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106641

Second Five-Year Review Report

For

Circuitron Corporation Superfund Site

East Farmingdale

Suffolk County, New York

April 2010

PREPARED BY:

U.S. Environmental Protection Agency
Region II
New York, New York

Five-Year Review Report

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List of Acronyms

ACM	Asbestos Containing Materials
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study
GCW	Groundwater Circulation Well
IVS	In-well Vapor Stripping
Lockheed	Lockheed Martin Technology Services
LTRA	Long-Term Response Action
MCLs	Maximum Contaminant Levels
Miller Environmental	Miller Environmental Group Inc.
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
O&M	Operation and Maintenance
OU	Operable Unit
PPA	Prospective Purchaser Agreement
ppb	parts per billion
PRAC	Preplaced Remedial Action Contract
RA	Remedial Action
RAO	Remedial Action Objective
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSE	Remediation System Evaluation
SCDHS	Suffolk County Department of Health Services
SD	Storm Drain
SPDES	State Pollutant Discharge Elimination System
SVE	Soil Vapor Extraction
URS	URS Corporation
USACE	United States Army Corps of Engineers
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This is the second five-year review for the Circuitron Corporation Superfund site, located in East Farmingdale, Suffolk County, New York. The remedies for the site included the demolition and removal of the Circuitron building, the excavation and off-site disposal of contaminated sediments and soils from underground structures, in-situ soil vapor extraction in the southwest corner of the property, and the treatment of contaminated groundwater via air stripping. Because the remedial action for groundwater will require more than five years completing, this five-year review is being conducted as a matter of the U.S. Environmental Protection Agency policy. The triggering action for this policy review is the completion of the first five-year review on August 5, 2005.

The community is serviced by a public water purveyor that meets appropriate Federal and State drinking water standards and exposure to contaminated drinking water has been interrupted. The results of this five-year review find that the immediate threats from the site have been addressed, the remedies are protective, and the groundwater cleanup goals are expected to be achieved through continued treatment of contaminated soil, groundwater and natural processes.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: **Circuitron Corporation**		
EPA ID *(from WasteLAN)*: **NYD981184229**		
Region: 2	**State: NY**	**City/County: East Farmingdale, Suffolk County**

SITE STATUS	
NPL status: ■ Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ■ Operating ■ Complete	
Multiple OUs?* ■ YES ☐ NO	**Construction completion date:** 09/22/2000
Has site been put into reuse? ■ YES ☐ NO The abandoned property was sold.	

REVIEW STATUS	
Lead agency: ■ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author name: Sharon Trocher	
Author title: Remedial Project Manager	**Author affiliation: USEPA**
Review period: 08/2005 to number 04/2010	
Date(s) of site inspection: 10/26/2009 and 10/27/2009	
Type of review: ■ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only ☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead ■ Regional Discretion	
Review number: ☐ 1 (first) ■ 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____ ☐ Construction Completion ■ Previous Five-Year Review Report ☐ Other (specify) ☐ Completion of the Preliminary Close-Out Report	
Triggering action date ***(from WasteLAN)***: 08/05/2005	
Due date ***(five years after triggering action date)***: 08/05/2010	
Does the report include recommendation(s) and follow-up action(s)? ☐ yes ■ no **Is human exposure under control?** ■ yes ☐ no **Is contaminated groundwater under control?** ■ yes ☐ no ☐ not yet determined **Is the remedy protective of the environment?** ■ yes ☐ no ☐ not yet determined	

* ["OU" refers to operable unit.]

Five-Year Review Summary Form (continued)

Issues, Recommendations, and Follow-Up Actions

Treatment of the soil and groundwater until the remedial action objectives are met is part of the ongoing remedial actions at this site. Contaminated soil located in the southwest corner of the property is the only remaining source area at the site. The cleanup of the groundwater and soil in the southwest corner of the property needs to be continued. The remedial remedies include ongoing operation, maintenance and monitoring activities.

This report did not identify any issue or make any recommendation for the protection of public health and/or the environment which was not included or anticipated by the decision documents.

Protectiveness Statement

The OU-1 and OU-2 remedial actions will restore soil and groundwater to allow for unlimited use without restriction. The implemented remedies for OU-1 and OU-2 protect human health and the environment because there are no exposure pathways that could result in unacceptable risks and none expected during remediation as long as the soils and groundwater continue to be remediated and monitored. Because all OUs are protective, the site is protective of human health and the environment.

Circuitron Corporation Site
East Farmingdale, New York
Second Five-Year Review

I. Introduction

This five-year review was conducted in accordance with the Comprehensive Five-Year Review Guidance, OSWER Directive 9355.7-03B-P (June 2001). The purpose of a five-year review is to assure that implemented remedies protect public health and the environment and function as intended by the decision documents. This document will become part of the site file.

The U.S. Environmental Protection Agency (EPA), Region II, conducted this five-year review of the remedies implemented at the Circuitron Corporation (Circuitron) Superfund site in East Farmingdale, New York. This review was conducted by the Remedial Project Manager (RPM) for the site. This is the second five-year review for the site.

The site is being addressed in two phases or operable units (OUs). The first operable unit (OU-1), which addressed the sources of the groundwater contamination, has been completed with the exception of addressing the soil contamination located in the southwest corner of the property via in-situ soil vapor extraction (SVE). A SVE system was constructed in March 2008 and is still in operation. The second operable unit (OU-2), which involves groundwater treatment has been constructed and operated from June 2000 to August 2007. This five-year review will evaluate both operable units.

II. Site Chronology

See Table 1 for site chronology.

III. Background

Physical Characteristics

The Circuitron site is situated at 82 Milbar Boulevard in East Farmingdale, Suffolk County, Long Island, New York (see Figure 1-1 for site location), in central Long Island near the Nassau County-Suffolk County border. The site encompasses approximately one acre in an industrial/commercial area. Within a mile of the site is a mixture of industrial and commercial areas, cemeteries, Republic Airport and a State park. The closest residential community is located approximately one mile southwest of the site.

The Circuitron site consisted of an abandoned 23,500 square foot building that was used between 1961 and 1986 for the manufacture of electric circuit boards. Circuitron vacated the premises between May and June of 1986. No manufacturing operations have taken place at the site since then.

The site is located on the outwash plain of Long Island and is generally flat and has a slight slope up to the southeast of less than 1 percent. The site elevation is approximately 85 to 90 feet above mean sea level. The uppermost aquifer, the Upper Glacial, underlies the site, and the depth to the water table has fluctuated between 25 and 30 feet below grade. The saturated portion of the Upper Glacial water aquifer, with a thickness of 50 feet, begins at the water table and extends down to 80 feet below grade. The Upper Glacial aquifer is underlain by the Magothy aquifer that is approximately 700 feet thick in the vicinity of the site. The groundwater flow direction is south-southeast for both the Upper Glacial and Magothy aquifers.

Land and Resource Use

East Farmingdale is predominantly an industrial and commercial area. It is one of the most heavily industrialized sections of Suffolk County, and has been characterized frequently by problems associated with industrial pollution. It is anticipated that the area will remain an industrial and commercial area into the future.

The groundwater pump and treat facility is currently the only permanent structure located on the Circuitron property. The Circuitron building was dismantled and demolished in the summer of 1996 after the building was determined to be structurally unsound. Circuitron was a subsidiary of FEE Industries, which ADI Electronics, Inc. bought in 1984. The property, which had been leased by Circuitron Corporation, was owned by 82 Millbar Boulevard Corporation from the time of Circuitron Corporation's tenancy until March of 2007. In March 2007, Suffolk County brought about the transfer of ownership of the property through public auction because of 82 Milbar Boulevard, Inc.'s failure to pay real estate taxes. The site will continue to be zoned for manufacturing use.

Approximately 15 public water supply wells, serving over 215,000 people, are located within three miles of the site. There are four public water supply wells of the East Farmingdale Water District located within a half-mile radius of the site. Of the four public water supply wells, two are located downgradient of the site, approximately 1,500 feet to the south. These two wells are completed within the Magothy aquifer at 191-268 and 524-585 feet below grade. The shallower of the two wells has been closed since 1978 due to the presence of low concentrations of volatile organic compounds (VOCs); these VOCs are of an unknown origin and are distinct from the Circuitron site contamination. The deep well is sampled quarterly by the Water District.

History of Contamination

Circuitron Corporation began manufacturing circuit boards at the site in 1961. The manufacturing process included drilling, silk screening, plating and scrubbing processes, all which generated chemical wastes. Wastes resulting from the site operations were discharged to an underground leaching pool that was licensed under the State Pollutant Discharge Elimination System (SPDES) and to a number of unauthorized and unpermitted leaching pools, as well as into an on-site storm drain.

The facility had received numerous warnings from both the Suffolk County Department of Health Services (SCDHS) and New York State Department of Environmental Conservation (NYSDEC) concerning SPDES permit violations and unauthorized discharges. In 1984 and 1985, the SCDHS ordered Circuitron Corporation to clean up the toxic and hazardous materials from the site and to perform a groundwater study. The company ceased operations and vacated the site in 1986, leaving behind waste stored in underground and aboveground structures, chemical containers and 55-gallon drums.

Initial Response

In June 1987, EPA initiated a removal action and a preliminary assessment of the site. Subsequently, Circuitron Corporation removed a substantial number of the containers left on-site. In 1988, EPA continued the removal action and sampled and removed remaining waste drums and three aboveground tanks, as well as the contents of seven underground storage tanks, two below-surface treatment basins, and several leaching basins. The action involved consolidating the various waste streams, removing the tanks located at the rear of the property, and removing contaminated debris inside the building. In total, 120 cubic yards of contaminated soil/sediments and debris, 56 drums of hazardous liquids, and an additional 1,400 gallons of tanked hazardous liquids were removed and properly disposed of off-site. The on-site removal activities were completed in September 1989.

EPA proposed to add the site to the National Priorities List on June 24, 1988 (53 FR 23988) and added it to the final list on March 31, 1989 (54 FR 13296).

Basis for Taking Action

The first Remedial Investigation and Feasibility Study (RI/FS) for the site was initiated in September 1988 and completed in January 1991. On March 29, 1991, a Record of Decision (ROD) was signed for OU-1, which addressed the contaminated soils and sediments at the site. A Focused Feasibility Study (FFS) for OU-2 was initiated in January 1992 and completed in the summer of 1994. Through the FFS, EPA obtained the additional data necessary to select a groundwater remedy for the site. The OU-2 ROD was signed on September 29, 1994. Through the site investigations, EPA determined that the contaminants of concern present in soils, sediments and in the groundwater included VOCs (primarily 1,1,1-trichloroethane), copper, chromium and lead. The site-related VOC groundwater contaminant plume was determined to

have a width of about 600 feet and to extend vertically into the shallow portion (upper 40 saturated feet) of the Upper Glacial aquifer. In addition, EPA determined from the risk assessment that the contaminants in the groundwater in the shallow portion of the Upper Glacial aquifer at the site, if not addressed, pose an elevated risk to human health. Groundwater contamination was also identified deeper in the groundwater beneath the site which was attributed to upgradient sources other than the Circuitron Corporation. The contamination from other sources is not a component of the remedial action at the site.

Institutional Control Review

The remedial action objectives for the site soils and groundwater provide for unlimited use of the source area properties and the groundwater aquifer without restrictions on exposures. There are no institutional controls included in the selected final remedies. The source area soil cleanup is complete except for a small area located in the southwest corner of the property. Groundwater cleanup is also currently occurring in this area of the site.

Institutional controls are not anticipated for the site at this time. EPA entered into a Prospective Purchaser Agreement (PPA) with Suffolk County, New York in an effort to return the site property to productive use. Under the PPA, the County transferred the title to the property to a new owner via a public auction. As a precondition of this transfer, the new owner signed the PPA and became obligated to provide EPA with continued access and to forebear from disturbing the site infrastructure. The PPA was signed in March 2007.

As part of the PPA, the County granted an easement to the United States prior to the property's transfer from the County to the new owner. This easement provided for nondisturbance of the groundwater treatment and monitoring well systems, as well as for continued access to the site, until such time that EPA has determined that the remedial action goals have been achieved. The easement therefore did not seek to restrict the future use of the groundwater at the site. At some later date, however, the terms of the easement could be amended (with some effort) to provide for specific restrictions on the use of the site groundwater, if EPA determines that property specific restrictions on the groundwater are warranted.

The site property is located in the middle of a multi-block area of active light industrial properties. This part of Farmingdale, New York is zoned for light industry; there are no residential uses of property in this area. Therefore, the site property is likely to continue to be zoned for light industrial uses into the future, and there are no future residential uses of the site property that can be reasonably contemplated. As previously mentioned, contaminated soil remains only in a small area in the southwest corner of the property and is currently being addressed.

New York State law restricts to a large degree the future use of groundwater at this site. New York Environmental Conservation Law Section 15-527 provides that on Long Island (which includes Suffolk County), "No person or public corporation shall hereafter install or operate any new or additional wells...to withdraw water from underground sources for any purpose or purposes whatsoever where the installed pumping capacity of any such new well or wells singly or in the aggregate, or the total installed pumping capacity of old and new wells on or for use on

one property is in excess of forty-five gallons a minute without a permit pursuant to this title." Furthermore, the New York Sanitary Code (Title 10 of the New York Code of Rules and Regulations Section 5-2.4) states that "No person shall construct or abandon any water well unless a permit has first been secured from the permit issuing official." Based on these statutory controls, it is likely that most potable uses of the site groundwater (for a property that is not now zoned residential and is likely never to be zoned as such) would not be permitted in the future. The area is serviced by a public water supply.

IV. REMEDIAL ACTIONS

Remedy Selection

As set forth above, the OU-1 ROD which addresses the contaminated soils and sediments at the site was signed on March 29, 1991, and the OU-2 ROD which addresses contaminated groundwater was signed on September 29, 1994. Remedial Action Objectives (RAOs) were developed as a result of data collected during the remedial investigations to aid in the development and screening of remedial alternatives considered in the RODs.

OU-1 - Source Control Remedy

The following is the RAO selected in the OU-1 ROD:

- Remove the site-related sources of contamination into the groundwater to expedite compliance with Federal and State groundwater standards.

The following are the major components of the source control remedy for the OU-1 ROD:

- In-situ soil vapor extraction of the contaminated soil in the southwest corner of the property in the area of high VOC contamination.
- Excavation of contaminated sediments from leaching pits, cesspools and storm drains outside and inside the building.
- Off-site treatment and disposal of contaminated sediments.
- Building decontamination via vacuuming of dust containing elevated concentrations of inorganic elements and replacement of the concrete floor in the building.

OU-2 - Groundwater Remedy

The following are the RAOs selected in the OU-2 ROD:

- Prevent potential future ingestion of site-related contaminated groundwater.

- Restore the quality of the groundwater contaminated from the site-related activities to levels consistent with the Federal and State drinking water and groundwater quality standards.

- Mitigate the off-site migration of the site-related contaminated groundwater.

The following are the major components of the groundwater remedy for the OU-2 ROD:

- Treatment, via metal precipitation and air stripping, of site-related contaminated groundwater in the upper 40 feet of the saturated Upper Glacial aquifer to drinking water standards.

- Disposal of treatment residuals at a RCRA Subtitle C facility.

Remedy Implementation

EPA performed the Remedial Designs and Remedial Actions (RDs/RAs) for the site since no viable potentially responsible parties were located. Circuitron Corporation and the property owner had filed for bankruptcy in 1986 and 1987, respectively.

Except for the in-situ SVE system, the remedial design (RD) of the remedies selected in the 1991 ROD was performed by ICF Corporation on behalf of EPA. The remedial design of the remedy selected in the 1994 ROD was performed by Ebasco Services Incorporated on behalf of EPA. EPA entered into an interagency agreement with the U.S. Army Corps of Engineers (USACE) for the implementation of the construction activities selected in the 1991 and 1994 RODs (except for addressing the contamination in the southwest corner of the property). The USACE contracted with Sevenson Environmental Services, Inc. through its Preplaced Remedial Action Contract (PRAC) to implement the building demolition and the contaminated sediment and soil removal selected in the 1991 ROD. ETG Environmental Inc. of Lansing, Michigan and Stone & Webster Environmental Technology and Services were part of the Sevenson team. The USACE contracted with Radian International to implement the groundwater treatment system selected in the 1994 ROD.

EPA entered into a contract with Lockheed Martin Technology Services (Lockheed) to perform the RD and the construction of the remedy selected to address the contamination in the southwest corner of the property. Lockheed procured Miller Environmental Group Inc. (Miller Environmental) to perform the construction of the selected remedy.

OU-2 - Groundwater Remediation

Ebasco Services Incorporated initiated the RD for the OU-2 groundwater treatment system in February 1995 and completed it in September 1996. The Remedial Action funding for this project was received in September 1997. URS Corporation (URS) was awarded the task order by USACE to perform the construction of the groundwater treatment system on September 30,

1998. Before beginning the RA, URS conducted groundwater sampling via test borings and new and existing groundwater monitoring wells in November 1998. The results of this sampling program were used to determine the final location of the groundwater extraction wells. URS initiated on-site construction activities in September 1999.

During construction activities in the northeastern portion of the site, URS uncovered seven dry wells approximately 10 feet in diameter and 15 feet deep. Approximately 340 tons of contaminated soils and sediments were removed from the seven dry wells. This amount included the removal of two of the drywell structures that were in the pathway of the groundwater reinjection trench. All materials were disposed of off-site as hazardous wastes at an appropriate RCRA facility. Other RA activities performed by URS included: (1) drilling three extraction wells and two monitoring wells, (2) trenching and installing the pipeline and electrical cables from the treatment facility to the extraction wells, (3) installing the reinjection trench, (4) constructing the building foundation and concrete slab, (5) erecting the pre-engineered metal building, (6) installing the process equipment, piping, electrical work and instrumentation, (7) grading the site and placing an approximate two-inch thickness of stone cover, and (8) testing and operation of the groundwater treatment facility. The groundwater remedy consisted of pumping contaminated groundwater out of the aquifer, treating it through filtration, air stripping and carbon adsorption, and reinjecting it into the aquifer. The total flowrate through the treatment plant was generally on the order of 35 gallons per minute, pumped from three extraction wells.

On June 28, 2000, EPA, NYSDEC and USACE conducted a pre-final inspection, during which punch list items were identified. The punch list items were completed by URS in early September 2000. Completion of these items was verified during a September 19, 2000 final inspection. On September 22, 2000, the EPA issued a *Preliminary Close-Out Report.*[7] On May 15, 2001, EPA approved a *Remedial Action Report* signifying that the system was operational and functional.

In 2004, EPA procured an independent contractor to conduct a remediation system evaluation (RSE) of the site to recommend improvements in the remedy effectiveness, to achieve reductions in operations and maintenance (O&M) costs and to attain site closure. To decrease the time frame required to remediate the groundwater, the RSE contractor recommended directly addressing the remaining contamination located in the southwest corner of the site near monitoring well MW-4S where moderate levels of VOCs have been detected in the groundwater by augmenting the existing SVE remedy with a limited number of air sparging points. VOC concentrations in most wells have dropped steadily since the installation of the groundwater remedy, however, dissolved concentration of 1,1,1-trichloroethane at MW-4S has been recalcitrant and remain well above groundwater drinking water standards. Radian International operated the groundwater treatment plant from its initial start-up in June 2000 to August 2007 when the groundwater treatment system was shutdown. The system was shutdown after the VOC influent concentration dropped to less than 10 ppb so it would not interfere with remedial activity planned for the southwest corner of the property.

OU-1 - Source Control Remediation

Contaminated Soil Treatment

Between November 2005 and February 2008, EPA conducted soil and groundwater sampling to fully delineate the horizontal and vertical extent of contamination near monitoring well MW-4S. The results of the sampling showed that high levels of VOCs still remained in two distinct source areas/pockets; the major one underneath storm drain SD3 located in the southwest corner of the Site, and a smaller one underneath storm drain SD2 about 30 feet north of SD3.

The highest contaminant concentration found in the site soils was 21,900 parts per million of 1,1,1-trichloroethane which was detected below storm drain SD3 at a depth of approximately 15 feet in the unsaturated zone. Historically, the water table at the site has fluctuated between 25 and 30 feet below grade. More recently, the water table has fluctuated between 25 and 27 feet below grade. The highest contaminant concentration found in saturated soil below SD3 was 620 parts per million of TCA at a depth of 29 feet below grade. The three-dimensional extent of the contamination around SD3 has been determined to be "carrot shape", with the widest part of the contamination estimated to be no more than 30 feet in diameter starting at a depth of approximately 15 feet below grade and tapering to a depth of 90 feet below grade. The center of the contamination is estimated to be approximately 10 feet south of the storm drain opening (a 24 inch diameter grate) at SD3.

At storm drain SD2, the highest contaminant concentration found was 58 parts per million of 1,1,1-trichloroethane at a depth of 12 feet below grade. Tetrachloroethene in the same soil sample (from 12 feet below grade) was found to be 17 parts per million. However, at SD2, contaminant concentrations exceeding the soil cleanup criteria of 1 parts per million for 1,1,1-trichloroethane and 1.5 parts per million for tetrachloroethene were detected only between the depths of 12 to 16 feet below grade in unsaturated soil. At SD2, the horizontal extent of contamination is estimated to be no more than 20 feet in diameter.

The RD for the treatment system to address the contaminated area in the southwest corner of the site was performed by Lockheed in May 2007. On July 18, 2007, Miller Environmental was issued the contract by Lockheed to perform the construction of the remedy. The contract called for installing a single integrated groundwater circulating well with an in-well vapor stripping and soil vapor extraction (GCW/SVE) system.

The GCW/SVE system was installed to address the contaminated subsurface soils and groundwater located in the southwest corner of the site. The purpose of the GCW/SVE was to physically separate the contaminants from the soil and the groundwater in vapor form. The GCW/SVE well circulated the groundwater in the area around a stripping well to remove the contaminants from the saturated zone. Volatile contaminates in the groundwater were transferred from the dissolved phase through an air stripping process. Groundwater was not removed from the subsurface. The SVE system used in the vadose zone was located around the

well to separate the contaminants from the soil in vapor form (see Figure 1-3). Air contaminated with VOCs stripped from the groundwater and the unsaturated soils were pulled through the well and transported above ground to the on-site equipment trailer for treatment via carbon adsorption.

Initial site work was initiated on July 18, 2007 and included marking and measuring the system installation layout. Miller Environmental started major construction activities for the GCW/SVE system on July 31, 2007. The bottom of storm drain SD2 and SD3 were grouted with an approximate eight-inch thick layer of bentonite to prevent short-circuiting of air flow and to increase the radius and influence of the soil vapor extraction well. The rest of the storm drain, SD2 was then backfilled with clean fill material. SD3 was also backfilled with clean soil so the single subsurface GCW/SVE well could be installed below SD3, which had the highest level of soil contamination. The bottom of the GCW was completed at 70 feet below ground surface. A pipeline and electrical cables were installed to connect the well to a trailer located on-site, where contaminated vapors removed from the subsurface soil and groundwater were treated.

The trailer housed the accompanying above ground support components consisting of an air pump (to deliver clean air to the bottom of the well), a vacuum blower (to pull in-well and soil vapors), a water knock-out unit (with a water-level actuated condensate return pump), vapor phase granulated activated carbon (for the capture of the extracted VOCs) and a control panel (to automate operation of the system). Soil gas and additional groundwater monitoring wells were installed to monitor the cleanup progress of the GCW/SVE system. Vapor process samples were collected from four ports located inside the equipment trailer (influent, before first carbon, in-between carbons and effluent) and analyzed for VOCs to monitor the cleanup progress of the GCW/SVE. Construction of the GCW/SVE system was completed on December 11, 2007. Based on the results of baseline soil sampling conducted prior to the operation of the GCW/SVE system, the GCW/SVE system was augmented with the installation of three air sparging points to remediate the deeper soil contaminants starting in May 2008. Each air sparging point was screened from 97-100 feet and located approximately 7.5 feet from the GCW/SVE system. In August 2008, a bag filter was added on the condensate return line to remove suspended particulates prior to returning the collected condensate to the GCW/SVE system. In October 2009, a membrane nitrogen separator was added to supply the in-well air stripping unit of the GCW and the air sparging points with nitrogen instead of air in order to reduce the iron fouling of the well screens.

During the construction of the GCW/SVE system, an approximately 2 feet in diameter and 3 feet deep cave-in occurred approximately 15 feet north of the GCW/SVE system on February 2, 2008. Over the years, eroded soil was finding its way into the void spaces of the perforated dry well referred to as NDW1 or SD50, causing an ever widening void pocket immediately underneath the asphalt. On March 13, 2008, Lockheed personnel performed a geophysical investigation to determine if other underground structures exist at the Site. Based on the results of the geophysical investigation, Lockheed personnel used a backhoe to excavate in the areas identified as being an anomaly or a potential dry well during the week of October 8, 2008. In addition to NDW1, an additional drywell was uncovered, NDW2. Both NDW1 and NDW2 are

located along the western fence line. The diameter of the drywells is 10 feet, and the bottoms of the drywells are approximately 14.5 feet below ground surface. Both NDW1 and NDW2 did not contain soil in the drywells.

Since deep soil samples could not be collected from NDW1 and NDW2 without first filling in the drywells with clean soil, it was decided to remove two feet of soil from the bottom of the drywells before sampling as a precaution. After two feet of soil were removed, soil samples were collected from the bottom of the two drywells to the top of the water table, i.e. at 10-15', 17-20', 20-25' and 25-30' below ground surface at NDW1 and NDW2. No VOCs were detected in any of the eight soil samples.

On December 11, 2007, EPA and Lockheed conducted a final inspection of the GCW/SVE system. After changes were made to the system, EPA and Lockheed oversaw a 48-hour continuous performance test conducted by Miller Environmental to establish that the system was operational on March 5, 2008. During the performance test, the control panel and treatment train were monitored. On March 13, 2008, the GCW/SVE system started continuous operation; however, there was an extended shakedown period. Lockheed will operate the GCW/SVE system until the OU-I soil cleanup levels are achieved.

Building Demolition

The 1991 ROD required the Circuitron building to be decontaminated via vacuuming of dust containing elevated concentrations of inorganic elements and replacement of the concrete floor in the building. However, due to inclement weather during the 1992/1993 winter, the building had deteriorated markedly and a decision was made to demolish the building. EPA documented this change in the 1994 ROD.

ICF Corporation initiated the RD in June 1991 and completed it in September 1994. Sevenson initiated on-site remedial activities in May 1995.

Prior to the start of demolition work, a safety inspection of the building was conducted and no major problems were found regarding worker safety for the planned work. All drums left on-site containing waste derived from previous investigations were sampled and properly disposed of off-site. Asbestos and lead paint surveys were conducted to determine the extent of asbestos containing materials (ACM) and lead paint in the building. An asbestos survey conducted in 1995, indicated the presence of ACM including piping insulation, floor tiles, roofing and window glazing. All ACM was removed and disposed of appropriately.

The dust found in the plating room was vacuumed utilizing a HEPA filter. The dust was containerized, sampled, and disposed of off-site as nonhazardous waste.

Subsequent to the removal of all debris, drums, ACM and dust vacuumed from the plating room, building demolition was initiated. The building was demolished in the summer of 1996 by first removing the nonstructural walls (when the debris was removed), followed by the roof and then

the structural walls. The demolition material was segregated and disposed of as nonhazardous material at a nearby landfill, except for cinder blocks which were recycled. The final inspection of these activities was conducted in August 1996, and it was determined that Sevenson completed all material decontamination, ACM abatement, building demolition and waste disposal in accordance with the USACE Scope of Work and the OU-1 and OU-2 RODs. A *Remedial Action Report*, documenting the completion of the remedial action was approved on September 30, 1996.

Contaminated Sediment and Soil Removal

ICF Corporation completed the RD for contaminated sediment and soil removal in September 1994. The first action taken was to conduct a geoprobe soil sampling and analyses to determine the spatial extent of metal contamination and to define the cutlines for excavation activities. In September 1995, a geoprobe study was conducted and consisted of collecting a total of 179 soil samples from three different depths (5, 12 and 20 feet). The remedial action work sequence was as follows: (1) removal of building flooring, (2) removal of sediments from underground structures, (3) removal of unusable underground structures, (4) removal of soil surrounding the underground structures as necessary, and (5) site grading and removal of rolloff containers. In total, approximately 50 tons of contaminated sediments and 1200 tons of contaminated soils were removed. In addition, nine 55-gallon drums and four 750-gallon polyethylene tanks left on-site containing waste derived from previous investigations were sampled for full RCRA Toxicity Characteristics Leaching Procedure, PCB and RCRA characteristics and properly disposed of off-site.

These activities were initiated on November 10, 1996 and completed on December 20, 1996. The final inspection was conducted in January 1997, and it was determined that the remedial activities were completed in accordance with the USACE Scope of Work and the OU-1 ROD as modified by the OU-2 ROD. A *Remedial Action Report*, documenting the completion of the remedial action, was approved by EPA on March 31, 1997.

System Operation/Operation Maintenance

OU-2

EPA entered into an interagency agreement with USACE for implementation of the long-term response action (LTRA) activities for the groundwater pump and treat facility. USACE contracted with URS to conduct the LTRA activities in accordance with the September 2000 Operation and Maintenance Manual prepared by URS and approved by EPA. Annual O&M costs for OU-2 are shown in Table 2a and include the operation and maintenance of the air stripping facility by URS, sampling and monitoring efforts, utilities, repairs and USACE oversight costs. The primary activities associated with LTRA included the following:

- Conduct monthly sampling of plant influent and effluent and annual sampling of groundwater monitoring wells;

- Spray wash internals of air stripper twice a month;
- Inspect, maintain and lubricate motors and pumps and check blowers' air filters monthly;
- Clean-out all "Y" strainers on process pumps once a week;
- Periodically remove sludge manually from several key locations where the deposition of sludge impedes flow;
- Power wash plant floor and skids twice monthly;
- Test fire alarm system monthly;
- Inspect fire extinguishers, emergency lighting and eyewash station monthly;
- Inspect recovery well vaults once a week for accumulated water, and pump out water as needed;
- Verify daily that the high-level and low-level shut off switches for the reinjection trench are working properly;
- Verify daily that the motor control center and the alarm/control panel are working properly, and inspect and test audio dial-out system; and
- Change liquid and vapor carbons and filtration systems' filter bags as needed.

As previously mentioned, the groundwater pump and treat system was shutdown in August 2007. URS, however, still maintains the site and keeps the equipment functional by operating the equipment twice a month for a short period of time in the event groundwater cleanup objectives are not met with the completion of the soil remediation in the southwest corner of the site property.

OU-1

EPA procured Lockheed for implementation of the remedial activities for the GCW/SVE system. Lockheed contracted with Miller Environmental to conduct the remedial activities in accordance with the Technical Specifications and the Performance Sampling Plan. Annual O&M costs for OU-1 are shown in Table 2b and include the operation and maintenance of the GCW/SVE system, sampling and monitoring efforts, utilities and repairs. The primary activities associated with the remedial action include the following:

- Conduct system operation readings of injection and extraction flow rates and operating pressures/vacuum;
- Conduct system performance monitoring which involves the collection of groundwater levels at monitoring wells and subsurface vacuum readings at the soil vapor probes located near the GCW;
- Flush/clean out the condensate return well line to reduce sediment buildup and to prevent clogging of the return well line;
- Inspect condensate tank for sediment build-up;
- Inspect and replace filter bag on condensate return line;
- Collect soil vapor samples at influent, in-between carbons and after carbon units;
- Verify that the high-level, high high-level and low-level shut off switches for the condensate tank are working properly;
- Replace vapor-phase granular activated carbon as needed.

V. Progress Since the Last Five-Year Review

As part of the ongoing remedial action at the site, the previous Five-Year Review report recommended that the remedial action addressing the groundwater be continued, and the source of contamination in the vicinity of monitoring well MW-4S be removed. Construction of a GCW/SVE system was completed in December 2007, and remedial actions to address the remaining contaminated soil and groundwater in the southwest corner of the property are still being implemented.

VI. Five-Year Review Process

Administration Components

The five-year review team consisted of Sharon Trocher, EPA RPM, Rob Alvey, EPA Hydrogeologist, and Chuck Nace, EPA Risk Assessor. This is an EPA-lead site. EPA's contractor for OU-2 LTRA is USACE. USACE procured URS Corporation to implement the OU-2 LTRA. EPA procured Lockheed to implement the remedial action to address the remaining contamination in the southwest corner of the property.

Community Involvement

The EPA Community Relations Coordinator for the site, Cecilia Echols, had a notice published in a local newspaper, the *Farmingdale Observer,* on November 27, 2009, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review of the remedies for the site to ensure that the implemented remedies remain protective of public health and the environment and are functioning as designed. The notice also indicated that once the five-year review is completed, the results will be made available in the local site repository. The notice included the Remedial Project Manager's address and telephone for questions related to the five-year review process for the site. Additionally, a superfund community update, which provided a description of the past and the planned remedial work for the site and encouraged public participation, was mailed to local residents in June 2007. No responses were received from the public.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data (see Section XI).

Data Review

VOCs

The groundwater pump and treat facility was monitored to determine its performance and whether the treated groundwater met the requirements for reinjection back into the aquifer. Influent and effluent groundwater samples from the groundwater treatment facility were

collected and analyzed for VOCs and inorganics on a monthly basis since its startup in June 2000 until it was shutdown in August 2007. The performance monitoring data indicated that the influent exceeded the groundwater discharge criteria for site VOCs of concern while the treated effluent was below the groundwater discharge criteria for site-related VOCs. These results indicate that the air stripper was effectively treating the groundwater pumped from the extraction wells to applicable criteria. The total VOC concentrations detected in the plant influent have dropped considerably over time from approximately 50 to 60 parts per billion (ppb) to below 10 ppb. From June 2000 to August 2007, approximately 90 million gallons of groundwater have been treated at the facility.

Groundwater monitoring wells are monitored to determine whether the groundwater contamination plume is being captured and to determine the progress of groundwater restoration and compliance with the groundwater quality criteria. There are 19 monitoring wells that can be used for groundwater monitoring of the OU-2 remedy. Of the 19 monitoring wells, 12 wells are shallow and located in the site-related groundwater plume. Shallow monitoring wells are those wells screened in the shallow portion of the Upper Glacial aquifer that are approximately 30 to 40 feet deep. The seven deep monitoring wells are those wells screened in the deeper portion of the Upper Glacial aquifer or the shallow portion of the Magothy aquifer that are approximately 90 to 100 feet deep. These deep monitoring wells are screened below the site-related groundwater plume and are not currently used to monitor the site plume. From June 2000 to August 2003, groundwater samples were collected from each well quarterly for VOCs and semi-annually for inorganic analytes. Starting in 2003, well sampling was reduced to an annual frequency, and after 2003, groundwater samples were analyzed for VOCs only.

Based on the groundwater sampling results, it can be concluded that the concentrations of VOCs have decreased substantially from the shallow wells. The OU-2 ROD required treating only the upper 40 feet of the saturated Upper Glacial aquifer where site-related contamination was detected. Table 3 summarizes the total VOC concentrations detected in monitoring wells during the annual groundwater sampling events (see Figure 1-2 for locations of monitoring wells). The decrease in VOC concentrations detected in the monitoring wells can be attributed to the removal of contaminated soils from the site and to the ongoing groundwater remediation.

Soil sampling conducted in the southwest corner of the property near monitoring well MW-4S detected 1,1,1-trichloroethane at levels as high as 21,900 parts per million during sampling conducted in November 2005 and June 2006. As previously mentioned, a GCW/SVE system was constructed in the southwest corner of the property to address the remaining source area at the site. The SVE extraction airflow rate is approximate 300 standard cubic feet per minute. Lockheed visits the site on a weekly basis to monitor system performance of the GCW/SVE system. System performance monitoring include collecting groundwater levels measurements at the monitoring wells, soil gas process sampling around the carbon units, groundwater sampling, subsurface vacuum reading at the soil vapor monitoring probes and nitrogen injection and extraction flow rates and pressure/vacuum readings at the trailer. The subsurface vacuum levels observed at soil vapor probes installed up to 45 feet away from the SVE well are in excess of 0.1 inch of water column. A water vacuum of 0.1 inch of water column is used to define the capture

zone for a SVE system. The 45 feet radius of influence covers the remaining contaminated source area. Soil gas process influent samples collected during performance monitoring indicate that VOCs are being removed from the GCW/SVE system. Groundwater modeling of the GCW/SVE system indicates that the groundwater plume emanating from the remaining source area is being captured. Prior to shutting down the GCW/SVE system, soil sampling will be conducted to verify that the ROD soil cleanup levels have been achieved.

Inorganics

All site-related inorganic contaminants were detected below applicable criteria during the monthly sampling of the groundwater treatment facility influent and effluent. During the annual sampling of monitoring wells, chromium was the only site-related inorganic contaminant detected above groundwater drinking water standards on more than one occasion in any individual well. Elevated levels of chromium were detected in shallow monitoring wells MW-4S, MW-6S, MW-7S and MW-19S, with the on-site monitoring well MW-4S detected at the highest level (1,110 ppb in July 2001). Since June 2000, the chromium levels detected in the groundwater from the monitoring wells MW-4S, MW-6S, MW-7S and MW-19S have widely fluctuated or have shown relatively little change. Filtered groundwater samples collected from the monitoring wells in April 2003 revealed that the dissolved chromium concentrations were well below the groundwater drinking water standard; whereas, the total chromium concentrations (unfiltered groundwater samples) were above the standard. This indicates that colloid-sized particles (high turbidity in the samples) are contributing to chromium concentrations and that dissolved chromium is not an issue. EPA subsequently determined that inorganics were no longer a concern regarding groundwater cleanup at the site, and as such, annual monitoring for inorganics in groundwater was terminated in 2004.

Site Inspection

Site inspections were performed on October 26, 2009 and October 27, 2009. The following parties were in attendance:

Terrence Johnson, EPA/ERT - 10/27/2009
Sam Morales, URS - 10/26/2009
Dan Patel, Lockheed - 10/27/2009
Sharon Trocher, EPA - 10/26/2009 and 10/27/2009

During the site inspections, major problems or deviations from the on-going operation and maintenance activities being implemented at the site were not observed. Minor housekeeping deviations were observed, but have since been addressed. In addition, a perimeter evaluation and a driving tour of the surrounding area were conducted by Chuck Nace, EPA, and Urszula Filipowicz, EPA, on December 16, 2009.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

Yes. The primary objectives of the RODs are to remove the continuing sources of contamination into the groundwater, prevent potential future ingestion of site-related contaminated groundwater, restore the quality of the groundwater and mitigate the off-site migration of the site-related contaminated groundwater. EPA's review of site documents and the results of the past site inspections indicate that the groundwater treatment plant was functioning as intended by the OU 2 ROD until its shutdown in August 2007 when the influent VOC concentration dropped to below 10 ppb. The air stripper, which had a 99 percent design efficiency, was performing as designed as verified by review of the monthly sampling data collected since June 2000 from the plant influent and effluent. Additionally, the groundwater plume of contamination was effectively being captured as determined by groundwater water modeling of the groundwater treatment plant and by annual sampling and hydraulic monitoring of the groundwater monitoring wells. Additionally, by removing contaminated sediment and soil and the on-site building, major sources of contamination into the groundwater were removed. Based on soil sampling, the only remaining source of groundwater contamination is located in the southwest corner of the site. The GCW/SVE system and the gas sparging points are expected to remove this remaining groundwater contamination source and to treat the impacted groundwater. As indicated in recent groundwater modeling, the groundwater contamination plume emanating from the site is being captured by the GCW/SVE system. Based on groundwater monitoring data collected from the monitoring well network, the size of the groundwater contamination plume and the contamination levels of the plume have been greatly reduced as a result of the remedial actions conducted at the site. The subsurface vacuum levels observed at the soil vapor probes around the SVE system indicate that the capture zone covers the contaminated source area. When the remaining contamination at the site is addressed, soil sampling will be conducted to confirm meeting the ROD cleanup levels.

Question B: Are the (a) exposure assumptions, (b) toxicity data, (c) cleanup levels and (d) remedial action objectives used at the time of the remedy selection still valid?

Human Health

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The land use for the site is expected to remain industrial over the next five years, the period of time considered in this review. The land use considerations and potential exposure pathways considered in the baseline human health risk assessment are still valid.

As previously mentioned, the OU 2 ROD groundwater cleanup values are the groundwater drinking water standards. The OU 1 soil cleanup values are 1.5 parts per million for tetrachloroethene and 1.0 part per million for 1,1,1-trichloroethane. The groundwater and soil cleanup values are still protective of human health and the environment.

The evaluation of groundwater in this review focused on two primary exposure pathways, direct ingestion (as a potable water source) and the possibility of vapor intrusion into buildings constructed over the plume. The evaluation of the direct contact pathway showed that nearby residents are on public water supplies, and since they are not using the contaminated wells for drinking water purposes, there is no current exposure. In addition, the contaminated groundwater is being captured and treated. Therefore, the remedy is protective for the direct ingestion route of exposure. The groundwater remediation goals selected in the ROD were the Maximum Contaminant Levels (MCLs) and the MCLs remain protective.

The previous five-year review evaluated the exposure assumptions and toxicity data and indicated that the exposure assumptions and toxicity data were still valid. The exposure assumptions and toxicity data were reviewed as part of this five-year review and they remain valid at this time. The cleanup levels have not changed since the last five-year review and therefore are still valid. The remedial action objectives that were used at the time of the remedy are still valid.

The 2005 five-year review also evaluated the vapor intrusion pathway. A conclusion was reached that the vapor intrusion pathway was incomplete due to not having any buildings located within 100 feet of the highest detected concentration in shallow groundwater combined with concentrations of volatile organic compounds in the groundwater being either below screening criteria or less than 50 times the screening value. The most recent groundwater data was evaluated using the same criteria as the previous five-year review and it was concluded that the vapor intrusion pathway is not completed for the site. Given that there are still VOCs present in the groundwater, this pathway should be examined during the next five-year review to ensure that the vapor intrusion pathway is not an issue.

Ecological

The potential exposure routes of site contamination to terrestrial wildlife were considered during the remedial investigation. The 1991 ROD indicated that since 95 percent of the Circuitron Corporation site was paved or covered by a building and the Site was situated in a densely populated industrial/commercial area, there was little, or any, potential for exposure to contaminated soils or groundwater on-Site, or for wildlife to be present within the general vicinity of the Site. As a result, EPA concluded that conducting a detail ecological risk assessment was not warranted. The site visit performed in December of 2009 verified that the contaminants in the groundwater do not discharge to any surface water body, and the residual contamination in the subsurface soils are covered by clean fill and a building, therefore there are no current impacts to ecological receptors. In addition, the Site and surrounding area remain densely populated and the area is a heavily industrial/commercial area that does not provide habitat for ecological receptors. Thus, the conclusions that there is little or no potential for exposure to wildlife is still valid.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

There is no other information that calls into question the protectiveness of the remedies.

Technical Assessment Summary

According to the data reviewed and the site inspections, the remedies are functioning as intended in the RODs. There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedies. The cleanup levels cited in the RODs have not yet been met. The RAOs are still valid and are currently being addressed. The groundwater contamination plume is being contained and treated. The groundwater monitoring wells are functional, and the annual groundwater sampling data from these wells indicate that the size of the groundwater plume and the site-related VOC groundwater contamination levels are considerably less than they were in June 2000.

Currently, there is no human or environmental exposure to, or ingestion of, contaminated groundwater and soil, and no exposures expected during the next five years. Except for the remaining soil contamination located in the southwest corner of the property, the potential impacts of contaminated soil on groundwater were addressed under OU 1 through removal of the contaminated soil and sediment at the site. The soil contaminated with VOCs in the vadose zone located in the southwest corner of the property is currently being remediated via SVE. The groundwater contamination and the contaminated soil in the saturated zone are being addressed through a combination of in-well vapor stripping and gas sparging to reduce the levels of contamination to groundwater drinking water standards. The community is serviced by public water that meets groundwater drinking water standards, and the pathway of potential exposure if no public water supply were available has been interrupted. Site remedial action at the site is ongoing and is expected to fully protect human health and the environment when it is completed.

VIII. Issues, Recommendations and Follow-Up Actions

Treatment of the soil and groundwater until the remedial action objectives are met is part of the ongoing remedial action at this site. Contaminated soil located in the southwest corner of the property is the only remaining source area at the site. The cleanup of the groundwater and soil in the southwest corner of the property needs to be continued. The remedial remedies include ongoing operation, maintenance and monitoring activities.

This report did not identify any issue or make any recommendation for the protection of public health and/or the environment which was not included or anticipated by the decision documents.

IX. Protectiveness Statement

The OU-1 and OU-2 remedial actions will restore soil and groundwater to allow for unlimited use without restriction. The implemented remedy for OU-1 and OU-2 protects human health and the environment because there are no exposure pathways that could result in unacceptable risks

and none expected during remediation as long as the soils and groundwater continue to be remediated and monitored. Because all OUs are protective, the site is protective of human health and the environment.

X. Next Review

The next five-year review for the Circuitron Corporation Superfund site will be completed within five years from the date of this review.

Approved by: Date:

April 5, 2010

Walter E. Mugdan, Director
Emergency and Remedial Response Division
U.S. Environmental Protection Agency

XI. Bibliography for Circuitron Corporation Superfund Site

1. On-Scene Coordinator's Report, U.S. Environmental Protection Agency, February 1990
2. Record of Decision, U.S. Environmental Protection Agency, March 1991
3. Record of Decision, U.S. Environmental Protection Agency, September 1994
4. Remedial Action Report Building Demolition, U.S. Environmental Protection Agency, September 1996
5. Remedial Action Report Contaminated Soil/Sediment Remediation, U.S. Environmental Protection Agency, March 1997
6. Preliminary Site Close-Out Report, U.S. Environmental Protection Agency, September 2000
7. Remedial Action Report Groundwater Treatment System, Radian International, April 2001
8. Comprehensive Five-Year Review Guidance, U.S. Environmental Protection Agency, EPA 540-R-01-007, June 2001
9. Monthly Progress Reports, URS Corporation, August 2005 through December 2009
10. Annual Performance Monitoring Reports, URS Corporation, September 2005, October 2006, December 2007, December 2008 and January 2010
11. Streamlined Remediation System Evaluation (RSE-Lite), GeoTrans, Inc., February 2005
12. Investigation of a Chlorinated Source at the Circuitron Site, Lockheed Martin Technology Services, April 2006
13. Assessment of Chlorinated Hydrocarbon Source and Remedy Evaluation of the Circuitron Site, Lockheed Martin Technology Services, October 2006
14. Quarterly Progress Reports, URS Corporation, May 2007 and October 2007
15. Geophysical Survey, Circuitron Site, Farmingdale, New York, Work Assignment # 0-132, Technical Memorandum, Lockheed Martin Technology Services, May 2008
16. Quarterly Progress Reports, Lockheed Martin, 2009 2nd Quarterly Report, 2009 3rd Quarterly Report and 2009 4th Quarterly Report

17. Analytical Results of the Baseline Soil Gas and Soil Investigation at the Circuitron Site, East Farmingdale, Long Island, New York, WA#0-022, Technical Memorandum: Appendix D, Lockheed Martin, January 2010

18. Installation of the Groundwater Circulation Well (GCW) and Temporary Well Points, Aquifer Testing, and Analytical Results of the Baseline Groundwater Sampling Event, Circuitron Site, East Farmingdale, Long Island, New York, WA#0-022, Technical Memorandum: Appendix E, Lockheed Martin, January 2010

19. Investigation and Closeout of Buried Dry Wells at the Circuitron Site, East Farmingdale, New York, Seras WA#022, Technical Memorandum, Lockheed Martin, February 2010

20. Remedial Alternatives Assessment for Residual Source Contamination Treatment at the Circuitron Site, East Farmingdale, New York WA#0-022, Technical Memorandum, Technical Memorandum, Lockheed Martin, February 2010

21. Rehabilitation of the Groundwater Circulation Well, Circuitron Site, East Farmingdale, New York WA#0-022, Technical Memorandum, Technical Memorandum: Appendix I, Lockheed Martin, February 2010

22. Conceptual Site Model and Groundwater Flow Model of the Pilot Source Treatment System (PSTS) at the Circuitron Site, East Farmingdale, Long Island, New York Work Assignment #0-022, Technical Memorandum, Technical Memorandum: Appendix K, Lockheed Martin, February 2010

Table 1: Chronology of Site Events

Event	Date
Removal activities - chemical containers and storage tanks	1987
Removal activities - drums, aboveground tanks, underground storage tanks and treatment basins.	1988-1989
Final listing on EPA National Priorities List	3/31/1989
RI/FS completed - Source Areas	1/1991
ROD selecting source control remedy signed	3/29/1991
RD approved for source control remedy	9/30/1994
RI/FS completed – Groundwater	5/25/1994
ROD selecting groundwater remedy signed	9/30/1994
Superfund State Contract signed	10/7/1994
Start of building demolition - OU-1	5/15/1995
Completion of building demolition - OU-1	8/8/1996
Remedial Action Report approved for building demolition	9/30/1996
RD approved for groundwater remedy - OU-2	9/30/1996
Start of contaminated soil/sediment remediation (except contaminated soil/sediment in the southwest corner of the site property) - OU-3	11/10/1996
Completion of contaminated soil/sediment remediation (except in the southwest corner of the site property) - OU-3	1/24/1997
Remedial Action Report approved for contaminated soil/sediment remediation except in the southwest corner of the site property)- OU-3	3/31/1997
Start of construction of groundwater pump and treat facility- OU-2	9/20/1999
Completion of construction of groundwater remedy - OU-1	6/30/2000
Final inspection of groundwater pump and treat facility	9/19/2000
Preliminary Close-Out Report approved	9/22/2000
Interim Remedial Action Report approved for groundwater remedy - OU-1	5/15/2001
OU1 RD submitted for the GCW/SVE system	5/9/2007
Start of construction of the GCW/SVE system	7/31/2007
Shutdown of the groundwater pump and treat facility	8/22/2007
Final inspection of the GCW/SVE system with EPA, Lockheed and Martin Environmental	12/11/2007
Start of operation of the GCW/SVE system	3/5/2008

Table 1: Chronology of Site Events	
Event	**Date**
Shut down of the GCW/SVE system to collect groundwater and soil gas samples and to install additional groundwater monitoring wells and soil vapor probes	4/28/2008
Start of installation of the three gas sparging points	5/28/2008
Finish installation of the three gas sparging points	7/9/2008
Start up of the GCW/SVE system	8/11/2008
Removed 2 feet of soil from drywells NDW1 and NDW2	12/9-10/2008

Table 2a: Annual System Operations/O&M Costs for LTRA, OU-2

Dates		Total Cost rounded to nearest $1,000
From	To	
6/2000	12/2000	$288,000
1/2001	12/2001	$479,000
1/2002	12/2002	$455,000
1/2003	12/2003	$439,000
1/2004	12/2004	$429,000
1/2005	12/2005	$541,000
1/2006	12/2006	$554,000
1/2007	12/2007	$376,000[a]
1/2008	12/2008	$88,000[a]
1/2009	12/2009	$158,000[a]

[a] Groundwater pump and treat facility was shutdown on August 27, 2007. O&M costs include URS and USACE costs. After August 27, 2007, URS O&M costs included inspecting, maintaining and "exercising" mechanical equipment every two weeks; paying utility bills; disposing used filter bags; and conducting site maintenance and repairs. USACE costs included conducting oversight activities and awarding contracts to URS.

Table 2b - Annual System Operations/O&M Costs for Southwest Corner

Dates		Total Cost rounded to nearest $1,000
From	To	
3/2008	9/2008	$90,000
10/2008	9/2009	$155,000

Table 3: Total Volatile Organic Compound Concentrations*

(Page 1 of 2)

Monitoring Well	Bottom of Well Screen (ft-bgs)	July 2009	July 2008	August 2007	July 2006	June 2005	June 2004	April 2003	Jul - Aug 2002	Jan - Feb 2002	Oct 2001	Jul - Aug 2001
MW-1S	34.78	0.74	ND	ND	ND	ND	ND	5	ND	8	4	56
MW-3S	37.62	1.8	ND	ND	ND	2	2	4	[a]4	6	8	8
MW-4S	27.7	122.7[b]	200	346.6	314.4	[a]89	[a]239	219	NS	347	328	93
MW-6S	33.72	ND	ND	ND	ND	16	[a]25	19	NS	64	107	[a]112
MW-7S	36.45	ND	ND	ND	ND	1	ND	ND	NS	NS	11	ND
MW-13	39.90	ND	4.6	11.5	ND	ND	[a]10	34	[a]14	35	31	41
MW-14	41.30	ND	ND	1.3	1.3	ND	[a]3	6	1	21	15	14
MW-15	39.00	0.20	ND	ND	ND	ND	ND	ND	ND	[a]2	5	ND
MW-16	39.80	ND	ND	ND	ND	ND	ND	ND	ND	3	1	ND
MW-17	40.00	25.1[c]	27.4	ND	ND	ND	ND	4	8	26	32	14
MW-18	39.50	ND	ND	ND	ND	5	ND	ND	ND	ND	10	[a]ND
MW-19S	52.70	1.2	ND	ND	ND	ND	ND	10	5	5	16	13

All concentrations in ug/L
ND: no VOCs detected
ft-bgs - feet below ground surface

[a]Values are the arithmetic mean of normal and duplicate samples. For June 2004, values are the arithmetic mean of multiple bag samples, and values are arithmetic mean of bag samples, duplicates, and low flow samples for MW-4S and MW-19D.
[b]MW-4S - 1,1,1-Trichloroethane was detected at 120 ppb. All other VOCs were detected below MCLs.
[c]MW-17 - 1,1,1-Trichloroethane was detected at 8.1 ppb. 1,1-Dichloroethane was detected at 17 ppb. All other VOCs were detected below MCLs.

*The January 2010 Annual Performance Monitoring Report, Appendix A-2 contains the concentration of each analyte detected in the groundwater during all sampling events.

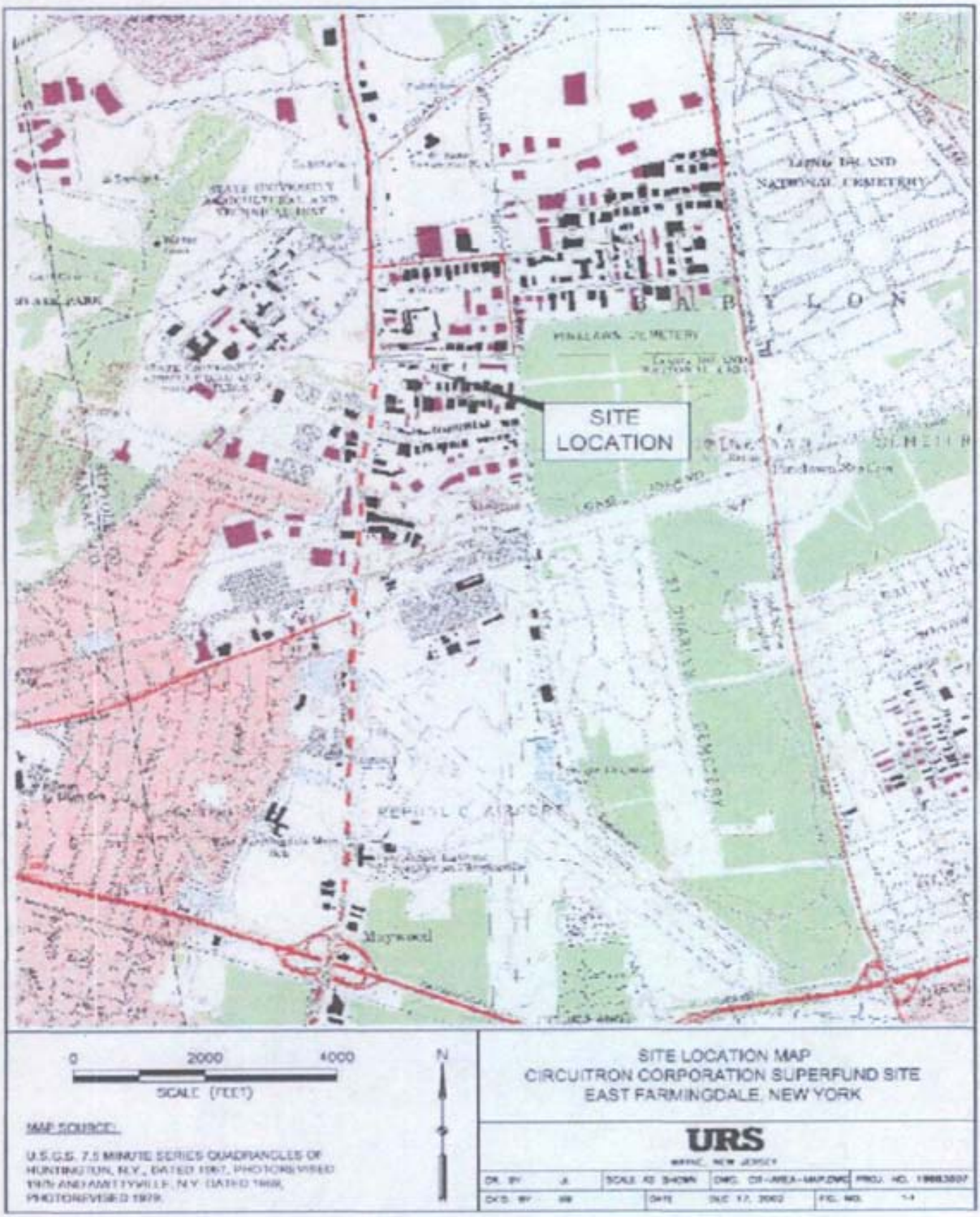
Table 3: Total Volatile Organic Compound Concentrations*
(Page 2 of 2)

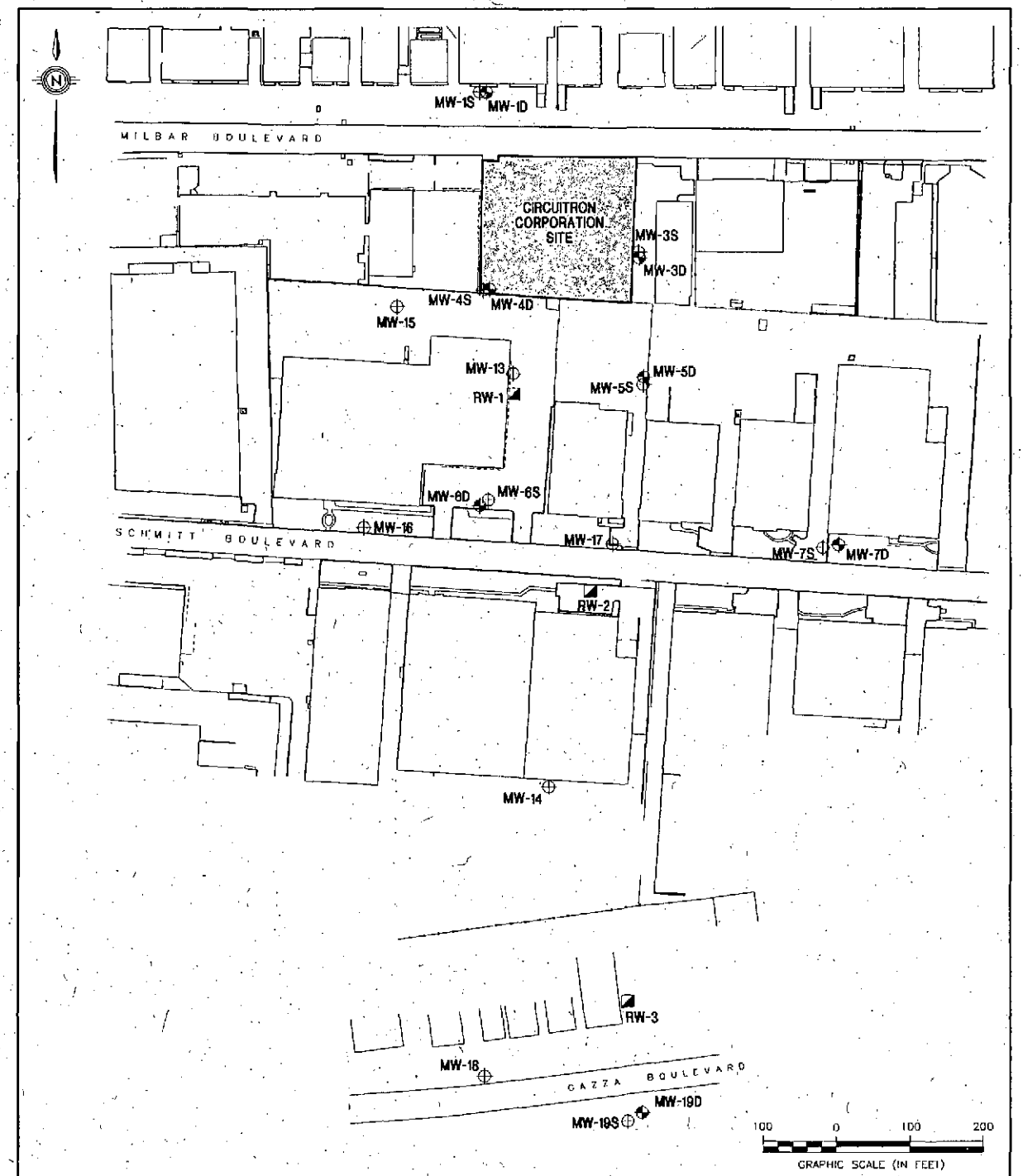
Monitoring Well	Bottom of Well Screen (ft-bgs)	Apr - May 2001	Jan - Feb 2001	Oct 2000	June 2000						
MW-1S	34.78	ND	5	ND	16						
MW-3S	37.62	7	5	13	20						
MW-4S	27.7	279	720	915	1155						
MW-6S	33.72	89	119	374	15						
MW-7S	36.45	ND	[a]2	[a]2	ND						
MW-13	39.90	47	124	397	154						
MW-14	41.30	13	17	10	30						
MW-15	39.00	29	[a]35	[a]1	68						
MW-16	39.80	[a]ND	ND	ND	ND						
MW-17	40.00	11	37	71	44						
MW-18	39.50	13	13	ND	ND						
MW-19S	52.70	14	21	34	17						

All concentrations in ug/L
ND: no VOCs detected
ft-bgs - feet below ground surface

[a]Values are the arithmetic mean of normal and duplicate samples. For June 2004, values are the arithmetic mean of multiple bag samples, and values are arithmetic mean of bag samples, duplicates, and low flow samples for MW-4S and MW-19D.
[b]MW-4S - 1,1,1-Trichloroethane was detected at 120 ppb. All other VOCs were detected below MCLs.
[c]MW-17 - 1,1,1-Trichloroethane was detected at 8.1 ppb. 1,1-Dichloroethane was detected at 17 ppb. All other VOCs were detected below MCLs.

*The January 2010 Annual Performance Monitoring Report, Appendix A-2 contains the concentration of each analyte detected in the groundwater during all sampling events.


SITE
LOCATION
0
2000
4000
SCALE (FEET)
N
MAP SOURCE:
U.S.G.S. 7.5 MINUTE SERIES QUADRANGLES OF
HUNTINGTON, N.Y., DATED 1967, PHOTOREVISED
1979 AND AMITYVILLE, N.Y. DATED 1968,
PHOTOREVISED 1979.
SITE LOCATION MAP
CIRCUITRON CORPORATION SUPERFUND SITE
EAST FARMINGDALE, NEW YORK
URS
WAYNE, NEW JERSEY
DR. BY J.
SCALE AS SHOWN
DWG. CR-AREA-MAP.DWG
PROJ. NO. 19663007
CKD. BY
DATE DEC 17, 2002
FIG. NO. 1-1



LEGEND

- SHALLOW MONITORING WELL
- DEEP MONITORING WELL
- RECOVERY WELL

Site Map

Circuitron Corporation Superfund Site
East Farmingdale, New York

URS

FILENAME: CIR-SITE-MAP.DWG	DATE: 4-29-03	FIGURE #: 1-2

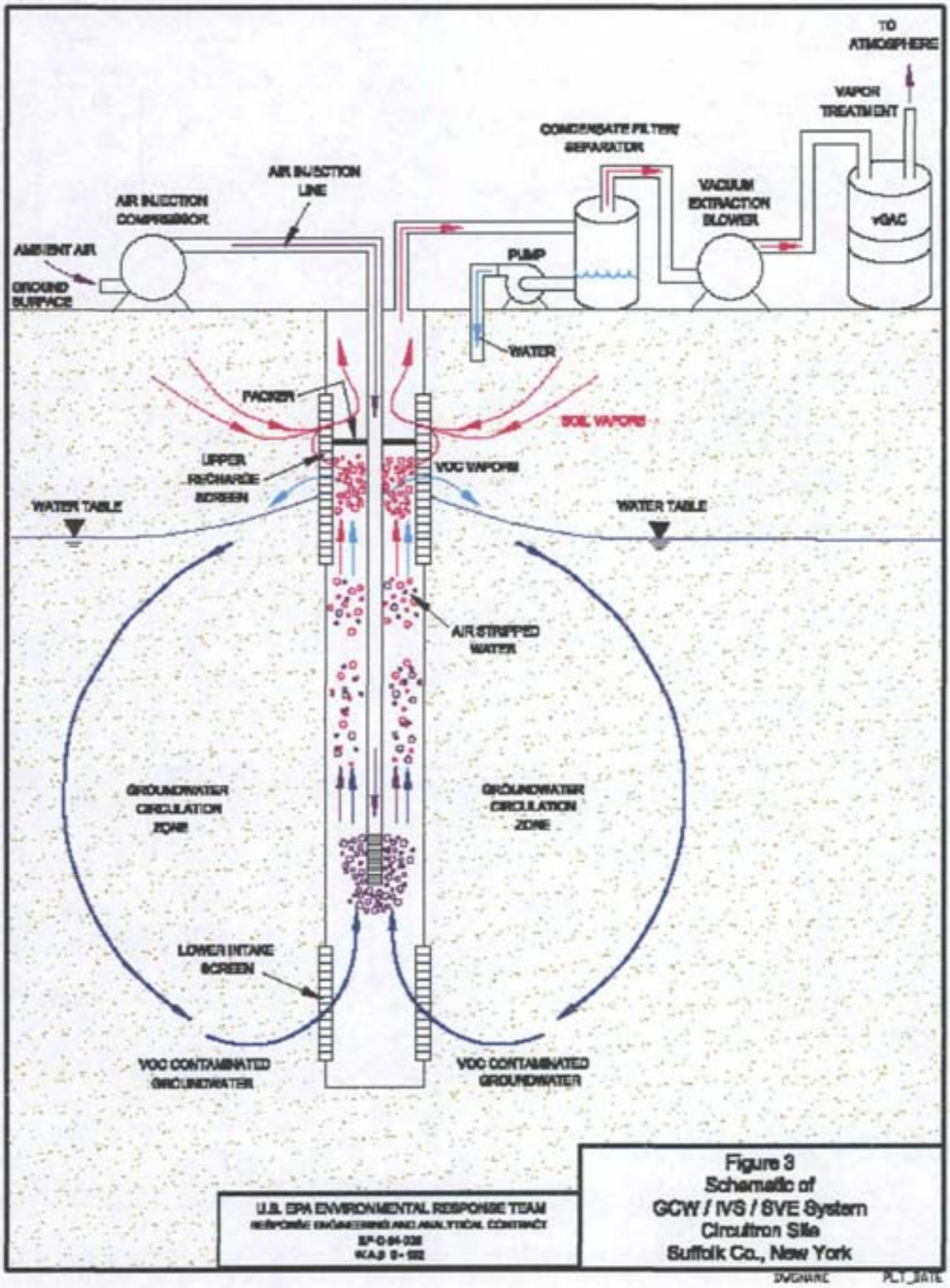


Figure 1-3 - Schematic of GCW/IVS/SVE System