Preliminary Site Close Out Report
Hooker Chemical/Ruco Polymers Site
Hicksville, Nassau County, New York

I. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has determined that all construction activities at the Hooker Chemical/Ruco Polymers ("Hooker Ruco") Superfund site (Site) have been completed in accordance with *Close Out Procedures for National Priorities List Sites* (OSWER Directive 9320.2, May 2011). Three Records of Decision (RODs) have been signed for the Site. The remedial actions for each of the three RODs have been constructed.

Based upon field observations associated with EPA oversight, as well as the pre-final and final inspections conducted by EPA and the New York State Department of Environmental Conservation (NYSDEC), EPA has determined that the potentially responsible parties (PRPs) have constructed the remedies for the Site in accordance with the RODs and approved remedial designs. EPA has also determined that no further response actions other than operation and maintenance of the biosparging system, long-term monitoring, and five-year reviews are necessary. The PRPs have initiated the activities necessary to achieve performance standards and Site completion. Human exposures and contaminated groundwater releases are under control.

II. SUMMARY OF SITE CONDITIONS

Background

The Site is located in an industrial park area of the hamlet of Hicksville on Long Island, New York and was a 14-acre former polymer manufacturing facility (see Figure 1). Commerce Street and adjacent industrial development comprise the 880-foot northern Site boundary. Along the Site's 1,000-foot eastern side is a large warehouse building formerly owned by the Northrop Corporation. A small portion of undeveloped land abuts the Hooker Ruco property's 250-foot southern boundary. Two active tracks of the Long Island Railroad parallel the property's 940-foot southwestern property boundary. New South Road borders the 270-foot western edge of the property. The property is totally enclosed by a chain-link fence. Immediately to the south and hydraulically downgradient of the Hooker Ruco facility is the Northrop Grumman (formerly Grumman Aerospace and Naval Weapons Industrial Reserve Plant Site) facility. Groundwater remediation, both on and off the Northrup Grumman property, is being conducted and overseen by the NYSDEC pursuant to the Resource Conservation and Recovery Act (RCRA). Downgradient of the Hooker Ruco property, a portion of the contaminated groundwater emanating from the Hooker Ruco property is comingled with groundwater contamination from the Northrop Grumman facility.

The Site was originally developed by the Rubber Corporation of America which was a small, privately-held company. Operations at the Site began in 1945 and included natural latex storage, concentration and compounding. From 1946 to 1978, a pilot plant at the facility used a heat transfer fluid called Therminol, which contained polychlorinated biphenyls (PCBs). During this period a release of Therminol occurred, and industrial process wastewater and storm water runoff from the facility was discharged to six on-Site recharge basins or sumps. Drums containing various chemicals were also stored on-Site where occasional spills would occur. Some of the contaminated soil was spread onto surrounding areas by surface water runoff, sediment transport, and truck traffic.

Various entities subsequently operated at the Site including the Ruco Division of the Hooker Chemical Company (currently known as the Occidental Chemical Corporation or Occidental). In 1998, Sybron Chemicals Inc. acquired the Ruco Polymer Corporation. Operations at the Site included the production of various polymers, polyvinyl chloride (PVC), styrene/butadiene latex, vinyl chloride/vinyl acetate copolymer, and polyurethane, as well as ester plasticizers. In 2000, the Bayer Corporation acquired the stock of Sybron Chemical Corporation. Operations at the facility ceased in 2002, and in 2003 Bayer Polymers LLC (n/k/a Bayer Materials Science LLC) assumed ownership of the Site. As a result of the cessation of operations, Bayer has also had to follow the RCRA hazardous waste facility closure and corrective action requirements, under NYSDEC oversight.

Initial investigations of the releases by Occidental were started in 1978. An August 1984 report entitled "Report of Groundwater & Soils Investigation at the Former Ruco Division Plant Site, Hicksville, New York" led to the Site being proposed to the National Priorities List (NPL) on October 15, 1984 (49 FR 40320) and listed on the NPL on June 10, 1986 (51 FR 21054).

In July 1988, EPA notified Occidental and Ruco Polymer of their potential liability and offered them the opportunity to conduct a remedial investigation and feasibility study (RI/FS) of the Site. In September 1988, Occidental agreed to perform the RI/FS and entered into an Administrative Order on Consent with EPA. The RI/FS commenced in September 1989. EPA has designated three operable units (OUs) for the Site. OU1 addresses contaminated soils at the Hooker Ruco facility and OU2 addresses PCB-contaminated surface soils. OU3 addresses the contaminated groundwater beneath the Hooker Ruco facility and the downgradient commingled contaminated groundwater plume beyond the Hooker Ruco facility.

In September 1990, EPA issued a ROD for OU2 to address the contamination surrounding the pilot plant building and a portion of a sump at the facility. At the time of the issuance of the OU2 ROD, the RI/FS for OU1 was underway but not ready for remedy selection. The ROD for OU1 was subsequently issued in January 1994 and called for the installation of groundwater and soil treatment systems at the Site and the excavation of additional contaminated soil. The third and final ROD was issued for OU3 in September 2000 and called for treatment of a sub-plume of vinyl chloride groundwater contamination.

Remedy Selection

OU2 ROD

The remedial action objectives for the first Superfund ROD for the Site, issued in 1990 for OU2, were to protect human health from exposure via ingestion of soil, inhalation of suspended Site soils, and direct contact with the soil. The major components of the selected remedy included the following:

- Excavation of PCB-contaminated soils in excess of 10 parts per million (ppm) in the direct spill area and transport areas surrounding the pilot plant. Soils at the bottom of the recharge basin will be excavated to ten feet. Confirmatory sampling will be performed to ensure soils that remain after the excavation will have PCB concentrations that do not exceed 10 ppm.
- Soils with PCB concentrations between 10 and 500 ppm, approximately 1,100 cubic yards, will be shipped for disposal to an off-Site hazardous waste landfill permitted under TSCA.
- Stockpiled soils, which were previously excavated during the removal of an underground fuel oil tank, will be included in the disposal of PCB-contaminated soils at an off-Site chemical waste landfill.
- Soils with PCB concentrations exceeding 500 ppm, approximately 36 cubic yards, will be shipped off-Site to a TSCA-permitted incineration facility. Residuals will be disposed of, as appropriate, by the incineration facility.
- Excavated areas will be backfilled with clean soil, and these soils, excluding the recharge basin will be paved with asphalt as appropriate.
- The PCB contamination in former sump five will be left in-place.

OU1 ROD

The remedial action objectives for the OU1 ROD, issued in 1994, included reduction of risks to human health associated with potential exposure to Site-related compounds by controlling the migration of groundwater downgradient from the Hooker Ruco property and attaining the groundwater cleanup criteria established by ARARs beneath the property. The major components of the selected remedy included the following:

- Installation of groundwater extraction wells to control the flow of contaminated ground-water from leaving the Hooker Ruco property and migrating downgradient.
- Installation of a groundwater treatment system to treat the extracted groundwater.
- Installation of a discharge system to dispose of the majority of the treated groundwater.
- Additional soil testing in the bottom of sump two to determine if contaminants are present in the deep soils and to compare the levels present in the soil to cleanup criteria that are considered protective of groundwater quality.
- Soil flushing for the deep soils in sump one, and possibly sump two (based upon the results of additional soil testing).

- Additional soil testing in the area around monitoring well E to determine if contaminants are present.
- Excavation of the soils in the former drum storage area and possibly the area around well E (to be determined by subsequent soil borings).
- Periodic monitoring of the groundwater extraction system to assure adequate control is maintained; periodic sampling of the groundwater treatment system discharge, to assure treatment standards are achieved; and periodic sampling of the soils in sump one and possibly sump two to measure the progress of the selected remedy in achieving the cleanup standards.
- The use of institutional controls in the form of deed restrictions and groundwater use restrictions at the Hooker Ruco property.

OU3 ROD

The remedial action objectives for OU3 were to protect human health from exposure (via ingestion, inhalation, and dermal contact) to vinyl chloride monomer (VCM), trichloroethylene (TCE), tetrachloroethylene (PCE), and tentatively identified compounds (TICs) in groundwater at concentrations in excess of state and federal drinking water standards.

The Superfund ROD for OU3 was issued in 2000 to install a biosparging groundwater treatment system to remediate a sub-plume of VCM which has migrated toward the Northrup/Grumman and Navy Sites. The major components of the OU3 selected remedy included the following:

- The use of biosparging technology in an *in-situ* application to enhance the VCM degradation with the goal of achieving state drinking water standards or federal maximum contaminant levels (MCLs).
- Vertical injection wells will be installed in the area of the VCM sub-plume to a depth of 200 to 400 ft. Additives (air/oxygen, nutrients) will be forced into the formation using either static head within the well or using pump-supplied pressure.
- A vadose zone or unsaturated zone monitoring program will be implemented to ensure that air stripping of VOCs, particularly VCM, is not occurring as a result of biosparging.
- If necessary, the selected remedy will also utilize a supplemental aerobic bioremediation technology following biosparging treatment. Supplemental bioremediation would involve the injection of nutrients (potentially including nitrogen and phosphorus along with suitable carbon sources such as methane) to enhance the growth and metabolic activities of indigenous microbial populations to effect the degradation of VCM in the aquifer.
- A long-term monitoring program will be developed to monitor groundwater quality in the area of the VCM sub-plume and to evaluate the fate and migration of VOCs southward and westward beyond the VCM sub-plume. New monitoring wells would be added to the existing network of monitoring well to increase the network's area of coverage. The objective of the long-term monitoring program is to evaluate the effectiveness of the selected remedy.

- If necessary, a contingency remedy would be implemented to install a groundwater extraction and treatment system to remediate the VCM sub-plume.

The contingency remedy, will be implemented if it is determined that biosparging is not effectively treating the sub-plume. If the Northrop Grumman groundwater treatment system should cease operation before the aquifer is restored or if the system is not capturing the contamination emanating from the Hooker Ruco Site, the contingency remedy would involve the installation of a groundwater extraction and treatment system to remediate the sub-plume.

Remedial Construction Activities

OU2 Remedial Actions

Occidental mobilized at the Site for the performance of the OU2 RA work on May 4, 1992. Approximately 52 cubic yards (CY) of soil with PCB concentrations exceeding 500 ppm were excavated and shipped off-Site for thermal destruction at a TSCA-permitted incineration facility. Approximately 1,957 CY of soil with PCB concentrations between 10 and 500 ppm were shipped off-Site and disposed of at a TSCA permitted landfill. EPA inspected the Site on September 3, 1992, and concluded that the remedial action was completed. Occidental's Remedial Action Report was approved on March 12, 1993. As noted above, the objective of the remedy was to eliminate human expose to PCB-contaminated soil. Additional PCB-contaminated soil was revealed, however, during Bayer's implementation of a New York State RCRA closure action in 2000. This additional contamination was recently (September 2014) addressed by the NYSDEC under the state hazardous waste and remediation programs.

OU1 Remedial Actions

On June 30, 1994, EPA unilaterally issued an administrative order to the Occidental Chemical Corporation and to the Ruco Polymer Corporation for implementation of the OU1 ROD. Soil sampling in the MW-E area, the sump 1 area, and the sump 2 area, took place in December 1998. Based upon the analysis of the soil sampling data collected in 1998, and the NYSDEC soil cleanup guidance, EPA determined that the MW-E area and the sump 2 area were not source areas of contamination. In November 2000, the concrete tank in sump 1 was removed. The tank demolition debris was disposed of at the Chemical Waste Management Facility in Model City, New York. In September 2001, EPA approved placement of the soil, which was excavated during removal of the tank, back into sump 1.

Excavation of PCB-impacted soils was necessary in the former drum-storage area since sampling indicated that the New York State cleanup criterion of 10 ppm had been exceeded. The excavation of 310 tons of soil occurred in early December 2001. Later in December 2001, based on confirmatory results, an additional 17 tons of soil were removed. The PCB-impacted soil was disposed of at the Chemical Waste Management Facility in Model City, New York.

The soil-flushing system for the OU1 remedy was installed in December 2001. The system consisted of one run of approximately 100 feet of perforated pipe installed in a rectangular, horizontal profile at a depth of 8 to 10 feet below ground surface. Four soil flushing events

occurred at sump 1 in August 2002, March 2003, March 2004, and March 2005. The volume of water used for each event was approximately 16,000 gallons. Since the flushing system was installed approximately 8 to 10 feet below the ground surface in an unsaturated zone which extends to approximately 50 feet below ground surface, the flushing system was abandoned in place. EPA's final inspection of the remedy occurred in January 2006, when the final sampling efforts were completed. On March 16, 2006, Occidental submitted to EPA the sample data which demonstrated that the operation achieved the state soil cleanup goals for PCBs, polycyclic aromatic hydrocarbons (PAHs), arsenic, zinc and chromium. On September 28, 2007, EPA issued a Remedial Action Report which documented the completion of OU1.

OU3 Remedial Actions

The ROD for OU3 was issued on September 29, 2000. The remedy called for the use of *in situ* bio treatment of the VCM sub-plume using air biosparging which will reduce the concentration of VCM to 2 parts per billion (ppb) which is the state drinking water standard and the federal MCL for VCM. Until these levels are reached, the remedy relies on the groundwater extraction system at the Northrop Grumman property to capture and treat residual concentrations of VCM from the Site after treatment, as well as the plume of TCE and PCE contamination from the Northrop/Grumman and Navy Sites

The VCM sub-plume's perimeter contains oxygen, nutrients, carbon sources, and microbes that biodegrade peripheral concentrations of VCM. It is in the core area of high VCM concentrations where the oxygen has been consumed, thus limiting the VCM biodegradation process. Low level PCE and TCE concentrations within the sub-plume have been biodegraded due to the anaerobic conditions created by the VCM. The injection of oxygen into the central core of the VCM sub-plume, replenishes the oxygen supply to restart and enhance the VCM biodegradation process after the PCE and TCE have been degraded. PCE and TCE associated with the Site that is not degraded is captured by the Northrop Grumman treatment system.

The objectives for OU3 are being accomplished using *in situ* bioremediation treatment of the VCM sub-plume using biosparging (with supplemental nutrient addition, if necessary) and natural attenuation. Remedial design data collected from the biosparging pilot system, which was installed as part of the remedial design, and data collected since the pilot have demonstrated that biosparging is reducing VCM concentrations in the groundwater. The remedy primarily concentrates on the central core area of the sub-plume where elevated concentrations exist. Once the concentrated VCM areas are addressed, lower concentrations are expected to be susceptible to the processes of natural degradation in the groundwater resulting in further reduction of the VCM sub-plume.

The on-Site air injection system is comprised of two injection well fences, or lines of injection wells. These two injection fences were identified as the middle and northern fences. There are eight injection locations for the middle fence and seven for the northern fence. A cluster of two air injection wells at different depths were installed at each injection location. The system was installed in two phases. The first, or design, phase was the pilot system which included a control building and the first four injection well nests of the middle fence. The control building and

other components of the pilot system (e.g., air compressor, air and water piping, controls, power and control conduits, and wiring, etc.) were installed by September 2006 and became fully operational in October 2006. The control center facility includes process equipment designed to inject air, water, and a carbon source, if needed, into the main VCM sub-plume in order to enhance VCM degradation. The control building is located on a parcel of property west of South Oyster Bay Road and south of Hazel Street. This location was selected due to its proximity to the middle injection well fence line and its accessibility.

The remainder of the biosparging system was installed in three stages: the north fence underground components, excluding the injection and monitoring wells, were installed from September through December 2008, the injection and monitoring wells for the north fence and the remainder for the middle fence were installed from September 2010 through May 2011 and the remainder of the system components (e.g., remainder of middle fence injection well vaults, power and control conduits and wiring, controls, air and liquid piping, etc.) were installed from March 2012 through August 2012. EPA and the NYSDEC conducted a final inspection of the system on September 12, 2012. On September 17, 2012, the system became fully operational.

A Remedial Action Report for OU3 was submitted to EPA by the PRP on September 26, 2012. EPA approved the report on June 30, 2013. Operation, monitoring and maintenance (OM&M) activities are currently carried out by the PRP in accordance with the OM&M Plan. An updated OM&M plan for the entire biosparging system was submitted in September 2012. The plan addresses the long-term operation, maintenance, and monitoring of the biosparging system and provides a summary of maintenance requirements for the various components of the system.

New York State RCRA Closure Actions

Closure of the Hooker Ruco facility under RCRA authority and under NYSDEC oversight has involved demolition of numerous buildings on Site. During the demolition work, and especially at the pilot plant building, additional PCB contamination was detected in the building debris and in the soil near and beneath the buildings. The NYSDEC requested Bayer to conduct several interim remedial actions at the Site from 2005 through 2009, which removed approximately 10,000 CY of PCB-contaminated soil. The concentration of PCBs removed during these actions ranged from 1.1 ppm to 23,000 ppm.

On December 18, 2012, the NYSDEC issued a ROD, under state authority, for remediation of surface soil that contained PCBs at a concentration of greater than 1 ppm and subsurface soil which contain PCBs at concentrations of more than 10 ppm. The ROD also addressed soil which contained PAHs with a total concentration of more than 500 ppm, arsenic with a concentration of greater than 16 ppm and cadmium at a concentration of greater than 9.3 ppm. The NYSDEC ROD called for the excavation of 10,762 CY of PCB contaminated soil, 70 CY of PAHs contaminated soil, 577 CY of arsenic and cadmium contaminated soil and installation of a cover system and demolition of the former administration building, the only original Site structure left, and any remaining soil excavation. The NYSDEC's remedy was completed in May 2015.

Institutional Controls

EPA's OU1 ROD called for institutional controls in the form of deed restrictions and groundwater use restrictions at the Hooker Ruco property. The controls will restrict the use of the property to industrial development as long as contaminants remain on the property and the biosparging treatment system is in place. In addition to an existing Nassau County ordinance, groundwater use restrictions will be implemented through deed restrictions as well. The use of groundwater will be restricted until the groundwater beneath the Site is fully remediated.

The ROD issued by NYSDEC in 2012 also called for institutional controls on the Hooker Ruco property. The controls will limit future use of the property to commercial use, impose restrictions on use of the property to protect the soil cover system, require the development of a Site management plan which will require testing and proper management of any excavated soil at the property, controls to protect the soil cover system and a provision for evaluating the need for installation of a soil vapor mitigation system to control the intrusion of contaminated soil vapor to indoor air at future buildings which may be constructed at the Site. Bayer, in coordination with EPA and NYSDEC, is in the process of developing the deed restrictions.

III. DEMONSTRATION OF CLEANUP ACTIVITY QA/QC

Cleanup activities at the Site were consistent with the RODs, the approved RDs, and all work plans prepared for design and construction of the remedial actions. A Quality Assurance/Quality Control (QA/QC) program was used throughout the remedial actions. The QA/QC program was in conformance with EPA and NYSDEC standards and, accordingly, EPA and NYSDEC have determined that all analytical results are accurate to the degree needed to assure satisfactory execution of the remedial actions consistent with the RODs, RD plans and specifications, and approved modifications by EPA.

IV. ACTIVITIES AND SCHEDULE FOR COMPLETION

The following activities remain for the Site:

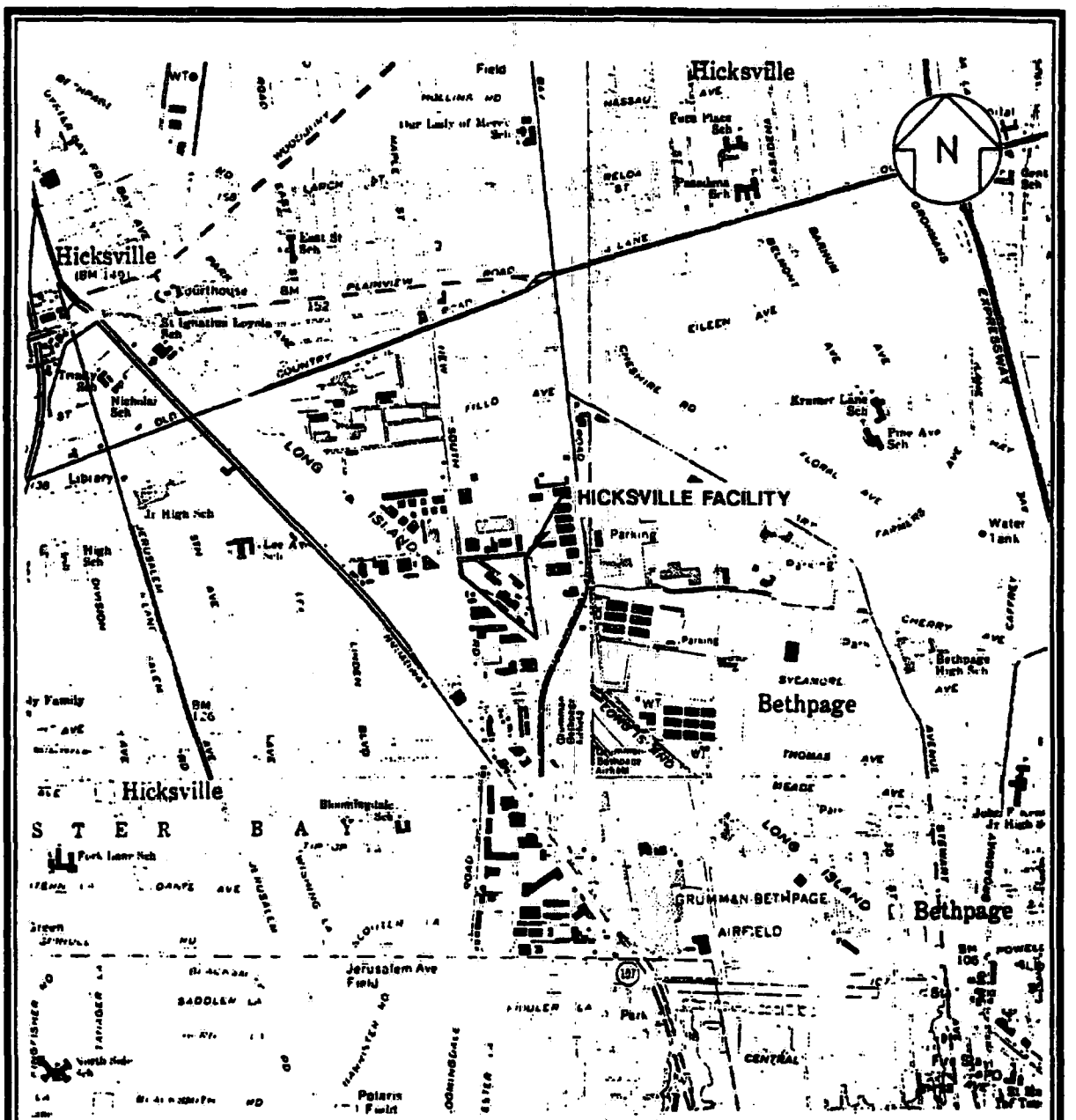
Activity	Estimated Completion	Responsible Organization
Conduct First Five-Year Review	June 2016	EPA
Complete EPA Specified Groundwater Use Restrictions	September 2016	EPA
Issue Final Close Out Report	March 2025	EPA
Deletion from the NPL	December 2026	EPA

V. FIVE-YEAR REVIEW

Hazardous substances will remain at the Site above levels that allow unlimited use and unrestricted exposure. Pursuant to CERCLA Section 121(c) and 40 Code of Federal Regulations Part 300.430(f) (4) (ii), EPA must conduct a statutory five-year review of the remedy at this Site. The first Five-Year Review Report is targeted for completion in fiscal year 2016.

Walter E. Mugdan, Director
Emergency & Remedial Response Division

July 1, 2015
Date



SOURCE: USGS TOPOGRAPHIC QUADRANGLES HICKSVILLE, N.Y., FREEPORT, N.Y., HUNTINGTON, N.Y. AND AMITYVILLE, N.Y.

HOOKER CHEMICAL/RUCO POLYMER SITE LOCATION MAP

Figure 1

Modified from LBG Engineering Services Inc. (2/93)