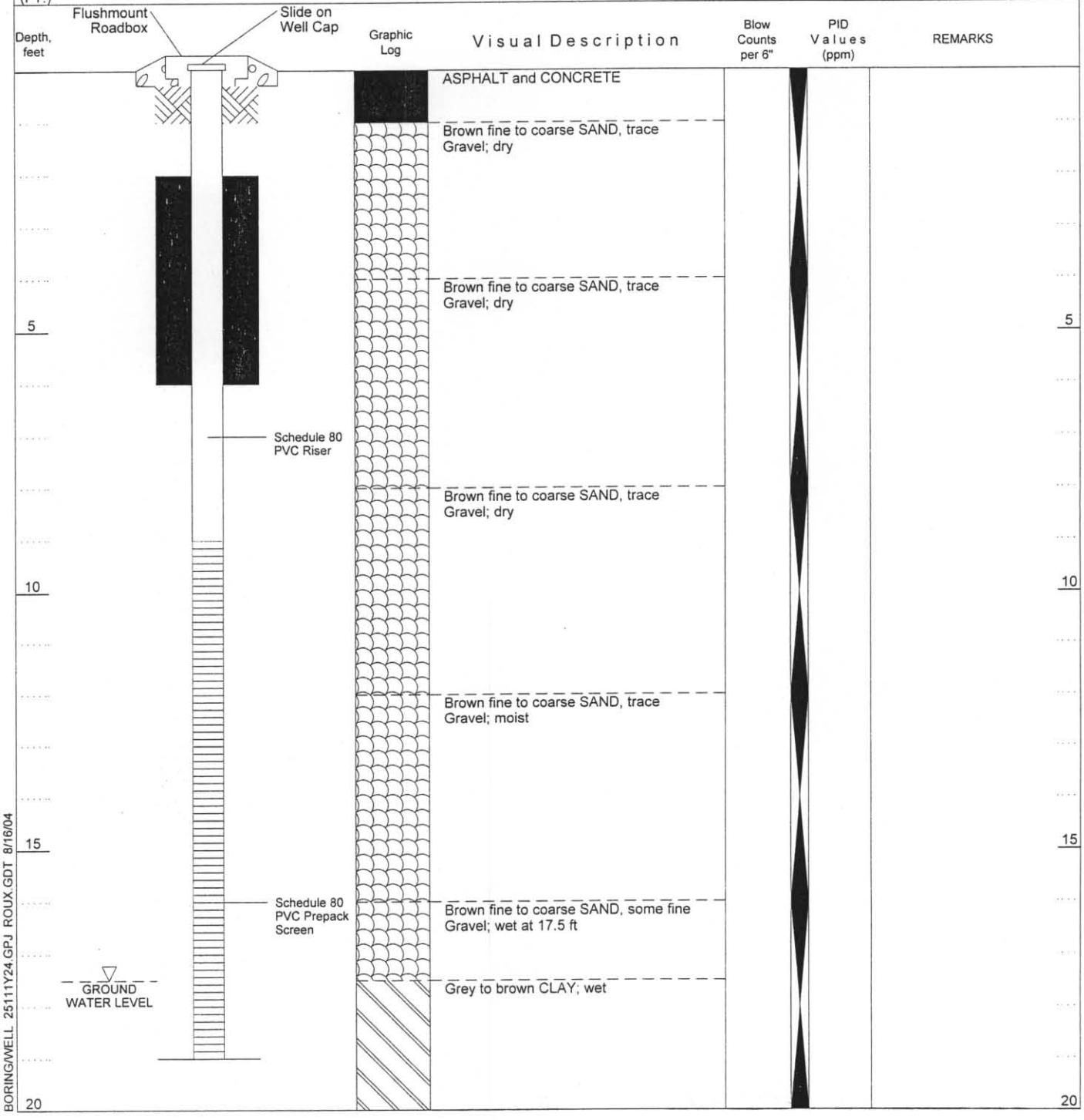
BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04

ROUX ASSOCIATES, INC.
Environmental Consulting & Management

209 Shafter Street
Islandia, NY 11749
Telephone: 631-232-2600
Fax: 631-232-9898

WELL CONSTRUCTION LOG

WELL NO. **OS-PZ-206**	NORTHING **Not Measured**	EASTING **Not Measured**			
PROJECT NO./NAME **25111Y24 / Offsite**		LOCATION **BASF Corporation 36 Riverside Avenue**			
APPROVED BY	LOGGED BY **M. Kroll**	**Rensselaer, New York**			
DRILLING CONTRACTOR/DRILLER **Aquifer Drilling and Testing / Harry Connel**		GEOGRAPHIC AREA **Riverside Avenue**			
DRILL BIT DIAMETER/TYPE **3-in. / Drive Sampler**	BOREHOLE DIAMETER **3-inches**	DRILLING EQUIPMENT/METHOD **6610 DT / Geoprobe**	SAMPLING METHOD **2" Macro-Core**	START-FINISH DATE **5/27/04-5/27/04**	
CASING MAT./DIA. **PVC / 1-inch**	SCREEN: TYPE **Pre-Packed** MAT. **PVC**	TOTAL LENGTH **10.0**	DIA. **1-inch**	SLOT SIZE **10-Slot**	
ELEVATION OF: (FT.)	GROUND SURFACE	TOP OF WELL CASING	TOP & BOTTOM SCREEN /	GW SURFACE	GRAVEL PACK **Morie #1**



BORING/WELL 25111Y24.GPJ ROUX.GDT 8/16/04